

# Easergy MiCOM C434

**Bay Unit for Control and Monitoring**

**C434/EN M/R-g8-B**

Version C434 -309 -416/417/418 -671

Technical Manual

Volume 1 of 2



#### *General Note on the PDF Version of this Technical Manual*

All entries in the Table of Contents and all cross-references to other sections, figures etc. in green letters are hyperlinks, i.e. by a single mouse click on the reference one can navigate directly to the referenced part of the manual.

In the Adobe Reader (or the Acrobat Pro), one can return back to the previous view by using the menu point *View / Page Navigation / Previous View* (keyboard shortcut: ALT + Left cursor key). (It might be necessary to do this several times, if the view at the target location has also been changed (e.g. by scrolling or changing the zoom setting)).





## IMPORTANT INFORMATION

### NOTICE:

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in death or serious injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to a potential personal injury hazard. Obey all safety messages that follow this symbol to avoid possible injury or death.

### DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

### WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, can result in death or serious injury.

### CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury with or without equipment damage.

### NOTICE

NOTICE, used without safety alert symbol, indicates a potentially hazardous situation which, if not avoided, can result in equipment damage.

When electrical equipment is in operation, dangerous voltage will be present in certain parts of the equipment.

  **DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Only qualified personnel, trained, authorized and familiar with the device and all the safety instructions in the general Safety Guide (SFTY/5LM/L11 or later version) and appropriate Chapter 5, Chapter 10, Chapter 11, Chapter 12 and Chapter 13 of this manual, shall work on installation, connection, commissioning, maintenance or servicing of this device.

Failure to follow these instructions will result in death or serious injury.

  **DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Switch off the auxiliary power supply before any work in the terminal strip area.
- Switch off all the power supplies in connection to the equipment before any work in the terminal strip area to isolate the device.
- Do not touch the terminal strip area when equipment is in operation.
- Do not remove or add wires in the terminal strip area when equipment is in operation.
- Short-circuit the system current transformers before disconnecting wires to the transformer board (valid only for pin terminals, not required for ring terminals which have a shortening block).
- A protective conductor (ground/earth) of at least 1.5 mm<sup>2</sup> must be connected to the protective conductor terminal on the power supply board and on the main relay case.
- Do never remove the protective conductor connection to the device casing as long as other wires are connected to it.
- Where stranded conductors are used, insulated crimped wire end ferrules must be employed.

Failure to follow these instructions will result in death or serious injury.

Note: Regarding the appropriate wiring connections of the equipment refer to the document Px3x\_Grounding\_Application\_Guide\_EN\_h.pdf.

The signals MAIN: Blocked/faulty and SFMON: Warning (LED) are permanently assigned to the LEDs labeled OUT OF SERVICE and ALARM and can be assigned to output relays to indicate the health of the device.

It is recommended that the signals MAIN: Blocked/faulty and SFMON: Warning (LED) are communicated to the substation automation system for alarm purposes, using hardwiring via output relays or the communication interface.

## WARNING

### HAZARD OF UNSAFE OPERATION

- Only qualified personnel, trained, authorized and familiar with the device and all the safety instructions in the general Safety Guide (SFTY/5LM/L11 or later version) and appropriate Chapter 5, Chapter 10, Chapter 11, Chapter 12 and Chapter 13 of this manual, shall work on installation, connection, commissioning, maintenance or servicing of this device.
- Proper and safe operation of this device depends on appropriate shipping and handling, proper storage, installation and commissioning, and on careful operation, maintenance and servicing. For this reason only qualified personnel shall work on or operate this device.
- Any modifications to this device must be in accordance with the manual. If any other modification is made without the express permission of Schneider Electric, it will invalidate the warranty, and may render the product unsafe.

Failure to follow these instructions can result in unintended equipment operation.

## DANGER

### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

In case of usage of the equipment with DHMI\*:

- A protective conductor (ground/earth) of at least 1.5 mm<sup>2</sup> (US: AWG14 or thicker) must be connected to the DHMI protective conductor terminal to link the DHMI and the main relay case; these must be located within the same substation.
- The DHMI communication cable must not be in contact with hazardous live parts.
- The DHMI communication cable must not be routed or placed alongside high-voltage cables or connections. Currents can be induced in the cable which may result in electromagnetic interference.
- We recommend to use only cables of category CAT6 (or better), which has been tested up to a length of 10 m.

Failure to follow these instructions will result in death or serious injury.

\* DHMI = Detachable Human Machine Interface



*Changes after going to press*



## Table of Contents

|          |                                                      |            |
|----------|------------------------------------------------------|------------|
| <b>1</b> | <b>Application and Scope .....</b>                   | <b>1-1</b> |
| 1.1      | Overview .....                                       | 1-1        |
| 1.1.1    | Design .....                                         | 1-3        |
| 1.2      | Including Function Groups in the Configuration ..... | 1-4        |
| 1.3      | Overview of Function Groups – Part 1 .....           | 1-5        |
| 1.4      | Overview of Function Groups – Part 2 .....           | 1-7        |
| 1.5      | Control Functions .....                              | 1-9        |
| 1.6      | Inputs and Outputs .....                             | 1-10       |
| 1.7      | Control and Display .....                            | 1-11       |
| 1.8      | Information Interfaces .....                         | 1-12       |
| <b>2</b> | <b>Technical Data .....</b>                          | <b>2-1</b> |
| 2.1      | Conformity .....                                     | 2-1        |
| 2.2      | General Data .....                                   | 2-2        |
| 2.2.1    | General Device Data .....                            | 2-2        |
| 2.3      | Tests .....                                          | 2-4        |
| 2.3.1    | Type Tests .....                                     | 2-4        |
| 2.4      | Environmental Conditions .....                       | 2-9        |
| 2.5      | Inputs and Outputs .....                             | 2-10       |
| 2.5.1    | Measuring Inputs .....                               | 2-10       |
| 2.5.2    | Binary Signal Inputs .....                           | 2-11       |
| 2.5.3    | IRIG-B Interface .....                               | 2-12       |
| 2.5.4    | Direct Current Input .....                           | 2-12       |
| 2.5.5    | Resistance Thermometer .....                         | 2-12       |
| 2.5.6    | Direct Current Output .....                          | 2-12       |
| 2.5.7    | Output Relays .....                                  | 2-13       |
| 2.5.8    | BCD Measured Data Output .....                       | 2-13       |
| 2.6      | Interfaces .....                                     | 2-14       |
| 2.6.1    | Local Control Panel .....                            | 2-14       |
| 2.6.2    | PC Interface .....                                   | 2-14       |
| 2.6.3    | Serial Communication Interface .....                 | 2-14       |
| 2.6.4    | Ethernet Communication Interface .....               | 2-15       |
| 2.6.5    | Fiber Optic budget calculations .....                | 2-16       |
| 2.6.6    | IRIG-B Interface .....                               | 2-17       |
| 2.7      | Information Output .....                             | 2-18       |
| 2.8      | Deviations .....                                     | 2-19       |
| 2.8.1    | Deviations of the Operate Values .....               | 2-19       |
| 2.8.2    | Deviations of Measured Data Acquisition .....        | 2-20       |
| 2.9      | Recording Functions .....                            | 2-21       |
| 2.9.1    | Organization of the Recording Memories .....         | 2-21       |
| 2.10     | Power Supply .....                                   | 2-22       |
| 2.11     | Current Transformer Specifications .....             | 2-23       |
| 2.11.1   | Symbols .....                                        | 2-23       |
| 2.11.2   | General Equations .....                              | 2-24       |
| <b>3</b> | <b>Operation .....</b>                               | <b>3-1</b> |
| 3.1      | Modular Structure .....                              | 3-1        |
| 3.2      | Operator-Machine Communication .....                 | 3-3        |

|         |                                                                                                     |       |
|---------|-----------------------------------------------------------------------------------------------------|-------|
| 3.3     | Cyber Security (Function Group CS) .....                                                            | 3-4   |
| 3.3.1   | Users, Roles and Rights for Easergy MiCOM P30 .....                                                 | 3-5   |
| 3.3.2   | Cyber Security Types and Communication Protocols (Based on Order Number) .....                      | 3-6   |
| 3.3.3   | Cyber Security Password Policy Recommendation .....                                                 | 3-8   |
| 3.4     | Configuration of the Local Control Panel (Function Group LOC) .....                                 | 3-10  |
| 3.4.1   | Bay Panel .....                                                                                     | 3-11  |
| 3.4.2   | Bay Panel .....                                                                                     | 3-13  |
| 3.4.3   | Signal Panel .....                                                                                  | 3-15  |
| 3.4.4   | Operation Panel .....                                                                               | 3-16  |
| 3.4.5   | Fault Panel .....                                                                                   | 3-17  |
| 3.4.6   | Selection of the Control Point .....                                                                | 3-18  |
| 3.4.7   | Configurable Clear Key .....                                                                        | 3-18  |
| 3.5     | Communication Interfaces .....                                                                      | 3-19  |
| 3.5.1   | PC Interface (Function Group PC) .....                                                              | 3-20  |
| 3.5.2   | Communication Interface 1 (Function Group COMM1) .....                                              | 3-21  |
| 3.5.3   | Communication Interface 2 (Function Group COMM2) .....                                              | 3-29  |
| 3.5.4   | Communication Interface Ethernet (Function Groups IEC, GOOSE and VINP) .....                        | 3-37  |
| 3.5.5   | Communication Interface Serial and Ethernet in Parallel .....                                       | 3-61  |
| 3.6     | IRIG-B Clock Synchronization (Function Group IRIGB) .....                                           | 3-62  |
| 3.7     | Configurable Function Keys (Function Group F_KEY) .....                                             | 3-63  |
| 3.8     | Configuration and Operating Mode of the Binary Inputs (Function Group INP) .....                    | 3-65  |
| 3.9     | Measured Data Input (Function Group MEASI) .....                                                    | 3-67  |
| 3.9.1   | Direct Current Input on the Analog (I/O) Module Y .....                                             | 3-68  |
| 3.9.2   | Connecting a Resistance Thermometer to the "PT 100 Analog Input" on the Analog (I/O) Module Y ..... | 3-71  |
| 3.10    | Configuration, Operating Mode, and Blocking of the Output Relays (Function Group OUP) .....         | 3-73  |
| 3.11    | Measured Data Output (Function Group MEASO) .....                                                   | 3-75  |
| 3.11.1  | General Settings .....                                                                              | 3-75  |
| 3.11.2  | BCD Measured Data Output .....                                                                      | 3-77  |
| 3.11.3  | Analog Measured Data Output .....                                                                   | 3-80  |
| 3.11.4  | Output of "External" Measured Data .....                                                            | 3-86  |
| 3.12    | Configuration and Operating Mode of the LED Indicators (Function Group LED) .....                   | 3-87  |
| 3.12.1  | Layout of the LED indicators .....                                                                  | 3-87  |
| 3.12.2  | Configuring the LED Indicators .....                                                                | 3-87  |
| 3.12.3  | Operating Mode of the LED Indicators .....                                                          | 3-88  |
| 3.13    | Main Functions of the C434 (Function Group MAIN) .....                                              | 3-91  |
| 3.13.1  | Conditioning of the Measured Variables .....                                                        | 3-91  |
| 3.13.2  | Operating Data Measurement .....                                                                    | 3-94  |
| 3.13.3  | Configuring and Enabling the Device Functions .....                                                 | 3-106 |
| 3.13.4  | Function Blocks .....                                                                               | 3-107 |
| 3.13.5  | Blocked/Faulty .....                                                                                | 3-108 |
| 3.13.6  | Multiple Signaling .....                                                                            | 3-108 |
| 3.13.7  | CB Trip Signal .....                                                                                | 3-110 |
| 3.13.8  | Communication Error .....                                                                           | 3-111 |
| 3.13.9  | Time Tagging and Clock Synchronization .....                                                        | 3-111 |
| 3.13.10 | Resetting Actions .....                                                                             | 3-114 |
| 3.13.11 | Assigning Communications Interfaces to Physical Communications Channels .....                       | 3-116 |
| 3.13.12 | Test Mode .....                                                                                     | 3-117 |
| 3.14    | Parameter Subset Selection (Function Group PSS) .....                                               | 3-118 |
| 3.15    | Self-Monitoring (Function Group SFMON) .....                                                        | 3-120 |
| 3.15.1  | Tests During Start-up .....                                                                         | 3-120 |
| 3.15.2  | Cyclic Tests .....                                                                                  | 3-120 |
| 3.15.3  | Signals .....                                                                                       | 3-120 |



|         |                                                                                         |       |
|---------|-----------------------------------------------------------------------------------------|-------|
| 3.15.4  | Device Response .....                                                                   | 3-121 |
| 3.15.5  | Monitoring Signal Memory .....                                                          | 3-122 |
| 3.15.6  | Monitoring Signal Memory Time Tag .....                                                 | 3-122 |
| 3.16    | Operating Data Recording (Function Group OP_RC) .....                                   | 3-123 |
| 3.17    | Monitoring Signal Recording (Function Group MT_RC) .....                                | 3-124 |
| 3.18    | Fault Recording (Function Group FT_RC) .....                                            | 3-125 |
| 3.18.1  | Start of Fault Recording .....                                                          | 3-125 |
| 3.18.2  | Time Tagging .....                                                                      | 3-125 |
| 3.18.3  | Fault Recordings .....                                                                  | 3-126 |
| 3.18.4  | Fault Value Recording .....                                                             | 3-127 |
| 3.19    | Automatic Synchronism Check (Function Group ASC) .....                                  | 3-129 |
| 3.19.1  | Disabling and Enabling the ASC Function .....                                           | 3-133 |
| 3.19.2  | ASC Readiness and Blocking .....                                                        | 3-134 |
| 3.19.3  | Close Request .....                                                                     | 3-135 |
| 3.19.4  | Extended Settings for the Close Enable Conditions .....                                 | 3-138 |
| 3.19.5  | Considering the CB Close Time .....                                                     | 3-141 |
| 3.19.6  | ASC Operating Modes .....                                                               | 3-141 |
| 3.19.7  | Testing the ASC Function .....                                                          | 3-148 |
| 3.19.8  | Integrating the ASC Function into the Control and Monitoring of Switchgear Units .....  | 3-149 |
| 3.19.9  | Measured Values Obtained by ASC .....                                                   | 3-150 |
| 3.19.10 | ASC Counters .....                                                                      | 3-150 |
| 3.20    | Limit Value Monitoring (Function Group LIMIT) .....                                     | 3-152 |
| 3.20.1  | Enable/Disable the Limit Value Monitoring Function .....                                | 3-152 |
| 3.20.2  | Monitoring the Linearized Measured DC Values .....                                      | 3-152 |
| 3.20.3  | Monitoring the Measured "PT 100" Temperature Value .....                                | 3-153 |
| 3.21    | Limit Value Monitoring of Currents and Voltages (Function Groups LIM_1 and LIM_2) ..... | 3-154 |
| 3.21.1  | Enabling or disabling limit value monitoring .....                                      | 3-154 |
| 3.21.2  | Monitoring Phase Currents and Phase Voltages .....                                      | 3-154 |
| 3.21.3  | Monitoring the Neutral Displacement Voltage .....                                       | 3-157 |
| 3.21.4  | Monitoring the Reference Voltage (LIM_1 only) .....                                     | 3-158 |
| 3.22    | Programmable Logic (Function Groups LOGIC and LOG_2) .....                              | 3-159 |
| 3.23    | Control and Monitoring of Switchgear Units (Function Groups DEV01 to DEV24) ...         | 3-167 |
| 3.23.1  | Bay Type Selection .....                                                                | 3-167 |
| 3.23.2  | Enable for Switch Commands Issued by the Control Functions .....                        | 3-170 |
| 3.23.3  | Designation of External Devices .....                                                   | 3-172 |
| 3.23.4  | Defining a Bay Panel Type .....                                                         | 3-172 |
| 3.23.5  | Processing Status Signals from Manually Operated Switchgear Units .....                 | 3-174 |
| 3.23.6  | Functional Sequence for Controllable Switchgear Units .....                             | 3-175 |
| 3.23.7  | Direct Motor Control .....                                                              | 3-186 |
| 3.24    | Interlocking Logic (Function Group ILOCK) .....                                         | 3-195 |
| 3.24.1  | IEC 61850 Reporting .....                                                               | 3-196 |
| 3.25    | Single-Pole Commands (Function Group CMD_1) .....                                       | 3-197 |
| 3.26    | Single-Pole Signals (Function Group SIG_1) .....                                        | 3-198 |
| 3.26.1  | Acquisition of Binary Signals for Control .....                                         | 3-200 |
| 3.27    | Binary Counts (Function Group COUNT) .....                                              | 3-204 |
| 3.27.1  | Enable/Disable the Counting Function .....                                              | 3-204 |
| 3.27.2  | Debouncing .....                                                                        | 3-204 |
| 3.27.3  | Counting Function .....                                                                 | 3-204 |
| 3.27.4  | Transmitting the Counter Values via Communications Interface .....                      | 3-204 |
| 3.27.5  | Counter Values Reset .....                                                              | 3-205 |
| 3.28    | TIMER (Function Group TIMER) .....                                                      | 3-206 |

|          |                                                                       |            |
|----------|-----------------------------------------------------------------------|------------|
| <b>4</b> | <b>Design .....</b>                                                   | <b>4-1</b> |
| 4.1      | Designs .....                                                         | 4-2        |
| 4.2      | Dimensional Drawings .....                                            | 4-4        |
| 4.2.1    | Dimensional Drawings for the 40 TE Case .....                         | 4-4        |
| 4.2.2    | Dimensional Drawings for the 84 TE Case .....                         | 4-5        |
| 4.2.3    | Detachable HMI .....                                                  | 4-7        |
| 4.3      | Hardware Modules .....                                                | 4-8        |
| <b>5</b> | <b>Installation and Connection .....</b>                              | <b>5-1</b> |
| 5.1      | Unpacking and Packing .....                                           | 5-4        |
| 5.2      | Checking Nominal Data and Design Type .....                           | 5-5        |
| 5.3      | Location Requirements .....                                           | 5-6        |
| 5.3.1    | Environmental Conditions .....                                        | 5-6        |
| 5.3.2    | Mechanical Conditions .....                                           | 5-6        |
| 5.3.3    | Electrical Conditions for Auxiliary Voltage of the Power Supply ..... | 5-6        |
| 5.3.4    | Electromagnetic Conditions .....                                      | 5-6        |
| 5.4      | Installation .....                                                    | 5-7        |
| 5.5      | Protective and Operational Grounding .....                            | 5-14       |
| 5.6      | Connection .....                                                      | 5-16       |
| 5.6.1    | Connecting Measuring and Auxiliary Circuits .....                     | 5-16       |
| 5.6.2    | Connecting the IRIG-B Interface .....                                 | 5-20       |
| 5.6.3    | Connecting the Communication Interfaces .....                         | 5-21       |
| 5.7      | Location and Connection Diagrams .....                                | 5-27       |
| 5.7.1    | Location Diagrams C434 -416/417/418 .....                             | 5-27       |
| 5.7.2    | Terminal Connection Diagrams C434-416/417/418 .....                   | 5-28       |
| <b>6</b> | <b>Local Control (HMI) .....</b>                                      | <b>6-1</b> |
| 6.1      | Local Control Panel (HMI) .....                                       | 6-1        |
| 6.1.1    | Ordering options .....                                                | 6-1        |
| 6.2      | Display and Keypad .....                                              | 6-2        |
| 6.2.1    | Text Display .....                                                    | 6-2        |
| 6.2.2    | Graphic Display .....                                                 | 6-2        |
| 6.2.3    | Short Description of Keys .....                                       | 6-3        |
| 6.2.4    | Display Levels .....                                                  | 6-6        |
| 6.2.5    | Availability of the Bay Panel .....                                   | 6-7        |
| 6.2.6    | Display Panels on the Text Display .....                              | 6-7        |
| 6.2.7    | Display Panels on the Graphic Display .....                           | 6-9        |
| 6.2.8    | Menu Tree and Data Points .....                                       | 6-9        |
| 6.2.9    | List Data Points .....                                                | 6-10       |
| 6.3      | Configurable Function Keys .....                                      | 6-11       |
| 6.3.1    | Configuration of the Function Keys F1 to Fx .....                     | 6-11       |
| 6.4      | Changing between Display Levels .....                                 | 6-14       |
| 6.4.1    | Note Concerning the Step-by-Step Descriptions .....                   | 6-14       |
| 6.4.2    | Changing Between Display Levels .....                                 | 6-14       |
| 6.4.3    | Changing Between Display Levels .....                                 | 6-15       |
| 6.5      | How to use Cyber Security Features .....                              | 6-16       |
| 6.5.1    | Usage .....                                                           | 6-16       |
| 6.6      | Control at Panel Level (HMI with Text Display) .....                  | 6-19       |
| 6.6.1    | Bay Panel .....                                                       | 6-19       |
| 6.7      | Control at Panel Level (HMI with Graphic Display) .....               | 6-23       |
| 6.7.1    | Bay Panel (HMI with Graphic Display) .....                            | 6-23       |

|          |                                                          |            |
|----------|----------------------------------------------------------|------------|
| 6.7.2    | Signal Panel(s) .....                                    | 6-33       |
| 6.7.3    | Measured Value Panels on the Graphic Display .....       | 6-36       |
| 6.7.4    | Event Panel on the Graphic Display .....                 | 6-37       |
| 6.8      | Control at the Menu Tree Level .....                     | 6-38       |
| 6.8.1    | Navigation in the Menu Tree .....                        | 6-38       |
| 6.8.2    | Switching Between Address Mode and Plain Text Mode ..... | 6-39       |
| 6.8.3    | Change-Enabling Function .....                           | 6-40       |
| 6.8.4    | Changing Parameters .....                                | 6-43       |
| 6.8.5    | List Parameters .....                                    | 6-46       |
| 6.8.6    | Memory Readout .....                                     | 6-49       |
| 6.8.7    | Resetting .....                                          | 6-52       |
| 6.8.8    | Password-Protected Control Actions .....                 | 6-54       |
| 6.8.9    | Changing the Password .....                              | 6-55       |
| <b>7</b> | <b>Settings .....</b>                                    | <b>7-1</b> |
| 7.1      | Parameters .....                                         | 7-1        |
| 7.1.1    | Device Identification .....                              | 7-4        |
| 7.1.2    | Configuration Parameters .....                           | 7-13       |
| 7.1.3    | Function Parameters .....                                | 7-193      |
| <b>8</b> | <b>Information and Control Functions .....</b>           | <b>8-1</b> |
| 8.1      | Operation .....                                          | 8-1        |
| 8.1.1    | Cyclic Values .....                                      | 8-2        |
| 8.1.2    | Control and Testing .....                                | 8-194      |
| 8.1.3    | Operating Data Recording .....                           | 8-202      |
| 8.2      | Events .....                                             | 8-204      |
| 8.2.1    | Event Counters .....                                     | 8-204      |
| 8.2.2    | Measured Event Data .....                                | 8-210      |
| 8.2.3    | Event Recording .....                                    | 8-211      |
| <b>9</b> | <b>IEC 61850 Settings via IED Configurator .....</b>     | <b>9-1</b> |
| 9.1      | Manage IED .....                                         | 9-2        |
| 9.2      | IED Details .....                                        | 9-3        |
| 9.3      | Communications .....                                     | 9-4        |
| 9.4      | SNTP .....                                               | 9-5        |
| 9.4.1    | General Config .....                                     | 9-5        |
| 9.4.2    | External Server 1 .....                                  | 9-5        |
| 9.4.3    | External Server 2 .....                                  | 9-5        |
| 9.5      | Dataset Definitions .....                                | 9-6        |
| 9.6      | GOOSE Publishing .....                                   | 9-7        |
| 9.6.1    | System/LLN0 .....                                        | 9-7        |
| 9.7      | GOOSE Subscribing .....                                  | 9-9        |
| 9.7.1    | Mapped Inputs .....                                      | 9-9        |
| 9.8      | Report Control Blocks .....                              | 9-12       |
| 9.8.1    | System/LLN0 .....                                        | 9-12       |
| 9.9      | Controls .....                                           | 9-13       |
| 9.9.1    | Control Objects .....                                    | 9-13       |
| 9.9.2    | Uniqueness of Control .....                              | 9-13       |
| 9.10     | Measurements .....                                       | 9-15       |
| 9.11     | Configurable Data Attributes .....                       | 9-16       |
| 9.11.1   | System/LLN0 .....                                        | 9-16       |

|           |                                                                                                          |             |
|-----------|----------------------------------------------------------------------------------------------------------|-------------|
| <b>10</b> | <b>Commissioning .....</b>                                                                               | <b>10-1</b> |
| 10.1      | Safety Instructions .....                                                                                | 10-1        |
| 10.2      | Commissioning Tests .....                                                                                | 10-5        |
| 10.2.1    | Preparation .....                                                                                        | 10-5        |
| 10.2.2    | Cyber Security Commission .....                                                                          | 10-7        |
| 10.2.3    | Testing .....                                                                                            | 10-9        |
| 10.2.4    | Checking the Binary Signal Inputs .....                                                                  | 10-9        |
| 10.2.5    | Checking the Output Relays .....                                                                         | 10-9        |
| 10.2.6    | Checking the Current-Measuring Inputs .....                                                              | 10-10       |
| 10.2.7    | Checking the Correct Phase Connection of Current and Voltage Transformers with Load Current .....        | 10-10       |
| 10.2.8    | Checking the Correct Phase Connection of the Residual Current Transformer with Load Current .....        | 10-10       |
| 10.2.9    | Simple Check of the Correct Phase Connection of the Residual Current Transformer with Load Current ..... | 10-11       |
| 10.2.10   | Checking Communication with MODBUS IEDs .....                                                            | 10-13       |
| 10.2.11   | Checking Control Functions .....                                                                         | 10-13       |
| 10.2.12   | Completing Commissioning .....                                                                           | 10-14       |
| <b>11</b> | <b>Troubleshooting .....</b>                                                                             | <b>11-1</b> |
| <b>12</b> | <b>Maintenance .....</b>                                                                                 | <b>12-1</b> |
| 12.1      | Maintenance Procedures in the Power Supply Area .....                                                    | 12-2        |
| 12.2      | Routine Functional Testing .....                                                                         | 12-4        |
| 12.3      | Analog Input Circuits .....                                                                              | 12-5        |
| 12.4      | Binary Opto Inputs .....                                                                                 | 12-6        |
| 12.5      | Binary Outputs .....                                                                                     | 12-7        |
| 12.6      | Communication Interfaces .....                                                                           | 12-8        |
| <b>13</b> | <b>Storage .....</b>                                                                                     | <b>13-1</b> |
| <b>14</b> | <b>Accessories and Spare Parts .....</b>                                                                 | <b>14-1</b> |
| <b>15</b> | <b>Order Information .....</b>                                                                           | <b>15-1</b> |
| <b>A1</b> | <b>Function Groups .....</b>                                                                             | <b>A1-1</b> |
| <b>A2</b> | <b>Internal Signals .....</b>                                                                            | <b>A2-1</b> |
| <b>A3</b> | <b>Glossary .....</b>                                                                                    | <b>A3-1</b> |
|           | Modules .....                                                                                            | A3-1        |
|           | Symbols .....                                                                                            | A3-1        |
|           | Examples of Signal Names .....                                                                           | A3-7        |
|           | Symbols Used .....                                                                                       | A3-8        |
| <b>A4</b> | <b>Telecontrol Interfaces .....</b>                                                                      | <b>A4-1</b> |
| A4.1      | Telecontrol Interface per EN 60870-5-101 or IEC 870-5-101 (Companion Standard) .....                     | A4-1        |
| A4.1.1    | Interoperability .....                                                                                   | A4-1        |
| A4.2      | Communication Interface per IEC 60870-5-103 .....                                                        | A4-12       |
| A4.2.1    | Interoperability .....                                                                                   | A4-12       |
| <b>A5</b> | <b>List of Bay Types .....</b>                                                                           | <b>A5-1</b> |
| A5.1      | Key to the List of Bay Types .....                                                                       | A5-1        |

|           |                                           |             |
|-----------|-------------------------------------------|-------------|
| A5.2      | Predefined Bay Types .....                | A5-4        |
| A5.2.1    | Feeder Bays .....                         | A5-4        |
| A5.2.2    | Bus Sectionalizer Bays .....              | A5-188      |
| A5.2.3    | Bus Coupler Bays .....                    | A5-270      |
| A5.2.4    | Bus Coupler and Sectionalizer Bays .....  | A5-316      |
| A5.2.5    | Busbar Measurement Bays .....             | A5-320      |
| A5.2.6    | Busbar Grounding Bays .....               | A5-358      |
| A5.2.7    | Other Bay Types .....                     | A5-362      |
| <b>A6</b> | <b>Version History .....</b>              | <b>A6-1</b> |
| A6.1      | C434 -301 -401 -601 .....                 | A6-1        |
| A6.2      | C434 -302 -401/402 -602 .....             | A6-1        |
| A6.3      | C434 -302 -401/402 -602-702 .....         | A6-2        |
| A6.4      | C434 -302 -401/402 -602-703 .....         | A6-2        |
| A6.5      | C434 -302 -401/402 -603 .....             | A6-2        |
| A6.6      | C434 -302 -401/402 -603-704 .....         | A6-3        |
| A6.7      | C434 -302 -401/402 -603-705 .....         | A6-3        |
| A6.8      | C434 -303 -401/402 -604 .....             | A6-4        |
| A6.9      | C434 -303 -401/402 -604-706 .....         | A6-5        |
| A6.10     | C434 -303 -401/402 -604-707 .....         | A6-5        |
| A6.11     | C434 -303 -401/402 -604-708 .....         | A6-6        |
| A6.12     | C434 -302/303 -401/402/403 -605 .....     | A6-6        |
| A6.13     | C434 -302/303 -401/402/403 -604-709 ..... | A6-7        |
| A6.14     | C434 -302/303 -401/402/403 -605-710 ..... | A6-7        |
| A6.15     | C434 -303 -401/402/403 -605-711 .....     | A6-8        |
| A6.16     | C434 -304 -404/405/406 -610 .....         | A6-9        |
| A6.17     | C434 -304 -404/405/406 -610-712 .....     | A6-11       |
| A6.18     | C434 -302/303 -401/402/403 -606 .....     | A6-12       |
| A6.19     | C434 -304 -404/405/406 -611 .....         | A6-14       |
| A6.20     | C434 -302/303 -401/402/403 -606-713 ..... | A6-16       |
| A6.21     | C434 -302/303 -401/402/403 -606-714 ..... | A6-16       |
| A6.22     | C434 -305 -407/408/409 -612 .....         | A6-17       |
| A6.23     | C434 -302/303 -401/402/403 -606-715 ..... | A6-19       |
| A6.24     | C434 -305 -407/408/409 -612-717 .....     | A6-19       |
| A6.25     | C434 -305 -407/408/409 -612-719 .....     | A6-20       |
| A6.26     | C434 -306 -407/408/409 -650 .....         | A6-21       |
| A6.27     | C434 -306 -407/408/409 -651 .....         | A6-26       |
| A6.28     | C434 -306 -407/408/409 -651 -701 .....    | A6-27       |
| A6.29     | C434 -307 -410/411/412 -652 .....         | A6-28       |
| A6.30     | C434 -308 -413/414/415 -661 .....         | A6-28       |
| A6.31     | C434 -309 -416/417/418 -671 .....         | A6-31       |
| A6.32     | C434 -309 -416/417/418 -671 -701 .....    | A6-33       |



# 1 Application and Scope

## 1.1 Overview

The C434 modular bay unit is used to control and monitor switchbays. Up to 18 electrically operated switchgear units can be controlled, and up to 24 switchgear units (equipped with electrical check-back signaling located in medium-voltage or high-voltage substations) can be monitored with the C434.



Fig. 1-1: C434 in a 40 TE sized case with text display.



Fig. 1-2: C434 in a 40 TE sized case with graphic display.



Fig. 1-3: C434 in a 84 TE sized case with text display .



Fig. 1-4: C434 in a 84 TE sized case with graphic display.

External auxiliary devices are largely obviated by the integration of binary inputs and power outputs that are independent of auxiliary voltages, by the direct connection option for current and voltage transformers, and by the comprehensive interlocking capability.

This simplifies handling of bay protection and control technology from planning to station commissioning. During operation, the user-friendly interface makes it easy to set the unit and allows safe operation of the substation by preventing non-permissible switching operations.

Continuous self-monitoring reduces maintenance costs for protection and control systems.

A built-in liquid crystal display (LC display) shows not only switchgear settings but also measured data and monitoring signals or indications.

The bay is controlled interactively by using the control keys and the display.

Adjustment to the quantity of information required is made via the integrated local control panel or the Easergy Studio operating program. To simplify the setting of parameters, a number of different bay types with defined default settings are stored in the C434 memory. The bay type corresponding to the bay being controlled can then be permanently set. The operator can select the bay type and adjust individual default parameters to correspond to the particular functions required. If a specific bay type is not included, it can be created on request and loaded into the C434.

The C434 can be connected to a higher control level by way of a built-in communications interface.



For a list of all available function groups see [Vol. 2, Glossary A1, \(p. A1-1\)](#).

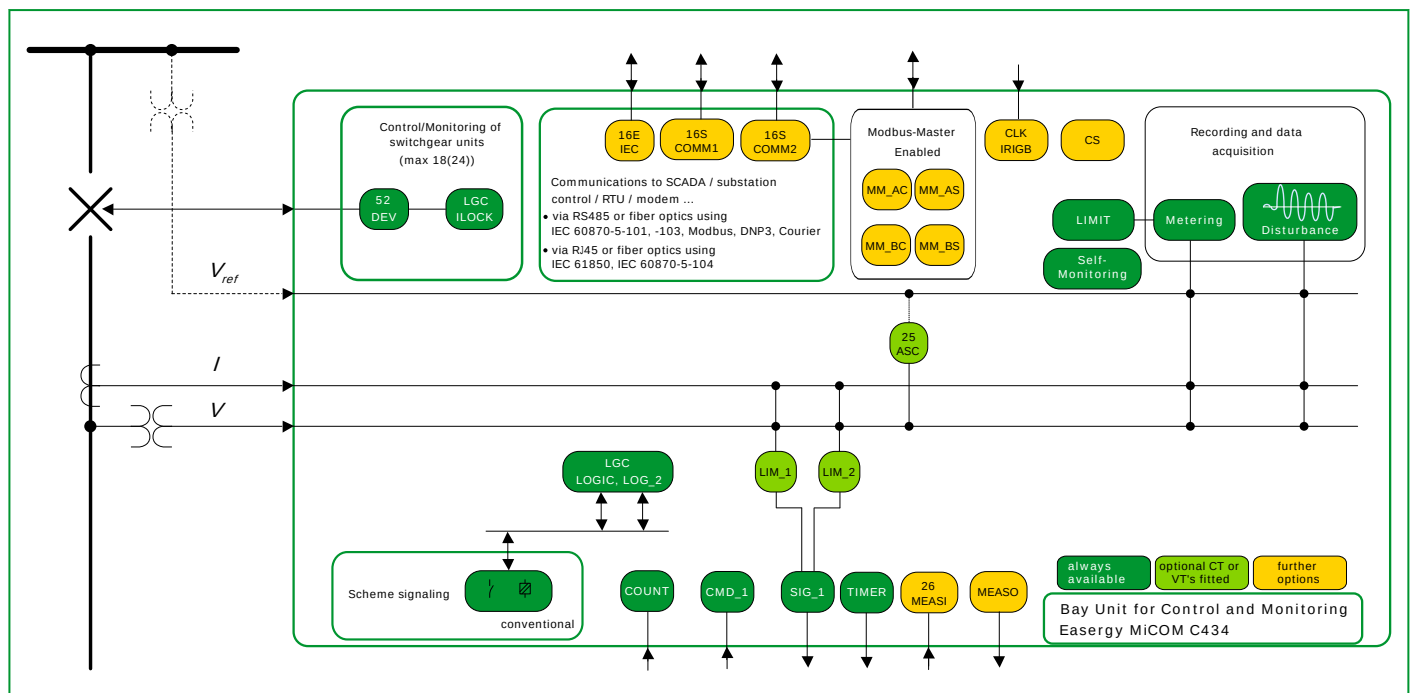


Fig. 1-5: Functional diagram.

### 1.1.1.1

### Design

The C434 is modular in design. The plug-in modules are housed in a robust aluminum case and electrically interconnected via one analog p/c board and one digital p/c board.

## 1.2 Including Function Groups in the Configuration

Functions listed in the tables in [Section 1.3, \(p. 1-5\)](#) and [Section 1.4, \(p. 1-7\)](#) are self-contained function groups and can be individually configured or de-configured according to the specific application requirements by using the Easergy Studio operating program. Unused or cancelled function groups are hidden to the user, thus simplifying the menu of the Easergy Studio.

This concept provides a large choice of functions and makes wide-ranging application of the protection device possible, with just one model version. On the other hand, simple and clear parameter settings can be made.

In this way the protection and control functions can be included in or excluded from the configuration.

### *Example*

For example, the measuring-circuit monitoring function (function group LIMIT)

- can be included in the configuration by setting  
LIMIT: Function group LIMIT to *With*
- can be excluded from the configuration by setting  
LIMIT: Function group LIMIT to *Without*

## 1.3

## Overview of Function Groups – Part 1

The following tables list the function groups that can be included in or excluded from the configuration of the C434.

✓ = Standard; (✓) = Ordering option.

| Protection functions |                                      |                         |                                                                                                            | C434 |
|----------------------|--------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------|------|
| ANSI                 | IEC 61850                            | Function group          | Function                                                                                                   |      |
| 25                   | RSYN1                                | ASC                     | Automatic synchronism check<br>→ only available if voltage transformers have been fitted (ordering option) | (✓)  |
|                      |                                      | LIMIT<br>LIM_1<br>LIM_2 | Limit value monitoring                                                                                     | ✓    |
| LGC                  | PloGGIOx (Ed. 1)<br>PloGAPCx (Ed. 2) | LOGIC<br>LOG_2          | Programmable logic                                                                                         | ✓    |

| Control functions |                                          |                   |                                                                                                                                                              | C434 |
|-------------------|------------------------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| ANSI              | IEC 61850                                | Function group    | Function                                                                                                                                                     |      |
| 52                | XCBRx / XSWIx /<br>CSWIx                 | DEV01 to<br>DEV24 | Control and monitoring of switchgear units<br>(control: up to 18, monitoring: up to 24,<br>these max. numbers depend on ordering<br>options / configuration) | (✓)  |
|                   | CtIGGIO6-9 (Ed. 1)<br>CtIGAPC6-9 (Ed. 2) | CMD_1             | Single-pole commands                                                                                                                                         | 96   |
|                   | CtIGGIO1-5 (Ed. 1)<br>CtIGAPC1-5 (Ed. 2) | SIG_1             | Single-pole signals                                                                                                                                          | 224  |
| LGC               |                                          | ILOCK             | Interlocking logic                                                                                                                                           | 32   |
|                   |                                          | COUNT             | Binary counters                                                                                                                                              | 24   |
|                   |                                          | TIMER             | Timer function                                                                                                                                               | 4    |

| Communication functions |           |                                  |                                                                                                                                                                                                                | C434 |
|-------------------------|-----------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| ANSI                    | IEC 61850 | Function group                   | Function                                                                                                                                                                                                       |      |
| 16S                     |           | COMM1, COMM2                     | 2 communication interfaces serial, RS 422 / 485 or fiber optic                                                                                                                                                 | (✓)  |
|                         |           | MM_AC<br>MM_AS<br>MM_BC<br>MM_BS | COMM2 configured as a MODBUS-Master to manage 4 MODBUS IEDs <ul style="list-style-type: none"> <li>● Analog commands</li> <li>● Analog signals</li> <li>● Binary commands</li> <li>● Binary signals</li> </ul> | (✓)  |
| CLK                     |           | IRIGB                            | Time synchronization IRIG-B                                                                                                                                                                                    | (✓)  |
| 16E                     |           | IEC                              | Communication interface Ethernet                                                                                                                                                                               | (✓)  |
| 16E                     | GosGGIOx  | GOOSE                            | IEC 61850                                                                                                                                                                                                      | (✓)  |
|                         |           | VINP                             | Virtual Inputs                                                                                                                                                                                                 | (✓)  |

| Measured value functions |                      |                |                                                                                                                                                                                      | C434                     |
|--------------------------|----------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| ANSI                     | IEC 61850            | Function group | Function                                                                                                                                                                             |                          |
| 26                       | RtdGGIO1<br>IdcGGIO1 | MEASI<br>MEASO | Analog inputs and outputs <ul style="list-style-type: none"> <li>● PT 100 analog input</li> <li>● 1× Measuring data input 20 mA</li> <li>● 2× Measuring data output 20 mA</li> </ul> | (✓)<br>(✓)<br>(✓)<br>(✓) |

## 1.4

## Overview of Function Groups – Part 2

The following tables list the function groups that are generally available for the C434, and which cannot be excluded from the configuration.

✓ = Standard; (✓) = Ordering option.

| Inputs and outputs |           |                                                                      |                                                                                                                                | C434                                                                           |
|--------------------|-----------|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| ANSI               | IEC 61850 | Function group                                                       |                                                                                                                                |                                                                                |
|                    |           | Abbrev.                                                              | Description                                                                                                                    |                                                                                |
|                    |           |                                                                      | Measuring inputs <ul style="list-style-type: none"><li>● Phase currents</li><li>● Residual current</li><li>● Voltage</li></ul> | (✓)<br>(✓)<br>(✓)                                                              |
|                    |           | <ul style="list-style-type: none"><li>● INP</li><li>● OUTP</li></ul> | Binary inputs and outputs <ul style="list-style-type: none"><li>● Optical coupler inputs</li><li>● Output relays</li></ul>     | <ul style="list-style-type: none"><li>● 4 ... 152</li><li>● 8 ... 56</li></ul> |

| General functions |                         |                |                                                                                                                                                                                                                                                                            | C434 |
|-------------------|-------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| ANSI              | IEC 61850               | Function group |                                                                                                                                                                                                                                                                            |      |
|                   |                         | Abbrev.        | Description                                                                                                                                                                                                                                                                |      |
|                   |                         | DVICE          | Device                                                                                                                                                                                                                                                                     | ✓    |
|                   |                         | CS             | Cyber Security                                                                                                                                                                                                                                                             | (✓)  |
|                   |                         | LOC            | Local control panel                                                                                                                                                                                                                                                        | ✓    |
|                   |                         | PC             | PC link                                                                                                                                                                                                                                                                    | ✓    |
|                   |                         | F_KEY          | 6 configurable function keys                                                                                                                                                                                                                                               | ✓    |
|                   |                         | LED            | LED indicators                                                                                                                                                                                                                                                             | ✓    |
|                   |                         | MAIN           | Main function                                                                                                                                                                                                                                                              | ✓    |
|                   | LLN0.SGCB<br>LLN0.CurSG | PSS            | Parameter subset selection                                                                                                                                                                                                                                                 | ✓    |
|                   |                         | SFMON          | Comprehensive self-monitoring                                                                                                                                                                                                                                              | ✓    |
|                   |                         | OP_RC          | Operating data recording (time-tagged event logging)                                                                                                                                                                                                                       | ✓    |
|                   |                         | MT_RC          | Monitoring signal recording                                                                                                                                                                                                                                                | ✓    |
|                   | PTRCx /<br>RDRE1        | FT_RC          | Fault recording (time-tagged event logging together with fault value recording of the three phase currents, the residual currents, the three phase-to-ground voltages, the neutral-point displacement voltage and the reference voltage before, during and after a fault). | ✓    |

## 1.5 Control Functions

Switchgear contact positions are acquired by binary signal inputs, that can signal and process a maximum of 24 two-pole contact positions. Output relays are available to control a maximum of 18 two-pole switchgear units.

The double-command lockout feature is a fixed part of the integrated control logic. All further commands will be refused during control command execution.

Up to 152 operation signals can be acquired through binary signal inputs and they are processed according to their primary significance (e.g. CB readiness). Each binary signal input for signals from switchgear and single-pole operations can have the debouncing and chatter suppression from eight groups assigned, for which the debouncing and chatter time can be individually set.

For the acquisition of binary counters, up to four binary inputs may be configured. The contents of these counters are transmitted cyclically via the serial link. The counter values are stored so that they are not lost if the supply voltage should fail. Counting continues from the stored value as the initial value when the C434 restarts.

The C434 sends control signals only after it has checked the readiness and validity to carry out such commands, and it then monitors the operating time of the switchgear units. If the protection device detects that a switchgear unit has failed, it will signal this information (e.g. by configuration to a LED indicator).

Before a switching command is issued the interlocking logic on the C434 checks if this new switchgear status corresponds with the bay and station topology. The interlocking logic is stored in form of bay interlocking, with and without station interlocking, for each Bay Panel in the default setting. The interlocking conditions can be adapted to the actual bay and station topology. Interlocking display and operation correspond to the programmable logic.

When the C434 is included in a station control system the local interlocking can easily be integrated with the overall system interlocking.

When the C434 is not included in a station control system then bay interlocking is applied without station interlocking.

If the bay and station topology are found to be valid the switching command is issued. If a non-permissible status would result from the switching action then the issuing of such a switching command is refused and an alarm is issued.

If not all binary outputs are required by the bay type then these vacant binary outputs can be freely utilized for other purposes.

Besides issuing switching commands binary outputs may also be triggered by persistent commands.

## 1.6 Inputs and Outputs

The following inputs and outputs are available with the basic device:

- 8 output relays, freely-configurable.
- 4 binary signal inputs (opto-coupler).

Optionally available are:

- 4 or 5 voltage measuring inputs
- 4 current-measuring inputs
- For 84 TE (up to 6 modules):  
For 40 TE (up to 4 modules):
  - additional 4 current measuring inputs and/or 4 voltage measuring inputs
  - additional binary module X(6I 6O) to monitor and control 3 switchgear units
  - additional binary modules X(6I 3O), or X(6O), or X(6I 8O)
  - module X(24I) with additional binary signal inputs with user-configurable function assignment

With the maximum number of binary signal inputs and output relays X(6I 6O) fitted, 24 switchgear units can be monitored and 18 switchgear units can be 2pole controlled by using pre-defined standard bay-types. Note that with the text display, there is a limit to 12 switchgear units.

The nominal currents and nominal voltages of the standard measuring inputs can be set.

The nominal voltage range of the binary signal inputs (opto-coupler) is 24 to 250 V DC. As an option binary signal input modules with a higher operate threshold are available.

The auxiliary voltage input for the power supply is also designed for an extended range. The nominal voltage ranges are 60 to 250 V DC and 100 to 230 V AC. As an option there is a variant available for the lower nominal voltage range 24 V to 60 V DC.

All output relays can be utilized for signaling and command purposes.

The optional PT 100 input (on the analog module Y(4I)) is lead-compensated and balanced and linearized for PT 100 resistance thermometers as per IEC 751.

The optional 0 to 20 mA input provides open-circuit and overload monitoring, zero suppression defined by a setting, plus the option of linearizing the input variable via 20 adjustable interpolation points.

Two selectable measured variables (cyclically updated measured operating data and stored measured fault data) can be output as a burden-independent direct current via the two optional 0 to 20 mA outputs. The characteristics are defined by 3 adjustable interpolation points allowing a minimum output current (4 mA, for example) for slave-side open-circuit monitoring, knee-point definition for fine scaling, and a limitation to lower nominal currents (10 mA, for example). Where sufficient output relays are available, a selectable measured variable can be output in BCD-coded form by contacts.



## 1.7 Control and Display

### *Monochrome text display*

- Local control panel with monochrome LC-display containing 12 × 32 alphanumeric characters  
Portrait orientation QVGA (192 × 96 pixels) with 3.5 Inches dimension

### *Colored graphic display*

- Local control panel with colored graphic LC-display  
Portrait orientation QVGA (320 × 240 pixels) with 5.7 Inches dimension

### *Enhanced local control panel interfaces*

- 25 LED indicators
  - 5 fixed system LEDs
  - 2 amber LED indicators for 'Local', 'Remote' and 'Local and Remote' states
  - 12 multi-color LEDs with user-definable functional assignment
  - 6 multi-color LEDs with user-definable functional assignment for function keys
- 6 configurable function keys
  - Customizable labels can be edited and inserted into the recessed pocket under the external membrane of the front panel
- PC interface (USB Type B)
- Communication interfaces (optional)

## 1.8 Information Interfaces

Information exchange is done via the local control panel, the PC interface and optional communication modules for serial and Ethernet based communication.

The serial communication module offers settable protocols conforming to IEC 60870-5-103, IEC 60870-5-101, DNP 3.0, Modbus and Courier. The second communication interface (COMM2) could be used alternatively as a slave device according to IEC 60870-5-103 or as a MODBUS master to communicate with up to four MODBUS IEDs.

The 4 available Ethernet module variants provide IEC 61850 communication and offer optional Ethernet communication protocol conforming to IEC 60870-5-104 with single Ethernet or alternatively redundancy PRP, HSR or RSTP protocols with RJ45 wire or LC fiber optic connectors and RJ45 service interface.

External time synchronization can be done using a configured binary input, using one of the communication protocols or by using the optional IRIG-B signal input.

## 2 Technical Data

### 2.1 Conformity

#### *Notice*

Applicable to C434, version -309 -416/417/418 -671.

#### *Declaration of Conformity*

The product designated "C434 Bay Unit for Control and Monitoring" has been designed and manufactured in conformance with the EMC and safety standards IEC 60255-26 and IEC 60255-27 and with the "EMC Directive" and the "Low Voltage Directive" issued by the Council of the European Community.

## 2.2 General Data

### 2.2.1 General Device Data

#### *Design*

- Surface-mounted case suitable for wall installation, or
- Flush-mounted case for 19" cabinets and for control panels.

#### *Installation Position*

- Vertical  $\pm 30^\circ$ .

#### *Degree of Protection*

Per DIN VDE 0470 and IEC 60529.

- IP 52 for the front panel.
- Flush-mounted case:
  - IP 50 for the case (excluding the rear connection area)
  - IP 20 for the rear connection area, pin-terminal connection
  - IP 10 for the rear connection area, ring-terminal connection
- Surface-mounted case:
  - IP 50 for the case
  - IP 50 for the fully enclosed connection area with the supplied rubber grommets fitted

#### *Weight*

- 40 TE case: Approx. 7 kg
- 84 TE case: Approx. 11 kg

#### *Dimensions and Connections*

See dimensional drawings ([Section 4.2, \(p. 4-4\)](#)), and the location and terminal connection diagrams ([Section 5.7, \(p. 5-27\)](#)).

#### *Terminals*

PC interface (X6)

- USB B connector

Communication interfaces COMM1 and COMM2

- Fiber (X7, X8 and X31, X32)
  - F-SMA optical fiber connection per IEC 60874-2 (for plastic fibers), or
  - optical fiber connection BFOC-ST<sup>®</sup> connector 2.5 per IEC 60874-10-1 (for glass fibers).

(ST<sup>®</sup> is a registered trademark of AT&T Lightguide Cable Connectors.)
- Wire leads (X9, X10 and X33)
  - M2 threaded terminal ends for wire cross-sections up to 1.5 mm<sup>2</sup>.

**Communication interface IEC 61850**

- Fiber (X13, X14)
  - Industry Standard Small Form Pluggable (SFP) package, LC duplex connector optical interface.
- Wire leads (X15)
  - RJ45 connector.
- IRIG-B Interface (X11)
  - 3 pin terminal block.

**Current measuring inputs (conventional inputs)**

- Threaded terminal ends, pin-type cable lugs: M5, self-centering with cage clamp to protect conductor cross-sections  $\leq 4 \text{ mm}^2$ , or:
- Threaded terminal, ring-terminal connection: M4.

**Other inputs and outputs**

- Threaded terminal ends, pin-type cable lugs: M3, self-centering with cage clamp to protect conductor cross-sections 0.2 to 2.5 mm<sup>2</sup>, or:
- Threaded terminal ends, ring-type cable lugs: M4.

***Creepage Distances and Clearances***

- Per IEC 60255-27.
- Pollution degree 3, working voltage 250 V,
- overvoltage category III, impulse test voltage 5 kV.

## 2.3 Tests

### 2.3.1 Type Tests

#### 2.3.1.1 Electromagnetic Compatibility (EMC)

All tests performed according IEC 60255-26 with typical setting parameter configurations. The following configuration shall be used to pass all tests without exceptions: /Parameters/Config. parameters/INP:

- (010 220) INP: Filter set to "6" (Default value).
- All binary inputs shall be set to filtered operating mode, i.e. "Active "high" filt." or "Active "low" filt.".
- All binary inputs assigned to switching devices DEV shall be subject to signal debouncing for "20 ms" (Default value), e.g. (221 200) MAIN: Debounce time gr. 1 with "0.02 s".

EMC tests on Ethernet are performed with cable of 8 meters (category 5E).

#### *Conducted Emission*

Per IEC 60255-26 and CISPR 22 Class A.

- 0.15 - 0.5 MHz, 79 dB $\mu$ V (quasi peak) 66 dB $\mu$ V (average).
- 0.5 - 30 MHz, 73 dB $\mu$ V (quasi peak) 60 dB $\mu$ V (average).

#### *Radiated Emission*

Per IEC 60255-26 and CISPR 11 Class A.

- 30 - 230 MHz, 40 dB $\mu$ V / m at 10 m measurement distance.
- 230 - 1 GHz, 47 dB $\mu$ V / m at 10 m measurement distance.

#### *100 kHz and 1 MHz Damped Oscillatory Test*

Per IEC 60255-26 and IEC 61000-4-18. level 3.

- Frequency: 100 kHz and 1 MHz.
- Common mode test level:  $\pm 2.5$  kV.
- Differential mode test level :  $\pm 1$  kV.

#### *Immunity to Electrostatic Discharge*

Per IEC 60255-26 and IEC 61000-4-2, severity level 4.

- 15 kV discharge in air to user interface, display, to all communication ports (outer earthed shell).
- 8 kV contact discharge to any metal part of the front of the product.

#### *Immunity to Radiated Electromagnetic Field*

Per IEC 60255-26 and IEC 61000-4-3, severity level 3.

- 10 V / m, 80 MHz to 1 GHz and 1.4 GHz to 2.7 GHz with 1 kHz 80 % AM.
- Spot tests at 80 MHz, 160 MHz, 380 MHz, 450 MHz, 900 MHz, 1850 MHz, and 2150 MHz.

#### *Electrical Fast Transient or Burst Test*

Per IEC 60255-26, Zone A.

- $\pm 4$  kV, 5 kHz applied directly to auxiliary supply, CTs, VTs, opto inputs, output relays.
- $\pm 2$  kV, 5 kHz applied to communication ports.

Per IEC 61000-4-4, Severity level 4.

- $\pm 4.0$  kV, 5 kHz applied to all power supply and earth port.
- $\pm 2.0$  kV, 5 kHz applied to all other ports.

EFT/Burst waveform parameter.

- Rise time of one pulse: 5 ns.
- Impulse duration (50 % value): 50 ns.
- Burst duration: 15 ms.
- Burst cycle: 300 ms.
- Source impedance: 50  $\Omega$ .

### *Power Frequency Immunity*

Per IEC 60255-26, severity Zone A.

Phase-to-phase

- RMS value 150 V.
- Coupling resistance 100  $\Omega$ .
- Coupling capacitor 0.1  $\mu\text{F}$ , for 10 s.

Phase-to-ground

- RMS value 300 V.
- Coupling resistance 220  $\Omega$ .
- Coupling capacitor 0.47  $\mu\text{F}$ , for 10 s.

### *Surge Immunity Test*

Per IEC 60255-26 and IEC 61000-4-5, severity Zone A or level 4.

- $\pm 4$  kV line to earth and  $\pm 2$  kV line to line for power supply, CTs, VTs, opto inputs and output contacts.
- $\pm 4$  kV cable shielded layer to ground for communication ports.

Surge waveform parameter.

- Open-circuit voltage front time / time to half-value: 1.2 / 50  $\mu\text{s}$ .
- Short-circuit current front time / time to half-value: 8 / 20  $\mu\text{s}$ .

CDN parameter.

- 12  $\Omega$  / 9  $\mu\text{F}$  (line to earth) and 2  $\Omega$  / 18  $\mu\text{F}$  (line to line) for power supply port.
- 42  $\Omega$  / 0.5  $\mu\text{F}$  (line to earth) and 42  $\Omega$  / 0.5  $\mu\text{F}$  (line to line) for IO ports.
- 2  $\Omega$  cable shielding layer to ground for shielding communication ports.
- Voltage transformer inputs shall be subject to protection time delay setting of at least 30 ms.
- In order to suppress transient interference peaks at the logic signal inputs it is suggested to set the parameter (010 220) INP: Filter to "6" and signal debouncing to "20 ms".
- Surge immunity test not required on communication port interfacing cables less than 10 m.

### *Conducted Immunity Test*

Per IEC 60255-26 and IEC 61000-4-6, severity level 3.

- Test level: 10 V.
- Test frequency range: 150 kHz - 80 MHz.
- Modulation: 1 kHz sine wave, 80 % AM modulated.
- Spot test frequency: 27 MHz, 68 MHz.

### *Power Frequency Magnetic Field Immunity*

Per IEC 61000-4-8, severity level 4.

- Test frequency: 50 Hz
- Test level: 30 A / m applied continuously, 300 A / m applied for 3 s.

### *Alternating Component (Ripple) in DC Auxiliary Energizing Quantity*

Per IEC 60255-26 and IEC 61000-4-17.

- Test level: 15 % of rated DC value.

## 2.3.1.2 Insulation

### *Insulation Resistance*

Per IEC 60255-27.

Insulation resistance > 100 MΩ at 500 Vdc.

### *Creepage Distances and Clearances*

Per IEC 60255-27.

Pollution degree 3, Overvoltage category III.

### *High Voltage Withstand (Dielectric) Test*

Per IEC 60255-27.

- 1 kV rms AC for 1 minute between RJ45 ports and the case earth (ground).
- 2 kV rms AC for 1 minute between all other terminals connected together and the case earth. Between all terminals of independent circuits.
- 1 kV rms AC for 1 minute, across open watchdog contacts.
- 1 kV rms AC for 1 minute, across open contacts of output relays.

### *Impulse Voltage Withstand Test*

Per IEC 60255-27.

- Front time: 1.2 μs, Time to half-value: 50 μs.  
Peak value: 1.5 kV, 0.5 J.  
Between RJ45 ports and the case earth (ground).
- Front time: 1.2 μs, Time to half-value: 50 μs,  
Peak value: 5 kV, 0.5 J.  
Between all other independent circuits and the case earth, also between all terminals of independent circuits.

## 2.3.1.3 Environmental test

### *Ambient Temperature Range Test*

Per IEC 60068-2-1 & IEC 60068-2-2.

- Operating temperature range: -25°C to +55°C (or -13°F to +131°F).
- Storage and transit: -40°C to +70°C (or -40°F to +158°F).



### *Ambient Humidity Range Test*

Per IEC 60068-2-78.

- 21 days at 93 % relative humidity and +40°C.

Per IEC 60068-2-14.

- 5 cycles, -25°C to +55 °C, 1°C / min rate of change.

Per IEC 60068-2-30.

- Damp heat cyclic, six cycles(12 hours + 12 hours), 93 % RH, +25°C to +55°C.

### *Corrosive Environment Test*

Per IEC 60068-2-60: 1995, Part 2, Test Ke, Method (class) 3

Industrial corrosive environment/ poor environmental control, mixed gas flow test.

- 21 days at 75 % relative humidity and 30°C (86°F) with exposure to elevated concentrations of H<sub>2</sub>S, NO<sub>2</sub>, Cl<sub>2</sub> and SO<sub>2</sub>.

#### 2.3.1.4

### *Mechanical Test*

Applicable to the following case variants:

- Surface-mounted 40 TE or 84 TE case
- Flush-mounted 40 TE or 84 TE case

### *Vibration Test*

Per IEC 60255-21-1, test severity class 1.

Frequency range in operation

- 10 to 60 Hz, 0.035 mm, and
- 60 to 150 Hz, 0.5 g

Frequency range during transport

- 10 to 150 Hz, 1 g

### *Shock Response and Withstand Test, Bump Test*

Per IEC 60255-21-2.

Acceleration and pulse duration:

- Shock Response tests are carried out to verify full operability (during operation), test severity class 1:  
5 g for 11 ms.
- Shock Withstand tests are carried out to verify the endurance (during transport), test severity class 1:  
15 g for 11 ms.
- Shock bump tests are carried out to verify permanent shock (during transport), test severity class 1:  
10 g for 16 ms.

### *Seismic Test*

Per IEC 60255-21-3, test procedure A, class 1.

#### Frequency range

- Horizontal axes of vibration: 1 Hz to 8 Hz with 3.5 mm peak displacement, 8 to 35 Hz with 10 m / s<sup>2</sup> peak acceleration. 2 x 1 cycle.
- Vertical axis of vibration: 1 Hz to 8 Hz with 1.5 mm peak displacement, 8 to 35 Hz with 5 m / s<sup>2</sup> peak acceleration. 1 x 1 cycle.

## 2.4 Environmental Conditions

### *Temperatures*

Per IEC 60255-1 & IEC 60068-2-1

Recommended temperature range

- -5°C to +55°C [+23°F to +131°F].

Limit temperature range

- Operation: -25°C to +55°C [-13°F to +131°F].
- Storage and transport: -40°C to +70°C [-40°F to +158°F].

### *Ambient Humidity Range*

- $\leq 75$  % relative humidity (annual mean).
- 21 days at  $\leq 95$  % relative humidity and 40°C [104°F].
- Condensation not permitted.

### *Solar Radiation*

Direct solar radiation on the front of the device must be avoided.

## 2.5 Inputs and Outputs

### 2.5.1 Measuring Inputs

#### *Current Measuring Inputs*

- Nominal current  $I_{nom}$ : 1 and 5 A AC (adjustable).
- Nominal consumption per phase:
  - 1 A CT burden: < 0.1 VA
  - 5 A CT burden: < 0.3 VA
- Load rating:
  - continuous:  $4 \cdot I_{nom}$ ,
  - for 10 s:  $30 \cdot I_{nom}$ ,
  - for 1 s:  $100 \cdot I_{nom}$ .
- Nominal surge current:  $250 \cdot I_{nom}$ .

#### *Voltage Measuring Inputs*

- Nominal voltage  $V_{nom}$ : 50 to 130 V AC (adjustable).
- Nominal consumption per phase: < 0.3 VA at  $V_{nom} = 130$  V AC.
- Load rating:
  - continuous: 150 V AC
  - for 10 s: 300 V AC

#### *Frequency*

- Nominal frequency  $f_{nom}$ : 50 Hz and 60 Hz (adjustable).
- Operating range: 0.95 to 1.05  $f_{nom}$ .
- Frequency protection: 40 to 70 Hz.

### 2.5.2 Binary Signal Inputs

Threshold pickup and drop-off points as per ordering option

- Standard variant with switching threshold at 65% of 24 V DC ( $V_{A,min}$ )

Special variants with switching thresholds from 58% to 72% of the nominal input voltage (i.e. definitively “low” for  $V_A < 58\%$  of the nominal supply voltage, definitively “high” for  $V_A > 72\%$  of the nominal supply voltage).

- Special variant with switching threshold at 65% of 110 V DC ( $V_{A,nom}$ ).
- Special variant with switching threshold at 65% of 127 V DC ( $V_{A,nom}$ ).
- Special variant with switching threshold at 65% of 220 V DC ( $V_{A,nom}$ ).
- Special variant with switching threshold at 65% of 250 V DC ( $V_{A,nom}$ ).

Power consumption per input

- 18 V standard variant:  
 $V_A = 19 \text{ to } 110 \text{ V DC} : 0.5 \text{ W} \pm 30\%$ ,  
 $V_A > 110 \text{ V DC} : V_A \cdot 5 \text{ mA} \pm 30\%$ .
- Special variants:  
 $V_A > \text{switching threshold} : V_A \cdot 5 \text{ mA} \pm 30\%$ .

*The standard variant of binary signal inputs (opto couplers) is recommended in most applications, as these inputs operate with any voltage from 19 V. Special versions with higher pick-up/drop-off thresholds are provided for applications where a higher switching threshold is expressly required.*

*The maximum voltage permitted for all binary signal inputs is 300 V DC.*

### 2.5.3 IRIG-B Interface

- Minimum / maximum input voltage level  
Demodulated: 2 Vpp / 6 Vpp (peak-peak)  
Modulated: a few hundred mVpp / 10 Vpp
- Electrical isolation: 2 kVrms

### 2.5.4 Direct Current Input

- Input current: 0 to 26 mA
- Value range: 0.00 to 1.20  $I_{DC,nom}$  ( $I_{DC,nom} = 20$  mA)
- Maximum continuous input current permitted: 50 mA
- Maximum input voltage permitted: 17 V DC
- Input load: 100  $\Omega$
- Open-circuit monitoring: 0 to 10 mA (adjustable)
- Overload monitoring: > 24.8 mA
- Zero suppression: 0.000 to 0.200  $I_{DC,nom}$  (adjustable).

### 2.5.5 Resistance Thermometer

Only PT 100 permitted for analog (I/O) module, mapping curve per IEC 75.1.

- Value range: -40.0°C to +215.0°C (-40°F to +419°F).
- 3-wire configuration: max. 20  $\Omega$  per conductor.
- Open and short-circuited input permitted.
- Open-circuit monitoring:  $\Theta > +215^{\circ}\text{C}$  and  $\Theta < -40^{\circ}\text{C}$  ( $\Theta > +419^{\circ}\text{F}$  and  $\Theta < -40^{\circ}\text{F}$ ).

### 2.5.6 Direct Current Output

- Output current: 0 to 20 mA
- Maximum permissible load: 500  $\Omega$
- Maximum output voltage: 15 V

### 2.5.7 Output Relays

|                         | Binary I/O Module X(6I 6O) for switchgear control.                                                                                                     | Binary I/O Module X(4H) with high-break contacts, applicable to DC circuits only.                                                                                                                                              | All other modules                                                                                                                                      |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rated voltage:          | 250 V DC<br>250 V AC                                                                                                                                   | 250 V DC                                                                                                                                                                                                                       | 250 V DC, 250 V AC.                                                                                                                                    |
| Continuous current:     | 8 A                                                                                                                                                    | 10 A                                                                                                                                                                                                                           | 5 A                                                                                                                                                    |
| Short-duration current: | <ul style="list-style-type: none"> <li>● 30 A for 0.5 s</li> </ul>                                                                                     | <ul style="list-style-type: none"> <li>● 250 A for 0.03 s,</li> <li>● 30 A for 3 s</li> </ul>                                                                                                                                  | 30 A for 0.5 s.                                                                                                                                        |
| Making capacity:        | 1000 W (VA) at L/R = 40 ms.                                                                                                                            | 30 A                                                                                                                                                                                                                           | 1000 W (VA) at L/R = 40 ms.                                                                                                                            |
| Breaking capacity:      | <ul style="list-style-type: none"> <li>● 0.2 A at 220 V DC and L/R = 40 ms,</li> <li>● 4 A at 230 V AC and <math>\cos \varphi = 0.4</math>.</li> </ul> | <ul style="list-style-type: none"> <li>● 7500 W resistive or 30 A at 250 V DC, Maximum values: 30 A and 300 V DC.</li> <li>● 2500 W inductive (L/R = 40 ms) or 10 A at 250 V DC, Maximum values: 10 A and 300 V DC.</li> </ul> | <ul style="list-style-type: none"> <li>● 0.2 A at 220 V DC and L/R = 40 ms,</li> <li>● 4 A at 230 V AC and <math>\cos \varphi = 0.4</math>.</li> </ul> |
| Operating time:         | less than 5 ms                                                                                                                                         | less than 0.2 ms                                                                                                                                                                                                               | less than 5 ms                                                                                                                                         |
| Reset time:             | less than 5 ms                                                                                                                                         | less than 8 ms                                                                                                                                                                                                                 | less than 5 ms                                                                                                                                         |

### 2.5.8 BCD Measured Data Output

Maximum numerical value that can be displayed: 399

## 2.6 Interfaces

### 2.6.1 Local Control Panel

#### Input or output

- 12 navigation/control keys, 4 context sensitive hotkeys and 6 user configurable function keys
- Display ordering option:
  - Graphic display: Portrait orientation QVGA (320 × 240 pixels) with 5.7 Inches dimension colored graphic liquid crystal display (LCD)
  - Text display: Portrait orientation QVGA (192 × 96 pixels) with 3.5 Inches dimension, LC display containing 12 × 32 alphanumeric characters

#### State and fault signals

- 5 fixed system LEDs (Healthy, Alarm, Trip, Out of Service, Edit Mode)
- 2 LED indicators for 'Local', 'Remote' and 'Local and Remote' states
- 12 multi-color LED indicators with user configurable functional assignment
- 6 multi-color LED indicators with user configurable functional assignment for function keys

### 2.6.2 PC Interface

- Transmission rate: 300 to 115,200 baud (adjustable)

### 2.6.3 Serial Communication Interface

The communication modules can be provided with up to three communication channels, depending on the module variant. Channel 1 and 3 may either be equipped to connect wire leads or optical fibers and channel 2 is only available to connect wire leads.

For communication interface 1, communication protocols based on IEC 870-5-103, IEC 60870-5-101, MODBUS, DNP 3.0, or Courier can be set.

- Transmission rate: 300 to 64000 baud (adjustable).

Communication interface 2 could be used alternatively as a slave device according to IEC 60870-5-103 or as a MODBUS master to communicate with up to four MODBUS IEDs.

- Transmission rate: 300 or 57600 baud (adjustable).

#### Wire Leads

- Per RS 485 or RS 422, 2 kV isolation
- Distance to be bridged
  - Point-to-point connection: max. 1200 m
  - Multipoint connection: max. 100 m



*Plastic Fiber Connection*

- Optical wavelength: typically 660 nm
- Optical output: min. -7.5 dBm
- Optical sensitivity: min. -20 dBm
- Optical input: max. -5 dBm
- Distance to be bridged: max. 45 m  
(Distance to be bridged given for identical optical outputs and inputs at both ends, a system reserve of 3 dB, and typical fiber attenuation)

*Glass Fiber Connection G 50/125*

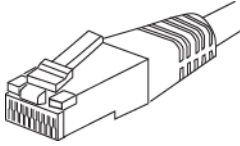
- Optical wavelength: typically 820 nm
- Optical output: min. -19.8 dBm
- Optical sensitivity: min. -24 dBm
- Optical input: max. -10 dBm
- Distance to be bridged: max. 400 m  
(Distance to be bridged given for identical optical outputs and inputs at both ends, a system reserve of 3 dB, and typical fiber attenuation)

*Glass Fiber Connection G 62.5/125*

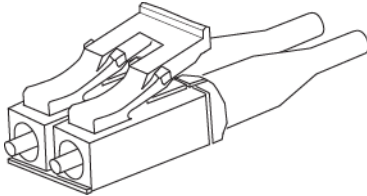
- Optical wavelength: typically 820 nm
- Optical output: min. -16 dBm
- Optical sensitivity: min. -24 dBm
- Optical input: max. -10 dBm
- Distance to be bridged: max. 1,400 m  
(Distance to be bridged given for identical optical outputs and inputs at both ends, a system reserve of 3 dB, and typical fiber attenuation)

## 2.6.4 Ethernet Communication Interface

*100BaseTx Port*

| Connector                    | Characteristics                                                                                            |
|------------------------------|------------------------------------------------------------------------------------------------------------|
| Type                         | Shielded RJ45 jack<br> |
| Manufacturer / Reference     |                                                                                                            |
| Twisted pair cable           | Cat 5                                                                                                      |
| Max. cable length with Cat 5 | 100 m                                                                                                      |

100BaseFx Multi-Mode Port

| Connector                 | Characteristics                                                                    |                                        |
|---------------------------|------------------------------------------------------------------------------------|----------------------------------------|
| Fiber port type           | LC duplex connector optical Interface                                              |                                        |
|                           |  |                                        |
| Manufacturer / Reference  | AVAGO HFBR-57E5APZ                                                                 |                                        |
| Center wavelength         | 1308 nm (Typ.)                                                                     |                                        |
| Optimal fiber cable       | 62.5/125 μm                                                                        | 50/125 μm                              |
| Output Optical Power (TX) | - 20.0 (Min.) - 17.0 dBm (Typ.)                                                    | - 23.5 (Min.) - 20.0 dBm (Typ.)        |
| Receiver Sensitivity (RX) | - 31.0 (Min.) dBm<br>- 14.0 (Max.) dBm                                             | - 31.0 (Min.) dBm<br>- 14.0 (Max.) dBm |
| Max. Fiber distance       | See Fibber optical budget calculation <a href="#">Section 2.6.5, (p. 2-16)</a>     |                                        |

2.6.5 Fiber Optic budget calculations

Optical power is expressed in Watts. However, the common unit of power measurement is the dBm, defined by the following equation:  $\text{Power (dBm)} = 10 \log \text{Power (mW)} / 1 \text{ mW}$ .

The fiber optic budget is the difference between the power emitted into the fiber and the sensitivity (minimum amount of power required) of the receiver connected through the fiber optic cable.

Link Power Budget = Transmitter Power (dBm) - Receiver Sensitivity (dBm)

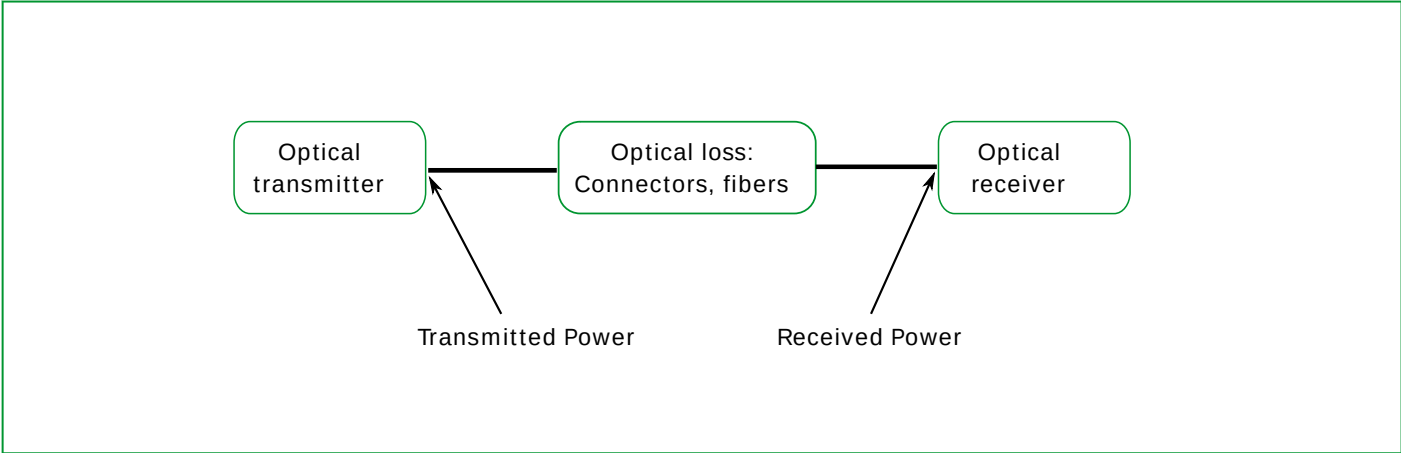


Fig. 2-1: Fiber budget.

| Fiber type               | Multi-Mode      |
|--------------------------|-----------------|
| Technology               | 62.5/125 micron |
| Power coupled into fiber | - 20 dBm (Min.) |
| Receiver Sensitivity     | - 31 dBm (Min.) |
| Link Power Budget        | 11 dB           |

*Example 1: between devices*

| Topic                     | Multi-Mode |
|---------------------------|------------|
| Link Power budget         | 11 dB      |
| Connector loss            | 1.6 dB     |
| Protective Margin         | 4 dB       |
| Allowed link attenuation  | 5.4 dB     |
| Typical cable attenuation | 1 dB/km    |
| Maximum range             | 5.4 km     |

*Example 2: between devices with patch panel*

| Topic                     | Multi-Mode |
|---------------------------|------------|
| Link Power budget         | 11 dB      |
| Connector loss            | 1.6 dB     |
| Patch loss                | 2 dB       |
| Protective Margin         | 4 dB       |
| Allowed link attenuation  | 3.4 dB     |
| Typical cable attenuation | 1 dB/km    |
| Maximum range             | 3.4 km     |

## 2.6.6

### IRIG-B Interface

- Modulated signal (B122 format)
- Demodulated signal (B000 format)
- Carrier frequency: 1 kHz
- BCD- coded variable data (daily)
- 2kVrms Dielectric withstand

## 2.7 Information Output

Counters, measured data, and indications: see chapter “Information and Control Functions”.

## 2.8 Deviations

### 2.8.1 Deviations of the Operate Values

#### 2.8.1.1 Definitions

##### Reference Conditions

- Quasi-stationary sinusoidal signals at nominal frequency  $f_{nom}$  (frequency protection excepted), total harmonic distortion  $\leq 2\%$ , ambient temperature  $20^{\circ}\text{C}$  ( $68^{\circ}\text{F}$ ), and nominal auxiliary voltage  $V_{A,nom}$ .

##### Deviation

- Deviation relative to the setting under reference conditions.

#### 2.8.1.2 Measuring-Circuit Monitoring

##### Operate values $I_{diff>}$ , $V_{min<}$

- Deviation:  $\pm 3\%$

#### 2.8.1.3 Direct Current Input

- Deviation:  $\pm 1\%$

#### 2.8.1.4 Resistance Thermometer

- Deviation:  $\pm 2^{\circ}\text{C}$  (in the range  $-40^{\circ}\text{C} \dots 120^{\circ}\text{C}$ )

#### 2.8.1.5 Analog Measured Data Output

- Deviation:  $\pm 1\%$
- Output residual ripple with max. load:  $\pm 1\%$

## 2.8.2 Deviations of Measured Data Acquisition

### 2.8.2.1 Definitions

#### Reference conditions

- Sinusoidal signals at nominal frequency  $f_{nom}$ , total harmonic distortion  $\leq 2\%$ , ambient temperature  $20^{\circ}\text{C}$  ( $68^{\circ}\text{F}$ ), and nominal auxiliary voltage  $V_{A,nom}$ .

#### Deviation

- Deviation relative to the nominal values under reference conditions.

### 2.8.2.2 Operating Data Measurement

#### Measuring input currents

- Deviation:  $\pm 0.2\%$

#### Measuring input voltages

- Deviation:  $\pm 0.5\%$

#### Internally formed resultant current and negative-sequence system current

- Deviation:  $\pm 2\%$

#### Internally formed neutral-point displacement voltage and voltages of positive- and negative-sequence systems

- Deviation:  $\pm 2\%$

#### Load angle

- Deviation:  $\pm 1^{\circ}$

#### Frequency

- Deviation:  $\pm 10 \text{ mHz}$

#### Direct current of measured data input and output

- Deviation:  $\pm 1\%$

#### Temperature

- Deviation:  $\pm 2^{\circ}\text{C}$  [approx.  $\pm 4^{\circ}\text{F}$ ]

### 2.8.2.3 Fault Data

#### Short-circuit current and voltage

- Deviation:  $\pm 3\%$

#### Short-circuit impedance, reactance, and fault location

- Deviation:  $\pm 5\%$

### 2.8.2.4 Internal Clock

#### With free running internal clock

- Deviation:  $< 1 \text{ min/month}$

#### With external synchronization (with a synchronization interval $\leq 1 \text{ min}$ )

- Deviation:  $< 10 \text{ ms}$

#### With synchronization via IRIG-B interface

- $\pm 1 \text{ ms}$

## 2.9 Recording Functions

### 2.9.1 Organization of the Recording Memories

#### *Operating Data Memory*

##### Scope for signals

- All signals relating to normal operation; from a total of up to 2048 different logic state signals.

##### Depth for signals

- The 3000 most recent signals.

#### *Monitoring Signal Memory*

##### Scope for signals

- All self-monitoring logic state signals.

##### Depth for signals

- Up to 30 signals.

#### *Fault Memory*

##### Number

- The 8 most recent faults.

##### Scope for signals and fault values

- All fault-relevant signals from a total of up to 2048 different logic state signals.
- Sampled values for all measured currents and voltages

##### Depth for signals and fault values

- 200 entries per fault event
- max. number of cycles per fault can be set by user;  
820 periods in total for all faults, that is 16.4 s (for  $f_{nom} = 50$  Hz) or 13.7 s (for  $f_{nom} = 60$  Hz).

## 2.10 Power Supply

Nominal auxiliary voltage  $V_{A,nom}$  (ordering option)

- 24 to 60 V DC (lower range supply)
- 60 to 250 V DC or 100 to 230 V AC (upper range supply)

Operating range for direct voltage

- 0.8 to 1.1  $V_{A,nom}$  with a residual ripple of up to 15 %  $V_{A,nom}$ .

Operating range for alternating voltage

- 0.9 to 1.1  $V_{A,nom}$ .

Nominal burden

- ... where  $V_A = 220$  V DC and with maximum module configuration
  - 40 TE case, relays de-energized/energized: approx. 12.6 W / 34.1 W
  - 84 TE case, relays de-energized/energized): approx. 14.5 W / 42.3 W

Start-up peak current

- < 3 A for duration of 0.25 ms

Stored energy time

- $\geq 20$  ms for interruption of  $V_A \geq 24$  V DC (lower and upper range supply)
- $\geq 50$  ms for interruption of  $V_A \geq 36$  V DC (lower range supply)
- $\geq 50$  ms for interruption of  $V_A \geq 90$  V DC (upper range supply)



## 2.11 Current Transformer Specifications

### 2.11.1 Symbols

The following symbols are used in accordance with IEC 61869 standards:

$I_{pn}$  Rated primary current (nominal primary current) of the CT

$I_{sn}$  Rated secondary current (nominal secondary current) of the CT

$I_{psc}$  Rated primary (symmetrical) short-circuit current

$K_{ssc}$  Rated symmetrical short-circuit current factor:

$$K_{ssc} = \frac{I_{psc}}{I_{pn}}$$

$I_{ref}$  Reference current of IDMT protection element

$R_{bn}$  Rated resistive burden (secondary connected) of the CT

$P_{bn}$  Equivalent power over the rated resistive burden of the CT for rated secondary current:

$$P_{bn} = R_{bn} \cdot I_{sn}^2$$

$R_b$  Actual resistive burden (secondary connected) of the CT

$P_b$  Equivalent power over the actual resistive burden of the CT for rated secondary current:

$$P_b = R_b \cdot I_{sn}^2$$

$R_{ct}$  Secondary winding resistance of the CT

$P_{ct}$  Equivalent power over the secondary winding resistance of the CT for secondary rated current:

$$P_{ct} = R_{ct} \cdot I_{sn}^2$$

$V_{sal}$  Secondary accuracy limiting voltage (e.m.f.) of the CT

$V_k$  Rated knee point voltage (e.m.f.) of the CT

$n_n$  Rated accuracy limit factor of the CT

$n_b$  Actual accuracy limit factor of the CT:

$$n_b = n_n \cdot \frac{R_{ct} + R_{bn}}{R_{ct} + R_b} = n_n \cdot \frac{P_{ct} + P_{bn}}{P_{ct} + P_b}$$

- $R_l$  One-way lead resistance from CT to relay  
 $R_{rel}$  Resistive burden of relay's CT input  
 $T_p$  Primary time constant (primary system time constant)  
 $\omega$  (System) angular frequency  
 $X_p/R_p$  Primary impedance ratio (system impedance ratio):  

$$\frac{X_p}{R_p} = \omega \cdot T_p$$
  
 $K_d$  Dimensioning factor for the CT  
 $K_{emp}$  Relay specific, empirically determined dimensioning factor for the CT

### 2.11.2

#### General Equations

The current transformer can be dimensioned

- either for the minimum required secondary accuracy limiting voltage acc. to IEC 61869, 3.4.209:  

$$V_{sal} \geq K_d \cdot K_{ssc} \cdot I_{sn} \cdot (R_{ct} + R_b)$$
- or for the minimum required rated accuracy limit factor acc. to IEC 61869, 3.4.208, as follows:

$$n_n \geq K_d \cdot K_{ssc} \cdot \frac{R_{ct} + R_b}{R_{ct} + R_{bn}} = K_d \cdot K_{ssc} \cdot \frac{P_{ct} + P_b}{P_{ct} + P_{bn}}$$

The relation between both methods is given as follows:

$$V_{sal} = n_n \cdot \left( \frac{P_{bn}}{I_{sn}} + I_{sn} \cdot R_{ct} \right)$$

The actual secondary connected burden  $R_b$  is given as follows:

- For phase-to-ground faults:  $R_b = 2 \cdot R_l + R_{rel}$
- For phase-to-phase faults:  $R_b = R_l + R_{rel}$

The wire lead burden is calculated as:

$$R_l = \rho \cdot \frac{l}{A}$$

- $\rho$  = specific conductor resistance  
(e.g. for copper  $0.021 \, \Omega \, \text{mm}^2/\text{m} = 2.1 \cdot 10^{-8} \, \Omega \, \text{m}$ , at  $75^\circ\text{C}$ )
- $l$  = wire length
- $A$  = wire cross section

For devices out of the platform Easergy MiCOM 30, the input CT burden  $R_{rel}$  is less than  $20 \, \text{m}\Omega$ , independent of the set nominal current (1 A or 5 A). Usually this relay burden can be neglected.

The rated knee point voltage  $V_k$  according to IEC 61869, 3.4.217 is lower than the secondary accuracy limiting voltage  $V_{sal}$  according to IEC 61869, 3.4.209. It is not possible to give a general relation between  $V_k$  and  $V_{sal}$ , but for standard core material the following relations applies:

- $V_k \approx 0.85 \cdot V_{sal}$  for class 5P CTs, and
- $V_k \approx 0.75 \cdot V_{sal}$  for class 10P CTs, respectively.

Theoretically, the specifications of the current transformer could be calculated to avoid saturation by inserting its maximum value, instead of the required over-dimensioning factor  $K_d$ :

$$K_d = K_{\max} \approx 1 + \frac{X_p}{R_p} = 1 + \omega \cdot T_p$$

However, this is not necessary. Instead, it is sufficient to consider an empirically determined dimensioning factor  $K_d = K_{\text{emp}}$  such that the appropriate operation of the protection function is ensured under the given conditions. This factor depends on application and relay type, as outlined in the following.



## 3 Operation

### 3.1 Modular Structure

The C434 is a numerical device out of Schneider Electric's family of devices named "Easergy MiCOM 30". The device types included in this family are built from identical uniform hardware modules. The figure below shows the basic hardware structure of the C434.

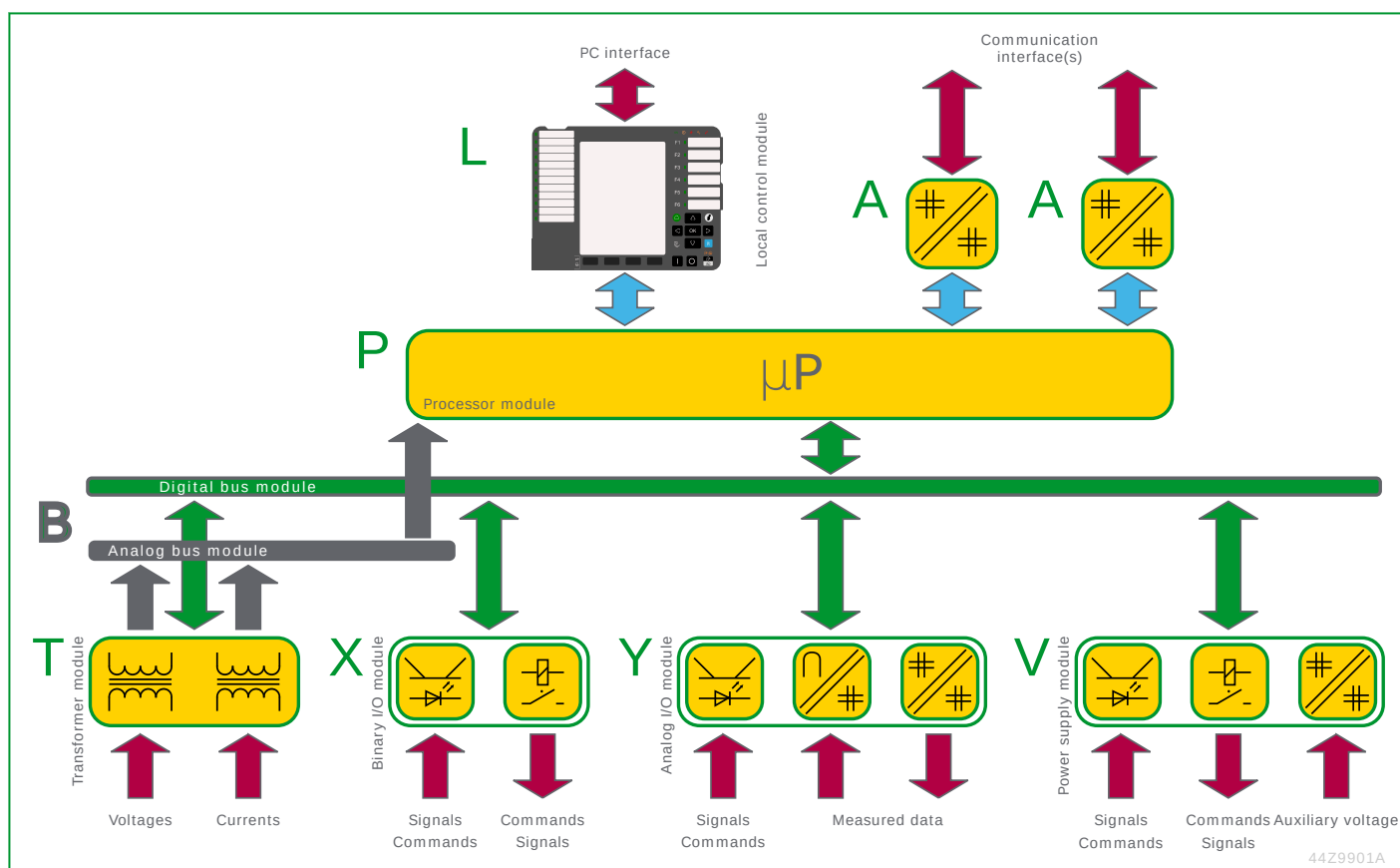


Fig. 3-1: Basic hardware structure

External analog quantities and binary quantities – electrically isolated – are converted to the internal processing levels by the peripheral modules T, Y, and X. The optional binary I/O modules X are equipped with optical couplers for binary signal input as well as output relays for the output of signals and commands or combinations of these.

The external auxiliary voltage is applied to the power supply module V, which supplies the auxiliary voltages that are required internally.

Analog data is transferred from the transformer module T via the analog bus module B to the processor module P. The processor module contains all the elements necessary for the conversion of measured analog variables, including multiplexers and analog/digital converters. The analog data conditioned by the analog I/O module Y is transferred to the processor module P via the digital bus module.

The processor handles the processing of digitized analog variables and of binary signals and transfers them to the binary I/O modules X via the digital bus module. The processor module also handles overall device communication.

The optional communication modules provide one or two serial communication interfaces for the integration of the protection and control unit into a substation control system.

The local control module L is located behind the front panel and connected to the processor module via a ribbon cable. It encompasses all control and display elements as well as a PC interface for running the operating program Easergy Studio.

## 3.2 Operator-Machine Communication

The following interfaces are available for the exchange of information between the user and the C434:

- Integrated user interface (LOC: local control panel)
- PC interface
- Communication interface

All settings and signals as well as all measurements and control functions are arranged within the branches of the menu tree following a scheme that is uniform throughout the device family. The main branches are:

### *“Parameters” Branch*

All settings are contained in this branch. This branch carries all settings, including the identification data of the C434, the configuration parameters for adapting the C434 interfaces to the system, and the function parameters for adapting the device functions to the process. All values in this group are stored in non-volatile memory, which means that the values will be preserved even if the power supply fails.

### *“Operation” Branch*

This branch includes all information relevant for operation such as measured operating data and binary signal states. This information is updated periodically and consequently is not stored. In addition, various controls are grouped here, for example those for resetting counters, memories and displays.

### *“Events” Branch*

The third branch is reserved for the recording of events. All information in this group is therefore stored.

### *Display of Settings and Signals*

Settings and signals are displayed either in plain text or as addresses, in accordance with the user's choice. All settings and signals of the C434 are documented in a separate collection of documents, the so-called “DataModelExplorer”. The “Addresses” document (being part of the “DataModelExplorer”) is complete in the sense that it contains all settings, signals and measured variables that are relevant for the user of the C434.

Normally (if a C434 unit with graphics display is installed), the local control panel will display the “Bay Panel”, which represents a selected bay and shows the up-to-date switching states. The configuration of the local control panel also permits the installation of Measured Value “Panels” on the LCD display.

### 3.3 Cyber Security (Function Group CS)

This product contains a Cyber Security function, which manages the encryption of the data exchanged through some of the communication channels. The aim is to protect the data (configuration and process data) from any corruption, malice, attack. Subsequently, this product might be subject to control from customs authorities, and it might be necessary to request special authorization from these customs authorities before any export/import operation. For any technical question relating to the characteristics of this encryption please contact your Customer Care Centre - <http://www.schneider-electric.com/CCC>.

*For devices of the Easergy MiCOM 30 platform, Cyber Security is available as of software version -661.  
Please refer to separately available "Cyber Security" Technical Manual for all details.*

Cyber Security is based on the model of Role Based Access Control (RBAC) which is a method to restrict resource access to authorized users. One role can have one and more access rights, one user (subject) can have several roles. A user (subject) is based on a session. This session controls for example the activity of the user. If the user is inactive for 15 minutes (default setting) the user will be locked out automatically.

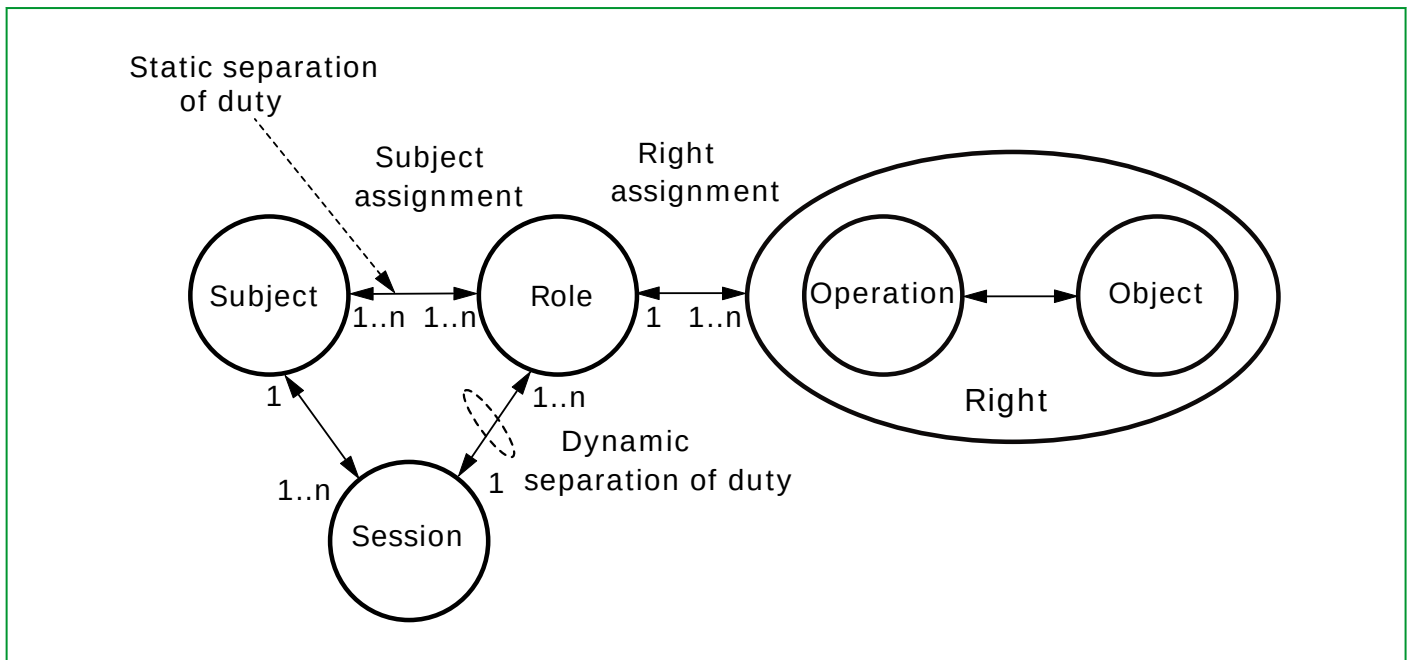


Fig. 3-2: RBAC model.



## NOTICE

### CYBER SECURITY HAZARD

To improve Cyber Security:

- Change all passwords from their default values when taking the protection device into use.
- Change all passwords regularly.

Failure to follow these instructions can increase the risk of unauthorized access.

### 3.3.1 Users, Roles and Rights for Easergy MiCOM P30

#### User accounts

When the user tries to access an IED, they need to login using their own username and their own password. The username/ password combination is then checked against the records stored on the IED. It is the role that defines their access to the relevant parts of the system.

The default user accounts for Easergy MiCOM P30 is as below:

*Schneider Electric points out that changing default users and default passwords constitutes an important security measure for the product. Therefore Schneider Electric recommends to change the default passwords after the first usage of the device. Not changing the default passwords can lead to the risk of undesirable changes by third parties.*

| User Accounts                   | Roles    |          |        |        |
|---------------------------------|----------|----------|--------|--------|
|                                 | ENGINEER | OPERATOR | VIEWER | SECADM |
| DefaultEngineer                 | x        | x        | x      |        |
| DefaultOperator                 |          | x        | x      |        |
| DefaultViewer                   |          |          | x      |        |
| SecurityAdmin<br>(for CAE only) |          |          |        | x      |
| DefaultUser<br>(for HMI only)   |          |          | x      |        |

Tab. 3-1: Default user accounts for Easergy MiCOM P30.

#### Roles

Different named roles are associated with different access rights. Roles and Rights are setup in a pre-defined arrangement, according to the IEC 62351 standard, but customized to the Easergy MiCOM P30 equipment.

The default roles for Easergy MiCOM P30 is as below:

| Role     | Description                                                                                                                                                                                                                                                             |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VIEWER   | Can View what objects are present within a Logical-Device by presenting the type ID of those objects.                                                                                                                                                                   |
| OPERATOR | An Operator can view what objects and values are present within a Logical-Device by presenting the type ID of those objects as well as perform control actions.                                                                                                         |
| ENGINEER | An Engineer can view what objects and values are present within a Logical-Device by presenting the type ID of those objects. Moreover, an engineer has full access to Datasets and Files and can configure the server locally or remotely.                              |
| SECADM   | Security Administrator can change subject-to-role assignments (outside the device) and role-to-right assignment (inside the device) and security policy setting; change security setting such as certificates for subject authentication and access token verification. |

Tab. 3-2: Default roles summary for Easergy MiCOM P30.

### Rights

In a similar way in which a set of pre-defined Roles have been created, a predefined set of Rights have been created.

*The reason why these are described as Default, is that it is possible to change the definitions of Roles and Rights, by using the CAE software. Depending on the work done by the system administrator, it is possible that your own situation may vary from these initial recommendations.*

### 3.3.2

#### Cyber Security Types and Communication Protocols (Based on Order Number)

Considered some users may not want to use the Cyber Security, Schneider Electric offers Easergy MiCOM 30 Series with or without CS as below: (See [Chapter 15, \(p. 15-1\)](#) for the order information.)

- Default CS: Default RBAC configuration with simple password management, no CAE (EcoStruxure™ Cybersecurity Admin Expert) required.
- Advanced CS: Advanced cyber security, CAE required.  
Complete security configuration via CAE (e.g. user and passwords, type of password complexity) and security services (e.g. Security logs).

| Order number | Communication                | Security types    | Security conf. | Supported protocols                                                                                                  | Configuration protocols                                                                                                       |
|--------------|------------------------------|-------------------|----------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| 97 (1-4)     | Ethernet module              | Default security  | -              | IEC 61850 Ed1/<br>IEC 61850 Ed2/<br>IEC 60870-5-104                                                                  | IEC 60870-5-103 TLS and SSH/SFTP and Webservices<br>OR serial<br>IEC 60870-5-103 serial and Firmware update and file transfer |
| 99 (1-4)     | Ethernet module              | Advanced security | With CAE       | IEC 61850 Ed1/<br>IEC 61850 Ed2/<br>IEC 60870-5-104                                                                  | IEC 60870-5-103 TLS and SSH/SFTP and Webservices<br>OR serial<br>IEC 60870-5-103 serial and Firmware update and file transfer |
| 92 x         | Serial module                | Default security  | -              | IEC 60870-5-103/<br>IEC 60870-5-101/<br>Modbus/<br>DNP                                                               | Serial only:<br>IEC 60870-5-103 serial and Firmware update and file transfer                                                  |
| 0            | Without communication module | Default security  | -              | -                                                                                                                    | Serial only:<br>IEC 60870-5-103 serial and Firmware update and file transfer                                                  |
| 97 (5-8)     | Ethernet + serial module     | Default security  | -              | IEC 61850 Ed1/<br>IEC 61850 Ed2/<br>IEC 60870-5-104<br>AND<br>IEC 60870-5-103/<br>IEC 60870-5-101/<br>Modbus/<br>DNP | IEC 60870-5-103 TLS and SSH/SFTP and Webservices<br>OR serial<br>IEC 60870-5-103 serial and Firmware update and file transfer |
| 99 (5-8)     | Ethernet + serial module     | Advanced security | With CAE       | IEC 61850 Ed1/<br>IEC 61850 Ed2/<br>IEC 60870-5-104<br>AND<br>IEC 60870-5-103/<br>IEC 60870-5-101/<br>Modbus/<br>DNP | IEC 60870-5-103 TLS and SSH/SFTP and Webservices<br>OR serial<br>IEC 60870-5-103 serial and Firmware update and file transfer |

Tab. 3-3: CS types and supported protocols for Easergy MiCOM P30.

The configuration interface can be chosen by the user either serial or via Ethernet. For security reasons it can be important to update for example the Ethernet module via the serial interface, therefore all maintenance and configuration services are available over serial. For convenience the important update functions are also over Ethernet available.

| Configuration                                 | Security types                    | Ethernet | Serial         |
|-----------------------------------------------|-----------------------------------|----------|----------------|
| Firmware update ethernet board (if available) | SSH/SFTP or serial file transfer  | X        | X              |
| Firmware update main board                    | Serial file transfer              |          | X              |
| Configuration of the main device function     | IEC 60870-5-103 via TLS or serial | X        | X              |
| User defined control pictures                 | Serial file transfer              |          | X              |
| User defined data model                       | Serial file transfer              |          | X              |
| Security configuration                        | Webservices                       | X        | X <sup>1</sup> |

Tab. 3-4: Configuration of Easergy MiCOM P30.

(x<sup>1</sup>) In the case of without security or without the Ethernet module, the device provides the default security. With the default security configuration, only passwords can be changed.

| NOTICE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>CYBER SECURITY HAZARD</b></p> <ul style="list-style-type: none"> <li>• Except for IEC 60870-5-103 via TLS and SFTP/SSH, the device does not have the capability to transmit data encrypted using the following protocols: IEC 61850 Ed1, IEC 61850 Ed2, IEC 60870-5-104, IEC 60870-5-103 serial, IEC 60870-5-101 serial, Modbus serial, and DNP3 serial.</li> <li>• If other users gained access to your network, transmitted information can be disclosed or subject to tampering.</li> <li>• For transmitting data over an internal network, physically or logically segment the network and restrict access using standard controls such as firewalls and other relevant features supported by your device such as IPTable whitelisting.</li> <li>• For transmitting data over an external network, encrypt protocol transmissions over all external connections using an encrypted tunnel, TLS wrapper or a similar solution.</li> </ul> <p>Failure to follow these instructions can increase the risk of unauthorized access.</p> |

### 3.3.3

#### Cyber Security Password Policy Recommendation

The Schneider Electric password policy is one of the key elements of the Cyber Security Policy.

*Good Practice to Improve Password Definition*

- Use common Cyber Security Good Practice for password complexity definition by using strong passwords.
- Change all passwords from default values when taking the protection device into use. (User must change password after first login).
- Change passwords regularly. (User must update password after a certain period of time).
- Use NERC compliant password as much as possible.
- Enforce the use of strong and complex password as: Caps characters + Lowercases characters + Numbers + Special characters in one password.
- Set the minimum password length to 10 characters.
- Switch off all communication ports that are not used on the device, if possible.
- Do not reuse old passwords.

*Best Practice Concerning Passwords*

- Not sharing personal passwords.
- Not displaying passwords during password entry.
- Not transmitting passwords in email or by other means.
- Not saving the passwords on PC's or other devices.
- Not writing password on any supports.
- Regularly reminding users about best practices concerning password.

### 3.4 Configuration of the Local Control Panel (Function Group LOC)

The configuration of the Local Control Panel includes the configuration of the Bay Panel and of the Measured Value Panels, and the selection of the control point.

When the graphic display has been fitted then the layout of a bay with its switchgear units will be shown on the Bay Panel. A Bay Panel usually consists of one Bay Panel image as a standard but after applying the bay editor from the PC Access Software Easergy Studio and having loaded a customized Bay Panel it can be sub-divided into up to eight pages. The graphic display also permits the display of the Event Panel and the configurable Signal Panel.

*To create customized bay types, the “Bay Type Configurator” (BTC), integrated in Easergy Studio (version 8.2 or higher) is needed. Older versions of the BTC can create not compatible hex files and thus can lead to communication failures.*

When the text display has been fitted the Bay Panel will display designations of switchgear devices as text, plus switching state signals and the active control site (local or remote).

In addition the C434 offers Measured Value Panels, which display the measured values relevant at a given time.

During normal power system operation; the Bay Panel or – if activated – the Operation Panel is displayed. If the Operation Panel is activated as an event occurs, the display switches to the appropriate Event Panel – provided that measured values have been selected for the Event Panels.

If the change enabling command has been issued (LOC: Param. change enabl.) it will be cancelled after the time period, defined by setting LOC: Hold-time for Panels has elapsed and the Bay Panel will be called up.

### 3.4.1 Bay Panel

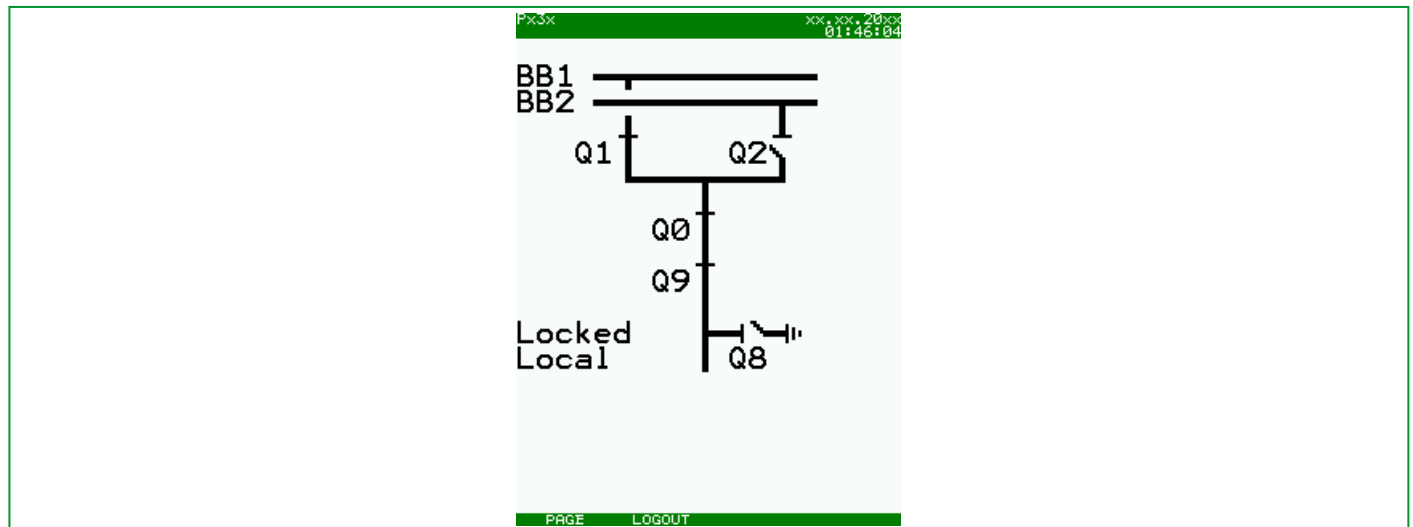


Fig. 3-3: Example of a Pre-defined Bay Panel (with graphic display).

The C434 offers a selection from pre-defined bay types. If the required bay type is not included in the standard selection, the user can contact the manufacturer of the C434 to request the definition of a customized bay type to download into the C434. By applying the bay editor from the PC Access Software Easergy Studio the user can also define new bay types.

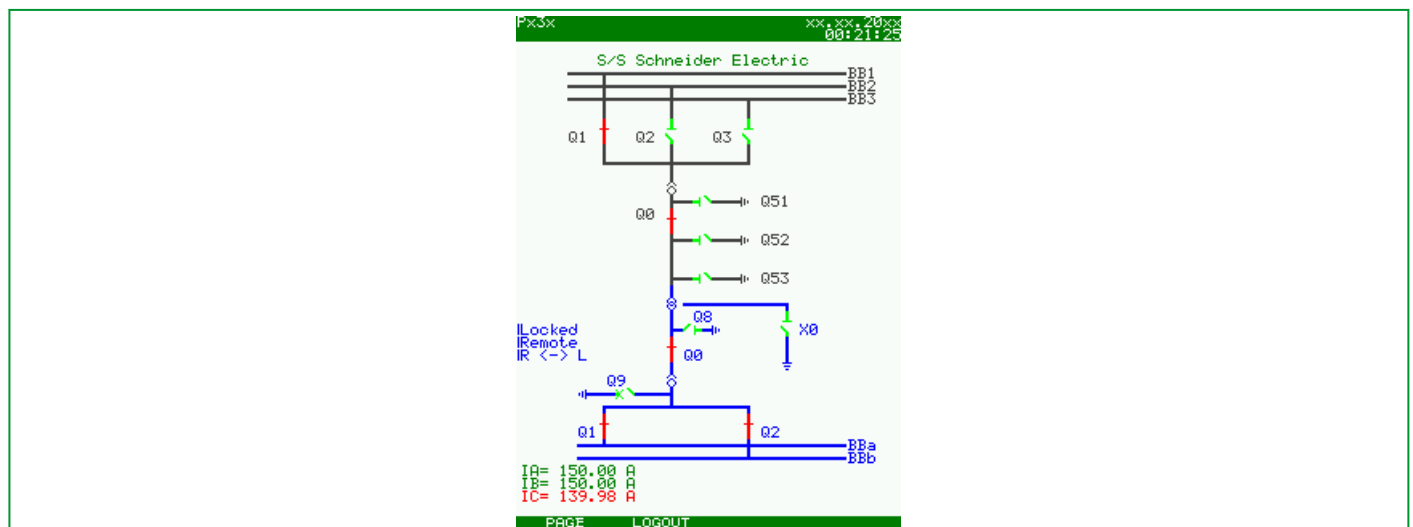


Fig. 3-4: Example of a Customized Bay Panel (with graphic display).

The activation of the Bay Panel display is described in [Chapter 6, \(p. 6-1\)](#). With the graphic display fitted the Bay Panel displays the up-to-date status of the selected bay as a single (phase) diagram. The user can choose between two character sets to represent switch gear on the bay panel. The character sets are described in [Section 6.7.1.1, \(p. 6-23\)](#).

Each external device represented in the Bay Panel is identified by an external device designation (see [Section 3.23.3, \(p. 3-172\)](#)).

The user can also define the designations for busbars and busbar sections (see descriptions of parameters LOC: Designation busbar 1 or LOC: Designat. bus sect.1, respectively, in the “Settings” chapter).

The display of external device designations can also be disabled. The display of the control point (local or remote control) and interlocking can also be disabled.

The switchgear unit to be controlled needs to be selected first. The selection is cancelled if the return time for illumination (LOC: Return time illumin.) or the return time for selection (LOC: Return time select.) has elapsed.

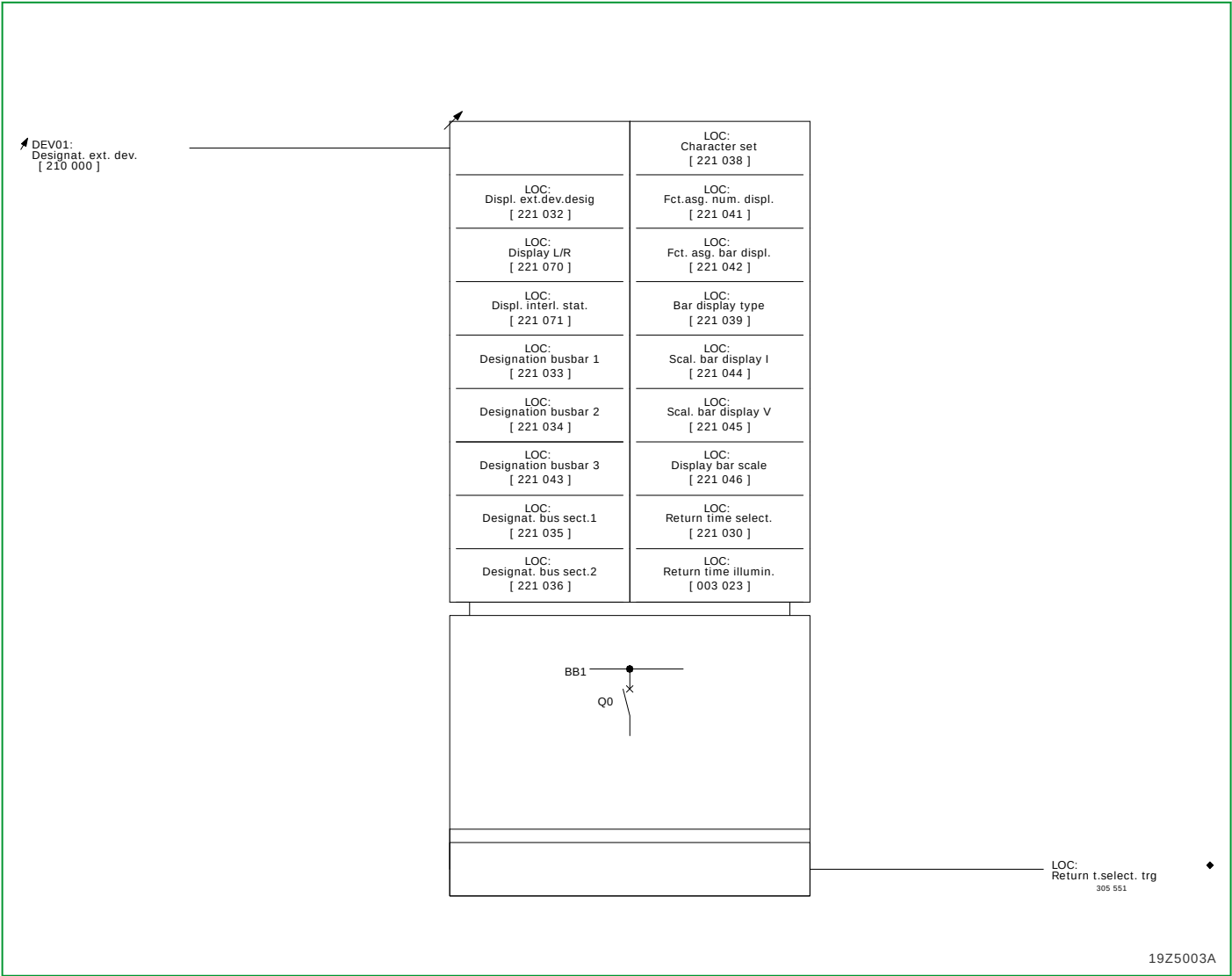


Fig. 3-5: Bay panel.



### 3.4.1.1 Measured Values Display

The measured values that will be displayed on the Bay Panel can first be selected separately for the numerical and the bar chart display by an “m out of n” parameter. Measured values to be displayed in bar chart form must also be selected for display as numerical measured values. However, not all measured values that can be displayed in numerical form can also be displayed in bar chart form. In such cases, a dummy or placeholder must be included in the selection list for the bar chart display at the same point at which a measured value that cannot be displayed in bar chart form appears in the selection list for numerical measured values. For the bar chart display, the orientation of the bar and the scaling can be selected (the latter separately for the current and voltage data). Display of the scaling can be disabled.

### 3.4.1.2 Hold-Time Measured Values Display

With the Bay Panel display the next or the previous configured measured value may be selected by pressing the keys “cursor down” or “cursor up”. Furthermore the respective subsequent measured value is displayed when the hold-time period set for LOC: Hold-t. meas.v.displ has elapsed. The standard default for LOC: Hold-t. meas.v.displ is *Blocked*; in this case the automatic change over feature to the subsequent measured value is not available.

## 3.4.2 Bay Panel



Fig. 3-6: Example of a Bay Panel (with text display)

The C434 offers a selection from pre-defined bay types.

The activation of the Bay Panel display is described in [Chapter 6, \(p. 6-1\)](#).

Each external device represented in the Bay Panel is identified by an external device designation (see [Section 3.23.3, \(p. 3-172\)](#)).

The display of external device designations can be disabled (at LOC: Display L/R). The display of the control point (local or remote control) and interlocking can also be disabled (at LOC: Displ. interl. stat.).

The switchgear unit to be controlled needs to be selected first. The selection is cancelled if the return time for illumination (LOC: Return time illumin.) or the return time for selection (LOC: Return time select.) has elapsed.

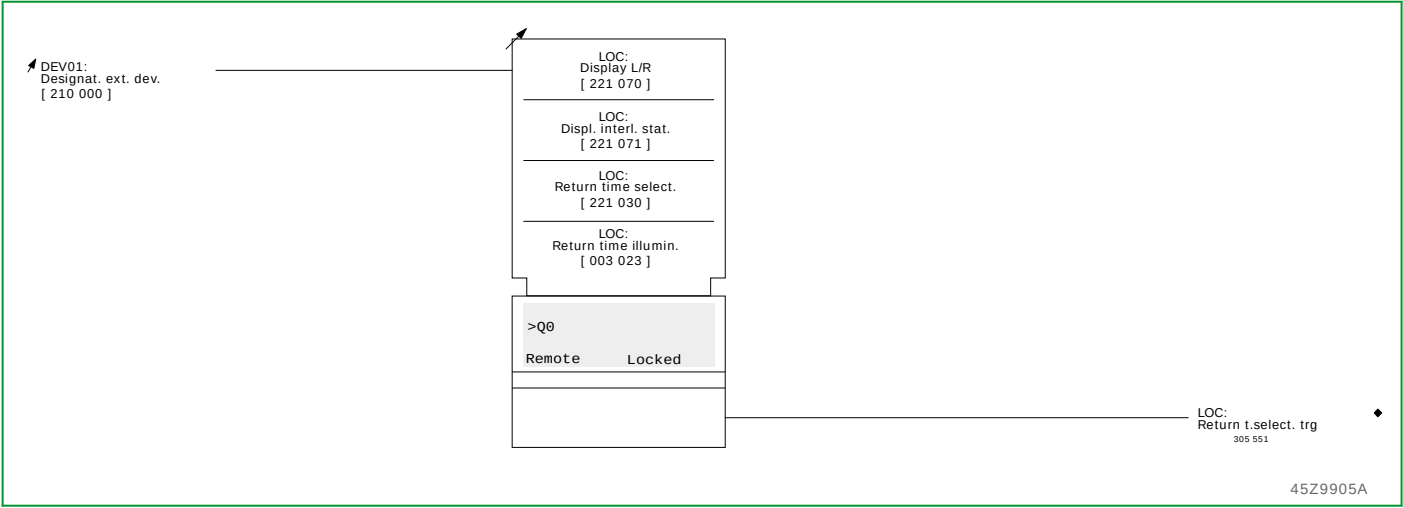


Fig. 3-7: Bay panel (text display)

### 3.4.3 Signal Panel

The Signal Panel is displayed when it is selected and when at least one signal has been configured. From all physical and logical binary states that the C434 has available up to 38 signals can be selected for display on the Signal Panel by an “m out of n” parameter. This occurs without influencing the Event Panel, which is additionally available. When more signals are selected for display than the LC display can accommodate, then the display will switch to the next set of signals at intervals defined by the setting for LOC: Hold-time for Panels or when the appropriate key on the local control panel is pressed. If automatic switching to the Signal Panel is configured at LOC: Aut.activ.Sign.Panel then the Signal Panel is automatically selected when there is a change of state for a signal configured in the panel.

With the parameter LOC: Stat.ind.Sign.Panel it is possible to differentiate between the states “signal active/available” and “signal inactive/not available” shown on the Signal Panel. This is shown by the “clear to black” square alone and the simultaneous change over from “normal” display to “highlighting” of text in the lines. The type of signaling and the clearing, which may become necessary is selected by setting LOC: Indicat.Sign.Panel.

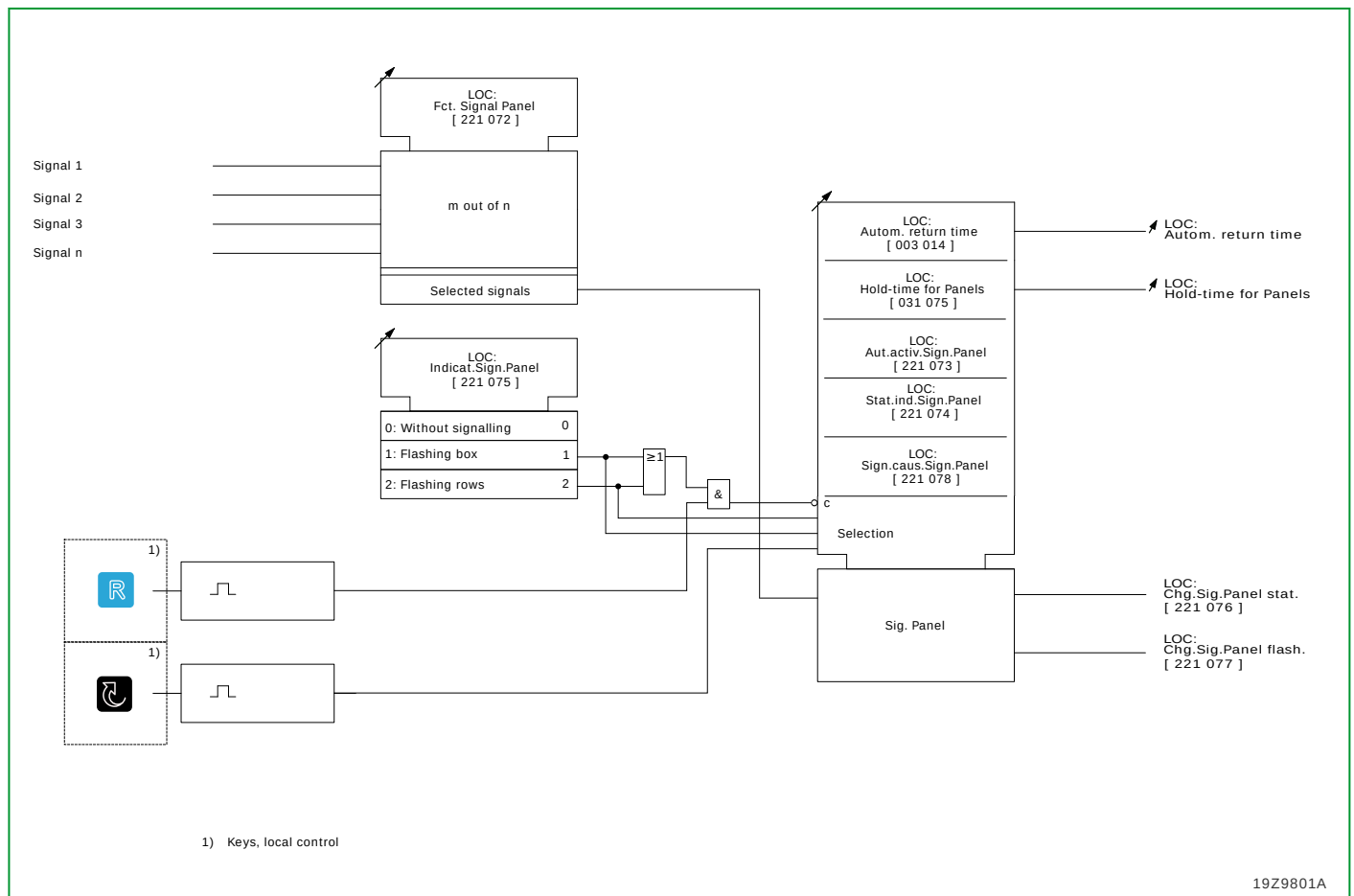


*Fig. 3-8: Signal Panel.*

3.4.4 Operation Panel

The Operation Panel is displayed after the set return time has elapsed, provided that at least one measured value has been configured.

The user can select which of the measured operating values will be displayed on the Operation Panel by means of an “m out of n” parameter. When more measured operating values are selected for display than the LC display can accommodate, then the display will either switch to the next set of measured operating values at intervals defined by the setting for LOC: Hold-time for Panels or when the appropriate key on the local control panel is pressed.

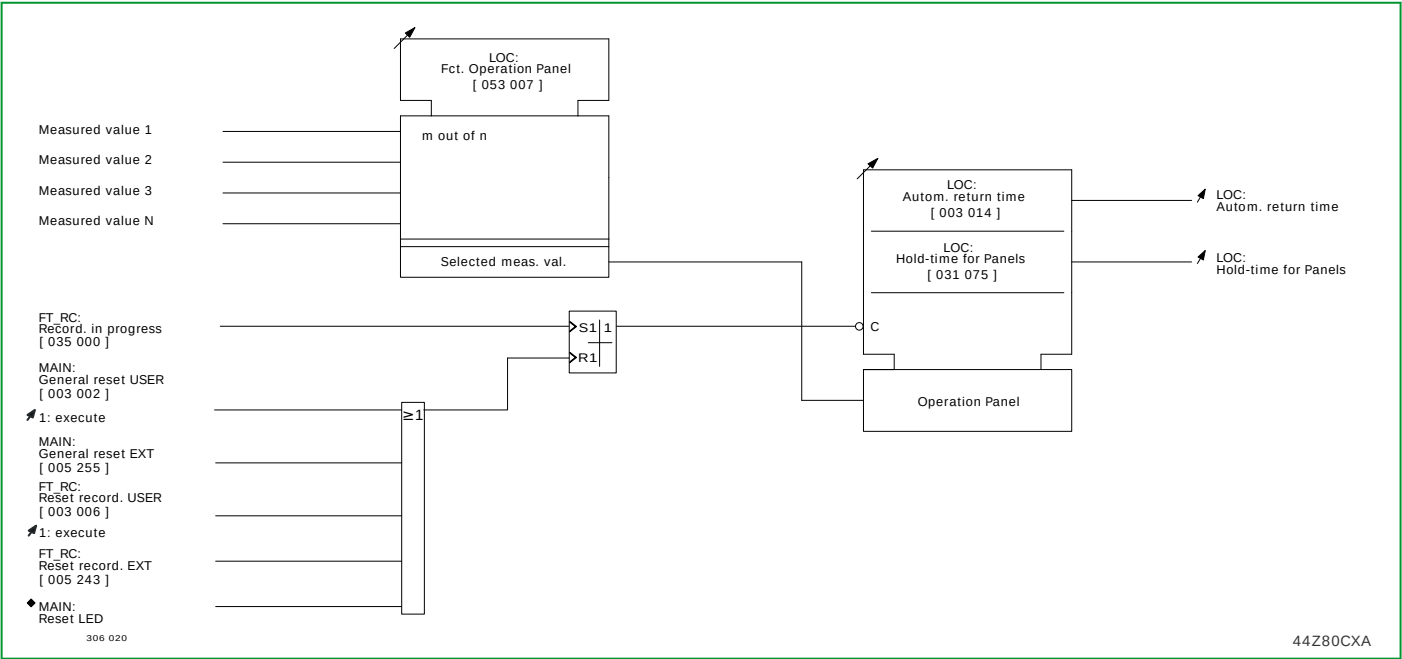


Fig. 3-9: Operation Panel.

### 3.4.5 Fault Panel

The Fault Panel is displayed in place of another data panel when there is a fault, provided that at least one measured value has been configured. The Fault Panel remains on display until the LED indicators or the fault memories are cleared.

The user can select the measured fault values that will be displayed on the Fault Panel by setting an “m out of n” parameter. When more measured fault values are selected for display than the LC display can accommodate, then the display will either switch to the next set of measured fault values at intervals defined by the setting for LOC: Hold-time for Panels or when the appropriate key on the local control panel is pressed.

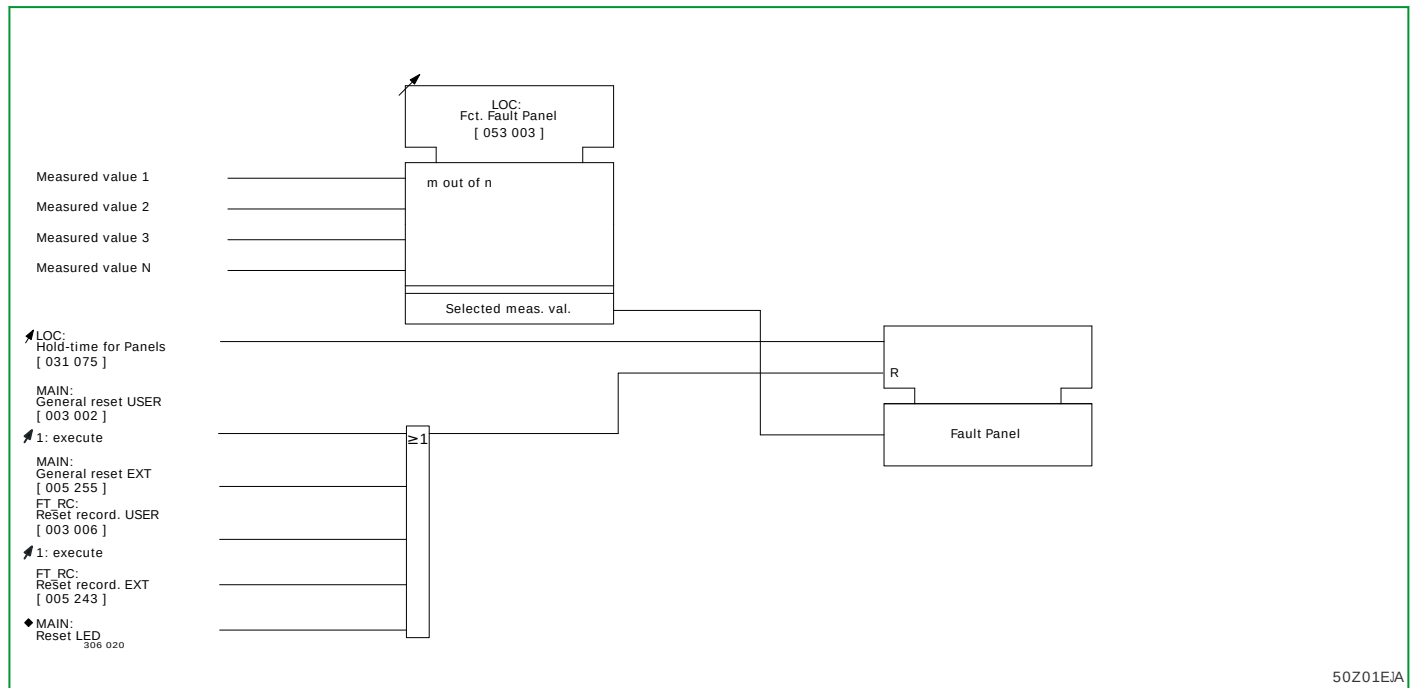


Fig. 3-10: Fault panel.

### 3.4.6 Selection of the Control Point

Switchgear units can be controlled from a remote location or locally. Switching between local and remote control is achieved by using either the L/R key on the local control panel or an external key switch. The position of this external key switch is checked by an appropriately configured binary signal input (configuration at MAIN: Inp.asg. L/R key sw.).

If the binary signal input is configured to *L/R key switch* then the L/R key on the local control panel is without function when the graphic display is fitted.

This setting for LOC: Fct. assign. L/R key determines whether the switching using either the L/R key or the key switch is between local and remote control (L↔R) or between local+remote and local control (R&L↔L).

If only remote control is enabled then there will be a local access blocking. If only local control is enabled then there will be a remote access blocking.

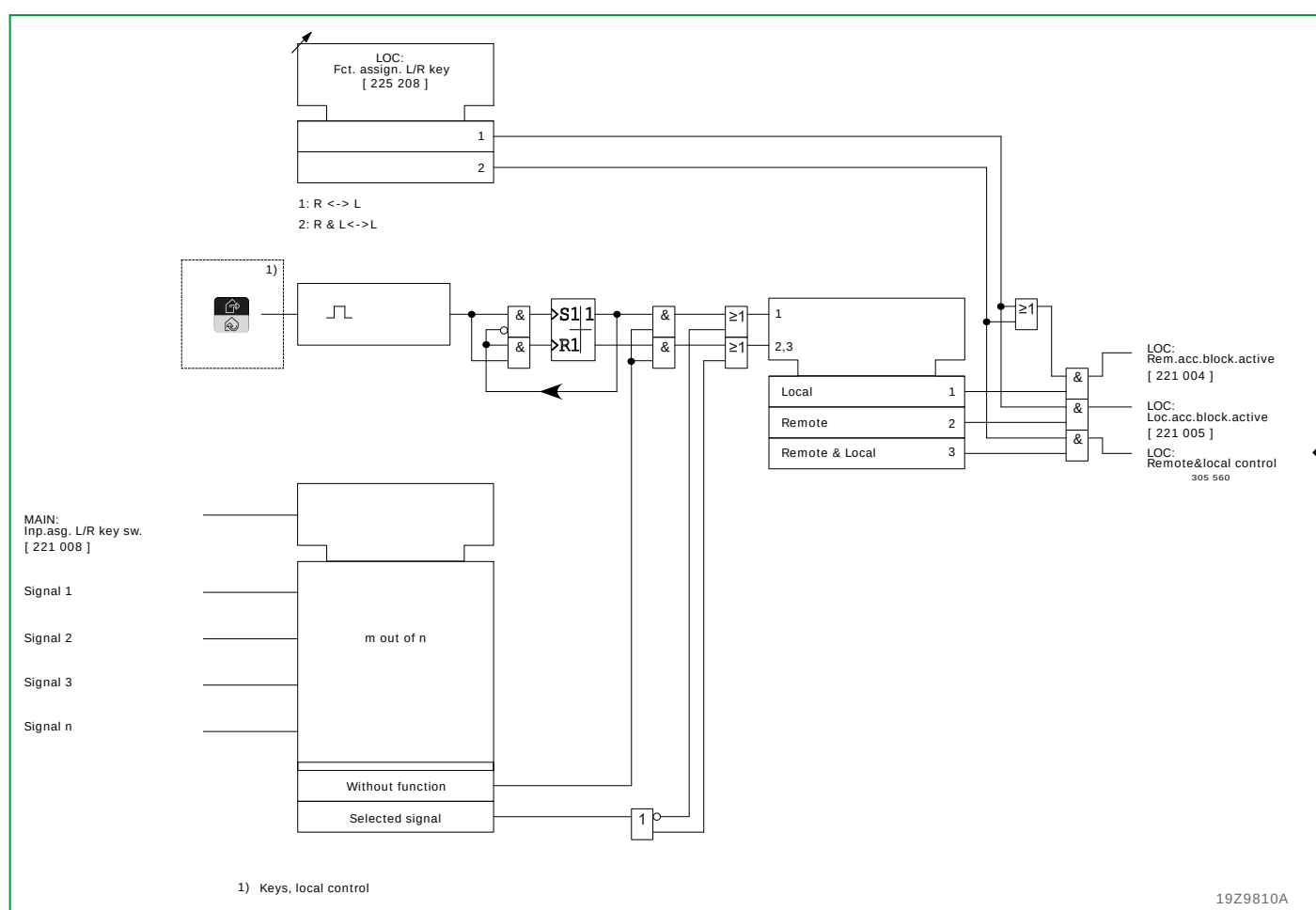


Fig. 3-11: Selection of the control point.

### 3.4.7 Configurable Clear Key

The C434 has a Clear key – © –, to which one or more reset functions can be assigned by selecting the required functions at LOC: Fct. reset key. Details on the functions' resetting features are given in [Section 3.13.10, \(p. 3-114\)](#).

## 3.5 Communication Interfaces

The C434 has a PC interface as a standard component. Communication module A is optional and can be provided with one or two communication channels – depending on the design version. Communication between the C434 and the control station's computer is through the communication module A. Setting and interrogation is possible through all the C434's interfaces.

If the communication module A with two communication channels is installed, settings for two communication interfaces will be available. The setting of communication interface 1 (COMM1) may be assigned to the physical communication channels 1 or 2 (see [Section 3.13.11, \(p. 3-116\)](#)). If the COMM1 settings have been assigned to communication channel 2, then the settings of communication interface 2 (COMM2) will automatically be active for communication channel 1.

COMM2 can only be used to transmit data to and from the C434 if its PC interface has been de-activated. As soon as the PC interface is used to transmit data, COMM2 becomes “dead”. It will only be enabled again when the “time-out” period for the PC interface has elapsed.

If tests are run on the C434, the user is advised to activate the test mode. In this way the PC or the control system will recognize all incoming test signals accordingly (see [Section 3.13.12, \(p. 3-117\)](#)).

Ethernet communication module is optional and can be provided with following options:

- 1 RJ45
- 1 RJ45 + 1 Fiber
- 1 RJ45 + 2 Fiber
- 3 RJ45

When Ethernet communication module is installed, IEC settings will be available and can be configured via Easergy Studio. Communication between the C434 and the control station can be through Ethernet protocols.

Parallel communication modules (serial communication module combined with Ethernet module) can be selected for C434 (see [Chapter 15, \(p. 15-1\)](#) and [Section 5.7, \(p. 5-27\)](#)).

### *NOTICE*

#### **CYBER SECURITY HAZARD**

- To improve Cyber Security, disable the Ethernet communication in environments where effective anti malware solutions have not been taken into use.

Failure to follow these instructions can increase the risk of unauthorized access.

3.5.1 PC Interface (Function Group PC)

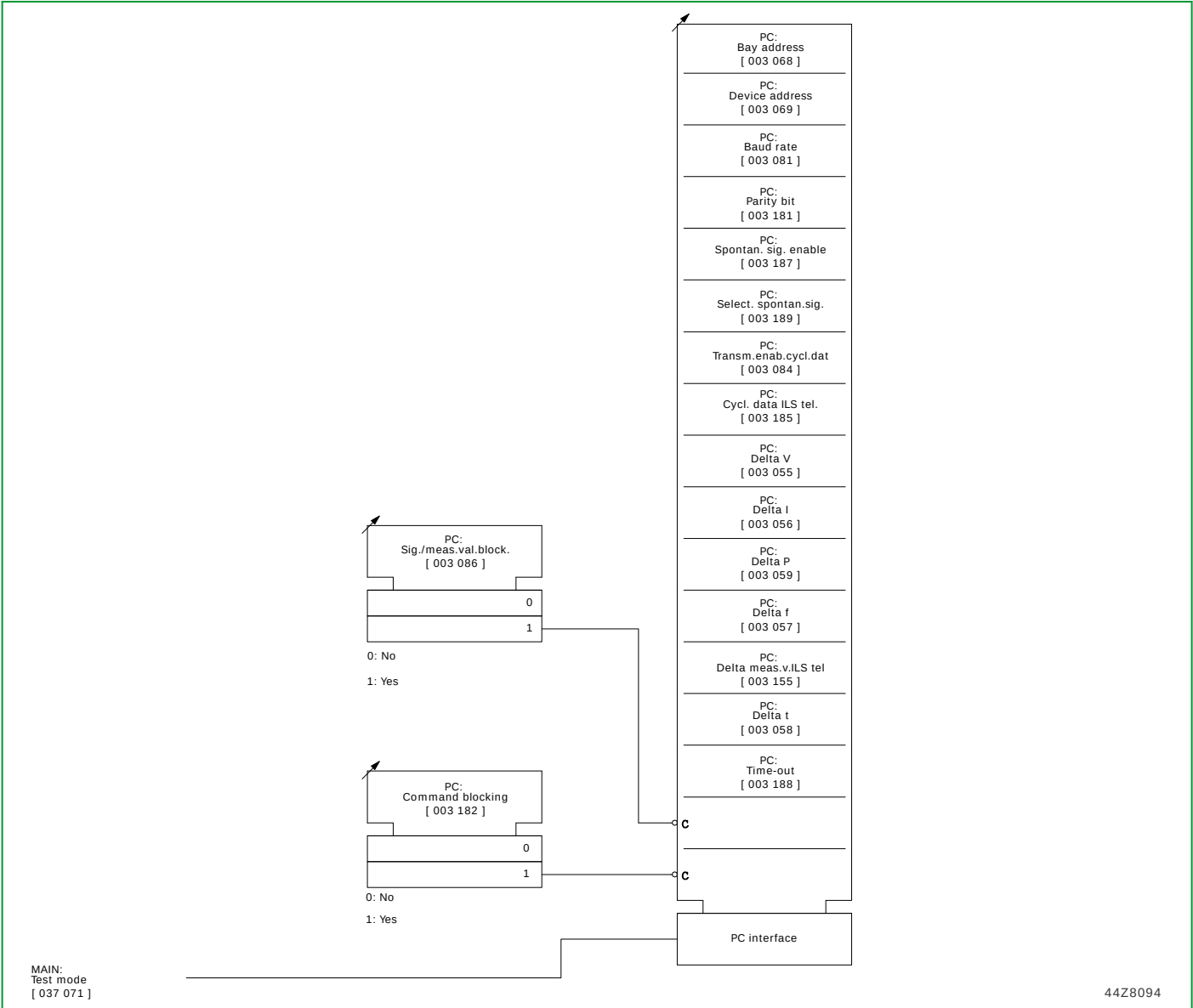


Fig. 3-12: PC interface settings.

Communication between the C434 and a PC is through the PC interface. In order for data transfer between the C434 and the PC to function, several settings must be made in the C434.

There is support software available as an accessory for C434 control.



3.5.2 Communication Interface 1 (Function Group COMM1)

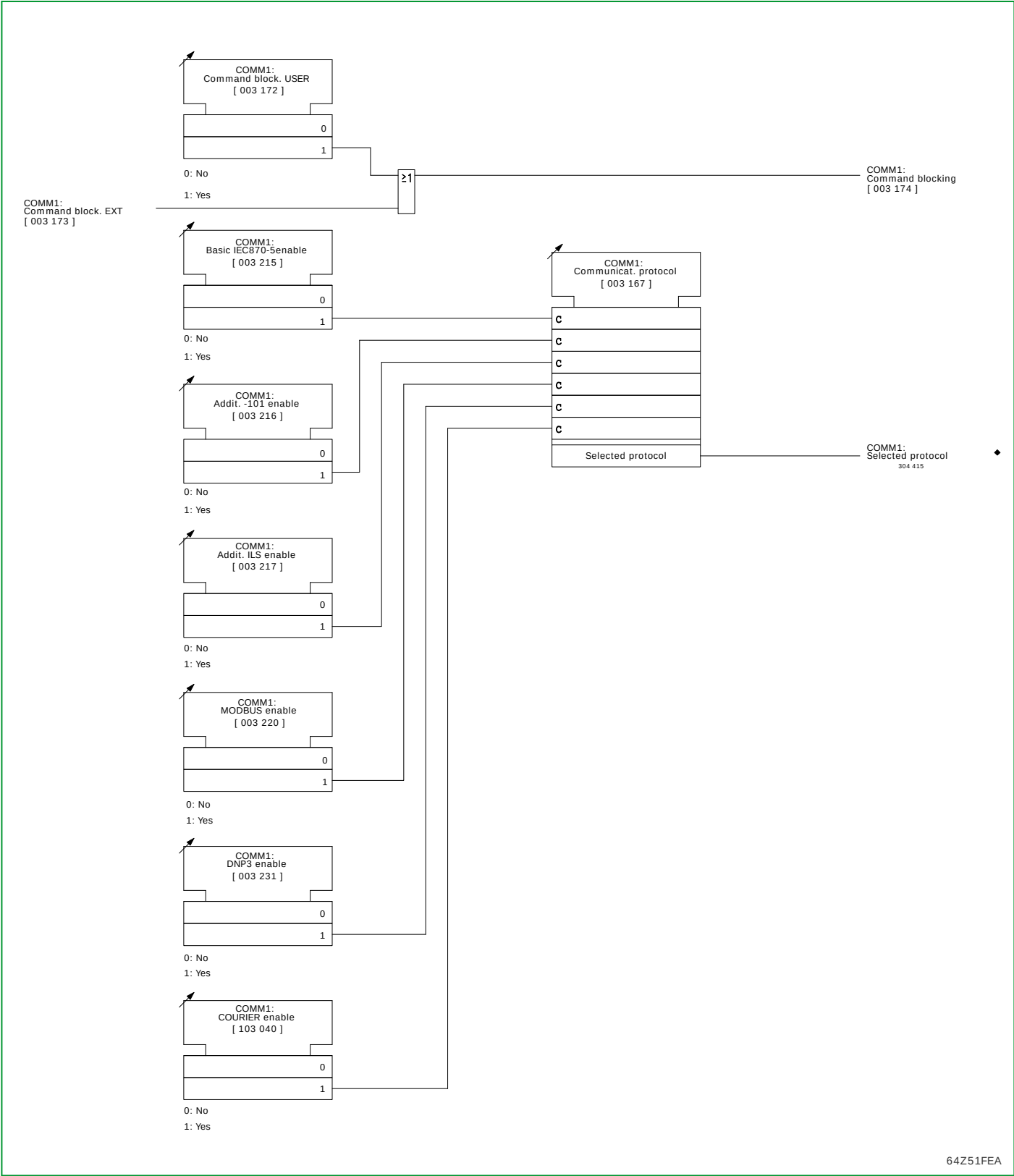


Fig. 3-13: Communication interface 1, selecting the interface protocol.

There are several different interface protocols available at the communication interface 1. The following user-selected interface protocols are available for use with the C434:

- IEC 60870-5-103, "Transmission protocols - Companion standard for the informative interface of protection equipment, first edition, 1997-12 (corresponds to VDEW / ZVEI Recommendation, "Protection communication companion standard 1, compatibility level 2", February 1995 edition) with additions covering control and monitoring
- IEC 870-5-101, "Telecontrol equipment and systems - Part 5: Transmission protocols - Section 101 Companion standard for basic telecontrol tasks," first edition 1995-11
- ILS-C, proprietary protocol of Schneider Electric
- MODBUS
- DNP 3.0
- COURIER

In order for data transfer to function properly, several settings must be made in the C434.

Communication interface 1 can be blocked through a binary signal input. In addition, a signal or measured-data block can also be imposed through a binary signal input.

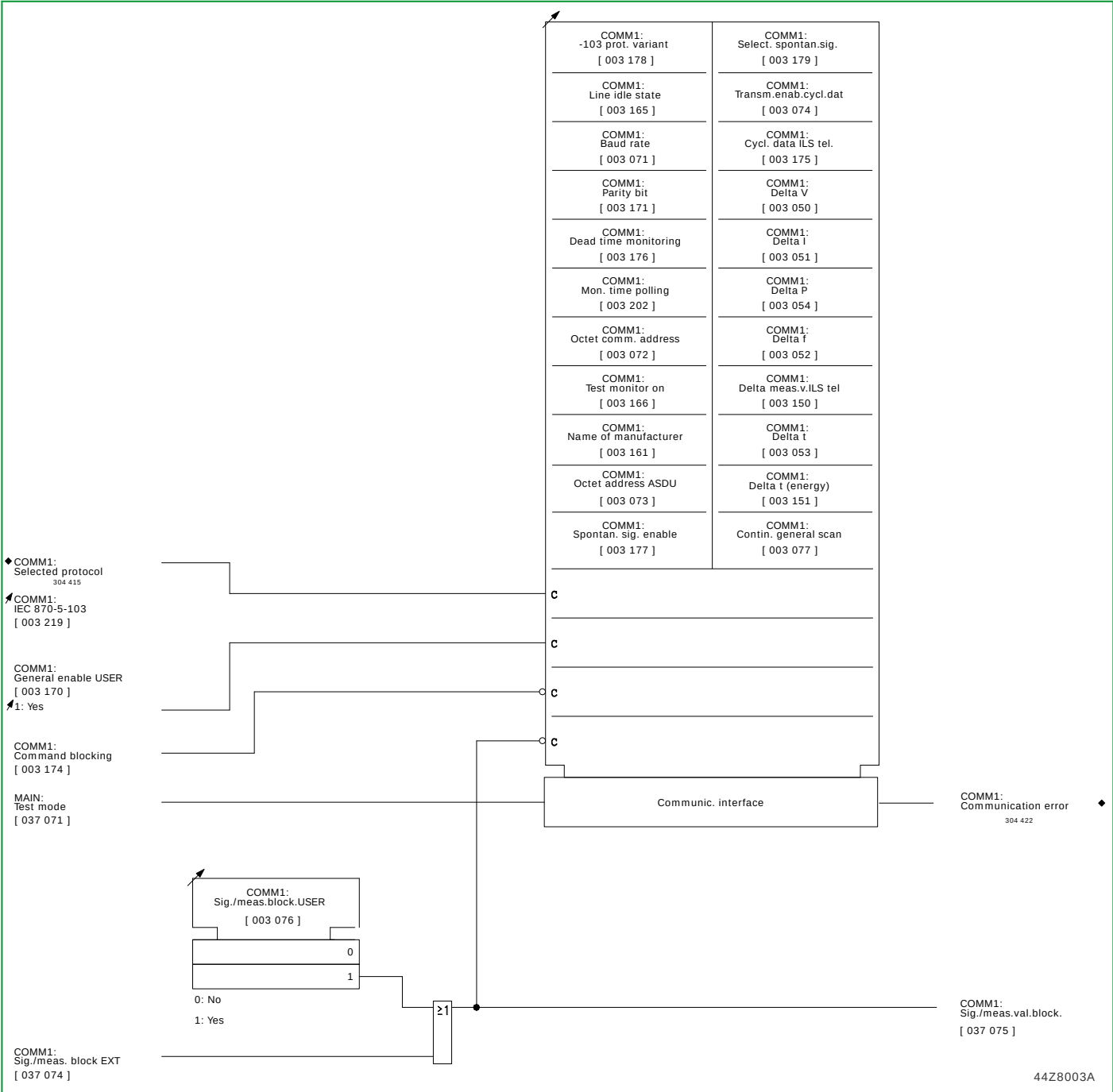


Fig. 3-14: Communication interface 1, settings for the IEC 60870-5-103 interface protocol.

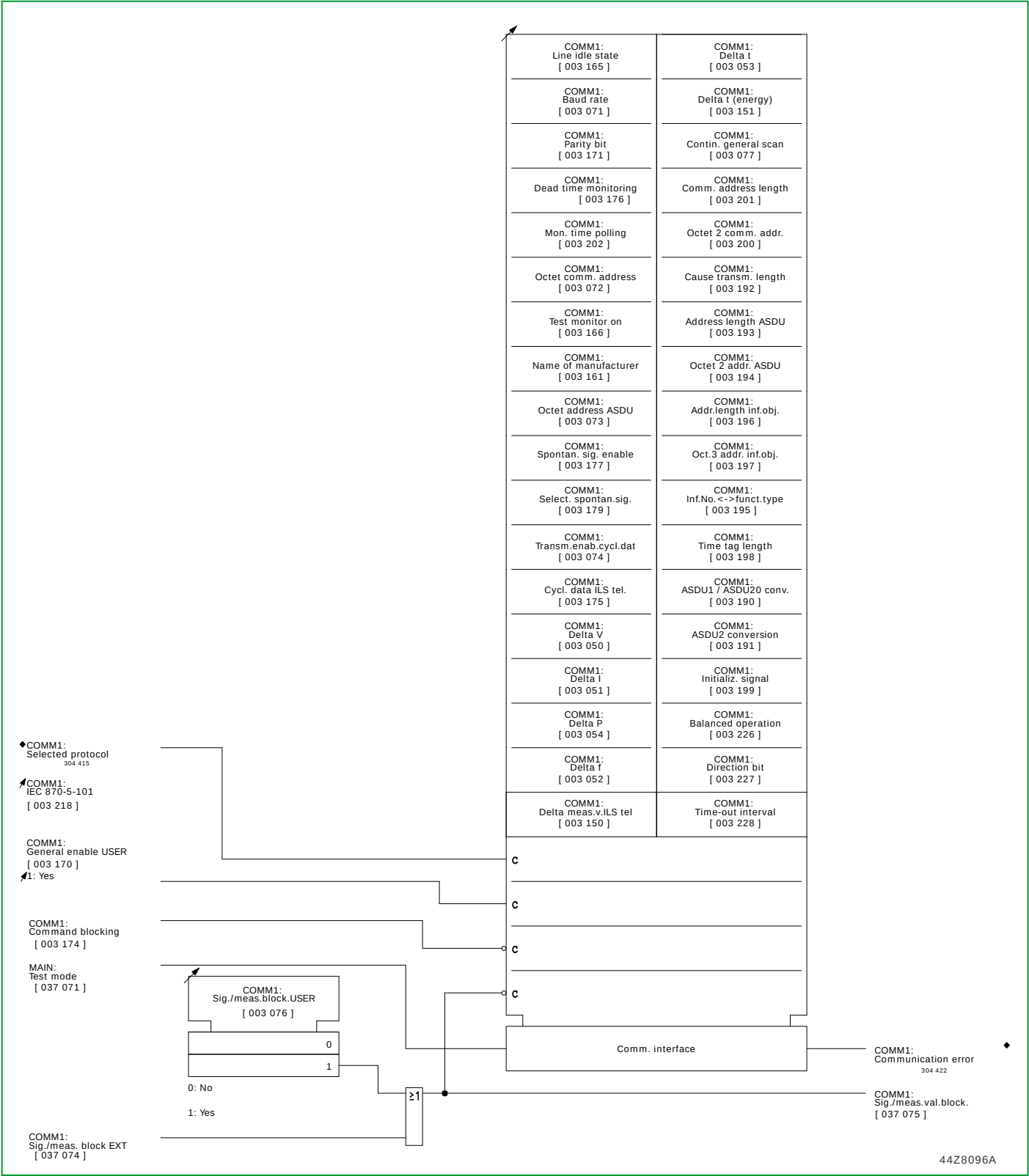


Fig. 3-15: Communication interface 1, settings for the IEC 870-5-101 interface protocol.

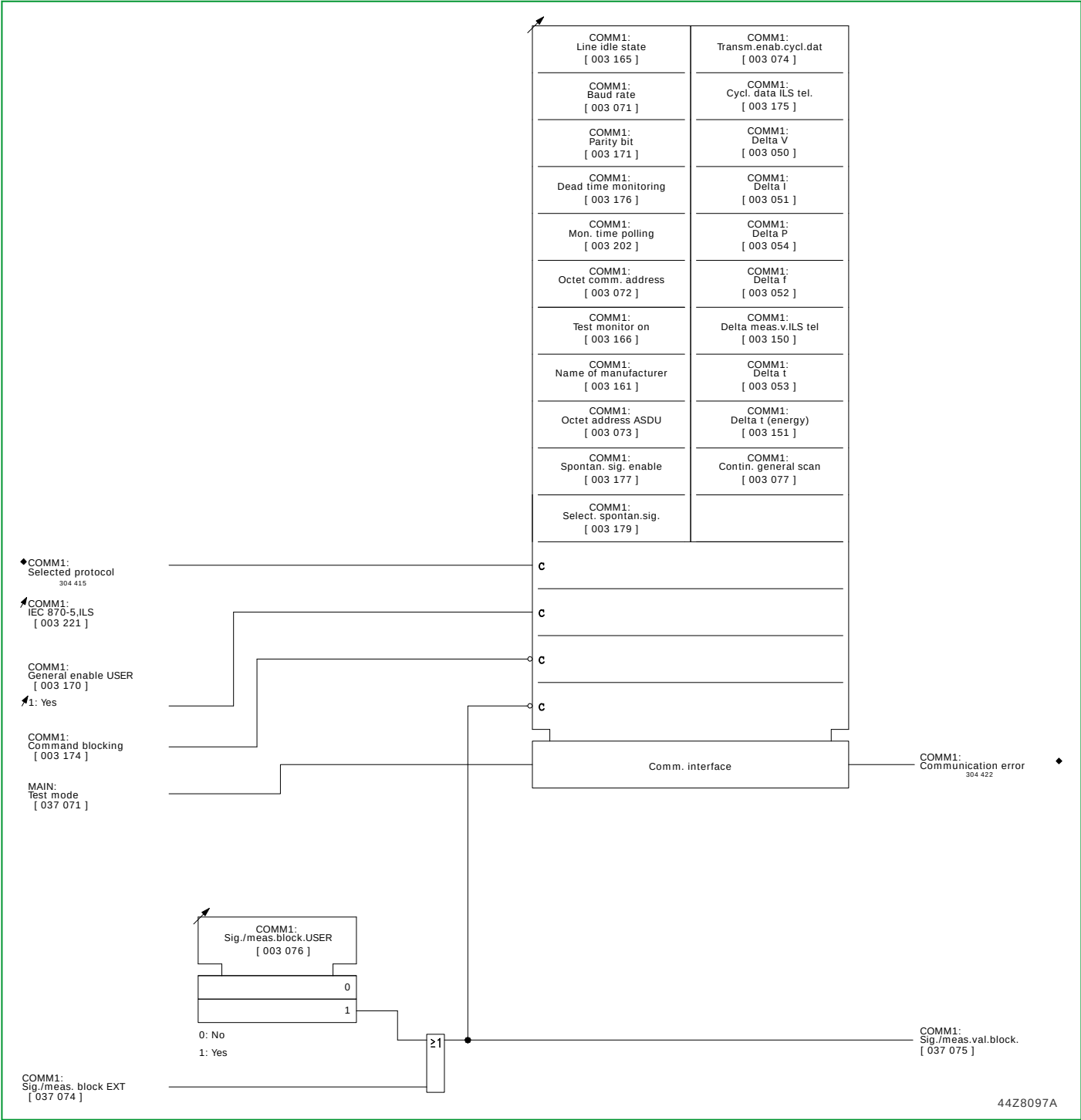


Fig. 3-16: Communication interface 1, settings for the ILS-C interface protocol.

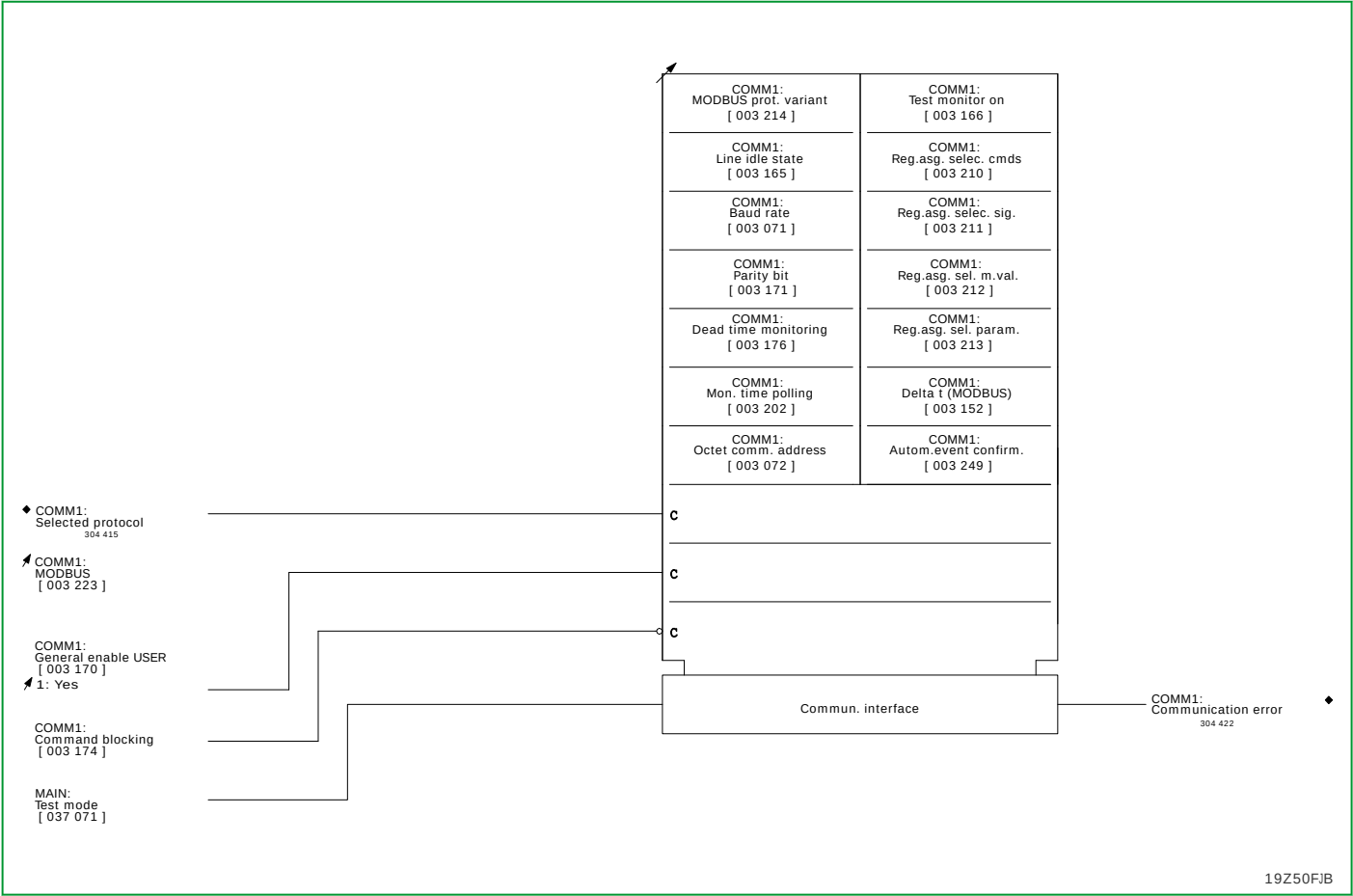


Fig. 3-17: Communication interface 1, settings for the MODBUS protocol.

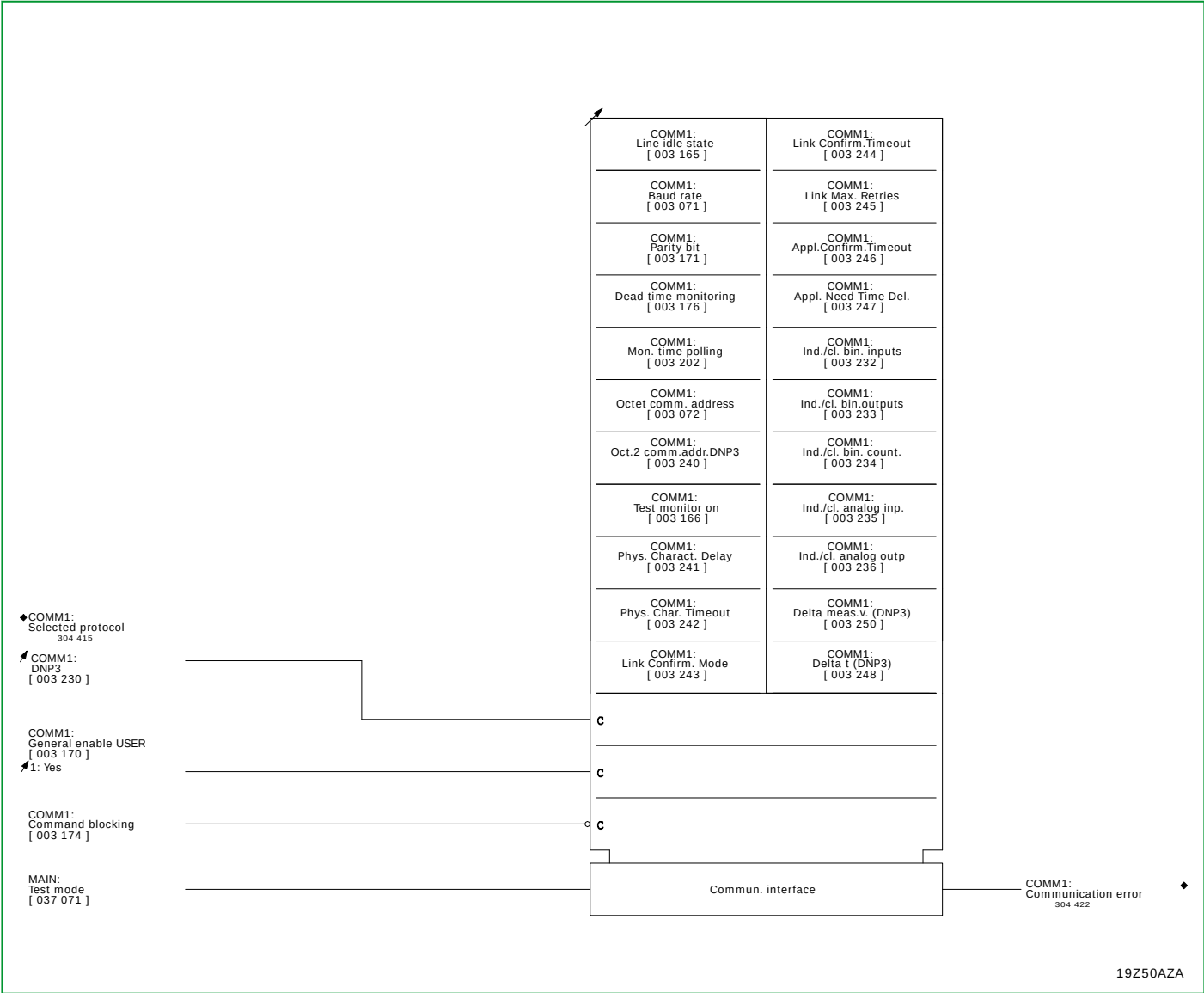


Fig. 3-18: Communication interface 1, settings for the DNP 3.0 protocol.

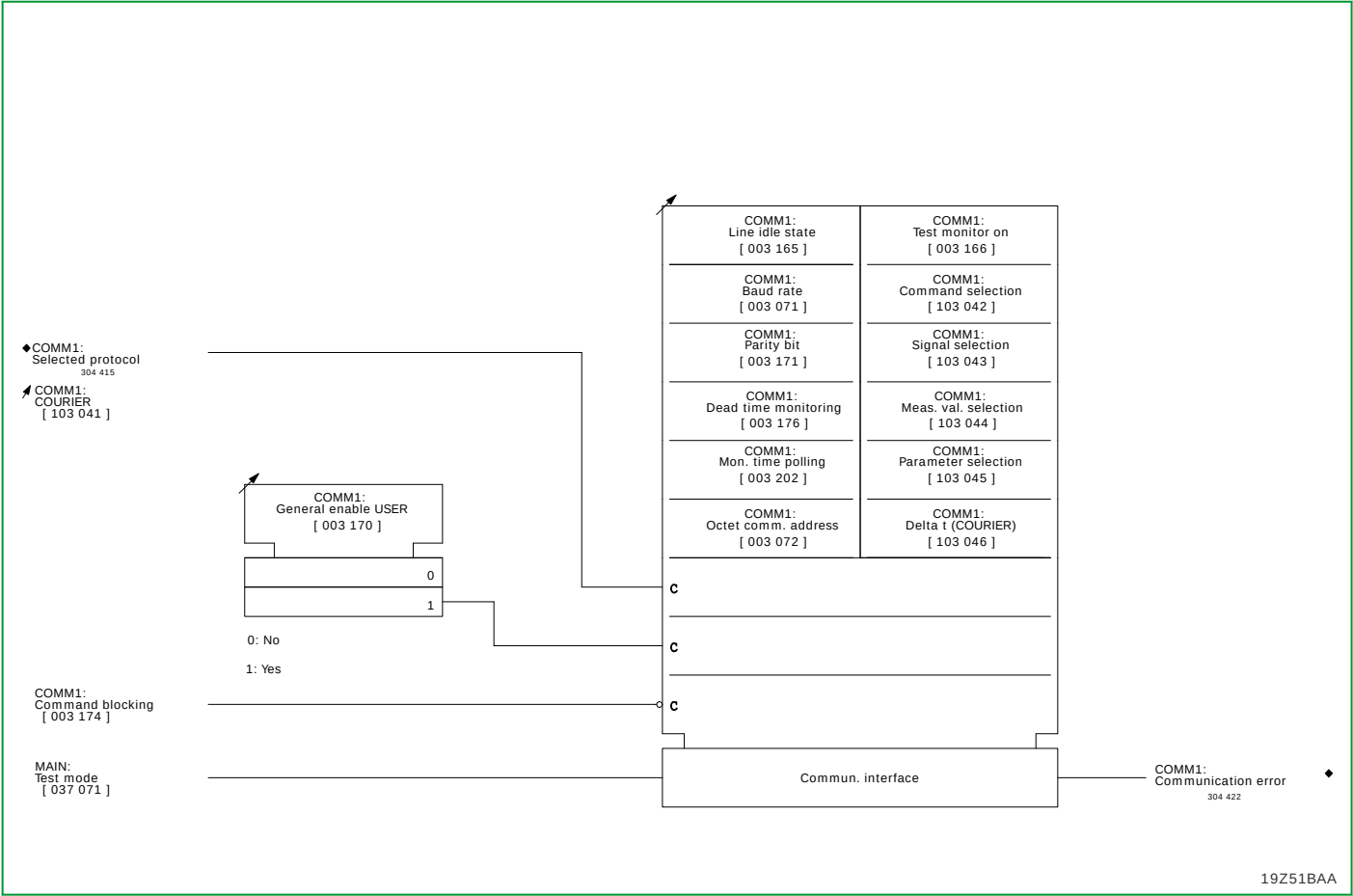


Fig. 3-19: Communication interface 1, settings for the COURIER protocol.



### 3.5.2.1 COMM1 – Checking Spontaneous Signals

For interface protocols based on IEC 60870-5-103, IEC 870-5-101, or ILS-C it is possible to select a signal for test purposes. The transmission of this signal to the control station as 'sig. start' or 'sig. end' can then be triggered using setting parameters.

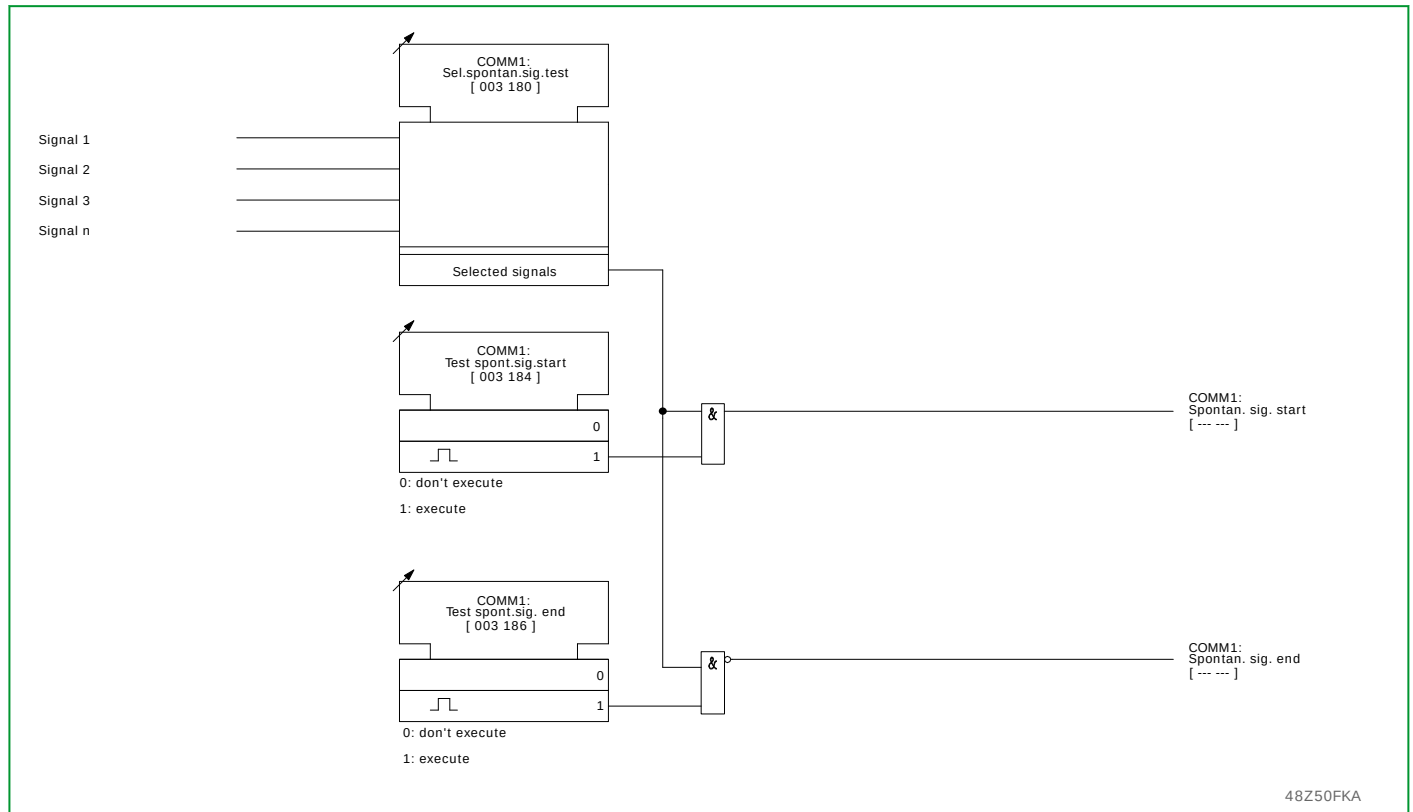


Fig. 3-20: COMM1 – Checking spontaneous signals.

### 3.5.2.2 Checking Switchgear Contact Positions and Signals

When checking during test operations with the interface protocols based on IEC 60870-5-103 it is possible to trigger signals (SIG) and contact positions (DEV) from the control part.

The following parameters are available:

- (221 105) COMM1: Sel. pos. dev.test  
Selection possibilities:
  - *Not assigned*
  - *DEV01 ... DEV10*
- (221 106) COMM1: Test position dev.  
Selection possibilities:
  - *don't execute*
  - *execute open*
  - *execute close*
  - *execute intermed.*

### 3.5.3 Communication Interface 2 (Function Group COMM2)

Communication interface 2 supports the following user-selectable communication protocols:

- IEC 60870-5-103, slave interface
- MODBUS-Master interface

It is provided only on the Serial communication module. It is intended for remote setting access only.

In order for data transfer to function properly, several settings must be made in the C434.

*The MODBUS-Master could be operated together with the interface protocols activated on communication interface 1 (COMM1), [Section 3.5.2, \(p. 3-21\)](#).*

*Up to 4 MODBUS slaves (IEDs = Intelligent Electronic Devices) can be connected.*

*Transmission of fault records and events is not supported. IEDs supporting time synchronization via MODBUS could be synchronized with a broadcast command.*

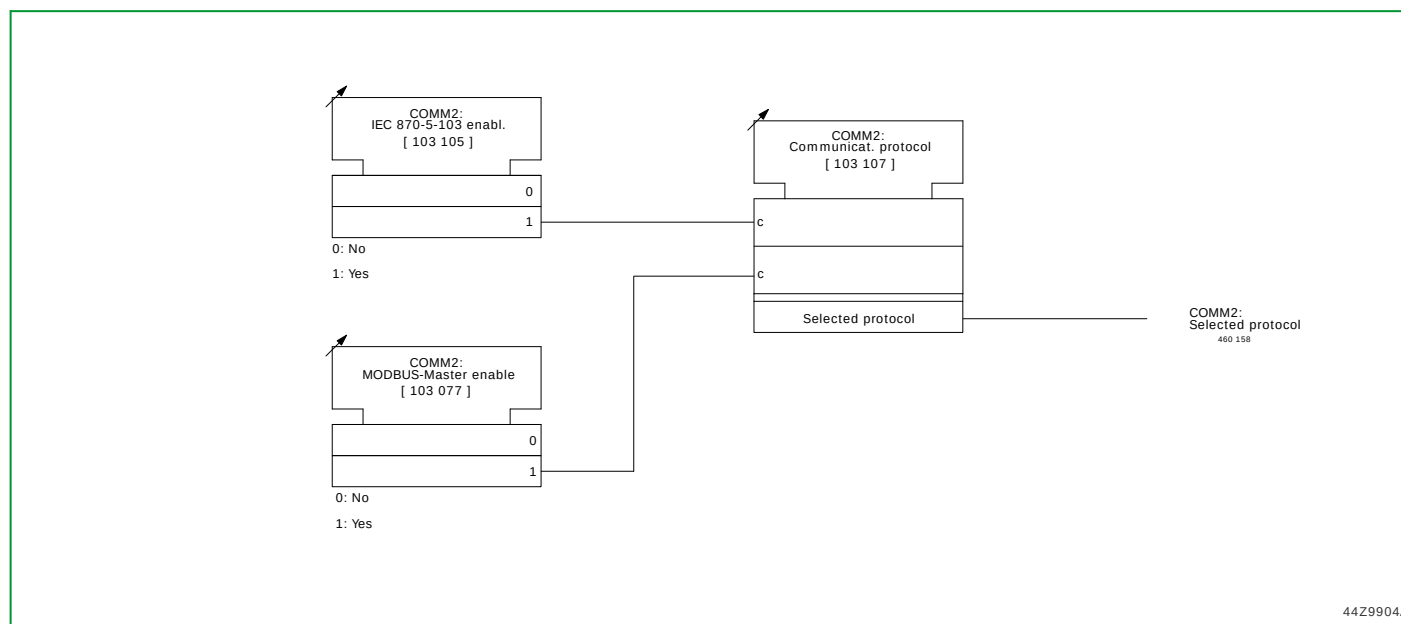


Fig. 3-21: COMM2 – Selecting the interface protocol.

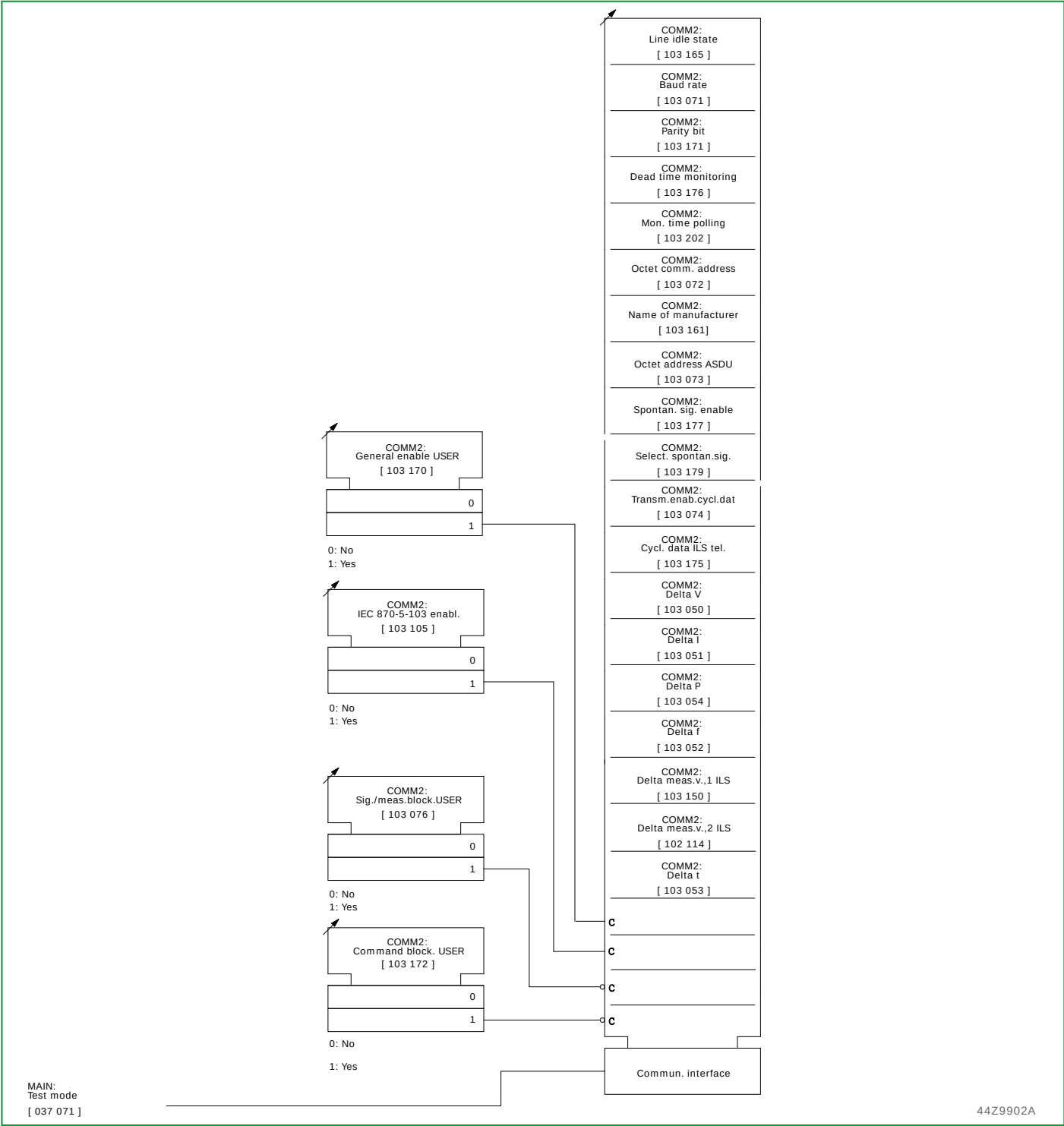


Fig. 3-22: COMM2 – Settings for the IEC 60870-5-103 interface protocol.

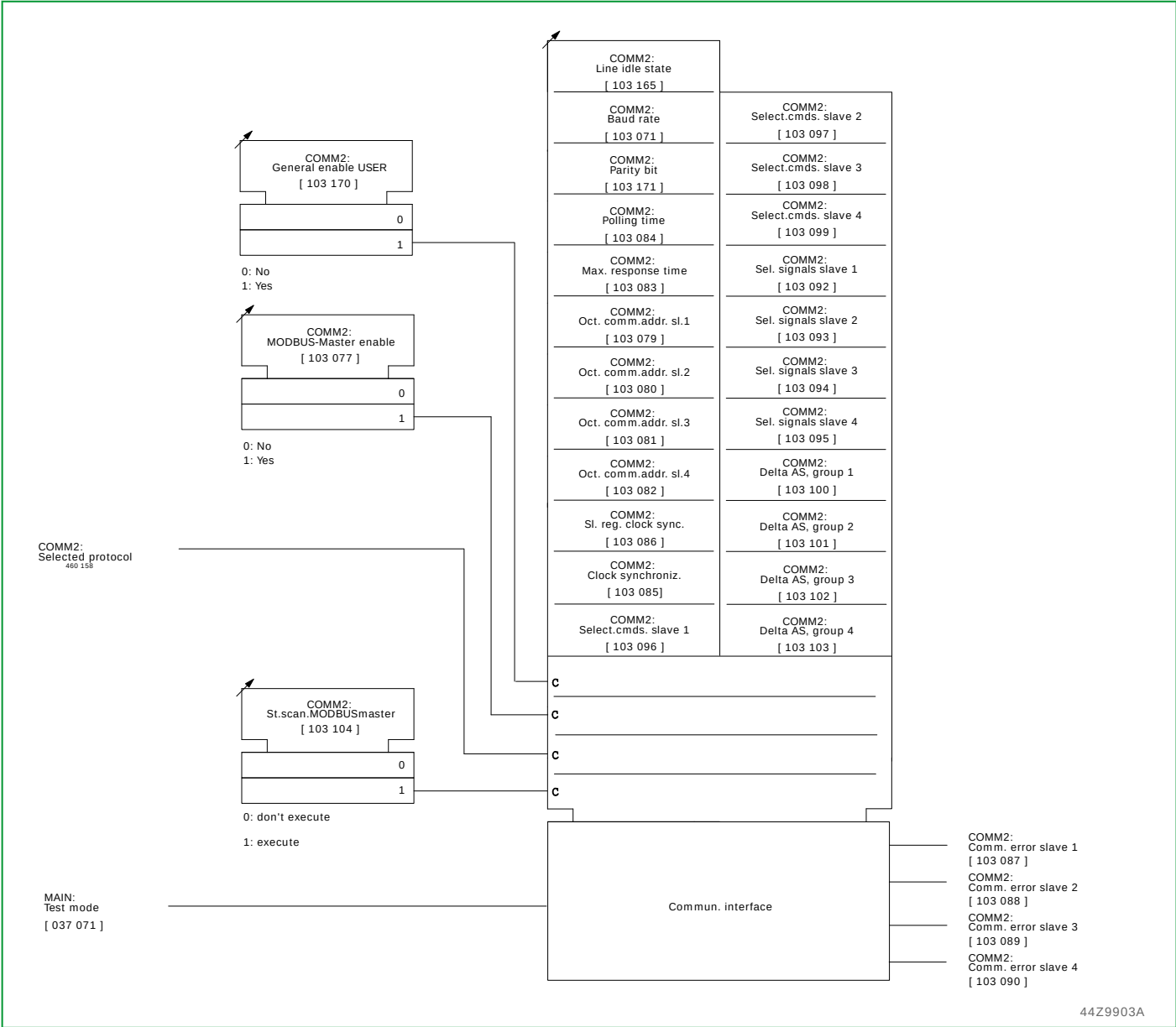


Fig. 3-23: COMM2 – Settings for the MODBUS-Master interface protocol.

3.5.3.1 COMM2 – Checking Spontaneous Signals

It is possible to select a signal for test purposes. The transmission of this signal to the control station as 'sig. start' or 'sig. end' can then be triggered via the local control panel.

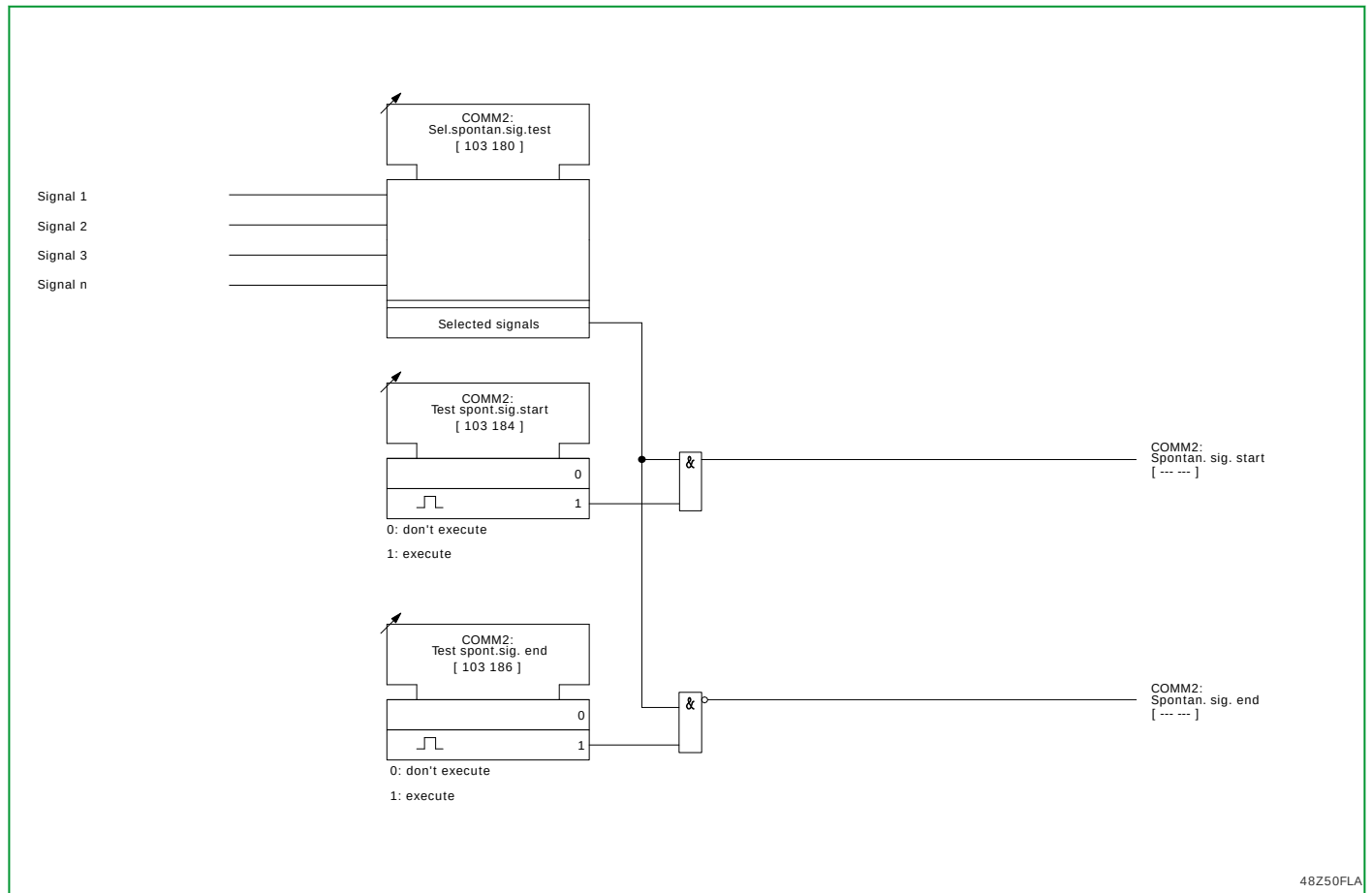


Fig. 3-24: COMM2 – Checking spontaneous signals.

### 3.5.3.2

#### MODBUS-Master Interface

The communication interface 2 (COMM2) can be configured as a MODBUS-Master which is able to manage up to four MODBUS IEDs. The IEDs (Slaves) are read and set by configurable MODBUS registers. These registers are grouped into analog and binary information and as well into commands and signals. Configured information can be displayed, communicated or partly processed by C434.

#### 3.5.3.2.1

##### Configuration of Binary Commands (Function Group MM\_BC)

Binary commands which are received via the communication interface 1 (COMM1) could be assigned to a MODBUS. The commands configured could be assigned to the four MODBUS IEDs independently by selection. A multiple selection is possible. Up to 40 binary commands could be managed. Up to 40 binary and analog commands could be configured per MODBUS IED.

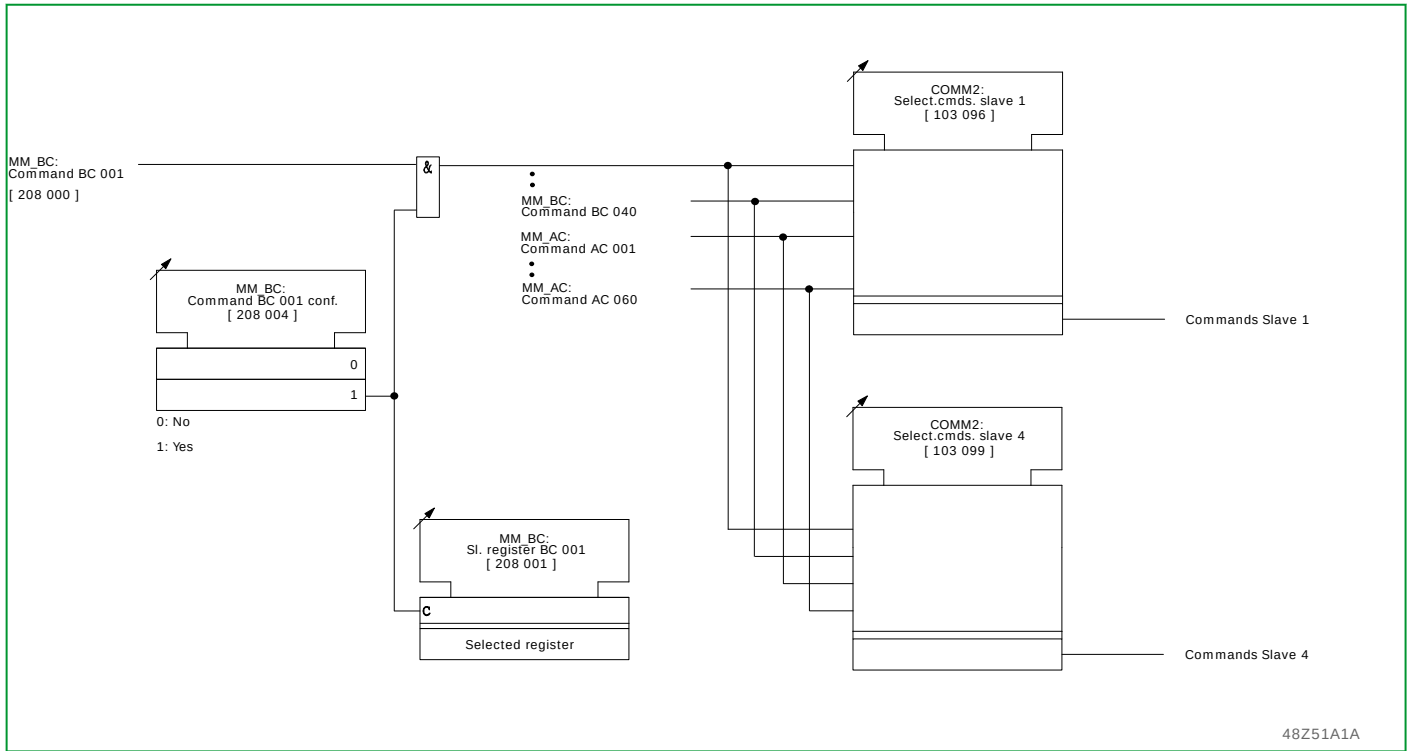


Fig. 3-25: Configuration of binary commands (Example: Command BC 001).

3.5.3.2.2

Configuration of Analog Commands (Function Group MM\_AC)

Analog commands which are received via the communication interface 1 (COMM1) could be assigned to a MODBUS. The commands configured could be assigned to the four MODBUS IEDs independently by selection. A multiple selection is possible. Up to 60 analog commands could be managed. Up to 40 binary and analog commands could be configured per MODBUS IED.

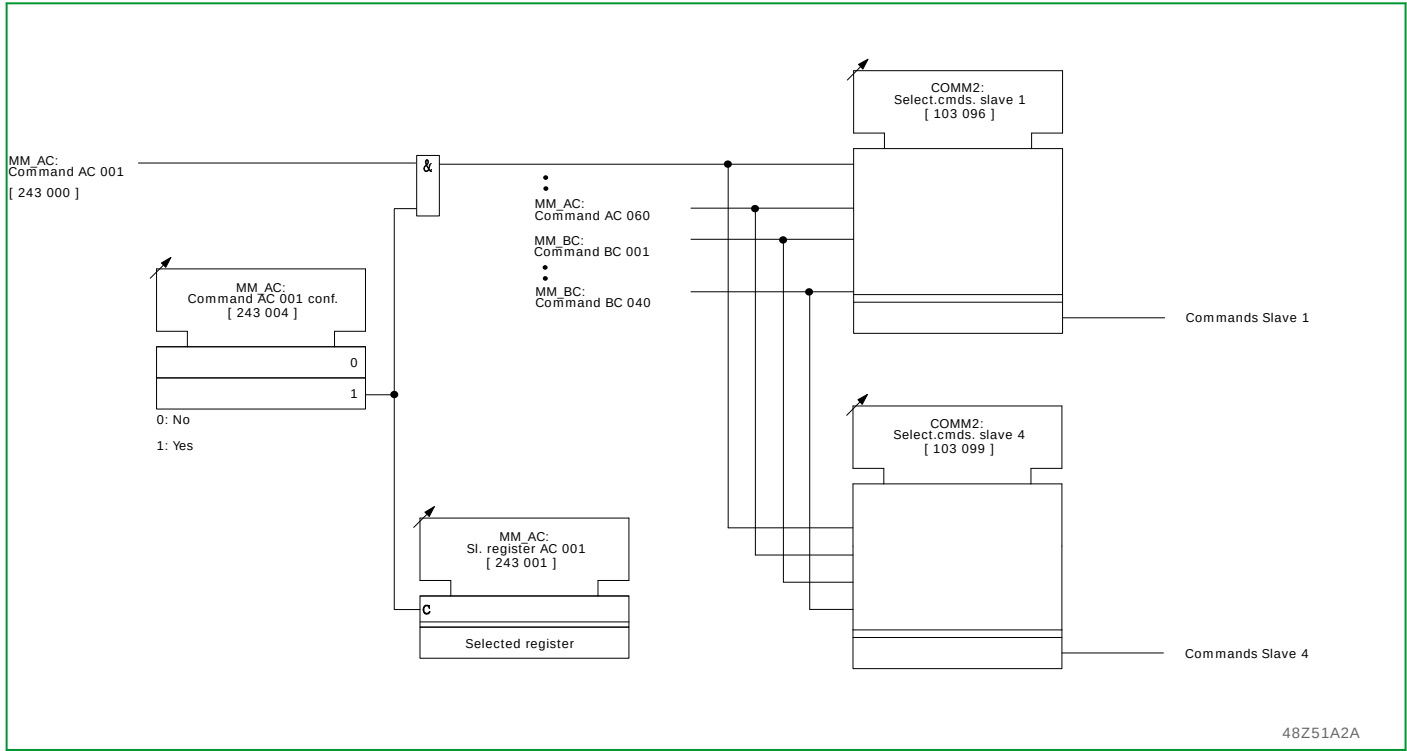


Fig. 3-26: Configuration of analog commands (Example: Command AC 001).

## 3.5.3.2.3

## Configuration of Binary Signals (Function Group MM\_BS)

Binary information which are provided by MODBUS IEDs could be read as binary signals from MODBUS registers. Therefore it is necessary to assign a MODBUS register to a logical signal. The signals configured could be assigned to one of the four MODBUS IEDs by selection. Up to 80 binary signals could be managed. Up to 40 binary and analog signals could be configured per MODBUS IED.

*Multiple selections of logical signals to different IEDs should be avoided.  
A function code must be assigned for each signal configured which will be used to read the MODBUS register.*

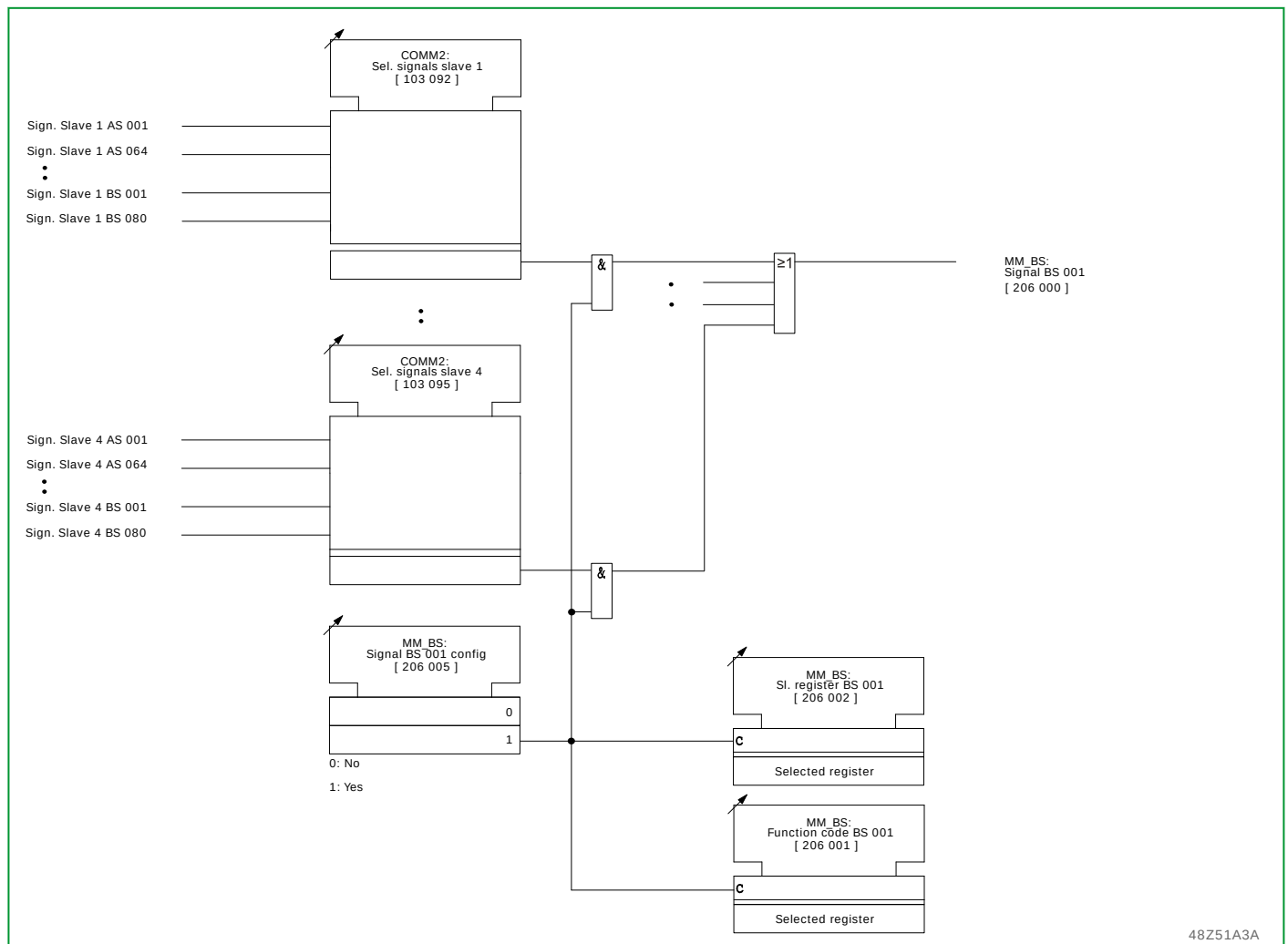


Fig. 3-27: Configuration of binary signals (Example: Command BS 001).

## 3.5.3.2.4

## Configuration of Analog Signals (Function Group MM\_AS)

Multiple state information which are provided by MODBUS IEDs could be read as analog signals from MODBUS registers. Therefore it is necessary to assign a MODBUS register to a logical signal. The signals configured could be assigned to one of the four MODBUS IEDs by selection. Up to 64 analog signals could be managed. Up to 40 binary and analog signals could be configured per MODBUS IED.

Multiple selections of logical signals to different IEDs should be avoided. A function code must be assigned for each signal configured which will be used to read the MODBUS register. Analog filtering of measurements at the logical communication interface 1 (COMM1) is provided by applying one of four settable filters (delta) to the analog signals.

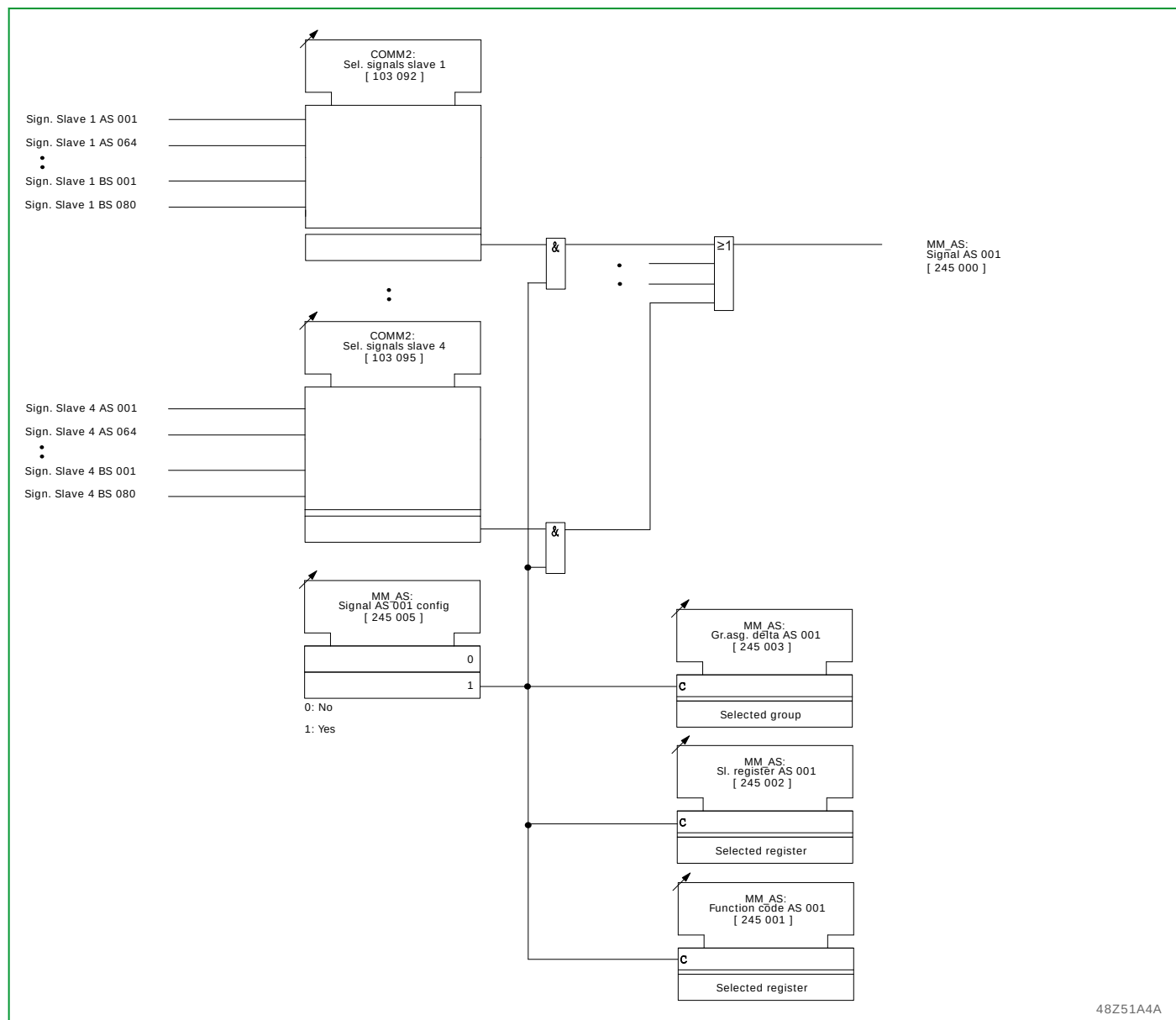


Fig. 3-28: Configuration of analog signals (Example: Command AS 001).



### 3.5.4 Communication Interface Ethernet (Function Groups IEC, GOOSE and VINP)

#### NOTICE

##### CYBER SECURITY HAZARD

- Substation communication via Ethernet interface is without encryption. User is requested to secure the network communication according to applicable standards.

Failure to follow these instructions can increase the risk of unauthorized access.

#### 3.5.4.1 Communication Module

*From the software version -661, the Single Ethernet module and Redundant Ethernet module are available for the devices of the Easergy MiCOM 30 Series. To get information of the former Ethernet module, please refer to the manuals before -661.*

The C434 Bay Unit for Control and Monitoring can be fitted with new communication module, the Single Ethernet module or Redundant Ethernet module. (See [Chapter 15, \(p. 15-1\)](#) for the exact order information and [Section 5.7, \(p. 5-27\)](#) for the location and connection diagrams.)

The Ethernet modules are developed to support PRP/HSR/RSTP redundancy protocol, conformance of IEC 61850 edition 1 and 2, Cyber Security (CS) and Flexible Product Naming (fPN).

##### 3.5.4.1.1 Hardware Modules

Four modules are available for Ethernet communication, two Single Ethernet Boards (SEB) and two Redundant Ethernet Boards (REB). *Easergy MiCOM 30* Series are constructed from standard hardware modules.

The Ethernet module is fitted into Slot 2 of the C434. For REB, each module has three MAC addresses, one for the managed embedded switch and two for the C434. The following table lists the item numbers of the Ethernet module variants:

| Type | Item number | Description                                   | Width |
|------|-------------|-----------------------------------------------|-------|
| A    | 9652161     | SEB copper: 1 * RJ45 + 1 * IRIG-B             | 4 TE  |
| A    | 9652162     | SEB fiber: 1 * RJ45 + 1 * SFP-LC + 1 * IRIG-B | 4 TE  |

Tab. 3-5: Single Ethernet Module variants.

| Type | Item number | Description                                   | Width |
|------|-------------|-----------------------------------------------|-------|
| A    | 9652159     | REB copper: 3 * RJ45 + 1 * IRIG-B             | 4 TE  |
| A    | 9652160     | REB fiber: 1 * RJ45 + 2 * SFP-LC + 1 * IRIG-B | 4 TE  |

Tab. 3-6: Redundant Ethernet Module variants.

*Only Redundant Ethernet module can support PRP/HSR/RSTP protocol.*

#### 3.5.4.1.2

##### Redundancy Protocols

The following list shows Schneider Electric's implementation of Ethernet redundancy, which has three variants with embedded IEC 61850, plus PRP, HSR and RSTP redundancy protocols.

##### Parallel Redundancy Protocol (PRP IEC 62439-3 (2012))

- The PRP uses two independent Ethernet networks that operate in parallel. The PRP is a "redundancy in the devices" method that provides bumpless switchover in case of failure or reintegration. Furthermore, it provides the shortest Ethernet network reconfiguration time as network reconfiguration is seamless.

##### High-availability Seamless Redundancy Protocol (HSR IEC 62439-3 (2012))

- HSR method is independent of any industrial Ethernet protocol and typically used in a ring topology. Nodes within the ring are restricted to be HSR-capable bridging nodes, thus avoiding the use of dedicated bridges. A simple HSR network consists of doubly attached bridging nodes, each having two ring ports, interconnected by full-duplex links.

##### Rapid Spanning Tree Protocol (RSTP IEEE 802.1w)

- This protocol variant offers compatibility with any RSTP device. RSTP is a standard used to quickly reconnect a network fault by finding an alternative path, allowing loop-free network topology. Although RSTP can recover network faults quickly, the fault recovery time depends on the number of devices and the topology.

Configuration of RSTP protocol can be set via Easergy Studio.

#### 3.5.4.1.3

##### Generic Functions for All Redundant Ethernet Modules

##### *Ethernet 100Base Fx/Tx*

The fiber optic ports are full duplex 100 Mbps LC connectors or wire RJ45 supports 100 Mbps.

##### *Forwarding*

The devices from the families Easergy MiCOM 30, 40, the C264 and the MiCOM H switches support store and forward mode. The MiCOM switch forwards messages with known addresses to the appropriate port. The messages with unknown addresses, the broadcast messages and the multicast messages are forwarded out to all ports except the source port. MiCOM switches do not forward error packets, 802.3x pause frames or local packets.

*Forwarding is active when HSR or RSTP protocol is selected.*

##### *Priority Tagging*

802.1p priority is enabled on all ports.

##### *Simple Network Management Protocol – SNMP*

Simple Network Management Protocol (SNMP) is the network protocol developed to manage devices in an IP network. SNMP relies on a Management Information Base (MIB) that contains information about parameters to supervise. The MIB

format is a tree structure, with each node in the tree identified by a numerical Object Identifier (OID). Each OID identifies a variable that can be read or set using SNMP with the appropriate software. The information in the MIBs is standardized.

Various SNMP client software tools can be used with the Series 30, 40, C264 and Hx5x range. Schneider Electric recommends using an SNMP MIB browser which can perform the basic SNMP operations such as *GET*, *GETNEXT*, *RESPONSE*. To access the network using SNMP, use the IP address of the embedded switch in the Redundant Ethernet module.

*For further information, please contact Schneider Electric.*

#### *Network Time Protocol – NTP*

Network Time Protocol is supported by both the C434 and the Redundant Ethernet switch. NTP is used to synchronize the clocks of computer systems over packet-switched, variable-latency data networks. A jitter buffer is used to reduce the effects of variable latency introduced by queuing in packet switched networks, ensuring a continuous data stream over the network.

The C434 receives the synchronization from the NTP server. This is done using the IP address of the NTP server entered into the C434 from the *IED Configurator* software.

#### 3.5.4.2 Communication Protocols

##### 3.5.4.2.1 IEC 61850

IEC 61850 was created jointly by users and manufacturers as an international standard. The main target of IEC 61850 is interoperability of devices. This includes the capability of two or more intelligent electronic devices (IED), manufactured by the same company or different companies, to exchange data for combined operation.

This communication standard IEC 61850 has now created an open and common basis for communication from the process control level down to the network control level, for the exchange of signals, data, measured values and commands.

For a standardized description of all information and services available in a field device, a data model, which lists all visible functions, is created. Such a data model, specifically created for each device, is used as a basis for an exchange of data between the devices and all process control installations interested in such information. In order to facilitate engineering at the process control level a standardized description file of the device, based on XML, is created with the help of the data model. This file can be imported and processed further by the relevant configuration program used by the process control device. This makes possible an automated creation of process variables, substations and signal images.

Available is the following documentation providing the description of the IEC 61850 data model which is used with the C434:

- ICD file based on XML in the SCL (Substation Configuration Description Language) with a description of data, properties and services, available from the C434, that are to be imported into the configuration tool “IED Configurator” or into a system configurator.
- PICS\_MICS\_ADL file with the following contents:
  - PICS (Protocol Implementation Conformance Statement) with an overview of available services.
  - MICS (Model Implementation Conformance Statement) with an overview of available object types.
  - ADL (Address Assignment List) with an overview of the assignment of parameter addresses (signals, measuring values, commands, etc.) used by the C434 with the device data model as per IEC 61850.

#### 3.5.4.2.1.1

##### Client Log-on

Communication in Ethernet no longer occurs in a restrictive master slave system, as is common with other protocols. Instead, server or client functionalities, as defined in the “Abstract Communication Service Interface” (ACSI, IEC 61850-7-2), are assigned to the devices. A “server” is always that device which provides information to other devices. A client may log on to this server in order to receive information, for instance “reports”. In its function as server the C434 can supply up to 16 clients, linked into the network, with spontaneous or cyclic information.

#### 3.5.4.2.1.2

##### Clock Synchronization

With IEC 61850 clock synchronization is effected via the SNTP protocol, defined as standard for Ethernet. Here the C434 functions as an SNTP client.

For clock synchronization one can choose between the operating modes *Anycast* from SNTP Server or *Request from Server*. With the first operating mode synchronization occurs by a broadcast message sent from the SNTP server to all devices in the network, and in the second operating mode the C434 requests a device-specific time signal during a settable cycle.

Two SNTP servers may be set. In this case, clock synchronization is preferably performed by the first server. The second server is only reverted to if no signal is received from the first server.

When looking at the source priority for clock synchronization, which is set at the MAIN function then, by selecting *IEC*, synchronization per IEC 61850 is automatically active but only if this communication protocol is applied.

#### 3.5.4.2.1.3

##### Transmitting Modeled Signals Not Provided by the IEC 61850 Data Model

In addition to the information included in the IEC 61850 data model an optional number of up to 16 signals can be selected from all the signals available in the C434 to be transmitted via reporting. A selection of state signals (shuttling to communications) is made by setting IEC: SigGGIO1 selection. The data object indexes defined for SigGGIO1 must follow the sequence given for the ‘m out of n’ selection for the state signals. The indexes SigGGIO1.ST.ind1 to SigGGIO1.ST.ind16 may then be included in the datasets just as the other data objects.

#### 3.5.4.2.1.4

##### Fault Transmission

Transmission of fault files is supported per “File Transfer”. COMTRADE fault files in the C434 are transmitted uniformly either as ASCII or binary formatted files.

#### 3.5.4.2.1.5

##### High Priority Transmission of Information

Whereas normal server-client services are transmitted at the MMS and TCP/IP level the high priority transmission of information is carried out directly at

Ethernet level. Furthermore messages in such a particular form can be received by all participants in the relevant sub-network, independent of their server or client function. They are deployed in instances where high speed transmission of information is wanted between two or more devices. Applications, for example, are reverse interlocking, transfer trip or decentralized substation interlock.

The standard IEC 61850 provides the Generic Object Oriented Substation Event (GOOSE) for high priority transmission of information. The GOOSE enables transmission of all data formats available in the data model, such as binary information, integer values, two-pole contact position signals or analog measured values. The C434 supports receipt and evaluation of GOOSE including binary information and two-pole contact position signals from external devices.

#### 3.5.4.2.1.6

#### Generating Datasets, Reporting

The specific project related feature of the C434's communications behavior is determined by the configuration of datasets, reports and high priority transmission methods. A piece of information must be included in a dataset so as to be transmitted as a signal. A dataset is a list to transmit certain data objects. The selection of data objects and the resulting length of the dataset is determined by the application; merely the GOOSE capacity, i.e. the maximum size of a dataset to be transmitted by GOOSE, is limited to 1500 bytes.

*It is not possible to read the IEC configuration back from the C434 if the "Dataset" sizes exceed the GOOSE size limit significantly. Therefore it is recommended to limit the "Dataset" size(s) to 100% of the GOOSE capacity. Too large a dataset can spoil IEC 61850 communication. Hence, the dataset size limit of 100% of the GOOSE capacity should not be exceeded, neither for GOOSE nor for reports.*

Data objects provided by the C434 are available for selection with a structure as specified by IEC 61850. Within the quality descriptor for each piece of information the invalid bit and the test bit are served according to the C434's state; the other attributes are not set. Any number of datasets may be created with the IED Configurator. Saving datasets at System\LLN0 is compulsory. The knowledge of dataset content is imperative for decoding and evaluating received signals. Configuration files possess a listing of all datasets with a description of all data objects included.

Next to their use with high priority transmission methods (see [Section 3.5.4.2.1.5, \(p. 3-40\)](#)) datasets are used mainly for reporting. The C434 provides up to 16 unbuffered reports and 8 buffered reports independent of the number of clients logged-on. Management is arranged into 16 Unbuffered Report Control Blocks (urcbA to urcbP) and 8 Buffered Report Control Blocks (brcbA to brcbH). Whereas with unbuffered reporting pieces of information may be lost during a communications failure, the buffered report control blocks support a buffered transmission which is required for the uninterrupted writing of events. A pre-defined dataset may be assigned to each report which will then determine which data object will be transmitted with the relevant report. Assigning datasets is not limited; the same dataset may be referenced in various reports or even in GOOSEs.

The C434 can serve up to 16 clients. Each client can log-on to any number of available reports. One unbuffered report can be allocated to max. 8 clients, and one buffered report can be allocated to max. 4 clients. A client is then able to activate the wanted report for himself and to set the transmission behavior to his requirements. The system concept with intended clients must be taken into account when datasets are assigned to the reports.

Reports are not received by the C434.

## 3.5.4.2.1.7

## Single Commands

Single commands (e.g. short command, long command, persistent command) are configured with the operating program. Sending commands to the C434 can be carried out from all clients that have previously logged-on to the C434. But only one command at a time is carried out. The operating mode *Direct control with normal security* is provided for single commands.

## 3.5.4.2.1.8

## Control and Monitoring of Switchgear Units

Configuration of control of switchgear devices for the IEC 61850 is only possible with a special configuration software, the *IED Configurator*.

Control of switchgear units can be carried out from all clients that have previously logged on to the C434. Only one control command is executed at a time, i.e. further control requests issued by other clients during the execution of such a command are rejected. The following operating modes [IC]: `ctlModel` are available to control external devices by clients and they can be individually set for each switchgear device:

- *Status only*
- *Direct control with enhanced security*
- *SBO (Select before operate) with enhanced security*

When set to the operating mode *Select before operate* the switchgear unit is selected by the client before the control command is issued. Because of this selection the switchgear unit is reserved for the client. Control requests issued by other clients are rejected. If after a selection no control command is issued by the client the C434 resets this selection after a settable timeout period [IC]: `sboTimeout` (default: 2 minutes) has elapsed.

If with a system application it must be ensured that only one control command at a time is being processed system wide ("uniqueness") then interlocking of secondary devices among themselves is setup with GOOSE. For further details see description of function group GOOSE.

The switchgear device's contact positions are signaled to the clients with the reports.

*Setting parameters labeled with brackets – i. e. "[IC]:..." – instead of a normal function group are set with the "IED Configurator". They cannot be modified from the local control panel (HMI), nor with the operating program.*

*There is a separate Chapter "IEC 61850 Settings via IED Configurator" with a description of all such setting parameters.*

## 3.5.4.2.1.9

## Originator Category

The *Originator* is an information type defined by IEC 61850, which is sent with switch commands and position signals of switchgear units. This kind of data consists of two information items:

- *Originator Identification*: This is text describing the originator of the switch command. (If unknown, then an empty text string is sent.)
- *Originator Category*: This is the originator of the command according to a list of standardized categories.

The range of values of the *Originator Category*, as listed in the following table, is supported.

|   | Originator category      | Originator Identification                | Use Case / Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---|--------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <i>remote-control</i>    | See note [1] (at the end of this table). | The control command is sent by an operator at station level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 2 | <i>automatic-remote</i>  | See note [1].                            | The control command is sent by an automatic function at station level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 3 | <i>station-control</i>   | See note [1].                            | The control command is sent by an operator at network level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 4 | <i>automatic-station</i> | See note [1].                            | The control command is sent by an automatic function at network level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 5 | <i>bay-control</i>       | <i>Local HMI Control</i>                 | The control command is generated at the local HMI of the C434.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 6 | <i>bay-control</i>       | <i>Local EXT Control</i>                 | <p>The control command is sent via binary input (see note [2]) by an operator at an external local control panel, using the setting</p> <ul style="list-style-type: none"> <li>● (221 061) MAIN: Electrical control = <i>Local</i></li> </ul> <p>and any of the following input signals:</p> <ul style="list-style-type: none"> <li>● DEVxx: Inp.asg.el.ctrl.open</li> <li>● DEVxx: Inp.asg.el.ctr.close.</li> </ul>                                                                                                                                    |
| 7 | <i>remote-control</i>    | <i>Remote EXT Control</i>                | <p>The control command is sent via binary input (see note [2]) by an operator at an external local control panel, using the setting</p> <ul style="list-style-type: none"> <li>● (221 061) MAIN: Electrical control = <i>Remote</i></li> </ul> <p>and any of the following input signals:</p> <ul style="list-style-type: none"> <li>● DEVxx: Inp.asg.el.ctrl.open</li> <li>● DEVxx: Inp.asg.el.ctr.close.</li> </ul>                                                                                                                                   |
| 8 | <i>process</i>           | <i>Spontaneous Process Event</i>         | <p>A trip or close command which is generated by a protection function.</p> <p>(See also note [2].)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 9 | <i>process</i>           | <i>Spontaneous Process Event</i>         | <p>There is a spontaneous position change of the switchgear device.</p> <p>Possible causes:</p> <ul style="list-style-type: none"> <li>● A manual switch command</li> <li>● The operation of another protection and control device</li> </ul> <p>Further possible causes:</p> <ul style="list-style-type: none"> <li>● Loss of supply voltage of electrical input signals</li> <li>● Faulty wiring</li> <li>● Faulty switchgear device</li> </ul> <p>(However, this usually results in an intermediate position 00 or 11 of the switchgear device.)</p> |

|    | Originator category | Originator Identification  | Use Case / Comment                                                                                                                                                                                                                                                                                        |
|----|---------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10 | <i>process</i>      | <i>IED Restart</i>         | Power-up or restart of the C434, intentionally or spontaneously. Possible causes: <ul style="list-style-type: none"> <li>● Loss of the auxiliary supply voltage of the C434</li> <li>● Commissioning activities</li> <li>● Operation of self-monitoring of the C434</li> </ul>                            |
| 11 | <i>maintenance</i>  | <i>Test Mode Operation</i> | The C434 is in test mode.<br>The test mode can be activated either by setting parameter <ul style="list-style-type: none"> <li>● (003 012) MAIN: Test mode USER</li> </ul> or by the binary signal <ul style="list-style-type: none"> <li>● (037 070) MAIN: Test mode EXT</li> </ul> (See also note [2].) |

[1]: The C434 copies the Originator Identification from the command request into the information report.

[2]: External binary signals can be received via various interfaces:

- Opto-coupler inputs
- InterMiCOM protection communication
- GOOSE substation communication
- Assignment of LOGIC outputs

The C434 does never send the *Originator Category* “automatic-bay”.



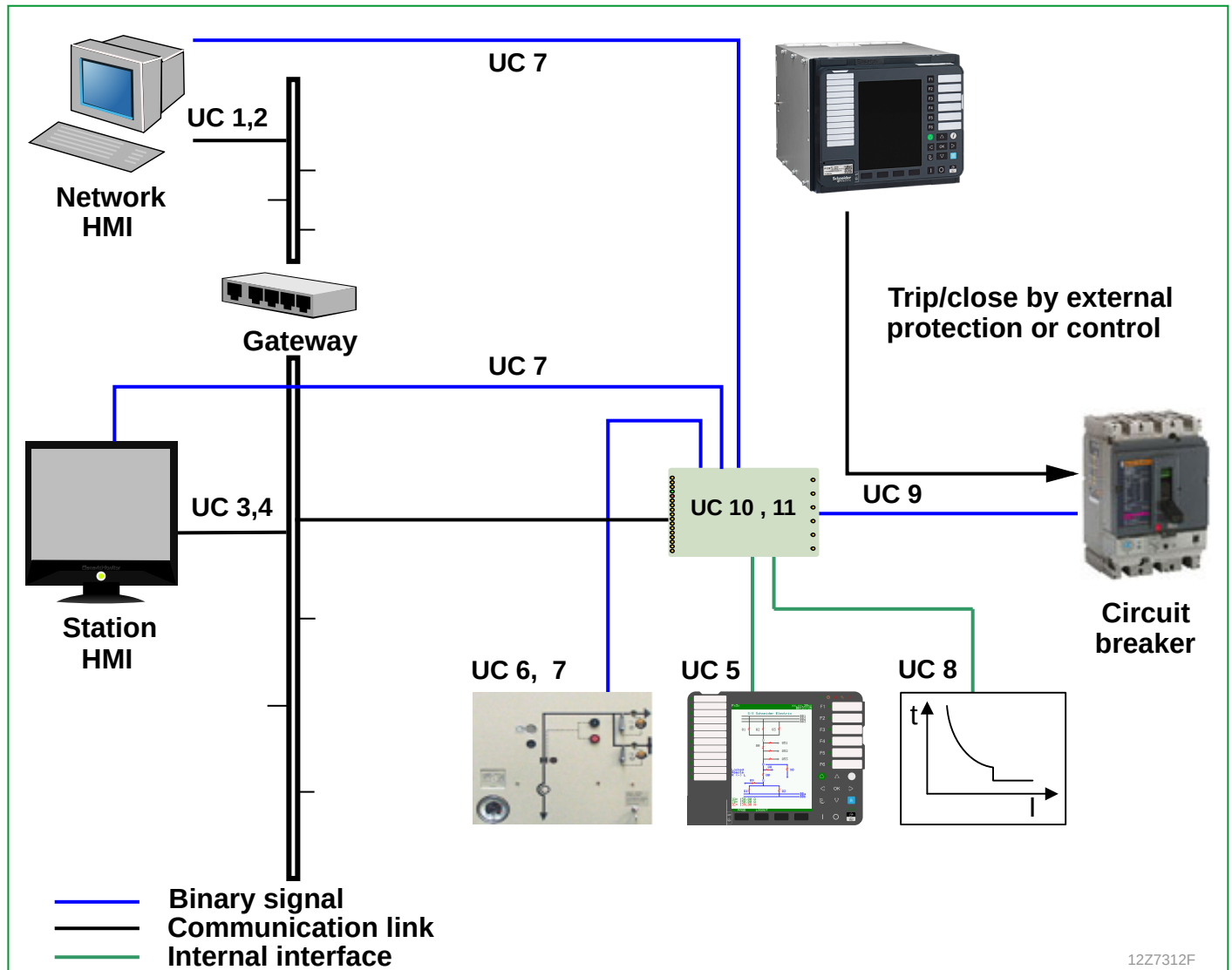


Fig. 3-29: Use cases in the network context. The "UC" numbers refer to Originator Categories in the table above.

#### 3.5.4.2.1.10

#### Setting Group Control Block

The setting-group-control-block (SGCB) model allows for an instance to have several values that can be used one at a time. The SGCB provides mechanisms to switch between several values of one or more data objects. Values that belong together build the setting group.

### 3.5.4.2.2 IEC 60870-5-104

#### 3.5.4.2.2.1 Overview

The IEC 60870-5-104 “Network access for IEC 60870-5-101 using standard transport profiles” is based on IEC 60870-5-101 “Transmission protocols – Companion standard for telecontrol tasks”, and was originally intended for SCADA applications but it is also applied in station bus communication.

The IEC 60870-5-104 implementation in Easergy MiCOM 30 relays includes server and client functionality with multiple connections. For every connection the types and addressing of every ASDU can be configured in data models. The data models also include a logic module to manipulate the data and to realize logical functions e.g. batch messages.

A Easergy MiCOM 30 bay unit can also act as a central unit. For this more complex logical functions two additional programs may be started: the logic and the boolean interlocking. These programs are used for functions like calculation of busbar voltage or substation interlocking.

The configuration for IEC 60870-5-104 is done with a special configuration tool which will be integrated in Easergy Studio like the IED Configurator.

In this manual only a short description of the IEC 60870-5-104 functions is possible. For detailed description, please refer to IEC 60870-5-104 Application Guide. Because the implementation of IEC 60870-5-104 is configurable, there is also a standardized interoperability document, the IEC 60870-5-104 Interoperability Guide.

#### 3.5.4.2.2.2 Integration

After setting IEC: General enable USER, the protocol IEC 60870-5-104 can be selected in Function group IEC by switching on IEC: IEC60870-5-104enable and selecting IEC 60870-5-104 in IEC: IEC prot. variant. The other settings visible for IEC 60870-5-104 protocol are functioning like described for IEC 61850, see [Section 3.5.4.3, \(p. 3-51\)](#):

- IEC: ETH COMM Mode
- IEC: Block Port A/B
- IEC: Block Port C

The protocol IEC 60870-5-104 also uses two configuration banks, one active and one standby bank. The configuration bank switching with IEC: Switch Config. Bank is functioning like in IEC 61850.

All settings in the IEC function group concerning the time zone and summer time are working like described for IEC 61850.

The setting IEC 60870-5-104 in IEC: IEC prot. variant selects only the communication protocol. The additional services on the Ethernet module working like described for IEC 61850:

- Checking Spontaneous Signals, see [Section 3.5.4.3.1, \(p. 3-55\)](#)
- Checking Switchgear Device Positions and Signals, see [Section 3.5.4.3.1.1, \(p. 3-56\)](#)
- Clock Synchronization, see [Section 3.5.4.2.1.2, \(p. 3-40\)](#)
- Virtual Local Area Network, see [Section 3.5.4.2.3, \(p. 3-49\)](#)
- Port Assignment, see [Section 3.5.4.2.4, \(p. 3-49\)](#)
- Secure Communication with the Easergy Studio via the Ethernet Interface, see [Section 3.5.4.2.6, \(p. 3-51\)](#)

## 3.5.4.2.2.3

## Engineering

The communication function in IEC 60870-5-104 are configurable by the IEC 60870-5-104 configuration tool. The maximum configuration is:

- 5 IEC 60870-5-104 server connections
- 2 IEC 60870-5-104 clients

For usage in central functions additional programs may be started to compute more complex logical functions:

- Logic
- Boolean station interlocking

The setting of the IEC 60870-5-104 is done in the following steps:

- Configuration

The first step is to configure the module, means to choose how many server lines are needed, how many servers need to be connected and whether logic and Boolean interlocking is needed.

- Setting of parameters

In this step the main parameters for IEC 60870-5-104 and installed services will be set, e.g.

- Port assignment, which service runs on which Ethernet port.
- Network configuration, VLANs, IP-addresses, subnetwork masks, ...
- IEC 60870-5-104 parameters, server and client addresses, ...

- Mapping data

The incoming data from the device or any IEC 60870-5-104 connection may be mapped to any server or client connection of the module. The type and addressing of the IEC 60870-5-104 messages is individual configurable. In addition to the mapping data can be manipulated and linked together through functions, for example:

- Logical functions (negation, and, or, ...),
- Arithmetical functions (multiply, division, ...),
- Time functions (on delay, off delay, ...),
- Set functions for data and cause of transmission,
- Filter functions (deadband, average, ...).

The mapping and manipulating of the data can be done individually in all IEC 60870-5-104 servers lines and clients.

- Generate and upload data bank

The generated data bank file is an archive of all IEC 60870-5-104 project data. It can be uploaded to the device via Ethernet service port or serial front interface.

For detailed description of IEC 60870-5-104 engineering and functions, please refer to IEC 60870-5-104 Application Guide.

## 3.5.4.2.2.4

## IEC 60870-5-104 Server and Client Functions

The IEC 60870-5-104 server connections can work in two modes:

- IEC 60870-5-104 Station Bus

In this mode one client can connect to the server. Redundancy is not used.

- IEC 60870-5-104 SCADA connection

In this mode up to 8 clients can connect to the server in one redundancy group. The redundancy can be configured in 2 modes:

- Redundancy defined in IEC 60870-5-104

In this mode one connection is active. Data messages are transmitted and received over this link. The other connections are passive, no data is transmitted. The links will be supervised by sending test frames.

- Multiple active connections

In this mode all connections transmit and receive data messages. It is up to the client to choose the active connection by processing the data.

One IEC 60870-5-104 client can connect to maximum 32 servers. Two IEC 60870-5-104 client processes can run on the communication module. The information of each connected servers can be mapped individually.

In IEC 60870-5-104 server and client include the following protocol related functions:

- Separation of communication layers in two processes, one for link and transport layer and one for application layer.
- Queues for priority controlled transmission of commands, signals and measurements.
- Packing and unpacking of messages with multiple information objects.
- Sending and receiving of ASDUs in reverse direction, signals in command direction and commands in monitor direction.
- Supervision and conversion of command procedures Direct Execute and Select and Execute (server only).
- Supervision of control uniqueness (server only).

For detailed list of supported IEC 60870-5-104 protocol function, please refer to IEC 60870-5-104 Interoperability Guide.

## 3.5.4.2.3

## Virtual Local Area Network

*From the software version -661, VLAN is available for the devices of the Easergy MiCOM 30 Series.  
Configuration of VLAN features is done with IED Configurator.*

A virtual LAN (VLAN) is any broadcast domain that is partitioned and isolated in a computer network at the data link layer (OSI layer 2). VLANs work through tags within network packets and tag handling in networking systems - recreating the appearance and functionality of network traffic that is physically on a single network but acts as if it is split between separate networks. It is possible to assign traffic to different VLANs to allow the separation of the traffic while using a single physical network.

In the table below shows the link between the Hardware modules/ ports and IED configurator inclusive requested VLAN support capability. Only physical interface 1 is to support VLANs in fixed number (2 VLANs for physical interface 1).

| Module Type | Interface 1 | Interface 2 | Interface 1 & VLAN support | Interface 2 & VLAN support |
|-------------|-------------|-------------|----------------------------|----------------------------|
| REB fiber   | Port A/B    | Port C      | Yes                        | No                         |
| REB copper  | Port A/B    | Port C      | Yes                        | No                         |
| SEB fiber   | Port A      | Port C      | Yes                        | No                         |
| SEB copper  | Port C      | -           | Yes                        | -                          |

Tab. 3-7: VLAN support capability.

## 3.5.4.2.4

## Port Assignment

Port assignment is the capability to assign TCP/IP services to a dedicated communication interface. The communication interface can be a physical interface or a virtual interface of the communication module. The port assignment can be configured for physical Ethernet interfaces as well as for VLANs.

Port assignment allows to configure TCP/IP services of networks for the customer needs.

*Default configuration*

In general the Ethernet communication module is designed that all TCP/IP services are working on all physical / virtual interfaces. The factory delivers a communication module without any specific port assignment. In this case – without port assignment and without VLAN – the communication services are available without restriction on the physical Ethernet Interfaces. Depending on the physical module type all services are working on A/B and C for redundant modules or A and C for the single fiber module or only C for the single copper module.

There is one exception the Web services for the CAE tool are only available on one interface at a time. Please find the details in [Section 3.5.4.2.5, \(p. 3-51\)](#).

*Port assignment example*

With the port assignment the user can choose which services shall work on which physical/ virtual interface. This allows for example to configure two networks,

where one network is dedicated to the station bus and the related services and the second network is dedicated for maintenance services. The user can configure configuration / administration services (configuration bus) as available on physical port C and the client application services (station bus) as available on port A/B.

The port assignment feature is available to together with the VLAN feature since the firmware version 661. The same scenario as above can be configured with VLAN together. For example VLAN1 as station bus and VLAN2 as configuration bus.

TCP/IP service

The following list of TCP/IP services can be assigned to interfaces.

| Services                                            | Description                                                      |
|-----------------------------------------------------|------------------------------------------------------------------|
| IEC 61850 (MMS) <sup>1)</sup>                       | All MMS services including report                                |
| Network time protocol (NTP)                         | NTP Service                                                      |
| IED configuration (TLS)                             | Services via TLS to configure the device from Easergy Studio     |
| Basic administration (SSH/SFTP) <sup>1)</sup>       | Update firmware, Read/Write MAC addresses                        |
| User management via RBAC (Webservice) <sup>2)</sup> | Web services for the CAE tool to configure security and the RBAC |

1) Minimum configuration: at least ONE "IEC 61850 (MMS)" and at least ONE "Basic administration (SSH/SFTP)" should be enabled across all interfaces

2) "User management via RBAC (Webservice)" option can be fully disabled or only enabled on ONE of the available interfaces

Tab. 3-8: TCP/IP service in port assignment.

Configured example

Address Configuration

☒ Enable VLANs

☒ Enable Port Assignment

Interface 1

VLAN1

VLAN2

Interface 2 (If fitted)

VLAN Id:

1

3E

IP Address:

0 . 0 . 0 . 0

192 . 168 . 10 . 4

192 . 168 . 11 . 4

0 . 0 . 0 . 0

SubNet Mask:

0 . 0 . 0 . 0

255 . 255 . 255 . 0

255 . 255 . 255 . 0

0 . 0 . 0 . 0

Gateway Address:

0 . 0 . 0 . 0

0 . 0 . 0 . 0

0 . 0 . 0 . 0

0 . 0 . 0 . 0

IEC 61850 (MMS):

☒

☒

☒

☐

Network time protocol (NTP):

☒

☐

☐

☒

IED Configuration (TLS):

☒

☐

☒

☐

Basic administration (SSH/SFTP):

☒

☐

☒

☒

User mgmt via RBAC (Webservice):

☒

☐

☐

☒

Fig. 3-30: VLANs and port assignment configured example for IEC 61850 Ed.2.

Note that the "VLAN Id" is configured in HEX.

#### 3.5.4.2.5 CAE-Tool Connectivity (w/wo Port Assignment)

The CAE (EcoStruxure™ Cybersecurity Admin Expert) allows to configure security rights for the IEDs, e.g. the user names and passwords, access rights and roles for the user. The CAE tool is working with Web services.

The communication between CAE and IED is restricted to one interface at the same time. The interface can be changed via port assignment configuration. The default behaviour of the CAE tool – without port assignment is described in the following table:

| Port Assignment Active | VLAN Active | Behavior<br>CAE Web services are available on:                                                                                                                         | Toggle Mode<br>(physical Ethernet port A/B or C) |
|------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| No                     | No          | Depending on the plugged cable to the physical interfaces the services switch between the physical Ethernet port A/B and C.<br>● Preferred is physical Ethernet port C | Yes                                              |
| No                     | Yes         | Fixed port assignment<br>● Physical Ethernet port C or VLAN1 or VLAN2                                                                                                  | No                                               |
| Yes                    | No          | One of the available physical interface is assigned via configuration for the Web services<br>● Physical Ethernet port A/B or C                                        | No                                               |
| Yes                    | Yes         | One of the available physical and possible virtual interfaces is assigned via configuration for the Web services<br>● Physical Ethernet C or VLAN1 or VLAN2            | No                                               |

Tab. 3-9: CAE Web services behavior.

#### 3.5.4.2.6 Secure Communication with the Easergy Studio via the Ethernet Interface

*The secure communication is valid for IEC 61850 Ed.2.  
The communication will be done using port 4422. Ensure this port is left unblocked on the network.*

When C434 and Easergy Studio are connected via the Ethernet interface, they will communicate securely using SSH (Secure Shell). The benefits of secure communication are:

- Help in the prevention of unwanted eavesdropping between Easergy Studio and the IED.
- Help in the prevention of modification of data between Easergy Studio and the IED.
- Ensure integrity of data.
- Help to prevent replay of data at a later data.

#### 3.5.4.3 Configuration and Enabling

The IEC function group can be included in the configuration by setting the parameter IEC: Function group IEC. This parameter is only visible if the optional Ethernet communication module is fitted to the C434. After activation of

IEC, all data points associated with this function group (setting parameters, IEC prot.variant etc.) become visible.

The function can then be enabled or disabled by setting IEC: General enable USER. IEC 60870-5-104, IEC 61850 Edition 1 or Edition 2 can be selected by setting IEC: IEC prot. variant. When Redundant Ethernet module is used, the redundancy protocols PRP/HSR/RSTP can be switched via IEC: ETH COMM Mode. Port A/B and service port C can be blocked by IEC: Block Port A/B and IEC: Block Port C.

The setting parameters from the IEC function group as well as the related GOOSE function group are not automatically active in the C434. The C434 features two memory “banks” one of which includes the active setting parameters. The other memory bank is used with the configuration procedure for parameters from the *IED Configurator* and the operating system. Specific project-related extensions of the IEC 61850 parameters from the *IED Configurator* are loaded into the C434 by downloading a .MCL file (Ed1) or .CID file (Ed2). The inactive communication parameters are activated by executing the command IEC: Switch Config. Bank. This command may also be issued from the *IED Configurator*.



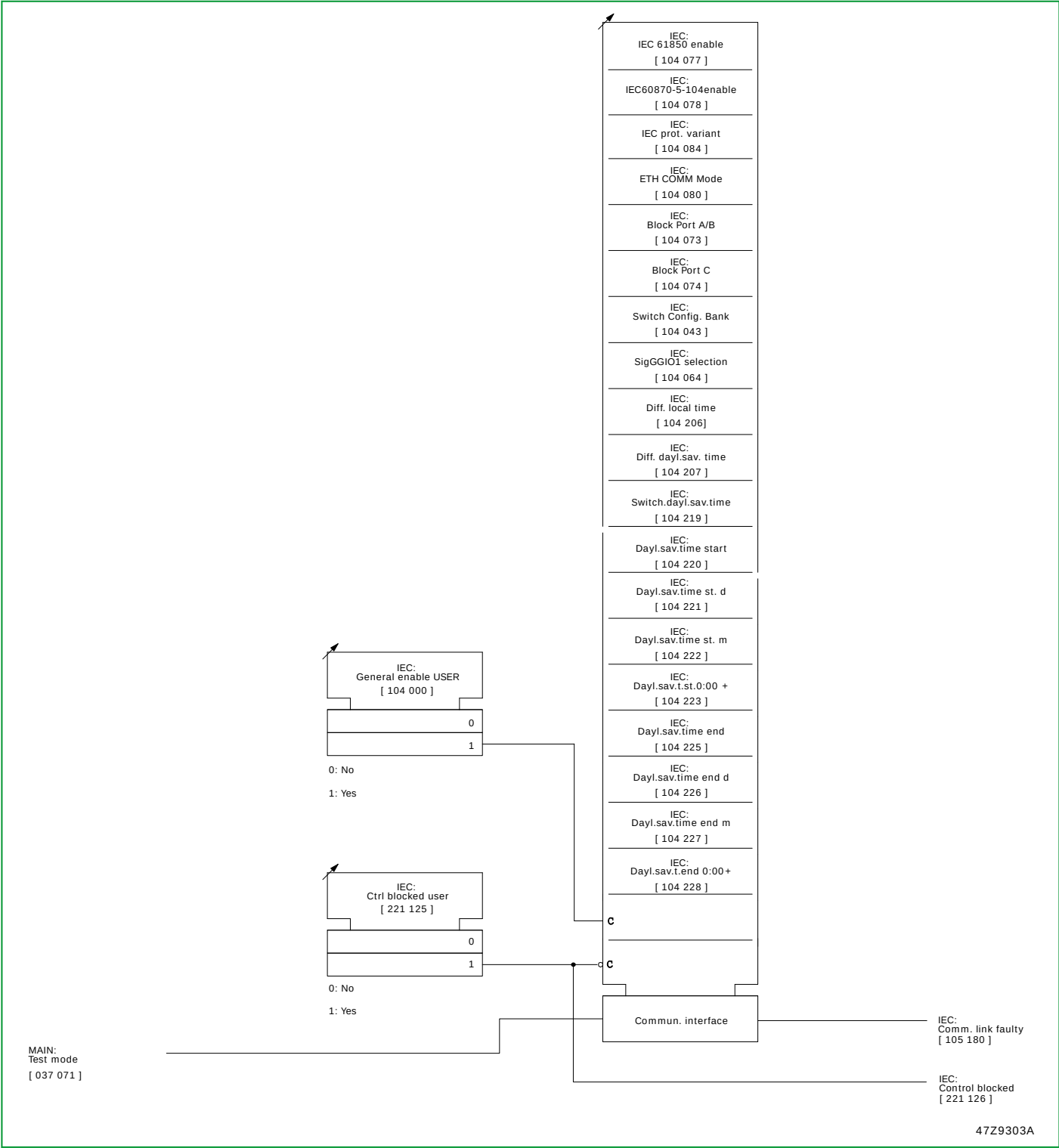


Fig. 3-31: Settings for communication interface IEC 61850.

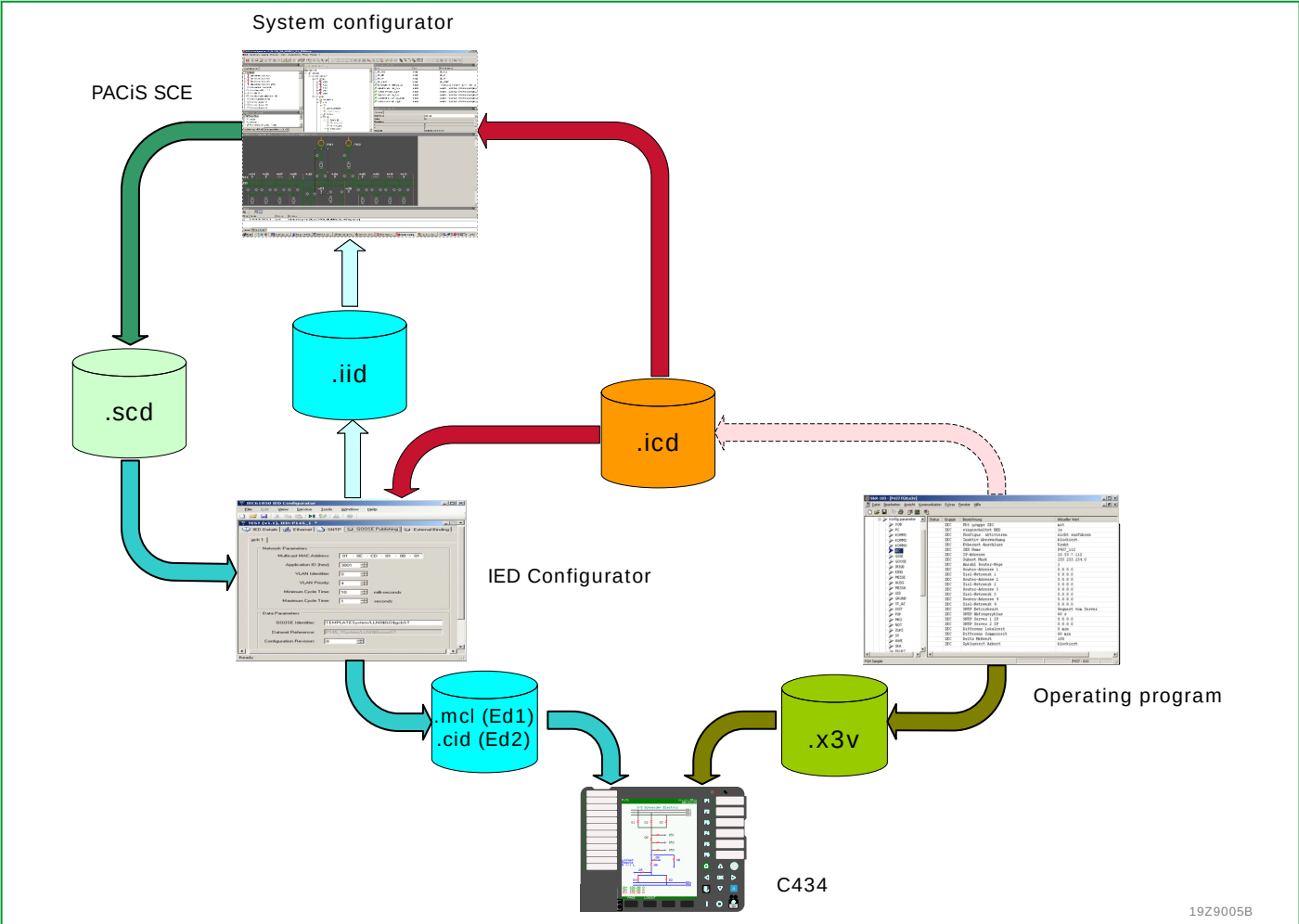


Fig. 3-32: Configuration according to IEC 61850-6.

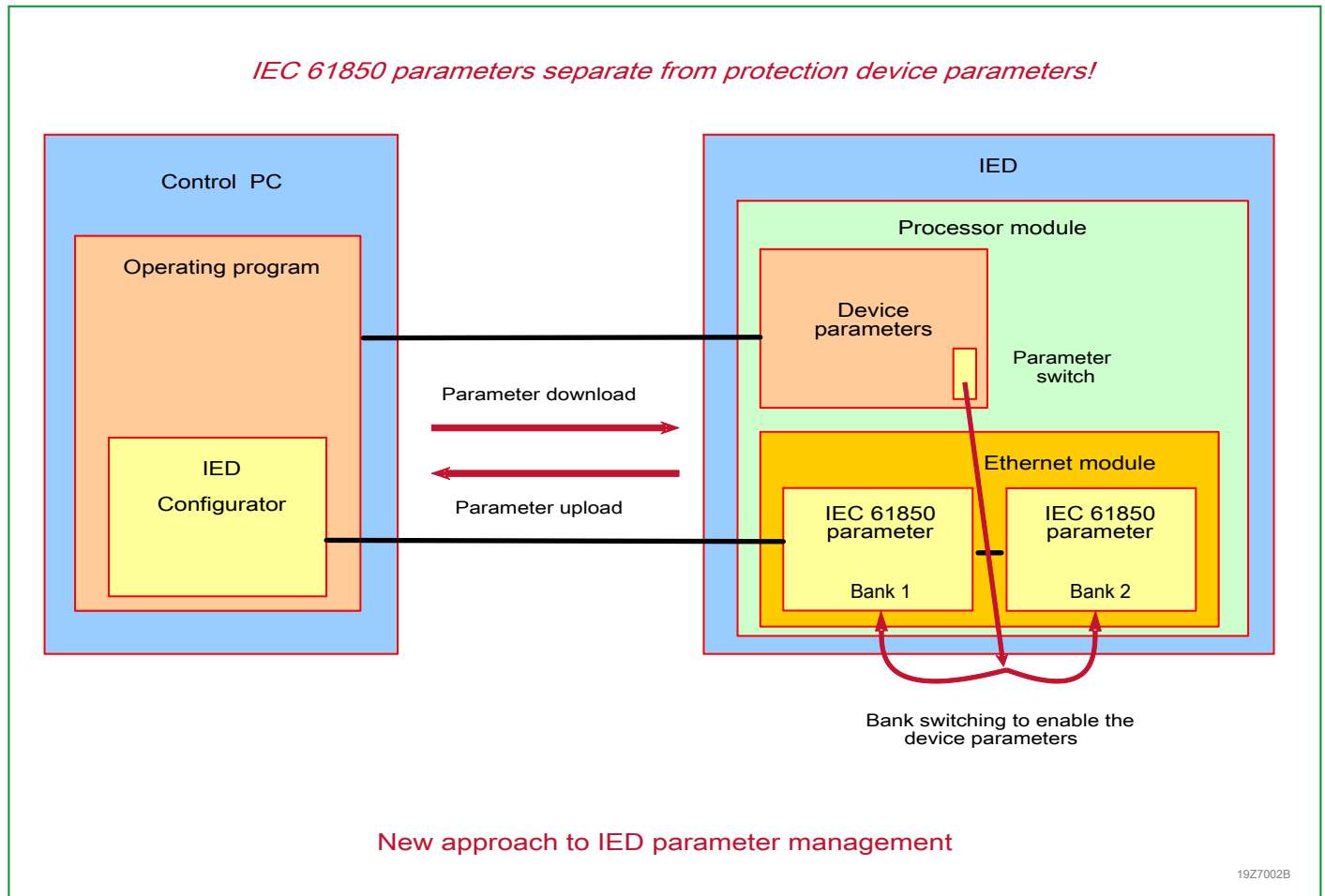


Fig. 3-33: Saving configuration parameters.

#### 3.5.4.3.1

#### IEC – Checking Spontaneous Signals

It is possible to select a signal for test purposes. The transmission of this signal to the control station as 'sig. start' or 'sig. end' can then be triggered via the local control panel.

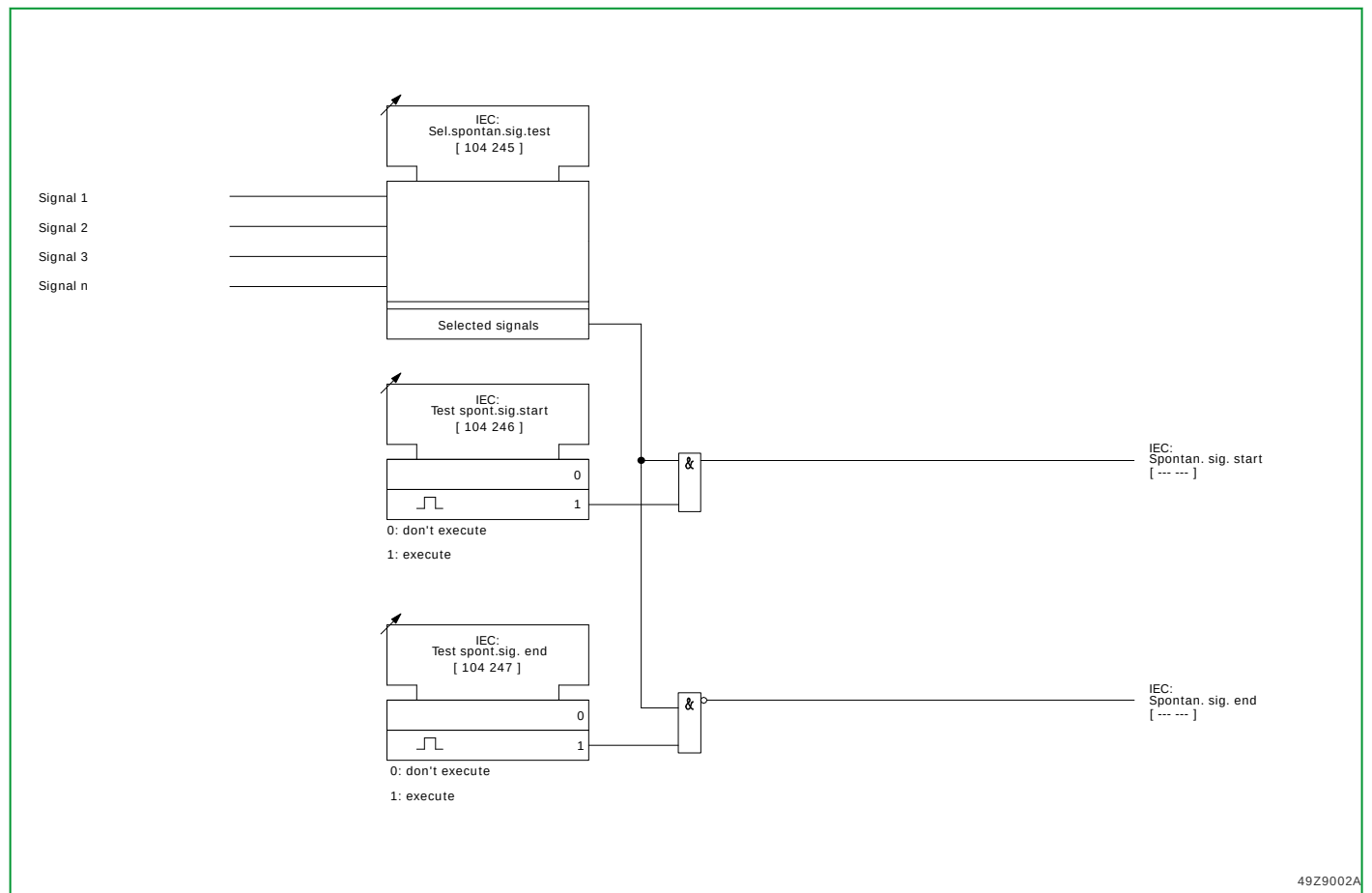


Fig. 3-34: IEC – Checking spontaneous signals.

#### 3.5.4.3.1.1

#### Checking Switchgear Contact Positions and Signals

When checking during test operations with the interface protocols based on IEC 61850 it is possible to trigger signals (SIG) and contact positions (DEV) from the control part.

The following parameters are available:

- (104 248) IEC: Sel. pos. DEV test  
Selection possibilities:
  - *Not assigned*
  - DEV01 ... DEVxx
- (104 249) IEC: Test position DEV  
Selection possibilities:
  - *don't execute*
  - *execute open*
  - *execute close*
  - *execute intermed.*

## 3.5.4.4

## Communication Interface (Function Group GOOSE)

For high priority exchange of information between individual devices (IEDs) in a local network, the C434 provides the function group GOOSE as defined in the standard IEC 61850. GOOSE features high-speed and secure transmission of information for reverse interlocking, decentralized substation interlock, trip commands, blocking, enabling, contact position signals and other signals.

GOOSE Messages are only transmitted by switches but not by routers. GOOSE messages therefore remain in the local network to which the C434 is connected.

This function group is only visible if IEC: IEC 61850 enable is set to Yes. After having configured the GOOSE: Function group GOOSE, all parameters associated to this function group are then visible and ready to be configured.

Further setting parameters from function group GOOSE are set with the IED Configurator, but they cannot be modified from the local control panel (MMI) or with the operating program.

The function can then be enabled or disabled by setting GOOSE: General enable USER.

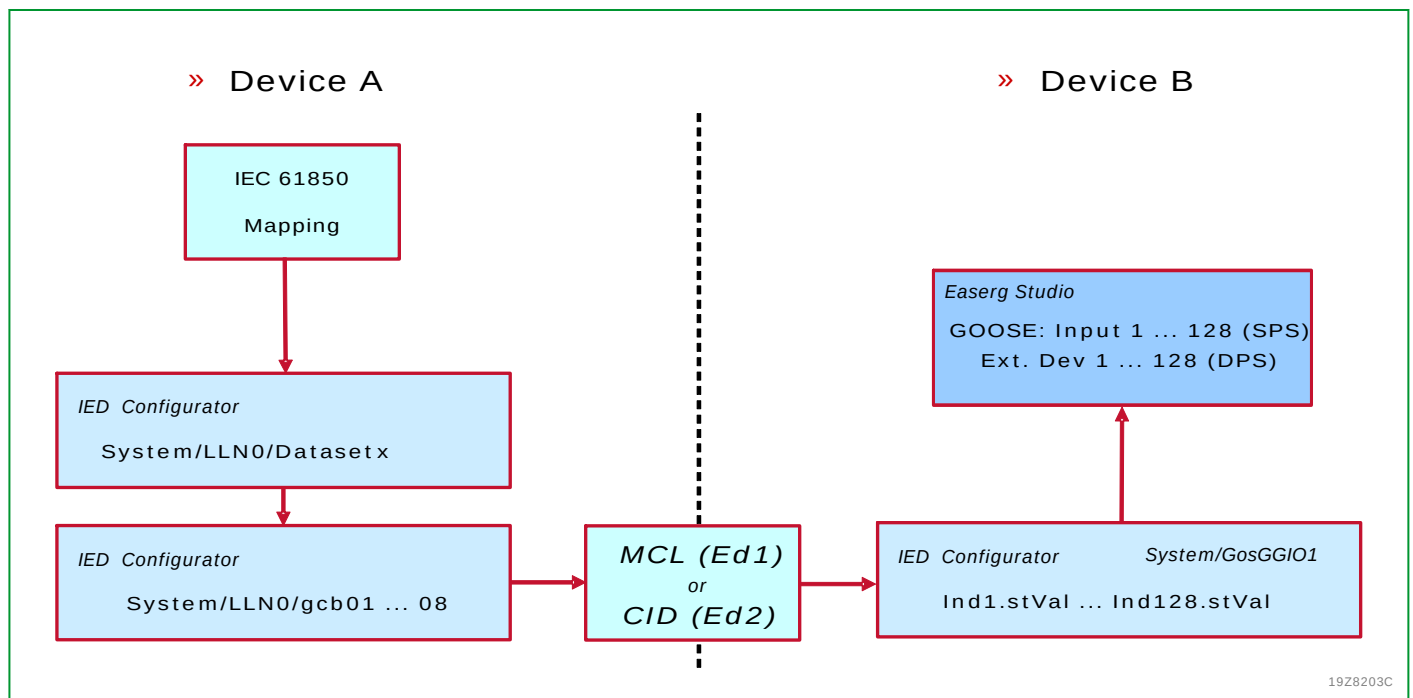


Fig. 3-35: GOOSE configuration.

## 3.5.4.4.1

## Configuration and Enabling

Function group GOOSE can be configured by setting the parameter GOOSE: Function group GOOSE. This parameter is only visible if the optional Ethernet communication module is fitted to the C434. After having configured the GOOSE all parameters associated to this function group are then visible and ready to be configured.

Further setting parameters from function group GOOSE are set with the IED Configurator, but they cannot be modified from the local control panel (MMI) or with the operating program.

The function can then be enabled or disabled by setting GOOSE: General enable USER.

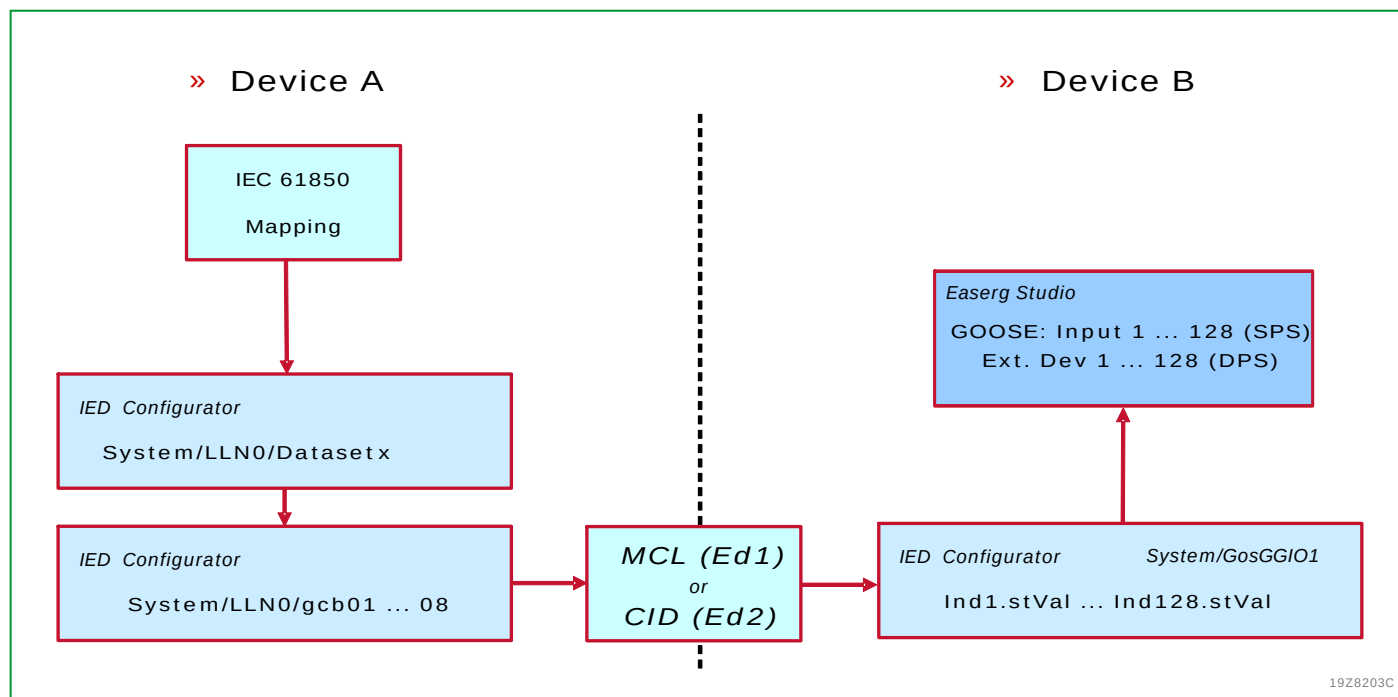


Fig. 3-36: GOOSE configuration.

#### 3.5.4.4.2

#### Sending GOOSE

The GOOSE can send up to 8 different GOOSE messages which are managed in 8 GOOSE Control Blocks (gcb01 to gcb08). Information content depends on the respective dataset assigned to GOOSE. The maximum size of a dataset to be sent by GOOSE is limited to 1500 bytes. A control display is shown by the IED Configurator to check this limit.

*It is not possible to read the IEC configuration back from the C434 if the "Dataset" sizes exceed the GOOSE size limit significantly. Therefore it is recommended to limit the "Dataset" size(s) to 100% of the GOOSE capacity. Too large a dataset can spoil IEC 61850 communication. Hence, the dataset size limit of 100% of the GOOSE capacity should not be exceeded, neither for GOOSE nor for reports.*

When defining the datasets for GOOSE it is advised to select the individual data attributes and not the overlapping data objects. By this the amount of data is kept within a limit and decoding is guaranteed on the receiving end.

When a state change occurs with a selected state signal or a measured value changes which is greater than the dead band set for the relevant data point then the complete GOOSE is sent. There will be multiple send repetitions at ascending time periods. The first send repetition occurs at the given cycle time set with the parameter [IC]: Minimum Cycle Time. The cycles for the following send repetitions result from a conditional equation with the increment set with the parameter [IC]: Increment. Should no further state changes occur up to the time when the maximum cycle time has elapsed [IC]: Maximum Cycle Time, then GOOSE will be sent cyclically at intervals as set for the maximum cycle time.

In order to have unambiguous identification of a GOOSE sent, characteristics such as [IC]: Multicast MAC Address, [IC]: Application ID (hex), [IC]: VLAN Identifier (hex), [IC]: VLAN Priority and [IC]: GOOSE Identifier must be entered in the IED Configurator settings. Further characteristics are [IC]: Dataset Reference and [IC]: Configuration Revision.

Each GOOSE is given the state change index and the number of send repetitions.

#### 3.5.4.4.3

##### Receiving GOOSE

With GOOSE up to 128 logic binary state signals as well as 128 two-pole contact position signals from external devices (Ext.Devxx) can be received. For each state signal or contact position signal to be received a specific GOOSE message is to be selected, which will contain the information wanted, by setting [IC]: Multicast MAC Address, [IC]: Application ID (hex), [IC]: Source Path, [IC]: GOOSE Identifier and [IC]: DataSet Reference. With the further setting of [IC]: Data Obj Index / Type, which corresponds to the GOOSE position index and the information structure of the sending device, the required information from the chosen GOOSE will be selected. The identification features "VLAN identifier" and [IC]: Configuration Revision that are also included in the GOOSE received will not be evaluated.

These parameters characterizing the information may be taken either from device or project planning documentation of the sending device or from a configuration file which is conform to IEC 61850. The *IED Configurator* will support the import of .IID, .SCD, .MCL (Ed1) and .CID (Ed2) files when the "browse function" (virtual key) is applied. The selection and acceptance of parameters from an existing project planning is distinguished by a simplified and very reliable data input.

Each GOOSE includes time information on the duration of validity of its information. This corresponds to the double time period to the next GOOSE repetition. If the duration of validity has elapsed without having received this GOOSE again (i.e. because of a fault in communications), the signals received will automatically be set to their respective default value

[IC]: Default Input Value. Which of the possible state values will set the wanted security grade is dependent on the relevant application.

The following configuration (shuttling to the device functions) of the logic state signals received from the logic node GosGGIO1 (GOOSE: Input 1 fct. assign. (or Input 2, ..., Input 128)) is made on the basis of the selection table of the binary signal inputs (opto-coupler inputs).

#### 3.5.4.4.4 Uniqueness of Control within a System

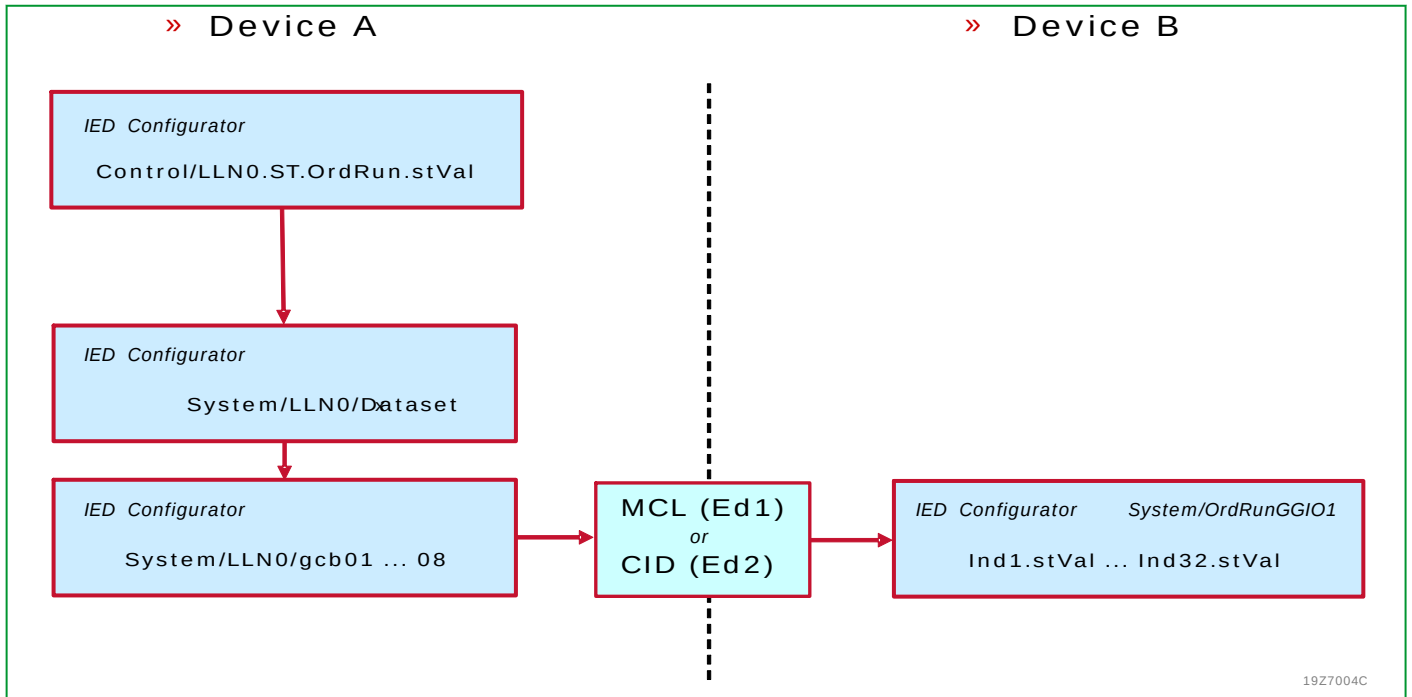


Fig. 3-37: Uniqueness of Control.

If with a system application it must be ensured that only one control command at a time is being processed system wide (“uniqueness”) then interlocking of secondary devices among themselves is setup with GOOSE. The C434 sets the status information `Control/LLN0.ST.OrdRun.stVal`. when it has received a control command. This information – stored in a dataset – is distributed in the system by GOOSE and is therefore available to all other devices as an interlocking condition. The state information is reset and accordingly signaled after termination of the command sequence.

The C434 is capable to monitor the command status of up to 32 further devices. With the *IED Configurator* `OrdRunGGIO1.ind1.stVal` to `OrdRunGGIO1.ind32.stVal` are configured in a similar way to the other GOOSE inputs. A shuttling to the interlocking equations is not necessary as their consideration within command checking is automatically enabled when the first binary signal input is configured. During a signaling receipt phase command effecting will be rejected.

#### 3.5.4.5 Virtual Inputs (Function Group VINP)

This function group is only visible if IEC: `IEC60870-5-104enable` is set to Yes. This functional group includes 64 virtual inputs and is intended to process binary information from the Ethernet module running with protocol IEC 60870-5-104. These inputs may be used e.g. in logic functions, signals or displayed on LEDs by assigning it to functions in `Config. Parameters/VINP`.

On Ethernet module, any binary information available may be mapped to these inputs. This may be status information of the module or any information received over a IEC 60870-5-104 connection.

The current state of the virtual inputs is visible under `Operation/Phys. state signals/VINP`.

The quality of the virtual inputs is visible under `Operation/Log. state signals/VINP`. The signal `Input xx faulty` is set to Yes if the quality “invalid” or “not topical” is set on the Ethernet module side.



### 3.5.5 Communication Interface Serial and Ethernet in Parallel

The serial communication module supporting IEC 60870-5-103, IEC 60870-5-101, Modbus and DNP 3.0 are able to work in parallel with the Ethernet module supporting IEC 61850 Ed1, Ed2 and IEC 60870-5-104 when parallel communication modules are ordered and fitted for C434.

The serial module shall be equipped on slot 2, while preferred and alternative slots for Ethernet module are defined in order information [Chapter 15, \(p. 15-1\)](#) and shown in location diagrams [Section 5.7, \(p. 5-27\)](#). Two Ethernet modules are not supported for C434.

#### *Configuration and Recognition*

If the serial and Ethernet modules are assembled correctly and firmware is loaded both on the serial module and on the Ethernet module after startup, the function groups for COMM1/COMM2 and IEC are available and can be configured independently.

Both software versions for the serial module (002 103) DVICE: SW version COMM1/2 and Ethernet module (025 185) DVICE: SW vers. Ethernet are visible.

#### *Assignment of Remote Control*

It is possible to switch the remote control functionality from the serial communication to the Ethernet by setting (104 242) MAIN: Fct.assignm. control to ensure that only one remote control center is connected. Parallel connection is not possible.

After changing the setting, a warm restart is needed. The remote control function is available only after the warm restart.

If only one communication module is fitted, the remote control is automatically assigned to the installed module and the content of the setting is ignored (even if the setting is still visible).

#### *Assignment of Time Synchronization*

Time synchronization is carried out over IEC 60870-5-103 serial telegram or Ethernet NTP protocol. The selection of the time synchronization source can be done with (103 210) MAIN: Prim.Source TimeSync and (103 211) MAIN: BackupSourceTimeSync.

3.6 IRIG-B Clock Synchronization (Function Group IRIGB)

If, for example, a GPS receiver with IRIG-B connection is available, the internal clock of the C434 can be synchronized to run on GPS time using the optional IRIG-B interface. It should be noted that the IRIG-B signal holds information on the day only (day of the current year). Using this information and the year set at the C434, the C434 calculates the current date (DD.MM.YY).

Disabling and Enabling the IRIG-B Interface

The IRIG-B interface can be disabled or enabled using a setting parameter.

Synchronization Readiness

If the IRIG-B interface is enabled and receiving a signal, the C434 checks the received signal for plausibility. Implausible signals are rejected by the C434. If the C434 does not receive a correct signal in the long run, synchronization will not be ready any longer.

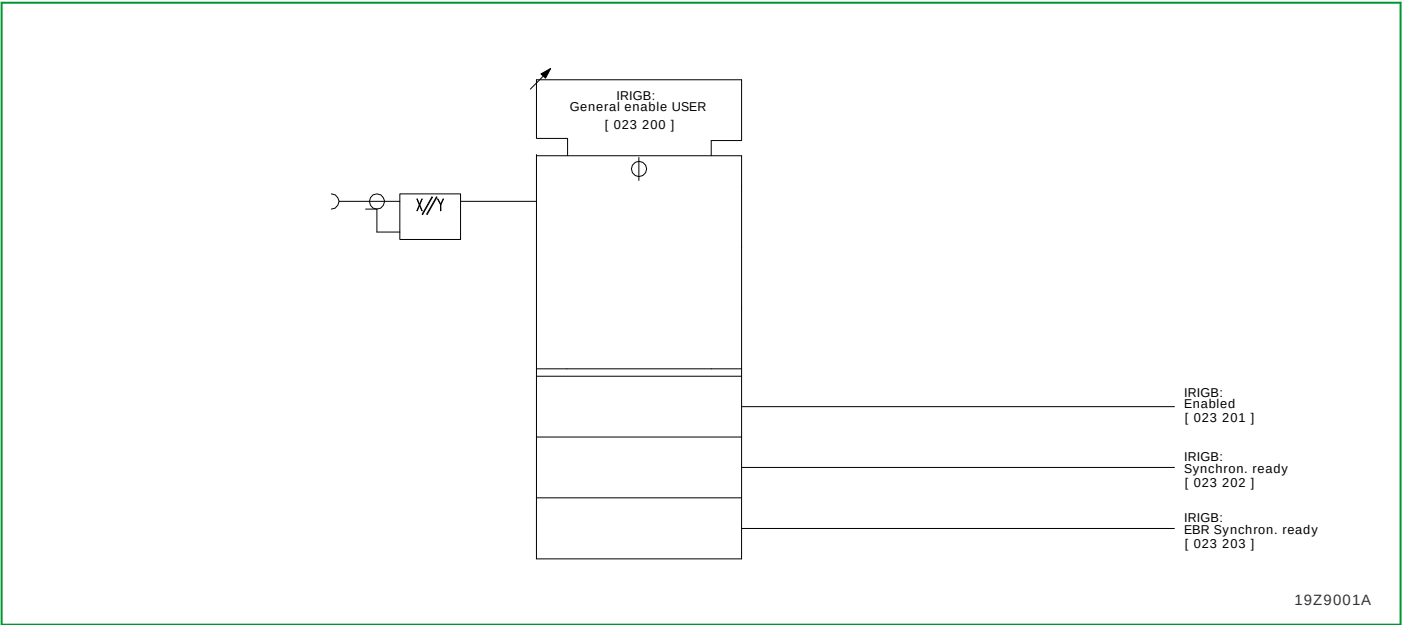


Fig. 3-38: IRIG-B interface.

*IRIG-B interface should be connected to only one IRIG-B connector on the serial or Ethernet module.*

### 3.7 Configurable Function Keys (Function Group F\_KEY)

The C434 provides six freely configurable function keys. A password may be configured for each function key (e.g. for F1 at F\_KEY: Password funct.key 1), and if a password has been configured then the respective function key will only be enabled when the configured password is entered.

As an example the operation of function key F1 is shown in [Fig. 3-39, \(p. 3-64\)](#). After the password has been entered the function key will remain active for the time period set at F\_KEY: Return time fct.keys. Thereafter, the function key is disabled until the password is entered again. The same is valid for function keys F2 to F6.

#### *Configuration of function keys with a single function*

One function may be assigned to each function key (e.g. for F1) at F\_KEY: Fct. assignm. F1 by selecting a logic state signal (except LOC: Trig. menu jmp 1 EXT and LOC: Trig. menu jmp 2 EXT). The assigned function is triggered by pressing the respective function key on the C434.

#### *Configuration of function keys with menu jump lists*

Instead of a single function each function key may have one of the two menu jump lists assigned (e.g. for F1) at F\_KEY: Fct. assignm. F1 by selecting the listing at LOC: Trig. menu jmp 1 EXT or LOC: Trig. menu jmp 2 EXT. The functions of the selected menu jump list are triggered in sequence by repeated pressing of the assigned function key.

Both menu jump lists are assembled at LOC: Fct. menu jmp list 1 or LOC: Fct. menu jmp list 2. Up to 16 functions such as setting parameters, event counters and/or event logs may be selected.

*LED indicators including the six positioned directly next to the function keys are configured independently and in this respect there is no relationship to the respective function key configuration.*

#### *Configuration of the READ key*

As with LOC: Fct. menu jmp list 1 or LOC: Fct. menu jmp list 2 up to 16 functions may also be selected from the same menu jump list at LOC: Fct. read key. They are triggered in sequence by repeated pressing of the "READ" key.

#### *Operating mode of the function keys*

For each function key the operating mode may be selected (e.g. for F1) at F\_KEY: Operating mode F1. Here it is possible to select whether the function key operates as a key or as a switch. In the *Key* operating mode the selected function is active while the function key is pressed. In the *Switch* operating mode the selected function is switched on or off every time the function key is pressed. The state of the function keys can be displayed.

#### *Handling keys*

If backlighting for the LC display is switched off it will automatically light up when a function key or the "READ" key is pressed. The assigned function will only be triggered when the respective key is pressed a second time. This is also valid for the other keys.

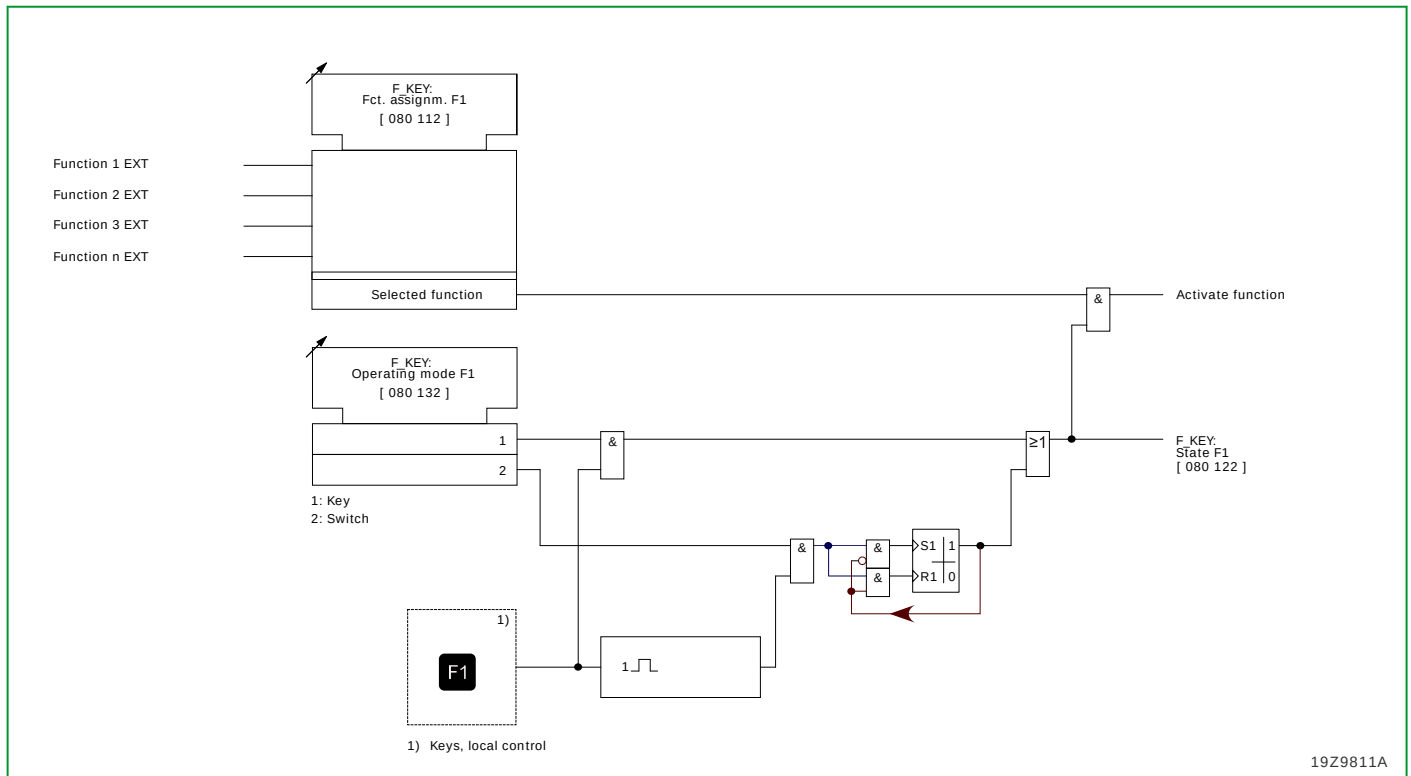


*Fig. 3-39: Configuration and operating mode of function keys. The assigned function is either a single function or a menu jump list.*

### 3.8 Configuration and Operating Mode of the Binary Inputs (Function Group INP)

The C434 has opto coupler inputs for processing binary signals from the substation. The functions that will be activated in the C434 by triggering these binary signal inputs are defined by the configuration of the binary signal inputs. In order to ensure that during normal operation the C434 will recognize an input signal, the input signal must persist for at least 8 ms plus the set filter time (provided that *Active "high", filt.* or *Active "low", filt.* has been selected for INP: Oper. mode U xxx).

#### *Configuring the Binary Inputs*

One function can be assigned to each binary signal input by configuration. The same function can be assigned to several signal inputs. Thus one function can be activated from several control points having different signal voltages.

It should be noted that time-critical applications such as time synchronization commands should not be mapped to the binary signal inputs of the analog I/O module as these have an increased reaction time due to internal processing.

In this technical manual, it is assumed that the required functions (marked "EXT" in the address description) have been assigned to binary signal inputs by configuration.

#### *Operating Mode of the Binary Inputs*

The operating mode for each binary signal input can be defined. The user can specify whether the presence (*Active "high" mode*) or absence (*Active "low" mode*) of a voltage shall be interpreted as the logic '1' signal. The display of the state of a binary signal input – "low" or "high" – is independent of the setting for the operating mode of the signal input.

#### *Filter Function*

An additional filter function may be enabled in order to suppress transient interference peaks at the logic signal inputs (operating modes *Active "high", filt.* or *Active "low", filt.*). With this function enabled a status change at the binary logic input is only signaled when the input signal remains at a steady signal level during a set number of sampling steps (sampling step size = period / 20). The number of sampling steps is set at parameter INP: Filter.

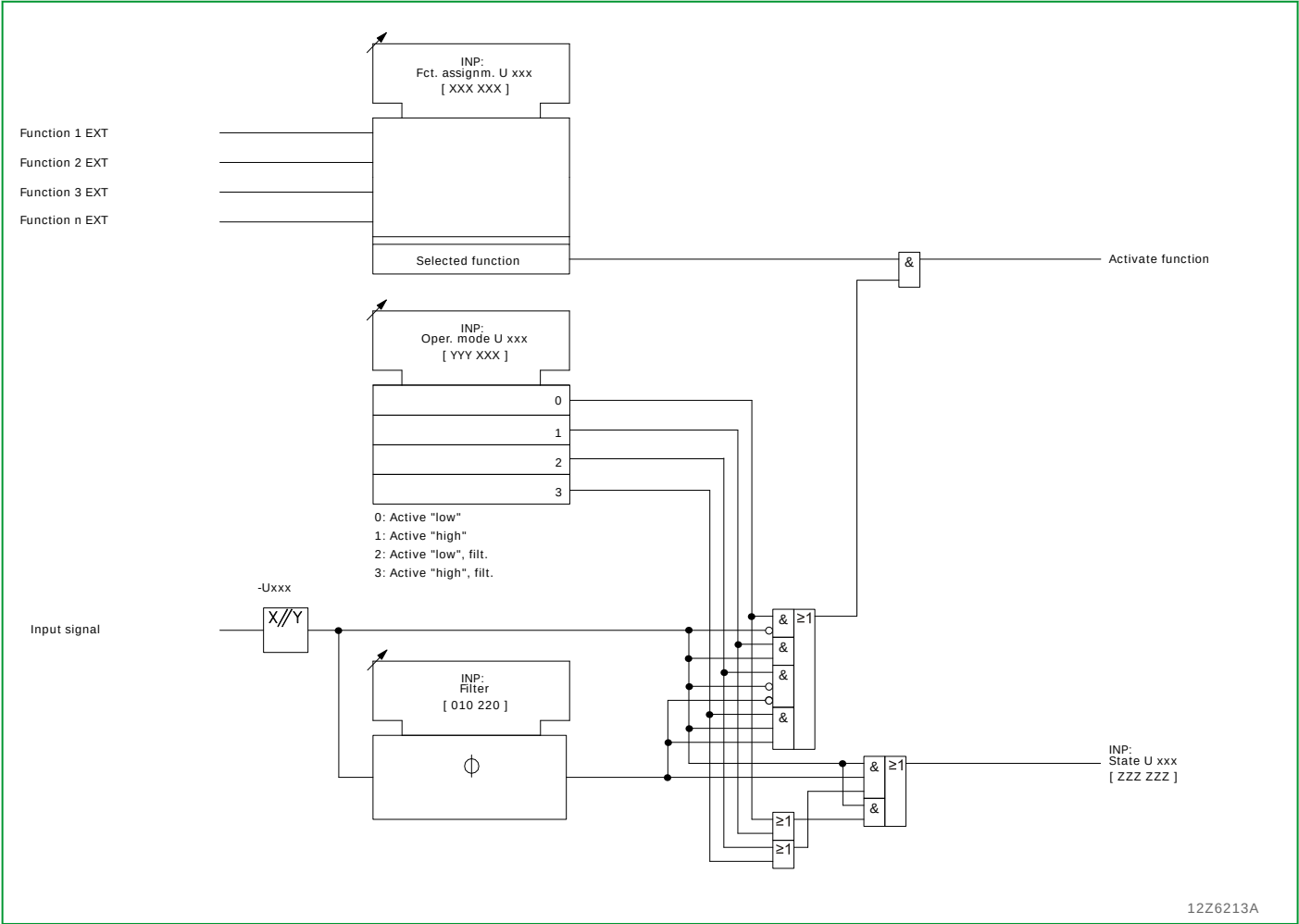


Fig. 3-40: Configuration and operating mode of the binary signal inputs.

### 3.9 Measured Data Input (Function Group MEASI)

The C434 has a measured data input function involving two inputs. Direct current is fed to the C434 through one of the inputs. The other input is designed for connection of a resistance thermometer.

The input current  $I_{DC}$  present at the analog (I/O) module Y is displayed as a measured operating value. The current that is conditioned for monitoring purposes ( $I_{DC,lin}$ ) is also displayed as a measured operating value. In addition, it is monitored by the Limit Value Monitoring function to detect whether it exceeds or falls below set thresholds (see [Section 3.20, \(p. 3-152\)](#)).

The measured temperatures are also displayed as measured operating values and monitored by the Limit Value Monitoring function to determine whether they exceed or fall below set thresholds (see [Section 3.20, \(p. 3-152\)](#)).

#### Disabling or Enabling the Measured Data Input Function

The Measured Data Input function can be disabled or enabled via setting parameters.

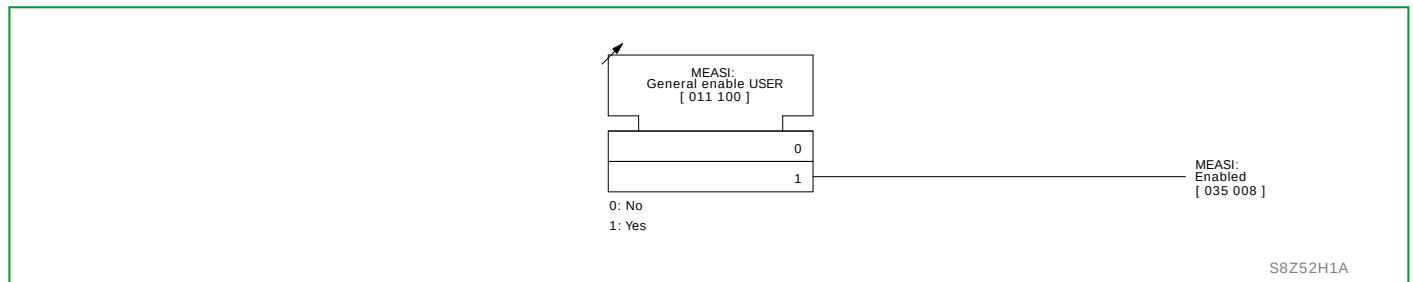


Fig. 3-41: Disabling or enabling the measured data input function.

### 3.9.1 Direct Current Input on the Analog (I/O) Module Y

External measuring transducers normally supply an output current of 0 to 20 mA that is directly proportional to the physical quantity being measured – the temperature, for example.

If the output current of the measuring transducer is directly proportional to the measured quantity only in certain ranges, linearization can be arranged, provided that the measured data input is set accordingly. Furthermore, for certain applications it may be necessary to limit the range being monitored or to monitor certain parts of the range with a higher or lower sensitivity.

By setting the value pair MEASI: IDC 1 and MEASI: IDC,lin 1, the user specifies which input current  $I_{DC}$  will correspond to the current that is monitored by the Limit Value Monitoring function, i.e.  $I_{DC,lin}$ . (These two setting parameters refer to value pair number 1; setting parameters for value pairs 2 to 20 are available, too.)

The resulting points, called “interpolation points”, are connected by straight lines in an  $I_{DC}$ - $I_{DC,lin}$  diagram. In order to implement a simple characteristic, it is sufficient to specify two interpolation points, which are also used as limiting values (see Fig. 3-42, (p. 3-68)). Up to 20 interpolation points are available to implement a complex characteristic.

When setting the characteristic the user must remember that only a rising/rising or falling/falling curve sense is allowed (no peak or vee-shapes). If the setting differs, the signal SFMON: Invalid scaling IDC will be generated.

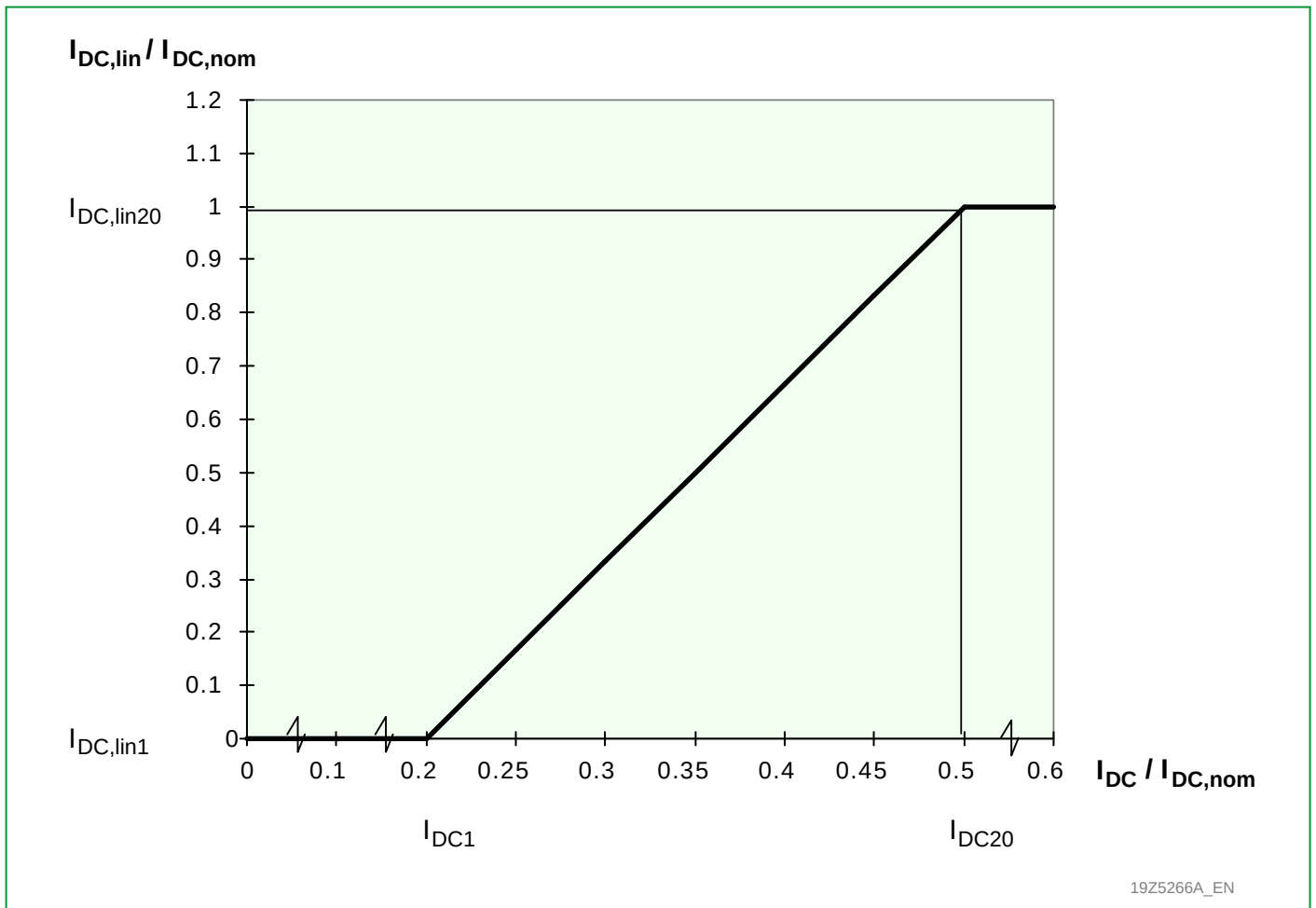


Fig. 3-42: Example of the conversion of 4 to 10 mA input current to 0 to 20 mA monitored current,  $I_{DC,lin}$ .



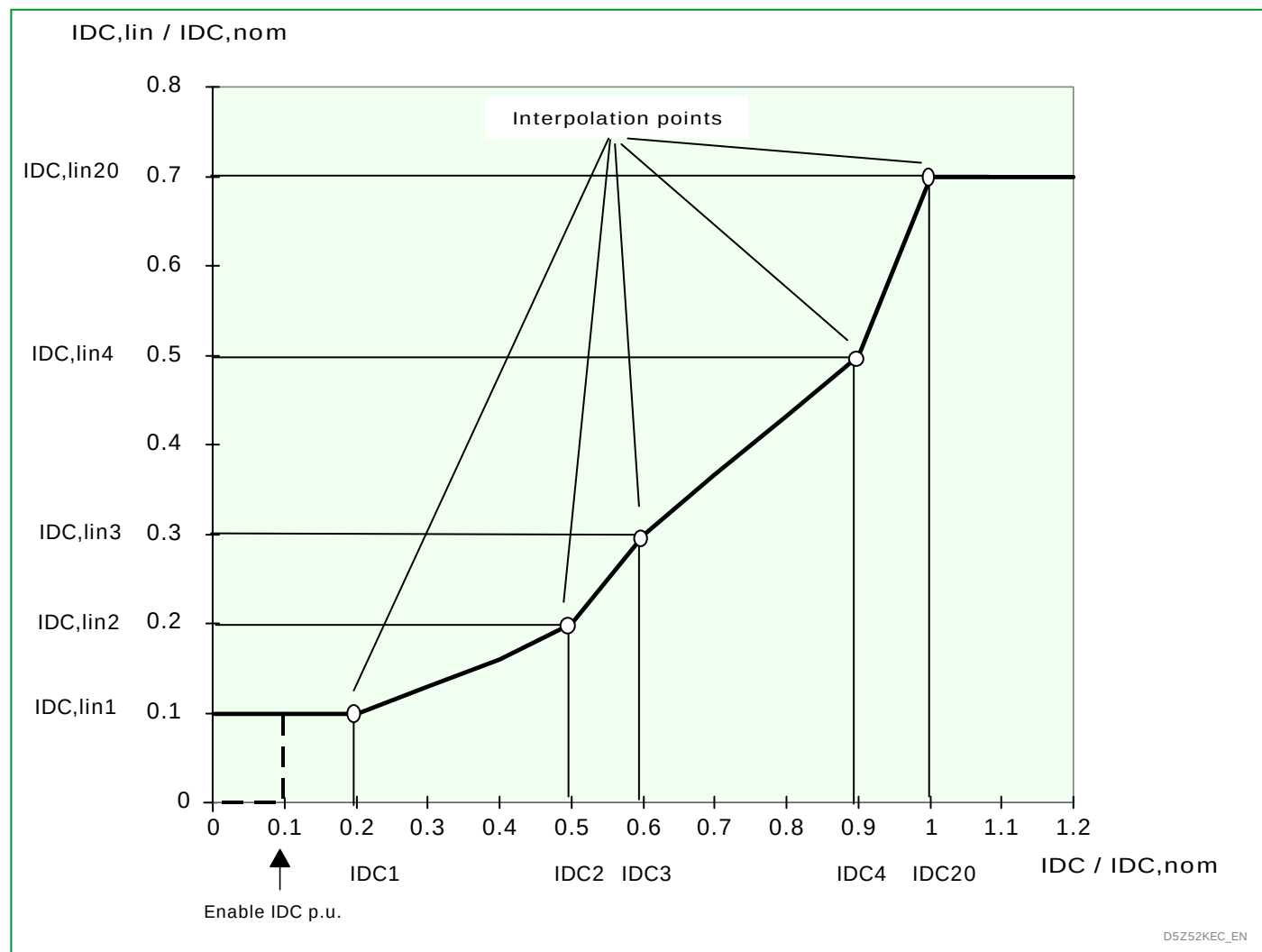


Fig. 3-43: Example of a characteristic with five interpolation points (characteristic with zero suppression setting of  $0.1 I_{DC,nom}$  is shown as a broken line).

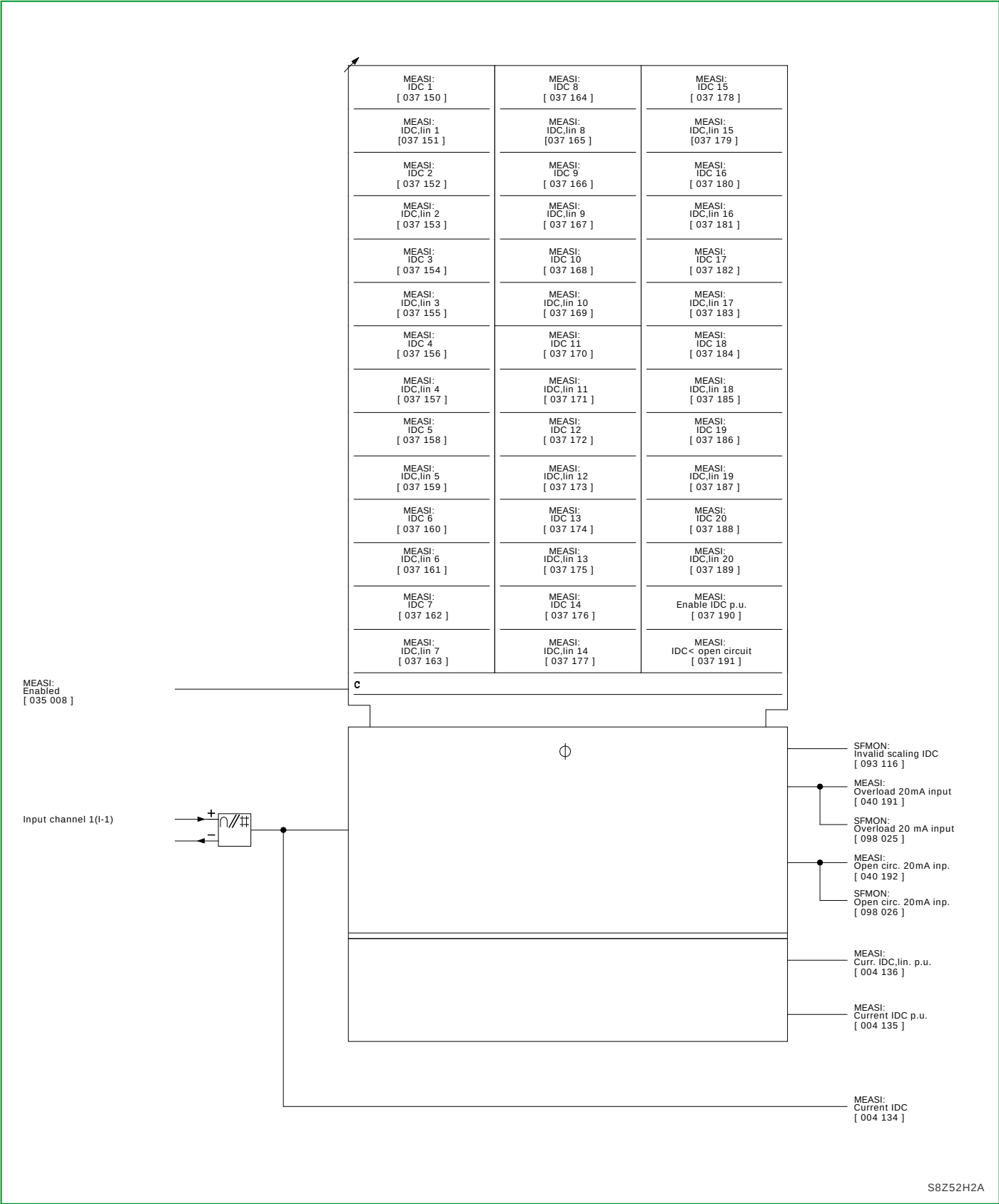


Fig. 3-44: Analog direct current input.

Beyond the linearization described above, the user has the option of scaling the linearized values. Thereby negative values, for example, can be displayed as well and are available for further processing by protection functions.

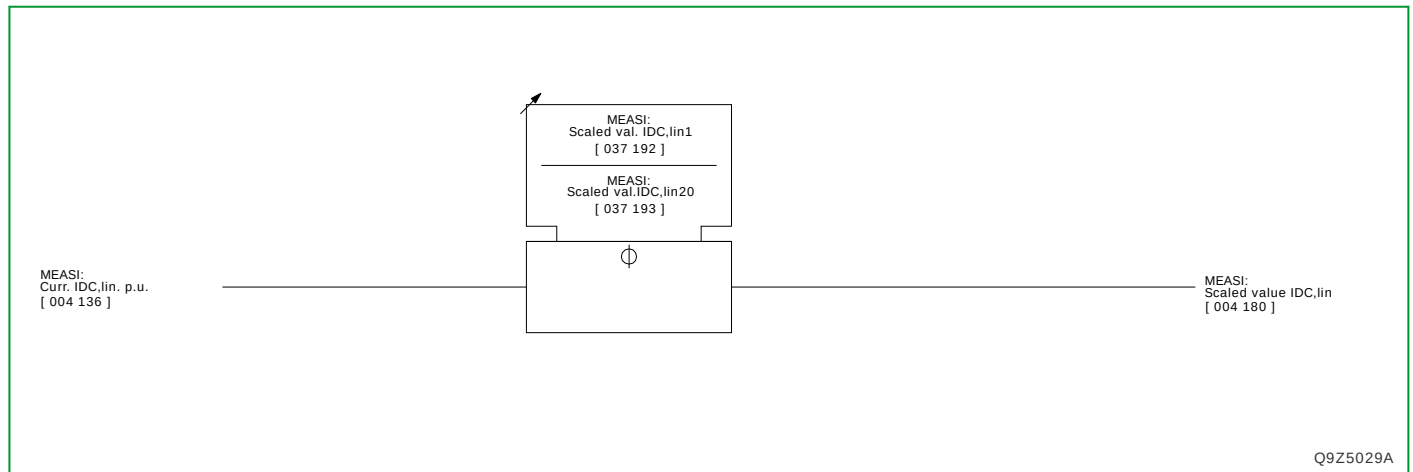


Fig. 3-45: Scaling of the linearized measured value.

#### 3.9.1.1 Zero Suppression

Zero suppression is defined by setting MEASI: Enable IDC p.u. If the direct current does not exceed the set threshold, the per-unit input current  $I_{DC\text{ p.u.}}$  and the current  $I_{DC,lin}$  will be displayed as having a value of “0”.

#### 3.9.1.2 Open-Circuit and Overload Monitoring

The C434 is equipped with an open-circuit monitoring function. If current  $I_{DC}$  falls below the set threshold MEASI: IDC < open circuit, the signal MEASI: Open circ. 20mA inp. is issued.

The input current is monitored in order to protect the 20 mA analog input against overloading. If it exceeds the set threshold of 24.8 mA, the signal MEASI: Overload 20mA input is issued.

#### 3.9.2 Connecting a Resistance Thermometer to the “PT 100 Analog Input” on the Analog (I/O) Module Y

This analog input on the analog (I/O) module Y is designed to connect a PT 100 resistance thermometer. The mapping curve  $R = f(T)$  of PT 100 resistance thermometers is defined in standard IEC 751. If the PT 100 resistance thermometer is connected using the 3-wire method, then no further calibration is required.

The result of a temperature measurement can be read out as a direct measurand (temperature T), a normalized value (temperature norm. T), and as the maximum value since the last reset.

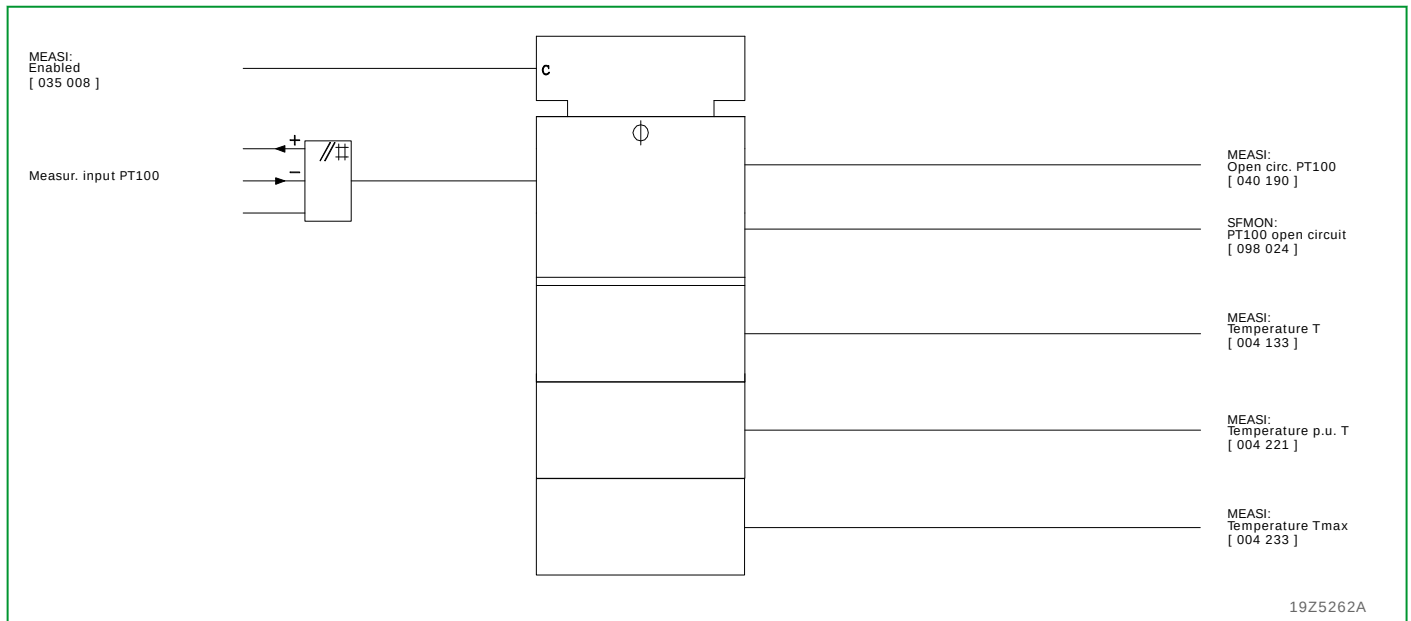


*Fig. 3-46: Temperature measurement using a PT 100 resistance thermometer connected to the analog (I/O) module.*

### 3.9.2.1 Open-Circuit Monitoring

If there is an open measuring circuit due to a broken wire, the signal MEASI: Open circ. PT100 is issued.

### 3.10 Configuration, Operating Mode, and Blocking of the Output Relays (Function Group OUTPUT)

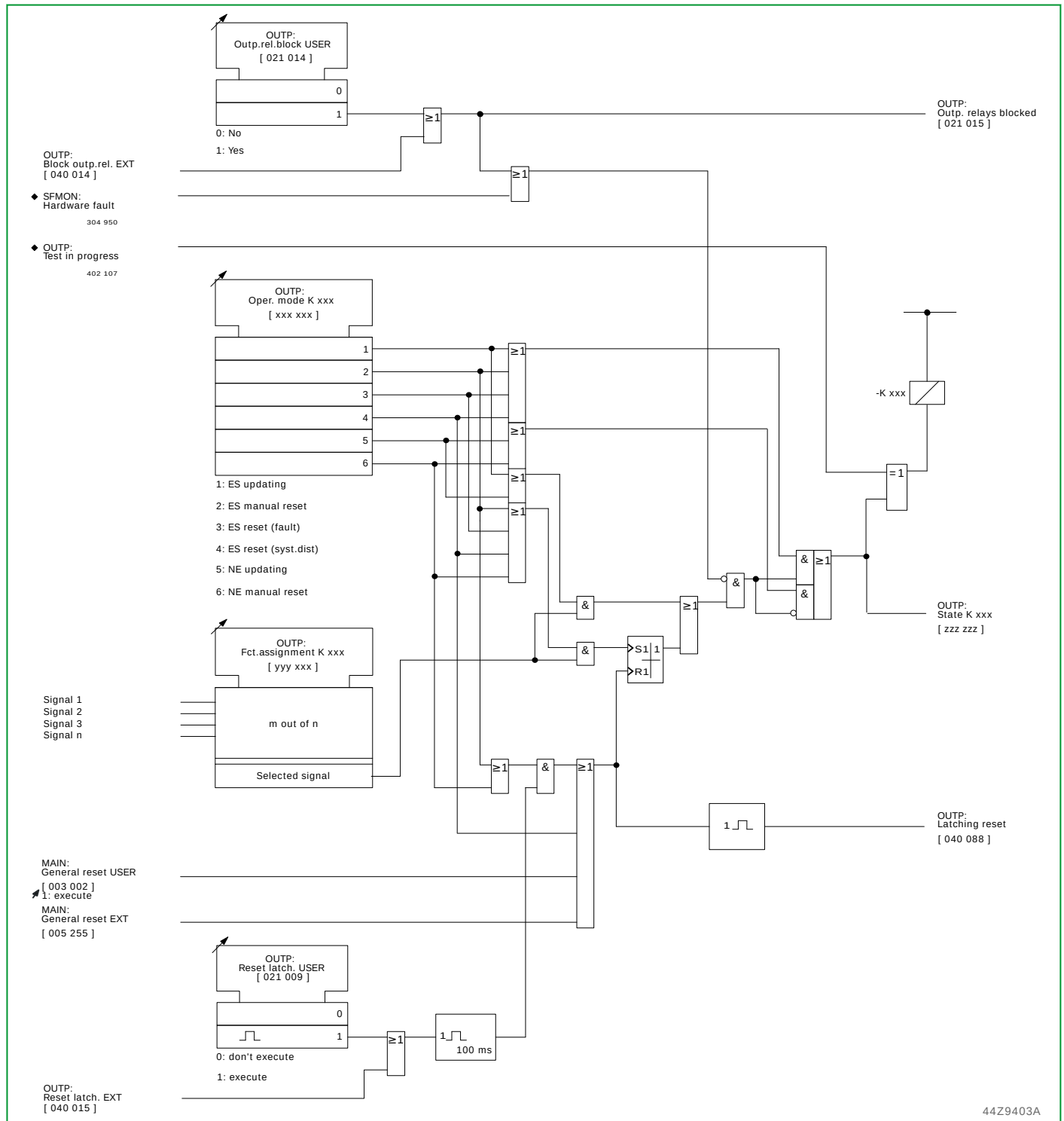


Fig. 3-47: Configuration, setting the operating mode, and blocking the output relays.

The C434 has output relays for the output of binary signals. The binary signal assignment is freely configurable by the user.

Configuration of the Output Relays

One binary signal can be assigned to each output relay. The same binary signal can be assigned to several output relays by configuration.

Operating Mode of the Output Relays

The user can set an operating mode for each output relay that determines whether the output relay operates in a normally open arrangement (NO) or normally closed arrangement (NC) and whether it operates in latching mode. Depending on the selected operating mode, latching can be disabled, either manually using a setting parameter or by an appropriately configured binary signal input at the start of a new fault, signaled by the onset of a general starting, or of a new system disturbance.

Blocking the Output Relays

The C434 offers the option of blocking all output relays via setting parameters or by way of an appropriately configured binary signal input. The output relays are likewise blocked if the C434 is disabled via appropriately configured binary inputs or if self-monitoring detects a hardware fault. Any output relay configured for MAIN: Blocked/faulty will not be included in the blocking signals.

Testing the Output Relays

For testing purposes, the user can select an output relay and trigger it via setting parameters. At the time when the test is triggered the C434 must be switched to “off-line”. Triggering persists for the duration of the set hold time.

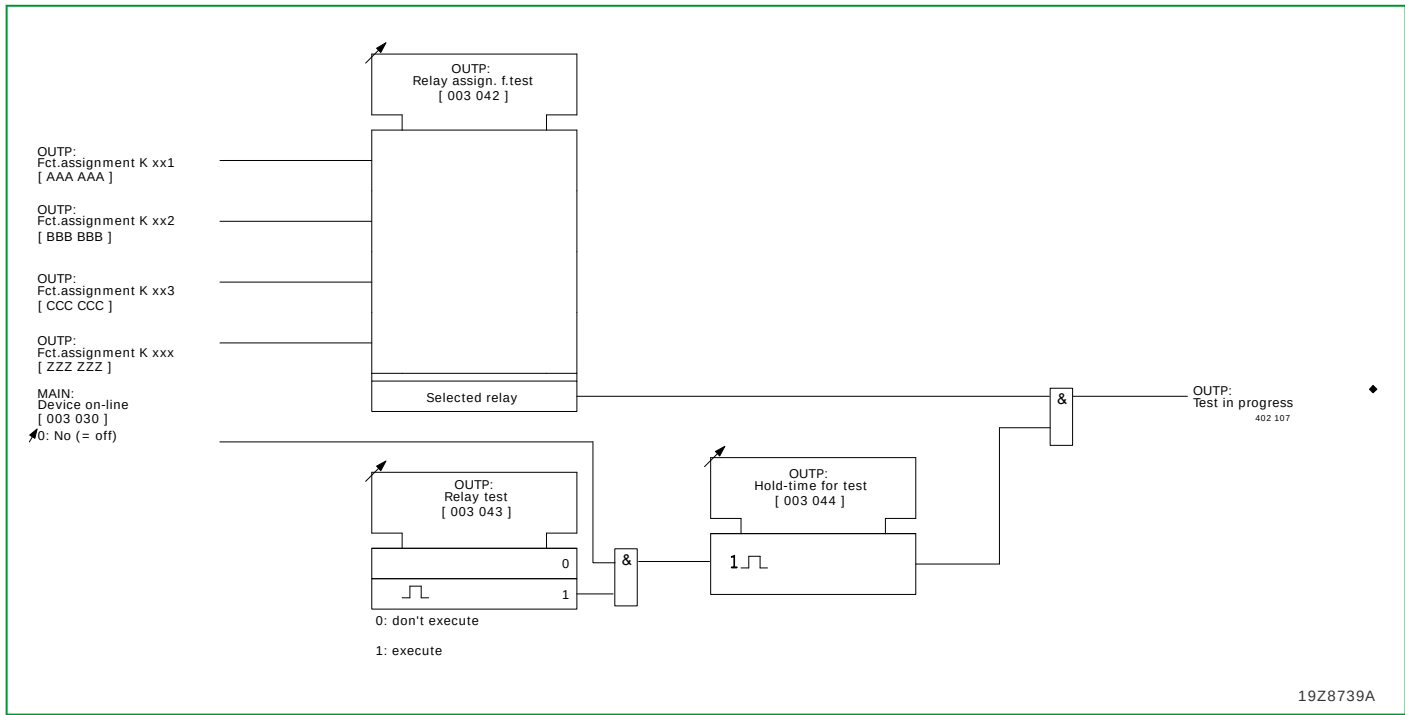


Fig. 3-48: Testing the output relays.

### 3.11 Measured Data Output (Function Group MEASO)

Measurands made available by the C434 can be provided in BCD (binary coded decimal) form through output relays or in analog form as direct current output. Output as direct current can only occur if the C434 is equipped with analog module Y. BCD output is always possible, whether the C434 is equipped with analog module Y or not.

#### 3.11.1 General Settings

##### 3.11.1.1 Disabling or Enabling the Measured Data Output Function

The Measured Data Output function can be disabled or enabled via setting parameters.

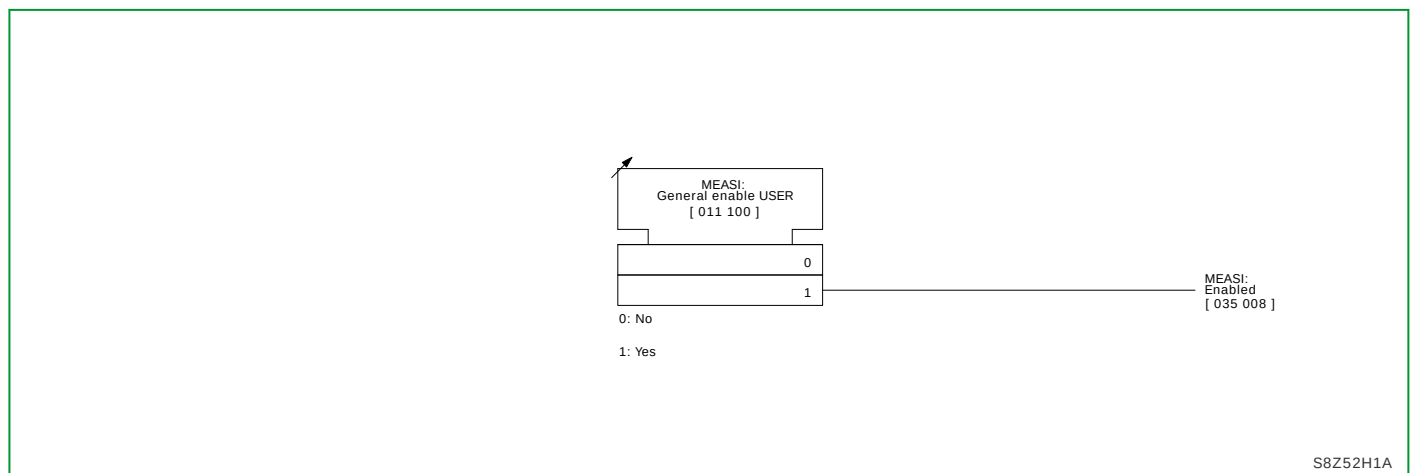


Fig. 3-49: Disabling or enabling the measured data output function.

##### 3.11.1.2 Enabling Measured Data Output

The measured data output can be enabled through a binary signal input, provided that the function MEASO: Outp. enabled EXT has been configured. If the function MEASO: Outp. enabled EXT has not been configured to a binary signal input, then the measured data output is always enabled.

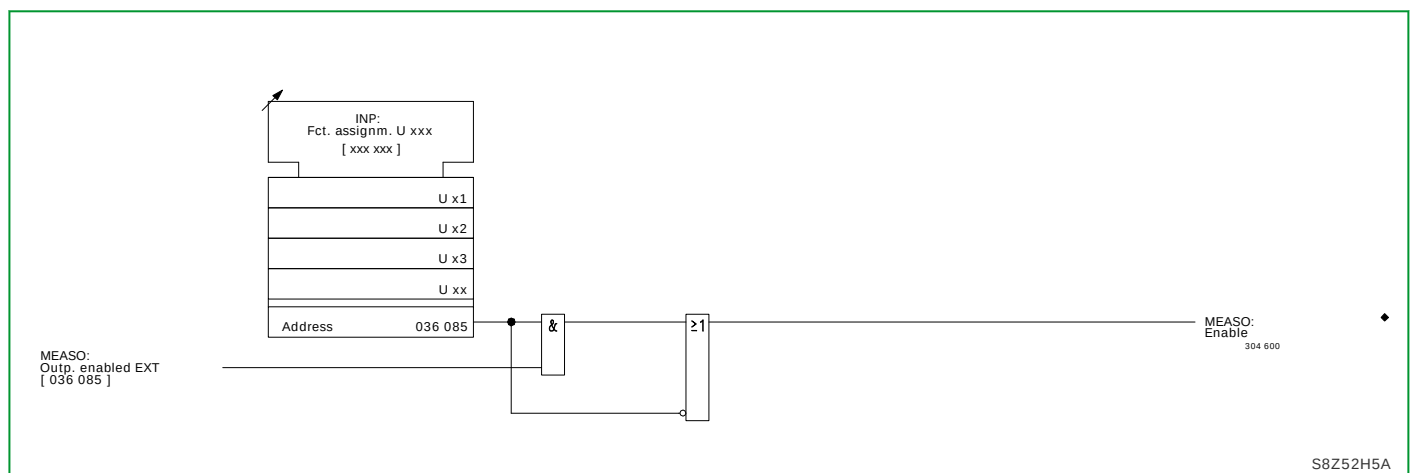


Fig. 3-50: Enabling measured data output.

## 3.11.1.3

## Resetting the Measured Data Output Function

BCD or analog output of measurands is terminated for the duration of the hold time if one of the following conditions is met:

- The measured data output function is reset from the integral local control panel or through an appropriately configured binary signal input.
- There is a general reset.
- LED indicators reset

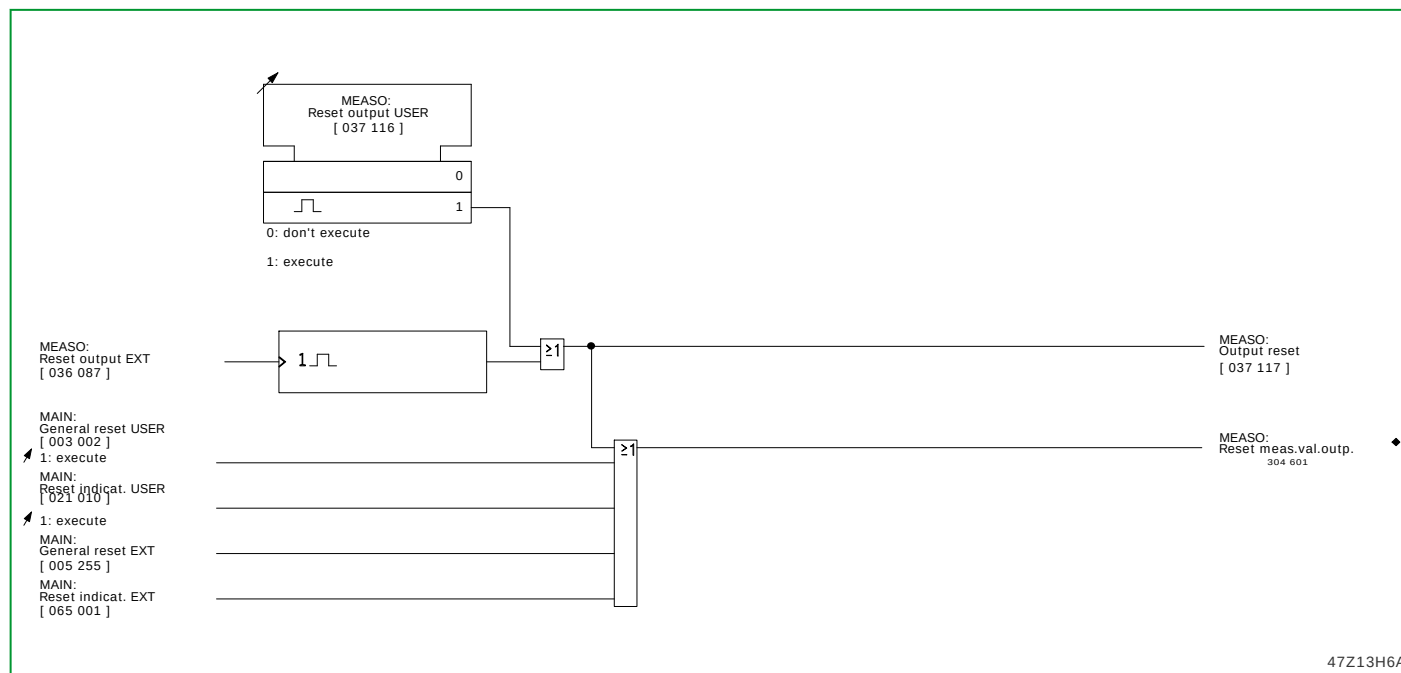


Fig. 3-51: Resetting the measured data output function.

## 3.11.1.4

## Scaling

Scaling is used to map the physical measuring range to the C434 inherent setting range.

Scaling of analog output is also suited for directional-signed output of some fault measurands, in particular fault location in percent.



### 3.11.2 BCD Measured Data Output

The user can select a measurand for output in BCD form by assigning output relays.

The selected measurand is available in BCD-coded form for the duration of the set hold time MEASO: Hold time output BCD. If the selected variable was not measured, then there is no output of a measurand value.

#### 3.11.2.1 Output of Measured Event Values

If the measured event value is updated during the hold time, the measurand output memory is cleared and the hold time is re-started. This leads to an immediate availability at the output of the updated value.

#### 3.11.2.2 Output of Measured Operating Values

The selected measured operating value is available for the duration of the set hold time. After the hold time has elapsed, the current value is saved and the hold time is re-started. If the hold time has been set to *blocked*, the measured operating value that has been output will be stored until the measured data output function is reset.

#### 3.11.2.3 Scaling of BCD Output

In order to define the resolution for measured data output the measurand range (Mx,min ... Mx,max) in scaled form (as Mx,scal,min ... Mx,scal,max) and the associated BCD display range (BCD,min ... BCD,max) have to be set.

- MEASO: Scaled min. val. BCD
- MEASO: Scaled max. val. BCD
- MEASO: BCD-Out min. value
- MEASO: BCD-Out max. value

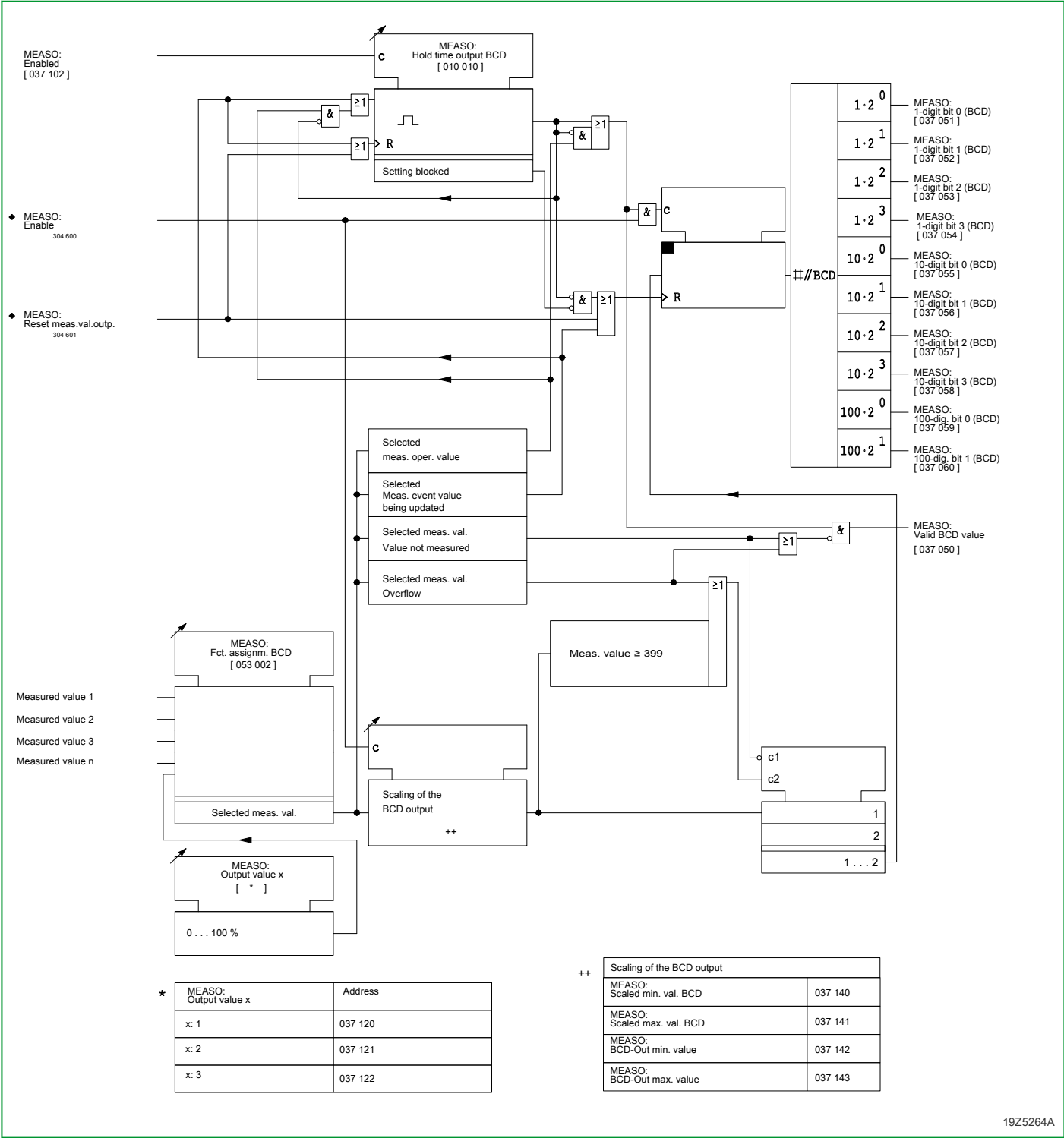
The BCD display range should be set so that the value 399 is never exceeded. If this should occur or if the measurand is outside the acceptable measuring range, then the value for "Overflow" (all relays triggered) is transmitted.

| Measurands                    | Range             |
|-------------------------------|-------------------|
| Measurands of the variable Mx | Mx,RL1 ... Mx,RL2 |
| Associated scaled measurands  | 0 ... 1           |

Scaling is made with reference to the complete range of values for the selected measurand (variable Mx). The complete range of values is defined by their end values Mx,RL1 and Mx,RL2. (Mx,RL1 and Mx,RL2 are listed in the operating program under "minimum" and "maximum".)

| Measurands to be output                         | Range                                                                                                                                                  |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurands to be output                         | Mx,min. ... Mx,max.                                                                                                                                    |
| Scaled measurands to be output                  | Mx,scal,min ... Mx,scal,max<br>with:<br>$Mx,scal,min = (Mx,min - Mx,RL1) / (Mx,RL2 - Mx,RL1)$<br>$Mx,scal,max = (Mx,max - Mx,RL1) / (Mx,RL2 - Mx,RL1)$ |
| Designation of the set values in the data model | "Scaled min. val. BCD" ... "Scaled max. val. BCD"                                                                                                      |

| Measurands                                         | BCD display values                                                    |
|----------------------------------------------------|-----------------------------------------------------------------------|
| Measurands in the range "Measurands to be output"  | <i>BCD-Out min. value ... BCD-Out max. value</i><br>(Valid BCD value) |
| Measurands:<br>Mx,RL1 = Mx = Mx,min                | <i>BCD-Out min. value</i> (BCD value not valid)                       |
| Measurands Mx:<br>Mx,max = Mx = Mx,RL2             | <i>BCD-Out max. value</i> (BCD value not valid)                       |
| Measurands Mx:<br>Mx < Mx,RL1<br>or<br>Mx > Mx,RL2 | <i>BCD-Out max. value</i> (Overflow)                                  |



19Z5264A

Fig. 3-52: BCD measured data output

### 3.11.3 Analog Measured Data Output

Analog output of measured data is two-channel.

The user can select two of the measurands available in the C434 for output in the form of load-independent direct current. Three interpolation points per channel can be defined for specific adjustments such as adjustment to the scaling of a measuring instrument. The direct current that is output is displayed as a measured operating value.

The selected measurand is output as direct current for the duration of the set hold time MEASO: Hold time output A-1. If the selected variable was not measured, then there is no output of a measurand value.

#### 3.11.3.1 Output of Measured Event Values

If the measured event value is updated during the hold time, the measurand output memory is cleared and the hold time is re-started. This leads to an immediate availability at the output of the updated value.

#### 3.11.3.2 Output of Measured Operating Values

The selected measured operating value is available for the duration of the set hold time. After the hold time has elapsed, the current value is saved and the hold time is re-started. If the hold time has been set to *blocked*, the measured operating value that has been output will be stored until the measured data output function is reset.

#### 3.11.3.3 Configuration of Output Relays Assigned to the Output Channels

The user must keep in mind that direct current output only occurs when the output relays assigned to the output channels are configured for MEASO: Value A-1 output, since the output channels would otherwise remain short-circuited (see the terminal connection diagrams, [Section 5.7, \(p. 5-27\)](#)).

#### 3.11.3.4 Scaling the Analog Display

In order to define the resolution for measured data output the measurand range in scaled form and the associated display range have to be set. One additional value for the knee point must also be defined. In this way the user can obtain an analog output characteristic similar to the characteristic shown in [Fig. 3-53, \(p. 3-84\)](#).

#### 3.11.3.5 Measurand Range to be Output

The measurand range to be output is (Mx,min ... Mx,knee ... Mx,max), with:

- Mx,min: minimum value to be output
- Mx,knee: Knee-point value for the measurand range to be output
- Mx,max: maximum value to be output

This measurand range to be output is defined by setting the following parameters:

- MEASO: Scaled min. val. A-1 or MEASO: Scaled min. val. A-2, resp.
- MEASO: Scaled knee val. A-1 or MEASO: Scaled knee val. A-2, resp.
- MEASO: Scaled max. val. A-1 or MEASO: Scaled max. val. A-2, resp.

Scaling is made with reference to the complete range of values for the selected measurand (variable Mx). The complete range of values is defined by their end

values  $M_{x,RL1}$  and  $M_{x,RL2}$ . ( $M_{x,RL1}$  and  $M_{x,RL2}$  are listed in the operating program – Easergy Studio – under “minimum” and “maximum”).

| Measurands                       | Range                       |
|----------------------------------|-----------------------------|
| Measurands of the variable $M_x$ | $M_{x,RL1} \dots M_{x,RL2}$ |
| Associated scaled measurands     | 0 ... 1                     |

| Measurands to be output                                 | Range                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurands with knee-point to be output                 | $M_{x,min} \dots M_{x,knee} \dots M_{x,max}$                                                                                                                                                                                                                                                   |
| Scaled measurands with a scaled knee-point to be output | $M_{x,scal,min} \dots M_{x,scal,knee} \dots M_{x,scal,max}$<br>with:<br>$M_{x,scal,min} = (M_{x,min} - M_{x,RL1}) / (M_{x,RL2} - M_{x,RL1})$<br>$M_{x,scal,knee} = (M_{x,knee} - M_{x,RL1}) / (M_{x,RL2} - M_{x,RL1})$<br>$M_{x,scal,max} = (M_{x,max} - M_{x,RL1}) / (M_{x,RL2} - M_{x,RL1})$ |
| Designation of the set values in the data model         | "Scal. min. value $A_x$ " ...<br>... "Scal. knee-point $A_x$ "<br>... "Scaled max. val. $A_x$ "                                                                                                                                                                                                |

### 3.11.3.6

#### Associated Display Range

The associated display range is defined by setting the following parameters:

- MEASO: AnOut min. val. A-1 or MEASO: AnOut min. val. A-2, resp.
- MEASO: AnOut knee point A-1 or MEASO: AnOut knee point A-2, resp.
- MEASO: AnOut max. val. A-1 or MEASO: AnOut max. val. A-2, resp.

| Measurands                                                         | Analog display values                                                                                  |
|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Measurands in the range "Measurands to be output"                  | "AnOut min. val. A-x" ...<br>... "AnOut knee point A-x" ...<br>... "AnOut max. val." (Value A-x valid) |
| Measurands:<br>$M_{x,RL1} = M_x = M_{x,min}$                       | "AnOut min. val." (Value A-x not valid)                                                                |
| Measurands $M_x$ :<br>$M_{x,max} = M_x = M_{x,RL2}$                | "AnOut max. val." (Value A-x not valid)                                                                |
| Measurands $M_x$ :<br>$M_x < M_{x,RL1}$<br>or<br>$M_x > M_{x,RL2}$ | "AnOut max. val." (Overflow)                                                                           |

3.11.3.7

Example for Scaling of Analog Display Ranges

Voltage A-B is selected as the measurand to be transmitted by channel A-1.  
The measuring range is from 0 to 1.5 V<sub>nom</sub> with V<sub>nom</sub> = 100 V.  
The range to be transmitted is from 0.02 to 1 V<sub>nom</sub> with the associated display range from 4 mA to 18 mA.  
The knee-point of the characteristic is 0.1 V<sub>nom</sub> with an associated display of 16 mA.

| Measurands                    | Range         |
|-------------------------------|---------------|
| Measurands of the variable Mx | 0 V ... 150 V |
| Associated scaled measurands  | 0 ... 1       |

| Measurands to be output                 | Range                                                                                                                                                                                                                                                                                         |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurands with knee-point to be output | 2 V ...10 V... 100 V                                                                                                                                                                                                                                                                          |
| Associated scaled measurands            | 0.013 ... 0.067 ... 0.67<br>with:<br>$Mx,scal,min = (2\text{ V} - 0\text{ V}) / (150\text{ V} - 0\text{ V}) = 0.013$<br>$Mx,scal,knee = (10\text{ V} - 0\text{ V}) / (150\text{ V} - 0\text{ V}) = 0.067$<br>$Mx,scal,max = (100\text{ V} - 0\text{ V}) / (150\text{ V} - 0\text{ V}) = 0.67$ |

| Measurands                                                                                                | Analog display values    |
|-----------------------------------------------------------------------------------------------------------|--------------------------|
| Measurands in the range "Measurands to be output"<br>0.02 ... 0.1 V <sub>nom</sub> ... 1 V <sub>nom</sub> | 4 mA ... 16 mA ... 18 mA |

In this example the following C434 settings are selected in the menu branch  
Parameter/Config. parameters:

| Address | Description                 | Current value                      |
|---------|-----------------------------|------------------------------------|
| 056 020 | MEASO: Function group MEASO | <i>With</i>                        |
| 031 074 | MEASO: General enable USER  | Yes                                |
| 053 000 | MEASO: Fct. assignm. A-1    | MAIN: Voltage A-B,1 p.u.           |
| 010 114 | MEASO: Hold time output A-1 | 1.00 s                             |
| 037 104 | MEASO: Scaled min. val. A-1 | 0.013 (corresponds with 0.02 Vnom) |
| 037 105 | MEASO: Scaled knee val. A-1 | 0.067 (corresponds with 0.10 Vnom) |
| 037 106 | MEASO: Scaled max. val. A-1 | 0.667 (corresponds with 1.00 Vnom) |
| 037 107 | MEASO: AnOut min. val. A-1  | 4 mA                               |
| 037 108 | MEASO: AnOut knee point A-1 | 16 mA                              |
| 037 109 | MEASO: AnOut max. val. A-1  | 18 mA                              |

By setting MEASO: AnOut min. val. A-1, the user can specify the output current that will be output when values are smaller than or equal to the set minimum measured value to be transmitted. The setting at MEASO: AnOut max. val. A-1 defines the output current that is output for the maximum measured value to be transmitted. By defining the knee-point, the user can obtain two characteristic curve sections with different slopes. When entering this setting the user must keep in mind that only a rising/rising or falling/falling curve sense is permitted (peaky or vee shapes not allowed). If the setting was not properly entered, the signal SFMON: Invalid scaling A-1 will be issued.

*A check of the set characteristic and its acceptance by the C434, if the setting was properly entered, will only occur after the C434 is switched on-line again (with the setting MAIN: Device on-line).*

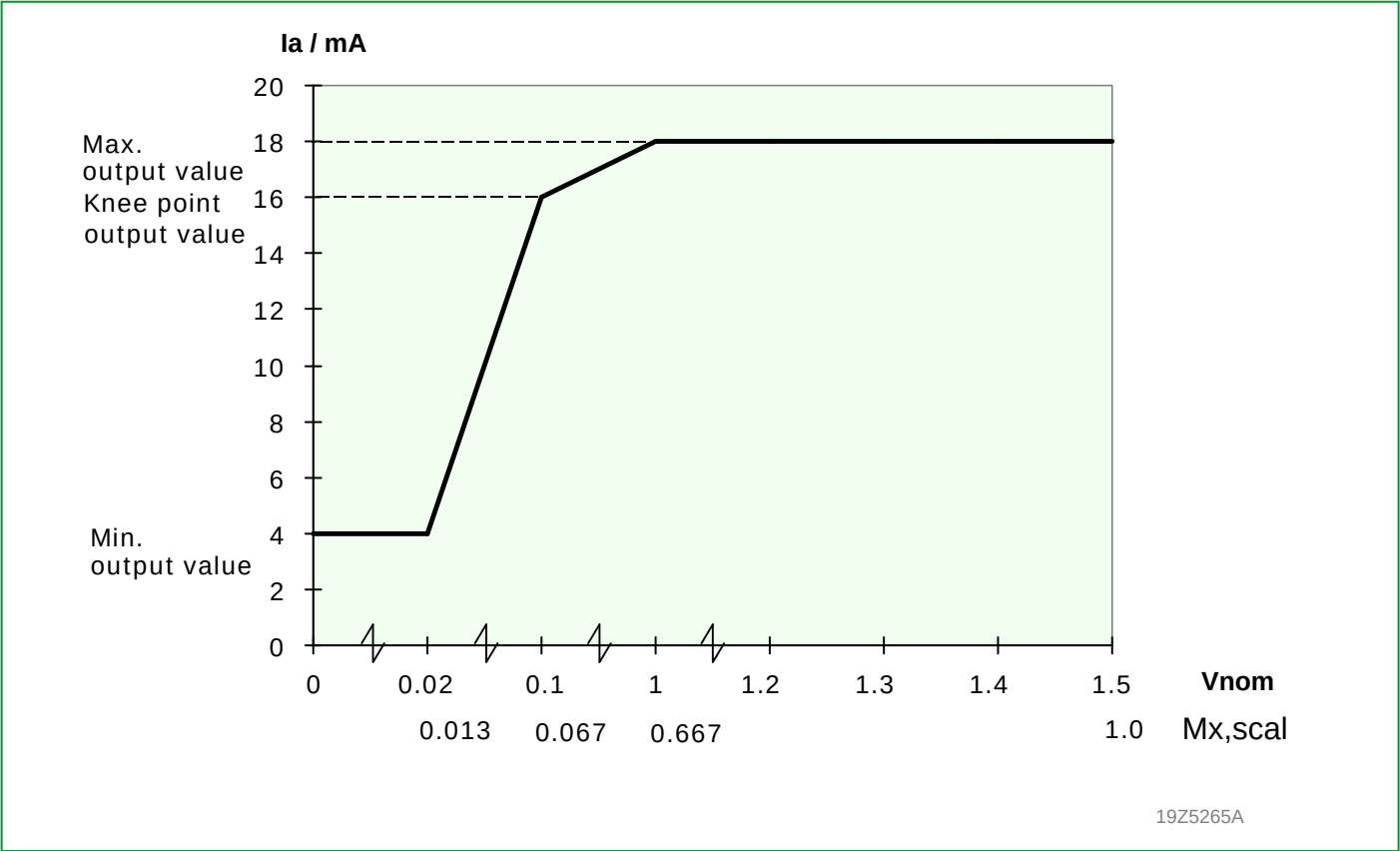


Fig. 3-53: Example of a characteristic curve for analog measured data output . In this example the range starting value is = 0; also possible is directional-signed output (see corresponding example in section BCD Measured Data Output).



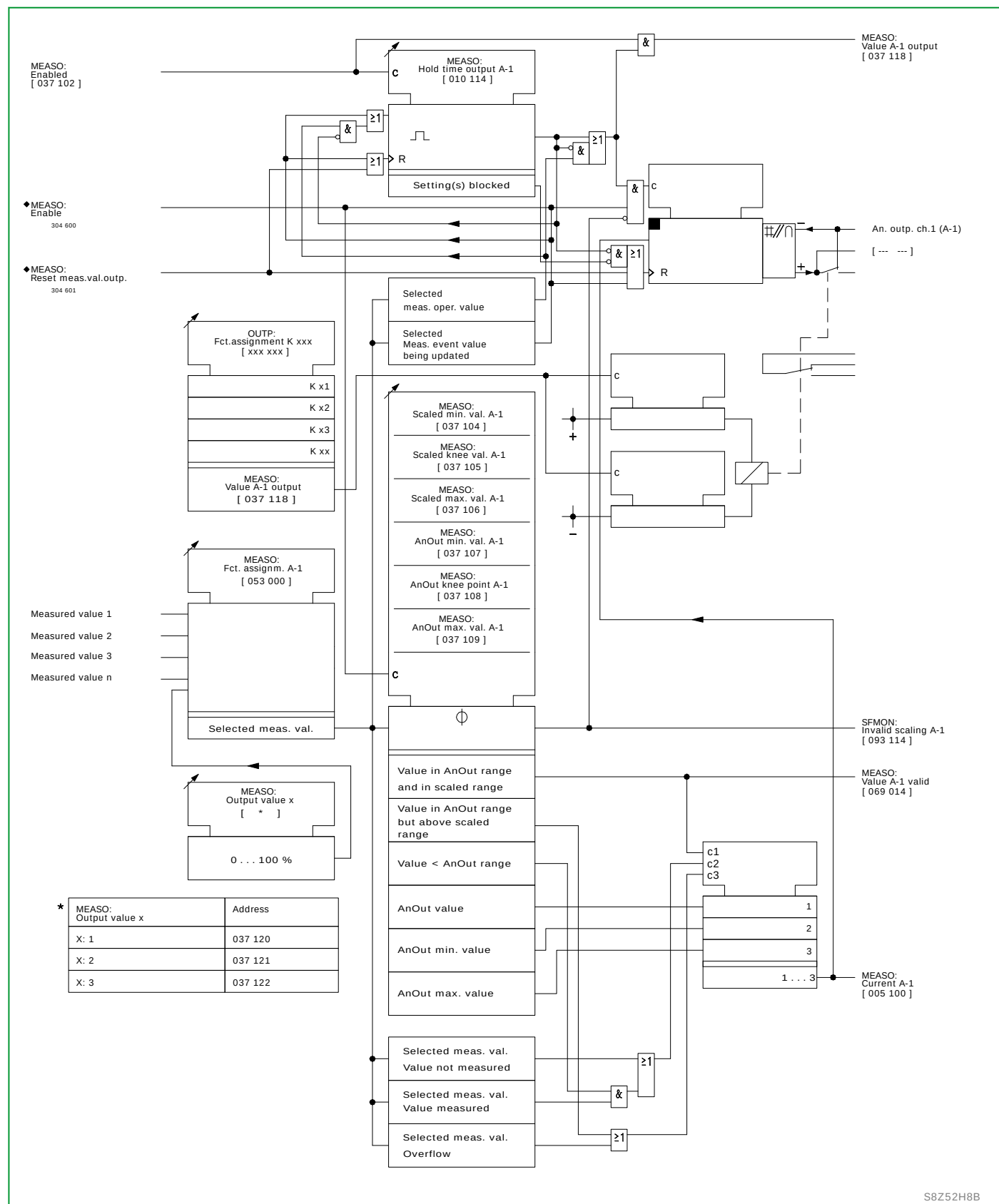


*Fig. 3-54: Analog measured data output.*

#### 3.11.4 Output of “External” Measured Data

Measured data from external devices, which must be scaled to 0 ... 100%, can be written to the following parameters of the C434 via the communications interface.

- MEASO: Output value 1
- MEASO: Output value 2
- MEASO: Output value 3

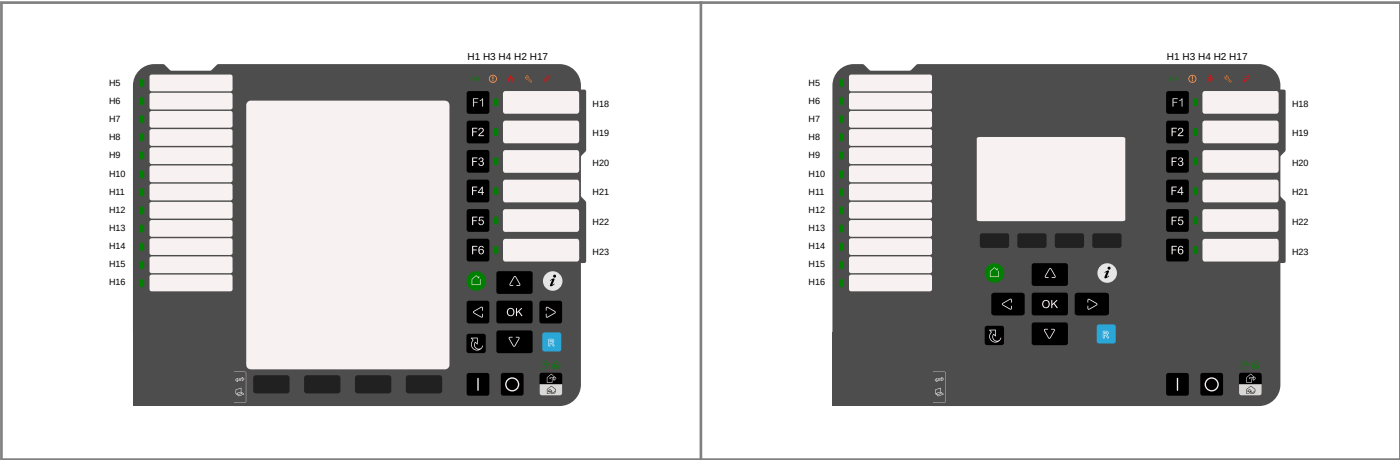
These “external” measured values are output by the C434 either in BCD data form or as load-independent direct current, provided that the BCD measured data output function or the channels of the analog measured data output function are configured accordingly.

3.12 Configuration and Operating Mode of the LED Indicators (Function Group LED)

The C434 has 25 LED indicators for the indication of binary signals. Five of the LED indicators are permanently assigned to fixed system functions and two for local/remote status. The other LED indicators are freely configurable. These freely configurable LEDs will emit either red or green or amber light (amber is made up of red and green light and may not be configured independently).

3.12.1 Layout of the LED indicators

The following figures illustrate the layout of LED indicators situated on the local control panel.



Tab. 3-10: Layout of the LED indicators on enhanced local control panel.

3.12.2 Configuring the LED Indicators

One binary signal can be assigned to each of the red and green LED color indications. The same binary signal can be assigned to several LED indicators (or colors), if required.

| LED indicator               | Description         | Configuration                                                                                                                                                                                                    |
|-----------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| H 1 (green)                 | HEALTHY             | Not configurable. H 1 indicates the operational readiness of the C434 (supply voltage is present).                                                                                                               |
| H 3 (amber)                 | ALARM               | Permanently configured with function SFMON: Warning (LED).                                                                                                                                                       |
| H 2 (amber)                 | OUT OF SERVICE      | Permanently configured with function MAIN: Blocked/faulty.                                                                                                                                                       |
| H 17 (red)                  | EDIT MODE           | Not configurable. H 17 indicates the input (edit) mode. Only when the C434 is in this mode, can parameter settings be changed by pressing the “Up” and “Down” keys. (See <a href="#">Section 6.2, (p. 6-2)</a> ) |
| H 4 to H 16<br>H 18 to H 23 | —                   | For each of these LED indicators both colors (red & green) may be configured freely and independently.                                                                                                           |
| Local and Remote LEDs       | Local/Remote status | Not configurable. These two LED indicators are for states of Remote (left LED with amber color), Local (right LED with red color) and Local&Remote (both LEDs).                                                  |

### 3.12.3

#### Operating Mode of the LED Indicators

For each of the freely configurable LED indicators, the operating mode can be selected separately. This setting will determine whether the LED indicator will operate either in energize-on-signal (ES) or normally-energized (NE) mode, whether it will be flashing and whether it will be in latching mode.

Latching is disabled, depending on the selected operating mode:

- either manually via setting parameters or by an appropriately configured binary signal input (see [Section 3.13.10, \(p. 3-114\)](#))
- or at the onset of a new fault, signaled by the onset of a general starting or of a new system disturbance.

Therefore there are eight operating modes available, which are built from combinations of the following components:

|                                |                         | updating              | latching with manual reset |
|--------------------------------|-------------------------|-----------------------|----------------------------|
| continuous (i.e. not flashing) | energize-on-signal (ES) | <i>ES updating</i>    | <i>ES manual reset</i>     |
|                                | normally-energized (NE) | <i>NE updating</i>    | <i>NE manual reset</i>     |
| flashing                       | energize-on-signal (ES) | <i>ES updating bl</i> | <i>ES manual reset bl</i>  |
|                                | normally-energized (NE) | <i>NE updating bl</i> | <i>NE manual reset bl</i>  |

In addition to these there are the following 4 operating modes:

|                                | energize-on-signal (ES) with reset after new fault | energize-on-signal (ES) with reset after new system disturbance |
|--------------------------------|----------------------------------------------------|-----------------------------------------------------------------|
| continuous (i.e. not flashing) | <i>ES reset (fault)</i>                            | <i>ES reset (syst.dist)</i>                                     |
| flashing                       | <i>ES reset (fault) bl</i>                         | <i>ES rst (syst.dst) bl</i>                                     |

Finally, as the 13<sup>th</sup> operating mode, every LED (except the permanently configured ones) can be set to the mode *ES Alarmunit*. This mode has the following flashing behavior:

- The LED starts flashing with the first starting of the signal that has been assigned to it.  
The LED assumes the color that has been assigned via setting parameter. If both colors (red and green) have been configured to different signals, and these two signals both become active then the LED flashes in amber color.
- If an LED reset is executed and the configured signal is still active the LED changes to continuous light.  
Important: If the LED was flashing in amber color then this color is kept, even if one of the two signals is no longer active.
- If all the configured signals are no longer active at the time of the LED reset, or become inactive at a later time, the LED goes out.
- If later, after the LED has gone out, any of the configured signals becomes active again then the LED starts flashing again (in the assigned color).  
If both colors have been configured and the LED shines continuously in amber color, then it is possible that one of these two signals becomes inactive and active again whilst the other signal stays active all the time. In this case the LED starts flashing again with the starting of that signal. But since the LED permanently keeps the amber color it is no longer possible to tell the two signals from each other. Therefore general caution is recommended whenever two different signals are configured to an LED with this operating mode.

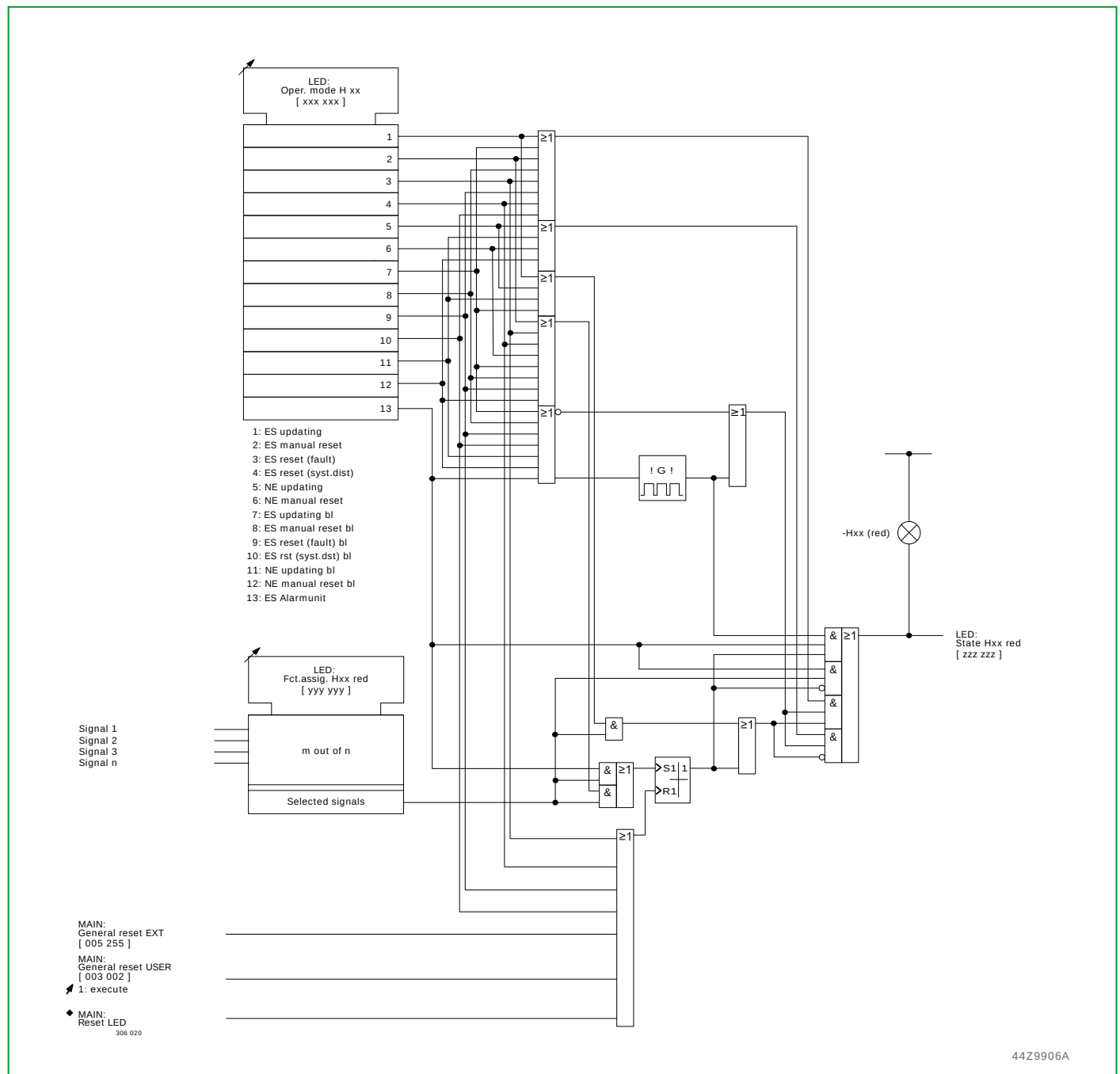


*Fig. 3-55: Configuration and Operating Mode of the LED Indicators, showing the example of the “red” LED color.*

### 3.13 Main Functions of the C434 (Function Group MAIN)

#### 3.13.1 Conditioning of the Measured Variables

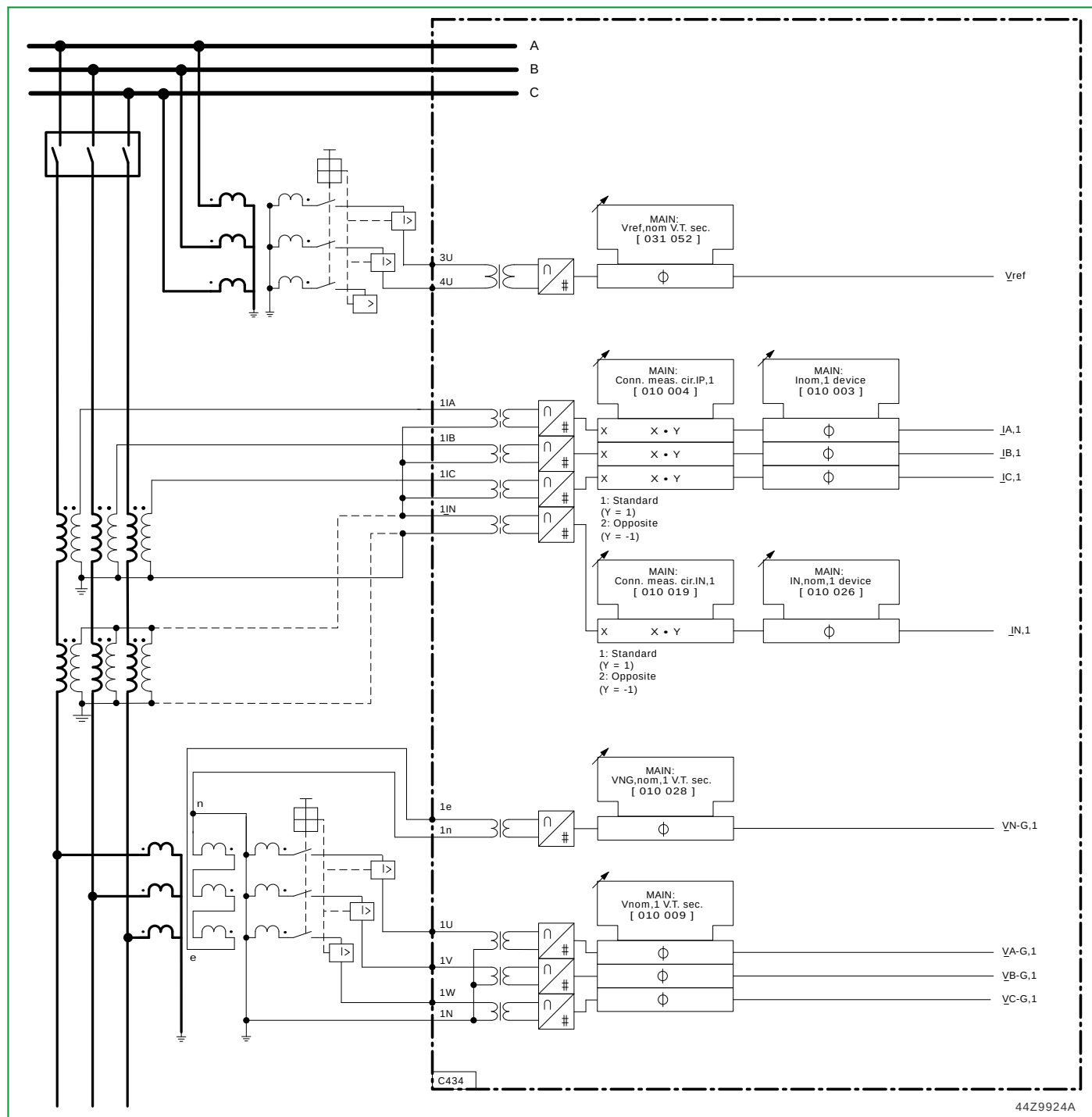


Fig. 3-56: Connecting the C434 measuring circuits,  $V_{ref}$  is only available if a module 4J/5V is used (when the C434 is equipped with the RTD module; see references in previous text).

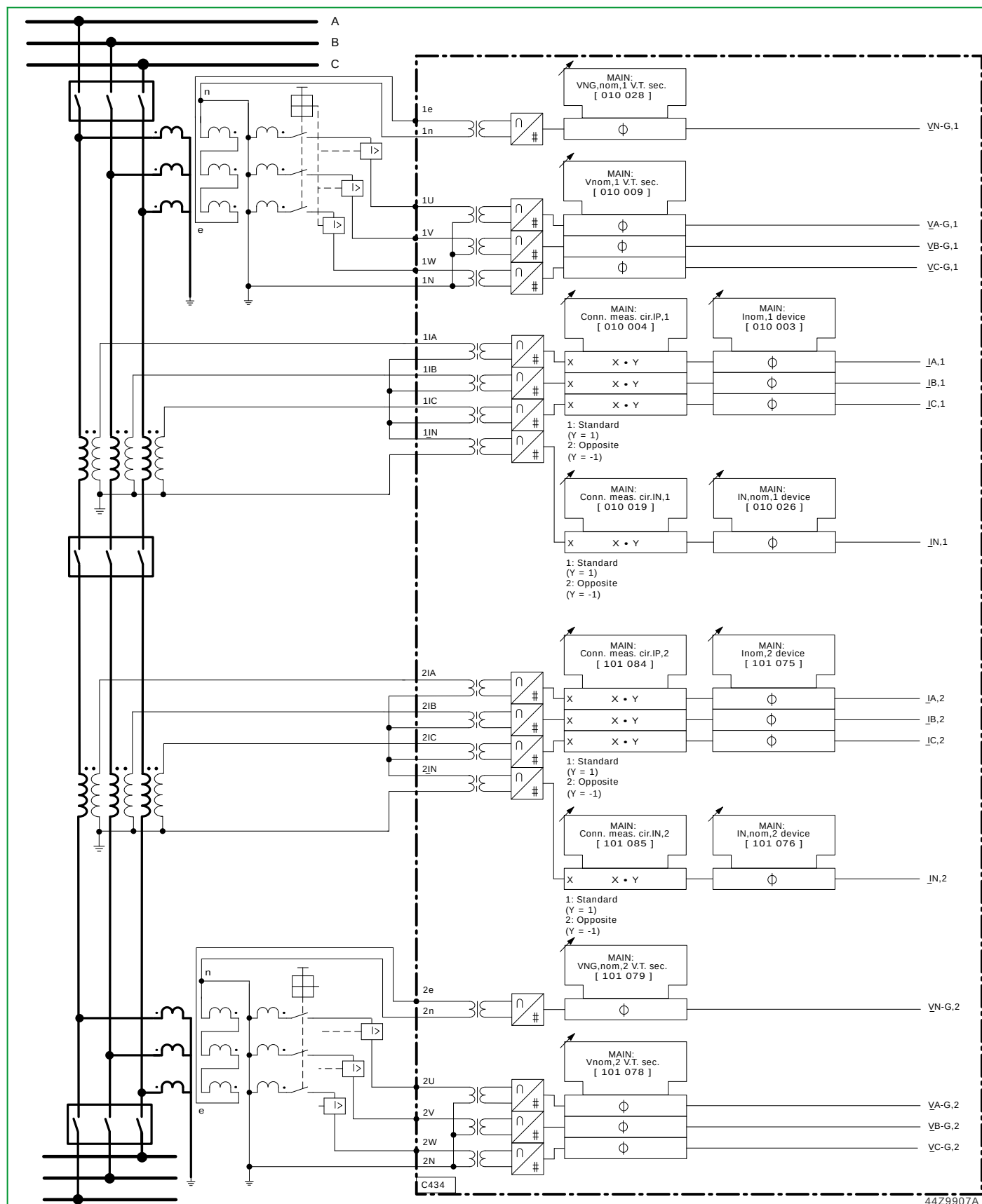


Fig. 3-57: Connecting the C434 measuring circuits with two transformer modules.

The secondary phase currents and phase voltages of the system transformers are fed to the C434 and – electrically isolated – are converted to normalized electronics-compatible levels. The analog quantities are digitized and are thus



available for further processing. Digital Fourier filters are used to suppress aperiodic signal components.

Different combinations of fitted measuring transformers for the acquisition of current and voltage values are available depending on the selected model and the options specified for slots 03–04 and 05–06 in ordering. (Location diagrams: [Section 5.7, \(p. 5-27\)](#), ordering options: [Chapter 5, \(p. 5-1\)](#).)

The C434 recognizes the fitted transformer combination during startup. Depending on this combination, measured value assignments can be performed. Only those setting parameters and measured values will be displayed that can be monitored or determined depending on the fitted transformers and the measured value assignments.

Settings that do not refer to nominal quantities are converted by the C434 to nominal quantities. The user must therefore set the secondary nominal currents and voltages of the system transformers.

The connection direction of the measuring circuits on the C434 must also be set. The connection diagrams above ([Fig. 3-56, \(p. 3-91\)](#) and [Fig. 3-56, \(p. 3-91\)](#)) show the standard connection illustrated for a transformer module on slot 03–04 or two modules on 03–04 and 05–06. By this setting the phase of the digitized currents is rotated by 180°.

### 3.13.2 Operating Data Measurement

The C434 has an operating data measurement function for the display of currents and voltages measured as well as quantities derived from these measured values. For the display of measured values, set lower thresholds need to be exceeded, to avoid fluctuating small values from noise. If these lower thresholds are not exceeded, the value *Not measured* is displayed.

C434 can display currents and voltages of two three phase systems if two transformer modules are available for slots 03-04 and 05-06. The following measured variables are displayed:

- Phase currents for all three phases
- Delayed and stored phase currents for all three phases – demand values for the three phases
- Minimum and maximum phase current
- Delayed and stored maximum phase current – maximum demand values
- Residual current measured by the C434 at the T 14 (T 24) transformer, and calculated resultant current
- Calculated unfiltered resultant current
- Phase-to-ground voltages
- Sum of the three phase-to-ground voltages and neutral-point displacement voltage measured by the C434 at the T 91 (T 92) transformer
- Reference voltage measured by the C434 at the T 19 transformer
- Phase-to-phase voltages
- Minimum and maximum phase-to-phase voltage and minimum and maximum phase-to-ground voltage
- Positive-sequence current and negative-sequence current (in units of  $I_{nom}$ ), taking into account the set phase sequence
- Positive-sequence voltage and negative-sequence voltage (in units of  $V_{nom}$ )
- Active, reactive and apparent power
- Active power factor
- Active and reactive energy output and input
- Load angle  $\varphi$  in all three phases
- Angle between measured residual current and measured neutral-point displacement voltage
- Phase relation between measured neutral current and calculated residual current (binary indication of equal or reverse phase)
- System frequency

The measured data are updated at approx. 0.3 s intervals. Updating is interrupted if the self-monitoring function detects a hardware fault.

### 3.13.2.1 Measured Current Values

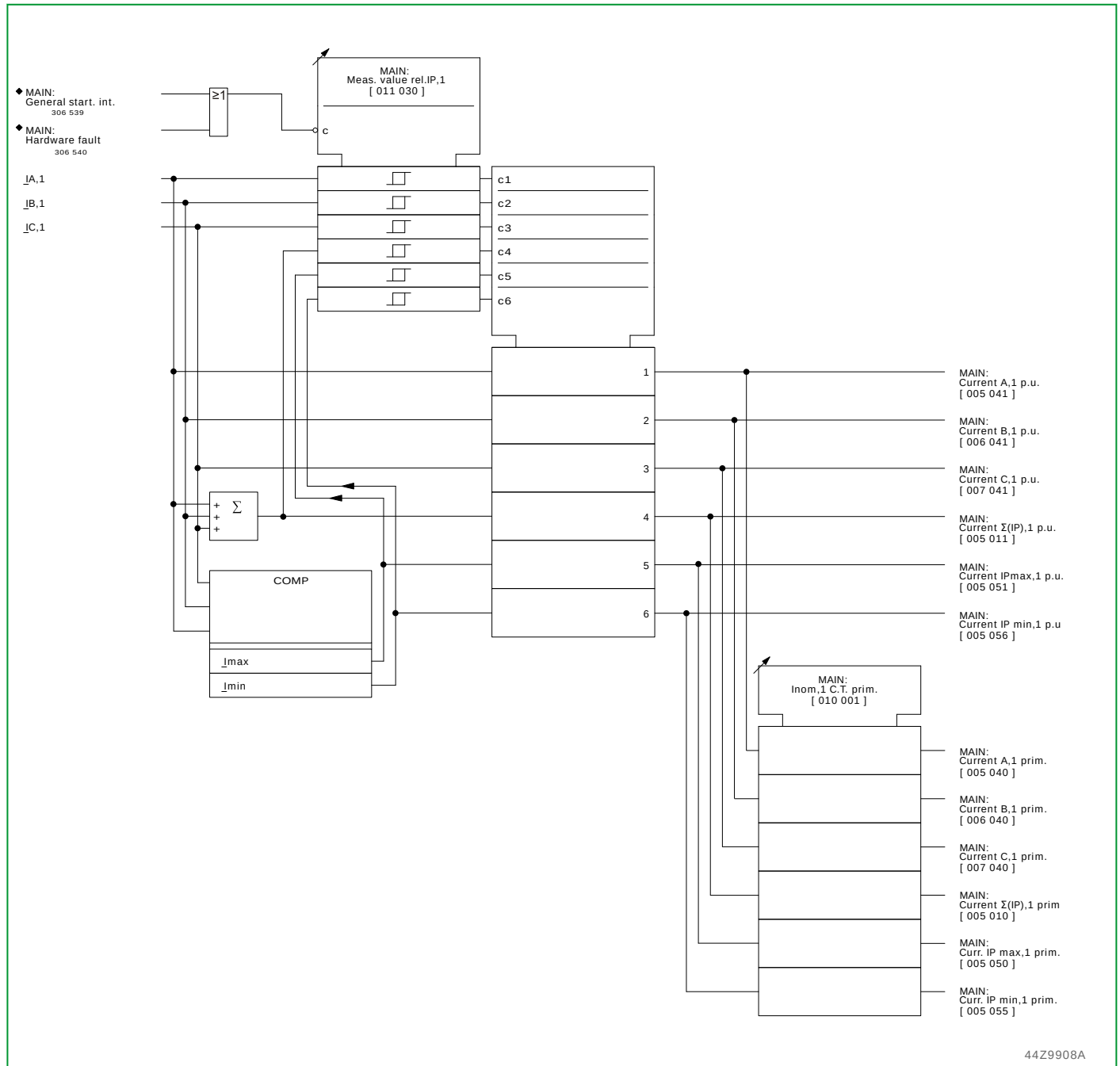


*Fig. 3-58: Measured operating data – phase current, part 1, shown here for three phase system 1 as an example.*

The measured current values are displayed both as per-unit quantities referred to the nominal quantities of the C434 and as primary quantities. To allow display in primary values, the primary nominal current of the system current transformer should be set in the C434.

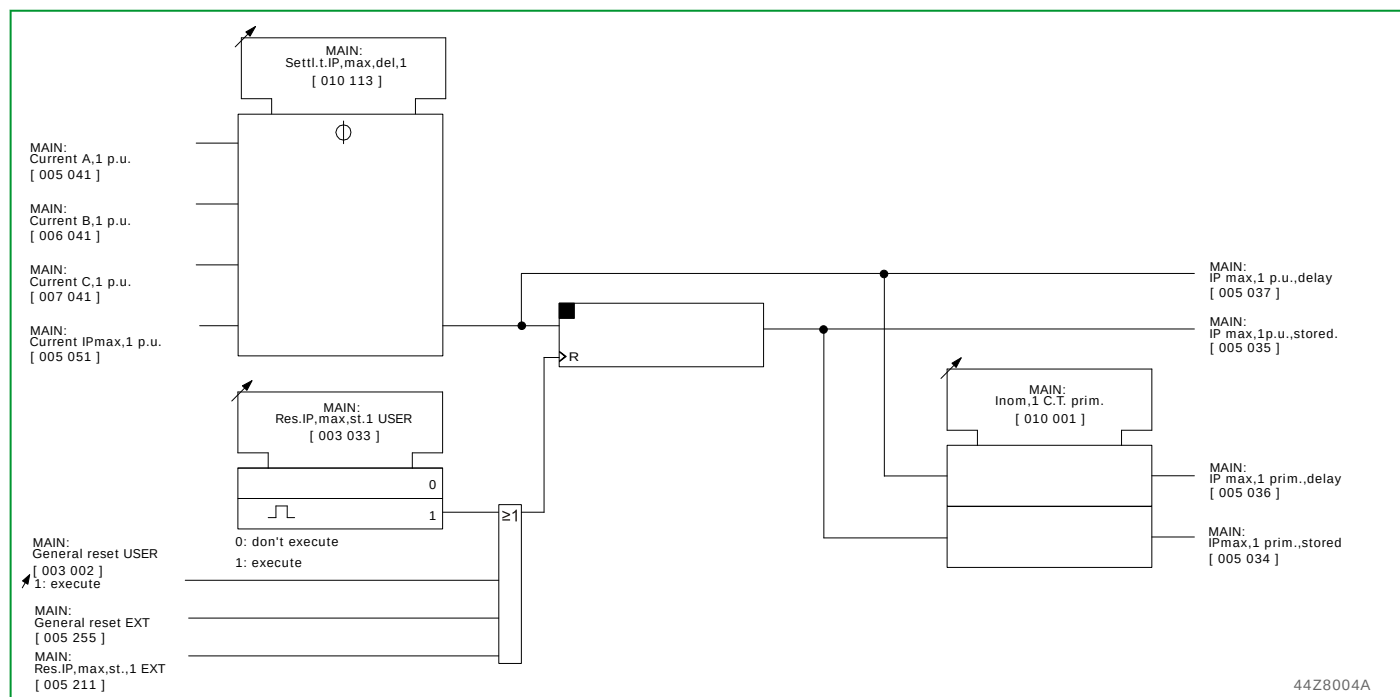


Fig. 3-59: Measured operating data – phase current, part 2: demand values, shown here for three phase system 1 as an example.

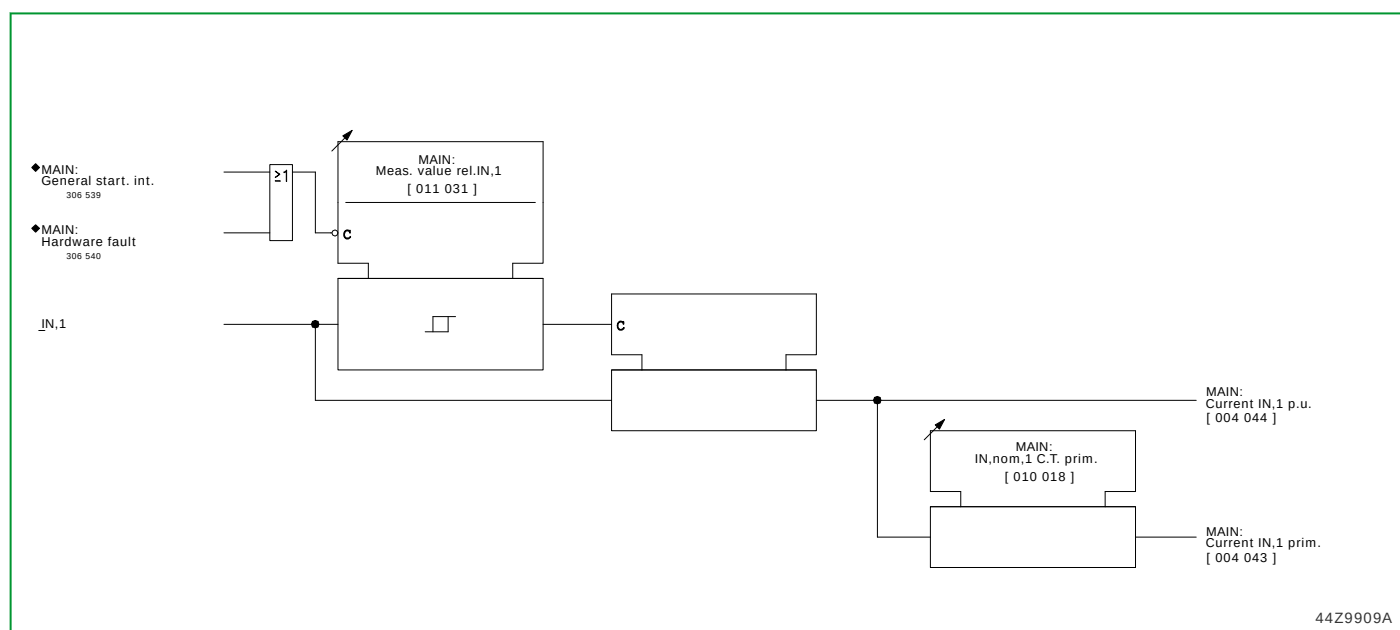


Fig. 3-60: Measured operating data – residual current, shown here for three phase system 1 as an example.

## 3.13.2.1.1 Delayed and Stored Current Values

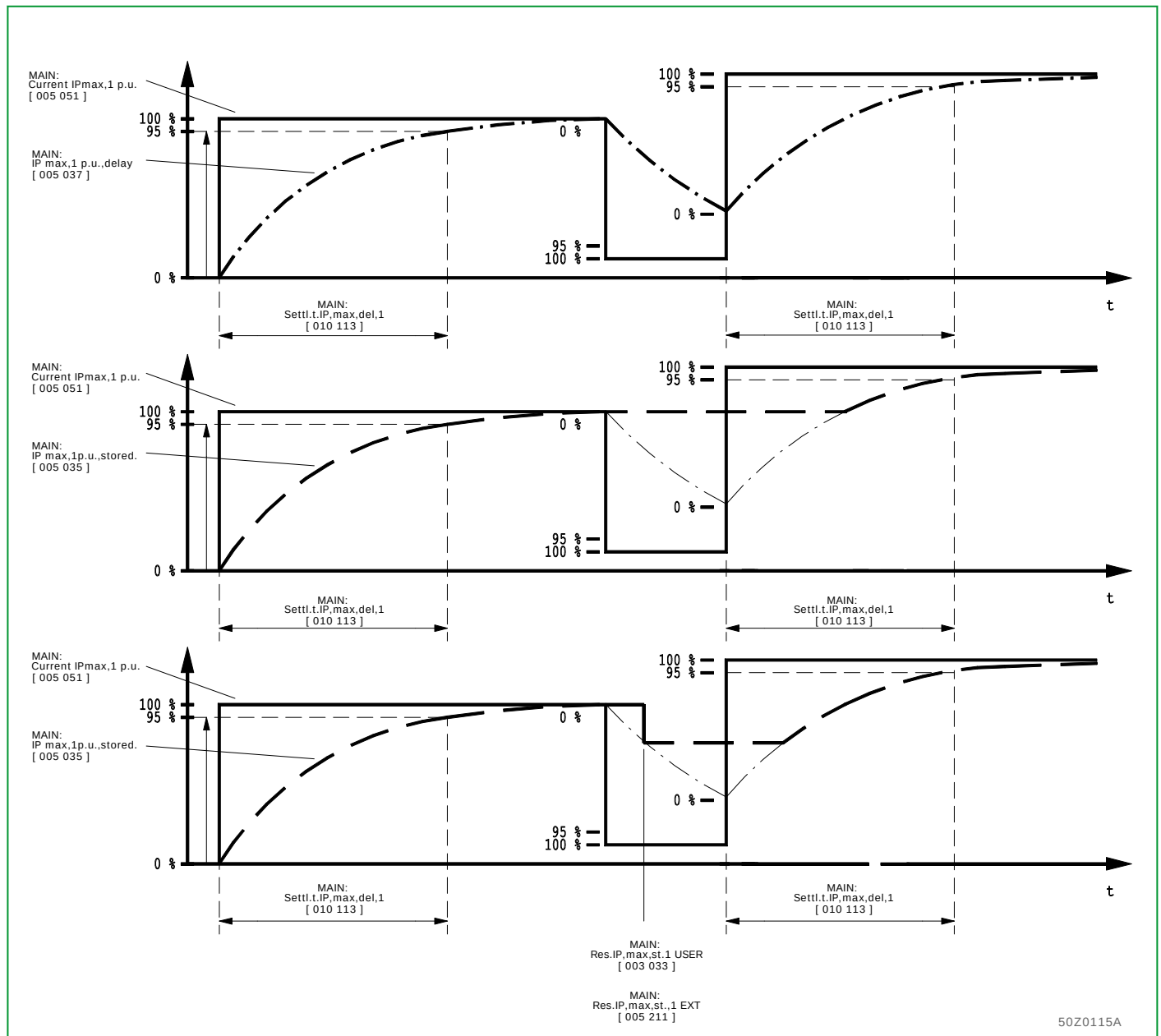


Fig. 3-61: Operation of delayed and stored maximum phase current display.

## 3.13.2.1.1.1 Display of Demand Values – Delayed Maximum Phase Current

The C434 offers the option of a delayed display of the maximum value of the three phase currents (thermal ammeter function). The delayed maximum phase current display is an exponential function of the maximum phase current (see upper curve in Fig. 3-61, (p. 3-97)). The time after which the delayed maximum phase current display will have reached 95 % of the maximum phase current is set at MAIN: Settl.t.IP,max,del,1.

## 3.13.2.1.1.2 Display of Demand Values – Stored Maximum Phase Current

The stored maximum phase current follows the delayed maximum phase current. If the value of the delayed maximum phase current is declining, then the highest value of the delayed maximum phase current remains stored. The display remains constant until the actual delayed maximum phase current exceeds the value of the stored maximum phase current (see middle curve in Fig. 3-61, (p. 3-

97)). The stored maximum phase current to the actual value of the delayed maximum phase current is set at MAIN: Res.IP,max,st.1 USER (see lower curve in Fig. 3-61, (p. 3-97)).

3.13.2.2 Measured Voltage Values

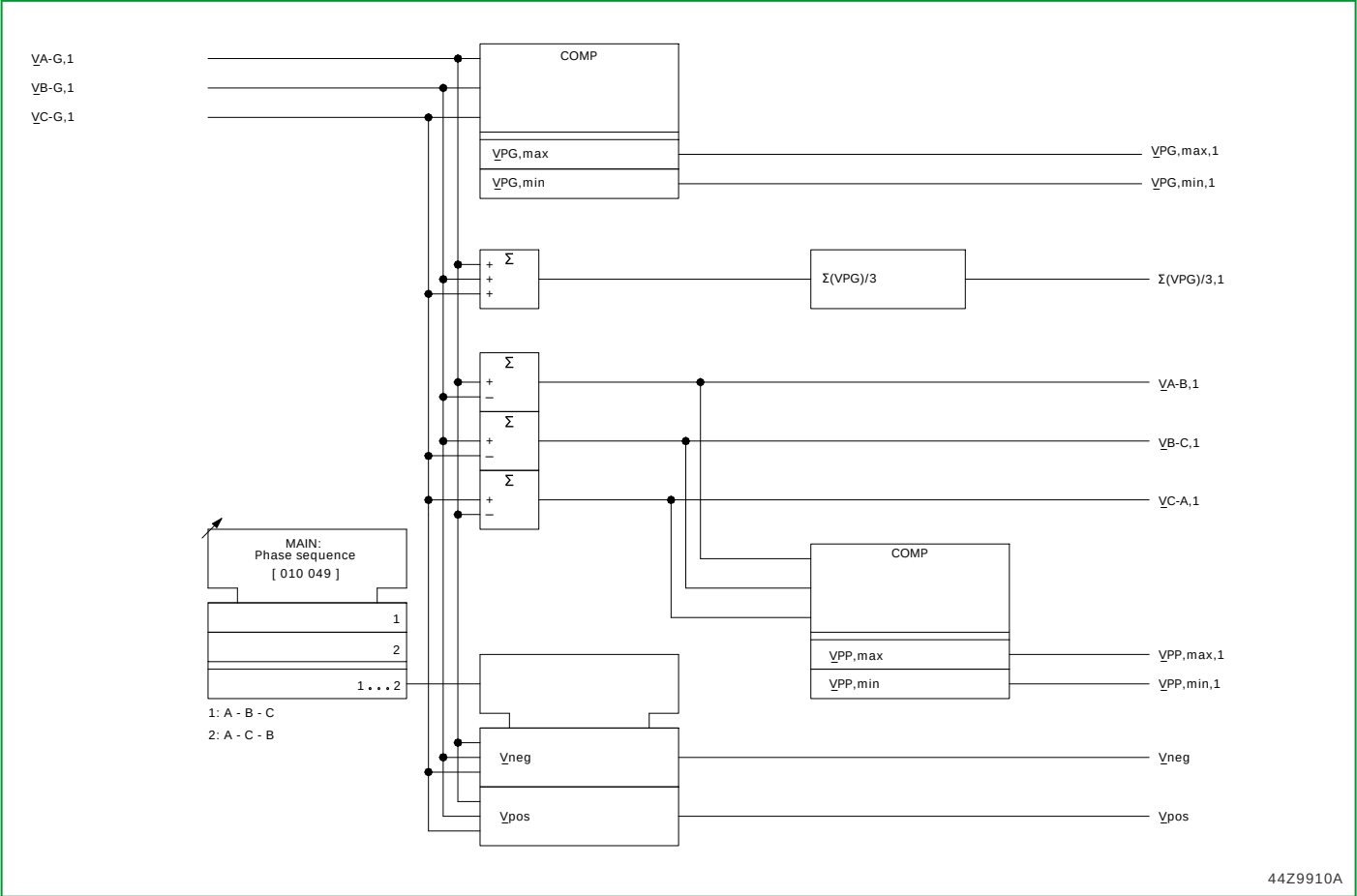


Fig. 3-62: Determining the minimum and maximum phase-to-ground and phase-to-phase voltages, shown here for three phase system 1 as an example.

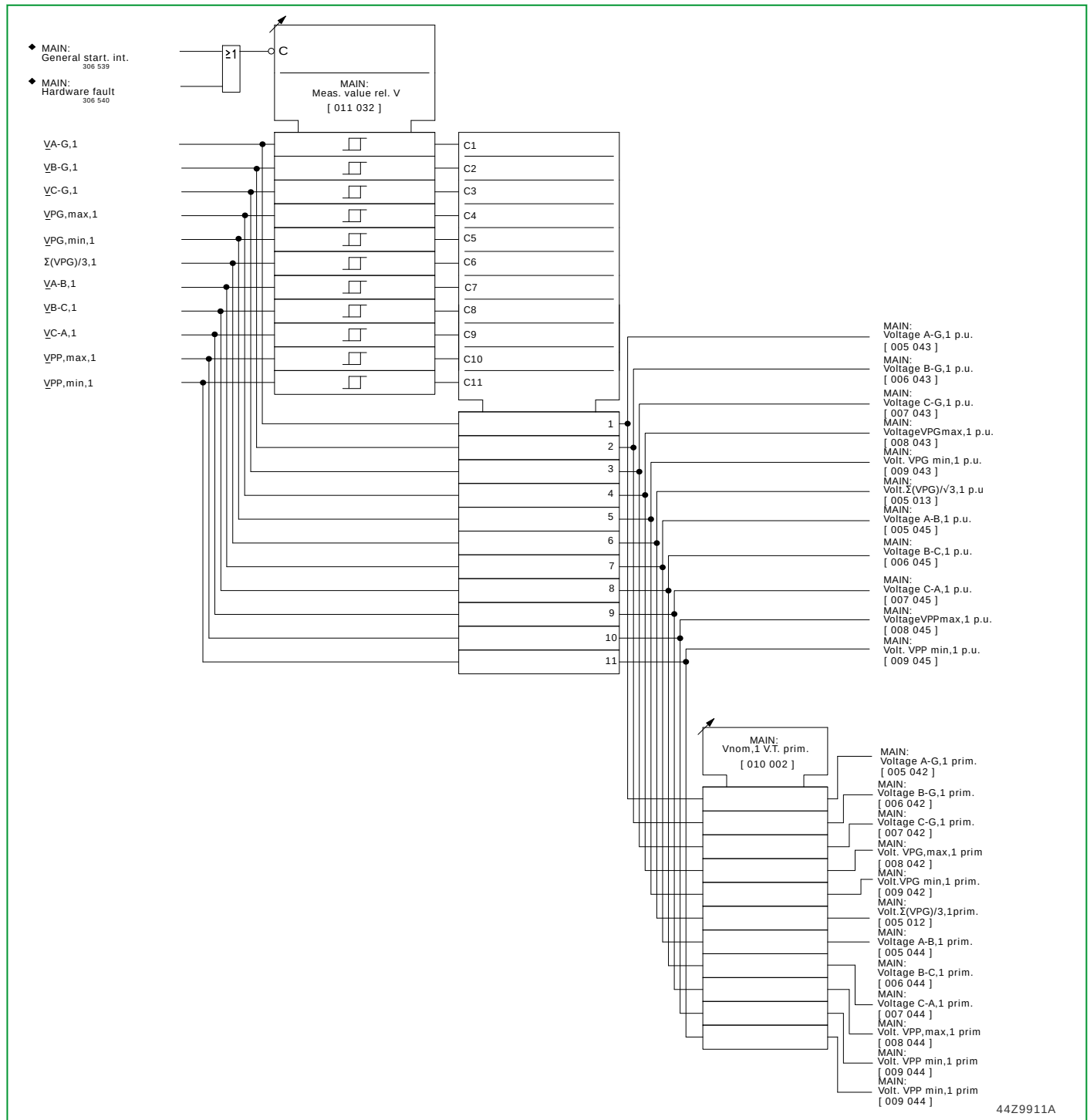


Fig. 3-63: Measured operating data – phase-to-ground and phase-to-phase voltages, shown here for three phase system 1 as an example.

The measured voltage values are displayed both as per-unit quantities referred to the nominal quantities of the C434 and as primary quantities. To allow a display in primary values, the primary nominal voltage of the system transformer needs to be set in the C434.

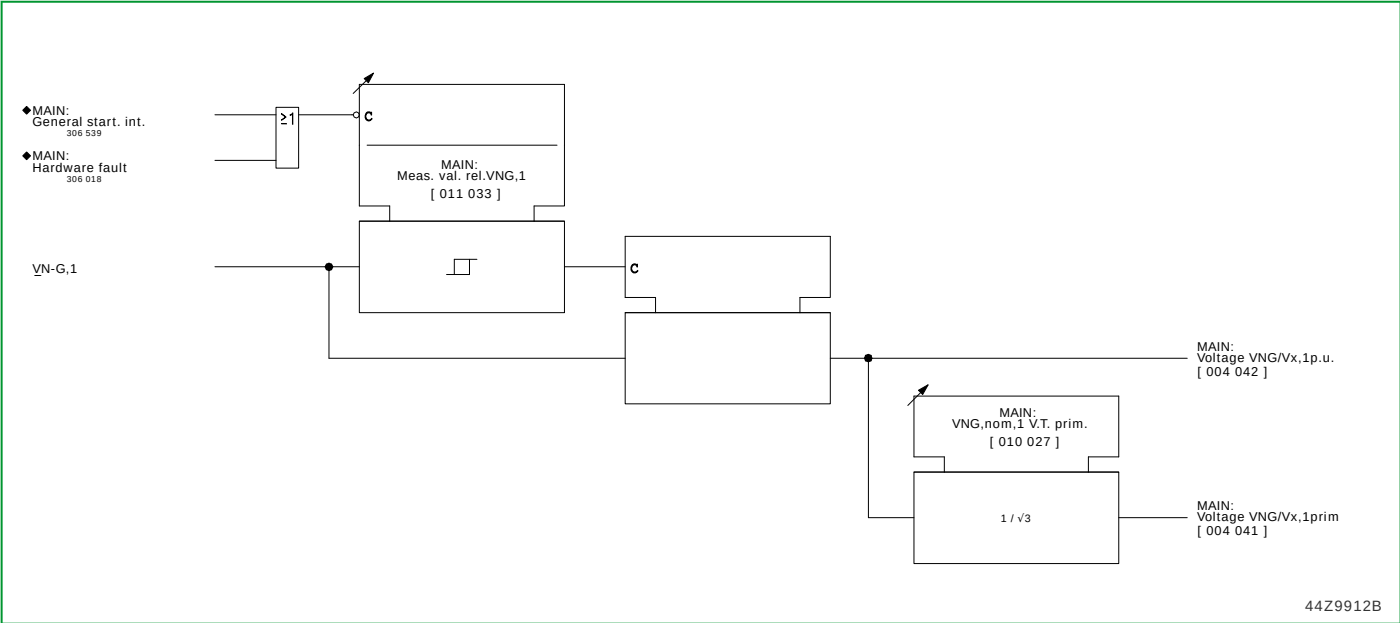


Fig. 3-64: Measured operating data – neutral-point displacement voltage, shown here for three phase system 1 as an example.

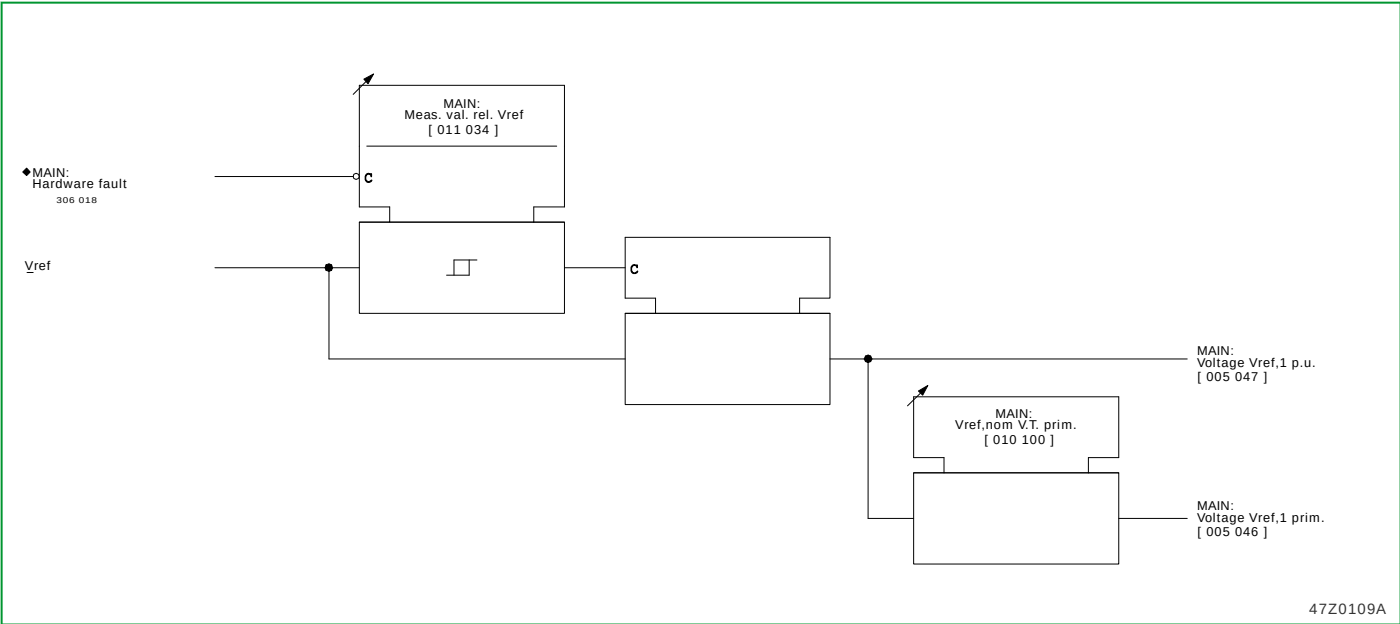


Fig. 3-65: Measured operating data – reference voltage.



## 3.13.2.3 Measured Values for Power, Active Power Factor, and Angle

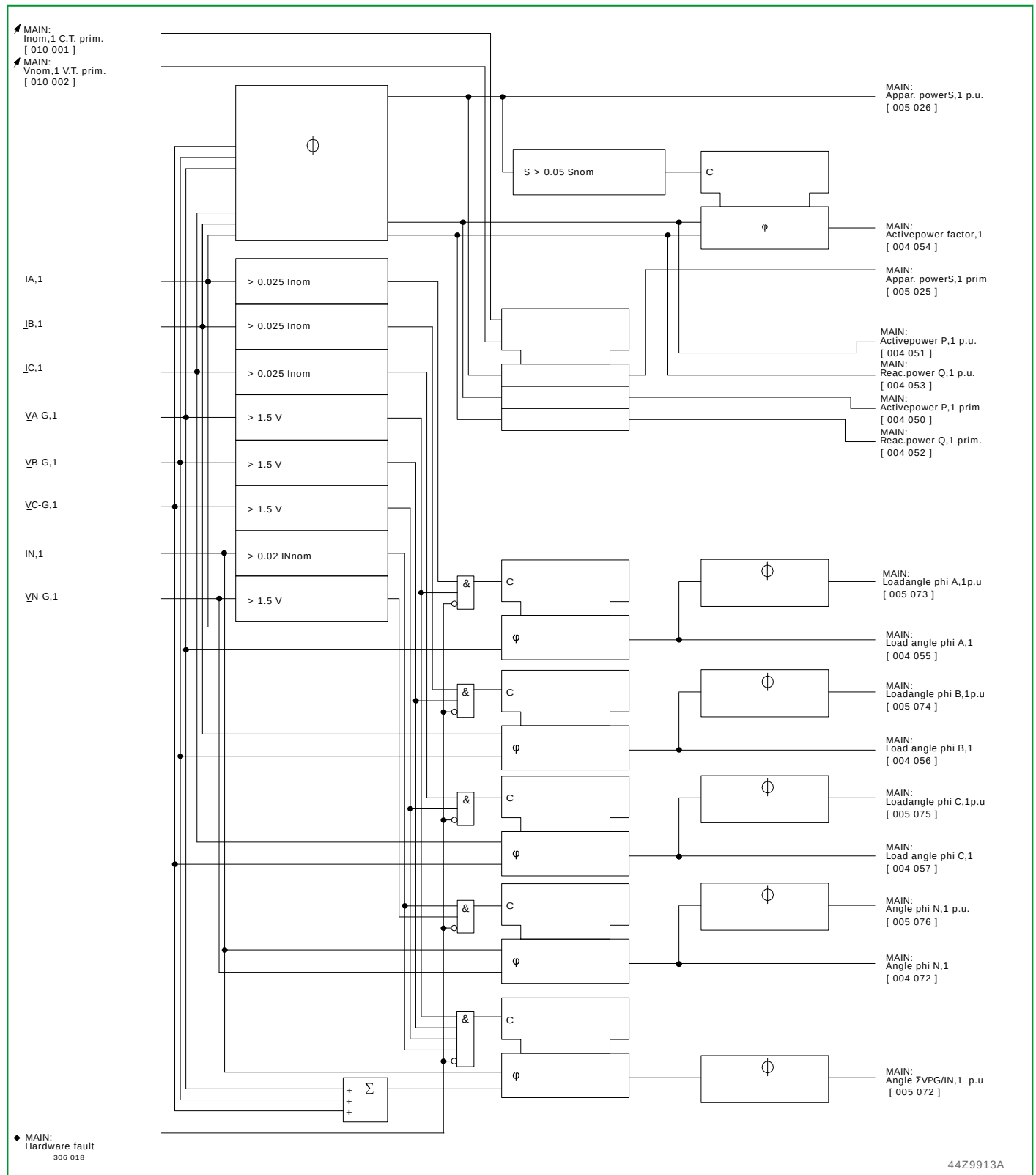


Fig. 3-66: Measured operating data – power, active power factor, and angle, shown here for three phase system 1 as an example.

Calculation of these derived operating quantities is subject to the following conditions:

- Values for active and reactive power will always be calculated and displayed as these quantities are required for the subsequent energy measurement. Greater deviations in measurements may occur with low phase currents or a critical power factor value.
- The active power factor will be calculated only if the apparent power value exceeds 5% of the nominal apparent power  $S_{nom}$ .
- Load angles will be displayed only if the respective phase current exceeds  $0.1 \cdot I_{nom}$  and if the phase-to-ground voltage exceeds 1.5 V.
- The angle between the measured values for the residual current and the neutral-point displacement voltage will only be displayed if the residual current exceeds  $0.02 \cdot I_{N,nom}$  and the neutral-point displacement voltage exceeds 1.5 V.

### 3.13.2.4 Phase Relation $I_N$

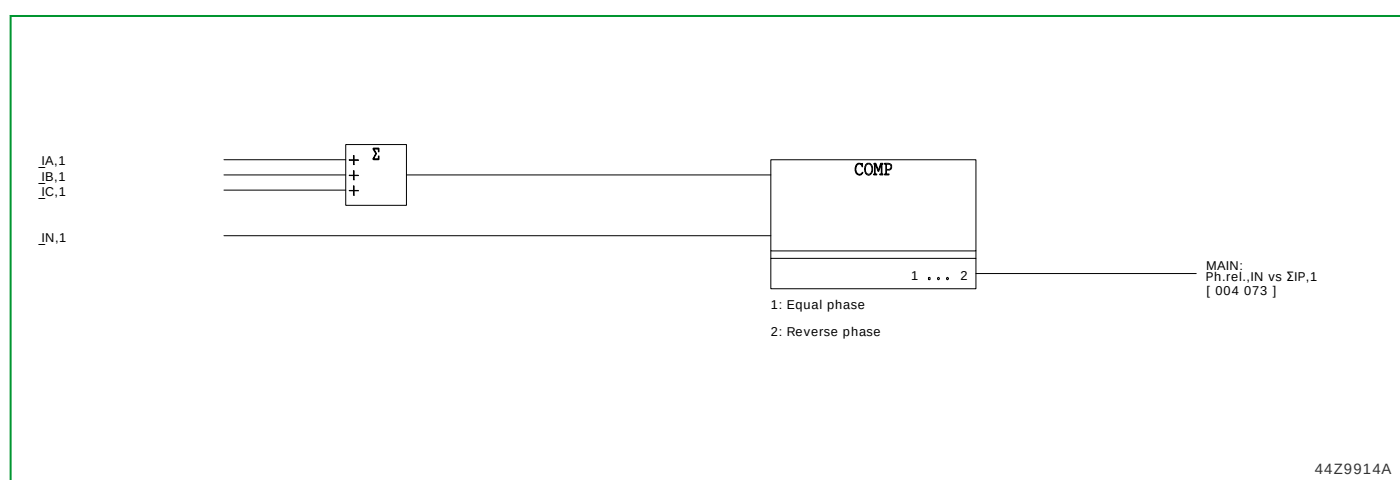


Fig. 3-67: Phase relation between calculated and measured residual current, shown here for three phase system 1 as an example.

The C434 checks if the phase relations of calculated residual current and measured residual current are coherent. If the phase displacement between the two currents is  $\leq 45^\circ$ , then the indication *Equal phase* is displayed.

### 3.13.2.5 Frequency

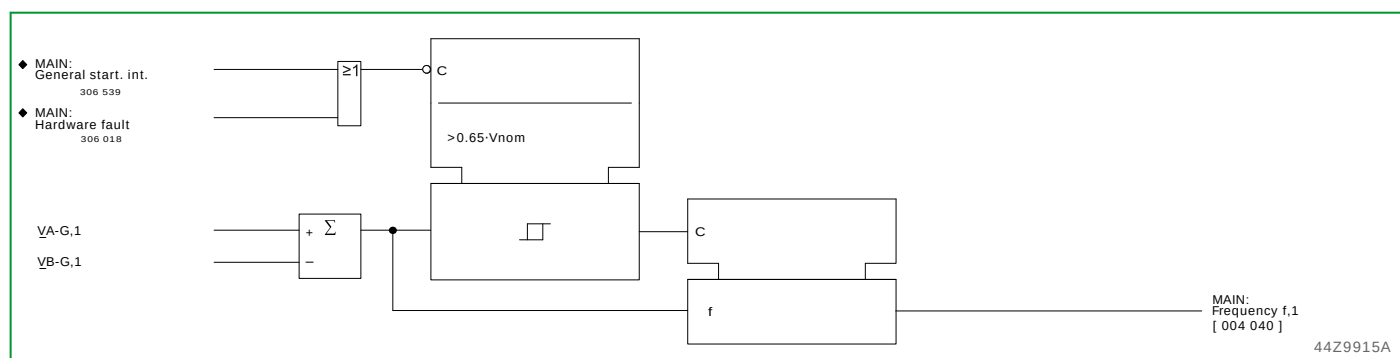


Fig. 3-68: Frequency measurement.

The C434 determines the frequency from the voltage  $\underline{V}_{A-B,1}$ . This voltage needs to exceed a minimum threshold of  $0.65 V_{nom}$  in order for frequency to be determined.

### 3.13.2.6 Active and Reactive Energy Output and Input

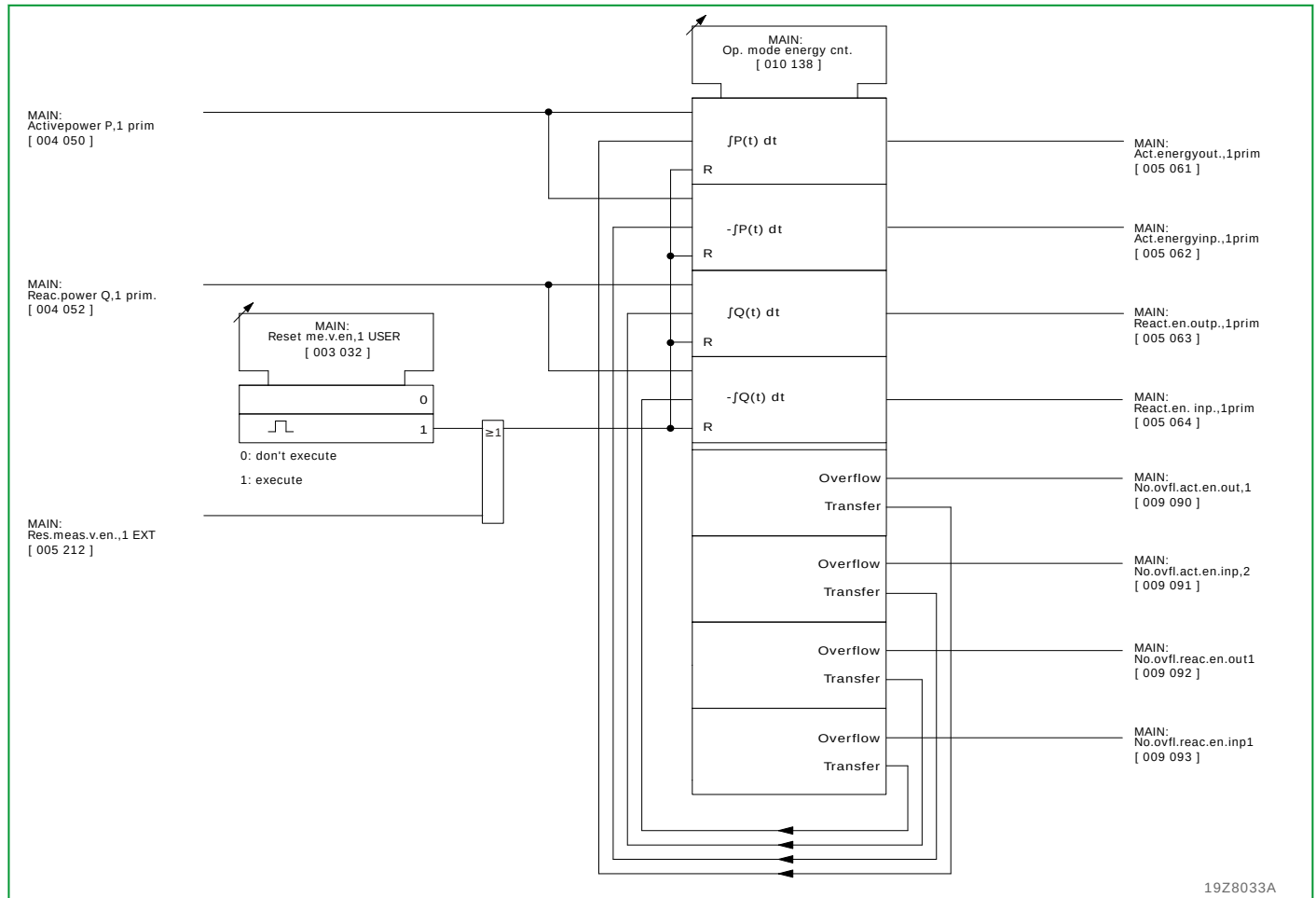


Fig. 3-69: Determining the active and reactive energy output and input.

The C434 determines the active and reactive energy output and input based on the primary active or reactive power.

There are two procedures available to determine active and reactive energy. If procedure 1 is selected, active and reactive energy are determined every 2 s (approximately). If procedure 2 is selected, active and reactive energy are determined every 100 ms (approximately). In this way higher accuracy is achieved.

Measured energy values are presented as 16 bit values together with overflow counters.

| Energy values as 16 bit values<br>Value range: 0 ... 655.35 MWh | Overflow counters for the 16 bit<br>energy values<br>Value range: 0 ... 10000 |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------|
| (005 061) MAIN: Act.energyout.,<br>1prim                        | (009 090)<br>MAIN: No.ovfl.act.en.out,1                                       |
| (005 062) MAIN: Act.energyinp.,<br>1prim                        | (009 091)<br>MAIN: No.ovfl.act.en.inp,2                                       |
| (005 063) MAIN: React.en.outp.,<br>1prim                        | (009 092)<br>MAIN: No.ovfl.reac.en.out1                                       |
| (005 064) MAIN: React.en. inp.,<br>1prim                        | (009 093)<br>MAIN: No.ovfl.reac.en.inp1                                       |

The total energy is calculated as follows:

Total energy = number of overflows · 655.35 + current count

For example:

(MAIN: Act.energyout.,1prim) = (MAIN: No.ovfl.act.en.out,1) · 655.35 +  
(MAIN: Act.energyout.,1prim)

## 3.13.2.7 Selection of the Procedure to Determine Energy Output

| Procedure | Characteristics                                                                                                                                                       | Applications                                                                                                                                                                                                                           |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1         | <ul style="list-style-type: none"> <li>● Determination of the active and reactive energy every 2 s (approximately)</li> <li>● Reduced system loading</li> </ul>       | <ul style="list-style-type: none"> <li>● Constant load and slow load variations (no significant load variations within 1 second).</li> <li>● Phase angles below <math>70^\circ</math> (<math>\cos \varphi &gt; 0.3</math>).</li> </ul> |
| 2         | <ul style="list-style-type: none"> <li>● Determination of the active and reactive energy every 100 ms (approximately).</li> <li>● Increased system loading</li> </ul> | <ul style="list-style-type: none"> <li>● Fast load variations</li> <li>● Phase angles below <math>70^\circ</math> (<math>\cos \varphi &gt; 0.3</math>).</li> </ul>                                                                     |

The maximum phase-angle error of the C434 of  $1^\circ$  leads to greater errors in measurement when the phase angle increases, as shown (for the range  $0^\circ \leq \varphi < 90^\circ$ ) in the following diagram.

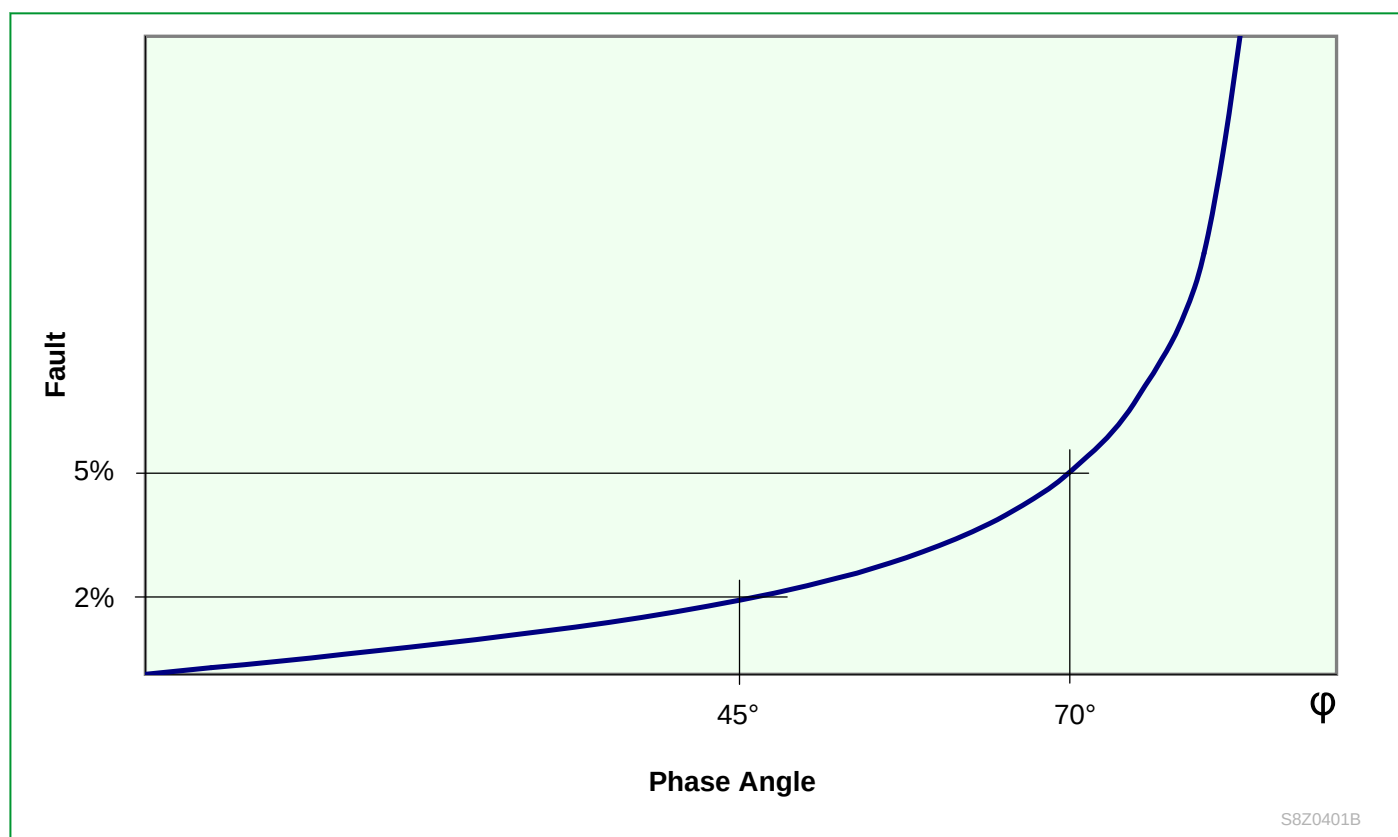


Fig. 3-70: Error of measurement in the determination of energy output resulting from the phase angle error of the C434.

Error of measurement:

- Approx.  $\pm 2\%$  of the measured value for  $|\cos \varphi| \geq 0.7$
- Approx.  $\pm 5\%$  of the measured value for  $|\cos \varphi| \geq 0.3$
- where the whole measuring range is  $-180^\circ \leq \varphi \leq 180^\circ$ .

For phase angles  $\varphi$  with  $|\cos \varphi| < 0.3$ , or when the error of measurement resulting from the maximum phase-angle error is not acceptable, external counters should be used to determine the energy output.

### 3.13.3 Configuring and Enabling the Device Functions

The C434 can be adapted to the requirements of a specific high-voltage system by configuring the available function range. By including the desired C434 functions in the configuration and canceling all other, the user creates an individually configured device appropriate to the specific application. Parameters, signals and measured values of cancelled device functions are not displayed on the local control panel. Functions of general applicability such as operating data recording (OP\_RC) or main functions (MAIN) cannot be cancelled.

#### 3.13.3.1 Canceling a Device Function

The following conditions must be met before a C434 function can be cancelled or removed:

- The C434 function must be disabled.
- None of the functions of the C434 function to be cancelled can be assigned to a binary input.
- None of the signals of the C434 function can be assigned to a binary output or an LED indicator.
- None of the functions of the C434 function to be cancelled may be selected in a list parameter setting.

If the above conditions are met, proceed through the “Configuration” branch of the menu tree to access the setting relevant for the C434 function to be cancelled. If, for example, the “LIMIT” function group is to be cancelled, the setting of LIMIT: Function group LIMIT is set to *Without*. To re-include the “LIMIT” function in the C434 configuration, the same setting is accessed and its value is changed to *With*.

The C434 function to which a setting, a signal, or a measured value belongs is defined by the function group designation (example: “LIMIT”). In the following description of the C434 functions, it is presumed that the corresponding C434 function is included in the configuration.

#### 3.13.3.2 Enabling or Disabling the Device Functions

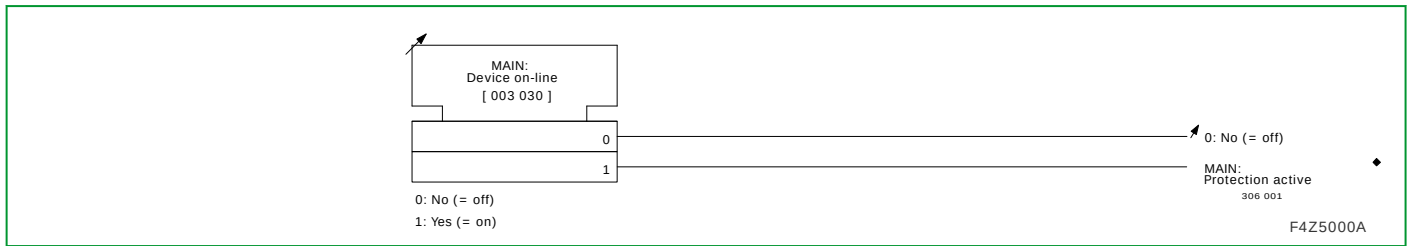


Fig. 3-71: Enabling or disabling the device functions.

Besides cancelling functions from the configuration, it is also possible to enable/disable the C434 via the parameter MAIN: Device on-line.

### 3.13.4 Function Blocks

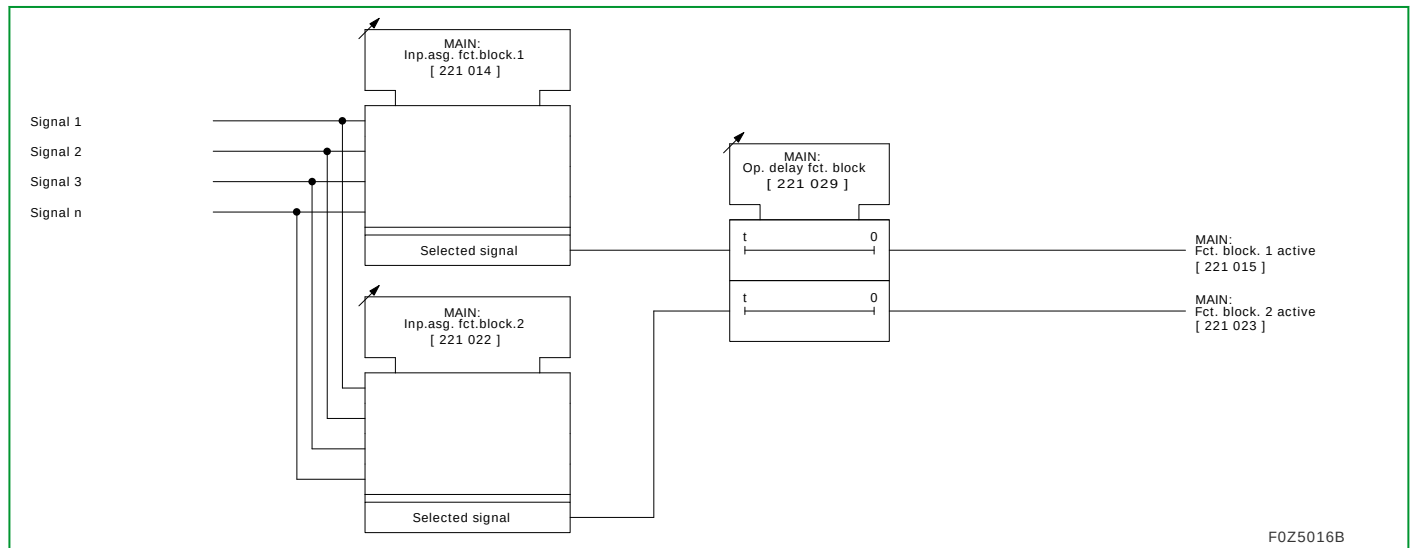


Fig. 3-72: Function blocks.

By including function blocks in the bay interlock conditions, switching operations can be prevented independent of the switching status at the time, for example, by an external signal “CB drive not ready” or by the trip command from an external protection device.

Binary input signals conditioned by debouncing and chatter suppression or output signals from the programmable logic function can be assigned to the function blocks 1 and 2 by setting a “1 out of n” parameter. The input signal from the function blocks starts a timer stage and after it has elapsed, the signal MAIN: Fct. block. 1 active is issued.

3.13.5 Blocked/Faulty

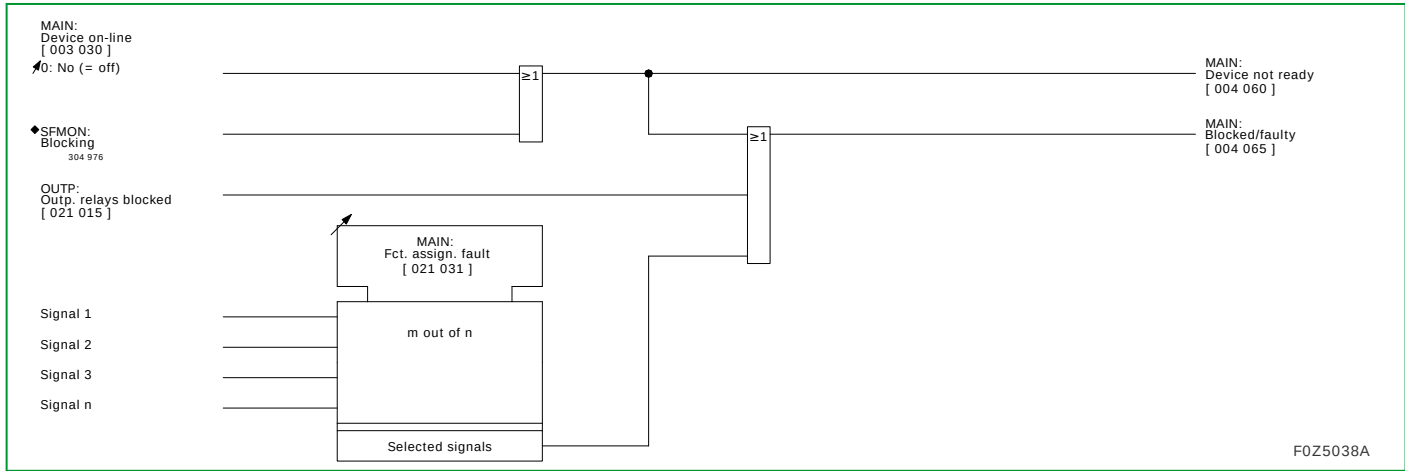


Fig. 3-73: “Blocked/faulty” signal.

If the protective functions are blocked, the condition is signaled by continuous illumination of the amber LED indicator H 2 on the local control panel and by a signal from an output relay configured MAIN: Blocked/faulty. In addition functions can be selected that will issue the MAIN: Blocked/faulty signal by setting a “m out of n” parameter.

3.13.6 Multiple Signaling

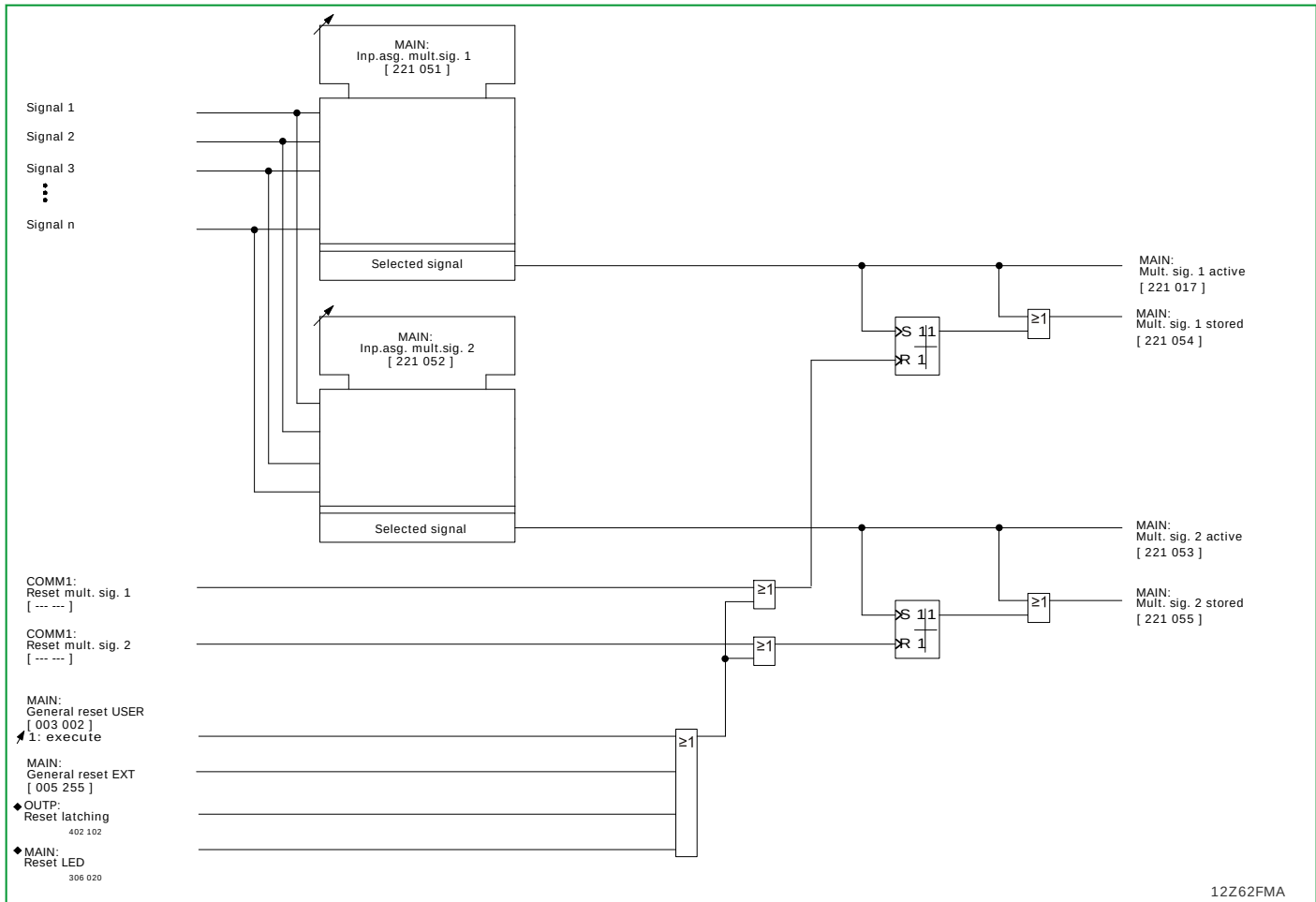


Fig. 3-74: Multiple signaling.



The multiple signals 1 and 2 are formed by the programmable logic function using *OR* operators. The programmable logic output to be interpreted as multiple signaling is defined by the configuration of the binary signal input assignment with the corresponding multiple signaling. Both an updated and a stored signal are generated. The stored signal is reset by the following actions:

- General reset
- Latching reset
- LED indicators reset
- A command received through the communication interface

If the multiple signaling is still present at the time of a reset, the stored signal will follow the updated signal.

### 3.13.7 CB Trip Signal

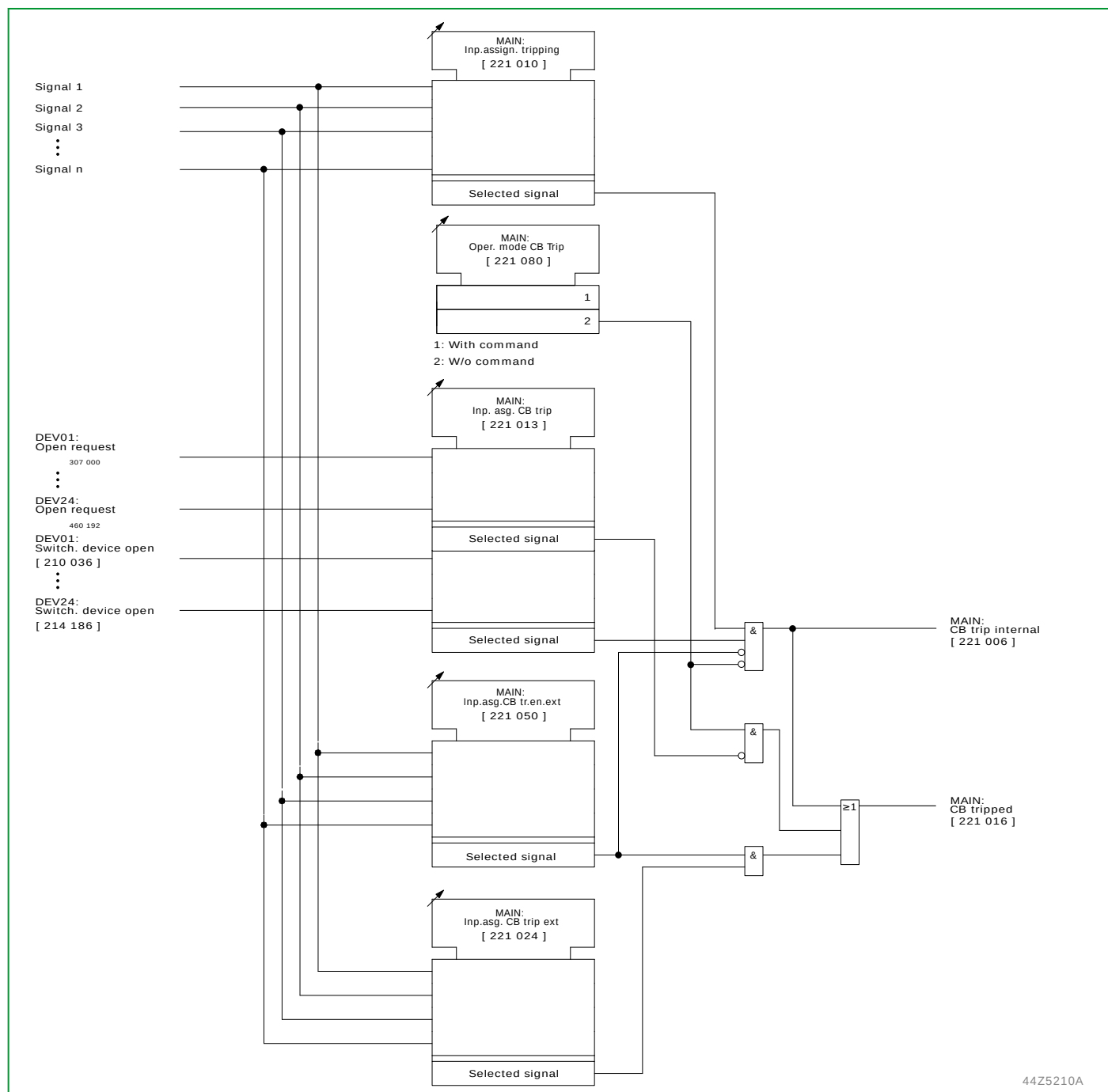


Fig. 3-75: CB trip signal.

The signal “CB Trip” depends on the mode of operation and is based on different events:

Mode of operation: “*With command*” (MAIN: Oper. mode CB Trip, 221 080):

In this mode of operation, in addition the MAIN: CB trip internal (221 006) signal is formed.

The signal MAIN: CB trip internal is issued if the following conditions are met simultaneously:

- The binary signal input configured for “tripping” is set to a logic value of “1” or the selected trip command from the C434 is present.
- At the binary signal input configured as “CB trip” a logic value of “1” is present.

Mode of operation: “W/o command” (MAIN: Oper. mode CB Trip, 221 080):  
The MAIN: CB tripped signal will only be issued, if the circuit breaker is tripping without any command issued by the C434. Commands via communication interfaces, local control panel or binary inputs are treated in the same manner. This mode of operation disables the MAIN: CB trip internal signal.

The CB trip signal of an external device can also be signaled. For this task, one input needs to be configured for “MAIN: Inp.asg.CB tr.en.ext”, a further input for “MAIN: Inp.asg. CB trip ext”.

### 3.13.8 Communication Error

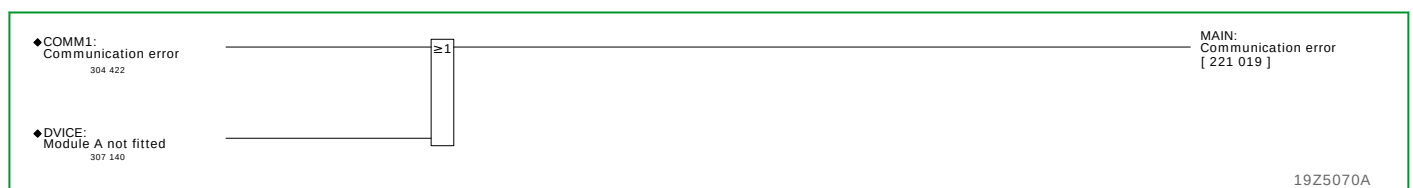


Fig. 3-76: Communication Error.

If a link to the control station cannot be established or if the link is interrupted, the signal “Communication error” will be issued. This signal will also be issued if communication module A is not fitted.

### 3.13.9 Time Tagging and Clock Synchronization

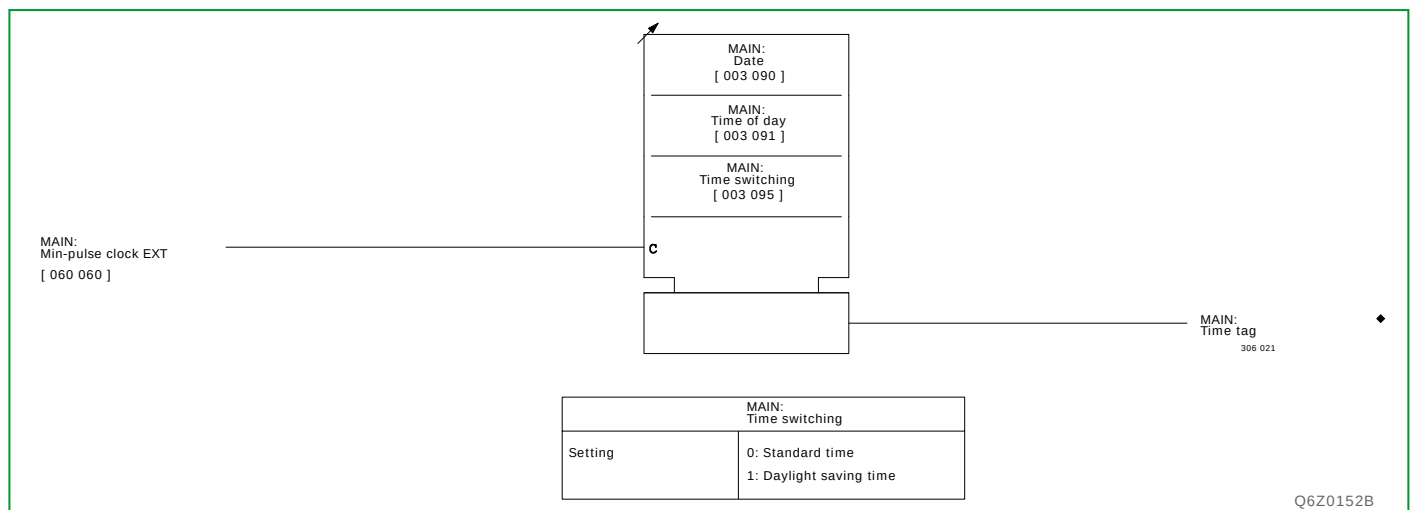


Fig. 3-77: Date/time setting and clock synchronization with minute pulses presented at a binary signal input.

Switching from standard to daylight saving time or back requires correct time setting frames from the time synchronization master (according the applied communication protocol).

The data stored in the operating data memory, the monitoring signal memory and the event memories are date- and time-tagged. For correct tagging, the date and time need to be set in the C434.

The time of different devices may be synchronized by a pulse given to an appropriately configured binary signal input. The C434 evaluates the rising edge. This will set the clock to the nearest full minute, rounding either up or down. If

several start/end signals occur (bouncing of a relay contact), only the last edge is evaluated.

### 3.13.9.1 Synchronization Source

The C434 provides numerous options to synchronize the internal clock:

- Telegram with the time of day via the communication interface COMM1/IEC (full time)
- Telegram with the time of day via the communication interface COMM2/PC (full time)
- IRIG-B Signal (IRIGB; time of day only)
- Minute pulse presented at a binary signal input (MAIN), see [Fig. 3-77, \(p. 3-111\)](#) and previous paragraph

With older C434 versions these interfaces had equal ranking i.e. clock synchronization was carried out regardless of which sub-function initiated triggering. No conflicts have to be taken into account as long as synchronization sources (communication master, IRIG-B and minute pulse source) operate at the same time of day. Should the synchronization sources operate with a different time basis unwanted step changes in the internal clock may occur. On the other hand a redundant time of day synchronization is often used so as to sustain time synchronization via IRIG-B interface even if and while the SCADA communication is out of service.

With the current C434 versions a primary and a backup source for time of day synchronization may now be set, where both provide the four options listed in the above.

MAIN: Prim.Source TimeSync

MAIN: BackupSourceTimeSync

With this feature synchronization occurs continuously from the primary source as long as time synchronization telegrams are received within a time-out period set at MAIN: Time sync. time-out The backup source is required if after the set time-out there is no synchronization through the primary source.

When selecting the time telegram via IEC as the primary source the C434 will expect time synchronization telegrams from server SNTP2 after server SNTP 1 has become defective, before it will switch over to the backup source.

Time synchronization occurs solely from the primary source when the time-out stage is blocked.

## 3.13.10

## Resetting Actions

Stored data such as event logs, measured fault data etc, can be cleared in several ways. The following types of resetting actions are possible:

- Automatic resetting of the event signals provided by LED indicators (given that the LED operating mode has been set accordingly) and of the display of measured event data on the local control panel LCD whenever a new event occurs. In this case only the displays on the local control panel LCD are cleared but not the internal memories such as the fault memory.
- Resetting of LED indicators and measured event data displayed on the local control panel LCD by pressing the “Reset” key located on the local control panel. By selecting the required function at LOC: Fct. reset key further memories may be assigned which will then also be cleared when the “Reset” key is pressed.
- Selective resetting of a particular memory type (e.g. only the fault memory) via setting parameters. (For this example: Navigate to menu point FT\_RC: Reset record. USER and set to *execute*, see also the exact step-by-step description in [Section 6.8.7, \(p. 6-52\).](#))
- Selective resetting of a particular memory type (e.g. only the fault memory) through appropriately configured binary signal inputs. (For this example: Assign parameter FT\_RC: Reset record. EXT to the relevant binary signal input e.g. INP: Fct. assignm. U 501 .)
- Group resetting by setting parameters, by navigating to menu point MAIN: Group reset 1 USER (or MAIN: Group reset 2 USER) and setting it to *execute*. For this the relevant memories (i.e. those to be reset) must be assigned to parameter MAIN: Fct.assign. reset 1 (or MAIN: Fct.assign. reset 2, resp.)
- Group resetting through appropriately configured binary signal inputs. (That is assign parameter MAIN: Group reset 1 EXT (or MAIN: Group reset 2 EXT) to the relevant binary signal input, e.g. INP: Fct. assignm. U 501 after memories to be reset have been assigned to parameter MAIN: Fct.assign. reset 1 (or MAIN: Fct.assign. reset 2).
- General resetting by setting parameters (menu point MAIN: General reset USER). All memories, counters, events etc. are reset without any special configuration options.
- General resetting through appropriately configured binary signal inputs. (MAIN: General reset EXT is assigned to the relevant binary signal input.) All memories, counters, events etc. are reset without any special configuration options.

Should several resetting actions have been configured for one particular memory then they all have equal priority.

In the event of a cold restart or simultaneous failure of both internal battery and substation auxiliary supply, all stored counter values will be lost.

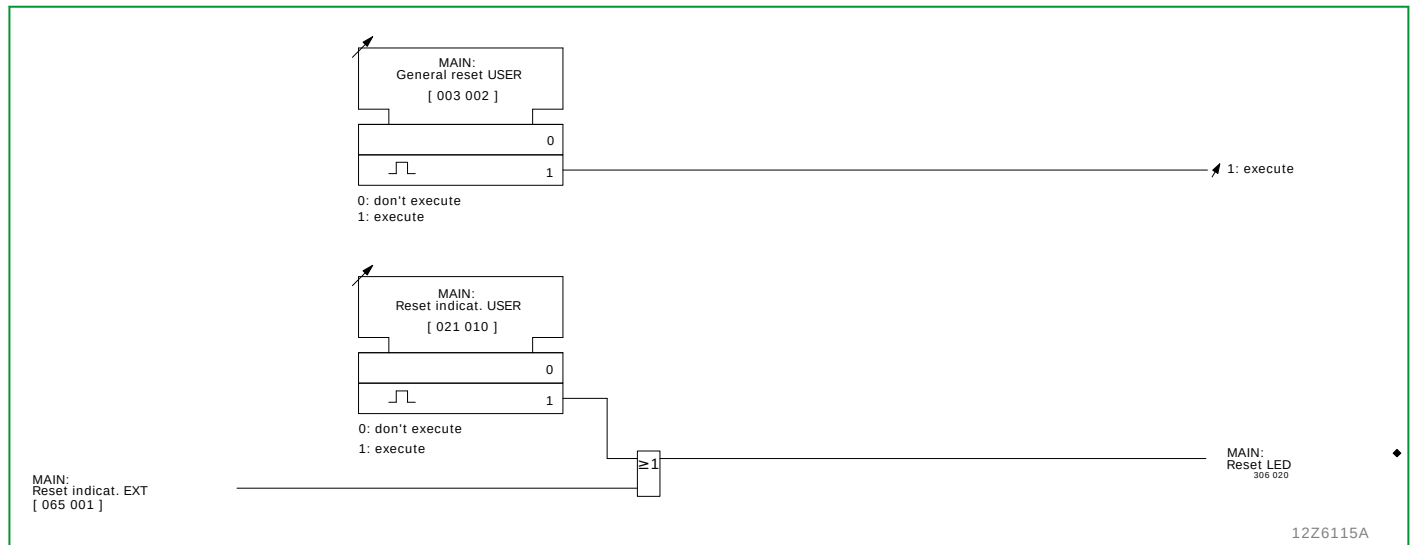


Fig. 3-78: General reset, LED reset and measured event data reset from the local control panel.

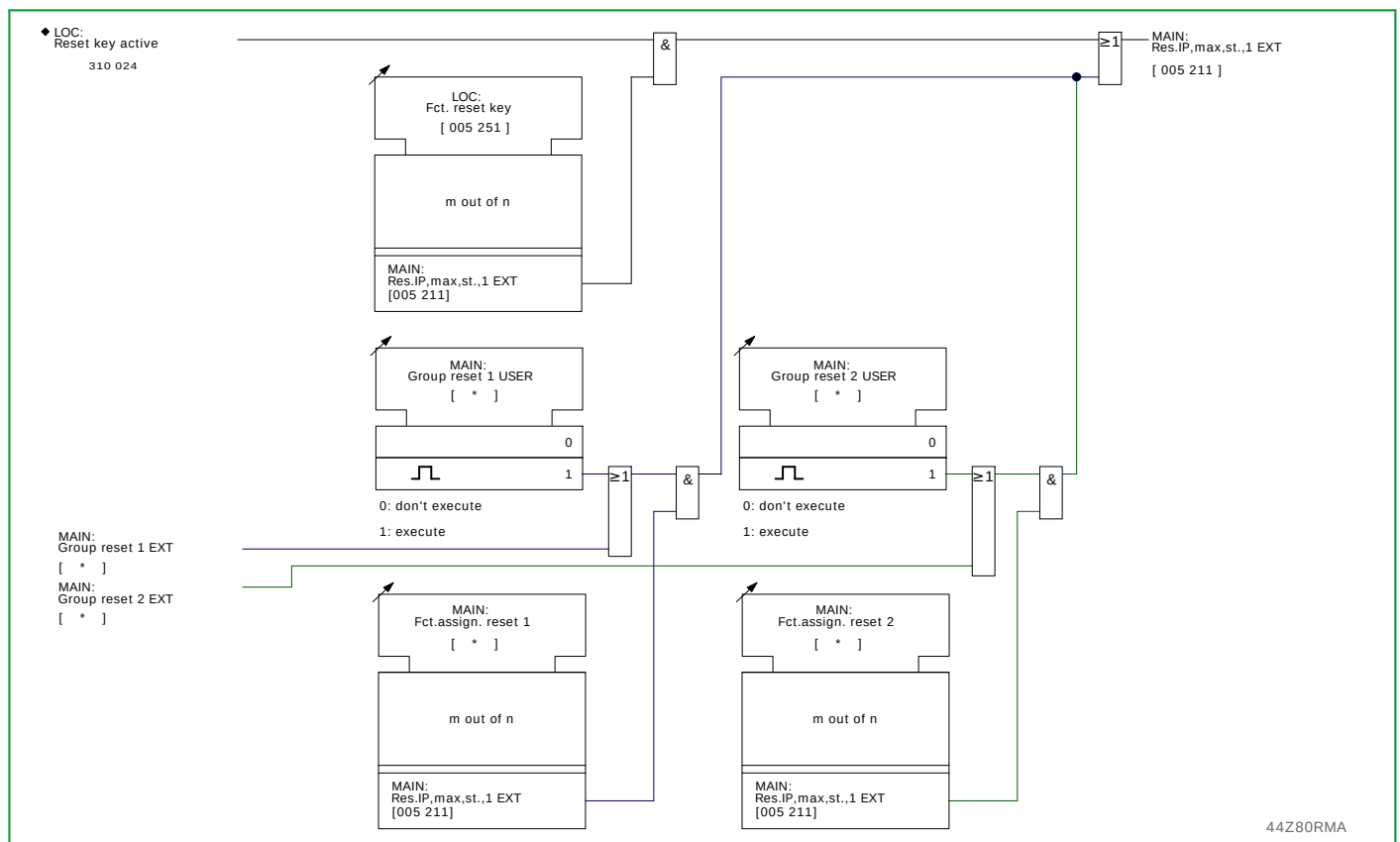


Fig. 3-79: "Reset" key on the local control panel and, as an example, group resetting of the stored maximum phase current (e.g. as an example for the reset signal MAIN: Res.IP,max,st.,1 EXT).

A complete list of all resetting parameters that can be used in the way shown in the diagram above can be obtained from the separately available DataModelExplorer: Look up the setting parameter MAIN: Fct.assign. reset 1 in the file C434-671\_en\_Addresses.pdf, and there follow the link to the referenced config. table.

### 3.13.10.1 Resetting Actions through Keys on the Local Control Panel

Further resetting possibilities are basically not distinct resetting actions but make access especially easy to one of the resetting actions described above i.e. by configuring them to a configurable key.

- One can include the relevant resetting action in the configuration of the “READ” key (through LOC: Fct. read key).

### 3.13.11 Assigning Communications Interfaces to Physical Communications Channels

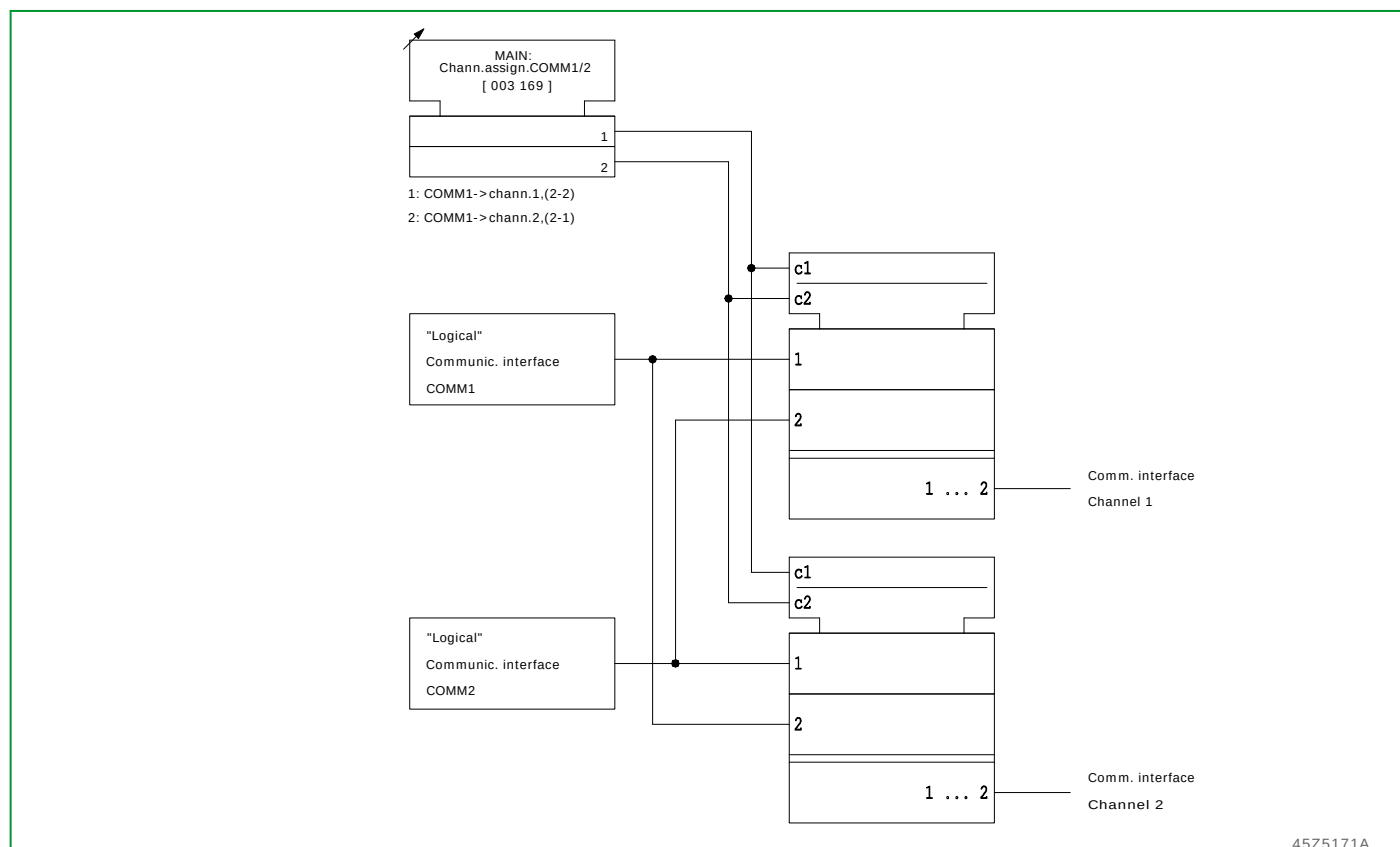


Fig. 3-80: Assignment of communication interfaces to physical communication channels.

Depending on the design version of the communications module A there are up to two communications channels available (see “Technical Data”, [Chapter 2, \(p. 2-1\)](#)). These physical communications channels may be assigned to communications interfaces COMM1 and COMM2.

If communications interface COMM1 is assigned to communications channel 2, then the settings of communications interface COMM2 are automatically assigned to communications channel 1.

COMM2 can only be used to transmit data to and from the C434 if its PC interface has been de-activated. As soon as the PC interface is used to transmit data, COMM2 becomes “dead”. It will only be enabled again when the “time-out” period for the PC interface has elapsed.



### 3.13.12 Test Mode

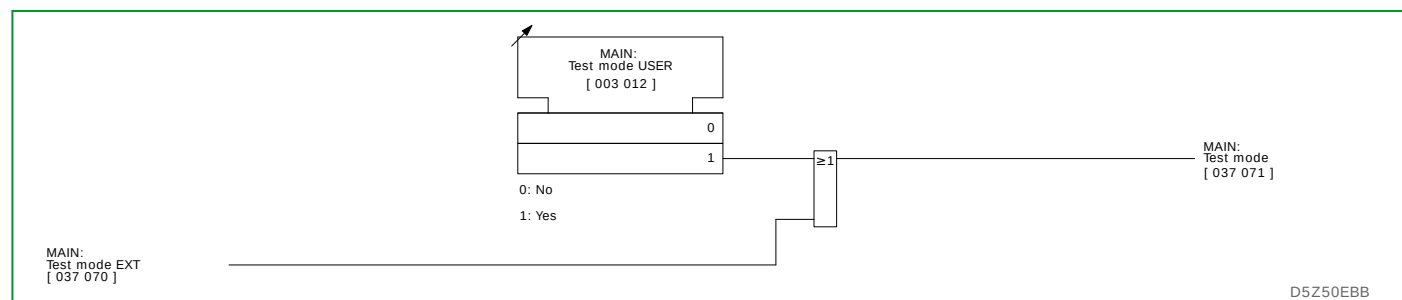


Fig. 3-81: Setting the test mode.

If tests are run on the C434, the user is advised to activate the test mode so that all incoming signals via the serial interfaces will be identified accordingly.

### 3.14 Parameter Subset Selection (Function Group PSS)

With the C434, four independent parameter subsets may be pre-set. The user may switch between parameter subsets during operation without interrupting the protection function.

#### *Selecting the Parameter Subset*

The control path determining the active parameter subset (function setting or binary signal input) may be selected via the function setting PSS: Control via USER or via the external signal PSS: Control via user EXT. Correspondingly, the parameter subset is selected either in accordance with the pre-set function setting PSS: Param.subs.sel. USER or in accordance with external signals. Which parameter subset is actually active at a particular time may be determined by scanning the logic state signals PSS: Actual param. subset or PSS: PS 1 active.

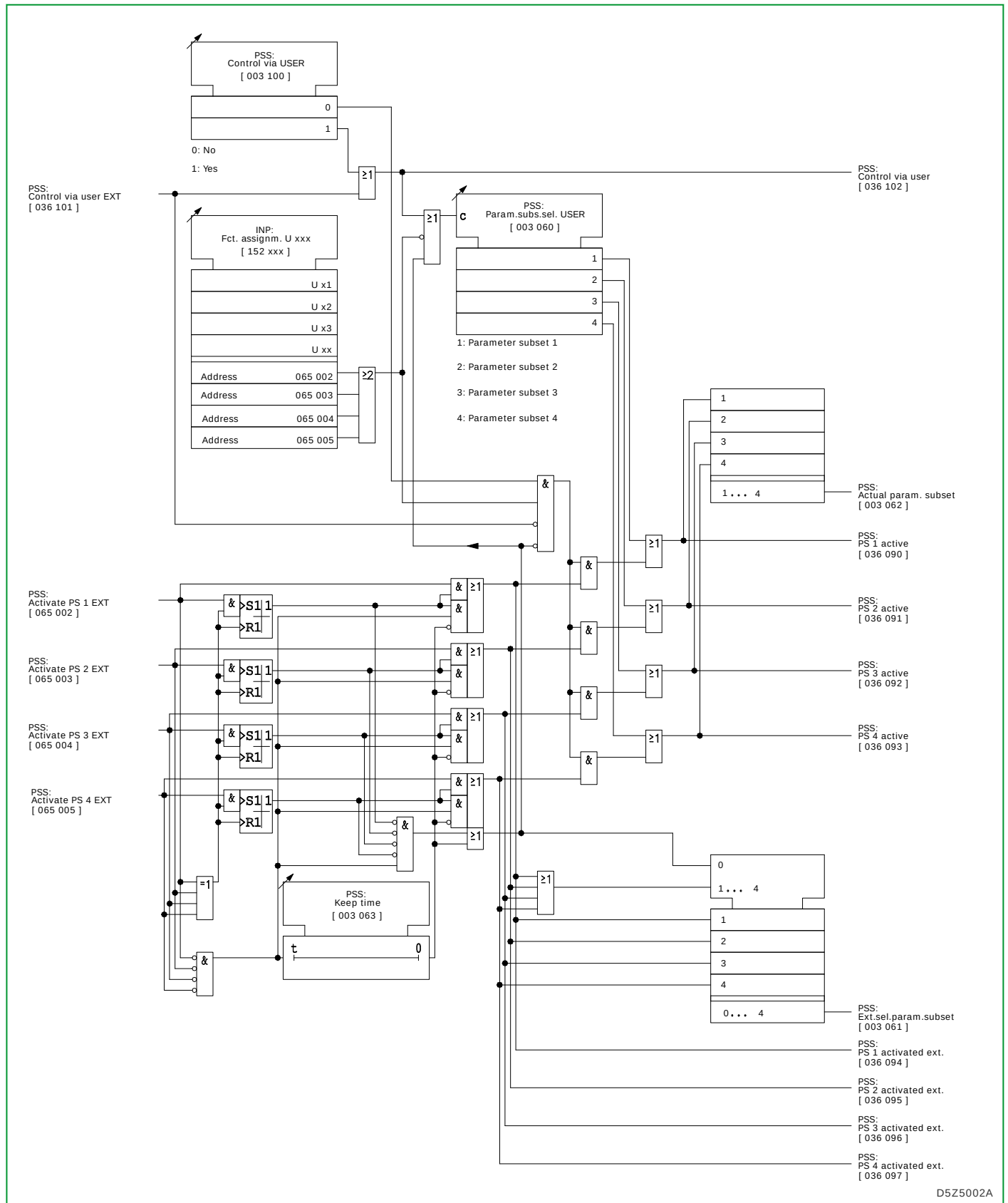
#### *Selecting the Parameter Subset via Binary Inputs*

If the binary signal inputs are to be used for parameter subset selection, then the C434 first checks to determine whether at least two binary inputs are configured for parameter subset selection. If this is not the case, then the parameter subset selected via the function setting will be active. The C434 also checks whether the signals present at the binary signal inputs allow an unambiguous parameter subset selection. This is only true when only one binary signal input is set to a logic level of "1". If more than one signal input is set to a logic level of "1", then the parameter subset previously selected remains active. Should a dead interval occur while switching between parameter subsets (this is the case if all binary signal inputs have a logic level of "0"), then the stored hold time is started. While this timer stage is running, the previously selected parameter subset remains active. As soon as a signal input has a logic level of "1", the associated parameter subset becomes active. If, after the stored time has elapsed, there is still no signal input with a logic level of "1", the parameter subset selected via the function parameter becomes active.

If, after the supply voltage is turned on, no logic level of "1" is present at any of the binary signal inputs selected for the parameter subset selection, then the parameter subset selected via the function parameter will become active once the stored time has elapsed. The previous parameter subset remains active while the stored hold timer stage is running.

Parameter subset selection may also occur during a starting condition. When subset selection is handled via binary signal inputs, a maximum inherent delay of approximately 100 ms must be taken into account.

Settings for which only one address is given in the following sections are equally effective for all four parameter subsets.



D5Z5002A

Fig. 3-82: Activating the parameter subsets.

3.15 Self-Monitoring (Function Group SFMON)

Comprehensive monitoring routines in the C434 ensure that internal faults are detected and do not lead to malfunctions. The selection of function assignments to the alarm signal includes, among others, self-monitoring signals from the communications monitor, measuring-circuit monitoring, open-circuit monitoring and the logic outputs.

3.15.1 Tests During Start-up

After the supply voltage has been turned on, various tests are carried out to verify full operability of the C434. If the C434 detects a fault in one of the tests, then start-up is terminated. The display shows which test was running when termination occurred. No control actions may be carried out. A new attempt to start up the C434 can only be initiated by turning the supply voltage off and then on again.

3.15.2 Cyclic Tests

After start-up has been successfully completed, cyclic self-monitoring tests will be run during operation. In the event of a positive test result, a specified monitoring signal will be issued and stored in a non-volatile(NV) memory – the monitoring signal memory – along with the assigned date and time (see [Section 3.17, \(p. 3-124\)](#)).  
The self-monitoring function monitors the built-in battery for any drop below the minimum acceptable voltage level. If the associated monitoring signal is displayed, then the power supply module should be replaced within a month, since otherwise there is the danger of data loss if the supply voltage should fail. [Section 12.1, \(p. 12-2\)](#) gives further information on maintenance procedures.

3.15.3 Signals

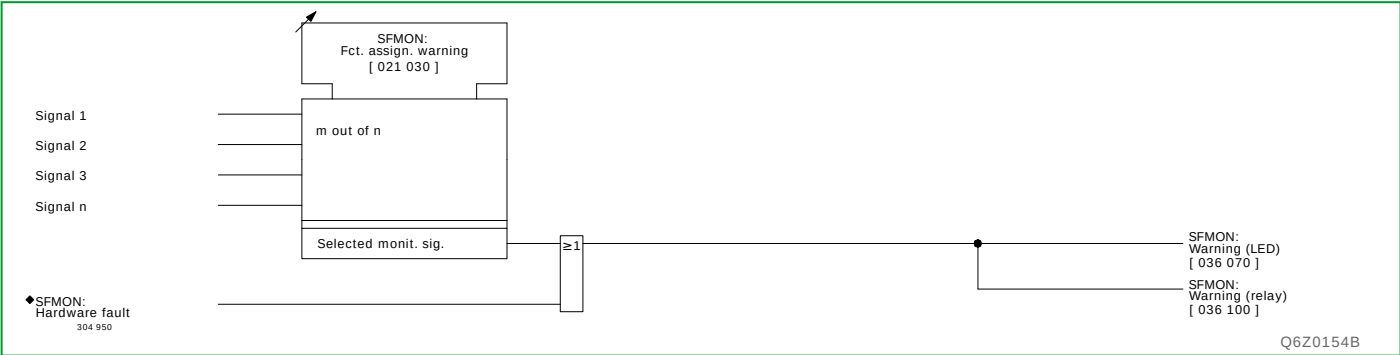


Fig. 3-83: Monitoring signals.

The monitoring signals are also signaled via the output relay configured SFMON: Warning (relay). The output relay operates as long as an internal fault is detected.

*Note: It is strongly recommended to use an output relay of the power supply module for signaling “blocked/faulty” state (so-called watchdog relay).*

### 3.15.4 Device Response

The response of the C434 is dependent on the type of monitoring signal. The following responses are possible:

- Signaling Only

If there is no malfunction associated with the monitoring signal, then only a signal is issued, and there are no further consequences. This situation exists, for example, when internal data acquisition memories overflow.

- Selective Blocking

If a fault is diagnosed solely in an area that does not affect the protective functions, then only the affected area is blocked. This would apply, for example, to the detection of a fault on the communication module or in the area of the PC interface.

- Warm Restart

If the self-monitoring function detects a fault that might be eliminated by a system restart – such as a fault caused by excessive electro-magnetic interference –, then a procedure called a warm restart is automatically initiated. During this procedure, as with any start-up, the computer system is reset to a defined state. A warm restart is characterized by the fact that no stored data and, in particular, no setting parameters are affected by the procedure. A warm restart can also be triggered manually by control action. During a warm restart sequence the protective functions and the communication through serial interfaces will be blocked.

If the same fault is detected after a warm restart has been triggered by the self-monitoring system within the set SFMON: Mon.sig. retention, then the protective functions remain blocked but communication through the serial interfaces will usually be possible again.

If a corrupted setting is diagnosed during the checksum test, which is part of the self-monitoring procedure, settings are restored from an internal back-up memory. Nevertheless, in order to get the device back to well defined operation conditions a warm restart is executed.

For any warm restart initiated by self-monitoring, the root cause (alarm event) is logged in the monitoring buffer.

- Cold Restart

In case the recovery of corrupted settings failed (e.g. because of an electrical defect of the memory chip), then a cold restart is carried out. This is necessary because the C434 cannot identify which parameter in the subset is corrupted. A cold restart causes all internal memories to be reset to a defined state. This means that all the protection device settings are also erased after a cold restart. In order to establish a safe initial state, the default values have been selected so that the protective functions are blocked. Both the monitoring signal that triggered the cold restart and the value indicating parameter loss are entered in the monitoring signal memory.

A cold restart can also be triggered manually by control action (to intentionally erase all memories and reset the device to default settings).

### 3.15.5 Monitoring Signal Memory

Depending on the type of internal fault detected the C434 will respond by trying to eliminate the problem with a warm restart. (See above; for further details read also about C434 behavior with problems in [Chapter 11, \(p. 11-1\)](#).) Whether or not this measure will suffice can only be determined if the monitoring signal has not already been stored in the monitoring signal memory because of a previous fault. If it was already stored and a second fault is detected then, depending on the type of fault detected, the C434 will be blocked after the second warm restart.

In order to better monitor this behavior the parameter at SFMON: Mon.sig. retention is applied. This parameter may either be set to '*Blocked*' or to a time duration (in hours). (It is, however, discouraged to set it to 0, because in this case, there would be no blocking at all, so that there would be the danger of maloperation in case of a permanent failure.)

The default for this timer stage is *Blocked*, i.e. blocking of the protection device with two identical faults occurs independently of the time elapsed since the first fault monitoring signal was issued.

The behavior caused by sporadic faults could lead to an unwanted blocking of the C434 if the monitoring signal memory had not been reset in the interim, for example, because the substation is difficult to reach in wintertime or reading-out and clearing of the monitoring signal memory via the communication interfaces was not enabled. To defuse this problem it is suggested to set the function parameter to a specific time period so that blocking will only occur if the same fault occurs again within this time period. Otherwise, the C434 will continue to operate normally after a warm restart.

### 3.15.6 Monitoring Signal Memory Time Tag

The time when the device fault occurred last is recorded.

### 3.16 Operating Data Recording (Function Group OP\_RC)

For the continuous recording of processes in system operation as well as of events, a battery backed memory is provided (cyclic buffer). The “operationally relevant” signals, each fully tagged with date and time at signal start and signal end, are entered in chronological order. The signals relevant for operation include control actions such as function disabling and enabling and triggers for testing and resetting. The start and end of system loggings and recordings that represent a deviation from normal operation is also recorded. The operating data memory can be cleared/reset.

#### Counter for Signals Relevant to System Operation

The signals stored in the operating data memory are counted.

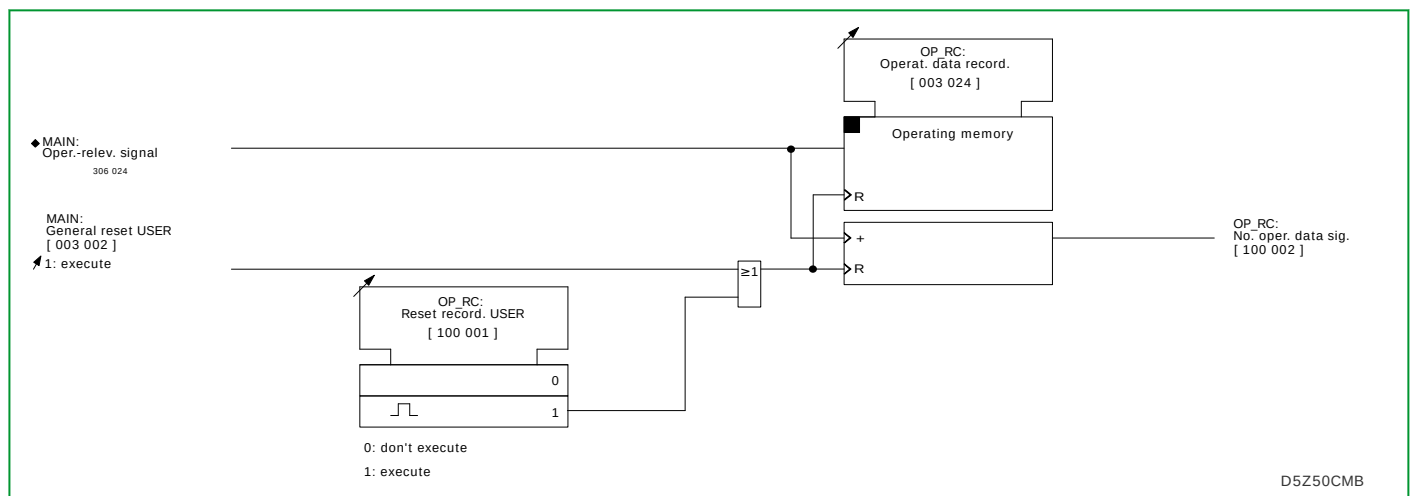


Fig. 3-84: Operating data recording and counter for signals relevant to system operation.

### 3.17 Monitoring Signal Recording (Function Group MT\_RC)

The monitoring signals generated by the self-monitoring function are recorded in the monitoring signal memory. The memory buffer allows for a maximum of 30 entries. If more than 29 monitoring signals occur without interim memory clearance, the SFMON: Overflow MT\_RC signal is entered as the last entry. Monitoring signals prompted by a hardware fault in the unit are always entered in the monitoring signal memory. Monitoring signals prompted by a peripheral fault can be entered into the monitoring signal memory, if desired. The user can select this option by setting an “m out of n” parameter (see [Section 3.15, \(p. 3-120\)](#)).

If at least one entry is stored in the monitoring signal memory, this fact is signaled by the red LED indicator H 3 on the local control panel. Each new entry causes the LED to flash (on/off/on....).

The monitoring signal memory can only be cleared manually by a control action. Entries in the monitoring signal memory are not cleared automatically, even if the corresponding test in a new test cycle now shows the C434 to be healthy. The contents of the monitoring signal memory can be read from the local control panel or through the PC or communication interface. The time and date information assigned to the individual entries can be read out through the PC or communication interface or from the local control panel.

#### Monitoring Signal Counter

The number of entries stored in the monitoring signal memory is displayed on the monitoring signal counter (MT\_RC: No. monit. signals).

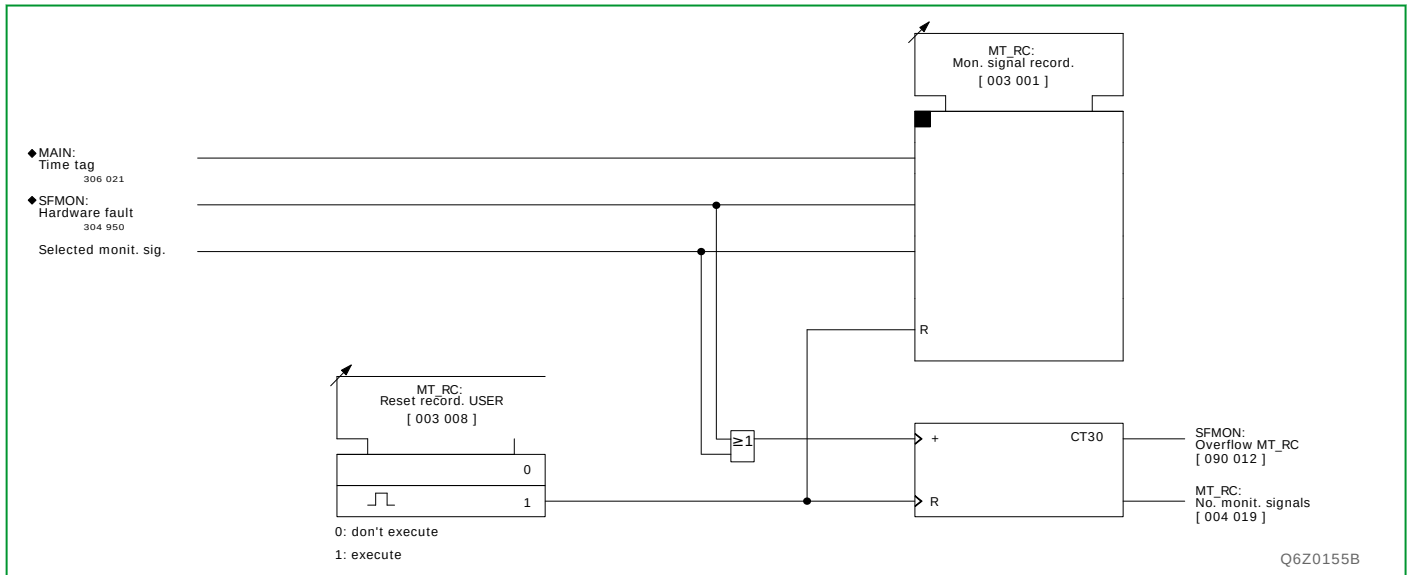


Fig. 3-85: Monitoring signal recording and the monitoring signal counter.



## 3.18 Fault Recording (Function Group FT\_RC)

### 3.18.1 Start of Fault Recording

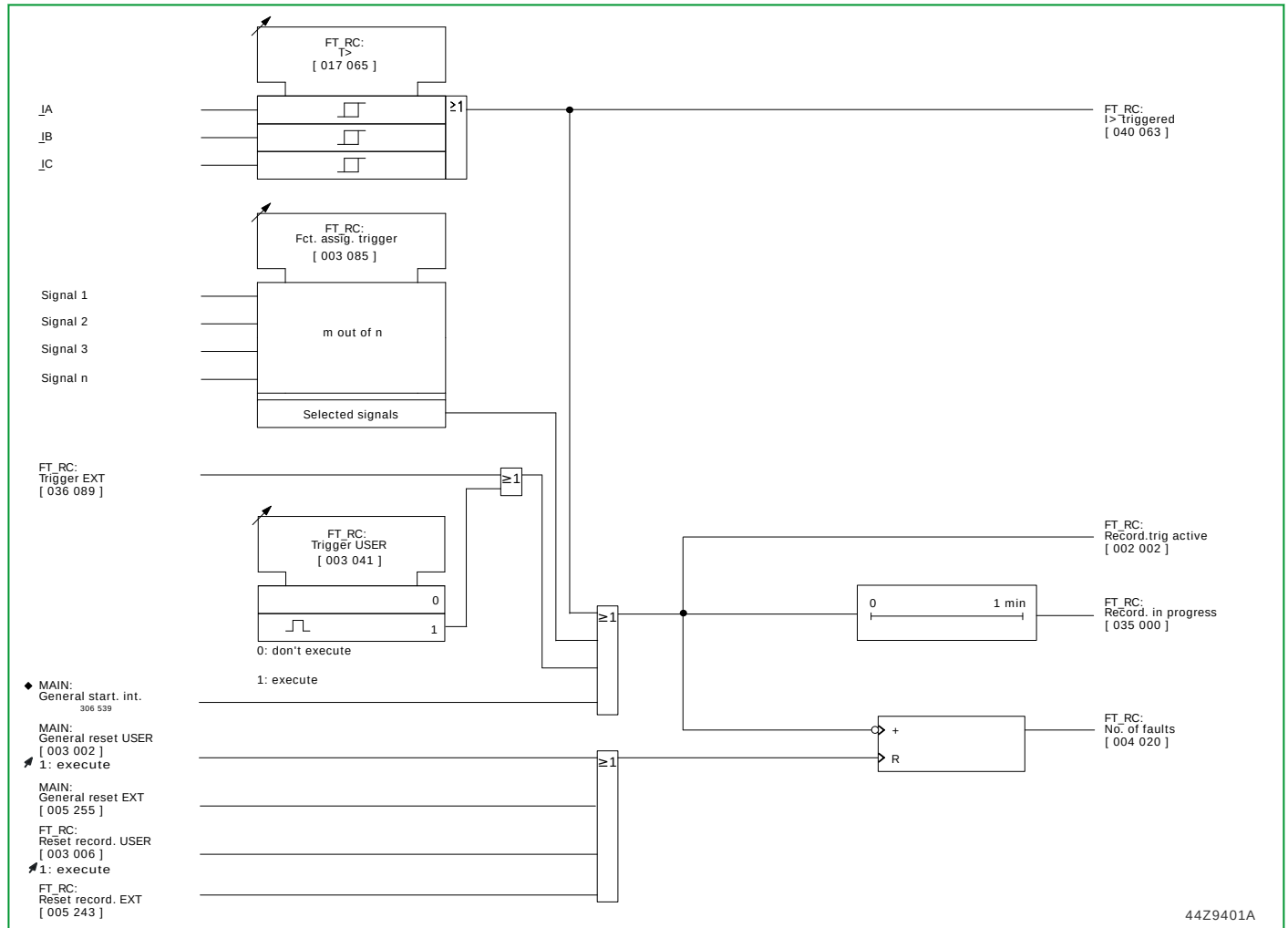


Fig. 3-86: Start of fault recording and fault counter.

A fault exists and fault recording begins if at least one of the following signals is present:

- FT\_RC: I> triggered

In addition, fault recording may also be started manually using setting parameters or externally through an appropriately configured binary signal input, or via a logical “OR” combination of logic signals (*m out of n* parameter).

Faults are counted and identified by sequential numbers.

### 3.18.2 Time Tagging

The date that is assigned to each fault by the internal clock is stored. A fault's individual start or end signals are likewise time-tagged. The date and time assigned to a fault when the fault begins can be read out from the fault memory on the local control panel or through the PC and communication interfaces. The time information (relative to the onset of the fault) that is assigned to the signals can be retrieved from the fault memory or through the PC or communication interfaces.

3.18.3 Fault Recordings

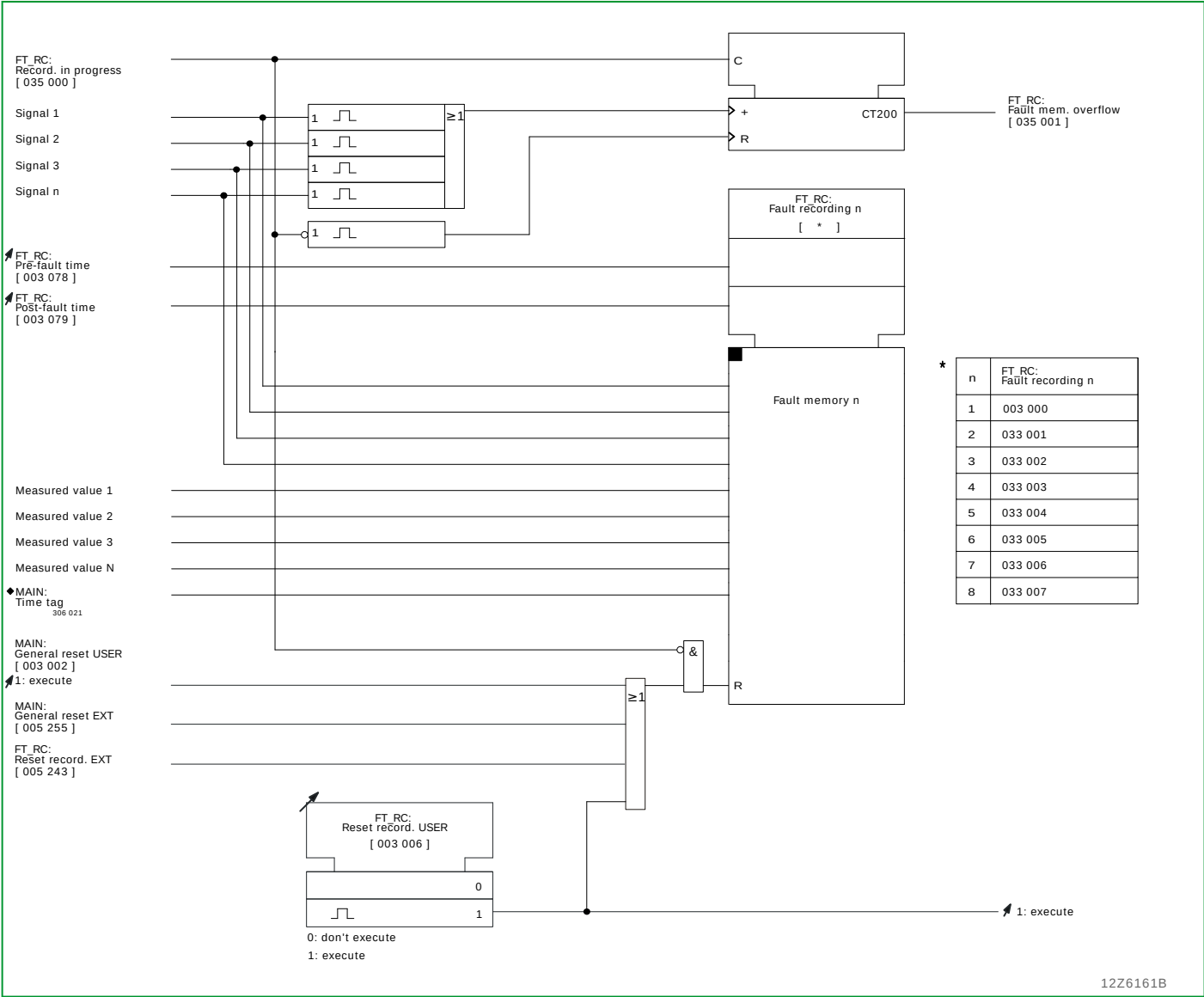


Fig. 3-87: Fault memory.

Protection signals, including the signals during the settable pre-fault and post-fault times, are logged in chronological order with reference to the specific fault. A total of eight faults, each involving a maximum of 200 start or end signals, can be stored in the non-volatile fault memories. After eight faults have been recorded, the oldest fault recording will be overwritten, unless memories have been cleared in the interim. If more than 199 start or end signals have occurred during a single fault, then FT\_RC: Fault mem. overflow will be entered as the last signal. If the time and date are changed during the pre-fault time, the signal FT\_RC: Faulty time tag is generated.

In addition to the fault signals, the measured fault data will also be entered in the fault memory.

The fault recordings can be read from the local control panel or through the PC or communication interfaces.

### 3.18.4 Fault Value Recording

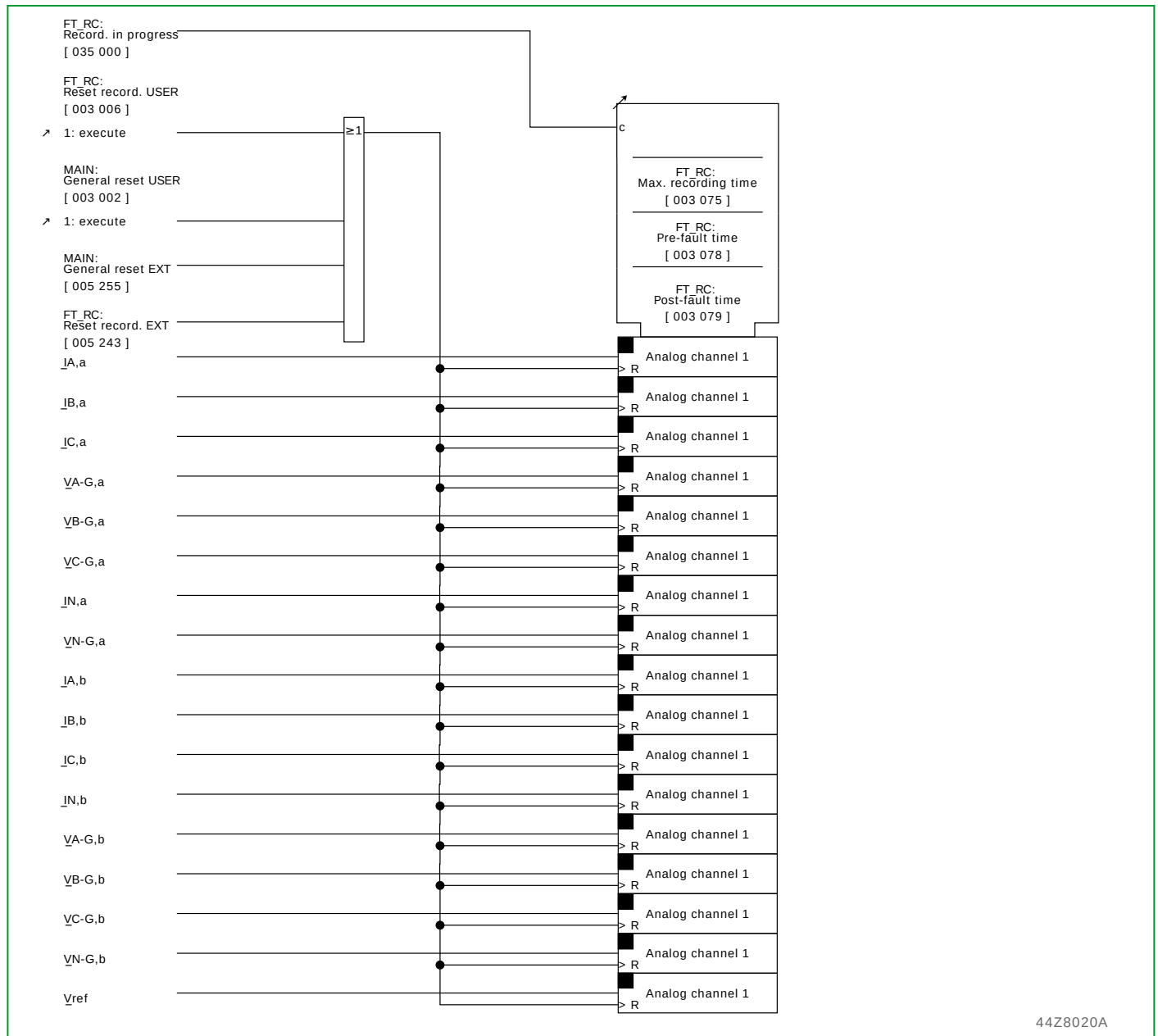


Fig. 3-88: Fault value recording.

The following analog signals are recorded:

- Phase currents
- Phase-to-ground voltages
- Residual currents, measured by the C434 at the T 14 and T 24 transformers
- Neutral-point displacement voltages, measured by the C434 at the T 91 and T 92 transformers
- Reference voltage  $V_{ref}$  (when a synchrocheck VT – featuring transformer T 19 – is fitted).

The signals are recorded before, during and after a fault. The window length for oscillography recording before and after the fault can be set. A maximum time period of 16.4 s is available for recording. This period can be divided among a maximum of eight faults. The maximum recording time per fault can be set. If a fault, including the set pre-fault and post-fault times, lasts longer than the set

maximum recording time, then recording will terminate when the set maximum recording time is reached.

The pre-fault time is exactly adhered to if it is shorter than the set maximum recording time. Otherwise the pre-fault time is set to the maximum recording time minus a sampling increment, and the post-fault time is set to zero.

If the maximum recording time of 16.4 s is exceeded, the analog values for the oldest fault are overwritten, but not the binary values. If more than eight faults have occurred since the last reset, then all data for the oldest fault are overwritten.

The analog oscillography data of the fault record can only be read out through the PC or communication interfaces.

When the supply voltage is interrupted or after a warm restart, the values of all faults remain stored.

### 3.19 Automatic Synchronism Check (Function Group ASC)

The automatic synchronism check (ASC) function allows the C434 to verify that before a close or reclose command is issued synchronism exists between system sections that are to be synchronized (paralleled) or whether one of the system sections is de-energized. In order to check for synchronism, two voltages – generally the voltages on the line and busbar sides – are compared for differences in frequency, angle, and voltage. Connecting the reference voltage transformer will determine which of the system sections will provide the reference voltage (e.g. the line side or the busbar side). The measurement loop must be set to correspond to the reference voltage connection (ASC: Measurement loop PSx) so that the correct measuring voltage is selected for the comparison. In the connection example shown in section “Conditioning of the Measured values” (see [Section 3.13, \(p. 3-91\)](#)), the busbar voltage  $V_{A-B}$  is the reference voltage.

Alternatively the C434 can be set to compare the voltage measured at the T91 voltage transformer against the reference voltage (-/5V), or in case of -/4V & -/4V, the voltage measured at the T91 voltage transformer against the reference voltage measured at the T92 voltage transformer, see connection example below.

*Note: In this context, the voltage measured at the T91 is called "V(T91)" to avoid mixing it up with  $V_{NG}$  which is in most applications measured through T91.*

This feature is enabled by setting ASC: Meas.V(T9x) USER PSx to Yes, or by configuring the parameter ASC: Meas.V(T9x) EXT to some binary input, or a communication protocol signal or programmable logic. Note, however, that in this case it is still the responsibility of the system engineering to make sure that the proper voltage (according to the setting ASC: Measurement loop PSx, see [Fig. 3-90, \(p. 3-131\)](#)) is indeed connected to transformer T9x. Of course, monitoring T9x instead of the three phase-to-ground voltages means to have a single-phase-check instead of three phases. Vref can be chosen in case of -/4V & -/4V by setting ASC: Select mod. Vref PSx.

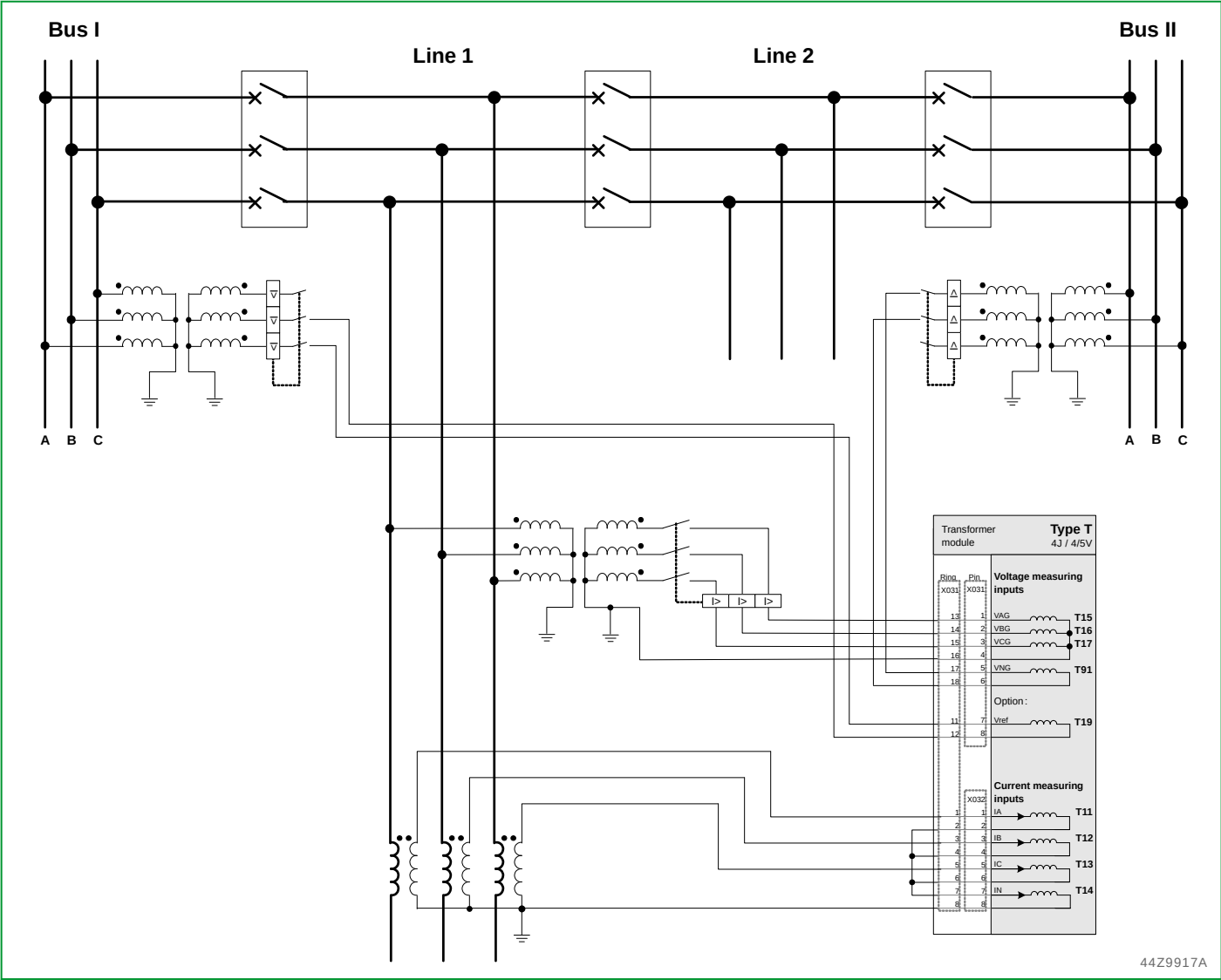


Fig. 3-89: Connecting the C434 measuring circuits for Synchronism Check 1.5CB application.

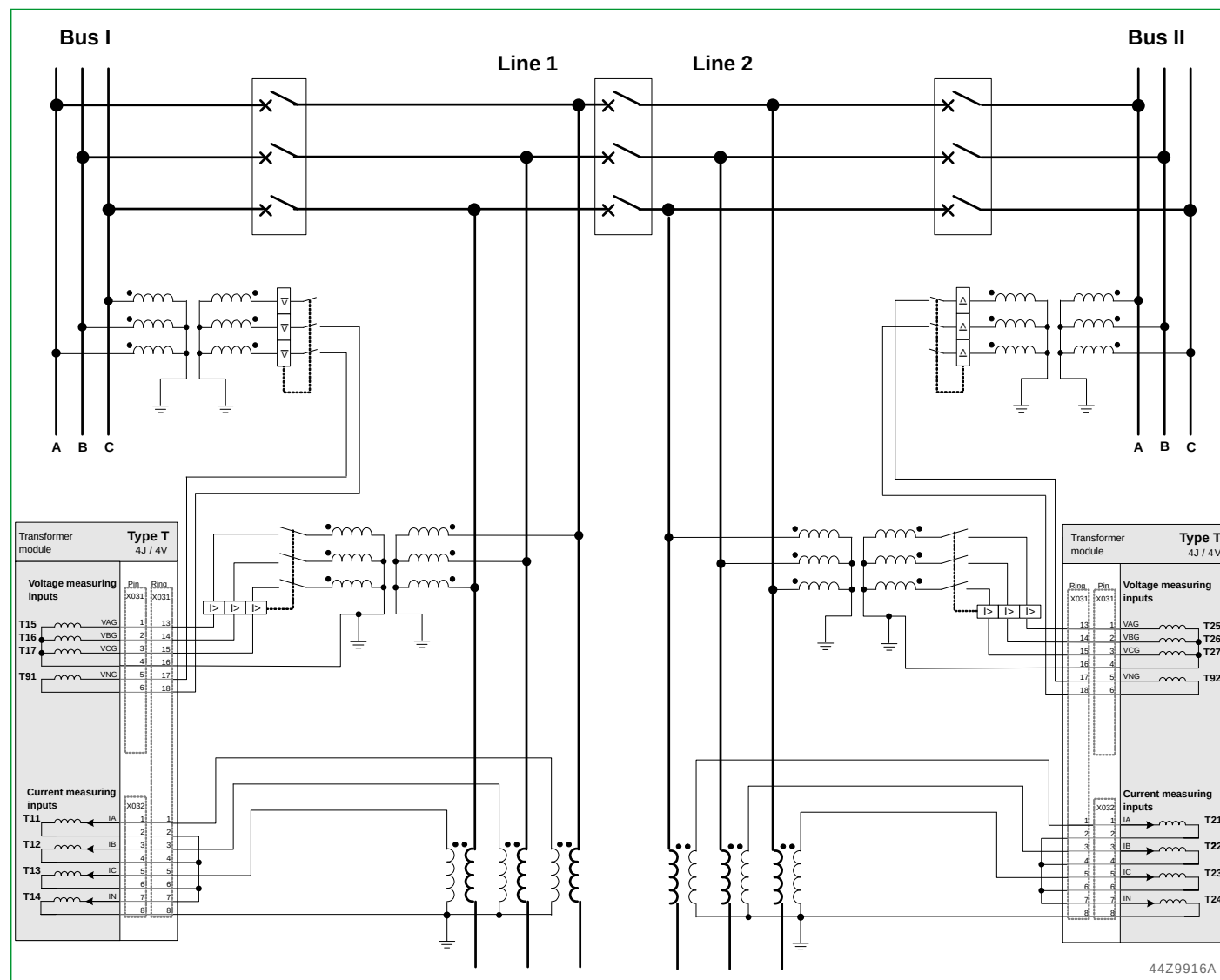
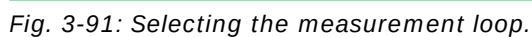


Fig. 3-90: Connecting the C434 measuring circuits for Synchronism Check with two three phase systems.





3.19.1 Disabling and Enabling the ASC Function

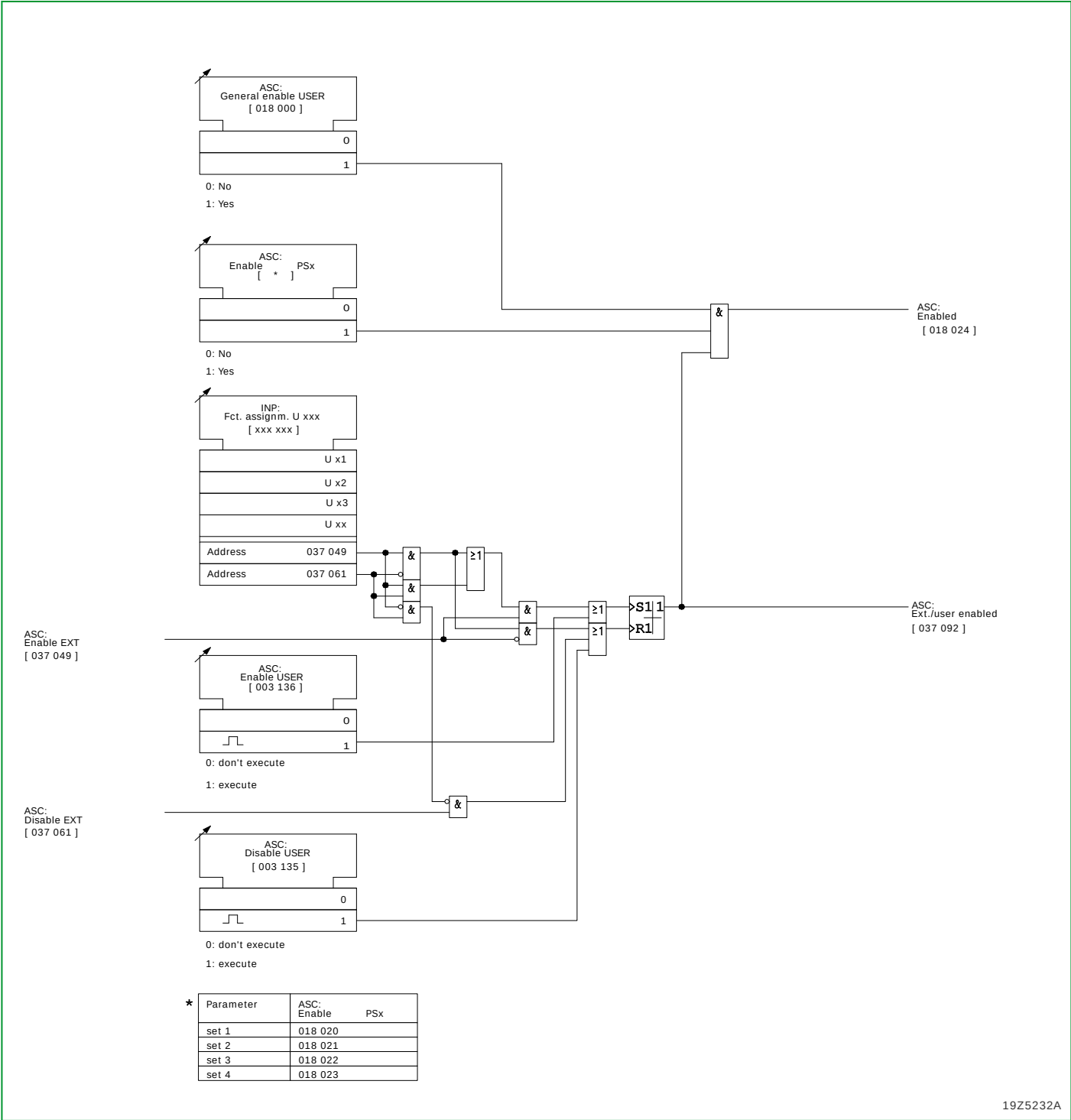


Fig. 3-92: Enabling/disabling the Automatic Synchronism Check function.

The function can be disabled or enabled using setting parameters or through binary signal inputs.

The function is enabled generally (independently of the parameter subsets) at ASC: General enable USER. It is enabled as a function of a parameter subset via ASC: Enable PSx. If these enabling functions have been activated, ASC can be disabled or enabled using setting parameters or through appropriately configured binary signal inputs. Parameters and configured binary signal inputs have equal status. If only the ASC: Enable EXT function is assigned to a binary

signal input, then the ASC will be enabled by a positive edge of the input signal and disabled by a negative edge. If only the ASC: Disable EXT function has been assigned to a binary signal input, then a signal at this input will have no effect.

If the ASC function is disabled an activation enable will always be issued.

3.19.2                    ASC Readiness and Blocking

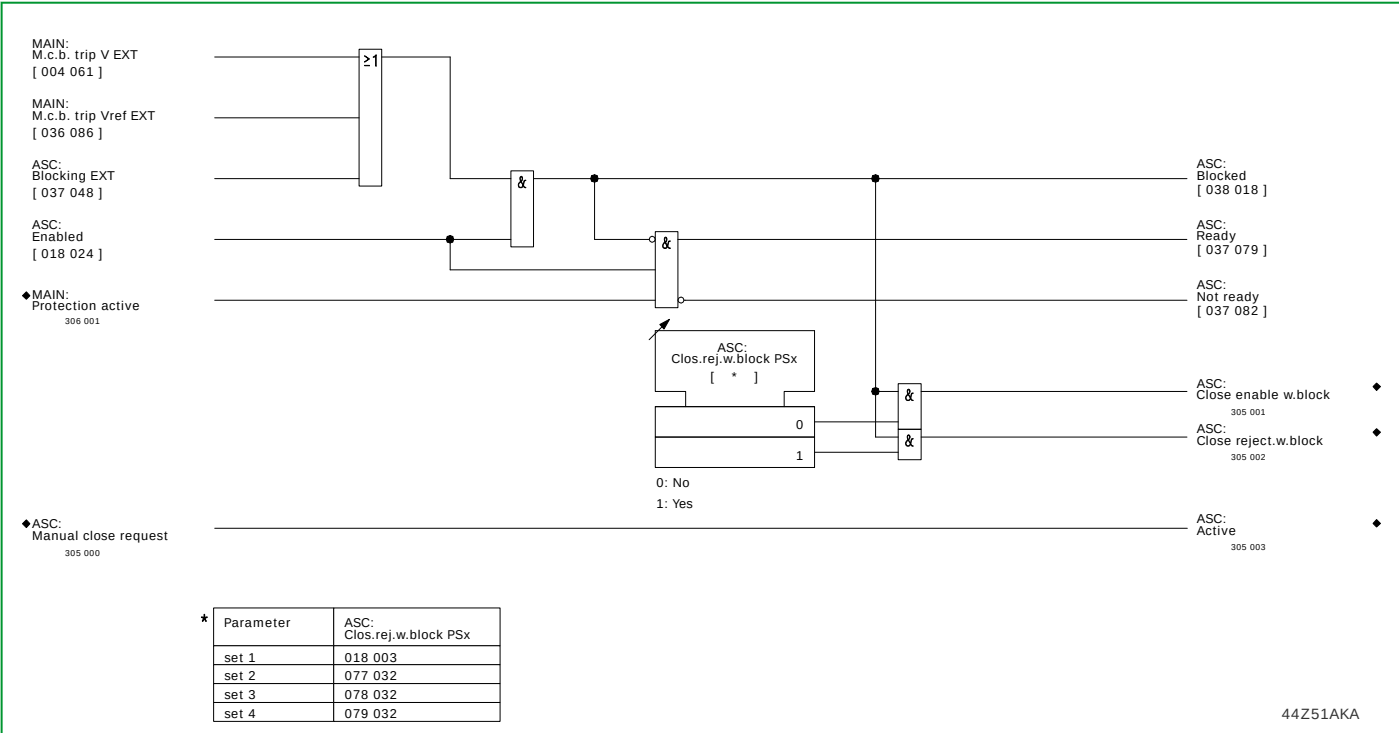


Fig. 3-93: ASC readiness and blocking.

The ASC function is ready if it is activated and enabled and if there is no blocking. Blocking can be brought about if a voltage transformer m.c.b. was tripped or by an appropriately configured binary signal input. The user can specify whether closing or reclosing will always be enabled or not (reclosure with or without a check) when the ASC function is blocked.

### 3.19.3 Close Request

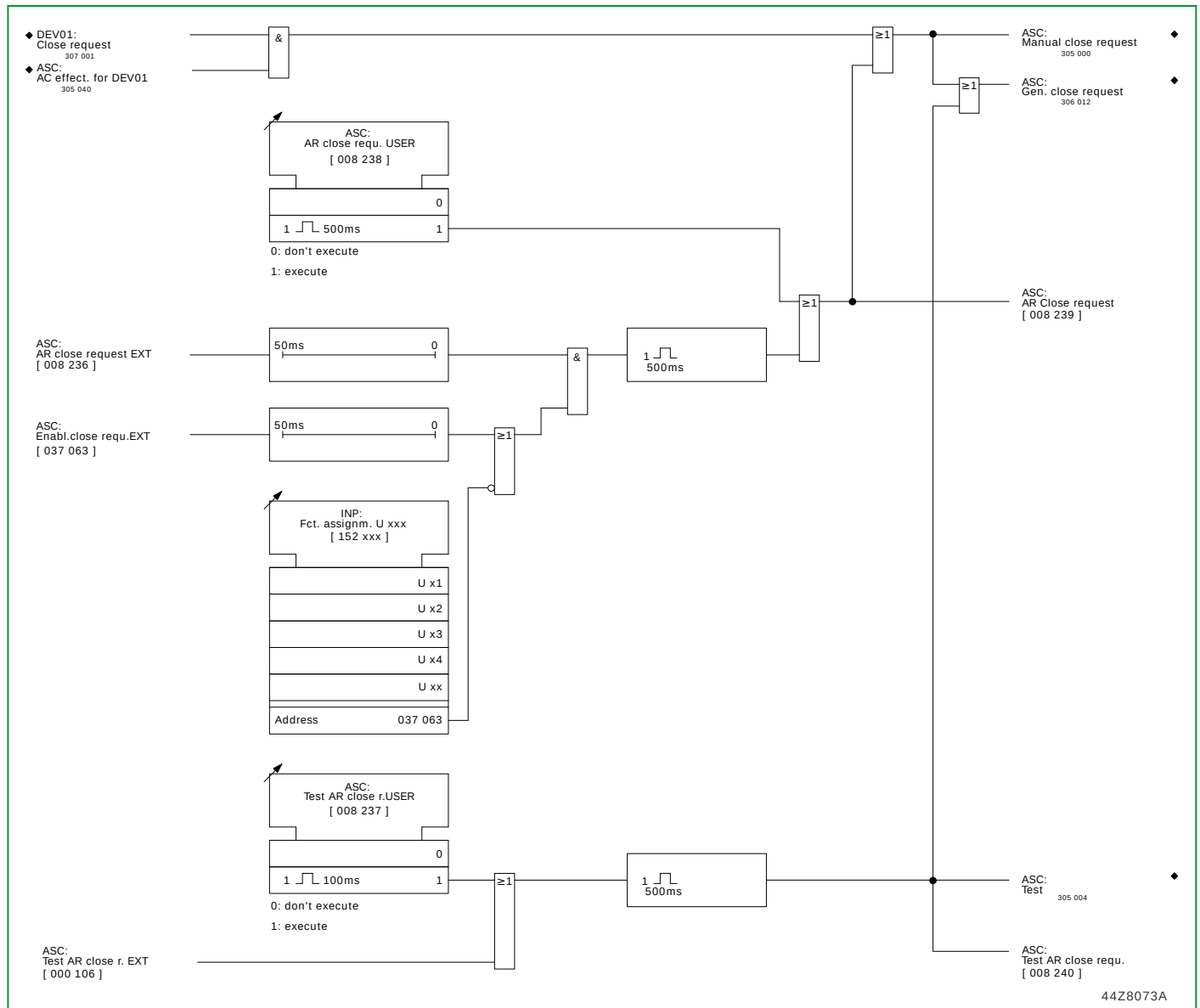


Fig. 3-94: Close request for autoreclose control.

The ASC function can be triggered by setting parameters, from an appropriately configured binary signal input (ASC: Enabl.close requ.EXT), or via a close request from the control function.

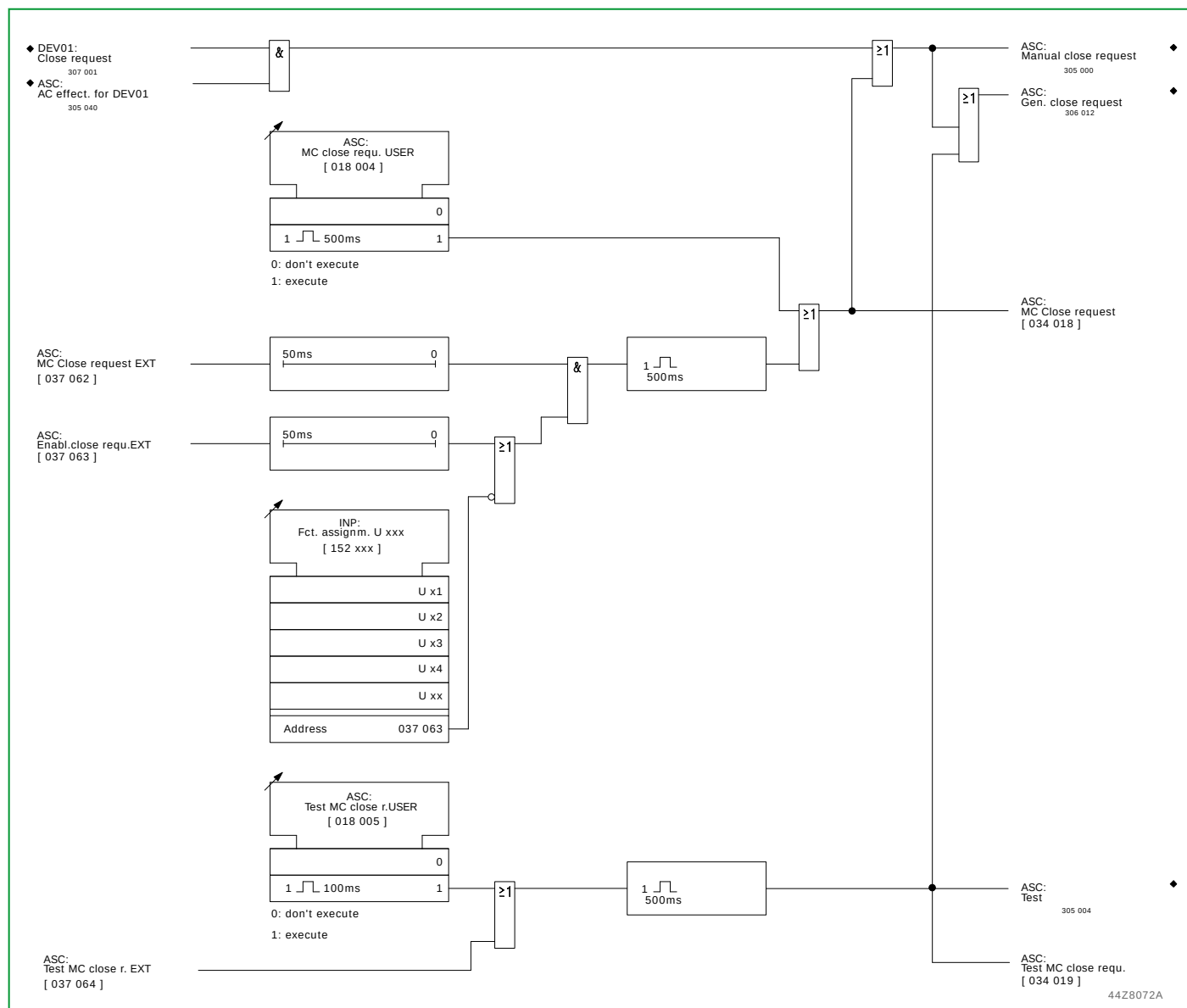


Fig. 3-95: Close request for manual close command.

The ASC operative time is started with the close request. If the close enable is issued before the ASC operative time has elapsed, the close command is issued. Otherwise an ASC: Close rejection signal is generated for 100 ms.

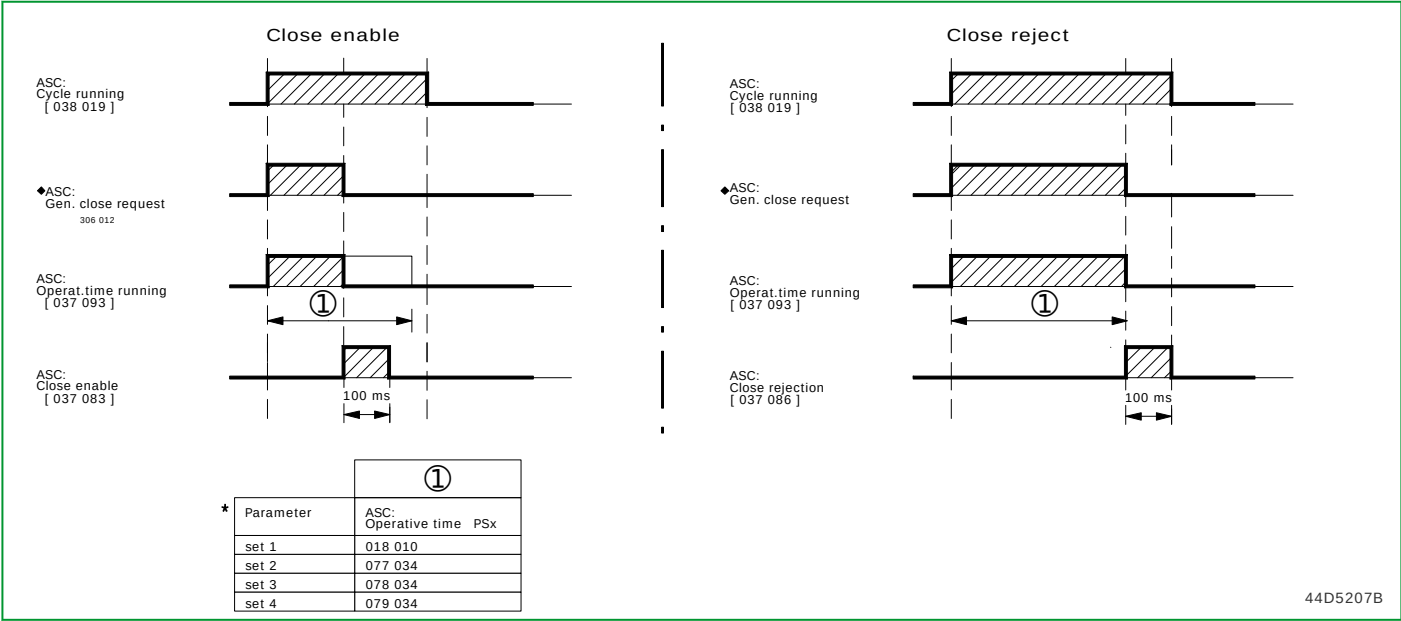


Fig. 3-96: Signal flow for a close enable and a close rejection.

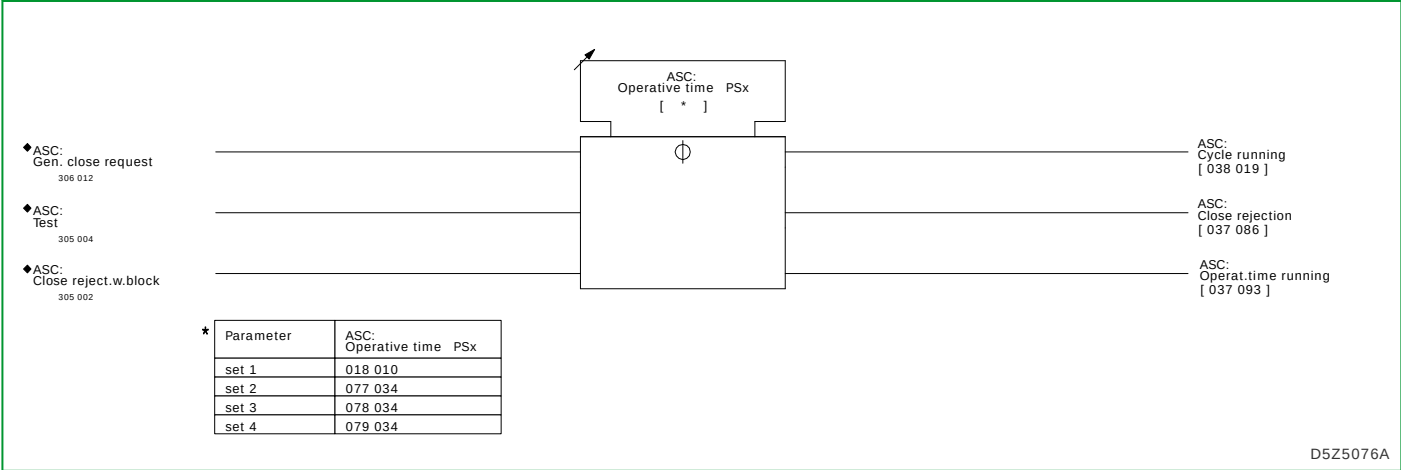


Fig. 3-97: ASC sequence control.

## 3.19.4

## Extended Settings for the Close Enable Conditions

The close enable conditions can now be set separately for auto-reclose control and manual close command. This makes it possible to select different operating modes as well as different tolerance ranges.

| Close enable conditions for Auto-reclose control | Close enable conditions for Manual close command |
|--------------------------------------------------|--------------------------------------------------|
| ASC: AR op. mode PSx                             | ASC: MC op. mode PSx                             |
| ASC: AR with tCB PSx                             | ASC: MC with tCB PSx                             |
| ASC: AR Op.mode v-chk.PSx                        | ASC: MC op.mode v-chk.PSx                        |
| ASC: AR V> volt.check PSx                        | ASC: MC V> volt.check PSx                        |
| ASC: AR V< volt.check PSx                        | ASC: MC V< volt.check PSx                        |
| ASC: AR tmin v-check PSx                         | ASC: MC tmin v-check PSx                         |
| ASC: AR V> sync.check PSx                        | ASC: MC V> sync.check PSx                        |
| ASC: AR Delta Vmax PSx                           | ASC: MC Delta Vmax PSx                           |
| ASC: AR Delta f max PSx                          | ASC: MC Delta f max PSx                          |
| ASC: AR Delta phi max PSx                        | ASC: MC Delta phi max PSx                        |
| ASC: AR tmin sync.chk PSx                        | ASC: MC tmin sync.chk PSx                        |

The automatic reclosure setting parameters become active when a close request is issued by the integrated ARC (for an RRC, HSR or TDR) or by a close request from an external ARC device sent to the binary signal input function ASC: AR close request EXT.

3.19.4.1 Continuous check

Continuous check for close enable conditions can now be set via (027 093) ASC: Continuous check PSx. When *With AR Parameter* or *With MC Parameter* is selected and ASC is ready, the ASC function checks the voltages continuously. In this case, operating time (018 010) ASC: Operative time PSx and close requests (AR close request, Test AR close request, MC close request, Test MC close request and DEV0x close request) are ignored and close enable signals are continuously updated. Measured values are obtained and calculated continuously, but counters are not updated.

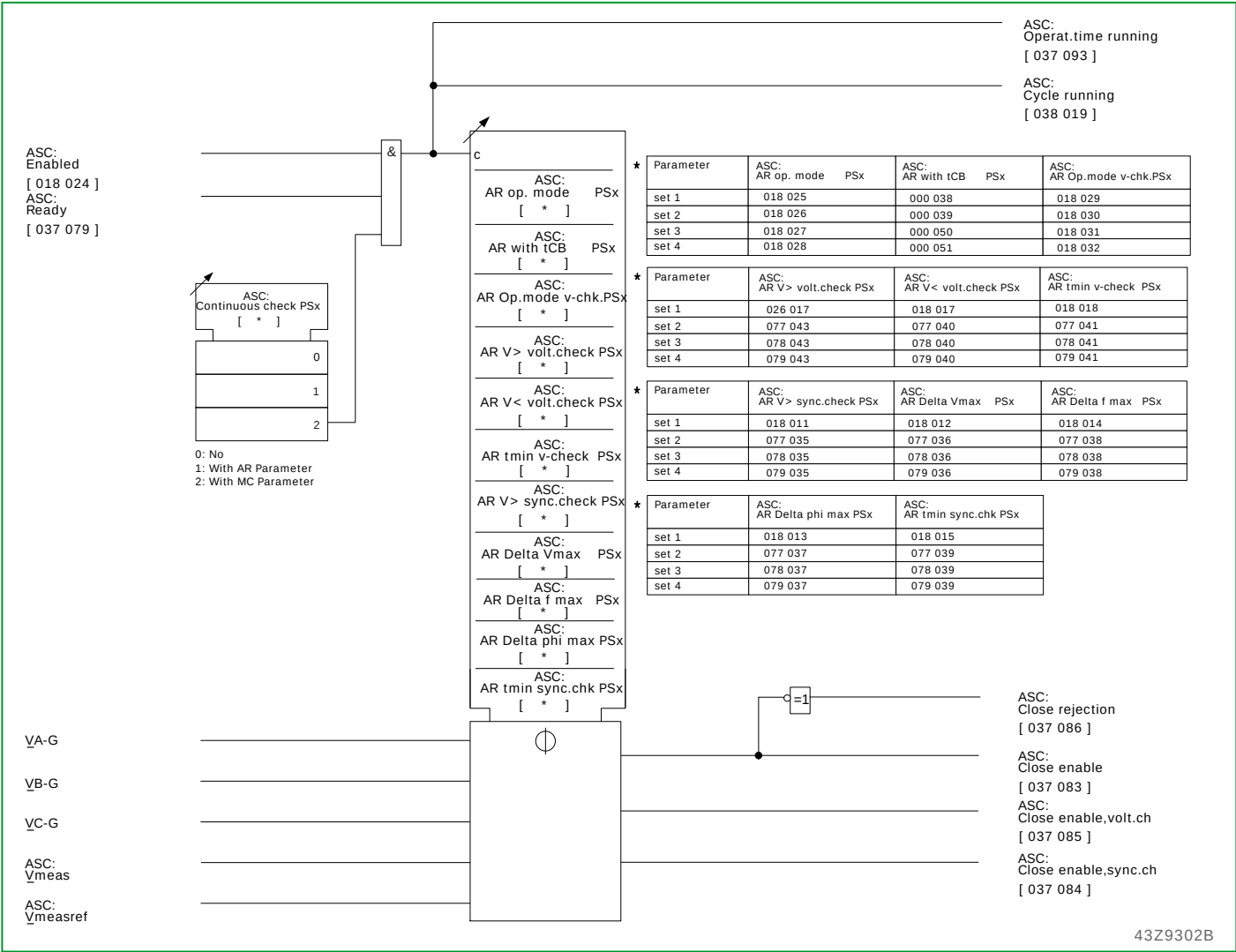


Fig. 3-98: Continuous check for auto-reclose control.

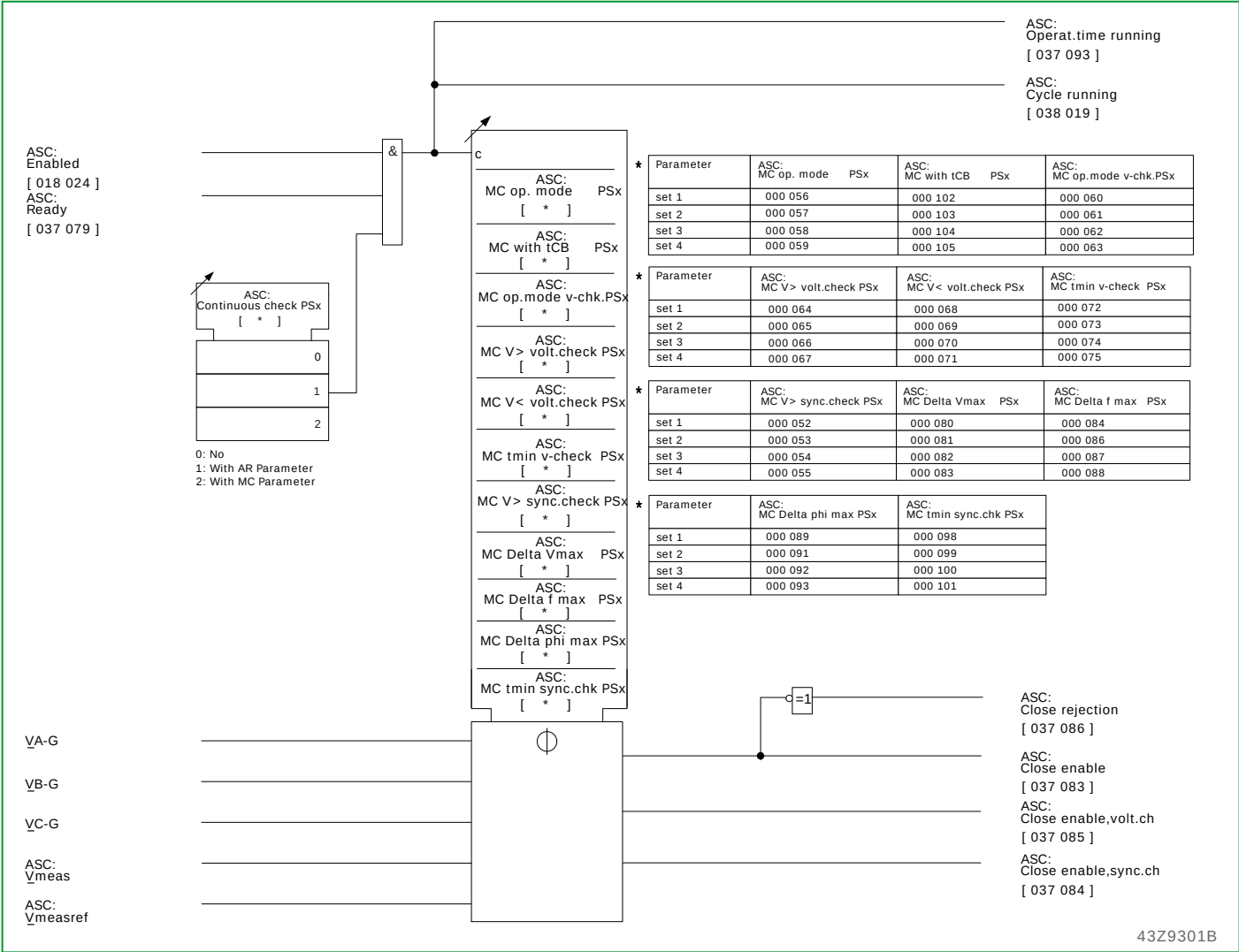


Fig. 3-99: Continuous check for manual close control.



### 3.19.5 Considering the CB Close Time

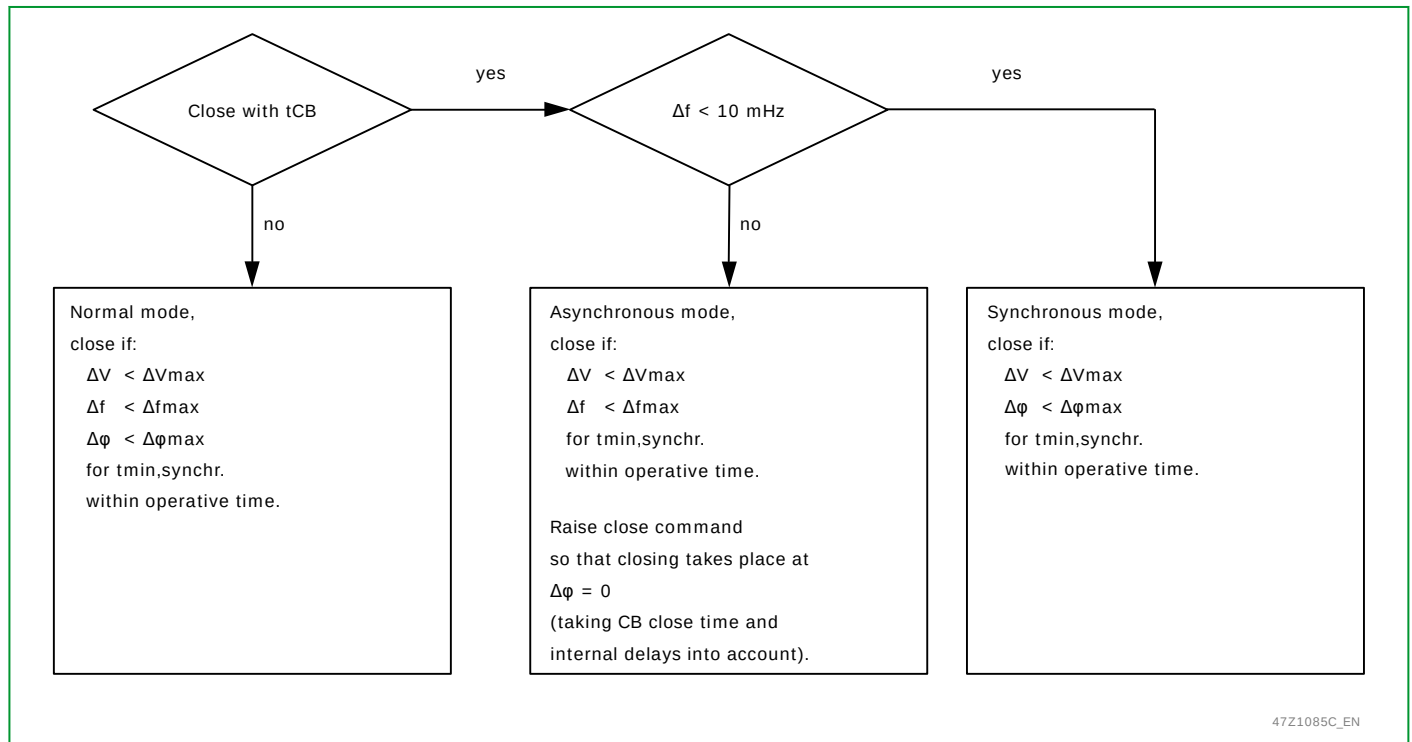


Fig. 3-100: Functional sequence and close conditions for the Synchronism check.

In slightly asynchronous power systems, setting ASC: AR with tCB PSx to Yes makes it possible to consider the circuit breaker closing time when issuing a close command.

The condition for “slightly asynchronous power systems” is given if the difference in frequencies lies within the range of  $10 \text{ mHz} < \Delta f < \Delta f_{\max}$ . If this condition and the voltage condition ( $\Delta V < \Delta V_{\max}$ ) are met then the next point in time is continuously calculated at which the phasors for  $V_{\text{ref}}$  and the corresponding voltage of the three-phase system are in phase (e.g. difference in voltage phase angles approaches  $0^\circ$ ). The close command, allowing for the set CB close time MAIN: tCB,close is then issued sooner.

### 3.19.6 ASC Operating Modes

The criteria for a close enable are determined by the ASC operating mode setting – (018 025) ASC: AR op. mode PSx or (000 056) ASC: MC op. mode PSx, resp.

The following operating mode settings are possible:

- Voltage-checked (see [Section 3.19.6.1, \(p. 3-142\)](#))
- Synchronism-checked (see [Section 3.19.6.2, \(p. 3-145\)](#))
- Voltage/synchronism-checked (see [Section 3.19.6.3, \(p. 3-147\)](#))

3.19.6.1 Voltage-Checked Close Enable

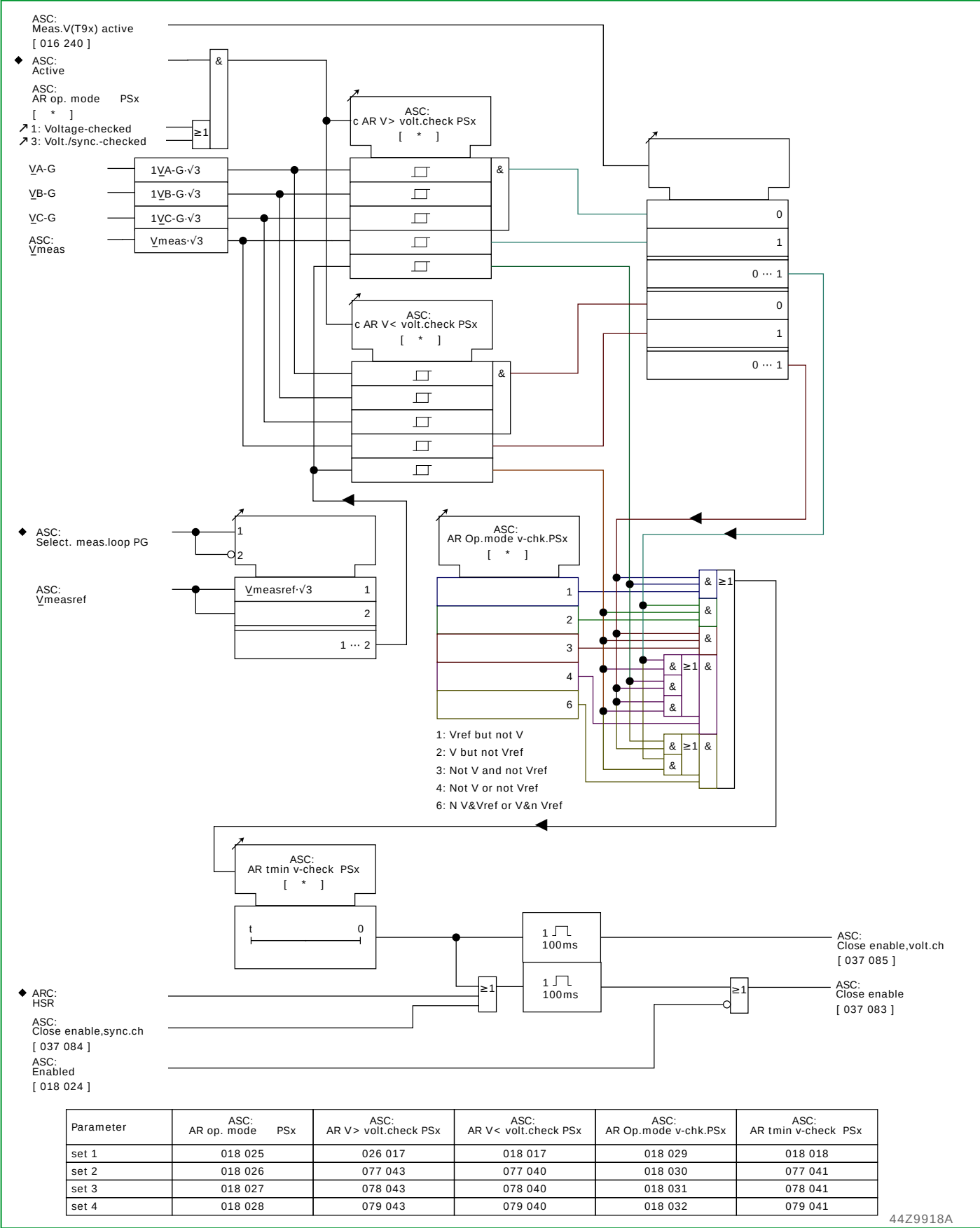


Fig. 3-101: Voltage-checked close enable for autoreclose control.

The synchronism-checked close enable can be bypassed using the voltage-checked close enable without affecting the former.

For this purpose the voltages are monitored to determine whether they exceed or fall below the set threshold values.

|                                     |                                     |
|-------------------------------------|-------------------------------------|
| ASC: AR $V > \text{volt.check PSx}$ | ASC: MC $V > \text{volt.check PSx}$ |
| ASC: AR $V < \text{volt.check PSx}$ | ASC: MC $V < \text{volt.check PSx}$ |

Depending on the operating mode selected for the voltage check, the selected measured voltages and reference voltage (see Fig. 3-91, (p. 3-132)) need to exceed or fall below the set value in order to meet the condition for voltage-checked closing. If the conditions corresponding to the set operating mode for the voltage synchronism check are met, then the close enable is issued after the set minimum time has elapsed.

|                                        |                                        |
|----------------------------------------|----------------------------------------|
| ASC: AR $t_{\min} \text{ v-check PSx}$ | ASC: MC $t_{\min} \text{ v-check PSx}$ |
|----------------------------------------|----------------------------------------|

The following operating modes for voltage checking can be selected separately for each parameter subset:

- *Vref but not V*
- *V but not Vref*
- *Not V and not Vref*
- *Not V or not Vref*
- *N V&Vref or V&n Vref*

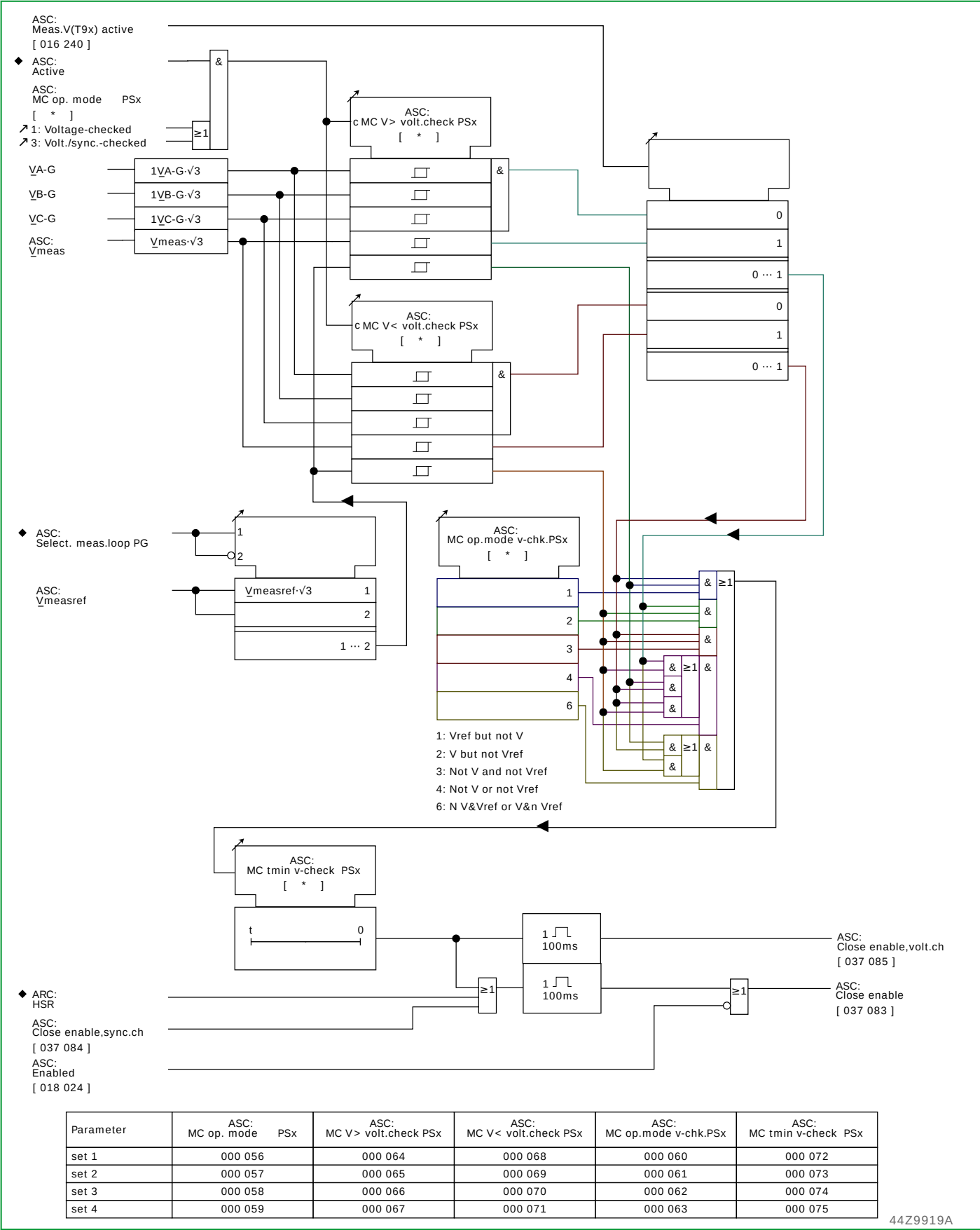


Fig. 3-102: Voltage-checked close enable for autoreclose control for manual close control.

## 3.19.6.2 Synchronism-Checked Close Enable

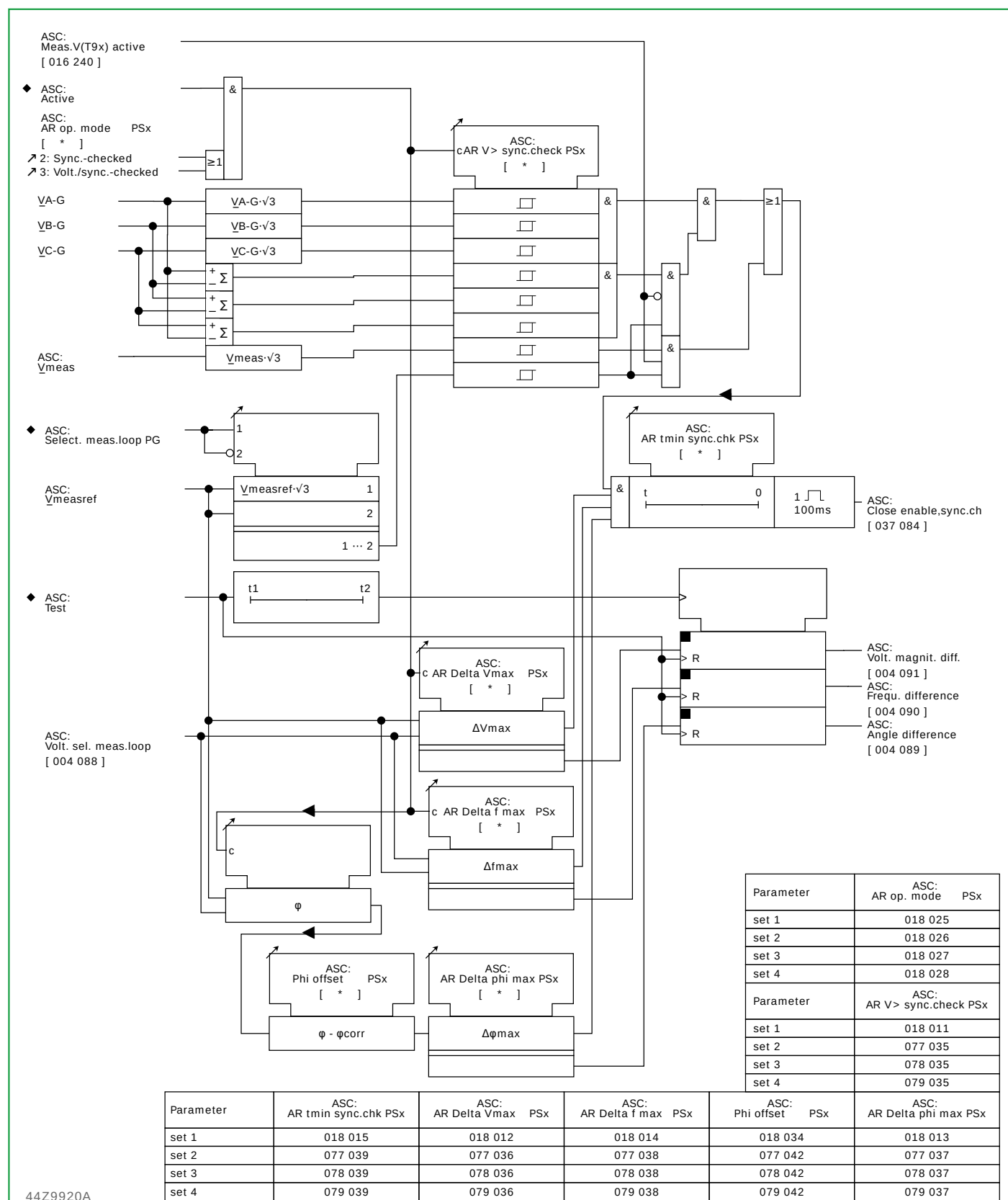


Fig. 3-103: Synchronism-checked close enable for auto-reclose control.

Before a close enable signal is issued, the ASC checks the voltages for synchronism. Synchronism is recognized if the following conditions are met simultaneously:

- The selected measured voltages and reference voltage (see Fig. 3-91, (p. 3-132)) must exceed the set threshold value.

|                           |                           |
|---------------------------|---------------------------|
| ASC: AR V> sync.check PSx | ASC: MC V> sync.check PSx |
|---------------------------|---------------------------|

- The difference in magnitude between measuring voltage and reference voltage must not exceed the set threshold value.

|                        |                        |
|------------------------|------------------------|
| ASC: AR Delta Vmax PSx | ASC: MC Delta Vmax PSx |
|------------------------|------------------------|

- The frequency difference between measuring voltage and reference voltage must not exceed the set threshold value.

|                         |                         |
|-------------------------|-------------------------|
| ASC: AR Delta f max PSx | ASC: MC Delta f max PSx |
|-------------------------|-------------------------|

- The angle difference between measuring voltage and reference voltage must not exceed the set threshold value. (In these comparisons the set offset angle ASC: Phi offset PSx is taken into account.)

|                           |                           |
|---------------------------|---------------------------|
| ASC: AR Delta phi max PSx | ASC: MC Delta phi max PSx |
|---------------------------|---------------------------|

If these conditions are met for at least the set time ASC: AR tmin sync.chk PSx or ASC: MC tmin sync.chk PSx, respectively, then a close enable signal is issued. The ASC operating time for the determination of differences in voltage, angle, and frequency is approximately 100 ms.

The voltage magnitude difference, angle difference, and frequency difference are stored as measured synchronism data at the time the close request is issued. In the event of another close request, they are automatically overwritten by the new data.

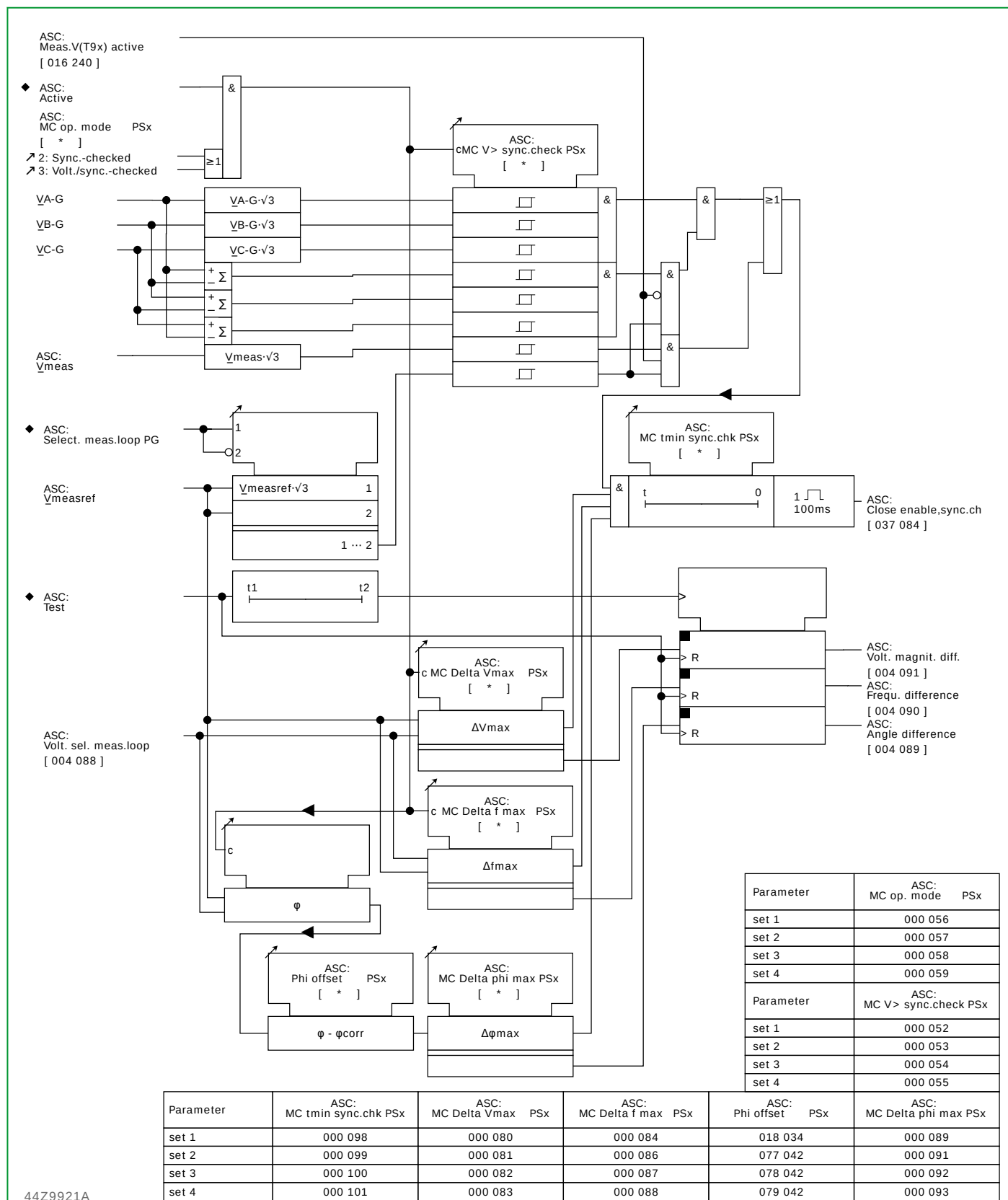


Fig. 3-104: Synchronism-checked close enable for manual close command.

## 3.19.6.3

## Voltage/Synchronism-Checked Close Enable

If this setting has been selected, then the close enable signal is issued if the conditions for voltage- or synchronism-checked closing are met.

3.19.7 Testing the ASC Function

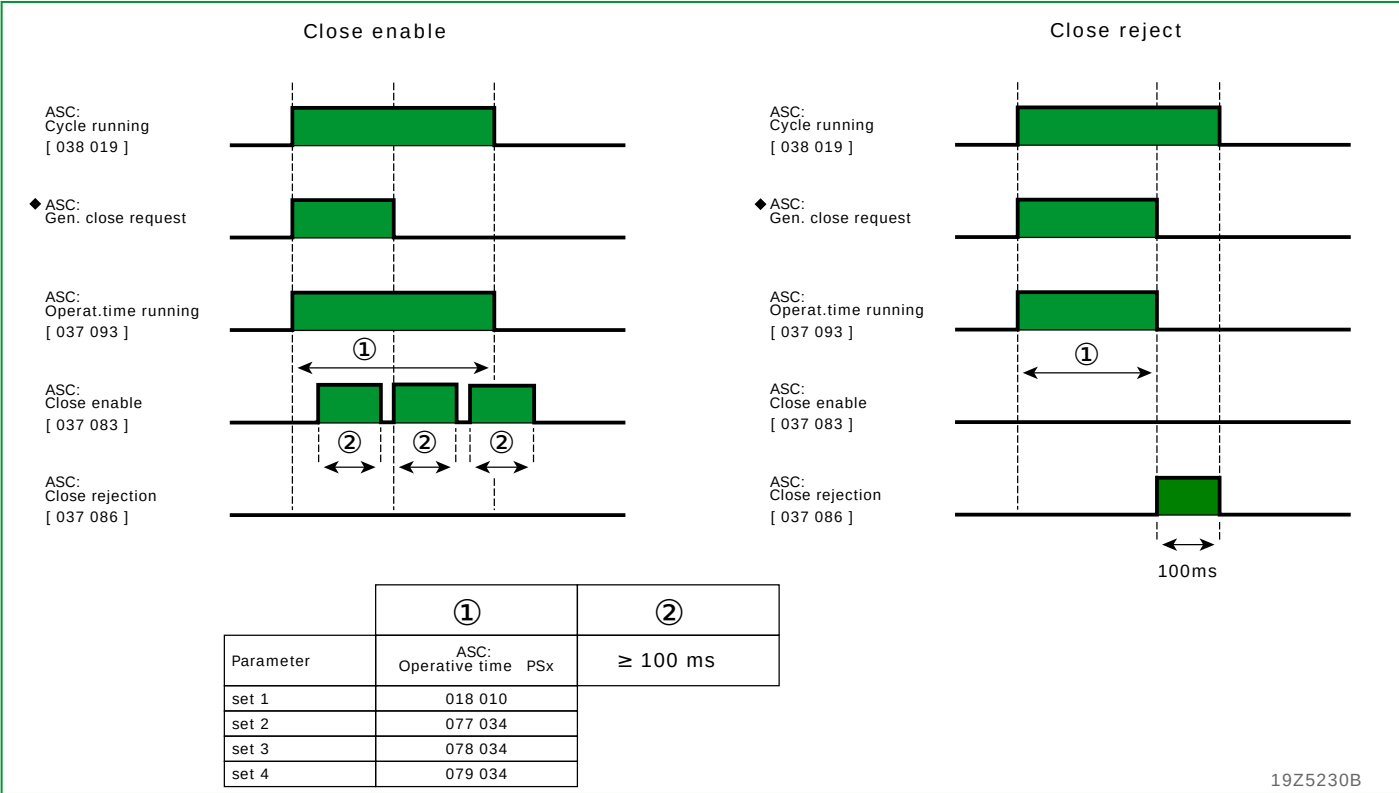


Fig. 3-105: ASC sequence during testing.

For test purposes a close request can be issued via a setting parameters or an appropriately configured binary signal input (see Fig. 3-105, (p. 3-148)). In this case no close command is issued and it is not counted.

Separate triggering parameters are available for testing the function with parameters for manual (MC) and automatic (AR) reclosure.

| Triggering parameter for auto-reclose control | Triggering parameter for manual close command |
|-----------------------------------------------|-----------------------------------------------|
| ASC: AR close requ. USER                      | ASC: MC close requ. USER                      |
| ASC: AR close request EXT                     | ASC: MC Close request EXT                     |
| ASC: AR Close request                         | ASC: MC Close request                         |
| ASC: Test AR close r.USER                     | ASC: Test MC close r.USER                     |
| ASC: Test AR close r. EXT                     | ASC: Test MC close r. EXT                     |
| ASC: Test AR close requ.                      | ASC: Test MC close requ.                      |

The ASC cycle and the operating time are started by the test close request. The network synchronism is checked during the whole operating time and ASC: Close enable is set accordingly. If at the end of the operate time no network synchronism is registered, a 100 ms signal ASC: Close rejection is issued.



3.19.8

Integrating the ASC Function into the Control and Monitoring of Switchgear Units

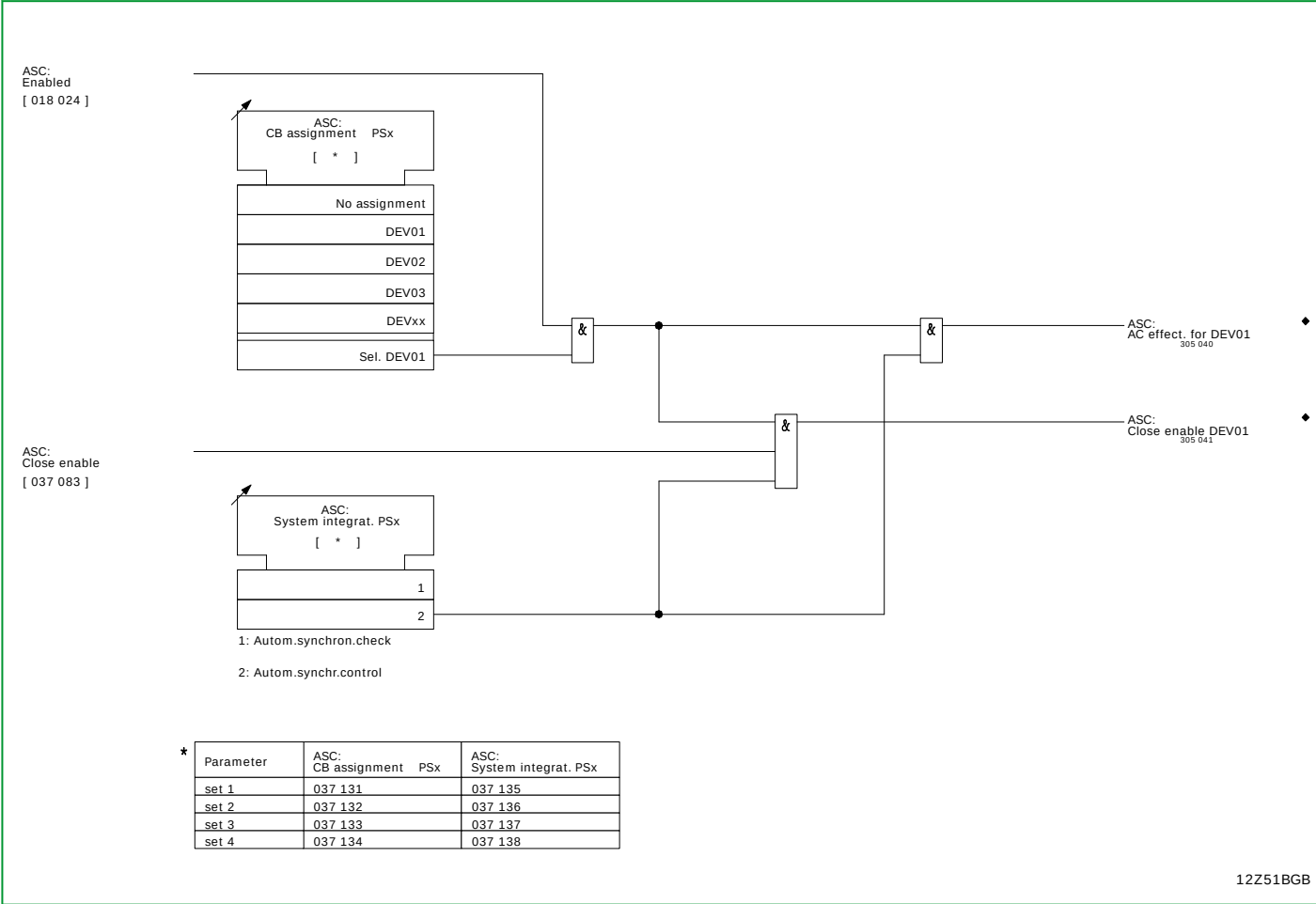


Fig. 3-106: Integrating the ASC function into the control and monitoring of switchgear units.

ASC triggering by a close request from the control functions is also possible. This requires that the circuit breaker is assigned to an external device and that the ASC system integration is set to *Autom.synchr.control*. If the control function issues a close request then the close command for the circuit breaker requires the ASC: Close enable (see [Section 3.23.6.5, \(p. 3-179\)](#)).

However if ASC: System integrat. PSx is set to *Autom.synchron.check* ASC will not interfere with any switching commands. Data generated and continuously updated by the ASC function is transmitted – when configurations have been set accordingly – to the central control station, where operators may make decisions as to which external device is to be given a switching command.

3.19.9 Measured Values Obtained by ASC

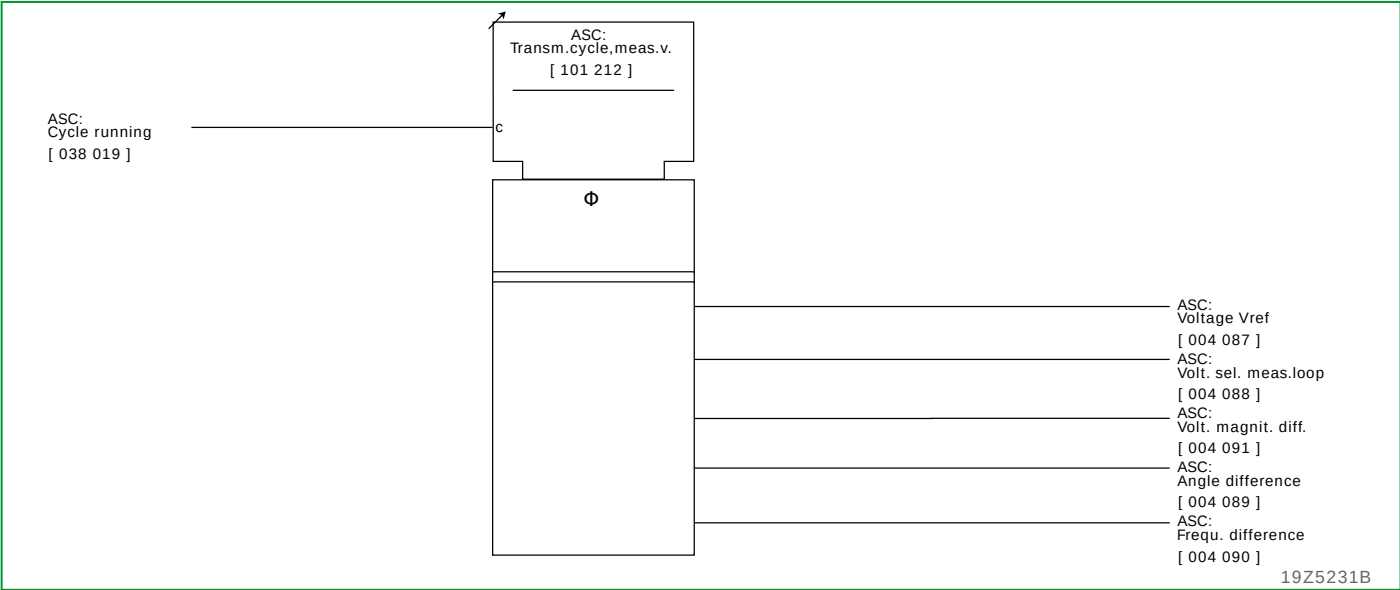


Fig. 3-107: Measured values obtained by ASC.

The following measured values are obtained and calculated during an ASC cycle and are transmitted during a set cycle time:

- Voltage from the reference voltage channel
- Voltage from the selected measuring loop
- Difference in phase voltage magnitudes
- Difference in phase angles
- Frequency difference

Outside of the ASC cycle the measured values have the status of *Not measured*.

3.19.10 ASC Counters

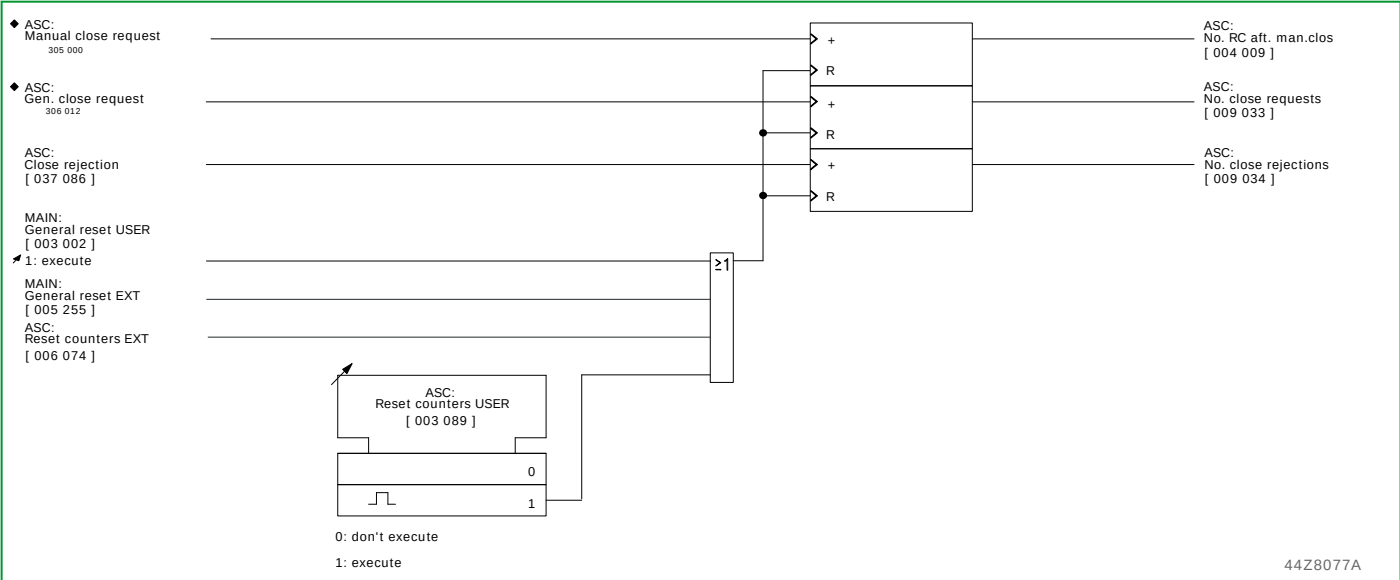


Fig. 3-108: ASC counters.

The following ASC signals are counted:

- Number of reclosures after a close request via setting parameters or an appropriately configured binary signal input
- Number of close requests
- Number of close rejections

The counters can either be reset individually (at the address at which they are displayed) or as a group.

3.20 Limit Value Monitoring (Function Group LIMIT)

Limit Value Monitoring is not designed to be a high-speed protection function; it is only applied for monitoring and signaling purposes as well as to monitor temperature limits.

3.20.1 Enable/Disable the Limit Value Monitoring Function

The Limit Value Monitoring function can be disabled or enabled via setting parameters.

3.20.2 Monitoring the Linearized Measured DC Values

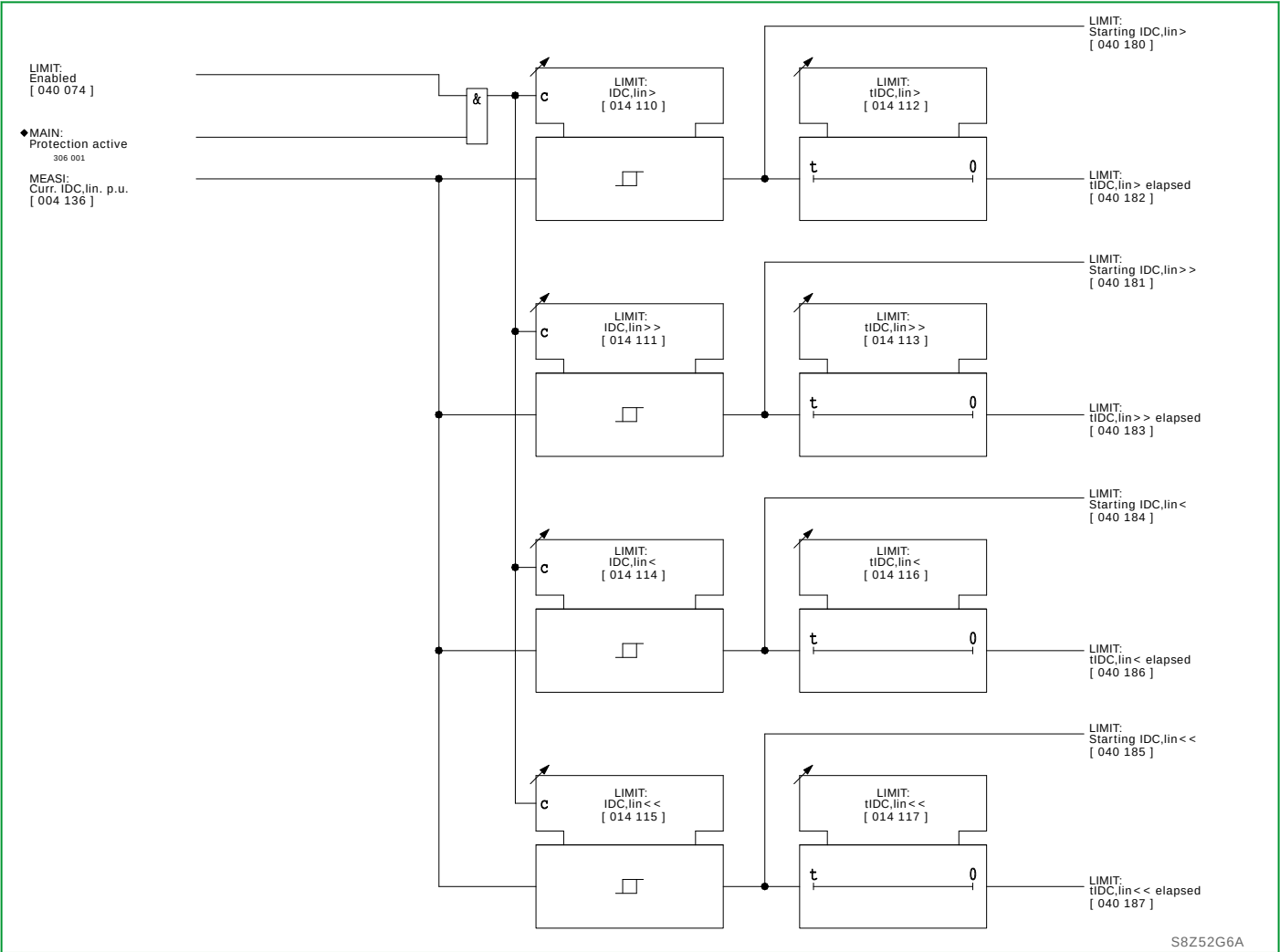


Fig. 3-109: Monitoring the linearized measured DC values.

The direct current, linearized by the analog measured data input, is monitored by two stages to determine if it exceeds or falls below set thresholds. If any of the measured values exceed or fall below the corresponding upper or lower limit values then a signal is issued after the associated time period has elapsed.

### 3.20.3 Monitoring the Measured “PT 100” Temperature Value

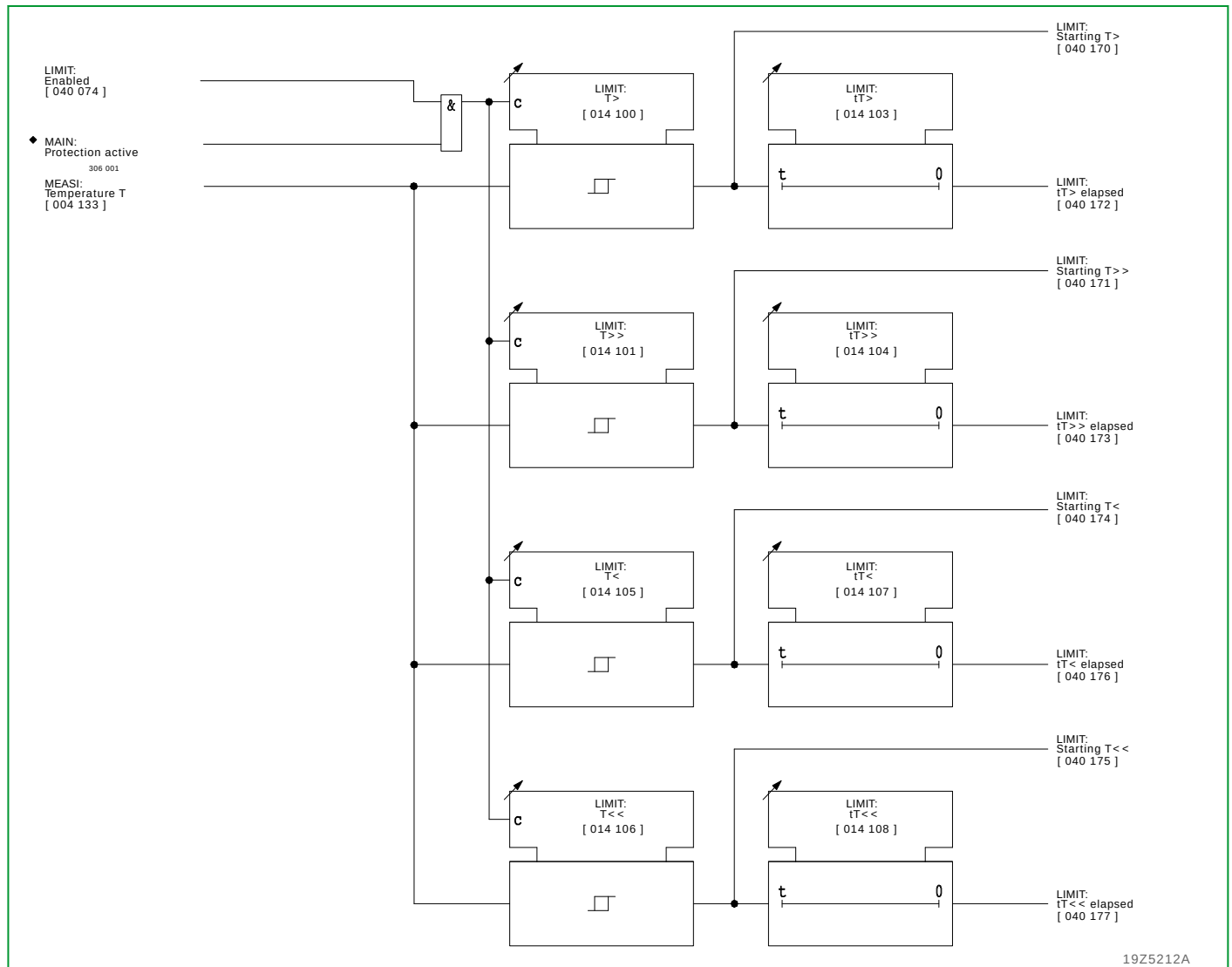


Fig. 3-110: Monitoring the measured “PT 100” temperature value.

The temperature value that is measured by the C434 with a resistance thermometer (PT 100) connected to the analog (I/O) module Y, is monitored by two stages to determine whether it exceeds or falls below the corresponding upper or lower limit values. If any of the measured values exceed or fall below the corresponding upper or lower limit values then a signal is issued after the associated time period has elapsed.

3.21 Limit Value Monitoring of Currents and Voltages (Function Groups LIM\_1 and LIM\_2)

The limit value monitoring functions LIM\_1 and LIM\_2 monitor the currents and voltages.

Function group LIM\_1 is assigned to the transformer module T at slot position 03-04.

Function group LIM\_2 is assigned to the transformer module T at slot position 05-06 and is available for the 84 TE case only.

3.21.1 Enabling or disabling limit value monitoring

The limit value monitoring functions LIM\_1 and LIM\_2 can be disabled or enabled via setting parameters.

3.21.2 Monitoring Phase Currents and Phase Voltages

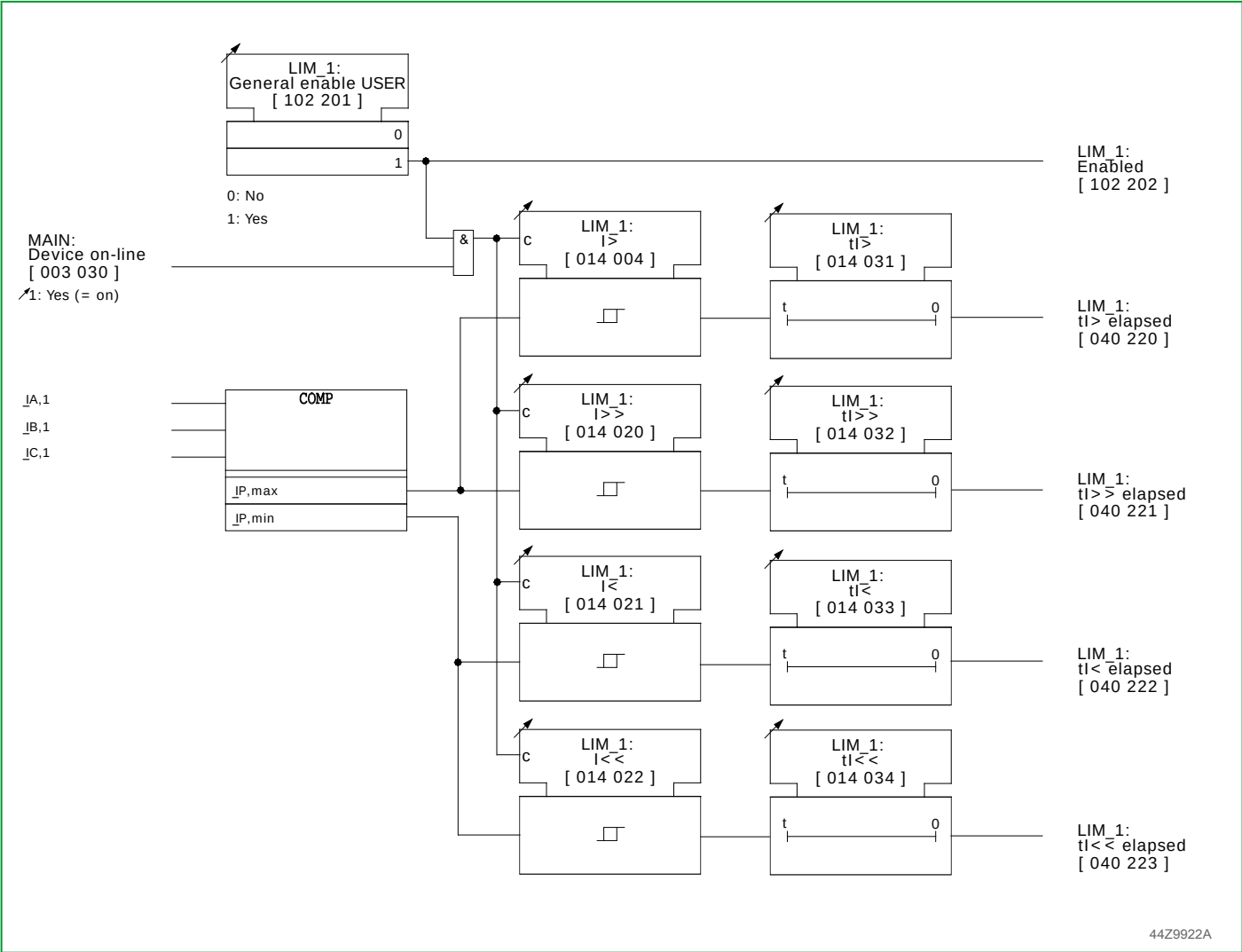


Fig. 3-111: Limit value monitoring of minimum and maximum phase current.

The C434 offers the possibility of monitoring the following measured values to determine if they exceed a set upper limit value or fall below a set lower limit value:

- Maximum phase current
- Minimum phase current
- Maximum phase-to-phase voltage
- Minimum phase-to-phase voltage
- Maximum phase-to-ground voltage
- Minimum phase-to-ground voltage

If one of the set upper limit values is exceeded or if a measured minimum value falls below the corresponding lower limit value, a signal is issued once a set time period has elapsed. The following figures show the setting options and the functions based on LIM\_1 as an example.

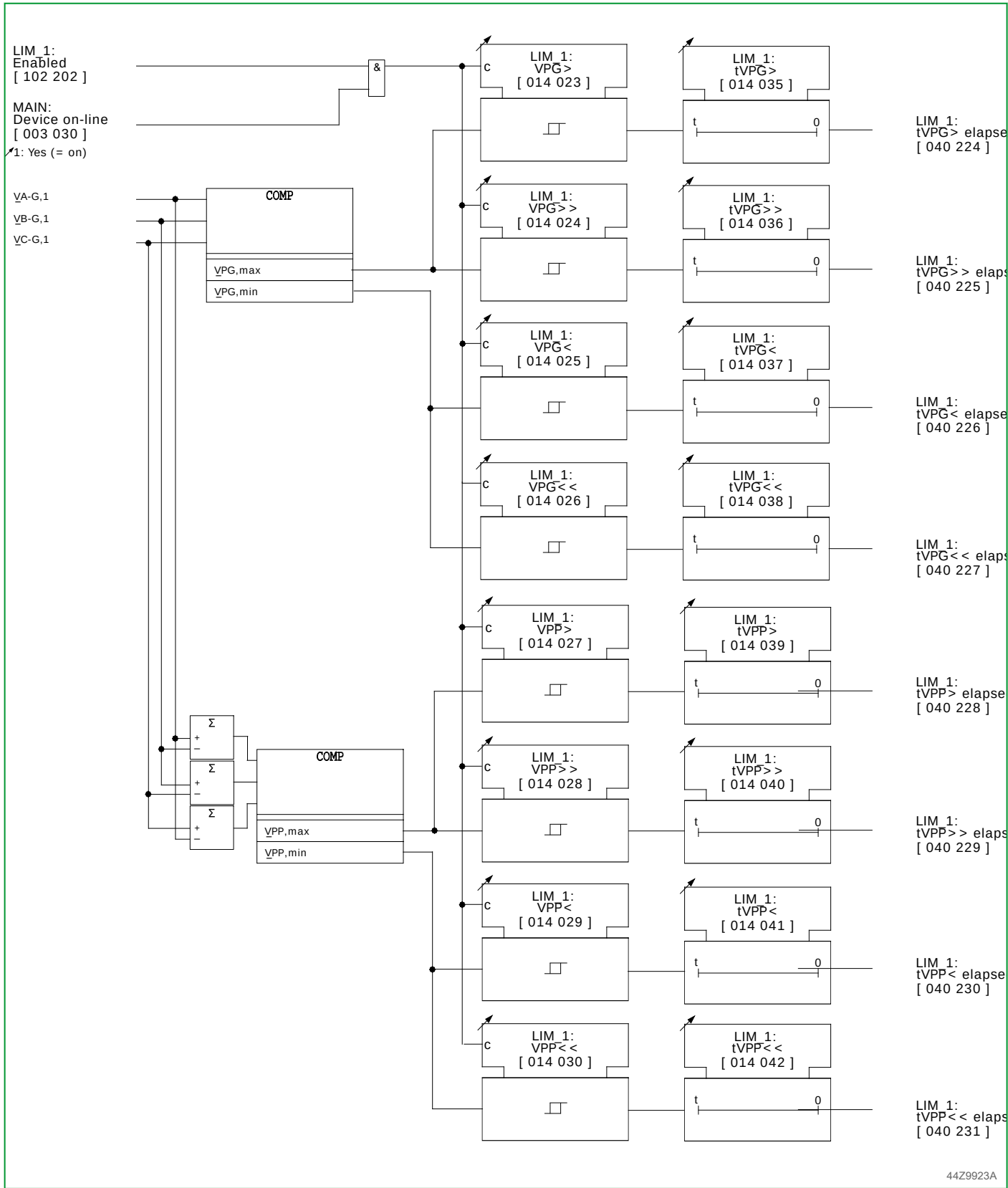


Fig. 3-112: Limit value monitoring of maximum and minimum phase-to-phase voltage and maximum and minimum phase-to-ground voltage.



### 3.21.3 Monitoring the Neutral Displacement Voltage

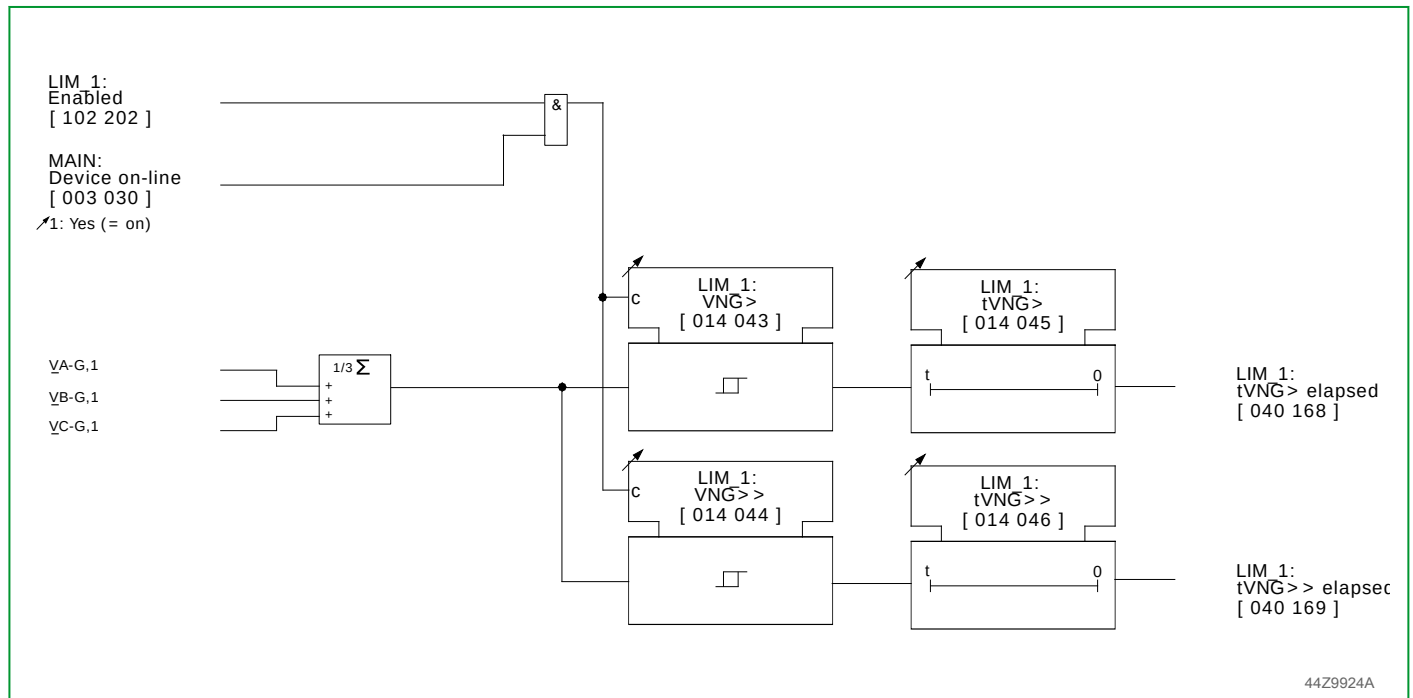


Fig. 3-113: Monitoring the neutral displacement voltage.

The neutral displacement voltage calculated from the three phase-to-ground voltages is monitored by two stages to determine whether it exceeds set thresholds. If the thresholds are exceeded, a signal is issued after a set time period has elapsed.

## 3.21.4

## Monitoring the Reference Voltage (LIM\_1 only)

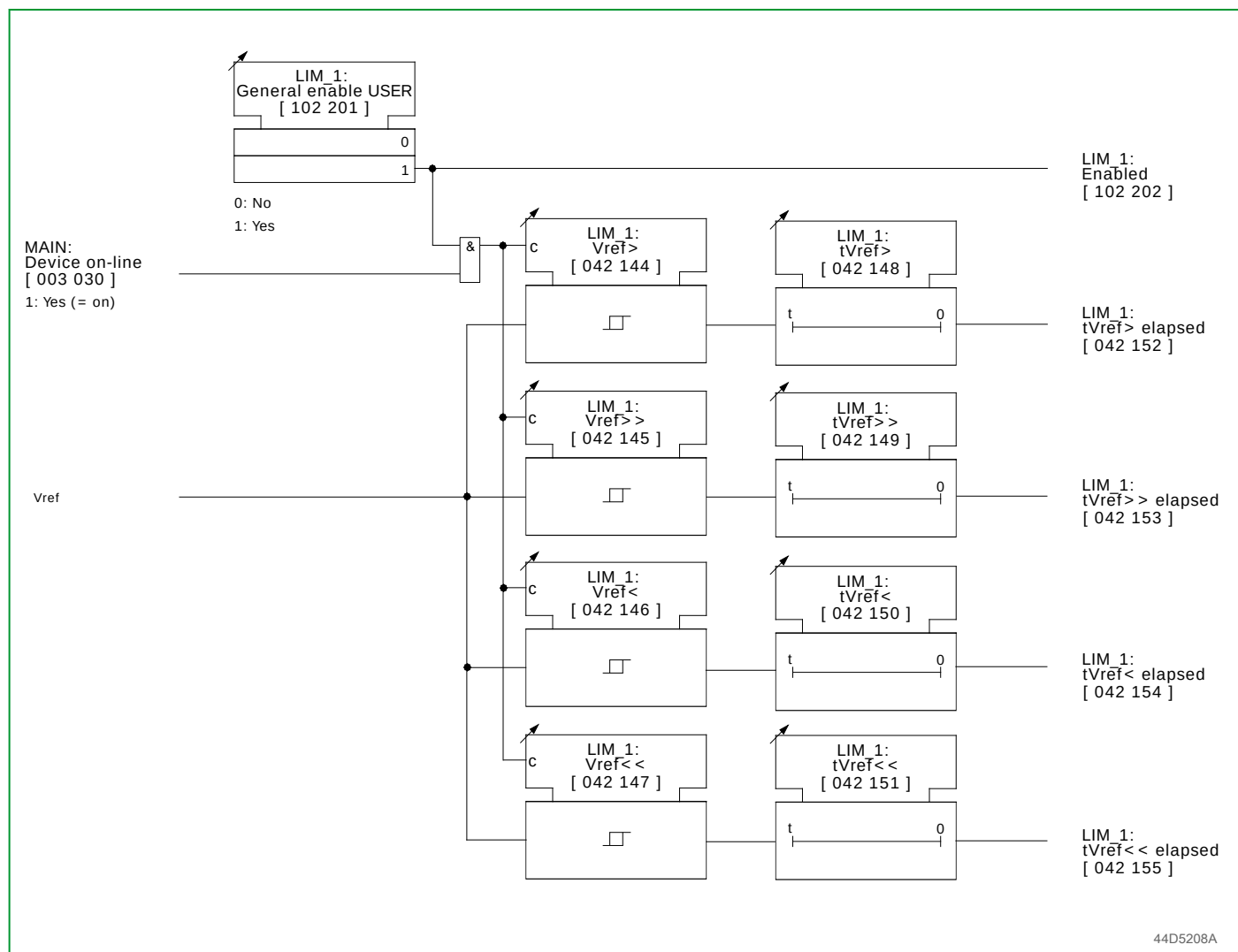


Fig. 3-114: Monitoring the reference voltage.

The reference voltage calculated from the transformer module placed on slot 03-04 is monitored by two stages to determine whether it exceeds set thresholds. If the thresholds are exceeded, a signal is issued after a set time period has elapsed.

### 3.22 Programmable Logic (Function Groups LOGIC and LOG\_2)

Programmable (or user-configurable) logic enables the user to link binary signals within a framework of Boolean equations.

Two function groups for programmable logic are available, that can be used independently of each other. There are only two differences between these two function groups:

- LOGIC offers 128 logical equations.  
LOG\_2 offers only 4 logical equations.
- On the other hand, LOG\_2 features long-term timers.  
For example for output 1:
  - LOGIC: Time t1 output 1 and LOGIC: Time t2 output 1: settable from 0 to 600 s.
  - LOG\_2: Time t1 output 1 and LOG\_2: Time t2 output 1: settable from 0 to 60,000 s.

*The following description concentrates on the function group LOGIC. Where applicable, any differences to LOG\_2 are mentioned.*

Binary signals in the C434 may be linked by logical “OR” or “AND” operations with the option of additional NOT operations by setting LOGIC: Fct.assignm. outp. 1 (to LOGIC: Fct.assignm.outp.128, or LOG\_2: Fct.assignm. outp. 1 to LOG\_2: Fct.assignm. outp. 4). The Boolean equations need to be defined without the use of brackets. The following rule applies to the operators: “NOT” before “AND” before “OR”.

A maximum of 32 elements can be processed in one Boolean equation. In addition to the signals generated by the C434, initial conditions for governing the equations can be set using setting parameters, through binary signal inputs, or through the serial interfaces.

Logical operations of the function group LOGIC can be controlled through the binary signal inputs in different ways.

The binary input signals LOGIC: Input 01 EXT (or LOGIC: Input 02 EXT, ..., LOGIC: Input 40 EXT) have an updating function, whereas the input signals LOGIC: Set 01 EXT (or LOGIC: Set 02 EXT, ..., LOGIC: Set 16 EXT) are latched. The logic can only be controlled from the binary signal inputs configured for LOGIC: Set 01 EXT if the corresponding reset input LOGIC: Reset 01 EXT) has been configured for a binary signal input. If only one or neither of the two functions is configured, then this is interpreted as “Logic externally set”. If the input signals of the two binary signal inputs are implausible (such as when they both have a logic value of “1”), then the last plausible state remains stored in memory. (For LOG\_2, there are no such parameters for assigning binary input signals.)

## ! WARNING

### HAZARD OF UNINTENDED EQUIPMENT OPERATION

- When using the programmable logic, it is necessary to carry out a functional type test to conform with the requirements of the relevant protection/control application. In particular, it is necessary to verify that the requirements for the implementation of logic linking (by setting) as well as the time performance during startup of the C434, during operation and when there is a fault (blocking of the C434) are fulfilled.

Failure to follow these instructions can result in unintended equipment operation.

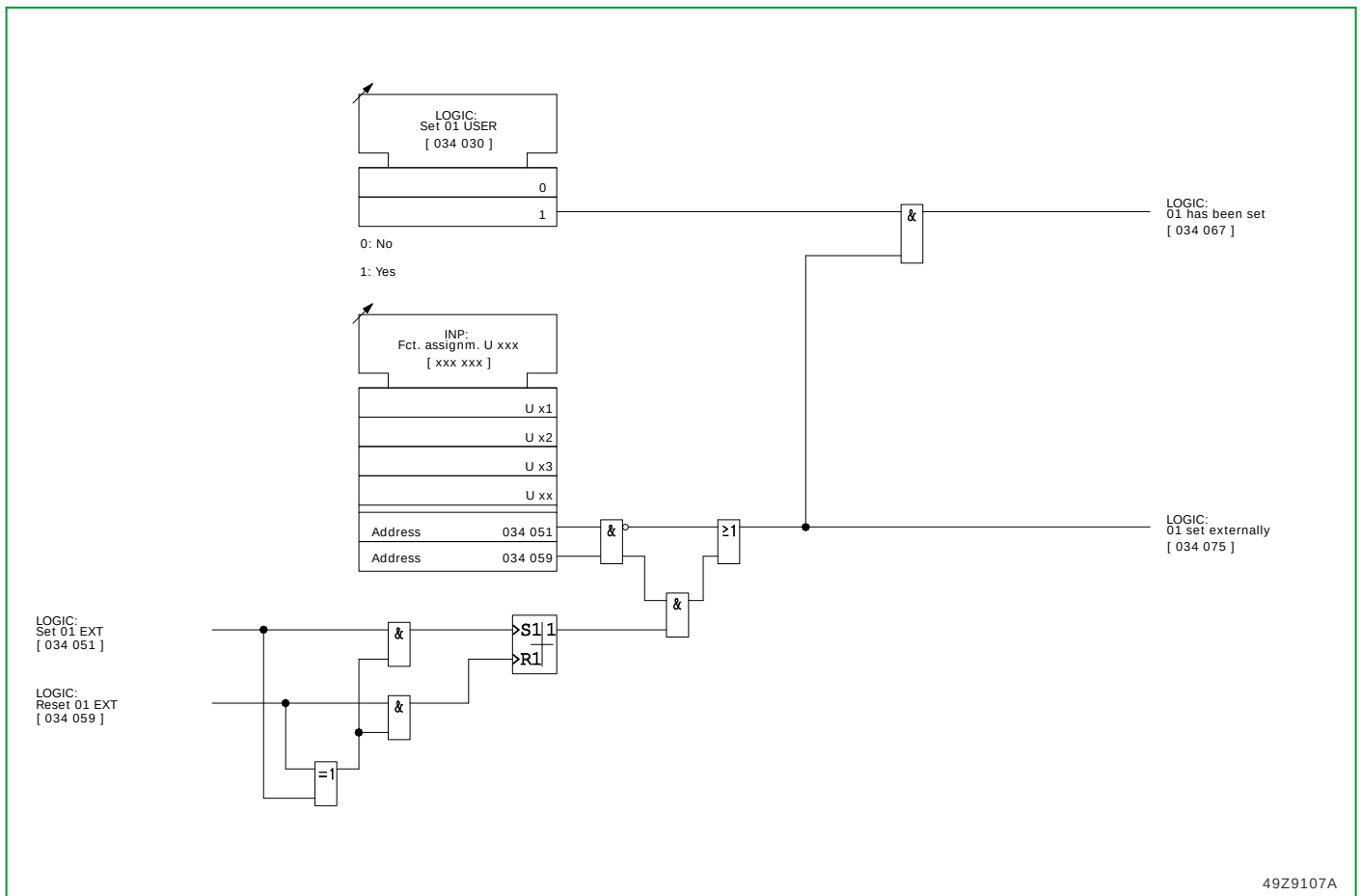


Fig. 3-115: Control of logic operations via setting parameters or stored input signals. (The logic does not apply to LOG\_2.)

The LOGIC: Trigger 1 signal is a “triggering function” that causes a 100 ms pulse to be issued.

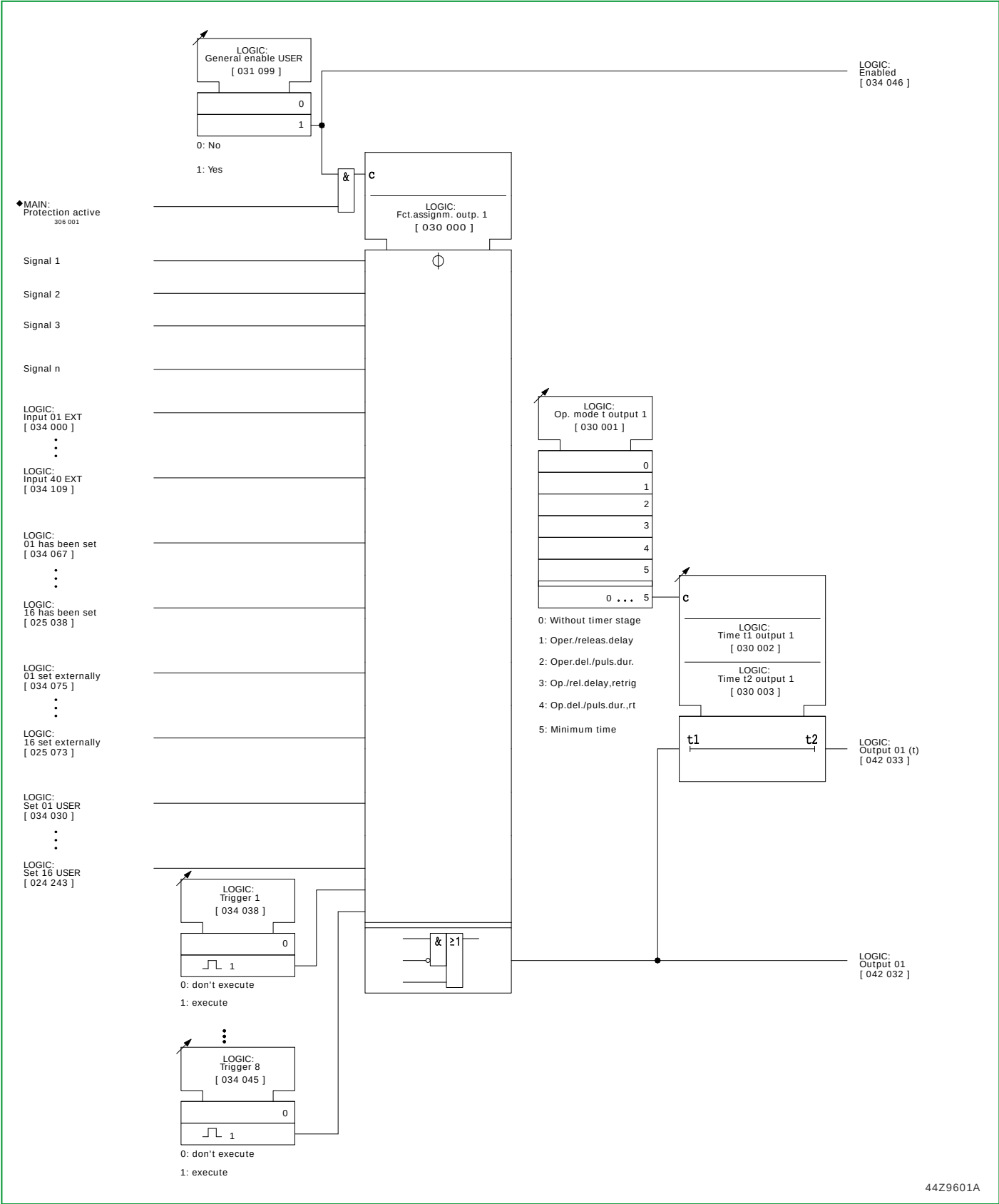


Fig. 3-116: Setting options for programmable logic, function group LOGIC (shown here for output 1).

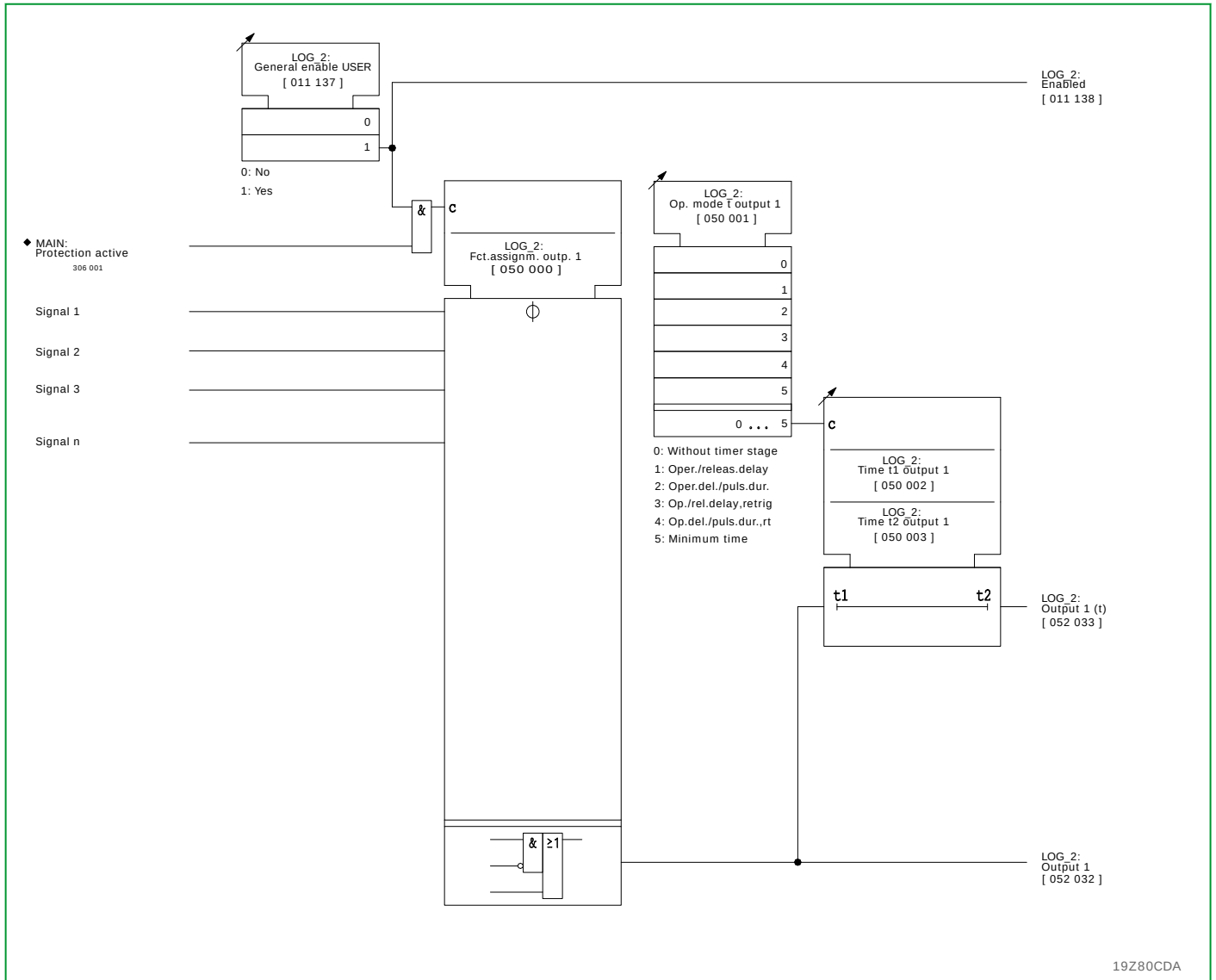


Fig. 3-117: Setting options for programmable logic, function group LOG\_2 (shown here for output 1).

The output signal of an equation can be fed into a further, higher order, equation as an input signal thus creating a sequence of interlinked Boolean equations. The equations are processed in the sequence defined by the order of each equation. It should be noted that in the case of overlapping equations, the result is provided by the equation with the highest order.

The output signal of each equation is fed to a separate timer stage with two timer elements and a choice of operating modes. This offers the possibility of assigning a freely configurable time characteristic to the output signal of each Boolean equation. In the *Minimum time* operating mode, the setting of timer stage t2 has no effect. The following diagrams (Fig. 3-118, (p. 3-163) to Fig. 3-122, (p. 3-165)) show the time characteristics for the various timer stage operating modes.

If the C434 is switched to offline the equations are not processed and all outputs are set to the "0" logic level.

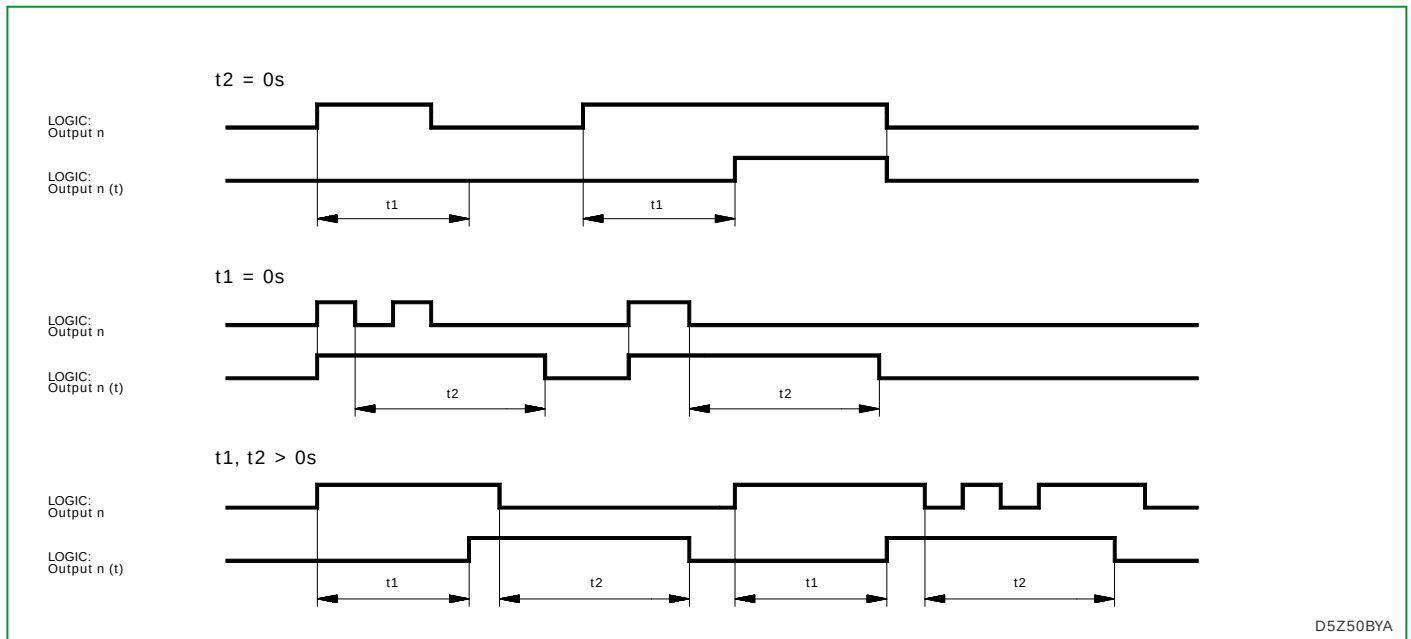


Fig. 3-118: Operating mode 1: Pickup/reset delay (Oper./releas.delay). (This diagram is also valid for LOG\_2, if the signal parameters are replaced by the corresponding ones from LOG\_2.)

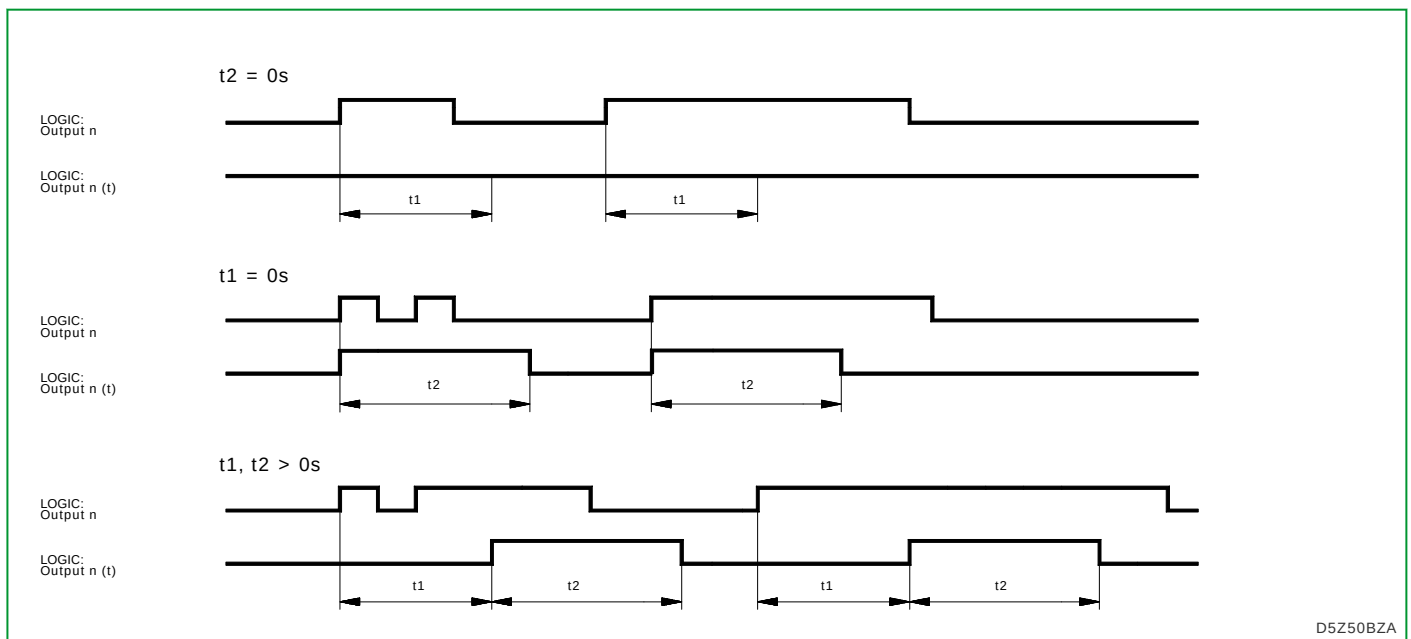


Fig. 3-119: Operating mode 2: Pulse, delayed pickup (Oper.del./puls.dur.). (This diagram is also valid for LOG\_2, if the signal parameters are replaced by the corresponding ones from LOG\_2.)

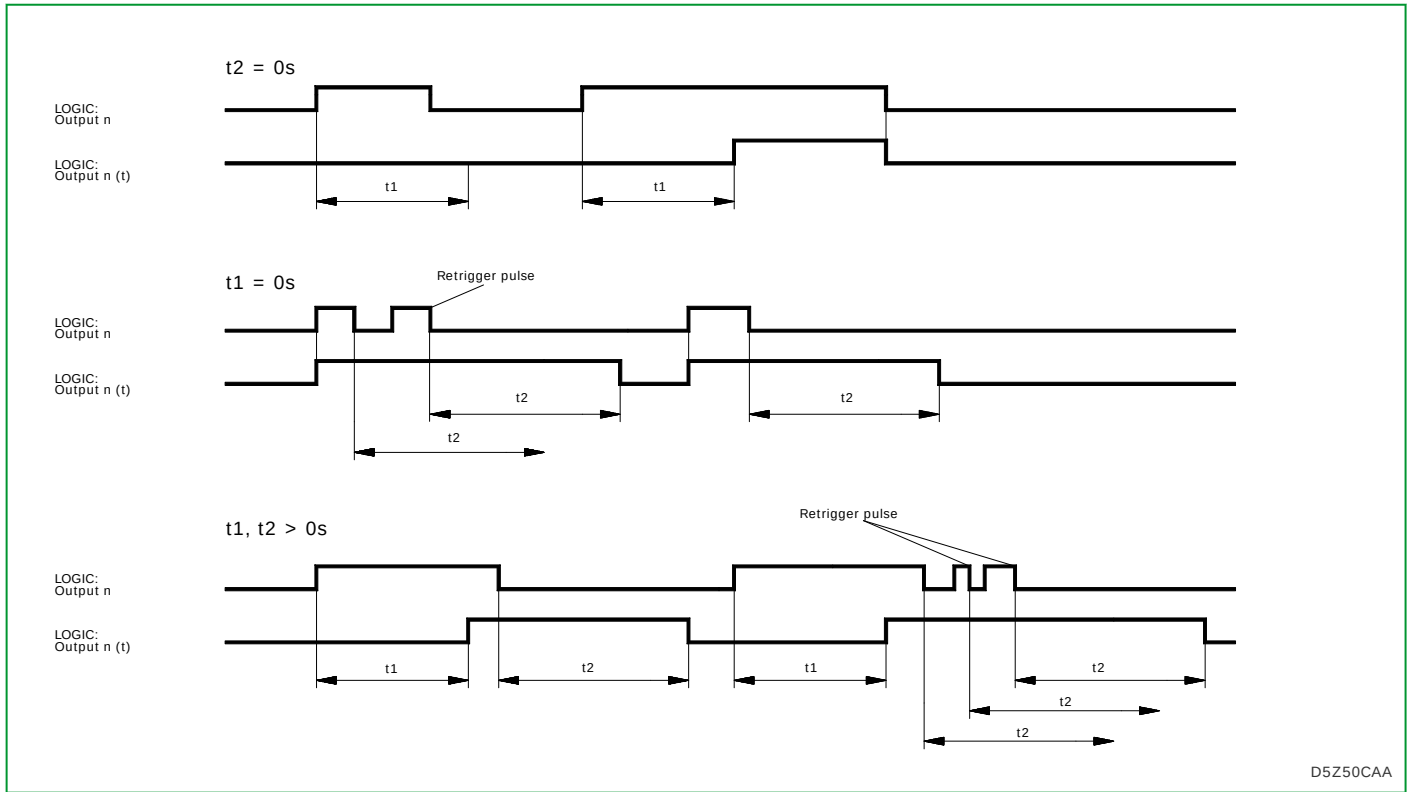


Fig. 3-120: Operating mode 3: Pickup/reset delay, retriggerable (Op./rel.delay, retrigger). (This diagram is also valid for LOG\_2, if the signal parameters are replaced by the corresponding ones from LOG\_2.)

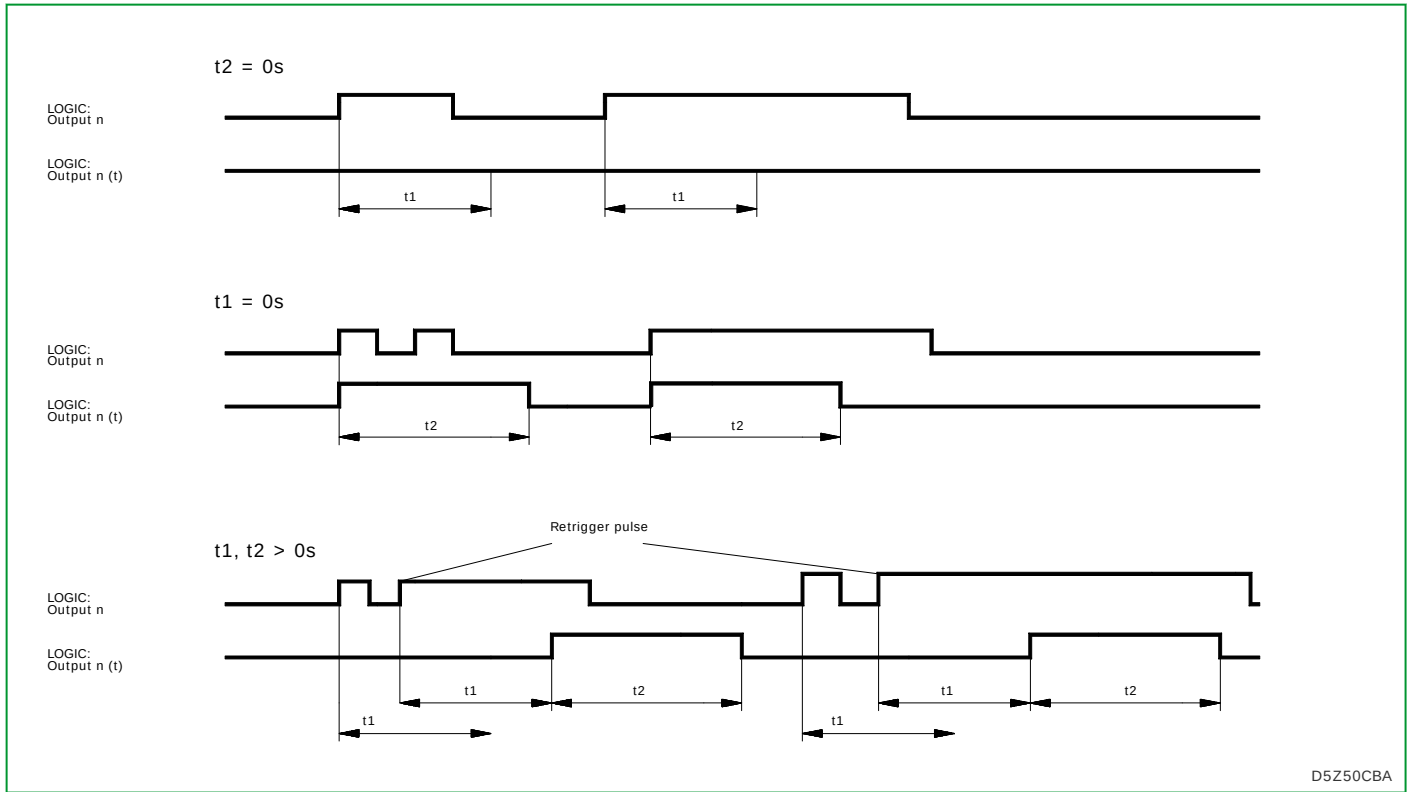


Fig. 3-121: Operating mode 4: Pulse, delayed pickup, retriggerable (Op.del./puls.dur., rt). (This diagram is also valid for LOG\_2, if the signal parameters are replaced by the corresponding ones from LOG\_2.)



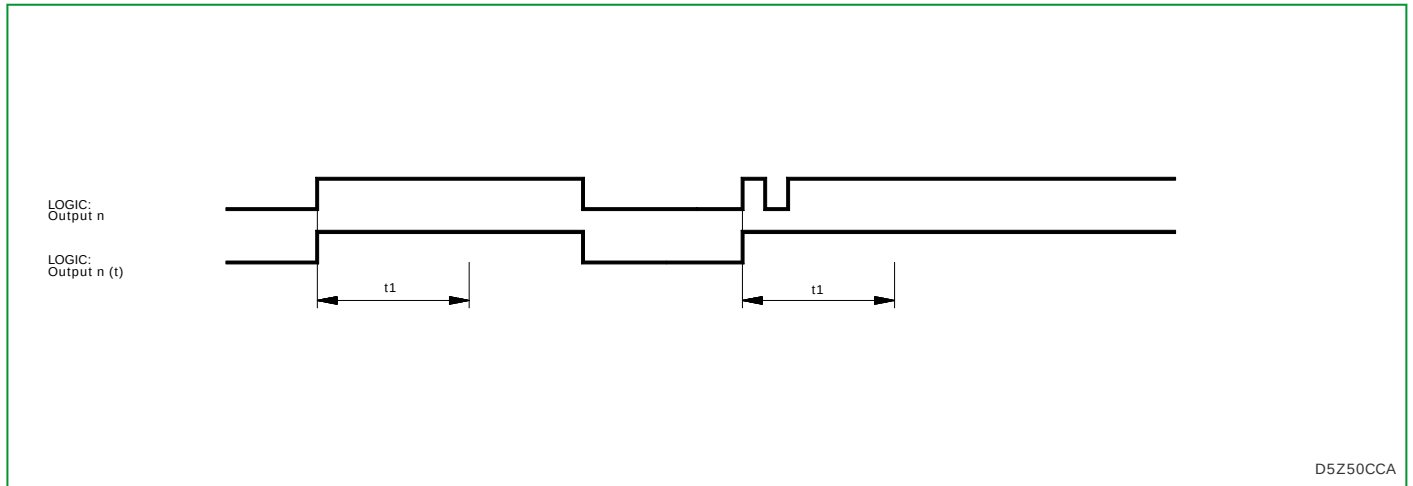
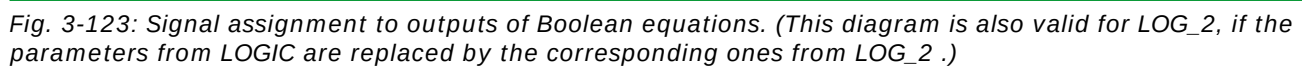


Fig. 3-122: Operating mode 5: Minimum time (Minimum time). (This diagram is also valid for LOG\_2, if the signal parameters are replaced by the corresponding ones from LOG\_2 .)

Through appropriate configuration, it is possible to assign the function of a binary input signal to each output of a logic operation. The output of the logic operation then has the same effect as if the binary signal input to which this function has been assigned were triggered.



### 3.23 Control and Monitoring of Switchgear Units (Function Groups DEV01 to DEV24)

- For the 40 TE case, up to 12 switchgear units can be controlled if four X(6I 6O) control modules are fitted.
- In case of a C434 with text display (40 TE or 84 TE), there is always a maximum of 12 switchgear units, independent of the set of fitted binary modules.
- For the 84 TE case with graphic display, up to 18 switchgear units can be controlled, and up to 24 switchgear units can be monitored if six X(6I 6O) control modules are fitted.

If the HMI with graphic display is fitted, more switchgear units can be controlled using binary inputs and outputs on the power supply module in combination with external high-break relays, or further binary modules with high-break contacts (ordering option).

See the table in [Section 4.3, \(p. 4-8\)](#) for the slots that have to be used for a particular set of ordered modules.

The C434 provides a bay panel concept to simplify the configuration of the switchgear control functions. The bay panel type defines the layout of a bay with its switchgear units on the HMI, an automated I/O assignment and the system/bay interlocking equations for all required switchgear units. [Vol. 2, Chapter A5, \(p. A5-1\)](#) provides a description of all bay types which are pre-defined (generally for all Easergy MiCOM 30 devices) and therefore immediately available. The selection of a bay type can be done with the parameter (220 000) MAIN: Type of bay. It is also possible to create a customized bay type and upload it to the C434. (See [Section 3.23.1, \(p. 3-167\)](#) for some more information.)

#### 3.23.1 Bay Type Selection

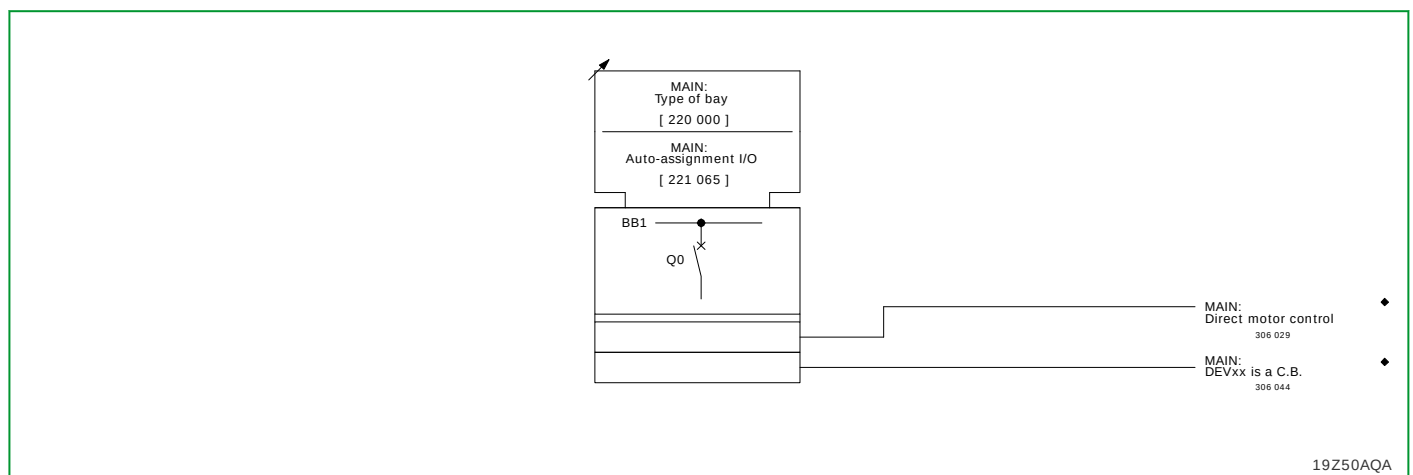


Fig. 3-124: Bay type selection.

The bay type defines the layout of a bay with its switchgear units on the HMI, an automated I/O assignment and the system/bay interlocking equations for all required switchgear units. [Vol. 2, Chapter A5, \(p. A5-1\)](#) provides a description of all bay types which are pre-defined (generally for all Easergy MiCOM 30 devices) and therefore immediately available. The selection of a bay type can be done with the parameter (220 000) MAIN: Type of bay.

Once the user has selected a bay type, the C434 can automatically configure the binary inputs and output relays with function assignments for the control of

switchgear units. This automatic assignment is defined via the parameter MAIN: Auto-assignment I/O.

The assignment of inputs and outputs for an automatic configuration is shown in the List of Bay Types (Vol. 2, Chapter A5, (p. A5-1)).

Should the required bay type be missing from the standard selection then the user can contact the manufacturer of the C434 to request the definition of a customized bay type to load into the C434.

It is also possible – using a special *Bay Configuration Tool* (BTC) being part of Easergy Studio – to create a customized bay type and upload it to the C434.

*To create customized bay types, the “Bay Type Configurator” (BTC), version 2.7 or higher, is needed. Older versions of the BTC can create not compatible hex files and thus can lead to communication failures.*

The same parameter – MAIN: Type of bay – can then be used to select (i. e. activate) this user-defined bay type. Note that there is no restriction to only one user-defined bay type: In fact, multiple customized bay types can be created with different IDs and be loaded into the C434. When using the BTC to create a bay type, it is recommended to always use an ID number in the range of 5000 ... 9999 for any customized bay type, because the pre-defined standard bay types use IDs in the reserved range of 0001 ... 4999. If the user tries to select a non-existing ID via (220 000) MAIN: Type of bay (i. e. an ID for which neither a standard nor a customized bay type is defined), then the selection will be rejected and an error message “Signal from device: Bay type not assigned (0x8073)” will be reported in the “kommprot.txt” log file.

*In general, the selection of a bay type (via MAIN: Type of bay) is accepted by the C434 only if all of the following requirements are fulfilled:*

- The selected ID number is known by the C434, i. e. is either available as a pre-defined standard bay type, or matches a bay type definition that has been loaded as a customized bay type into the C434 memory in file transfer mode. (Customized bay types are not supported for C434 with text display.)
- Binary I/O module X(6I 6O) has been fitted to slot 5 (40 TE case) or 10 (84 TE case).
- The hardware (in particular the set of all binary I/O modules and power supply) has got a sufficient number of inputs and outputs as required by the selected bay type.
- None of the inputs/outputs required by the selected bay type has been previously assigned to a non-control function.

*In case of the setting MAIN: Auto-assignment I/O = Yes, the following two constraints must be noted:*

- The activation of a new bay type overwrites all DEVxx / SIG\_1 / CMD\_1 assignments to I/O elements that have been previously made (for the previous bay type definition).
- If the automatic I/O assignment fails because some required inputs and outputs have been assigned to a non-control function, or because the number of I/O elements available is not sufficient, then the previously selected bay type remains active and an error message "Signal from device: Hardware module not fitted (0x8063)" is reported in the "kommprot.txt" log file.

*Some bay types are only applicable if the required hardware order option is fitted:*

- If an HMI with text display is used, bay types with more than 12 switchgear devices are not supported.
- If an HMI with graphic display is used, bay types with more than 12 switchgear devices are supported.

## 3.23.2

## Enable for Switch Commands Issued by the Control Functions

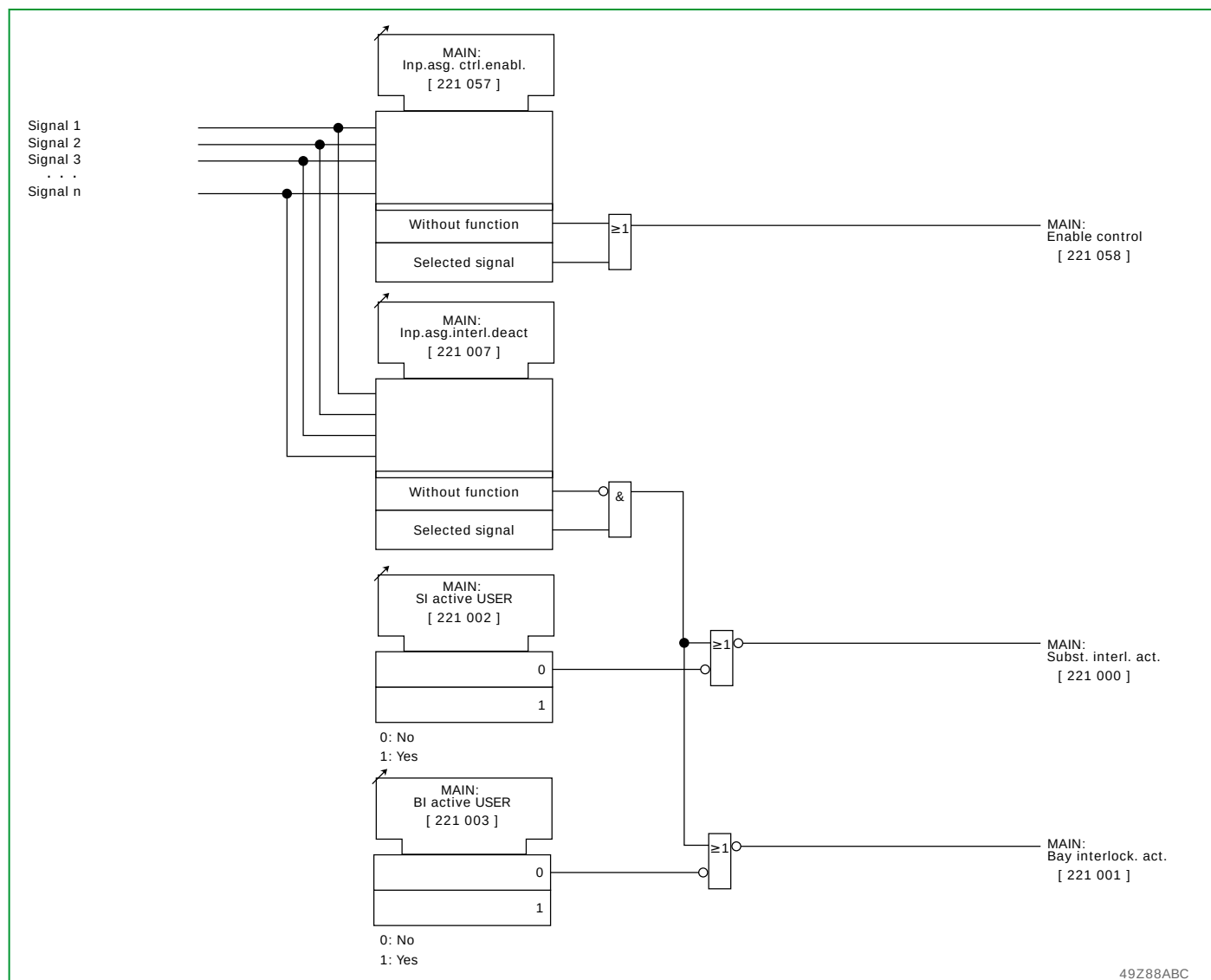


Fig. 3-125: General enable for switch commands issued by the control functions; activating or canceling the interlocks.

Before a switching unit within the bay is closed or opened by the control functions of the C434, the C434 first checks whether the switch command may be executed. A switch command will be executed if the optional control enable has been issued and the interlock conditions are met. The interlock conditions are defined in the interlocking logic for each switching unit within the bay that is subject to control actions and for each control direction (Open/Close). Different conditions are defined for the bay interlock equations to operate with or without station interlock. The check of bay or station interlock equations can be cancelled for all electrically controllable switchgear units within a bay. If the station interlock is active, it may be cancelled selectively for each switching unit and each control direction.

The bay and station interlocks may be cancelled through an appropriately configured binary signal input. This cancellation is effective for all of the operating modes "Local", "Remote" and "Remote & Local" (setting LOC: Fct. assign. L/R key = R & L  $\leftrightarrow$  L). In other words, the functionality of the binary input for cancelling the bay and station interlocks is independent of the operating mode of the control point for switching between local and remote control.

*All station interlock functionality (e.g. the parameter MAIN: SI active USER) is active and available only if a communication module (i.e. a module of type "A") with 2 serial interfaces is fitted and either the IEC 60870-5-101 or -103 communication protocol is configured.*

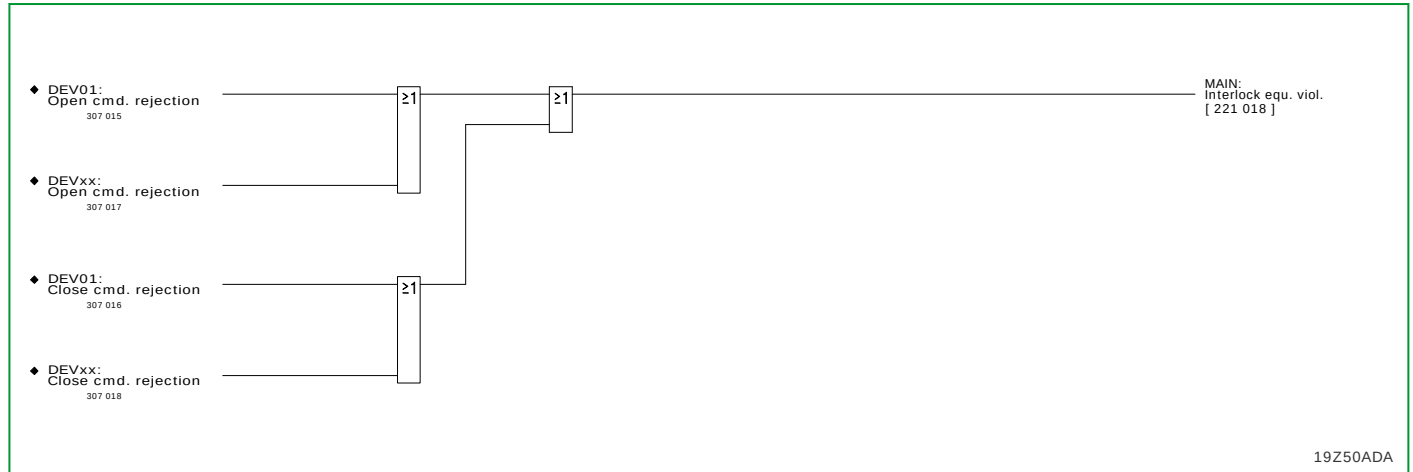


Fig. 3-126: Rejection of the switching commands.

During a switch command is being executed, any further switch command is rejected ("Double Command Lockout"). This includes interlocking of parallel switching operations and further switch commands to the currently selected switching unit.

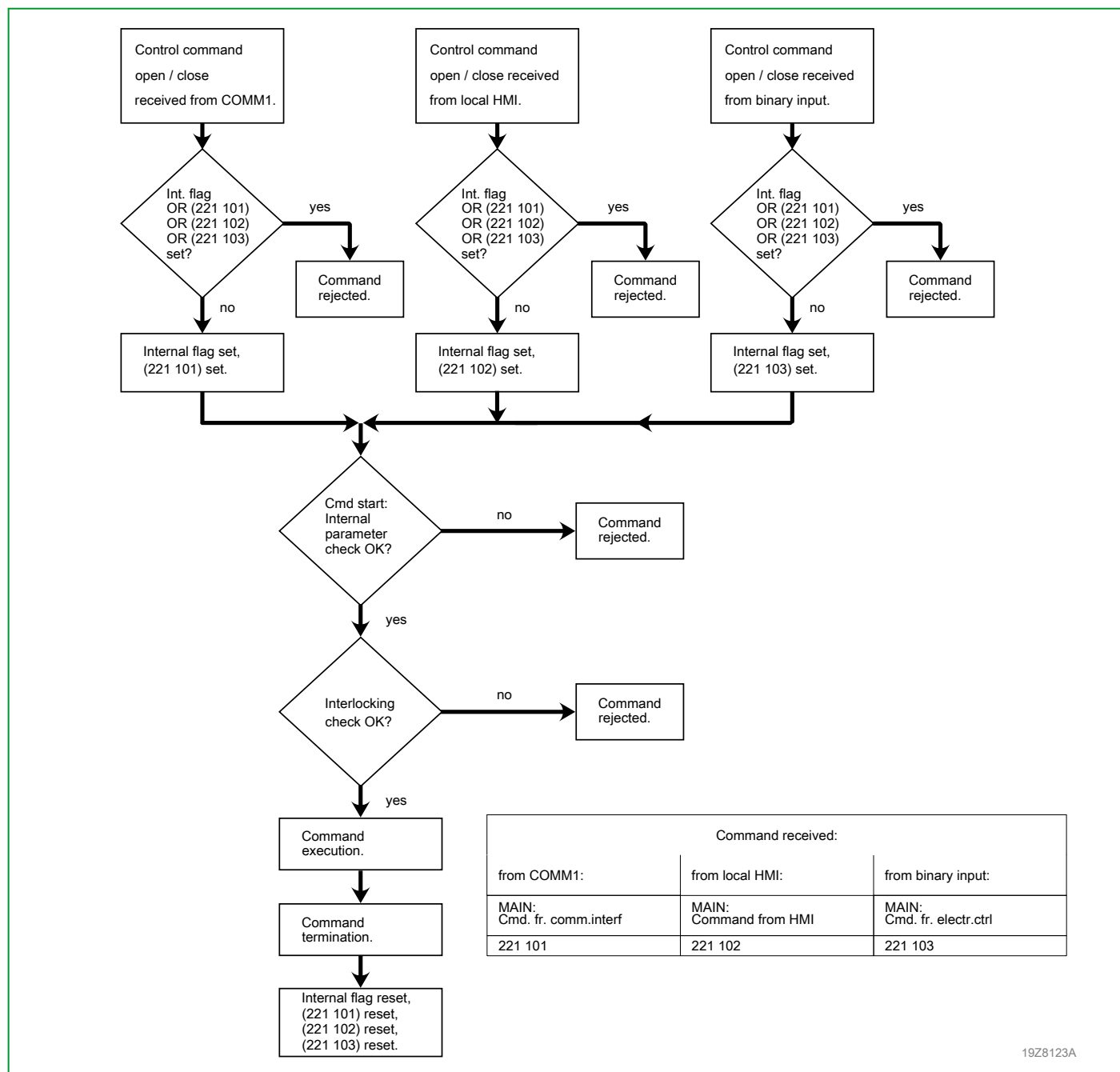


Fig. 3-127: "Double Command Lockout".

### 3.23.3 Designation of External Devices

Each external device represented in the Bay Panel is identified by an external device designation. The user can either select this designation from a list of over 70 pre-defined names (via the parameter DEV01: Designat. ext. dev. in case of DEV01, for example), or this parameter is set to *Device Name User*. With this selection, a user-defined text for the name of the external device will be used as the designation. This user-defined text has to be entered at DEV01: DEV-Name User (in case of DEV01, for example).

(The maximum length is 4 characters, as with the fixed identifiers. Longer text entries are truncated to 4 characters internally.)

### 3.23.4 Defining a Bay Panel Type

With the selection of a Bay Panel type, the following definitions are made:



- Manually operated switchgear units with status signals to be processed.
- Switchgear units to be controlled and signaled by the C434.
- The bay interlock conditions for the “Open” / “Close” command control of the switchgear units, for operation with or without the station interlock function.
- Binary inputs required for switchgear units with direct motor control.
- Binary outputs required for switchgear units with direct motor control.

When a Bay Panel type is selected, the binary inputs for switchgear status signals and the output relays for control commands are configured automatically if MAIN: Auto-assignment I/O is set to Yes. If set to No, the user will need to carry out this configuration. The list of Bay Panel types in the Appendix shows which binary inputs and output relays have been assigned signals or commands for control of switchgear units in the case of automatic configuration.

Setting options for the C434 and the different possibilities to integrate a switchgear unit into the functional sequence of the C434 (processing of status signals only or controlling and signaling) will be explained below, using one switchgear unit as an example. Function group DEV01 will be used throughout in this example. If a signal is identified in the function diagrams by function group “COMM1:” with a blank address [--- ---], it will indicate that it is a signal to or from the communication interface and that it has not been assigned an address.

### 3.23.5 Processing Status Signals from Manually Operated Switchgear Units

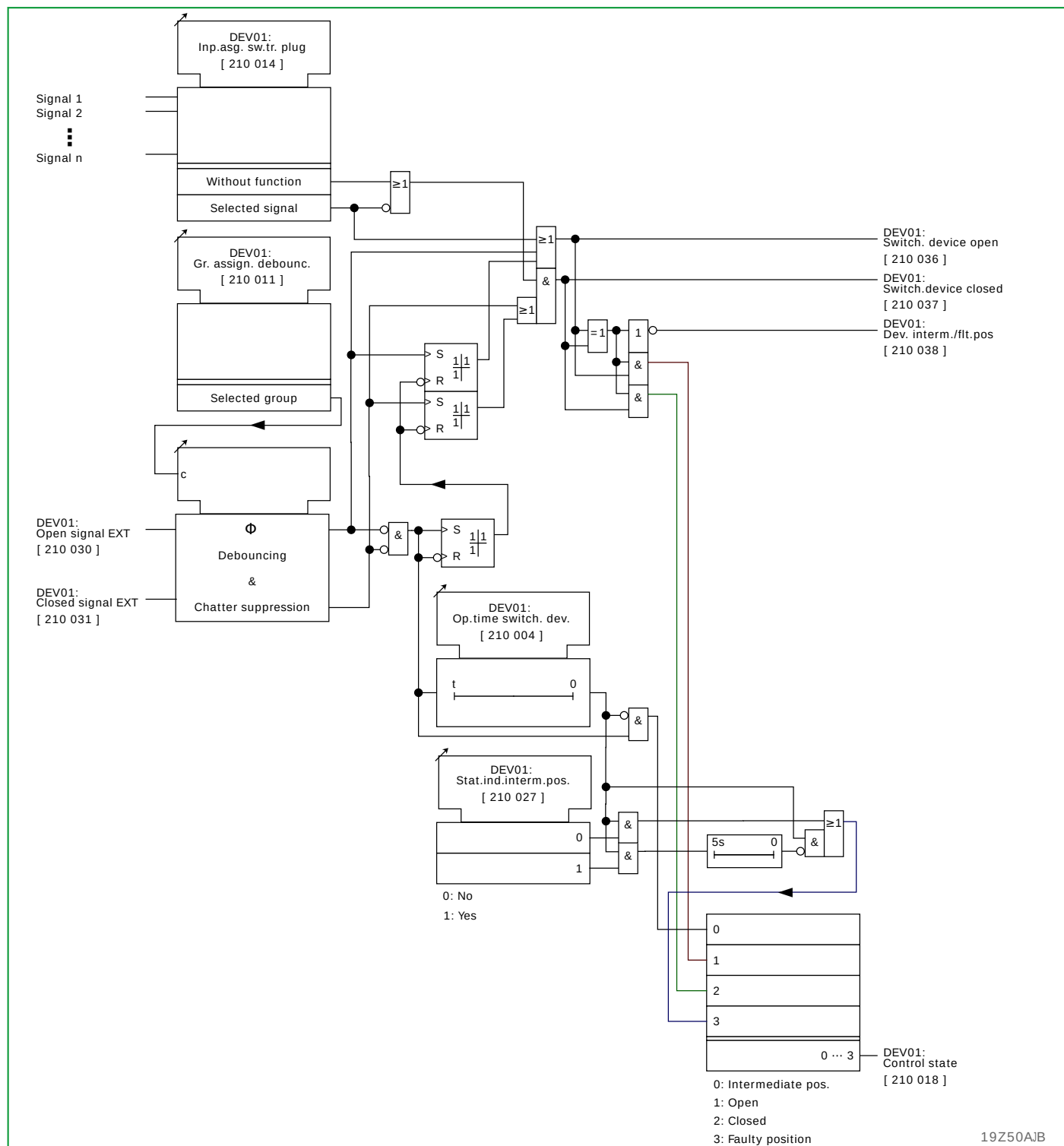


Fig. 3-128: Processing Status Signals from Manually Operated Switchgear Units.

#### 3.23.5.1 Status Signals

The status signals “Open” and “Closed” are assigned to binary signal inputs. The signals conditioned by debouncing and chatter suppression (see [Section 3.26.1.1, \(p. 3-201\)](#)) are used for further processing. If no logic value of “1” is present at any of the two binary signal inputs, the running time monitoring function is started. For the duration of the set time period for running time

monitoring or until the contacts on the switchgear unit are back to a defined position – either “Open” or “Closed” – the signal “Intermediate position” is issued.

If DEV01: Interm. pos. suppr. is set to Yes, the previous switchgear unit status will continue to be signaled to the communication interfaces while the switchgear unit is operating. Once the contacts on the switchgear unit have reached their new position, the updated status is signaled accordingly to the communication interfaces. This parameter has no impact to internal signals, such as DEV01: Switch. device open, DEV01: Switch.device closed or DEV01: Dev. interm./flt.pos.

The signal “Faulty position” is issued if the contacts on the switchgear unit have not reached either their “Open” or “Closed” position after the set time period for running time monitoring and the delay time set in MAIN: Delay Man.Op.Superv. have elapsed. If DEV01: Stat.ind.interm.pos. is set to Yes, a delay time of 5 s is started. Once this time period has elapsed and there is no status signal for the position, the state actually present at the binary inputs will be signaled.

### 3.23.5.2

#### Switch Truck

For switchgear units mounted on switch trucks with switch truck plugs, it is possible to configure a single-pole status signal from the switch truck plug. If such a configuration has been assigned, the status signal for the position of the associated switchgear unit is set to “Open” while the input has a logic value of “1”.

### 3.23.6

#### Functional Sequence for Controllable Switchgear Units

#### 3.23.6.1

##### Local or Remote Control of External Devices

Switchgear units can be controlled from a remote location or locally. The selection of the control point is described in [Section 3.4.6, \(p. 3-18\)](#). Usually, remote control is carried out via the communication interface, local control via the keys on the local control panel. Moreover, switchgear units can be controlled via binary inputs configured appropriately (configuration via DEV01: Inp.asg.el.ctr.open or DEV01: Inp.asg.el.ctr.close). The setting MAIN: Electrical control determines whether the inputs function as remote or local control points.

Dependent on the respective position of control the C434 will issue the following logic state signals:

- MAIN: Cmd. fr. comm.interf, or
- MAIN: Command from HMI, or
- MAIN: Cmd. fr. electr.ctr

Additionally the following state signals are issued and entered into the operating data memory:

- DEV01: Open cmd. received
- DEV01: Close cmd. received

The operating mode of the control point is signaled as follows:

|                           | “Remote” | “Local” | “Remote & Local” |
|---------------------------|----------|---------|------------------|
| LOC: Rem.acc.block.active | No       | Yes     | No               |
| LOC: Loc.acc.block.active | Yes      | No      | No               |

## 3.23.6.2

## Selection of the Switchgear Unit to be Controlled and Generating a Switching Request

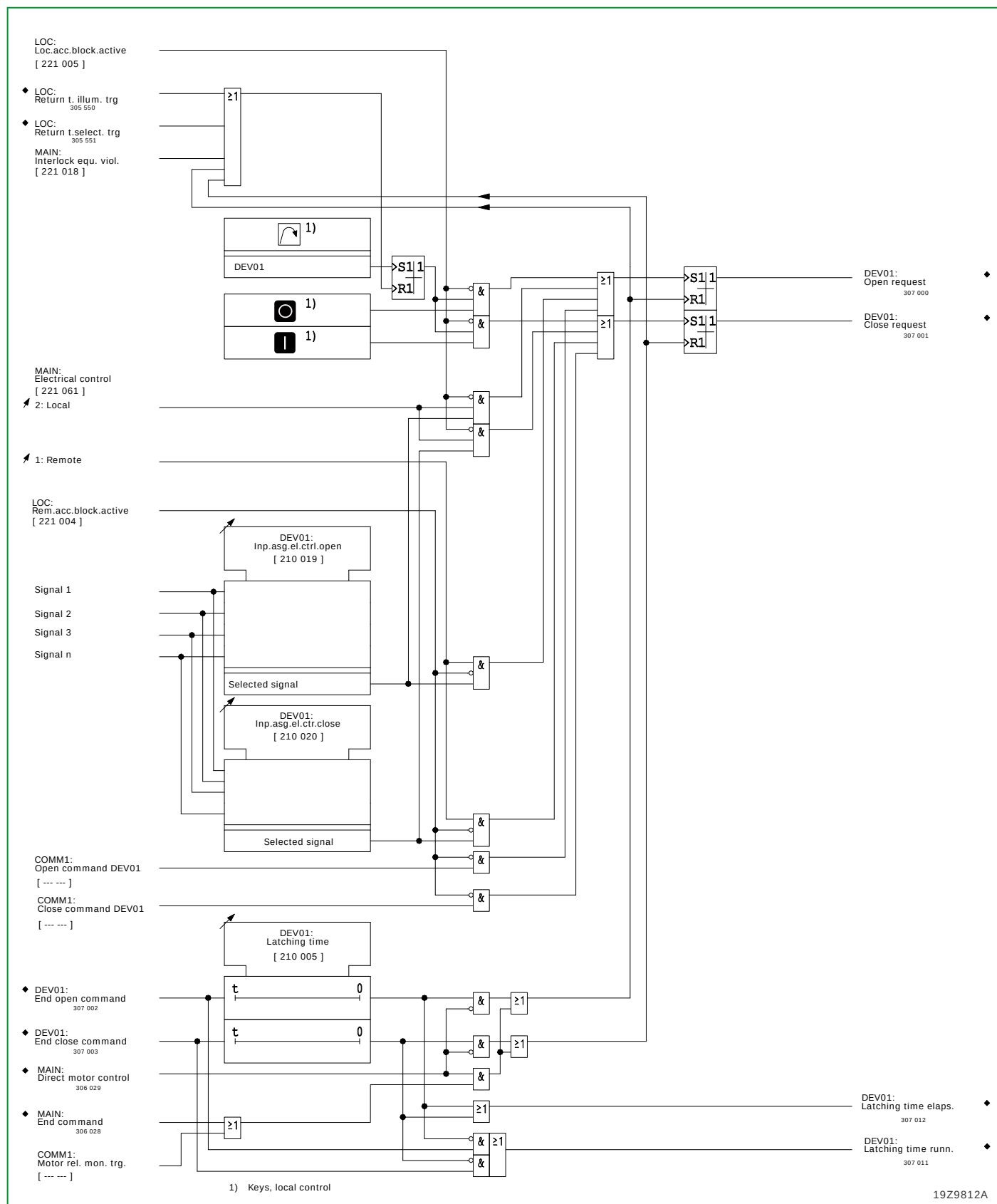


Fig. 3-129: Generating a switching request.

The switchgear unit to be controlled is selected and the switching command is sent to this selected switchgear unit. This can be carried out via the local control panel using the selection key and pressing the “Open” or “Close” key to generate the switching request. For control via binary inputs, the appropriate control inputs need to be configured for switchgear units selected to be controlled. For control via the communication interface, the control commands “Open” or “Close” will also address the switchgear unit to be controlled.

### 3.23.6.3 Enabling Switching Commands

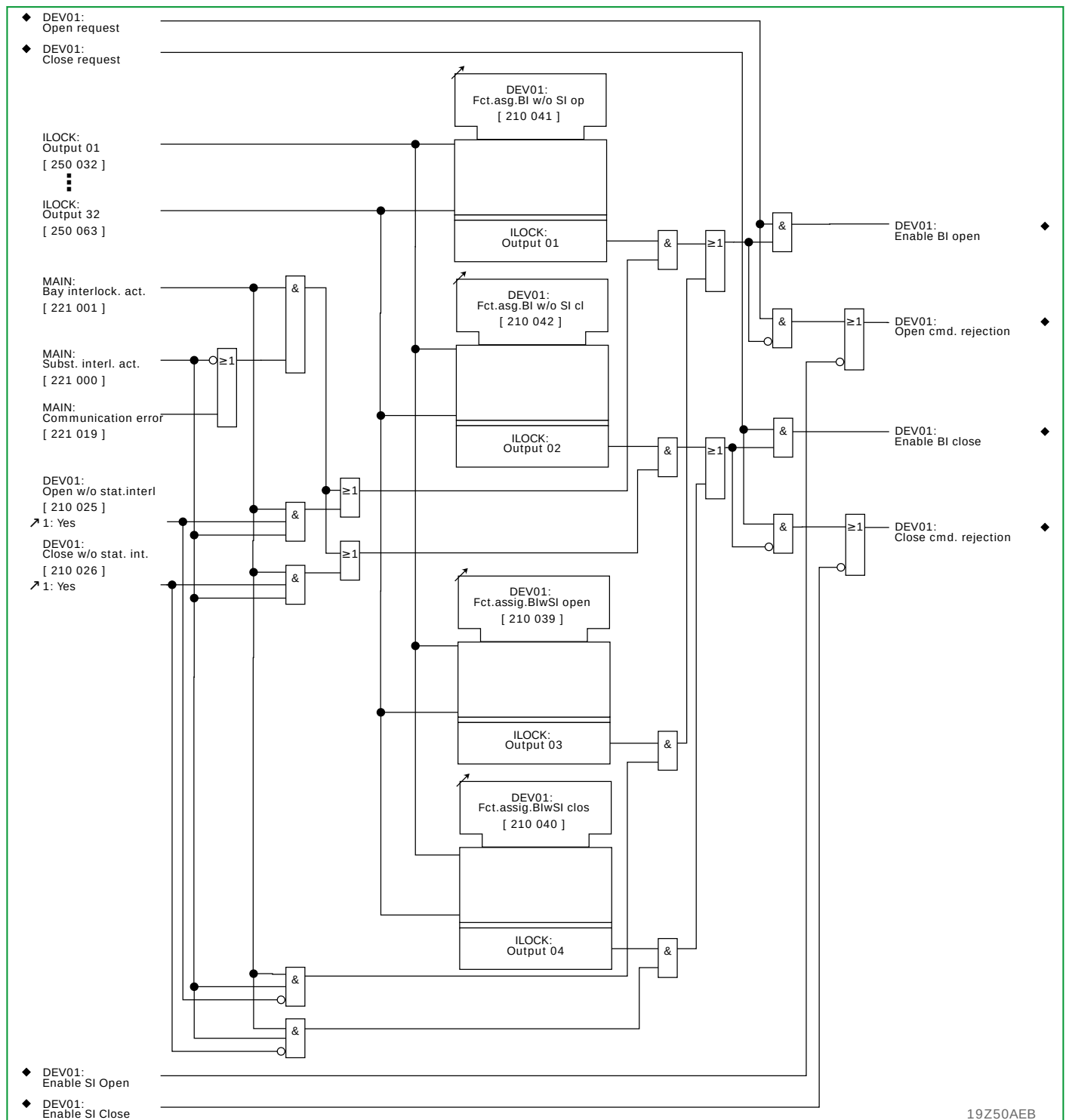


Fig. 3-130: Assignment of the equations of the interlocking logic to the switching commands; enabling of switching commands by the bay interlock function.

Before a switching command is executed, the C434 checks the interlocking conditions defined in the interlocking logic to determine whether a switching command is permitted or not. Bay interlock conditions for operation with or without the station interlock function can be defined. The assignment of an output relay from the interlocking logic to a switching command determines the interlocking conditions that define, for example, the conditions for the “Open” command for operation without the station interlock function.

### 3.23.6.4 Bay Interlock for Operation with the Station Interlock Function

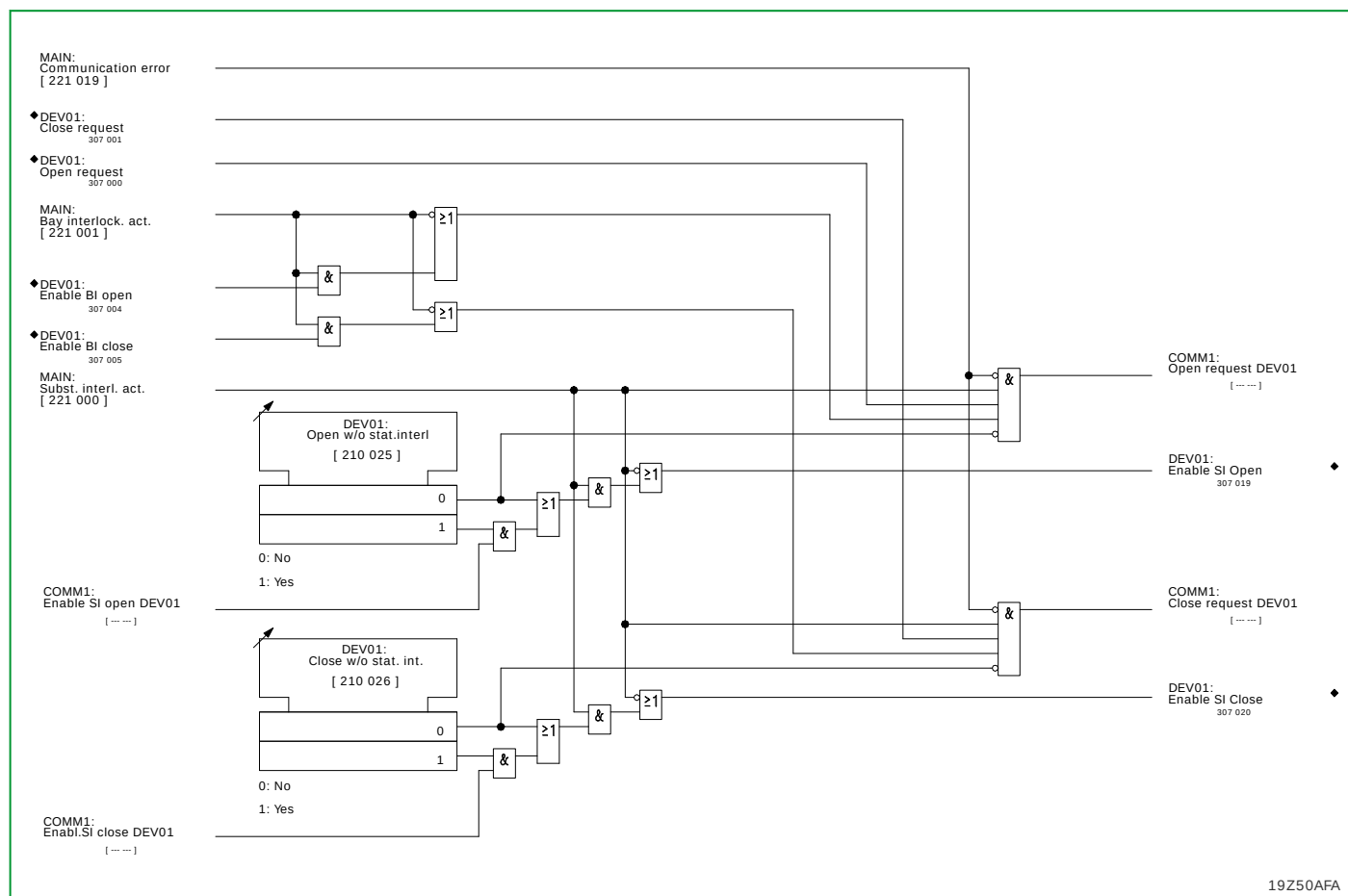


Fig. 3-131: Enabling of the switching commands by the station interlock.

For the station interlock function conditions to be interrogated, there needs to be a communication link with the substation control level. If the C434 detects a communication error or if there is no communication interface available, there will be an automatic switch to bay interlock without the station interlock function. If there is to be a check on the bay interlock and the station interlock function, the bay interlock will be checked first. If bay interlocking issues a switching enable, a switching request will be sent to the substation control level. At substation control level, there will then be a check – taking into account the station interlock functions – as to whether switching is permitted or not. If the substation control level also issues an enabling command, the switching operation is carried out provided that the enable from the bay interlock is still present. Optionally, the “Open” or “Close” switching operation can be carried out without checking the station interlock function conditions. In this case, the bay interlock conditions defined for operation without station interlock functions will be considered.

## 3.23.6.5 Issue of Switching Commands

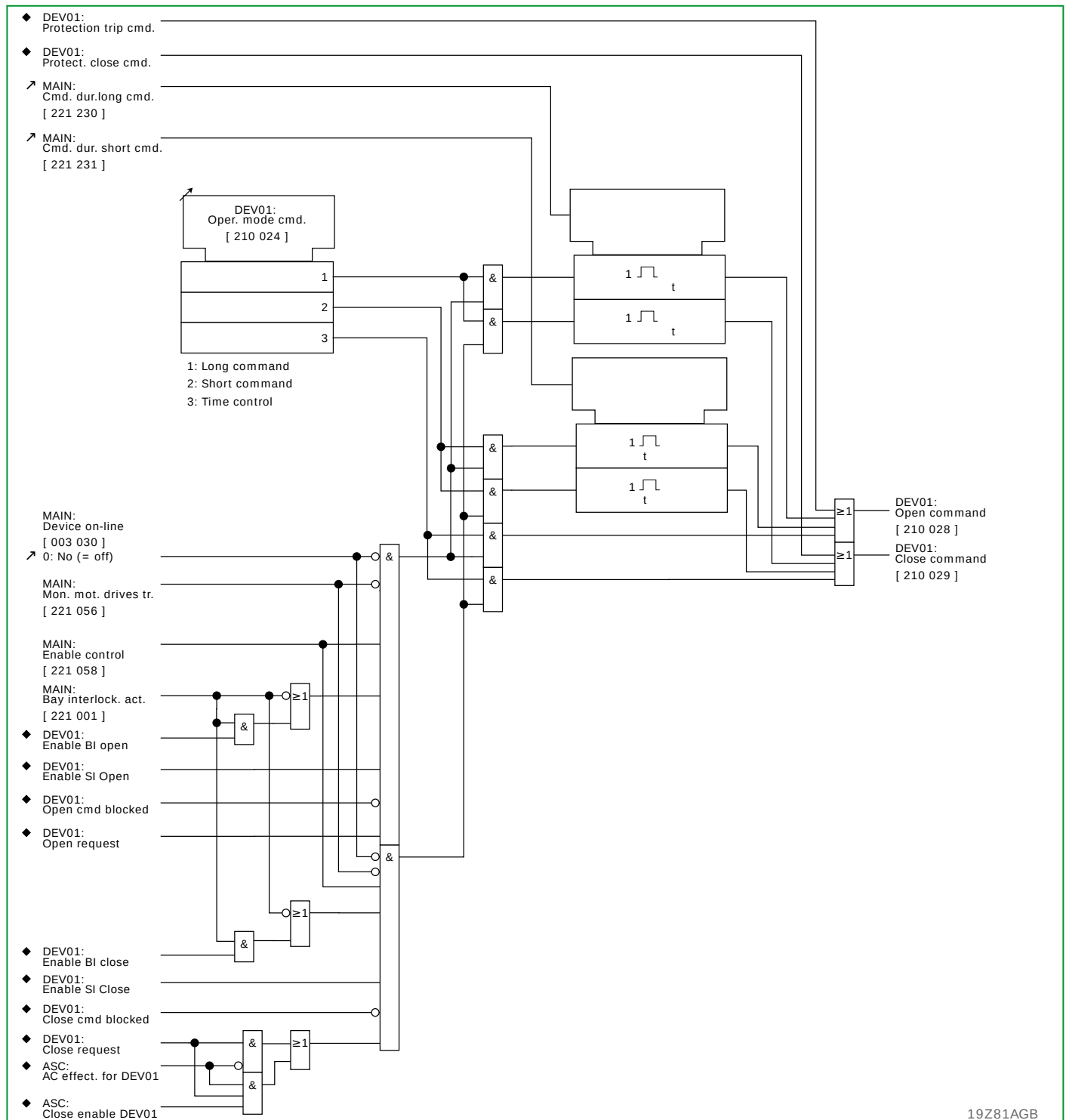


Fig. 3-132: Issue of switching commands.

Dependent on the operating mode (set at DEV01: Oper. mode cmd.) set for commands, switching commands are issued for the set timer durations or according to time control.

When the automatic synchronism check (ASC) is active and the parameter ASC: System integrat. PSx is set to *Autom.synchr.control* a "Close" request will automatically issue a "Close" command for the circuit breaker after a *close enable* was issued by the ASC.

However if ASC: System integrat. PSx is set to *Autom.synchron.check* ASC will not interfere with any switching commands. Data generated and continuously updated by the ASC function is transmitted – when configurations have been set accordingly – to the central control station, where operators may make decisions as to which external device is to be given a switching command.

### 3.23.6.5.1 Blocking of Switchgear Device Operation

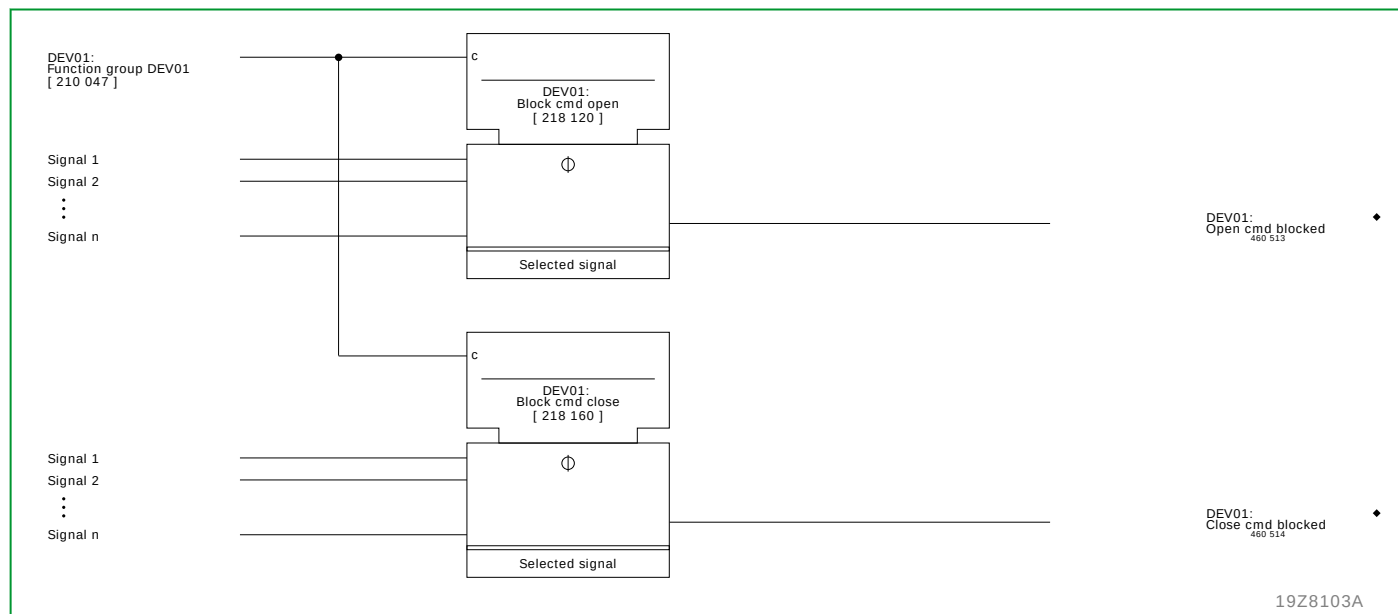


Fig. 3-133: Blocking of switchgear device operation.

It is possible to generally block open and / or close commands to a switchgear device. Setting parameters DEV01: Block cmd open and DEV01: Block cmd close (and correspondent parameters for the other DEVxx) are available for this purpose. Due to safety reasons the blocking inputs are effective only if no command is active. During a switching operation the blocking is disabled to secure that the switch will move always into a safe position.

To each of these setting parameters can be signals assigned; each of these signals then activate the blocking of the switching command appropriate to this setting parameter. In this case the signal MAIN: Interlock equ. viol. is issued, just like with a breach of the interlocking conditions.

### 3.23.6.5.2 External Termination Control

If the operating mode *Time control* was selected it is possible to intervene in the control process of external switchgear units by using external termination contacts. It will then be necessary to set the C434 at MAIN: W. ext. cmd. termin. to Yes and binary signal inputs must be configured so they can be connected to the external termination contacts. The input configuration has to be done for each device separately. Be aware that an external command termination does not make sense for a fast switch as a circuit breaker, as its operation is edge-controlled and involves no motor being directly time-controlled (contrast to a disconnecter drive).



## 3.23.6.6

## Switch Truck

For switchgear units mounted on switch trucks with switch truck plugs, it is possible to configure a single-pole status signal from the switch truck plug. If such a configuration has been assigned, the status signal for the position of the associated switchgear unit is set to 'Open' while the input has a logic value of "1".

### 3.23.6.7 Time Control of Switching Commands

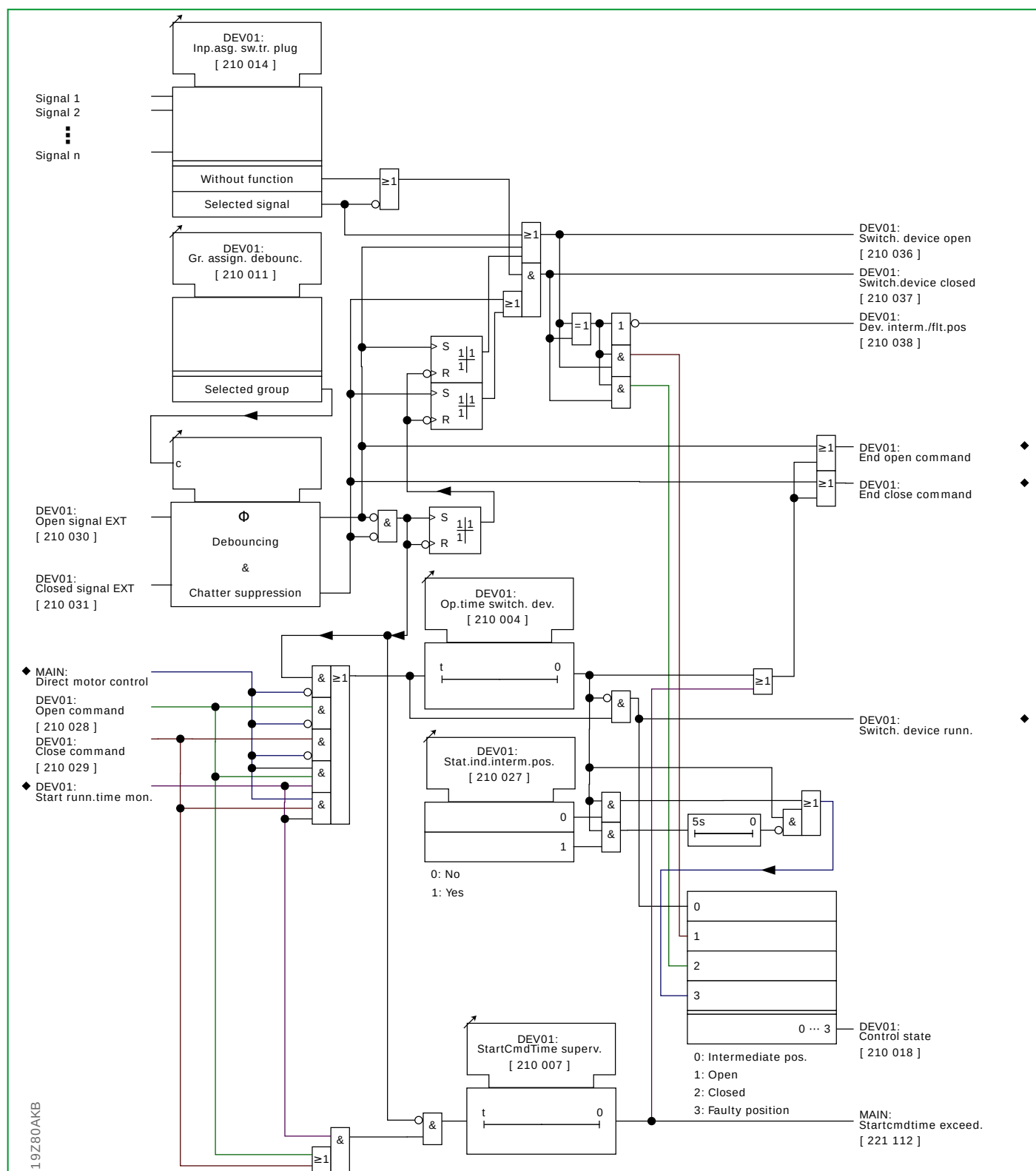


*Fig. 3-134: Monitoring of switching commands.*

After sending an Open / Close command, running time monitoring for the switchgear unit is started.

The C434 expects that the switchgear unit has reached its intermediate position within a period of time that can be configured via DEV01: StartCmdTime superv. (for DEV01, respective setting parameters exist for the other DEVxx). If

the switchgear unit has not reached its intermediate position after this time has elapsed then the command is deactivated and an exceeded timer is flagged by the signal `MAIN: Startcmdtime exceed..` In case of a switchgear unit for which it is (almost) impossible to detect the intermediate position (for example a Circuit Breaker) it is recommended to switch off this monitoring by setting the parameter to `Blocked`.

Moreover, the C434 expects a status signal – “Open” or “Closed” to be issued by the switchgear unit within the duration of running time monitoring. The status signal for the position of the contacts on the switchgear unit is present at appropriately configured binary inputs on the C434, which can be set to debouncing and chatter suppression mode (see [Section 3.26.1.1, \(p. 3-201\)](#)). For the duration of running time monitoring or until the contacts on the switchgear unit are back to a defined position – either “Open” or “Closed” – the signal “Intermediate position” is issued.

If `DEV01: Interm. pos. suppr.` is set to `Yes`, the previous switchgear unit status will continue to be signaled to the communication interfaces while the switchgear unit is operating. Once the contacts on the switchgear unit have reached their new position, the updated status is signaled accordingly to the communication interfaces. This parameter has no impact to internal signals, such as `DEV01: Switch. device open`, `DEV01: Switch.device closed` or `DEV01: Dev. interm./flt.pos.`

If the contacts on the switchgear unit have not reached either their “Open” or “Closed” position after the set time period for running time monitoring has elapsed the signal *Faulty position* is issued. If `DEV01: Stat.ind.interm.pos.` is set to `Yes`, a delay time of 5 s is started. Once this time period has elapsed and there is no status signal for the position, the state actually present at the binary inputs will be signaled.

If the operating mode without external termination contacts was selected (`MAIN: W. ext. cmd. termin..` is set to `No`) the switching command is terminated after the set latching time has elapsed, when either the ‘Open’ or ‘Closed’ position status signal is received or the set time period for running time monitoring has elapsed (see [Fig. 3-129, \(p. 3-176\)](#)).

If the operating mode with external termination contacts was selected (`MAIN: W. ext. cmd. termin..` is set to `Yes`) the switching command is terminated, after the set latching time has elapsed, when a termination command is issued while the set time period for running time monitoring is active.

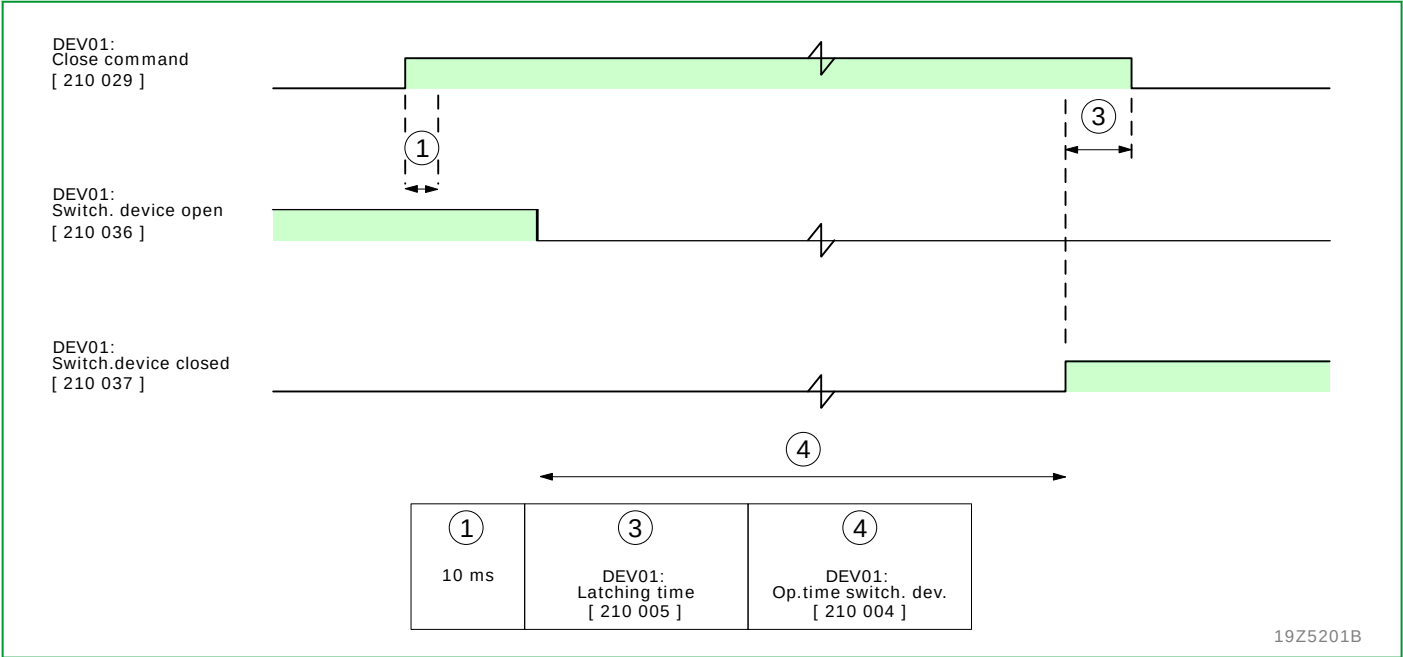


Fig. 3-135: Sequence for time control of switching commands without external termination control, example for switching operation “close”.

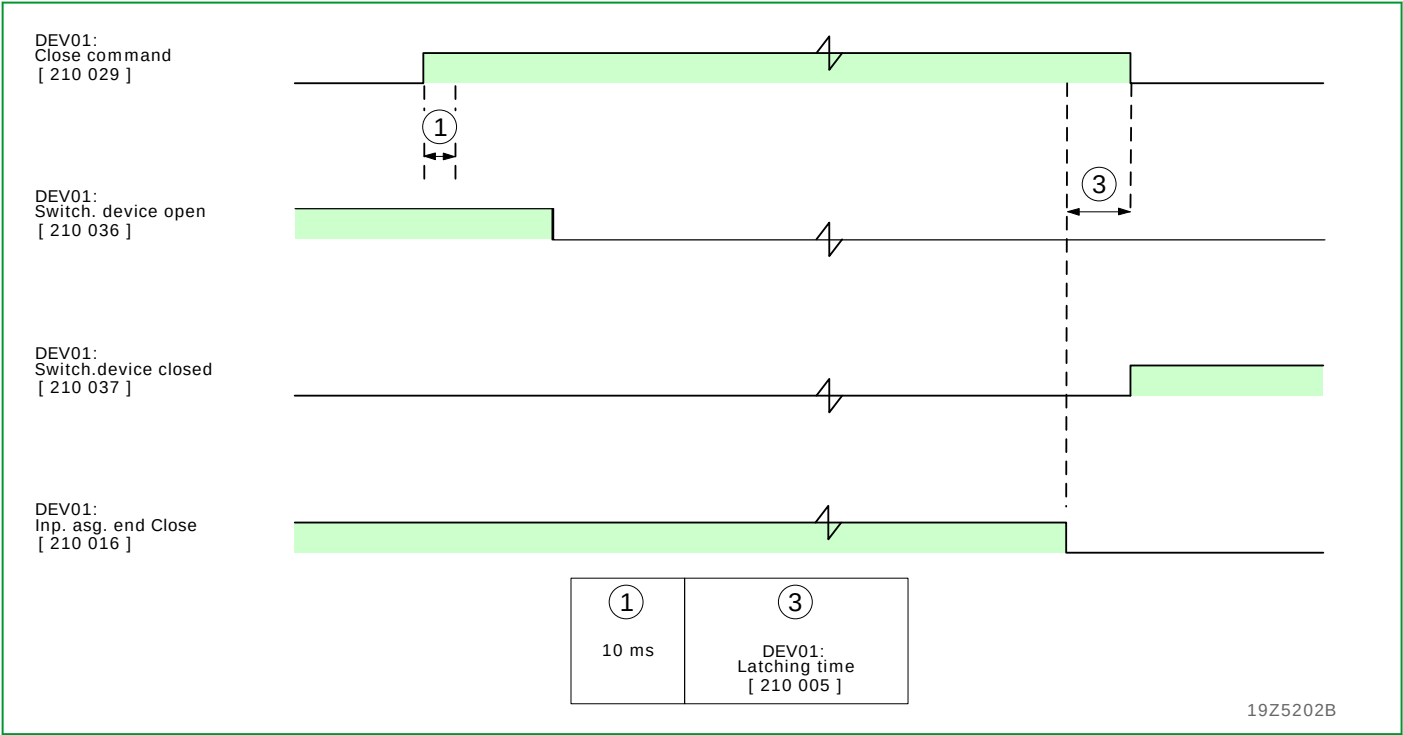


Fig. 3-136: Sequence for time control of switching commands with external termination control, example for switching operation “close”.

#### 3.23.6.8 Monitoring the Number of CB Operations Permitted

The maximum number of CB operations within an ARC cycle (or within a specific time period) may be set with parameter MAIN: CB1 max. oper. cap. Associated with this parameter is the counter at MAIN: CB1 act. oper. cap. to which the maximum number of CB operations permitted is assigned as soon as the positive edge of an event is present that has been selected by a "1 out of n" parameter at MAIN: CB1 ready fct.assign.

The number of CB operations permitted, set with the counter at MAIN: CB1 act. oper. cap. are then decremented by 1 with each CB operation. Operation of the CB is recognized from the contact position signals DEV01: Switch.device open and DEV01: Switch.device closed.

The counter at MAIN: CB1 act. oper. cap. may only be decremented to a value of 1. Reaching a value of 1 will in no way effect the protection or control functionality, in particular there will be no blocking of CB operation! When a CB fault has occurred (i.e. MAIN: CB1 faulty EXT is set to Yes) the counter MAIN: CB1 act. oper. cap. is immediately set to 1.

3.23.7 Direct Motor Control

3.23.7.1 Monitoring the Motor Drives in Case of Direct Motor Control

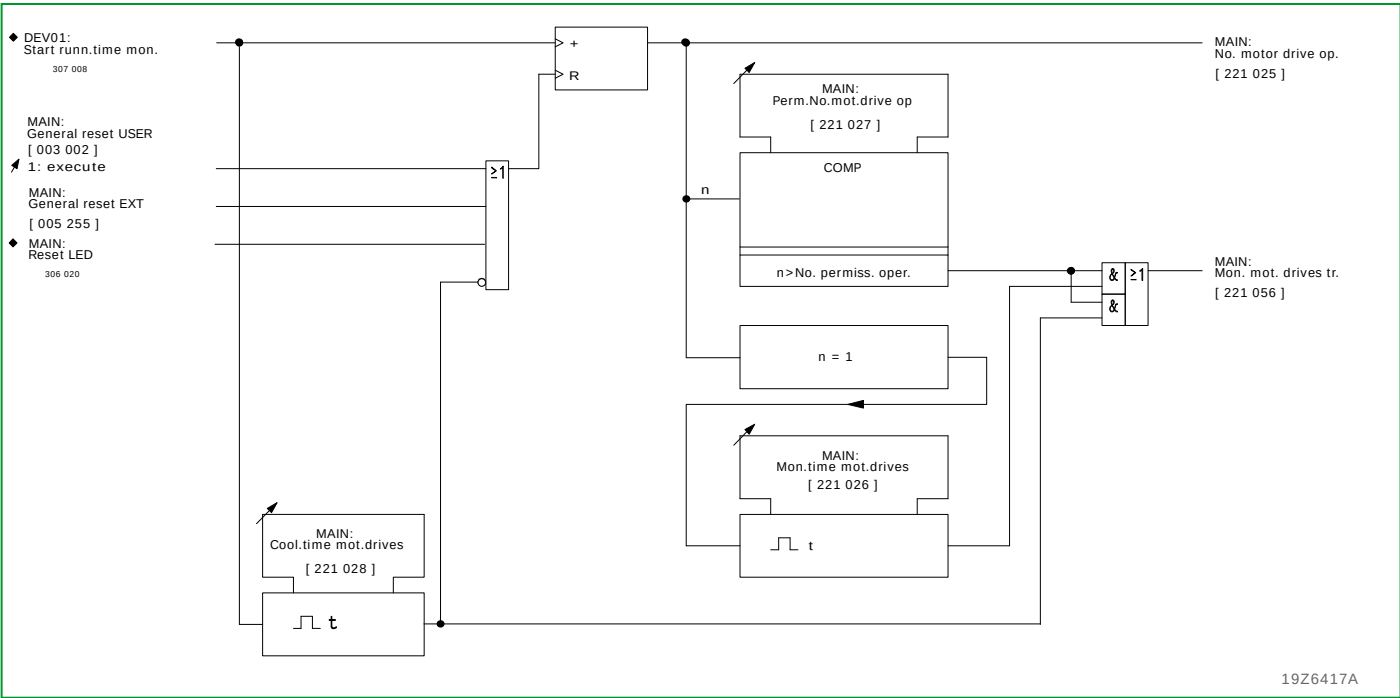


Fig. 3-137: Monitoring the Motor Drives in Case of Direct Motor Control.

For bays with direct motor drive control of load disconnecting switches, isolating links or grounding switches, a monitoring function is provided to protect motors from overheating.

The number of switching operations within a set monitoring period is counted. If the number of switching operations within the monitoring period exceeds the set limit, the signal MAIN: Mon. mot. drives tr. is issued. For the duration of the set cooling time, no control commands to motor-driven switchgear units will be executed. Once the set cooling time has elapsed, the control commands are enabled again.

3.23.7.2 Counter for the Open / Close Commands

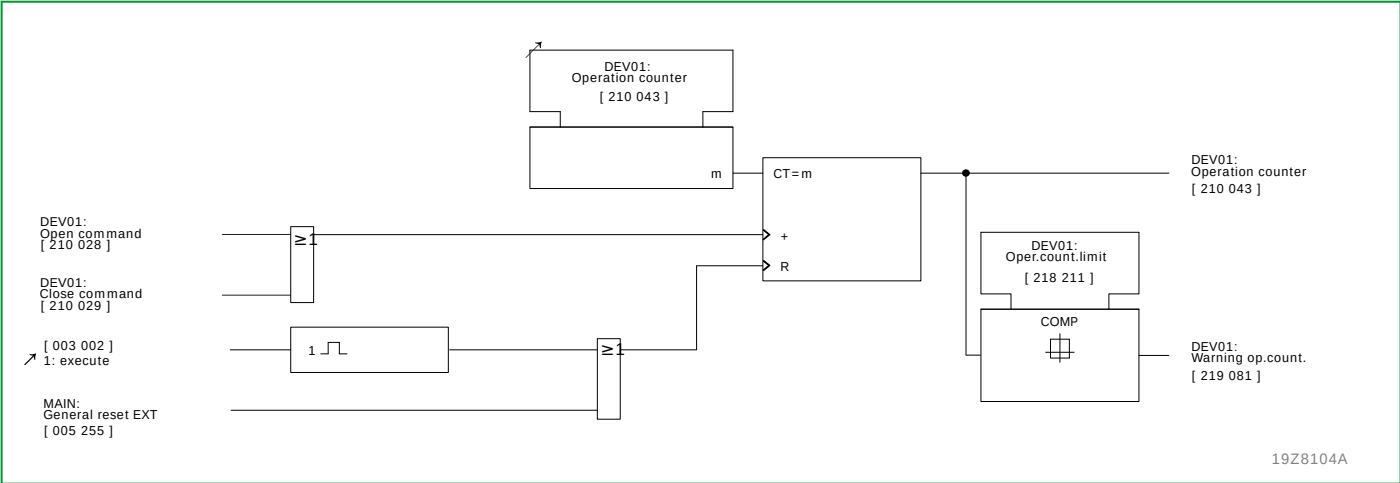


Fig. 3-138: Counter for the Open / Close Commands.

The diagram above shows the example of function group DEV01. The logic, however, is valid for all DEVxx with the appropriate parameters.

All Open and Close commands to the switchgear unit are counted. One counter per DEVxx function group is available for this purpose.

Moreover, a limit value can optionally be set for the counter value. If the counter value reaches the set limit a warning signal is issued. Due to safety reasons the switchgear control will not be blocked when the set limit has been reached.

### 3.23.7.3

#### Time Control for Direct Motor Control

The control sequence described above applies to all switchgear units operated via an "Open" contact or a "Close" contact. For bays with direct motor control of load disconnecting switches, isolating links or grounding switches, the following modified control sequence described below applies to motor-operated switchgear units. The list of Bay Panel types shows which bay types are defined for direct motor control. An example for the connection of a bay with direct motor control is illustrated in Chapter "Installation and Connection".

If a Bay Panel type with direct motor control is selected, a binary input for the status signal of the motor relay and one output relay each to trigger the motor relay and the shunt windings will have to be configured. In the example illustrated in [Fig. 3-139, \(p. 3-189\)](#), the single-pole command CMD\_1: Command C012 is defined for control of the motor relay, the single-pole command CMD\_1: Command C011 is defined for control of the shunt windings and the single-pole signal SIG\_1: Signal S012 EXT (debounced and conditioned by chatter suppression) is defined for the status signal to the motor relay.

After triggering the motor relay, a set monitoring time period is started during which the status signal must be issued by the motor relay. If the status signal is not received during this time period a signal is transferred to the substation control level. In addition, the "Close" command issued to the output relays, configured to *Motor relay* or *Shunt winding*, is terminated if MAIN: Cmd.end f. DC fail. is set to its default value Yes. This results in interrupting the motor control command circuit and thereby preventing an undefined switch position. However, this would involve the danger of contact burn.

A different type of monitoring is active if MAIN: Cmd.end f. DC fail. is set to No: In this case the direction control contacts will remain closed. (Note: This feature bears the danger of an undefined switch position!) Moreover, the C434 issues the following signals (depending on the type of fault) when the monitoring time delay has expired:

- (221 108) MAIN: DC fail. cmd. End – This signal is issued if the K200 contacts have not opened after the set monitoring time-delay has elapsed.
- (221 109) MAIN: DC fail. cmd.start – This signal is issued if the K200 contacts have not closed after the set monitoring time-delay has elapsed.
- (221 110) MAIN: DEV op.time exceeded – This fault signal is issued (as a group signal) when no positive position signal (status signal) has been received from the external device after a command has been issued and the set running time-delay has elapsed.

*For further processing each of these fault signals may be configured to selection parameters from the function groups LED (assignment to LED indicators), OUTP (assignment to output relays), LOGIC (processing by the programmable logic function), COMMx / IEC / GOOSE (signaling via the control system) or they may be mapped to the signal panel as an alarm signal. Acknowledging from the local control panel HMI is done by pressing the CLEAR (C) key.*

If the status signal from the motor relay is issued during the monitoring time period, the running time monitoring of the motor relay is started simultaneously with this status signal. Monitoring of the switching command is then the same as with electromechanically operated switchgear units.

If the operating mode without external termination contacts was selected the "Close" command to the motor relay is terminated after the set latching time has elapsed, when either the "Open" or "Closed" position status signal is received or the set time period for running time monitoring has elapsed (see [Fig. 3-129](#), [p. 3-176](#)). The monitoring time period is again started with the termination of the "Close" command to the motor relay and after it has elapsed the control commands "Open" or "Close" are also terminated. The same is valid for the shunt windings.

If the operating mode with external termination contacts was selected (MAIN: W. ext. cmd. termin. is set to Yes) the switching command to the motor relay is terminated after the set latching time has elapsed, when a termination command is issued while the set time period for running time monitoring is active. With the setting MAIN: ext.cmd.term. w/o PI = No, the switching command is also terminated when either the "Open" or "Closed" position status signal is received. The switching command to the motor relay is always terminated after the set latching time has elapsed. The monitoring time period is again started with the termination of the "Close" command to the motor relay and after it has elapsed the control commands "Open" or "Close" are also terminated.



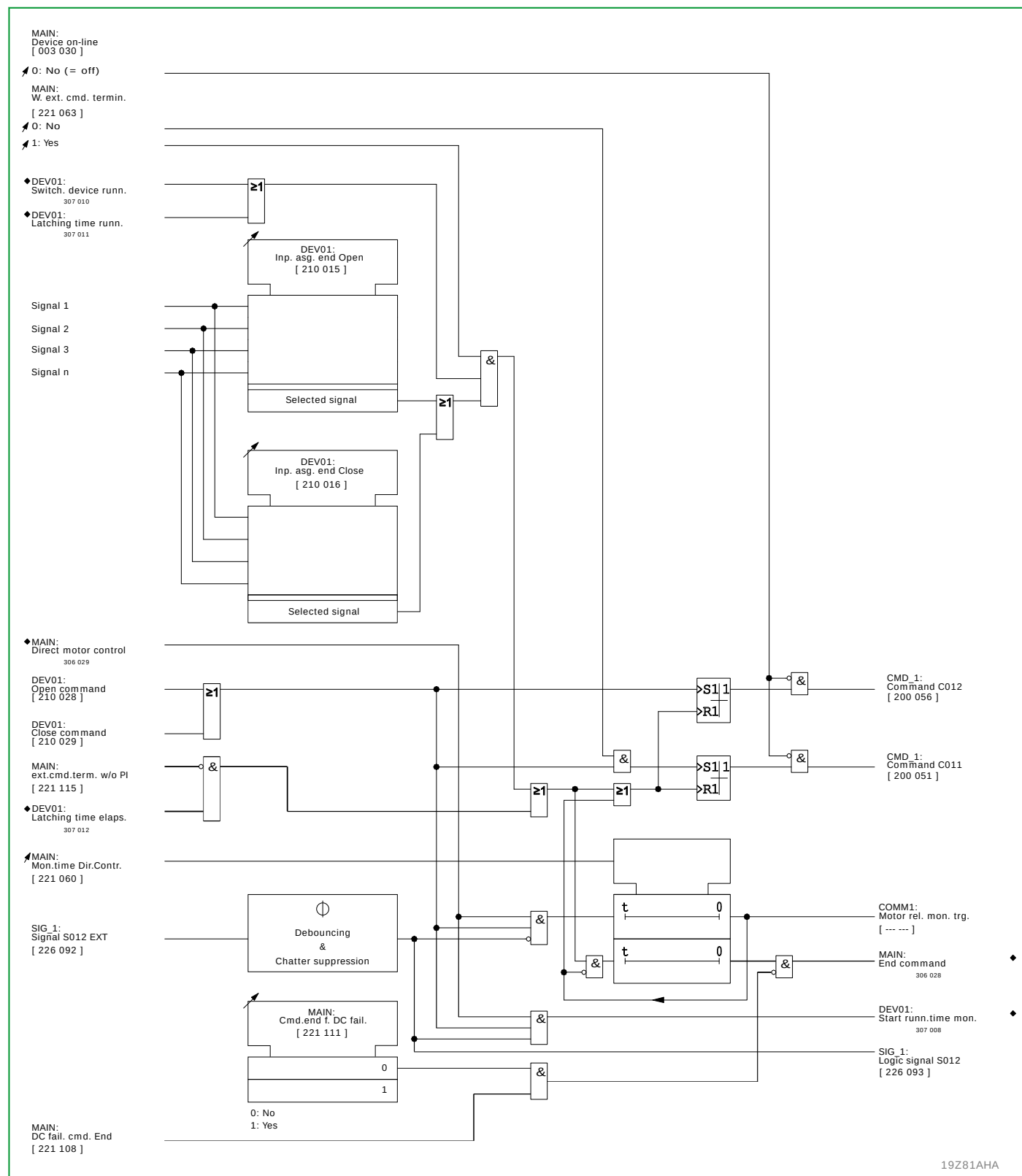


Fig. 3-139: Control and monitoring of the motor relay.

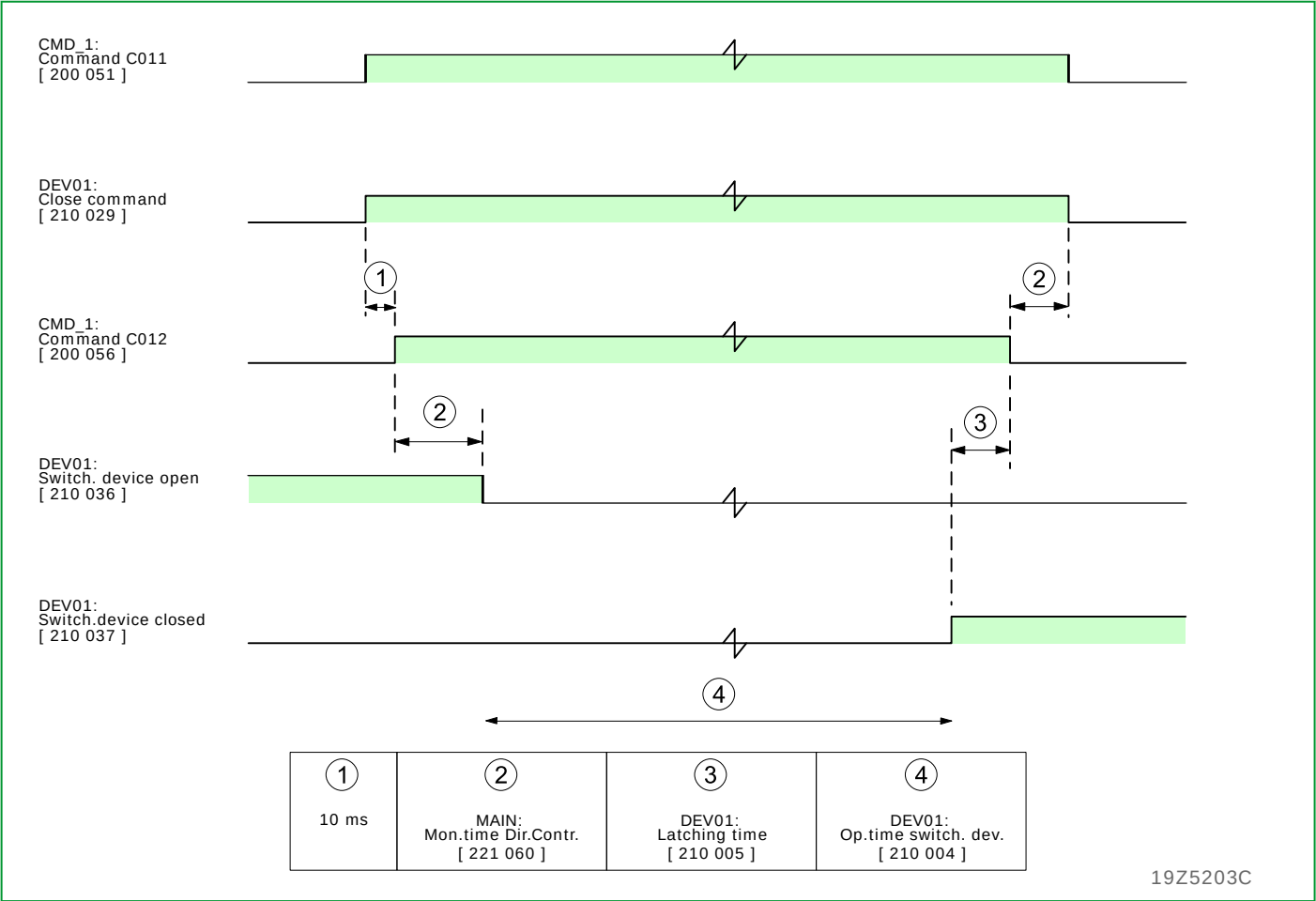


Fig. 3-140: Sequence of time monitoring for direct motor control without external termination, example for switching operation “close”.

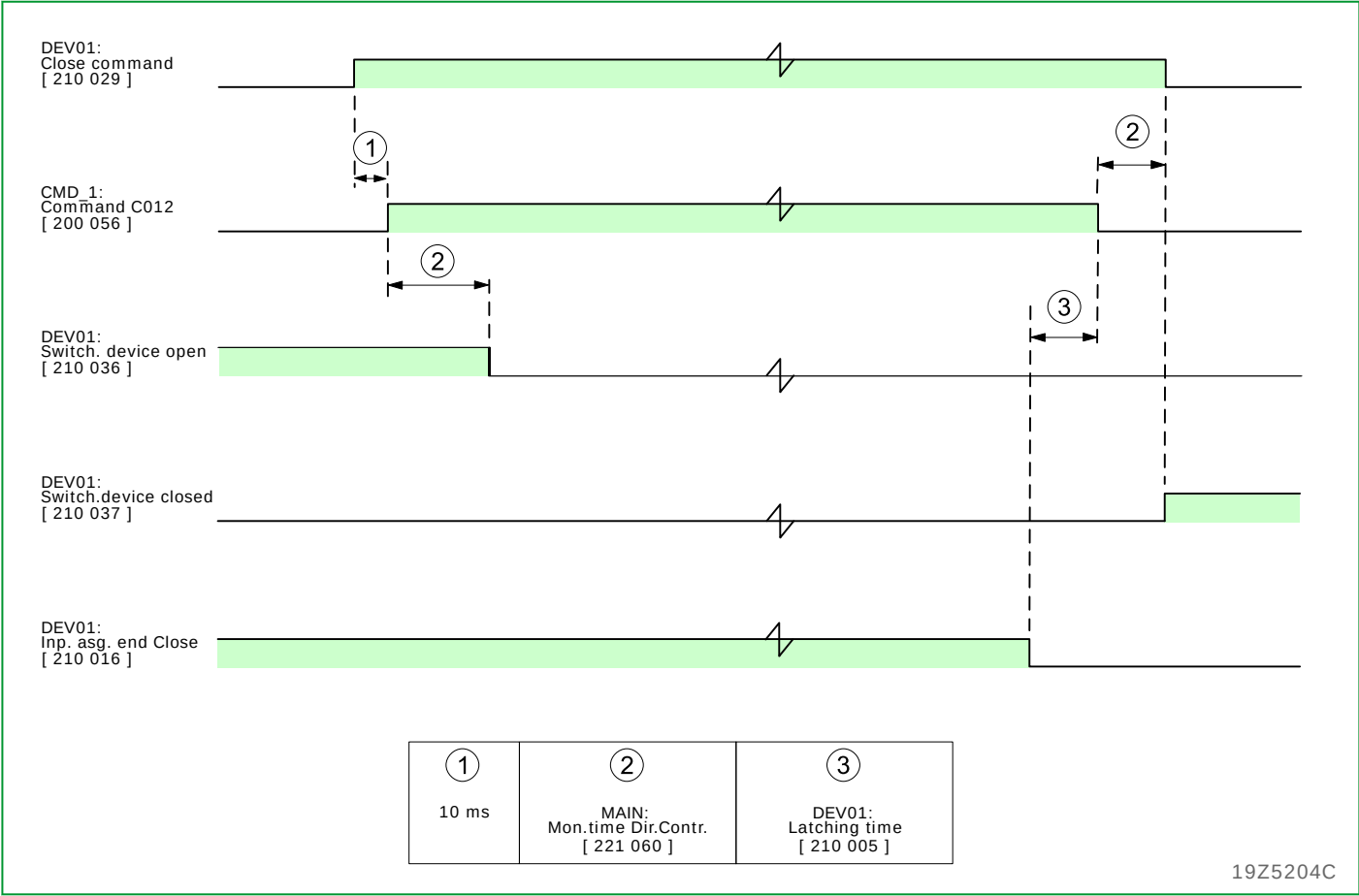


Fig. 3-141: Sequence of time monitoring for direct motor control with external termination, example for switching operation “close”.

3.23.7.4

Single-Pole Commands for Integrated Direct Motor Control

The C434 has an integrated logic for direct motor control. Three single-pole commands (see also function group CMD\_1, [Section 3.25, \(p. 3-197\)](#)), together with a single-pole signal (see also function group SIG\_1, [Section 3.26, \(p. 3-198\)](#)), are available for this purpose.

**CMD\_1: CMD\_DC1**

- Direct control of starting sequence with impulse command.

Note that this requires external high-precision contacts for command reset and for breaking the power circuit of the motor drive.

The operation of this command is delayed by the set value MAIN: DC op. delay t1.

The command is reset either when the timer MAIN: DC1 impulse t2 has elapsed, or with positive indication of the final switchgear position.

**CMD\_1: CMD\_DC2**

- Direct control without check back signal.

The operation of this command is delayed by the set value MAIN: DC op. delay t1.

The command is reset with positive indication of the final switchgear position, but this reset is delayed by the set value MAIN: DC2/3 release delay.

**CMD\_1: CMD\_DC3**

- Direct control with check back signal.

The operation of this command is delayed by the set value MAIN: DC op. delay t1.

The command is reset...:

- with positive indication of the final switchgear position, if  
MAIN: ext.cmd.term. w/o PI = No, or
- with the single-pole signal "SIG\_DC3" (SIG\_1: Logic SIG\_DC3).

In either case the reset is delayed by the set value MAIN: DC2/3 release delay.

If none of these reset conditions is met after the set monitoring time-delay has elapsed the reaction of the C434 depends on the setting  
MAIN: Cmd.end f. DC fail.:

- If MAIN: Cmd.end f. DC fail. is set to its default value Yes the command is terminated.
- If MAIN: Cmd.end f. DC fail. is set to No the contacts of the assigned output relays remain closed and the C434 issues the following signals (depending on the type of fault) when the monitoring time delay has expired:

(221 108) MAIN: DC fail. cmd. End

(221 109) MAIN: DC fail. cmd.start

(221 110) MAIN: DEV op.time exceeded

This behavior is comparable to the time-monitoring described in [Section 3.23.7.3, \(p. 3-187\)](#).

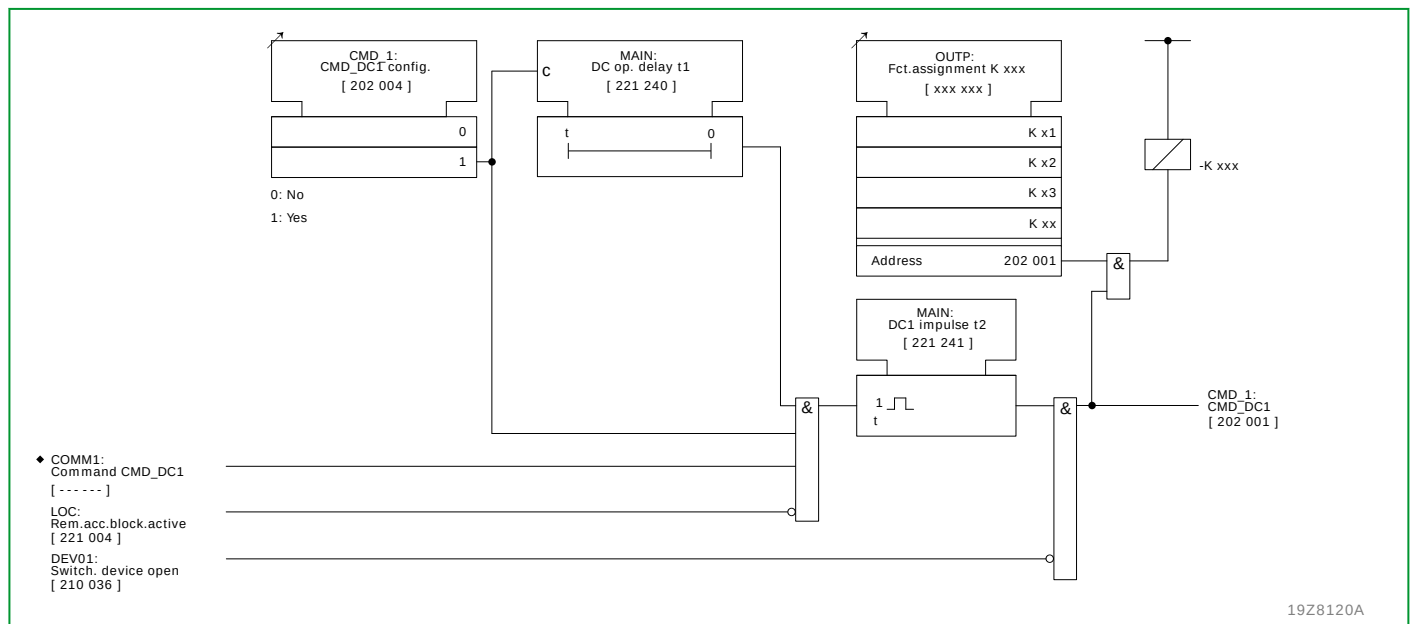


Fig. 3-142: Direct control of starting sequence with impulse command (CMD\_1: CMD\_DC1).

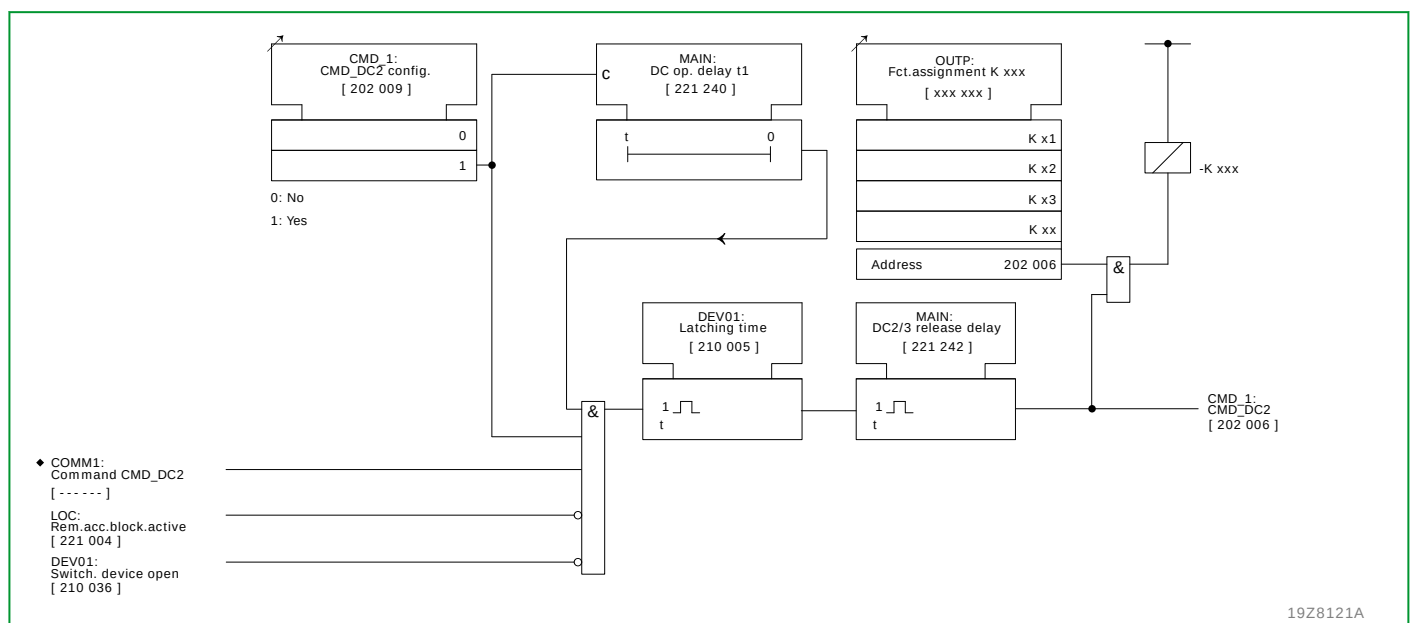


Fig. 3-143: Direct control without check back signal (CMD\_1: CMD\_DC2).

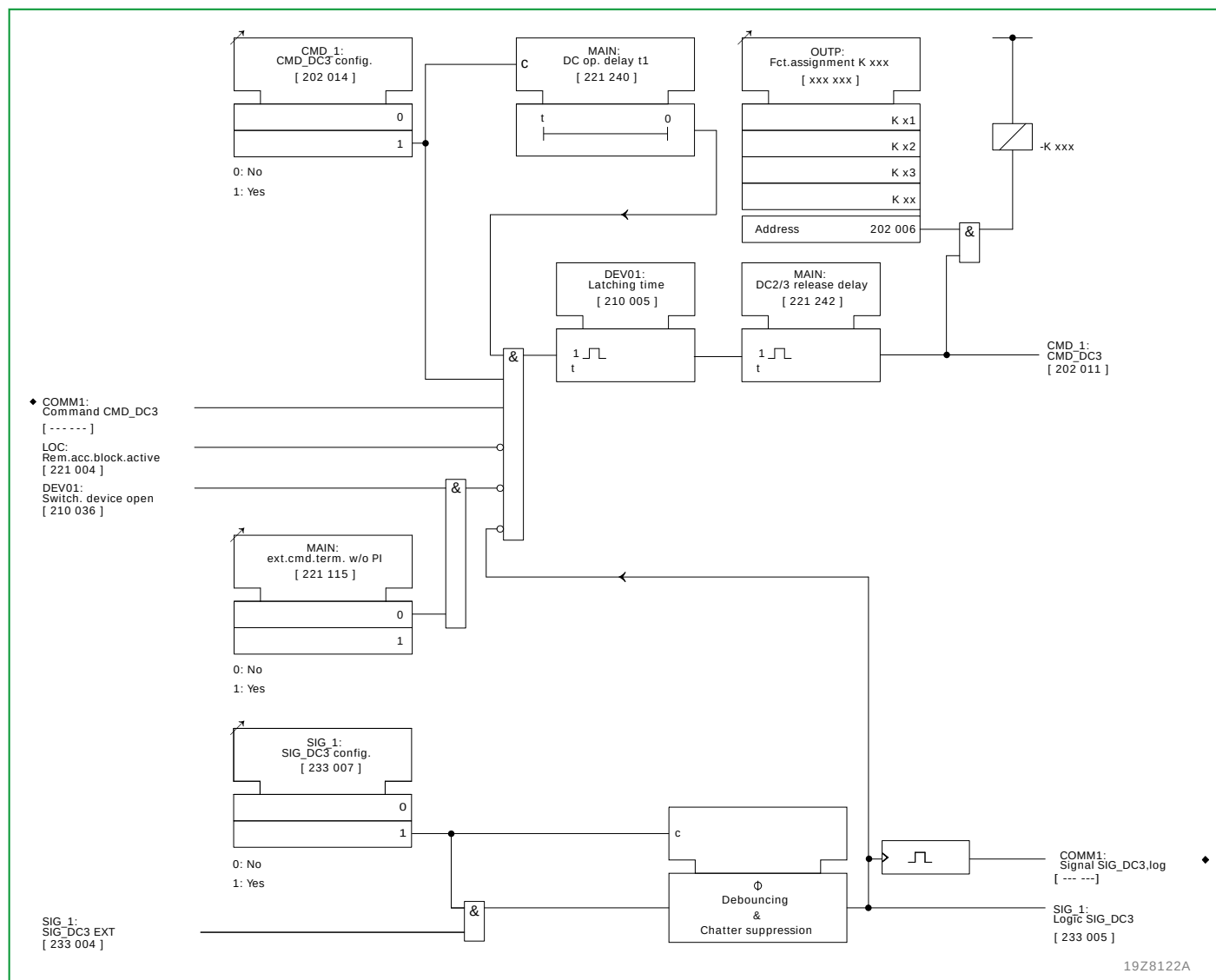


Fig. 3-144: Direct control with check back signal (CMD\_1: CMD\_DC3).

### 3.24 Interlocking Logic (Function Group ILOCK)

The switching commands to the controllable switchgear units in the bay are enabled only after interlock conditions have been checked. The interlock conditions are defined in the form of Boolean equations in the interlocking logic function.

The choice of the bay type automatically defines the bay interlock conditions (or equations) for the 'Open' and 'Close' operations of the individual switchgear units in the bay. The bay interlock equations for operation with station interlock differ from the bay interlock equations for operation without station interlock (see [Vol. 2, Chapter A5, \(p. A5-1\)](#)). These automatically defined interlock conditions – determined by the choice of bay type – can be modified by the user at any time to fit particular station requirements. The following signals acquired by the C434 are linked by logic operations for the bay interlock:

- Function blocks 1 and 2
- Programmable logic outputs
- Switchgear position signals, after debouncing and chatter suppression
- Single-pole signals, after debouncing and chatter suppression

A maximum of 32 equations with 32 equation elements each are available to define interlock conditions. The Boolean equations need to be defined without the use of brackets. The following rule applies to the operators: "NOT" before "AND" before "OR". The output signal of one equation can be fed into a higher-order equation as an input thus creating a sequence of interlinked Boolean equations.

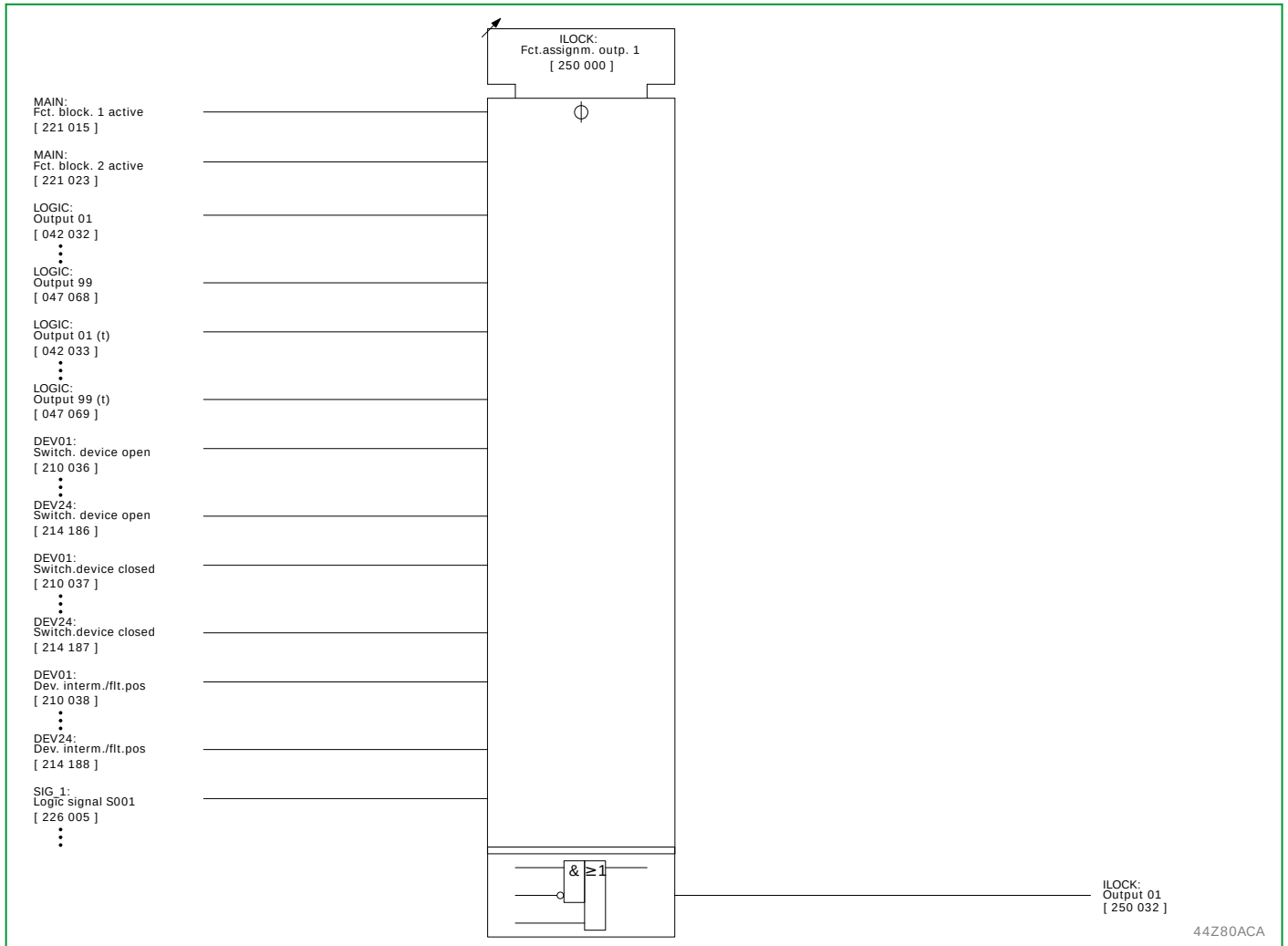


Fig. 3-145: Interlocking logic as illustrated for equation 1.

### 3.24.1 IEC 61850 Reporting

As the interlock conditions are also transmitted together with reporting in the IEC 61850 communication protocol it is a requirement that these interlock conditions are cyclically checked and not only with the request for a switching operation.

Therefore the parameter (221 104) ILOCK: Cycle t interl.check allows for setting the cycle time (range from 100 ms to 10 s), after which a check of the interlock conditions is carried out. If this parameter is set to *blocked* (default value), the ILOCK signals over IEC 61850 will be updated only if a control command gets executed. If the DEV state changes without a control command these signals remain unchanged. As additional processor capacity must be provided for each of these checks it must be ensured that a favorable compromise is found for the cycle time setting value. On the one hand it is desirable to select a cycle time value which is as short as possible so that changes in the interlock conditions are updated without any notable delays, but on the other hand this cycle time value should not be so short that the C434 system will be under too much strain. As the C434 CPU load is dependent on the total number of function groups having been configured it is not possible to suggest a generally acceptable cycle time value.



### 3.25 Single-Pole Commands (Function Group CMD\_1)

Commands may be transmitted to the C434 via the communications interface. When the C434 receives such a command, and if the remote control mode is enabled, an appropriately configured output relay will be triggered and a signal issued.

The user can select the operating mode for each 1-pole command. The following settings are possible:

- *Long command*
- *Short command*
- *Persistent command*

If the operating mode *Long command* or *Short command* has been selected the output relay will be triggered for the time period set at MAIN: Cmd. dur.long cmd. or MAIN: Cmd. dur. short cmd..

The setting options and the functional sequence are shown in the example for Command C001. This will apply accordingly to all other single-pole commands.

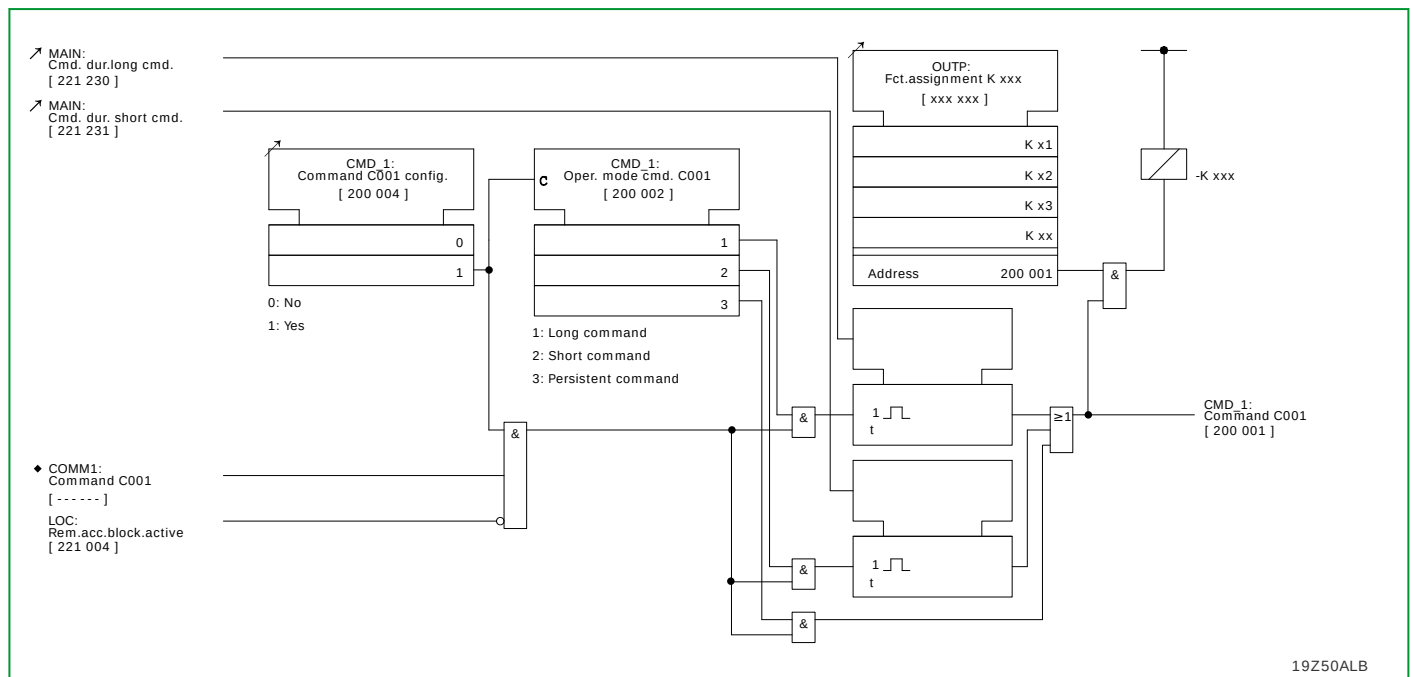


Fig. 3-146: Functional sequence for single-pole commands, as illustrated for Command C001.

## 3.26 Single-Pole Signals (Function Group SIG\_1)

Binary, single-pole signals issued by the system may be transmitted by the C434 via its appropriately configured binary signal inputs to the control station.

Such single-pole input signals are conditioned by debouncing and chatter suppression (see [Section 3.26.1.1, \(p. 3-201\)](#)). This conditioned signal is then presented as SIG\_1: Logic signal S001 (to SIG\_1: Logic signal S224).

Signaling behavior via the communications interface is determined by selecting the operating mode. The following settings are possible:

- *Without function*
- *Start/end signal*
- *Transient signal*

If setting *Without function* has been selected then no message is transmitted when the signal state at the binary signal input changes. If setting *Start/end signal* has been selected then a message is transmitted every time the signal state at the binary signal input changes. A requirement for transmission of the “*Start signal*” message is that the logic “1” signal is present for the set minimum time period. If setting *Transient signal* has been selected then a message is transmitted every time the signal state at the binary signal input changes from logic “0” to logic “1”.

The following figure displays setting modes and the functional sequence with the example for logic signal S001. This will apply accordingly to all other single-pole signals.

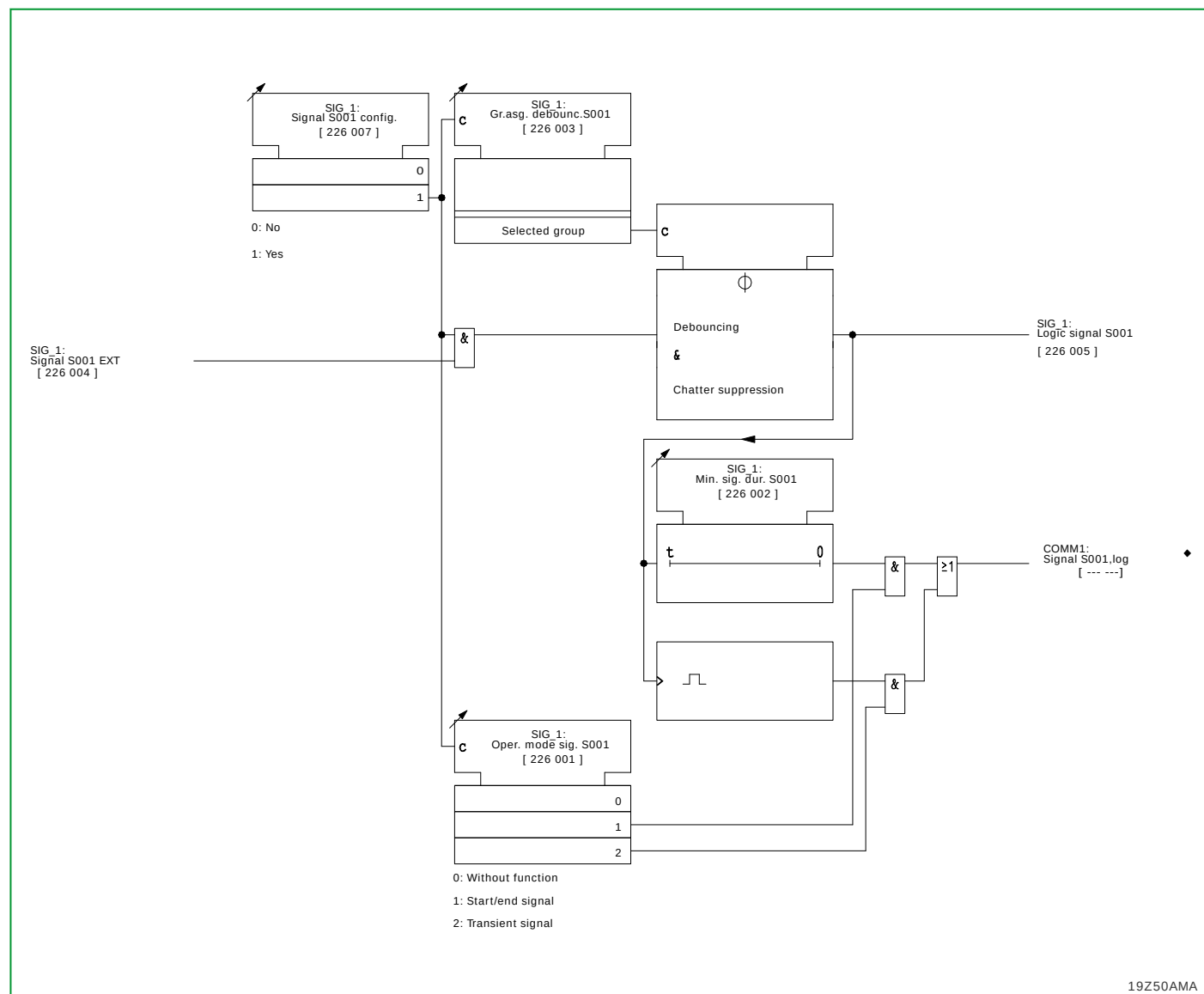


Fig. 3-147: Functional sequence for single-pole signals with the example for logic signal S001.

3.26.1 Acquisition of Binary Signals for Control

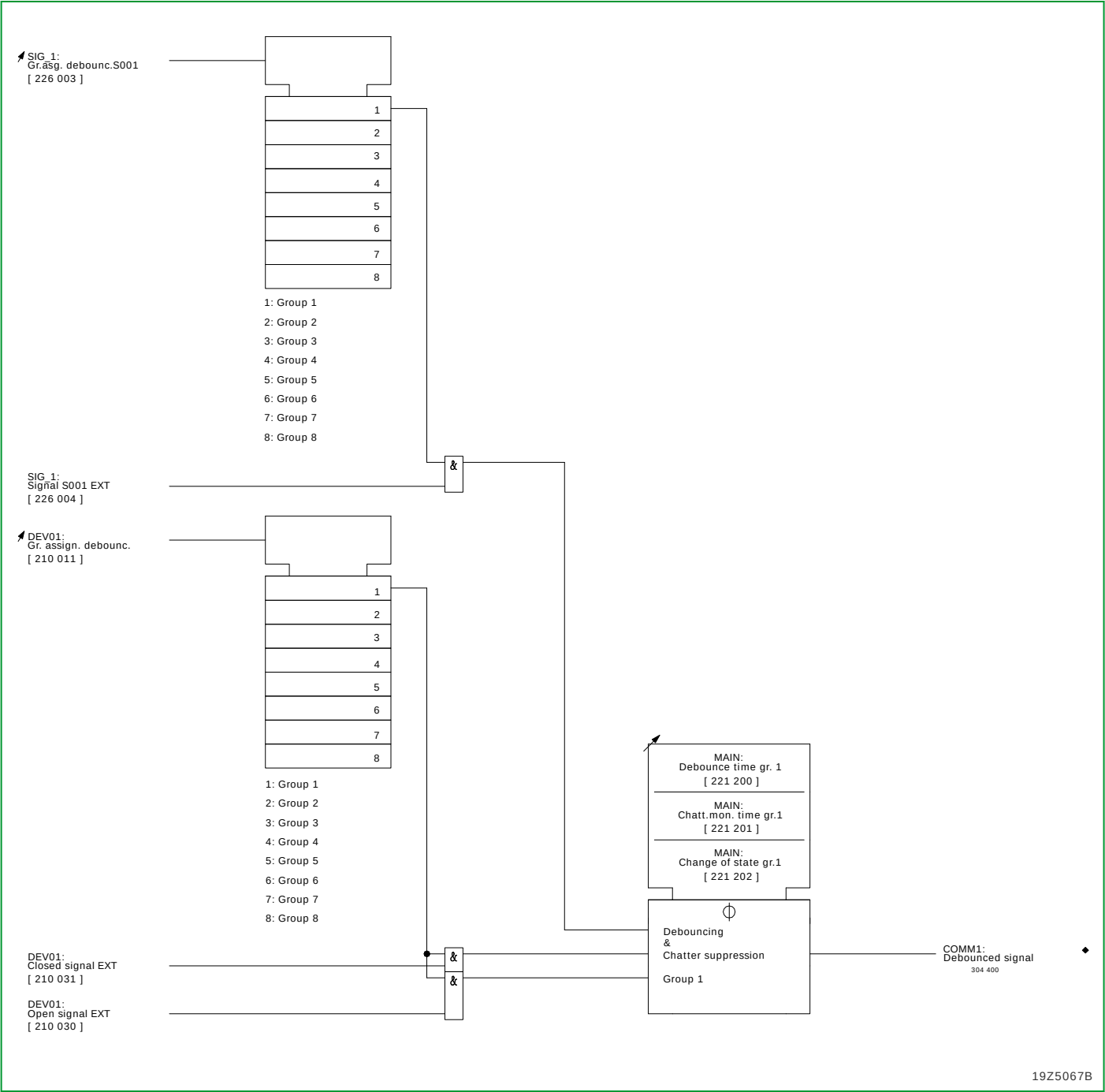


Fig. 3-148: Group assignment and setting of debouncing and chatter suppression, illustrated for group 1.

In the acquisition of signals for control purposes, the functions real time acquisition (time tagging), debouncing and chatter suppression are included as standard. Each of these signals can be assigned to one of eight groups and for each of these groups the debouncing time and chatter suppression can be set. Matching of these two parameters achieves the suppression of multiple spurious pickups.

### 3.26.1.1 Debouncing and Chatter Suppression

#### 3.26.1.1.1 Debouncing

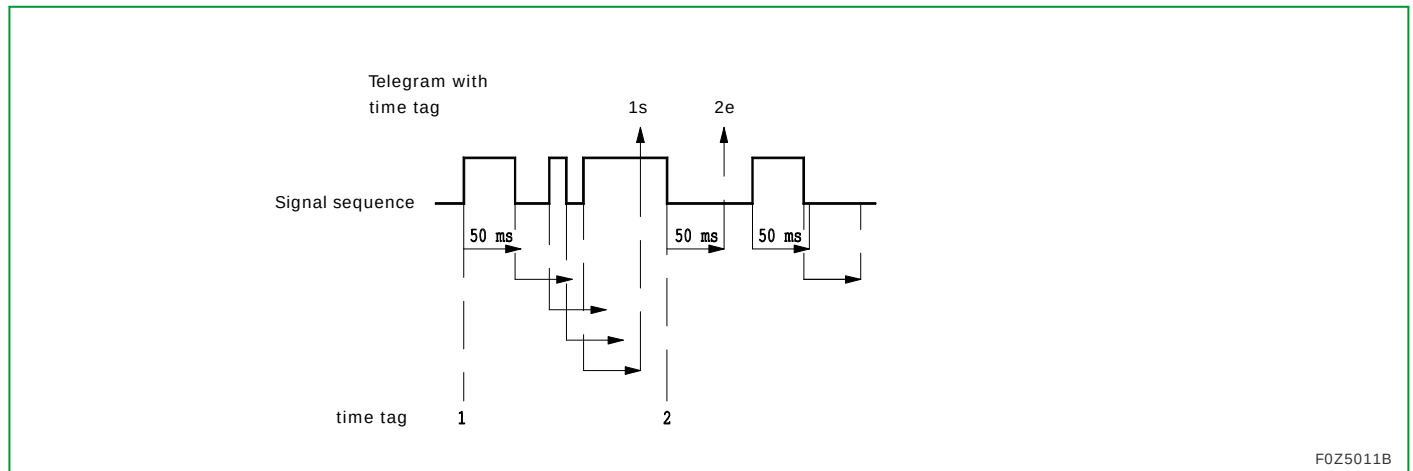


Fig. 3-149: Signal flow with debouncing when time tagging occurs with the 1st pulse edge (e.g. parameter MAIN: Time tag set to the value *1stEdge,OpMem unsort* or *1stEdge,OpMem sorted*.) Example: Set debouncing time: 50 ms, s: start, e: end.

The first pulse edge of a signal starts a timer stage running for the duration of the set debouncing time. Each pulse edge during the debouncing time re-triggers the timer stage.

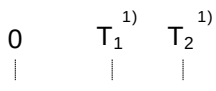
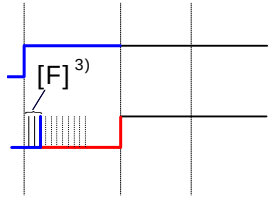
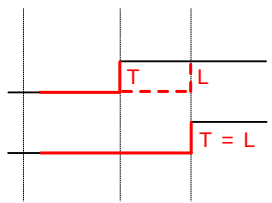
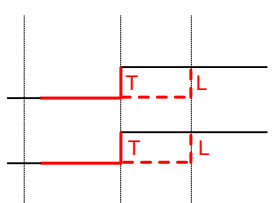
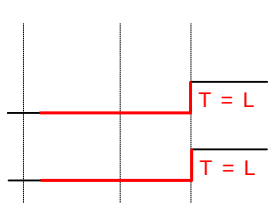
If the signal is stable until the set debouncing time elapses, a telegram containing the time tag of the first pulse edge is generated. As an alternative the time tag may be generated after debouncing by setting parameter MAIN: Time tag to the value *After debounce time*.

After the set debouncing time has elapsed, the state of the signal is checked. If it is the same as prior to the occurrence of the first pulse edge, no telegram is generated.

Time-tagged entries of the first pulse edge are only generated after debounce time has elapsed. If these entries are saved without delay (setting of MAIN: Time tag to the value *1stEdge,OpMem unsort*) they are not necessarily saved in chronological order in the operating data memory. If above parameter has been set to the value *1stEdge,OpMem sorted* then all entries are always saved in chronological order in the operating data memory.

#### Time Tag

The following overview illustrates how the (221 098) MAIN: Time tag setting is operating.

|                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Acquisition of binary signals for control                                                                                                                                                                                                                                                                                     | <div> <div>0</div> <div><math>T_1^{1)}</math></div> <div><math>T_2^{1)}</math></div> </div>  |
| Voltage present at input terminals:<br>Filter function to suppress transient interferences (required number of steps with active signal)<br>(226 004) SIG_1: Signal S001 EXT<br>(no time tag, internal signal to start debouncing) <sup>2)</sup>                                                                              |                                                                                              |
| <i>1stEdge,OpMem sorted:</i><br>(226 005) SIG_1: Logic signal S001 <ul style="list-style-type: none"> <li>on COMM1/IEC<br/>(Signaling at <math>T_2</math> with time tag <math>T_1</math>)</li> <li>internal on operating memory<br/>(Entry in operating memory at <math>T_2</math> with time tag <math>T_2</math>)</li> </ul> |                                                                                              |
| <i>1stEdge,OpMem unsort:</i><br>(226 005) SIG_1: Logic signal S001 <ul style="list-style-type: none"> <li>on COMM1/IEC<br/>(Signaling at <math>T_2</math> with time tag <math>T_1</math>)</li> <li>internal on operating memory<br/>(Entry in operating memory at <math>T_2</math> with time tag <math>T_1</math>)</li> </ul> |                                                                                             |
| <i>After debounce time:</i><br>(226 005) SIG_1: Logic signal S001 <ul style="list-style-type: none"> <li>on COMM1/IEC<br/>(Signaling at <math>T_2</math> with time tag <math>T_2</math>)</li> <li>internal on operating memory<br/>(Entry in operating memory at <math>T_2</math> with time tag <math>T_2</math>)</li> </ul>  |                                                                                            |
| <sup>1)</sup> $T_2 = T_1$ (cycle time) + debounce time<br><sup>2)</sup> SIG_1: Signal S001 EXT is not foreseen for any further transmission via communication interface, neither for assigning to functions nor LOGIC.<br><sup>3)</sup> Filter (e. g. 3 sampling steps)                                                       | <div> <div>T = Time tag</div> <div>L = Log of state</div> </div>                                                                                                                |

## 3.26.1.1.2 Chatter Suppression

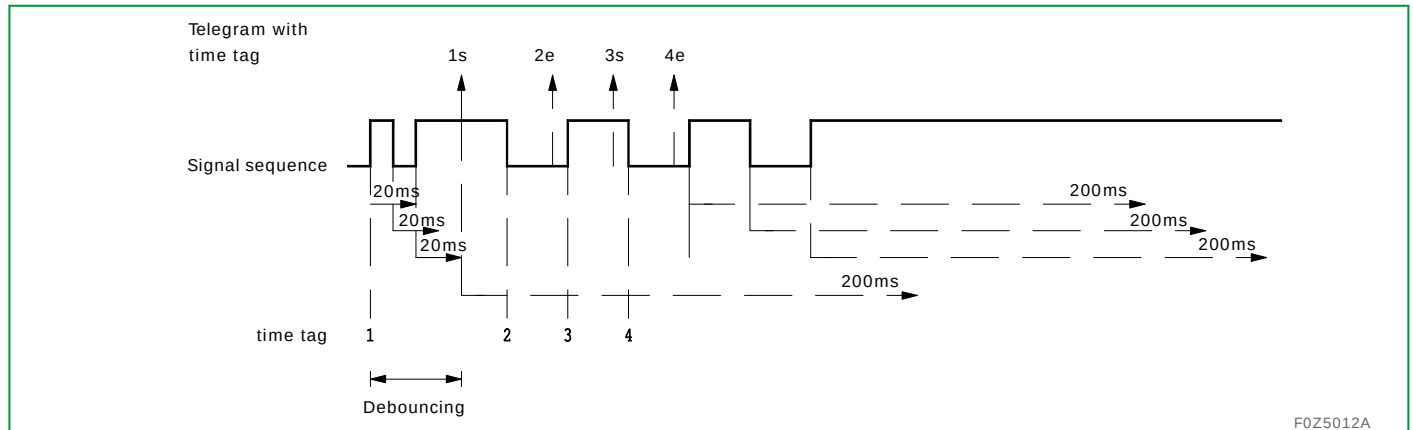


Fig. 3-150: Signal flow for debouncing and chatter suppression. Set debouncing time: 20 ms, set chatter monitoring time: 200 ms, number of admissible signal changes: 4, s: start, e: end.

Sending of the first telegram starts a timer stage running for the duration of the set monitoring time. While the timer stage is elapsing, telegrams are generated for the admissible signal changes. The number of admissible signal changes can be set. After the first “inadmissible” signal change, no further telegrams are generated and the timer stage is re-triggered. While the timer stage is elapsing, it is re-triggered by each new signal change. Once the timer stage has elapsed, each signal change triggers a telegram.

## 3.27 Binary Counts (Function Group COUNT)

The C434 features twenty-four binary counters. Each of these can count the positive pulse edges of a binary signal present at an appropriately configured binary signal input. Such a binary signal can be provided with debouncing.

### 3.27.1 Enable/Disable the Counting Function

The counting function (COUNT) can be disabled or enabled via setting parameters.

### 3.27.2 Debouncing

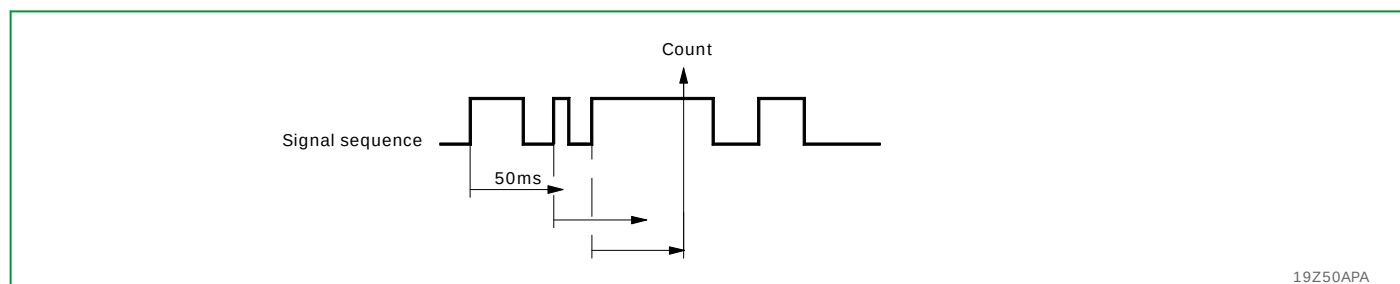


Fig. 3-151: Debouncing signal flow. Set debouncing time: 50 ms.

The first positive pulse edge of the binary input signal to be counted will trigger a timer stage which will continue to run for the set debouncing time period. Each positive pulse edge during the debouncing time re-triggers the timer stage. The binary input signal will be counted if it is stable during the set debouncing time period.

The debouncing time can be set separately for each of the twenty-four counters. After the set debouncing time has elapsed, the state of the signal is checked. If it is the same as prior to the occurrence of the first pulse edge, it will not be counted.

### 3.27.3 Counting Function

The debounced binary signal is counted by a 16 bit counter. The counters may be set to a specific count value (preload function) by setting a parameter or via the serial interfaces. The values of the counters can be shown on the LC-display and read out via the PC interface or the communications interface.

For each of the twenty-four counters, there is a limit value that can be optionally set:

- COUNT: Limit counter 1 (and the same way for counters 2 to 24),
- settable from 1 to 65000,
- setting "Blocked" disables the limit check. (This setting is the default value.)

A warning signal (COUNT: Warning count 1 and the same way for counters 2 to 24) is issued if the associated counter value exceeds the set limit.

### 3.27.4 Transmitting the Counter Values via Communications Interface

The counter values are transmitted via the communications interface when a signal is presented to an appropriately configured binary signal input, a trigger signal is issued by a setting parameter or at cyclic intervals as set at the cycle time stage COUNT: Cycle t.count transm. When the counter value is transmitted at cyclic intervals, then transmission is time synchronized if the ratio



60/(set cycle time) comes to an integer. In all other cases the counter values are transmitted at time intervals determined by a free running internal clock.

### 3.27.5 Counter Values Reset

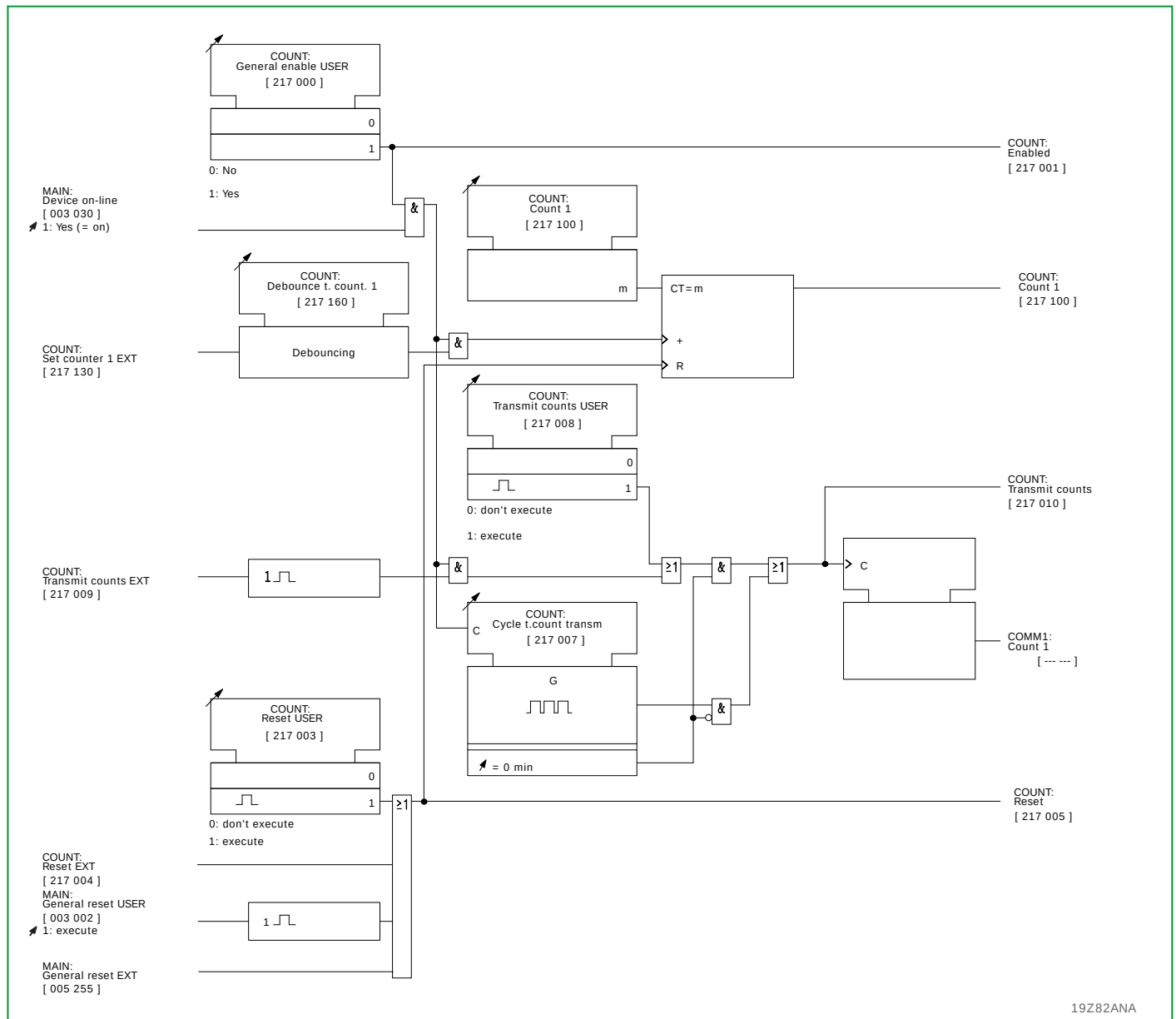


Fig. 3-152: Binary Count. (This diagram shows counter 1 as an example. The displayed logic is also valid for counters 2 to 24, where **COUNT: Set counter 1 EXT** and **COUNT: Count 1** have to be replaced by the respective parameters.

The counter values may be reset – all at once – by setting parameter **COUNT: Reset USER** or via an appropriately configured binary signal input as well as by the general reset action.

### 3.28 TIMER (Function Group TIMER)

Four groups of timer are available in the C434. The timer can set time for starting and ending automatically with start time (TIMER: Start hour 1, TIMER: Start minute 1 ) and end time (TIMER: End hour 1, TIMER: End minute 1). Each of the timer can set one or more repeat days in a week TIMER: Calendar 1 (from Monday to Sunday).

For example, it is able to set time for automatic's activation (e.g. keeping the output relay closed) between 12 PM and 18 PM from Monday to Friday for timer stage1 and between 16 PM and 19 PM on Saturday and Sunday for timer stage 2.

From version -655 the timer settings allow more flexibility.

If the end time is before (smaller than) start time, the "active" window will end on the next day. For example, timer stage 1 is set for Saturday with start time 18 p.m. and end time 12 p.m., then it will be active from Saturday 18 p.m. until Sunday 12 p.m.

If start and end timers are set to the same value, the timer stage gets active for 24h. For example, timer stage 1 is set for Saturday with start time 12 p.m. and end time 12 p.m., then it will be active from Saturday 12 p.m. until Sunday 12 p.m.

The internal clock is the source of the Timer function. It is also possible to use the time synchronised clock signal (GPS, DCF77, SNTP).

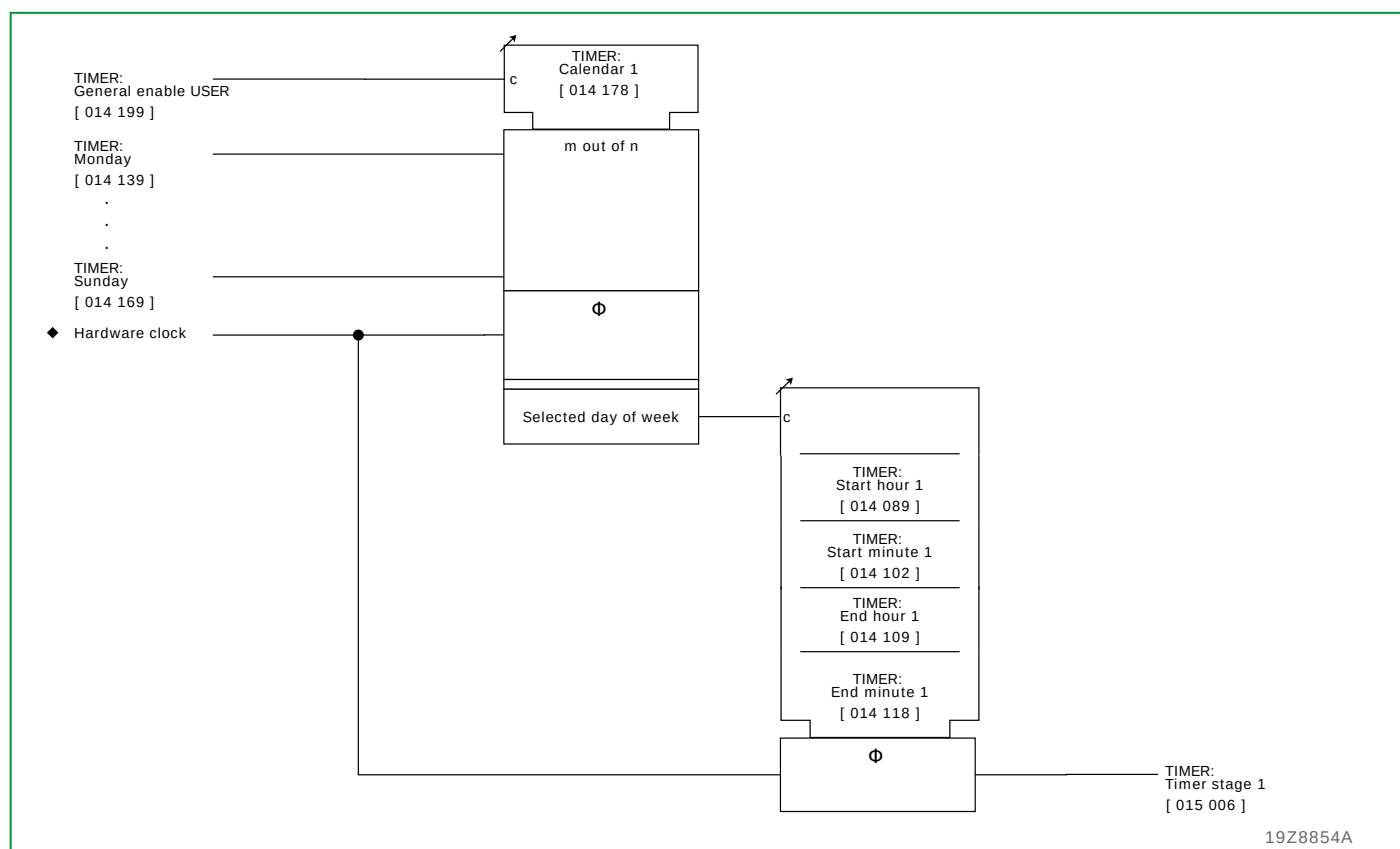


*Fig. 3-153: TIMER logic (Calendar 1 shown as an example for 4 calendar timers).*

## 4

## Design

The C434 is available in different types of cases and with different combinations of modules.

Irrespective of the type a C434 is equipped with a detachable HMI or a fixed local control panel. The local control panel is fitted with seals to ensure that the specified degree of IP protection will be maintained.

In addition to the essential control and display elements, a parallel display consisting of multi-colored LED indicators is also incorporated (see [Section 6.2, \(p. 6-2\)](#)). The meaning of the various LED indications is shown in plain text on a label strip.

The PC interface (USB Type B socket) is located under the hinged cover at the lower left side of the local control panel.

### *NOTICE*

The hinged cover should remain closed to ensure IP protection of the connector is maintained.

## 4.1 Designs

The C434 is available in a surface-mounted and a flush-mounted case. Depending on the connection type – pin-terminal or ring-terminal connection – the case sizes differ. The location diagrams (Section 5.7, (p. 5-27)) show the available combinations of case widths and connection types.

Electrical connections are made via plug-in threaded terminal blocks. The threaded terminal blocks in the surface-mounted case are accessible from the front of the device after unscrewing the torx head steal screws on the sides (see Fig. 4-1, (p. 4-3), ①) and removing the local control panel. The local control panel can then be secured by inserting the tabs in the slots in the left side wall (see Fig. 4-1, (p. 4-3), ②). The flush-mounted case is connected at the back of the case.

### WARNING

#### HAZARD OF EQUIPMENT DAMAGE

- The local control panel (or front element) is connected to processor module P by a plug-in connecting cable. Make sure the connector position is correct. Do not bend the connecting cable!

Failure to follow these instructions can result in equipment damage or unintended equipment operation.

### DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Do not open the secondary circuit of live system current transformers! If the secondary circuit of a live CT is opened, there is the danger that the resulting voltages will endanger personnel and damage the insulation.
- For pin-terminal connection devices, the terminal block for system current transformer connection is not a shorting block! Therefore always short-circuit the system current transformers before loosening the threaded terminals.

Failure to follow these instructions will result in death or serious injury.

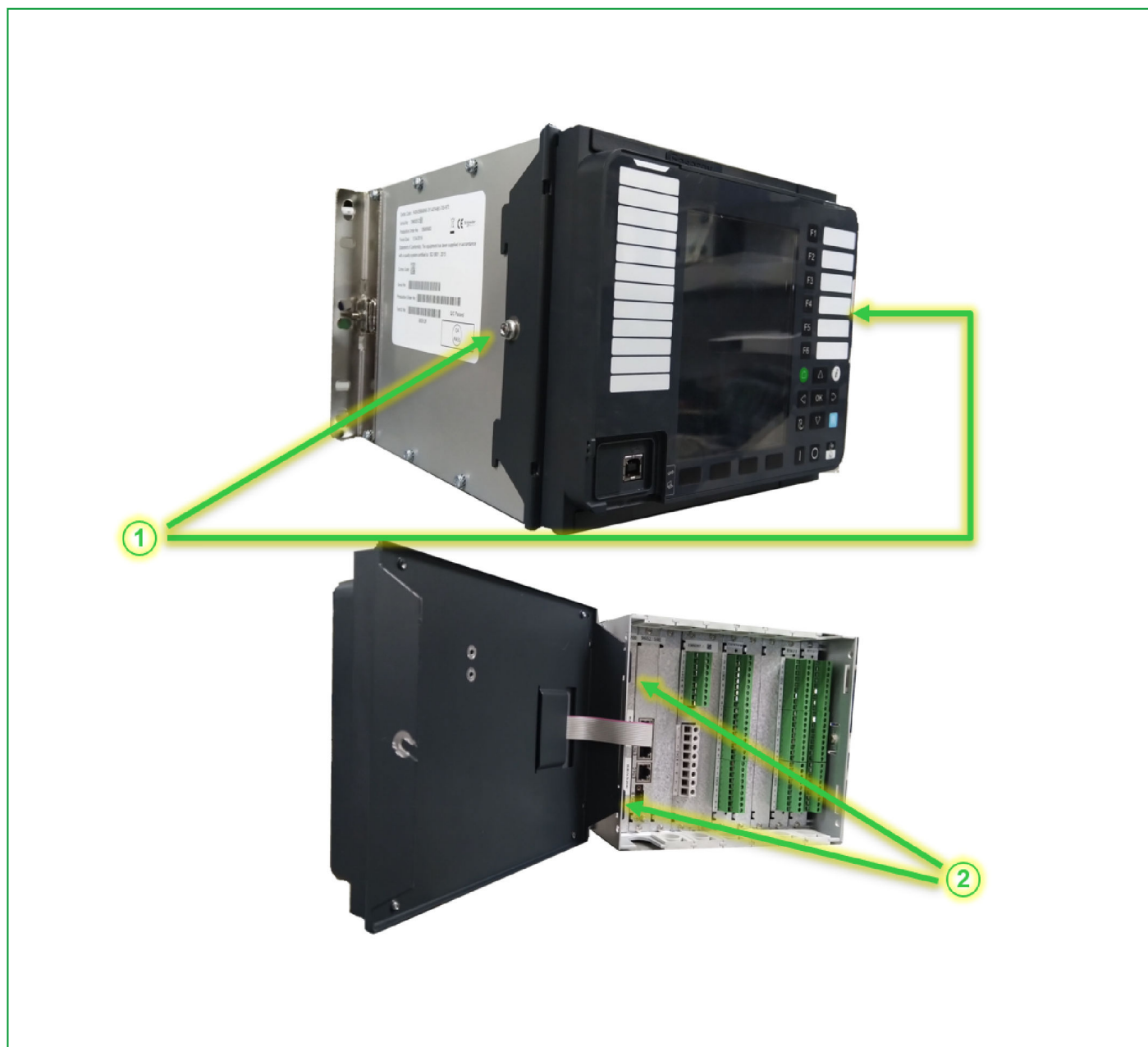


Fig. 4-1: Surface-mounted case, removal of local control panel (or – in case of a detachable HMI – the case front panel). The illustration shows the 40TE case with (fixed) local control panel as an example.

## 4.2 Dimensional Drawings

### 4.2.1 Dimensional Drawings for the 40 TE Case

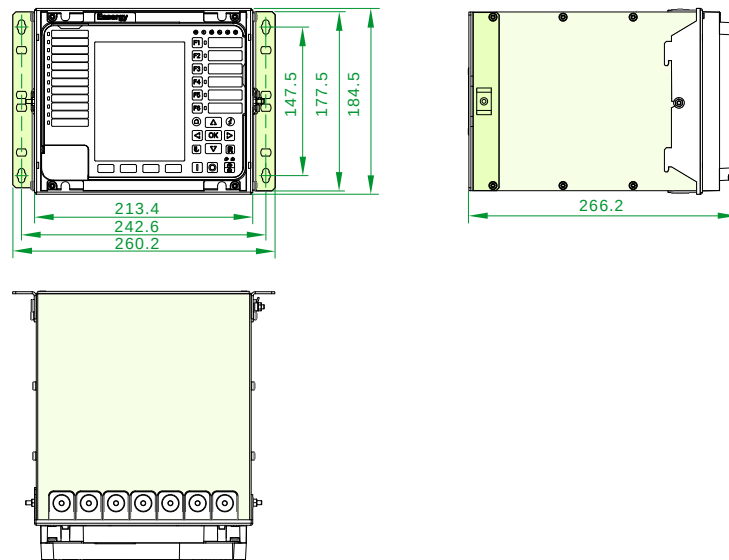


Fig. 4-2: Surface-mounted 40 TE case. (Dimensions in mm.)

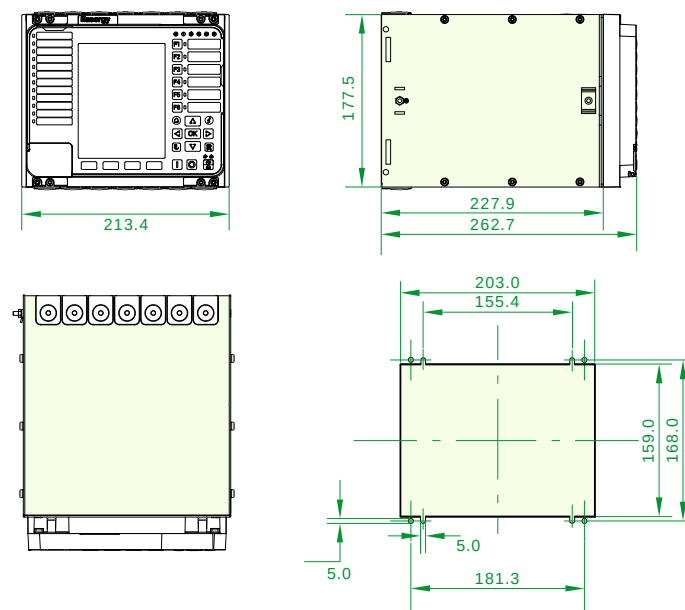


Fig. 4-3: Flush-mounted case 40 TE with panel opening, flush-mount method 1 with panel cut out (without angle brackets). (Dimensions in mm.)

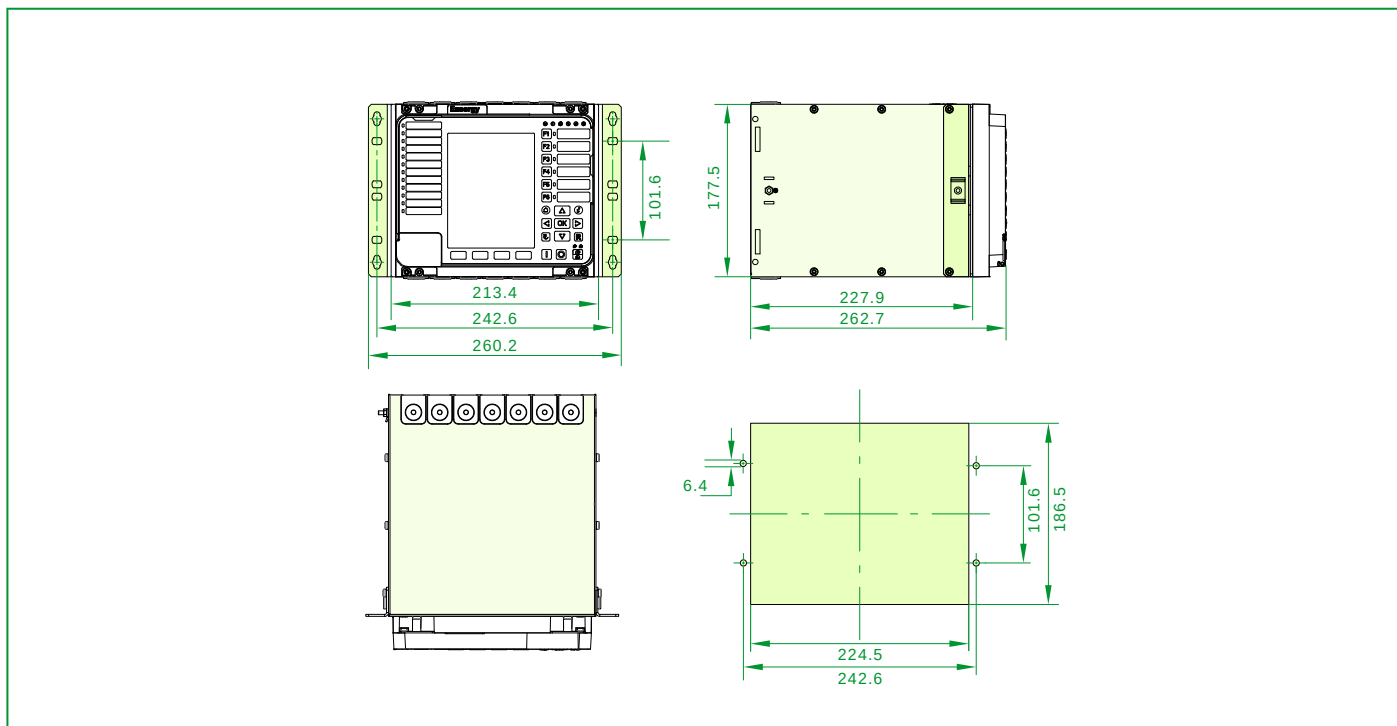


Fig. 4-4: Flush-mounted case 40 TE with panel opening, flush-mount method 2 with panel cut out (with angle brackets and frame). (Dimensions in mm.)

*The device has increased mechanical robustness if flush-mount method 2 (with angle brackets and frame) is used for the flush-mounted case.*

#### 4.2.2

#### Dimensional Drawings for the 84 TE Case

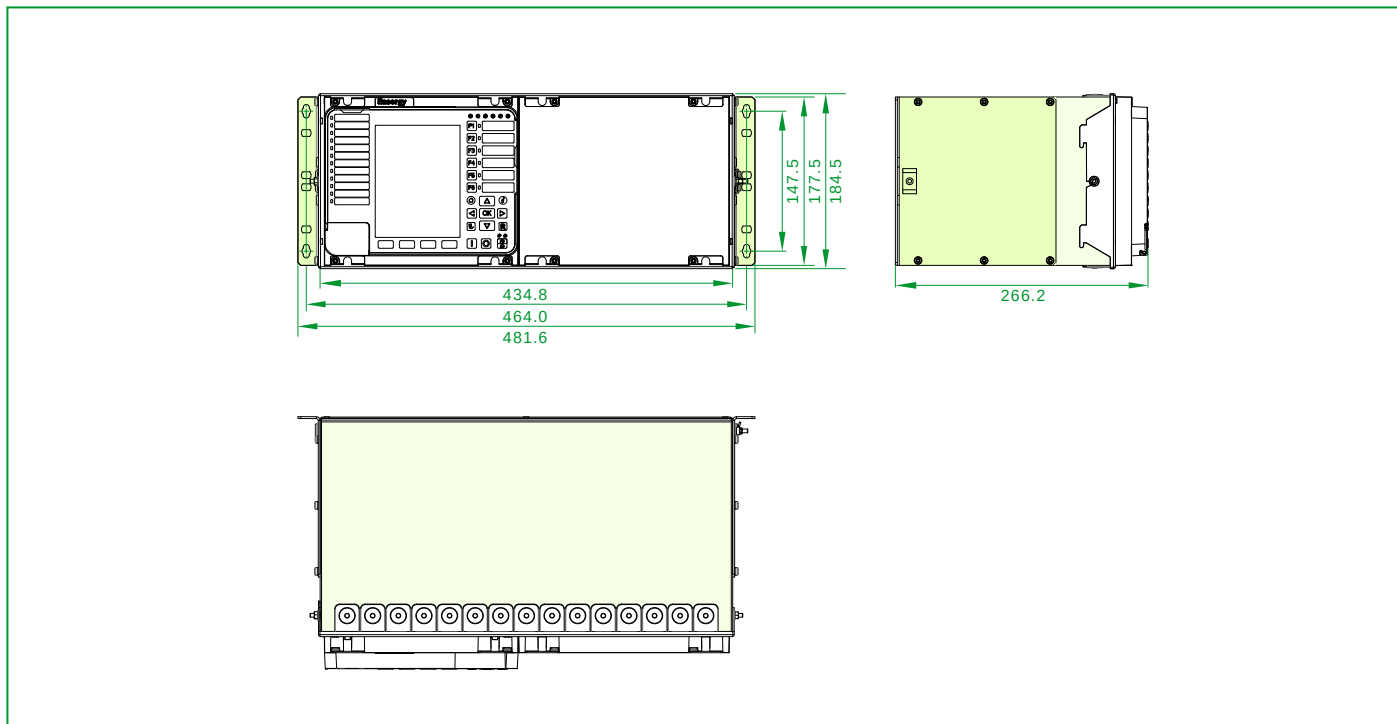


Fig. 4-5: Surface-mounted 84 TE case. (Dimensions in mm.)

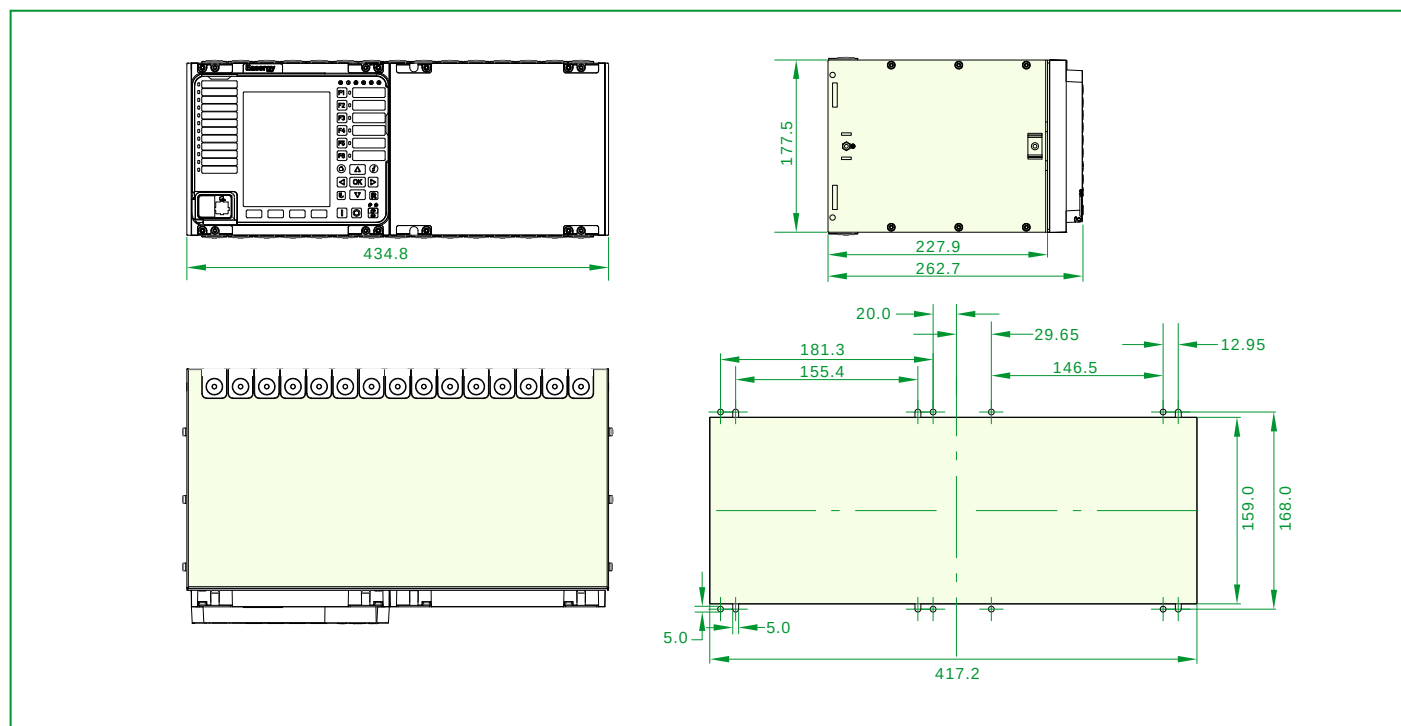


Fig. 4-6: Flush-mounted case 84 TE with panel opening, flush-mount method 1 with panel cut out (without angle brackets). (Dimensions in mm.)

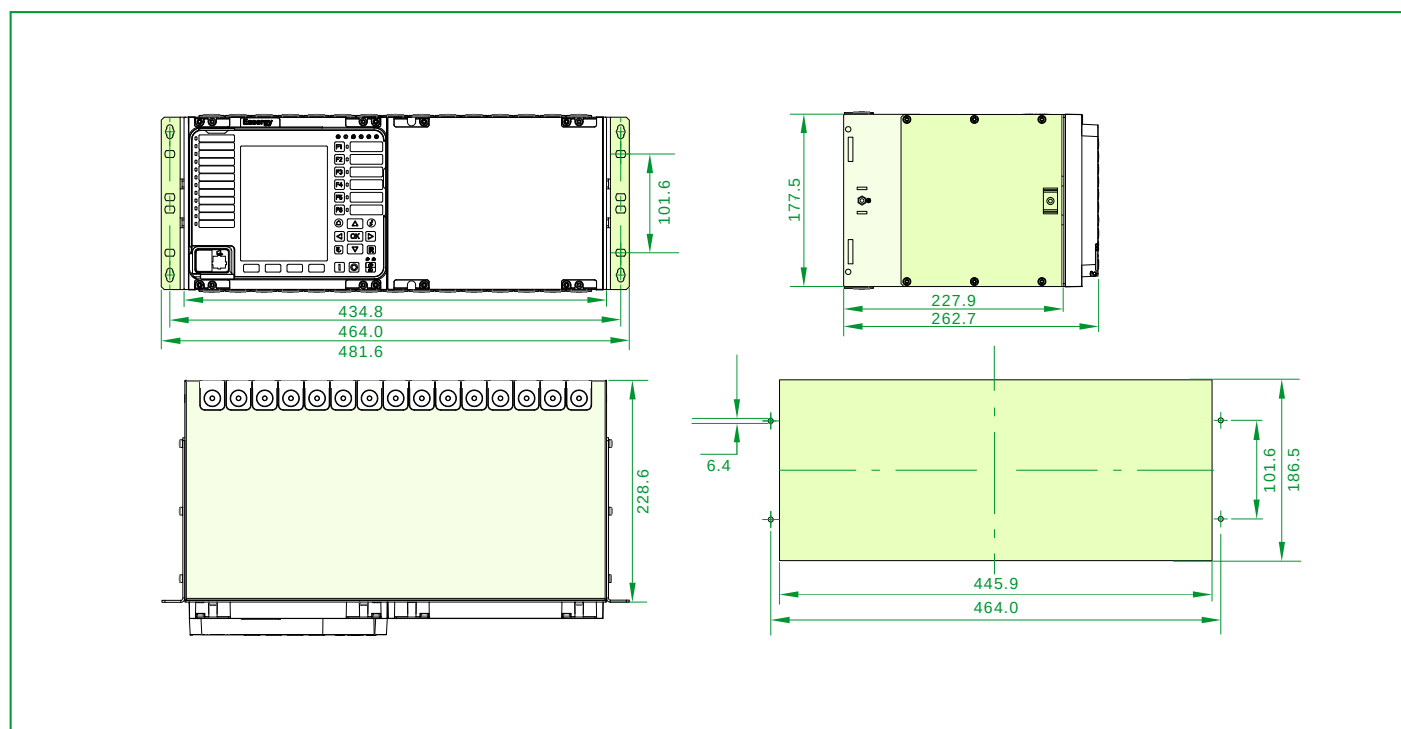


Fig. 4-7: Flush-mounted case 84 TE with panel opening, flush-mount method 2 with panel cut out (with angle brackets and frame). (Dimensions in mm.)

The device has increased mechanical robustness if flush-mount method 2 (with angle brackets and frame) is used for the flush-mounted case.



### 4.2.3 Detachable HMI

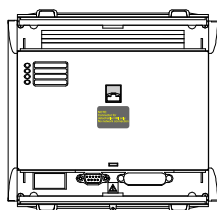


Fig. 4-8: View of case 40TE for connection of detachable HMI.

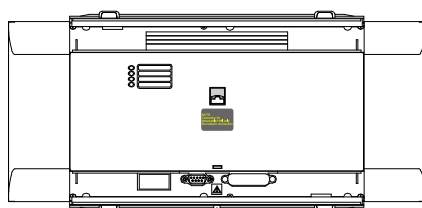


Fig. 4-9: View of case 84TE for connection of detachable HMI.

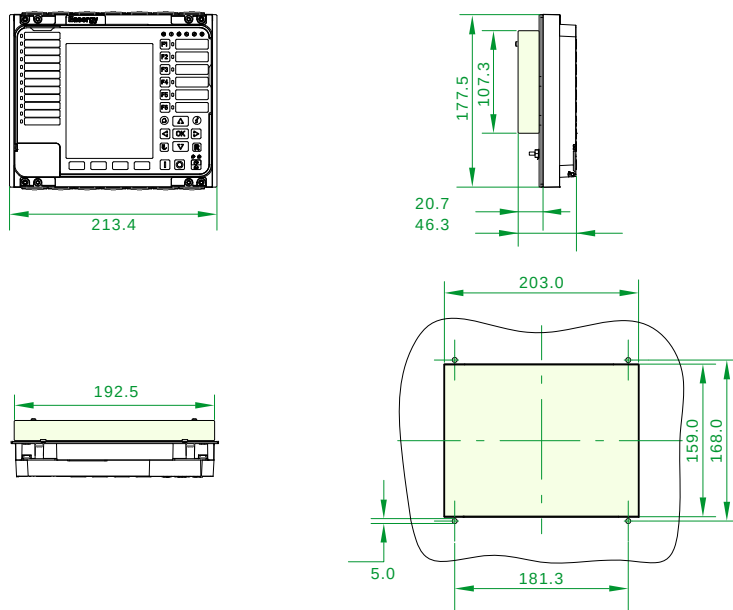


Fig. 4-10: Detachable HMI with panel opening.

### 4.3 Hardware Modules

The C434 is constructed from standard hardware modules. The following table gives an overview of the modules relevant for the C434.

Key:

- ●: standard equipment,
- ○: optional,
- □: depending on order,
- \*: Module is not depicted in the terminal connection diagrams ([Section 5.7, \(p. 5-27\)](#)).
- →xx: Module has to be fitted into slot number xx.
- 1<sup>st</sup>→xx, 2<sup>nd</sup>→yy [etc.]:
  - If several modules of the same type may be ordered, these must be fitted into the appropriate slots in a particular order: If only one has been ordered it must be fitted into slot xx (i. e. slot yy is not permitted). If two modules have been ordered these must be fitted into slots xx and yy, etc.
  - For parallel communication options (serial communication module and additional Ethernet module variant [Chapter 15, \(p. 15-1\)](#)):  
If serial communication module is on slot xx, the preferred slot for Ethernet module is slot yy and alternative one is slot zz.

| Item Number | Description                                                                                                        | Type           | Width | C434<br>-416                                | C434<br>-417                                     | C434<br>-418                                     |
|-------------|--------------------------------------------------------------------------------------------------------------------|----------------|-------|---------------------------------------------|--------------------------------------------------|--------------------------------------------------|
| 9650356     | A ff Communication module<br>(for RS 485 wire connection)                                                          | A(CH1<br>CH2)  | 4 TE  | ○<br>→02                                    | ○<br>→02                                         | ○<br>→02                                         |
| 9650355     | A ff Communication module<br>(for plastic fiber)                                                                   |                |       |                                             |                                                  |                                                  |
| 9650354     | A ff Communication module<br>(for glass fiber, ST connector)                                                       |                |       |                                             |                                                  |                                                  |
| 9652162     | A ff Single Ethernet Board (100 Mbit/s, glass<br>fiber LC connector, 2nd wire RJ45)                                | A(SEB<br>LC)   | 4 TE  | ○<br>1 <sup>st</sup> →02,                   | ○<br>1 <sup>st</sup> →02,                        | ○<br>1 <sup>st</sup> →02,                        |
| 9652161     | A ff Single Ethernet Board (100 Mbit/s, wire<br>RJ45)                                                              | A(SEB<br>RJ45) |       | 2 <sup>nd</sup> →08,<br>3 <sup>rd</sup> →07 | 2 <sup>nd</sup> →06,<br>3 <sup>rd</sup> →08      | 2 <sup>nd</sup> →06,<br>3 <sup>rd</sup> →08      |
| 9652160     | A ff Redundant Ethernet Board (100 Mbit/s,<br>glass fiber LC connector, PRP/HSR/RSTP<br>switchable, 2nd wire RJ45) | A(REB<br>LC)   |       |                                             |                                                  |                                                  |
| 9652159     | A ff Redundant Ethernet Board (100 Mbit/s,<br>wire RJ45, PRP/HSR/RSTP switchable,<br>2nd wire RJ45)                | A(REB<br>RJ45) |       |                                             |                                                  |                                                  |
| 0336187     | D ff Bus module (digital, for 40 TE device)                                                                        | B*             |       | ●                                           |                                                  |                                                  |
| 0336188     | C ff Bus module (digital, for 84 TE device)                                                                        | B*             |       |                                             | ●                                                | ●                                                |
| 0336421     | B ff Bus module (analog)                                                                                           | B*             |       | ●                                           | ●                                                | ●                                                |
| 9652215     | B ff Local control module<br>Coloured graphical new (D)HMI                                                         | L*             |       | □                                           | □                                                | □                                                |
| 9652214     | B ff Local control module<br>Monochrome new (D)HMI                                                                 | L*             |       | □                                           | □                                                | □                                                |
| 9650561     | D ff DHMI Adapter Board                                                                                            | L*             |       | □                                           | □                                                |                                                  |
| 9650563     | F ff Processor Unit Adapter Board                                                                                  | L*             |       | □                                           | □                                                | □                                                |
| 9651571     | E ff Processor Unit                                                                                                | P*             | 4 TE  | ●<br>→01                                    | ●<br>→01                                         | ●<br>→01                                         |
| 9650384     | A ff Transformer module, 4 current<br>transformers (pin connection)                                                | T(4J)          | 8 TE  | □<br>→03                                    | □<br>1 <sup>st</sup> →03,<br>2 <sup>nd</sup> →05 |                                                  |
| 9650411     | A ff Transformer module, 4 current<br>transformers (ring connection)                                               | T(4J)          | 8 TE  |                                             |                                                  | □<br>1 <sup>st</sup> →03,<br>2 <sup>nd</sup> →05 |

| Item Number | Description                                                                                                                  | Type     | Width | C434<br>-416                    | C434<br>-417                                                            | C434<br>-418                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------------|----------|-------|---------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 9650098     | B ff Transformer module, 4 voltage transformers (pin connection)                                                             | T(4V)    | 8 TE  | <input type="checkbox"/><br>→03 | <input type="checkbox"/><br>1 <sup>st</sup> →03,<br>2 <sup>nd</sup> →05 |                                                                         |
| 9650335     | A ff Transformer module, 4 voltage transformers (ring connection)                                                            | T(4V)    | 8 TE  |                                 |                                                                         | <input type="checkbox"/><br>1 <sup>st</sup> →03,<br>2 <sup>nd</sup> →05 |
| 9650409     | A ff Transformer module, 4 current transformers, 4 voltage transformers (pin connection)                                     | T(4J 4V) | 8 TE  | <input type="checkbox"/><br>→03 | <input type="checkbox"/><br>1 <sup>st</sup> →03,<br>2 <sup>nd</sup> →05 |                                                                         |
| 9650412     | A ff Transformer module, 4 current transformers, 4 voltage transformers (ring connection)                                    | T(4J 4V) | 8 TE  |                                 |                                                                         | <input type="checkbox"/><br>1 <sup>st</sup> →03,<br>2 <sup>nd</sup> →05 |
| 9650410     | A ff Transformer module, 4 current transformers, 5 voltage transformers (pin connection)                                     | T(4J 5V) | 8 TE  | <input type="checkbox"/><br>→03 | <input type="checkbox"/><br>→03                                         |                                                                         |
| 9650413     | A ff Transformer module, 4 current transformers, 5 voltage transformers (ring connection)                                    | T(4J 5V) | 8 TE  |                                 |                                                                         | <input type="checkbox"/><br>→03                                         |
| 9651534     | B ff Power supply module 24 – 60 V DC, standard variant (switching threshold 18 V)                                           | V(4I 8O) | 4 TE  | <input type="checkbox"/><br>→09 | <input type="checkbox"/><br>→20                                         | <input type="checkbox"/><br>→20                                         |
| 9651536     | B ff Power supply module 24 – 60 V DC, switching threshold 73 V                                                              |          |       |                                 |                                                                         |                                                                         |
| 9651537     | B ff Power supply module 24 – 60 V DC, switching threshold 90 V                                                              |          |       |                                 |                                                                         |                                                                         |
| 9651539     | B ff Power supply module 24 – 60 V DC, switching threshold 155 V                                                             |          |       |                                 |                                                                         |                                                                         |
| 9651538     | B ff Power supply module 24 – 60 V DC, switching threshold 146 V                                                             |          |       |                                 |                                                                         |                                                                         |
| 9651544     | B ff Power supply module 60 – 250 V DC / 100 – 230 V AC, Standard variant with switching threshold at 65% of 24 VDC (VA,min) | V(4I 8O) | 4 TE  | <input type="checkbox"/><br>→09 | <input type="checkbox"/><br>→20                                         | <input type="checkbox"/><br>→20                                         |
| 9651546     | B ff Power supply module 60 – 250 V DC / 100 – 230 V AC, Special variant with switching threshold at 65% of 110 VDC (VA,nom) |          |       |                                 |                                                                         |                                                                         |

| Item Number | Description                                                                                                                    | Type     | Width | C434<br>-416                                                                                     | C434<br>-417                                                                                                                                     | C434<br>-418                                                                                                                                     |
|-------------|--------------------------------------------------------------------------------------------------------------------------------|----------|-------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 9651547     | B ff Power supply module 60 – 250 V DC / 100 – 230 V AC, Special variant with switching threshold at 65% of 127 VDC (VA,nom)   |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |
| 9651549     | B ff Power supply module 60 – 250 V DC / 100 – 230 V AC, Special variant with switching threshold at 65% of 220 VDC (VA,nom)   |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |
| 9651548     | B ff Power supply module 60 – 250 V DC / 100 – 230 V AC, Special variant with switching threshold at 65% of 250 VDC (VA,nom)   |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |
| 0337612     | A ff Binary I/O module (24 binary inputs), Standard variant with switching threshold at 65% of 24 VDC (VA,min)                 | X(24I)   | 4 TE  | ○<br>1 <sup>st</sup> →05,<br>2 <sup>nd</sup> →06,<br>3 <sup>rd</sup> →07,<br>4 <sup>th</sup> →08 | ○<br>1 <sup>st</sup> →10,<br>2 <sup>nd</sup> →12,<br>3 <sup>rd</sup> →14,<br>4 <sup>th</sup> →16,<br>5 <sup>th</sup> →18,<br>6 <sup>th</sup> →08 | ○<br>1 <sup>st</sup> →10,<br>2 <sup>nd</sup> →12,<br>3 <sup>rd</sup> →14,<br>4 <sup>th</sup> →16,<br>5 <sup>th</sup> →18,<br>6 <sup>th</sup> →08 |
| 9651332     | A ff Binary I/O module (24 binary inputs), Special variant with switching threshold at 65% of 127 VDC (VA,nom)                 |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |
| 9651360     | A ff Binary I/O module (24 binary inputs), Special variant with switching threshold at 65% of 250 VDC (VA,nom)                 |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |
| 9651493     | B ff Binary module (4 high-break contacts)                                                                                     | X(4H)    | 4 TE  | ○→10                                                                                             | ○→18                                                                                                                                             | ○→18                                                                                                                                             |
|             | Order option: J, K                                                                                                             | X(6I 3O) | 4 TE  | ○→10                                                                                             | ○→18                                                                                                                                             | ○→18                                                                                                                                             |
| 9651512     | B ff Binary I/O module (6 binary inputs, 3 output relays), Standard variant with switching threshold at 65% of 24 VDC (VA,min) |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |
| 9651514     | B ff Binary I/O module (6 binary inputs, 3 output relays), Special variant with switching threshold at 65% of 127 VDC (VA,nom) |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |
| 9651515     | B ff Binary I/O module (6 binary inputs, 3 output relays), Special variant with switching threshold at 65% of 250 VDC (VA,nom) |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |
|             | Order option: A - E                                                                                                            | X(6I 3O) | 4 TE  | ○<br>1 <sup>nd</sup> →05,<br>2 <sup>rd</sup> →06,<br>3 <sup>th</sup> →07,<br>4 <sup>th</sup> →08 | ○<br>1 <sup>nd</sup> →10,<br>2 <sup>rd</sup> →12,<br>3 <sup>th</sup> →14,<br>4 <sup>th</sup> →16,<br>5 <sup>th</sup> →08                         | ○<br>1 <sup>nd</sup> →10,<br>2 <sup>rd</sup> →12,<br>3 <sup>th</sup> →14,<br>4 <sup>th</sup> →16,<br>5 <sup>th</sup> →08                         |
| 9651512     | B ff Binary I/O module (6 binary inputs, 3 output relays), Standard variant with switching threshold at 65% of 24 VDC (VA,min) |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |

| Item Number | Description                                                                                                                    | Type     | Width | C434<br>-416                                                                                     | C434<br>-417                                                                                                                                     | C434<br>-418                                                                                                                                     |
|-------------|--------------------------------------------------------------------------------------------------------------------------------|----------|-------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 9651514     | B ff Binary I/O module (6 binary inputs, 3 output relays), Special variant with switching threshold at 65% of 127 VDC (VA,nom) |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |
| 9651515     | B ff Binary I/O module (6 binary inputs, 3 output relays), Special variant with switching threshold at 65% of 250 VDC (VA,nom) |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |
| 0337377     | E ff Binary I/O module (6 binary inputs, 6 output relays), Standard variant with switching threshold at 65% of 24 VDC (VA,min) | X(6I 6O) | 4 TE  | ○<br>1 <sup>st</sup> →05,<br>2 <sup>nd</sup> →06,<br>3 <sup>rd</sup> →07,<br>4 <sup>th</sup> →08 | ○<br>1 <sup>st</sup> →10,<br>2 <sup>nd</sup> →12,<br>3 <sup>rd</sup> →14,<br>4 <sup>th</sup> →16,<br>5 <sup>th</sup> →18,<br>6 <sup>th</sup> →08 | ○<br>1 <sup>st</sup> →10,<br>2 <sup>nd</sup> →12,<br>3 <sup>rd</sup> →14,<br>4 <sup>th</sup> →16,<br>5 <sup>th</sup> →18,<br>6 <sup>th</sup> →08 |
| 9651333     | A ff Binary I/O module (6 binary inputs, 6 output relays), Special variant with switching threshold at 65% of 127 VDC (VA,nom) |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |
| 9651361     | A ff Binary I/O module (6 binary inputs, 6 output relays), Special variant with switching threshold at 65% of 250 VDC (VA,nom) |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |
| 0336971     | D ff Binary I/O module (6 binary inputs, 8 output relays), Standard variant with switching threshold at 65% of 24 VDC (VA,min) | X(6I 8O) | 4 TE  | ○<br>1 <sup>st</sup> →05,<br>2 <sup>nd</sup> →06,<br>3 <sup>rd</sup> →07,<br>4 <sup>th</sup> →08 | ○<br>1 <sup>st</sup> →10,<br>2 <sup>nd</sup> →12,<br>3 <sup>rd</sup> →14,<br>4 <sup>th</sup> →16,<br>5 <sup>th</sup> →18,<br>6 <sup>th</sup> →08 | ○<br>1 <sup>st</sup> →10,<br>2 <sup>nd</sup> →12,<br>3 <sup>rd</sup> →14,<br>4 <sup>th</sup> →16,<br>5 <sup>th</sup> →18,<br>6 <sup>th</sup> →08 |
| 9651334     | A ff Binary I/O module (6 binary inputs, 8 output relays), Special variant with switching threshold at 65% of 127 VDC (VA,nom) |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |
| 9651362     | A ff Binary I/O module (6 binary inputs, 8 output relays), Special variant with switching threshold at 65% of 250 VDC (VA,nom) |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |
| 0336973     | B/D ff Binary module (6 output relays)                                                                                         | X(6O)    | 4 TE  | ○<br>→10                                                                                         | ○<br>→18                                                                                                                                         | ○<br>→18                                                                                                                                         |
| 0337406     | D ff Analog I/O module, standard variant (switching threshold 18 V)                                                            | Y(4I)    | 4 TE  | ○<br>→08                                                                                         | ○<br>→08                                                                                                                                         | ○<br>→08                                                                                                                                         |
| 9651335     | A ff Analog I/O module, switching threshold 90 V                                                                               |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |
| 9651363     | A ff Analog I/O module, switching threshold 155 V                                                                              |          |       |                                                                                                  |                                                                                                                                                  |                                                                                                                                                  |

The space available for the modules measures 4 HE in height by 40 TE or 84 TE in width (HE = 44.45 mm, TE = 5.08 mm).

The location of the individual modules and the position of the threaded terminal blocks in the C434 are shown in the location figures and terminal connection diagrams ([Section 5.7, \(p. 5-27\)](#)).





## 5

## Installation and Connection

 **DANGER****HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- When electrical equipment is in operation, dangerous voltage will be present in certain parts of the equipment.
- Proper and safe operation of this device depends on appropriate shipping and handling, proper storage, installation and commissioning, and on careful operation, maintenance and servicing. For this reason only qualified personnel shall work on or operate this device.

Failure to follow these instructions will result in death or serious injury.

 **DANGER****HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Switch off the auxiliary power supply before any work in the terminal strip area.
- Switch off all the power supplies in connection to the equipment before any work in the terminal strip area to isolate the device.
- Do not touch the terminal strip area when equipment is in operation.
- Do not remove or add wires in the terminal strip area when equipment is in operation.
- Short-circuit the system current transformers before disconnecting wires to the transformer board (valid only for pin terminals, not required for ring terminals which have a shortening block).
- A protective conductor (ground/earth) of at least 1.5 mm<sup>2</sup> must be connected to the protective conductor terminal on the power supply board and on the main relay case.
- Do never remove the protective conductor connection to the device casing as long as other wires are connected to it.
- Where stranded conductors are used, insulated crimped wire end ferrules must be employed.

Failure to follow these instructions will result in death or serious injury.

Note: Regarding the appropriate wiring connections of the equipment refer to the document Px3x\_Grounding\_Application\_Guide\_EN\_h.pdf.

## WARNING

### HAZARD OF UNSAFE OPERATION

- The user should be familiar with the warnings in the Safety Guide (SFTY/5LM/L11 or later version) before working on the equipment.
- The user should be familiar with the safety messages in Chapter 5, Chapter 10, Chapter 11 and Chapter 12 and with the content of Chapter 13 of this technical manual, before working on the equipment.
- Proper and safe operation of this device depends on appropriate shipping and handling, proper storage, installation and commissioning, and on careful operation, maintenance and servicing. For this reason only qualified personnel shall work on or operate this device.
- Any modifications to this device must be in accordance with the manual. If any other modification is made without the express permission of Schneider Electric, it will invalidate the warranty, and may render the product unsafe.

Failure to follow these instructions can result in unintended equipment operation.

The signals MAIN: Blocked/faulty and SFMON: Warning (LED) are permanently assigned to the LEDs labeled OUT OF SERVICE and ALARM and can be assigned to output relays to indicate the health of the device.

It is recommended that the signals MAIN: Blocked/faulty and SFMON: Warning (LED) are communicated to the substation automation system for alarm purposes, using hardwiring via output relays or the communication interface.

## DANGER

### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

In case of usage of the equipment with DHMI:

- A protective conductor (ground/earth) of at least 1.5 mm<sup>2</sup> (US: AWG14 or thicker) must be connected to the DHMI protective conductor terminal to link the DHMI and the main relay case; these must be located within the same substation.
- The DHMI communication cable must not be in contact with hazardous live parts.
- The DHMI communication cable must not be routed or placed alongside high-voltage cables or connections. Currents can be induced in the cable which may result in electromagnetic interference.
- We recommend to use only cables of category CAT6 (or better), which has been tested up to a length of 10 m.

Failure to follow these instructions will result in death or serious injury.

 **WARNING****HAZARD OF ELECTRIC SHOCK**

- Do not use RJ45 cable longer than 10 m in large AIS HV substations with potential ground differences.
- We recommend to use optical fiber cables instead of RJ45.

Failure to follow these instructions can result in death or serious injury.

 **WARNING****HAZARD OF EQUIPMENT DAMAGE OR LIFETIME REDUCTION**

- The instructions given in the Section 5.5, (p. 5-14) (“Protective and Operational Grounding”) should be noted. In particular, check that the protective ground connection is secured with a tooth lock washer, as per the diagram “Installing the protective grounding conductor terminal” (Fig. 5-8. (p. 5-15)).
- If a cable screen is added to this connection or removed from it, then the protective grounding should be checked again.

Failure to follow these instructions can result in death, serious injury or equipment damage.

 **WARNING****HAZARD OF EQUIPMENT DAMAGE OR LIFETIME REDUCTION**

- Do not sustain exposure to high humidity during storage, the value shall not exceed 75 % relative humidity.
- Once the device has been unpacked, it is recommended to energize it within the three following months.
- The device has to be energized at least once in 4 years, if it is not in permanent operation.
- Where electrical equipment is being installed, sufficient time should be allowed for acclimatization to the ambient temperature of the environment before energization.

Failure to follow these instructions can result in equipment damage, unintended equipment operation or reduction of equipment lifetime.

## 5.1 Unpacking and Packing

All C434 devices are packaged separately into dedicated cartons and shipped with outer packaging. Our products leave our factory in closed, sealed original packaging. If at receipt of the delivery the transport packaging is open or the seal is broken, the confidentiality and authenticity of the information contained in the products cannot be ensured.

Use special care when opening cartons and unpacking devices, and do not use force. In addition, make sure to remove supporting documents and the type identification label supplied with each individual device from the inside carton. The design revision level of each module included in the device when shipped can be determined from the list of components (assembly list). This list of components should be filed carefully.

After unpacking, each device should be inspected visually to confirm it is in proper mechanical condition.

If the C434 needs to be shipped, both inner and outer packaging must be used. If the original packaging is no longer available, make sure that packaging conforms to DIN ISO 2248 specifications for a drop height  $\leq 0.8$  m.

5.2

Checking Nominal Data and Design Type

The nominal data and design type of the C434 can be determined by checking the type identification label (see below). One type identification label is located on the top of the local control panel and a second label can be found under the hinged cover at the lower left side of the device. Another copy of the type identification label is fixed to the outside of the C434 packaging.



Fig. 5-1: Example of the type identification label of a device from the Easergy MiCOM 30 family.

The C434 design version can be determined from the order number. A breakdown of the order number is given in Chapter “Order Information” (Chapter 15, (p. 15-1)).

## 5.3 Location Requirements

The C434 has been designed to conform to EN 60255-6. Therefore it is important when choosing the installation location to make certain that it provides the operating conditions as specified in above DIN norm sections 3.2 to 3.4. Several of these important operating conditions are listed below.

### 5.3.1 Environmental Conditions

Ambient temperature: -5 °C to +55 °C [+23 °F to +131 °F]

Air pressure: 800 to 1100 hPa

Relative humidity: The relative humidity must not result in the formation of either condensed water or ice in the C434.

Ambient air: The ambient air must not be significantly polluted by dust, smoke, gases or vapors, or salt.

Solar Radiation: Direct solar radiation on the front of the device must be avoided to ensure that the LC-Display remains readable.

### 5.3.2 Mechanical Conditions

Vibration stress: 10 to 60 Hz, 0.035 mm and 60 to 150 Hz, 0.5 g

Earth quake resistance: 5 ... 8 Hz, 3.5 mm / 1.5 mm, 8 ... 35 Hz, 5 m/s<sup>2</sup>,  
3 x 1 cycle

### 5.3.3 Electrical Conditions for Auxiliary Voltage of the Power Supply

Operating range: 0.8 to 1.1  $V_{A,nom}$  with a residual ripple of up to 12 %  $V_{A,nom}$

### 5.3.4 Electromagnetic Conditions

Substation secondary system design must follow the best of modern practices, especially with respect to grounding and EMC.

## 5.4 Installation

The dimensions and mounting dimensions for surface-mounted cases are given in [Section 4.2, \(p. 4-4\)](#). When the C434 is surface-mounted on a panel, the wiring to the C434 is normally run along the front side of the mounting plane. If the wiring is to be at the back, an opening can be provided above or below the surface-mounted case. [Fig. 5-2, \(p. 5-7\)](#) shows such an opening.

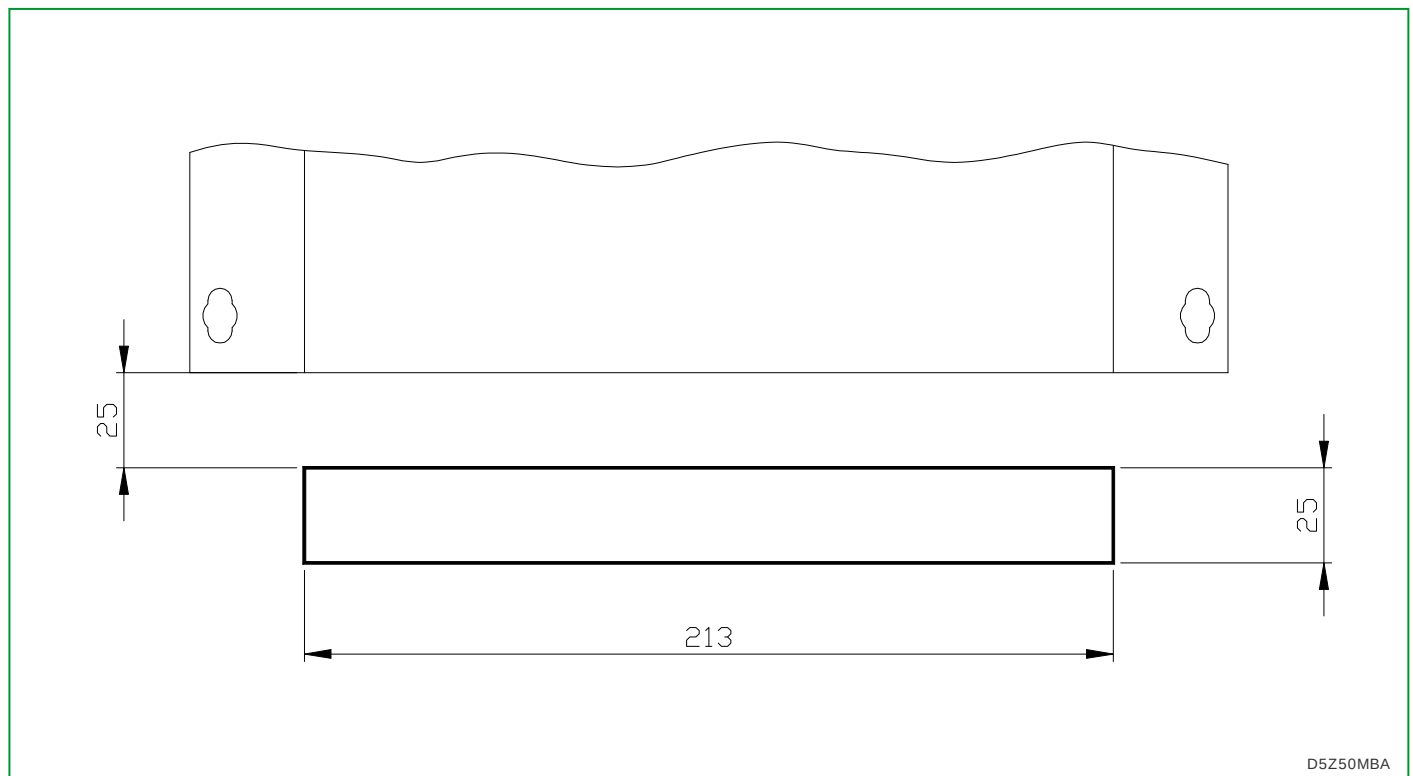


Fig. 5-2: Opening (cutout) for running the connecting leads to an 40 TE surface-mounted case.

The opening width for the 40 TE surface-mounted case: 213 mm (shown in this figure), for the 84 TE surface-mounted case: 435 mm. The other dimensions are the same for all cases.

Flush-mounted cases are designed for control panels. The dimensions and mounting dimensions are given in Chapter “Design”. When the C434 is mounted on a cabinet door, special sealing measures are necessary to provide the degree of protection required for the cabinet (IP 51).

Connection of protective grounding conductor: See “Protective and Operational Grounding” ([Section 5.5, \(p. 5-14\)](#))

*Instructions for selecting the flush-mount method:*

*The C434 has increased mechanical robustness if either the surface-mounted case or – for the flush-mounted case – flush-mount method 2 (with angle brackets and frame) is used. In this case, test severity class 2 of the vibration test, test severity class 2 of the shock response test on operability as well as test severity class 1 of the shock response test on permanent shock are applied additionally.*

*Dimensions of the panel cutouts:*

*Dimensional drawings of the panel cutouts for all cases and for the detachable HMI can be found in [Section 4.2, \(p. 4-4\)](#).*

For flush-mount method 1 (without angle brackets and frame), the procedure is as follows:

Before the C434 can be installed into a control panel, the local control panel (or the front element of the case for devices with detachable display) must be taken down. The local control panel is removed as described below:

1. Remove the mounting point cover.
2. Remove the M3.5 screws (see [Fig. 5-3, \(p. 5-9\)](#)).
3. Then remove the local control panel.



### WARNING

#### HAZARD OF EQUIPMENT DAMAGE

- The local control panel (or front element) is connected to processor module P by a plug-in connecting cable. Make sure the connector position is correct. Do not bend the connecting cable!

Failure to follow these instructions can result in equipment damage or unintended equipment operation.

Then remove the lower M4 screws and only loosen the upper M4 screws (see [Fig. 5-3, \(p. 5-9\)](#)). Now insert the C434 into the panel opening from the rear so that the upper M4 screws fit into the corresponding holes. Then tighten all the M4 screws. After this, replace the local control panel.

### NOTICE

#### HAZARD OF EQUIPMENT DAMAGE

- When replacing the local control panel, take care not to tighten the screws with too much strength! (Fastening torque 1.5 to 1.8 Newton meters).
- If the control panel thickness is  $\geq 2$  mm, the longer screws as enclosed within the device packing must be used.

Failure to follow these instructions can result in equipment damage.



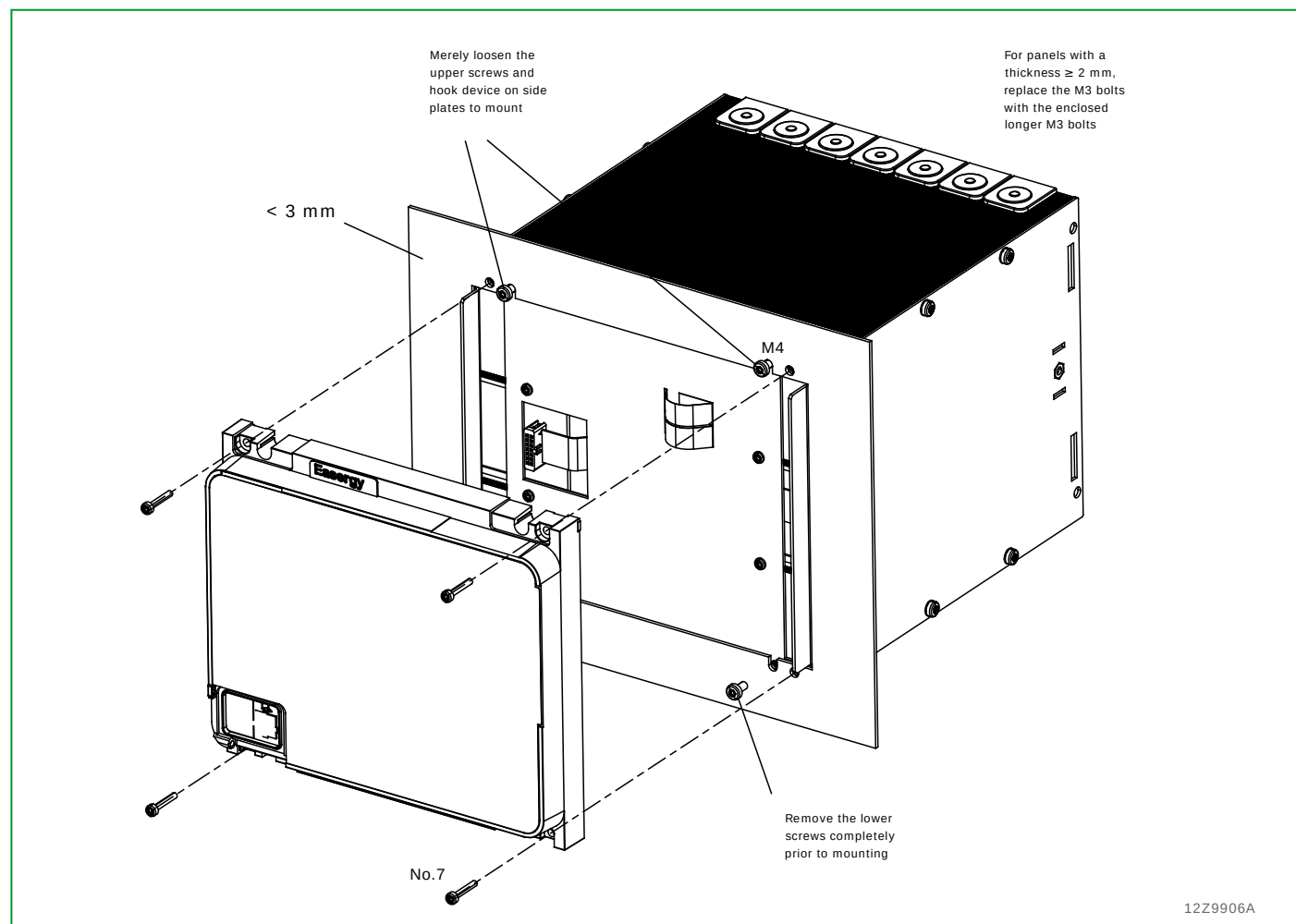


Fig. 5-3: Installation of a case into a control panel. Flush-mount method 1 (without the angle brackets and frame ). Example for a device with a 40 TE case.

### NOTICE

#### HAZARD OF EQUIPMENT DAMAGE

- The equipment provides increased mechanical robustness if either the surface-mounted case or for the flush-mounted case flush-mount method 2 (with angle brackets and frame, see Fig. 5-5, (p. 5-10)) is used.

Failure to follow these instructions can result in equipment damage.

### DANGER

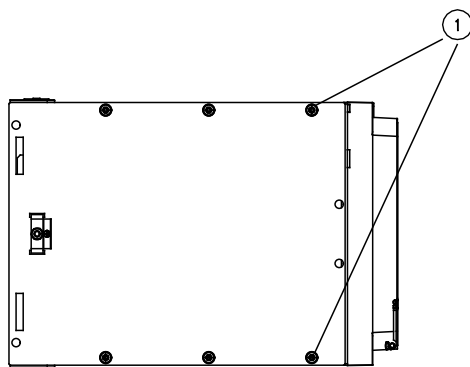
#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Secure connection of protective grounding conductor: See Section 5.5, (p. 5-14).

Failure to follow these instructions will result in death or serious injury.

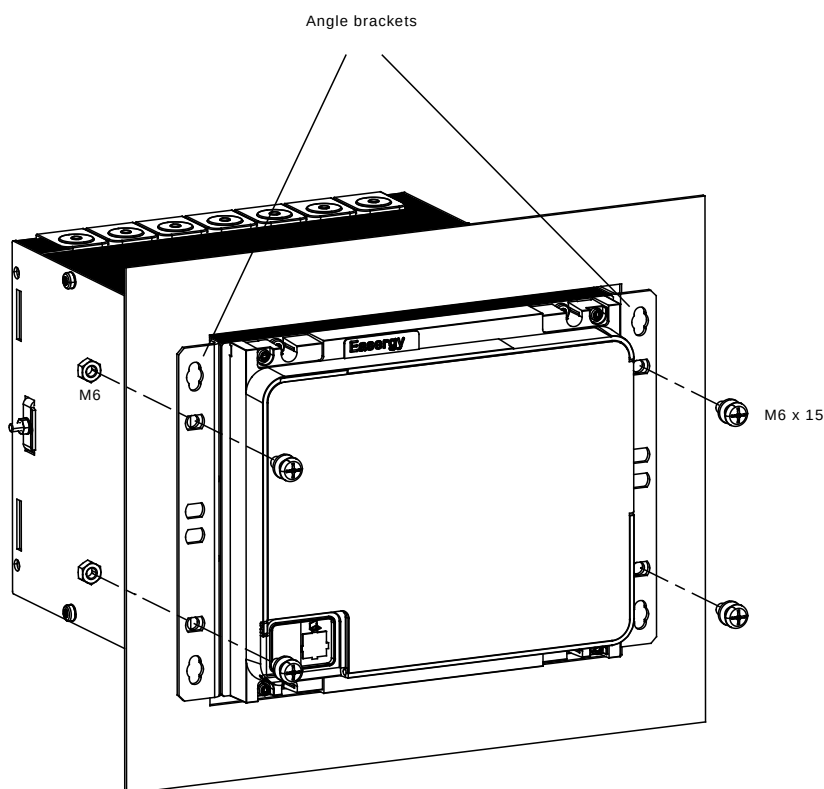
For flush-mount method 2 (using the angle brackets and frame), the procedure is as follows:

1. Remove the screws as shown in Fig. 5-4, (p. 5-10), ① and mount the enclosed angle brackets using these same screws.
2. Then push the device into the control panel cutout from the front.
3. Secure the device to the control panel by using the enclosed M6 screws (see Fig. 5-5, (p. 5-10)).
4. Assemble the cover frame and snap-fasten onto the fixing screws.



19Z9905A

Fig. 5-4: Mounting the angle brackets.



12Z9907A

Fig. 5-5: Installation of a case into a control panel, flush-mount method 2 (with angle brackets). Example for a device in a 40 TE case.

In order to cover the angle brackets used with flush-mount method 2, an accessory set containing the frame fairing pack is optional available. Please refer to the following instruction figure for frame fairing assembly.

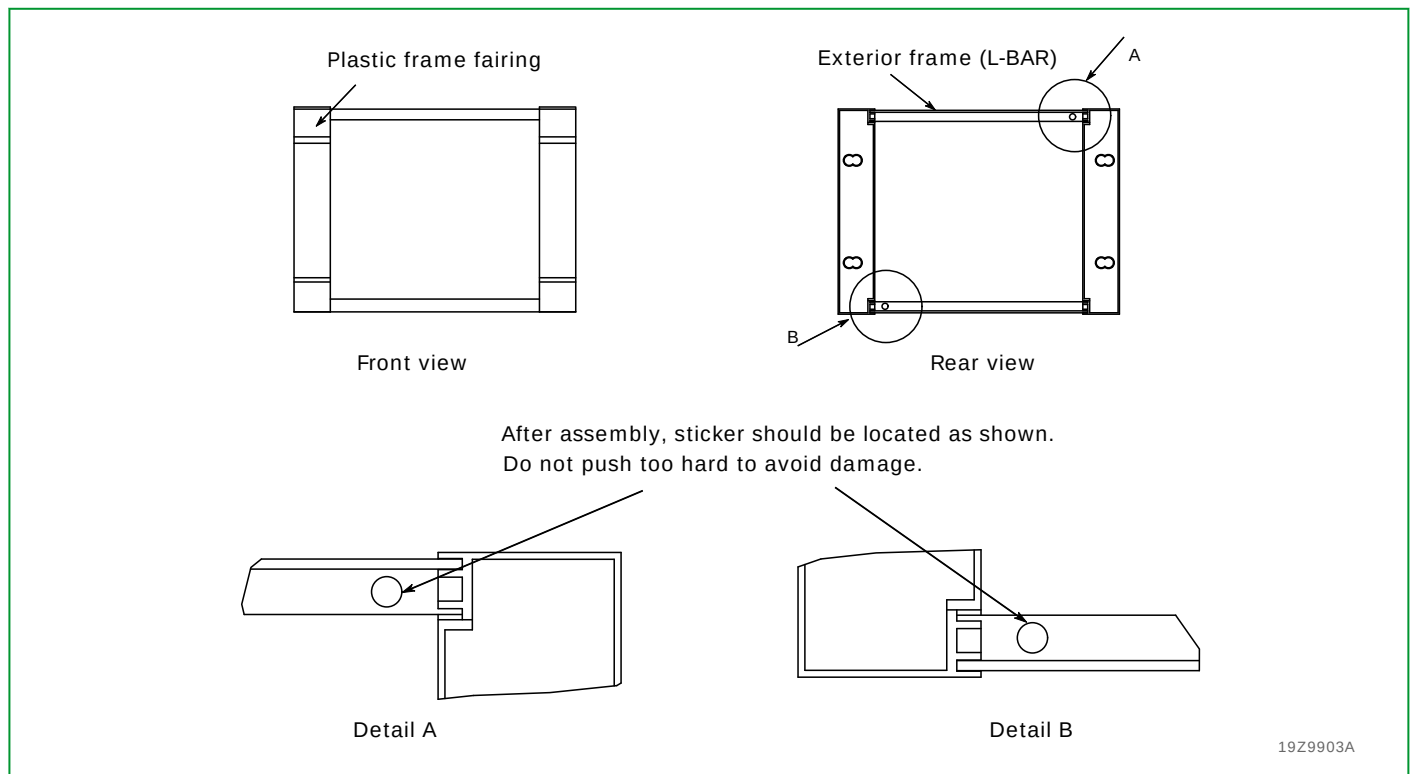


Fig. 5-6: Frame fairing pack assembly instruction. Example for a device in a 40 TE case (optional accessory).

### NOTICE

#### HAZARD OF EQUIPMENT DAMAGE

- Make sure the position of the stickers on the exterior frame is correct when assembling.
- Do not push the exterior frame with too much strength avoiding to damage the plastic frame fairing.

Failure to follow these instructions can result in equipment damage.

*Accessories for mounting method 2 are available separately for ordering, refer to Chapter 14, (p. 14-1).*

The cover frame width of the 40 TE surface-mounted case is: 280 mm, of the 84 TE case is: 486 mm. The cover frame height is for all cases: 204 mm.

## NOTICE

### HAZARD OF EQUIPMENT DAMAGE

- The equipment provides increased mechanical robustness if either the surface-mounted case or for the flush-mounted case flush-mount method 2 (with angle brackets and frame, see Fig. 5-5, (p. 5-10)) is used.

Failure to follow these instructions can result in equipment damage.

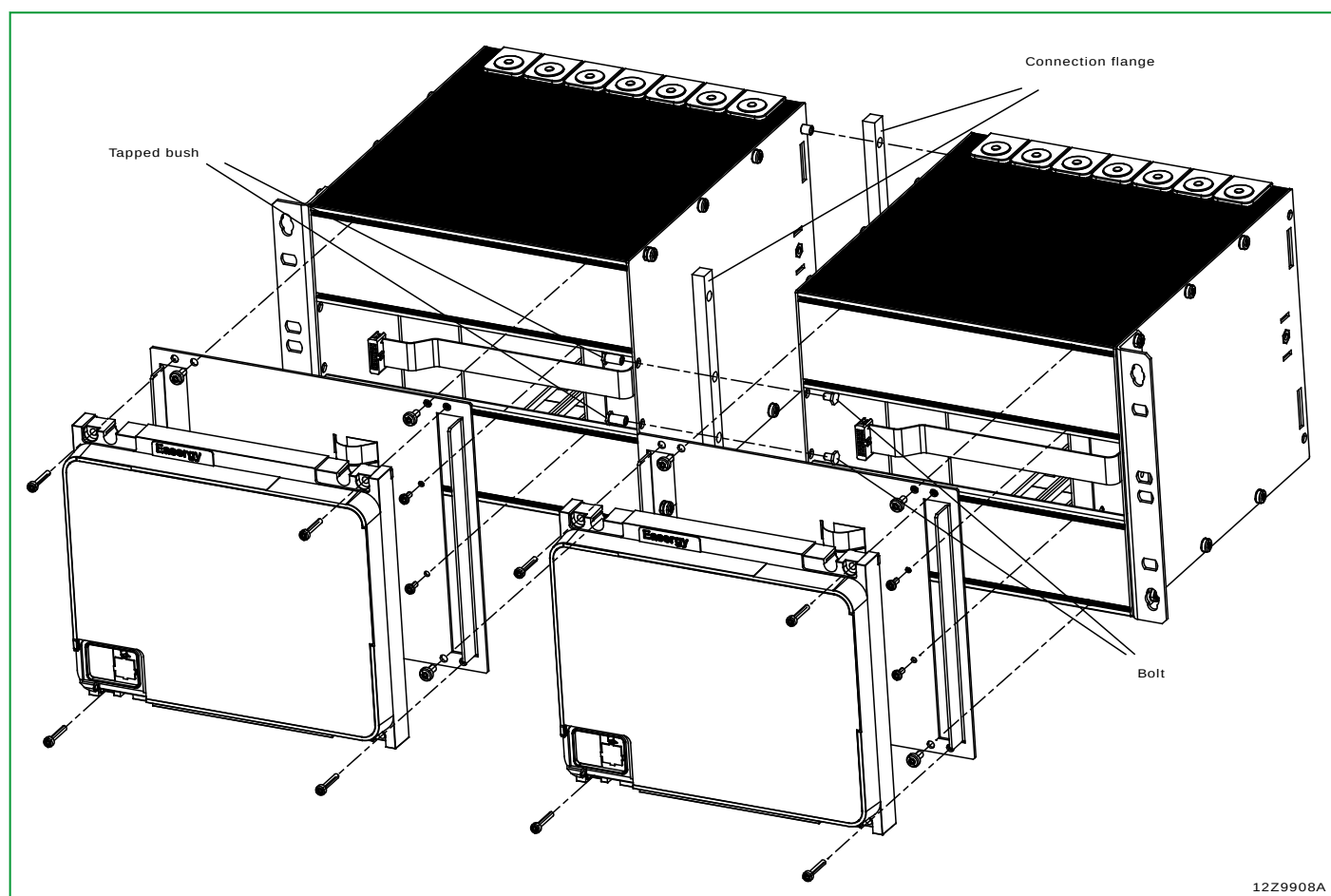
## ⚡ ⚠ DANGER

### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Secure connection of protective grounding conductor: See Section 5.5, (p. 5-14).

Failure to follow these instructions will result in death or serious injury.

A rack mounting kit can be used to combine a flush-mounted 40 TE case with a second sub-rack to form a 19" mounting rack (see Fig. 5-7, (p. 5-12)). The second sub-rack can be another device, for example, or an empty sub-rack with a blank front panel. Fit the 19" mounting rack to a cabinet as shown in Fig. 5-8, (p. 5-13).



12Z9908A

Fig. 5-7: Combining 40 TE flush-mounted cases to form a 19" mounting rack.

**⚡ ⚠ DANGER****HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Secure connection of protective grounding conductor: See Section 5.5, (p. 5-14).

Failure to follow these instructions will result in death or serious injury.

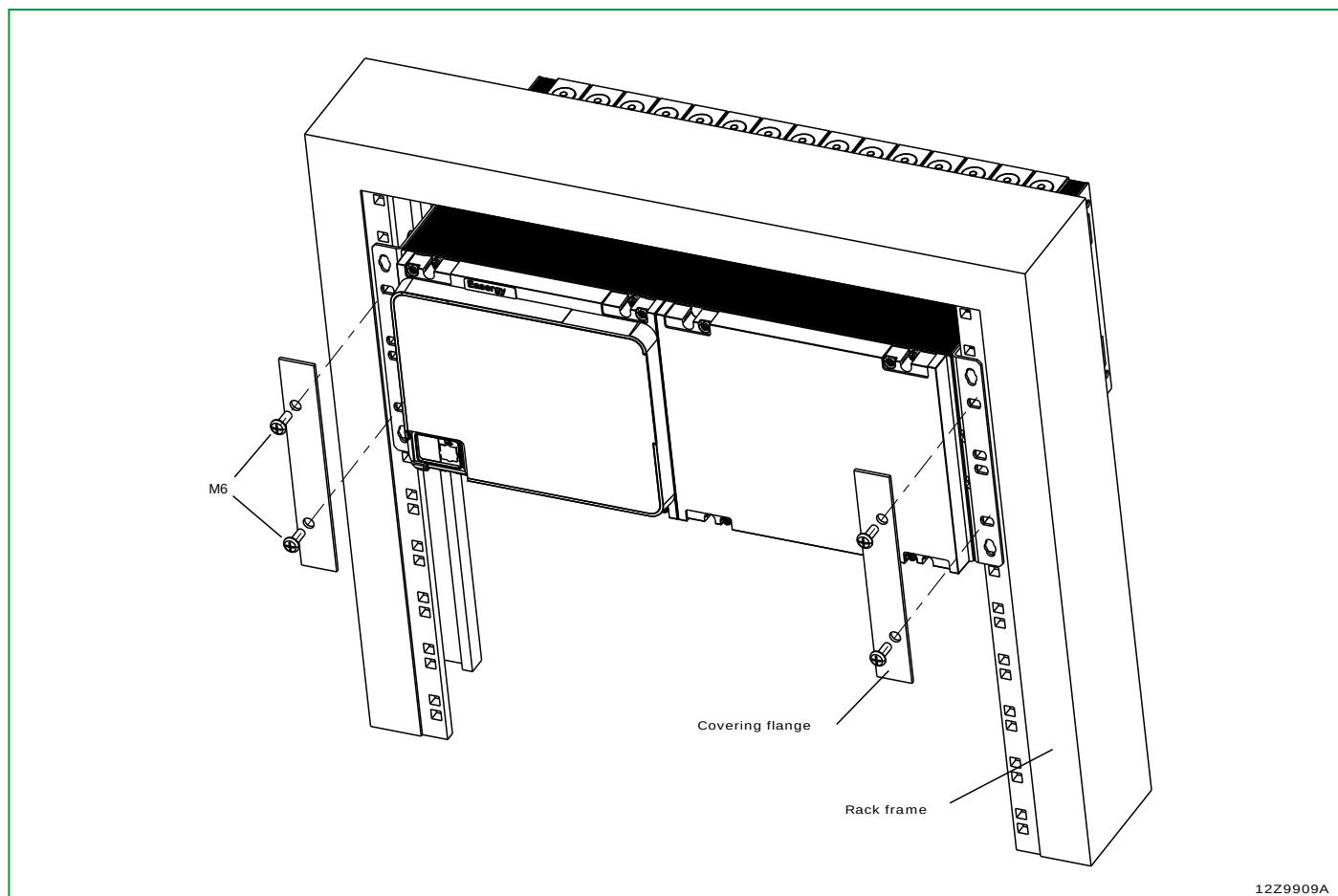


Fig. 5-8: Installing the C434 in a cabinet with a 19" mounting rack.

**⚡ ⚠ DANGER****HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Secure connection of protective grounding conductor: See Section 5.5, (p. 5-14).

Failure to follow these instructions will result in death or serious injury.

## 5.5 Protective and Operational Grounding



### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- The device must be reliably grounded to meet protective equipment grounding requirements.
- The surface-mounted case is grounded using the bolt and nut, appropriately marked, as the ground connection. The flush-mounted case must be grounded in the area of the rear sidepieces at the location provided. The bracket is marked with the protective ground symbol: ⚡. The cross-section of the ground conductor must conform to applicable national standards. A minimum cross section of 2.5 mm<sup>2</sup> ( $\leq$  AWG12) is required.
- In addition, a protective ground connection at the terminal contact on the power supply module (identified by the letters "PE" on the terminal connection diagram) is also required for proper operation of the device. The cross-section of this ground conductor must also conform to applicable national standards. A minimum cross section of 1.5 mm<sup>2</sup> (US: AWG14 or thicker) is required.
- If a detachable HMI is installed, a further protective conductor (ground/earth) of at least 1.5 mm<sup>2</sup> (US: AWG14 or thicker) must be connected to the DHMI protective conductor terminal to link the DHMI and the main relay case; these must be located within the same substation.
- All grounding connections must be low-inductance, i.e. it must be kept as short as possible.
- The protective conductor (earth) must always be connected to the protective grounding conductor terminal in order to guarantee the safety given by this setup.

Failure to follow these instructions will result in death or serious injury.

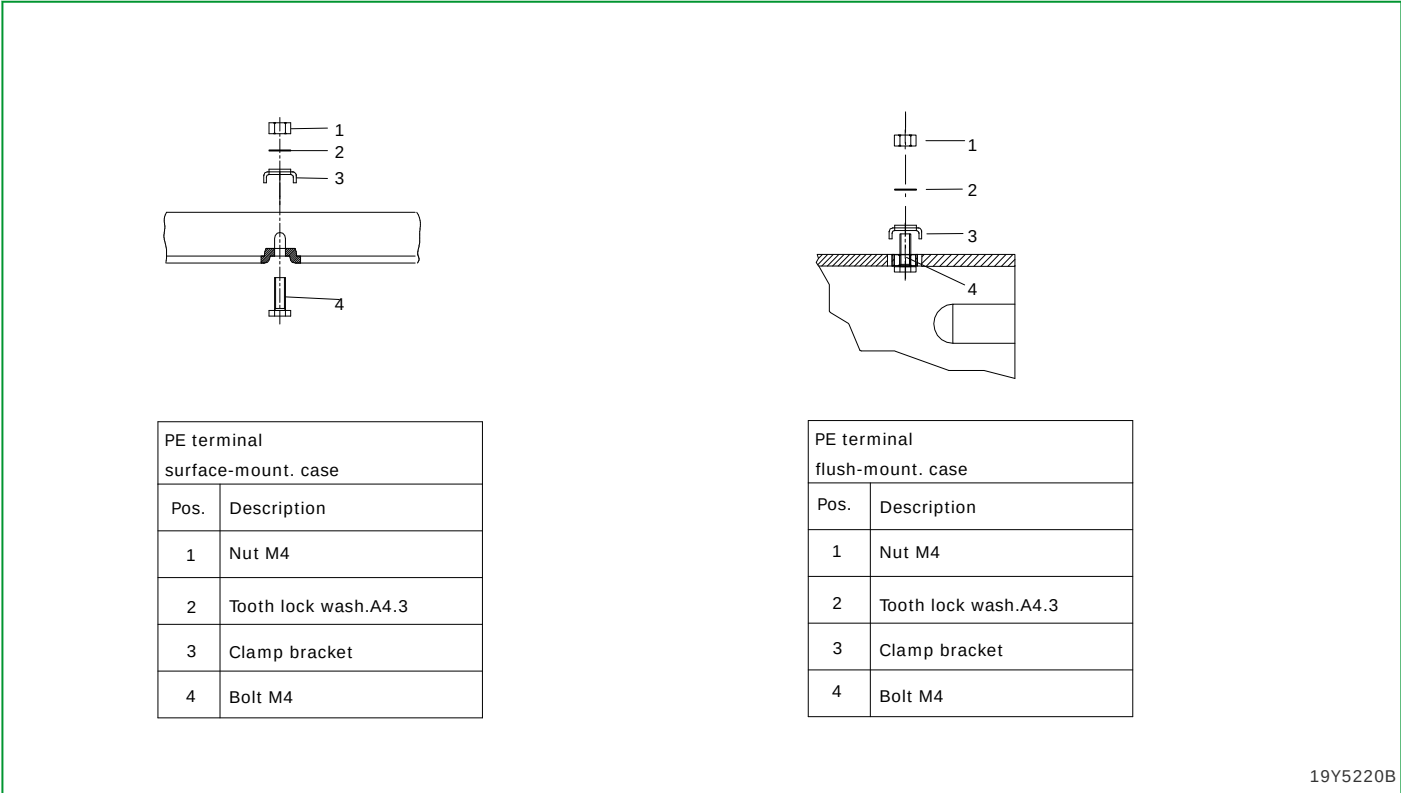


Fig. 5-9: Installing the protective grounding conductor terminal.

5.6 Connection

The C434 Bay Unit for Control and Monitoring must be connected in accordance with the terminal connection diagram as indicated on the type identification label. The relevant terminal connection diagrams that apply to the C434 are to be found either in the supporting documents supplied with the device, or in [Section 5.7, \(p. 5-27\)](#).

In general copper conductors with a cross section of 2.5 mm<sup>2</sup> (US: AWG12) are sufficient to connect a system current transformer to a current input on the C434. To reduce CT knee-point voltage requirements, it may be necessary to install shorter copper conductors with a greater cross section between the system current transformers and the current inputs on the C434. Copper conductors having a cross section of 1.5 mm<sup>2</sup> (US: AWG14) are adequate to connect binary signal inputs, the output relays and the power supply input. All connections run into the system must always have a defined potential. Connections that are pre-wired but not used should preferably be grounded when binary inputs and output relays are isolated. When binary inputs and output relays are connected to common potential, the pre-wired but unused connections should be connected to the common potential of the grouped connections.

 **DANGER**

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- When increased-safety machinery is located in a hazardous area the device must always be installed outside of this hazardous area to protect this equipment.

Failure to follow these instructions will result in death or serious injury.

5.6.1 Connecting Measuring and Auxiliary Circuits

5.6.1.1 Power Supply

Before connecting the auxiliary voltage V<sub>A</sub> for the C434 power supply, it must be ensured that the nominal value of the auxiliary device voltage corresponds with the nominal value of the auxiliary system voltage.

 **DANGER**

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- The power supply must be turned off for at least 5 s before power supply module V is removed. Otherwise there is the danger of an electric shock.

Failure to follow these instructions will result in death or serious injury.

5.6.1.2 Current-Measuring Inputs

When connecting the system transformers, it must be ensured that the secondary nominal currents of the system and the device correspond.



## ⚡ ⚠ DANGER

### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Do not open the secondary circuit of live system current transformers! If the secondary circuit of a live CT is opened, there is the danger that the resulting voltages will endanger personnel and damage the insulation.
- For pin-terminal connection devices, the terminal block for system current transformer connection is not a shorting block! Therefore always short-circuit the system current transformers before loosening the threaded terminals.

Failure to follow these instructions will result in death or serious injury.

#### 5.6.1.3

#### Connecting the Measuring Circuits

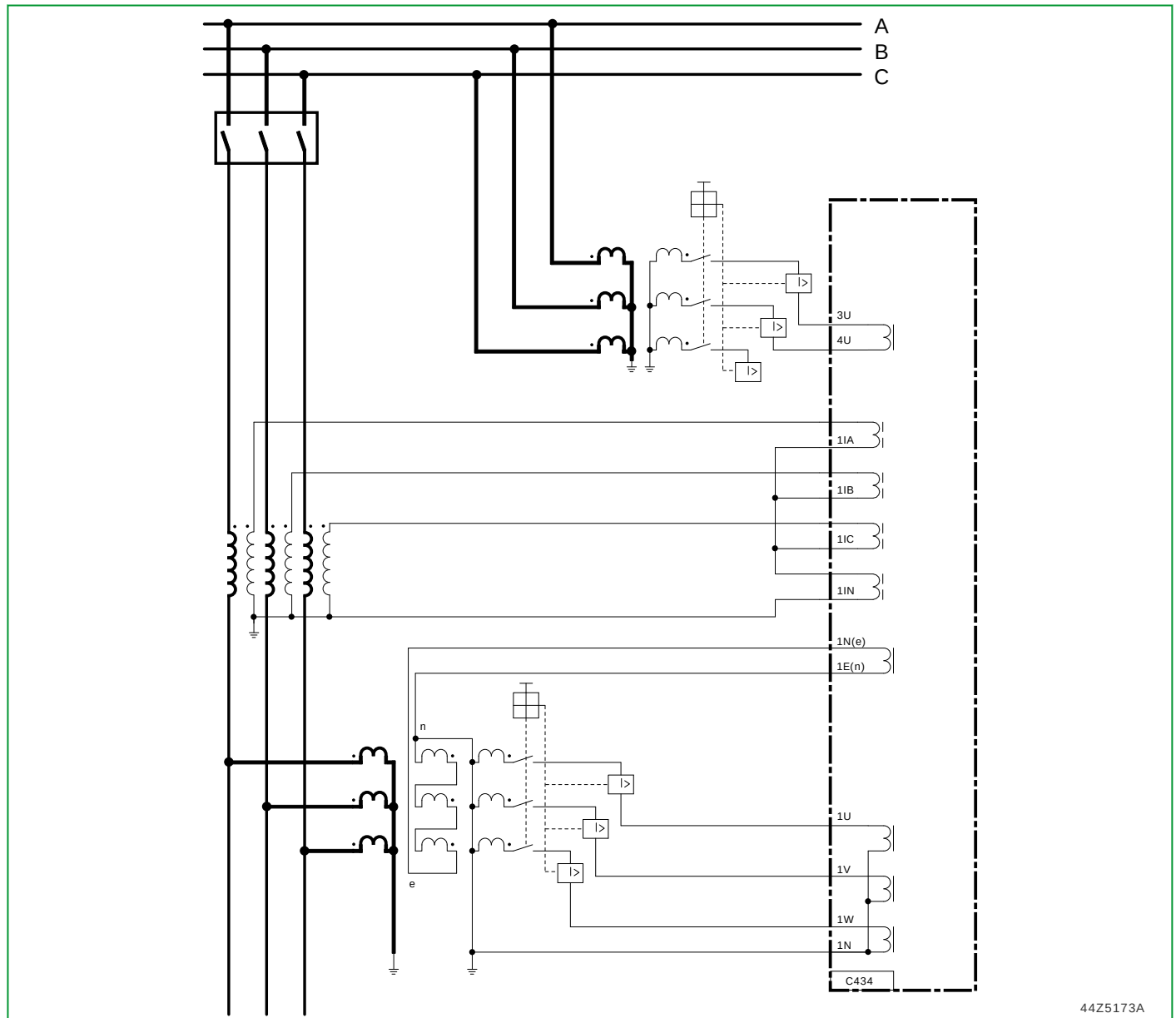


Fig. 5-10: Standard schematic diagram for the measuring circuits (Example case 40 TE).

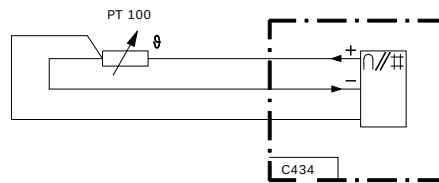
The system current and voltage transformers must be connected in accordance with the standard schematic diagram shown above. It is essential that the grounding configuration shown in the diagram be followed. If the CT or VT connection is reversed, this can be taken into account when making settings (see Chapter "Settings").

**WARNING**

When using Automatic Synchronism Control (ASC), check the correct allocation of the reference voltage input according to the transformer board type!

#### 5.6.1.4 Connecting a Resistance Thermometer

A resistance thermometer can be connected if the device is fitted with analog module Y. This analog I/O module input is designed to connect a PT 100 resistance thermometer. The PT 100 should be connected using the 3-wire method (see Fig. 5-11, (p. 5-19)). No supply conductor compensation is required in this case.



S8Z52H9A

Fig. 5-11: Connecting a PT 100 using the 3-wire method.

#### 5.6.1.5 Connecting Binary Inputs and Output Relays

The binary inputs and output relays are freely configurable. When configuring these components it is important to note that the contact rating of the binary I/O modules (X) varies (see Section 2.5.7, (p. 2-13)).

Once the user has selected a bay type, the C434 can automatically configure the binary inputs and output relays with function assignments for the control of switchgear units. The standard configuration of binary inputs and output relays for each bay type is given in the list of bay types to be found in the Appendix (see Vol. 2, Chapter A5, (p. A5-1)).

The polarity for connected binary signal inputs is to be found in the terminal connection diagrams (see supporting documents supplied with the device or in Section 5.7, (p. 5-27)). This is to be understood as a recommendation only. Connection to binary inputs can be made as desired.

#### 5.6.1.6 Connection of Switchgear Units Having Direct Motor Control

In the case of bay types having direct motor control, one binary input is configured for the status signal and one output relay is configured for triggering and resetting the motor relay. Configuration of appropriate output relays to trigger the armature and shunt windings of motors on load disconnect switches, isolating links or grounding switches is in accordance with the “List of Bay Types” (see Appendix). A connection example for a direct motor control is shown in the following diagram.

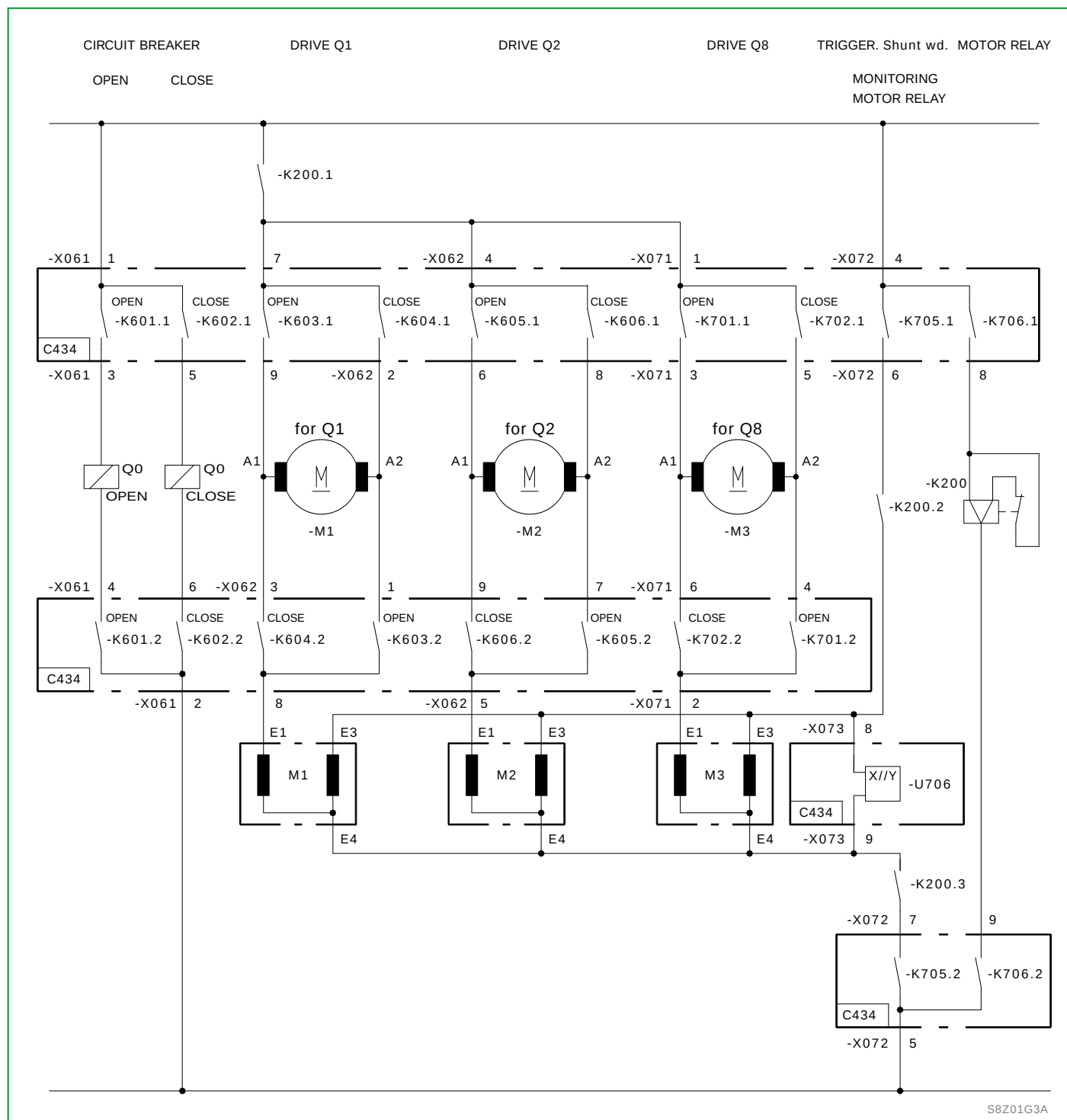


Fig. 5-12: Connection example, motor with shunt winding for a direct motor control, bay type No. 89 (A23.105.M04), feeder bay with circuit breaker, double busbar.

### 5.6.2

#### Connecting the IRIG-B Interface

An IRIG-B interface for time synchronization is available with the Ethernet module. It is connected by a BNC connector. Demodulated and modulated signals can be used.

### 5.6.3 Connecting the Communication Interfaces

#### 5.6.3.1 PC Interface

The PC interface is provided so that personnel can operate the device from a personal computer (PC).

#### DANGER

##### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- The PC interface is not designed as a permanent connection. Consequently, the female connector does not have the extra insulation from circuits connected to the system that is required per IEC/EN 60255-27. Therefore DO NOT leave any permanent cable connection on the PC interface connector at the HMI front panel.

Failure to follow these instructions will result in death or serious injury.

#### WARNING

##### UNEXPECTED EQUIPMENT OPERATION

- Do not use a PC with active termination on any connection pin of the RS232 interface. Wrong termination can drive the device to delay operating actions from the HMI as long as this wrong termination is active on the PC interface.

Failure to follow these instructions can result in unintended equipment operation.

#### 5.6.3.2 Serial Communication Interfaces

The serial communication interfaces are provided as a permanent connection of the device to a control system for substations or to a central substation unit. Depending on the type, communication interface 1 on the device is connected either by a special fiber-optic connector or an RS 485 interface with twisted pair copper wires. Communication interface 2 is only available as an RS 485 interface.

The selection and assembly of a properly cut fiber-optic connecting cable requires special knowledge and expertise and is therefore not covered in this operating manual.

#### DANGER

##### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Do not connect or disconnect the RS 485 or fiber-optic interface when the supply voltage for the device is under power and in operation.

Failure to follow these instructions will result in death or serious injury.

An RS 485 data transmission link between a master and several slave devices can be established by using the optional communication interface. The

communication master could be, for instance, a central control station. Devices linked to the communication master, e.g. C434, are set-up as slave devices.

The RS 485 interface available on the C434 was designed so that data transfer in a full duplex transmission mode is possible using a 4-wire data link between devices. Data transfer between devices using the RS 485 interface is set up only for a half duplex transmission mode. To connect the RS 485 communication interface the following must be observed:

- Only twisted pair shielded cables must be used, that are common in telecommunication installations.
- At least one symmetrical twisted pair of wires is necessary.
- Conductor insulation and shielding must only be removed from the core in the immediate vicinity of the terminal strips and connected according to national standards.
- All shielding must be connected to an effective protective ground surface at both ends.
- Unused conductors must all be grounded at one end.

A 4-wire data link as an alternative to a 2-wire communications link is also possible. A cable with two symmetrical twisted pair wires is required for a 4-wire data link. A 2-wire data link is shown in [Fig. 5-13, \(p. 5-23\)](#), and a 4-wire data link is shown in [Fig. 5-14, \(p. 5-24\)](#) as an example for channel 2 on the communication module. The same is valid if channel 1 on the communication module is available as a RS 485 interface.

2-wire data link:

The transmitter must be bridged with the receiver on all devices equipped electrically with a full duplex communication interface, e.g. the C434. The two devices situated at either far end must have a 200 to 220  $\Omega$  resistor installed to terminate the data transmission conductor. In devices from the *Easergy MiCOM 30* family, and also in the C434, a 220  $\Omega$  resistor is integrated into the RS 485 interface hardware and can be connected with a wire jumper. An external resistor is therefore not necessary.

4-wire data link:

Transmitter and receiver must be bridged in the device situated on one far end of the data transmission conductor. The receivers of slave devices, that have an electrically full-duplex communication interface as part of their electrical system, e.g. the C434, are connected to the transmitter of the communication master device, and the transmitters of slave devices are connected to the receiver of the master device. Devices equipped electrically with only a half duplex RS 485 communication interface are connected to the transmitter of the communication master device. The last device in line (master or slave device) on the data transmission conductor must have the transmitter and receiver terminated with a 200 to 220  $\Omega$  resistor each. In devices from the *Easergy MiCOM 30* family, and also in the C434, a 220  $\Omega$  resistor is integrated into the RS 485 interface hardware and can be connected with a wire jumper. An external resistor is therefore not necessary. The second resistor must be connected externally to the device (resistor order number see Chapter "Accessories and Spare Parts").

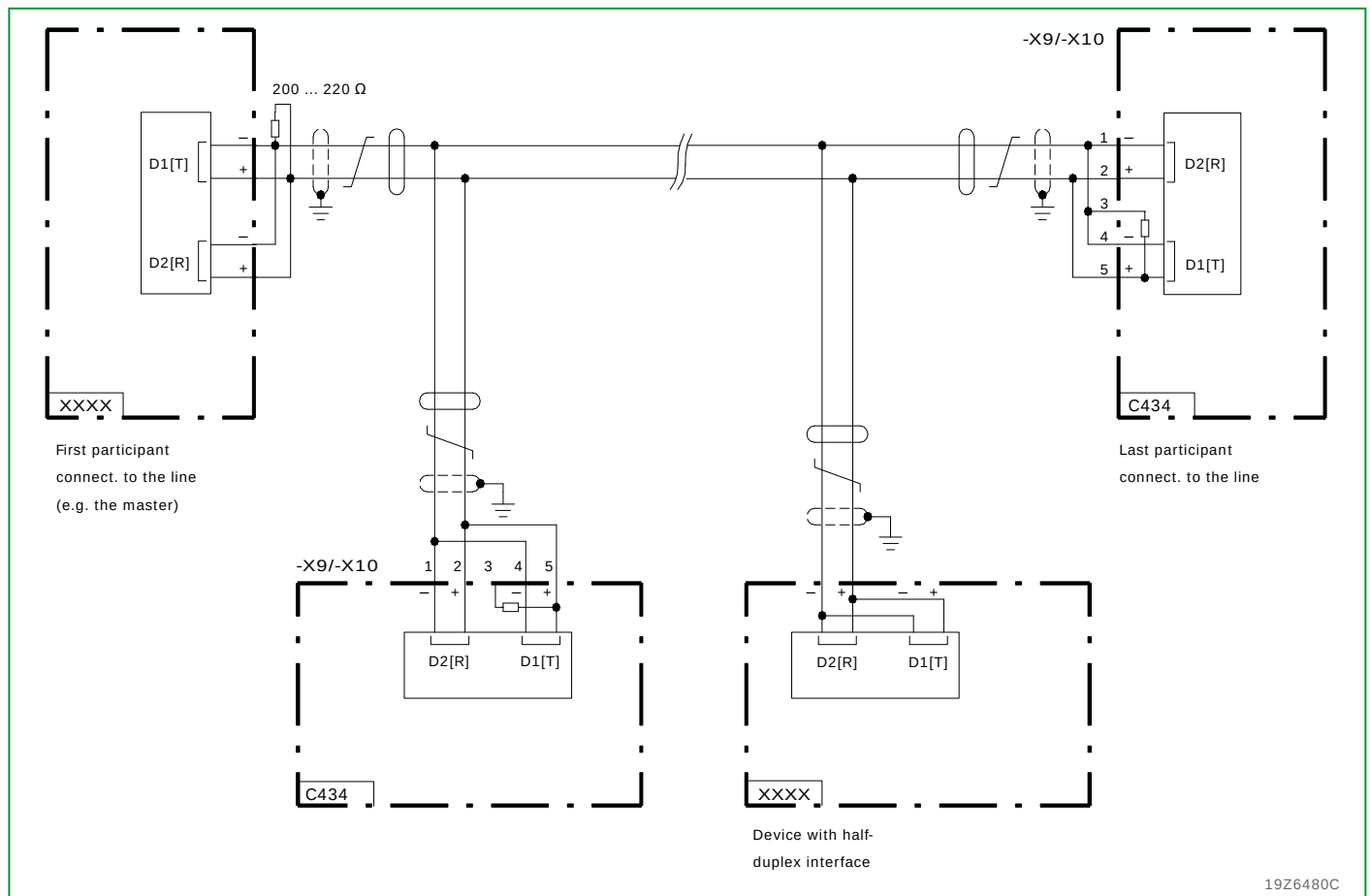


Fig. 5-13: 2-wire data link. (Note: the setting `MAIN: Chann.assign.COMM1/2` decides about whether -X9 (=channel 1) or -X10 (=channel 2) is used.)

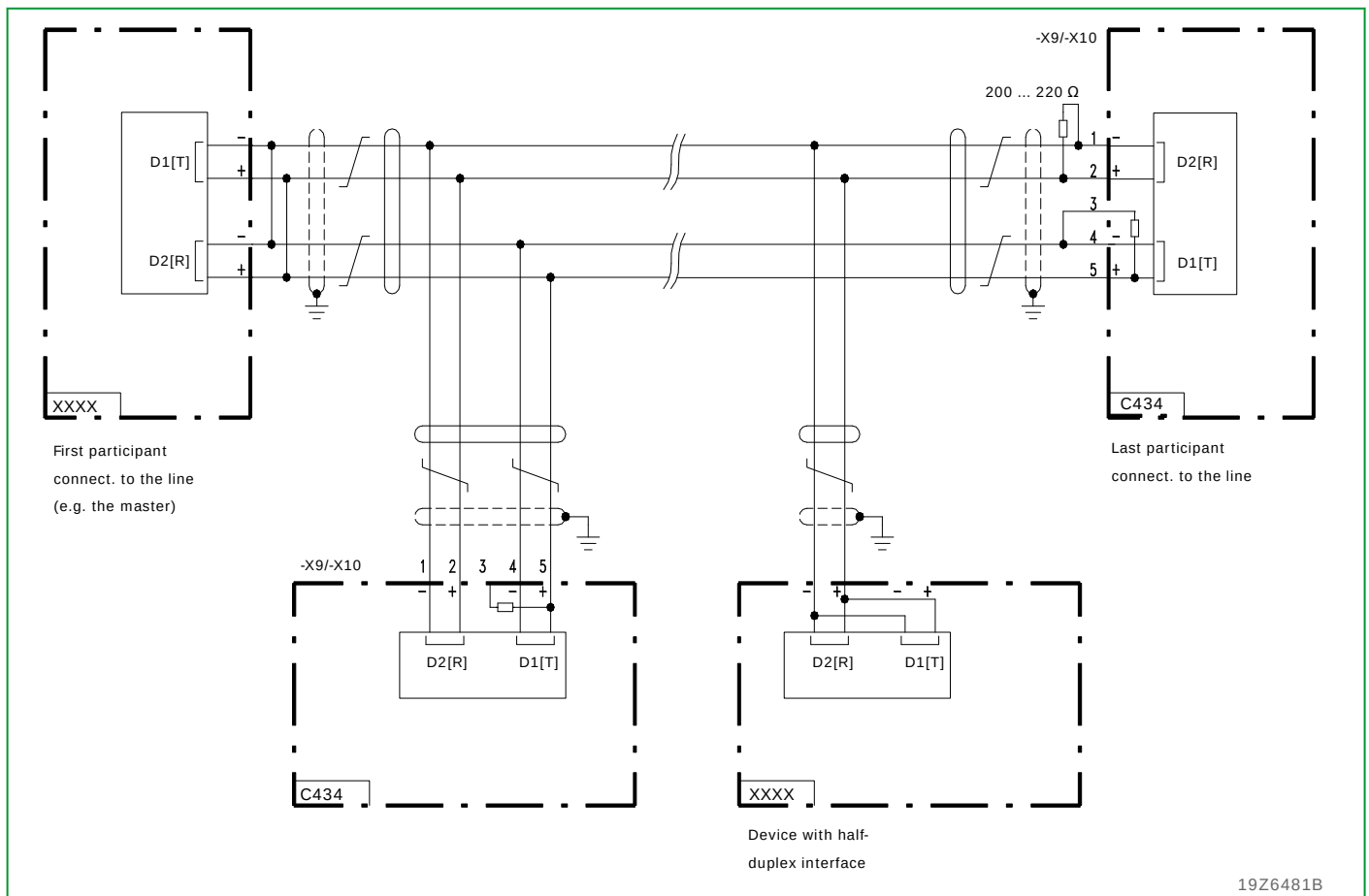


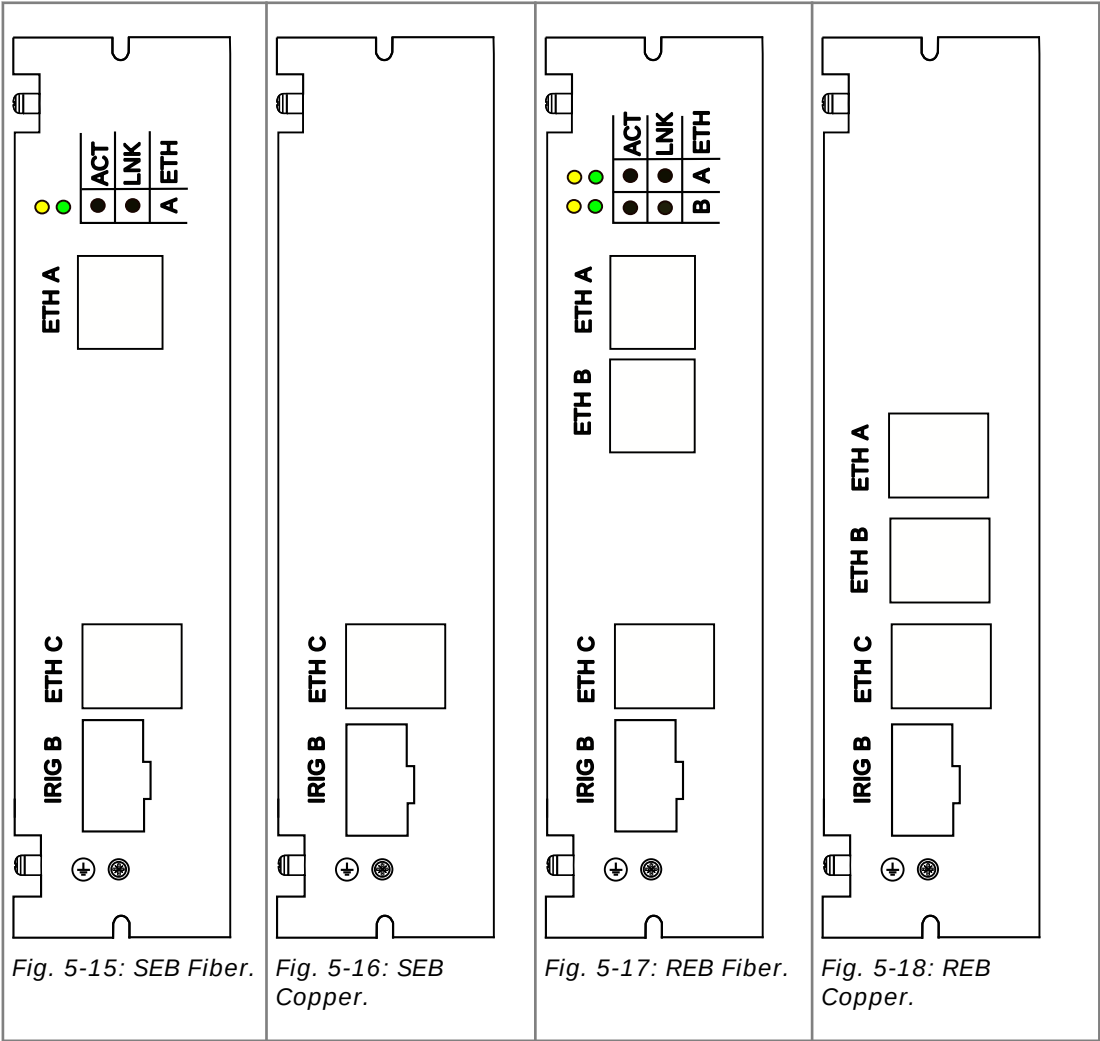
Fig. 5-14: 4-wire data link. (Note: the setting MAIN: Chann.assign.COMM1/2 decides about whether -X9 (=channel 1) or -X10 (=channel 2) is used.)

For CH1/CH2 connection diagram, please refer to [Section 5.7, \(p. 5-27\)](#)



5.6.3.3 Ethernet Module Connection

The diagram and the related tables below show the Interface arrangement of Ethernet module, as they are the fiber/copper connectors and IRIG-B connector.



| Connector | Connections                                    |
|-----------|------------------------------------------------|
| ETH A     | Fiber/Copper                                   |
| ETH B     | Fiber/Copper                                   |
| ETH C     | Copper                                         |
| IRIG-B    | Demodulated (DC IRIG-B)/ Modulated (AC IRIG-B) |

Tab. 5-1: Connector functionality.

| LED    | Function | On        | Off         | Flashing                  |
|--------|----------|-----------|-------------|---------------------------|
| Green  | Link     | Link o.k. | Link broken |                           |
| Yellow | Activity |           |             | Packets received/ emitted |

Tab. 5-2: LED functionality.

## 5.6.3.4

## Parallel Serial and Ethernet Modules Connection

The parallel serial and Ethernet modules should be fitted into the appropriate slots in a particular order. The serial communication module must be fitted into slot 2. The preferred and alternative slots for Ethernet module are shown in the location diagrams [Section 5.7, \(p. 5-27\)](#).

Regarding the appropriate wiring connections of parallel serial and Ethernet modules refer to [Section 5.6.3.2, \(p. 5-21\)](#) and [Section 5.6.3.3, \(p. 5-25\)](#).

## 5.7 Location and Connection Diagrams

### 5.7.1 Location Diagrams C434 -416/417/418

Location diagram for C434 in 40 TE case

- Pin-terminal connection (C434 -416)

| 01 | 02                   | 03 | 04                                    | 05                                                          | 06                                                          | 07                                                          | 08                                                                     | 09            | 10                                  |
|----|----------------------|----|---------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------|---------------|-------------------------------------|
| P  | A<br>CH1<br>CH2      |    | T<br>4J<br>4V<br>4J<br>4V<br>4J<br>5V | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O<br>Y<br>4I | V<br>4I<br>8O | X<br>6O<br>X<br>6I<br>3O<br>X<br>4H |
|    | A<br>SEB<br>A<br>REB |    |                                       |                                                             |                                                             | A<br>SEB<br>A<br>REB                                        | A<br>SEB<br>A<br>REB                                                   |               |                                     |
| 01 | 02                   | 03 | 04                                    | 05                                                          | 06                                                          | 07                                                          | 08                                                                     | 09            | 10                                  |

Location diagrams for C434 in 84 TE case

- Pin terminal connection (C434 -417)

| 01 | 02                   | 03 | 04                                    | 05 | 06                        | 07 | 08                                                                     | 09 | 10                                                          | 11 | 12                                                          | 13 | 14                                                          | 15 | 16                                                          | 17 | 18                                                                                | 19 | 20            | 21 |
|----|----------------------|----|---------------------------------------|----|---------------------------|----|------------------------------------------------------------------------|----|-------------------------------------------------------------|----|-------------------------------------------------------------|----|-------------------------------------------------------------|----|-------------------------------------------------------------|----|-----------------------------------------------------------------------------------|----|---------------|----|
| P  | A<br>CH1<br>CH2      |    | T<br>4J<br>4V<br>4J<br>4V<br>4J<br>5V |    | T<br>4J<br>4V<br>4J<br>4V |    | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O<br>Y<br>4I |    | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O |    | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O |    | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O |    | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O |    | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O<br>X<br>4H<br>X<br>6O |    | V<br>4I<br>8O |    |
|    | A<br>SEB<br>A<br>REB |    |                                       |    | A<br>SEB<br>A<br>REB      |    | A<br>SEB<br>A<br>REB                                                   |    |                                                             |    |                                                             |    |                                                             |    |                                                             |    |                                                                                   |    |               |    |
| 01 | 02                   | 03 | 04                                    | 05 | 06                        | 07 | 08                                                                     | 09 | 10                                                          | 11 | 12                                                          | 13 | 14                                                          | 15 | 16                                                          | 17 | 18                                                                                | 19 | 20            | 21 |

- Ring terminal connection (C434 -418)

| 01 | 02                   | 03 | 04                                    | 05 | 06                        | 07 | 08                                                                     | 09 | 10                                                          | 11 | 12                                                          | 13 | 14                                                          | 15 | 16                                                          | 17 | 18                                                                                | 19 | 20            | 21 |
|----|----------------------|----|---------------------------------------|----|---------------------------|----|------------------------------------------------------------------------|----|-------------------------------------------------------------|----|-------------------------------------------------------------|----|-------------------------------------------------------------|----|-------------------------------------------------------------|----|-----------------------------------------------------------------------------------|----|---------------|----|
| P  | A<br>CH1<br>CH2      |    | T<br>4J<br>4V<br>4J<br>4V<br>4J<br>5V |    | T<br>4J<br>4V<br>4J<br>4V |    | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O<br>Y<br>4I |    | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O |    | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O |    | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O |    | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O |    | X<br>6I<br>6O<br>X<br>6I<br>8O<br>X<br>24I<br>X<br>6I<br>3O<br>X<br>4H<br>X<br>6O |    | V<br>4I<br>8O |    |
|    | A<br>SEB<br>A<br>REB |    |                                       |    | A<br>SEB<br>A<br>REB      |    | A<br>SEB<br>A<br>REB                                                   |    |                                                             |    |                                                             |    |                                                             |    |                                                             |    |                                                                                   |    |               |    |
| 01 | 02                   | 03 | 04                                    | 05 | 06                        | 07 | 08                                                                     | 09 | 10                                                          | 11 | 12                                                          | 13 | 14                                                          | 15 | 16                                                          | 17 | 18                                                                                | 19 | 20            | 21 |

*Each of the numbered slots can be fitted with max. 1 module.*

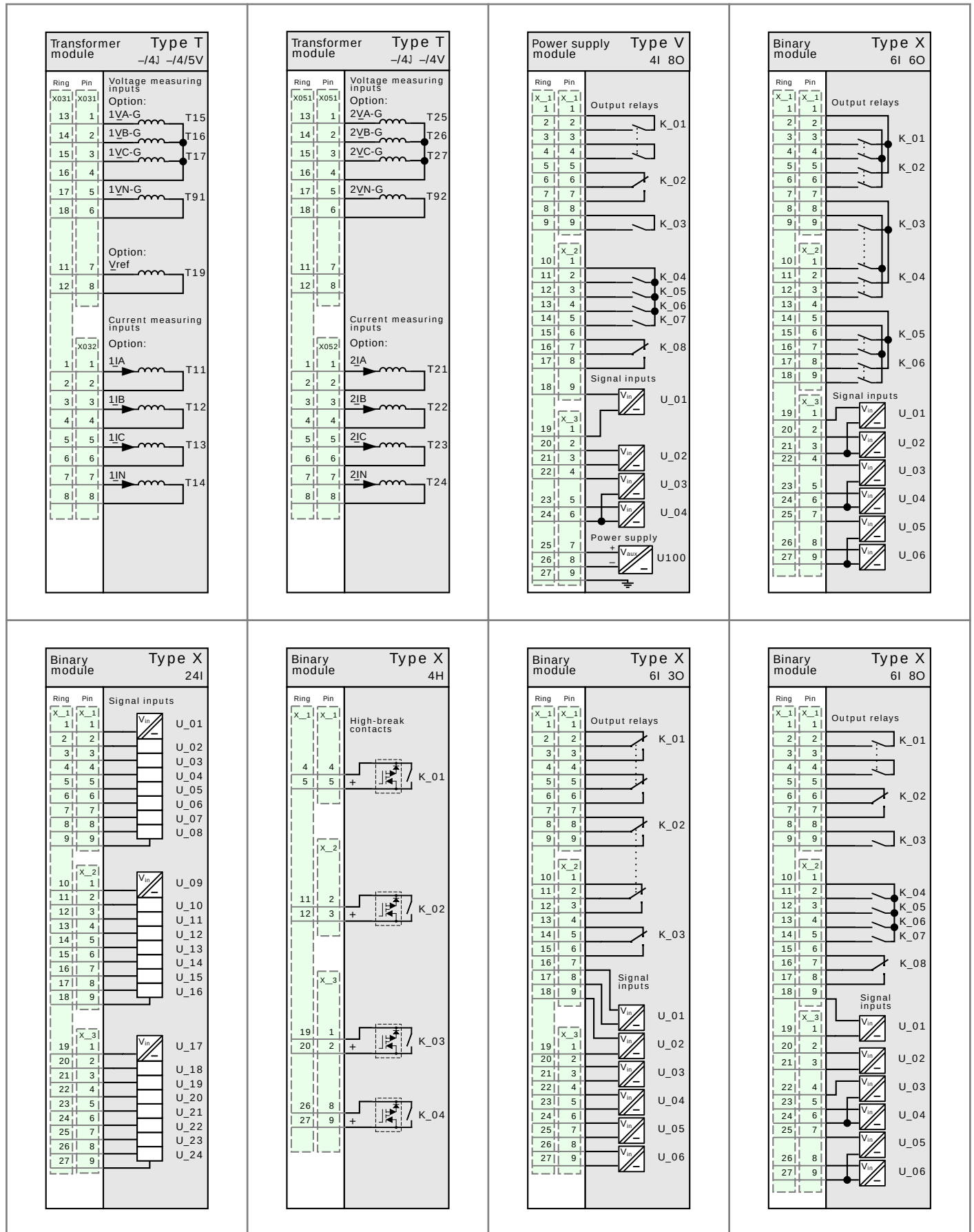
*If a location diagram shows several modules for a particular slot, then these are alternatives, depending on the ordering options.*

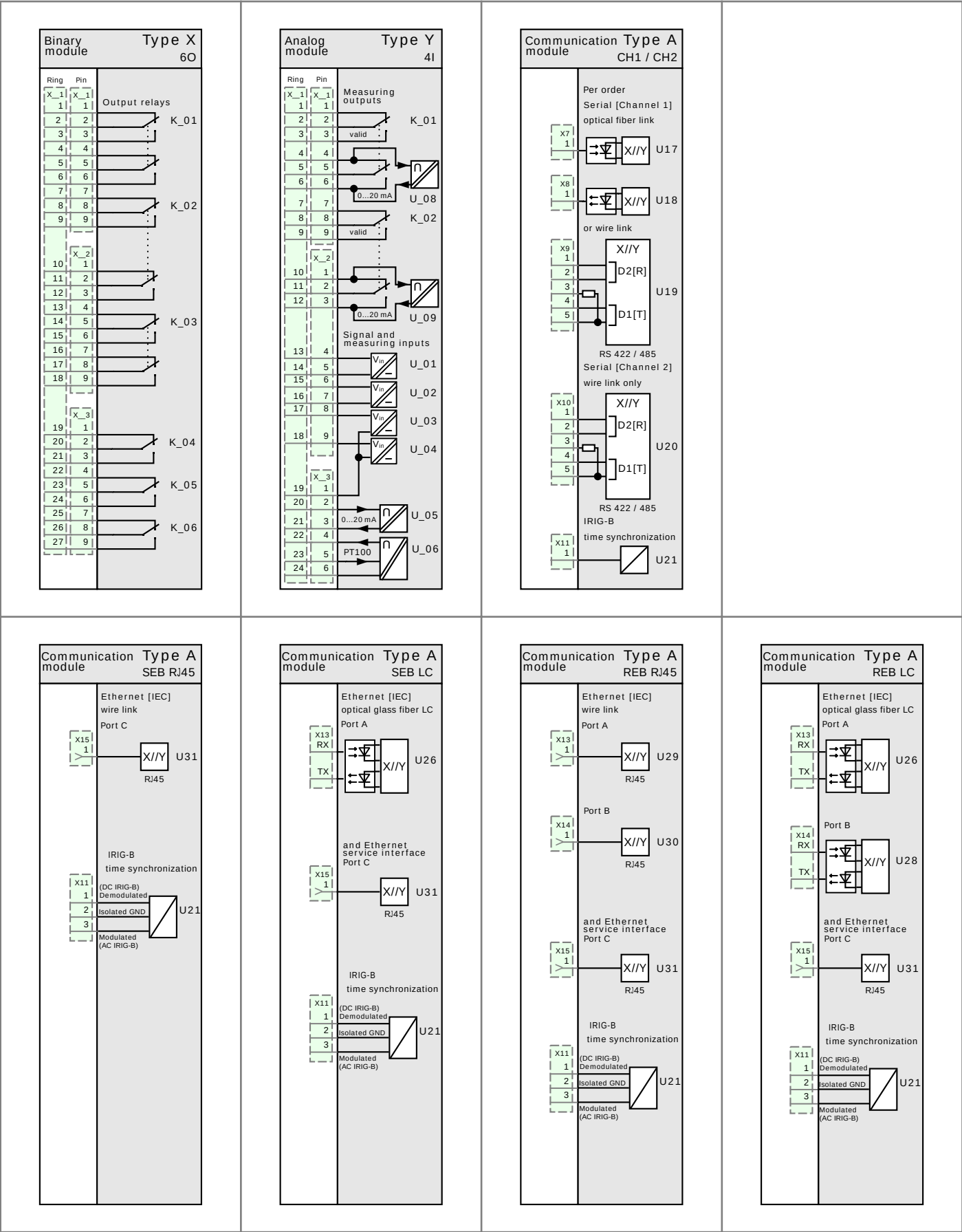
*If serial communication module is on slot 2, the preferred slot for Ethernet communication module for 40 TE is slot 8 and alternatively slot 7, while for 84 TE is slot 6 and alternatively slot 8.*

### 5.7.2

### Terminal Connection Diagrams C434-416/417/418

*"\_" is a placeholder for the slot.*





## 6 Local Control (HMI)

### 6.1 Local Control Panel (HMI)

Switchgear installed in the bay can be controlled from the local control panel (HMI). All the data required for operation of the protection device is entered from the local control panel, and the data important for system management is read out there as well. The following tasks can be handled from the local control panel:

- Controlling switchgear units
- Readout and modification of settings
- Readout of cyclically updated measured operating data and logic status signals
- Readout of operating data logs and of monitoring signal logs
- Readout of event logs
- Device resetting and triggering of additional control functions used in testing and commissioning

Control is also possible through the PC interface. This requires a suitable PC and a specific operating program.

#### 6.1.1 Ordering options

For the local control panel (HMI), the following ordering options are available:

- HMI with text display
- HMI with graphic display

Where necessary, a distinction will be made between these ordering options throughout this chapter.

6.2 Display and Keypad

6.2.1 Text Display

The local control panel is a 3.5 Inches LC display with a resolution of 192 × 96 pixels portrait orientation QVGA, containing 12 × 32 alphanumeric characters. There are six freely configurable function keys, nine keys for navigation and three keys for control functions. Moreover, there are four context sensitive hotkeys/softkeys situated below the LCD.

Futhermore the local control panel is provided with 25 LED indicators. 5 of these are system LEDs on the top right side of the device. 2 status LEDs are above local/remote keys. 12 of user configurable multi-color LEDs are on the left hand side of the LCD. The other 6 multi-color LED indicators are situated to the right of the six freely configurable function keys. (The configuration of the LED indicators is described in [Section 3.12.2, \(p. 3-87\).](#))

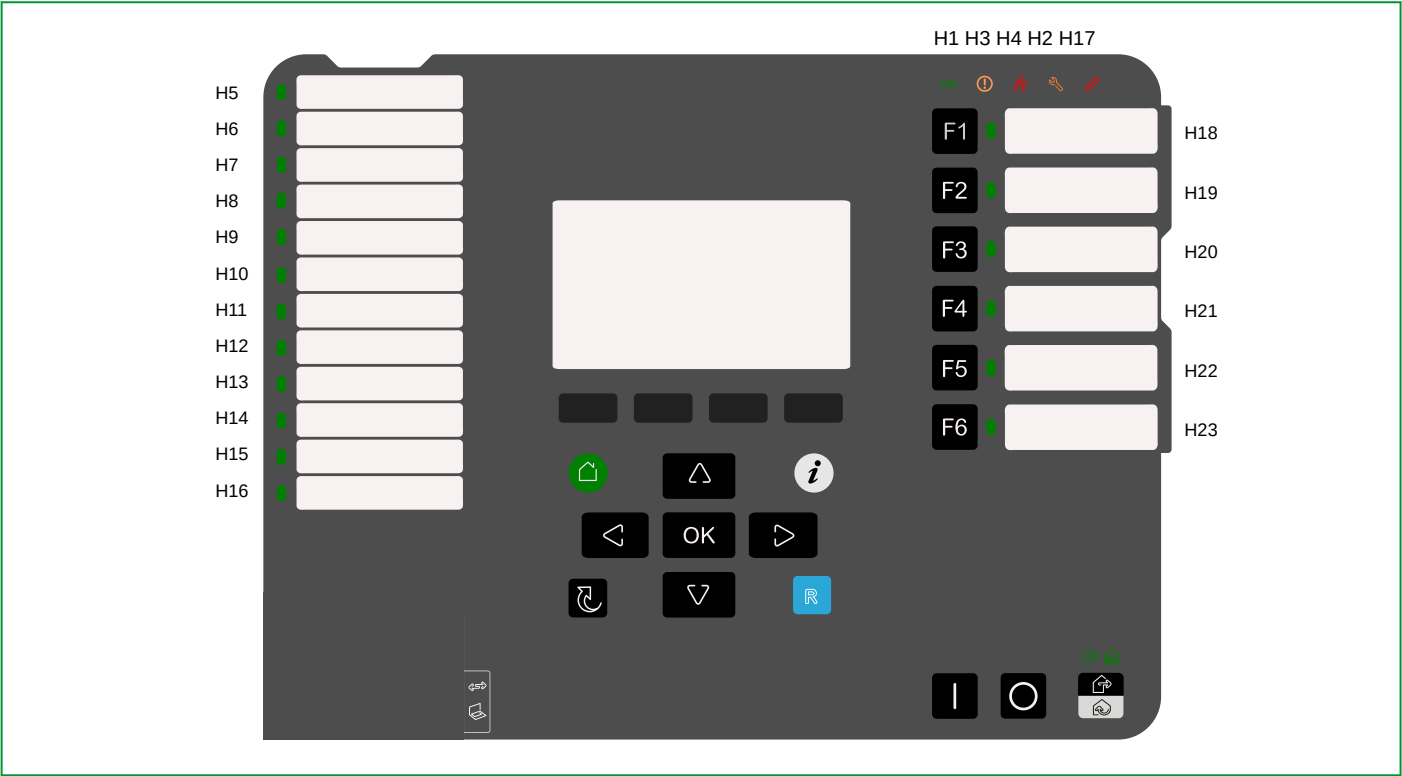


Fig. 6-1: View of the local control panel and layout of the LED indicators for the text display.

6.2.2 Graphic Display

The local control panel is a 5.7 Inches colored graphic LC display with a resolution of 320 × 240 pixels portrait orientation QVGA. There are six freely configurable function keys and twelve keys for navigation/ control functions on the right hand side of the LCD. Moreover, there are four context sensitive hotkeys/softkeys situated below the LCD.

Futhermore the local control panel is provided with 25 LED indicators. 5 of these are system LEDs on the top right side of the device. 2 status LEDs are above local/remote keys. 12 of user configurable multi-color LEDs are on the left hand side of the LCD. The other 6 multi-color LED indicators are situated to the right of the six freely configurable function keys. (The configuration of the LED indicators is described in [Section 3.12, \(p. 3-87\).](#))



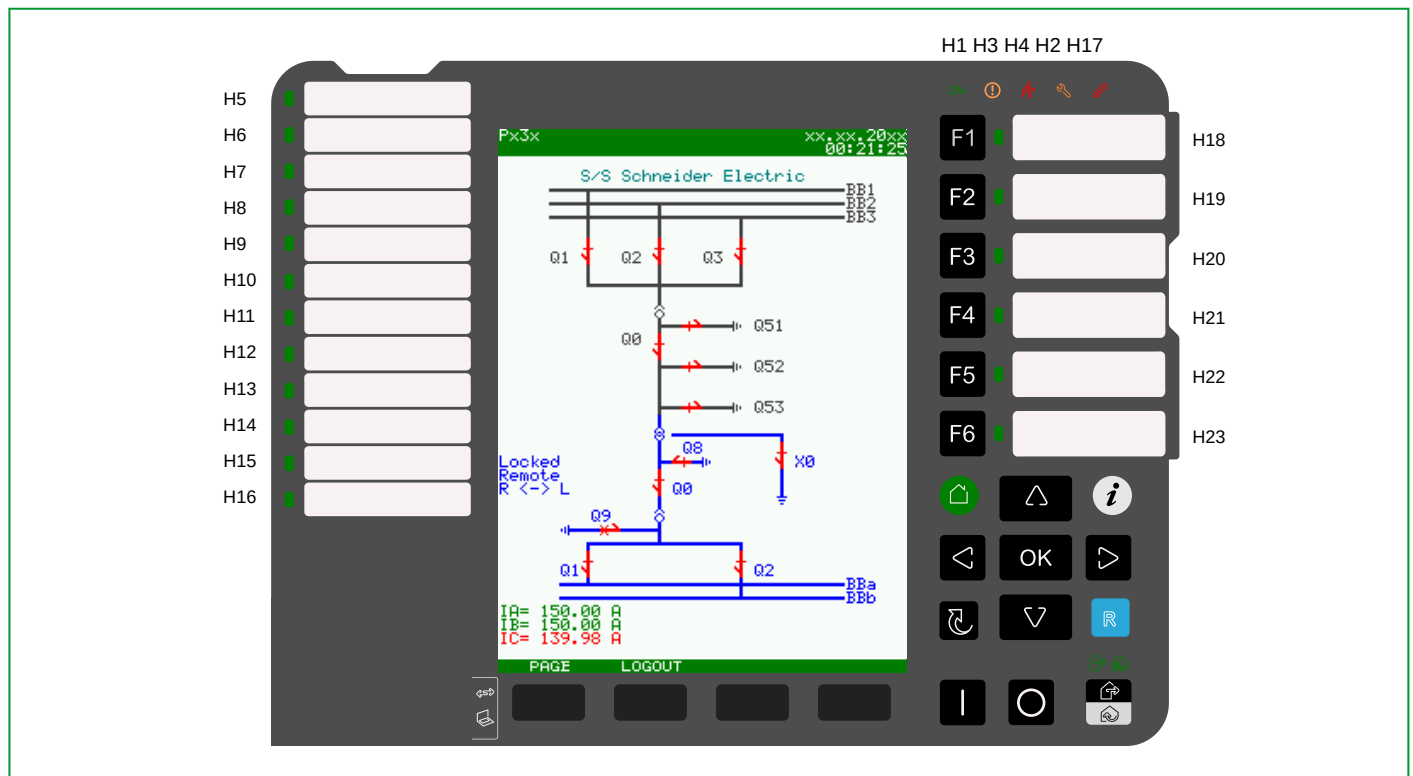


Fig. 6-2: View of the local control panel and layout of the LED indicators for the graphic display.

### 6.2.3 Short Description of Keys

#### 6.2.3.1 “Up” and “Down” Keys



**Panel Level:** The “up”/“down” keys switch between the pages of the Measured Value Panel.

**Menu Tree Level:** Press the “up” and “down” keys to navigate up and down through the menu tree in a vertical direction. If the unit is in input mode, the “up” and “down” keys have a different function.

**Input mode:** Settings can only be changed in the input mode, which is signaled by the LED indicator labeled EDIT MODE. Press the “up” and “down” keys in this mode to change the setting value.

- “Up” key: the next higher value is selected.
- “Down” key: the next lower value is selected.

With list settings, press the “up” and “down” key to change the logic operator of the value element.

#### 6.2.3.2 “Left” and “Right” Keys



Menu Tree Level: Press the “left” and “right” keys to navigate through the menu tree in a horizontal direction. If the unit is in input mode, the “left” and “right” keys have a different function.

Input mode: Settings can only be changed in the input mode, which is signaled by the LED indicator labeled EDIT MODE. When the “left” and “right” keys are pressed, the cursor positioned below one of the digits in the change-enabled value moves one digit to the right or left.

- “Left” key: the cursor moves to the next digit on the left.
- “Right” key: the cursor moves to the next digit on the right.

In the case of a list setting, press the “left” and “right” keys to navigate through the list of items available for selection.

#### 6.2.3.3

##### ENTER Key



Panel Level: Press the ENTER key at the Panel level to go to the menu tree.

Menu Tree Level: Press the ENTER key to enter the input mode. Press the ENTER key a second time to accept the changes as entered and exit the input mode. The LED indicator labeled EDIT MODE signals that the input mode is active.

#### 6.2.3.4

##### RESET Key



Press the RESET key to reset the functions assigned to the Reset key via LOC: Fct. reset key.

Press the RESET key to reset the LED indicators and clear all measured event data. The records in the recording memories are not affected by this action.

Panel level: Press the RESET key to cancel selection of switchgear unit (when Bay Panel mode is selected).

Input mode: When the RESET key is pressed all changes entered are rejected and the input mode is exited.

When changing the password, press Reset key to cancel the change of password.

#### 6.2.3.5

##### READ Key



Press the READ key to access a selected event recording from either the Panel level or from any other point in the menu tree.

#### 6.2.3.6

##### HOME Key



Pressing the HOME key returns to the default display from anywhere in the menu.

If setting mode is enabled, the setting change should be confirmed/cancelled when pressing the HOME key. The edited setting parameter value is returned to its original value if the setting change is cancelled.

#### 6.2.3.7 Configurable Function Keys



By pressing a function key (F1 ... F6) the assigned function is triggered.

More details on assigning functions to function keys can be found in [Section 3.7, \(p. 3-63\)](#).

More details on handling function keys can be found in [Section 6.3, \(p. 6-11\)](#).

#### 6.2.3.8 “Local/Remote” Key



The local/remote key is effective in the Bay Panel except where a binary signal input has been configured for this function.

The local/remote key is the transfer switch between remote and local control (setting  $R \leftrightarrow L$ ), or between remote&local and local control (setting  $R \& L \leftrightarrow L$ ).

If the “Local/Remote” key is set to switch from *Remote* control to *Local* control, then this can only occur if the password has first been entered first. Switching from *Local* to *Remote* control will occur without checking the password.

The local, remote or local&remote states can be identified by the two LEDs located above the key. Left LED with amber color is for the remote status, right LED with red color for local status and both LEDs for the local&remote status.

#### 6.2.3.9 Selection Key



Bay Panel: The Selection key is effective only in the Bay Panel and only if local control is activated.

If local control has been selected, pressing the selection key selects the switchgear unit to be controlled. The selected external device will be marked by an asterisk (\*) – as long as no external device names are displayed. Otherwise the external device name will flash and will be displayed in the status line.

Signal Panel: The Selection key is used to select a flashing signal (not yet acknowledged) and will also automatically switch to pages that might be available. When the last flashing signal has been reached pressing the Selection key again will start with the first flashing signal.

#### 6.2.3.10 OPEN Key



The OPEN key is effective in the Bay Panel only.

Pressing the OPEN key controls the selected switchgear unit – taking into account the interlock equation – to assume the “open” status.

#### 6.2.3.11

##### CLOSE Key



The CLOSE key is effective in the Bay Panel only.

Pressing the CLOSE key controls the selected switchgear unit – taking into account the interlock equation – to assume the “closed” status.

#### 6.2.3.12

##### SOFTKEY

Four softkeys are situated below the LCD and the function labels are displayed on the lower line of the LCD display using smaller Font.

The function of Softkey 1 and 2 is fixed and is not user configurable. The function of Softkey 3 and 4 is not assigned.

Panel Level: Softkey 1 is to provide the Page select function to switch between the different panels available.

Softkey 2 is to provide a Logout function (HMI, Easergy Studio logout and USB connection).

Menu Tree Level: Softkey 1 is to go to the top of menu tree within the current selected Folder.

Softkey 2 is to provide Logout function (HMI, Easergy Studio logout and USB connection).

#### 6.2.4

##### Display Levels

All data relevant for operation and all device settings are displayed on two levels. At the Panel level, data such as measurements are displayed in Panels that provide a quick overview of the current state of the bay. The “*menu tree*” level below the panel level allows the user to select all data points (settings, signals, measured variables, etc.) and to change them, if appropriate. To access a selected event recording from either the panel level or from any other point in the menu tree, press the “READ” key:

### 6.2.5 Availability of the Bay Panel

The Bay Panel is only available under these conditions:

1. On the hardware side the protection unit must be fitted with the binary module X(6I 6O) to a slot supporting this module.
2. By selecting and sending a bay type (with parameter MAIN: Type of bay) a bay type has been generated.

To access a selected event recording from either the panel level or from any other point in the menu tree, press the "READ" key.

From the control and display panels (e.g. measured value panels or the bay panel) the user can access the menu tree level by pressing the "ENTER" key.

To return to the previously selected control and display panel from the menu tree level the user must simultaneously press the keys "UP" and "RESET". (If previously no panel was selected, i.e. after a system restart, then the bay panel, if available, is accessed.)

After the set LOC: Autom. return time has elapsed the protection unit will also return automatically from the menu tree level to the control and display panel last selected.

The user can move from a bay panel to a measured value panel by pressing the softkey 1 "Page".

### 6.2.6 Display Panels on the Text Display

The text display of the C434 can display Measured Value Panels which are called up according to system conditions.

Selected measured values are displayed on the Measured Value Panels. The system condition determines which Panel is called up (examples are the Operation Panel and the Fault Panel). Only the Measured Value Panels relevant for the particular design version of the given device and its associated range of functions are actually available.

The Operation Panel is always provided.

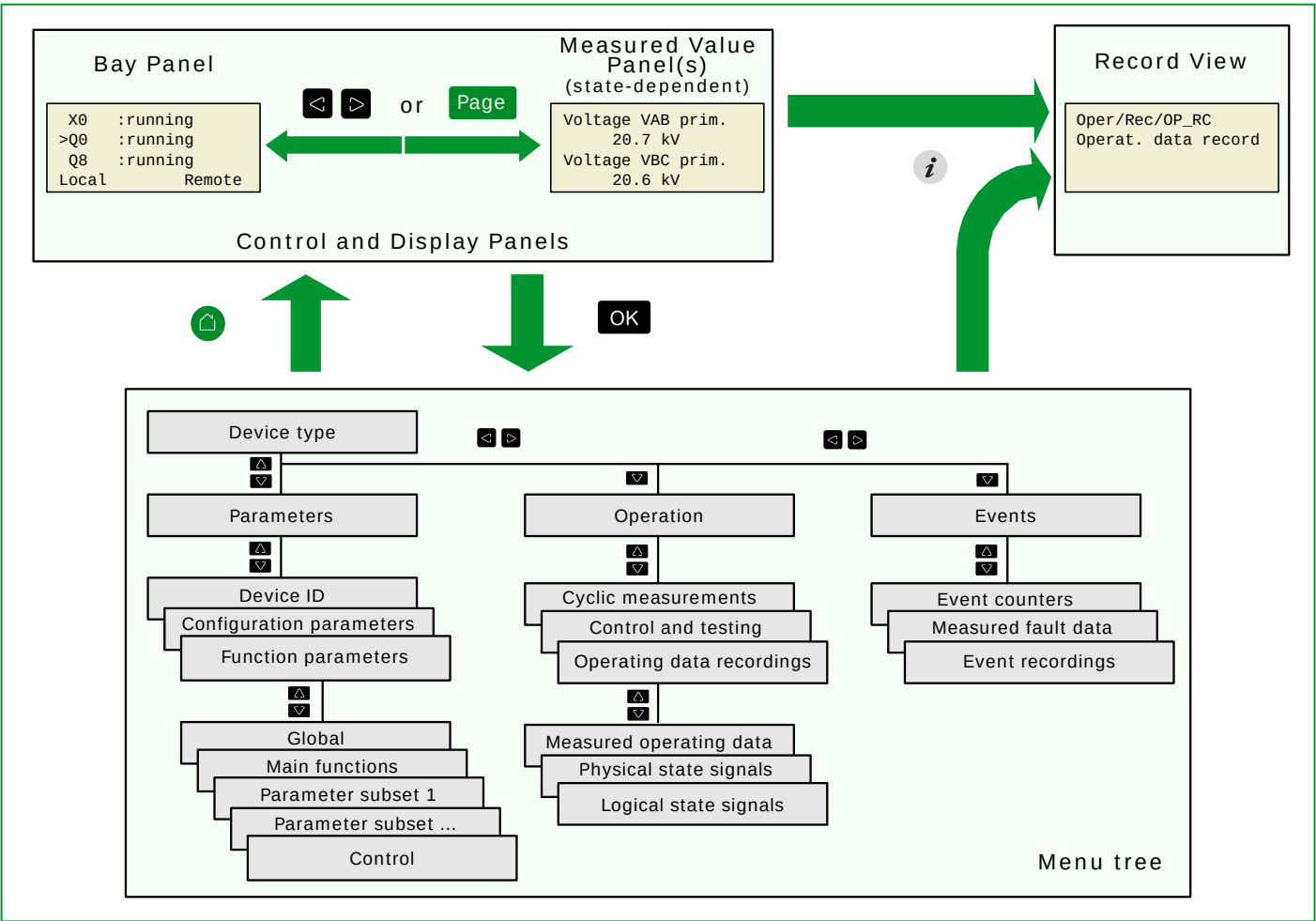


Fig. 6-3: Display panels and menu tree.

## 6.2.7

## Display Panels on the Graphic Display

The following display panels are available with the graphic display:

- Bay Panel
- Signal Panel
- Measured Value Panels, which are called up according to system conditions
- Event Panel

The Bay Panel displays the up-to-date switching status of the selected bay as a one line diagram. If user-defined bay types are applied, resulting information may be sub-divided into up to eight pages. A maximum of 38 physical and logic binary status may be configured to one Signal Panel and, depending on the operating mode, acknowledged. Selected measured values are displayed on the Measured Value Panels (maximum 35 values in one page). Only the Measured Value Panels relevant for the particular design version of the given device and its associated range of functions are actually available.

The Event Panel displays the most recent events (maximum 8 events in one page), each with a time tag, such as the opening of a switchgear unit.

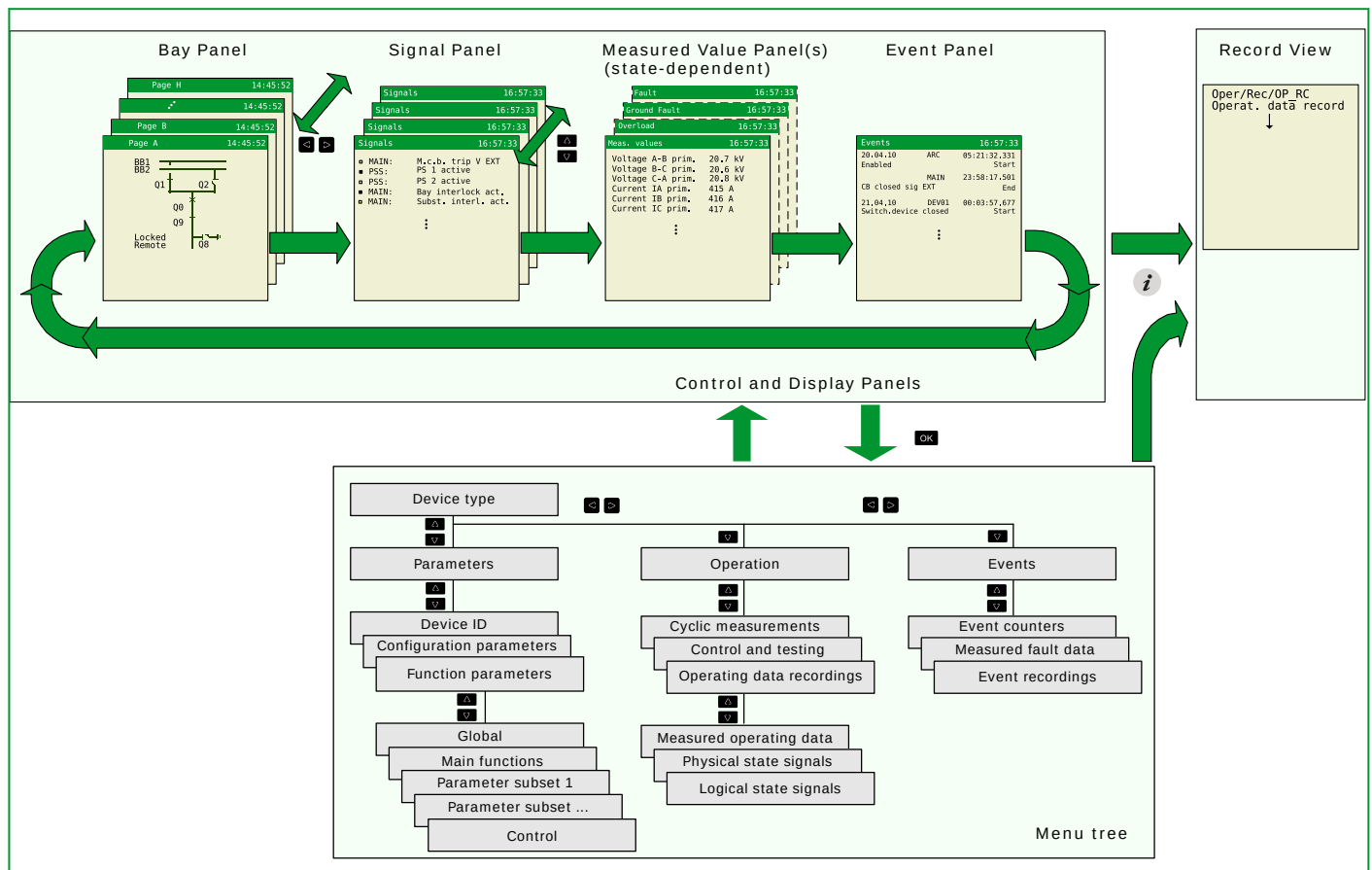


Fig. 6-4: Display panels and menu tree.

## 6.2.8

## Menu Tree and Data Points

All *data points* (setting values, signals, measured values, etc.) are selected using a *menu tree*. When navigating through the *menu tree*, the first two lines of the LC-Display always show the branch of the *menu tree* that is active, as selected by the user. The *data points* are found at the lowest level of a *menu tree* branch and they are displayed either with their plain text description or in numerically encoded form, as selected by the user. The value associated with the selected

*data point*, its meaning, and its unit of measurement are displayed in the line below.

#### 6.2.9

##### List Data Points

*List data points* are a special category. In contrast to other data points, *list data points* generally have more than one associated value element. This category includes tripping matrices, programmable logic functions, and event logs. When a *list data point* is selected, the symbol '↓' is displayed in the bottom line of the LCD, indicating that a sub-level is situated below this displayed level. The individual value elements of a *list data point* are found at this sub-level. In the case of a *list parameter*, the individual value elements are linked by operators such as "OR".



## 6.3 Configurable Function Keys

### 6.3.1 Configuration of the Function Keys F1 to Fx

Function keys [F1] to [Fx] can be assigned a password (see [Section 6.8.9, \(p. 6-55\)](#)). In such a case they are effective only after that password has been entered. By default, no password is required to use the function key.

It is assumed for the following operating example that function key [F1] is enabled only after the password (as assigned at F\_KEY: Password funct.key 1) has been entered. After the password has been entered the function key will remain active for the duration set at F\_KEY: Return time fct.keys. Thereafter, the function key is disabled until the password is entered again.

|         | Control Step / Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Control Action                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Display                                                                                    |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Step 0  | Display example.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Voltage A-B prim. 20.7 kV<br>Voltage B-C prim. 20.6 kV                                     |
| Step 1  | Press function key [F1].<br>Eight asterisks (*) appear in the fourth line as a prompt to enter the password if it is required.<br>(By default, i.e. no password required, this step and the next do not exist and the function key is effective immediately as described in Step 3.)                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                    | *****                                                                                      |
| Step 2a | If a password is set, press the keys corresponding to the set password, for example:<br>“Left”<br><br>“Down”<br><br>“Right”<br><br>“Up”<br>The display will change as shown in the right hand side column.<br><br>Now press the ENTER key. If the correct password has been entered, the active display will re-appear.<br>Function key [F1] is now effective for the set return time.<br>By default, no password is required and therefore function key [F1] is always effective.<br>Each function key can be assigned its own password, and the return time is running after correct password entry for each individual function key!)<br>If an invalid password has been entered, the display shown above in Step 1 will appear. | <br><br><br><br><br><br><br><br> | *<br><br>*<br><br>*<br><br>*<br><br>Voltage A-B prim. 20.7 kV<br>Voltage B-C prim. 20.6 kV |
| Step 2b | This control step can be canceled at any time by pressing the RESET key before the ENTER key is pressed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                  | Voltage A-B prim. 20.7 kV<br>Voltage B-C prim. 20.6 kV                                     |

|        | Control Step / Description                                                                                                                                                                                                                                                           | Control Action                                                                      | Display                                                      |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Step 3 | Press [F1] again. The function configured to this function key is carried out.                                                                                                                                                                                                       |  | Voltage A-B<br>prim. 20.7 kV<br>Voltage B-C<br>prim. 20.6 kV |
| Step 4 | When function keys are pressed during their associated return time, then the set function is carried out directly, i.e. without checking for the password again.<br>(By default, i.e. no password required, this step does not exist and the function key is permanently effective.) |  | Oper/CtrlTest/LOC<br>Param. change enabl.<br>Yes             |

## 6.4 Changing between Display Levels

### 6.4.1 Note Concerning the Step-by-Step Descriptions

The following presentation of the individual control steps shows which displays can be changed in each case by pressing keys. A small black square to the right of the enter key indicates that the LED indicator labeled Edit Mode is illuminated. The examples used here are not necessarily valid for the device type described in this manual; they merely serve to illustrate the control principles involved.

### 6.4.2 Changing Between Display Levels

#### *Jumping from Menu Tree Level to Panel Level*

After start-up of the device, the menu tree level is displayed.

|        | Control Step / Description                                                                                                                                                                                     | Control Action                                                                                                                                                                      | Display                                                      |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Step 0 | From the Menu Tree Level, the user can jump to the Panel Level from any position within the menu tree.                                                                                                         |                                                                                                                                                                                     | Par/Func/Glob/MAIN<br>Device on-line<br>No (=off)            |
| Step 1 | First press the “up” key and hold it down while pressing the Reset key.<br><br>Note: It is important to press the “up” key first and release it last in order to avoid unintentional resetting of stored data. | <br>+<br> | Voltage A-B prim.<br>20.7 kV<br>Voltage B-C prim.<br>20.6 kV |

#### *Jumping from Panel Level to Menu Tree Level*

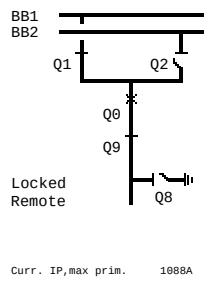
|        | Control Step / Description                                             | Control Action                                                                        | Display                                                      |
|--------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Step 0 | Example of a Measured Value Panel.                                     |                                                                                       | Voltage A-B prim.<br>20.7 kV<br>Voltage B-C prim.<br>20.6 kV |
| Step 1 | Press the Enter key to go from the Panel Level to the Menu Tree Level. |  | C434                                                         |

After the set return time has elapsed (setting in menu tree: “Par/Conf/LOC”), the display will automatically switch to the Panel level if a Measured Value Panel has been configured.

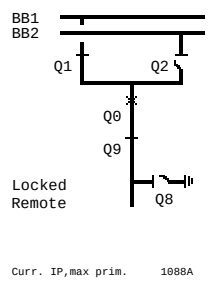
### 6.4.3 Changing Between Display Levels

#### *Jumping from Panel Level to Menu Tree Level*

After start-up of the device, the display is at the Panel Level. The Bay Panel is displayed.

|        | Control Step / Description                                                                                                                                                                                                                                                                                | Control Action                                                                      | Display                                                                             |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Step 0 | Example of a display after start-up of the device.<br>Note: When the device is delivered, it is set for a dummy bay without switchgear units. Therefore only the name of the device appears on the Bay Panel. The display shown in the example will not appear until a "real" bay type has been selected. |                                                                                     |  |
| Step 1 | Press the Enter key to go from the Panel Level to the Menu Tree Level.                                                                                                                                                                                                                                    |  | C434<br>Menu<br>Parameters                                                          |

#### *Jumping from Menu Tree Level to Panel Level*

|        | Control Step / Description                                                                                                                                                                                                                      | Control Action                                                                                                                                                                                                                                                                     | Display                                                                               |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Step 0 | From the Menu Tree Level, the user can jump to the Panel Level from any position within the menu tree.                                                                                                                                          |                                                                                                                                                                                                                                                                                    | Par/Func/Glob/MAIN<br>Device on-line<br>No (=off)                                     |
| Step 1 | Press the Home key.<br>Alternatively first press the "up" key and hold it down while pressing the Reset key.<br>Note: It is important to press the "up" key first and release it last in order to avoid unintentional resetting of stored data. | <br>or<br><br>+<br> |  |

After the set return time has elapsed (setting in menu tree: "Par/Conf/LOC"), the display will switch automatically to the Bay Panel.

## 6.5 How to use Cyber Security Features

These sections shows the most common tasks associated with Cyber Security features.

For many of these tasks, the steps you take are the same as you have performed previously and with the main changes being in the steps you use to login and/or logout.

*Schneider Electric points out that changing default users and default passwords constitutes an important security measure for the product. Therefore Schneider Electric recommends to change the default passwords after the first usage of the device. Not changing the default passwords can lead to the risk of undesirable changes by third parties.*

### 6.5.1 Usage

#### 6.5.1.1 How to Login

##### 6.5.1.1.1 Local Default Access

If the Local Default Access is enabled, the user can login via the front panel without password with associated roles.

##### 6.5.1.1.2 Login with Prompt User List

This login process will happen if authorization is required for the current operation.

In this case, the IED will prompt the user list, and the user needs to select proper user name and enter the password to login.

|        | Login Step / Description                                                                                       | Control Action                                                                                                                                                                   | Display                                                               |
|--------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| Step 0 | When operation needs authorization, the device security insufficient rights message is displayed for 2 seconds |                                                                                                                                                                                  | Device Security<br>insuff. rights                                     |
| Step 1 | The user list is shown<br>Select proper user by pressing the 'up' or 'down'                                    | <br>Or<br> | Select a user<br>>DefaultViewer<br>DefaultOperator<br>DefaultEngineer |
| Step 2 | Confirm the selection by 'Enter' key                                                                           |                                                                                               |                                                                       |
| Step 3 | Password message is shown for user to enter                                                                    |                                                                                                                                                                                  | User Password?<br>*****                                               |
| Step 4 | If password is correct                                                                                         |                                                                                                                                                                                  | Device Security<br>login successful                                   |
| Step 5 | If password is incorrect, password message shows again (as in step 3)                                          |                                                                                                                                                                                  | Device Security<br>login failed                                       |
| Step 6 | If decided not to login (by pressing the 'Reset' key), the message is displayed for 2 seconds.                 |                                                                                             | User not selected<br>Aborted with R key                               |

#### 6.5.1.2 How to Logout

##### 6.5.1.2.1 How to Logout at the IED

For security consideration, it would be better to logout the IED once the configuration is done.

The user can be logged out with 'HMI Logout' in the menu tree: 'Par/Conf/CS' or using the softkey 'LOGOUT'.

##### 6.5.1.2.2 How to Logout at Easergy Studio

- Right-click on the device name and select Log Off.
- In the Log Off confirmation dialog click Yes.

##### 6.5.1.3 How to Disable a Physical Port

It is possible to disable unused physical ports for security reason.

The physical ports can be disabled by using Easergy Studio or the front panel. This can't be done by the CAE. An Engineer-role is needed to perform this action. COMM1 section:

- Allows to disable commands.

It can be disabled with 'Command blocking' in the menu tree: 'Par/Func/Glob/COMM1'.

COMM2 section:

- Allows to disable commands and measurements. If both are disabled, the complete interface is disabled.

It can be disabled with 'Command blocking' or 'Sig./meas.val.block' in the menu tree: 'Par/Func/Glob/COMM2'.

IEC section:

- Allows to disable the physical interface A/B or A (if available).
- Allows to disable the physical interface C.

The physical ports can be disabled with 'Block Port A/B' or 'Block Port C' in the menu tree: 'Par/Conf/IEC'.

PC section (IEC 103):

- Allows to disable commands and measurements. If both are disabled, the complete interface is disabled.

It can be disabled with 'Command blocking' or 'Sig./meas.val.block' in the menu tree: 'Par/Func/Glob/PC'.

#### 6.5.1.4

#### How to Secure Function key

For device security reasons, this function has been linked to the front panel authorization.

- When the function key pressed, if there is no user login in the front panel or the logged- in user is not authorized, a prompt message will be raised in the front panel to ask the user login.  
Once the user logged-in, function key password is needed if function key has a password. If the user already logged in with authorization and the function key has no password, the command will be executed immediately.
- By default, the OPERATOR or ENGINEER Roles are able to operate the function keys.
- If unauthorized users press Function Key during the setting change, they need to commit the changes first then login with authorized user to operate the function key.



6.6 Control at Panel Level (HMI with Text Display)

The measured values that will be displayed on the Measured Value Panels can first be selected in the menu tree under *Par/Conf/LOC*. The user can select different sets of measured values for the Operation Panel (LOC: Fct. Operation Panel), and the Fault Panel (LOC: Fct. Fault Panel).

Only the Measured Value Panels relevant for the particular design version of the given device and its associated range of functions are actually available. The selected set of values for the Operation Panel is always available. Please see [Section 6.8.5.1, \(p. 6-46\)](#) for instructions regarding selection.

If “MAIN: Without function” has been selected for a given panel, then that panel is disabled.

The Measured Value Panels are called up according to system conditions.

|        | Control Step / Description                                                                                                                                                                                                                                                                                                     | Control Action                     | Display                                                      |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------------------------------------------------------|
| Step 0 | Two measured values can be displayed simultaneously on the Panel.                                                                                                                                                                                                                                                              |                                    | Voltage A-B prim.<br>20.7 kV<br>Voltage B-C prim.<br>20.6 kV |
| Step 1 | If more than two measured values have been selected, they can be viewed one page at a time by pressing the “up” or “down” keys.<br><br>The device will also show the next page of the Measured Value Panel after the set Hold-Time for Panels (LOC: Hold-time for Panels, located at “Par/Conf” in the menu tree) has elapsed. | <div>▲</div><br>or<br><div>▼</div> | Voltage C-A prim.<br>20.8 kV<br>Current A prim.<br>415 A     |

6.6.1 Bay Panel

6.6.1.1 Information Displayed on the Bay Panel

If available the Bay Panel will display switching state signals from external devices (closed, open, intermediate position) and the active control site (local or remote). The text display HMI will show up to 12 external devices, one per line, where the external device selected is marked with the flashing symbol “>” in front of the external devices’ designation text.



Fig. 6-5: Example of a bay panel on a text display.

The sequence for external devices is downwards in columns according to their numbering (DEV01, DEV02, ...). To designate these external devices there are up to four characters available, and next to these, separated by a colon, their current state is displayed (“Interm. pos.”, “Open”, “Closed” or “Faulty pos.”). The active control unit (“Remote” or “Local”) is displayed in the fourth line, as well as its state: “Locked” or “Unlocked”.

#### 6.6.1.2 Controlling Switchgear Units (HMI with Text Display)

*Note that the operating modes LOC SBO option 1 and LOC SBO option 2 (that can be set via parameter (011 240) LOC: Operation mode) are not effective if the C434 is fitted with a text HMI. In other words, this setting is not relevant for the following step-by-step description.*

*(See [Section 6.7.1.3, \(p. 6-26\)](#) for a description how to control switchgear units if the C434 is fitted with a graphic HMI.)*

##### 6.6.1.2.1 Controlling Switchgear Units

Switchgear units can be controlled from the local control panel, provided that the unit has been set for “local control”. If the local/remote key is set to switch between remote and local control (R↔L), then the switch from “remote” to “local” operation requires a proper user operation.

|         | Control Step / Description                                                                                                                                                                                                                                                                                                                                                                        | Control Action                                                                                                                                                                                                                                                              | Display                                                                                                                                                                                                      |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 0  | Select the Bay Panel.                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                             | X0 :Closed<br>Q0 :Closed<br>Q8 :Closed<br>Remote Locked                                                                                                                                                      |
| Step 1  | Press the “local/remote” key (L/R) to switch the device to local operation. The Bay Panel is no longer displayed. Insufficient rights message is displayed for 2 seconds.                                                                                                                                                                                                                         |                                                                                                                                                                                          | Device Security<br>insuff. rights                                                                                                                                                                            |
| Step 2  | Select proper user by pressing 'up' and 'down'.<br><br>Press the ENTER key. Eight asterisks (*) appear in the display.<br><br>Enter the configured password of the selected user. Please refer to <a href="#">Section 3.3.2, (p. 3-6)</a> for detailed information about the compatibility with or without Cyber Security.<br><br>Bay Panel will re-appear. The fourth line will display “Local”. | <br>or<br><br><br> | Select a user<br>>DefaultViewer<br>DefaultOperate<br>DefaultEngineer<br><br>User Password?<br>*****<br><br>Device Security<br>login successful<br><br>X0 :Closed<br>Q0 :Closed<br>Q8 :Closed<br>Local Locked |
| Step 3a | Press the Selection key to select a switchgear unit. Only switchgear units that are electrically controllable can be selected. The external device designation for the selected switchgear unit – “Q0”, for example – is marked by a flashing “>” character.                                                                                                                                      |                                                                                                                                                                                        | X0 :Closed<br>>Q0 :Closed<br>Q8 :Closed<br>Local Locked                                                                                                                                                      |
| Step 3b | To cancel the selection of a switchgear unit, press the Reset key. Press the Selection key to select a new switchgear unit.                                                                                                                                                                                                                                                                       |                                                                                                                                                                                        | X0 :Closed<br>Q0 :Closed<br>Q8 :Closed<br>Local Locked                                                                                                                                                       |
| Step 4  | After selecting a switchgear unit, press the keys “Open” or “Close” to control the switchgear unit. Before this switching action is executed, compliance with bay interlock conditions – if applicable – is checked.                                                                                                                                                                              | <br>or<br>                                                                                        |                                                                                                                                                                                                              |
| Step 4a | If the check of bay interlock conditions determines that an operation can be carried out, then the switch command is executed. The status “Interm[ediate] pos[ition]” is displayed while the switchgear unit is operating.                                                                                                                                                                        |                                                                                                                                                                                                                                                                             | X0 :Closed<br>Q0 :Interm. pos<br>Q8 :Closed<br>Local Locked                                                                                                                                                  |

|         | Control Step / Description                                                                                                                                                                                                                                                            | Control Action                                                                      | Display                                                |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------|
|         | Once the operating time of the switchgear unit has elapsed, the resulting switching status is displayed.                                                                                                                                                                              |                                                                                     | X0 :Closed<br>Q0 :Open<br>Q8 :Closed<br>Local Locked   |
| Step 4b | If the check of interlock conditions determines that switching is not allowed, then the selected switchgear unit is no longer marked.<br><br>If the LED indicators have been configured accordingly, the LED indicator for the signal MAIN: Interlock equ. viol. will be illuminated. |                                                                                     | X0 :Closed<br>Q0 :Closed<br>Q8 :Closed<br>Local Locked |
| Step 5  | If no control action takes place within a set time period after selection of a switchgear unit or if the return time for illumination (LOC: Return time illumin.) or the return time for selection (LOC: Return time select.) has elapsed, then the selection is canceled.            |                                                                                     |                                                        |
| Step 6  | Press the local/remote key (L/R) to switch to remote control.                                                                                                                                                                                                                         |  | X0 :Closed<br>Q0 :Open<br>Q8 :Closed<br>Remote Locked  |

## 6.7 Control at Panel Level (HMI with Graphic Display)

At Panel Level, the user can move from one Panel type to another by pressing the Page key (in one direction only) or the “left”/“right” keys (in both directions).

### 6.7.1 Bay Panel (HMI with Graphic Display)

#### 6.7.1.1 Information Displayed on the Bay Panel

Fig. 6-6, (p. 6-23) shows an example of a predefined Bay Panel. The top green line shows the device type on the left and the current date and time on the right. The lower line indicates the softkeys of the device. An example of customized Bay Type Fig. 6-7, (p. 6-23) contains the appropriate information required to display and animate the single line diagram (in color).

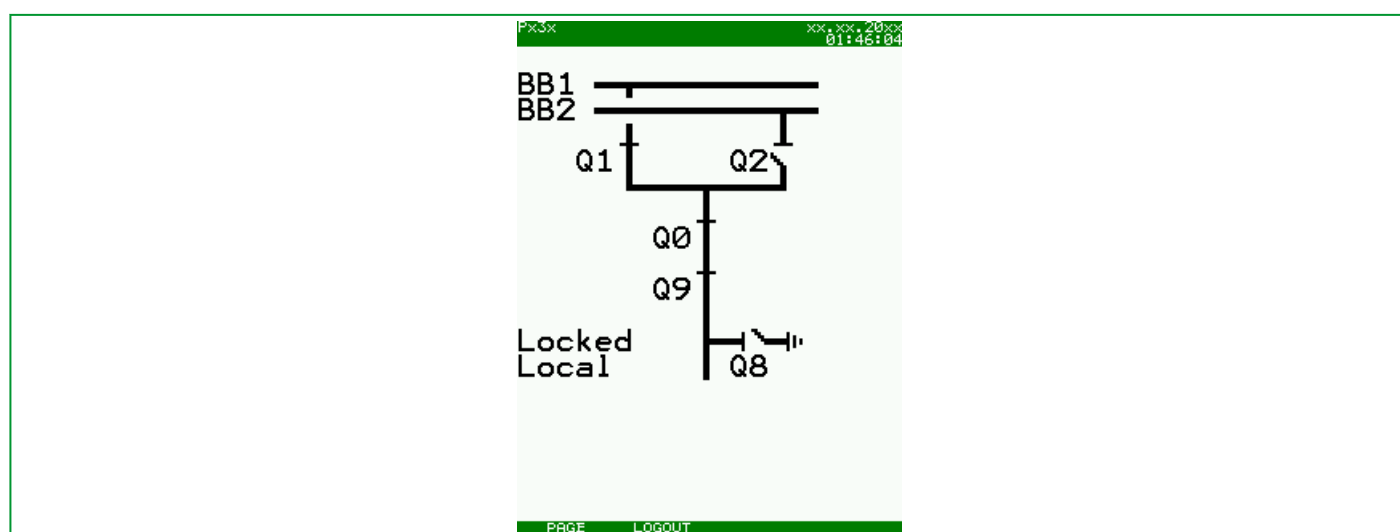


Fig. 6-6: Example of a Predefined Bay Panel.

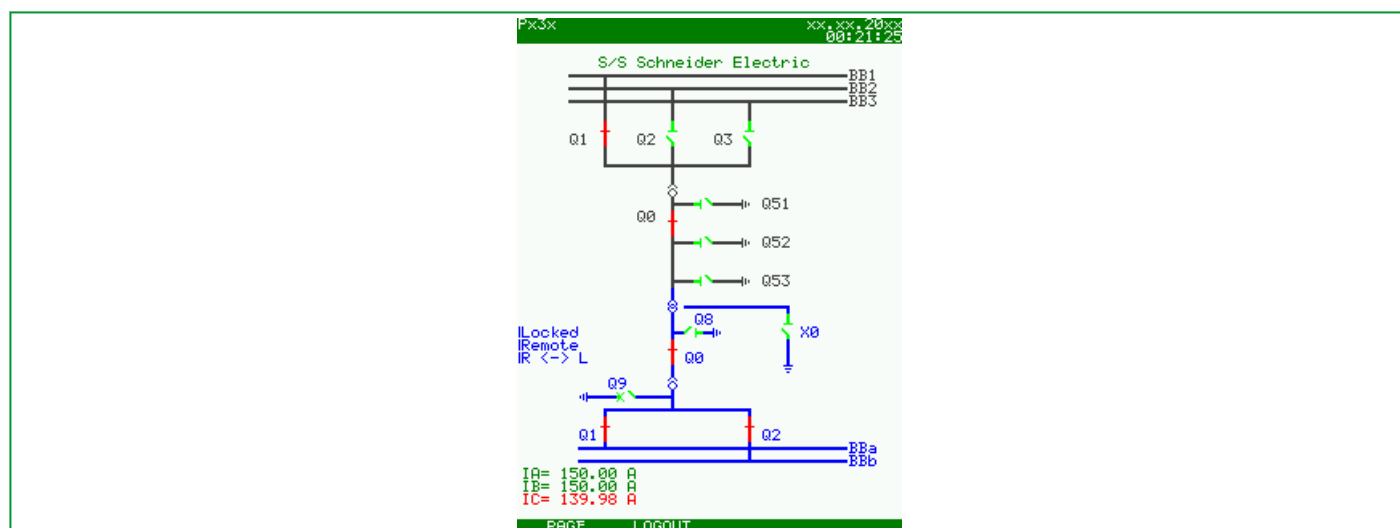


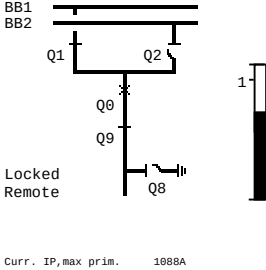
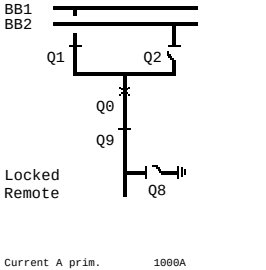
Fig. 6-7: Example of a Customized Bay Panel.

The Bay Panel shown below in one-line diagram representation is a function of the set bay type. The symbols shown in the following table are used to represent the switchgear units and other external devices as well as the status of switchgear units. The user can switch between character sets 1, 2, and 3. Character set 3 is identical to character set 1 in as-delivered condition but can be

replaced by a user-defined character set – by using a special ancillary tool. The symbols of character set 1 are used in the following description.

| External device     | Position, e.g.:<br>DEV01:<br>Control state | Setting<br>LOC:<br>Character set                                                     |                                                                                       |
|---------------------|--------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                     |                                            | 1: Character set 1                                                                   | 2: Character set 2                                                                    |
| Circuit breaker     | 1: Open                                    |    |    |
|                     | 2: Closed                                  |    |    |
|                     | 3: Faulty position<br>0: Intermediate pos. |    |    |
| Switch disconnector | 1: Open                                    |    |    |
|                     | 2: Closed                                  |    |    |
|                     | 3: Faulty position<br>0: Intermediate pos. |    |    |
| Disconnecter        | 1: Open                                    |   |   |
|                     | 2: Closed                                  |  |  |
|                     | 3: Faulty position<br>0: Intermediate pos. |  |  |
| Switch truck        | 1: Open                                    |  |  |
|                     | 2: Closed                                  |  |  |
|                     | 3: Faulty position<br>0: Intermediate pos. |  |  |
| Fuse unit           | 1: Open                                    |  |  |
|                     | 2: Closed                                  |  |  |

6.7.1.2 Measured Value Display in the Bay Panel

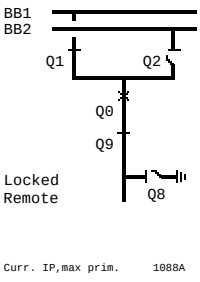
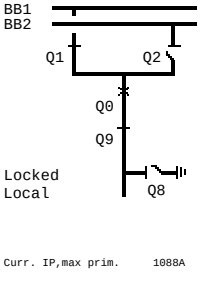
|        | Control Step / Description                                                                                                                                                                                                                                                                 | Control Action                                   | Display                                                                              |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------------------------------------------|
| Step 0 | <p>Measured values are shown one at a time.</p> <p>A configuration step determines whether the measured value will also be displayed in bar chart form. The position of the bar chart can also be set for horizontal or vertical display (the setting applies to all measured values).</p> |                                                  |   |
| Step 1 | <p>By pressing the “up” or “down” key the next measured value is displayed. In the example shown, no bar chart display has been configured for the measured value.</p>                                                                                                                     | <div><div>▲</div><div>or</div><div>▼</div></div> |  |

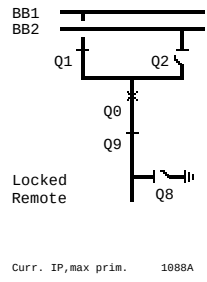
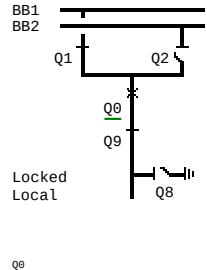
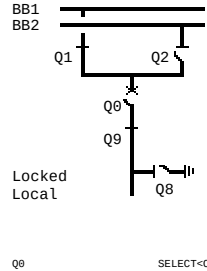
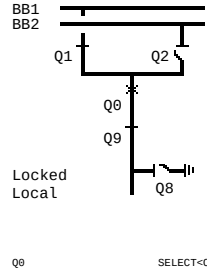
#### 6.7.1.3 Controlling Switchgear Units

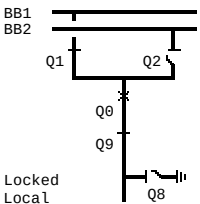
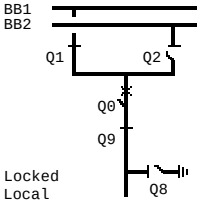
Switchgear units can be controlled from the local control panel, provided that the unit has been set for “local control”. If the local/remote key is set to switch between remote and local control (R↔L), then the switch from “remote” to “local” requires a proper user operation. When more than one Bay Panel page is used only joint “local/remote” switching is available.

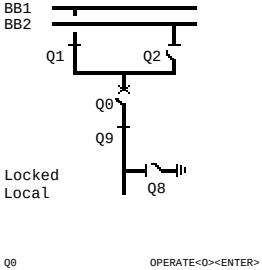
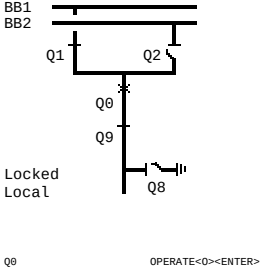
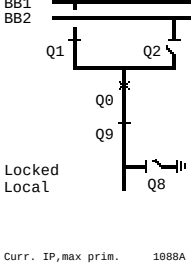
Some action steps and the behavior of the C434 depend on the setting LOC: Operation mode and device security login.

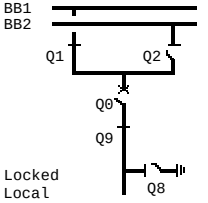
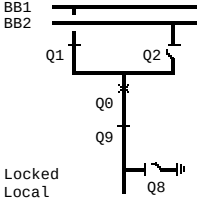
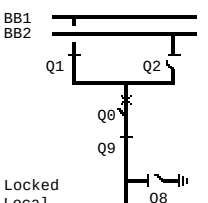
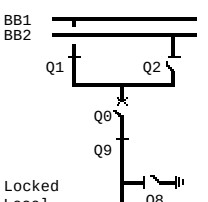


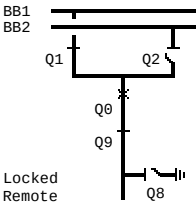
|         | Control Step / Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Control Action                                                                                                                                                                                                                                                                                                                                                                              | Display                                                                                                                                                                                                                                                                                       |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 0  | Select the Bay Panel.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                            |
| Step 1  | Press the “local/remote” key (L/R) to switch the device to local operation. The Bay Panel is no longer displayed.                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                               |
| Step 2a | <p>Login procedure</p> <p>Insufficient rights message is displayed for 2 seconds.</p> <p>Select proper user with control rights by pressing 'up' and 'down'.</p> <p>Press the ENTER key. Eight asterisks (*) appear in the display.</p> <p>Enter the configured password of the selected user. Please refer to <a href="#">Section 3.3.2, (p. 3-6)</a> for detailed information about the compatibility with or without Cyber Security.</p> <p>The Bay Panel will re-appear. The control status will display “Local”.</p> | <p></p> <p>or</p> <p></p> <p></p> <p></p> | <p>Device Security<br/>insuff. rights</p> <p>Select a user<br/>&gt;DefaultViewer<br/>DefaultOperate<br/>DefaultEngineer</p> <p>User Password?<br/>*****</p> <p>Device Security<br/>login successful</p>  |

|         | Control Step / Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Control Action                                                                      | Display                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 2b | <p>This control step can be canceled at any time by pressing the RESET key before the Enter key is pressed.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                                                                                                                                                                                                                                                                                                                                           |
| Step 3a | <p>Press the Selection key to select a switchgear unit. (Pressing the key again selects the next switchgear unit, etc.) Only switchgear units that are electrically controllable can be selected.</p> <p>The external device designation for the selected switchgear unit –“Q0”, for example – is displayed in flashing characters. If the display of external device designations has been disabled, the selected switchgear unit will be marked by a flashing asterisk (*).</p> <p>If LOC: Operation mode is set to <i>LOC SBO option 2</i>, the switchgear unit's position also changes; the position is displayed that will be assumed by a successful operation. If, however, LOC: Operation mode is set to <i>LOC Direct</i> or to <i>LOC SBO option 1</i> then still the current position is displayed.</p> <p>The external device designation for the selected switchgear unit also appears in the bottom line of the display. (For this line, no flashing characters are used.)</p> <p>If LOC: Operation mode is set to <i>LOC SBO option 1</i> or to <i>LOC SBO option 2</i> the symbols [O] („open“) and [I] („close“) are displayed as flashing characters. This is a signal for the user, that the “Open” (or “Close”) key may now be pressed.</p> |  | <p>LOC: Operation mode = <i>LOC Direct</i>:</p>  <p>LOC: Operation mode = <i>LOC SBO option 2</i>:</p>  <p>LOC: Operation mode = <i>LOC SBO option 1</i>:</p>  |

|         | Control Step / Description                                                                                                                                                                                                                                                                                                                                                                                                              | Control Action                                                                                                                                                                   | Display                                                                                                                                                                          |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 3b | To cancel the selection of a switchgear unit, press the RESET key. Pressing the Selection key selects another switchgear unit.                                                                                                                                                                                                                                                                                                          |                                                                                               | <br><small>Curr. IP,max prim. 1088A</small>                                                   |
| Step 4  | After selecting a switchgear unit, press the keys “Open” or “Close” to control the switchgear unit. Before this switching action is executed, compliance with bay interlock conditions – if applicable – is checked.                                                                                                                                                                                                                    | <br>or<br> |                                                                                                                                                                                  |
| Step 4a | <p>For the setting LOC: Operation mode = <i>LOC Direct</i>, there is a simplified operation:</p> <p>If the check of bay interlock conditions determines that an operation can be carried out, then the switch command is executed.</p> <p>The “off-end” (intermediate position) symbol is displayed while the switchgear unit is operating. While the switch command is being executed, no further switchgear unit can be selected.</p> |                                                                                                                                                                                  | <p>LOC: Operation mode = <i>LOC Direct</i>:</p> <br><small>Curr. IP,max prim. 1088A</small> |
| Step 4b | If LOC: Operation mode is set to <i>LOC SBO option 1</i> or <i>LOC SBO option 2</i> , there is one more operation step:                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                  |                                                                                                                                                                                  |

|         | Control Step / Description                                                                                                                                                                                                                                                                                                                 | Control Action                                                                                                                                                                                                       | Display                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         | <p>If the check of bay interlock conditions determines that an operation can be carried out, then the next-to-last line displays the symbol of the the selected switching operation (e.g. [O]) together with a prompt to the Enter key (in flashing characters).</p>                                                                       | <div><div></div><div>or</div><div></div></div> | <p>LOC: Operation mode = <i>LOC SBO</i><br/>option 1:</p> <div></div> <p>LOC: Operation mode = <i>LOC SBO</i><br/>option 2:</p> <div></div> <p>LOC: Operation mode = <i>LOC Direct</i>:</p> <div></div> |
| Step 4c | <p>For LOC: Operation mode = <i>LOC Direct</i>:</p> <p>If the check of interlock conditions determines that switching is not allowed, then the selected switchgear unit is no longer highlighted.</p> <p>If the LED indicators have been configured accordingly, the LED indicator for MAIN: Interlock equ. viol. will be illuminated.</p> |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

|         | Control Step / Description                                                                                                                                                                                                                                                                                                                                                                                               | Control Action | Display                                                                                                                                                                                                                                                                                                                        |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 4d | <p>For LOC: Operation mode = <i>LOC SBO option 1</i> or <i>LOC SBO option 2</i>:</p> <p>If the check of bay interlock conditions determines that an operation cannot be carried out, then the error message "SBO not OK" displays for 5 seconds, using flashing letters.</p> <p>After these 5 seconds the C434 cancels the selection of the switchgear unit and displays the Bay Panel as at the end of step 2.</p>      |                | <p>LOC: Operation mode = <i>LOC SBO option 2</i>:</p>  <p>Q0 SBO not OK</p> <p>LOC: Operation mode = <i>LOC SBO option 1</i>:</p>  <p>Q0 SBO not OK</p> |
| Step 5  | <p>For LOC: Operation mode = <i>LOC SBO option 1</i> or <i>LOC SBO option 2</i>:</p> <p>If the operation can be carried out, the Enter key can be pressed. After this, the switch command is executed.</p> <p>The "off-end" (intermediate position) symbol is displayed while the switchgear unit is operating. No new switchgear unit can be selected until the execution of the current command has been finished.</p> | OK             |  <p>Q0 SBO not OK</p> <p>Curr. IP, max prim. 1088A</p>                                                                                                                                                                                    |
| Step 6  | Once the operating time of the switchgear unit has elapsed, the resulting switching status is displayed.                                                                                                                                                                                                                                                                                                                 |                |  <p>Q0 SBO not OK</p> <p>Curr. IP, max prim. 1088A</p>                                                                                                                                                                                    |

|        | Control Step / Description                                                                                                                                                                                                                                                 | Control Action                                                                      | Display                                                                                                                                                                                         |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 7 | If no control action takes place within a set time period after selection of a switchgear unit or if the return time for illumination (LOC: Return time illumin.) or the return time for selection (LOC: Return time select.) has elapsed, then the selection is canceled. |                                                                                     |                                                                                                                                                                                                 |
| Step 8 | Press the local/remote key (L/R) to switch to remote control; this is accomplished without a password prompt.                                                                                                                                                              |  |  <p>BB1<br/>BB2</p> <p>Q1 Q2</p> <p>Q6</p> <p>Q9</p> <p>Locked Remote Q8</p> <p>Curr. IP,max prim. 1888A</p> |

### 6.7.2 Signal Panel(s)

The Signal Panel is used to display the up to 64 different physical and logical binary states that the device has available. The top line in the display shows the panel designation "Signals" and the current time of day. The following empty line separates the heading from actual signals. This gives display capacity of up to 35 signals to one Signal Panel. Additional pages are created when more than 35 signals have been configured. As with all other panels, switching between pages is carried out automatically, after the parameter panel hold-time (LOC: Hold-time for Panels) has elapsed, or manually by pressing the "Up"/"Down" keys. Each signal shows a status marker (square).

Each signal shows two parts: the associated function group and the full text for this signal.

|                                                                                   |          |                                |
|-----------------------------------------------------------------------------------|----------|--------------------------------|
|  | clear    | Signal inactive / not powered. |
|  | black    | Signal active / powered.       |
|  | flashing | Signaling.                     |

#### 6.7.2.1 Automatic Activation

When automatic activation of the Signal Panel is set (LOC: Aut.activ.Sign.Panel) each status change of signals, configured to a panel, is automatically switched from the Bay Panel page or the Operation Panel/Event Panel (depending on the actual selection) to the Signal Panel. Using the softkey Page will make the display jump to the other panels at any time.

#### 6.7.2.2 Status Display and Signaling

To differentiate between the states "signal active / powered" and "signal inactive / not powered" shown on the Signal Panel the parameter (LOC: Stat.ind.Sign.Panel) is used. This will distinguish between a clear/black square alone and the simultaneous change over from normal display to highlighting of text in both lines (the first line with the status marker will remain unchanged).

By using the parameter (LOC: Indicat.Sign.Panel) the signaling of status changes of signals in the Signal Panel is controlled. There is a difference between no signaling (acknowledgement is not necessary, but, if so configured, the Signal Panel is switched on at any status change), signaling by the flashing status marker "" alone or by flashing of the two lines (change over from normal display to highlighting of text and the status marker). The flashing frequency is fixed and may not be changed.

Each status change of signals, configured to a panel of the Bay Panel page can be set to call for user attention either by having the status marker or both signal lines flash when a new event has occurred. The switching control will then automatically switch to the page, which includes the first signal that has experienced a status change. After pressing the Selection key this flashing signal is selected on the current page (signal preceded by a flashing cursor ">"). The next flashing signal can be called up by pressing the Selection key again. At this point it may occur that the display will automatically jump to the next page. When the last flashing signal has been reached pressing the Selection key again will start with the first flashing signal.

Depending on LOC: Sign.caus.Sign.Panel the cause of a flashing signal may be set. Either each status change of the binary information or only "incoming" edges for transient signals will lead to a flashing signal. The status change is

generally shown as 'storing" i.e. the flashing signal will remain until it has been acknowledged.

#### 6.7.2.3 Acknowledging Flashing Signals

Acknowledging a flashing signal that has been selected will occur by pressing the RESET key. This will not reset illuminated LED indicators but will only acknowledge the display. The flashing will stop when the RESET key is pressed and a static status display will appear. Then the display will automatically jump to the next flashing signal. This will enable the user to acknowledge any flashing signals by multiple pressing of the RESET key. As long as the Selection key is pressed and no resetting has occurred the current page will be continuously displayed (no automatic switching to the next page). The selection will remain active until the time set for LOC: Return time select. has elapsed. When the time has elapsed the display will jump to the next page. During an active selection the user may at any time jump to the next or the previous page by pressing the "up" or "down" keys (similar to the Measured Value Panel and the Event Panel).

#### 6.7.2.4 Status Change Signaling

As long as at least one status change signal in the Signal Panel has not been acknowledged, LOC: Chg.Sig.Panel stat. will show the status change of the Signal Panel as a static signal. This signal is made available in the selection tables for the function groups LED, OUTP, LOGIC, PC, COMM1 and COMM2.

The second internal logic signal LOC: Chg.Sig.Panel flash.. shows the status change of the Signal Panel as an alternating signal with a frequency of about 0.5 Hz. This signal is only made available in the selection tables for the function groups LED, OUTP and LOGIC. It is generated independent of the operating mode as set in LOC: Sign.caus.Sign.Panel; for example a LED configured to this signal will also be triggered as flashing even if the operating mode is set to *Without signalling*.

In order to be able to continue with the processing of flashing signals the device has two internal logic signals available.



|         | Description                                                                                         | Display                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 1  | Example of a Signal Panel with status display by status markers (squares)                           | <p>Signals 23:56:10</p> <ul style="list-style-type: none"> <li>■ INP State U 1604</li> <li>■ INP State U 1605</li> <li>□ MAIN M.c.b. trip Vref EXT</li> <li>■ FT_RC Fault mem. overflow</li> <li>■ LOC Rem.acc.block.active</li> <li>■ OUTP Outp. relays blocked</li> <li>□ PSS Activate PS 3 EXT</li> <li>■ LOGIC Reset 3 EXT</li> <li>□ LOGIC Reset 4 EXT</li> </ul> <p style="text-align: right;">↑↓ 1/x</p> |
| Step 2  | Example of a Signal Panel with status display by status markers (squares) and highlighting of lines | <p>Signals 23:56:10</p> <ul style="list-style-type: none"> <li>■ INP State U 1604</li> <li>■ INP State U 1605</li> <li>□ MAIN M.c.b. trip Vref EXT</li> <li>■ FT_RC Fault mem. overflow</li> <li>■ LOC Rem.acc.block.active</li> <li>■ OUTP Outp. relays blocked</li> <li>□ PSS Activate PS 3 EXT</li> <li>■ LOGIC Reset 3 EXT</li> <li>□ LOGIC Reset 4 EXT</li> </ul> <p style="text-align: right;">↑↓ 1/x</p> |
| Step 3a | Example of the selection of a status display with status markers.                                   | >SFMON Battery failure                                                                                                                                                                                                                                                                                                                                                                                          |
|         | Cursor ">" is flashing.                                                                             | ■>SFMON Battery failure                                                                                                                                                                                                                                                                                                                                                                                         |
| Step 3b | Example of the selection of a status display with status markers and highlighting of text.          | >SFMON Battery failure                                                                                                                                                                                                                                                                                                                                                                                          |
|         | Cursor ">" and highlighted text are flashing.                                                       | ■>SFMON ■ Battery failure                                                                                                                                                                                                                                                                                                                                                                                       |

### 6.7.3 Measured Value Panels on the Graphic Display

The measured values that will be displayed on the Measured Value Panels can first be selected in the menu tree under Par/Conf/LOC. The user can select different sets of measured values for the Operation Panel and the Fault Panel. Only the Measured Value Panels relevant for the particular design version of the given device and its associated range of functions are actually available. The selected set of values for the Operation Panel is always available. Please see the section entitled “Setting a List Parameter” ([Section 6.8.5, \(p. 6-46\)](#)) for instructions regarding selection. The measured value display can be structured by inserting a dummy or placeholder in the list of selected measured values. If the MAIN: Without function setting has been selected for a given panel, then that panel is disabled.

|        | Control Step / Description                                                                                                                                                                                                                                                                                                                            | Control Action                                                                                                                                                                   | Display                                                                                                                                                                       |          |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Step 0 | <p>The uppermost line of the display shows the type of measured values being displayed. In this example, the display shows measured operating values (abbreviated as “Meas. values”). The time of day is shown at the upper right of the display.</p> <p>Up to thirty five selected measured values can be displayed on the Panel simultaneously.</p> |                                                                                                                                                                                  | Meas.values<br>Voltage A-B prim. 20.7 kV<br>Voltage B-C prim. 20.6 kV<br>Voltage C-A prim. 20.8 kV<br>Current A prim. 415 A<br>Current B prim. 416 A<br>Current C prim. 417 A | 16:57:33 |
| Step 1 | <p>If more than thirty five measured values have been selected, they can be viewed one page at a time by pressing the “up” or “down” keys. The device will also show the next page of the Measured Value Panel after the set Hold-time for Panels (setting in menu tree: “Par/Conf/LOC”) has elapsed.</p>                                             | or<br><br> | Meas.values<br>Voltage A-B norm. 0.7 kV<br>Voltage B-C norm. 0.6 kV<br>Voltage C-A norm. 0.8 kV<br>Current A norm. 1.5 A<br>Current B norm. 1.6 A<br>Current C norm. 1.7 A    | 16:57:35 |

#### 6.7.4 Event Panel on the Graphic Display

The Event Panel shows the signals relevant for operation, each with the complete time tag (date and time of day). A maximum of twelve signals are displayed. The Event Panel is based on entries in the operating data memory (menu tree: "Oper/Rec/OP\_RC").

|        | Control Step / Description                                                                                                                                                                                                                                     | Control Action                                                                                                                                                                                                 | Display                                                                                                                                                                                                                    |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 0 | The uppermost line of the display shows the panel designation and the current time of day. Below this line, the signals are shown in chronological order. The arrows at the bottom of the display area indicate that additional signals can also be displayed. |                                                                                                                                                                                                                | <div>Events 16:57:33</div> <div>20.04.13 MAIN 05:21:32.331<br/>Trip command Start</div> <div>Trip command MAIN 05:21:35.501<br/>End</div> <div>21.04.13 MAIN 00:03:57.677<br/>Blocked/faulty Start</div> <div>↓↑ 1/x</div> |
| Step 1 | Pressing the "up" or "down" keys will display the signals one page at a time.                                                                                                                                                                                  | <div>  </div> <div>or</div> <div>  </div> | <div>Events 16:57:35</div> <div>22.04.13 MAIN 15:34:02.361<br/>Trip command Start</div> <div>Blocked/faulty MAIN 20:03:57.677<br/>Start</div> <div>Blocked/faulty MAIN 20:03:59.688<br/>End</div> <div>↓↑ 2/x</div>        |

6.8 Control at the Menu Tree Level

6.8.1 Navigation in the Menu Tree

Folders and Function Groups

All data points are organized in different folders based on practical control requirements.

At the root of the menu tree is the unit type; the tree branches into the three main folders “Settings”, “Measurements & Tests” and “Fault & Event Records”, which form the first folder level. Up to two further folder levels follow so that the entire folder structure consists of three main branches and a maximum of three folder levels.

At the end of each branch of folders are the various function groups in which the individual data points (settings) are combined.

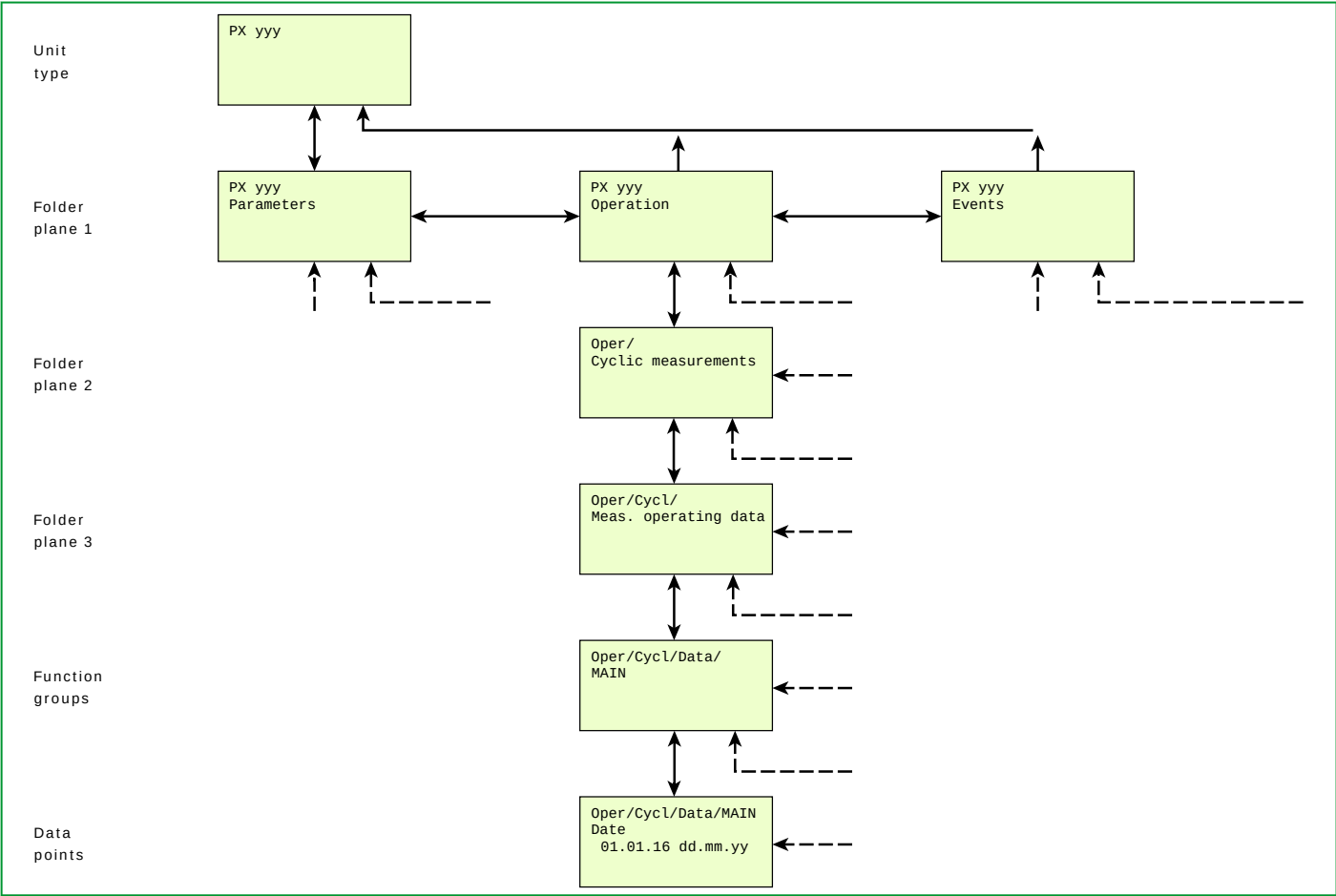


Fig. 6-8: Basic menu tree structure.

6.8.2 Switching Between Address Mode and Plain Text Mode

The display on the menu tree can be switched between address mode and plain text mode. In the address mode the display shows settings, signals, and measured values in numerically coded form, that is, as addresses. In plain text mode the settings, signals, and measured values are displayed in the form of plain text descriptions. In either case, control is guided by the menu tree. The active branch of the menu tree is displayed in plain text in both modes. In the following examples, the display is shown in plain text mode only.

The following description can be accessed and executed after device security LogIn.

|        | Control Step / Description                                                                                                                                                                     | Control Action                                                                                                                                                                                                                                                                                  | Display                                            |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Step 0 | In this example, the user switches from plain text mode to address mode.                                                                                                                       |                                                                                                                                                                                                                                                                                                 | Par/Func/Glob/MAIN<br>Device on-line<br>No (= off) |
| Step 1 | To switch from address mode to plain text mode or vice versa, press the RESET key and either the “left” key or the “right” key simultaneously. This can be done at any point in the menu tree. | <br><br>+<br><br><br><br>or<br><br> | Par/Func/Glob/MAIN<br>003.030<br>0                 |

### 6.8.3 Change-Enabling Function

Although it is possible to select any data point in the menu tree and read the associated value by pressing the keys, it is not possible to switch directly to the input mode. This safeguard prevents unintended changes in the settings.

There are two ways to enter the input mode.

- Global change-enabling function: To activate the global change-enabling function, set the (003 010) LOC: Param. change enabl. parameter to Yes (menu tree: Oper/CtrlTest/LOC).

The change can only be made after the password has been entered. Thereafter, all further changes – with the exception of specially protected control actions (see [Section 6.8.8, \(p. 6-54\)](#)) – are enabled without entering the password.

- Selective change-enabling function: Password input prior to any setting change.

This setup is designed to prevent accidental output and applies even when the global change-enabling function has been activated. The following example is based on the factory-set password. If the password has been changed by the user, the following description will apply accordingly.

*With blank password the device needs to be set to (003 010) LOC: Param. change enabl. = Yes (menu tree: Oper/CtrlTest/LOC) before parameter change is possible.*

|        | Control Step / Description                                                                                                                                                                                                                                                                                                                                                                                                                   | Control Action                                                                                                                                                                                                                                                                                                                                                          | Display                                                                                                                                                                                                 |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 0 | In the menu tree Oper/CtrlTest/LOC, select the LOC: Param. change enabl. parameter.                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                         | Oper/CtrlTest/LOC<br>Param. change enabl.<br>No                                                                                                                                                         |
| Step 1 | <p>Login procedure</p> <p>Press the ENTER key. Insufficient rights message is displayed for 2 seconds.</p> <p>Select proper user by pressing 'up' and 'down'.</p> <p>Press the ENTER key. Eight asterisks (*) appear in the display.</p> <p>Enter the configured password of the selected user. Please refer to <a href="#">Section 3.3.2, (p. 3-6)</a> for detailed information about the compatibility with or without Cyber Security.</p> | <p></p> <p> or </p> <p></p> | <p>Device Security<br/>insuff. rights</p> <p>Select a user<br/>&gt;DefaultViewer<br/>DefaultOperate<br/>DefaultEngineer</p> <p>User Password?<br/>*****</p> <p>Device Security<br/>login successful</p> |
| Step 2 | The LED indicator labeled EDIT MODE will light up. This indicates that the setting can now be changed by pressing the “up” or “down” keys.                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                         | Oper/CtrlTest/LOC<br>Param. change enabl.<br>No                                                                                                                                                         |
| Step 3 | Change the setting to Yes.                                                                                                                                                                                                                                                                                                                                                                                                                   | <p></p> <p></p>                                                                                                                                                                               | Oper/CtrlTest/LOC<br>Param. change enabl.<br>Yes                                                                                                                                                        |
| Step 4 | Press the ENTER key again. The LED indicator will go out. The unit is enabled for further setting changes.                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                    | Oper/CtrlTest/LOC<br>Param. change enabl.<br>Yes                                                                                                                                                        |

The same procedure applies to any setting change unless the global change-enabling function has been activated. This method is recommended for a single setting change only. If several settings are to be changed, then the global change-enabling function is preferable. In the following examples, the global change-enabling function has been activated.

#### 6.8.3.1 Automatic Return

The automatic return function prevents the change-enabling function from remaining activated after a change of settings has been completed. Once the set return time (LOC: Autom. return time, menu tree “Par/Conf/LOC”) has elapsed, the change-enabling function is automatically deactivated, and the display switches to a Measured Value Panel corresponding to the current system condition. The return time is restarted when any of the control keys is pressed.

#### 6.8.3.2 Forced Return

The return described above can be forced from the local control panel by first pressing the “up” key and then holding it down while pressing the RESET key.

*It is important to press the “up” key first and release it last in order to avoid unintentional deletion of stored data.*

Even when the change-enabling function is activated, not all settings can be changed. For some settings it is also necessary to disable the protective function (MAIN: Device on-line, menu tree: Par/Func/Glob/MAIN). Such settings include the configuration settings, by means of which the device interfaces can be adapted to the system. The following entries in the “Change” column of the “Telegram Documentation” (part of the separately available “DataModelExplorer”) indicate whether values can be changed or not:

- “on”: The value can be changed even when the protective function is enabled.
- “off”: The value can only be changed when the protective function is disabled.
- “–”: The value can be read out but cannot be changed.

The device is factory-set so that the protective function is disabled.



#### 6.8.4 Changing Parameters

If all the conditions for a value change are satisfied, the desired setting can be entered.

|        | Control Step / Description                                                                                                                                                                                                                                                                                                                                                                                                                       | Control Action                                                                                                                                                                                                                                                                                                                                                     | Display                                                                                                                                                                                                 |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 0 | Example of a display.<br>In this example, the change-enabling function is activated and the protective function is disabled, if necessary.                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                    | Oper/CtrlTest/LOC<br>Param. change enabl.<br>Yes                                                                                                                                                        |
| Step 1 | Select the desired setting by pressing the keys.                                                                                                                                                                                                                                                                                                                                                                                                 | <br><br>               | Par/Conf/LOC<br>Autom. return time<br>50000 s                                                                                                                                                           |
| Step 2 | <p>Login procedure</p> <p>Press the ENTER key. Insufficient rights message is displayed for 2 seconds.</p> <p>Select proper user by pressing 'up' and 'down'.</p> <p>Press the ENTER key. Eight asterisks (*) appear in the display.</p> <p>Enter the configured password of the selected user.<br/>Please refer to <a href="#">Section 3.3.2, (p. 3-6)</a> for detailed information about the compatibility with or without Cyber Security.</p> | <br><br><br><br><br> | <p>Device Security<br/>insuff. rights</p> <p>Select a user<br/>&gt;DefaultViewer<br/>DefaultOperate<br/>DefaultEngineer</p> <p>User Password?<br/>*****</p> <p>Device Security<br/>login successful</p> |
| Step 3 | The LED indicator labeled EDIT MODE will light up. The last digit of the value is highlighted by a cursor (underlined).                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                    | Par/Conf/LOC<br>Autom. return time<br>50000 s                                                                                                                                                           |
| Step 4 | Press the “left” or “right” keys to move the cursor to the left or right.                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                          | Par/Conf/LOC<br>Autom. return time<br>5000_0 s                                                                                                                                                          |
| Step 5 | Change the value highlighted by the cursor by pressing the “up” and “down” keys. In the meantime the device will continue to operate with the old value.                                                                                                                                                                                                                                                                                         | <br>                                                                                                                                                                                     | Par/Conf/LOC<br>Autom. return time<br>5001_0 s                                                                                                                                                          |

|        | Control Step / Description                                                                                                                                                                                                                                                                               | Control Action                                                                      | Display                                       |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------|
| Step 6 | Press the ENTER key. The LED indicator labeled EDIT MODE will go out and the device will now operate with the new value. Press the keys to select another setting for a value change.                                                                                                                    |  | Par/Conf/LOC<br>Autom. return time<br>50010 s |
| Step 7 | If you wish to reject the new setting while you are still entering it (LED indicator labeled EDIT MODE is on), press the RESET key. The LED indicator will go out and the device will continue to operate with the old value. A further setting can be selected for a value change by pressing the keys. |  | Par/Conf/LOC<br>Autom. return time<br>50000 s |

## 6.8.5 List Parameters

### 6.8.5.1 Setting a List Parameter

Using list settings, the user is able to select several elements from a list in order to perform tasks such as defining a trip command or defining the measurements that will be displayed on Measured Value Panels. As a rule, the selected elements are linked by an “OR” operator. Other operators (NOT, OR, AND, NOT OR and NOT AND) are available in the LOGIC function group for linking the selected list items. In this way binary signals and binary input signals can be processed in a Boolean equation tailored to meet user requirements. For the DNP 3.0 communication protocol, the user defines the class of a setting instead of assigning operators. The definition of a trip command shall be used here as an illustration.

|        | Control Step / Description                                                                                                                                                                                                                                                                                                      | Control Action                                                                                                                                                                 | Display                                                                                                                               |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Step 0 | Select a list setting (in this example, the parameter LOC: Fct.asg. num. displ. at "Par/Conf/LOC" in the menu tree). The down arrow (↓) indicates that a list setting has been selected.                                                                                                                                        |                                                                                                                                                                                | Par/Conf/LOC<br>Fct.asg. num. displ.<br><br>↓                                                                                         |
| Step 1 | Press the "down" key. The first function and the first selected signal will appear in the third and fourth lines, respectively. The symbol "#01" in the display indicates the first item of the selection. If MAIN: Without function appears for the first item, then this means that no function assignment has yet been made. |                                                                                             | Par/Conf/LOC<br>Fct.asg. num. displ.<br>#01 MEAS0<br>Current A-1                                                                      |
| Step 2 | Scroll through the list of assigned functions by pressing the "right" and "left" keys.<br><br>Once the end of the list is reached, the display shown on the right will appear.                                                                                                                                                  |          | Par/Conf/LOC<br>Fct.asg. num. displ.<br>OR #02 MAIN<br>Frequency f,1<br><br>Par/Conf/LOC<br>Fct.asg. num. displ.<br>#05 MAIN<br>????? |
| Step 3 | Press the ENTER key at any position in the list. The LED indicator labeled EDIT MODE will light up.                                                                                                                                                                                                                             |                                                                                           | Par/Conf/LOC<br>Fct.asg. num. displ.<br>#02 MAIN<br>Frequency f,1                                                                     |
| Step 4 | Scroll through the assignable functions by pressing the "right" and "left" keys in the input mode.                                                                                                                                                                                                                              |      | Par/Conf/LOC<br>Fct.asg. num. displ.<br>#02 MAIN<br>Angle phi N,1                                                                     |
| Step 5 | Select the operator or the class using the "up" and "down" keys. In this particular case, only the "OR" operator can be selected. There is no limitation on the selection of classes.                                                                                                                                           | <br> | Par/Conf/LOC<br>Fct.asg. num. displ.<br>OR #02 MAIN<br>Angle phi N,1                                                                  |
| Step 6 | Press the ENTER key. The LED indicator will go out. The assignment has been made. The unit will now operate with the new settings.<br><br>If no operator has been selected, the "OR" operator is always assigned automatically when the ENTER key is pressed. There is no automatic assignment of classes.                      |                                                                                           | Par/Conf/LOC<br>Fct.asg. num. displ.<br>OR #02 MAIN<br>Angle phi N,1                                                                  |
| Step 7 | Press the "up" key to exit the list at any point in the list.                                                                                                                                                                                                                                                                   |                                                                                           | Par/Conf/LOC<br>Fct.asg. num. displ.<br><br>↓                                                                                         |
| Step 8 | If you wish to reject the new setting while you are still entering it (LED indicator labeled EDIT MODE is on), press the RESET key. The LED indicator labeled EDIT MODE will be extinguished.                                                                                                                                   |                                                                                           | Par/Conf/LOC<br>Fct.asg. num. displ.<br>OR #02 MAIN<br>Frequency f,1                                                                  |

#### 6.8.5.2 Deleting a List Parameter

If MAIN: Without function is assigned to a given item, then all the following items are deleted. If this occurs for item #01, everything is deleted.

### 6.8.6 Memory Readout

Memories can be read out after going to the corresponding entry point. This does not necessitate activating the change-enabling function or even disabling the protective functions. Inadvertent clearing of a memory at the entry point is not possible.

The following memories are available:

- In the menu tree “Oper/Rec/OP\_RC”: Operating data memory
- In the menu tree “Oper/Rec/MT\_RC”: Monitoring signal memory
- Event memories
  - In the menu tree “Events/Rec/FT\_RC”: Fault memories 1 to 8
  - In the menu tree “Events/Rec/OL\_RC”: Overload memories 1 to 8

Not all of these event memories are present in each unit.

#### 6.8.6.1 Readout of the Operating Data Memory

The operating data memory contains stored signals of actions that occur during operation, such as the enabling or disabling of a device function. A maximum of 100 entries is possible, after which the oldest entry is overwritten.

|        | Control Step / Description                                                                                                                                                                                        | Control Action                                                                        | Display                                                      |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Step 0 | Select the entry point for the operating data memory.                                                                                                                                                             |                                                                                       | Oper/Rec/OP RC<br>Operat. data record.<br><br>↓              |
| Step 1 | Press the “down” key to enter the operating data memory. The latest entry is displayed.                                                                                                                           |  | Oper/Rec/OP RC<br>01.01.13 11:33 ARC<br>Enabled USER<br>No   |
| Step 2 | Press the “left” key repeatedly to display the entries one after the other in chronological order. Once the end of the operating data memory has been reached, pressing the “left” key again will have no effect. |  | Oper/Rec/OP RC<br>01.01.13 11:33 PSIG<br>Enabled USER<br>Yes |
| Step 3 | Press the “right” key to display the previous entry.                                                                                                                                                              |  | Oper/Rec/OP RC<br>01.01.13 11:33 ARC<br>Enabled USER<br>No   |
| Step 4 | Press the “up” key at any point within the operating data memory to return to the entry point.                                                                                                                    |  | Oper/Rec/OP RC<br>Operat. data record.<br><br>↓              |

## 6.8.6.2 Readout of the Monitoring Signal Memory

If the unit detects an internal fault in the course of internal self-monitoring routines or if it detects power system conditions that prevent flawless functioning of the unit, then an entry is made in the monitoring signal memory. A maximum of 30 entries is possible. After that an “overflow” signal is issued.

|        | Control Step / Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Control Action                                                                        | Display                                                              |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Step 0 | Select the entry point for the monitoring signal memory.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                       | Oper/Rec/MT RC<br>Mon. signal record.<br><br>↓                       |
| Step 1 | Press the “down” key to enter the monitoring signal memory. The oldest entry is displayed.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |    | Mon. signal record.<br>01.01.13 13:33 SFMON<br>Checksum error param  |
| Step 2 | Press the “right” key repeatedly to display the entries one after the other in chronological order. If more than 30 monitoring signals have been entered since the last reset, the “overflow” signal is displayed as the last entry.                                                                                                                                                                                                                                                                                                           |    | Mon. signal record.<br>01.01.13 10:01 SFMON<br>Exception oper. syst. |
| Step 3 | Press the “left” key to display the previous entry.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | Mon. signal record.<br>01.01.13 13:33 SFMON<br>Checksum error param  |
| Step 4 | If the “down” key is held down while a monitoring signal is being displayed, the following additional information will be displayed: <ul style="list-style-type: none"> <li>● First<br/>Time when the signal first occurred</li> <li>● Updated<br/>The fault is still being detected (Yes) or is no longer detected (No) by the self-monitoring function.</li> <li>● Acknowledged<br/>The fault was no longer detected by the self-monitoring function and has been reset (Yes).</li> <li>● Number<br/>The signal occurred x times.</li> </ul> |  | Mon. signal record.<br>01.01.13 13:33 SFMON<br>Checksum error param  |
|        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                       | First 13:33:59.744<br>Updated Yes<br>Acknowledged No<br>Number 5     |
| Step 5 | Press the “up” key at any point within the monitoring signal memory to return to the entry point.                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | Oper/Rec/MT RC<br>Mon. signal record.<br><br>↓                       |



### 6.8.6.3 Readout of the Event Memories (Records)

There are eight event memories for each type of event. The latest event is stored in event memory 1, the previous one in event memory 2, and so forth.

Readout of event memories is illustrated using the fault memory as an example.

|        | Control Step / Description                                                                                                                                                                                                                                                                                                                                                                                                                       | Control Action                                                                        | Display                                                         |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Step 0 | Select the entry point for the first fault memory, for example. If the memory contains entries, the third line of the display will show the date and time the fault began. If the third line is blank, then there are no entries in the fault memory.                                                                                                                                                                                            |                                                                                       | Events/Rec/FT RC<br>Fault recording 1<br>01.01.13 10:00:33<br>↓ |
| Step 1 | Press the “down” key to enter the fault memory. First, the fault number is shown. In this example it is the 22nd fault since the last reset.                                                                                                                                                                                                                                                                                                     |    | Fault recording 1<br>FT RC<br>Event<br>22                       |
| Step 2 | Press the “right” key repeatedly to see first the measured fault data and then the binary signals in chronological order. The time shown in the second line is the time, measured from the onset of the fault, at which the value was measured or the binary signal started or ended.<br><br>Once the end of the fault has been reached (after the “right” key has been pressed repeatedly), pressing the “right” key again will have no effect. |    | Fault recording 1<br>200 ms FT DA<br>Running time<br>0.17 s     |
|        |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | Fault recording 1<br>0 ms FT RC<br>Record. in progress<br>Start |
|        |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | Fault recording 1<br>241 ms FT RC<br>Record. in progress<br>End |
| Step 3 | Press the “left” key to see the previous measured value or the previous signal.                                                                                                                                                                                                                                                                                                                                                                  |  | Fault recording 1<br>0 ms FT RC<br>Record. in progress<br>Start |
| Step 4 | Press the “up” key at any point within the fault memory to return to the entry point.                                                                                                                                                                                                                                                                                                                                                            |  | Events/Rec/FT RC<br>Fault recording 1<br>01.01.13 10:00:33<br>↓ |

## 6.8.7

## Resetting

All information memories – including the event memories and the monitoring signal memory – as well as the LED indicators can be reset manually. In addition, the LED indicators are automatically cleared and initialized at the onset of a new fault – provided that the appropriate operating mode has been selected – so that they always indicate the latest fault.

The LED indicators can also be reset manually by pressing the RESET key, which is always possible in the standard control mode. This action also triggers an LED indicator test and an LCD display test. The event memories are not affected by this action, so that inadvertent deletion of the records associated with the reset signal pattern is reliably prevented.

Because of the ring structure of the event memories, the data for eight consecutive events are updated automatically so that manual resetting should not be necessary, in principle.

Deleting the event memories completely (e.g. after a function test), can be accomplished by various resetting actions including the configuration of a group resetting for several memories. An overview of all resetting actions can be found in section “Resetting Actions” in Chapter “Operation”.

Resetting a single memory from the local control panel is described in the following with the example of a fault memory. In this example the global change-enabling function has already been activated.

|        | Control Step / Description                                                                                                                                                                                                                                                                                                                                                                                                                   | Control Action                                                                                                                                                                                                                                                                                                                                                              | Display                                                                                                                                                                                                 |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 0 | Select the reset setting. Line 3 of the display shows the number of faults since the last reset, 10 in this example.                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                             | Oper/CtrlTest/FT RC<br>Reset record. user<br>10                                                                                                                                                         |
| Step 1 | <p>Login procedure</p> <p>Press the ENTER key. Insufficient rights message is displayed for 2 seconds.</p> <p>Select proper user by pressing 'up' and 'down'.</p> <p>Press the ENTER key. Eight asterisks (*) appear in the display.</p> <p>Enter the configured password of the selected user. Please refer to <a href="#">Section 3.3.2, (p. 3-6)</a> for detailed information about the compatibility with or without Cyber Security.</p> | <p></p> <p></p> <p></p> <p></p> | <p>Device Security<br/>insuff. rights</p> <p>Select a user<br/>&gt;DefaultViewer<br/>DefaultOperate<br/>DefaultEngineer</p> <p>User Password?<br/>*****</p> <p>Device Security<br/>login successful</p> |
| Step 2 | The LED indicator labeled EDIT MODE will light up.                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                             | Oper/CtrlTest/FT RC<br>Reset recording<br>10<br>don't execute                                                                                                                                           |
| Step 3 | Press the “Up” or “Down” keys to change the setting to <i>execute</i> .                                                                                                                                                                                                                                                                                                                                                                      | <p></p> <p></p>                                                                                                                                                                                   | Oper/CtrlTest/FT RC<br>Reset record. user<br>10<br>execute                                                                                                                                              |
| Step 4 | Press the ENTER key. The LED indicator labeled EDIT MODE will be extinguished. The value in line 3 is reset to 0.                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                        | Oper/CtrlTest/FT RC<br>Reset record. user<br>0                                                                                                                                                          |
| Step 5 | To cancel the intended clearing of the fault recordings after leaving the standard control mode (the LED indicator labeled EDIT MODE is on), press the RESET key. The LED indicator will be extinguished, and the fault recordings remain stored unchanged in the protection unit's memory. Any setting can be selected again for a value change by pressing the keys.                                                                       |                                                                                                                                                                                                                                                                                        | Oper/CtrlTest/FT RC<br>Reset record. user<br>10                                                                                                                                                         |

### 6.8.8 Password-Protected Control Actions

Certain actions from the local control panel such as a manual trip command for testing purposes can only be carried out by entering a password so as to prevent unwanted output even though the global change-enabling function has been activated (see [Section 6.8.3, \(p. 6-40\)](#)).

This setup is designed to prevent accidental output and applies even when the global change-enabling function has been activated. The password consists of a pre-defined sequential key combination entered within a specific time interval. If the password has been changed by the user (see [Section 6.8.9, \(p. 6-55\)](#)), the following description will apply accordingly.

|        | Control Step / Description                                                                                                                                                                                                                                                                                                                                                                                                                   | Control Action                                                                                                                                                                                                                                                                                                                                                              | Display                                                                                                                                                                                                 |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 0 | In the menu tree “Oper/CtrlTest/OUTP”, select the parameter OUTP: Relay test.                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                             | Oper/CtrlTest/OUTP<br>Relay test<br>Don't execute                                                                                                                                                       |
| Step 1 | <p>Login procedure</p> <p>Press the ENTER key. Insufficient rights message is displayed for 2 seconds.</p> <p>Select proper user by pressing 'up' and 'down'.</p> <p>Press the ENTER key. Eight asterisks (*) appear in the display.</p> <p>Enter the configured password of the selected user. Please refer to <a href="#">Section 3.3.2, (p. 3-6)</a> for detailed information about the compatibility with or without Cyber Security.</p> | <br><br><br>or<br><br><br> | <p>Device Security<br/>insuff. rights</p> <p>Select a user<br/>&gt;DefaultViewer<br/>DefaultOperate<br/>DefaultEngineer</p> <p>User Password?<br/>*****</p> <p>Device Security<br/>login successful</p> |
| Step 2 | The LED indicator labeled EDIT MODE will light up. This indicates that the setting can now be changed by pressing the “up” or “down” keys.                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                             | Oper/CtrlTest/OUTP<br>Relay test<br>Don't execute                                                                                                                                                       |
| Step 3 | Change the setting to <i>execute</i> .                                                                                                                                                                                                                                                                                                                                                                                                       | <br>                                                                                                                                                                                              | Oper/CtrlTest/OUTP<br>Relay test<br>Execute                                                                                                                                                             |
| Step 4 | Press the enter key again. The LED indicator labeled EDIT MODE will go out. The unit will execute the command.                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                        | Oper/CtrlTest/OUTP<br>Relay test<br>Don't execute                                                                                                                                                       |
| Step 5 | As long as the LED indicator labeled EDIT MODE is on, the control action can be terminated by pressing the RESET key. The LED indicator labeled EDIT MODE will be extinguished.                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                        | Oper/CtrlTest/OUTP<br>Relay test<br>Don't execute                                                                                                                                                       |

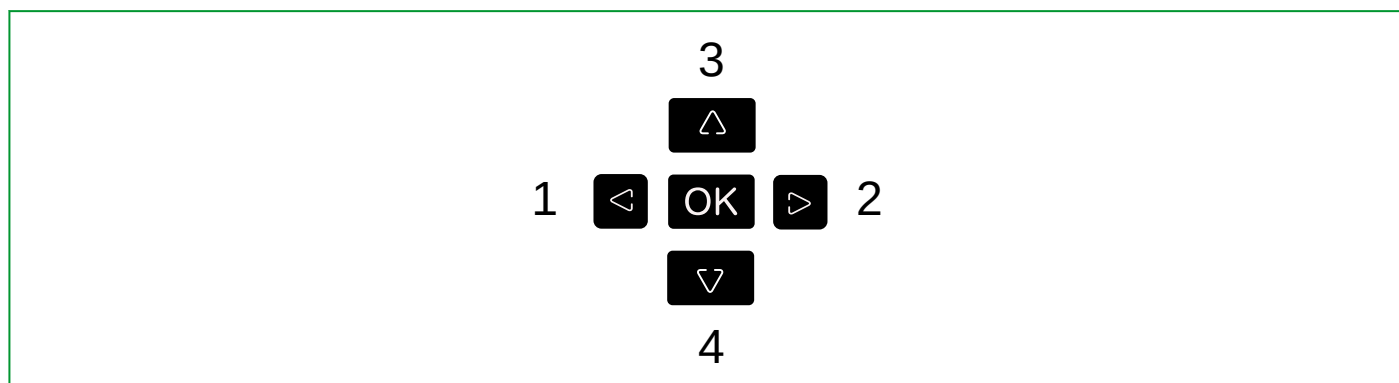
### 6.8.9 Changing the Password

The following presentation of changing the password, is related to the device without Cyber Security.

For device with Cyber Security functionality, the CAE tool has to be used. Please refer to Cyber Security Commission for detailed information (see [Section 10.2.2, \(p. 10-7\)](#)).

#### 6.8.9.1 Function key with Password Protection

The password consists of a combination of keys that must be entered sequentially within a specific time interval. The “left”, “right”, “up” and “down” keys may be used to define the password and represent the numbers 1, 2, 3 and 4, respectively:



|         | Control Step / Description                                                                                                                                                                                                                                                                                                                                                                                                                   | Control Action                                  | Display                                                                                                                                                                                                 |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 0  | In the menu tree "Par/Conf/F_KEY", select the F_KEY: Password funct.key 1 setting.                                                                                                                                                                                                                                                                                                                                                           |                                                 | Par/Conf/F_KEY<br>Password funct.key 1<br>*****                                                                                                                                                         |
| Step 1  | <p>Login procedure</p> <p>Press the ENTER key. Insufficient rights message is displayed for 2 seconds.</p> <p>Select proper user by pressing 'up' and 'down'.</p> <p>Press the ENTER key. Eight asterisks (*) appear in the display.</p> <p>Enter the configured password of the selected user. Please refer to <a href="#">Section 3.3.2, (p. 3-6)</a> for detailed information about the compatibility with or without Cyber Security.</p> | <p>OK</p> <p>or</p> <p>△</p> <p>▽</p> <p>OK</p> | <p>Device Security<br/>insuff. rights</p> <p>Select a user<br/>&gt;DefaultViewer<br/>DefaultOperate<br/>DefaultEngineer</p> <p>User Password?<br/>*****</p> <p>Device Security<br/>login successful</p> |
| Step 2  | The LED indicator labeled EDIT MODE will light up. The current password will appear in the third line.                                                                                                                                                                                                                                                                                                                                       |                                                 | Par/Conf/F_KEY<br>Password funct.key 1<br>0                                                                                                                                                             |
| Step 3  | Enter the new password, which in this example is done by pressing the "up" key followed by the "down" key.                                                                                                                                                                                                                                                                                                                                   | △                                               | Par/Conf/F_KEY<br>Password funct.key 1<br>*                                                                                                                                                             |
|         |                                                                                                                                                                                                                                                                                                                                                                                                                                              | ▽                                               | Par/Conf/F_KEY<br>Password funct.key 1<br>**                                                                                                                                                            |
| Step 4  | Press the enter key again. Asterisks appear in the third line, and a cursor (underscore) in the fourth line prompts the user to enter the new password again.                                                                                                                                                                                                                                                                                | OK                                              | Par/Conf/F_KEY<br>Password funct.key 1<br>**<br>—                                                                                                                                                       |
| Step 5  | Re-enter the password.                                                                                                                                                                                                                                                                                                                                                                                                                       | △                                               | Par/Conf/F_KEY<br>Password funct.key 1<br>**<br>*                                                                                                                                                       |
|         |                                                                                                                                                                                                                                                                                                                                                                                                                                              | ▽                                               | Par/Conf/F_KEY<br>Password funct.key 1<br>**<br>**                                                                                                                                                      |
| Step 6a | Press the ENTER key again. If the password has been re-entered correctly, the LED indicator labeled EDIT MODE goes out and the display appears as shown on the right. The new Password is now valid.                                                                                                                                                                                                                                         | OK                                              | Par/Conf/F_KEY<br>Password funct.key 1<br>*****                                                                                                                                                         |

|         | Control Step / Description                                                                                                                                                                                                                                         | Control Action                                                                      | Display                                           |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|
| Step 6b | If the password has been re-entered incorrectly, the LED indicator labeled EDIT MODE remains on and the display shown on the right appears. The password has to be re-entered. It is also possible to cancel the change of the Password by pressing the RESET key. |                                                                                     | Par/Conf/F_KEY<br>Password funct.key 1<br>**<br>— |
| Step 7  | The change in password can be canceled at any time before Step 6 by pressing the RESET key. If this is done, the original Password continues to be valid.                                                                                                          |  | Par/Conf/F_KEY<br>Password funct.key 1<br>*****   |

#### 6.8.9.2 Function Key without Password Protection

Operation from the function key without password protection is also possible. To select this option, immediately press the ENTER key a second time in steps 4 and 6 of [Table, \(p. 6-56\)](#), without entering anything else. This will configure the function key without password protection, and no control actions involving changes will be possible until the global change-enabling function has been activated (see “Change-Enabling Function”, [Section 6.8.3, \(p. 6-40\)](#)).





## 7 Settings

### 7.1 Parameters

The C434 must be adjusted to the system and to the protected equipment by appropriate settings. This chapter gives instructions for determining the settings, which are located in the folder titled “Parameters” in the menu tree. The sequence in which the settings are listed and described in this chapter corresponds to their sequence in the menu tree.

The C434 devices are supplied with a factory-set standard configuration of settings that, in most cases, correspond to the default settings or become apparent after a “cold restart”. The C434 is blocked in that case. All settings must be re-entered after a cold restart.

#### Note

*Detailed information about all parameters, including complete selection tables and IEC 60870-5-103 protocol properties, are separately available as a set of interlinked PDF files for user-friendly navigation, packed in one ZIP archive named DataModelExplorer\_C434\_en\_P01.zip.*

*In contrast to C434 versions before C434-630, the implementation of the IEC 61850 protocol now features parameters that cannot be modified from the local control panel (HMI) or with the operating program. Instead, these parameters are set with a special IEC 61850 operating software, named “IED Configurator”. Therefore these settings are not listed in this chapter or the following chapter. These parameters are described in Chapter “IEC 61850 Settings via IED Configurator”.*

#### Cancelling a Protection or Control Function

The user can adapt the device to the requirements of a particular high-voltage system by including the relevant protection or control functions in the device configuration and cancelling all others (removing them from the device configuration).

The following conditions must be met before cancelling a protection or control function:

- The protection or control function in question must be disabled.
- None of the functions of the protection or control function to be cancelled may be assigned to a binary input.
- None of the signals of the protection or control function may be assigned to a binary output or an LED indicator.
- No functions of the device function being cancelled can be selected in a list setting.
- None of the signals of the protection or control function may be linked to other signals by way of an “m out of n” parameter.

The protection or control function to which a parameter, a signal, or a measured value belongs is defined by the function group designation (example: “LIMIT:”).

#### General Notes on the Configuration of Function Group “Binary Input” (INP)

The C434 has optical coupler inputs for processing binary signals from the system. The number and connection schemes for the available binary inputs are shown in the terminal connection diagrams. The “DataModelExplorer” (available

as a separate ZIP archive file) gives information about the configuration options for all binary inputs.

The C434 identifies the installed modules during startup. If a given binary I/O module is not installed or has fewer binary signal inputs than the maximum number possible at this slot, then the configuration addresses for the missing binary signal inputs are automatically hidden in the menu tree.

When configuring binary inputs, one should keep in mind that the same function can be assigned to several signal inputs. Thus one function can be activated from several control points having different signal voltages.

The configuration in slots A and B and the configuration for the binary inputs U C01 to U C08 will be changed with the selection of a new bay type. (Whether automatic configuration occurs, is defined in the setting MAIN: Auto-assignment I/O.) Depending on the connection type chosen for the C434 – pin-type or ring-type cable socket terminals – the symbolic slots A, B and C refer to the following slots:

| Symbolic slot | Pin-type cable socket terminals | Ring-type cable socket terminals |
|---------------|---------------------------------|----------------------------------|
| A             | 06                              | 12                               |
| B             | 07                              | 14                               |
| C             | 08                              | 16                               |

The configuration of binary inputs for each bay type – in the case of auto-assignment – is given in the List of Bay Types in the Appendix.

In the case of auto-assignment, the following notes apply:

*Before selecting a new bay type, make sure that the binary inputs at slots A and B as well as the binary inputs U C01 to U C08 are configured for functions from the DEVxx function groups only. Otherwise there will be an error message, and the new bay type will not be activated.*

*Before selecting a new bay type, make sure that all binary inputs specified in the List of Bay types for the selected bay type are actually available in the device. Otherwise there will be an error message, and the new bay type will not be activated.*

In order to ensure that the device will recognize the input signals, the triggering signals must persist for at least 30 ms. The operating mode for each binary signal input can be defined.

The user can specify whether the presence (*active 'high'* mode) or absence (*active 'low'* mode) of a voltage shall be interpreted as the logic "1" signal.

#### *General Notes on the Configuration of Function Group "Binary Output" (OUTP)*

The C434 has output relays for the output of binary signals. The number and connection schemes for the available binary output relays are shown in the terminal connection diagrams. The "DataModelExplorer" (available as a separate ZIP archive file) gives information about the configuration options for all binary outputs.

The C434 identifies the installed modules during startup. If a given binary I/O module is not installed or has fewer output relays than the maximum number possible at this slot, then the configuration addresses for the missing output relays are automatically hidden in the menu tree.

The contact data for the all-or-nothing relays permits them to be used either as command relays or as signal relays. It is important to note that the contact rating of the binary I/O modules (X) varies (see Chapter “Technical Data”). One signal can also be assigned simultaneously to several output relays for the purpose of contact multiplication.

Selecting a new bay type can change the configuration for slots A and B. (Whether automatic configuration occurs, is defined in the setting MAIN: Auto-assignment I/O.) Depending on the connection type chosen for the C434 – pin-type or ring-type cable socket terminals – the symbolic slots A and B correspond to the following slots:

| Symbolic slot | Pin-type cable socket terminals | Ring-type cable socket terminals |
|---------------|---------------------------------|----------------------------------|
| A             | 06                              | 12                               |
| B             | 07                              | 14                               |

The configuration of output relays for each bay type – in the case of auto-assignment – is given in the List of Bay Types in the Appendix.

In the case of auto-assignment, the following notes apply:

*Before selecting a new bay type, make sure that the output relays at slots A and B are configured for functions from the DEVxx function groups only. Otherwise there will be an error message, and the new bay type will not be activated.*

*Before selecting a new bay type, make sure that all output relays specified in the List of Bay types for the selected bay type are actually available in the device. Otherwise there will be an error message, and the new bay type will not be activated.*

An operating mode can be defined for each output relay. Depending on the selected operating mode, the output relay will operate in either an energize-on-signal (ES) mode or a normally-energized (NE) mode and in either a latching or non-latching mode. For output relays operating in latching mode, the operating mode setting also determines when latching will be cancelled.

#### General Notes on the Configuration of the LED Indicators

The C434 has LED indicators for parallel display of binary signals. LED indicator H 1 is not configurable. It is labeled “HEALTHY” and signals the operational readiness of the protection unit (supply voltage present). LED indicators H 2 and H 3 are not configurable either. H 2 is labeled “OUT OF SERVICE” and signals a blocking or malfunction; H 3 is labeled “ALARM” and signals a warning alarm. LED indicator H 17 indicates that the user is in the “EDIT MODE”. Section “Configuration and Operating Mode of the LED Indicators (Function Group LED)” in Chapter “Operation” describes the layout of the LED indicators and the factory setting for LED indicator H 4.

An operating mode can be defined for each LED indicator. Depending on the set operating mode, the LED indicator will operate in either energize-on-signal (ES) mode (“open-circuit principle”) or normally-energized (NE) mode (“closed-circuit principle”) and in either latching or non-latching mode. For LED indicators operating in latching mode, the operating mode setting also determines when latching will be cancelled.

With the multi-color LED indicators the colors red and green can be independently assigned with functions. The third color amber results as a

mixture of red and green, i.e. when both functions assigned to the LED indicator are simultaneously present.

#### 7.1.1 Device Identification

The device identification settings are used to record the ordering information and the design version of the C434. They have no effect on the device functions. These settings should only be changed if the design version of the C434 is modified.

## Device

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                           |            |            |          |  | Address       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|----------|--|---------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                             | Min        | Max        | Unit     |  | Logic Diagram |
| DVICE: Device type                                                                                                                                                                                                                                                                                                                                                                                                  |            |            |          |  | 000 000       |
| 434                                                                                                                                                                                                                                                                                                                                                                                                                 | 0          | 65535      |          |  |               |
| The device type is displayed. This display cannot be altered.                                                                                                                                                                                                                                                                                                                                                       |            |            |          |  |               |
| DVICE: Software version 1XX                                                                                                                                                                                                                                                                                                                                                                                         |            |            |          |  | 024 219       |
| Not measured                                                                                                                                                                                                                                                                                                                                                                                                        | 0          | 65535      |          |  |               |
| The setting defines the software version of the device. This display cannot be altered.                                                                                                                                                                                                                                                                                                                             |            |            |          |  |               |
| DVICE: SW date                                                                                                                                                                                                                                                                                                                                                                                                      |            |            |          |  | 002 122       |
| 1997-01-01                                                                                                                                                                                                                                                                                                                                                                                                          | 1997-01-01 | 2098-11-08 | dd.mm.yy |  |               |
| Date the software was created. This display cannot be altered.<br>Note: The centuries are not displayed. The supported dates range from January 1st, 1997, until November 7th, 2098.                                                                                                                                                                                                                                |            |            |          |  |               |
| DVICE: SW version COMM1/2                                                                                                                                                                                                                                                                                                                                                                                           |            |            |          |  | 002 103       |
| Not measured                                                                                                                                                                                                                                                                                                                                                                                                        | 0.00       | 655.35     |          |  |               |
| Software version for the device's communication software. This display cannot be altered.                                                                                                                                                                                                                                                                                                                           |            |            |          |  |               |
| DVICE: SW vers. Ethernet                                                                                                                                                                                                                                                                                                                                                                                            |            |            |          |  | 025 185       |
| Not measured                                                                                                                                                                                                                                                                                                                                                                                                        | 0.00       | 655.35     |          |  |               |
| Software version for the device's Ethernet software. This display cannot be altered.<br>Note: "Not measured" means either no communication board available or the firmware IEC 61850 is not started or an failure during startup.                                                                                                                                                                                   |            |            |          |  |               |
| DVICE: DM IEC 61850 version                                                                                                                                                                                                                                                                                                                                                                                         |            |            |          |  | 002 059       |
| Not measured                                                                                                                                                                                                                                                                                                                                                                                                        | 0          | 65535      |          |  |               |
| Software version of the communication software based on the device's protocol per IEC 61850. This display cannot be altered.                                                                                                                                                                                                                                                                                        |            |            |          |  |               |
| DVICE: Language version                                                                                                                                                                                                                                                                                                                                                                                             |            |            |          |  | 002 123       |
| 0.0                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.0        | 899.9      |          |  |               |
| Identification of the change level of the texts of the data model. This display cannot be altered.                                                                                                                                                                                                                                                                                                                  |            |            |          |  |               |
| DVICE: Text vers.data model                                                                                                                                                                                                                                                                                                                                                                                         |            |            |          |  | 002 121       |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                   | 0          | 255        |          |  |               |
| Using the 'text replacement tool' provided by the operating program, the user can change the parameter descriptors (plain text designations) and load them into the device. These customized data models contain an identifier defined by the user while preparing the data model. This identifier is displayed at this point in the menu tree. Standard data models have the identifier '0' (factory-set default). |            |            |          |  |               |

| Parameter                                                                       |     |      |      |  | Address       |  |  |         |
|---------------------------------------------------------------------------------|-----|------|------|--|---------------|--|--|---------|
| Default                                                                         | Min | Max  | Unit |  | Logic Diagram |  |  |         |
| DVICE: F number                                                                 |     |      |      |  |               |  |  | 002 124 |
| 0                                                                               | 0   | 9999 |      |  |               |  |  |         |
| The F number is the serial number of the device. The display cannot be altered. |     |      |      |  |               |  |  |         |
| DVICE: AFS Order No.                                                            |     |      |      |  |               |  |  | 001 000 |
| 0:                                                                              |     |      |      |  |               |  |  |         |
| DVICE: PCS Order No.                                                            |     |      |      |  |               |  |  | 001 200 |
| 0:                                                                              |     |      |      |  |               |  |  |         |
| Order numbers for the device. The user cannot alter this number.                |     |      |      |  |               |  |  |         |
| DVICE: Order ext. No. 1                                                         |     |      |      |  |               |  |  | 000 003 |
| 0                                                                               | 0   | 999  |      |  |               |  |  |         |
| DVICE: Order ext. No. 2                                                         |     |      |      |  |               |  |  | 000 004 |
| 0                                                                               | 0   | 999  |      |  |               |  |  |         |
| DVICE: Order ext. No. 3                                                         |     |      |      |  |               |  |  | 000 005 |
| 0                                                                               | 0   | 999  |      |  |               |  |  |         |
| DVICE: Order ext. No. 4                                                         |     |      |      |  |               |  |  | 000 006 |
| 0                                                                               | 0   | 999  |      |  |               |  |  |         |
| DVICE: Order ext. No. 5                                                         |     |      |      |  |               |  |  | 000 007 |
| 0                                                                               | 0   | 999  |      |  |               |  |  |         |
| DVICE: Order ext. No. 6                                                         |     |      |      |  |               |  |  | 000 008 |
| 0                                                                               | 0   | 999  |      |  |               |  |  |         |
| DVICE: Order ext. No. 7                                                         |     |      |      |  |               |  |  | 000 009 |
| 0                                                                               | 0   | 999  |      |  |               |  |  |         |
| DVICE: Order ext. No. 8                                                         |     |      |      |  |               |  |  | 000 010 |
| 0                                                                               | 0   | 999  |      |  |               |  |  |         |
| DVICE: Order ext. No. 9                                                         |     |      |      |  |               |  |  | 000 011 |
| 0                                                                               | 0   | 999  |      |  |               |  |  |         |
| DVICE: Order ext. No. 10                                                        |     |      |      |  |               |  |  | 000 012 |
| 0                                                                               | 0   | 999  |      |  |               |  |  |         |
| DVICE: Order ext. No. 11                                                        |     |      |      |  |               |  |  | 000 013 |
| 0                                                                               | 0   | 999  |      |  |               |  |  |         |
| DVICE: Order ext. No. 12                                                        |     |      |      |  |               |  |  | 000 014 |
| 0                                                                               | 0   | 999  |      |  |               |  |  |         |
| DVICE: Order ext. No. 13                                                        |     |      |      |  |               |  |  | 000 015 |
| 0                                                                               | 0   | 999  |      |  |               |  |  |         |
| DVICE: Order ext. No. 14                                                        |     |      |      |  |               |  |  | 000 016 |
| 0                                                                               | 0   | 999  |      |  |               |  |  |         |

| Parameter                               |     |     |      | Address       |
|-----------------------------------------|-----|-----|------|---------------|
| Default                                 | Min | Max | Unit | Logic Diagram |
| DVICE: Order ext. No. 15                |     |     |      | 000 017       |
| 0                                       | 0   | 999 |      |               |
| DVICE: Order ext. No. 16                |     |     |      | 000 018       |
| 0                                       | 0   | 999 |      |               |
| DVICE: Order ext. No. 17                |     |     |      | 000 019       |
| 0                                       | 0   | 999 |      |               |
| DVICE: Order ext. No. 18                |     |     |      | 000 020       |
| 0                                       | 0   | 999 |      |               |
| DVICE: Order ext. No. 19                |     |     |      | 000 021       |
| 0                                       | 0   | 999 |      |               |
| DVICE: Order ext. No. 20                |     |     |      | 000 022       |
| 0                                       | 0   | 999 |      |               |
| DVICE: Order ext. No. 21                |     |     |      | 000 023       |
| 0                                       | 0   | 999 |      |               |
| DVICE: Order ext. No. 22                |     |     |      | 000 024       |
| 0                                       | 0   | 999 |      |               |
| DVICE: Order ext. No. 23                |     |     |      | 000 025       |
| 0                                       | 0   | 999 |      |               |
| DVICE: Order ext. No. 24                |     |     |      | 000 026       |
| 0                                       | 0   | 999 |      |               |
| DVICE: Order ext. No. 25                |     |     |      | 000 027       |
| 0                                       | 0   | 999 |      |               |
| DVICE: Order ext. No. 26                |     |     |      | 000 028       |
| 0                                       | 0   | 999 |      |               |
| DVICE: Order ext. No. 27                |     |     |      | 000 029       |
| 0                                       | 0   | 999 |      |               |
| Order extension numbers for the device. |     |     |      |               |
| DVICE: Module var. slot 1               |     |     |      | 086 050       |
| 65535: Not fitted                       |     |     |      |               |
| DVICE: Module var. slot 2               |     |     |      | 086 051       |
| 65535: Not fitted                       |     |     |      |               |
| DVICE: Module var. slot 3               |     |     |      | 086 052       |
| 65535: Not fitted                       |     |     |      |               |
| DVICE: Module var. slot 4               |     |     |      | 086 053       |
| 65535: Not fitted                       |     |     |      |               |
| DVICE: Module var. slot 5               |     |     |      | 086 054       |
| 65535: Not fitted                       |     |     |      |               |

| Parameter                                                                      |     |     |      |  | Address       |  |
|--------------------------------------------------------------------------------|-----|-----|------|--|---------------|--|
| Default                                                                        | Min | Max | Unit |  | Logic Diagram |  |
| DVICE: Module var. slot 6                                                      |     |     |      |  | 086 055       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| DVICE: Module var. slot 7                                                      |     |     |      |  | 086 056       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| DVICE: Module var. slot 8                                                      |     |     |      |  | 086 057       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| DVICE: Module var. slot 9                                                      |     |     |      |  | 086 058       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| DVICE: Module var. slot 10                                                     |     |     |      |  | 086 059       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| DVICE: Module var. slot 11                                                     |     |     |      |  | 086 060       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| DVICE: Module var. slot 12                                                     |     |     |      |  | 086 061       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| DVICE: Module var. slot 13                                                     |     |     |      |  | 086 062       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| DVICE: Module var. slot 14                                                     |     |     |      |  | 086 063       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| DVICE: Module var. slot 15                                                     |     |     |      |  | 086 064       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| DVICE: Module var. slot 16                                                     |     |     |      |  | 086 065       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| DVICE: Module var. slot 17                                                     |     |     |      |  | 086 066       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| DVICE: Module var. slot 18                                                     |     |     |      |  | 086 067       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| DVICE: Module var. slot 19                                                     |     |     |      |  | 086 068       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| DVICE: Module var. slot 20                                                     |     |     |      |  | 086 069       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| DVICE: Module var. slot 21                                                     |     |     |      |  | 086 070       |  |
| 65535: Not fitted                                                              |     |     |      |  |               |  |
| Item number of the module inserted in the respective slot 1 to 21.             |     |     |      |  |               |  |
| The display always shows the actual component configuration at any given time. |     |     |      |  |               |  |
| DVICE: Module vers. slot 1                                                     |     |     |      |  | 086 193       |  |
| 27: Not fitted                                                                 |     |     |      |  |               |  |
| DVICE: Module vers. slot 2                                                     |     |     |      |  | 086 194       |  |
| 27: Not fitted                                                                 |     |     |      |  |               |  |



| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| DVICE: Module vers. slot 3  |     |     |      | 086 195       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 4  |     |     |      | 086 196       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 5  |     |     |      | 086 197       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 6  |     |     |      | 086 198       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 7  |     |     |      | 086 199       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 8  |     |     |      | 086 200       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 9  |     |     |      | 086 201       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 10 |     |     |      | 086 202       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 11 |     |     |      | 086 203       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 12 |     |     |      | 086 204       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 13 |     |     |      | 086 205       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 14 |     |     |      | 086 206       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 15 |     |     |      | 086 207       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 16 |     |     |      | 086 208       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 17 |     |     |      | 086 209       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 18 |     |     |      | 086 210       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 19 |     |     |      | 086 211       |
| 27: Not fitted              |     |     |      |               |
| DVICE: Module vers. slot 20 |     |     |      | 086 212       |
| 27: Not fitted              |     |     |      |               |

| Parameter                                                                        |     |     |      | Address       |
|----------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                          | Min | Max | Unit | Logic Diagram |
| DVICE: Module vers. slot 21                                                      |     |     |      | 086 213       |
| 27: Not fitted                                                                   |     |     |      |               |
| Index letter specifying the version of the module fitted in the respective slot. |     |     |      |               |
| DVICE: Variant of module A                                                       |     |     |      | 086 047       |
| 65535: Not fitted                                                                |     |     |      |               |
| Item number of module A in this design version.                                  |     |     |      |               |
| DVICE: Version of module A                                                       |     |     |      | 086 190       |
| 27: Not fitted                                                                   |     |     |      |               |
| Index letter specifying the version of module A.                                 |     |     |      |               |
| DVICE: Variant of module L                                                       |     |     |      | 086 048       |
| 65535: Not fitted                                                                |     |     |      |               |
| Item number of module L in this design version.                                  |     |     |      |               |
| DVICE: Version of module L                                                       |     |     |      | 086 191       |
| 27: Not fitted                                                                   |     |     |      |               |
| Index letter specifying the version of module L.                                 |     |     |      |               |
| DVICE: Variant of module B                                                       |     |     |      | 086 049       |
| 65535: Not fitted                                                                |     |     |      |               |
| Item number of module B in this design version.                                  |     |     |      |               |
| DVICE: Version of module B                                                       |     |     |      | 086 192       |
| 27: Not fitted                                                                   |     |     |      |               |
| Index letter specifying the version of the digital bus module B.                 |     |     |      |               |
| DVICE: Variant module B (a)                                                      |     |     |      | 086 046       |
| 65535: Not fitted                                                                |     |     |      |               |
| Item number of the analog bus module B in this design version.                   |     |     |      |               |
| DVICE: Version module B (a)                                                      |     |     |      | 086 189       |
| 27: Not fitted                                                                   |     |     |      |               |
| Index letter specifying the version of the digital bus module B.                 |     |     |      |               |
| DVICE: IP address                                                                |     |     |      | 111 000       |
| 2:                                                                               |     |     |      |               |
| DVICE: Subnet mask                                                               |     |     |      | 111 001       |
| 2:                                                                               |     |     |      |               |

| Parameter                                                                                                                                                                                                                    |      |       |      | Address       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|------|---------------|
| Default                                                                                                                                                                                                                      | Min  | Max   | Unit | Logic Diagram |
| DVICE: MAC address                                                                                                                                                                                                           |      |       |      | 111 003       |
| 2:                                                                                                                                                                                                                           |      |       |      |               |
| Display of the IP address (or subnet mask, MAC address, respectively) of the Ethernet interface of the processor module. This can be useful for network analysis, especially if these settings have been retrieved via DHCP. |      |       |      |               |
| DVICE: Customer ID data 1                                                                                                                                                                                                    |      |       |      | 000 040       |
| 0.00                                                                                                                                                                                                                         | 0.00 | 99.99 |      |               |
| DVICE: Customer ID data 2                                                                                                                                                                                                    |      |       |      | 000 041       |
| 0.00                                                                                                                                                                                                                         | 0.00 | 99.99 |      |               |
| DVICE: Customer ID data 3                                                                                                                                                                                                    |      |       |      | 000 042       |
| 0.00                                                                                                                                                                                                                         | 0.00 | 99.99 |      |               |
| DVICE: Customer ID data 4                                                                                                                                                                                                    |      |       |      | 000 043       |
| 0.00                                                                                                                                                                                                                         | 0.00 | 99.99 |      |               |
| DVICE: Customer ID data 5                                                                                                                                                                                                    |      |       |      | 000 044       |
| 0.00                                                                                                                                                                                                                         | 0.00 | 99.99 |      |               |
| DVICE: Customer ID data 6                                                                                                                                                                                                    |      |       |      | 000 045       |
| 0.00                                                                                                                                                                                                                         | 0.00 | 99.99 |      |               |
| DVICE: Customer ID data 7                                                                                                                                                                                                    |      |       |      | 000 046       |
| 0.00                                                                                                                                                                                                                         | 0.00 | 99.99 |      |               |
| DVICE: Customer ID data 8                                                                                                                                                                                                    |      |       |      | 000 047       |
| 0.00                                                                                                                                                                                                                         | 0.00 | 99.99 |      |               |
| Set your numerically coded user data here for your records.                                                                                                                                                                  |      |       |      |               |
| DVICE: Location                                                                                                                                                                                                              |      |       |      | 001 201       |
| 0:                                                                                                                                                                                                                           |      |       |      |               |
| Reference input for the device's location as selected by user.                                                                                                                                                               |      |       |      |               |
| DVICE: Device ID                                                                                                                                                                                                             |      |       |      | 000 035       |
| 0                                                                                                                                                                                                                            | 0    | 9999  |      |               |
| ID code for use by the PC programs for operating and setting. Further instructions on this setting are given in the description of the respective operating program.                                                         |      |       |      |               |
| DVICE: Substation ID                                                                                                                                                                                                         |      |       |      | 000 036       |
| 0                                                                                                                                                                                                                            | 0    | 9999  |      |               |
| ID code for use by the PC programs for operating and setting. Further instructions on this setting are given in the description of the respective operating program.                                                         |      |       |      |               |

| Parameter                                                                                                                                                            |      |        |      |  | Address       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------|------|--|---------------|
| Default                                                                                                                                                              | Min  | Max    | Unit |  | Logic Diagram |
| DVICE: Feeder ID                                                                                                                                                     |      |        |      |  | 000 037       |
| 0                                                                                                                                                                    | 0    | 9999   |      |  |               |
| ID code for use by the PC programs for operating and setting. Further instructions on this setting are given in the description of the respective operating program. |      |        |      |  |               |
| DVICE: Device password 1                                                                                                                                             |      |        |      |  | 000 048       |
| 0                                                                                                                                                                    | 0    | 9999   |      |  |               |
| DVICE: Device password 2                                                                                                                                             |      |        |      |  | 000 049       |
| 0                                                                                                                                                                    | 0    | 9999   |      |  |               |
| ID code used by the operating program for identification purposes. See description of the respective operating program for more detailed setting instructions.       |      |        |      |  |               |
| DVICE: SW version DHMI                                                                                                                                               |      |        |      |  | 002 131       |
| Not measured                                                                                                                                                         | 0.00 | 655.35 |      |  |               |
| DVICE: SW version DHMI DM                                                                                                                                            |      |        |      |  | 002 132       |
| 1.10                                                                                                                                                                 | 0.00 | 655.35 |      |  |               |
| DVICE: SW vers.Chin.DHMI DM                                                                                                                                          |      |        |      |  | 008 233       |
| 1.17                                                                                                                                                                 | 0.00 | 655.35 |      |  |               |
| Internal software version numbers.                                                                                                                                   |      |        |      |  |               |

## Local control panel

| Parameter                                                                                    |     |     |      |  | Address       |
|----------------------------------------------------------------------------------------------|-----|-----|------|--|---------------|
| Default                                                                                      | Min | Max | Unit |  | Logic Diagram |
| LOC: Local HMI exists                                                                        |     |     |      |  | 221 099       |
| 1: Yes                                                                                       |     |     |      |  |               |
| When set to Yes it is apparent that the device is fitted with the local control panel (HMI). |     |     |      |  |               |

### 7.1.2 Configuration Parameters

#### Cyber Security

| Parameter                                                                                                                                                                                                                                                                   | Address |       |      |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|------|---------------|
| Default                                                                                                                                                                                                                                                                     | Min     | Max   | Unit | Logic Diagram |
| CS: CyberSecurity Vers.                                                                                                                                                                                                                                                     |         |       |      | 180 031       |
| 2                                                                                                                                                                                                                                                                           | 0       | 65535 |      |               |
| Version of Cyber Security implementation within the device. Easergy MiCOM 30 is starting with value 2 to be compatible with other Schneider Electric devices.                                                                                                               |         |       |      |               |
| CS: Number of users                                                                                                                                                                                                                                                         |         |       |      | 180 002       |
| 0                                                                                                                                                                                                                                                                           | 0       | 9999  |      |               |
| Actual number of users in RBAC configuration.                                                                                                                                                                                                                               |         |       |      |               |
| CS: Comms logout                                                                                                                                                                                                                                                            |         |       |      | 180 032       |
| 0: don't execute                                                                                                                                                                                                                                                            |         |       |      |               |
| If executed, the current logged in user at PC port or via Tunneling interface is logged out (can be only executed by Comms).                                                                                                                                                |         |       |      |               |
| CS: HMI logout                                                                                                                                                                                                                                                              |         |       |      | 180 033       |
| 0: don't execute                                                                                                                                                                                                                                                            |         |       |      |               |
| If executed, the current logged in user at HMI interface is logged out (can be only executed by HMI).                                                                                                                                                                       |         |       |      |               |
| CS: Comms username                                                                                                                                                                                                                                                          |         |       |      | 180 043       |
| 0:                                                                                                                                                                                                                                                                          |         |       |      |               |
| Display of the name of the user which is logged in either at PC-port or via Tunneling.                                                                                                                                                                                      |         |       |      |               |
| CS: HMI username                                                                                                                                                                                                                                                            |         |       |      | 180 034       |
| 0:                                                                                                                                                                                                                                                                          |         |       |      |               |
| Display of the name of the user which is logged in at HMI.                                                                                                                                                                                                                  |         |       |      |               |
| CS: User access role                                                                                                                                                                                                                                                        |         |       |      | 180 013       |
| 0:                                                                                                                                                                                                                                                                          |         |       |      |               |
| Role(s) of user which is actually logged in. It will be set by the device after successful login and will be cleared when user is logged off. Of the first 5 roles of a user, the first 3 chars of the roles names will be displayed separated with one blank between each. |         |       |      |               |
| CS: Max login attempts                                                                                                                                                                                                                                                      |         |       |      | 180 011       |
| 0                                                                                                                                                                                                                                                                           | 0       | 9999  |      |               |
| Number of possible login attempts or blocked (blocked means no limitation of attempts).                                                                                                                                                                                     |         |       |      |               |
| CS: Login attempts left                                                                                                                                                                                                                                                     |         |       |      | 180 010       |
| 0                                                                                                                                                                                                                                                                           | 0       | 9999  |      |               |
| Remaining login attempts.                                                                                                                                                                                                                                                   |         |       |      |               |

| Parameter                                                                                                                  |     |      |      | Address       |
|----------------------------------------------------------------------------------------------------------------------------|-----|------|------|---------------|
| Default                                                                                                                    | Min | Max  | Unit | Logic Diagram |
| CS: Blocking time                                                                                                          |     |      |      | 180 015       |
| 0                                                                                                                          | 0   | 1800 | s    |               |
| Time how long login shall be blocked after erroneous login attempts or blocked (blocked means it will not getting active). |     |      |      |               |
| CS: Block time left                                                                                                        |     |      |      | 180 012       |
| 0                                                                                                                          | 0   | 1800 | s    |               |
| Remaining blocking login time after erroneous login attempts.                                                              |     |      |      |               |
| CS: Result EPW setting                                                                                                     |     |      |      | 180 041       |
| 0                                                                                                                          | -5  | 0    |      |               |
| Display of a value to inform on the result of the password setting. (EPW = Encrypted Password)                             |     |      |      |               |
| CS: Change pincode                                                                                                         |     |      |      | 180 003       |
| 0                                                                                                                          | 0   | 0    |      |               |
| Change the PIN code using the navigation keys of the HMI. It is not necessary at communication interface.                  |     |      |      |               |
| CS: Config disabled                                                                                                        |     |      |      | 180 044       |
| 1: Yes                                                                                                                     |     |      |      |               |
| Configure disabled or not.                                                                                                 |     |      |      |               |
| CS: Recovery Password                                                                                                      |     |      |      | 180 014       |
| 0:                                                                                                                         |     |      |      |               |
| Display of the Token and allow entry for reset to factory password.                                                        |     |      |      |               |
| CS: Reset RBAC                                                                                                             |     |      |      | 180 045       |
| 12                                                                                                                         | 1   | 12   |      |               |
| Only on HMI. Starting reset timer and display code.                                                                        |     |      |      |               |

| Parameter                                                                                                                                                                             |     |     |      | Address       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                               | Min | Max | Unit | Logic Diagram |
| TIMER: Function group TIMER                                                                                                                                                           |     |     |      | 056 093       |
| 0: Without                                                                                                                                                                            |     |     |      |               |
| Cancelling function group TIMER or including it in the configuration. If the function group is cancelled from the configuration, then all associated settings and signals are hidden. |     |     |      |               |

## Real Timer

## Virtual Inputs

| Parameter                                                                                                                                                                            | Address |     |      |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                              | Min     | Max | Unit | Logic Diagram |
| VINP: Function group VINP                                                                                                                                                            |         |     |      | 056 098       |
| 0: Without                                                                                                                                                                           |         |     |      |               |
| Cancelling function group VINP or including it in the configuration. If the function group is cancelled from the configuration, then all associated settings and signals are hidden. |         |     |      |               |
| VINP: General enable USER                                                                                                                                                            |         |     |      | 115 000       |
| 0: No                                                                                                                                                                                |         |     |      |               |
| Disabling or enabling VINP function.                                                                                                                                                 |         |     |      |               |
| VINP: Input 1 fct.assig.                                                                                                                                                             |         |     |      | 115 150       |
| 061 000: MAIN: Without function                                                                                                                                                      |         |     |      |               |
| VINP: Input 2 fct.assig.                                                                                                                                                             |         |     |      | 115 151       |
| 061 000: MAIN: Without function                                                                                                                                                      |         |     |      |               |
| VINP: Input 3 fct.assig.                                                                                                                                                             |         |     |      | 115 152       |
| 061 000: MAIN: Without function                                                                                                                                                      |         |     |      |               |
| VINP: Input 4 fct.assig.                                                                                                                                                             |         |     |      | 115 153       |
| 061 000: MAIN: Without function                                                                                                                                                      |         |     |      |               |
| VINP: Input 5 fct.assig.                                                                                                                                                             |         |     |      | 115 154       |
| 061 000: MAIN: Without function                                                                                                                                                      |         |     |      |               |
| VINP: Input 6 fct.assig.                                                                                                                                                             |         |     |      | 115 155       |
| 061 000: MAIN: Without function                                                                                                                                                      |         |     |      |               |
| VINP: Input 7 fct.assig.                                                                                                                                                             |         |     |      | 115 156       |
| 061 000: MAIN: Without function                                                                                                                                                      |         |     |      |               |
| VINP: Input 8 fct.assig.                                                                                                                                                             |         |     |      | 115 157       |
| 061 000: MAIN: Without function                                                                                                                                                      |         |     |      |               |
| VINP: Input 9 fct.assig.                                                                                                                                                             |         |     |      | 115 158       |
| 061 000: MAIN: Without function                                                                                                                                                      |         |     |      |               |
| VINP: Input 10 fct.assig.                                                                                                                                                            |         |     |      | 115 159       |
| 061 000: MAIN: Without function                                                                                                                                                      |         |     |      |               |
| VINP: Input 11 fct.assig.                                                                                                                                                            |         |     |      | 115 160       |
| 061 000: MAIN: Without function                                                                                                                                                      |         |     |      |               |
| VINP: Input 12 fct.assig.                                                                                                                                                            |         |     |      | 115 161       |
| 061 000: MAIN: Without function                                                                                                                                                      |         |     |      |               |
| VINP: Input 13 fct.assig.                                                                                                                                                            |         |     |      | 115 162       |
| 061 000: MAIN: Without function                                                                                                                                                      |         |     |      |               |
| VINP: Input 14 fct.assig.                                                                                                                                                            |         |     |      | 115 163       |
| 061 000: MAIN: Without function                                                                                                                                                      |         |     |      |               |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| VINP: Input 15 fct.assig.       |     |     |      |  |               |  | 115 164 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 16 fct.assig.       |     |     |      |  |               |  | 115 165 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 17 fct.assig.       |     |     |      |  |               |  | 115 166 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 18 fct.assig.       |     |     |      |  |               |  | 115 167 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 19 fct.assig.       |     |     |      |  |               |  | 115 168 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 20 fct.assig.       |     |     |      |  |               |  | 115 169 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 21 fct.assig.       |     |     |      |  |               |  | 115 170 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 22 fct.assig.       |     |     |      |  |               |  | 115 171 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 23 fct.assig.       |     |     |      |  |               |  | 115 172 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 24 fct.assig.       |     |     |      |  |               |  | 115 173 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 25 fct.assig.       |     |     |      |  |               |  | 115 174 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 26 fct.assig.       |     |     |      |  |               |  | 115 175 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 27 fct.assig.       |     |     |      |  |               |  | 115 176 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 28 fct.assig.       |     |     |      |  |               |  | 115 177 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 29 fct.assig.       |     |     |      |  |               |  | 115 178 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 30 fct.assig.       |     |     |      |  |               |  | 115 179 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 31 fct.assig.       |     |     |      |  |               |  | 115 180 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 32 fct.assig.       |     |     |      |  |               |  | 115 181 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| VINP: Input 33 fct.assig.       |     |     |      |  |               |  | 115 182 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |



| Parameter                       |     |     |      | Address       |
|---------------------------------|-----|-----|------|---------------|
| Default                         | Min | Max | Unit | Logic Diagram |
| VINP: Input 34 fct.assig.       |     |     |      | 115 183       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 35 fct.assig.       |     |     |      | 115 184       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 36 fct.assig.       |     |     |      | 115 185       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 37 fct.assig.       |     |     |      | 115 186       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 38 fct.assig.       |     |     |      | 115 187       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 39 fct.assig.       |     |     |      | 115 188       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 40 fct.assig.       |     |     |      | 115 189       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 41 fct.assig.       |     |     |      | 115 190       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 42 fct.assig.       |     |     |      | 115 191       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 43 fct.assig.       |     |     |      | 115 192       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 44 fct.assig.       |     |     |      | 115 193       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 45 fct.assig.       |     |     |      | 115 194       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 46 fct.assig.       |     |     |      | 115 195       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 47 fct.assig.       |     |     |      | 115 196       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 48 fct.assig.       |     |     |      | 115 197       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 49 fct.assig.       |     |     |      | 115 198       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 50 fct.assig.       |     |     |      | 115 199       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 51 fct.assig.       |     |     |      | 115 200       |
| 061 000: MAIN: Without function |     |     |      |               |
| VINP: Input 52 fct.assig.       |     |     |      | 115 201       |
| 061 000: MAIN: Without function |     |     |      |               |

| Parameter                                                                                                                                                                                 |     |     |      |  | Address       |  |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                                                                                                                                                                                   | Min | Max | Unit |  | Logic Diagram |  |         |
| VINP: Input 53 fct.assig.                                                                                                                                                                 |     |     |      |  |               |  | 115 202 |
| 061 000: MAIN: Without function                                                                                                                                                           |     |     |      |  |               |  |         |
| VINP: Input 54 fct.assig.                                                                                                                                                                 |     |     |      |  |               |  | 115 203 |
| 061 000: MAIN: Without function                                                                                                                                                           |     |     |      |  |               |  |         |
| VINP: Input 55 fct.assig.                                                                                                                                                                 |     |     |      |  |               |  | 115 204 |
| 061 000: MAIN: Without function                                                                                                                                                           |     |     |      |  |               |  |         |
| VINP: Input 56 fct.assig.                                                                                                                                                                 |     |     |      |  |               |  | 115 205 |
| 061 000: MAIN: Without function                                                                                                                                                           |     |     |      |  |               |  |         |
| VINP: Input 57 fct.assig.                                                                                                                                                                 |     |     |      |  |               |  | 115 206 |
| 061 000: MAIN: Without function                                                                                                                                                           |     |     |      |  |               |  |         |
| VINP: Input 58 fct.assig.                                                                                                                                                                 |     |     |      |  |               |  | 115 207 |
| 061 000: MAIN: Without function                                                                                                                                                           |     |     |      |  |               |  |         |
| VINP: Input 59 fct.assig.                                                                                                                                                                 |     |     |      |  |               |  | 115 208 |
| 061 000: MAIN: Without function                                                                                                                                                           |     |     |      |  |               |  |         |
| VINP: Input 60 fct.assig.                                                                                                                                                                 |     |     |      |  |               |  | 115 209 |
| 061 000: MAIN: Without function                                                                                                                                                           |     |     |      |  |               |  |         |
| VINP: Input 61 fct.assig.                                                                                                                                                                 |     |     |      |  |               |  | 115 210 |
| 061 000: MAIN: Without function                                                                                                                                                           |     |     |      |  |               |  |         |
| VINP: Input 62 fct.assig.                                                                                                                                                                 |     |     |      |  |               |  | 115 211 |
| 061 000: MAIN: Without function                                                                                                                                                           |     |     |      |  |               |  |         |
| VINP: Input 63 fct.assig.                                                                                                                                                                 |     |     |      |  |               |  | 115 212 |
| 061 000: MAIN: Without function                                                                                                                                                           |     |     |      |  |               |  |         |
| VINP: Input 64 fct.assig.                                                                                                                                                                 |     |     |      |  |               |  | 115 213 |
| 061 000: MAIN: Without function                                                                                                                                                           |     |     |      |  |               |  |         |
| Function assignment of the virtual binary inputs VINP to a binary logical state signal on the device so that they can be processed further by the protection, control or logic functions. |     |     |      |  |               |  |         |

## Local control panel

| Parameter                                                                                                                                                                        | Address |      |      |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|------|---------------|
| Default                                                                                                                                                                          | Min     | Max  | Unit | Logic Diagram |
| LOC: Language                                                                                                                                                                    |         |      |      | 003 020       |
| 2: Reference language                                                                                                                                                            |         |      |      |               |
| Language in which texts will be displayed on the user interface (HMI).                                                                                                           |         |      |      |               |
| LOC: Decimal delimiter                                                                                                                                                           |         |      |      | 003 021       |
| 1: Dot                                                                                                                                                                           |         |      |      |               |
| Character to be used as decimal delimiter on the local control panel.                                                                                                            |         |      |      |               |
| LOC: Password                                                                                                                                                                    |         |      |      | 003 035       |
| 1234                                                                                                                                                                             | 0       | 4444 |      |               |
| The password to be used for changing settings from the local control panel can be defined here.                                                                                  |         |      |      |               |
| LOC: Password L/R                                                                                                                                                                |         |      |      | 221 040       |
| 1423                                                                                                                                                                             | 0       | 4444 |      |               |
| The password used to change the setting from “Remote” to “Local” control can be defined here. (Switching from “Local” to “Remote” control occurs without checking the password.) |         |      |      |               |
| LOC: Displ. ext.dev.desig                                                                                                                                                        |         |      |      | 221 032       |
| 1: With <a href="#">Fig. 3-5, (p. 3-12)</a>                                                                                                                                      |         |      |      |               |
| This setting defines whether the external device designations shall be displayed on the Bay Panel.                                                                               |         |      |      |               |
| LOC: Display L/R                                                                                                                                                                 |         |      |      | 221 070       |
| 1: With <a href="#">Fig. 3-5, (p. 3-12)</a><br><a href="#">Fig. 3-7, (p. 3-14)</a>                                                                                               |         |      |      |               |
| This setting defines whether the control site – “Local” or “Remote” – shall be displayed on the bay panel.                                                                       |         |      |      |               |
| LOC: Displ. interl. stat.                                                                                                                                                        |         |      |      | 221 071       |
| 1: With <a href="#">Fig. 3-5, (p. 3-12)</a><br><a href="#">Fig. 3-7, (p. 3-14)</a>                                                                                               |         |      |      |               |
| This setting defines whether the “Locked” or “Unlocked” status shall be displayed on the bay panel.                                                                              |         |      |      |               |
| LOC: Busbar1 Name by User                                                                                                                                                        |         |      |      | 218 191       |
| 0:                                                                                                                                                                               |         |      |      |               |
| LOC: Designation busbar 1                                                                                                                                                        |         |      |      | 221 033       |
| 1: BB1 <a href="#">Fig. 3-5, (p. 3-12)</a>                                                                                                                                       |         |      |      |               |
| LOC: Busbar2 Name by User                                                                                                                                                        |         |      |      | 218 192       |
| 0:                                                                                                                                                                               |         |      |      |               |
| LOC: Designation busbar 2                                                                                                                                                        |         |      |      | 221 034       |
| 2: BB2 <a href="#">Fig. 3-5, (p. 3-12)</a>                                                                                                                                       |         |      |      |               |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |     |      | Address       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Min | Max | Unit | Logic Diagram |
| LOC: Busbar3 Name by User                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |     |      | 218 193       |
| 0:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| LOC: Designation busbar 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |     |      | 221 043       |
| 3: BB3 <span>Fig. 3-5, (p. 3-12)</span>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| Setting for the busbar designations to be displayed on the Bay Panel. At LOC: Busbar1 Name by User any text (max. 3 characters) may be entered which will then be used as the designation, if the associated parameter LOC: Designation busbar 1 has been set to <i>BB-User Name</i> . When instead one of the pre-defined designations is selected at LOC: Designation busbar 1 it will be used and LOC: Busbar1 Name by User will be ignored. A designation with more than 3 characters is internally truncated. (The same is true of BB2,...)           |     |     |      |               |
| LOC: BB Sect.1-NameUser                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      | 218 195       |
| 0:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| LOC: Designat. bus sect.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |     |      | 221 035       |
| 1: BSa <span>Fig. 3-5, (p. 3-12)</span>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| LOC: BB Sect.2-NameUser                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      | 218 196       |
| 0:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| LOC: Designat. bus sect.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |     |      | 221 036       |
| 2: BSb <span>Fig. 3-5, (p. 3-12)</span>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| Setting for the busbar section designations to be displayed on the Bay Panel. At LOC: BB Sect.1-NameUser any text (max 3 characters) may be entered which will then be used as the designation, if the associated parameter LOC: Designat. bus sect.1 has been set to <i>BB-Sect.User Name</i> . When one of the pre-defined designations is selected at LOC: Designat. bus sect.1 it will be used and LOC: BB Sect.1-NameUser will be ignored. A designation with more than 3 characters is internally truncated. (The same is true of busbar section 2.) |     |     |      |               |
| LOC: Character set                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      | 221 038       |
| 1: Character set 1 <span>Fig. 3-5, (p. 3-12)</span>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      |               |
| The user can choose between several character sets to represent switchgear and their switching states on the Bay Panel.<br>Note: Character set 3 is identical to character set 1 in the factory default setting, but can be replaced by an user-defined character set, by applying an accessory tool to the operating program.                                                                                                                                                                                                                             |     |     |      |               |
| LOC: Fct. reset key                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 005 251       |
| 060 000: MAIN: Without function <span>Fig. 3-79, (p. 3-115)</span>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| Selection of counters and memories that are reset by pressing the RESET key on the local control panel. (Resetting LED indicators and measured event values is permanently assigned internally, so that they are always reset when the RESET key is pressed.)                                                                                                                                                                                                                                                                                              |     |     |      |               |

| Parameter                                                                                                                                                                                                                                                         | Address |     |      |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                                                                                           | Min     | Max | Unit | Logic Diagram |
| LOC: Fct. read key                                                                                                                                                                                                                                                |         |     |      | 080 110       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                   |         |     |      |               |
| Selection of up to 16 functions to be triggered when pressing the read key. Event counters and event recordings are offered for selection. If several functions have been selected then they will be sequentially triggered by repeated pressing of the read key. |         |     |      |               |
| LOC: Operation mode                                                                                                                                                                                                                                               |         |     |      | 011 240       |
| 0: LOC Direct                                                                                                                                                                                                                                                     |         |     |      |               |
| This setting defines which of the three implemented operating modes the C434 shall use for the local control of switchgear units via LOC.                                                                                                                         |         |     |      |               |
| LOC: SI request                                                                                                                                                                                                                                                   |         |     |      | 221 118       |
| 1: Yes                                                                                                                                                                                                                                                            |         |     |      |               |
| This setting defines whether or not the check of the interlock equations, that is carried out with the local control of switchgear units, also includes a check of station interlocking.                                                                          |         |     |      |               |
| LOC: Fct. assign. L/R key                                                                                                                                                                                                                                         |         |     |      | 225 208       |
| 1: R <-> L <span style="float: right;">Fig. 3-11, (p. 3-18)</span>                                                                                                                                                                                                |         |     |      |               |
| This setting defines whether the (electric) key-operated switch switches between remote / local control (L↔R) or between remote+local control / local control (R&L↔L).                                                                                            |         |     |      |               |
| LOC: Fct. menu jmp list 1                                                                                                                                                                                                                                         |         |     |      | 030 238       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                   |         |     |      |               |
| LOC: Fct. menu jmp list 2                                                                                                                                                                                                                                         |         |     |      | 030 239       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                   |         |     |      |               |
| Selection of specified functions which will be sequentially displayed by repeated reading of the menu jump list 1 (or 2).                                                                                                                                         |         |     |      |               |
| LOC: Fct. Operation Panel                                                                                                                                                                                                                                         |         |     |      | 053 007       |
| 060 000: MAIN: Without function <span style="float: right;">Fig. 3-9, (p. 3-16)</span>                                                                                                                                                                            |         |     |      |               |
| Definition of the values to be displayed on the Measured Value Panel also referred to as the Operation Panel.                                                                                                                                                     |         |     |      |               |
| LOC: Fct. Fault Panel                                                                                                                                                                                                                                             |         |     |      | 053 003       |
| 060 000: MAIN: Without function <span style="float: right;">Fig. 3-10, (p. 3-17)</span>                                                                                                                                                                           |         |     |      |               |
| Definition of the values to be displayed on the Fault Panel.                                                                                                                                                                                                      |         |     |      |               |
| LOC: Fct. Signal Panel                                                                                                                                                                                                                                            |         |     |      | 221 072       |
| 060 000: MAIN: Without function <span style="float: right;">Fig. 3-8, (p. 3-15)</span>                                                                                                                                                                            |         |     |      |               |
| Definition of the values to be displayed on the Signal Panel.                                                                                                                                                                                                     |         |     |      |               |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | Address             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Min | Max | Unit | Logic Diagram       |
| LOC: Aut.activ.Sign.Panel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 221 073             |
| 0: Activation off                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |     |      | Fig. 3-8, (p. 3-15) |
| Activation of the automatic switching to the Signal Panel at every change of state of a configured signal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |     |      |                     |
| LOC: Stat.ind.Sign.Panel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |     |      | 221 074             |
| 1: Filled box                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      | Fig. 3-8, (p. 3-15) |
| Definition of display type of active / inactive signals on the Signal Panel.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |     |      |                     |
| LOC: Indicativ.Sign.Panel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 221 075             |
| 0: Without signalling                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |     |      | Fig. 3-8, (p. 3-15) |
| Definition of signal type at change of state and response to an acknowledge command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |     |      |                     |
| LOC: Sign.caus.Sign.Panel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 221 078             |
| 1: All status changes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |     |      | Fig. 3-8, (p. 3-15) |
| Definition of cause for signaling (every change of state / incoming signals only).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |                     |
| LOC: Fct.asg.num.displ.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      | 221 041             |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | Fig. 3-5, (p. 3-12) |
| Definition of the measured values to be displayed on the Bay Panel in numerical form.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |     |      |                     |
| LOC: Fct.asg.bar displ.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      | 221 042             |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | Fig. 3-5, (p. 3-12) |
| Definition of the measured values to be displayed on the Bay Panel in bar form.<br>Note: Measured values to be displayed in bar chart form must also be selected for display as numerical measured values. However, not all measured values that can be displayed in numerical form can also be displayed in bar chart form! In such cases, a dummy or placeholder must be included in the selection list for the bar chart display at the same point at which a measured value that cannot be displayed in bar chart form appears in the selection list for numerical measured values.<br>Example: Current IB is to be displayed. In this case, either the primary current IB or the per-unit current IB shall be selected for the numerical display. The per-unit current IB shall be entered at the same position in the selection list for the bar chart display. |     |     |      |                     |
| LOC: Bar display type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |     |      | 221 039             |
| 0: No bar display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |     |      | Fig. 3-5, (p. 3-12) |
| Disabling the bar chart display or definition of the orientation of the bar chart to display measured values on the Bay Panel.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      |                     |
| LOC: Scal.bar display I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      | 221 044             |
| 1: 1.2 Inom                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      | Fig. 3-5, (p. 3-12) |
| Scaling of measured current values to be displayed in bar chart form.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |     |      |                     |

| Parameter                                                                                                                                                                                                                                                                                                                                                           |     |       |      | Address                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|------|--------------------------------------------|
| Default                                                                                                                                                                                                                                                                                                                                                             | Min | Max   | Unit | Logic Diagram                              |
| LOC: Scal. bar display V                                                                                                                                                                                                                                                                                                                                            |     |       |      | 221 045                                    |
| 1: 1.2 Vnom                                                                                                                                                                                                                                                                                                                                                         |     |       |      | Fig. 3-5, (p. 3-12)                        |
| Scaling of measured voltage values to be displayed in bar chart form.                                                                                                                                                                                                                                                                                               |     |       |      |                                            |
| LOC: Display bar scale                                                                                                                                                                                                                                                                                                                                              |     |       |      | 221 046                                    |
| 1: Yes                                                                                                                                                                                                                                                                                                                                                              |     |       |      | Fig. 3-5, (p. 3-12)                        |
| Setting this window can disable the scalable bar chart.                                                                                                                                                                                                                                                                                                             |     |       |      |                                            |
| LOC: Hold-time for Panels                                                                                                                                                                                                                                                                                                                                           |     |       |      | 031 075                                    |
| 5                                                                                                                                                                                                                                                                                                                                                                   | 1   | 10    | s    | Fig. 3-8, (p. 3-15)<br>Fig. 3-9, (p. 3-16) |
| Setting for the time period during which a panel is displayed, before switching to the next panel. This setting is only relevant if more values are selected than can be shown on the LC-Display.                                                                                                                                                                   |     |       |      |                                            |
| LOC: Hold-t. meas.v.displ                                                                                                                                                                                                                                                                                                                                           |     |       |      | 031 072                                    |
| Blocked                                                                                                                                                                                                                                                                                                                                                             | 1   | 60    | s    |                                            |
| Always when the time period set here has elapsed the next value will be shown on the Bay Panel display. With a setting to <i>Blocked</i> this automatic switching forward to the next measured value will be deactivated. Independent of this the next or the previous configured measured value may be selected by pressing the keys "cursor down" or "cursor up". |     |       |      |                                            |
| LOC: Autom. return time                                                                                                                                                                                                                                                                                                                                             |     |       |      | 003 014                                    |
| 60                                                                                                                                                                                                                                                                                                                                                                  | 60  | 60000 | s    | Fig. 3-8, (p. 3-15)<br>Fig. 3-9, (p. 3-16) |
| If the user does not press a key on the local control panel during this set time period, the change-enabling function is deactivated.                                                                                                                                                                                                                               |     |       |      |                                            |
| LOC: Return time select.                                                                                                                                                                                                                                                                                                                                            |     |       |      | 221 030                                    |
| 60                                                                                                                                                                                                                                                                                                                                                                  | 60  | 60000 | s    | Fig. 3-5, (p. 3-12)<br>Fig. 3-7, (p. 3-14) |
| If the user does not press a key on the local control panel during this set time period, then the selection of a switchgear unit is cancelled.                                                                                                                                                                                                                      |     |       |      |                                            |
| LOC: Return time illumin.                                                                                                                                                                                                                                                                                                                                           |     |       |      | 003 023                                    |
| 60                                                                                                                                                                                                                                                                                                                                                                  | 60  | 60000 | s    | Fig. 3-5, (p. 3-12)<br>Fig. 3-7, (p. 3-14) |
| If the user does not press a key on the local control panel during this set time period, then the backlighting of the LCD display is switched off, and any switchgear selection that might have been made is cancelled.                                                                                                                                             |     |       |      |                                            |

## PC link

| Parameter                                                                                                                                                |     |      |       |                      | Address       |  |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|-------|----------------------|---------------|--|---------|
| Default                                                                                                                                                  | Min | Max  | Unit  |                      | Logic Diagram |  |         |
| PC: Bay address                                                                                                                                          |     |      |       |                      |               |  | 003 068 |
| 1                                                                                                                                                        | 0   | 254  |       | Fig. 3-12, (p. 3-20) |               |  |         |
| PC: Device address                                                                                                                                       |     |      |       |                      |               |  | 003 069 |
| 1                                                                                                                                                        | 0   | 255  |       | Fig. 3-12, (p. 3-20) |               |  |         |
| Bay and device addresses are used to address the device in communication via the PC interface. An identical setting must be selected for both addresses. |     |      |       |                      |               |  |         |
| PC: Baud rate                                                                                                                                            |     |      |       |                      |               |  | 003 081 |
| 115.2: 115.2 kBaud                                                                                                                                       |     |      | Baud  | Fig. 3-12, (p. 3-20) |               |  |         |
| Baud rate of the PC interface.                                                                                                                           |     |      |       |                      |               |  |         |
| PC: Parity bit                                                                                                                                           |     |      |       |                      |               |  | 003 181 |
| 1: Even                                                                                                                                                  |     |      |       | Fig. 3-12, (p. 3-20) |               |  |         |
| Set the same parity that is set at the interface of the PC connected to the C434.                                                                        |     |      |       |                      |               |  |         |
| PC: Spontan. sig. enable                                                                                                                                 |     |      |       |                      |               |  | 003 187 |
| 0: None                                                                                                                                                  |     |      |       | Fig. 3-12, (p. 3-20) |               |  |         |
| Enable for the transmission of spontaneous signals via the PC interface.                                                                                 |     |      |       |                      |               |  |         |
| PC: Select. spontan.sig.                                                                                                                                 |     |      |       |                      |               |  | 003 189 |
| 060 000: MAIN: Without function                                                                                                                          |     |      |       | Fig. 3-12, (p. 3-20) |               |  |         |
| Selection of spontaneous signals for transmission via the PC interface.                                                                                  |     |      |       |                      |               |  |         |
| PC: Transm.enab.cycl.dat                                                                                                                                 |     |      |       |                      |               |  | 003 084 |
| 0: Without                                                                                                                                               |     |      |       | Fig. 3-12, (p. 3-20) |               |  |         |
| Enable for the cyclic transmission of measured values via the PC interface.                                                                              |     |      |       |                      |               |  |         |
| PC: Cycl. data ILS tel.                                                                                                                                  |     |      |       |                      |               |  | 003 185 |
| 060 000: MAIN: Without function                                                                                                                          |     |      |       | Fig. 3-12, (p. 3-20) |               |  |         |
| Selection of the measured values that are transmitted in a user-defined telegram via the PC interface.                                                   |     |      |       |                      |               |  |         |
| PC: Delta V                                                                                                                                              |     |      |       |                      |               |  | 003 055 |
| 3.0                                                                                                                                                      | 0.0 | 15.0 | %Vnom | Fig. 3-12, (p. 3-20) |               |  |         |
| A measured voltage value is transmitted via the PC interface if it differs by the set delta quantity from the last measured value transmitted.           |     |      |       |                      |               |  |         |
| PC: Delta I                                                                                                                                              |     |      |       |                      |               |  | 003 056 |
| 3.0                                                                                                                                                      | 0.0 | 15.0 | %Inom | Fig. 3-12, (p. 3-20) |               |  |         |
| A measured current value is transmitted via the PC interface if it differs by the set delta quantity from the last measured value transmitted.           |     |      |       |                      |               |  |         |
| PC: IP address                                                                                                                                           |     |      |       |                      |               |  | 111 004 |
| 192                                                                                                                                                      | 0   | 255  |       |                      |               |  |         |



| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |     |      | Address       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Min | Max | Unit | Logic Diagram |
| PC: IP address 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |     |      | 111 005       |
| 168                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0   | 255 |      |               |
| PC: IP address 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |     |      | 111 006       |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0   | 255 |      |               |
| PC: IP address 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |     |      | 111 007       |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0   | 255 |      |               |
| <p>IP address of the Ethernet interface of the C434's processor module.</p> <p>This is the Ethernet interface of the processor module and can be used for special service activities, e.g. for uploading new firmware.</p> <p>Note: In the operating program, the complete IP address is displayed at PC: IP address. The device's front panel display only displays the IP address distributed to these four data model addresses:</p> <ul style="list-style-type: none"> <li>● PC: IP address,</li> <li>● PC: IP address 1,</li> <li>● PC: IP address 2,</li> <li>● PC: IP address 3.</li> </ul> <p>Note: This interface can only be used if it has been configured (PC: IP address, PC: Subnet mask, PC: IP address mode) and activated via PC: IP Enable config..</p> |     |     |      |               |
| PC: Subnet mask                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      | 111 008       |
| 255                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0   | 255 |      |               |
| PC: Subnet mask 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      | 111 009       |
| 255                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0   | 255 |      |               |
| PC: Subnet mask 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      | 111 010       |
| 255                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0   | 255 |      |               |
| PC: Subnet mask 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      | 111 011       |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0   | 255 |      |               |
| <p>Subnet mask of the Ethernet interface of the processor module.</p> <p>Note: In the operating program, the complete mask is displayed at PC: Subnet mask. The device's front panel display only displays the mask distributed to these four data model addresses:</p> <ul style="list-style-type: none"> <li>● PC: Subnet mask,</li> <li>● PC: Subnet mask 1,</li> <li>● PC: Subnet mask 2,</li> <li>● PC: Subnet mask 3.</li> </ul>                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                         | Address |      |       |                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|-------|----------------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                           | Min     | Max  | Unit  | Logic Diagram        |
| PC: IP address mode                                                                                                                                                                                                                                                                                                                                                                                               |         |      |       | 111 016              |
| 1: DHCP                                                                                                                                                                                                                                                                                                                                                                                                           |         |      |       |                      |
| Setting of the method how the IP address of the Ethernet interface of the processor module shall be defined.                                                                                                                                                                                                                                                                                                      |         |      |       |                      |
| <ul style="list-style-type: none"> <li>● <i>DHCP</i>: The IP address shall be retrieved from a DHCP server.</li> <li>● <i>Fix</i>: The setting of PC: IP address shall be used.</li> <li>● <i>Device address</i>: The setting of PC: IP address shall be used for the first three number values of the IP address, the fourth number value of the IP address shall be the value of PC: Device address.</li> </ul> |         |      |       |                      |
| PC: IP Enable config.                                                                                                                                                                                                                                                                                                                                                                                             |         |      |       | 111 017              |
| 0: don't execute                                                                                                                                                                                                                                                                                                                                                                                                  |         |      |       |                      |
| Activating the Ethernet interface of the processor module.                                                                                                                                                                                                                                                                                                                                                        |         |      |       |                      |
| PC: Delta P                                                                                                                                                                                                                                                                                                                                                                                                       |         |      |       | 003 059              |
| 15.0                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0     | 15.0 | %Snom | Fig. 3-12, (p. 3-20) |
| The active power value is transmitted via the PC interface if it differs by the set delta quantity from the last measured value transmitted.                                                                                                                                                                                                                                                                      |         |      |       |                      |
| PC: Delta f                                                                                                                                                                                                                                                                                                                                                                                                       |         |      |       | 003 057              |
| 2.0                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0     | 2.0  | %fnom | Fig. 3-12, (p. 3-20) |
| The measured frequency value is transmitted via the PC interface if it differs by the set delta from the last measured value transmitted.                                                                                                                                                                                                                                                                         |         |      |       |                      |
| PC: Delta meas.v.ILS tel                                                                                                                                                                                                                                                                                                                                                                                          |         |      |       | 003 155              |
| 3.0                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0     | 15.0 |       | Fig. 3-12, (p. 3-20) |
| The telegram is transmitted if a measured value differs by the set delta quantity from the last measured value transmitted.                                                                                                                                                                                                                                                                                       |         |      |       |                      |
| PC: Delta t                                                                                                                                                                                                                                                                                                                                                                                                       |         |      |       | 003 058              |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                 | 0       | 15   | min   | Fig. 3-12, (p. 3-20) |
| All measured values are transmitted again via the PC interface after this time period has elapsed – provided that transmission has not been triggered by the other delta conditions.                                                                                                                                                                                                                              |         |      |       |                      |
| PC: Time-out                                                                                                                                                                                                                                                                                                                                                                                                      |         |      |       | 003 188              |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                 | 1       | 60   | min   | Fig. 3-12, (p. 3-20) |
| Setting for the time to elapse after the last telegram exchange via the PC interface before activating the second communication channel of communication module A.                                                                                                                                                                                                                                                |         |      |       |                      |

“Logical”  
communication  
interface 1

| Parameter                                                                                                                                                                                                                 | Address |     |      |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                                                   | Min     | Max | Unit | Logic Diagram |
| COMM1: Function group COMM1                                                                                                                                                                                               |         |     |      | 056 026       |
| 0: Without                                                                                                                                                                                                                |         |     |      |               |
| Cancelling function group COMM1 or including it in the configuration. If the function group is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |         |     |      |               |
| COMM1: General enable USER                                                                                                                                                                                                |         |     |      | 003 170       |
| 0: No                                                                                                                                                                                                                     |         |     |      |               |
| Disabling or enabling communication interface 1.                                                                                                                                                                          |         |     |      |               |
| COMM1: Basic IEC870-5 enable                                                                                                                                                                                              |         |     |      | 003 215       |
| 0: No <span style="color: green;">Fig. 3-13, (p. 3-21)</span>                                                                                                                                                             |         |     |      |               |
| Common settings for enabling all protocols based on IEC 870-5-xxx.                                                                                                                                                        |         |     |      |               |
| COMM1: Addit. -101 enable                                                                                                                                                                                                 |         |     |      | 003 216       |
| 0: No <span style="color: green;">Fig. 3-13, (p. 3-21)</span>                                                                                                                                                             |         |     |      |               |
| Enabling additional settings that are relevant for the protocol based on IEC 870-5-101.                                                                                                                                   |         |     |      |               |
| COMM1: Addit. ILS enable                                                                                                                                                                                                  |         |     |      | 003 217       |
| 0: No <span style="color: green;">Fig. 3-13, (p. 3-21)</span>                                                                                                                                                             |         |     |      |               |
| Enabling additional settings that are relevant for the ILS protocol.                                                                                                                                                      |         |     |      |               |
| COMM1: MODBUS enable                                                                                                                                                                                                      |         |     |      | 003 220       |
| 0: No <span style="color: green;">Fig. 3-13, (p. 3-21)</span>                                                                                                                                                             |         |     |      |               |
| Enabling settings relevant for the MODBUS protocol.                                                                                                                                                                       |         |     |      |               |
| COMM1: DNP3 enable                                                                                                                                                                                                        |         |     |      | 003 231       |
| 0: No <span style="color: green;">Fig. 3-13, (p. 3-21)</span>                                                                                                                                                             |         |     |      |               |
| Enabling settings relevant for the DNP 3.0 protocol.                                                                                                                                                                      |         |     |      |               |
| COMM1: COURIER enable                                                                                                                                                                                                     |         |     |      | 103 040       |
| 0: No <span style="color: green;">Fig. 3-13, (p. 3-21)</span>                                                                                                                                                             |         |     |      |               |
| Enabling settings relevant for the COURIER protocol.                                                                                                                                                                      |         |     |      |               |
| COMM1: Communicat. protocol                                                                                                                                                                                               |         |     |      | 003 167       |
| 060 000: MAIN: Without function <span style="color: green;">Fig. 3-13, (p. 3-21)</span>                                                                                                                                   |         |     |      |               |
| Select the communication protocol that shall be used for the communication interface.                                                                                                                                     |         |     |      |               |

| Parameter                                                                                                                                                                                                                                     | Address |     |      |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                                                                       | Min     | Max | Unit | Logic Diagram |
| COMM1: -103 prot. variant                                                                                                                                                                                                                     |         |     |      | 003 178       |
| 1: Private <span>Fig. 3-14, (p. 3-23)</span>                                                                                                                                                                                                  |         |     |      |               |
| The user may select between two variants of the 103 protocol.                                                                                                                                                                                 |         |     |      |               |
| Note: This setting is hidden unless the IEC 870-5-xxx protocol is enabled.                                                                                                                                                                    |         |     |      |               |
| COMM1: MODBUS prot. variant                                                                                                                                                                                                                   |         |     |      | 003 214       |
| 1: Compatible <span>Fig. 3-17, (p. 3-26)</span>                                                                                                                                                                                               |         |     |      |               |
| The user may select between two variants of the MODBUS protocol.                                                                                                                                                                              |         |     |      |               |
| Note: This setting is hidden unless the MODBUS protocol is enabled.                                                                                                                                                                           |         |     |      |               |
| COMM1: Line idle state                                                                                                                                                                                                                        |         |     |      | 003 165       |
| 1: Light on / high <span>Fig. 3-14, (p. 3-23)</span><br><span>Fig. 3-15, (p. 3-24)</span><br><span>Fig. 3-16, (p. 3-25)</span><br><span>Fig. 3-17, (p. 3-26)</span><br><span>Fig. 3-18, (p. 3-27)</span><br><span>Fig. 3-19, (p. 3-28)</span> |         |     |      |               |
| Setting for the line idle state indication.                                                                                                                                                                                                   |         |     |      |               |
| COMM1: Baud rate                                                                                                                                                                                                                              |         |     |      | 003 071       |
| 19.2: 19.2 kBaud <span>Fig. 3-14, (p. 3-23)</span><br><span>Fig. 3-15, (p. 3-24)</span><br><span>Fig. 3-16, (p. 3-25)</span><br><span>Fig. 3-17, (p. 3-26)</span><br><span>Fig. 3-18, (p. 3-27)</span><br><span>Fig. 3-19, (p. 3-28)</span>   |         |     |      |               |
| Baud rate of the communication interface.                                                                                                                                                                                                     |         |     |      |               |
| COMM1: Parity bit                                                                                                                                                                                                                             |         |     |      | 003 171       |
| 2: Even <span>Fig. 3-14, (p. 3-23)</span><br><span>Fig. 3-15, (p. 3-24)</span><br><span>Fig. 3-16, (p. 3-25)</span><br><span>Fig. 3-17, (p. 3-26)</span><br><span>Fig. 3-18, (p. 3-27)</span><br><span>Fig. 3-19, (p. 3-28)</span>            |         |     |      |               |
| Set the same parity that is set at the interface of the control system connected to the C434.                                                                                                                                                 |         |     |      |               |

| Parameter                                                                                                                                                                                                                                                                                                                       |     |     |      | Address                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Default                                                                                                                                                                                                                                                                                                                         | Min | Max | Unit | Logic Diagram                                                                                                                                                                                                                                |
| <b>COMM1: Dead time monitoring</b>                                                                                                                                                                                                                                                                                              |     |     |      | 003 176                                                                                                                                                                                                                                      |
| 1: Yes                                                                                                                                                                                                                                                                                                                          |     |     |      | <a href="#">Fig. 3-14, (p. 3-23)</a><br><a href="#">Fig. 3-15, (p. 3-24)</a><br><a href="#">Fig. 3-16, (p. 3-25)</a><br><a href="#">Fig. 3-17, (p. 3-26)</a><br><a href="#">Fig. 3-18, (p. 3-27)</a><br><a href="#">Fig. 3-19, (p. 3-28)</a> |
| <p>The C434 monitors telegram transmission to make sure that no excessive pause occurs within a telegram. This monitoring function can be disabled if it is not required.</p> <p>Note: This setting is only necessary for modem transmission.</p>                                                                               |     |     |      |                                                                                                                                                                                                                                              |
| <b>COMM1: Mon. time polling</b>                                                                                                                                                                                                                                                                                                 |     |     |      | 003 202                                                                                                                                                                                                                                      |
| 25                                                                                                                                                                                                                                                                                                                              | 3   | 254 | s    | <a href="#">Fig. 3-14, (p. 3-23)</a><br><a href="#">Fig. 3-15, (p. 3-24)</a><br><a href="#">Fig. 3-16, (p. 3-25)</a><br><a href="#">Fig. 3-17, (p. 3-26)</a><br><a href="#">Fig. 3-18, (p. 3-27)</a><br><a href="#">Fig. 3-19, (p. 3-28)</a> |
| <p>The time between two polling calls from the communication master must be less than the time set here.</p>                                                                                                                                                                                                                    |     |     |      |                                                                                                                                                                                                                                              |
| <b>COMM1: Octet comm. address</b>                                                                                                                                                                                                                                                                                               |     |     |      | 003 072                                                                                                                                                                                                                                      |
| 1                                                                                                                                                                                                                                                                                                                               | 0   | 254 |      | <a href="#">Fig. 3-14, (p. 3-23)</a><br><a href="#">Fig. 3-15, (p. 3-24)</a><br><a href="#">Fig. 3-16, (p. 3-25)</a><br><a href="#">Fig. 3-17, (p. 3-26)</a><br><a href="#">Fig. 3-18, (p. 3-27)</a><br><a href="#">Fig. 3-19, (p. 3-28)</a> |
| <p>The communication address and the ASDU address are used to identify the device in communication via the interface. An identical setting must be selected for both addresses.</p> <p>“ASDU”: Application Service Data Unit</p>                                                                                                |     |     |      |                                                                                                                                                                                                                                              |
| <b>COMM1: Oct.2 comm.addr.DNP3</b>                                                                                                                                                                                                                                                                                              |     |     |      | 003 240                                                                                                                                                                                                                                      |
| 0                                                                                                                                                                                                                                                                                                                               | 0   | 255 |      | <a href="#">Fig. 3-18, (p. 3-27)</a>                                                                                                                                                                                                         |
| <p>In the DNP 3.0 protocol, a 16-bit address is used to identify devices. The address that can be set here is the higher-order octet, whereas the address set at <b>COMM1: Octet comm. address</b> is the lower-order octet of the DNP address.</p> <p>Note: This setting is hidden unless the DNP 3.0 protocol is enabled.</p> |     |     |      |                                                                                                                                                                                                                                              |

| Parameter                                                                                                                                                                                                                                                                                           | Address |     |      |                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|----------------------------------------------------------------------------------------------------------------------|
| Default                                                                                                                                                                                                                                                                                             | Min     | Max | Unit | Logic Diagram                                                                                                        |
| <b>COMM1: Pos. acknowledgement</b>                                                                                                                                                                                                                                                                  |         |     |      | 103 060                                                                                                              |
| 1: Single character E5                                                                                                                                                                                                                                                                              |         |     |      |                                                                                                                      |
| <p>The following transmission frame formats are available (according to the standard):</p> <ul style="list-style-type: none"> <li>● <i>Short message FT 1.2</i>: short message with a fixed block length of 5 characters</li> <li>● <i>Single character E5</i>: single control character</li> </ul> |         |     |      |                                                                                                                      |
| <b>COMM1: Test monitor on</b>                                                                                                                                                                                                                                                                       |         |     |      | 003 166                                                                                                              |
| 0: No                                                                                                                                                                                                                                                                                               |         |     |      |                                                                                                                      |
| <a href="#">Fig. 3-14, (p. 3-23)</a><br><a href="#">Fig. 3-15, (p. 3-24)</a><br><a href="#">Fig. 3-16, (p. 3-25)</a><br><a href="#">Fig. 3-17, (p. 3-26)</a><br><a href="#">Fig. 3-18, (p. 3-27)</a><br><a href="#">Fig. 3-19, (p. 3-28)</a>                                                        |         |     |      |                                                                                                                      |
| Setting specifying whether data shall be recorded for service activities.                                                                                                                                                                                                                           |         |     |      |                                                                                                                      |
| <b>COMM1: Name of manufacturer</b>                                                                                                                                                                                                                                                                  |         |     |      | 003 161                                                                                                              |
| 1: SE                                                                                                                                                                                                                                                                                               |         |     |      |                                                                                                                      |
| <a href="#">Fig. 3-14, (p. 3-23)</a><br><a href="#">Fig. 3-15, (p. 3-24)</a><br><a href="#">Fig. 3-16, (p. 3-25)</a>                                                                                                                                                                                |         |     |      |                                                                                                                      |
| Setting for the name of the manufacturer.                                                                                                                                                                                                                                                           |         |     |      |                                                                                                                      |
| Note:                                                                                                                                                                                                                                                                                               |         |     |      |                                                                                                                      |
| <ul style="list-style-type: none"> <li>● This setting can be changed to ensure compatibility.</li> <li>● This setting is hidden unless an IEC 870-5 protocol is enabled.</li> </ul>                                                                                                                 |         |     |      |                                                                                                                      |
| <b>COMM1: Octet address ASDU</b>                                                                                                                                                                                                                                                                    |         |     |      | 003 073                                                                                                              |
| 1                                                                                                                                                                                                                                                                                                   | 0       | 255 |      | <a href="#">Fig. 3-14, (p. 3-23)</a><br><a href="#">Fig. 3-15, (p. 3-24)</a><br><a href="#">Fig. 3-16, (p. 3-25)</a> |
| The communication address and the ASDU address are used to identify the device in communication via the interface. An identical setting must be selected for both addresses.                                                                                                                        |         |     |      |                                                                                                                      |
| Note: This setting is hidden unless an IEC 870-5 protocol is enabled.                                                                                                                                                                                                                               |         |     |      |                                                                                                                      |
| “ASDU”: Application Service Data Unit                                                                                                                                                                                                                                                               |         |     |      |                                                                                                                      |
| <b>COMM1: Spontan. sig. enable</b>                                                                                                                                                                                                                                                                  |         |     |      | 003 177                                                                                                              |
| 65535: All                                                                                                                                                                                                                                                                                          |         |     |      |                                                                                                                      |
| <a href="#">Fig. 3-14, (p. 3-23)</a><br><a href="#">Fig. 3-15, (p. 3-24)</a><br><a href="#">Fig. 3-16, (p. 3-25)</a>                                                                                                                                                                                |         |     |      |                                                                                                                      |
| Enable for the transmission of spontaneous signals via the communication interface.                                                                                                                                                                                                                 |         |     |      |                                                                                                                      |
| Note: This setting is hidden unless an IEC 870-5 protocol is enabled.                                                                                                                                                                                                                               |         |     |      |                                                                                                                      |

| Parameter                                                                                                                                                 |     |      |       | Address                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|-------|----------------------------------------------------------------------|
| Default                                                                                                                                                   | Min | Max  | Unit  | Logic Diagram                                                        |
| <b>COMM1: Select. spontan.sig.</b>                                                                                                                        |     |      |       | 003 179                                                              |
| 060 000: MAIN: Without function                                                                                                                           |     |      |       | Fig. 3-14, (p. 3-23)<br>Fig. 3-15, (p. 3-24)<br>Fig. 3-16, (p. 3-25) |
| Selection of spontaneous signals for transmission via “logical” communication interface 1.                                                                |     |      |       |                                                                      |
| <b>COMM1: Transm.enab.cycl.dat</b>                                                                                                                        |     |      |       | 003 074                                                              |
| 0: Without                                                                                                                                                |     |      |       | Fig. 3-14, (p. 3-23)<br>Fig. 3-15, (p. 3-24)<br>Fig. 3-16, (p. 3-25) |
| Enabling of cyclic transmission of measured values via the communication interface.                                                                       |     |      |       |                                                                      |
| Note: This setting is hidden unless an IEC 870-5 protocol is enabled.                                                                                     |     |      |       |                                                                      |
| <b>COMM1: Cycl. data ILS tel.</b>                                                                                                                         |     |      |       | 003 175                                                              |
| 060 000: MAIN: Without function                                                                                                                           |     |      |       | Fig. 3-14, (p. 3-23)<br>Fig. 3-15, (p. 3-24)<br>Fig. 3-16, (p. 3-25) |
| Selection of the measured values that are transmitted in a user-defined telegram via the communication interface.                                         |     |      |       |                                                                      |
| Note: This setting is hidden unless an IEC 870-5 protocol is enabled.                                                                                     |     |      |       |                                                                      |
| <b>COMM1: Delta V</b>                                                                                                                                     |     |      |       | 003 050                                                              |
| 3.0                                                                                                                                                       | 0.0 | 15.0 | %Vnom | Fig. 3-14, (p. 3-23)<br>Fig. 3-15, (p. 3-24)<br>Fig. 3-16, (p. 3-25) |
| A measured voltage value is transmitted via the communication interface if it differs by the set delta quantity from the last measured value transmitted. |     |      |       |                                                                      |
| Note: This setting is hidden unless an IEC 870-5 protocol is enabled.                                                                                     |     |      |       |                                                                      |
| <b>COMM1: Delta I</b>                                                                                                                                     |     |      |       | 003 051                                                              |
| 3.0                                                                                                                                                       | 0.0 | 15.0 | %Inom | Fig. 3-14, (p. 3-23)<br>Fig. 3-15, (p. 3-24)<br>Fig. 3-16, (p. 3-25) |
| A measured current value is transmitted via the communication interface if it differs by the set delta quantity from the last measured value transmitted. |     |      |       |                                                                      |
| Note: This setting is hidden unless an IEC 870-5 protocol is enabled.                                                                                     |     |      |       |                                                                      |
| <b>COMM1: Delta P</b>                                                                                                                                     |     |      |       | 003 054                                                              |
| 15.0                                                                                                                                                      | 0.0 | 15.0 | %Snom | Fig. 3-14, (p. 3-23)<br>Fig. 3-15, (p. 3-24)<br>Fig. 3-16, (p. 3-25) |
| The active power value is transmitted via the communication interface if it differs by the set delta quantity from the last measured value transmitted.   |     |      |       |                                                                      |
| Note: This setting is hidden unless an IEC 870-5 protocol is enabled.                                                                                     |     |      |       |                                                                      |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                             | Address |      |       |                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|-------|----------------------------------------------------------------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                               | Min     | Max  | Unit  | Logic Diagram                                                        |
| <b>COMM1: Delta f</b>                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |      |       | 003 052                                                              |
| 2.0                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.0     | 2.0  | %fnom | Fig. 3-14, (p. 3-23)<br>Fig. 3-15, (p. 3-24)<br>Fig. 3-16, (p. 3-25) |
| The measured frequency value is transmitted via the communication interface if it differs by the set delta quantity from the last measured value transmitted.<br>Note: This setting is hidden unless an IEC 870-5 protocol is enabled.                                                                                                                                                                                                                |         |      |       |                                                                      |
| <b>COMM1: Delta meas.v.ILS tel</b>                                                                                                                                                                                                                                                                                                                                                                                                                    |         |      |       | 003 150                                                              |
| 3.0                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.0     | 15.0 |       | Fig. 3-14, (p. 3-23)<br>Fig. 3-15, (p. 3-24)<br>Fig. 3-16, (p. 3-25) |
| The telegram is transmitted if a measured value from the transformer module at slot 03-04 differs by the set delta quantity from the last measured value transmitted.                                                                                                                                                                                                                                                                                 |         |      |       |                                                                      |
| <b>COMM1: Delta t</b>                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |      |       | 003 053                                                              |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0       | 15   | min   | Fig. 3-14, (p. 3-23)<br>Fig. 3-15, (p. 3-24)<br>Fig. 3-16, (p. 3-25) |
| All measured values are transmitted again via the communication interface after this time period has elapsed – provided that transmission has not been triggered by the other delta conditions.<br>Note: This setting is hidden unless an IEC 870-5 protocol is enabled.                                                                                                                                                                              |         |      |       |                                                                      |
| <b>COMM1: Delta t (energy)</b>                                                                                                                                                                                                                                                                                                                                                                                                                        |         |      |       | 003 151                                                              |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0       | 15   | min   | Fig. 3-14, (p. 3-23)<br>Fig. 3-15, (p. 3-24)<br>Fig. 3-16, (p. 3-25) |
| The measured values for active energy and reactive energy are transmitted via the communication interface after this time has elapsed.<br>Note: This setting is hidden unless an IEC 870-5 protocol is enabled.                                                                                                                                                                                                                                       |         |      |       |                                                                      |
| <b>COMM1: Contin. general scan</b>                                                                                                                                                                                                                                                                                                                                                                                                                    |         |      |       | 003 077                                                              |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                               | 10      | 9000 | s     | Fig. 3-14, (p. 3-23)<br>Fig. 3-15, (p. 3-24)<br>Fig. 3-16, (p. 3-25) |
| A continuous or background general scan means that the C434 transmits all settings, signals, and monitoring signals through the communication interface during slow periods when there is not much activity. This ensures that there will be data consistency with a connected control system. The time to be set defines the minimum time difference between two telegrams.<br>Note: This setting is hidden unless an IEC 870-5 protocol is enabled. |         |      |       |                                                                      |



| Parameter                                                                                                                                                                                                               |     |     |      |                      | Address              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|----------------------|----------------------|
| Default                                                                                                                                                                                                                 | Min | Max | Unit |                      | Logic Diagram        |
| COMM1: Comm. address length                                                                                                                                                                                             |     |     |      |                      | 003 201              |
| 1                                                                                                                                                                                                                       | 1   | 2   | Byte | Fig. 3-15, (p. 3-24) |                      |
| Setting for the communication address length.<br>Note: This setting is hidden unless the IEC 870-5-101 protocol is set.                                                                                                 |     |     |      |                      |                      |
| COMM1: Octet 2 comm. addr.                                                                                                                                                                                              |     |     |      |                      | 003 200              |
| 0                                                                                                                                                                                                                       | 0   | 255 |      | Fig. 3-15, (p. 3-24) |                      |
| Setting for the length of the higher-order communication address.<br>Note: This setting is hidden unless the IEC 870-5-101 protocol is set.                                                                             |     |     |      |                      |                      |
| COMM1: Cause transm. length                                                                                                                                                                                             |     |     |      |                      | 003 192              |
| 1: W/o source address                                                                                                                                                                                                   |     |     |      |                      | Fig. 3-15, (p. 3-24) |
| Setting for the length of the cause of transmission.<br>Note: This setting is hidden unless the IEC 870-5-101 protocol is set.                                                                                          |     |     |      |                      |                      |
| COMM1: Address length ASDU                                                                                                                                                                                              |     |     |      |                      | 003 193              |
| 1                                                                                                                                                                                                                       | 1   | 2   | Byte | Fig. 3-15, (p. 3-24) |                      |
| Setting for the length of the common address for identification of telegram structures.<br>Note: This setting is hidden unless the IEC 870-5-101 protocol is set.<br>"ASDU": Application Service Data Unit              |     |     |      |                      |                      |
| COMM1: Octet 2 addr. ASDU                                                                                                                                                                                               |     |     |      |                      | 003 194              |
| 0                                                                                                                                                                                                                       | 0   | 255 |      | Fig. 3-15, (p. 3-24) |                      |
| Setting for the length of the common higher-order address for identification of telegram structures.<br>Note: This setting is hidden unless the IEC 870-5-101 protocol is set.<br>"ASDU": Application Service Data Unit |     |     |      |                      |                      |
| COMM1: Addr.length inf.obj.                                                                                                                                                                                             |     |     |      |                      | 003 196              |
| 2                                                                                                                                                                                                                       | 2   | 3   | Byte | Fig. 3-15, (p. 3-24) |                      |
| Setting for the length of the address for information objects.<br>Note: This setting is hidden unless the IEC 870-5-101 protocol is set.                                                                                |     |     |      |                      |                      |
| COMM1: Oct.3 addr. inf.obj.                                                                                                                                                                                             |     |     |      |                      | 003 197              |
| 0                                                                                                                                                                                                                       | 0   | 255 |      | Fig. 3-15, (p. 3-24) |                      |
| Setting for the length of the higher-order address for information objects.<br>Note: This setting is hidden unless the IEC 870-5-101 protocol is set.                                                                   |     |     |      |                      |                      |
| COMM1: Inf.No.<->funct.type                                                                                                                                                                                             |     |     |      |                      | 003 195              |
| 0: No                                                                                                                                                                                                                   |     |     |      |                      | Fig. 3-15, (p. 3-24) |
| Setting specifying whether information numbers and function type shall be reversed in the object address.<br>Note: This setting is hidden unless the IEC 870-5-101 protocol is set.                                     |     |     |      |                      |                      |

| Parameter                                                                                                                                                                                                                        | Address |      |      |                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|------|----------------------|
| Default                                                                                                                                                                                                                          | Min     | Max  | Unit | Logic Diagram        |
| <b>COMM1: Time tag length</b>                                                                                                                                                                                                    |         |      |      | 003 198              |
| 3: 3                                                                                                                                                                                                                             |         |      | Byte | Fig. 3-15, (p. 3-24) |
| Setting for the time tag length.<br>Note: This setting is hidden unless the IEC 870-5-101 protocol is set.                                                                                                                       |         |      |      |                      |
| <b>COMM1: ASDU1 / ASDU20 conv.</b>                                                                                                                                                                                               |         |      |      | 003 190              |
| 1: Single signal                                                                                                                                                                                                                 |         |      |      | Fig. 3-15, (p. 3-24) |
| Setting specifying whether telegram structure 1 or 20 shall be converted as a single signal or double signal.<br>Note: This setting is hidden unless the IEC 870-5-101 protocol is set.<br>"ASDU": Application Service Data Unit |         |      |      |                      |
| <b>COMM1: ASDU2 conversion</b>                                                                                                                                                                                                   |         |      |      | 003 191              |
| 1: Single signal                                                                                                                                                                                                                 |         |      |      | Fig. 3-15, (p. 3-24) |
| Setting specifying whether telegram structure 2 shall be converted as a single signal or double signal.<br>Note: This setting is hidden unless the IEC 870-5-101 protocol is set.<br>"ASDU": Application Service Data Unit       |         |      |      |                      |
| <b>COMM1: Initializ. signal</b>                                                                                                                                                                                                  |         |      |      | 003 199              |
| 1: Yes                                                                                                                                                                                                                           |         |      |      | Fig. 3-15, (p. 3-24) |
| Setting specifying whether an initialization signal shall be issued.<br>Note: This setting is hidden unless the IEC 870-5-101 protocol is set.                                                                                   |         |      |      |                      |
| <b>COMM1: Balanced operation</b>                                                                                                                                                                                                 |         |      |      | 003 226              |
| 0: No                                                                                                                                                                                                                            |         |      |      | Fig. 3-15, (p. 3-24) |
| Setting that determines whether communication takes place on a balanced basis (full duplex operation).<br>Note: This setting is hidden unless the IEC 870-5-101 protocol is set.                                                 |         |      |      |                      |
| <b>COMM1: Direction bit</b>                                                                                                                                                                                                      |         |      |      | 003 227              |
| 0                                                                                                                                                                                                                                | 0       | 1    |      | Fig. 3-15, (p. 3-24) |
| Setting for the transmission direction. Normally this value will be set to '1' at the control center and to '0' at the substation.<br>Note: This setting is hidden unless the IEC 870-5-101 protocol is enabled.                 |         |      |      |                      |
| <b>COMM1: Time-out interval</b>                                                                                                                                                                                                  |         |      |      | 003 228              |
| 0.40                                                                                                                                                                                                                             | 0.10    | 2.55 | s    | Fig. 3-15, (p. 3-24) |
| Setting for the maximum time that will elapse until the status signal for the acknowledgment command is issued.<br>Note: This setting is hidden unless the IEC 870-5-101 protocol is set.                                        |         |      |      |                      |

| Parameter                                                                                                                                                                                                                                                  | Address |     |      |                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|--------------------------------------|
| Default                                                                                                                                                                                                                                                    | Min     | Max | Unit | Logic Diagram                        |
| <b>COMM1: Reg.asg. selec. cmds</b>                                                                                                                                                                                                                         |         |     |      | 003 210                              |
| 060 000: MAIN: Without function <a href="#">Fig. 3-17, (p. 3-26)</a>                                                                                                                                                                                       |         |     |      |                                      |
| MODBUS registers in the range 00301 to 00400 are assigned to the selected commands. Assignment is made in the order of selection. This means that the first command is given the register no. 00301, the second the register no. 00302, etc.               |         |     |      |                                      |
| Note: This setting is hidden unless the MODBUS protocol is enabled.                                                                                                                                                                                        |         |     |      |                                      |
| <b>COMM1: Reg.asg. selec. sig.</b>                                                                                                                                                                                                                         |         |     |      | 003 211                              |
| 060 000: MAIN: Without function <a href="#">Fig. 3-17, (p. 3-26)</a>                                                                                                                                                                                       |         |     |      |                                      |
| MODBUS registers in the range 10301 to 10400 are assigned to the selected signals. Assignment is made in the order of selection. This means that the first signal is given the register no. 10301, the second the register no. 10302, etc.                 |         |     |      |                                      |
| Note: This setting is hidden unless the MODBUS protocol is enabled.                                                                                                                                                                                        |         |     |      |                                      |
| <b>COMM1: Reg.asg. sel. m.val.</b>                                                                                                                                                                                                                         |         |     |      | 003 212                              |
| 060 000: MAIN: Without function <a href="#">Fig. 3-17, (p. 3-26)</a>                                                                                                                                                                                       |         |     |      |                                      |
| MODBUS registers in the range 30301 to 30400 are assigned to the selected measured values. Assignment is made in the order of selection. This means that the first measured value is given the register no. 30301, the second the register no. 30302, etc. |         |     |      |                                      |
| Note: This setting is hidden unless the MODBUS protocol is enabled.                                                                                                                                                                                        |         |     |      |                                      |
| <b>COMM1: Reg.asg. sel. param.</b>                                                                                                                                                                                                                         |         |     |      | 003 213                              |
| 060 000: MAIN: Without function <a href="#">Fig. 3-17, (p. 3-26)</a>                                                                                                                                                                                       |         |     |      |                                      |
| MODBUS registers in the range 40301 to 40400 are assigned to the selected parameters. Assignment is made in the order of selection. This means that the first parameter is given the register no. 40301, the second the register no. 40302, etc.           |         |     |      |                                      |
| Note: This setting is hidden unless the MODBUS protocol is enabled.                                                                                                                                                                                        |         |     |      |                                      |
| <b>COMM1: Delta t (MODBUS)</b>                                                                                                                                                                                                                             |         |     |      | 003 152                              |
| 5                                                                                                                                                                                                                                                          | 1       | 120 | s    | <a href="#">Fig. 3-17, (p. 3-26)</a> |
| All MODBUS registers are transmitted again through the communication interface after this time has elapsed.                                                                                                                                                |         |     |      |                                      |
| Note: This setting is hidden unless the MODBUS protocol is enabled.                                                                                                                                                                                        |         |     |      |                                      |
| <b>COMM1: Autom.event confirm.</b>                                                                                                                                                                                                                         |         |     |      | 003 249                              |
| 0: Without <a href="#">Fig. 3-17, (p. 3-26)</a>                                                                                                                                                                                                            |         |     |      |                                      |
| Setting specifying whether an event must be confirmed by the master in order for an event to be deleted from the 'event queue'.                                                                                                                            |         |     |      |                                      |
| Note: This setting is hidden unless the MODBUS protocol is enabled.                                                                                                                                                                                        |         |     |      |                                      |

| Parameter                                                                                                                                  | Address |      |      |                      |
|--------------------------------------------------------------------------------------------------------------------------------------------|---------|------|------|----------------------|
| Default                                                                                                                                    | Min     | Max  | Unit | Logic Diagram        |
| <b>COMM1: Phys. Charact. Delay</b>                                                                                                         |         |      |      | 003 241              |
| 0                                                                                                                                          | 0       | 254  | Bit  | Fig. 3-18, (p. 3-27) |
| Number of bits that must pass between the receipt of the 'request' and the start of sending the 'response'.                                |         |      |      |                      |
| Note: This setting is hidden unless the DNP 3.0 protocol is enabled.                                                                       |         |      |      |                      |
| <b>COMM1: Phys. Char. Timeout</b>                                                                                                          |         |      |      | 003 242              |
| 40                                                                                                                                         | 0       | 254  | Bit  | Fig. 3-18, (p. 3-27) |
| Number of bits that may be missing from the telegram before receipt is terminated.                                                         |         |      |      |                      |
| Note: This setting is hidden unless the DNP 3.0 protocol is enabled.                                                                       |         |      |      |                      |
| <b>COMM1: Link Confirm. Mode</b>                                                                                                           |         |      |      | 003 243              |
| 1: Multi-frame fragment                                                                                                                    |         |      |      | Fig. 3-18, (p. 3-27) |
| Setting for the acknowledgment mode of the link layer.                                                                                     |         |      |      |                      |
| Note: This setting is hidden unless the DNP 3.0 protocol is enabled.                                                                       |         |      |      |                      |
| <b>COMM1: Link Confirm.Timeout</b>                                                                                                         |         |      |      | 003 244              |
| 0.10                                                                                                                                       | 0.05    | 2.54 | s    | Fig. 3-18, (p. 3-27) |
| Setting for the time period within which the master must acknowledge at the link layer.                                                    |         |      |      |                      |
| Note: This setting is hidden unless the DNP 3.0 protocol is enabled.                                                                       |         |      |      |                      |
| <b>COMM1: Link Max. Retries</b>                                                                                                            |         |      |      | 003 245              |
| 2                                                                                                                                          | 1       | 10   |      | Fig. 3-18, (p. 3-27) |
| Number of repetitions that are carried out on the link layer if errors have occurred during transmission (such as failure to acknowledge). |         |      |      |                      |
| Note: This setting is hidden unless the DNP 3.0 protocol is enabled.                                                                       |         |      |      |                      |
| <b>COMM1: Appl.Confirm.Timeout</b>                                                                                                         |         |      |      | 003 246              |
| 5.0                                                                                                                                        | 0.5     | 25.4 | s    | Fig. 3-18, (p. 3-27) |
| Setting for the time period within which the master must acknowledge at the application layer.                                             |         |      |      |                      |
| Note: This setting is hidden unless the DNP 3.0 protocol is enabled.                                                                       |         |      |      |                      |
| <b>COMM1: Appl. Need Time Del.</b>                                                                                                         |         |      |      | 003 247              |
| 60                                                                                                                                         | 5       | 254  | s    | Fig. 3-18, (p. 3-27) |
| Time interval within which the slave requests time synchronization cyclically from the master.                                             |         |      |      |                      |
| Note: This setting is hidden unless the DNP 3.0 protocol is enabled.                                                                       |         |      |      |                      |

| Parameter                                                                                                                                                                                                                                                                                                        |     |     |      | Address              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|----------------------|
| Default                                                                                                                                                                                                                                                                                                          | Min | Max | Unit | Logic Diagram        |
| <b>COMM1: Ind./cl. bin. inputs</b>                                                                                                                                                                                                                                                                               |     |     |      | 003 232              |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                  |     |     |      | Fig. 3-18, (p. 3-27) |
| Selection of data points and data classes for object 1 – binary inputs. Assignment of indices is made in the order of selection, beginning with 0. Note: This setting is hidden unless the DNP 3.0 protocol is enabled.                                                                                          |     |     |      |                      |
| <b>COMM1: Ind./cl. bin. outputs</b>                                                                                                                                                                                                                                                                              |     |     |      | 003 233              |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                  |     |     |      | Fig. 3-18, (p. 3-27) |
| Selection of data points and data classes for object 10 – binary outputs. Assignment of indices is made in the order of selection, beginning with 0. Note: This setting is hidden unless the DNP 3.0 protocol is enabled.                                                                                        |     |     |      |                      |
| <b>COMM1: Ind./cl. bin. count.</b>                                                                                                                                                                                                                                                                               |     |     |      | 003 234              |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                  |     |     |      | Fig. 3-18, (p. 3-27) |
| Selection of data points and data classes for object 20 – binary counters. Assignment of indexes is made in the order of selection, beginning with 0. Note: This setting is hidden unless the DNP 3.0 protocol is enabled.                                                                                       |     |     |      |                      |
| <b>COMM1: Ind./cl. analog inp.</b>                                                                                                                                                                                                                                                                               |     |     |      | 003 235              |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                  |     |     |      | Fig. 3-18, (p. 3-27) |
| Selection of data points and data classes for object 30 – analog inputs. Assignment of indices is made in the order of selection, beginning with 0. Note: This setting is hidden unless the DNP 3.0 protocol is enabled.                                                                                         |     |     |      |                      |
| <b>COMM1: Ind./cl. analog outp</b>                                                                                                                                                                                                                                                                               |     |     |      | 003 236              |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                  |     |     |      | Fig. 3-18, (p. 3-27) |
| Selection of data points and data classes for object 40 – analog outputs. Assignment of indices is made in the order of selection, beginning with 0. Note: This setting is hidden unless the DNP 3.0 protocol is enabled.                                                                                        |     |     |      |                      |
| <b>COMM1: Delta meas.v. (DNP3)</b>                                                                                                                                                                                                                                                                               |     |     |      | 003 250              |
| 16                                                                                                                                                                                                                                                                                                               | 0   | 255 |      | Fig. 3-18, (p. 3-27) |
| Initialization value of threshold values for transmission of measured values in object 30. The threshold values can be changed separately by the master for each measured value by writing to object 34, 'analog input reporting deadband'. Note: This setting is hidden unless the DNP 3.0 protocol is enabled. |     |     |      |                      |
| <b>COMM1: Delta t (DNP3)</b>                                                                                                                                                                                                                                                                                     |     |     |      | 003 248              |
| 5                                                                                                                                                                                                                                                                                                                | 1   | 120 | s    | Fig. 3-18, (p. 3-27) |
| Cycle time for updating DNP object 30 (analog inputs). Note: This setting is hidden unless the DNP 3.0 protocol is enabled.                                                                                                                                                                                      |     |     |      |                      |

| Parameter                                                                                 |     |     |                      | Address              |
|-------------------------------------------------------------------------------------------|-----|-----|----------------------|----------------------|
| Default                                                                                   | Min | Max | Unit                 | Logic Diagram        |
| COMM1: Command selection                                                                  |     |     |                      | 103 042              |
| 060 000: MAIN: Without function                                                           |     |     | Fig. 3-19, (p. 3-28) |                      |
| Selection of commands to be issued via the COURIER protocol.                              |     |     |                      |                      |
| Note: This setting is hidden unless the COURIER protocol is enabled.                      |     |     |                      |                      |
| COMM1: Signal selection                                                                   |     |     |                      | 103 043              |
| 060 000: MAIN: Without function                                                           |     |     | Fig. 3-19, (p. 3-28) |                      |
| Selection of signals to be transmitted via the COURIER protocol.                          |     |     |                      |                      |
| Note: This setting is hidden unless the COURIER protocol is enabled.                      |     |     |                      |                      |
| COMM1: Meas. val. selection                                                               |     |     |                      | 103 044              |
| 060 000: MAIN: Without function                                                           |     |     | Fig. 3-19, (p. 3-28) |                      |
| Selection of measured values to be transmitted via the Courier protocol.                  |     |     |                      |                      |
| Note: This setting is hidden unless the Courier protocol is enabled.                      |     |     |                      |                      |
| COMM1: Parameter selection                                                                |     |     |                      | 103 045              |
| 060 000: MAIN: Without function                                                           |     |     | Fig. 3-19, (p. 3-28) |                      |
| Selection of settings to be altered via the Courier protocol.                             |     |     |                      |                      |
| Note: This setting is hidden unless the Courier protocol is enabled.                      |     |     |                      |                      |
| COMM1: Delta t (COURIER)                                                                  |     |     |                      | 103 046              |
| 5                                                                                         | 1   | 120 | s                    | Fig. 3-19, (p. 3-28) |
| Cycle time at the conclusion of which the selected measured values are again transmitted. |     |     |                      |                      |
| Note: This setting is hidden unless the COURIER protocol is enabled.                      |     |     |                      |                      |

“Logical”  
communication  
interface 2

| Parameter                                                                                                                                                                                                                 | Address |     |      |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                                                   | Min     | Max | Unit | Logic Diagram |
| COMM2: Function group COMM2                                                                                                                                                                                               |         |     |      | 056 057       |
| 0: Without                                                                                                                                                                                                                |         |     |      |               |
| Cancelling function group COMM2 or including it in the configuration. If the function group is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |         |     |      |               |
| COMM2: General enable USER                                                                                                                                                                                                |         |     |      | 103 170       |
| 0: No                                                                                                                                                                                                                     |         |     |      |               |
| Fig. 3-22, (p. 3-31)<br>Fig. 3-23, (p. 3-32)                                                                                                                                                                              |         |     |      |               |
| Disabling or enabling communication interface 2.                                                                                                                                                                          |         |     |      |               |
| COMM2: IEC 870-5-103 enabl.                                                                                                                                                                                               |         |     |      | 103 105       |
| 0: No                                                                                                                                                                                                                     |         |     |      |               |
| Fig. 3-21, (p. 3-30)<br>Fig. 3-22, (p. 3-31)                                                                                                                                                                              |         |     |      |               |
| Enabling settings for protocol based on IEC 870-5-103.                                                                                                                                                                    |         |     |      |               |
| COMM2: MODBUS-Master enable                                                                                                                                                                                               |         |     |      | 103 077       |
| 0: No                                                                                                                                                                                                                     |         |     |      |               |
| Fig. 3-21, (p. 3-30)<br>Fig. 3-23, (p. 3-32)                                                                                                                                                                              |         |     |      |               |
| Enabling settings for the MODBUS master protocol.                                                                                                                                                                         |         |     |      |               |
| COMM2: Communicat. protocol                                                                                                                                                                                               |         |     |      | 103 107       |
| 060 000: MAIN: Without function                                                                                                                                                                                           |         |     |      |               |
| Fig. 3-21, (p. 3-30)                                                                                                                                                                                                      |         |     |      |               |
| Select the communication protocol that shall be used for the communication interface.                                                                                                                                     |         |     |      |               |
| COMM2: Line idle state                                                                                                                                                                                                    |         |     |      | 103 165       |
| 1: Light on / high                                                                                                                                                                                                        |         |     |      |               |
| Fig. 3-22, (p. 3-31)<br>Fig. 3-23, (p. 3-32)                                                                                                                                                                              |         |     |      |               |
| Setting for the line idle state indication.                                                                                                                                                                               |         |     |      |               |
| COMM2: Baud rate                                                                                                                                                                                                          |         |     |      | 103 071       |
| 19.2: 19.2 kBaud                                                                                                                                                                                                          |         |     |      |               |
| Baud                                                                                                                                                                                                                      |         |     |      |               |
| Fig. 3-22, (p. 3-31)<br>Fig. 3-23, (p. 3-32)                                                                                                                                                                              |         |     |      |               |
| Baud rate of the communication interface.                                                                                                                                                                                 |         |     |      |               |
| COMM2: Parity bit                                                                                                                                                                                                         |         |     |      | 103 171       |
| 2: Even                                                                                                                                                                                                                   |         |     |      |               |
| Fig. 3-22, (p. 3-31)<br>Fig. 3-23, (p. 3-32)                                                                                                                                                                              |         |     |      |               |
| Set the same parity that is set at the interface of the control system connected to the C434.                                                                                                                             |         |     |      |               |

| Parameter                                                                                                                                                                    | Address |     |      |                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|-----------------------------------|
| Default                                                                                                                                                                      | Min     | Max | Unit | Logic Diagram                     |
| COMM2: Dead time monitoring                                                                                                                                                  |         |     |      | 103 176                           |
| 1: Yes <span>Fig. 3-22, (p. 3-31)</span>                                                                                                                                     |         |     |      |                                   |
| The C434 monitors telegram transmission to make sure that no excessive pause occurs within a telegram. This monitoring function can be disabled if it is not required.       |         |     |      |                                   |
| Note: This setting is only necessary for modem transmission.                                                                                                                 |         |     |      |                                   |
| COMM2: Mon. time polling                                                                                                                                                     |         |     |      | 103 202                           |
| 25                                                                                                                                                                           | 3       | 254 | s    | <span>Fig. 3-22, (p. 3-31)</span> |
| The time between two polling calls from the communication master must be less than the time set here.                                                                        |         |     |      |                                   |
| COMM2: Positive ackn. fault                                                                                                                                                  |         |     |      | 103 203                           |
| 0: No                                                                                                                                                                        |         |     |      |                                   |
| It is possible to set whether or not faults can be acknowledged positively after transmission (and consequently deleted from the fault overview at the COMM2/PC interface).  |         |     |      |                                   |
| COMM2: Octet comm. address                                                                                                                                                   |         |     |      | 103 072                           |
| 1                                                                                                                                                                            | 0       | 254 |      | <span>Fig. 3-22, (p. 3-31)</span> |
| The communication address and the ASDU address are used to identify the device in communication via the interface. An identical setting must be selected for both addresses. |         |     |      |                                   |
| “ASDU”: Application Service Data Unit                                                                                                                                        |         |     |      |                                   |
| COMM2: Name of manufacturer                                                                                                                                                  |         |     |      | 103 161                           |
| 1: SE <span>Fig. 3-22, (p. 3-31)</span>                                                                                                                                      |         |     |      |                                   |
| Setting for the name of the manufacturer.                                                                                                                                    |         |     |      |                                   |
| Note: This setting can be changed to ensure compatibility.                                                                                                                   |         |     |      |                                   |
| COMM2: Octet address ASDU                                                                                                                                                    |         |     |      | 103 073                           |
| 1                                                                                                                                                                            | 0       | 255 |      | <span>Fig. 3-22, (p. 3-31)</span> |
| The communication address and the ASDU address are used to identify the device in communication via the interface. An identical setting must be selected for both addresses. |         |     |      |                                   |
| “ASDU”: Application Service Data Unit                                                                                                                                        |         |     |      |                                   |
| COMM2: Spontan. sig. enable                                                                                                                                                  |         |     |      | 103 177                           |
| 65535: All <span>Fig. 3-22, (p. 3-31)</span>                                                                                                                                 |         |     |      |                                   |
| Enable for the transmission of spontaneous signals via the communication interface.                                                                                          |         |     |      |                                   |
| COMM2: Select. spontan.sig.                                                                                                                                                  |         |     |      | 103 179                           |
| 060 000: MAIN: Without function <span>Fig. 3-22, (p. 3-31)</span>                                                                                                            |         |     |      |                                   |
| Selection of spontaneous signals for transmission via communication interface 2.                                                                                             |         |     |      |                                   |



| Parameter                                                                                                                                                             | Address |      |       |                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|-------|--------------------------------------|
| Default                                                                                                                                                               | Min     | Max  | Unit  | Logic Diagram                        |
| COMM2: Transm.enab.cycl.dat                                                                                                                                           |         |      |       | 103 074                              |
| 0: Without <a href="#">Fig. 3-22, (p. 3-31)</a>                                                                                                                       |         |      |       |                                      |
| Enable for the cyclic transmission of measured values via the communication interface.                                                                                |         |      |       |                                      |
| COMM2: Cycl. data ILS tel.                                                                                                                                            |         |      |       | 103 175                              |
| 060 000: MAIN: Without function <a href="#">Fig. 3-22, (p. 3-31)</a>                                                                                                  |         |      |       |                                      |
| Selection of the measured values transmitted in a user-defined telegram via the communication interface.                                                              |         |      |       |                                      |
| COMM2: Delta V                                                                                                                                                        |         |      |       | 103 050                              |
| 3.0                                                                                                                                                                   | 0.0     | 15.0 | %Vnom | <a href="#">Fig. 3-22, (p. 3-31)</a> |
| A measured voltage value is transmitted via the communication interface if it differs by the set delta quantity from the last measured value transmitted.             |         |      |       |                                      |
| COMM2: Delta I                                                                                                                                                        |         |      |       | 103 051                              |
| 3.0                                                                                                                                                                   | 0.0     | 15.0 | %Inom | <a href="#">Fig. 3-22, (p. 3-31)</a> |
| A measured current value is transmitted via the communication interface if it differs by the set delta quantity from the last measured value transmitted.             |         |      |       |                                      |
| COMM2: Delta P                                                                                                                                                        |         |      |       | 103 054                              |
| 15.0                                                                                                                                                                  | 0.0     | 15.0 | %Snom | <a href="#">Fig. 3-22, (p. 3-31)</a> |
| The active power value is transmitted via the communication interface if it differs by the set delta quantity from the last measured value transmitted.               |         |      |       |                                      |
| COMM2: Delta f                                                                                                                                                        |         |      |       | 103 052                              |
| 2.0                                                                                                                                                                   | 0.0     | 2.0  | %fnom | <a href="#">Fig. 3-22, (p. 3-31)</a> |
| The measured frequency value is transmitted via the communication interface if it differs by the set delta quantity from the last measured value transmitted.         |         |      |       |                                      |
| COMM2: Delta meas.v.,1 ILS                                                                                                                                            |         |      |       | 103 150                              |
| 3.0                                                                                                                                                                   | 0.0     | 15.0 |       | <a href="#">Fig. 3-22, (p. 3-31)</a> |
| The telegram is transmitted if a measured value from the transformer module at slot 03-04 differs by the set delta quantity from the last measured value transmitted. |         |      |       |                                      |
| COMM2: Delta meas.v.,2 ILS                                                                                                                                            |         |      |       | 102 114                              |
| 3.0                                                                                                                                                                   | 0.0     | 15.0 |       | <a href="#">Fig. 3-22, (p. 3-31)</a> |
| The telegram is transmitted if a measured value from the transformer module at slot 05-06 differs by the set delta quantity from the last measured value transmitted. |         |      |       |                                      |

| Parameter                                                                                                                                                                                       |     |       |      | Address                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|------|----------------------------------------------------------------------|
| Default                                                                                                                                                                                         | Min | Max   | Unit | Logic Diagram                                                        |
| COMM2: Delta t                                                                                                                                                                                  |     |       |      | 103 053                                                              |
| 1                                                                                                                                                                                               | 0   | 15    | min  | Fig. 3-22, (p. 3-31)                                                 |
| All measured values are transmitted again via the communication interface after this time period has elapsed – provided that transmission has not been triggered by the other delta conditions. |     |       |      |                                                                      |
| COMM2: Polling time                                                                                                                                                                             |     |       |      | 103 084                                                              |
| 500                                                                                                                                                                                             | 1   | 60000 | ms   | Fig. 3-23, (p. 3-32)                                                 |
| The time between two MODBUS queries.                                                                                                                                                            |     |       |      |                                                                      |
| COMM2: Max. response time                                                                                                                                                                       |     |       |      | 103 083                                                              |
| 1                                                                                                                                                                                               | 1   | 60    | s    | Fig. 3-23, (p. 3-32)                                                 |
| The time period the MODBUS master waits for a response on a query (exception: broadcast message for the time synchronization).                                                                  |     |       |      |                                                                      |
| COMM2: Oct. comm.addr. sl.4                                                                                                                                                                     |     |       |      | 103 082                                                              |
| 5                                                                                                                                                                                               | 1   | 247   |      | Fig. 3-23, (p. 3-32)                                                 |
| COMM2: Oct. comm.addr. sl.1                                                                                                                                                                     |     |       |      | 103 079                                                              |
| 2                                                                                                                                                                                               | 1   | 247   |      | Fig. 3-23, (p. 3-32)                                                 |
| COMM2: Oct. comm.addr. sl.2                                                                                                                                                                     |     |       |      | 103 080                                                              |
| 3                                                                                                                                                                                               | 1   | 247   |      | Fig. 3-23, (p. 3-32)                                                 |
| COMM2: Oct. comm.addr. sl.3                                                                                                                                                                     |     |       |      | 103 081                                                              |
| 4                                                                                                                                                                                               | 1   | 247   |      | Fig. 3-23, (p. 3-32)                                                 |
| Communication address of the MODBUS slaves.                                                                                                                                                     |     |       |      |                                                                      |
| COMM2: Sl. reg. clock sync.                                                                                                                                                                     |     |       |      | 103 086                                                              |
| 0                                                                                                                                                                                               | 0   | 65535 |      | Fig. 3-23, (p. 3-32)                                                 |
| Disabling or enabling the time synchronization function of the MODBUS master.<br>Note: The MODBUS slaves, linked to the MODBUS master must support this functionality.                          |     |       |      |                                                                      |
| COMM2: Clock synchroniz.                                                                                                                                                                        |     |       |      | 103 085                                                              |
| 0: Without                                                                                                                                                                                      |     |       |      | Fig. 3-23, (p. 3-32)                                                 |
| Register address of the time synchronization message.                                                                                                                                           |     |       |      |                                                                      |
| COMM2: Select.cmds. slave 4                                                                                                                                                                     |     |       |      | 103 099                                                              |
| 060 000: MAIN: Without function                                                                                                                                                                 |     |       |      | Fig. 3-23, (p. 3-32)<br>Fig. 3-25, (p. 3-34)<br>Fig. 3-26, (p. 3-34) |
| COMM2: Select.cmds. slave 1                                                                                                                                                                     |     |       |      | 103 096                                                              |
| 060 000: MAIN: Without function                                                                                                                                                                 |     |       |      | Fig. 3-23, (p. 3-32)<br>Fig. 3-25, (p. 3-34)<br>Fig. 3-26, (p. 3-34) |

| Parameter                                                                                                                                                                         |     |      |      | Address                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|------|----------------------------------------------------------------------|
| Default                                                                                                                                                                           | Min | Max  | Unit | Logic Diagram                                                        |
| COMM2: Select.cmds. slave 2                                                                                                                                                       |     |      |      | 103 097                                                              |
| 060 000: MAIN: Without function                                                                                                                                                   |     |      |      | Fig. 3-23, (p. 3-32)                                                 |
| COMM2: Select.cmds. slave 3                                                                                                                                                       |     |      |      | 103 098                                                              |
| 060 000: MAIN: Without function                                                                                                                                                   |     |      |      | Fig. 3-23, (p. 3-32)                                                 |
| List of instructions for a MODBUS slave for the command direction.<br>Note: The list of commands is transmitted spontaneously by a trigger and is not transmitted within a cycle. |     |      |      |                                                                      |
| COMM2: Sel. signals slave 4                                                                                                                                                       |     |      |      | 103 095                                                              |
| 060 000: MAIN: Without function                                                                                                                                                   |     |      |      | Fig. 3-23, (p. 3-32)<br>Fig. 3-27, (p. 3-35)<br>Fig. 3-28, (p. 3-36) |
| COMM2: Sel. signals slave 1                                                                                                                                                       |     |      |      | 103 092                                                              |
| 060 000: MAIN: Without function                                                                                                                                                   |     |      |      | Fig. 3-23, (p. 3-32)<br>Fig. 3-27, (p. 3-35)<br>Fig. 3-28, (p. 3-36) |
| COMM2: Sel. signals slave 2                                                                                                                                                       |     |      |      | 103 093                                                              |
| 060 000: MAIN: Without function                                                                                                                                                   |     |      |      | Fig. 3-23, (p. 3-32)                                                 |
| COMM2: Sel. signals slave 3                                                                                                                                                       |     |      |      | 103 094                                                              |
| 060 000: MAIN: Without function                                                                                                                                                   |     |      |      | Fig. 3-23, (p. 3-32)                                                 |
| List of instructions for a MODBUS slave for the monitoring direction.<br>Note: The list of information is processed cyclicly by the MODBUS master.                                |     |      |      |                                                                      |
| COMM2: Delta AS, group 4                                                                                                                                                          |     |      |      | 103 103                                                              |
| 0.0                                                                                                                                                                               | 0.0 | 15.0 | %    | Fig. 3-23, (p. 3-32)                                                 |
| COMM2: Delta AS, group 1                                                                                                                                                          |     |      |      | 103 100                                                              |
| 0.0                                                                                                                                                                               | 0.0 | 15.0 | %    | Fig. 3-23, (p. 3-32)                                                 |
| COMM2: Delta AS, group 2                                                                                                                                                          |     |      |      | 103 101                                                              |
| 0.0                                                                                                                                                                               | 0.0 | 15.0 | %    | Fig. 3-23, (p. 3-32)                                                 |
| COMM2: Delta AS, group 3                                                                                                                                                          |     |      |      | 103 102                                                              |
| 0.0                                                                                                                                                                               | 0.0 | 15.0 | %    | Fig. 3-23, (p. 3-32)                                                 |
| The telegram is transmitted if a measured value differs by the set delta quantity from the last measured value transmitted.                                                       |     |      |      |                                                                      |

IEC 61850  
Communication

| Parameter                                                                                                                                                                                                                                                                        | Address |     |      |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                                                                                                          | Min     | Max | Unit | Logic Diagram |
| IEC: Function group IEC                                                                                                                                                                                                                                                          |         |     |      | 056 059       |
| 0: Without                                                                                                                                                                                                                                                                       |         |     |      |               |
| Cancelling function group IEC or including it in the configuration. If the function group is cancelled from the configuration, then all associated settings and signals are hidden.                                                                                              |         |     |      |               |
| Important notice: Some of the parameters in function group IEC are set with the IEC 61850 configuration tool "IED Configurator", they cannot be modified from the local control panel (HMI) or with the operating program, and therefore these parameters are listed separately. |         |     |      |               |
| IEC: General enable USER                                                                                                                                                                                                                                                         |         |     |      | 104 000       |
| 0: No <a href="#">Fig. 3-31, (p. 3-53)</a>                                                                                                                                                                                                                                       |         |     |      |               |
| Enabling and disabling function group IEC.                                                                                                                                                                                                                                       |         |     |      |               |
| IEC: IEC 61850 enable                                                                                                                                                                                                                                                            |         |     |      | 104 077       |
| 0: No <a href="#">Fig. 3-31, (p. 3-53)</a>                                                                                                                                                                                                                                       |         |     |      |               |
| Disabling or enabling IEC 61850.                                                                                                                                                                                                                                                 |         |     |      |               |
| IEC: RSTP enable                                                                                                                                                                                                                                                                 |         |     |      | 105 182       |
| 0: No                                                                                                                                                                                                                                                                            |         |     |      |               |
| Enabling relevant settings for the RSTP protocol.                                                                                                                                                                                                                                |         |     |      |               |
| IEC: IEC60870-5-104 enable                                                                                                                                                                                                                                                       |         |     |      | 104 078       |
| 0: No <a href="#">Fig. 3-31, (p. 3-53)</a>                                                                                                                                                                                                                                       |         |     |      |               |
| Disabling or enabling IEC 60870-5-104.                                                                                                                                                                                                                                           |         |     |      |               |
| IEC: ETH COMM Mode                                                                                                                                                                                                                                                               |         |     |      | 104 080       |
| 1: PRP <a href="#">Fig. 3-31, (p. 3-53)</a>                                                                                                                                                                                                                                      |         |     |      |               |
| Selection of the redundant Ethernet protocol between <i>PRP</i> , <i>HSR</i> and <i>RSTP</i> .                                                                                                                                                                                   |         |     |      |               |
| IEC: IEC prot. variant                                                                                                                                                                                                                                                           |         |     |      | 104 084       |
| 060 000: MAIN: Without function <a href="#">Fig. 3-31, (p. 3-53)</a>                                                                                                                                                                                                             |         |     |      |               |
| Selection of the enabled Ethernet protocol.                                                                                                                                                                                                                                      |         |     |      |               |
| IEC: Block Port A/B                                                                                                                                                                                                                                                              |         |     |      | 104 073       |
| 0: No <a href="#">Fig. 3-31, (p. 3-53)</a>                                                                                                                                                                                                                                       |         |     |      |               |
| When Port A/B blocked is activated, Port A for SEB or Port A&B for REB will be disabled.                                                                                                                                                                                         |         |     |      |               |
| IEC: Block Port C                                                                                                                                                                                                                                                                |         |     |      | 104 074       |
| 0: No <a href="#">Fig. 3-31, (p. 3-53)</a>                                                                                                                                                                                                                                       |         |     |      |               |
| When Port C blocked is activated, Port C will be disabled.                                                                                                                                                                                                                       |         |     |      |               |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      | Address              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|----------------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Min | Max | Unit | Logic Diagram        |
| IEC: Switch Config. Bank                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |     |      | 104 043              |
| 0: don't execute                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | Fig. 3-31, (p. 3-53) |
| This parameter can only be sent individually. Accepting the previously set communication parameters as the active communication settings.                                                                                                                                                                                                                                                                                                                                    |     |     |      |                      |
| IEC: Active Config. Name                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |     |      | 104 045              |
| 2:                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      |                      |
| Name of the configuration bank currently valid.<br>Setting is carried out with the IED Configurator.                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |                      |
| IEC: Active Config. Vers.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      | 104 046              |
| 2:                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      |                      |
| Version number of the configuration bank currently valid.<br>Setting is carried out with the IED Configurator.                                                                                                                                                                                                                                                                                                                                                               |     |     |      |                      |
| IEC: Inact. Config. Name                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |     |      | 104 047              |
| 2:                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      |                      |
| Name of the inactive configuration bank.<br>Setting is carried out with the IED Configurator.                                                                                                                                                                                                                                                                                                                                                                                |     |     |      |                      |
| IEC: Inact. Config. Vers.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      | 104 048              |
| 2:                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      |                      |
| Version number of the inactive configuration bank.<br>Setting is carried out with the IED Configurator.                                                                                                                                                                                                                                                                                                                                                                      |     |     |      |                      |
| IEC: IED name                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |     |      | 104 057              |
| 2:                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      |                      |
| Explicitly assigned unit name for the function in the system (IED); is part of the Logical Device Name.<br>Setting is carried out with the IED Configurator.<br>Important note: According to the IEC standard the name must consist of only letters (A..Z, a..z), digits (0..9) and underscore characters (_), and neither a digit nor the underscore character must be the first character. Note that a non-standard name causes problems with the IEC 61850 communication. |     |     |      |                      |
| IEC: IP address                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |     |      | 104 001              |
| 2:                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      |                      |
| Assigned IP address of the device for the server function in the system.<br>Note: This is an information parameter ('read only') and its value is set from the "IED Configurator" with <i>Communications: IP Address</i> .                                                                                                                                                                                                                                                   |     |     |      |                      |

| Parameter                                                                                                                                                                                                                                                                                                                                    |     |       |      | Address       |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|------|---------------|--|
| Default                                                                                                                                                                                                                                                                                                                                      | Min | Max   | Unit | Logic Diagram |  |
| IEC: Subnet mask                                                                                                                                                                                                                                                                                                                             |     |       |      | 104 005       |  |
| 2:                                                                                                                                                                                                                                                                                                                                           |     |       |      |               |  |
| <p>The subnet mask defines which part of the IP address is addressed by the sub-network and which part by the device that is logged-on to the network.</p> <p>Note: This is an information parameter ('read only') and its value is set from the "IED Configurator" with <i>Communications: SubNet Mask</i>.</p>                             |     |       |      |               |  |
| IEC: Gateway address                                                                                                                                                                                                                                                                                                                         |     |       |      | 104 011       |  |
| 2:                                                                                                                                                                                                                                                                                                                                           |     |       |      |               |  |
| <p>This parameter shows the IPv4 address of the network gateway for communication links to clients outside of the local network.</p> <p>Note: This is an information parameter ('read only') and its value is set from the "IED Configurator" with <i>Communications: Gateway Address</i>.</p>                                               |     |       |      |               |  |
| IEC: IP address 2                                                                                                                                                                                                                                                                                                                            |     |       |      | 104 070       |  |
| 2:                                                                                                                                                                                                                                                                                                                                           |     |       |      |               |  |
| <p>Assigned IP address 2 of the device for the server function in the system.</p> <p>Note: This is an information parameter ('read only') and its value is set from the "IED Configurator" with <i>Communications: IP Address Interface 2 (If fitted)</i>.</p>                                                                               |     |       |      |               |  |
| IEC: Subnet mask 2                                                                                                                                                                                                                                                                                                                           |     |       |      | 104 071       |  |
| 2:                                                                                                                                                                                                                                                                                                                                           |     |       |      |               |  |
| <p>The subnet mask 2 defines which part of the IP address 2 is addressed by the sub-network and which part by the device that is logged-on to the network.</p> <p>Note: This is an information parameter ('read only') and its value is set from the "IED Configurator" with <i>Communications: SubNet Mask Interface 2 (If fitted)</i>.</p> |     |       |      |               |  |
| IEC: Gateway address 2                                                                                                                                                                                                                                                                                                                       |     |       |      | 104 072       |  |
| 2:                                                                                                                                                                                                                                                                                                                                           |     |       |      |               |  |
| <p>This parameter shows the IPv4 address of the network gateway 2 for communication links to clients outside of the local network.</p> <p>Note: This is an information parameter ('read only') and its value is set from the "IED Configurator" with <i>Communications: Gateway Address Interface 2 (If fitted)</i>.</p>                     |     |       |      |               |  |
| IEC: IP address VLAN 1                                                                                                                                                                                                                                                                                                                       |     |       |      | 104 091       |  |
| 2:                                                                                                                                                                                                                                                                                                                                           |     |       |      |               |  |
| IEC: IP address VLAN 2                                                                                                                                                                                                                                                                                                                       |     |       |      | 104 095       |  |
| 2:                                                                                                                                                                                                                                                                                                                                           |     |       |      |               |  |
| <p>Assigned IP address of VLAN in the system.</p> <p>Note: This is an information parameter ('read only') and its value is set from the "IED Configurator" with <i>Communications: IP Address</i>.</p>                                                                                                                                       |     |       |      |               |  |
| IEC: Identifier VLAN 1                                                                                                                                                                                                                                                                                                                       |     |       |      | 104 092       |  |
| 0                                                                                                                                                                                                                                                                                                                                            | 0   | 65535 |      |               |  |

| Parameter                                                                                                                                                                                                                                                                                                   |     |       |      | Address       |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|------|---------------|---------|
| Default                                                                                                                                                                                                                                                                                                     | Min | Max   | Unit | Logic Diagram |         |
| IEC: Identifier VLAN 2                                                                                                                                                                                                                                                                                      |     |       |      |               | 104 096 |
| 0                                                                                                                                                                                                                                                                                                           | 0   | 65535 |      |               |         |
| Assigned VLAN ID in the system.<br>Note: This is an information parameter ('read only') and its value is set from the "IED Configurator" with Communications: Vlan ID.                                                                                                                                      |     |       |      |               |         |
| IEC: Subnet mask VLAN 1                                                                                                                                                                                                                                                                                     |     |       |      |               | 104 093 |
| 2:                                                                                                                                                                                                                                                                                                          |     |       |      |               |         |
| IEC: Subnet mask VLAN 2                                                                                                                                                                                                                                                                                     |     |       |      |               | 104 097 |
| 2:                                                                                                                                                                                                                                                                                                          |     |       |      |               |         |
| The subnet mask of VLAN defines which part of the IP address is addressed by the sub-network and which part by the device that is logged-on to the network.<br>Note: This is an information parameter ('read only') and its value is set from the "IED Configurator" with Communications: VLAN Subnet Mask. |     |       |      |               |         |
| IEC: Gateway address VL 1                                                                                                                                                                                                                                                                                   |     |       |      |               | 104 094 |
| 2:                                                                                                                                                                                                                                                                                                          |     |       |      |               |         |
| IEC: Gateway address VL 2                                                                                                                                                                                                                                                                                   |     |       |      |               | 104 098 |
| 2:                                                                                                                                                                                                                                                                                                          |     |       |      |               |         |
| This parameter shows the network gateway of the VLAN for communication links to clients outside of the local network.<br>Note: This is an information parameter ('read only') and its value is set from the "IED Configurator" with Communications: Gateway Address.                                        |     |       |      |               |         |
| IEC: SNTP server 1 IP                                                                                                                                                                                                                                                                                       |     |       |      |               | 104 202 |
| 2:                                                                                                                                                                                                                                                                                                          |     |       |      |               |         |
| IP address of the preferred server used for clock synchronization.<br>Note: This is an information parameter ('read only') and its value is set from the "IED Configurator".                                                                                                                                |     |       |      |               |         |
| IEC: SNTP server 2 IP                                                                                                                                                                                                                                                                                       |     |       |      |               | 104 210 |
| 2:                                                                                                                                                                                                                                                                                                          |     |       |      |               |         |
| IP address of the backup server used for clock synchronization.<br>Note: This is an information parameter ('read only') and its value is set from the "IED Configurator".                                                                                                                                   |     |       |      |               |         |
| IEC: MAC address 1                                                                                                                                                                                                                                                                                          |     |       |      |               | 104 061 |
| 2:                                                                                                                                                                                                                                                                                                          |     |       |      |               |         |
| Mac address for Interface 1.<br>Note: This is an information parameter ('read only').                                                                                                                                                                                                                       |     |       |      |               |         |

| Parameter                                                                                                                                                                                                                                                                                                                                               | Address |     |      |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                                                                                                                                                                                 | Min     | Max | Unit | Logic Diagram |
| IEC: MAC address 2                                                                                                                                                                                                                                                                                                                                      |         |     |      | 104 217       |
| 2:                                                                                                                                                                                                                                                                                                                                                      |         |     |      |               |
| Mac address for Interface 2.<br>Note: This is an information parameter ('read only').                                                                                                                                                                                                                                                                   |         |     |      |               |
| IEC: MAC address 3                                                                                                                                                                                                                                                                                                                                      |         |     |      | 104 218       |
| 2:                                                                                                                                                                                                                                                                                                                                                      |         |     |      |               |
| Mac address for NIOS (HSR / PRP only).<br>Note: This is an information parameter ('read only').                                                                                                                                                                                                                                                         |         |     |      |               |
| IEC: SGCB ResvTms                                                                                                                                                                                                                                                                                                                                       |         |     |      | 104 199       |
| 30                                                                                                                                                                                                                                                                                                                                                      | 0       | 600 |      |               |
| The configuration attribute ResvTms defines the time interval in seconds for which the reservation of a SGCB is granted by a client. A reservation of a SGCB starts after a successful selection of a Setting Group using the service SelectEditSG. The client is granted to edit one or multiple parameters of this SGCB if this time has not elapsed. |         |     |      |               |
| IEC: SigGGIO1 selection                                                                                                                                                                                                                                                                                                                                 |         |     |      | 104 064       |
| 060 000: MAIN: Without function <span style="color: green;">Fig. 3-31, (p. 3-53)</span>                                                                                                                                                                                                                                                                 |         |     |      |               |
| Optional signal assignment for a transmission per communication protocol IEC 61850 based on the selection table of the binary inputs (opto coupler inputs).                                                                                                                                                                                             |         |     |      |               |
| IEC: RSTP priority                                                                                                                                                                                                                                                                                                                                      |         |     |      | 105 183       |
| 32768: 32768                                                                                                                                                                                                                                                                                                                                            |         |     |      |               |
| Setting for port priority in the spanning tree.                                                                                                                                                                                                                                                                                                         |         |     |      |               |
| IEC: RSTP max age                                                                                                                                                                                                                                                                                                                                       |         |     |      | 105 184       |
| 20                                                                                                                                                                                                                                                                                                                                                      | 6       | 40  | s    |               |
| Setting for maximum age of the information transmitted by the Bridge when it is the Root Bridge.                                                                                                                                                                                                                                                        |         |     |      |               |
| IEC: RSTP forward delay                                                                                                                                                                                                                                                                                                                                 |         |     |      | 105 185       |
| 15                                                                                                                                                                                                                                                                                                                                                      | 4       | 30  | s    |               |
| Setting for time delay used by Bridges to transition Root and Designated Ports to Forwarding.                                                                                                                                                                                                                                                           |         |     |      |               |
| IEC: RSTP hello time                                                                                                                                                                                                                                                                                                                                    |         |     |      | 105 186       |
| 2                                                                                                                                                                                                                                                                                                                                                       | 1       | 2   | s    |               |
| Setting for time interval between periodic transmissions of BPDU message.                                                                                                                                                                                                                                                                               |         |     |      |               |
| IEC: RSTP configuration                                                                                                                                                                                                                                                                                                                                 |         |     |      | 105 187       |
| 0: don't execute                                                                                                                                                                                                                                                                                                                                        |         |     |      |               |
| Send the RSTP configuration parameters to the communication module. The communication module reboots after setting the values.                                                                                                                                                                                                                          |         |     |      |               |



| Parameter                                                                                                                                                                                                                                                                                                                                                                                                              |       |      |      | Address              |  |  |         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|------|----------------------|--|--|---------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                | Min   | Max  | Unit | Logic Diagram        |  |  |         |
| IEC: Diff. local time                                                                                                                                                                                                                                                                                                                                                                                                  |       |      |      |                      |  |  | 104 206 |
| 0                                                                                                                                                                                                                                                                                                                                                                                                                      | -1440 | 1440 | min  | Fig. 3-31, (p. 3-53) |  |  |         |
| Time difference between UTC and local time at the devices' substation (IED).                                                                                                                                                                                                                                                                                                                                           |       |      |      |                      |  |  |         |
| IEC: Diff. dayl.sav. time                                                                                                                                                                                                                                                                                                                                                                                              |       |      |      |                      |  |  | 104 207 |
| 60                                                                                                                                                                                                                                                                                                                                                                                                                     | -1440 | 1440 | min  | Fig. 3-31, (p. 3-53) |  |  |         |
| Time difference of the daylight saving time to standard time.                                                                                                                                                                                                                                                                                                                                                          |       |      |      |                      |  |  |         |
| IEC: Switch.dayl.sav.time                                                                                                                                                                                                                                                                                                                                                                                              |       |      |      |                      |  |  | 104 219 |
| 1: Yes                                                                                                                                                                                                                                                                                                                                                                                                                 |       |      |      | Fig. 3-31, (p. 3-53) |  |  |         |
| This setting defines whether an automatic switching to daylight saving time is wanted. If it is wanted, the time switching is executed upon receiving a related SNTP frame.                                                                                                                                                                                                                                            |       |      |      |                      |  |  |         |
| IEC: Dayl.sav.time start                                                                                                                                                                                                                                                                                                                                                                                               |       |      |      |                      |  |  | 104 220 |
| 5: Last                                                                                                                                                                                                                                                                                                                                                                                                                |       |      |      | Fig. 3-31, (p. 3-53) |  |  |         |
| IEC: Dayl.sav.time st. d                                                                                                                                                                                                                                                                                                                                                                                               |       |      |      |                      |  |  | 104 221 |
| 7: Sunday                                                                                                                                                                                                                                                                                                                                                                                                              |       |      |      | Fig. 3-31, (p. 3-53) |  |  |         |
| IEC: Dayl.sav.time st. m                                                                                                                                                                                                                                                                                                                                                                                               |       |      |      |                      |  |  | 104 222 |
| 3: March                                                                                                                                                                                                                                                                                                                                                                                                               |       |      |      | Fig. 3-31, (p. 3-53) |  |  |         |
| These three parameters define the date (e.g. at what day of the year) for switching from standard time over to daylight saving time. Available for IEC: Dayl.sav.time start are the values <i>First</i> , <i>Second</i> , <i>Third</i> , <i>Fourth</i> , and <i>Last</i> . For IEC: Dayl.sav.time st. d the seven weekdays are available so that for example a setting like “on the last Sunday in March” may be used. |       |      |      |                      |  |  |         |
| IEC: Dayl.sav.t.st.0:00 +                                                                                                                                                                                                                                                                                                                                                                                              |       |      |      |                      |  |  | 104 223 |
| 120                                                                                                                                                                                                                                                                                                                                                                                                                    | 0     | 1440 | min  | Fig. 3-31, (p. 3-53) |  |  |         |
| Time period in minutes after midnight when daylight saving time is switched to standard time. If for example the clock is advanced one hour from 2:00 AM to 3:00 AM the parameter IEC: Dayl.sav.t.st.0:00 + is set to 120 (minutes).                                                                                                                                                                                   |       |      |      |                      |  |  |         |
| IEC: Dayl.sav.time end                                                                                                                                                                                                                                                                                                                                                                                                 |       |      |      |                      |  |  | 104 225 |
| 5: Last                                                                                                                                                                                                                                                                                                                                                                                                                |       |      |      | Fig. 3-31, (p. 3-53) |  |  |         |
| IEC: Dayl.sav.time end d                                                                                                                                                                                                                                                                                                                                                                                               |       |      |      |                      |  |  | 104 226 |
| 7: Sunday                                                                                                                                                                                                                                                                                                                                                                                                              |       |      |      | Fig. 3-31, (p. 3-53) |  |  |         |
| IEC: Dayl.sav.time end m                                                                                                                                                                                                                                                                                                                                                                                               |       |      |      |                      |  |  | 104 227 |
| 10: October                                                                                                                                                                                                                                                                                                                                                                                                            |       |      |      | Fig. 3-31, (p. 3-53) |  |  |         |
| IEC: Dayl.sav.t.end 0:00+                                                                                                                                                                                                                                                                                                                                                                                              |       |      |      |                      |  |  | 104 228 |
| 180                                                                                                                                                                                                                                                                                                                                                                                                                    | 0     | 1440 | min  | Fig. 3-31, (p. 3-53) |  |  |         |
| This parameter defines the date and time of day for the clock changeover from daylight saving time to standard time. The setting is similar to that for the clock changeover to daylight saving time.                                                                                                                                                                                                                  |       |      |      |                      |  |  |         |

Generic Object  
Orientated  
Substation Events

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                     | Address |     |      |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                       | Min     | Max | Unit | Logic Diagram |
| GOOSE: Function group GOOSE                                                                                                                                                                                                                                                                                                                                                                                                                   |         |     |      | 056 068       |
| 0: Without                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |     |      |               |
| <p>Cancelling function group GOOSE or including it in the configuration.<br/>If the function group is cancelled from the configuration, then all associated settings and signals are hidden.</p> <p>Parameters included in this function group are only effective when function group IEC is configured and enabled and when the parameters in this function group have been activated by setting the parameter IEC: Switch Config. Bank.</p> |         |     |      |               |
| GOOSE: General enable USER                                                                                                                                                                                                                                                                                                                                                                                                                    |         |     |      | 106 001       |
| 0: No                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |     |      |               |
| Enabling and disabling function group GOOSE.                                                                                                                                                                                                                                                                                                                                                                                                  |         |     |      |               |
| GOOSE: Output 1 fct.assig.                                                                                                                                                                                                                                                                                                                                                                                                                    |         |     |      | 106 011       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                               |         |     |      |               |
| GOOSE: Output 2 fct.assig.                                                                                                                                                                                                                                                                                                                                                                                                                    |         |     |      | 106 013       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                               |         |     |      |               |
| GOOSE: Output 3 fct.assig.                                                                                                                                                                                                                                                                                                                                                                                                                    |         |     |      | 106 015       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                               |         |     |      |               |
| GOOSE: Output 4 fct.assig.                                                                                                                                                                                                                                                                                                                                                                                                                    |         |     |      | 106 017       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                               |         |     |      |               |
| GOOSE: Output 5 fct.assig.                                                                                                                                                                                                                                                                                                                                                                                                                    |         |     |      | 106 019       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                               |         |     |      |               |
| GOOSE: Output 6 fct.assig.                                                                                                                                                                                                                                                                                                                                                                                                                    |         |     |      | 106 021       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                               |         |     |      |               |
| GOOSE: Output 7 fct.assig.                                                                                                                                                                                                                                                                                                                                                                                                                    |         |     |      | 106 023       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                               |         |     |      |               |
| GOOSE: Output 8 fct.assig.                                                                                                                                                                                                                                                                                                                                                                                                                    |         |     |      | 106 025       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                               |         |     |      |               |
| GOOSE: Output 9 fct.assig.                                                                                                                                                                                                                                                                                                                                                                                                                    |         |     |      | 106 027       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                               |         |     |      |               |
| GOOSE: Output 10 fct.assig.                                                                                                                                                                                                                                                                                                                                                                                                                   |         |     |      | 106 029       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                               |         |     |      |               |
| GOOSE: Output 11 fct.assig.                                                                                                                                                                                                                                                                                                                                                                                                                   |         |     |      | 106 031       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                               |         |     |      |               |
| GOOSE: Output 12 fct.assig.                                                                                                                                                                                                                                                                                                                                                                                                                   |         |     |      | 106 033       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                               |         |     |      |               |

| Parameter                       |     |     |      | Address       |
|---------------------------------|-----|-----|------|---------------|
| Default                         | Min | Max | Unit | Logic Diagram |
| GOOSE: Output 13 fct.assig.     |     |     |      | 106 035       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 14 fct.assig.     |     |     |      | 106 037       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 15 fct.assig.     |     |     |      | 106 039       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 16 fct.assig.     |     |     |      | 106 041       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 17 fct.assig.     |     |     |      | 106 043       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 18 fct.assig.     |     |     |      | 106 045       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 19 fct.assig.     |     |     |      | 106 047       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 20 fct.assig.     |     |     |      | 106 049       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 21 fct.assig.     |     |     |      | 106 051       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 22 fct.assig.     |     |     |      | 106 053       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 23 fct.assig.     |     |     |      | 106 055       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 24 fct.assig.     |     |     |      | 106 057       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 25 fct.assig.     |     |     |      | 106 059       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 26 fct.assig.     |     |     |      | 106 061       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 27 fct.assig.     |     |     |      | 106 063       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 28 fct.assig.     |     |     |      | 106 065       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 29 fct.assig.     |     |     |      | 106 067       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 30 fct.assig.     |     |     |      | 106 069       |
| 060 000: MAIN: Without function |     |     |      |               |
| GOOSE: Output 31 fct.assig.     |     |     |      | 106 071       |
| 060 000: MAIN: Without function |     |     |      |               |

| Parameter                                                                                                                                                                              |     |     |      | Address       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                | Min | Max | Unit | Logic Diagram |
| GOOSE: Output 32 fct.assig.                                                                                                                                                            |     |     |      | 106 073       |
| 060 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| Function assignment of a binary logical state signal to the virtual GOOSE outputs. Signals configured here can be included as GosGGIO2.ST.ind1, GosGGIO2.ST.ind2, ... in the datasets. |     |     |      |               |
| GOOSE: Input 1 fct.assig.                                                                                                                                                              |     |     |      | 107 006       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| GOOSE: Input 2 fct.assig.                                                                                                                                                              |     |     |      | 107 016       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| GOOSE: Input 3 fct.assig.                                                                                                                                                              |     |     |      | 107 026       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| GOOSE: Input 4 fct.assig.                                                                                                                                                              |     |     |      | 107 036       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| GOOSE: Input 5 fct.assig.                                                                                                                                                              |     |     |      | 107 046       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| GOOSE: Input 6 fct.assig.                                                                                                                                                              |     |     |      | 107 056       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| GOOSE: Input 7 fct.assig.                                                                                                                                                              |     |     |      | 107 066       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| GOOSE: Input 8 fct.assig.                                                                                                                                                              |     |     |      | 107 076       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| GOOSE: Input 9 fct.assig.                                                                                                                                                              |     |     |      | 107 086       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| GOOSE: Input 10 fct.assig.                                                                                                                                                             |     |     |      | 107 096       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| GOOSE: Input 11 fct.assig.                                                                                                                                                             |     |     |      | 107 106       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| GOOSE: Input 12 fct.assig.                                                                                                                                                             |     |     |      | 107 116       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| GOOSE: Input 13 fct.assig.                                                                                                                                                             |     |     |      | 107 126       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| GOOSE: Input 14 fct.assig.                                                                                                                                                             |     |     |      | 107 136       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| GOOSE: Input 15 fct.assig.                                                                                                                                                             |     |     |      | 107 146       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |
| GOOSE: Input 16 fct.assig.                                                                                                                                                             |     |     |      | 107 156       |
| 061 000: MAIN: Without function                                                                                                                                                        |     |     |      |               |

| Parameter                       |     |     |      | Address       |
|---------------------------------|-----|-----|------|---------------|
| Default                         | Min | Max | Unit | Logic Diagram |
| GOOSE: Input 17 fct.assig.      |     |     |      | 107 157       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 18 fct.assig.      |     |     |      | 107 158       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 19 fct.assig.      |     |     |      | 107 159       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 20 fct.assig.      |     |     |      | 107 160       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 21 fct.assig.      |     |     |      | 107 161       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 22 fct.assig.      |     |     |      | 107 162       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 23 fct.assig.      |     |     |      | 107 163       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 24 fct.assig.      |     |     |      | 107 164       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 25 fct.assig.      |     |     |      | 107 165       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 26 fct.assig.      |     |     |      | 107 166       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 27 fct.assig.      |     |     |      | 107 167       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 28 fct.assig.      |     |     |      | 107 168       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 29 fct.assig.      |     |     |      | 107 169       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 30 fct.assig.      |     |     |      | 107 170       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 31 fct.assig.      |     |     |      | 107 171       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 32 fct.assig.      |     |     |      | 107 172       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 33 fct.assig.      |     |     |      | 112 000       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 34 fct.assig.      |     |     |      | 112 001       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 35 fct.assig.      |     |     |      | 112 002       |
| 061 000: MAIN: Without function |     |     |      |               |

| Parameter                       |     |     |      |  | Address       |
|---------------------------------|-----|-----|------|--|---------------|
| Default                         | Min | Max | Unit |  | Logic Diagram |
| GOOSE: Input 36 fct.assig.      |     |     |      |  | 112 003       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 37 fct.assig.      |     |     |      |  | 112 004       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 38 fct.assig.      |     |     |      |  | 112 005       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 39 fct.assig.      |     |     |      |  | 112 006       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 40 fct.assig.      |     |     |      |  | 112 007       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 41 fct.assig.      |     |     |      |  | 112 008       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 42 fct.assig.      |     |     |      |  | 112 009       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 43 fct.assig.      |     |     |      |  | 112 010       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 44 fct.assig.      |     |     |      |  | 112 011       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 45 fct.assig.      |     |     |      |  | 112 012       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 46 fct.assig.      |     |     |      |  | 112 013       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 47 fct.assig.      |     |     |      |  | 112 014       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 48 fct.assig.      |     |     |      |  | 112 015       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 49 fct.assig.      |     |     |      |  | 112 016       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 50 fct.assig.      |     |     |      |  | 112 017       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 51 fct.assig.      |     |     |      |  | 112 018       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 52 fct.assig.      |     |     |      |  | 112 019       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 53 fct.assig.      |     |     |      |  | 112 020       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 54 fct.assig.      |     |     |      |  | 112 021       |
| 061 000: MAIN: Without function |     |     |      |  |               |

| Parameter                       |     |     |      | Address       |
|---------------------------------|-----|-----|------|---------------|
| Default                         | Min | Max | Unit | Logic Diagram |
| GOOSE: Input 55 fct.assig.      |     |     |      | 112 022       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 56 fct.assig.      |     |     |      | 112 023       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 57 fct.assig.      |     |     |      | 112 024       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 58 fct.assig.      |     |     |      | 112 025       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 59 fct.assig.      |     |     |      | 112 026       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 60 fct.assig.      |     |     |      | 112 027       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 61 fct.assig.      |     |     |      | 112 028       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 62 fct.assig.      |     |     |      | 112 029       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 63 fct.assig.      |     |     |      | 112 030       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 64 fct.assig.      |     |     |      | 112 031       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 65 fct.assig.      |     |     |      | 112 032       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 66 fct.assig.      |     |     |      | 112 033       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 67 fct.assig.      |     |     |      | 112 034       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 68 fct.assig.      |     |     |      | 112 035       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 69 fct.assig.      |     |     |      | 112 036       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 70 fct.assig.      |     |     |      | 112 037       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 71 fct.assig.      |     |     |      | 112 038       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 72 fct.assig.      |     |     |      | 112 039       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 73 fct.assig.      |     |     |      | 112 040       |
| 061 000: MAIN: Without function |     |     |      |               |

| Parameter                       |     |     |      |  | Address       |
|---------------------------------|-----|-----|------|--|---------------|
| Default                         | Min | Max | Unit |  | Logic Diagram |
| GOOSE: Input 74 fct.assig.      |     |     |      |  | 112 041       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 75 fct.assig.      |     |     |      |  | 112 042       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 76 fct.assig.      |     |     |      |  | 112 043       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 77 fct.assig.      |     |     |      |  | 112 044       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 78 fct.assig.      |     |     |      |  | 112 045       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 79 fct.assig.      |     |     |      |  | 112 046       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 80 fct.assig.      |     |     |      |  | 112 047       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 81 fct.assig.      |     |     |      |  | 112 048       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 82 fct.assig.      |     |     |      |  | 112 049       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 83 fct.assig.      |     |     |      |  | 112 050       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 84 fct.assig.      |     |     |      |  | 112 051       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 85 fct.assig.      |     |     |      |  | 112 052       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 86 fct.assig.      |     |     |      |  | 112 053       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 87 fct.assig.      |     |     |      |  | 112 054       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 88 fct.assig.      |     |     |      |  | 112 055       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 89 fct.assig.      |     |     |      |  | 112 056       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 90 fct.assig.      |     |     |      |  | 112 057       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 91 fct.assig.      |     |     |      |  | 112 058       |
| 061 000: MAIN: Without function |     |     |      |  |               |
| GOOSE: Input 92 fct.assig.      |     |     |      |  | 112 059       |
| 061 000: MAIN: Without function |     |     |      |  |               |



| Parameter                       |     |     |      | Address       |
|---------------------------------|-----|-----|------|---------------|
| Default                         | Min | Max | Unit | Logic Diagram |
| GOOSE: Input 93 fct.assig.      |     |     |      | 112 060       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 94 fct.assig.      |     |     |      | 112 061       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 95 fct.assig.      |     |     |      | 112 062       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 96 fct.assig.      |     |     |      | 112 063       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 97 fct.assig.      |     |     |      | 112 064       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 98 fct.assig.      |     |     |      | 112 065       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 99 fct.assig.      |     |     |      | 112 066       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 100 fct.assig.     |     |     |      | 112 067       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 101 fct.assig.     |     |     |      | 112 068       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 102 fct.assig.     |     |     |      | 112 069       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 103 fct.assig.     |     |     |      | 112 070       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 104 fct.assig.     |     |     |      | 112 071       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 105 fct.assig.     |     |     |      | 112 072       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 106 fct.assig.     |     |     |      | 112 073       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 107 fct.assig.     |     |     |      | 112 074       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 108 fct.assig.     |     |     |      | 112 075       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 109 fct.assig.     |     |     |      | 112 076       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 110 fct.assig.     |     |     |      | 112 077       |
| 061 000: MAIN: Without function |     |     |      |               |
| GOOSE: Input 111 fct.assig.     |     |     |      | 112 078       |
| 061 000: MAIN: Without function |     |     |      |               |

| Parameter                                                                                                                                                                                                                                                                                                                                                        |     |     |      | Address       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                                                                                                                                                                                          | Min | Max | Unit | Logic Diagram |
| GOOSE: Input 112 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 079       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 113 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 080       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 114 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 081       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 115 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 082       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 116 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 083       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 117 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 084       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 118 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 085       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 119 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 086       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 120 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 087       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 121 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 088       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 122 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 089       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 123 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 090       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 124 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 091       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 125 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 092       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 126 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 093       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 127 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 094       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| GOOSE: Input 128 fct.assig.                                                                                                                                                                                                                                                                                                                                      |     |     |      | 112 095       |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| Function assignment of the virtual binary GOOSE inputs (GosGGIO1/Pos1.stVal, GosGGIO1/Pos2.stVal, ...) to a binary logical state signal on the device so that they can be processed further by the protection, control or logic functions. Signals configured here contain the received and pre-processed state of data attributes configured for GOOSE receipt. |     |     |      |               |

IRIG-B interface

| Parameter                                                                                                                                                                             |     |     |      |  | Address              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|--|----------------------|
| Default                                                                                                                                                                               | Min | Max | Unit |  | Logic Diagram        |
| IRIGB: Function group IRIGB                                                                                                                                                           |     |     |      |  | 056 072              |
| 0: Without                                                                                                                                                                            |     |     |      |  |                      |
| Cancelling function group IRIGB or including it in the configuration. If the function group is cancelled from the configuration, then all associated settings and signals are hidden. |     |     |      |  |                      |
| IRIGB: General enable USER                                                                                                                                                            |     |     |      |  | 023 200              |
| 0: No                                                                                                                                                                                 |     |     |      |  | Fig. 3-38, (p. 3-62) |
| Disabling or enabling the IRIG-B interface.                                                                                                                                           |     |     |      |  |                      |

MODBUS master,  
analog command

| Parameter                                                                                                                                                                                                                | Address |     |      |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                                                  | Min     | Max | Unit | Logic Diagram |
| MM_AC: Function group MM_AC                                                                                                                                                                                              |         |     |      | 244 250       |
| 0: Without                                                                                                                                                                                                               |         |     |      |               |
| Canceling function group MM_AC or including it in the configuration. If the function group is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |         |     |      |               |
| MM_AC: Command AC 001 conf.                                                                                                                                                                                              |         |     |      | 243 004       |
| 0: No <span style="color: green;">Fig. 3-26, (p. 3-34)</span>                                                                                                                                                            |         |     |      |               |
| MM_AC: Command AC 002 conf.                                                                                                                                                                                              |         |     |      | 243 009       |
| 0: No                                                                                                                                                                                                                    |         |     |      |               |
| MM_AC: Command AC 003 conf.                                                                                                                                                                                              |         |     |      | 243 014       |
| 0: No                                                                                                                                                                                                                    |         |     |      |               |
| MM_AC: Command AC 004 conf.                                                                                                                                                                                              |         |     |      | 243 019       |
| 0: No                                                                                                                                                                                                                    |         |     |      |               |
| MM_AC: Command AC 005 conf.                                                                                                                                                                                              |         |     |      | 243 024       |
| 0: No                                                                                                                                                                                                                    |         |     |      |               |
| MM_AC: Command AC 006 conf.                                                                                                                                                                                              |         |     |      | 243 029       |
| 0: No                                                                                                                                                                                                                    |         |     |      |               |
| MM_AC: Command AC 007 conf.                                                                                                                                                                                              |         |     |      | 243 034       |
| 0: No                                                                                                                                                                                                                    |         |     |      |               |
| MM_AC: Command AC 008 conf.                                                                                                                                                                                              |         |     |      | 243 039       |
| 0: No                                                                                                                                                                                                                    |         |     |      |               |
| MM_AC: Command AC 009 conf.                                                                                                                                                                                              |         |     |      | 243 044       |
| 0: No                                                                                                                                                                                                                    |         |     |      |               |
| MM_AC: Command AC 010 conf.                                                                                                                                                                                              |         |     |      | 243 049       |
| 0: No                                                                                                                                                                                                                    |         |     |      |               |
| MM_AC: Command AC 011 conf.                                                                                                                                                                                              |         |     |      | 243 054       |
| 0: No                                                                                                                                                                                                                    |         |     |      |               |
| MM_AC: Command AC 012 conf.                                                                                                                                                                                              |         |     |      | 243 059       |
| 0: No                                                                                                                                                                                                                    |         |     |      |               |
| MM_AC: Command AC 013 conf.                                                                                                                                                                                              |         |     |      | 243 064       |
| 0: No                                                                                                                                                                                                                    |         |     |      |               |
| MM_AC: Command AC 014 conf.                                                                                                                                                                                              |         |     |      | 243 069       |
| 0: No                                                                                                                                                                                                                    |         |     |      |               |
| MM_AC: Command AC 015 conf.                                                                                                                                                                                              |         |     |      | 243 074       |
| 0: No                                                                                                                                                                                                                    |         |     |      |               |
| MM_AC: Command AC 016 conf.                                                                                                                                                                                              |         |     |      | 243 079       |
| 0: No                                                                                                                                                                                                                    |         |     |      |               |

| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| MM_AC: Command AC 017 conf. |     |     |      | 243 084       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 018 conf. |     |     |      | 243 089       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 019 conf. |     |     |      | 243 094       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 020 conf. |     |     |      | 243 099       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 021 conf. |     |     |      | 243 104       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 022 conf. |     |     |      | 243 109       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 023 conf. |     |     |      | 243 114       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 024 conf. |     |     |      | 243 119       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 025 conf. |     |     |      | 243 124       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 026 conf. |     |     |      | 243 129       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 027 conf. |     |     |      | 243 134       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 028 conf. |     |     |      | 243 139       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 029 conf. |     |     |      | 243 144       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 030 conf. |     |     |      | 243 149       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 031 conf. |     |     |      | 243 154       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 032 conf. |     |     |      | 243 159       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 033 conf. |     |     |      | 243 164       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 034 conf. |     |     |      | 243 169       |
| 0: No                       |     |     |      |               |
| MM_AC: Command AC 035 conf. |     |     |      | 243 174       |
| 0: No                       |     |     |      |               |

| Parameter                   |     |     |      |  | Address       |
|-----------------------------|-----|-----|------|--|---------------|
| Default                     | Min | Max | Unit |  | Logic Diagram |
| MM_AC: Command AC 036 conf. |     |     |      |  | 243 179       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 037 conf. |     |     |      |  | 243 184       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 038 conf. |     |     |      |  | 243 189       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 039 conf. |     |     |      |  | 243 194       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 040 conf. |     |     |      |  | 243 199       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 041 conf. |     |     |      |  | 243 204       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 042 conf. |     |     |      |  | 243 209       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 043 conf. |     |     |      |  | 243 214       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 044 conf. |     |     |      |  | 243 219       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 045 conf. |     |     |      |  | 243 224       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 046 conf. |     |     |      |  | 243 229       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 047 conf. |     |     |      |  | 243 234       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 048 conf. |     |     |      |  | 243 239       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 049 conf. |     |     |      |  | 243 244       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 050 conf. |     |     |      |  | 243 249       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 051 conf. |     |     |      |  | 243 254       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 052 conf. |     |     |      |  | 244 003       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 053 conf. |     |     |      |  | 244 008       |
| 0: No                       |     |     |      |  |               |
| MM_AC: Command AC 054 conf. |     |     |      |  | 244 013       |
| 0: No                       |     |     |      |  |               |

| Parameter                                                                                                                                                                                                 |     |       |                      | Address       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|----------------------|---------------|
| Default                                                                                                                                                                                                   | Min | Max   | Unit                 | Logic Diagram |
| MM_AC: Command AC 055 conf.                                                                                                                                                                               |     |       |                      | 244 018       |
| 0: No                                                                                                                                                                                                     |     |       |                      |               |
| MM_AC: Command AC 056 conf.                                                                                                                                                                               |     |       |                      | 244 023       |
| 0: No                                                                                                                                                                                                     |     |       |                      |               |
| MM_AC: Command AC 057 conf.                                                                                                                                                                               |     |       |                      | 244 028       |
| 0: No                                                                                                                                                                                                     |     |       |                      |               |
| MM_AC: Command AC 058 conf.                                                                                                                                                                               |     |       |                      | 244 033       |
| 0: No                                                                                                                                                                                                     |     |       |                      |               |
| MM_AC: Command AC 059 conf.                                                                                                                                                                               |     |       |                      | 244 038       |
| 0: No                                                                                                                                                                                                     |     |       |                      |               |
| MM_AC: Command AC 060 conf.                                                                                                                                                                               |     |       |                      | 244 043       |
| 0: No                                                                                                                                                                                                     |     |       |                      |               |
| Canceling MM_AC function or including in the configuration. If the function is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |     |       |                      |               |
| MM_AC: Sl. register AC 001                                                                                                                                                                                |     |       |                      | 243 001       |
| 0                                                                                                                                                                                                         | 0   | 65535 | Fig. 3-26, (p. 3-34) |               |
| MM_AC: Sl. register AC 002                                                                                                                                                                                |     |       |                      | 243 006       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_AC: Sl. register AC 003                                                                                                                                                                                |     |       |                      | 243 011       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_AC: Sl. register AC 004                                                                                                                                                                                |     |       |                      | 243 016       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_AC: Sl. register AC 005                                                                                                                                                                                |     |       |                      | 243 021       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_AC: Sl. register AC 006                                                                                                                                                                                |     |       |                      | 243 026       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_AC: Sl. register AC 007                                                                                                                                                                                |     |       |                      | 243 031       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_AC: Sl. register AC 008                                                                                                                                                                                |     |       |                      | 243 036       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_AC: Sl. register AC 009                                                                                                                                                                                |     |       |                      | 243 041       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_AC: Sl. register AC 010                                                                                                                                                                                |     |       |                      | 243 046       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_AC: Sl. register AC 011                                                                                                                                                                                |     |       |                      | 243 051       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |

| Parameter                  |     |       |      |  | Address       |  |         |
|----------------------------|-----|-------|------|--|---------------|--|---------|
| Default                    | Min | Max   | Unit |  | Logic Diagram |  |         |
| MM_AC: Sl. register AC 012 |     |       |      |  |               |  | 243 056 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 013 |     |       |      |  |               |  | 243 061 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 014 |     |       |      |  |               |  | 243 066 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 015 |     |       |      |  |               |  | 243 071 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 016 |     |       |      |  |               |  | 243 076 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 017 |     |       |      |  |               |  | 243 081 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 018 |     |       |      |  |               |  | 243 086 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 019 |     |       |      |  |               |  | 243 091 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 020 |     |       |      |  |               |  | 243 096 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 021 |     |       |      |  |               |  | 243 101 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 022 |     |       |      |  |               |  | 243 106 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 023 |     |       |      |  |               |  | 243 111 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 024 |     |       |      |  |               |  | 243 116 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 025 |     |       |      |  |               |  | 243 121 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 026 |     |       |      |  |               |  | 243 126 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 027 |     |       |      |  |               |  | 243 131 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 028 |     |       |      |  |               |  | 243 136 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 029 |     |       |      |  |               |  | 243 141 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AC: Sl. register AC 030 |     |       |      |  |               |  | 243 146 |
| 0                          | 0   | 65535 |      |  |               |  |         |



| Parameter                  |     |       |      | Address       |
|----------------------------|-----|-------|------|---------------|
| Default                    | Min | Max   | Unit | Logic Diagram |
| MM_AC: Sl. register AC 031 |     |       |      | 243 151       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 032 |     |       |      | 243 156       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 033 |     |       |      | 243 161       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 034 |     |       |      | 243 166       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 035 |     |       |      | 243 171       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 036 |     |       |      | 243 176       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 037 |     |       |      | 243 181       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 038 |     |       |      | 243 186       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 039 |     |       |      | 243 191       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 040 |     |       |      | 243 196       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 041 |     |       |      | 243 201       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 042 |     |       |      | 243 206       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 043 |     |       |      | 243 211       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 044 |     |       |      | 243 216       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 045 |     |       |      | 243 221       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 046 |     |       |      | 243 226       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 047 |     |       |      | 243 231       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 048 |     |       |      | 243 236       |
| 0                          | 0   | 65535 |      |               |
| MM_AC: Sl. register AC 049 |     |       |      | 243 241       |
| 0                          | 0   | 65535 |      |               |

| Parameter                                                       |     |       |      | Address       |  |  |         |
|-----------------------------------------------------------------|-----|-------|------|---------------|--|--|---------|
| Default                                                         | Min | Max   | Unit | Logic Diagram |  |  |         |
| MM_AC: SI. register AC 050                                      |     |       |      |               |  |  | 243 246 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_AC: SI. register AC 051                                      |     |       |      |               |  |  | 243 251 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_AC: SI. register AC 052                                      |     |       |      |               |  |  | 244 000 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_AC: SI. register AC 053                                      |     |       |      |               |  |  | 244 005 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_AC: SI. register AC 054                                      |     |       |      |               |  |  | 244 010 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_AC: SI. register AC 055                                      |     |       |      |               |  |  | 244 015 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_AC: SI. register AC 056                                      |     |       |      |               |  |  | 244 020 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_AC: SI. register AC 057                                      |     |       |      |               |  |  | 244 025 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_AC: SI. register AC 058                                      |     |       |      |               |  |  | 244 030 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_AC: SI. register AC 059                                      |     |       |      |               |  |  | 244 035 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_AC: SI. register AC 060                                      |     |       |      |               |  |  | 244 040 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| Setting the register address which will be used in the message. |     |       |      |               |  |  |         |

MODBUS master,  
analog signal

| Parameter                                                                                                                                                                                                                |     |     |      | Address       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                                                  | Min | Max | Unit | Logic Diagram |
| MM_AS: Function group MM_AS                                                                                                                                                                                              |     |     |      | 247 250       |
| 0: Without                                                                                                                                                                                                               |     |     |      |               |
| Canceling function group MM_AS or including it in the configuration. If the function group is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |     |     |      |               |
| MM_AS: Signal AS 001 config                                                                                                                                                                                              |     |     |      | 245 005       |
| 0: No <span style="color: green;">Fig. 3-28, (p. 3-36)</span>                                                                                                                                                            |     |     |      |               |
| MM_AS: Signal AS 002 config                                                                                                                                                                                              |     |     |      | 245 011       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_AS: Signal AS 003 config                                                                                                                                                                                              |     |     |      | 245 017       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_AS: Signal AS 004 config                                                                                                                                                                                              |     |     |      | 245 023       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_AS: Signal AS 005 config                                                                                                                                                                                              |     |     |      | 245 029       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_AS: Signal AS 006 config                                                                                                                                                                                              |     |     |      | 245 035       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_AS: Signal AS 007 config                                                                                                                                                                                              |     |     |      | 245 041       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_AS: Signal AS 008 config                                                                                                                                                                                              |     |     |      | 245 047       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_AS: Signal AS 009 config                                                                                                                                                                                              |     |     |      | 245 053       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_AS: Signal AS 010 config                                                                                                                                                                                              |     |     |      | 245 059       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_AS: Signal AS 011 config                                                                                                                                                                                              |     |     |      | 245 065       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_AS: Signal AS 012 config                                                                                                                                                                                              |     |     |      | 245 071       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_AS: Signal AS 013 config                                                                                                                                                                                              |     |     |      | 245 077       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_AS: Signal AS 014 config                                                                                                                                                                                              |     |     |      | 245 083       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_AS: Signal AS 015 config                                                                                                                                                                                              |     |     |      | 245 089       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_AS: Signal AS 016 config                                                                                                                                                                                              |     |     |      | 245 095       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |

| Parameter                   |     |     |      |  | Address       |  |         |
|-----------------------------|-----|-----|------|--|---------------|--|---------|
| Default                     | Min | Max | Unit |  | Logic Diagram |  |         |
| MM_AS: Signal AS 017 config |     |     |      |  |               |  | 245 101 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 018 config |     |     |      |  |               |  | 245 107 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 019 config |     |     |      |  |               |  | 245 113 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 020 config |     |     |      |  |               |  | 245 119 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 021 config |     |     |      |  |               |  | 245 125 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 022 config |     |     |      |  |               |  | 245 131 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 023 config |     |     |      |  |               |  | 245 137 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 024 config |     |     |      |  |               |  | 245 143 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 025 config |     |     |      |  |               |  | 245 149 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 026 config |     |     |      |  |               |  | 245 155 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 027 config |     |     |      |  |               |  | 245 161 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 028 config |     |     |      |  |               |  | 245 167 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 029 config |     |     |      |  |               |  | 245 173 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 030 config |     |     |      |  |               |  | 245 179 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 031 config |     |     |      |  |               |  | 245 185 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 032 config |     |     |      |  |               |  | 245 191 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 033 config |     |     |      |  |               |  | 245 197 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 034 config |     |     |      |  |               |  | 245 203 |
| 0: No                       |     |     |      |  |               |  |         |
| MM_AS: Signal AS 035 config |     |     |      |  |               |  | 245 209 |
| 0: No                       |     |     |      |  |               |  |         |

| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| MM_AS: Signal AS 036 config |     |     |      | 245 215       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 037 config |     |     |      | 245 221       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 038 config |     |     |      | 245 227       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 039 config |     |     |      | 245 233       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 040 config |     |     |      | 245 239       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 041 config |     |     |      | 245 245       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 042 config |     |     |      | 245 251       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 043 config |     |     |      | 246 001       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 044 config |     |     |      | 246 007       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 045 config |     |     |      | 246 013       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 046 config |     |     |      | 246 019       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 047 config |     |     |      | 246 025       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 048 config |     |     |      | 246 031       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 049 config |     |     |      | 246 037       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 050 config |     |     |      | 246 043       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 051 config |     |     |      | 246 049       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 052 config |     |     |      | 246 055       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 053 config |     |     |      | 246 061       |
| 0: No                       |     |     |      |               |
| MM_AS: Signal AS 054 config |     |     |      | 246 067       |
| 0: No                       |     |     |      |               |

| Parameter                                                                                                                                                                                                 |     |       |      |                      | Address       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|------|----------------------|---------------|
| Default                                                                                                                                                                                                   | Min | Max   | Unit |                      | Logic Diagram |
| MM_AS: Signal AS 055 config                                                                                                                                                                               |     |       |      |                      | 246 073       |
| 0: No                                                                                                                                                                                                     |     |       |      |                      |               |
| MM_AS: Signal AS 056 config                                                                                                                                                                               |     |       |      |                      | 246 079       |
| 0: No                                                                                                                                                                                                     |     |       |      |                      |               |
| MM_AS: Signal AS 057 config                                                                                                                                                                               |     |       |      |                      | 246 085       |
| 0: No                                                                                                                                                                                                     |     |       |      |                      |               |
| MM_AS: Signal AS 058 config                                                                                                                                                                               |     |       |      |                      | 246 091       |
| 0: No                                                                                                                                                                                                     |     |       |      |                      |               |
| MM_AS: Signal AS 059 config                                                                                                                                                                               |     |       |      |                      | 246 097       |
| 0: No                                                                                                                                                                                                     |     |       |      |                      |               |
| MM_AS: Signal AS 060 config                                                                                                                                                                               |     |       |      |                      | 246 103       |
| 0: No                                                                                                                                                                                                     |     |       |      |                      |               |
| MM_AS: Signal AS 061 config                                                                                                                                                                               |     |       |      |                      | 246 109       |
| 0: No                                                                                                                                                                                                     |     |       |      |                      |               |
| MM_AS: Signal AS 062 config                                                                                                                                                                               |     |       |      |                      | 246 115       |
| 0: No                                                                                                                                                                                                     |     |       |      |                      |               |
| MM_AS: Signal AS 063 config                                                                                                                                                                               |     |       |      |                      | 246 121       |
| 0: No                                                                                                                                                                                                     |     |       |      |                      |               |
| MM_AS: Signal AS 064 config                                                                                                                                                                               |     |       |      |                      | 246 127       |
| 0: No                                                                                                                                                                                                     |     |       |      |                      |               |
| Canceling MM_AS function or including in the configuration. If the function is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |     |       |      |                      |               |
| MM_AS: Sl. register AS 001                                                                                                                                                                                |     |       |      |                      | 245 002       |
| 0                                                                                                                                                                                                         | 0   | 65535 |      | Fig. 3-28, (p. 3-36) |               |
| MM_AS: Sl. register AS 002                                                                                                                                                                                |     |       |      |                      | 245 008       |
| 0                                                                                                                                                                                                         | 0   | 65535 |      |                      |               |
| MM_AS: Sl. register AS 003                                                                                                                                                                                |     |       |      |                      | 245 014       |
| 0                                                                                                                                                                                                         | 0   | 65535 |      |                      |               |
| MM_AS: Sl. register AS 004                                                                                                                                                                                |     |       |      |                      | 245 020       |
| 0                                                                                                                                                                                                         | 0   | 65535 |      |                      |               |
| MM_AS: Sl. register AS 005                                                                                                                                                                                |     |       |      |                      | 245 026       |
| 0                                                                                                                                                                                                         | 0   | 65535 |      |                      |               |
| MM_AS: Sl. register AS 006                                                                                                                                                                                |     |       |      |                      | 245 032       |
| 0                                                                                                                                                                                                         | 0   | 65535 |      |                      |               |
| MM_AS: Sl. register AS 007                                                                                                                                                                                |     |       |      |                      | 245 038       |
| 0                                                                                                                                                                                                         | 0   | 65535 |      |                      |               |

| Parameter                  |     |       |      | Address       |
|----------------------------|-----|-------|------|---------------|
| Default                    | Min | Max   | Unit | Logic Diagram |
| MM_AS: Sl. register AS 008 |     |       |      | 245 044       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 009 |     |       |      | 245 050       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 010 |     |       |      | 245 056       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 011 |     |       |      | 245 062       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 012 |     |       |      | 245 068       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 013 |     |       |      | 245 074       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 014 |     |       |      | 245 080       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 015 |     |       |      | 245 086       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 016 |     |       |      | 245 092       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 017 |     |       |      | 245 098       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 018 |     |       |      | 245 104       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 019 |     |       |      | 245 110       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 020 |     |       |      | 245 116       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 021 |     |       |      | 245 122       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 022 |     |       |      | 245 128       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 023 |     |       |      | 245 134       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 024 |     |       |      | 245 140       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 025 |     |       |      | 245 146       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 026 |     |       |      | 245 152       |
| 0                          | 0   | 65535 |      |               |

| Parameter                  |     |       |      |  | Address       |  |         |
|----------------------------|-----|-------|------|--|---------------|--|---------|
| Default                    | Min | Max   | Unit |  | Logic Diagram |  |         |
| MM_AS: Sl. register AS 027 |     |       |      |  |               |  | 245 158 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 028 |     |       |      |  |               |  | 245 164 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 029 |     |       |      |  |               |  | 245 170 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 030 |     |       |      |  |               |  | 245 176 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 031 |     |       |      |  |               |  | 245 182 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 032 |     |       |      |  |               |  | 245 188 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 033 |     |       |      |  |               |  | 245 194 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 034 |     |       |      |  |               |  | 245 200 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 035 |     |       |      |  |               |  | 245 206 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 036 |     |       |      |  |               |  | 245 212 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 037 |     |       |      |  |               |  | 245 218 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 038 |     |       |      |  |               |  | 245 224 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 039 |     |       |      |  |               |  | 245 230 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 040 |     |       |      |  |               |  | 245 236 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 041 |     |       |      |  |               |  | 245 242 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 042 |     |       |      |  |               |  | 245 248 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 043 |     |       |      |  |               |  | 245 254 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 044 |     |       |      |  |               |  | 246 004 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_AS: Sl. register AS 045 |     |       |      |  |               |  | 246 010 |
| 0                          | 0   | 65535 |      |  |               |  |         |



| Parameter                  |     |       |      | Address       |
|----------------------------|-----|-------|------|---------------|
| Default                    | Min | Max   | Unit | Logic Diagram |
| MM_AS: Sl. register AS 046 |     |       |      | 246 016       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 047 |     |       |      | 246 022       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 048 |     |       |      | 246 028       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 049 |     |       |      | 246 034       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 050 |     |       |      | 246 040       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 051 |     |       |      | 246 046       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 052 |     |       |      | 246 052       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 053 |     |       |      | 246 058       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 054 |     |       |      | 246 064       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 055 |     |       |      | 246 070       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 056 |     |       |      | 246 076       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 057 |     |       |      | 246 082       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 058 |     |       |      | 246 088       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 059 |     |       |      | 246 094       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 060 |     |       |      | 246 100       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 061 |     |       |      | 246 106       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 062 |     |       |      | 246 112       |
| 0                          | 0   | 65535 |      |               |
| MM_AS: Sl. register AS 063 |     |       |      | 246 118       |
| 0                          | 0   | 65535 |      |               |

| Parameter                                                       |     |       |      | Address              |
|-----------------------------------------------------------------|-----|-------|------|----------------------|
| Default                                                         | Min | Max   | Unit | Logic Diagram        |
| MM_AS: Sl. register AS 064                                      |     |       |      | 246 124              |
| 0                                                               | 0   | 65535 |      |                      |
| Setting the register address which will be used in the message. |     |       |      |                      |
| MM_AS: Function code AS 001                                     |     |       |      | 245 001              |
| 3                                                               | 3   | 4     |      | Fig. 3-28, (p. 3-36) |
| MM_AS: Function code AS 002                                     |     |       |      | 245 007              |
| 3                                                               | 3   | 4     |      |                      |
| MM_AS: Function code AS 003                                     |     |       |      | 245 013              |
| 3                                                               | 3   | 4     |      |                      |
| MM_AS: Function code AS 004                                     |     |       |      | 245 019              |
| 3                                                               | 3   | 4     |      |                      |
| MM_AS: Function code AS 005                                     |     |       |      | 245 025              |
| 3                                                               | 3   | 4     |      |                      |
| MM_AS: Function code AS 006                                     |     |       |      | 245 031              |
| 3                                                               | 3   | 4     |      |                      |
| MM_AS: Function code AS 007                                     |     |       |      | 245 037              |
| 3                                                               | 3   | 4     |      |                      |
| MM_AS: Function code AS 008                                     |     |       |      | 245 043              |
| 3                                                               | 3   | 4     |      |                      |
| MM_AS: Function code AS 009                                     |     |       |      | 245 049              |
| 3                                                               | 3   | 4     |      |                      |
| MM_AS: Function code AS 010                                     |     |       |      | 245 055              |
| 3                                                               | 3   | 4     |      |                      |
| MM_AS: Function code AS 011                                     |     |       |      | 245 061              |
| 3                                                               | 3   | 4     |      |                      |
| MM_AS: Function code AS 012                                     |     |       |      | 245 067              |
| 3                                                               | 3   | 4     |      |                      |
| MM_AS: Function code AS 013                                     |     |       |      | 245 073              |
| 3                                                               | 3   | 4     |      |                      |
| MM_AS: Function code AS 014                                     |     |       |      | 245 079              |
| 3                                                               | 3   | 4     |      |                      |
| MM_AS: Function code AS 015                                     |     |       |      | 245 085              |
| 3                                                               | 3   | 4     |      |                      |
| MM_AS: Function code AS 016                                     |     |       |      | 245 091              |
| 3                                                               | 3   | 4     |      |                      |
| MM_AS: Function code AS 017                                     |     |       |      | 245 097              |
| 3                                                               | 3   | 4     |      |                      |

| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| MM_AS: Function code AS 018 |     |     |      | 245 103       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 019 |     |     |      | 245 109       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 020 |     |     |      | 245 115       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 021 |     |     |      | 245 121       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 022 |     |     |      | 245 127       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 023 |     |     |      | 245 133       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 024 |     |     |      | 245 139       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 025 |     |     |      | 245 145       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 026 |     |     |      | 245 151       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 027 |     |     |      | 245 157       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 028 |     |     |      | 245 163       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 029 |     |     |      | 245 169       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 030 |     |     |      | 245 175       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 031 |     |     |      | 245 181       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 032 |     |     |      | 245 187       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 033 |     |     |      | 245 193       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 034 |     |     |      | 245 199       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 035 |     |     |      | 245 205       |
| 3                           | 3   | 4   |      |               |
| MM_AS: Function code AS 036 |     |     |      | 245 211       |
| 3                           | 3   | 4   |      |               |

| Parameter                   |     |     |      |  | Address       |  |         |
|-----------------------------|-----|-----|------|--|---------------|--|---------|
| Default                     | Min | Max | Unit |  | Logic Diagram |  |         |
| MM_AS: Function code AS 037 |     |     |      |  |               |  | 245 217 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 038 |     |     |      |  |               |  | 245 223 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 039 |     |     |      |  |               |  | 245 229 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 040 |     |     |      |  |               |  | 245 235 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 041 |     |     |      |  |               |  | 245 241 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 042 |     |     |      |  |               |  | 245 247 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 043 |     |     |      |  |               |  | 245 253 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 044 |     |     |      |  |               |  | 246 003 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 045 |     |     |      |  |               |  | 246 009 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 046 |     |     |      |  |               |  | 246 015 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 047 |     |     |      |  |               |  | 246 021 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 048 |     |     |      |  |               |  | 246 027 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 049 |     |     |      |  |               |  | 246 033 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 050 |     |     |      |  |               |  | 246 039 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 051 |     |     |      |  |               |  | 246 045 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 052 |     |     |      |  |               |  | 246 051 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 053 |     |     |      |  |               |  | 246 057 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 054 |     |     |      |  |               |  | 246 063 |
| 3                           | 3   | 4   |      |  |               |  |         |
| MM_AS: Function code AS 055 |     |     |      |  |               |  | 246 069 |
| 3                           | 3   | 4   |      |  |               |  |         |

| Parameter                                       |                      |     |      | Address       |
|-------------------------------------------------|----------------------|-----|------|---------------|
| Default                                         | Min                  | Max | Unit | Logic Diagram |
| MM_AS: Function code AS 056                     |                      |     |      | 246 075       |
| 3                                               | 3                    | 4   |      |               |
| MM_AS: Function code AS 057                     |                      |     |      | 246 081       |
| 3                                               | 3                    | 4   |      |               |
| MM_AS: Function code AS 058                     |                      |     |      | 246 087       |
| 3                                               | 3                    | 4   |      |               |
| MM_AS: Function code AS 059                     |                      |     |      | 246 093       |
| 3                                               | 3                    | 4   |      |               |
| MM_AS: Function code AS 060                     |                      |     |      | 246 099       |
| 3                                               | 3                    | 4   |      |               |
| MM_AS: Function code AS 061                     |                      |     |      | 246 105       |
| 3                                               | 3                    | 4   |      |               |
| MM_AS: Function code AS 062                     |                      |     |      | 246 111       |
| 3                                               | 3                    | 4   |      |               |
| MM_AS: Function code AS 063                     |                      |     |      | 246 117       |
| 3                                               | 3                    | 4   |      |               |
| MM_AS: Function code AS 064                     |                      |     |      | 246 123       |
| 3                                               | 3                    | 4   |      |               |
| Setting the function code of the analog signal. |                      |     |      |               |
| MM_AS: Gr.asg. delta AS 001                     |                      |     |      | 245 003       |
| 1: Group 1                                      | Fig. 3-28, (p. 3-36) |     |      |               |
| MM_AS: Gr.asg. delta AS 002                     |                      |     |      | 245 009       |
| 1: Group 1                                      |                      |     |      |               |
| MM_AS: Gr.asg. delta AS 003                     |                      |     |      | 245 015       |
| 1: Group 1                                      |                      |     |      |               |
| MM_AS: Gr.asg. delta AS 004                     |                      |     |      | 245 021       |
| 1: Group 1                                      |                      |     |      |               |
| MM_AS: Gr.asg. delta AS 005                     |                      |     |      | 245 027       |
| 1: Group 1                                      |                      |     |      |               |
| MM_AS: Gr.asg. delta AS 006                     |                      |     |      | 245 033       |
| 1: Group 1                                      |                      |     |      |               |
| MM_AS: Gr.asg. delta AS 007                     |                      |     |      | 245 039       |
| 1: Group 1                                      |                      |     |      |               |
| MM_AS: Gr.asg. delta AS 008                     |                      |     |      | 245 045       |
| 1: Group 1                                      |                      |     |      |               |
| MM_AS: Gr.asg. delta AS 009                     |                      |     |      | 245 051       |
| 1: Group 1                                      |                      |     |      |               |

| Parameter                   |     |     |      | Address       |  |  |         |
|-----------------------------|-----|-----|------|---------------|--|--|---------|
| Default                     | Min | Max | Unit | Logic Diagram |  |  |         |
| MM_AS: Gr.asg. delta AS 010 |     |     |      |               |  |  | 245 057 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 011 |     |     |      |               |  |  | 245 063 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 012 |     |     |      |               |  |  | 245 069 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 013 |     |     |      |               |  |  | 245 075 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 014 |     |     |      |               |  |  | 245 081 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 015 |     |     |      |               |  |  | 245 087 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 016 |     |     |      |               |  |  | 245 093 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 017 |     |     |      |               |  |  | 245 099 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 018 |     |     |      |               |  |  | 245 105 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 019 |     |     |      |               |  |  | 245 111 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 020 |     |     |      |               |  |  | 245 117 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 021 |     |     |      |               |  |  | 245 123 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 022 |     |     |      |               |  |  | 245 129 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 023 |     |     |      |               |  |  | 245 135 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 024 |     |     |      |               |  |  | 245 141 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 025 |     |     |      |               |  |  | 245 147 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 026 |     |     |      |               |  |  | 245 153 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 027 |     |     |      |               |  |  | 245 159 |
| 1: Group 1                  |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 028 |     |     |      |               |  |  | 245 165 |
| 1: Group 1                  |     |     |      |               |  |  |         |

| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| MM_AS: Gr.asg. delta AS 029 |     |     |      | 245 171       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 030 |     |     |      | 245 177       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 031 |     |     |      | 245 183       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 032 |     |     |      | 245 189       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 033 |     |     |      | 245 195       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 034 |     |     |      | 245 201       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 035 |     |     |      | 245 207       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 036 |     |     |      | 245 213       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 037 |     |     |      | 245 219       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 038 |     |     |      | 245 225       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 039 |     |     |      | 245 231       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 040 |     |     |      | 245 237       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 041 |     |     |      | 245 243       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 042 |     |     |      | 245 249       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 043 |     |     |      | 245 255       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 044 |     |     |      | 246 005       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 045 |     |     |      | 246 011       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 046 |     |     |      | 246 017       |
| 1: Group 1                  |     |     |      |               |
| MM_AS: Gr.asg. delta AS 047 |     |     |      | 246 023       |
| 1: Group 1                  |     |     |      |               |

| Parameter                                                                                                          |     |     |      | Address       |  |  |         |
|--------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|--|--|---------|
| Default                                                                                                            | Min | Max | Unit | Logic Diagram |  |  |         |
| MM_AS: Gr.asg. delta AS 048                                                                                        |     |     |      |               |  |  | 246 029 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 049                                                                                        |     |     |      |               |  |  | 246 035 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 050                                                                                        |     |     |      |               |  |  | 246 041 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 051                                                                                        |     |     |      |               |  |  | 246 047 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 052                                                                                        |     |     |      |               |  |  | 246 053 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 053                                                                                        |     |     |      |               |  |  | 246 059 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 054                                                                                        |     |     |      |               |  |  | 246 065 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 055                                                                                        |     |     |      |               |  |  | 246 071 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 056                                                                                        |     |     |      |               |  |  | 246 077 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 057                                                                                        |     |     |      |               |  |  | 246 083 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 058                                                                                        |     |     |      |               |  |  | 246 089 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 059                                                                                        |     |     |      |               |  |  | 246 095 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 060                                                                                        |     |     |      |               |  |  | 246 101 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 061                                                                                        |     |     |      |               |  |  | 246 107 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 062                                                                                        |     |     |      |               |  |  | 246 113 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 063                                                                                        |     |     |      |               |  |  | 246 119 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| MM_AS: Gr.asg. delta AS 064                                                                                        |     |     |      |               |  |  | 246 125 |
| 1: Group 1                                                                                                         |     |     |      |               |  |  |         |
| The telegram is transmitted if a value differs by the set delta quantity from the last measured value transmitted. |     |     |      |               |  |  |         |



MODBUS master,  
binary command

| Parameter                                                                                                                                                                                                                | Address |     |      |                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|----------------------|
| Default                                                                                                                                                                                                                  | Min     | Max | Unit | Logic Diagram        |
| MM_BC: Function group MM_BC                                                                                                                                                                                              |         |     |      | 208 250              |
| 0: Without                                                                                                                                                                                                               |         |     |      |                      |
| Canceling function group MM_BC or including it in the configuration. If the function group is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |         |     |      |                      |
| MM_BC: Command BC 001 conf.                                                                                                                                                                                              |         |     |      | 208 004              |
| 0: No                                                                                                                                                                                                                    |         |     |      | Fig. 3-25, (p. 3-34) |
| MM_BC: Command BC 002 conf.                                                                                                                                                                                              |         |     |      | 208 009              |
| 0: No                                                                                                                                                                                                                    |         |     |      |                      |
| MM_BC: Command BC 003 conf.                                                                                                                                                                                              |         |     |      | 208 014              |
| 0: No                                                                                                                                                                                                                    |         |     |      |                      |
| MM_BC: Command BC 004 conf.                                                                                                                                                                                              |         |     |      | 208 019              |
| 0: No                                                                                                                                                                                                                    |         |     |      |                      |
| MM_BC: Command BC 005 conf.                                                                                                                                                                                              |         |     |      | 208 024              |
| 0: No                                                                                                                                                                                                                    |         |     |      |                      |
| MM_BC: Command BC 006 conf.                                                                                                                                                                                              |         |     |      | 208 029              |
| 0: No                                                                                                                                                                                                                    |         |     |      |                      |
| MM_BC: Command BC 007 conf.                                                                                                                                                                                              |         |     |      | 208 034              |
| 0: No                                                                                                                                                                                                                    |         |     |      |                      |
| MM_BC: Command BC 008 conf.                                                                                                                                                                                              |         |     |      | 208 039              |
| 0: No                                                                                                                                                                                                                    |         |     |      |                      |
| MM_BC: Command BC 009 conf.                                                                                                                                                                                              |         |     |      | 208 044              |
| 0: No                                                                                                                                                                                                                    |         |     |      |                      |
| MM_BC: Command BC 010 conf.                                                                                                                                                                                              |         |     |      | 208 049              |
| 0: No                                                                                                                                                                                                                    |         |     |      |                      |
| MM_BC: Command BC 011 conf.                                                                                                                                                                                              |         |     |      | 208 054              |
| 0: No                                                                                                                                                                                                                    |         |     |      |                      |
| MM_BC: Command BC 012 conf.                                                                                                                                                                                              |         |     |      | 208 059              |
| 0: No                                                                                                                                                                                                                    |         |     |      |                      |
| MM_BC: Command BC 013 conf.                                                                                                                                                                                              |         |     |      | 208 064              |
| 0: No                                                                                                                                                                                                                    |         |     |      |                      |
| MM_BC: Command BC 014 conf.                                                                                                                                                                                              |         |     |      | 208 069              |
| 0: No                                                                                                                                                                                                                    |         |     |      |                      |
| MM_BC: Command BC 015 conf.                                                                                                                                                                                              |         |     |      | 208 074              |
| 0: No                                                                                                                                                                                                                    |         |     |      |                      |
| MM_BC: Command BC 016 conf.                                                                                                                                                                                              |         |     |      | 208 079              |
| 0: No                                                                                                                                                                                                                    |         |     |      |                      |

| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| MM_BC: Command BC 017 conf. |     |     |      | 208 084       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 018 conf. |     |     |      | 208 089       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 019 conf. |     |     |      | 208 094       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 020 conf. |     |     |      | 208 099       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 021 conf. |     |     |      | 208 104       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 022 conf. |     |     |      | 208 109       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 023 conf. |     |     |      | 208 114       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 024 conf. |     |     |      | 208 119       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 025 conf. |     |     |      | 208 124       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 026 conf. |     |     |      | 208 129       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 027 conf. |     |     |      | 208 134       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 028 conf. |     |     |      | 208 139       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 029 conf. |     |     |      | 208 144       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 030 conf. |     |     |      | 208 149       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 031 conf. |     |     |      | 208 154       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 032 conf. |     |     |      | 208 159       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 033 conf. |     |     |      | 208 164       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 034 conf. |     |     |      | 208 169       |
| 0: No                       |     |     |      |               |
| MM_BC: Command BC 035 conf. |     |     |      | 208 174       |
| 0: No                       |     |     |      |               |

| Parameter                                                                                                                                                                                                 |     |       |                      | Address       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|----------------------|---------------|
| Default                                                                                                                                                                                                   | Min | Max   | Unit                 | Logic Diagram |
| MM_BC: Command BC 036 conf.                                                                                                                                                                               |     |       |                      | 208 179       |
| 0: No                                                                                                                                                                                                     |     |       |                      |               |
| MM_BC: Command BC 037 conf.                                                                                                                                                                               |     |       |                      | 208 184       |
| 0: No                                                                                                                                                                                                     |     |       |                      |               |
| MM_BC: Command BC 038 conf.                                                                                                                                                                               |     |       |                      | 208 189       |
| 0: No                                                                                                                                                                                                     |     |       |                      |               |
| MM_BC: Command BC 039 conf.                                                                                                                                                                               |     |       |                      | 208 194       |
| 0: No                                                                                                                                                                                                     |     |       |                      |               |
| MM_BC: Command BC 040 conf.                                                                                                                                                                               |     |       |                      | 208 199       |
| 0: No                                                                                                                                                                                                     |     |       |                      |               |
| Canceling MM_BC function or including in the configuration. If the function is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |     |       |                      |               |
| MM_BC: Sl. register BC 001                                                                                                                                                                                |     |       |                      | 208 001       |
| 0                                                                                                                                                                                                         | 0   | 65535 | Fig. 3-25, (p. 3-34) |               |
| MM_BC: Sl. register BC 002                                                                                                                                                                                |     |       |                      | 208 006       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_BC: Sl. register BC 003                                                                                                                                                                                |     |       |                      | 208 011       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_BC: Sl. register BC 004                                                                                                                                                                                |     |       |                      | 208 016       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_BC: Sl. register BC 005                                                                                                                                                                                |     |       |                      | 208 021       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_BC: Sl. register BC 006                                                                                                                                                                                |     |       |                      | 208 026       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_BC: Sl. register BC 007                                                                                                                                                                                |     |       |                      | 208 031       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_BC: Sl. register BC 008                                                                                                                                                                                |     |       |                      | 208 036       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_BC: Sl. register BC 009                                                                                                                                                                                |     |       |                      | 208 041       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_BC: Sl. register BC 010                                                                                                                                                                                |     |       |                      | 208 046       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_BC: Sl. register BC 011                                                                                                                                                                                |     |       |                      | 208 051       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |
| MM_BC: Sl. register BC 012                                                                                                                                                                                |     |       |                      | 208 056       |
| 0                                                                                                                                                                                                         | 0   | 65535 |                      |               |

| Parameter                  |     |       |      |  | Address       |  |         |
|----------------------------|-----|-------|------|--|---------------|--|---------|
| Default                    | Min | Max   | Unit |  | Logic Diagram |  |         |
| MM_BC: Sl. register BC 013 |     |       |      |  |               |  | 208 061 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 014 |     |       |      |  |               |  | 208 066 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 015 |     |       |      |  |               |  | 208 071 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 016 |     |       |      |  |               |  | 208 076 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 017 |     |       |      |  |               |  | 208 081 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 018 |     |       |      |  |               |  | 208 086 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 019 |     |       |      |  |               |  | 208 091 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 020 |     |       |      |  |               |  | 208 096 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 021 |     |       |      |  |               |  | 208 101 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 022 |     |       |      |  |               |  | 208 106 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 023 |     |       |      |  |               |  | 208 111 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 024 |     |       |      |  |               |  | 208 116 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 025 |     |       |      |  |               |  | 208 121 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 026 |     |       |      |  |               |  | 208 126 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 027 |     |       |      |  |               |  | 208 131 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 028 |     |       |      |  |               |  | 208 136 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 029 |     |       |      |  |               |  | 208 141 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 030 |     |       |      |  |               |  | 208 146 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BC: Sl. register BC 031 |     |       |      |  |               |  | 208 151 |
| 0                          | 0   | 65535 |      |  |               |  |         |

| Parameter                                                       |     |       |      | Address       |  |  |         |
|-----------------------------------------------------------------|-----|-------|------|---------------|--|--|---------|
| Default                                                         | Min | Max   | Unit | Logic Diagram |  |  |         |
| MM_BC: Sl. register BC 032                                      |     |       |      |               |  |  | 208 156 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_BC: Sl. register BC 033                                      |     |       |      |               |  |  | 208 161 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_BC: Sl. register BC 034                                      |     |       |      |               |  |  | 208 166 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_BC: Sl. register BC 035                                      |     |       |      |               |  |  | 208 171 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_BC: Sl. register BC 036                                      |     |       |      |               |  |  | 208 176 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_BC: Sl. register BC 037                                      |     |       |      |               |  |  | 208 181 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_BC: Sl. register BC 038                                      |     |       |      |               |  |  | 208 186 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_BC: Sl. register BC 039                                      |     |       |      |               |  |  | 208 191 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| MM_BC: Sl. register BC 040                                      |     |       |      |               |  |  | 208 196 |
| 0                                                               | 0   | 65535 |      |               |  |  |         |
| Setting the register address which will be used in the message. |     |       |      |               |  |  |         |

MODBUS master,  
binary signal

| Parameter                                                                                                                                                                                                                |     |     |      | Address       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                                                  | Min | Max | Unit | Logic Diagram |
| MM_BS: Function group MM_BS                                                                                                                                                                                              |     |     |      | 207 250       |
| 0: Without                                                                                                                                                                                                               |     |     |      |               |
| Canceling function group MM_BS or including it in the configuration. If the function group is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |     |     |      |               |
| MM_BS: Signal BS 001 config                                                                                                                                                                                              |     |     |      | 206 005       |
| 0: No <span style="color: green;">Fig. 3-27, (p. 3-35)</span>                                                                                                                                                            |     |     |      |               |
| MM_BS: Signal BS 002 config                                                                                                                                                                                              |     |     |      | 206 011       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_BS: Signal BS 003 config                                                                                                                                                                                              |     |     |      | 206 017       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_BS: Signal BS 004 config                                                                                                                                                                                              |     |     |      | 206 023       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_BS: Signal BS 005 config                                                                                                                                                                                              |     |     |      | 206 029       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_BS: Signal BS 006 config                                                                                                                                                                                              |     |     |      | 206 035       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_BS: Signal BS 007 config                                                                                                                                                                                              |     |     |      | 206 041       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_BS: Signal BS 008 config                                                                                                                                                                                              |     |     |      | 206 047       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_BS: Signal BS 009 config                                                                                                                                                                                              |     |     |      | 206 053       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_BS: Signal BS 010 config                                                                                                                                                                                              |     |     |      | 206 059       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_BS: Signal BS 011 config                                                                                                                                                                                              |     |     |      | 206 065       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_BS: Signal BS 012 config                                                                                                                                                                                              |     |     |      | 206 071       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_BS: Signal BS 013 config                                                                                                                                                                                              |     |     |      | 206 077       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_BS: Signal BS 014 config                                                                                                                                                                                              |     |     |      | 206 083       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_BS: Signal BS 015 config                                                                                                                                                                                              |     |     |      | 206 089       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |
| MM_BS: Signal BS 016 config                                                                                                                                                                                              |     |     |      | 206 095       |
| 0: No                                                                                                                                                                                                                    |     |     |      |               |

| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| MM_BS: Signal BS 017 config |     |     |      | 206 101       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 018 config |     |     |      | 206 107       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 019 config |     |     |      | 206 113       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 020 config |     |     |      | 206 119       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 021 config |     |     |      | 206 125       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 022 config |     |     |      | 206 131       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 023 config |     |     |      | 206 137       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 024 config |     |     |      | 206 143       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 025 config |     |     |      | 206 149       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 026 config |     |     |      | 206 155       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 027 config |     |     |      | 206 161       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 028 config |     |     |      | 206 167       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 029 config |     |     |      | 206 173       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 030 config |     |     |      | 206 179       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 031 config |     |     |      | 206 185       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 032 config |     |     |      | 206 191       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 033 config |     |     |      | 206 197       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 034 config |     |     |      | 206 203       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 035 config |     |     |      | 206 209       |
| 0: No                       |     |     |      |               |

| Parameter                   |     |     |      |  | Address       |
|-----------------------------|-----|-----|------|--|---------------|
| Default                     | Min | Max | Unit |  | Logic Diagram |
| MM_BS: Signal BS 036 config |     |     |      |  | 206 215       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 037 config |     |     |      |  | 206 221       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 038 config |     |     |      |  | 206 227       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 039 config |     |     |      |  | 206 233       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 040 config |     |     |      |  | 206 239       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 041 config |     |     |      |  | 206 245       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 042 config |     |     |      |  | 206 251       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 043 config |     |     |      |  | 207 001       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 044 config |     |     |      |  | 207 007       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 045 config |     |     |      |  | 207 013       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 046 config |     |     |      |  | 207 019       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 047 config |     |     |      |  | 207 025       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 048 config |     |     |      |  | 207 031       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 049 config |     |     |      |  | 207 037       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 050 config |     |     |      |  | 207 043       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 051 config |     |     |      |  | 207 049       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 052 config |     |     |      |  | 207 055       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 053 config |     |     |      |  | 207 061       |
| 0: No                       |     |     |      |  |               |
| MM_BS: Signal BS 054 config |     |     |      |  | 207 067       |
| 0: No                       |     |     |      |  |               |



| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| MM_BS: Signal BS 055 config |     |     |      | 207 073       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 056 config |     |     |      | 207 079       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 057 config |     |     |      | 207 085       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 058 config |     |     |      | 207 091       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 059 config |     |     |      | 207 097       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 060 config |     |     |      | 207 103       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 061 config |     |     |      | 207 109       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 062 config |     |     |      | 207 115       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 063 config |     |     |      | 207 121       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 064 config |     |     |      | 207 127       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 065 config |     |     |      | 207 133       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 066 config |     |     |      | 207 139       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 067 config |     |     |      | 207 145       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 068 config |     |     |      | 207 151       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 069 config |     |     |      | 207 157       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 070 config |     |     |      | 207 163       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 071 config |     |     |      | 207 169       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 072 config |     |     |      | 207 175       |
| 0: No                       |     |     |      |               |
| MM_BS: Signal BS 073 config |     |     |      | 207 181       |
| 0: No                       |     |     |      |               |

| Parameter                                                                                                                                                                                                 | Address |       |                      |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|----------------------|---------------|
| Default                                                                                                                                                                                                   | Min     | Max   | Unit                 | Logic Diagram |
| MM_BS: Signal BS 074 config                                                                                                                                                                               |         |       |                      | 207 187       |
| 0: No                                                                                                                                                                                                     |         |       |                      |               |
| MM_BS: Signal BS 075 config                                                                                                                                                                               |         |       |                      | 207 193       |
| 0: No                                                                                                                                                                                                     |         |       |                      |               |
| MM_BS: Signal BS 076 config                                                                                                                                                                               |         |       |                      | 207 199       |
| 0: No                                                                                                                                                                                                     |         |       |                      |               |
| MM_BS: Signal BS 077 config                                                                                                                                                                               |         |       |                      | 207 205       |
| 0: No                                                                                                                                                                                                     |         |       |                      |               |
| MM_BS: Signal BS 078 config                                                                                                                                                                               |         |       |                      | 207 211       |
| 0: No                                                                                                                                                                                                     |         |       |                      |               |
| MM_BS: Signal BS 079 config                                                                                                                                                                               |         |       |                      | 207 217       |
| 0: No                                                                                                                                                                                                     |         |       |                      |               |
| MM_BS: Signal BS 080 config                                                                                                                                                                               |         |       |                      | 207 223       |
| 0: No                                                                                                                                                                                                     |         |       |                      |               |
| Canceling MM_BS function or including in the configuration. If the function is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |         |       |                      |               |
| MM_BS: Sl. register BS 001                                                                                                                                                                                |         |       |                      | 206 002       |
| 0                                                                                                                                                                                                         | 0       | 65535 | Fig. 3-27, (p. 3-35) |               |
| MM_BS: Sl. register BS 002                                                                                                                                                                                |         |       |                      | 206 008       |
| 0                                                                                                                                                                                                         | 0       | 65535 |                      |               |
| MM_BS: Sl. register BS 003                                                                                                                                                                                |         |       |                      | 206 014       |
| 0                                                                                                                                                                                                         | 0       | 65535 |                      |               |
| MM_BS: Sl. register BS 004                                                                                                                                                                                |         |       |                      | 206 020       |
| 0                                                                                                                                                                                                         | 0       | 65535 |                      |               |
| MM_BS: Sl. register BS 005                                                                                                                                                                                |         |       |                      | 206 026       |
| 0                                                                                                                                                                                                         | 0       | 65535 |                      |               |
| MM_BS: Sl. register BS 006                                                                                                                                                                                |         |       |                      | 206 032       |
| 0                                                                                                                                                                                                         | 0       | 65535 |                      |               |
| MM_BS: Sl. register BS 007                                                                                                                                                                                |         |       |                      | 206 038       |
| 0                                                                                                                                                                                                         | 0       | 65535 |                      |               |
| MM_BS: Sl. register BS 008                                                                                                                                                                                |         |       |                      | 206 044       |
| 0                                                                                                                                                                                                         | 0       | 65535 |                      |               |
| MM_BS: Sl. register BS 009                                                                                                                                                                                |         |       |                      | 206 050       |
| 0                                                                                                                                                                                                         | 0       | 65535 |                      |               |
| MM_BS: Sl. register BS 010                                                                                                                                                                                |         |       |                      | 206 056       |
| 0                                                                                                                                                                                                         | 0       | 65535 |                      |               |

| Parameter                  |     |       |      | Address       |
|----------------------------|-----|-------|------|---------------|
| Default                    | Min | Max   | Unit | Logic Diagram |
| MM_BS: Sl. register BS 011 |     |       |      | 206 062       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 012 |     |       |      | 206 068       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 013 |     |       |      | 206 074       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 014 |     |       |      | 206 080       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 015 |     |       |      | 206 086       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 016 |     |       |      | 206 092       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 017 |     |       |      | 206 098       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 018 |     |       |      | 206 104       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 019 |     |       |      | 206 110       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 020 |     |       |      | 206 116       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 021 |     |       |      | 206 122       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 022 |     |       |      | 206 128       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 023 |     |       |      | 206 134       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 024 |     |       |      | 206 140       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 025 |     |       |      | 206 146       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 026 |     |       |      | 206 152       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 027 |     |       |      | 206 158       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 028 |     |       |      | 206 164       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 029 |     |       |      | 206 170       |
| 0                          | 0   | 65535 |      |               |

| Parameter                  |     |       |      |  | Address       |  |         |
|----------------------------|-----|-------|------|--|---------------|--|---------|
| Default                    | Min | Max   | Unit |  | Logic Diagram |  |         |
| MM_BS: Sl. register BS 030 |     |       |      |  |               |  | 206 176 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 031 |     |       |      |  |               |  | 206 182 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 032 |     |       |      |  |               |  | 206 188 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 033 |     |       |      |  |               |  | 206 194 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 034 |     |       |      |  |               |  | 206 200 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 035 |     |       |      |  |               |  | 206 206 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 036 |     |       |      |  |               |  | 206 212 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 037 |     |       |      |  |               |  | 206 218 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 038 |     |       |      |  |               |  | 206 224 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 039 |     |       |      |  |               |  | 206 230 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 040 |     |       |      |  |               |  | 206 236 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 041 |     |       |      |  |               |  | 206 242 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 042 |     |       |      |  |               |  | 206 248 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 043 |     |       |      |  |               |  | 206 254 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 044 |     |       |      |  |               |  | 207 004 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 045 |     |       |      |  |               |  | 207 010 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 046 |     |       |      |  |               |  | 207 016 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 047 |     |       |      |  |               |  | 207 022 |
| 0                          | 0   | 65535 |      |  |               |  |         |
| MM_BS: Sl. register BS 048 |     |       |      |  |               |  | 207 028 |
| 0                          | 0   | 65535 |      |  |               |  |         |

| Parameter                  |     |       |      | Address       |
|----------------------------|-----|-------|------|---------------|
| Default                    | Min | Max   | Unit | Logic Diagram |
| MM_BS: Sl. register BS 049 |     |       |      | 207 034       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 050 |     |       |      | 207 040       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 051 |     |       |      | 207 046       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 052 |     |       |      | 207 052       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 053 |     |       |      | 207 058       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 054 |     |       |      | 207 064       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 055 |     |       |      | 207 070       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 056 |     |       |      | 207 076       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 057 |     |       |      | 207 082       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 058 |     |       |      | 207 088       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 059 |     |       |      | 207 094       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 060 |     |       |      | 207 100       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 061 |     |       |      | 207 106       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 062 |     |       |      | 207 112       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 063 |     |       |      | 207 118       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 064 |     |       |      | 207 124       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 065 |     |       |      | 207 130       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 066 |     |       |      | 207 136       |
| 0                          | 0   | 65535 |      |               |
| MM_BS: Sl. register BS 067 |     |       |      | 207 142       |
| 0                          | 0   | 65535 |      |               |

| Parameter                                                       |     |       |      |  | Address              |
|-----------------------------------------------------------------|-----|-------|------|--|----------------------|
| Default                                                         | Min | Max   | Unit |  | Logic Diagram        |
| MM_BS: Sl. register BS 068                                      |     |       |      |  | 207 148              |
| 0                                                               | 0   | 65535 |      |  |                      |
| MM_BS: Sl. register BS 069                                      |     |       |      |  | 207 154              |
| 0                                                               | 0   | 65535 |      |  |                      |
| MM_BS: Sl. register BS 070                                      |     |       |      |  | 207 160              |
| 0                                                               | 0   | 65535 |      |  |                      |
| MM_BS: Sl. register BS 071                                      |     |       |      |  | 207 166              |
| 0                                                               | 0   | 65535 |      |  |                      |
| MM_BS: Sl. register BS 072                                      |     |       |      |  | 207 172              |
| 0                                                               | 0   | 65535 |      |  |                      |
| MM_BS: Sl. register BS 073                                      |     |       |      |  | 207 178              |
| 0                                                               | 0   | 65535 |      |  |                      |
| MM_BS: Sl. register BS 074                                      |     |       |      |  | 207 184              |
| 0                                                               | 0   | 65535 |      |  |                      |
| MM_BS: Sl. register BS 075                                      |     |       |      |  | 207 190              |
| 0                                                               | 0   | 65535 |      |  |                      |
| MM_BS: Sl. register BS 076                                      |     |       |      |  | 207 196              |
| 0                                                               | 0   | 65535 |      |  |                      |
| MM_BS: Sl. register BS 077                                      |     |       |      |  | 207 202              |
| 0                                                               | 0   | 65535 |      |  |                      |
| MM_BS: Sl. register BS 078                                      |     |       |      |  | 207 208              |
| 0                                                               | 0   | 65535 |      |  |                      |
| MM_BS: Sl. register BS 079                                      |     |       |      |  | 207 214              |
| 0                                                               | 0   | 65535 |      |  |                      |
| MM_BS: Sl. register BS 080                                      |     |       |      |  | 207 220              |
| 0                                                               | 0   | 65535 |      |  |                      |
| Setting the register address which will be used in the message. |     |       |      |  |                      |
| MM_BS: Function code BS 001                                     |     |       |      |  | 206 001              |
| 1                                                               | 1   | 2     |      |  | Fig. 3-27, (p. 3-35) |
| MM_BS: Function code BS 002                                     |     |       |      |  | 206 007              |
| 1                                                               | 1   | 2     |      |  |                      |
| MM_BS: Function code BS 003                                     |     |       |      |  | 206 013              |
| 1                                                               | 1   | 2     |      |  |                      |
| MM_BS: Function code BS 004                                     |     |       |      |  | 206 019              |
| 1                                                               | 1   | 2     |      |  |                      |
| MM_BS: Function code BS 005                                     |     |       |      |  | 206 025              |
| 1                                                               | 1   | 2     |      |  |                      |

| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| MM_BS: Function code BS 006 |     |     |      | 206 031       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 007 |     |     |      | 206 037       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 008 |     |     |      | 206 043       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 009 |     |     |      | 206 049       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 010 |     |     |      | 206 055       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 011 |     |     |      | 206 061       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 012 |     |     |      | 206 067       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 013 |     |     |      | 206 073       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 014 |     |     |      | 206 079       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 015 |     |     |      | 206 085       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 016 |     |     |      | 206 091       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 017 |     |     |      | 206 097       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 018 |     |     |      | 206 103       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 019 |     |     |      | 206 109       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 020 |     |     |      | 206 115       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 021 |     |     |      | 206 121       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 022 |     |     |      | 206 127       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 023 |     |     |      | 206 133       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 024 |     |     |      | 206 139       |
| 1                           | 1   | 2   |      |               |

| Parameter                   |     |     |      |  | Address       |  |         |
|-----------------------------|-----|-----|------|--|---------------|--|---------|
| Default                     | Min | Max | Unit |  | Logic Diagram |  |         |
| MM_BS: Function code BS 025 |     |     |      |  |               |  | 206 145 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 026 |     |     |      |  |               |  | 206 151 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 027 |     |     |      |  |               |  | 206 157 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 028 |     |     |      |  |               |  | 206 163 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 029 |     |     |      |  |               |  | 206 169 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 030 |     |     |      |  |               |  | 206 175 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 031 |     |     |      |  |               |  | 206 181 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 032 |     |     |      |  |               |  | 206 187 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 033 |     |     |      |  |               |  | 206 193 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 034 |     |     |      |  |               |  | 206 199 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 035 |     |     |      |  |               |  | 206 205 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 036 |     |     |      |  |               |  | 206 211 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 037 |     |     |      |  |               |  | 206 217 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 038 |     |     |      |  |               |  | 206 223 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 039 |     |     |      |  |               |  | 206 229 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 040 |     |     |      |  |               |  | 206 235 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 041 |     |     |      |  |               |  | 206 241 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 042 |     |     |      |  |               |  | 206 247 |
| 1                           | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 043 |     |     |      |  |               |  | 206 253 |
| 1                           | 1   | 2   |      |  |               |  |         |



| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| MM_BS: Function code BS 044 |     |     |      | 207 003       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 045 |     |     |      | 207 009       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 046 |     |     |      | 207 015       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 047 |     |     |      | 207 021       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 048 |     |     |      | 207 027       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 049 |     |     |      | 207 033       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 050 |     |     |      | 207 039       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 051 |     |     |      | 207 045       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 052 |     |     |      | 207 051       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 053 |     |     |      | 207 057       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 054 |     |     |      | 207 063       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 055 |     |     |      | 207 069       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 056 |     |     |      | 207 075       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 057 |     |     |      | 207 081       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 058 |     |     |      | 207 087       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 059 |     |     |      | 207 093       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 060 |     |     |      | 207 099       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 061 |     |     |      | 207 105       |
| 1                           | 1   | 2   |      |               |
| MM_BS: Function code BS 062 |     |     |      | 207 111       |
| 1                           | 1   | 2   |      |               |

| Parameter                                       |     |     |      |  | Address       |  |         |
|-------------------------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                                         | Min | Max | Unit |  | Logic Diagram |  |         |
| MM_BS: Function code BS 063                     |     |     |      |  |               |  | 207 117 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 064                     |     |     |      |  |               |  | 207 123 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 065                     |     |     |      |  |               |  | 207 129 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 066                     |     |     |      |  |               |  | 207 135 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 067                     |     |     |      |  |               |  | 207 141 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 068                     |     |     |      |  |               |  | 207 147 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 069                     |     |     |      |  |               |  | 207 153 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 070                     |     |     |      |  |               |  | 207 159 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 071                     |     |     |      |  |               |  | 207 165 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 072                     |     |     |      |  |               |  | 207 171 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 073                     |     |     |      |  |               |  | 207 177 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 074                     |     |     |      |  |               |  | 207 183 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 075                     |     |     |      |  |               |  | 207 189 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 076                     |     |     |      |  |               |  | 207 195 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 077                     |     |     |      |  |               |  | 207 201 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 078                     |     |     |      |  |               |  | 207 207 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 079                     |     |     |      |  |               |  | 207 213 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| MM_BS: Function code BS 080                     |     |     |      |  |               |  | 207 219 |
| 1                                               | 1   | 2   |      |  |               |  |         |
| Setting the function code of the binary signal. |     |     |      |  |               |  |         |

Configurable function keys

| Parameter                                                                                                                                                                                                                               |     |      |      |               | Address |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|------|---------------|---------|
| Default                                                                                                                                                                                                                                 | Min | Max  | Unit | Logic Diagram |         |
| F_KEY: Password funct.key 1                                                                                                                                                                                                             |     |      |      |               | 003 036 |
| 0                                                                                                                                                                                                                                       | 0   | 4444 |      |               |         |
| F_KEY: Password funct.key 2                                                                                                                                                                                                             |     |      |      |               | 030 242 |
| 0                                                                                                                                                                                                                                       | 0   | 4444 |      |               |         |
| F_KEY: Password funct.key 3                                                                                                                                                                                                             |     |      |      |               | 030 243 |
| 0                                                                                                                                                                                                                                       | 0   | 4444 |      |               |         |
| F_KEY: Password funct.key 4                                                                                                                                                                                                             |     |      |      |               | 030 244 |
| 0                                                                                                                                                                                                                                       | 0   | 4444 |      |               |         |
| F_KEY: Password funct.key 5                                                                                                                                                                                                             |     |      |      |               | 030 245 |
| 0                                                                                                                                                                                                                                       | 0   | 4444 |      |               |         |
| F_KEY: Password funct.key 6                                                                                                                                                                                                             |     |      |      |               | 030 246 |
| 0                                                                                                                                                                                                                                       | 0   | 4444 |      |               |         |
| Definition of the password for enabling the function keys.                                                                                                                                                                              |     |      |      |               |         |
| F_KEY: Fct. assignm. F1                                                                                                                                                                                                                 |     |      |      |               | 080 112 |
| 061 000: MAIN: Without function                                                                                                                                                                                                         |     |      |      |               |         |
| F_KEY: Fct. assignm. F2                                                                                                                                                                                                                 |     |      |      |               | 080 113 |
| 061 000: MAIN: Without function                                                                                                                                                                                                         |     |      |      |               |         |
| F_KEY: Fct. assignm. F3                                                                                                                                                                                                                 |     |      |      |               | 080 114 |
| 061 000: MAIN: Without function                                                                                                                                                                                                         |     |      |      |               |         |
| F_KEY: Fct. assignm. F4                                                                                                                                                                                                                 |     |      |      |               | 080 115 |
| 061 000: MAIN: Without function                                                                                                                                                                                                         |     |      |      |               |         |
| F_KEY: Fct. assignm. F5                                                                                                                                                                                                                 |     |      |      |               | 080 116 |
| 061 000: MAIN: Without function                                                                                                                                                                                                         |     |      |      |               |         |
| F_KEY: Fct. assignm. F6                                                                                                                                                                                                                 |     |      |      |               | 080 117 |
| 061 000: MAIN: Without function                                                                                                                                                                                                         |     |      |      |               |         |
| Assignment of functions to the function keys. Either a single function or a menu jump list may be selected. There are two menu jump lists, which are assembled at LOC: Fct. menu jmp list 1 or LOC: Fct. menu jmp list 2, respectively. |     |      |      |               |         |
| F_KEY: Operating mode F1                                                                                                                                                                                                                |     |      |      |               | 080 132 |
| 1: Key                                                                                                                                                                                                                                  |     |      |      |               |         |
| F_KEY: Operating mode F2                                                                                                                                                                                                                |     |      |      |               | 080 133 |
| 1: Key                                                                                                                                                                                                                                  |     |      |      |               |         |
| F_KEY: Operating mode F3                                                                                                                                                                                                                |     |      |      |               | 080 134 |
| 1: Key                                                                                                                                                                                                                                  |     |      |      |               |         |
| F_KEY: Operating mode F4                                                                                                                                                                                                                |     |      |      |               | 080 135 |
| 1: Key                                                                                                                                                                                                                                  |     |      |      |               |         |

| Parameter                                                                                                                                                                         |     |       |      | Address       |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|------|---------------|---------|
| Default                                                                                                                                                                           | Min | Max   | Unit | Logic Diagram |         |
| F_KEY: Operating mode F5                                                                                                                                                          |     |       |      |               | 080 136 |
| 1: Key                                                                                                                                                                            |     |       |      |               |         |
| F_KEY: Operating mode F6                                                                                                                                                          |     |       |      |               | 080 137 |
| 1: Key                                                                                                                                                                            |     |       |      |               |         |
| Choice between operation of the function key as a key or switch.                                                                                                                  |     |       |      |               |         |
| F_KEY: Return time fct.keys                                                                                                                                                       |     |       |      |               | 003 037 |
| 10                                                                                                                                                                                | 1   | 60000 | s    |               |         |
| Once the password has been entered, the function keys remain active for no longer than this time. Thereafter, the function keys are disabled until the password is entered again. |     |       |      |               |         |

## Binary input

| Parameter                                                                                                                                                                                                                                                                                    |     |     |                      | Address       |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|----------------------|---------------|---------|
| Default                                                                                                                                                                                                                                                                                      | Min | Max | Unit                 | Logic Diagram |         |
| INP: Filter                                                                                                                                                                                                                                                                                  |     |     |                      |               | 010 220 |
| 0                                                                                                                                                                                                                                                                                            | 0   | 20  | Fig. 3-40, (p. 3-66) |               |         |
| Input filter which is activated when either the mode <i>Active "high", filt.</i> or <i>Active "low", filt.</i> has been selected for INP: Oper. mode U xxx. In order to suppress transient interference peaks at the logic signal inputs it is suggested to set this parameter to 6 [steps]. |     |     |                      |               |         |
| INP: Fct. assignm. U 501                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 002 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |
| INP: Fct. assignm. U 502                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 006 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |
| INP: Fct. assignm. U 503                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 010 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |
| INP: Fct. assignm. U 504                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 014 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |
| INP: Fct. assignm. U 505                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 018 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |
| INP: Fct. assignm. U 506                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 022 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |
| INP: Fct. assignm. U 507                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 026 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |
| INP: Fct. assignm. U 508                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 030 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |
| INP: Fct. assignm. U 509                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 034 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |
| INP: Fct. assignm. U 510                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 038 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |
| INP: Fct. assignm. U 511                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 042 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |
| INP: Fct. assignm. U 512                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 046 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |
| INP: Fct. assignm. U 513                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 050 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |
| INP: Fct. assignm. U 514                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 054 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |
| INP: Fct. assignm. U 515                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 058 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |
| INP: Fct. assignm. U 516                                                                                                                                                                                                                                                                     |     |     |                      |               | 181 062 |
| 061 000: MAIN: Without function                                                                                                                                                                                                                                                              |     |     |                      |               |         |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Fct. assignm. U 517        |     |     |      |  |               |  | 181 066 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 518        |     |     |      |  |               |  | 181 070 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 519        |     |     |      |  |               |  | 181 074 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 520        |     |     |      |  |               |  | 181 078 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 521        |     |     |      |  |               |  | 181 082 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 522        |     |     |      |  |               |  | 181 086 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 523        |     |     |      |  |               |  | 181 090 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 524        |     |     |      |  |               |  | 181 094 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 601        |     |     |      |  |               |  | 152 091 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 602        |     |     |      |  |               |  | 152 094 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 603        |     |     |      |  |               |  | 152 097 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 604        |     |     |      |  |               |  | 152 100 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 605        |     |     |      |  |               |  | 152 103 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 606        |     |     |      |  |               |  | 152 106 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 607        |     |     |      |  |               |  | 182 026 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 608        |     |     |      |  |               |  | 182 030 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 609        |     |     |      |  |               |  | 182 034 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 610        |     |     |      |  |               |  | 182 038 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 611        |     |     |      |  |               |  | 182 042 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |

| Parameter                       |     |     |      | Address       |  |  |         |
|---------------------------------|-----|-----|------|---------------|--|--|---------|
| Default                         | Min | Max | Unit | Logic Diagram |  |  |         |
| INP: Fct. assignm. U 612        |     |     |      |               |  |  | 182 046 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 613        |     |     |      |               |  |  | 182 050 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 614        |     |     |      |               |  |  | 182 054 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 615        |     |     |      |               |  |  | 182 058 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 616        |     |     |      |               |  |  | 182 062 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 617        |     |     |      |               |  |  | 182 066 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 618        |     |     |      |               |  |  | 182 070 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 619        |     |     |      |               |  |  | 182 074 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 620        |     |     |      |               |  |  | 182 078 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 621        |     |     |      |               |  |  | 182 082 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 622        |     |     |      |               |  |  | 182 086 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 623        |     |     |      |               |  |  | 182 090 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 624        |     |     |      |               |  |  | 182 094 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 701        |     |     |      |               |  |  | 152 109 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 702        |     |     |      |               |  |  | 152 112 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 703        |     |     |      |               |  |  | 152 115 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 704        |     |     |      |               |  |  | 152 118 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 705        |     |     |      |               |  |  | 152 121 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |
| INP: Fct. assignm. U 706        |     |     |      |               |  |  | 152 124 |
| 061 000: MAIN: Without function |     |     |      |               |  |  |         |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Fct. assignm. U 707        |     |     |      |  |               |  | 183 026 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 708        |     |     |      |  |               |  | 183 030 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 709        |     |     |      |  |               |  | 183 034 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 710        |     |     |      |  |               |  | 183 038 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 711        |     |     |      |  |               |  | 183 042 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 712        |     |     |      |  |               |  | 183 046 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 713        |     |     |      |  |               |  | 183 050 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 714        |     |     |      |  |               |  | 183 054 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 715        |     |     |      |  |               |  | 183 058 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 716        |     |     |      |  |               |  | 183 062 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 717        |     |     |      |  |               |  | 183 066 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 718        |     |     |      |  |               |  | 183 070 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 719        |     |     |      |  |               |  | 183 074 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 720        |     |     |      |  |               |  | 183 078 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 721        |     |     |      |  |               |  | 183 082 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 722        |     |     |      |  |               |  | 183 086 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 723        |     |     |      |  |               |  | 183 090 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 724        |     |     |      |  |               |  | 183 094 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 801        |     |     |      |  |               |  | 184 002 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |



| Parameter                       |     |     |      | Address       |
|---------------------------------|-----|-----|------|---------------|
| Default                         | Min | Max | Unit | Logic Diagram |
| INP: Fct. assignm. U 802        |     |     |      | 184 006       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 803        |     |     |      | 184 010       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 804        |     |     |      | 184 014       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 805        |     |     |      | 184 018       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 806        |     |     |      | 184 022       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 807        |     |     |      | 184 026       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 808        |     |     |      | 184 030       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 809        |     |     |      | 184 034       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 810        |     |     |      | 184 038       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 811        |     |     |      | 184 042       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 812        |     |     |      | 184 046       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 813        |     |     |      | 184 050       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 814        |     |     |      | 184 054       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 815        |     |     |      | 184 058       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 816        |     |     |      | 184 062       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 817        |     |     |      | 184 066       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 818        |     |     |      | 184 070       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 819        |     |     |      | 184 074       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 820        |     |     |      | 184 078       |
| 061 000: MAIN: Without function |     |     |      |               |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Fct. assignm. U 821        |     |     |      |  |               |  | 184 082 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 822        |     |     |      |  |               |  | 184 086 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 823        |     |     |      |  |               |  | 184 090 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 824        |     |     |      |  |               |  | 184 094 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 901        |     |     |      |  |               |  | 152 145 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 902        |     |     |      |  |               |  | 152 148 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 903        |     |     |      |  |               |  | 152 151 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 904        |     |     |      |  |               |  | 152 154 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 905        |     |     |      |  |               |  | 153 002 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 906        |     |     |      |  |               |  | 153 006 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 907        |     |     |      |  |               |  | 153 010 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 908        |     |     |      |  |               |  | 153 014 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 909        |     |     |      |  |               |  | 153 018 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 910        |     |     |      |  |               |  | 153 022 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 911        |     |     |      |  |               |  | 153 026 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 912        |     |     |      |  |               |  | 153 030 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 913        |     |     |      |  |               |  | 153 034 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 914        |     |     |      |  |               |  | 153 038 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 915        |     |     |      |  |               |  | 153 042 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |

| Parameter                       |     |     |      | Address       |
|---------------------------------|-----|-----|------|---------------|
| Default                         | Min | Max | Unit | Logic Diagram |
| INP: Fct. assignm. U 916        |     |     |      | 153 046       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 917        |     |     |      | 153 050       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 918        |     |     |      | 153 054       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 919        |     |     |      | 153 058       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 920        |     |     |      | 153 062       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 921        |     |     |      | 153 066       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 922        |     |     |      | 153 070       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 923        |     |     |      | 153 074       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 924        |     |     |      | 153 078       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1001       |     |     |      | 152 163       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1002       |     |     |      | 152 166       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1003       |     |     |      | 152 169       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1004       |     |     |      | 152 172       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1005       |     |     |      | 152 175       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1006       |     |     |      | 152 178       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1007       |     |     |      | 186 026       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1008       |     |     |      | 186 030       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1009       |     |     |      | 186 034       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1010       |     |     |      | 186 038       |
| 061 000: MAIN: Without function |     |     |      |               |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Fct. assignm. U 1011       |     |     |      |  |               |  | 186 042 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1012       |     |     |      |  |               |  | 186 046 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1013       |     |     |      |  |               |  | 186 050 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1014       |     |     |      |  |               |  | 186 054 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1015       |     |     |      |  |               |  | 186 058 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1016       |     |     |      |  |               |  | 186 062 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1017       |     |     |      |  |               |  | 186 066 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1018       |     |     |      |  |               |  | 186 070 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1019       |     |     |      |  |               |  | 186 074 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1020       |     |     |      |  |               |  | 186 078 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1021       |     |     |      |  |               |  | 186 082 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1022       |     |     |      |  |               |  | 186 086 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1023       |     |     |      |  |               |  | 186 090 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1024       |     |     |      |  |               |  | 186 094 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1101       |     |     |      |  |               |  | 187 002 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1102       |     |     |      |  |               |  | 187 006 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1103       |     |     |      |  |               |  | 187 010 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1104       |     |     |      |  |               |  | 187 014 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1105       |     |     |      |  |               |  | 187 018 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |

| Parameter                       |     |     |      | Address       |
|---------------------------------|-----|-----|------|---------------|
| Default                         | Min | Max | Unit | Logic Diagram |
| INP: Fct. assignm. U 1106       |     |     |      | 187 022       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1107       |     |     |      | 187 026       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1108       |     |     |      | 187 030       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1109       |     |     |      | 187 034       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1110       |     |     |      | 187 038       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1111       |     |     |      | 187 042       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1112       |     |     |      | 187 046       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1113       |     |     |      | 187 050       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1114       |     |     |      | 187 054       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1115       |     |     |      | 187 058       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1116       |     |     |      | 187 062       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1117       |     |     |      | 187 066       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1118       |     |     |      | 187 070       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1119       |     |     |      | 187 074       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1120       |     |     |      | 187 078       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1121       |     |     |      | 187 082       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1122       |     |     |      | 187 086       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1123       |     |     |      | 187 090       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1124       |     |     |      | 187 094       |
| 061 000: MAIN: Without function |     |     |      |               |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Fct. assignm. U 1201       |     |     |      |  |               |  | 152 199 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1202       |     |     |      |  |               |  | 152 202 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1203       |     |     |      |  |               |  | 152 205 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1204       |     |     |      |  |               |  | 152 208 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1205       |     |     |      |  |               |  | 152 211 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1206       |     |     |      |  |               |  | 152 214 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1207       |     |     |      |  |               |  | 188 026 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1208       |     |     |      |  |               |  | 188 030 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1209       |     |     |      |  |               |  | 188 034 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1210       |     |     |      |  |               |  | 188 038 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1211       |     |     |      |  |               |  | 188 042 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1212       |     |     |      |  |               |  | 188 046 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1213       |     |     |      |  |               |  | 188 050 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1214       |     |     |      |  |               |  | 188 054 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1215       |     |     |      |  |               |  | 188 058 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1216       |     |     |      |  |               |  | 188 062 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1217       |     |     |      |  |               |  | 188 066 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1218       |     |     |      |  |               |  | 188 070 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1219       |     |     |      |  |               |  | 188 074 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |

| Parameter                       |     |     |      | Address       |
|---------------------------------|-----|-----|------|---------------|
| Default                         | Min | Max | Unit | Logic Diagram |
| INP: Fct. assignm. U 1220       |     |     |      | 188 078       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1221       |     |     |      | 188 082       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1222       |     |     |      | 188 086       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1223       |     |     |      | 188 090       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1224       |     |     |      | 188 094       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1301       |     |     |      | 189 002       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1302       |     |     |      | 189 006       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1303       |     |     |      | 189 010       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1304       |     |     |      | 189 014       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1305       |     |     |      | 189 018       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1306       |     |     |      | 189 022       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1307       |     |     |      | 189 026       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1308       |     |     |      | 189 030       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1309       |     |     |      | 189 034       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1310       |     |     |      | 189 038       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1311       |     |     |      | 189 042       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1312       |     |     |      | 189 046       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1313       |     |     |      | 189 050       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1314       |     |     |      | 189 054       |
| 061 000: MAIN: Without function |     |     |      |               |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Fct. assignm. U 1315       |     |     |      |  |               |  | 189 058 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1316       |     |     |      |  |               |  | 189 062 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1317       |     |     |      |  |               |  | 189 066 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1318       |     |     |      |  |               |  | 189 070 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1319       |     |     |      |  |               |  | 189 074 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1320       |     |     |      |  |               |  | 189 078 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1321       |     |     |      |  |               |  | 189 082 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1322       |     |     |      |  |               |  | 189 086 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1323       |     |     |      |  |               |  | 189 090 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1324       |     |     |      |  |               |  | 189 094 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1401       |     |     |      |  |               |  | 190 002 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1402       |     |     |      |  |               |  | 190 006 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1403       |     |     |      |  |               |  | 190 010 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1404       |     |     |      |  |               |  | 190 014 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1405       |     |     |      |  |               |  | 190 018 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1406       |     |     |      |  |               |  | 190 022 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1407       |     |     |      |  |               |  | 190 026 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1408       |     |     |      |  |               |  | 190 030 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1409       |     |     |      |  |               |  | 190 034 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |



| Parameter                       |     |     |      | Address       |
|---------------------------------|-----|-----|------|---------------|
| Default                         | Min | Max | Unit | Logic Diagram |
| INP: Fct. assignm. U 1410       |     |     |      | 190 038       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1411       |     |     |      | 190 042       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1412       |     |     |      | 190 046       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1413       |     |     |      | 190 050       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1414       |     |     |      | 190 054       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1415       |     |     |      | 190 058       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1416       |     |     |      | 190 062       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1417       |     |     |      | 190 066       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1418       |     |     |      | 190 070       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1419       |     |     |      | 190 074       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1420       |     |     |      | 190 078       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1421       |     |     |      | 190 082       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1422       |     |     |      | 190 086       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1423       |     |     |      | 190 090       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1424       |     |     |      | 190 094       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1501       |     |     |      | 191 002       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1502       |     |     |      | 191 006       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1503       |     |     |      | 191 010       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1504       |     |     |      | 191 014       |
| 061 000: MAIN: Without function |     |     |      |               |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Fct. assignm. U 1505       |     |     |      |  |               |  | 191 018 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1506       |     |     |      |  |               |  | 191 022 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1507       |     |     |      |  |               |  | 191 026 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1508       |     |     |      |  |               |  | 191 030 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1509       |     |     |      |  |               |  | 191 034 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1510       |     |     |      |  |               |  | 191 038 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1511       |     |     |      |  |               |  | 191 042 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1512       |     |     |      |  |               |  | 191 046 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1513       |     |     |      |  |               |  | 191 050 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1514       |     |     |      |  |               |  | 191 054 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1515       |     |     |      |  |               |  | 191 058 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1516       |     |     |      |  |               |  | 191 062 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1517       |     |     |      |  |               |  | 191 066 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1518       |     |     |      |  |               |  | 191 070 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1519       |     |     |      |  |               |  | 191 074 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1520       |     |     |      |  |               |  | 191 078 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1521       |     |     |      |  |               |  | 191 082 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1522       |     |     |      |  |               |  | 191 086 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1523       |     |     |      |  |               |  | 191 090 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |

| Parameter                       |     |     |      | Address       |
|---------------------------------|-----|-----|------|---------------|
| Default                         | Min | Max | Unit | Logic Diagram |
| INP: Fct. assignm. U 1524       |     |     |      | 191 094       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1601       |     |     |      | 192 002       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1602       |     |     |      | 192 006       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1603       |     |     |      | 192 010       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1604       |     |     |      | 192 014       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1605       |     |     |      | 192 018       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1606       |     |     |      | 192 022       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1607       |     |     |      | 192 026       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1608       |     |     |      | 192 030       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1609       |     |     |      | 192 034       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1610       |     |     |      | 192 038       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1611       |     |     |      | 192 042       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1612       |     |     |      | 192 046       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1613       |     |     |      | 192 050       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1614       |     |     |      | 192 054       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1615       |     |     |      | 192 058       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1616       |     |     |      | 192 062       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1617       |     |     |      | 192 066       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1618       |     |     |      | 192 070       |
| 061 000: MAIN: Without function |     |     |      |               |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Fct. assignm. U 1619       |     |     |      |  |               |  | 192 074 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1620       |     |     |      |  |               |  | 192 078 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1621       |     |     |      |  |               |  | 192 082 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1622       |     |     |      |  |               |  | 192 086 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1623       |     |     |      |  |               |  | 192 090 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1624       |     |     |      |  |               |  | 192 094 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1701       |     |     |      |  |               |  | 193 002 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1702       |     |     |      |  |               |  | 193 006 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1703       |     |     |      |  |               |  | 193 010 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1704       |     |     |      |  |               |  | 193 014 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1705       |     |     |      |  |               |  | 193 018 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1706       |     |     |      |  |               |  | 193 022 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1707       |     |     |      |  |               |  | 193 026 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1708       |     |     |      |  |               |  | 193 030 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1709       |     |     |      |  |               |  | 193 034 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1710       |     |     |      |  |               |  | 193 038 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1711       |     |     |      |  |               |  | 193 042 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1712       |     |     |      |  |               |  | 193 046 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1713       |     |     |      |  |               |  | 193 050 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |

| Parameter                       |     |     |      | Address       |
|---------------------------------|-----|-----|------|---------------|
| Default                         | Min | Max | Unit | Logic Diagram |
| INP: Fct. assignm. U 1714       |     |     |      | 193 054       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1715       |     |     |      | 193 058       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1716       |     |     |      | 193 062       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1717       |     |     |      | 193 066       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1718       |     |     |      | 193 070       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1719       |     |     |      | 193 074       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1720       |     |     |      | 193 078       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1721       |     |     |      | 193 082       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1722       |     |     |      | 193 086       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1723       |     |     |      | 193 090       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1724       |     |     |      | 193 094       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1801       |     |     |      | 194 002       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1802       |     |     |      | 194 006       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1803       |     |     |      | 194 010       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1804       |     |     |      | 194 014       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1805       |     |     |      | 194 018       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1806       |     |     |      | 194 022       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1807       |     |     |      | 194 026       |
| 061 000: MAIN: Without function |     |     |      |               |
| INP: Fct. assignm. U 1808       |     |     |      | 194 030       |
| 061 000: MAIN: Without function |     |     |      |               |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Fct. assignm. U 1809       |     |     |      |  |               |  | 194 034 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1810       |     |     |      |  |               |  | 194 038 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1811       |     |     |      |  |               |  | 194 042 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1812       |     |     |      |  |               |  | 194 046 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1813       |     |     |      |  |               |  | 194 050 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1814       |     |     |      |  |               |  | 194 054 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1815       |     |     |      |  |               |  | 194 058 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1816       |     |     |      |  |               |  | 194 062 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1817       |     |     |      |  |               |  | 194 066 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1818       |     |     |      |  |               |  | 194 070 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1819       |     |     |      |  |               |  | 194 074 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1820       |     |     |      |  |               |  | 194 078 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1821       |     |     |      |  |               |  | 194 082 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1822       |     |     |      |  |               |  | 194 086 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1823       |     |     |      |  |               |  | 194 090 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 1824       |     |     |      |  |               |  | 194 094 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 2001       |     |     |      |  |               |  | 153 087 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 2002       |     |     |      |  |               |  | 153 090 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |
| INP: Fct. assignm. U 2003       |     |     |      |  |               |  | 153 093 |
| 061 000: MAIN: Without function |     |     |      |  |               |  |         |

| Parameter                                        |     |     |      | Address       |
|--------------------------------------------------|-----|-----|------|---------------|
| Default                                          | Min | Max | Unit | Logic Diagram |
| INP: Fct. assignm. U 2004                        |     |     |      | 153 096       |
| 061 000: MAIN: Without function                  |     |     |      |               |
| Assignment of functions to binary signal inputs. |     |     |      |               |
| INP: Oper. mode U 501                            |     |     |      | 181 003       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 502                            |     |     |      | 181 007       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 503                            |     |     |      | 181 011       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 504                            |     |     |      | 181 015       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 505                            |     |     |      | 181 019       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 506                            |     |     |      | 181 023       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 507                            |     |     |      | 181 027       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 508                            |     |     |      | 181 031       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 509                            |     |     |      | 181 035       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 510                            |     |     |      | 181 039       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 511                            |     |     |      | 181 043       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 512                            |     |     |      | 181 047       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 513                            |     |     |      | 181 051       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 514                            |     |     |      | 181 055       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 515                            |     |     |      | 181 059       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 516                            |     |     |      | 181 063       |
| 1: Active "high"                                 |     |     |      |               |
| INP: Oper. mode U 517                            |     |     |      | 181 067       |
| 1: Active "high"                                 |     |     |      |               |

| Parameter             |     |     |      |  | Address       |  |         |
|-----------------------|-----|-----|------|--|---------------|--|---------|
| Default               | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Oper. mode U 518 |     |     |      |  |               |  | 181 071 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 519 |     |     |      |  |               |  | 181 075 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 520 |     |     |      |  |               |  | 181 079 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 521 |     |     |      |  |               |  | 181 083 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 522 |     |     |      |  |               |  | 181 087 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 523 |     |     |      |  |               |  | 181 091 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 524 |     |     |      |  |               |  | 181 095 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 601 |     |     |      |  |               |  | 152 092 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 602 |     |     |      |  |               |  | 152 095 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 603 |     |     |      |  |               |  | 152 098 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 604 |     |     |      |  |               |  | 152 101 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 605 |     |     |      |  |               |  | 152 104 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 606 |     |     |      |  |               |  | 152 107 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 607 |     |     |      |  |               |  | 182 027 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 608 |     |     |      |  |               |  | 182 031 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 609 |     |     |      |  |               |  | 182 035 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 610 |     |     |      |  |               |  | 182 039 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 611 |     |     |      |  |               |  | 182 043 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 612 |     |     |      |  |               |  | 182 047 |
| 1: Active "high"      |     |     |      |  |               |  |         |



| Parameter             |     |     |      | Address       |  |  |         |
|-----------------------|-----|-----|------|---------------|--|--|---------|
| Default               | Min | Max | Unit | Logic Diagram |  |  |         |
| INP: Oper. mode U 613 |     |     |      |               |  |  | 182 051 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 614 |     |     |      |               |  |  | 182 055 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 615 |     |     |      |               |  |  | 182 059 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 616 |     |     |      |               |  |  | 182 063 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 617 |     |     |      |               |  |  | 182 067 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 618 |     |     |      |               |  |  | 182 071 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 619 |     |     |      |               |  |  | 182 075 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 620 |     |     |      |               |  |  | 182 079 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 621 |     |     |      |               |  |  | 182 083 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 622 |     |     |      |               |  |  | 182 087 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 623 |     |     |      |               |  |  | 182 091 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 624 |     |     |      |               |  |  | 182 095 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 701 |     |     |      |               |  |  | 152 110 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 702 |     |     |      |               |  |  | 152 113 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 703 |     |     |      |               |  |  | 152 116 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 704 |     |     |      |               |  |  | 152 119 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 705 |     |     |      |               |  |  | 152 122 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 706 |     |     |      |               |  |  | 152 125 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 707 |     |     |      |               |  |  | 183 027 |
| 1: Active "high"      |     |     |      |               |  |  |         |

| Parameter             |     |     |      |  | Address       |  |         |
|-----------------------|-----|-----|------|--|---------------|--|---------|
| Default               | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Oper. mode U 708 |     |     |      |  |               |  | 183 031 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 709 |     |     |      |  |               |  | 183 035 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 710 |     |     |      |  |               |  | 183 039 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 711 |     |     |      |  |               |  | 183 043 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 712 |     |     |      |  |               |  | 183 047 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 713 |     |     |      |  |               |  | 183 051 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 714 |     |     |      |  |               |  | 183 055 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 715 |     |     |      |  |               |  | 183 059 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 716 |     |     |      |  |               |  | 183 063 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 717 |     |     |      |  |               |  | 183 067 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 718 |     |     |      |  |               |  | 183 071 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 719 |     |     |      |  |               |  | 183 075 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 720 |     |     |      |  |               |  | 183 079 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 721 |     |     |      |  |               |  | 183 083 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 722 |     |     |      |  |               |  | 183 087 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 723 |     |     |      |  |               |  | 183 091 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 724 |     |     |      |  |               |  | 183 095 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 801 |     |     |      |  |               |  | 184 003 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 802 |     |     |      |  |               |  | 184 007 |
| 1: Active "high"      |     |     |      |  |               |  |         |

| Parameter             |     |     |      | Address       |  |  |         |
|-----------------------|-----|-----|------|---------------|--|--|---------|
| Default               | Min | Max | Unit | Logic Diagram |  |  |         |
| INP: Oper. mode U 803 |     |     |      |               |  |  | 184 011 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 804 |     |     |      |               |  |  | 184 015 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 805 |     |     |      |               |  |  | 184 019 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 806 |     |     |      |               |  |  | 184 023 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 807 |     |     |      |               |  |  | 184 027 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 808 |     |     |      |               |  |  | 184 031 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 809 |     |     |      |               |  |  | 184 035 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 810 |     |     |      |               |  |  | 184 039 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 811 |     |     |      |               |  |  | 184 043 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 812 |     |     |      |               |  |  | 184 047 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 813 |     |     |      |               |  |  | 184 051 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 814 |     |     |      |               |  |  | 184 055 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 815 |     |     |      |               |  |  | 184 059 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 816 |     |     |      |               |  |  | 184 063 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 817 |     |     |      |               |  |  | 184 067 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 818 |     |     |      |               |  |  | 184 071 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 819 |     |     |      |               |  |  | 184 075 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 820 |     |     |      |               |  |  | 184 079 |
| 1: Active "high"      |     |     |      |               |  |  |         |
| INP: Oper. mode U 821 |     |     |      |               |  |  | 184 083 |
| 1: Active "high"      |     |     |      |               |  |  |         |

| Parameter             |     |     |      |  | Address       |  |         |
|-----------------------|-----|-----|------|--|---------------|--|---------|
| Default               | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Oper. mode U 822 |     |     |      |  |               |  | 184 087 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 823 |     |     |      |  |               |  | 184 091 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 824 |     |     |      |  |               |  | 184 095 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 901 |     |     |      |  |               |  | 152 146 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 902 |     |     |      |  |               |  | 152 149 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 903 |     |     |      |  |               |  | 152 152 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 904 |     |     |      |  |               |  | 152 155 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 905 |     |     |      |  |               |  | 153 003 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 906 |     |     |      |  |               |  | 153 007 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 907 |     |     |      |  |               |  | 153 011 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 908 |     |     |      |  |               |  | 153 015 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 909 |     |     |      |  |               |  | 153 019 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 910 |     |     |      |  |               |  | 153 023 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 911 |     |     |      |  |               |  | 153 027 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 912 |     |     |      |  |               |  | 153 031 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 913 |     |     |      |  |               |  | 153 035 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 914 |     |     |      |  |               |  | 153 039 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 915 |     |     |      |  |               |  | 153 043 |
| 1: Active "high"      |     |     |      |  |               |  |         |
| INP: Oper. mode U 916 |     |     |      |  |               |  | 153 047 |
| 1: Active "high"      |     |     |      |  |               |  |         |

| Parameter              |     |     |      | Address       |  |  |         |
|------------------------|-----|-----|------|---------------|--|--|---------|
| Default                | Min | Max | Unit | Logic Diagram |  |  |         |
| INP: Oper. mode U 917  |     |     |      |               |  |  | 153 051 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 918  |     |     |      |               |  |  | 153 055 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 919  |     |     |      |               |  |  | 153 059 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 920  |     |     |      |               |  |  | 153 063 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 921  |     |     |      |               |  |  | 153 067 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 922  |     |     |      |               |  |  | 153 071 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 923  |     |     |      |               |  |  | 153 075 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 924  |     |     |      |               |  |  | 153 079 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 1001 |     |     |      |               |  |  | 152 164 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 1002 |     |     |      |               |  |  | 152 167 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 1003 |     |     |      |               |  |  | 152 170 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 1004 |     |     |      |               |  |  | 152 173 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 1005 |     |     |      |               |  |  | 152 176 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 1006 |     |     |      |               |  |  | 152 179 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 1007 |     |     |      |               |  |  | 186 027 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 1008 |     |     |      |               |  |  | 186 031 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 1009 |     |     |      |               |  |  | 186 035 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 1010 |     |     |      |               |  |  | 186 039 |
| 1: Active "high"       |     |     |      |               |  |  |         |
| INP: Oper. mode U 1011 |     |     |      |               |  |  | 186 043 |
| 1: Active "high"       |     |     |      |               |  |  |         |

| Parameter              |     |     |      |  | Address       |  |         |
|------------------------|-----|-----|------|--|---------------|--|---------|
| Default                | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Oper. mode U 1012 |     |     |      |  |               |  | 186 047 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1013 |     |     |      |  |               |  | 186 051 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1014 |     |     |      |  |               |  | 186 055 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1015 |     |     |      |  |               |  | 186 059 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1016 |     |     |      |  |               |  | 186 063 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1017 |     |     |      |  |               |  | 186 067 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1018 |     |     |      |  |               |  | 186 071 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1019 |     |     |      |  |               |  | 186 075 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1020 |     |     |      |  |               |  | 186 079 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1021 |     |     |      |  |               |  | 186 083 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1022 |     |     |      |  |               |  | 186 087 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1023 |     |     |      |  |               |  | 186 091 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1024 |     |     |      |  |               |  | 186 095 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1101 |     |     |      |  |               |  | 187 003 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1102 |     |     |      |  |               |  | 187 007 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1103 |     |     |      |  |               |  | 187 011 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1104 |     |     |      |  |               |  | 187 015 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1105 |     |     |      |  |               |  | 187 019 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1106 |     |     |      |  |               |  | 187 023 |
| 1: Active "high"       |     |     |      |  |               |  |         |

| Parameter              |     |     |      | Address       |
|------------------------|-----|-----|------|---------------|
| Default                | Min | Max | Unit | Logic Diagram |
| INP: Oper. mode U 1107 |     |     |      | 187 027       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1108 |     |     |      | 187 031       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1109 |     |     |      | 187 035       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1110 |     |     |      | 187 039       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1111 |     |     |      | 187 043       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1112 |     |     |      | 187 047       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1113 |     |     |      | 187 051       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1114 |     |     |      | 187 055       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1115 |     |     |      | 187 059       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1116 |     |     |      | 187 063       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1117 |     |     |      | 187 067       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1118 |     |     |      | 187 071       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1119 |     |     |      | 187 075       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1120 |     |     |      | 187 079       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1121 |     |     |      | 187 083       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1122 |     |     |      | 187 087       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1123 |     |     |      | 187 091       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1124 |     |     |      | 187 095       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1201 |     |     |      | 152 200       |
| 1: Active "high"       |     |     |      |               |

| Parameter              |     |     |      |  | Address       |  |         |
|------------------------|-----|-----|------|--|---------------|--|---------|
| Default                | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Oper. mode U 1202 |     |     |      |  |               |  | 152 203 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1203 |     |     |      |  |               |  | 152 206 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1204 |     |     |      |  |               |  | 152 209 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1205 |     |     |      |  |               |  | 152 212 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1206 |     |     |      |  |               |  | 152 215 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1207 |     |     |      |  |               |  | 188 027 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1208 |     |     |      |  |               |  | 188 031 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1209 |     |     |      |  |               |  | 188 035 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1210 |     |     |      |  |               |  | 188 039 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1211 |     |     |      |  |               |  | 188 043 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1212 |     |     |      |  |               |  | 188 047 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1213 |     |     |      |  |               |  | 188 051 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1214 |     |     |      |  |               |  | 188 055 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1215 |     |     |      |  |               |  | 188 059 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1216 |     |     |      |  |               |  | 188 063 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1217 |     |     |      |  |               |  | 188 067 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1218 |     |     |      |  |               |  | 188 071 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1219 |     |     |      |  |               |  | 188 075 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1220 |     |     |      |  |               |  | 188 079 |
| 1: Active "high"       |     |     |      |  |               |  |         |



| Parameter              |     |     |      |  | Address       |  |         |
|------------------------|-----|-----|------|--|---------------|--|---------|
| Default                | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Oper. mode U 1221 |     |     |      |  |               |  | 188 083 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1222 |     |     |      |  |               |  | 188 087 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1223 |     |     |      |  |               |  | 188 091 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1224 |     |     |      |  |               |  | 188 095 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1301 |     |     |      |  |               |  | 189 003 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1302 |     |     |      |  |               |  | 189 007 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1303 |     |     |      |  |               |  | 189 011 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1304 |     |     |      |  |               |  | 189 015 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1305 |     |     |      |  |               |  | 189 019 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1306 |     |     |      |  |               |  | 189 023 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1307 |     |     |      |  |               |  | 189 027 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1308 |     |     |      |  |               |  | 189 031 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1309 |     |     |      |  |               |  | 189 035 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1310 |     |     |      |  |               |  | 189 039 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1311 |     |     |      |  |               |  | 189 043 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1312 |     |     |      |  |               |  | 189 047 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1313 |     |     |      |  |               |  | 189 051 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1314 |     |     |      |  |               |  | 189 055 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1315 |     |     |      |  |               |  | 189 059 |
| 1: Active "high"       |     |     |      |  |               |  |         |

| Parameter              |     |     |      |  | Address       |  |         |
|------------------------|-----|-----|------|--|---------------|--|---------|
| Default                | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Oper. mode U 1316 |     |     |      |  |               |  | 189 063 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1317 |     |     |      |  |               |  | 189 067 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1318 |     |     |      |  |               |  | 189 071 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1319 |     |     |      |  |               |  | 189 075 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1320 |     |     |      |  |               |  | 189 079 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1321 |     |     |      |  |               |  | 189 083 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1322 |     |     |      |  |               |  | 189 087 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1323 |     |     |      |  |               |  | 189 091 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1324 |     |     |      |  |               |  | 189 095 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1401 |     |     |      |  |               |  | 190 003 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1402 |     |     |      |  |               |  | 190 007 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1403 |     |     |      |  |               |  | 190 011 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1404 |     |     |      |  |               |  | 190 015 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1405 |     |     |      |  |               |  | 190 019 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1406 |     |     |      |  |               |  | 190 023 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1407 |     |     |      |  |               |  | 190 027 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1408 |     |     |      |  |               |  | 190 031 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1409 |     |     |      |  |               |  | 190 035 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1410 |     |     |      |  |               |  | 190 039 |
| 1: Active "high"       |     |     |      |  |               |  |         |

| Parameter              |     |     |      | Address       |
|------------------------|-----|-----|------|---------------|
| Default                | Min | Max | Unit | Logic Diagram |
| INP: Oper. mode U 1411 |     |     |      | 190 043       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1412 |     |     |      | 190 047       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1413 |     |     |      | 190 051       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1414 |     |     |      | 190 055       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1415 |     |     |      | 190 059       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1416 |     |     |      | 190 063       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1417 |     |     |      | 190 067       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1418 |     |     |      | 190 071       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1419 |     |     |      | 190 075       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1420 |     |     |      | 190 079       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1421 |     |     |      | 190 083       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1422 |     |     |      | 190 087       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1423 |     |     |      | 190 091       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1424 |     |     |      | 190 095       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1501 |     |     |      | 191 003       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1502 |     |     |      | 191 007       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1503 |     |     |      | 191 011       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1504 |     |     |      | 191 015       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1505 |     |     |      | 191 019       |
| 1: Active "high"       |     |     |      |               |

| Parameter              |     |     |      |  | Address       |  |         |
|------------------------|-----|-----|------|--|---------------|--|---------|
| Default                | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Oper. mode U 1506 |     |     |      |  |               |  | 191 023 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1507 |     |     |      |  |               |  | 191 027 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1508 |     |     |      |  |               |  | 191 031 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1509 |     |     |      |  |               |  | 191 035 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1510 |     |     |      |  |               |  | 191 039 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1511 |     |     |      |  |               |  | 191 043 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1512 |     |     |      |  |               |  | 191 047 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1513 |     |     |      |  |               |  | 191 051 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1514 |     |     |      |  |               |  | 191 055 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1515 |     |     |      |  |               |  | 191 059 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1516 |     |     |      |  |               |  | 191 063 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1517 |     |     |      |  |               |  | 191 067 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1518 |     |     |      |  |               |  | 191 071 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1519 |     |     |      |  |               |  | 191 075 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1520 |     |     |      |  |               |  | 191 079 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1521 |     |     |      |  |               |  | 191 083 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1522 |     |     |      |  |               |  | 191 087 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1523 |     |     |      |  |               |  | 191 091 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1524 |     |     |      |  |               |  | 191 095 |
| 1: Active "high"       |     |     |      |  |               |  |         |

| Parameter              |     |     |      | Address       |
|------------------------|-----|-----|------|---------------|
| Default                | Min | Max | Unit | Logic Diagram |
| INP: Oper. mode U 1601 |     |     |      | 192 003       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1602 |     |     |      | 192 007       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1603 |     |     |      | 192 011       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1604 |     |     |      | 192 015       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1605 |     |     |      | 192 019       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1606 |     |     |      | 192 023       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1607 |     |     |      | 192 027       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1608 |     |     |      | 192 031       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1609 |     |     |      | 192 035       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1610 |     |     |      | 192 039       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1611 |     |     |      | 192 043       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1612 |     |     |      | 192 047       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1613 |     |     |      | 192 051       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1614 |     |     |      | 192 055       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1615 |     |     |      | 192 059       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1616 |     |     |      | 192 063       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1617 |     |     |      | 192 067       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1618 |     |     |      | 192 071       |
| 1: Active "high"       |     |     |      |               |
| INP: Oper. mode U 1619 |     |     |      | 192 075       |
| 1: Active "high"       |     |     |      |               |

| Parameter              |     |     |      |  | Address       |         |
|------------------------|-----|-----|------|--|---------------|---------|
| Default                | Min | Max | Unit |  | Logic Diagram |         |
| INP: Oper. mode U 1620 |     |     |      |  |               | 192 079 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1621 |     |     |      |  |               | 192 083 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1622 |     |     |      |  |               | 192 087 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1623 |     |     |      |  |               | 192 091 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1624 |     |     |      |  |               | 192 095 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1701 |     |     |      |  |               | 193 003 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1702 |     |     |      |  |               | 193 007 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1703 |     |     |      |  |               | 193 011 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1704 |     |     |      |  |               | 193 015 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1705 |     |     |      |  |               | 193 019 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1706 |     |     |      |  |               | 193 023 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1707 |     |     |      |  |               | 193 027 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1708 |     |     |      |  |               | 193 031 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1709 |     |     |      |  |               | 193 035 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1710 |     |     |      |  |               | 193 039 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1711 |     |     |      |  |               | 193 043 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1712 |     |     |      |  |               | 193 047 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1713 |     |     |      |  |               | 193 051 |
| 1: Active "high"       |     |     |      |  |               |         |
| INP: Oper. mode U 1714 |     |     |      |  |               | 193 055 |
| 1: Active "high"       |     |     |      |  |               |         |

| Parameter              |     |     |      |  | Address       |  |         |
|------------------------|-----|-----|------|--|---------------|--|---------|
| Default                | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Oper. mode U 1715 |     |     |      |  |               |  | 193 059 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1716 |     |     |      |  |               |  | 193 063 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1717 |     |     |      |  |               |  | 193 067 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1718 |     |     |      |  |               |  | 193 071 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1719 |     |     |      |  |               |  | 193 075 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1720 |     |     |      |  |               |  | 193 079 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1721 |     |     |      |  |               |  | 193 083 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1722 |     |     |      |  |               |  | 193 087 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1723 |     |     |      |  |               |  | 193 091 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1724 |     |     |      |  |               |  | 193 095 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1801 |     |     |      |  |               |  | 194 003 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1802 |     |     |      |  |               |  | 194 007 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1803 |     |     |      |  |               |  | 194 011 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1804 |     |     |      |  |               |  | 194 015 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1805 |     |     |      |  |               |  | 194 019 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1806 |     |     |      |  |               |  | 194 023 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1807 |     |     |      |  |               |  | 194 027 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1808 |     |     |      |  |               |  | 194 031 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1809 |     |     |      |  |               |  | 194 035 |
| 1: Active "high"       |     |     |      |  |               |  |         |

| Parameter              |     |     |      |  | Address       |  |         |
|------------------------|-----|-----|------|--|---------------|--|---------|
| Default                | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: Oper. mode U 1810 |     |     |      |  |               |  | 194 039 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1811 |     |     |      |  |               |  | 194 043 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1812 |     |     |      |  |               |  | 194 047 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1813 |     |     |      |  |               |  | 194 051 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1814 |     |     |      |  |               |  | 194 055 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1815 |     |     |      |  |               |  | 194 059 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1816 |     |     |      |  |               |  | 194 063 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1817 |     |     |      |  |               |  | 194 067 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1818 |     |     |      |  |               |  | 194 071 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1819 |     |     |      |  |               |  | 194 075 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1820 |     |     |      |  |               |  | 194 079 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1821 |     |     |      |  |               |  | 194 083 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1822 |     |     |      |  |               |  | 194 087 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1823 |     |     |      |  |               |  | 194 091 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 1824 |     |     |      |  |               |  | 194 095 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 2001 |     |     |      |  |               |  | 153 088 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 2002 |     |     |      |  |               |  | 153 091 |
| 1: Active "high"       |     |     |      |  |               |  |         |
| INP: Oper. mode U 2003 |     |     |      |  |               |  | 153 094 |
| 1: Active "high"       |     |     |      |  |               |  |         |



| Parameter                                             |     |     |      | Address       |  |  |         |
|-------------------------------------------------------|-----|-----|------|---------------|--|--|---------|
| Default                                               | Min | Max | Unit | Logic Diagram |  |  |         |
| INP: Oper. mode U 2004                                |     |     |      |               |  |  | 153 097 |
| 1: Active "high"                                      |     |     |      |               |  |  |         |
| Selection of operating mode for binary signal inputs. |     |     |      |               |  |  |         |

## Measured data input

| Parameter                                                                                                                                                                                | Address |       |         |                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|---------|----------------------|
| Default                                                                                                                                                                                  | Min     | Max   | Unit    | Logic Diagram        |
| MEASI: Function group MEASI                                                                                                                                                              |         |       |         | 056 030              |
| 0: Without                                                                                                                                                                               |         |       |         |                      |
| Cancelling function group MEASI or including it in the configuration.<br>If the function group is cancelled from the configuration, then all associated settings and signals are hidden. |         |       |         |                      |
| MEASI: General enable USER                                                                                                                                                               |         |       |         | 011 100              |
| 0: No                                                                                                                                                                                    |         |       |         |                      |
| Disabling or enabling analog measured data input.                                                                                                                                        |         |       |         |                      |
| MEASI: Enable IDC p.u.                                                                                                                                                                   |         |       |         | 037 190              |
| 0.000                                                                                                                                                                                    | 0.000   | 0.200 | IDC,nom | Fig. 3-44, (p. 3-70) |
| Setting for the minimum current that must flow in order for the C434 to display a measured value > 0 (zero suppression).                                                                 |         |       |         |                      |
| MEASI: IDC < open circuit                                                                                                                                                                |         |       |         | 037 191              |
| 3.0                                                                                                                                                                                      | 0.0     | 10.0  | mA      | Fig. 3-44, (p. 3-70) |
| If the input current falls below the set threshold, the C434 will issue an "open circuit" signal.                                                                                        |         |       |         |                      |
| MEASI: IDC 1                                                                                                                                                                             |         |       |         | 037 150              |
| 0.000                                                                                                                                                                                    | 0.000   | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |
| MEASI: IDC 2                                                                                                                                                                             |         |       |         | 037 152              |
| Blocked                                                                                                                                                                                  | 0.000   | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |
| MEASI: IDC 3                                                                                                                                                                             |         |       |         | 037 154              |
| Blocked                                                                                                                                                                                  | 0.000   | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |
| MEASI: IDC 4                                                                                                                                                                             |         |       |         | 037 156              |
| Blocked                                                                                                                                                                                  | 0.000   | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |
| MEASI: IDC 5                                                                                                                                                                             |         |       |         | 037 158              |
| Blocked                                                                                                                                                                                  | 0.000   | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |
| MEASI: IDC 6                                                                                                                                                                             |         |       |         | 037 160              |
| Blocked                                                                                                                                                                                  | 0.000   | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |
| MEASI: IDC 7                                                                                                                                                                             |         |       |         | 037 162              |
| Blocked                                                                                                                                                                                  | 0.000   | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |
| MEASI: IDC 8                                                                                                                                                                             |         |       |         | 037 164              |
| Blocked                                                                                                                                                                                  | 0.000   | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |
| MEASI: IDC 9                                                                                                                                                                             |         |       |         | 037 166              |
| Blocked                                                                                                                                                                                  | 0.000   | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |
| MEASI: IDC 10                                                                                                                                                                            |         |       |         | 037 168              |
| Blocked                                                                                                                                                                                  | 0.000   | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |

| Parameter                                                                                               |       |       |         | Address              |  |  |         |
|---------------------------------------------------------------------------------------------------------|-------|-------|---------|----------------------|--|--|---------|
| Default                                                                                                 | Min   | Max   | Unit    | Logic Diagram        |  |  |         |
| MEASI: IDC 11                                                                                           |       |       |         |                      |  |  | 037 170 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC 12                                                                                           |       |       |         |                      |  |  | 037 172 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC 13                                                                                           |       |       |         |                      |  |  | 037 174 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC 14                                                                                           |       |       |         |                      |  |  | 037 176 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC 15                                                                                           |       |       |         |                      |  |  | 037 178 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC 16                                                                                           |       |       |         |                      |  |  | 037 180 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC 17                                                                                           |       |       |         |                      |  |  | 037 182 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC 18                                                                                           |       |       |         |                      |  |  | 037 184 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC 19                                                                                           |       |       |         |                      |  |  | 037 186 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC 20                                                                                           |       |       |         |                      |  |  | 037 188 |
| 1.200                                                                                                   | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| Setting for the input current that will correspond to a linearized value that has been set accordingly. |       |       |         |                      |  |  |         |
| MEASI: IDC,lin 1                                                                                        |       |       |         |                      |  |  | 037 151 |
| 0.000                                                                                                   | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 2                                                                                        |       |       |         |                      |  |  | 037 153 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 3                                                                                        |       |       |         |                      |  |  | 037 155 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 4                                                                                        |       |       |         |                      |  |  | 037 157 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 5                                                                                        |       |       |         |                      |  |  | 037 159 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 6                                                                                        |       |       |         |                      |  |  | 037 161 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 7                                                                                        |       |       |         |                      |  |  | 037 163 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 8                                                                                        |       |       |         |                      |  |  | 037 165 |
| Blocked                                                                                                 | 0.000 | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |

| Parameter                                                                                                  |        |       |         | Address              |  |  |         |
|------------------------------------------------------------------------------------------------------------|--------|-------|---------|----------------------|--|--|---------|
| Default                                                                                                    | Min    | Max   | Unit    | Logic Diagram        |  |  |         |
| MEASI: IDC,lin 9                                                                                           |        |       |         |                      |  |  | 037 167 |
| Blocked                                                                                                    | 0.000  | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 10                                                                                          |        |       |         |                      |  |  | 037 169 |
| Blocked                                                                                                    | 0.000  | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 11                                                                                          |        |       |         |                      |  |  | 037 171 |
| Blocked                                                                                                    | 0.000  | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 12                                                                                          |        |       |         |                      |  |  | 037 173 |
| Blocked                                                                                                    | 0.000  | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 13                                                                                          |        |       |         |                      |  |  | 037 175 |
| Blocked                                                                                                    | 0.000  | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 14                                                                                          |        |       |         |                      |  |  | 037 177 |
| Blocked                                                                                                    | 0.000  | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 15                                                                                          |        |       |         |                      |  |  | 037 179 |
| Blocked                                                                                                    | 0.000  | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 16                                                                                          |        |       |         |                      |  |  | 037 181 |
| Blocked                                                                                                    | 0.000  | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 17                                                                                          |        |       |         |                      |  |  | 037 183 |
| Blocked                                                                                                    | 0.000  | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 18                                                                                          |        |       |         |                      |  |  | 037 185 |
| Blocked                                                                                                    | 0.000  | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 19                                                                                          |        |       |         |                      |  |  | 037 187 |
| Blocked                                                                                                    | 0.000  | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| MEASI: IDC,lin 20                                                                                          |        |       |         |                      |  |  | 037 189 |
| 1.200                                                                                                      | 0.000  | 1.200 | IDC,nom | Fig. 3-44, (p. 3-70) |  |  |         |
| Setting for the linearized current that will correspond to an input current that has been set accordingly. |        |       |         |                      |  |  |         |
| MEASI: Scaled val. IDC,lin1                                                                                |        |       |         |                      |  |  | 037 192 |
| 0                                                                                                          | -32768 | 32767 |         | Fig. 3-45, (p. 3-71) |  |  |         |
| Setting for the scaled value of IDC,lin1.                                                                  |        |       |         |                      |  |  |         |
| MEASI: Scaled val.IDC,lin20                                                                                |        |       |         |                      |  |  | 037 193 |
| 1200                                                                                                       | -32768 | 32767 |         | Fig. 3-45, (p. 3-71) |  |  |         |
| Setting for the scaled value of IDC,lin20.                                                                 |        |       |         |                      |  |  |         |
| MEASI: Type of TempSensors                                                                                 |        |       |         |                      |  |  | 004 254 |
| 0: PT 100                                                                                                  |        |       |         |                      |  |  |         |
| Selection of the temperature sensor type (PT 100, NI 100 or NI 120).                                       |        |       |         |                      |  |  |         |

Binary and analog output

| Parameter                       |     |     |      |               | Address |
|---------------------------------|-----|-----|------|---------------|---------|
| Default                         | Min | Max | Unit | Logic Diagram |         |
| OUTP: Fct. assignm. K 0501      |     |     |      |               | 150 097 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0502      |     |     |      |               | 150 100 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0503      |     |     |      |               | 150 103 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0504      |     |     |      |               | 150 106 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0505      |     |     |      |               | 150 109 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0506      |     |     |      |               | 150 112 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0507      |     |     |      |               | 150 115 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0508      |     |     |      |               | 150 118 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0601      |     |     |      |               | 150 121 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0602      |     |     |      |               | 150 124 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0603      |     |     |      |               | 150 127 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0604      |     |     |      |               | 150 130 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0605      |     |     |      |               | 150 133 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0606      |     |     |      |               | 150 136 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0607      |     |     |      |               | 150 139 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0608      |     |     |      |               | 150 142 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0701      |     |     |      |               | 150 145 |
| 060 000: MAIN: Without function |     |     |      |               |         |
| OUTP: Fct. assignm. K 0702      |     |     |      |               | 150 148 |
| 060 000: MAIN: Without function |     |     |      |               |         |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| OUTP: Fct. assignm. K 0703      |     |     |      |  |               |  | 150 151 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0704      |     |     |      |  |               |  | 150 154 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0705      |     |     |      |  |               |  | 150 157 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0706      |     |     |      |  |               |  | 150 160 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0707      |     |     |      |  |               |  | 150 163 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0708      |     |     |      |  |               |  | 150 166 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0801      |     |     |      |  |               |  | 150 169 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0802      |     |     |      |  |               |  | 150 172 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0803      |     |     |      |  |               |  | 150 175 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0804      |     |     |      |  |               |  | 150 178 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0805      |     |     |      |  |               |  | 150 181 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0806      |     |     |      |  |               |  | 150 184 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0807      |     |     |      |  |               |  | 150 187 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0808      |     |     |      |  |               |  | 150 190 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0901      |     |     |      |  |               |  | 150 193 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0902      |     |     |      |  |               |  | 150 196 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0903      |     |     |      |  |               |  | 150 199 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0904      |     |     |      |  |               |  | 150 202 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 0905      |     |     |      |  |               |  | 150 205 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |

| Parameter                       |     |     |      | Address       |  |  |         |
|---------------------------------|-----|-----|------|---------------|--|--|---------|
| Default                         | Min | Max | Unit | Logic Diagram |  |  |         |
| OUTP: Fct. assignm. K 0906      |     |     |      |               |  |  | 150 208 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 0907      |     |     |      |               |  |  | 150 211 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 0908      |     |     |      |               |  |  | 150 214 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1001      |     |     |      |               |  |  | 150 217 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1002      |     |     |      |               |  |  | 150 220 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1003      |     |     |      |               |  |  | 150 223 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1004      |     |     |      |               |  |  | 150 226 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1005      |     |     |      |               |  |  | 150 229 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1006      |     |     |      |               |  |  | 150 232 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1007      |     |     |      |               |  |  | 150 235 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1008      |     |     |      |               |  |  | 150 238 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1101      |     |     |      |               |  |  | 150 241 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1102      |     |     |      |               |  |  | 150 244 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1103      |     |     |      |               |  |  | 150 247 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1104      |     |     |      |               |  |  | 150 250 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1105      |     |     |      |               |  |  | 150 253 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1106      |     |     |      |               |  |  | 151 000 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1107      |     |     |      |               |  |  | 151 003 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1108      |     |     |      |               |  |  | 151 006 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| OUTP: Fct. assignm. K 1201      |     |     |      |  |               |  | 151 009 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1202      |     |     |      |  |               |  | 151 012 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1203      |     |     |      |  |               |  | 151 015 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1204      |     |     |      |  |               |  | 151 018 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1205      |     |     |      |  |               |  | 151 021 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1206      |     |     |      |  |               |  | 151 024 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1207      |     |     |      |  |               |  | 151 027 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1208      |     |     |      |  |               |  | 151 030 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1301      |     |     |      |  |               |  | 168 002 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1302      |     |     |      |  |               |  | 168 006 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1303      |     |     |      |  |               |  | 168 010 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1304      |     |     |      |  |               |  | 168 014 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1305      |     |     |      |  |               |  | 168 018 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1306      |     |     |      |  |               |  | 168 022 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1307      |     |     |      |  |               |  | 168 026 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1308      |     |     |      |  |               |  | 168 030 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1401      |     |     |      |  |               |  | 169 002 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1402      |     |     |      |  |               |  | 169 006 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1403      |     |     |      |  |               |  | 169 010 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |



| Parameter                       |     |     |      | Address       |  |  |         |
|---------------------------------|-----|-----|------|---------------|--|--|---------|
| Default                         | Min | Max | Unit | Logic Diagram |  |  |         |
| OUTP: Fct. assignm. K 1404      |     |     |      |               |  |  | 169 014 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1405      |     |     |      |               |  |  | 169 018 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1406      |     |     |      |               |  |  | 169 022 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1407      |     |     |      |               |  |  | 169 026 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1408      |     |     |      |               |  |  | 169 030 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1501      |     |     |      |               |  |  | 170 002 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1502      |     |     |      |               |  |  | 170 006 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1503      |     |     |      |               |  |  | 170 010 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1504      |     |     |      |               |  |  | 170 014 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1505      |     |     |      |               |  |  | 170 018 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1506      |     |     |      |               |  |  | 170 022 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1507      |     |     |      |               |  |  | 170 026 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1508      |     |     |      |               |  |  | 170 030 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1601      |     |     |      |               |  |  | 171 002 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1602      |     |     |      |               |  |  | 171 006 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1603      |     |     |      |               |  |  | 171 010 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1604      |     |     |      |               |  |  | 171 014 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1605      |     |     |      |               |  |  | 171 018 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |
| OUTP: Fct. assignm. K 1606      |     |     |      |               |  |  | 171 022 |
| 060 000: MAIN: Without function |     |     |      |               |  |  |         |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| OUTP: Fct. assignm. K 1607      |     |     |      |  |               |  | 171 026 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1608      |     |     |      |  |               |  | 171 030 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1701      |     |     |      |  |               |  | 172 002 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1702      |     |     |      |  |               |  | 172 006 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1703      |     |     |      |  |               |  | 172 010 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1704      |     |     |      |  |               |  | 172 014 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1705      |     |     |      |  |               |  | 172 018 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1706      |     |     |      |  |               |  | 172 022 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1707      |     |     |      |  |               |  | 172 026 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1708      |     |     |      |  |               |  | 172 030 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1801      |     |     |      |  |               |  | 173 002 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1802      |     |     |      |  |               |  | 173 006 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1803      |     |     |      |  |               |  | 173 010 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1804      |     |     |      |  |               |  | 173 014 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1805      |     |     |      |  |               |  | 173 018 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1806      |     |     |      |  |               |  | 173 022 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1807      |     |     |      |  |               |  | 173 026 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 1808      |     |     |      |  |               |  | 173 030 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| OUTP: Fct. assignm. K 2001      |     |     |      |  |               |  | 151 201 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |

| Parameter                                 |     |     |      | Address       |
|-------------------------------------------|-----|-----|------|---------------|
| Default                                   | Min | Max | Unit | Logic Diagram |
| OUTP: Fct. assignm. K 2002                |     |     |      | 151 204       |
| 060 000: MAIN: Without function           |     |     |      |               |
| OUTP: Fct. assignm. K 2003                |     |     |      | 151 207       |
| 060 000: MAIN: Without function           |     |     |      |               |
| OUTP: Fct. assignm. K 2004                |     |     |      | 151 210       |
| 060 000: MAIN: Without function           |     |     |      |               |
| OUTP: Fct. assignm. K 2005                |     |     |      | 151 213       |
| 060 000: MAIN: Without function           |     |     |      |               |
| OUTP: Fct. assignm. K 2006                |     |     |      | 151 216       |
| 060 000: MAIN: Without function           |     |     |      |               |
| OUTP: Fct. assignm. K 2007                |     |     |      | 151 219       |
| 060 000: MAIN: Without function           |     |     |      |               |
| OUTP: Fct. assignm. K 2008                |     |     |      | 151 222       |
| 060 000: MAIN: Without function           |     |     |      |               |
| OUTP: Fct. assignm. K 2101                |     |     |      | 151 225       |
| 060 000: MAIN: Without function           |     |     |      |               |
| OUTP: Fct. assignm. K 2102                |     |     |      | 151 228       |
| 060 000: MAIN: Without function           |     |     |      |               |
| OUTP: Fct. assignm. K 2103                |     |     |      | 151 231       |
| 060 000: MAIN: Without function           |     |     |      |               |
| OUTP: Fct. assignm. K 2104                |     |     |      | 151 234       |
| 060 000: MAIN: Without function           |     |     |      |               |
| OUTP: Fct. assignm. K 2105                |     |     |      | 151 237       |
| 060 000: MAIN: Without function           |     |     |      |               |
| OUTP: Fct. assignm. K 2106                |     |     |      | 151 240       |
| 060 000: MAIN: Without function           |     |     |      |               |
| Assignment of functions to output relays. |     |     |      |               |
| OUTP: Oper. mode K 0501                   |     |     |      | 150 098       |
| 1: ES updating                            |     |     |      |               |
| OUTP: Oper. mode K 0502                   |     |     |      | 150 101       |
| 1: ES updating                            |     |     |      |               |
| OUTP: Oper. mode K 0503                   |     |     |      | 150 104       |
| 1: ES updating                            |     |     |      |               |
| OUTP: Oper. mode K 0504                   |     |     |      | 150 107       |
| 1: ES updating                            |     |     |      |               |
| OUTP: Oper. mode K 0505                   |     |     |      | 150 110       |
| 1: ES updating                            |     |     |      |               |

| Parameter               |     |     |      |  | Address       |
|-------------------------|-----|-----|------|--|---------------|
| Default                 | Min | Max | Unit |  | Logic Diagram |
| OUTP: Oper. mode K 0506 |     |     |      |  | 150 113       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0507 |     |     |      |  | 150 116       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0508 |     |     |      |  | 150 119       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0601 |     |     |      |  | 150 122       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0602 |     |     |      |  | 150 125       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0603 |     |     |      |  | 150 128       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0604 |     |     |      |  | 150 131       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0605 |     |     |      |  | 150 134       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0606 |     |     |      |  | 150 137       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0607 |     |     |      |  | 150 140       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0608 |     |     |      |  | 150 143       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0701 |     |     |      |  | 150 146       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0702 |     |     |      |  | 150 149       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0703 |     |     |      |  | 150 152       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0704 |     |     |      |  | 150 155       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0705 |     |     |      |  | 150 158       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0706 |     |     |      |  | 150 161       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0707 |     |     |      |  | 150 164       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 0708 |     |     |      |  | 150 167       |
| 1: ES updating          |     |     |      |  |               |

| Parameter               |     |     |      | Address       |
|-------------------------|-----|-----|------|---------------|
| Default                 | Min | Max | Unit | Logic Diagram |
| OUTP: Oper. mode K 0801 |     |     |      | 150 170       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 0802 |     |     |      | 150 173       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 0803 |     |     |      | 150 176       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 0804 |     |     |      | 150 179       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 0805 |     |     |      | 150 182       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 0806 |     |     |      | 150 185       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 0807 |     |     |      | 150 188       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 0808 |     |     |      | 150 191       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 0901 |     |     |      | 150 194       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 0902 |     |     |      | 150 197       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 0903 |     |     |      | 150 200       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 0904 |     |     |      | 150 203       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 0905 |     |     |      | 150 206       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 0906 |     |     |      | 150 209       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 0907 |     |     |      | 150 212       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 0908 |     |     |      | 150 215       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1001 |     |     |      | 150 218       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1002 |     |     |      | 150 221       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1003 |     |     |      | 150 224       |
| 1: ES updating          |     |     |      |               |

| Parameter               |     |     |      |  | Address       |  |         |
|-------------------------|-----|-----|------|--|---------------|--|---------|
| Default                 | Min | Max | Unit |  | Logic Diagram |  |         |
| OUTP: Oper. mode K 1004 |     |     |      |  |               |  | 150 227 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1005 |     |     |      |  |               |  | 150 230 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1006 |     |     |      |  |               |  | 150 233 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1007 |     |     |      |  |               |  | 150 236 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1008 |     |     |      |  |               |  | 150 239 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1101 |     |     |      |  |               |  | 150 242 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1102 |     |     |      |  |               |  | 150 245 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1103 |     |     |      |  |               |  | 150 248 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1104 |     |     |      |  |               |  | 150 251 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1105 |     |     |      |  |               |  | 150 254 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1106 |     |     |      |  |               |  | 151 001 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1107 |     |     |      |  |               |  | 151 004 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1108 |     |     |      |  |               |  | 151 007 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1201 |     |     |      |  |               |  | 151 010 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1202 |     |     |      |  |               |  | 151 013 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1203 |     |     |      |  |               |  | 151 016 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1204 |     |     |      |  |               |  | 151 019 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1205 |     |     |      |  |               |  | 151 022 |
| 1: ES updating          |     |     |      |  |               |  |         |
| OUTP: Oper. mode K 1206 |     |     |      |  |               |  | 151 025 |
| 1: ES updating          |     |     |      |  |               |  |         |

| Parameter               |     |     |      | Address       |
|-------------------------|-----|-----|------|---------------|
| Default                 | Min | Max | Unit | Logic Diagram |
| OUTP: Oper. mode K 1207 |     |     |      | 151 028       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1208 |     |     |      | 151 031       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1301 |     |     |      | 168 003       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1302 |     |     |      | 168 007       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1303 |     |     |      | 168 011       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1304 |     |     |      | 168 015       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1305 |     |     |      | 168 019       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1306 |     |     |      | 168 023       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1307 |     |     |      | 168 027       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1308 |     |     |      | 168 031       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1401 |     |     |      | 169 003       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1402 |     |     |      | 169 007       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1403 |     |     |      | 169 011       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1404 |     |     |      | 169 015       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1405 |     |     |      | 169 019       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1406 |     |     |      | 169 023       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1407 |     |     |      | 169 027       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1408 |     |     |      | 169 031       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1501 |     |     |      | 170 003       |
| 1: ES updating          |     |     |      |               |

| Parameter               |     |     |      |  | Address       |
|-------------------------|-----|-----|------|--|---------------|
| Default                 | Min | Max | Unit |  | Logic Diagram |
| OUTP: Oper. mode K 1502 |     |     |      |  | 170 007       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1503 |     |     |      |  | 170 011       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1504 |     |     |      |  | 170 015       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1505 |     |     |      |  | 170 019       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1506 |     |     |      |  | 170 023       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1507 |     |     |      |  | 170 027       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1508 |     |     |      |  | 170 031       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1601 |     |     |      |  | 171 003       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1602 |     |     |      |  | 171 007       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1603 |     |     |      |  | 171 011       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1604 |     |     |      |  | 171 015       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1605 |     |     |      |  | 171 019       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1606 |     |     |      |  | 171 023       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1607 |     |     |      |  | 171 027       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1608 |     |     |      |  | 171 031       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1701 |     |     |      |  | 172 003       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1702 |     |     |      |  | 172 007       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1703 |     |     |      |  | 172 011       |
| 1: ES updating          |     |     |      |  |               |
| OUTP: Oper. mode K 1704 |     |     |      |  | 172 015       |
| 1: ES updating          |     |     |      |  |               |



| Parameter               |     |     |      | Address       |
|-------------------------|-----|-----|------|---------------|
| Default                 | Min | Max | Unit | Logic Diagram |
| OUTP: Oper. mode K 1705 |     |     |      | 172 019       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1706 |     |     |      | 172 023       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1707 |     |     |      | 172 027       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1708 |     |     |      | 172 031       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1801 |     |     |      | 173 003       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1802 |     |     |      | 173 007       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1803 |     |     |      | 173 011       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1804 |     |     |      | 173 015       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1805 |     |     |      | 173 019       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1806 |     |     |      | 173 023       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1807 |     |     |      | 173 027       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 1808 |     |     |      | 173 031       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 2001 |     |     |      | 151 202       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 2002 |     |     |      | 151 205       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 2003 |     |     |      | 151 208       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 2004 |     |     |      | 151 211       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 2005 |     |     |      | 151 214       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 2006 |     |     |      | 151 217       |
| 1: ES updating          |     |     |      |               |
| OUTP: Oper. mode K 2007 |     |     |      | 151 220       |
| 1: ES updating          |     |     |      |               |

| Parameter                                      |     |     |      |  | Address       |  |
|------------------------------------------------|-----|-----|------|--|---------------|--|
| Default                                        | Min | Max | Unit |  | Logic Diagram |  |
| OUTP: Oper. mode K 2008                        |     |     |      |  | 151 223       |  |
| 1: ES updating                                 |     |     |      |  |               |  |
| OUTP: Oper. mode K 2101                        |     |     |      |  | 151 226       |  |
| 1: ES updating                                 |     |     |      |  |               |  |
| OUTP: Oper. mode K 2102                        |     |     |      |  | 151 229       |  |
| 1: ES updating                                 |     |     |      |  |               |  |
| OUTP: Oper. mode K 2103                        |     |     |      |  | 151 232       |  |
| 1: ES updating                                 |     |     |      |  |               |  |
| OUTP: Oper. mode K 2104                        |     |     |      |  | 151 235       |  |
| 1: ES updating                                 |     |     |      |  |               |  |
| OUTP: Oper. mode K 2105                        |     |     |      |  | 151 238       |  |
| 1: ES updating                                 |     |     |      |  |               |  |
| OUTP: Oper. mode K 2106                        |     |     |      |  | 151 241       |  |
| 1: ES updating                                 |     |     |      |  |               |  |
| Selection of operating mode for output relays. |     |     |      |  |               |  |

## Measured data output

| Parameter                                                                                                                                                                                                                                                                                                | Address |       |      |                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|------|-----------------------------------|
| Default                                                                                                                                                                                                                                                                                                  | Min     | Max   | Unit | Logic Diagram                     |
| MEASO: Function group MEASO                                                                                                                                                                                                                                                                              |         |       |      | 056 020                           |
| 0: Without                                                                                                                                                                                                                                                                                               |         |       |      |                                   |
| Cancelling function group MEASI or including it in the configuration.<br>If the function group is cancelled from the configuration, then all associated settings and signals are hidden. If the function group is cancelled from the configuration, then all associated settings and signals are hidden. |         |       |      |                                   |
| MEASO: General enable USER                                                                                                                                                                                                                                                                               |         |       |      | 031 074                           |
| 0: No                                                                                                                                                                                                                                                                                                    |         |       |      |                                   |
| Disabling or enabling the measured data output function.                                                                                                                                                                                                                                                 |         |       |      |                                   |
| MEASO: Fct. assignm. BCD                                                                                                                                                                                                                                                                                 |         |       |      | 053 002                           |
| 060 000: MAIN: Without function <span>Fig. 3-52, (p. 3-79)</span>                                                                                                                                                                                                                                        |         |       |      |                                   |
| Selection of the measured value to be transmitted in BCD form.                                                                                                                                                                                                                                           |         |       |      |                                   |
| MEASO: Hold time output BCD                                                                                                                                                                                                                                                                              |         |       |      | 010 010                           |
| 0.10                                                                                                                                                                                                                                                                                                     | 0.10    | 10.00 | s    | <span>Fig. 3-52, (p. 3-79)</span> |
| Setting for the transmission time of the selected measured value in BCD form.                                                                                                                                                                                                                            |         |       |      |                                   |
| MEASO: Scaled min. val. BCD                                                                                                                                                                                                                                                                              |         |       |      | 037 140                           |
| 0.000                                                                                                                                                                                                                                                                                                    | 0.000   | 1.000 |      |                                   |
| MEASO: Scaled max. val. BCD                                                                                                                                                                                                                                                                              |         |       |      | 037 141                           |
| 1.000                                                                                                                                                                                                                                                                                                    | 0.000   | 1.000 |      |                                   |
| MEASO: BCD-Out min. value                                                                                                                                                                                                                                                                                |         |       |      | 037 142                           |
| 0                                                                                                                                                                                                                                                                                                        | 0       | 399   |      |                                   |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Address |       |      |                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|------|----------------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Min     | Max   | Unit | Logic Diagram        |
| MEASO: BCD-Out max. value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |         |       |      | 037 143              |
| 399                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0       | 399   |      |                      |
| <p>The variable Mx is to be issued in BCD form.</p> <p>For measured values in the range “measured values to be issued” the output value should change linearly with the measured value.</p> <ul style="list-style-type: none"> <li>● Range of measured values for the variable Mx: Mx,RL1 ... Mx,RL2</li> <li>● Range of associated scaled measured values: 0 ... 1</li> <li>● Range of measured values to be issued: Mx,min ... Mx,max</li> <li>● Range of scaled measured values to be issued: Mx,scal,min ... Mx,scal,max</li> <li>● Designation of the set values in the data model: “Scaled min. val. BCD” ... “Scaled max. val. BCD”</li> </ul> <p>with:</p> $Mx,scal,min = (Mx,min - Mx,RL1)/(Mx,RL2 - Mx,RL1)$ $Mx,scal,max = (Mx,max - Mx,RL1)/(Mx,RL2 - Mx,RL1)$ <p>BCD display values for measured values in the range “measured values to be issued”; range: “BCD-Out min. value” ... “BCD-Out max. value”</p> <p>BBCD display values for measured values <math>\leq</math> Mx,min; range: “BCD-Out min. value”</p> <p>BCD display values for measured values <math>\geq</math> Mx,max; range: “BCD-Out max. value”</p> |         |       |      |                      |
| MEASO: Fct. assignm. A-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |       |      | 053 000              |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |       |      | Fig. 3-54, (p. 3-85) |
| MEASO: Fct. assignm. A-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |       |      | 053 001              |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |       |      |                      |
| Selection of the measured value to be transmitted in analog form.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |       |      |                      |
| MEASO: Hold time output A-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |      | 010 114              |
| 0.10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.10    | 10.00 | s    | Fig. 3-54, (p. 3-85) |
| MEASO: Hold time output A-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |      | 010 115              |
| 0.10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.10    | 10.00 | s    |                      |
| Setting for the time delay for output of the selected measured value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |         |       |      |                      |
| MEASO: Scaled min. val. A-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |      | 037 104              |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.000   | 1.000 |      | Fig. 3-54, (p. 3-85) |
| MEASO: Scaled knee val. A-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |      | 037 105              |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.000   | 1.000 |      | Fig. 3-54, (p. 3-85) |
| MEASO: Scaled max. val. A-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |      | 037 106              |
| 1.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.000   | 1.000 |      | Fig. 3-54, (p. 3-85) |
| MEASO: Scaled min. val. A-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |      | 037 110              |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.000   | 1.000 |      |                      |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |       |      | Address              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|------|----------------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Min   | Max   | Unit | Logic Diagram        |
| MEASO: Scaled knee val. A-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |       |      | 037 111              |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.000 | 1.000 |      |                      |
| MEASO: Scaled max. val. A-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |       |      | 037 112              |
| 1.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.000 | 1.000 |      |                      |
| <p>After conversion via a characteristic the selected measured value Ax (x = 1, 2) is to be issued as an output current. For this purpose a range "measured values to be issued" is defined. In this range the characteristic has two linear sections, which are separated by a knee point.</p> <ul style="list-style-type: none"> <li>● Range of measured values for the variable Mx: Mx,RL1 ... Mx,RL2</li> <li>● Range of associated scaled measured values: 0 ... 1</li> <li>● Range of measured values to be issued: Mx,min ... Mx,max</li> <li>● Range of scaled measured values to be output: Mx,scal,min ... Mx,scal,max</li> <li>● Designation of the set values in the data model: „Scaled min. val. Ax“ ... „Scaled max. val. Ax“</li> </ul> <p>with:</p> $Mx,scal,min = (Mx,min - Mx,RL1)/(Mx,RL2 - Mx,RL1)$ $Mx,scal,max = (Mx,max - Mx,RL1)/(Mx,RL2 - Mx,RL1)$ <ul style="list-style-type: none"> <li>● Designation of value for knee point: Mx,knee</li> <li>● Designation of scaled knee point value: Mx,scaled,knee</li> <li>● Designation of this set value in the data model: „Scaled knee val. Ax“</li> </ul> <p>with:</p> $Mx,scaled,knee = (Mx,knee - Mx,RL1)/(Mx,RL2 - Mx,RL1)$ |       |       |      |                      |
| MEASO: AnOut min. val. A-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |       |      | 037 107              |
| 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.00  | 20.00 | mA   | Fig. 3-54, (p. 3-85) |
| MEASO: AnOut knee point A-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |       |      | 037 108              |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.00  | 20.00 | mA   | Fig. 3-54, (p. 3-85) |
| MEASO: AnOut max. val. A-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |       |      | 037 109              |
| 20.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.00  | 20.00 | mA   | Fig. 3-54, (p. 3-85) |
| MEASO: AnOut min. val. A-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |       |      | 037 113              |
| 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.00  | 20.00 | mA   |                      |
| MEASO: AnOut knee point A-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |       |      | 037 114              |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.00  | 20.00 | mA   |                      |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |        |      | Address       |  |  |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------|------|---------------|--|--|---------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Min  | Max    | Unit | Logic Diagram |  |  |         |
| MEASO: AnOut max. val. A-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |        |      |               |  |  | 037 115 |
| 20.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.00 | 20.00  | mA   |               |  |  |         |
| <p>Output current range for measured values in the range “measured values to be issued”; designation in the data model: “An-Out min. val. Ax” ... “An-Out max. val. Ax”</p> <p>Output current to be set for measured values <math>\leq</math> Mx,min; designation in the data model: “An-Out min. val. Ax”</p> <p>Output current to be set for measured values <math>\geq</math> Mx,max; designation in the data model: “An-Out max. val. Ax”</p> <p>Output current to be set for measured values = Mx,knee; designation in the data model: “AnOut knee point Ax”</p> <p>with:</p> <p>Mx,min ... Mx,max: measured values to be issued</p> |      |        |      |               |  |  |         |
| MEASO: Output value 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |        |      |               |  |  | 037 120 |
| 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.00 | 100.00 | %    |               |  |  |         |
| MEASO: Output value 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |        |      |               |  |  | 037 121 |
| 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.00 | 100.00 | %    |               |  |  |         |
| MEASO: Output value 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |        |      |               |  |  | 037 122 |
| 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.00 | 100.00 | %    |               |  |  |         |
| <p>Measured values of external devices, which must be scaled to 0 to 100%, can be issued.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |        |      |               |  |  |         |

## LED indicators

| Parameter                                                                                                             | Address |     |      |               |
|-----------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                               | Min     | Max | Unit | Logic Diagram |
| LED: Fct.assig. H 1 green                                                                                             |         |     |      | 085 184       |
| 060 001: MAIN: Healthy                                                                                                |         |     |      |               |
| Display of the operational readiness of the protection device.<br>The function MAIN: Healthy is permanently assigned. |         |     |      |               |
| LED: Fct.assig. H 2 yell.                                                                                             |         |     |      | 085 001       |
| 004 065: MAIN: Blocked/faulty                                                                                         |         |     |      |               |
| Display of the function assigned to LED indicator H 2.<br>The function MAIN: Blocked/faulty is permanently assigned.  |         |     |      |               |
| LED: Fct.assig. H 3 yell.                                                                                             |         |     |      | 085 004       |
| 036 070: SFMON: Warning (LED)                                                                                         |         |     |      |               |
| Display of the function assigned to LED indicator H 3.<br>The function SFMON: Warning (LED) is permanently assigned.  |         |     |      |               |
| LED: Fct.assig. H 4 red                                                                                               |         |     |      | 085 007       |
| 060 000: MAIN: Without function                                                                                       |         |     |      |               |
| LED: Fct.assig. H 4 green                                                                                             |         |     |      | 085 057       |
| 060 000: MAIN: Without function                                                                                       |         |     |      |               |
| LED: Fct.assig. H 5 red                                                                                               |         |     |      | 085 010       |
| 060 000: MAIN: Without function                                                                                       |         |     |      |               |
| LED: Fct.assig. H 5 green                                                                                             |         |     |      | 085 060       |
| 060 000: MAIN: Without function                                                                                       |         |     |      |               |
| LED: Fct.assig. H 6 red                                                                                               |         |     |      | 085 013       |
| 060 000: MAIN: Without function                                                                                       |         |     |      |               |
| LED: Fct.assig. H 6 green                                                                                             |         |     |      | 085 063       |
| 060 000: MAIN: Without function                                                                                       |         |     |      |               |
| LED: Fct.assig. H 7 red                                                                                               |         |     |      | 085 016       |
| 060 000: MAIN: Without function                                                                                       |         |     |      |               |
| LED: Fct.assig. H 7 green                                                                                             |         |     |      | 085 066       |
| 060 000: MAIN: Without function                                                                                       |         |     |      |               |
| LED: Fct.assig. H 8 red                                                                                               |         |     |      | 085 019       |
| 060 000: MAIN: Without function                                                                                       |         |     |      |               |
| LED: Fct.assig. H 8 green                                                                                             |         |     |      | 085 069       |
| 060 000: MAIN: Without function                                                                                       |         |     |      |               |
| LED: Fct.assig. H 9 red                                                                                               |         |     |      | 085 022       |
| 060 000: MAIN: Without function                                                                                       |         |     |      |               |
| LED: Fct.assig. H 9 green                                                                                             |         |     |      | 085 072       |
| 060 000: MAIN: Without function                                                                                       |         |     |      |               |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| LED: Fct.assig. H10 red         |     |     |      |  |               |  | 085 025 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H10 green       |     |     |      |  |               |  | 085 075 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H11 red         |     |     |      |  |               |  | 085 028 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H11 green       |     |     |      |  |               |  | 085 078 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H12 red         |     |     |      |  |               |  | 085 031 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H12 green       |     |     |      |  |               |  | 085 081 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H13 red         |     |     |      |  |               |  | 085 034 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H13 green       |     |     |      |  |               |  | 085 084 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H14 red         |     |     |      |  |               |  | 085 037 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H14 green       |     |     |      |  |               |  | 085 087 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H15 red         |     |     |      |  |               |  | 085 040 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H15 green       |     |     |      |  |               |  | 085 090 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H16 red         |     |     |      |  |               |  | 085 043 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H16 green       |     |     |      |  |               |  | 085 093 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H18 red         |     |     |      |  |               |  | 085 131 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H18 green       |     |     |      |  |               |  | 085 161 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H19 red         |     |     |      |  |               |  | 085 134 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H19 green       |     |     |      |  |               |  | 085 164 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| LED: Fct.assig. H20 red         |     |     |      |  |               |  | 085 137 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |



| Parameter                                                                                                       |     |     |      | Address       |
|-----------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                         | Min | Max | Unit | Logic Diagram |
| LED: Fct.assig. H20 green                                                                                       |     |     |      | 085 167       |
| 060 000: MAIN: Without function                                                                                 |     |     |      |               |
| LED: Fct.assig. H21 red                                                                                         |     |     |      | 085 140       |
| 060 000: MAIN: Without function                                                                                 |     |     |      |               |
| LED: Fct.assig. H21 green                                                                                       |     |     |      | 085 170       |
| 060 000: MAIN: Without function                                                                                 |     |     |      |               |
| LED: Fct.assig. H22 red                                                                                         |     |     |      | 085 143       |
| 060 000: MAIN: Without function                                                                                 |     |     |      |               |
| LED: Fct.assig. H22 green                                                                                       |     |     |      | 085 173       |
| 060 000: MAIN: Without function                                                                                 |     |     |      |               |
| LED: Fct.assig. H23 red                                                                                         |     |     |      | 085 146       |
| 060 000: MAIN: Without function                                                                                 |     |     |      |               |
| LED: Fct.assig. H23 green                                                                                       |     |     |      | 085 177       |
| 060 000: MAIN: Without function                                                                                 |     |     |      |               |
| Assignment of functions to LED indicators.                                                                      |     |     |      |               |
| LED: Fct.assig. H17 red                                                                                         |     |     |      | 085 185       |
| 080 111: LOC: Edit mode                                                                                         |     |     |      |               |
| Display of the function assigned to LED indicator H 17.<br>The function LOC: Edit mode is permanently assigned. |     |     |      |               |
| LED: Operating mode H 1                                                                                         |     |     |      | 085 182       |
| 1: ES updating                                                                                                  |     |     |      |               |
| The operating mode <i>ES updating</i> is permanently assigned.                                                  |     |     |      |               |
| LED: Operating mode H 2                                                                                         |     |     |      | 085 002       |
| 1: ES updating                                                                                                  |     |     |      |               |
| The operating mode <i>ES updating</i> is permanently assigned.                                                  |     |     |      |               |
| LED: Operating mode H 3                                                                                         |     |     |      | 085 005       |
| 1: ES updating                                                                                                  |     |     |      |               |
| The <i>ES updating</i> operating mode is permanently assigned.                                                  |     |     |      |               |
| LED: Operating mode H 4                                                                                         |     |     |      | 085 008       |
| 3: ES reset (fault)                                                                                             |     |     |      |               |
| LED: Operating mode H 5                                                                                         |     |     |      | 085 011       |
| 1: ES updating                                                                                                  |     |     |      |               |
| LED: Operating mode H 6                                                                                         |     |     |      | 085 014       |
| 1: ES updating                                                                                                  |     |     |      |               |
| LED: Operating mode H 7                                                                                         |     |     |      | 085 017       |
| 1: ES updating                                                                                                  |     |     |      |               |

| Parameter                                                      |     |     |      |  | Address       |
|----------------------------------------------------------------|-----|-----|------|--|---------------|
| Default                                                        | Min | Max | Unit |  | Logic Diagram |
| LED: Operating mode H 8                                        |     |     |      |  | 085 020       |
| 1: ES updating                                                 |     |     |      |  |               |
| LED: Operating mode H 9                                        |     |     |      |  | 085 023       |
| 1: ES updating                                                 |     |     |      |  |               |
| LED: Operating mode H 10                                       |     |     |      |  | 085 026       |
| 1: ES updating                                                 |     |     |      |  |               |
| LED: Operating mode H 11                                       |     |     |      |  | 085 029       |
| 1: ES updating                                                 |     |     |      |  |               |
| LED: Operating mode H 12                                       |     |     |      |  | 085 032       |
| 1: ES updating                                                 |     |     |      |  |               |
| LED: Operating mode H 13                                       |     |     |      |  | 085 035       |
| 1: ES updating                                                 |     |     |      |  |               |
| LED: Operating mode H 14                                       |     |     |      |  | 085 038       |
| 1: ES updating                                                 |     |     |      |  |               |
| LED: Operating mode H 15                                       |     |     |      |  | 085 041       |
| 1: ES updating                                                 |     |     |      |  |               |
| LED: Operating mode H 16                                       |     |     |      |  | 085 044       |
| 1: ES updating                                                 |     |     |      |  |               |
| LED: Operating mode H 18                                       |     |     |      |  | 085 132       |
| 1: ES updating                                                 |     |     |      |  |               |
| LED: Operating mode H 19                                       |     |     |      |  | 085 135       |
| 1: ES updating                                                 |     |     |      |  |               |
| LED: Operating mode H 20                                       |     |     |      |  | 085 138       |
| 1: ES updating                                                 |     |     |      |  |               |
| LED: Operating mode H 21                                       |     |     |      |  | 085 141       |
| 1: ES updating                                                 |     |     |      |  |               |
| LED: Operating mode H 22                                       |     |     |      |  | 085 144       |
| 1: ES updating                                                 |     |     |      |  |               |
| LED: Operating mode H 23                                       |     |     |      |  | 085 147       |
| 1: ES updating                                                 |     |     |      |  |               |
| Selection of operating mode for LED indicators.                |     |     |      |  |               |
| LED: Operating mode H 17                                       |     |     |      |  | 085 183       |
| 1: ES updating                                                 |     |     |      |  |               |
| The operating mode <i>ES updating</i> is permanently assigned. |     |     |      |  |               |

## Main function

| Parameter                                                                                                                                                                                                                                                                                                       | Address |      |      |                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|------|------------------------|
| Default                                                                                                                                                                                                                                                                                                         | Min     | Max  | Unit | Logic Diagram          |
| MAIN: Fct.assignm. control                                                                                                                                                                                                                                                                                      |         |      |      | 104 242                |
| 0: COMM1                                                                                                                                                                                                                                                                                                        |         |      |      |                        |
| Selection of the communication interfaces for control.                                                                                                                                                                                                                                                          |         |      |      |                        |
| MAIN: Chann.assign.COMM1/2                                                                                                                                                                                                                                                                                      |         |      |      | 003 169                |
| 1: COMM1->chann.1,(2-2)                                                                                                                                                                                                                                                                                         |         |      |      | Fig. 3-80, (p. 3-116)  |
| Assignment of communication interfaces to physical communication channels.                                                                                                                                                                                                                                      |         |      |      |                        |
| MAIN: Auto-assignment I/O                                                                                                                                                                                                                                                                                       |         |      |      | 221 065                |
| 1: Yes                                                                                                                                                                                                                                                                                                          |         |      |      | Fig. 3-124, (p. 3-167) |
| Disabling or enabling of automatic assignment of binary inputs and outputs to the set bay type.                                                                                                                                                                                                                 |         |      |      |                        |
| MAIN: Type of bay                                                                                                                                                                                                                                                                                               |         |      |      | 220 000                |
| 1                                                                                                                                                                                                                                                                                                               | 1       | 9999 |      | Fig. 3-124, (p. 3-167) |
| Configuration of a bay type.                                                                                                                                                                                                                                                                                    |         |      |      |                        |
| MAIN: Prim.Source TimeSync                                                                                                                                                                                                                                                                                      |         |      |      | 103 210                |
| 0: IEC                                                                                                                                                                                                                                                                                                          |         |      |      |                        |
| Selection of the primary source for date and time synchronization. Available are <i>IEC</i> , <i>COMM1</i> , <i>COMM2/PC</i> or a binary input for minute signal pulses.                                                                                                                                        |         |      |      |                        |
| MAIN: BackupSourceTimeSync                                                                                                                                                                                                                                                                                      |         |      |      | 103 211                |
| 1: COMM1                                                                                                                                                                                                                                                                                                        |         |      |      |                        |
| Selection of the backup source for date and time synchronization. Available are <i>IEC</i> , <i>COMM1</i> , <i>COMM2/PC</i> or a binary input for minute signal pulses. The backup source is used when there is no synchronization generated by the primary source after MAIN: Time sync. time-out has elapsed. |         |      |      |                        |
| MAIN: Time sync. time-out                                                                                                                                                                                                                                                                                       |         |      |      | 103 212                |
| Blocked                                                                                                                                                                                                                                                                                                         | 1       | 60   | min  |                        |
| Time-out setting for the time synchronization generated by the primary source.                                                                                                                                                                                                                                  |         |      |      |                        |

## Operating data recording

| Parameter                                                         | Address |     |      |               |
|-------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                           | Min     | Max | Unit | Logic Diagram |
| OP_RC: Op.mode recording                                          |         |     |      | 100 004       |
| 0: Operating signals                                              |         |     |      |               |
| Selection for the operating mode of the operating data recording. |         |     |      |               |

## Fault recording

| Parameter                                                                   | Address |     |      |               |
|-----------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                     | Min     | Max | Unit | Logic Diagram |
| FT_RC: Rec. analog chann. 1                                                 |         |     |      | 035 160       |
| 1: Current IA                                                               |         |     |      |               |
| FT_RC: Rec. analog chann. 2                                                 |         |     |      | 035 161       |
| 2: Current IB                                                               |         |     |      |               |
| FT_RC: Rec. analog chann. 3                                                 |         |     |      | 035 162       |
| 3: Current IC                                                               |         |     |      |               |
| FT_RC: Rec. analog chann. 4                                                 |         |     |      | 035 163       |
| 5: Voltage A-G                                                              |         |     |      |               |
| FT_RC: Rec. analog chann. 5                                                 |         |     |      | 035 164       |
| 6: Voltage B-G                                                              |         |     |      |               |
| FT_RC: Rec. analog chann. 6                                                 |         |     |      | 035 165       |
| 7: Voltage C-G                                                              |         |     |      |               |
| FT_RC: Rec. analog chann. 7                                                 |         |     |      | 035 166       |
| 4: Current IN                                                               |         |     |      |               |
| FT_RC: Rec. analog chann. 8                                                 |         |     |      | 035 167       |
| 8: Voltage VNG                                                              |         |     |      |               |
| FT_RC: Rec. analog chann. 9                                                 |         |     |      | 035 168       |
| 69: Current IA,b                                                            |         |     |      |               |
| FT_RC: Rec. analog chann.10                                                 |         |     |      | 035 169       |
| 10: Current IB,b                                                            |         |     |      |               |
| FT_RC: Rec. analog chann.11                                                 |         |     |      | 035 170       |
| 71: Current IC,b                                                            |         |     |      |               |
| FT_RC: Rec. analog chann.12                                                 |         |     |      | 035 171       |
| 72: Current IN,b                                                            |         |     |      |               |
| FT_RC: Rec. analog chann.13                                                 |         |     |      | 035 172       |
| 238: Voltage A-G,b                                                          |         |     |      |               |
| FT_RC: Rec. analog chann.14                                                 |         |     |      | 035 173       |
| 239: Voltage B-G,b                                                          |         |     |      |               |
| FT_RC: Rec. analog chann.15                                                 |         |     |      | 035 174       |
| 240: Voltage C-G,b                                                          |         |     |      |               |
| FT_RC: Rec. analog chann.16                                                 |         |     |      | 035 175       |
| 241: Voltage VNG,b                                                          |         |     |      |               |
| FT_RC: Rec. analog chann.17                                                 |         |     |      | 016 102       |
| 210: Voltage Vref                                                           |         |     |      |               |
| The user specifies the channel on which each physical variable is recorded. |         |     |      |               |

Automatic  
synchronism check

| Parameter                                                                                                                                                                           | Address |     |      |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                             | Min     | Max | Unit | Logic Diagram |
| ASC: Function group ASC                                                                                                                                                             |         |     |      | 056 006       |
| 0: Without                                                                                                                                                                          |         |     |      |               |
| Cancelling function group ASC or including it in the configuration. If any function group is cancelled from the configuration, then all associated settings and signals are hidden. |         |     |      |               |

Limit value  
monitoring

| Parameter                                                                                                                                                                                                                 | Address |     |      |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                                                   | Min     | Max | Unit | Logic Diagram |
| LIMIT: Function group LIMIT                                                                                                                                                                                               |         |     |      | 056 025       |
| 0: Without                                                                                                                                                                                                                |         |     |      |               |
| Cancelling function group LIMIT or including it in the configuration. If the function group is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |         |     |      |               |

Limit value  
monitoring

| Parameter                                                                                                                                                                                                                | Address |     |      |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                                                  | Min     | Max | Unit | Logic Diagram |
| LIM_1: Function group LIM_1                                                                                                                                                                                              |         |     |      | 102 200       |
| 0: Without                                                                                                                                                                                                               |         |     |      |               |
| Canceling function group LIM_1 or including it in the configuration. If the function group is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |         |     |      |               |

Limit value  
monitoring

| Parameter                                                                                                                                                                                                                | Address |     |      |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                                                  | Min     | Max | Unit | Logic Diagram |
| LIM_2: Function group LIM_2                                                                                                                                                                                              |         |     |      | 102 020       |
| 0: Without                                                                                                                                                                                                               |         |     |      |               |
| Canceling function group LIM_1 or including it in the configuration. If the function group is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |         |     |      |               |

Programmable Logic

| Parameter                                                                                                                                                                                            |     |     |      |  | Address       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|--|---------------|
| Default                                                                                                                                                                                              | Min | Max | Unit |  | Logic Diagram |
| LOG_2: Function group LOG_2                                                                                                                                                                          |     |     |      |  | 056 089       |
| 0: Without                                                                                                                                                                                           |     |     |      |  |               |
| Cancelling function group LOG_2 ("Logic 2") or including it in the configuration.<br>If the function group is cancelled from the configuration, then all associated settings and signals are hidden. |     |     |      |  |               |

Programmable Logic

| Parameter                                                                                                                                                                                |     |     |      |  | Address       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|--|---------------|
| Default                                                                                                                                                                                  | Min | Max | Unit |  | Logic Diagram |
| LOGIC: Function group LOGIC                                                                                                                                                              |     |     |      |  | 056 017       |
| 0: Without                                                                                                                                                                               |     |     |      |  |               |
| Cancelling function group LOGIC or including it in the configuration.<br>If the function group is cancelled from the configuration, then all associated settings and signals are hidden. |     |     |      |  |               |

## External device

| Parameter                   |     |     |      |  | Address       |
|-----------------------------|-----|-----|------|--|---------------|
| Default                     | Min | Max | Unit |  | Logic Diagram |
| DEV01: Function group DEV01 |     |     |      |  | 210 047       |
| 0: Without                  |     |     |      |  |               |
| DEV02: Function group DEV02 |     |     |      |  | 210 097       |
| 0: Without                  |     |     |      |  |               |
| DEV03: Function group DEV03 |     |     |      |  | 210 147       |
| 0: Without                  |     |     |      |  |               |
| DEV04: Function group DEV04 |     |     |      |  | 210 197       |
| 0: Without                  |     |     |      |  |               |
| DEV05: Function group DEV05 |     |     |      |  | 210 247       |
| 0: Without                  |     |     |      |  |               |
| DEV06: Function group DEV06 |     |     |      |  | 211 047       |
| 0: Without                  |     |     |      |  |               |
| DEV07: Function group DEV07 |     |     |      |  | 211 097       |
| 0: Without                  |     |     |      |  |               |
| DEV08: Function group DEV08 |     |     |      |  | 211 147       |
| 0: Without                  |     |     |      |  |               |
| DEV09: Function group DEV09 |     |     |      |  | 211 197       |
| 0: Without                  |     |     |      |  |               |
| DEV10: Function group DEV10 |     |     |      |  | 211 247       |
| 0: Without                  |     |     |      |  |               |
| DEV11: Function group DEV11 |     |     |      |  | 212 047       |
| 0: Without                  |     |     |      |  |               |
| DEV12: Function group DEV12 |     |     |      |  | 212 097       |
| 0: Without                  |     |     |      |  |               |
| DEV13: Function group DEV13 |     |     |      |  | 212 147       |
| 0: Without                  |     |     |      |  |               |
| DEV14: Function group DEV14 |     |     |      |  | 212 197       |
| 0: Without                  |     |     |      |  |               |
| DEV15: Function group DEV15 |     |     |      |  | 212 247       |
| 0: Without                  |     |     |      |  |               |
| DEV16: Function group DEV16 |     |     |      |  | 213 047       |
| 0: Without                  |     |     |      |  |               |
| DEV17: Function group DEV17 |     |     |      |  | 213 097       |
| 0: Without                  |     |     |      |  |               |
| DEV18: Function group DEV18 |     |     |      |  | 213 147       |
| 0: Without                  |     |     |      |  |               |
| DEV19: Function group DEV19 |     |     |      |  | 213 197       |
| 0: Without                  |     |     |      |  |               |

| Parameter                                                                                                                                                                                         |     |     |      | Address       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                           | Min | Max | Unit | Logic Diagram |
| DEV20: Function group DEV20                                                                                                                                                                       |     |     |      | 213 247       |
| 0: Without                                                                                                                                                                                        |     |     |      |               |
| DEV21: Function group DEV21                                                                                                                                                                       |     |     |      | 214 047       |
| 0: Without                                                                                                                                                                                        |     |     |      |               |
| DEV22: Function group DEV22                                                                                                                                                                       |     |     |      | 214 097       |
| 0: Without                                                                                                                                                                                        |     |     |      |               |
| DEV23: Function group DEV23                                                                                                                                                                       |     |     |      | 214 147       |
| 0: Without                                                                                                                                                                                        |     |     |      |               |
| DEV24: Function group DEV24                                                                                                                                                                       |     |     |      | 214 197       |
| 0: Without                                                                                                                                                                                        |     |     |      |               |
| Cancelling function groups DEV01 to DEV03 or including them in the configuration. If any function group is cancelled from the configuration, then all associated settings and signals are hidden. |     |     |      |               |
| DEV01: Funct. type, signal                                                                                                                                                                        |     |     |      | 210 034       |
| 242                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV02: Funct. type, signal                                                                                                                                                                        |     |     |      | 210 084       |
| 242                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV03: Funct. type, signal                                                                                                                                                                        |     |     |      | 210 134       |
| 242                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV04: Funct. type, signal                                                                                                                                                                        |     |     |      | 210 184       |
| 242                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV05: Funct. type, signal                                                                                                                                                                        |     |     |      | 210 234       |
| 242                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV06: Funct. type, signal                                                                                                                                                                        |     |     |      | 211 034       |
| 242                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV07: Funct. type, signal                                                                                                                                                                        |     |     |      | 211 084       |
| 242                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV08: Funct. type, signal                                                                                                                                                                        |     |     |      | 211 134       |
| 242                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV09: Funct. type, signal                                                                                                                                                                        |     |     |      | 211 184       |
| 242                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV10: Funct. type, signal                                                                                                                                                                        |     |     |      | 211 234       |
| 242                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV11: Funct. type, signal                                                                                                                                                                        |     |     |      | 212 034       |
| 242                                                                                                                                                                                               | 0   | 255 |      |               |
| DEV12: Funct. type, signal                                                                                                                                                                        |     |     |      | 212 084       |
| 242                                                                                                                                                                                               | 0   | 255 |      |               |



| Parameter                                                                                                                                                                                                                       |     |     |      | Address       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                                                         | Min | Max | Unit | Logic Diagram |
| DEV13: Funct. type, signal                                                                                                                                                                                                      |     |     |      | 212 134       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |               |
| DEV14: Funct. type, signal                                                                                                                                                                                                      |     |     |      | 212 184       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |               |
| DEV15: Funct. type, signal                                                                                                                                                                                                      |     |     |      | 212 234       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |               |
| DEV16: Funct. type, signal                                                                                                                                                                                                      |     |     |      | 213 034       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |               |
| DEV17: Funct. type, signal                                                                                                                                                                                                      |     |     |      | 213 084       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |               |
| DEV18: Funct. type, signal                                                                                                                                                                                                      |     |     |      | 213 134       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |               |
| DEV19: Funct. type, signal                                                                                                                                                                                                      |     |     |      | 213 184       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |               |
| DEV20: Funct. type, signal                                                                                                                                                                                                      |     |     |      | 213 234       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |               |
| DEV21: Funct. type, signal                                                                                                                                                                                                      |     |     |      | 214 034       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |               |
| DEV22: Funct. type, signal                                                                                                                                                                                                      |     |     |      | 214 084       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |               |
| DEV23: Funct. type, signal                                                                                                                                                                                                      |     |     |      | 214 134       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |               |
| DEV24: Funct. type, signal                                                                                                                                                                                                      |     |     |      | 214 184       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |               |
| Setting the function type of the signal.                                                                                                                                                                                        |     |     |      |               |
| Note: If the IEC 870-5-101 communication protocol has been set, then the 'low address' of the information object will be defined by this setting. If the ILS-C protocol has been set, then this setting will correspond to DN2. |     |     |      |               |
| DEV01: Inform. No., signal                                                                                                                                                                                                      |     |     |      | 210 035       |
| 1                                                                                                                                                                                                                               | 0   | 254 |      |               |
| DEV02: Inform. No., signal                                                                                                                                                                                                      |     |     |      | 210 085       |
| 3                                                                                                                                                                                                                               | 0   | 254 |      |               |
| DEV03: Inform. No., signal                                                                                                                                                                                                      |     |     |      | 210 135       |
| 5                                                                                                                                                                                                                               | 0   | 254 |      |               |
| DEV04: Inform. No., signal                                                                                                                                                                                                      |     |     |      | 210 185       |
| 7                                                                                                                                                                                                                               | 0   | 254 |      |               |
| DEV05: Inform. No., signal                                                                                                                                                                                                      |     |     |      | 210 235       |
| 9                                                                                                                                                                                                                               | 0   | 254 |      |               |

| Parameter                  |     |     |      |  | Address       |  |         |
|----------------------------|-----|-----|------|--|---------------|--|---------|
| Default                    | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV06: Inform. No., signal |     |     |      |  |               |  | 211 035 |
| 11                         | 0   | 254 |      |  |               |  |         |
| DEV07: Inform. No., signal |     |     |      |  |               |  | 211 085 |
| 13                         | 0   | 255 |      |  |               |  |         |
| DEV08: Inform. No., signal |     |     |      |  |               |  | 211 135 |
| 15                         | 0   | 254 |      |  |               |  |         |
| DEV09: Inform. No., signal |     |     |      |  |               |  | 211 185 |
| 17                         | 0   | 254 |      |  |               |  |         |
| DEV10: Inform. No., signal |     |     |      |  |               |  | 211 235 |
| 19                         | 0   | 254 |      |  |               |  |         |
| DEV11: Inform. No., signal |     |     |      |  |               |  | 212 035 |
| 21                         | 0   | 255 |      |  |               |  |         |
| DEV12: Inform. No., signal |     |     |      |  |               |  | 212 085 |
| 23                         | 0   | 255 |      |  |               |  |         |
| DEV13: Inform. No., signal |     |     |      |  |               |  | 212 135 |
| 25                         | 0   | 255 |      |  |               |  |         |
| DEV14: Inform. No., signal |     |     |      |  |               |  | 212 185 |
| 27                         | 0   | 255 |      |  |               |  |         |
| DEV15: Inform. No., signal |     |     |      |  |               |  | 212 235 |
| 29                         | 0   | 255 |      |  |               |  |         |
| DEV16: Inform. No., signal |     |     |      |  |               |  | 213 035 |
| 31                         | 0   | 255 |      |  |               |  |         |
| DEV17: Inform. No., signal |     |     |      |  |               |  | 213 085 |
| 33                         | 0   | 255 |      |  |               |  |         |
| DEV18: Inform. No., signal |     |     |      |  |               |  | 213 135 |
| 35                         | 0   | 255 |      |  |               |  |         |
| DEV19: Inform. No., signal |     |     |      |  |               |  | 213 185 |
| 37                         | 0   | 255 |      |  |               |  |         |
| DEV20: Inform. No., signal |     |     |      |  |               |  | 213 235 |
| 39                         | 0   | 255 |      |  |               |  |         |
| DEV21: Inform. No., signal |     |     |      |  |               |  | 214 035 |
| 41                         | 0   | 255 |      |  |               |  |         |
| DEV22: Inform. No., signal |     |     |      |  |               |  | 214 085 |
| 43                         | 0   | 255 |      |  |               |  |         |
| DEV23: Inform. No., signal |     |     |      |  |               |  | 214 135 |
| 45                         | 0   | 255 |      |  |               |  |         |

| Parameter                                                                                                                                                                                                                                                                         |     |     |      | Address       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                                                                                                           | Min | Max | Unit | Logic Diagram |
| DEV24: Inform. No., signal                                                                                                                                                                                                                                                        |     |     |      | 214 185       |
| 47                                                                                                                                                                                                                                                                                | 0   | 255 |      |               |
| Setting the information number of the signal.<br>Note: If the IEC 870-5-101 communication protocol has been set, then the 'high address' of the information object will be defined by this setting. If the ILS-C protocol has been set, then this setting will correspond to DN3. |     |     |      |               |
| DEV01: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 210 032       |
| 242                                                                                                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV02: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 210 082       |
| 242                                                                                                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV03: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 210 132       |
| 242                                                                                                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV04: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 210 182       |
| 242                                                                                                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV05: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 210 232       |
| 242                                                                                                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV06: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 211 032       |
| 242                                                                                                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV07: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 211 082       |
| 242                                                                                                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV08: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 211 132       |
| 242                                                                                                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV09: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 211 182       |
| 242                                                                                                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV10: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 211 232       |
| 242                                                                                                                                                                                                                                                                               | 1   | 254 |      |               |
| DEV11: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 212 032       |
| 242                                                                                                                                                                                                                                                                               | 0   | 255 |      |               |
| DEV12: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 212 082       |
| 242                                                                                                                                                                                                                                                                               | 0   | 255 |      |               |
| DEV13: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 212 132       |
| 242                                                                                                                                                                                                                                                                               | 0   | 255 |      |               |
| DEV14: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 212 182       |
| 91                                                                                                                                                                                                                                                                                | 0   | 255 |      |               |
| DEV15: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 212 232       |
| 242                                                                                                                                                                                                                                                                               | 0   | 255 |      |               |
| DEV16: Funct. type, command                                                                                                                                                                                                                                                       |     |     |      | 213 032       |
| 242                                                                                                                                                                                                                                                                               | 0   | 255 |      |               |

| Parameter                                                                                                                                                                                                                       |     |     |      |  | Address       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|--|---------------|
| Default                                                                                                                                                                                                                         | Min | Max | Unit |  | Logic Diagram |
| DEV17: Funct. type, command                                                                                                                                                                                                     |     |     |      |  | 213 082       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |  |               |
| DEV18: Funct. type, command                                                                                                                                                                                                     |     |     |      |  | 213 132       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |  |               |
| DEV19: Funct. type, command                                                                                                                                                                                                     |     |     |      |  | 213 182       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |  |               |
| DEV20: Funct. type, command                                                                                                                                                                                                     |     |     |      |  | 213 232       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |  |               |
| DEV21: Funct. type, command                                                                                                                                                                                                     |     |     |      |  | 214 032       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |  |               |
| DEV22: Funct. type, command                                                                                                                                                                                                     |     |     |      |  | 214 082       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |  |               |
| DEV23: Funct. type, command                                                                                                                                                                                                     |     |     |      |  | 214 132       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |  |               |
| DEV24: Funct. type, command                                                                                                                                                                                                     |     |     |      |  | 214 182       |
| 242                                                                                                                                                                                                                             | 0   | 255 |      |  |               |
| Setting for the function type of the command.                                                                                                                                                                                   |     |     |      |  |               |
| Note: If the IEC 870-5-101 communication protocol has been set, then the “low address” of the information object will be defined by this setting. If the ILS-C protocol has been set, then this setting will correspond to DN2. |     |     |      |  |               |
| DEV01: Inform. No., command                                                                                                                                                                                                     |     |     |      |  | 210 033       |
| 65                                                                                                                                                                                                                              | 0   | 254 |      |  |               |
| DEV02: Inform. No., command                                                                                                                                                                                                     |     |     |      |  | 210 083       |
| 67                                                                                                                                                                                                                              | 0   | 254 |      |  |               |
| DEV03: Inform. No., command                                                                                                                                                                                                     |     |     |      |  | 210 133       |
| 69                                                                                                                                                                                                                              | 0   | 254 |      |  |               |
| DEV04: Inform. No., command                                                                                                                                                                                                     |     |     |      |  | 210 183       |
| 71                                                                                                                                                                                                                              | 0   | 254 |      |  |               |
| DEV05: Inform. No., command                                                                                                                                                                                                     |     |     |      |  | 210 233       |
| 73                                                                                                                                                                                                                              | 0   | 254 |      |  |               |
| DEV06: Inform. No., command                                                                                                                                                                                                     |     |     |      |  | 211 033       |
| 75                                                                                                                                                                                                                              | 0   | 254 |      |  |               |
| DEV07: Inform. No., command                                                                                                                                                                                                     |     |     |      |  | 211 083       |
| 77                                                                                                                                                                                                                              | 0   | 254 |      |  |               |
| DEV08: Inform. No., command                                                                                                                                                                                                     |     |     |      |  | 211 133       |
| 79                                                                                                                                                                                                                              | 0   | 254 |      |  |               |
| DEV09: Inform. No., command                                                                                                                                                                                                     |     |     |      |  | 211 183       |
| 81                                                                                                                                                                                                                              | 0   | 254 |      |  |               |

| Parameter                                                                                                                                                                                                                        |     |     |      |  | Address       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|--|---------------|
| Default                                                                                                                                                                                                                          | Min | Max | Unit |  | Logic Diagram |
| DEV10: Inform. No., command                                                                                                                                                                                                      |     |     |      |  | 211 233       |
| 83                                                                                                                                                                                                                               | 0   | 254 |      |  |               |
| DEV11: Inform. No., command                                                                                                                                                                                                      |     |     |      |  | 212 033       |
| 85                                                                                                                                                                                                                               | 0   | 255 |      |  |               |
| DEV12: Inform. No., command                                                                                                                                                                                                      |     |     |      |  | 212 083       |
| 87                                                                                                                                                                                                                               | 0   | 255 |      |  |               |
| DEV13: Inform. No., command                                                                                                                                                                                                      |     |     |      |  | 212 133       |
| 89                                                                                                                                                                                                                               | 0   | 255 |      |  |               |
| DEV14: Inform. No., command                                                                                                                                                                                                      |     |     |      |  | 212 183       |
| 242                                                                                                                                                                                                                              | 0   | 255 |      |  |               |
| DEV15: Inform. No., command                                                                                                                                                                                                      |     |     |      |  | 212 233       |
| 93                                                                                                                                                                                                                               | 0   | 255 |      |  |               |
| DEV16: Inform. No., command                                                                                                                                                                                                      |     |     |      |  | 213 033       |
| 95                                                                                                                                                                                                                               | 0   | 255 |      |  |               |
| DEV17: Inform. No., command                                                                                                                                                                                                      |     |     |      |  | 213 083       |
| 97                                                                                                                                                                                                                               | 0   | 255 |      |  |               |
| DEV18: Inform. No., command                                                                                                                                                                                                      |     |     |      |  | 213 133       |
| 99                                                                                                                                                                                                                               | 0   | 255 |      |  |               |
| DEV19: Inform. No., command                                                                                                                                                                                                      |     |     |      |  | 213 183       |
| 101                                                                                                                                                                                                                              | 0   | 255 |      |  |               |
| DEV20: Inform. No., command                                                                                                                                                                                                      |     |     |      |  | 213 233       |
| 103                                                                                                                                                                                                                              | 0   | 255 |      |  |               |
| DEV21: Inform. No., command                                                                                                                                                                                                      |     |     |      |  | 214 033       |
| 105                                                                                                                                                                                                                              | 0   | 255 |      |  |               |
| DEV22: Inform. No., command                                                                                                                                                                                                      |     |     |      |  | 214 083       |
| 107                                                                                                                                                                                                                              | 0   | 255 |      |  |               |
| DEV23: Inform. No., command                                                                                                                                                                                                      |     |     |      |  | 214 133       |
| 109                                                                                                                                                                                                                              | 0   | 255 |      |  |               |
| DEV24: Inform. No., command                                                                                                                                                                                                      |     |     |      |  | 214 183       |
| 111                                                                                                                                                                                                                              | 0   | 255 |      |  |               |
| Setting the information number of the command.                                                                                                                                                                                   |     |     |      |  |               |
| Note: If the IEC 870-5-101 communication protocol has been set, then the 'high address' of the information object will be defined by this setting. If the ILS-C protocol has been set, then this setting will correspond to DN3. |     |     |      |  |               |

## Single-pole signals

| Parameter                                                                                                                                                                                                                    | Address |     |      |                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|------------------------|
| Default                                                                                                                                                                                                                      | Min     | Max | Unit | Logic Diagram          |
| SIG_1: Function group SIG_1                                                                                                                                                                                                  |         |     |      | 249 250                |
| 1: With                                                                                                                                                                                                                      |         |     |      |                        |
| Cancelling function group SIG_1 or including it in the configuration.<br>If the function group is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |         |     |      |                        |
| SIG_1: Signal S001 config.                                                                                                                                                                                                   |         |     |      | 226 007                |
| 0: No                                                                                                                                                                                                                        |         |     |      | Fig. 3-147, (p. 3-199) |
| SIG_1: Signal S002 config.                                                                                                                                                                                                   |         |     |      | 226 015                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| SIG_1: Signal S003 config.                                                                                                                                                                                                   |         |     |      | 226 023                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| SIG_1: Signal S004 config.                                                                                                                                                                                                   |         |     |      | 226 031                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| SIG_1: Signal S005 config.                                                                                                                                                                                                   |         |     |      | 226 039                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| SIG_1: Signal S006 config.                                                                                                                                                                                                   |         |     |      | 226 047                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| SIG_1: Signal S007 config.                                                                                                                                                                                                   |         |     |      | 226 055                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| SIG_1: Signal S008 config.                                                                                                                                                                                                   |         |     |      | 226 063                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| SIG_1: Signal S009 config.                                                                                                                                                                                                   |         |     |      | 226 071                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| SIG_1: Signal S010 config.                                                                                                                                                                                                   |         |     |      | 226 079                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| SIG_1: Signal S011 config.                                                                                                                                                                                                   |         |     |      | 226 087                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| SIG_1: Signal S012 config.                                                                                                                                                                                                   |         |     |      | 226 095                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| SIG_1: Signal S013 config.                                                                                                                                                                                                   |         |     |      | 226 103                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| SIG_1: Signal S014 config.                                                                                                                                                                                                   |         |     |      | 226 111                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| SIG_1: Signal S015 config.                                                                                                                                                                                                   |         |     |      | 226 119                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| SIG_1: Signal S016 config.                                                                                                                                                                                                   |         |     |      | 226 127                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |

| Parameter                  |     |     |      | Address       |
|----------------------------|-----|-----|------|---------------|
| Default                    | Min | Max | Unit | Logic Diagram |
| SIG_1: Signal S017 config. |     |     |      | 226 135       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S018 config. |     |     |      | 226 143       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S019 config. |     |     |      | 226 151       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S020 config. |     |     |      | 226 159       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S021 config. |     |     |      | 226 167       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S022 config. |     |     |      | 226 175       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S023 config. |     |     |      | 226 183       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S024 config. |     |     |      | 226 191       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S025 config. |     |     |      | 226 199       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S026 config. |     |     |      | 226 207       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S027 config. |     |     |      | 226 215       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S028 config. |     |     |      | 226 223       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S029 config. |     |     |      | 226 231       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S030 config. |     |     |      | 226 239       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S031 config. |     |     |      | 226 247       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S032 config. |     |     |      | 226 255       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S033 config. |     |     |      | 227 007       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S034 config. |     |     |      | 227 015       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S035 config. |     |     |      | 227 023       |
| 0: No                      |     |     |      |               |

| Parameter                  |     |     |      |  | Address       |
|----------------------------|-----|-----|------|--|---------------|
| Default                    | Min | Max | Unit |  | Logic Diagram |
| SIG_1: Signal S036 config. |     |     |      |  | 227 031       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S037 config. |     |     |      |  | 227 039       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S038 config. |     |     |      |  | 227 047       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S039 config. |     |     |      |  | 227 055       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S040 config. |     |     |      |  | 227 063       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S041 config. |     |     |      |  | 227 071       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S042 config. |     |     |      |  | 227 079       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S043 config. |     |     |      |  | 227 087       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S044 config. |     |     |      |  | 227 095       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S045 config. |     |     |      |  | 227 103       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S046 config. |     |     |      |  | 227 111       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S047 config. |     |     |      |  | 227 119       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S048 config. |     |     |      |  | 227 127       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S049 config. |     |     |      |  | 227 135       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S050 config. |     |     |      |  | 227 143       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S051 config. |     |     |      |  | 227 151       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S052 config. |     |     |      |  | 227 159       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S053 config. |     |     |      |  | 227 167       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S054 config. |     |     |      |  | 227 175       |
| 0: No                      |     |     |      |  |               |



| Parameter                  |     |     |      | Address       |
|----------------------------|-----|-----|------|---------------|
| Default                    | Min | Max | Unit | Logic Diagram |
| SIG_1: Signal S055 config. |     |     |      | 227 183       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S056 config. |     |     |      | 227 191       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S057 config. |     |     |      | 227 199       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S058 config. |     |     |      | 227 207       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S059 config. |     |     |      | 227 215       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S060 config. |     |     |      | 227 223       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S061 config. |     |     |      | 227 231       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S062 config. |     |     |      | 227 239       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S063 config. |     |     |      | 227 247       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S064 config. |     |     |      | 227 255       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S065 config. |     |     |      | 228 007       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S066 config. |     |     |      | 228 015       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S067 config. |     |     |      | 228 023       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S068 config. |     |     |      | 228 031       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S069 config. |     |     |      | 228 039       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S070 config. |     |     |      | 228 047       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S071 config. |     |     |      | 228 055       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S072 config. |     |     |      | 228 063       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S073 config. |     |     |      | 228 071       |
| 0: No                      |     |     |      |               |

| Parameter                  |     |     |      |  | Address       |
|----------------------------|-----|-----|------|--|---------------|
| Default                    | Min | Max | Unit |  | Logic Diagram |
| SIG_1: Signal S074 config. |     |     |      |  | 228 079       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S075 config. |     |     |      |  | 228 087       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S076 config. |     |     |      |  | 228 095       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S077 config. |     |     |      |  | 228 103       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S078 config. |     |     |      |  | 228 111       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S079 config. |     |     |      |  | 228 119       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S080 config. |     |     |      |  | 228 127       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S081 config. |     |     |      |  | 228 135       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S082 config. |     |     |      |  | 228 143       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S083 config. |     |     |      |  | 228 151       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S084 config. |     |     |      |  | 228 159       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S085 config. |     |     |      |  | 228 167       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S086 config. |     |     |      |  | 228 175       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S087 config. |     |     |      |  | 228 183       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S088 config. |     |     |      |  | 228 191       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S089 config. |     |     |      |  | 228 199       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S090 config. |     |     |      |  | 228 207       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S091 config. |     |     |      |  | 228 215       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S092 config. |     |     |      |  | 228 223       |
| 0: No                      |     |     |      |  |               |

| Parameter                  |     |     |      | Address       |
|----------------------------|-----|-----|------|---------------|
| Default                    | Min | Max | Unit | Logic Diagram |
| SIG_1: Signal S093 config. |     |     |      | 228 231       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S094 config. |     |     |      | 228 239       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S095 config. |     |     |      | 228 247       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S096 config. |     |     |      | 228 255       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S097 config. |     |     |      | 229 007       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S098 config. |     |     |      | 229 015       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S099 config. |     |     |      | 229 023       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S100 config. |     |     |      | 229 031       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S101 config. |     |     |      | 229 039       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S102 config. |     |     |      | 229 047       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S103 config. |     |     |      | 229 055       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S104 config. |     |     |      | 229 063       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S105 config. |     |     |      | 229 071       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S106 config. |     |     |      | 229 079       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S107 config. |     |     |      | 229 087       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S108 config. |     |     |      | 229 095       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S109 config. |     |     |      | 229 103       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S110 config. |     |     |      | 229 111       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S111 config. |     |     |      | 229 119       |
| 0: No                      |     |     |      |               |

| Parameter                  |     |     |      |  | Address       |
|----------------------------|-----|-----|------|--|---------------|
| Default                    | Min | Max | Unit |  | Logic Diagram |
| SIG_1: Signal S112 config. |     |     |      |  | 229 127       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S113 config. |     |     |      |  | 229 135       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S114 config. |     |     |      |  | 229 143       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S115 config. |     |     |      |  | 229 151       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S116 config. |     |     |      |  | 229 159       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S117 config. |     |     |      |  | 229 167       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S118 config. |     |     |      |  | 229 175       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S119 config. |     |     |      |  | 229 183       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S120 config. |     |     |      |  | 229 191       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S121 config. |     |     |      |  | 229 199       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S122 config. |     |     |      |  | 229 207       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S123 config. |     |     |      |  | 229 215       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S124 config. |     |     |      |  | 229 223       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S125 config. |     |     |      |  | 229 231       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S126 config. |     |     |      |  | 229 239       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S127 config. |     |     |      |  | 229 247       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S128 config. |     |     |      |  | 229 255       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S129 config. |     |     |      |  | 230 007       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S130 config. |     |     |      |  | 230 015       |
| 0: No                      |     |     |      |  |               |

| Parameter                  |     |     |      | Address       |
|----------------------------|-----|-----|------|---------------|
| Default                    | Min | Max | Unit | Logic Diagram |
| SIG_1: Signal S131 config. |     |     |      | 230 023       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S132 config. |     |     |      | 230 031       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S133 config. |     |     |      | 230 039       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S134 config. |     |     |      | 230 047       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S135 config. |     |     |      | 230 055       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S136 config. |     |     |      | 230 063       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S137 config. |     |     |      | 230 071       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S138 config. |     |     |      | 230 079       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S139 config. |     |     |      | 230 087       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S140 config. |     |     |      | 230 095       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S141 config. |     |     |      | 230 103       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S142 config. |     |     |      | 230 111       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S143 config. |     |     |      | 230 119       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S144 config. |     |     |      | 230 127       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S145 config. |     |     |      | 230 135       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S146 config. |     |     |      | 230 143       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S147 config. |     |     |      | 230 151       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S148 config. |     |     |      | 230 159       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S149 config. |     |     |      | 230 167       |
| 0: No                      |     |     |      |               |

| Parameter                  |     |     |      |  | Address       |     |
|----------------------------|-----|-----|------|--|---------------|-----|
| Default                    | Min | Max | Unit |  | Logic Diagram |     |
| SIG_1: Signal S150 config. |     |     |      |  | 230           | 175 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S151 config. |     |     |      |  | 230           | 183 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S152 config. |     |     |      |  | 230           | 191 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S153 config. |     |     |      |  | 230           | 199 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S154 config. |     |     |      |  | 230           | 207 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S155 config. |     |     |      |  | 230           | 215 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S156 config. |     |     |      |  | 230           | 223 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S157 config. |     |     |      |  | 230           | 231 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S158 config. |     |     |      |  | 230           | 239 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S159 config. |     |     |      |  | 230           | 247 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S160 config. |     |     |      |  | 230           | 255 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S161 config. |     |     |      |  | 231           | 007 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S162 config. |     |     |      |  | 231           | 015 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S163 config. |     |     |      |  | 231           | 023 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S164 config. |     |     |      |  | 231           | 031 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S165 config. |     |     |      |  | 231           | 039 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S166 config. |     |     |      |  | 231           | 047 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S167 config. |     |     |      |  | 231           | 055 |
| 0: No                      |     |     |      |  |               |     |
| SIG_1: Signal S168 config. |     |     |      |  | 231           | 063 |
| 0: No                      |     |     |      |  |               |     |

| Parameter                  |     |     |      | Address       |
|----------------------------|-----|-----|------|---------------|
| Default                    | Min | Max | Unit | Logic Diagram |
| SIG_1: Signal S169 config. |     |     |      | 231 071       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S170 config. |     |     |      | 231 079       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S171 config. |     |     |      | 231 087       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S172 config. |     |     |      | 231 095       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S173 config. |     |     |      | 231 103       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S174 config. |     |     |      | 231 111       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S175 config. |     |     |      | 231 119       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S176 config. |     |     |      | 231 127       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S177 config. |     |     |      | 231 135       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S178 config. |     |     |      | 231 143       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S179 config. |     |     |      | 231 151       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S180 config. |     |     |      | 231 159       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S181 config. |     |     |      | 231 167       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S182 config. |     |     |      | 231 175       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S183 config. |     |     |      | 231 183       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S184 config. |     |     |      | 231 191       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S185 config. |     |     |      | 231 199       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S186 config. |     |     |      | 231 207       |
| 0: No                      |     |     |      |               |
| SIG_1: Signal S187 config. |     |     |      | 231 215       |
| 0: No                      |     |     |      |               |

| Parameter                  |     |     |      |  | Address       |
|----------------------------|-----|-----|------|--|---------------|
| Default                    | Min | Max | Unit |  | Logic Diagram |
| SIG_1: Signal S188 config. |     |     |      |  | 231 223       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S189 config. |     |     |      |  | 231 231       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S190 config. |     |     |      |  | 231 239       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S191 config. |     |     |      |  | 231 247       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S192 config. |     |     |      |  | 231 255       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S193 config. |     |     |      |  | 232 007       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S194 config. |     |     |      |  | 232 015       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S195 config. |     |     |      |  | 232 023       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S196 config. |     |     |      |  | 232 031       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S197 config. |     |     |      |  | 232 039       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S198 config. |     |     |      |  | 232 047       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S199 config. |     |     |      |  | 232 055       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S200 config. |     |     |      |  | 232 063       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S201 config. |     |     |      |  | 232 071       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S202 config. |     |     |      |  | 232 079       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S203 config. |     |     |      |  | 232 087       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S204 config. |     |     |      |  | 232 095       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S205 config. |     |     |      |  | 232 103       |
| 0: No                      |     |     |      |  |               |
| SIG_1: Signal S206 config. |     |     |      |  | 232 111       |
| 0: No                      |     |     |      |  |               |



| Parameter                                                                                                                                  |     |     |      | Address       |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                    | Min | Max | Unit | Logic Diagram |
| SIG_1: Signal S207 config.                                                                                                                 |     |     |      | 232 119       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S208 config.                                                                                                                 |     |     |      | 232 127       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S209 config.                                                                                                                 |     |     |      | 232 135       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S210 config.                                                                                                                 |     |     |      | 232 143       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S211 config.                                                                                                                 |     |     |      | 232 151       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S212 config.                                                                                                                 |     |     |      | 232 159       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S213 config.                                                                                                                 |     |     |      | 232 167       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S214 config.                                                                                                                 |     |     |      | 232 175       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S215 config.                                                                                                                 |     |     |      | 232 183       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S216 config.                                                                                                                 |     |     |      | 232 191       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S217 config.                                                                                                                 |     |     |      | 232 199       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S218 config.                                                                                                                 |     |     |      | 232 207       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S219 config.                                                                                                                 |     |     |      | 232 215       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S220 config.                                                                                                                 |     |     |      | 232 223       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S221 config.                                                                                                                 |     |     |      | 232 231       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S222 config.                                                                                                                 |     |     |      | 232 239       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S223 config.                                                                                                                 |     |     |      | 232 247       |
| 0: No                                                                                                                                      |     |     |      |               |
| SIG_1: Signal S224 config.                                                                                                                 |     |     |      | 232 255       |
| 0: No                                                                                                                                      |     |     |      |               |
| Cancelling the signal or including it in the configuration. If a signal is cancelled, then all associated settings and signals are hidden. |     |     |      |               |

| Parameter                                                                                                                                                                                       |     |     |                        | Address       |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------------------------|---------------|---------|
| Default                                                                                                                                                                                         | Min | Max | Unit                   | Logic Diagram |         |
| SIG_1: SIG_DC3 config.                                                                                                                                                                          |     |     |                        |               | 233 007 |
| 0: No                                                                                                                                                                                           |     |     | Fig. 3-144, (p. 3-194) |               |         |
| Cancelling the signal SIG_DC3 or including it in the configuration. This signal is used to terminate a direct motor control command in combination with the single-pole command CMD_1: CMD_DC3. |     |     |                        |               |         |
| If this signal is cancelled, then all associated settings are hidden.                                                                                                                           |     |     |                        |               |         |

Single-pole  
commands

| Parameter                                                                                                                                                                                                                    | Address |     |      |                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|------------------------|
| Default                                                                                                                                                                                                                      | Min     | Max | Unit | Logic Diagram          |
| CMD_1: Function group CMD_1                                                                                                                                                                                                  |         |     |      | 249 252                |
| 1: With                                                                                                                                                                                                                      |         |     |      |                        |
| Cancelling function group CMD_1 or including it in the configuration.<br>If the function group is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |         |     |      |                        |
| CMD_1: Command C001 config.                                                                                                                                                                                                  |         |     |      | 200 004                |
| 0: No                                                                                                                                                                                                                        |         |     |      | Fig. 3-146, (p. 3-197) |
| CMD_1: Command C002 config.                                                                                                                                                                                                  |         |     |      | 200 009                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| CMD_1: Command C003 config.                                                                                                                                                                                                  |         |     |      | 200 014                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| CMD_1: Command C004 config.                                                                                                                                                                                                  |         |     |      | 200 019                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| CMD_1: Command C005 config.                                                                                                                                                                                                  |         |     |      | 200 024                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| CMD_1: Command C006 config.                                                                                                                                                                                                  |         |     |      | 200 029                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| CMD_1: Command C007 config.                                                                                                                                                                                                  |         |     |      | 200 034                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| CMD_1: Command C008 config.                                                                                                                                                                                                  |         |     |      | 200 039                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| CMD_1: Command C009 config.                                                                                                                                                                                                  |         |     |      | 200 044                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| CMD_1: Command C010 config.                                                                                                                                                                                                  |         |     |      | 200 049                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| CMD_1: Command C011 config.                                                                                                                                                                                                  |         |     |      | 200 054                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| CMD_1: Command C012 config.                                                                                                                                                                                                  |         |     |      | 200 059                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| CMD_1: Command C013 config.                                                                                                                                                                                                  |         |     |      | 200 064                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| CMD_1: Command C014 config.                                                                                                                                                                                                  |         |     |      | 200 069                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| CMD_1: Command C015 config.                                                                                                                                                                                                  |         |     |      | 200 074                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |
| CMD_1: Command C016 config.                                                                                                                                                                                                  |         |     |      | 200 079                |
| 0: No                                                                                                                                                                                                                        |         |     |      |                        |

| Parameter                   |     |     |      |  | Address       |
|-----------------------------|-----|-----|------|--|---------------|
| Default                     | Min | Max | Unit |  | Logic Diagram |
| CMD_1: Command C017 config. |     |     |      |  | 200 084       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C018 config. |     |     |      |  | 200 089       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C019 config. |     |     |      |  | 200 094       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C020 config. |     |     |      |  | 200 099       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C021 config. |     |     |      |  | 200 104       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C022 config. |     |     |      |  | 200 109       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C023 config. |     |     |      |  | 200 114       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C024 config. |     |     |      |  | 200 119       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C025 config. |     |     |      |  | 200 124       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C026 config. |     |     |      |  | 200 129       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C027 config. |     |     |      |  | 200 134       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C028 config. |     |     |      |  | 200 139       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C029 config. |     |     |      |  | 200 144       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C030 config. |     |     |      |  | 200 149       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C031 config. |     |     |      |  | 200 154       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C032 config. |     |     |      |  | 200 159       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C033 config. |     |     |      |  | 200 164       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C034 config. |     |     |      |  | 200 169       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C035 config. |     |     |      |  | 200 174       |
| 0: No                       |     |     |      |  |               |

| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| CMD_1: Command C036 config. |     |     |      | 200 179       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C037 config. |     |     |      | 200 184       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C038 config. |     |     |      | 200 189       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C039 config. |     |     |      | 200 194       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C040 config. |     |     |      | 200 199       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C041 config. |     |     |      | 200 204       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C042 config. |     |     |      | 200 209       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C043 config. |     |     |      | 200 214       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C044 config. |     |     |      | 200 219       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C045 config. |     |     |      | 200 224       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C046 config. |     |     |      | 200 229       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C047 config. |     |     |      | 200 234       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C048 config. |     |     |      | 200 239       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C049 config. |     |     |      | 201 004       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C050 config. |     |     |      | 201 009       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C051 config. |     |     |      | 201 014       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C052 config. |     |     |      | 201 019       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C053 config. |     |     |      | 201 024       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C054 config. |     |     |      | 201 029       |
| 0: No                       |     |     |      |               |

| Parameter                   |     |     |      |  | Address       |
|-----------------------------|-----|-----|------|--|---------------|
| Default                     | Min | Max | Unit |  | Logic Diagram |
| CMD_1: Command C055 config. |     |     |      |  | 201 034       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C056 config. |     |     |      |  | 201 039       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C057 config. |     |     |      |  | 201 044       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C058 config. |     |     |      |  | 201 049       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C059 config. |     |     |      |  | 201 054       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C060 config. |     |     |      |  | 201 059       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C061 config. |     |     |      |  | 201 064       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C062 config. |     |     |      |  | 201 069       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C063 config. |     |     |      |  | 201 074       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C064 config. |     |     |      |  | 201 079       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C065 config. |     |     |      |  | 201 084       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C066 config. |     |     |      |  | 201 089       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C067 config. |     |     |      |  | 201 094       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C068 config. |     |     |      |  | 201 099       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C069 config. |     |     |      |  | 201 104       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C070 config. |     |     |      |  | 201 109       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C071 config. |     |     |      |  | 201 114       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C072 config. |     |     |      |  | 201 119       |
| 0: No                       |     |     |      |  |               |
| CMD_1: Command C073 config. |     |     |      |  | 201 124       |
| 0: No                       |     |     |      |  |               |

| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| CMD_1: Command C074 config. |     |     |      | 201 129       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C075 config. |     |     |      | 201 134       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C076 config. |     |     |      | 201 139       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C077 config. |     |     |      | 201 144       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C078 config. |     |     |      | 201 149       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C079 config. |     |     |      | 201 154       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C080 config. |     |     |      | 201 159       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C081 config. |     |     |      | 201 164       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C082 config. |     |     |      | 201 169       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C083 config. |     |     |      | 201 174       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C084 config. |     |     |      | 201 179       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C085 config. |     |     |      | 201 184       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C086 config. |     |     |      | 201 189       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C087 config. |     |     |      | 201 194       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C088 config. |     |     |      | 201 199       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C089 config. |     |     |      | 201 204       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C090 config. |     |     |      | 201 209       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C091 config. |     |     |      | 201 214       |
| 0: No                       |     |     |      |               |
| CMD_1: Command C092 config. |     |     |      | 201 219       |
| 0: No                       |     |     |      |               |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |     |      | Address       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Min | Max | Unit | Logic Diagram |
| CMD_1: Command C093 config.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |     |      | 201 224       |
| 0: No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| CMD_1: Command C094 config.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |     |      | 201 229       |
| 0: No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| CMD_1: Command C095 config.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |     |      | 201 234       |
| 0: No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| CMD_1: Command C096 config.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |     |      | 201 239       |
| 0: No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |
| Cancelling the command or including it in the configuration. If the command is cancelled, then all associated settings and signals are hidden, with the exception of this setting.                                                                                                                                                                                                                                                                                                                                                                     |     |     |      |               |
| CMD_1: CMD_DC1 config.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |     |      | 202 004       |
| 0: No <a href="#">Fig. 3-142, (p. 3-193)</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      |               |
| Cancelling command CMD_DC1 or including it in the configuration. This command is used for Three Position Drives, the operation is delayed by the set value MAIN: DC op. delay t1, and it is terminated either with positive indication of the final switchgear position, or when the timer MAIN: DC1 impulse t2 has elapsed.<br>If the command is cancelled, then all associated settings and signals are hidden, with the exception of this setting.                                                                                                  |     |     |      |               |
| CMD_1: CMD_DC2 config.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |     |      | 202 009       |
| 0: No <a href="#">Fig. 3-143, (p. 3-193)</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      |               |
| Cancelling command CMD_DC2 or including it in the configuration. This command is used for direct motor control, the operation is delayed by the set value MAIN: DC op. delay t1, and it is terminated with positive indication of the final switchgear position, but this reset is delayed by the set value MAIN: DC2/3 release delay.<br>If the command is cancelled, then all associated settings and signals are hidden, with the exception of this setting.                                                                                        |     |     |      |               |
| CMD_1: CMD_DC3 config.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |     |      | 202 014       |
| 0: No <a href="#">Fig. 3-144, (p. 3-194)</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      |               |
| Cancelling command CMD_DC3 or including it in the configuration. This command is used for direct motor control, the operation is delayed by the set value MAIN: DC op. delay t1, and it is terminated with the signal SIG_1: Logic SIG_DC3 or – if MAIN: ext.cmd.term. w/o PI = No – with positive indication of the final switchgear position; in any case this reset is delayed by the set value MAIN: DC2/3 release delay.<br>If the command is cancelled, then all associated settings and signals are hidden, with the exception of this setting. |     |     |      |               |



## Interlocking logic

| Parameter                                                                                                                                                                                                                 | Address |     |      |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                                                   | Min     | Max | Unit | Logic Diagram |
| ILOCK: Function group ILOCK                                                                                                                                                                                               |         |     |      | 250 102       |
| 1: With                                                                                                                                                                                                                   |         |     |      |               |
| Cancelling function group ILOCK or including it in the configuration. If the function group is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |         |     |      |               |

## Binary counts

| Parameter                                                                                                                                                                                                                 | Address |     |      |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                                                   | Min     | Max | Unit | Logic Diagram |
| COUNT: Function group COUNT                                                                                                                                                                                               |         |     |      | 217 047       |
| 0: Without                                                                                                                                                                                                                |         |     |      |               |
| Cancelling function group COUNT or including it in the configuration. If the function group is cancelled from the configuration, then all associated settings and signals are hidden, with the exception of this setting. |         |     |      |               |

## 7.1.3

## Function Parameters

## 7.1.3.1

## Global

## PC link

| Parameter                                                                                                                   | Address |     |      |               |
|-----------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                     | Min     | Max | Unit | Logic Diagram |
| PC: Command blocking                                                                                                        |         |     |      | 003 182       |
| 0: No <span style="color: green;">Fig. 3-12, (p. 3-20)</span>                                                               |         |     |      |               |
| When command blocking is activated, commands are rejected at the PC interface.                                              |         |     |      |               |
| PC: Sig./meas.val.block.                                                                                                    |         |     |      | 003 086       |
| 0: No <span style="color: green;">Fig. 3-12, (p. 3-20)</span>                                                               |         |     |      |               |
| When signal and measured value blocking is activated, no signals or measured data are transmitted through the PC interface. |         |     |      |               |

“Logical”  
communication  
interface 1

| Parameter                                                                                                                                     |     |     |      | Address                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|----------------------------------------------------------------------|
| Default                                                                                                                                       | Min | Max | Unit | Logic Diagram                                                        |
| COMM1: Command block. USER                                                                                                                    |     |     |      | 003 172                                                              |
| 1: Yes                                                                                                                                        |     |     |      | Fig. 3-13, (p. 3-21)                                                 |
| When command blocking is activated, commands are rejected at communication interface 1.                                                       |     |     |      |                                                                      |
| COMM1: Sig./meas.block.USER                                                                                                                   |     |     |      | 003 076                                                              |
| 0: No                                                                                                                                         |     |     |      | Fig. 3-14, (p. 3-23)<br>Fig. 3-15, (p. 3-24)<br>Fig. 3-16, (p. 3-25) |
| When signal and measured value blocking user is activated, no signals or measured data are transmitted through communication interface COMM1. |     |     |      |                                                                      |

“Logical”  
communication  
interface 2

| Parameter                                                                                                                                     |     |     |      | Address              |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|----------------------|
| Default                                                                                                                                       | Min | Max | Unit | Logic Diagram        |
| COMM2: Command block. USER                                                                                                                    |     |     |      | 103 172              |
| 1: Yes                                                                                                                                        |     |     |      | Fig. 3-22, (p. 3-31) |
| When command blocking is activated, commands are rejected at communication interface 2.                                                       |     |     |      |                      |
| COMM2: Sig./meas.block.USER                                                                                                                   |     |     |      | 103 076              |
| 0: No                                                                                                                                         |     |     |      | Fig. 3-22, (p. 3-31) |
| When signal and measured value blocking user is activated, no signals or measured data are transmitted through communication interface COMM2. |     |     |      |                      |

IEC 61850  
Communication

| Parameter                                                                                                                                             | Address |     |      |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                               | Min     | Max | Unit | Logic Diagram |
| IEC: Command block. USER                                                                                                                              |         |     |      | 104 085       |
| 1: Yes                                                                                                                                                |         |     |      |               |
| When command blocking is activated, commands are rejected at IEC communication interface.                                                             |         |     |      |               |
| IEC: Ctrl blocked user                                                                                                                                |         |     |      | 221 125       |
| 0: No <span style="color: green;">Fig. 3-31, (p. 3-53)</span>                                                                                         |         |     |      |               |
| When control blocking is activated, controls are rejected at IEC communication, i.e no output data (digital by relays) will be issued to the process. |         |     |      |               |
| IEC: Sig./meas.block.USER                                                                                                                             |         |     |      | 104 088       |
| 0: No                                                                                                                                                 |         |     |      |               |
| When signal and measured value blocking user is activated, no signals or measured data are transmitted through IEC communication interface.           |         |     |      |               |

Binary and analog  
output

| Parameter                                                       | Address |     |      |               |
|-----------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                         | Min     | Max | Unit | Logic Diagram |
| OUTP: Outp.rel.block USER                                       |         |     |      | 021 014       |
| 0: No <span style="color: green;">Fig. 3-47, (p. 3-73)</span>   |         |     |      |               |
| When this blocking is activated, all output relays are blocked. |         |     |      |               |

## Main function

| Parameter                                                                                                                                                                                                                                                                                                                                                     | Address |       |      |                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|------|-------------------------------------------------------------------------------------------------------------------------------|
| Default                                                                                                                                                                                                                                                                                                                                                       | Min     | Max   | Unit | Logic Diagram                                                                                                                 |
| MAIN: Device on-line                                                                                                                                                                                                                                                                                                                                          |         |       |      | 003 030                                                                                                                       |
| 0: No (= off)                                                                                                                                                                                                                                                                                                                                                 |         |       |      | Fig. 3-71, (p. 3-106)<br>Fig. 3-111, (p. 3-154)<br>Fig. 3-112, (p. 3-156)<br>Fig. 3-113, (p. 3-157)<br>Fig. 3-114, (p. 3-158) |
| Switching the device off-line or on-line. Some parameters can only be changed when protection is disabled.                                                                                                                                                                                                                                                    |         |       |      |                                                                                                                               |
| MAIN: Test mode USER                                                                                                                                                                                                                                                                                                                                          |         |       |      | 003 012                                                                                                                       |
| 0: No                                                                                                                                                                                                                                                                                                                                                         |         |       |      | Fig. 3-81, (p. 3-117)                                                                                                         |
| When the test mode user is activated, signals or measured data for PC and communication interfaces are labeled 'test mode'.                                                                                                                                                                                                                                   |         |       |      |                                                                                                                               |
| MAIN: Nominal frequ. f <sub>nom</sub>                                                                                                                                                                                                                                                                                                                         |         |       |      | 010 030                                                                                                                       |
| 50: 50 Hz                                                                                                                                                                                                                                                                                                                                                     |         |       | Hz   |                                                                                                                               |
| Setting for the nominal frequency of the protected system.                                                                                                                                                                                                                                                                                                    |         |       |      |                                                                                                                               |
| MAIN: Phase sequence                                                                                                                                                                                                                                                                                                                                          |         |       |      | 010 049                                                                                                                       |
| 1: A - B - C                                                                                                                                                                                                                                                                                                                                                  |         |       |      | Fig. 3-62, (p. 3-98)                                                                                                          |
| Setting the phase sequence A-B-C or A-C-B.<br>(Alternative terminology: Setting for the rotary field's direction, either clockwise or anticlockwise.)                                                                                                                                                                                                         |         |       |      |                                                                                                                               |
| MAIN: Time tag                                                                                                                                                                                                                                                                                                                                                |         |       |      | 221 098                                                                                                                       |
| 1: 1stEdge,OpMem sorted                                                                                                                                                                                                                                                                                                                                       |         |       |      |                                                                                                                               |
| For bay control function signals detected via binary signal inputs and conditioned with debouncing it is now possible to select whether the time tag for the signal is to be issued after debouncing or when the first pulse edge is detected. Furthermore it is defined whether entries in the operating data memory are made in chronological order or not. |         |       |      |                                                                                                                               |
| MAIN: I <sub>nom,1</sub> C.T. prim.                                                                                                                                                                                                                                                                                                                           |         |       |      | 010 001                                                                                                                       |
| 1000                                                                                                                                                                                                                                                                                                                                                          | 1       | 50000 | A    | Fig. 3-58, (p. 3-95)<br>Fig. 3-59, (p. 3-96)                                                                                  |
| MAIN: I <sub>nom,2</sub> C.T. prim.                                                                                                                                                                                                                                                                                                                           |         |       |      | 101 070                                                                                                                       |
| 1000                                                                                                                                                                                                                                                                                                                                                          | 1       | 10000 | A    |                                                                                                                               |
| Setting for the primary nominal current of the main current transformers for measurement of phase currents.                                                                                                                                                                                                                                                   |         |       |      |                                                                                                                               |
| MAIN: I <sub>N,nom,1</sub> C.T. prim.                                                                                                                                                                                                                                                                                                                         |         |       |      | 010 018                                                                                                                       |
| 1000                                                                                                                                                                                                                                                                                                                                                          | 1       | 50000 | A    | Fig. 3-60, (p. 3-96)                                                                                                          |

| Parameter                                                                                                                                                     |     |        |      | Address                                      |  |  |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------|------|----------------------------------------------|--|--|---------|
| Default                                                                                                                                                       | Min | Max    | Unit | Logic Diagram                                |  |  |         |
| MAIN: IN,nom,2 C.T. prim.                                                                                                                                     |     |        |      |                                              |  |  | 101 071 |
| 1000                                                                                                                                                          | 1   | 10000  | A    |                                              |  |  |         |
| Setting for the primary nominal current of the main current transformer for measurement of residual current.                                                  |     |        |      |                                              |  |  |         |
| MAIN: Vnom,1 V.T. prim.                                                                                                                                       |     |        |      |                                              |  |  | 010 002 |
| 100.0                                                                                                                                                         | 0.1 | 1000.0 | kV   | Fig. 3-63, (p. 3-99)                         |  |  |         |
| MAIN: Vnom,2 V.T. prim.                                                                                                                                       |     |        |      |                                              |  |  | 101 072 |
| 100.0                                                                                                                                                         | 0.1 | 1000.0 | kV   |                                              |  |  |         |
| Setting for the primary nominal voltage of the system transformer for measurement of phase-to-ground and phase-to-phase voltages.                             |     |        |      |                                              |  |  |         |
| MAIN: VNG,nom,1 V.T. prim.                                                                                                                                    |     |        |      |                                              |  |  | 010 027 |
| 100.0                                                                                                                                                         | 0.1 | 1000.0 | kV   | Fig. 3-64, (p. 3-100)                        |  |  |         |
| MAIN: VNG,nom,2 V.T. prim.                                                                                                                                    |     |        |      |                                              |  |  | 101 073 |
| 100.0                                                                                                                                                         | 0.1 | 1000.0 | kV   |                                              |  |  |         |
| Setting for the primary nominal voltage of the system transformer for measurement of neutral-point displacement voltage.                                      |     |        |      |                                              |  |  |         |
| MAIN: Vref,nom V.T. prim.                                                                                                                                     |     |        |      |                                              |  |  | 010 100 |
| 100.0                                                                                                                                                         | 0.1 | 1000.0 | kV   | Fig. 3-65, (p. 3-100)                        |  |  |         |
| Setting for the primary nominal voltage of the system transformer for measurement of reference voltage for automatic synchronism check.                       |     |        |      |                                              |  |  |         |
| MAIN: Inom,1 device                                                                                                                                           |     |        |      |                                              |  |  | 010 003 |
| 1.0: 1.0 A                                                                                                                                                    |     |        | A    | Fig. 3-56, (p. 3-91)<br>Fig. 3-57, (p. 3-92) |  |  |         |
| MAIN: Inom,2 device                                                                                                                                           |     |        |      |                                              |  |  | 101 075 |
| 1.0: 1.0 A                                                                                                                                                    |     |        | A    | Fig. 3-57, (p. 3-92)                         |  |  |         |
| Setting for the secondary nominal current of the system transformer for measurement of phase currents. This also corresponds to the nominal device current.   |     |        |      |                                              |  |  |         |
| MAIN: IN,nom,1 device                                                                                                                                         |     |        |      |                                              |  |  | 010 026 |
| 1.0: 1.0 A                                                                                                                                                    |     |        | A    | Fig. 3-56, (p. 3-91)<br>Fig. 3-57, (p. 3-92) |  |  |         |
| MAIN: IN,nom,2 device                                                                                                                                         |     |        |      |                                              |  |  | 101 076 |
| 1.0: 1.0 A                                                                                                                                                    |     |        | A    | Fig. 3-57, (p. 3-92)                         |  |  |         |
| Setting for the secondary nominal current of the system transformer for measurement of residual current. This also corresponds to the nominal device current. |     |        |      |                                              |  |  |         |
| MAIN: Vnom,1 V.T. sec.                                                                                                                                        |     |        |      |                                              |  |  | 010 009 |
| 100                                                                                                                                                           | 50  | 130    | V    | Fig. 3-56, (p. 3-91)<br>Fig. 3-57, (p. 3-92) |  |  |         |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |       |      |                                              | Address       |  |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|------|----------------------------------------------|---------------|--|---------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Min   | Max   | Unit |                                              | Logic Diagram |  |         |
| MAIN: Vnom,2 V.T. sec.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |       |      |                                              |               |  | 101 078 |
| 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 50    | 130   | V    | Fig. 3-57, (p. 3-92)                         |               |  |         |
| Setting for the secondary nominal voltage of the system transformer for measurement of phase-to-ground and phase-to-phase voltages.                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |      |                                              |               |  |         |
| MAIN: VNG,nom,1 V.T. sec.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |       |      |                                              |               |  | 010 028 |
| 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 50    | 130   | V    | Fig. 3-56, (p. 3-91)<br>Fig. 3-57, (p. 3-92) |               |  |         |
| MAIN: VNG,nom,2 V.T. sec.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |       |      |                                              |               |  | 101 079 |
| 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 50    | 130   | V    | Fig. 3-57, (p. 3-92)                         |               |  |         |
| Setting for the secondary nominal voltage of the system transformer for measurement of neutral-point displacement voltage.                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |       |      |                                              |               |  |         |
| MAIN: Vref,nom V.T. sec.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |       |      |                                              |               |  | 031 052 |
| 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 30    | 130   | V    | Fig. 3-56, (p. 3-91)                         |               |  |         |
| Setting for the secondary nominal voltage of the system transformer for measurement of reference voltage for automatic synchronism check.                                                                                                                                                                                                                                                                                                                                                                                                                   |       |       |      |                                              |               |  |         |
| MAIN: Conn. meas. cir.IP,1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |       |      |                                              |               |  | 010 004 |
| 1: Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |       |      | Fig. 3-56, (p. 3-91)<br>Fig. 3-57, (p. 3-92) |               |  |         |
| MAIN: Conn. meas. cir.IP,2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |       |      |                                              |               |  | 101 084 |
| 1: Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |       |      | Fig. 3-57, (p. 3-92)                         |               |  |         |
| Short-circuit direction determination depends on the connection of the measuring circuits. If the connection is as shown in Chapter "Installation and Connection", then the setting must be <i>Standard</i> , if the C434's 'forward' decision is to be in the direction of the outgoing feeder. If the connection direction is reversed or – given a connection scheme according to Chapter "Installation and Connection" – if the 'forward' decision is to be in the busbar direction, then the setting must be <i>Opposite</i> .                         |       |       |      |                                              |               |  |         |
| MAIN: Conn. meas. cir.IN,1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |       |      |                                              |               |  | 010 019 |
| 1: Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |       |      | Fig. 3-56, (p. 3-91)<br>Fig. 3-57, (p. 3-92) |               |  |         |
| MAIN: Conn. meas. cir.IN,2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |       |      |                                              |               |  | 101 085 |
| 1: Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |       |      | Fig. 3-57, (p. 3-92)                         |               |  |         |
| Direction determination of the ground fault measuring systems depends on the connection of the measuring circuits. If the connection is as shown in Chapter "Installation and Connection", then the setting must be <i>Standard</i> , if the C434's 'forward' decision is to be in the direction of the outgoing feeder. If the connection direction is reversed or – given a connection scheme according to Chapter "Installation and Connection" – if the 'forward' decision is to be in the busbar direction, then the setting must be <i>Opposite</i> . |       |       |      |                                              |               |  |         |
| MAIN: Meas. value rel.IP,1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |       |      |                                              |               |  | 011 030 |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.000 | 0.200 | Inom | Fig. 3-58, (p. 3-95)                         |               |  |         |

| Parameter                                                                                                                                                                                                                    |       |       |          | Address               |  |  |         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|----------|-----------------------|--|--|---------|
| Default                                                                                                                                                                                                                      | Min   | Max   | Unit     | Logic Diagram         |  |  |         |
| MAIN: Meas. value rel.IP,2                                                                                                                                                                                                   |       |       |          |                       |  |  | 101 086 |
| 0.000                                                                                                                                                                                                                        | 0.000 | 0.200 | Inom     |                       |  |  |         |
| Setting for the minimum current that must be exceeded so that measured operating values of the phase currents and, if applicable, derived currents are displayed.                                                            |       |       |          |                       |  |  |         |
| MAIN: Meas. value rel.IN,1                                                                                                                                                                                                   |       |       |          |                       |  |  | 011 031 |
| 0.000                                                                                                                                                                                                                        | 0.000 | 0.200 | IN,nom   | Fig. 3-60, (p. 3-96)  |  |  |         |
| MAIN: Meas. value rel.IN,2                                                                                                                                                                                                   |       |       |          |                       |  |  | 101 087 |
| 0.000                                                                                                                                                                                                                        | 0.000 | 0.200 | IN,nom   |                       |  |  |         |
| Setting for the minimum current that must be exceeded so that the measured operating value of the residual current is displayed.                                                                                             |       |       |          |                       |  |  |         |
| MAIN: Meas. value rel. V                                                                                                                                                                                                     |       |       |          |                       |  |  | 011 032 |
| 0.000                                                                                                                                                                                                                        | 0.000 | 0.200 | Vnom     | Fig. 3-63, (p. 3-99)  |  |  |         |
| MAIN: Meas. value rel. V,2                                                                                                                                                                                                   |       |       |          |                       |  |  | 101 088 |
| 0.000                                                                                                                                                                                                                        | 0.000 | 0.200 | Vnom     |                       |  |  |         |
| Setting for the minimum voltage that must be exceeded so that measured operating values of the phase-to-ground voltages, phase-to-phase voltages, and, if applicable, derived voltages are displayed.                        |       |       |          |                       |  |  |         |
| MAIN: Meas. val. rel.VNG,1                                                                                                                                                                                                   |       |       |          |                       |  |  | 011 033 |
| 0.000                                                                                                                                                                                                                        | 0.000 | 0.200 | VNG,nom  | Fig. 3-64, (p. 3-100) |  |  |         |
| MAIN: Meas. Val. rel.VNG,2                                                                                                                                                                                                   |       |       |          |                       |  |  | 101 089 |
| 0.000                                                                                                                                                                                                                        | 0.000 | 0.200 | VNG,nom  |                       |  |  |         |
| Setting for the minimum voltage that must be exceeded so that the measured operating value of the neutral-point displacement voltage is displayed.                                                                           |       |       |          |                       |  |  |         |
| MAIN: Meas. val. rel. Vref                                                                                                                                                                                                   |       |       |          |                       |  |  | 011 034 |
| 0.000                                                                                                                                                                                                                        | 0.000 | 0.200 | Vref,nom | Fig. 3-65, (p. 3-100) |  |  |         |
| Setting for the minimum voltage that must be exceeded so that the measured operating value of the reference voltage for the automatic synchronism check is displayed.                                                        |       |       |          |                       |  |  |         |
| MAIN: Op. mode energy cnt.                                                                                                                                                                                                   |       |       |          |                       |  |  | 010 138 |
| 1: Procedure 1                                                                                                                                                                                                               |       |       |          | Fig. 3-69, (p. 3-103) |  |  |         |
| Selection of the procedure to determine the active and reactive energy output. 1 <sup>st</sup> procedure: Data acquisition every 2s (approximately). 2 <sup>nd</sup> procedure: Data acquisition every 100ms (approximately) |       |       |          |                       |  |  |         |
| MAIN: Settl.t.IP,max,del,1                                                                                                                                                                                                   |       |       |          |                       |  |  | 010 113 |
| 15.0                                                                                                                                                                                                                         | 0.1   | 60.0  | min      | Fig. 3-59, (p. 3-96)  |  |  |         |

| Parameter                                                                                                                                                                                                                                                                                   | Address |       |      |                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|------|------------------------|
| Default                                                                                                                                                                                                                                                                                     | Min     | Max   | Unit | Logic Diagram          |
| MAIN: Settling time, max, delay                                                                                                                                                                                                                                                             |         |       |      | 101 091                |
| 15.0                                                                                                                                                                                                                                                                                        | 0.1     | 60.0  | min  |                        |
| Setting for the time after which the delayed maximum current display shall reach 95% of the maximum current $I_{P,max}$ .                                                                                                                                                                   |         |       |      |                        |
| MAIN: Fct. assign. reset 1                                                                                                                                                                                                                                                                  |         |       |      | 005 248                |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                             |         |       |      | Fig. 3-79, (p. 3-115)  |
| Assigning specific memories and counters which are to be reset jointly if MAIN: Group reset 1 USER is enabled.                                                                                                                                                                              |         |       |      |                        |
| MAIN: Fct. assign. reset 2                                                                                                                                                                                                                                                                  |         |       |      | 005 249                |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                             |         |       |      | Fig. 3-79, (p. 3-115)  |
| Assigning specific memories and counters which are to be reset jointly if MAIN: Group reset 2 USER is enabled.                                                                                                                                                                              |         |       |      |                        |
| MAIN: Fct. assign. block. 1                                                                                                                                                                                                                                                                 |         |       |      | 021 021                |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                             |         |       |      |                        |
| Assignment of functions that will be blocked simultaneously when blocking input 1 (MAIN: Blocking 1 EXT) is activated.                                                                                                                                                                      |         |       |      |                        |
| MAIN: Fct. assign. block. 2                                                                                                                                                                                                                                                                 |         |       |      | 021 022                |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                             |         |       |      |                        |
| Assignment of functions that will be blocked simultaneously when blocking input 2 (MAIN: Blocking 2 EXT) is activated.                                                                                                                                                                      |         |       |      |                        |
| MAIN: tCB, close                                                                                                                                                                                                                                                                            |         |       |      | 000 032                |
| 0.060                                                                                                                                                                                                                                                                                       | 0.000   | 1.000 | s    |                        |
| This setting determines the CB close time. In slightly asynchronous power systems, the CB close time is taken into account by the automatic synchronism check (ASC) to issue of a close command. This is only possible if setting ASC: AR with tCB PSx = Yes or ASC: MC with tCB PSx = Yes. |         |       |      |                        |
| MAIN: Fct. assign. fault                                                                                                                                                                                                                                                                    |         |       |      | 021 031                |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                             |         |       |      | Fig. 3-73, (p. 3-108)  |
| Selection of the signals to be signaled as Blocked/Faulty in addition to the messages that always result in the message Blocked/Faulty.                                                                                                                                                     |         |       |      |                        |
| MAIN: Debounce time gr. 1                                                                                                                                                                                                                                                                   |         |       |      | 221 200                |
| 0.02                                                                                                                                                                                                                                                                                        | 0.01    | 2.54  | s    | Fig. 3-148, (p. 3-200) |
| MAIN: Debounce time gr. 2                                                                                                                                                                                                                                                                   |         |       |      | 221 203                |
| 0.02                                                                                                                                                                                                                                                                                        | 0.01    | 2.54  | s    |                        |
| MAIN: Debounce time gr. 3                                                                                                                                                                                                                                                                   |         |       |      | 221 206                |
| 0.02                                                                                                                                                                                                                                                                                        | 0.01    | 2.54  | s    |                        |
| MAIN: Debounce time gr. 4                                                                                                                                                                                                                                                                   |         |       |      | 221 209                |
| 0.02                                                                                                                                                                                                                                                                                        | 0.01    | 2.54  | s    |                        |



| Parameter                                |      |      |      | Address                |  |  |         |
|------------------------------------------|------|------|------|------------------------|--|--|---------|
| Default                                  | Min  | Max  | Unit | Logic Diagram          |  |  |         |
| MAIN: Debounce time gr. 5                |      |      |      |                        |  |  | 221 212 |
| 0.02                                     | 0.01 | 2.54 | s    |                        |  |  |         |
| MAIN: Debounce time gr. 6                |      |      |      |                        |  |  | 221 215 |
| 0.02                                     | 0.01 | 2.54 | s    |                        |  |  |         |
| MAIN: Debounce time gr. 7                |      |      |      |                        |  |  | 221 218 |
| 0.02                                     | 0.01 | 2.54 | s    |                        |  |  |         |
| MAIN: Debounce time gr. 8                |      |      |      |                        |  |  | 221 221 |
| 0.02                                     | 0.01 | 2.54 | s    |                        |  |  |         |
| Setting for the debouncing time.         |      |      |      |                        |  |  |         |
| MAIN: Chatt.mon. time gr.1               |      |      |      |                        |  |  | 221 201 |
| 0.0                                      | 0.0  | 25.4 | s    | Fig. 3-148, (p. 3-200) |  |  |         |
| MAIN: Chatt.mon. time gr.2               |      |      |      |                        |  |  | 221 204 |
| 0.0                                      | 0.0  | 25.4 | s    |                        |  |  |         |
| MAIN: Chatt.mon. time gr.3               |      |      |      |                        |  |  | 221 207 |
| 0.0                                      | 0.0  | 25.4 | s    |                        |  |  |         |
| MAIN: Chatt.mon. time gr.4               |      |      |      |                        |  |  | 221 210 |
| 0.0                                      | 0.0  | 25.4 | s    |                        |  |  |         |
| MAIN: Chatt.mon. time gr.5               |      |      |      |                        |  |  | 221 213 |
| 0.0                                      | 0.0  | 25.4 | s    |                        |  |  |         |
| MAIN: Chatt.mon. time gr.6               |      |      |      |                        |  |  | 221 216 |
| 0.0                                      | 0.0  | 25.4 | s    |                        |  |  |         |
| MAIN: Chatt.mon. time gr.7               |      |      |      |                        |  |  | 221 219 |
| 0.0                                      | 0.0  | 25.4 | s    |                        |  |  |         |
| MAIN: Chatt.mon. time gr.8               |      |      |      |                        |  |  | 221 222 |
| 0.0                                      | 0.0  | 25.4 | s    |                        |  |  |         |
| Setting for the chatter monitoring time. |      |      |      |                        |  |  |         |
| MAIN: Change of state gr.1               |      |      |      |                        |  |  | 221 202 |
| 0                                        | 0    | 254  |      | Fig. 3-148, (p. 3-200) |  |  |         |
| MAIN: Change of state gr.2               |      |      |      |                        |  |  | 221 205 |
| 0                                        | 0    | 254  |      |                        |  |  |         |
| MAIN: Change of state gr.3               |      |      |      |                        |  |  | 221 208 |
| 0                                        | 0    | 254  |      |                        |  |  |         |
| MAIN: Change of state gr.4               |      |      |      |                        |  |  | 221 211 |
| 0                                        | 0    | 254  |      |                        |  |  |         |
| MAIN: Change of state gr.5               |      |      |      |                        |  |  | 221 214 |
| 0                                        | 0    | 254  |      |                        |  |  |         |

| Parameter                                                                                                                                          |     |     |      |               | Address                |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|------------------------|
| Default                                                                                                                                            | Min | Max | Unit | Logic Diagram |                        |
| MAIN: Change of state gr.6                                                                                                                         |     |     |      |               | 221 217                |
| 0                                                                                                                                                  | 0   | 254 |      |               |                        |
| MAIN: Change of state gr.7                                                                                                                         |     |     |      |               | 221 220                |
| 0                                                                                                                                                  | 0   | 254 |      |               |                        |
| MAIN: Change of state gr.8                                                                                                                         |     |     |      |               | 221 223                |
| 0                                                                                                                                                  | 0   | 254 |      |               |                        |
| Setting the number of signal changes allowed during the chatter monitoring time before chatter suppression operates.                               |     |     |      |               |                        |
| MAIN: Cmd. dur.long cmd.                                                                                                                           |     |     |      |               | 221 230                |
| 20                                                                                                                                                 | 1   | 254 | s    |               |                        |
| Setting for the command duration for a long command.                                                                                               |     |     |      |               |                        |
| MAIN: Cmd. dur. short cmd.                                                                                                                         |     |     |      |               | 221 231                |
| 1                                                                                                                                                  | 1   | 254 | s    |               |                        |
| Setting for the command duration for a short command.                                                                                              |     |     |      |               |                        |
| MAIN: Oper. mode CB Trip                                                                                                                           |     |     |      |               | 221 080                |
| 1: With command                                                                                                                                    |     |     |      |               | Fig. 3-75, (p. 3-110)  |
| Definition of the operating mode of the CB trip.                                                                                                   |     |     |      |               |                        |
| MAIN: Inp.asg. ctrl.enabl.                                                                                                                         |     |     |      |               | 221 057                |
| 060 000: MAIN: Without function                                                                                                                    |     |     |      |               | Fig. 3-125, (p. 3-170) |
| Definition of the binary signal used to issue a general command output enable.                                                                     |     |     |      |               |                        |
| MAIN: Inp.asg.interl.deact                                                                                                                         |     |     |      |               | 221 007                |
| 060 000: MAIN: Without function                                                                                                                    |     |     |      |               | Fig. 3-125, (p. 3-170) |
| Definition of the binary signal used to disable interlocking of control commands for switchgear.                                                   |     |     |      |               |                        |
| MAIN: Inp.asg. L/R key sw.                                                                                                                         |     |     |      |               | 221 008                |
| 060 000: MAIN: Without function                                                                                                                    |     |     |      |               |                        |
| Definition of the binary signal used to switch from remote control to local control.                                                               |     |     |      |               |                        |
| MAIN: Electrical control                                                                                                                           |     |     |      |               | 221 061                |
| 1: Remote                                                                                                                                          |     |     |      |               |                        |
| This setting determines whether the binary inputs, that are configured to control switchgear, will be active with remote control or local control. |     |     |      |               |                        |

| Parameter                                                                                                                                                                                                                                                                                                                                             |     |     |      | Address               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|-----------------------|
| Default                                                                                                                                                                                                                                                                                                                                               | Min | Max | Unit | Logic Diagram         |
| MAIN: Delay Man.Op.Superv.                                                                                                                                                                                                                                                                                                                            |     |     |      | 221 079               |
| 3                                                                                                                                                                                                                                                                                                                                                     | 0   | 255 | s    |                       |
| After the delay time period, to be set in this window, has elapsed (with the signal “Sw. dev. interm. pos.” already present and the status signal continuously absent), the actual switchgear status signal, as obtained from the respective binary inputs, will be issued. (See also “Processing status signals from manually operated switchgear”.) |     |     |      |                       |
| MAIN: Inp.assign. tripping                                                                                                                                                                                                                                                                                                                            |     |     |      | 221 010               |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                       |     |     |      | Fig. 3-75, (p. 3-110) |
| Definition of the binary signal used to signal the tripping of an external protection device. This signal is used to form the CB trip signal.                                                                                                                                                                                                         |     |     |      |                       |
| MAIN: Inp. asg. CB trip                                                                                                                                                                                                                                                                                                                               |     |     |      | 221 013               |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                       |     |     |      | Fig. 3-75, (p. 3-110) |
| Definition of the binary signal used by the C434 to signal the “CB open” position signal.                                                                                                                                                                                                                                                             |     |     |      |                       |
| MAIN: Inp.asg.CB tr.en.ext                                                                                                                                                                                                                                                                                                                            |     |     |      | 221 050               |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                       |     |     |      | Fig. 3-75, (p. 3-110) |
| Definition of the binary signal used to enable the CB trip signal of an external device.                                                                                                                                                                                                                                                              |     |     |      |                       |
| MAIN: Inp.asg. CB trip ext                                                                                                                                                                                                                                                                                                                            |     |     |      | 221 024               |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                       |     |     |      | Fig. 3-75, (p. 3-110) |
| Definition of the binary signal used to carry the CB trip signal of an external device.                                                                                                                                                                                                                                                               |     |     |      |                       |
| MAIN: Inp.asg. mult.sig. 1                                                                                                                                                                                                                                                                                                                            |     |     |      | 221 051               |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                       |     |     |      | Fig. 3-74, (p. 3-108) |
| MAIN: Inp.asg. mult.sig. 2                                                                                                                                                                                                                                                                                                                            |     |     |      | 221 052               |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                       |     |     |      | Fig. 3-74, (p. 3-108) |
| Definition of the function that will be interpreted as a multiple signal (group signal).                                                                                                                                                                                                                                                              |     |     |      |                       |

## Parameter subset selection

| Parameter                                                                                                                                                                                                                                                                                                                                                    | Address |        |      |                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------|------|-----------------------|
| Default                                                                                                                                                                                                                                                                                                                                                      | Min     | Max    | Unit | Logic Diagram         |
| PSS: Control via USER                                                                                                                                                                                                                                                                                                                                        |         |        |      | 003 100               |
| 0: No <span style="float: right;">Fig. 3-82, (p. 3-119)</span>                                                                                                                                                                                                                                                                                               |         |        |      |                       |
| If parameter subset selection is to be handled from the integrated local control panel rather than via binary signal inputs, choose the setting Yes.                                                                                                                                                                                                         |         |        |      |                       |
| PSS: Param.subs.sel. USER                                                                                                                                                                                                                                                                                                                                    |         |        |      | 003 060               |
| 1: Parameter subset 1 <span style="float: right;">Fig. 3-82, (p. 3-119)</span>                                                                                                                                                                                                                                                                               |         |        |      |                       |
| Selection of the parameter subset from the local control panel.                                                                                                                                                                                                                                                                                              |         |        |      |                       |
| PSS: Keep time                                                                                                                                                                                                                                                                                                                                               |         |        |      | 003 063               |
| Blocked                                                                                                                                                                                                                                                                                                                                                      | 0.000   | 65.000 | s    | Fig. 3-82, (p. 3-119) |
| The setting of this timer stage is relevant only if parameter subset selection is carried out via the binary signal inputs. Any voltage-free pause that may occur during selection is bridged. If, after this time period has elapsed, no binary signal input has yet been set, then the parameter subset selected from the local control panel shall apply. |         |        |      |                       |

## Self-monitoring

| Parameter                                                                                                                                                                                                                                                                                                                     | Address |     |      |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                                                                                                                                                       | Min     | Max | Unit | Logic Diagram |
| SFMON: Fct. assign. warning                                                                                                                                                                                                                                                                                                   |         |     |      | 021 030       |
| 060 000: MAIN: Without function <span style="float: right;">Fig. 3-83, (p. 3-120)</span>                                                                                                                                                                                                                                      |         |     |      |               |
| Selection of the signals whose appearance shall result in the signals “Warning (LED)” and “Warning (relay)” and in the activation of the LED indicator labeled “ALARM”. Signals caused by faulty hardware and leading to blocking of the device are not configurable. They always result in the above signals and indication. |         |     |      |               |
| SFMON: Mon.sig. retention                                                                                                                                                                                                                                                                                                     |         |     |      | 021 018       |
| Blocked                                                                                                                                                                                                                                                                                                                       | 0       | 240 | h    |               |
| This setting defines the duration (in hours) for which a device-internal fault is stored, so that a decision may be taken between an automatic warm restart and an automatic device blocking. (Setting to <i>Blocked</i> may be considered the same as unlimited storage.)                                                    |         |     |      |               |

## Fault recording

| Parameter                                                                                                                    | Address |       |         |                                       |
|------------------------------------------------------------------------------------------------------------------------------|---------|-------|---------|---------------------------------------|
| Default                                                                                                                      | Min     | Max   | Unit    | Logic Diagram                         |
| FT_RC: Fct. assig. trigger                                                                                                   |         |       |         | 003 085                               |
| 060 000: MAIN: Without function <a href="#">Fig. 3-86, (p. 3-125)</a>                                                        |         |       |         |                                       |
| This setting defines the signals that will trigger fault recording.                                                          |         |       |         |                                       |
| FT_RC: I >                                                                                                                   |         |       |         | 017 065                               |
| Blocked                                                                                                                      | 0.01    | 40.00 | Inom    | <a href="#">Fig. 3-86, (p. 3-125)</a> |
| This setting defines the threshold value of the phase currents that will trigger fault recording and fault data acquisition. |         |       |         |                                       |
| FT_RC: Pre-fault time                                                                                                        |         |       |         | 003 078                               |
| 5                                                                                                                            | 1       | 50    | Periods | <a href="#">Fig. 3-88, (p. 3-127)</a> |
| Setting for the time during which data will be recorded before the onset of a fault (pre-fault recording time).              |         |       |         |                                       |
| FT_RC: Post-fault time                                                                                                       |         |       |         | 003 079                               |
| 5                                                                                                                            | 1       | 750   | Periods | <a href="#">Fig. 3-88, (p. 3-127)</a> |
| Setting for the time during which data will be recorded after the end of a fault (post-fault recording time).                |         |       |         |                                       |
| FT_RC: Max. recording time                                                                                                   |         |       |         | 003 075                               |
| 50                                                                                                                           | 5       | 750   | Periods | <a href="#">Fig. 3-88, (p. 3-127)</a> |
| Setting for the maximum recording time per fault. This includes pre-fault and post-fault recording times.                    |         |       |         |                                       |

7.1.3.2 General Functions

Real Timer

| Parameter                                            |     |     |      | Address                |
|------------------------------------------------------|-----|-----|------|------------------------|
| Default                                              | Min | Max | Unit | Logic Diagram          |
| TIMER: General enable USER                           |     |     |      | 014 199                |
| 0: No                                                |     |     |      | Fig. 3-153, (p. 3-206) |
| Disabling or enabling TIMER protection.              |     |     |      |                        |
| TIMER: Start hour 1                                  |     |     |      | 014 089                |
| 0                                                    | 0   | 23  | h    | Fig. 3-153, (p. 3-206) |
| TIMER: Start hour 2                                  |     |     |      | 014 119                |
| 0                                                    | 0   | 23  | h    |                        |
| TIMER: Start hour 3                                  |     |     |      | 015 030                |
| 0                                                    | 0   | 23  | h    |                        |
| TIMER: Start hour 4                                  |     |     |      | 015 063                |
| 0                                                    | 0   | 23  | h    |                        |
| The parameter defines the start hour of the TIMER.   |     |     |      |                        |
| TIMER: Start minute 1                                |     |     |      | 014 102                |
| 0                                                    | 0   | 59  | min  | Fig. 3-153, (p. 3-206) |
| TIMER: Start minute 1                                |     |     |      | 014 128                |
| 0                                                    | 0   | 59  | min  |                        |
| TIMER: Start minute 3                                |     |     |      | 015 052                |
| 0                                                    | 0   | 59  | min  |                        |
| TIMER: Start minute 4                                |     |     |      | 015 089                |
| 0                                                    | 0   | 59  | min  |                        |
| The parameter defines the start minute of the TIMER. |     |     |      |                        |
| TIMER: End hour 1                                    |     |     |      | 014 109                |
| 0                                                    | 0   | 23  | h    | Fig. 3-153, (p. 3-206) |
| TIMER: End hour 2                                    |     |     |      | 014 129                |
| 0                                                    | 0   | 23  | h    |                        |
| TIMER: End hour 3                                    |     |     |      | 015 061                |
| 0                                                    | 0   | 23  | h    |                        |
| TIMER: End hour 4                                    |     |     |      | 015 200                |
| 0                                                    | 0   | 23  | h    |                        |
| The parameter defines the end hour of the TIMER.     |     |     |      |                        |
| TIMER: End minute 1                                  |     |     |      | 014 118                |
| 0                                                    | 0   | 59  | min  | Fig. 3-153, (p. 3-206) |
| TIMER: End minute 1                                  |     |     |      | 014 138                |
| 0                                                    | 0   | 59  | mi   |                        |

| Parameter                                                                                                      |     |     |      | Address                |  |  |         |
|----------------------------------------------------------------------------------------------------------------|-----|-----|------|------------------------|--|--|---------|
| Default                                                                                                        | Min | Max | Unit | Logic Diagram          |  |  |         |
| TIMER: End minute 3                                                                                            |     |     |      |                        |  |  | 015 062 |
| 0                                                                                                              | 0   | 59  | min  |                        |  |  |         |
| TIMER: End minute 4                                                                                            |     |     |      |                        |  |  | 015 201 |
| 0                                                                                                              | 0   | 59  | min  |                        |  |  |         |
| The parameter defines the end minute of the TIMER.                                                             |     |     |      |                        |  |  |         |
| TIMER: Calendar 1                                                                                              |     |     |      |                        |  |  | 014 178 |
| 060 000: MAIN: Without function                                                                                |     |     |      | Fig. 3-153, (p. 3-206) |  |  |         |
| TIMER: Calendar 2                                                                                              |     |     |      |                        |  |  | 014 179 |
| 060 000: MAIN: Without function                                                                                |     |     |      |                        |  |  |         |
| TIMER: Calendar 3                                                                                              |     |     |      |                        |  |  | 014 189 |
| 060 000: MAIN: Without function                                                                                |     |     |      |                        |  |  |         |
| TIMER: Calendar 4                                                                                              |     |     |      |                        |  |  | 015 005 |
| 060 000: MAIN: Without function                                                                                |     |     |      |                        |  |  |         |
| The setting defines the calendar day of week for the TIMER. One or more of the seven weekdays can be selected. |     |     |      |                        |  |  |         |

#### Automatic synchronism check

| Parameter                                              |     |     |      | Address                |  |  |         |
|--------------------------------------------------------|-----|-----|------|------------------------|--|--|---------|
| Default                                                | Min | Max | Unit | Logic Diagram          |  |  |         |
| ASC: General enable USER                               |     |     |      |                        |  |  | 018 000 |
| 0: No                                                  |     |     |      | Fig. 3-92, (p. 3-133)  |  |  |         |
| Enabling or disabling the automatic synchronism check. |     |     |      |                        |  |  |         |
| ASC: Transm.cycle, meas.v.                             |     |     |      |                        |  |  | 101 212 |
| 3                                                      | 0   | 10  | s    | Fig. 3-107, (p. 3-150) |  |  |         |
| Cycle period for transmission of ASC measured values.  |     |     |      |                        |  |  |         |

## Limit value monitoring

| Parameter                                                                               | Address |       |         |                        |
|-----------------------------------------------------------------------------------------|---------|-------|---------|------------------------|
| Default                                                                                 | Min     | Max   | Unit    | Logic Diagram          |
| LIMIT: General enable USER                                                              |         |       |         | 014 010                |
| 0: No                                                                                   |         |       |         |                        |
| Disabling or enabling limit value monitoring.                                           |         |       |         |                        |
| LIMIT: IDC,lin >                                                                        |         |       |         | 014 110                |
| Blocked                                                                                 | 0.100   | 1.100 | IDC,nom | Fig. 3-109, (p. 3-152) |
| Setting for the operate value IDC,lin > for monitoring the linearized direct current.   |         |       |         |                        |
| LIMIT: IDC,lin > >                                                                      |         |       |         | 014 111                |
| Blocked                                                                                 | 0.100   | 1.100 | IDC,nom | Fig. 3-109, (p. 3-152) |
| Setting for the operate value IDC,lin > > for monitoring the linearized direct current. |         |       |         |                        |
| LIMIT: tIDC,lin >                                                                       |         |       |         | 014 112                |
| Blocked                                                                                 | 0.00    | 20.00 | s       | Fig. 3-109, (p. 3-152) |
| Setting for the operate delay of overcurrent stage IDC,lin >.                           |         |       |         |                        |
| LIMIT: tIDC,lin > >                                                                     |         |       |         | 014 113                |
| Blocked                                                                                 | 0.00    | 20.00 | s       | Fig. 3-109, (p. 3-152) |
| Setting for the operate delay of overcurrent stage IDC,lin > >.                         |         |       |         |                        |
| LIMIT: IDC,lin <                                                                        |         |       |         | 014 114                |
| Blocked                                                                                 | 0.100   | 1.100 | IDC,nom | Fig. 3-109, (p. 3-152) |
| Setting for the operate value IDC,lin < for monitoring the linearized direct current.   |         |       |         |                        |
| LIMIT: IDC,lin < <                                                                      |         |       |         | 014 115                |
| Blocked                                                                                 | 0.100   | 1.100 | IDC,nom | Fig. 3-109, (p. 3-152) |
| Setting for the operate value IDC,lin < < for monitoring the linearized direct current. |         |       |         |                        |
| LIMIT: tIDC,lin <                                                                       |         |       |         | 014 116                |
| Blocked                                                                                 | 0.00    | 20.00 | s       | Fig. 3-109, (p. 3-152) |
| Setting for the operate delay of undercurrent stage IDC,lin <.                          |         |       |         |                        |
| LIMIT: tIDC,lin < <                                                                     |         |       |         | 014 117                |
| Blocked                                                                                 | 0.00    | 20.00 | s       | Fig. 3-109, (p. 3-152) |
| Setting for the operate delay of undercurrent stage IDC,lin < <.                        |         |       |         |                        |
| LIMIT: T >                                                                              |         |       |         | 014 100                |
| 200                                                                                     | -20     | 200   | °C      | Fig. 3-110, (p. 3-153) |
| Setting for the operate value of temperature monitoring T >.                            |         |       |         |                        |



| Parameter                                                      | Address |      |      |                        |
|----------------------------------------------------------------|---------|------|------|------------------------|
| Default                                                        | Min     | Max  | Unit | Logic Diagram          |
| LIMIT: T > >                                                   |         |      |      | 014 101                |
| 200                                                            | -20     | 200  | °C   | Fig. 3-110, (p. 3-153) |
| Setting for the operate value of temperature monitoring T > >. |         |      |      |                        |
| LIMIT: tT >                                                    |         |      |      | 014 103                |
| Blocked                                                        | 0       | 1000 | s    | Fig. 3-110, (p. 3-153) |
| Setting for the operate delay of temperature monitoring T >.   |         |      |      |                        |
| LIMIT: tT > >                                                  |         |      |      | 014 104                |
| Blocked                                                        | 0       | 1000 | s    | Fig. 3-110, (p. 3-153) |
| Setting for the operate delay of temperature monitoring T > >. |         |      |      |                        |
| LIMIT: T <                                                     |         |      |      | 014 105                |
| -20                                                            | -20     | 200  | °C   | Fig. 3-110, (p. 3-153) |
| Setting for the operate value of temperature monitoring T <.   |         |      |      |                        |
| LIMIT: T < <                                                   |         |      |      | 014 106                |
| -20                                                            | -20     | 200  | °C   | Fig. 3-110, (p. 3-153) |
| Setting for the operate value of temperature monitoring T < <. |         |      |      |                        |
| LIMIT: tT <                                                    |         |      |      | 014 107                |
| Blocked                                                        | 0       | 1000 | s    | Fig. 3-110, (p. 3-153) |
| Setting for the operate delay of temperature monitoring T <.   |         |      |      |                        |
| LIMIT: tT < <                                                  |         |      |      | 014 108                |
| Blocked                                                        | 0       | 1000 | s    | Fig. 3-110, (p. 3-153) |
| Setting for the operate delay of temperature monitoring T < <. |         |      |      |                        |

## Limit value monitoring

| Parameter                                                                                 | Min  | Max    | Unit | Address                                          |
|-------------------------------------------------------------------------------------------|------|--------|------|--------------------------------------------------|
| Default                                                                                   |      |        |      | Logic Diagram                                    |
| LIM_1: General enable USER                                                                |      |        |      | 102 201                                          |
| 0: No                                                                                     |      |        |      | Fig. 3-111, (p. 3-154)<br>Fig. 3-114, (p. 3-158) |
| LIM_2: General enable USER                                                                |      |        |      | 102 021                                          |
| 0: No                                                                                     |      |        |      |                                                  |
| Enabling or disabling limit value monitoring.                                             |      |        |      |                                                  |
| LIM_1: I >                                                                                |      |        |      | 014 004                                          |
| 1.10                                                                                      | 0.10 | 2.40   | Inom | Fig. 3-111, (p. 3-154)                           |
| LIM_2: I >                                                                                |      |        |      | 102 022                                          |
| 1.10                                                                                      | 0.10 | 2.40   | Inom |                                                  |
| Setting for the operate value of the first overcurrent stage for limit value monitoring.  |      |        |      |                                                  |
| LIM_1: I > >                                                                              |      |        |      | 014 020                                          |
| 1.20                                                                                      | 0.10 | 2.40   | Inom | Fig. 3-111, (p. 3-154)                           |
| LIM_2: I > >                                                                              |      |        |      | 102 023                                          |
| 1.20                                                                                      | 0.10 | 2.40   | Inom |                                                  |
| Setting for the operate value of the second overcurrent stage for limit value monitoring. |      |        |      |                                                  |
| LIM_1: tI >                                                                               |      |        |      | 014 031                                          |
| 0.05                                                                                      | 0.00 | 655.00 | s    | Fig. 3-111, (p. 3-154)                           |
| LIM_2: tI >                                                                               |      |        |      | 102 024                                          |
| 0.05                                                                                      | 0.00 | 655.00 | s    |                                                  |
| Setting for the operate delay of the first overcurrent stage of limit value monitoring.   |      |        |      |                                                  |
| LIM_1: tI > >                                                                             |      |        |      | 014 032                                          |
| 0.05                                                                                      | 0.00 | 655.00 | s    | Fig. 3-111, (p. 3-154)                           |
| LIM_2: tI > >                                                                             |      |        |      | 102 025                                          |
| 0.05                                                                                      | 0.00 | 655.00 | s    |                                                  |
| Setting for the operate delay of the second overcurrent stage of limit value monitoring.  |      |        |      |                                                  |
| LIM_1: I <                                                                                |      |        |      | 014 021                                          |
| 0.90                                                                                      | 0.10 | 2.40   | Inom | Fig. 3-111, (p. 3-154)                           |
| LIM_2: I <                                                                                |      |        |      | 102 026                                          |
| 0.90                                                                                      | 0.10 | 2.40   | Inom |                                                  |
| Setting for the operate value of the first undercurrent stage of limit value monitoring.  |      |        |      |                                                  |

| Parameter                                                                                 |      |        |         | Address                |  |  |         |
|-------------------------------------------------------------------------------------------|------|--------|---------|------------------------|--|--|---------|
| Default                                                                                   | Min  | Max    | Unit    | Logic Diagram          |  |  |         |
| LIM_1: I<<                                                                                |      |        |         |                        |  |  | 014 022 |
| 0.80                                                                                      | 0.10 | 2.40   | Inom    | Fig. 3-111, (p. 3-154) |  |  |         |
| LIM_2: I<<                                                                                |      |        |         |                        |  |  | 102 027 |
| 0.80                                                                                      | 0.10 | 2.40   | Inom    |                        |  |  |         |
| Setting for the operate value of the second undercurrent stage of limit value monitoring. |      |        |         |                        |  |  |         |
| LIM_1: tI<                                                                                |      |        |         |                        |  |  | 014 033 |
| 0.05                                                                                      | 0.00 | 655.00 | s       | Fig. 3-111, (p. 3-154) |  |  |         |
| LIM_2: tI<                                                                                |      |        |         |                        |  |  | 102 028 |
| 0.05                                                                                      | 0.00 | 655.00 | s       |                        |  |  |         |
| Setting for the operate delay of the first undercurrent stage of limit value monitoring.  |      |        |         |                        |  |  |         |
| LIM_1: tI<<                                                                               |      |        |         |                        |  |  | 014 034 |
| 0.05                                                                                      | 0.00 | 655.00 | s       | Fig. 3-111, (p. 3-154) |  |  |         |
| LIM_2: tI<<                                                                               |      |        |         |                        |  |  | 102 029 |
| 0.05                                                                                      | 0.00 | 655.00 | s       |                        |  |  |         |
| Setting for the operate delay of the second undercurrent stage of limit value monitoring. |      |        |         |                        |  |  |         |
| LIM_1: VPG>                                                                               |      |        |         |                        |  |  | 014 023 |
| 1.10                                                                                      | 0.10 | 2.50   | Vnom/√3 | Fig. 3-112, (p. 3-156) |  |  |         |
| LIM_2: VPG>                                                                               |      |        |         |                        |  |  | 102 030 |
| 1.10                                                                                      | 0.10 | 2.50   | Vnom/√3 |                        |  |  |         |
| Setting for the operate value of overvoltage stage VPG> of limit value monitoring.        |      |        |         |                        |  |  |         |
| LIM_1: VPG>>                                                                              |      |        |         |                        |  |  | 014 024 |
| 1.20                                                                                      | 0.10 | 2.50   | Vnom/√3 | Fig. 3-112, (p. 3-156) |  |  |         |
| LIM_2: VPG>>                                                                              |      |        |         |                        |  |  | 102 031 |
| 1.20                                                                                      | 0.10 | 2.50   | Vnom/√3 |                        |  |  |         |
| Setting for the operate value of overvoltage stage VPG>> of limit value monitoring.       |      |        |         |                        |  |  |         |
| LIM_1: tVPG>                                                                              |      |        |         |                        |  |  | 014 035 |
| 0.05                                                                                      | 0.00 | 655.00 | s       | Fig. 3-112, (p. 3-156) |  |  |         |
| LIM_2: tVPG>                                                                              |      |        |         |                        |  |  | 102 032 |
| 0.05                                                                                      | 0.00 | 655.00 | s       |                        |  |  |         |
| Setting for the operate delay of overvoltage stage VPG> of limit value monitoring.        |      |        |         |                        |  |  |         |
| LIM_1: tVPG>>                                                                             |      |        |         |                        |  |  | 014 036 |
| 0.05                                                                                      | 0.00 | 655.00 | s       | Fig. 3-112, (p. 3-156) |  |  |         |

| Parameter                                                                            |      |        |                  | Address                |  |  |         |
|--------------------------------------------------------------------------------------|------|--------|------------------|------------------------|--|--|---------|
| Default                                                                              | Min  | Max    | Unit             | Logic Diagram          |  |  |         |
| LIM_2: tVPG>>                                                                        |      |        |                  |                        |  |  | 102 033 |
| 0.05                                                                                 | 0.00 | 655.00 | s                |                        |  |  |         |
| Setting for the operate delay of overvoltage stage VPG>> of limit value monitoring.  |      |        |                  |                        |  |  |         |
| LIM_1: VPG<                                                                          |      |        |                  |                        |  |  | 014 025 |
| 0.90                                                                                 | 0.10 | 2.50   | Vnom/ $\sqrt{3}$ | Fig. 3-112, (p. 3-156) |  |  |         |
| LIM_2: VPG<                                                                          |      |        |                  |                        |  |  | 102 034 |
| 0.90                                                                                 | 0.10 | 2.50   | Vnom/ $\sqrt{3}$ |                        |  |  |         |
| Setting for the operate value of undervoltage stage VPG< of limit value monitoring.  |      |        |                  |                        |  |  |         |
| LIM_1: VPG<<                                                                         |      |        |                  |                        |  |  | 014 026 |
| 0.80                                                                                 | 0.10 | 2.50   | Vnom/ $\sqrt{3}$ | Fig. 3-112, (p. 3-156) |  |  |         |
| LIM_2: VPG<<                                                                         |      |        |                  |                        |  |  | 102 035 |
| 0.80                                                                                 | 0.10 | 2.50   | Vnom/ $\sqrt{3}$ |                        |  |  |         |
| Setting for the operate value of undervoltage stage VPG<< of limit value monitoring. |      |        |                  |                        |  |  |         |
| LIM_1: tVPG<                                                                         |      |        |                  |                        |  |  | 014 037 |
| 0.05                                                                                 | 0.00 | 655.00 | s                | Fig. 3-112, (p. 3-156) |  |  |         |
| LIM_2: tVPG<                                                                         |      |        |                  |                        |  |  | 102 036 |
| 0.05                                                                                 | 0.00 | 655.00 | s                |                        |  |  |         |
| Setting for the operate delay of undervoltage stage VPG< of limit value monitoring.  |      |        |                  |                        |  |  |         |
| LIM_1: tVPG<<                                                                        |      |        |                  |                        |  |  | 014 038 |
| 0.05                                                                                 | 0.00 | 655.00 | s                | Fig. 3-112, (p. 3-156) |  |  |         |
| LIM_2: tVPG<<                                                                        |      |        |                  |                        |  |  | 102 037 |
| 0.05                                                                                 | 0.00 | 655.00 | s                |                        |  |  |         |
| Setting for the operate delay of undervoltage stage VPG<< of limit value monitoring. |      |        |                  |                        |  |  |         |
| LIM_1: VPP>                                                                          |      |        |                  |                        |  |  | 014 027 |
| 1.10                                                                                 | 0.10 | 1.50   | Vnom             | Fig. 3-112, (p. 3-156) |  |  |         |
| LIM_2: VPP>                                                                          |      |        |                  |                        |  |  | 102 038 |
| 1.10                                                                                 | 0.10 | 1.50   | Vnom             |                        |  |  |         |
| Setting for the operate value of overvoltage stage VPP> of limit value monitoring.   |      |        |                  |                        |  |  |         |
| LIM_1: VPP>>                                                                         |      |        |                  |                        |  |  | 014 028 |
| 1.20                                                                                 | 0.10 | 1.50   | Vnom             | Fig. 3-112, (p. 3-156) |  |  |         |

| Parameter     |      |        |      | Address                                                                              |  |  |         |
|---------------|------|--------|------|--------------------------------------------------------------------------------------|--|--|---------|
| Default       | Min  | Max    | Unit | Logic Diagram                                                                        |  |  |         |
| LIM_2: VPP>>  |      |        |      |                                                                                      |  |  | 102 039 |
| 1.20          | 0.10 | 1.50   | Vnom | Setting for the operate value of overvoltage stage VPP>> of limit value monitoring.  |  |  |         |
|               |      |        |      |                                                                                      |  |  |         |
| LIM_1: tVPP>  |      |        |      |                                                                                      |  |  | 014 039 |
| 0.05          | 0.00 | 655.00 | s    | Fig. 3-112, (p. 3-156)                                                               |  |  |         |
| LIM_2: tVPP>  |      |        |      |                                                                                      |  |  | 102 040 |
| 0.05          | 0.00 | 655.00 | s    | Setting for the operate delay of overvoltage stage VPP> of limit value monitoring.   |  |  |         |
|               |      |        |      |                                                                                      |  |  |         |
| LIM_1: tVPP>> |      |        |      |                                                                                      |  |  | 014 040 |
| 0.05          | 0.00 | 655.00 | s    | Fig. 3-112, (p. 3-156)                                                               |  |  |         |
| LIM_2: tVPP>> |      |        |      |                                                                                      |  |  | 102 041 |
| 0.05          | 0.00 | 655.00 | s    | Setting for the operate delay of overvoltage stage VPP>> of limit value monitoring.  |  |  |         |
|               |      |        |      |                                                                                      |  |  |         |
| LIM_1: VPP<   |      |        |      |                                                                                      |  |  | 014 029 |
| 0.90          | 0.10 | 1.50   | Vnom | Fig. 3-112, (p. 3-156)                                                               |  |  |         |
| LIM_2: VPP<   |      |        |      |                                                                                      |  |  | 102 042 |
| 0.90          | 0.10 | 1.50   | Vnom | Setting for the operate value of undervoltage stage VPP< of limit value monitoring.  |  |  |         |
|               |      |        |      |                                                                                      |  |  |         |
| LIM_1: VPP<<  |      |        |      |                                                                                      |  |  | 014 030 |
| 0.80          | 0.10 | 1.50   | Vnom | Fig. 3-112, (p. 3-156)                                                               |  |  |         |
| LIM_2: VPP<<  |      |        |      |                                                                                      |  |  | 102 043 |
| 0.80          | 0.10 | 1.50   | Vnom | Setting for the operate value of undervoltage stage VPP<< of limit value monitoring. |  |  |         |
|               |      |        |      |                                                                                      |  |  |         |
| LIM_1: tVPP<  |      |        |      |                                                                                      |  |  | 014 041 |
| 0.05          | 0.00 | 655.00 | s    | Fig. 3-112, (p. 3-156)                                                               |  |  |         |
| LIM_2: tVPP<  |      |        |      |                                                                                      |  |  | 102 044 |
| 0.05          | 0.00 | 655.00 | s    | Setting for the operate delay of undervoltage stage VPP< of limit value monitoring.  |  |  |         |
|               |      |        |      |                                                                                      |  |  |         |
| LIM_1: tVPP<< |      |        |      |                                                                                      |  |  | 014 042 |
| 0.05          | 0.00 | 655.00 | s    | Fig. 3-112, (p. 3-156)                                                               |  |  |         |

| Parameter                                                                                                                                                                                                                                                                       | Address |        |      |                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------|------|------------------------|
| Default                                                                                                                                                                                                                                                                         | Min     | Max    | Unit | Logic Diagram          |
| LIM_2: tVPP < <                                                                                                                                                                                                                                                                 |         |        |      | 102 045                |
| 0.05                                                                                                                                                                                                                                                                            | 0.00    | 655.00 | s    |                        |
| Setting for the operate delay of undervoltage stage VPP < < of limit value monitoring.                                                                                                                                                                                          |         |        |      |                        |
| LIM_1: Evaluation VNG                                                                                                                                                                                                                                                           |         |        |      | 015 210                |
| 1: Calculated                                                                                                                                                                                                                                                                   |         |        |      |                        |
| LIM_2: Evaluation VNG                                                                                                                                                                                                                                                           |         |        |      | 016 101                |
| 1: Calculated                                                                                                                                                                                                                                                                   |         |        |      |                        |
| This setting specifies which neutral-point displacement voltage will be used for the operate value of VNG stages of limit value monitoring: The displacement voltage calculated from the phase-to-ground voltages, or the displacement voltage measured at the T9x transformer. |         |        |      |                        |
| LIM_1: VNG >                                                                                                                                                                                                                                                                    |         |        |      | 014 043                |
| 0.050                                                                                                                                                                                                                                                                           | 0.010   | 1.000  | Vnom | Fig. 3-113, (p. 3-157) |
| LIM_2: VNG >                                                                                                                                                                                                                                                                    |         |        |      | 102 046                |
| 0.050                                                                                                                                                                                                                                                                           | 0.010   | 1.000  | Vnom |                        |
| Setting for the operate value of overvoltage stage VNG > of limit value monitoring.                                                                                                                                                                                             |         |        |      |                        |
| LIM_1: VNG > >                                                                                                                                                                                                                                                                  |         |        |      | 014 044                |
| 0.100                                                                                                                                                                                                                                                                           | 0.010   | 1.000  | Vnom | Fig. 3-113, (p. 3-157) |
| LIM_2: VNG > >                                                                                                                                                                                                                                                                  |         |        |      | 102 047                |
| 0.100                                                                                                                                                                                                                                                                           | 0.010   | 1.000  | Vnom |                        |
| Setting for the operate value of overvoltage stage VNG > > of limit value monitoring.                                                                                                                                                                                           |         |        |      |                        |
| LIM_1: tVNG >                                                                                                                                                                                                                                                                   |         |        |      | 014 045                |
| 0.05                                                                                                                                                                                                                                                                            | 0.00    | 655.00 | s    | Fig. 3-113, (p. 3-157) |
| LIM_2: tVNG >                                                                                                                                                                                                                                                                   |         |        |      | 102 048                |
| 0.05                                                                                                                                                                                                                                                                            | 0.00    | 655.00 | s    |                        |
| Setting for the operate delay of overvoltage stage VNG > of limit value monitoring.                                                                                                                                                                                             |         |        |      |                        |
| LIM_1: tVNG > >                                                                                                                                                                                                                                                                 |         |        |      | 014 046                |
| 0.05                                                                                                                                                                                                                                                                            | 0.00    | 655.00 | s    | Fig. 3-113, (p. 3-157) |
| LIM_2: tVNG > >                                                                                                                                                                                                                                                                 |         |        |      | 102 049                |
| 0.05                                                                                                                                                                                                                                                                            | 0.00    | 655.00 | s    |                        |
| Setting for the operate delay of overvoltage stage VNG > > of limit value monitoring.                                                                                                                                                                                           |         |        |      |                        |

| Parameter                                                                              |      |        |          |                        | Address |         |  |
|----------------------------------------------------------------------------------------|------|--------|----------|------------------------|---------|---------|--|
| Default                                                                                | Min  | Max    | Unit     | Logic Diagram          |         |         |  |
| LIM_1: Vref>                                                                           |      |        |          |                        |         | 042 144 |  |
| 1.10                                                                                   | 0.10 | 2.50   | Vref,nom | Fig. 3-114, (p. 3-158) |         |         |  |
| Setting for the operate value of overvoltage stage Vref> for limit value monitoring.   |      |        |          |                        |         |         |  |
| LIM_1: Vref>>                                                                          |      |        |          |                        |         | 042 145 |  |
| 1.20                                                                                   | 0.10 | 2.50   | Vref,nom | Fig. 3-114, (p. 3-158) |         |         |  |
| Setting for the operate value of overvoltage stage Vref>> for limit value monitoring.  |      |        |          |                        |         |         |  |
| LIM_1: tVref>                                                                          |      |        |          |                        |         | 042 148 |  |
| 0.05                                                                                   | 0.00 | 655.00 | s        | Fig. 3-114, (p. 3-158) |         |         |  |
| Setting for the operate delay of overvoltage stage Vref> for limit value monitoring.   |      |        |          |                        |         |         |  |
| LIM_1: tVref>>                                                                         |      |        |          |                        |         | 042 149 |  |
| 0.05                                                                                   | 0.00 | 655.00 | s        | Fig. 3-114, (p. 3-158) |         |         |  |
| Setting for the operate delay of overvoltage stage Vref>> for limit value monitoring.  |      |        |          |                        |         |         |  |
| LIM_1: Vref<                                                                           |      |        |          |                        |         | 042 146 |  |
| 0.90                                                                                   | 0.10 | 2.50   | Vref,nom | Fig. 3-114, (p. 3-158) |         |         |  |
| Setting for the operate value of undervoltage stage Vref< for limit value monitoring.  |      |        |          |                        |         |         |  |
| LIM_1: Vref<<                                                                          |      |        |          |                        |         | 042 147 |  |
| 0.80                                                                                   | 0.10 | 2.50   | Vref,nom | Fig. 3-114, (p. 3-158) |         |         |  |
| Setting for the operate value of undervoltage stage Vref<< for limit value monitoring. |      |        |          |                        |         |         |  |
| LIM_1: tVref<                                                                          |      |        |          |                        |         | 042 150 |  |
| 0.05                                                                                   | 0.00 | 655.00 | s        | Fig. 3-114, (p. 3-158) |         |         |  |
| Setting for the operate delay of undervoltage stage Vref< for limit value monitoring.  |      |        |          |                        |         |         |  |
| LIM_1: tVref<<                                                                         |      |        |          |                        |         | 042 151 |  |
| 0.05                                                                                   | 0.00 | 655.00 | s        | Fig. 3-114, (p. 3-158) |         |         |  |
| Setting for the operate delay of undervoltage stage Vref<< for limit value monitoring. |      |        |          |                        |         |         |  |

## Programmable Logic

| Parameter                                                              |     |       |      | Address                             |
|------------------------------------------------------------------------|-----|-------|------|-------------------------------------|
| Default                                                                | Min | Max   | Unit | Logic Diagram                       |
| LOG_2: General enable USER                                             |     |       |      | 011 137                             |
| 0: No <span>Fig. 3-117, (p. 3-162)</span>                              |     |       |      |                                     |
| Enable/disable the function group LOG_2 (Programmable Logic 2).        |     |       |      |                                     |
| LOG_2: Fct.assignm. outp. 1                                            |     |       |      | 050 000                             |
| 060 000: MAIN: Without function <span>Fig. 3-117, (p. 3-162)</span>    |     |       |      |                                     |
| LOG_2: Fct.assignm. outp. 2                                            |     |       |      | 050 004                             |
| 060 000: MAIN: Without function s                                      |     |       |      |                                     |
| LOG_2: Fct.assignm. outp. 3                                            |     |       |      | 050 008                             |
| 060 000: MAIN: Without function                                        |     |       |      |                                     |
| LOG_2: Fct.assignm. outp. 4                                            |     |       |      | 050 012                             |
| 060 000: MAIN: Without function                                        |     |       |      |                                     |
| These settings assign functions to the outputs.                        |     |       |      |                                     |
| LOG_2: Op. mode t output 1                                             |     |       |      | 050 001                             |
| 0: Without timer stage <span>Fig. 3-117, (p. 3-162)</span>             |     |       |      |                                     |
| LOG_2: Op. mode t output 2                                             |     |       |      | 050 005                             |
| 0: Without timer stage                                                 |     |       |      |                                     |
| LOG_2: Op. mode t output 3                                             |     |       |      | 050 009                             |
| 0: Without timer stage                                                 |     |       |      |                                     |
| LOG_2: Op. mode t output 4                                             |     |       |      | 050 013                             |
| 0: Without timer stage                                                 |     |       |      |                                     |
| These settings define the operating modes for the output timer stages. |     |       |      |                                     |
| LOG_2: Time t1 output 1                                                |     |       |      | 050 002                             |
| 0                                                                      | 0   | 60000 | s    | <span>Fig. 3-117, (p. 3-162)</span> |
| LOG_2: Time t1 output 2                                                |     |       |      | 050 006                             |
| 0                                                                      | 0   | 60000 | s    |                                     |
| LOG_2: Time t1 output 3                                                |     |       |      | 050 010                             |
| 0                                                                      | 0   | 60000 | s    |                                     |
| LOG_2: Time t1 output 4                                                |     |       |      | 050 014                             |
| 0                                                                      | 0   | 60000 | s    |                                     |
| Settings of timer stage t1 for the respective outputs.                 |     |       |      |                                     |
| LOG_2: Time t2 output 1                                                |     |       |      | 050 003                             |
| 0                                                                      | 0   | 60000 | s    | <span>Fig. 3-117, (p. 3-162)</span> |
| LOG_2: Time t2 output 2                                                |     |       |      | 050 007                             |
| 0                                                                      | 0   | 60000 | s    |                                     |
| LOG_2: Time t2 output 3                                                |     |       |      | 050 011                             |
| 0                                                                      | 0   | 60000 | s    |                                     |



| Parameter                                                                                        |     |       |      | Address       |  |  |         |
|--------------------------------------------------------------------------------------------------|-----|-------|------|---------------|--|--|---------|
| Default                                                                                          | Min | Max   | Unit | Logic Diagram |  |  |         |
| LOG_2: Time t2 output 4                                                                          |     |       |      |               |  |  | 050 015 |
| 0                                                                                                | 0   | 60000 | s    |               |  |  |         |
| Settings for timer stage t2 for the respective outputs.                                          |     |       |      |               |  |  |         |
| Note: This setting has no effect in the “minimum time” operating mode.                           |     |       |      |               |  |  |         |
| LOG_2: Sig. assign. outp. 1                                                                      |     |       |      |               |  |  | 064 000 |
| 061 000: MAIN: Without function                                                                  |     |       |      |               |  |  |         |
| LOG_2: Sig. assign. outp. 2                                                                      |     |       |      |               |  |  | 064 002 |
| 061 000: MAIN: Without function                                                                  |     |       |      |               |  |  |         |
| LOG_2: Sig. assign. outp. 3                                                                      |     |       |      |               |  |  | 064 004 |
| 061 000: MAIN: Without function                                                                  |     |       |      |               |  |  |         |
| LOG_2: Sig. assign. outp. 4                                                                      |     |       |      |               |  |  | 064 006 |
| 061 000: MAIN: Without function                                                                  |     |       |      |               |  |  |         |
| These settings assign the function of a binary input signal to the output of the logic equation. |     |       |      |               |  |  |         |
| LOG_2: Sig. assign. outp. 1(t)                                                                   |     |       |      |               |  |  | 064 001 |
| 061 000: MAIN: Without function                                                                  |     |       |      |               |  |  |         |
| LOG_2: Sig. assign. outp. 2(t)                                                                   |     |       |      |               |  |  | 064 003 |
| 061 000: MAIN: Without function                                                                  |     |       |      |               |  |  |         |
| LOG_2: Sig. assign. outp. 3(t)                                                                   |     |       |      |               |  |  | 064 005 |
| 061 000: MAIN: Without function                                                                  |     |       |      |               |  |  |         |
| LOG_2: Sig. assign. outp. 4(t)                                                                   |     |       |      |               |  |  | 064 007 |
| 061 000: MAIN: Without function                                                                  |     |       |      |               |  |  |         |
| These settings assign the function of a binary input signal to the output of the logic equation. |     |       |      |               |  |  |         |

## Programmable Logic

| Parameter                                                                 |     |     |                        | Address       |         |
|---------------------------------------------------------------------------|-----|-----|------------------------|---------------|---------|
| Default                                                                   | Min | Max | Unit                   | Logic Diagram |         |
| LOGIC: General enable USER                                                |     |     |                        |               | 031 099 |
| 0: No                                                                     |     |     | Fig. 3-116, (p. 3-161) |               |         |
| Enable/disable the logic function.                                        |     |     |                        |               |         |
| LOGIC: Set 01 USER                                                        |     |     |                        |               | 034 030 |
| 0: No                                                                     |     |     | Fig. 3-115, (p. 3-160) |               |         |
| LOGIC: Set 02 USER                                                        |     |     |                        |               | 034 031 |
| 0: No                                                                     |     |     |                        |               |         |
| LOGIC: Set 03 USER                                                        |     |     |                        |               | 034 032 |
| 0: No                                                                     |     |     |                        |               |         |
| LOGIC: Set 04 USER                                                        |     |     |                        |               | 034 033 |
| 0: No                                                                     |     |     |                        |               |         |
| LOGIC: Set 05 USER                                                        |     |     |                        |               | 034 034 |
| 0: No                                                                     |     |     |                        |               |         |
| LOGIC: Set 06 USER                                                        |     |     |                        |               | 034 035 |
| 0: No                                                                     |     |     |                        |               |         |
| LOGIC: Set 07 USER                                                        |     |     |                        |               | 034 036 |
| 0: No                                                                     |     |     |                        |               |         |
| LOGIC: Set 08 USER                                                        |     |     |                        |               | 034 037 |
| 0: No                                                                     |     |     |                        |               |         |
| LOGIC: Set 09 USER                                                        |     |     |                        |               | 024 236 |
| 0: No                                                                     |     |     |                        |               |         |
| LOGIC: Set 10 USER                                                        |     |     |                        |               | 024 237 |
| 0: No                                                                     |     |     |                        |               |         |
| LOGIC: Set 11 USER                                                        |     |     |                        |               | 024 238 |
| 0: No                                                                     |     |     |                        |               |         |
| LOGIC: Set 12 USER                                                        |     |     |                        |               | 024 239 |
| 0: No                                                                     |     |     |                        |               |         |
| LOGIC: Set 13 USER                                                        |     |     |                        |               | 024 240 |
| 0: No                                                                     |     |     |                        |               |         |
| LOGIC: Set 14 USER                                                        |     |     |                        |               | 024 241 |
| 0: No                                                                     |     |     |                        |               |         |
| LOGIC: Set 15 USER                                                        |     |     |                        |               | 024 242 |
| 0: No                                                                     |     |     |                        |               |         |
| LOGIC: Set 16 USER                                                        |     |     |                        |               | 024 243 |
| 0: No                                                                     |     |     |                        |               |         |
| These settings define the static input conditions for the logic function. |     |     |                        |               |         |

| Parameter                                       |     |     |      | Address                |
|-------------------------------------------------|-----|-----|------|------------------------|
| Default                                         | Min | Max | Unit | Logic Diagram          |
| LOGIC: Fct.assignm. outp. 1                     |     |     |      | 030 000                |
| 060 000: MAIN: Without function                 |     |     |      | Fig. 3-116, (p. 3-161) |
| LOGIC: Fct.assignm.outp.128                     |     |     |      | 045 252                |
| 060 000: MAIN: Without function                 |     |     |      |                        |
| These settings assign functions to the outputs. |     |     |      |                        |
| LOGIC: Op. mode t output 1                      |     |     |      | 030 001                |
| 0: Without timer stage                          |     |     |      | Fig. 3-116, (p. 3-161) |
| LOGIC: Op. mode t output 2                      |     |     |      | 030 005                |
| 0: Without timer stage                          |     |     |      |                        |
| LOGIC: Op. mode t output 3                      |     |     |      | 030 009                |
| 0: Without timer stage                          |     |     |      |                        |
| LOGIC: Op. mode t output 4                      |     |     |      | 030 013                |
| 0: Without timer stage                          |     |     |      |                        |
| LOGIC: Op. mode t output 5                      |     |     |      | 030 017                |
| 0: Without timer stage                          |     |     |      |                        |
| LOGIC: Op. mode t output 6                      |     |     |      | 030 021                |
| 0: Without timer stage                          |     |     |      |                        |
| LOGIC: Op. mode t output 7                      |     |     |      | 030 025                |
| 0: Without timer stage                          |     |     |      |                        |
| LOGIC: Op. mode t output 8                      |     |     |      | 030 029                |
| 0: Without timer stage                          |     |     |      |                        |
| LOGIC: Op. mode t output 9                      |     |     |      | 030 033                |
| 0: Without timer stage                          |     |     |      |                        |
| LOGIC: Op. mode t output 10                     |     |     |      | 030 037                |
| 0: Without timer stage                          |     |     |      |                        |
| LOGIC: Op. mode t output 11                     |     |     |      | 030 041                |
| 0: Without timer stage                          |     |     |      |                        |
| LOGIC: Op. mode t output 12                     |     |     |      | 030 045                |
| 0: Without timer stage                          |     |     |      |                        |
| LOGIC: Op. mode t output 13                     |     |     |      | 030 049                |
| 0: Without timer stage                          |     |     |      |                        |
| LOGIC: Op. mode t output 14                     |     |     |      | 030 053                |
| 0: Without timer stage                          |     |     |      |                        |
| LOGIC: Op. mode t output 15                     |     |     |      | 030 057                |
| 0: Without timer stage                          |     |     |      |                        |
| LOGIC: Op. mode t output 16                     |     |     |      | 030 061                |
| 0: Without timer stage                          |     |     |      |                        |

| Parameter                   |     |     |      |  | Address       |  |         |
|-----------------------------|-----|-----|------|--|---------------|--|---------|
| Default                     | Min | Max | Unit |  | Logic Diagram |  |         |
| LOGIC: Op. mode t output 17 |     |     |      |  |               |  | 030 065 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 18 |     |     |      |  |               |  | 030 069 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 19 |     |     |      |  |               |  | 030 073 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 20 |     |     |      |  |               |  | 030 077 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 21 |     |     |      |  |               |  | 030 081 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 22 |     |     |      |  |               |  | 030 085 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 23 |     |     |      |  |               |  | 030 089 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 24 |     |     |      |  |               |  | 030 093 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 25 |     |     |      |  |               |  | 030 097 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 26 |     |     |      |  |               |  | 031 001 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 27 |     |     |      |  |               |  | 031 005 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 28 |     |     |      |  |               |  | 031 009 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 29 |     |     |      |  |               |  | 031 013 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 30 |     |     |      |  |               |  | 031 017 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 31 |     |     |      |  |               |  | 031 021 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 32 |     |     |      |  |               |  | 031 025 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 33 |     |     |      |  |               |  | 030 101 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 34 |     |     |      |  |               |  | 030 105 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 35 |     |     |      |  |               |  | 030 109 |
| 0: Without timer stage      |     |     |      |  |               |  |         |

| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| LOGIC: Op. mode t output 36 |     |     |      | 030 113       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 37 |     |     |      | 030 117       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 38 |     |     |      | 030 121       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 39 |     |     |      | 030 125       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 40 |     |     |      | 030 129       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 41 |     |     |      | 030 133       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 42 |     |     |      | 030 137       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 43 |     |     |      | 030 141       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 44 |     |     |      | 030 145       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 45 |     |     |      | 030 149       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 46 |     |     |      | 030 153       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 47 |     |     |      | 030 157       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 48 |     |     |      | 030 161       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 49 |     |     |      | 030 165       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 50 |     |     |      | 030 169       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 51 |     |     |      | 030 173       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 52 |     |     |      | 030 177       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 53 |     |     |      | 030 181       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 54 |     |     |      | 030 185       |
| 0: Without timer stage      |     |     |      |               |

| Parameter                   |     |     |      |  | Address       |  |         |
|-----------------------------|-----|-----|------|--|---------------|--|---------|
| Default                     | Min | Max | Unit |  | Logic Diagram |  |         |
| LOGIC: Op. mode t output 55 |     |     |      |  |               |  | 030 189 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 56 |     |     |      |  |               |  | 030 193 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 57 |     |     |      |  |               |  | 030 197 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 58 |     |     |      |  |               |  | 030 201 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 59 |     |     |      |  |               |  | 030 205 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 60 |     |     |      |  |               |  | 030 209 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 61 |     |     |      |  |               |  | 030 213 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 62 |     |     |      |  |               |  | 030 217 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 63 |     |     |      |  |               |  | 030 221 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 64 |     |     |      |  |               |  | 030 225 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 65 |     |     |      |  |               |  | 046 001 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 66 |     |     |      |  |               |  | 045 005 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 67 |     |     |      |  |               |  | 045 009 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 68 |     |     |      |  |               |  | 045 013 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 69 |     |     |      |  |               |  | 045 017 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 70 |     |     |      |  |               |  | 045 021 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 71 |     |     |      |  |               |  | 045 025 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 72 |     |     |      |  |               |  | 045 029 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 73 |     |     |      |  |               |  | 045 033 |
| 0: Without timer stage      |     |     |      |  |               |  |         |

| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| LOGIC: Op. mode t output 74 |     |     |      | 045 037       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 75 |     |     |      | 045 041       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 76 |     |     |      | 045 045       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 77 |     |     |      | 045 049       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 78 |     |     |      | 045 053       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 79 |     |     |      | 045 057       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 80 |     |     |      | 045 061       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 81 |     |     |      | 045 065       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 82 |     |     |      | 045 069       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 83 |     |     |      | 045 073       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 84 |     |     |      | 045 077       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 85 |     |     |      | 045 081       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 86 |     |     |      | 045 085       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 87 |     |     |      | 045 089       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 88 |     |     |      | 045 093       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 89 |     |     |      | 045 097       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 90 |     |     |      | 045 101       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 91 |     |     |      | 045 105       |
| 0: Without timer stage      |     |     |      |               |
| LOGIC: Op. mode t output 92 |     |     |      | 045 109       |
| 0: Without timer stage      |     |     |      |               |

| Parameter                   |     |     |      |  | Address       |  |         |
|-----------------------------|-----|-----|------|--|---------------|--|---------|
| Default                     | Min | Max | Unit |  | Logic Diagram |  |         |
| LOGIC: Op. mode t output 93 |     |     |      |  |               |  | 045 113 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 94 |     |     |      |  |               |  | 045 117 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 95 |     |     |      |  |               |  | 045 121 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 96 |     |     |      |  |               |  | 045 125 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 97 |     |     |      |  |               |  | 045 129 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 98 |     |     |      |  |               |  | 045 133 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output 99 |     |     |      |  |               |  | 045 137 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output100 |     |     |      |  |               |  | 045 141 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output101 |     |     |      |  |               |  | 045 145 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output102 |     |     |      |  |               |  | 045 149 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output103 |     |     |      |  |               |  | 045 153 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output104 |     |     |      |  |               |  | 045 157 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output105 |     |     |      |  |               |  | 045 161 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output106 |     |     |      |  |               |  | 045 165 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output107 |     |     |      |  |               |  | 045 169 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output108 |     |     |      |  |               |  | 045 173 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output109 |     |     |      |  |               |  | 045 177 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output110 |     |     |      |  |               |  | 045 181 |
| 0: Without timer stage      |     |     |      |  |               |  |         |
| LOGIC: Op. mode t output111 |     |     |      |  |               |  | 045 185 |
| 0: Without timer stage      |     |     |      |  |               |  |         |



| Parameter                                                              |      |        |      | Address                |
|------------------------------------------------------------------------|------|--------|------|------------------------|
| Default                                                                | Min  | Max    | Unit | Logic Diagram          |
| LOGIC: Op. mode t output112                                            |      |        |      | 045 189                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output113                                            |      |        |      | 045 193                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output114                                            |      |        |      | 045 197                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output115                                            |      |        |      | 045 201                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output116                                            |      |        |      | 045 205                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output117                                            |      |        |      | 045 209                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output118                                            |      |        |      | 045 213                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output119                                            |      |        |      | 045 217                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output120                                            |      |        |      | 045 221                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output121                                            |      |        |      | 045 225                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output122                                            |      |        |      | 045 229                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output123                                            |      |        |      | 045 233                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output124                                            |      |        |      | 045 237                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output125                                            |      |        |      | 045 241                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output126                                            |      |        |      | 045 245                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output127                                            |      |        |      | 045 249                |
| 0: Without timer stage                                                 |      |        |      |                        |
| LOGIC: Op. mode t output128                                            |      |        |      | 045 253                |
| 0: Without timer stage                                                 |      |        |      |                        |
| These settings define the operating modes for the output timer stages. |      |        |      |                        |
| LOGIC: Time t1 output 1                                                |      |        |      | 030 002                |
| 0.00                                                                   | 0.00 | 600.00 | s    | Fig. 3-116, (p. 3-161) |

| Parameter                                              |      |        |      | Address                |
|--------------------------------------------------------|------|--------|------|------------------------|
| Default                                                | Min  | Max    | Unit | Logic Diagram          |
| LOGIC: Time t1 output128                               |      |        |      | 045 254                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| Settings of timer stage t1 for the respective outputs. |      |        |      |                        |
| LOGIC: Time t2 output 1                                |      |        |      | 030 003                |
| 0.00                                                   | 0.00 | 600.00 | s    | Fig. 3-116, (p. 3-161) |
| LOGIC: Time t2 output 2                                |      |        |      | 030 007                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| LOGIC: Time t2 output 3                                |      |        |      | 030 011                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| LOGIC: Time t2 output 4                                |      |        |      | 030 015                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| LOGIC: Time t2 output 5                                |      |        |      | 030 019                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| LOGIC: Time t2 output 6                                |      |        |      | 030 023                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| LOGIC: Time t2 output 7                                |      |        |      | 030 027                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| LOGIC: Time t2 output 8                                |      |        |      | 030 031                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| LOGIC: Time t2 output 9                                |      |        |      | 030 035                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| LOGIC: Time t2 output 10                               |      |        |      | 030 039                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| LOGIC: Time t2 output 11                               |      |        |      | 030 043                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| LOGIC: Time t2 output 12                               |      |        |      | 030 047                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| LOGIC: Time t2 output 13                               |      |        |      | 030 051                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| LOGIC: Time t2 output 14                               |      |        |      | 030 055                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| LOGIC: Time t2 output 15                               |      |        |      | 030 059                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| LOGIC: Time t2 output 16                               |      |        |      | 030 063                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |
| LOGIC: Time t2 output 17                               |      |        |      | 030 067                |
| 0.00                                                   | 0.00 | 600.00 | s    |                        |

| Parameter                |      |        |      |  | Address       |  |  |         |
|--------------------------|------|--------|------|--|---------------|--|--|---------|
| Default                  | Min  | Max    | Unit |  | Logic Diagram |  |  |         |
| LOGIC: Time t2 output 18 |      |        |      |  |               |  |  | 030 071 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 19 |      |        |      |  |               |  |  | 030 075 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 20 |      |        |      |  |               |  |  | 030 079 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 21 |      |        |      |  |               |  |  | 030 083 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 22 |      |        |      |  |               |  |  | 030 087 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 23 |      |        |      |  |               |  |  | 030 091 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 24 |      |        |      |  |               |  |  | 030 095 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 25 |      |        |      |  |               |  |  | 030 099 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 26 |      |        |      |  |               |  |  | 031 003 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 27 |      |        |      |  |               |  |  | 031 007 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 28 |      |        |      |  |               |  |  | 031 011 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 29 |      |        |      |  |               |  |  | 031 015 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 30 |      |        |      |  |               |  |  | 031 019 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 31 |      |        |      |  |               |  |  | 031 023 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 32 |      |        |      |  |               |  |  | 031 027 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 33 |      |        |      |  |               |  |  | 030 103 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 34 |      |        |      |  |               |  |  | 030 107 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 35 |      |        |      |  |               |  |  | 030 111 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 36 |      |        |      |  |               |  |  | 030 115 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |

| Parameter                |      |        |      | Address       |  |  |         |
|--------------------------|------|--------|------|---------------|--|--|---------|
| Default                  | Min  | Max    | Unit | Logic Diagram |  |  |         |
| LOGIC: Time t2 output 37 |      |        |      |               |  |  | 030 119 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 38 |      |        |      |               |  |  | 030 123 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 39 |      |        |      |               |  |  | 030 127 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 40 |      |        |      |               |  |  | 030 131 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 41 |      |        |      |               |  |  | 030 135 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 42 |      |        |      |               |  |  | 030 139 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 43 |      |        |      |               |  |  | 030 143 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 44 |      |        |      |               |  |  | 030 147 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 45 |      |        |      |               |  |  | 030 151 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 46 |      |        |      |               |  |  | 030 155 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 47 |      |        |      |               |  |  | 030 159 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 48 |      |        |      |               |  |  | 030 163 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 49 |      |        |      |               |  |  | 030 167 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 50 |      |        |      |               |  |  | 030 171 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 51 |      |        |      |               |  |  | 030 175 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 52 |      |        |      |               |  |  | 030 179 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 53 |      |        |      |               |  |  | 030 183 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 54 |      |        |      |               |  |  | 030 187 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 55 |      |        |      |               |  |  | 030 191 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |

| Parameter                |      |        |      |  | Address       |  |  |         |
|--------------------------|------|--------|------|--|---------------|--|--|---------|
| Default                  | Min  | Max    | Unit |  | Logic Diagram |  |  |         |
| LOGIC: Time t2 output 56 |      |        |      |  |               |  |  | 030 195 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 57 |      |        |      |  |               |  |  | 030 199 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 58 |      |        |      |  |               |  |  | 030 203 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 59 |      |        |      |  |               |  |  | 030 207 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 60 |      |        |      |  |               |  |  | 030 211 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 61 |      |        |      |  |               |  |  | 030 215 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 62 |      |        |      |  |               |  |  | 030 219 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 63 |      |        |      |  |               |  |  | 030 223 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 64 |      |        |      |  |               |  |  | 030 227 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 65 |      |        |      |  |               |  |  | 046 003 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 66 |      |        |      |  |               |  |  | 045 007 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 67 |      |        |      |  |               |  |  | 045 011 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 68 |      |        |      |  |               |  |  | 045 015 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 69 |      |        |      |  |               |  |  | 045 019 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 70 |      |        |      |  |               |  |  | 045 023 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 71 |      |        |      |  |               |  |  | 045 027 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 72 |      |        |      |  |               |  |  | 045 031 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 73 |      |        |      |  |               |  |  | 045 035 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |
| LOGIC: Time t2 output 74 |      |        |      |  |               |  |  | 045 039 |
| 0.00                     | 0.00 | 600.00 | s    |  |               |  |  |         |

| Parameter                |      |        |      | Address       |  |  |         |
|--------------------------|------|--------|------|---------------|--|--|---------|
| Default                  | Min  | Max    | Unit | Logic Diagram |  |  |         |
| LOGIC: Time t2 output 75 |      |        |      |               |  |  | 045 043 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 76 |      |        |      |               |  |  | 045 047 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 77 |      |        |      |               |  |  | 045 051 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 78 |      |        |      |               |  |  | 045 055 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 79 |      |        |      |               |  |  | 045 059 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 80 |      |        |      |               |  |  | 045 063 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 81 |      |        |      |               |  |  | 045 067 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 82 |      |        |      |               |  |  | 045 071 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 83 |      |        |      |               |  |  | 045 075 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 84 |      |        |      |               |  |  | 045 079 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 85 |      |        |      |               |  |  | 045 083 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 86 |      |        |      |               |  |  | 045 087 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 87 |      |        |      |               |  |  | 045 091 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 88 |      |        |      |               |  |  | 045 095 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 89 |      |        |      |               |  |  | 045 099 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 90 |      |        |      |               |  |  | 045 103 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 91 |      |        |      |               |  |  | 045 107 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 92 |      |        |      |               |  |  | 045 111 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 93 |      |        |      |               |  |  | 045 115 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |

| Parameter                |      |        |      | Address       |  |  |         |
|--------------------------|------|--------|------|---------------|--|--|---------|
| Default                  | Min  | Max    | Unit | Logic Diagram |  |  |         |
| LOGIC: Time t2 output 94 |      |        |      |               |  |  | 045 119 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 95 |      |        |      |               |  |  | 045 123 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 96 |      |        |      |               |  |  | 045 127 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 97 |      |        |      |               |  |  | 045 131 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 98 |      |        |      |               |  |  | 045 135 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output 99 |      |        |      |               |  |  | 045 139 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output100 |      |        |      |               |  |  | 045 143 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output101 |      |        |      |               |  |  | 045 147 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output102 |      |        |      |               |  |  | 045 151 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output103 |      |        |      |               |  |  | 045 155 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output104 |      |        |      |               |  |  | 045 159 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output105 |      |        |      |               |  |  | 045 163 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output106 |      |        |      |               |  |  | 045 167 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output107 |      |        |      |               |  |  | 045 171 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output108 |      |        |      |               |  |  | 045 175 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output109 |      |        |      |               |  |  | 045 179 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output110 |      |        |      |               |  |  | 045 183 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output111 |      |        |      |               |  |  | 045 187 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |
| LOGIC: Time t2 output112 |      |        |      |               |  |  | 045 191 |
| 0.00                     | 0.00 | 600.00 | s    |               |  |  |         |

| Parameter                                                              |      |        |      | Address                |  |  |         |
|------------------------------------------------------------------------|------|--------|------|------------------------|--|--|---------|
| Default                                                                | Min  | Max    | Unit | Logic Diagram          |  |  |         |
| LOGIC: Time t2 output113                                               |      |        |      |                        |  |  | 045 195 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| LOGIC: Time t2 output114                                               |      |        |      |                        |  |  | 045 199 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| LOGIC: Time t2 output115                                               |      |        |      |                        |  |  | 045 203 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| LOGIC: Time t2 output116                                               |      |        |      |                        |  |  | 045 207 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| LOGIC: Time t2 output117                                               |      |        |      |                        |  |  | 045 211 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| LOGIC: Time t2 output118                                               |      |        |      |                        |  |  | 045 215 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| LOGIC: Time t2 output119                                               |      |        |      |                        |  |  | 045 219 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| LOGIC: Time t2 output120                                               |      |        |      |                        |  |  | 045 223 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| LOGIC: Time t2 output121                                               |      |        |      |                        |  |  | 045 227 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| LOGIC: Time t2 output122                                               |      |        |      |                        |  |  | 045 231 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| LOGIC: Time t2 output123                                               |      |        |      |                        |  |  | 045 235 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| LOGIC: Time t2 output124                                               |      |        |      |                        |  |  | 045 239 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| LOGIC: Time t2 output125                                               |      |        |      |                        |  |  | 045 243 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| LOGIC: Time t2 output126                                               |      |        |      |                        |  |  | 045 247 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| LOGIC: Time t2 output127                                               |      |        |      |                        |  |  | 045 251 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| LOGIC: Time t2 output128                                               |      |        |      |                        |  |  | 045 255 |
| 0.00                                                                   | 0.00 | 600.00 | s    |                        |  |  |         |
| Settings for timer stage t2 for the respective outputs.                |      |        |      |                        |  |  |         |
| Note: This setting has no effect in the “minimum time” operating mode. |      |        |      |                        |  |  |         |
| LOGIC: Sig. assig. outp. 1                                             |      |        |      |                        |  |  | 044 000 |
| 061 000: MAIN: Without function                                        |      |        |      | Fig. 3-123, (p. 3-166) |  |  |         |



| Parameter                                                                                        |     |     |      | Address       |
|--------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                          | Min | Max | Unit | Logic Diagram |
| LOGIC: Sig.assig. outp.128                                                                       |     |     |      | 048 126       |
| 061 000: MAIN: Without function                                                                  |     |     |      |               |
| These settings assign the function of a binary input signal to the output of the logic equation. |     |     |      |               |
| LOGIC: Sig.assig.outp. 1(t)                                                                      |     |     |      | 044 001       |
| 061 000: MAIN: Without function                                                                  |     |     |      |               |
| Fig. 3-123, (p. 3-166)                                                                           |     |     |      |               |
| LOGIC: Sig.assig.outp128(t)                                                                      |     |     |      | 048 127       |
| 061 000: MAIN: Without function                                                                  |     |     |      |               |
| These settings assign the function of a binary input signal to the output of the logic equation. |     |     |      |               |

## Single-pole signals

| Parameter                                                                                                                                |     |     |      | Address                |
|------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|------------------------|
| Default                                                                                                                                  | Min | Max | Unit | Logic Diagram          |
| SIG_1: Designat. sig. S001                                                                                                               |     |     |      | 226 000                |
| 1: S001                                                                                                                                  |     |     |      |                        |
| SIG_1: Designat. sig. S224                                                                                                               |     |     |      | 232 248                |
| 224: S224                                                                                                                                |     |     |      |                        |
| SIG_1: Designat. SIG_DC3                                                                                                                 |     |     |      | 233 000                |
| 234: SIGNAL DC3                                                                                                                          |     |     |      |                        |
| Selection of the signal designation.                                                                                                     |     |     |      |                        |
| SIG_1: Oper. mode sig. S001                                                                                                              |     |     |      | 226 001                |
| 1: Start/end signal                                                                                                                      |     |     |      |                        |
| Fig. 3-147, (p. 3-199)                                                                                                                   |     |     |      |                        |
| SIG_1: Oper. mode sig. S224                                                                                                              |     |     |      | 232 249                |
| 1: Start/end signal                                                                                                                      |     |     |      |                        |
| Selection of the signal operating mode.                                                                                                  |     |     |      |                        |
| SIG_1: Gr.asg. debounc.S001                                                                                                              |     |     |      | 226 003                |
| 1: Group 1                                                                                                                               |     |     |      |                        |
| Fig. 3-147, (p. 3-199)                                                                                                                   |     |     |      |                        |
| SIG_1: Gr.asg. debounc.S224                                                                                                              |     |     |      | 232 251                |
| 1: Group 1                                                                                                                               |     |     |      |                        |
| Group assignment for the debouncing time and the chatter suppression.                                                                    |     |     |      |                        |
| SIG_1: Min. sig. dur. S001                                                                                                               |     |     |      | 226 002                |
| 0                                                                                                                                        | 0   | 254 | s    | Fig. 3-147, (p. 3-199) |
| SIG_1: Min. sig. dur. S224                                                                                                               |     |     |      | 232 250                |
| 0                                                                                                                                        | 0   | 254 | s    |                        |
| The logic "1" signal must be available for this minimum time setting so that a telegram can be sent in the <i>Start/end signal</i> mode. |     |     |      |                        |

Single-pole  
commands

| Parameter                                |     |     |      |  | Address                |
|------------------------------------------|-----|-----|------|--|------------------------|
| Default                                  | Min | Max | Unit |  | Logic Diagram          |
| CMD_1: Design. command C001              |     |     |      |  | 200 000                |
| 1: C001                                  |     |     |      |  |                        |
| CMD_1: Design. command C096              |     |     |      |  | 201 235                |
| 96: C096                                 |     |     |      |  |                        |
| CMD_1: Design. CMD_DC1                   |     |     |      |  | 202 000                |
| 232: CMD_DC1                             |     |     |      |  |                        |
| CMD_1: Design. CMD_DC2                   |     |     |      |  | 202 005                |
| 233: CMD_DC2                             |     |     |      |  |                        |
| CMD_1: Design. CMD_DC3                   |     |     |      |  | 202 010                |
| 234: CMD_DC3                             |     |     |      |  |                        |
| Selection of the command designation.    |     |     |      |  |                        |
| CMD_1: Oper. mode cmd. C001              |     |     |      |  | 200 002                |
| 3: Persistent command                    |     |     |      |  | Fig. 3-146, (p. 3-197) |
| CMD_1: Oper. mode cmd. C096              |     |     |      |  | 201 237                |
| 3: Persistent command                    |     |     |      |  |                        |
| Selection of the command operating mode. |     |     |      |  |                        |

## Binary counts

| Parameter                            |     |      |      | Address                |
|--------------------------------------|-----|------|------|------------------------|
| Default                              | Min | Max  | Unit | Logic Diagram          |
| COUNT: General enable USER           |     |      |      | 217 000                |
| 0: No                                |     |      |      | Fig. 3-152, (p. 3-205) |
| Disabling or enabling binary counts. |     |      |      |                        |
| COUNT: Debounce t. count. 1          |     |      |      | 217 160                |
| 3                                    | 0   | 1000 | ms   | Fig. 3-152, (p. 3-205) |
| COUNT: Debounce t. count. 2          |     |      |      | 217 161                |
| 3                                    | 0   | 1000 | ms   |                        |
| COUNT: Debounce t. count. 3          |     |      |      | 217 162                |
| 3                                    | 0   | 1000 | ms   |                        |
| COUNT: Debounce t. count. 4          |     |      |      | 217 163                |
| 3                                    | 0   | 1000 | ms   |                        |
| COUNT: Debounce t. count. 5          |     |      |      | 217 164                |
| 3                                    | 0   | 1000 | ms   |                        |
| COUNT: Debounce t. count. 6          |     |      |      | 217 165                |
| 3                                    | 0   | 1000 | ms   |                        |
| COUNT: Debounce t. count. 7          |     |      |      | 217 166                |
| 3                                    | 0   | 1000 | ms   |                        |
| COUNT: Debounce t. count. 8          |     |      |      | 217 167                |
| 3                                    | 0   | 1000 | ms   |                        |
| COUNT: Debounce t. count. 9          |     |      |      | 217 168                |
| 3                                    | 0   | 1000 | ms   |                        |
| COUNT: Debounce t. count.10          |     |      |      | 217 169                |
| 3                                    | 0   | 1000 | ms   |                        |
| COUNT: Debounce t. count.11          |     |      |      | 217 170                |
| 3                                    | 0   | 1000 | ms   |                        |
| COUNT: Debounce t. count.12          |     |      |      | 217 171                |
| 3                                    | 0   | 1000 | ms   |                        |
| COUNT: Debounce t. count.13          |     |      |      | 217 172                |
| 3                                    | 0   | 1000 | ms   |                        |
| COUNT: Debounce t. count.14          |     |      |      | 217 173                |
| 3                                    | 0   | 1000 | ms   |                        |
| COUNT: Debounce t. count.15          |     |      |      | 217 174                |
| 3                                    | 0   | 1000 | ms   |                        |
| COUNT: Debounce t. count.16          |     |      |      | 217 175                |
| 3                                    | 0   | 1000 | ms   |                        |
| COUNT: Debounce t. count.17          |     |      |      | 217 176                |
| 3                                    | 0   | 1000 | ms   |                        |

| Parameter                                                         |     |       |      | Address       |
|-------------------------------------------------------------------|-----|-------|------|---------------|
| Default                                                           | Min | Max   | Unit | Logic Diagram |
| COUNT: Debounce t. count.18                                       |     |       |      | 217 177       |
| 3                                                                 | 0   | 1000  | ms   |               |
| COUNT: Debounce t. count.19                                       |     |       |      | 217 178       |
| 3                                                                 | 0   | 1000  | ms   |               |
| COUNT: Debounce t. count.20                                       |     |       |      | 217 179       |
| 3                                                                 | 0   | 1000  | ms   |               |
| COUNT: Debounce t. count.21                                       |     |       |      | 217 180       |
| 3                                                                 | 0   | 1000  | ms   |               |
| COUNT: Debounce t. count.22                                       |     |       |      | 217 181       |
| 3                                                                 | 0   | 1000  | ms   |               |
| COUNT: Debounce t. count.23                                       |     |       |      | 217 182       |
| 3                                                                 | 0   | 1000  | ms   |               |
| COUNT: Debounce t. count.24                                       |     |       |      | 217 183       |
| 3                                                                 | 0   | 1000  | ms   |               |
| Setting for the debounce time of the binary signal to be counted. |     |       |      |               |
| COUNT: Limit counter 1                                            |     |       |      | 217 221       |
| Blocked                                                           | 1   | 65000 |      |               |
| COUNT: Limit counter 5                                            |     |       |      | 027 097       |
| Blocked                                                           | 1   | 65000 |      |               |
| COUNT: Limit counter 6                                            |     |       |      | 027 098       |
| Blocked                                                           | 1   | 65000 |      |               |
| COUNT: Limit counter 7                                            |     |       |      | 027 099       |
| Blocked                                                           | 1   | 65000 |      |               |
| COUNT: Limit counter 8                                            |     |       |      | 027 100       |
| Blocked                                                           | 1   | 65000 |      |               |
| COUNT: Limit counter 9                                            |     |       |      | 027 101       |
| Blocked                                                           | 1   | 65000 |      |               |
| COUNT: Limit counter 10                                           |     |       |      | 027 102       |
| Blocked                                                           | 1   | 65000 |      |               |
| COUNT: Limit counter 11                                           |     |       |      | 027 103       |
| Blocked                                                           | 1   | 65000 |      |               |
| COUNT: Limit counter 12                                           |     |       |      | 027 104       |
| Blocked                                                           | 1   | 65000 |      |               |
| COUNT: Limit counter 13                                           |     |       |      | 027 105       |
| Blocked                                                           | 1   | 65000 |      |               |
| COUNT: Limit counter 14                                           |     |       |      | 027 106       |
| Blocked                                                           | 1   | 65000 |      |               |

| Parameter                                                                                                                                                                                                                           |     |       |      | Address                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|------|------------------------|
| Default                                                                                                                                                                                                                             | Min | Max   | Unit | Logic Diagram          |
| COUNT: Limit counter 15                                                                                                                                                                                                             |     |       |      | 027 107                |
| Blocked                                                                                                                                                                                                                             | 1   | 65000 |      |                        |
| COUNT: Limit counter 16                                                                                                                                                                                                             |     |       |      | 027 108                |
| Blocked                                                                                                                                                                                                                             | 1   | 65000 |      |                        |
| COUNT: Limit counter 17                                                                                                                                                                                                             |     |       |      | 027 109                |
| Blocked                                                                                                                                                                                                                             | 1   | 65000 |      |                        |
| COUNT: Limit counter 18                                                                                                                                                                                                             |     |       |      | 027 110                |
| Blocked                                                                                                                                                                                                                             | 1   | 65000 |      |                        |
| COUNT: Limit counter 19                                                                                                                                                                                                             |     |       |      | 027 111                |
| Blocked                                                                                                                                                                                                                             | 1   | 65000 |      |                        |
| COUNT: Limit counter 20                                                                                                                                                                                                             |     |       |      | 027 112                |
| Blocked                                                                                                                                                                                                                             | 1   | 65000 |      |                        |
| COUNT: Limit counter 21                                                                                                                                                                                                             |     |       |      | 027 113                |
| Blocked                                                                                                                                                                                                                             | 1   | 65000 |      |                        |
| COUNT: Limit counter 22                                                                                                                                                                                                             |     |       |      | 027 114                |
| Blocked                                                                                                                                                                                                                             | 1   | 65000 |      |                        |
| COUNT: Limit counter 23                                                                                                                                                                                                             |     |       |      | 027 115                |
| Blocked                                                                                                                                                                                                                             | 1   | 65000 |      |                        |
| COUNT: Limit counter 24                                                                                                                                                                                                             |     |       |      | 027 116                |
| Blocked                                                                                                                                                                                                                             | 1   | 65000 |      |                        |
| COUNT: Limit counter 2                                                                                                                                                                                                              |     |       |      | 217 222                |
| Blocked                                                                                                                                                                                                                             | 1   | 65000 |      |                        |
| COUNT: Limit counter 3                                                                                                                                                                                                              |     |       |      | 217 223                |
| Blocked                                                                                                                                                                                                                             | 1   | 65000 |      |                        |
| COUNT: Limit counter 4                                                                                                                                                                                                              |     |       |      | 217 224                |
| Blocked                                                                                                                                                                                                                             | 1   | 65000 |      |                        |
| Setting a limit for the counter value. A warning signal is issued if the counter value exceeds the set limit. Setting this parameter to <i>Blocked</i> disables the limit check.                                                    |     |       |      |                        |
| COUNT: Cycle t.count transm                                                                                                                                                                                                         |     |       |      | 217 007                |
| 0: No transmission                                                                                                                                                                                                                  |     |       |      | Fig. 3-152, (p. 3-205) |
| Setting the cycle time for the periodic transmission of the counts.                                                                                                                                                                 |     |       |      |                        |
| COUNT: IEC61850 pulsQty                                                                                                                                                                                                             |     |       |      | 221 096                |
| 1                                                                                                                                                                                                                                   | 0   | 1000  |      |                        |
| Setting the scaling factor to transmit the counter value via IEC 61850. According to the standard the resulting value is calculated as:<br>Value transmitted = actual value · pulsQty<br>(see IEC 61850: Value = actVal · pulsQty). |     |       |      |                        |

## 7.1.3.3

## Parameter Subsets

Automatic  
synchronism check

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Address                                        |         |         |               |  |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------|---------|---------------|--|--|--|--|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Min                                            | Max     | Unit    | Logic Diagram |  |  |  |  |
| ASC: Enable PSx                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 018 020                                        | 018 021 | 018 022 | 018 023       |  |  |  |  |
| 0: No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Fig. 3-92, (p. 3-133)                          |         |         |               |  |  |  |  |
| This setting defines the parameter subset in which automatic synchronism check (ASC) is enabled.                                                                                                                                                                                                                                                                                                                                                                                                              |                                                |         |         |               |  |  |  |  |
| ASC: Continuous check PSx                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 027 093                                        | 027 094 | 027 095 | 027 096       |  |  |  |  |
| 0: No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Fig. 3-98, (p. 3-139)<br>Fig. 3-99, (p. 3-140) |         |         |               |  |  |  |  |
| If this parameter is set to <i>With AR Parameter</i> or <i>With MC Parameter</i> and ASC is ready, then ASC function checks the voltages continuously.<br>In this case, operating time (018 010) ASC: Operative time PSx and close requests (AR close request, Test AR close request, MC close request, Test MC close request and DEV0x close request) are ignored and close enable signals are continuously updated. Measured values are obtained and calculated continuously, but counters are not updated. |                                                |         |         |               |  |  |  |  |
| ASC: CB assignment PSx                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 037 131                                        | 037 132 | 037 133 | 037 134       |  |  |  |  |
| 0: Not assigned                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Fig. 3-106, (p. 3-149)                         |         |         |               |  |  |  |  |
| This setting defines the function group DEVxx that will control the circuit breaker.                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                |         |         |               |  |  |  |  |
| ASC: System integrat. PSx                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 037 135                                        | 037 136 | 037 137 | 037 138       |  |  |  |  |
| 1: Autom.synchron.check                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Fig. 3-106, (p. 3-149)                         |         |         |               |  |  |  |  |
| This setting defines whether ASC will operate in “Autom. synchron. check” or “Autom. synchr. control” mode.                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |         |         |               |  |  |  |  |
| ASC: Clos.rej.w.block PSx                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 018 003                                        | 077 032 | 078 032 | 079 032       |  |  |  |  |
| 0: No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Fig. 3-93, (p. 3-134)                          |         |         |               |  |  |  |  |
| This setting defines whether reclosing is rejected after being blocked by ASC.                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                |         |         |               |  |  |  |  |
| ASC: Meas.V(T9x) USER PSx                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 016 222                                        | 016 223 | 016 224 | 016 225       |  |  |  |  |
| 0: No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                |         |         |               |  |  |  |  |
| This setting decides which voltage(s) the ASC function shall use for the operating modes “voltage-checked close enable” and “voltage/synchronism-checked close enable”:                                                                                                                                                                                                                                                                                                                                       |                                                |         |         |               |  |  |  |  |
| <ul style="list-style-type: none"><li>● If set to <i>No</i> then the three phase-to-ground voltages are checked.</li><li>● If set to <i>Yes</i> then the (single-phase) voltage measured at transformer T9x is checked. (Note that it is left to system engineering that the proper voltage – matching the setting ASC: Measurement loop PSx – is connected to the T9x input.)</li></ul>                                                                                                                      |                                                |         |         |               |  |  |  |  |

| Parameter                                                                                                                                                                                                                                                                                      |      |        |      | Address                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------|------|--------------------------------------------------|
| Default                                                                                                                                                                                                                                                                                        | Min  | Max    | Unit | Logic Diagram                                    |
| ASC: Operative time PSx                                                                                                                                                                                                                                                                        |      |        |      | 018 010 077 034 078 034 079 034                  |
| 100.0                                                                                                                                                                                                                                                                                          | 0.0  | 6000.0 | s    | Fig. 3-97, (p. 3-137)                            |
| Setting for the operative time for ASC.                                                                                                                                                                                                                                                        |      |        |      |                                                  |
| ASC: Measurement loop PSx                                                                                                                                                                                                                                                                      |      |        |      | 031 060 077 044 078 044 079 044                  |
| 4: Loop A-B                                                                                                                                                                                                                                                                                    |      |        |      | Fig. 3-91, (p. 3-132)                            |
| The voltage measurement loop, corresponding to the reference voltage, must be selected so that determination of differential values is correct.<br>Example: Connect transformer T 19 to measure the reference voltage to phases A & B. The measurement loop should be set to <i>Loop A-B</i> . |      |        |      |                                                  |
| ASC: Select mod. Vref PSx                                                                                                                                                                                                                                                                      |      |        |      | 101 200 101 201 101 202 101 203                  |
| 2: Vref on module 2                                                                                                                                                                                                                                                                            |      |        |      |                                                  |
| Setting for the transformer module which provides the reference voltage.<br>Note: For the reference voltage from transformer module at slot 03-04 <i>Vref on module 1</i> has to be set.                                                                                                       |      |        |      |                                                  |
| ASC: Phi offset PSx                                                                                                                                                                                                                                                                            |      |        |      | 018 034 077 042 078 042 079 042                  |
| 0                                                                                                                                                                                                                                                                                              | -180 | 180    | °    | Fig. 3-103, (p. 3-145)<br>Fig. 3-104, (p. 3-147) |
| Setting for a Phi offset that may be necessary so that determination of the differential angle is correct.                                                                                                                                                                                     |      |        |      |                                                  |
| ASC: AR op. mode PSx                                                                                                                                                                                                                                                                           |      |        |      | 018 025 018 026 018 027 018 028                  |
| 1: Voltage-checked                                                                                                                                                                                                                                                                             |      |        |      | Fig. 3-98, (p. 3-139)                            |
| Auto-reclosing control: Criteria for a close enable are defined by setting for the operating mode.                                                                                                                                                                                             |      |        |      |                                                  |
| ASC: AR with tCB PSx                                                                                                                                                                                                                                                                           |      |        |      | 000 038 000 039 000 050 000 051                  |
| 0: No                                                                                                                                                                                                                                                                                          |      |        |      | Fig. 3-98, (p. 3-139)                            |
| Function ASC provides a choice as to whether the CB operating time (tCB), as configured at MAIN: tCB,close is to be taken into account for the precisely synchronized reclosure (AR) or not.                                                                                                   |      |        |      |                                                  |
| ASC: AR Op. mode v-chk.PSx                                                                                                                                                                                                                                                                     |      |        |      | 018 029 018 030 018 031 018 032                  |
| 1: Vref but not V                                                                                                                                                                                                                                                                              |      |        |      | Fig. 3-98, (p. 3-139)<br>Fig. 3-101, (p. 3-142)  |
| Auto-reclosing control: This setting defines the logic linking of trigger decisions for a voltage controlled close enable.                                                                                                                                                                     |      |        |      |                                                  |

| Parameter                                                                                                                                                                                  |      |       |           | Address                                         |         |         |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|-----------|-------------------------------------------------|---------|---------|---------|
| Default                                                                                                                                                                                    | Min  | Max   | Unit      | Logic Diagram                                   |         |         |         |
| ASC: AR V> volt.check PSx                                                                                                                                                                  |      |       |           | 026 017                                         | 077 043 | 078 043 | 079 043 |
| 0.80                                                                                                                                                                                       | 0.10 | 1.20  | Vnom/(√3) | Fig. 3-98, (p. 3-139)<br>Fig. 3-101, (p. 3-142) |         |         |         |
| Auto-reclosing control: Setting the voltage threshold that the phase-to-ground voltages and the reference voltage must exceed so that they are recognized as “Voltage present”.            |      |       |           |                                                 |         |         |         |
| Note: The logic linking of trigger decisions is defined by setting ASC: AR Op.mode v-chk.PSx.                                                                                              |      |       |           |                                                 |         |         |         |
| ASC: AR V< volt.check PSx                                                                                                                                                                  |      |       |           | 018 017                                         | 077 040 | 078 040 | 079 040 |
| 0.20                                                                                                                                                                                       | 0.10 | 0.80  | Vnom/(√3) | Fig. 3-98, (p. 3-139)<br>Fig. 3-101, (p. 3-142) |         |         |         |
| Auto-reclosing control: Setting the voltage threshold that the phase-to-ground voltages and the reference voltage must fall below so that they are recognized as “No voltage”.             |      |       |           |                                                 |         |         |         |
| Note: The logic linking of trigger decisions is defined by setting ASC: AR Op.mode v-chk.PSx.                                                                                              |      |       |           |                                                 |         |         |         |
| ASC: AR tmin v-check PSx                                                                                                                                                                   |      |       |           | 018 018                                         | 077 041 | 078 041 | 079 041 |
| 0.10                                                                                                                                                                                       | 0.00 | 10.00 | s         | Fig. 3-98, (p. 3-139)<br>Fig. 3-101, (p. 3-142) |         |         |         |
| Auto-reclosing control: Setting for the operate delay value to define the minimum time period during which voltage conditions must be met so that the close enable of the ASC is effected. |      |       |           |                                                 |         |         |         |
| ASC: AR V> sync.check PSx                                                                                                                                                                  |      |       |           | 018 011                                         | 077 035 | 078 035 | 079 035 |
| 0.80                                                                                                                                                                                       | 0.40 | 1.20  | Vnom/(√3) | Fig. 3-98, (p. 3-139)<br>Fig. 3-103, (p. 3-145) |         |         |         |
| Auto-reclosing control: Setting for the threshold of the minimum voltage to obtain a synchronism checked close enable.                                                                     |      |       |           |                                                 |         |         |         |
| ASC: AR Delta Vmax PSx                                                                                                                                                                     |      |       |           | 018 012                                         | 077 036 | 078 036 | 079 036 |
| 0.10                                                                                                                                                                                       | 0.02 | 0.40  | Vnom      | Fig. 3-98, (p. 3-139)<br>Fig. 3-103, (p. 3-145) |         |         |         |
| Auto-reclosing control: Setting the maximum differential voltage between measured and reference voltages to obtain a synchronism checked close enable.                                     |      |       |           |                                                 |         |         |         |
| ASC: AR Delta f max PSx                                                                                                                                                                    |      |       |           | 018 014                                         | 077 038 | 078 038 | 079 038 |
| 0.20                                                                                                                                                                                       | 0.01 | 1.00  | Hz        | Fig. 3-98, (p. 3-139)<br>Fig. 3-103, (p. 3-145) |         |         |         |
| Auto-reclosing control: Setting the maximum differential frequency between measured and reference voltages to obtain a synchronism checked close enable.                                   |      |       |           |                                                 |         |         |         |



| Parameter                                                                                                                                                                                                                             |      |       |           | Address                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|-----------|-------------------------------------------------|
| Default                                                                                                                                                                                                                               | Min  | Max   | Unit      | Logic Diagram                                   |
| ASC: AR Delta phi max PSx                                                                                                                                                                                                             |      |       |           | 018 013 077 037 078 037 079 037                 |
| 15                                                                                                                                                                                                                                    | 5    | 100   | °         | Fig. 3-98, (p. 3-139)<br>Fig. 3-103, (p. 3-145) |
| Auto-reclosing control: Setting the maximum differential angle between measured and reference voltages to obtain a synchronism checked close enable.                                                                                  |      |       |           |                                                 |
| ASC: AR tmin sync.chk PSx                                                                                                                                                                                                             |      |       |           | 018 015 077 039 078 039 079 039                 |
| 0.10                                                                                                                                                                                                                                  | 0.00 | 10.00 | s         | Fig. 3-98, (p. 3-139)<br>Fig. 3-103, (p. 3-145) |
| Auto-reclosing control: Setting for the operate delay value to define the minimum time period during which synchronism conditions must be met so that the close enable of the ASC is effected.                                        |      |       |           |                                                 |
| ASC: MC op. mode PSx                                                                                                                                                                                                                  |      |       |           | 000 056 000 057 000 058 000 059                 |
| 1: Voltage-checked                                                                                                                                                                                                                    |      |       |           | Fig. 3-99, (p. 3-140)                           |
| Manual close command: Criteria for a close enable are defined by setting for the operating mode.                                                                                                                                      |      |       |           |                                                 |
| ASC: MC with tCB PSx                                                                                                                                                                                                                  |      |       |           | 000 102 000 103 000 104 000 105                 |
| 0: No                                                                                                                                                                                                                                 |      |       |           | Fig. 3-99, (p. 3-140)                           |
| Manual close command: In slightly asynchronous power systems, setting this parameter to Yes ensures that the circuit breaker closing time is taken into account by the automatic synchronism check (ASC) to issue of a close command. |      |       |           |                                                 |
| ASC: MC op.mode v-chk.PSx                                                                                                                                                                                                             |      |       |           | 000 060 000 061 000 062 000 063                 |
| 1: Vref but not V                                                                                                                                                                                                                     |      |       |           | Fig. 3-99, (p. 3-140)<br>Fig. 3-102, (p. 3-144) |
| Manual close command: This setting defines the logic linking of trigger decisions for a voltage controlled close enable.                                                                                                              |      |       |           |                                                 |
| ASC: MC V> volt.check PSx                                                                                                                                                                                                             |      |       |           | 000 064 000 065 000 066 000 067                 |
| 0.80                                                                                                                                                                                                                                  | 0.10 | 1.20  | Vnom(/√3) | Fig. 3-99, (p. 3-140)<br>Fig. 3-102, (p. 3-144) |
| Manual close command: Setting the voltage threshold that the phase-to-ground voltages and the reference voltage must exceed so that they are recognized as "Voltage present".                                                         |      |       |           |                                                 |
| Note: The logic linking of trigger decisions is defined by setting ASC: MC op.mode v-chk.PSx.                                                                                                                                         |      |       |           |                                                 |

| Parameter                                                                                                                                                                                    |      |       |           | Address                                         |         |         |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|-----------|-------------------------------------------------|---------|---------|---------|
| Default                                                                                                                                                                                      | Min  | Max   | Unit      | Logic Diagram                                   |         |         |         |
| ASC: MC V< volt.check PSx                                                                                                                                                                    |      |       |           | 000 068                                         | 000 069 | 000 070 | 000 071 |
| 0.20                                                                                                                                                                                         | 0.10 | 1.20  | Vnom(/√3) | Fig. 3-99, (p. 3-140)<br>Fig. 3-102, (p. 3-144) |         |         |         |
| Manual close command: Setting the voltage threshold that the phase-to-ground voltages and the reference voltage must fall below so that they are recognized as “No voltage”.                 |      |       |           |                                                 |         |         |         |
| Note: The logic linking of trigger decisions is defined by setting ASC: MC op.mode v-chk.PSx.                                                                                                |      |       |           |                                                 |         |         |         |
| ASC: MC tmin v-check PSx                                                                                                                                                                     |      |       |           | 000 072                                         | 000 073 | 000 074 | 000 075 |
| 0.10                                                                                                                                                                                         | 0.00 | 10.00 | s         | Fig. 3-99, (p. 3-140)<br>Fig. 3-102, (p. 3-144) |         |         |         |
| Manual close command: Setting for the operate delay value to define the minimum time period during which voltage conditions must be met so that the close enable of the ASC is effected.     |      |       |           |                                                 |         |         |         |
| ASC: MC V> sync.check PSx                                                                                                                                                                    |      |       |           | 000 052                                         | 000 053 | 000 054 | 000 055 |
| 0.80                                                                                                                                                                                         | 0.40 | 1.20  | Vnom(/√3) | Fig. 3-99, (p. 3-140)<br>Fig. 3-104, (p. 3-147) |         |         |         |
| Manual close command: Setting for the threshold of the minimum voltage to obtain a synchronism checked close enable.                                                                         |      |       |           |                                                 |         |         |         |
| ASC: MC Delta Vmax PSx                                                                                                                                                                       |      |       |           | 000 080                                         | 000 081 | 000 082 | 000 083 |
| 0.10                                                                                                                                                                                         | 0.02 | 0.40  | Vnom      | Fig. 3-99, (p. 3-140)<br>Fig. 3-104, (p. 3-147) |         |         |         |
| Manual close command: Setting the maximum differential voltage between measured and reference voltages to obtain a synchronism checked close enable.                                         |      |       |           |                                                 |         |         |         |
| ASC: MC Delta f max PSx                                                                                                                                                                      |      |       |           | 000 084                                         | 000 086 | 000 087 | 000 088 |
| 0.20                                                                                                                                                                                         | 0.01 | 2.00  | Hz        | Fig. 3-99, (p. 3-140)<br>Fig. 3-104, (p. 3-147) |         |         |         |
| Manual close command: Setting the maximum differential frequency between measured and reference voltages to obtain a synchronism checked close enable.                                       |      |       |           |                                                 |         |         |         |
| ASC: MC Delta phi max PSx                                                                                                                                                                    |      |       |           | 000 089                                         | 000 091 | 000 092 | 000 093 |
| 15                                                                                                                                                                                           | 5    | 100   | °         | Fig. 3-99, (p. 3-140)<br>Fig. 3-104, (p. 3-147) |         |         |         |
| Manual close command: Setting the maximum differential angle between measured and reference voltages to obtain a synchronism checked close enable.                                           |      |       |           |                                                 |         |         |         |
| ASC: MC tmin sync.chk PSx                                                                                                                                                                    |      |       |           | 000 098                                         | 000 099 | 000 100 | 000 101 |
| 0.10                                                                                                                                                                                         | 0.00 | 10.00 | s         | Fig. 3-99, (p. 3-140)<br>Fig. 3-104, (p. 3-147) |         |         |         |
| Manual close command: Setting for the operate delay value to define the minimum time period during which synchronism conditions must be met so that the close enable of the ASC is effected. |      |       |           |                                                 |         |         |         |

## 7.1.3.4

## Control

| Main function | Parameter                                                                                                         |      |      |      | Address                                          |
|---------------|-------------------------------------------------------------------------------------------------------------------|------|------|------|--------------------------------------------------|
|               | Default                                                                                                           | Min  | Max  | Unit | Logic Diagram                                    |
|               | MAIN: BI active USER                                                                                              |      |      |      | 221 003                                          |
|               | 1: Yes                                                                                                            |      |      |      | Fig. 3-125, (p. 3-170)                           |
|               | Enabling the bay interlocking function from the local control panel.                                              |      |      |      |                                                  |
|               | MAIN: SI active USER                                                                                              |      |      |      | 221 002                                          |
|               | 0: No                                                                                                             |      |      |      | Fig. 3-125, (p. 3-170)                           |
|               | Enabling the station interlocking function from the local control panel.                                          |      |      |      |                                                  |
|               | MAIN: Inp.asg. fct.block.1                                                                                        |      |      |      | 221 014                                          |
|               | 060 000: MAIN: Without function                                                                                   |      |      |      | Fig. 3-72, (p. 3-107)                            |
|               | MAIN: Inp.asg. fct.block.2                                                                                        |      |      |      | 221 022                                          |
|               | 060 000: MAIN: Without function                                                                                   |      |      |      | Fig. 3-72, (p. 3-107)                            |
|               | Definition of the binary signals assigned to function block 1 and 2.                                              |      |      |      |                                                  |
|               | MAIN: Op. delay fct. block                                                                                        |      |      |      | 221 029                                          |
|               | 0                                                                                                                 | 0    | 60   | s    | Fig. 3-72, (p. 3-107)                            |
|               | Setting for the operate delay of the function blocks.                                                             |      |      |      |                                                  |
|               | MAIN: Perm.No.mot.drive op                                                                                        |      |      |      | 221 027                                          |
|               | 15                                                                                                                | 1    | 20   |      | Fig. 3-137, (p. 3-186)                           |
|               | Setting for the permissible motor drive operations within the time interval defined at MAIN: Mon.time mot.drives. |      |      |      |                                                  |
|               | MAIN: Mon.time mot.drives                                                                                         |      |      |      | 221 026                                          |
|               | 15                                                                                                                | 1    | 20   | min  | Fig. 3-137, (p. 3-186)                           |
|               | Setting for the monitoring time to monitor the number of motor drives.                                            |      |      |      |                                                  |
|               | MAIN: Cool.time mot.drives                                                                                        |      |      |      | 221 028                                          |
|               | 3                                                                                                                 | 0    | 10   | min  | Fig. 3-137, (p. 3-186)                           |
|               | Setting for the cooling time for motors in motor-operated switchgear.                                             |      |      |      |                                                  |
|               | MAIN: Mon.time Dir.Contr.                                                                                         |      |      |      | 221 060                                          |
|               | 0.10                                                                                                              | 0.01 | 2.00 | s    | Fig. 3-140, (p. 3-190)<br>Fig. 3-141, (p. 3-191) |
|               | Setting for the monitoring time for the motor relay.                                                              |      |      |      |                                                  |
|               | MAIN: CB1 max. oper. cap.                                                                                         |      |      |      | 221 084                                          |
|               | 1                                                                                                                 | 1    | 99   |      |                                                  |
|               | MAIN: CB2 max. oper. cap.                                                                                         |      |      |      | 221 088                                          |
|               | 1                                                                                                                 | 1    | 99   |      |                                                  |
|               | Setting for the maximum number of CB operations for an ARC cycle (or for a limited time period).                  |      |      |      |                                                  |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                | Address |       |      |                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|------|----------------------------------------------------------------------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                  | Min     | Max   | Unit | Logic Diagram                                                              |
| MAIN: CB1 ready fct.assign                                                                                                                                                                                                                                                                                                                                                                                               |         |       |      | 221 085                                                                    |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                          |         |       |      |                                                                            |
| Selecting the event which, when present, will initialize the counter at MAIN: CB1 act. oper. cap. with the value at MAIN: CB1 max. oper. cap..                                                                                                                                                                                                                                                                           |         |       |      |                                                                            |
| MAIN: CB2 ready fct.assign                                                                                                                                                                                                                                                                                                                                                                                               |         |       |      | 221 089                                                                    |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                          |         |       |      |                                                                            |
| Selecting the event which, when present, will initialize the counter at MAIN: CB1 act. oper. cap. (or MAIN: CB2 act. oper. cap.) with the value at MAIN: CB1 max. oper. cap. (or MAIN: CB2 max. oper. cap., respectively).                                                                                                                                                                                               |         |       |      |                                                                            |
| MAIN: DC op. delay t1                                                                                                                                                                                                                                                                                                                                                                                                    |         |       |      | 221 240                                                                    |
| 0.10                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.00    | 2.00  | s    | Fig. 3-142, (p. 3-193)<br>Fig. 3-143, (p. 3-193)<br>Fig. 3-144, (p. 3-194) |
| Setting the delay of the commands CMD_DC1, CMD_DC2 and CMD_DC3.                                                                                                                                                                                                                                                                                                                                                          |         |       |      |                                                                            |
| MAIN: DC1 impulse t2                                                                                                                                                                                                                                                                                                                                                                                                     |         |       |      | 221 241                                                                    |
| 1.50                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.00    | 20.00 | s    | Fig. 3-142, (p. 3-193)                                                     |
| Setting the maximum duration of the command CMD_DC1.                                                                                                                                                                                                                                                                                                                                                                     |         |       |      |                                                                            |
| MAIN: DC2/3 release delay                                                                                                                                                                                                                                                                                                                                                                                                |         |       |      | 221 242                                                                    |
| 0.10                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.01    | 2.00  | s    | Fig. 3-143, (p. 3-193)<br>Fig. 3-144, (p. 3-194)                           |
| Setting the delay of the termination of the commands CMD_DC2 and CMD_DC3.                                                                                                                                                                                                                                                                                                                                                |         |       |      |                                                                            |
| MAIN: W. ext. cmd. termin.                                                                                                                                                                                                                                                                                                                                                                                               |         |       |      | 221 063                                                                    |
| 0: No                                                                                                                                                                                                                                                                                                                                                                                                                    |         |       |      |                                                                            |
| This setting determines if bay types, defined for direct motor control, can be used together with external termination contacts to directly influence the control process of motor driven switchgear.                                                                                                                                                                                                                    |         |       |      |                                                                            |
| MAIN: Cmd.end f. DC fail.                                                                                                                                                                                                                                                                                                                                                                                                |         |       |      | 221 111                                                                    |
| 1: Yes                                                                                                                                                                                                                                                                                                                                                                                                                   |         |       |      | Fig. 3-139, (p. 3-189)                                                     |
| In the case of direct motor control by motor relay K200, this parameter can be set to Yes or No. If the K200 contacts should not have opened until the end of the command to the motor when the set monitoring time-delay had expired (monitoring via binary signal input –U 706, signal SIG_1: Signal S012 EXT as the standard setting) then the direction control contacts are opened if this parameter is set to Yes. |         |       |      |                                                                            |
| If this parameter is set to No then respective fault signals (MAIN: DC fail. cmd. End, MAIN: DC fail. cmd.start, MAIN: DEV op.time exceeded) are issued when the monitoring time-delay has expired and the direction control contacts will remain closed. (Note: This behavior still bears the danger of an undefined switch position!)                                                                                  |         |       |      |                                                                            |

| Parameter                                                                                                                                                                                                                                                               |     |     |                        | Address       |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------------------------|---------------|---------|
| Default                                                                                                                                                                                                                                                                 | Min | Max | Unit                   | Logic Diagram |         |
| MAIN: ext.cmd.term. w/o PI                                                                                                                                                                                                                                              |     |     |                        |               | 221 115 |
| 1: Yes                                                                                                                                                                                                                                                                  |     |     | Fig. 3-144, (p. 3-194) |               |         |
| Select whether the command CMD_DC3 shall be terminated only by the signal SIG_DC3, or with positive indication of the final switchgear position as well.<br>(Note that in either case, the termination of CMD_DC3 is delayed by the setting MAIN: DC2/3 release delay.) |     |     |                        |               |         |

## External device

| Parameter                  | Address |     |      |               |
|----------------------------|---------|-----|------|---------------|
| Default                    | Min     | Max | Unit | Logic Diagram |
| DEV01: Designat. ext. dev. |         |     |      | 210 000       |
| 0: Not assigned            |         |     |      |               |
| DEV02: Designat. ext. dev. |         |     |      | 210 050       |
| 0: Not assigned            |         |     |      |               |
| DEV03: Designat. ext. dev. |         |     |      | 210 100       |
| 0: Not assigned            |         |     |      |               |
| DEV04: Designat. ext. dev. |         |     |      | 210 150       |
| 0: Not assigned            |         |     |      |               |
| DEV05: Designat. ext. dev. |         |     |      | 210 200       |
| 0: Not assigned            |         |     |      |               |
| DEV06: Designat. ext. dev. |         |     |      | 211 000       |
| 0: Not assigned            |         |     |      |               |
| DEV07: Designat. ext. dev. |         |     |      | 211 050       |
| 0: Not assigned            |         |     |      |               |
| DEV08: Designat. ext. dev. |         |     |      | 211 100       |
| 0: Not assigned            |         |     |      |               |
| DEV09: Designat. ext. dev. |         |     |      | 211 150       |
| 0: Not assigned            |         |     |      |               |
| DEV10: Designat. ext. dev. |         |     |      | 211 200       |
| 0: Not assigned            |         |     |      |               |
| DEV11: Designat. ext. dev. |         |     |      | 212 000       |
| 0: Not assigned            |         |     |      |               |
| DEV12: Designat. ext. dev. |         |     |      | 212 050       |
| 0: Not assigned            |         |     |      |               |
| DEV13: Designat. ext. dev. |         |     |      | 212 100       |
| 0: Not assigned            |         |     |      |               |
| DEV14: Designat. ext. dev. |         |     |      | 212 150       |
| 0: Not assigned            |         |     |      |               |
| DEV15: Designat. ext. dev. |         |     |      | 212 200       |
| 0: Not assigned            |         |     |      |               |
| DEV16: Designat. ext. dev. |         |     |      | 213 000       |
| 0: Not assigned            |         |     |      |               |
| DEV17: Designat. ext. dev. |         |     |      | 213 050       |
| 0: Not assigned            |         |     |      |               |
| DEV18: Designat. ext. dev. |         |     |      | 213 100       |
| 0: Not assigned            |         |     |      |               |
| DEV19: Designat. ext. dev. |         |     |      | 213 150       |
| 0: Not assigned            |         |     |      |               |

| Parameter                                                      |     |     |      | Address       |
|----------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                        | Min | Max | Unit | Logic Diagram |
| DEV20: Designat. ext. dev.                                     |     |     |      | 213 200       |
| 0: Not assigned                                                |     |     |      |               |
| DEV21: Designat. ext. dev.                                     |     |     |      | 214 000       |
| 0: Not assigned                                                |     |     |      |               |
| DEV22: Designat. ext. dev.                                     |     |     |      | 214 050       |
| 0: Not assigned                                                |     |     |      |               |
| DEV23: Designat. ext. dev.                                     |     |     |      | 214 100       |
| 0: Not assigned                                                |     |     |      |               |
| DEV24: Designat. ext. dev.                                     |     |     |      | 214 150       |
| 0: Not assigned                                                |     |     |      |               |
| Setting for the designation of the respective external device. |     |     |      |               |
| DEV01: DEV-Name User                                           |     |     |      | 218 101       |
| 0:                                                             |     |     |      |               |
| DEV02: DEV-Name User                                           |     |     |      | 218 102       |
| 0:                                                             |     |     |      |               |
| DEV03: DEV-Name User                                           |     |     |      | 218 103       |
| 0:                                                             |     |     |      |               |
| DEV04: DEV-Name User                                           |     |     |      | 218 104       |
| 0:                                                             |     |     |      |               |
| DEV05: DEV-Name User                                           |     |     |      | 218 105       |
| 0:                                                             |     |     |      |               |
| DEV06: DEV-Name User                                           |     |     |      | 218 106       |
| 0:                                                             |     |     |      |               |
| DEV07: DEV-Name User                                           |     |     |      | 218 107       |
| 0:                                                             |     |     |      |               |
| DEV08: DEV-Name User                                           |     |     |      | 218 108       |
| 0:                                                             |     |     |      |               |
| DEV09: DEV-Name User                                           |     |     |      | 218 109       |
| 0:                                                             |     |     |      |               |
| DEV10: DEV-Name User                                           |     |     |      | 218 110       |
| 0:                                                             |     |     |      |               |
| DEV11: DEV-Name User                                           |     |     |      | 218 111       |
| 0:                                                             |     |     |      |               |
| DEV12: DEV-Name User                                           |     |     |      | 218 112       |
| 0:                                                             |     |     |      |               |
| DEV13: DEV-Name User                                           |     |     |      | 218 113       |
| 0:                                                             |     |     |      |               |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | Address       |  |  |                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|--|--|------------------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Min | Max | Unit | Logic Diagram |  |  |                        |
| DEV14: DEV-Name User                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      |               |  |  | 218 114                |
| 0:                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |               |  |  |                        |
| DEV15: DEV-Name User                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      |               |  |  | 218 115                |
| 0:                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |               |  |  |                        |
| DEV16: DEV-Name User                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      |               |  |  | 218 116                |
| 0:                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |               |  |  |                        |
| DEV17: DEV-Name User                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      |               |  |  | 218 117                |
| 0:                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |               |  |  |                        |
| DEV18: DEV-Name User                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      |               |  |  | 218 118                |
| 0:                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |               |  |  |                        |
| DEV19: DEV-Name User                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      |               |  |  | 218 119                |
| 0:                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |               |  |  |                        |
| DEV20: DEV-Name User                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      |               |  |  | 218 130                |
| 0:                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |               |  |  |                        |
| DEV21: DEV-Name User                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      |               |  |  | 218 131                |
| 0:                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |               |  |  |                        |
| DEV22: DEV-Name User                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      |               |  |  | 218 132                |
| 0:                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |               |  |  |                        |
| DEV23: DEV-Name User                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      |               |  |  | 218 133                |
| 0:                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |               |  |  |                        |
| DEV24: DEV-Name User                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      |               |  |  | 218 134                |
| 0:                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |               |  |  |                        |
| Any text (max. 4 characters) may be entered as the devices' name which will then be used as the designation, if the associated parameter DEV01: Designat. ext. dev. has been set to <i>Device Name User</i> . When instead one of the pre-defined designations is selected at DEV01: Designat. ext. dev. it will be used and DEV01: DEV-Name User is ignored. A designation with more than 4 characters is internally truncated. (The same holds for DEV02 etc.) |     |     |      |               |  |  |                        |
| DEV01: Oper. mode cmd.                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      |               |  |  | 210 024                |
| 3: Time control                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |  |  | Fig. 3-132, (p. 3-179) |
| DEV02: Oper. mode cmd.                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      |               |  |  | 210 074                |
| 3: Time control                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |  |  |                        |
| DEV03: Oper. mode cmd.                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      |               |  |  | 210 124                |
| 3: Time control                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |  |  |                        |
| DEV04: Oper. mode cmd.                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      |               |  |  | 210 174                |
| 3: Time control                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |  |  |                        |
| DEV05: Oper. mode cmd.                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |      |               |  |  | 210 224                |
| 3: Time control                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |     |      |               |  |  |                        |



| Parameter              |     |     |      | Address       |
|------------------------|-----|-----|------|---------------|
| Default                | Min | Max | Unit | Logic Diagram |
| DEV06: Oper. mode cmd. |     |     |      | 211 024       |
| 3: Time control        |     |     |      |               |
| DEV07: Oper. mode cmd. |     |     |      | 211 074       |
| 3: Time control        |     |     |      |               |
| DEV08: Oper. mode cmd. |     |     |      | 211 124       |
| 3: Time control        |     |     |      |               |
| DEV09: Oper. mode cmd. |     |     |      | 211 174       |
| 3: Time control        |     |     |      |               |
| DEV10: Oper. mode cmd. |     |     |      | 211 224       |
| 3: Time control        |     |     |      |               |
| DEV11: Oper. mode cmd. |     |     |      | 212 024       |
| 3: Time control        |     |     |      |               |
| DEV12: Oper. mode cmd. |     |     |      | 212 074       |
| 3: Time control        |     |     |      |               |
| DEV13: Oper. mode cmd. |     |     |      | 212 124       |
| 3: Time control        |     |     |      |               |
| DEV14: Oper. mode cmd. |     |     |      | 212 174       |
| 3: Time control        |     |     |      |               |
| DEV15: Oper. mode cmd. |     |     |      | 212 224       |
| 3: Time control        |     |     |      |               |
| DEV16: Oper. mode cmd. |     |     |      | 213 024       |
| 3: Time control        |     |     |      |               |
| DEV17: Oper. mode cmd. |     |     |      | 213 074       |
| 3: Time control        |     |     |      |               |
| DEV18: Oper. mode cmd. |     |     |      | 213 124       |
| 3: Time control        |     |     |      |               |
| DEV19: Oper. mode cmd. |     |     |      | 213 174       |
| 3: Time control        |     |     |      |               |
| DEV20: Oper. mode cmd. |     |     |      | 213 224       |
| 3: Time control        |     |     |      |               |
| DEV21: Oper. mode cmd. |     |     |      | 214 024       |
| 3: Time control        |     |     |      |               |
| DEV22: Oper. mode cmd. |     |     |      | 214 074       |
| 3: Time control        |     |     |      |               |
| DEV23: Oper. mode cmd. |     |     |      | 214 124       |
| 3: Time control        |     |     |      |               |

| Parameter                                                                                     |      |      |      |  | Address                                                                                                                                                                                                        |  |  |         |
|-----------------------------------------------------------------------------------------------|------|------|------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|---------|
| Default                                                                                       | Min  | Max  | Unit |  | Logic Diagram                                                                                                                                                                                                  |  |  |         |
| DEV24: Oper. mode cmd.                                                                        |      |      |      |  |                                                                                                                                                                                                                |  |  | 214 174 |
| 3: Time control                                                                               |      |      |      |  |                                                                                                                                                                                                                |  |  |         |
| Selecting the operating mode of the command from long command, short command or time control. |      |      |      |  |                                                                                                                                                                                                                |  |  |         |
| DEV01: Latching time                                                                          |      |      |      |  |                                                                                                                                                                                                                |  |  | 210 005 |
| 0.00                                                                                          | 0.00 | 5.00 | s    |  | <a href="#">Fig. 3-129, (p. 3-176)</a><br><a href="#">Fig. 3-135, (p. 3-184)</a><br><a href="#">Fig. 3-136, (p. 3-184)</a><br><a href="#">Fig. 3-140, (p. 3-190)</a><br><a href="#">Fig. 3-141, (p. 3-191)</a> |  |  |         |
| DEV02: Latching time                                                                          |      |      |      |  |                                                                                                                                                                                                                |  |  | 210 055 |
| 0.00                                                                                          | 0.00 | 5.00 | s    |  |                                                                                                                                                                                                                |  |  |         |
| DEV03: Latching time                                                                          |      |      |      |  |                                                                                                                                                                                                                |  |  | 210 105 |
| 0.00                                                                                          | 0.00 | 5.00 | s    |  |                                                                                                                                                                                                                |  |  |         |
| DEV04: Latching time                                                                          |      |      |      |  |                                                                                                                                                                                                                |  |  | 210 155 |
| 0.00                                                                                          | 0.00 | 5.00 | s    |  |                                                                                                                                                                                                                |  |  |         |
| DEV05: Latching time                                                                          |      |      |      |  |                                                                                                                                                                                                                |  |  | 210 205 |
| 0.00                                                                                          | 0.00 | 5.00 | s    |  |                                                                                                                                                                                                                |  |  |         |
| DEV06: Latching time                                                                          |      |      |      |  |                                                                                                                                                                                                                |  |  | 211 005 |
| 0.00                                                                                          | 0.00 | 5.00 | s    |  |                                                                                                                                                                                                                |  |  |         |
| DEV07: Latching time                                                                          |      |      |      |  |                                                                                                                                                                                                                |  |  | 211 055 |
| 0.00                                                                                          | 0.00 | 5.00 | s    |  |                                                                                                                                                                                                                |  |  |         |
| DEV08: Latching time                                                                          |      |      |      |  |                                                                                                                                                                                                                |  |  | 211 105 |
| 0.00                                                                                          | 0.00 | 5.00 | s    |  |                                                                                                                                                                                                                |  |  |         |
| DEV09: Latching time                                                                          |      |      |      |  |                                                                                                                                                                                                                |  |  | 211 155 |
| 0.00                                                                                          | 0.00 | 5.00 | s    |  |                                                                                                                                                                                                                |  |  |         |
| DEV10: Latching time                                                                          |      |      |      |  |                                                                                                                                                                                                                |  |  | 211 205 |
| 0.00                                                                                          | 0.00 | 5.00 | s    |  |                                                                                                                                                                                                                |  |  |         |
| DEV11: Latching time                                                                          |      |      |      |  |                                                                                                                                                                                                                |  |  | 212 005 |
| 0.00                                                                                          | 0.00 | 5.00 | s    |  |                                                                                                                                                                                                                |  |  |         |
| DEV12: Latching time                                                                          |      |      |      |  |                                                                                                                                                                                                                |  |  | 212 055 |
| 0.00                                                                                          | 0.00 | 5.00 | s    |  |                                                                                                                                                                                                                |  |  |         |
| DEV13: Latching time                                                                          |      |      |      |  |                                                                                                                                                                                                                |  |  | 212 105 |
| 0.00                                                                                          | 0.00 | 5.00 | s    |  |                                                                                                                                                                                                                |  |  |         |
| DEV14: Latching time                                                                          |      |      |      |  |                                                                                                                                                                                                                |  |  | 212 155 |
| 0.00                                                                                          | 0.00 | 5.00 | s    |  |                                                                                                                                                                                                                |  |  |         |
| DEV15: Latching time                                                                          |      |      |      |  |                                                                                                                                                                                                                |  |  | 212 205 |
| 0.00                                                                                          | 0.00 | 5.00 | s    |  |                                                                                                                                                                                                                |  |  |         |

| Parameter                                                                                                                             |      |      |      | Address                                                                                                                                                              |  |  |         |
|---------------------------------------------------------------------------------------------------------------------------------------|------|------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|---------|
| Default                                                                                                                               | Min  | Max  | Unit | Logic Diagram                                                                                                                                                        |  |  |         |
| DEV16: Latching time                                                                                                                  |      |      |      |                                                                                                                                                                      |  |  | 213 005 |
| 0.00                                                                                                                                  | 0.00 | 5.00 | s    |                                                                                                                                                                      |  |  |         |
| DEV17: Latching time                                                                                                                  |      |      |      |                                                                                                                                                                      |  |  | 213 055 |
| 0.00                                                                                                                                  | 0.00 | 5.00 | s    |                                                                                                                                                                      |  |  |         |
| DEV18: Latching time                                                                                                                  |      |      |      |                                                                                                                                                                      |  |  | 213 105 |
| 0.00                                                                                                                                  | 0.00 | 5.00 | s    |                                                                                                                                                                      |  |  |         |
| DEV19: Latching time                                                                                                                  |      |      |      |                                                                                                                                                                      |  |  | 213 155 |
| 0.00                                                                                                                                  | 0.00 | 5.00 | s    |                                                                                                                                                                      |  |  |         |
| DEV20: Latching time                                                                                                                  |      |      |      |                                                                                                                                                                      |  |  | 213 205 |
| 0.00                                                                                                                                  | 0.00 | 5.00 | s    |                                                                                                                                                                      |  |  |         |
| DEV21: Latching time                                                                                                                  |      |      |      |                                                                                                                                                                      |  |  | 214 005 |
| 0.00                                                                                                                                  | 0.00 | 2.54 | s    |                                                                                                                                                                      |  |  |         |
| DEV22: Latching time                                                                                                                  |      |      |      |                                                                                                                                                                      |  |  | 214 055 |
| 0.00                                                                                                                                  | 0.00 | 2.54 | s    |                                                                                                                                                                      |  |  |         |
| DEV23: Latching time                                                                                                                  |      |      |      |                                                                                                                                                                      |  |  | 214 105 |
| 0.00                                                                                                                                  | 0.00 | 2.54 | s    |                                                                                                                                                                      |  |  |         |
| DEV24: Latching time                                                                                                                  |      |      |      |                                                                                                                                                                      |  |  | 214 155 |
| 0.00                                                                                                                                  | 0.00 | 2.54 | s    |                                                                                                                                                                      |  |  |         |
| Setting for the time that a control command is sustained after a switchgear position signal – “Open” or “Closed” – has been received. |      |      |      |                                                                                                                                                                      |  |  |         |
| DEV01: Op.time switch. dev.                                                                                                           |      |      |      |                                                                                                                                                                      |  |  | 210 004 |
| 20                                                                                                                                    | 0    | 254  | s    | <a href="#">Fig. 3-128, (p. 3-174)</a><br><a href="#">Fig. 3-134, (p. 3-182)</a><br><a href="#">Fig. 3-135, (p. 3-184)</a><br><a href="#">Fig. 3-140, (p. 3-190)</a> |  |  |         |
| DEV02: Op.time switch. dev.                                                                                                           |      |      |      |                                                                                                                                                                      |  |  | 210 054 |
| 20                                                                                                                                    | 0    | 254  | s    |                                                                                                                                                                      |  |  |         |
| DEV03: Op.time switch. dev.                                                                                                           |      |      |      |                                                                                                                                                                      |  |  | 210 104 |
| 20                                                                                                                                    | 0    | 254  | s    |                                                                                                                                                                      |  |  |         |
| DEV04: Op.time switch. dev.                                                                                                           |      |      |      |                                                                                                                                                                      |  |  | 210 154 |
| 20                                                                                                                                    | 0    | 254  | s    |                                                                                                                                                                      |  |  |         |
| DEV05: Op.time switch. dev.                                                                                                           |      |      |      |                                                                                                                                                                      |  |  | 210 204 |
| 20                                                                                                                                    | 0    | 254  | s    |                                                                                                                                                                      |  |  |         |
| DEV06: Op.time switch. dev.                                                                                                           |      |      |      |                                                                                                                                                                      |  |  | 211 004 |
| 20                                                                                                                                    | 0    | 254  | s    |                                                                                                                                                                      |  |  |         |
| DEV07: Op.time switch. dev.                                                                                                           |      |      |      |                                                                                                                                                                      |  |  | 211 054 |
| 20                                                                                                                                    | 0    | 254  | s    |                                                                                                                                                                      |  |  |         |

| Parameter                                                     |     |     |      |                                                  | Address       |  |         |
|---------------------------------------------------------------|-----|-----|------|--------------------------------------------------|---------------|--|---------|
| Default                                                       | Min | Max | Unit |                                                  | Logic Diagram |  |         |
| DEV08: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 211 104 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV09: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 211 154 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV10: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 211 204 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV11: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 212 004 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV12: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 212 054 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV13: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 212 104 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV14: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 212 154 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV15: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 212 204 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV16: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 213 004 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV17: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 213 054 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV18: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 213 104 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV19: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 213 154 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV20: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 213 204 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV21: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 214 004 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV22: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 214 054 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV23: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 214 104 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| DEV24: Op.time switch. dev.                                   |     |     |      |                                                  |               |  | 214 154 |
| 20                                                            | 0   | 254 | s    |                                                  |               |  |         |
| Setting the operating time for switchgear (switching device). |     |     |      |                                                  |               |  |         |
| DEV01: Gr. assign. debounc.                                   |     |     |      |                                                  |               |  | 210 011 |
| 1: Group 1                                                    |     |     |      | Fig. 3-128, (p. 3-174)<br>Fig. 3-134, (p. 3-182) |               |  |         |

| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| DEV02: Gr. assign. debounc. |     |     |      | 210 061       |
| 1: Group 1                  |     |     |      |               |
| DEV03: Gr. assign. debounc. |     |     |      | 210 111       |
| 1: Group 1                  |     |     |      |               |
| DEV04: Gr. assign. debounc. |     |     |      | 210 161       |
| 1: Group 1                  |     |     |      |               |
| DEV05: Gr. assign. debounc. |     |     |      | 210 211       |
| 1: Group 1                  |     |     |      |               |
| DEV06: Gr. assign. debounc. |     |     |      | 211 011       |
| 1: Group 1                  |     |     |      |               |
| DEV07: Gr. assign. debounc. |     |     |      | 211 061       |
| 1: Group 1                  |     |     |      |               |
| DEV08: Gr. assign. debounc. |     |     |      | 211 111       |
| 1: Group 1                  |     |     |      |               |
| DEV09: Gr. assign. debounc. |     |     |      | 211 161       |
| 1: Group 1                  |     |     |      |               |
| DEV10: Gr. assign. debounc. |     |     |      | 211 211       |
| 1: Group 1                  |     |     |      |               |
| DEV11: Gr. assing. debounc. |     |     |      | 212 011       |
| 1: Group 1                  |     |     |      |               |
| DEV12: Gr. assing. debounc. |     |     |      | 212 061       |
| 1: Group 1                  |     |     |      |               |
| DEV13: Gr. assing. debounc. |     |     |      | 212 111       |
| 1: Group 1                  |     |     |      |               |
| DEV14: Gr. assing. debounc. |     |     |      | 212 161       |
| 1: Group 1                  |     |     |      |               |
| DEV15: Gr. assing. debounc. |     |     |      | 212 211       |
| 1: Group 1                  |     |     |      |               |
| DEV16: Gr. assing. debounc. |     |     |      | 213 011       |
| 1: Group 1                  |     |     |      |               |
| DEV17: Gr. assing. debounc. |     |     |      | 213 061       |
| 1: Group 1                  |     |     |      |               |
| DEV18: Gr. assing. debounc. |     |     |      | 213 111       |
| 1: Group 1                  |     |     |      |               |
| DEV19: Gr. assing. debounc. |     |     |      | 213 161       |
| 1: Group 1                  |     |     |      |               |
| DEV20: Gr. assing. debounc. |     |     |      | 213 211       |
| 1: Group 1                  |     |     |      |               |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |      |      | Address                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|------|------------------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Min | Max  | Unit | Logic Diagram          |
| DEV21: Gr. assing. debounc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |      | 214 011                |
| 1: Group 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |      |      |                        |
| DEV22: Gr. assing. debounc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |      | 214 061                |
| 1: Group 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |      |      |                        |
| DEV23: Gr. assing. debounc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |      | 214 111                |
| 1: Group 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |      |      |                        |
| DEV24: Gr. assing. debounc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |      | 214 161                |
| 1: Group 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |      |      |                        |
| Assigning the external device to one of the groups for debouncing and chatter suppression.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |      |      |                        |
| DEV01: StartCmdTime superv.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |      | 210 007                |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.1 | 10.0 | s    | Fig. 3-134, (p. 3-182) |
| DEV02: StartCmdTime superv.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |      | 210 057                |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.1 | 10.0 | s    |                        |
| DEV03: StartCmdTime superv.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |      | 210 107                |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.1 | 10.0 | s    |                        |
| DEV04: StartCmdTime superv.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |      | 210 157                |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.1 | 10.0 | s    |                        |
| DEV05: StartCmdTime superv.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |      | 210 207                |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.1 | 10.0 | s    |                        |
| DEV06: StartCmdTime superv.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |      | 211 007                |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.1 | 10.0 | s    |                        |
| DEV07: StartCmdTime superv.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |      | 211 057                |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.1 | 10.0 | s    |                        |
| DEV08: StartCmdTime superv.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |      | 211 107                |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.1 | 10.0 | s    |                        |
| DEV09: StartCmdTime superv.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |      | 211 157                |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.1 | 10.0 | s    |                        |
| DEV10: StartCmdTime superv.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |      | 211 207                |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.1 | 10.0 | s    |                        |
| <p>This parameter allows for defining a monitoring timer for the begin of a switch command.</p> <p>After sending an Open / Close command, the corresponding timer starts. If the switchgear unit has not reached its intermediate position after this time has elapsed then the command is deactivated and MAIN: Startcmdtime exceed. is signaled.</p> <p>In the default setting <i>blocked</i> this monitoring is switched off. This is recommended for switchgear units for which it is impossible to detect the intermediate position.</p> |     |      |      |                        |

| Parameter                  |     |     |      | Address       |
|----------------------------|-----|-----|------|---------------|
| Default                    | Min | Max | Unit | Logic Diagram |
| DEV01: Interm. pos. suppr. |     |     |      | 210 012       |
| 0: No                      |     |     |      |               |
| DEV02: Interm. pos. suppr. |     |     |      | 210 062       |
| 0: No                      |     |     |      |               |
| DEV03: Interm. pos. suppr. |     |     |      | 210 112       |
| 0: No                      |     |     |      |               |
| DEV04: Interm. pos. suppr. |     |     |      | 210 162       |
| 0: No                      |     |     |      |               |
| DEV05: Interm. pos. suppr. |     |     |      | 210 212       |
| 0: No                      |     |     |      |               |
| DEV06: Interm. pos. suppr. |     |     |      | 211 012       |
| 0: No                      |     |     |      |               |
| DEV07: Interm. pos. suppr. |     |     |      | 211 062       |
| 0: No                      |     |     |      |               |
| DEV08: Interm. pos. suppr. |     |     |      | 211 112       |
| 0: No                      |     |     |      |               |
| DEV09: Interm. pos. suppr. |     |     |      | 211 162       |
| 0: No                      |     |     |      |               |
| DEV10: Interm. pos. suppr. |     |     |      | 211 212       |
| 0: No                      |     |     |      |               |
| DEV11: Interm. pos. suppr. |     |     |      | 212 012       |
| 0: No                      |     |     |      |               |
| DEV12: Interm. pos. suppr. |     |     |      | 212 062       |
| 0: No                      |     |     |      |               |
| DEV13: Interm. pos. suppr. |     |     |      | 212 112       |
| 0: No                      |     |     |      |               |
| DEV14: Interm. pos. suppr. |     |     |      | 212 162       |
| 0: No                      |     |     |      |               |
| DEV15: Interm. pos. suppr. |     |     |      | 212 212       |
| 0: No                      |     |     |      |               |
| DEV16: Interm. pos. suppr. |     |     |      | 213 012       |
| 0: No                      |     |     |      |               |
| DEV17: Interm. pos. suppr. |     |     |      | 213 062       |
| 0: No                      |     |     |      |               |
| DEV18: Interm. pos. suppr. |     |     |      | 213 112       |
| 0: No                      |     |     |      |               |
| DEV19: Interm. pos. suppr. |     |     |      | 213 162       |
| 0: No                      |     |     |      |               |

| Parameter                                                                                                                        |     |     |      | Address                                          |
|----------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|--------------------------------------------------|
| Default                                                                                                                          | Min | Max | Unit | Logic Diagram                                    |
| DEV20: Interm. pos. suppr.                                                                                                       |     |     |      | 213 212                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |
| DEV21: Interm. pos. suppr.                                                                                                       |     |     |      | 214 012                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |
| DEV22: Interm. pos. suppr.                                                                                                       |     |     |      | 214 062                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |
| DEV23: Interm. pos. suppr.                                                                                                       |     |     |      | 214 112                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |
| DEV24: Interm. pos. suppr.                                                                                                       |     |     |      | 214 162                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |
| This setting determines whether the “intermediate position” signal will be suppressed or not, while the switchgear is operating. |     |     |      |                                                  |
| DEV01: Stat.ind.interm.pos.                                                                                                      |     |     |      | 210 027                                          |
| 0: No                                                                                                                            |     |     |      | Fig. 3-128, (p. 3-174)<br>Fig. 3-134, (p. 3-182) |
| DEV02: Stat.ind.interm.pos.                                                                                                      |     |     |      | 210 077                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |
| DEV03: Stat.ind.interm.pos.                                                                                                      |     |     |      | 210 127                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |
| DEV04: Stat.ind.interm.pos.                                                                                                      |     |     |      | 210 177                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |
| DEV05: Stat.ind.interm.pos.                                                                                                      |     |     |      | 210 227                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |
| DEV06: Stat.ind.interm.pos.                                                                                                      |     |     |      | 211 027                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |
| DEV07: Stat.ind.interm.pos.                                                                                                      |     |     |      | 211 077                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |
| DEV08: Stat.ind.interm.pos.                                                                                                      |     |     |      | 211 127                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |
| DEV09: Stat.ind.interm.pos.                                                                                                      |     |     |      | 211 177                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |
| DEV10: Stat.ind.interm.pos.                                                                                                      |     |     |      | 211 227                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |
| DEV11: Stat.ind.interm.pos.                                                                                                      |     |     |      | 212 027                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |
| DEV12: Stat.ind.interm.pos.                                                                                                      |     |     |      | 212 077                                          |
| 0: No                                                                                                                            |     |     |      |                                                  |



| Parameter                                                                                                                         |     |     |      | Address                                          |
|-----------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|--------------------------------------------------|
| Default                                                                                                                           | Min | Max | Unit | Logic Diagram                                    |
| DEV13: Stat.ind.interm.pos.                                                                                                       |     |     |      | 212 127                                          |
| 0: No                                                                                                                             |     |     |      |                                                  |
| DEV14: Stat.ind.interm.pos.                                                                                                       |     |     |      | 212 177                                          |
| 0: No                                                                                                                             |     |     |      |                                                  |
| DEV15: Stat.ind.interm.pos.                                                                                                       |     |     |      | 212 227                                          |
| 0: No                                                                                                                             |     |     |      |                                                  |
| DEV16: Stat.ind.interm.pos.                                                                                                       |     |     |      | 213 027                                          |
| 0: No                                                                                                                             |     |     |      |                                                  |
| DEV17: Stat.ind.interm.pos.                                                                                                       |     |     |      | 213 077                                          |
| 0: No                                                                                                                             |     |     |      |                                                  |
| DEV18: Stat.ind.interm.pos.                                                                                                       |     |     |      | 213 127                                          |
| 0: No                                                                                                                             |     |     |      |                                                  |
| DEV19: Stat.ind.interm.pos.                                                                                                       |     |     |      | 213 177                                          |
| 0: No                                                                                                                             |     |     |      |                                                  |
| DEV20: Stat.ind.interm.pos.                                                                                                       |     |     |      | 213 227                                          |
| 0: No                                                                                                                             |     |     |      |                                                  |
| DEV21: Stat.ind.interm.pos.                                                                                                       |     |     |      | 214 027                                          |
| 0: No                                                                                                                             |     |     |      |                                                  |
| DEV22: Stat.ind.interm.pos.                                                                                                       |     |     |      | 214 077                                          |
| 0: No                                                                                                                             |     |     |      |                                                  |
| DEV23: Stat.ind.interm.pos.                                                                                                       |     |     |      | 214 127                                          |
| 0: No                                                                                                                             |     |     |      |                                                  |
| DEV24: Stat.ind.interm.pos.                                                                                                       |     |     |      | 214 177                                          |
| 0: No                                                                                                                             |     |     |      |                                                  |
| This setting determines whether the actual status will be signaled with a 5 s delay after the “Faulty position” signal is issued. |     |     |      |                                                  |
| DEV01: Inp.asg. sw.tr. plug                                                                                                       |     |     |      | 210 014                                          |
| 060 000: MAIN: Without function                                                                                                   |     |     |      | Fig. 3-128, (p. 3-174)<br>Fig. 3-134, (p. 3-182) |
| DEV02: Inp.asg. sw.tr. plug                                                                                                       |     |     |      | 210 064                                          |
| 060 000: MAIN: Without function                                                                                                   |     |     |      |                                                  |
| DEV03: Inp.asg. sw.tr. plug                                                                                                       |     |     |      | 210 114                                          |
| 060 000: MAIN: Without function                                                                                                   |     |     |      |                                                  |
| DEV04: Inp.asg. sw.tr. plug                                                                                                       |     |     |      | 210 164                                          |
| 060 000: MAIN: Without function                                                                                                   |     |     |      |                                                  |
| DEV05: Inp.asg. sw.tr. plug                                                                                                       |     |     |      | 210 214                                          |
| 060 000: MAIN: Without function                                                                                                   |     |     |      |                                                  |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV06: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 211 014 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV07: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 211 064 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV08: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 211 114 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV09: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 211 164 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV10: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 211 214 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV11: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 212 014 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV12: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 212 064 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV13: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 212 114 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV14: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 212 164 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV15: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 212 214 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV16: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 213 014 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV17: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 213 064 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV18: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 213 114 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV19: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 213 164 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV20: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 213 214 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV21: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 214 014 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV22: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 214 064 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV23: Inp.asg. sw.tr. plug     |     |     |      |  |               |  | 214 114 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |

| Parameter                                                                                                                  |     |     |      | Address       |
|----------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                    | Min | Max | Unit | Logic Diagram |
| DEV24: Inp.asg.sw.tr.plug                                                                                                  |     |     |      | 214 164       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| Definition of the binary signal that is used to signal the position ("plugged-in" / "unplugged") of the switch truck plug. |     |     |      |               |
| DEV01: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 210 019       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| Fig. 3-129, (p. 3-176)                                                                                                     |     |     |      |               |
| DEV02: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 210 069       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| DEV03: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 210 119       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| DEV04: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 210 169       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| DEV05: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 210 219       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| DEV06: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 211 019       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| DEV07: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 211 069       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| DEV08: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 211 119       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| DEV09: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 211 169       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| DEV10: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 211 219       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| DEV11: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 212 019       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| DEV12: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 212 069       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| DEV13: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 212 119       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| DEV14: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 212 169       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| DEV15: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 212 219       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| DEV16: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 213 019       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |
| DEV17: Inp.asg.el.ctrl.open                                                                                                |     |     |      | 213 069       |
| 060 000: MAIN: Without function                                                                                            |     |     |      |               |

| Parameter                                                                                                                                                                                                                        |     |     |      |  | Address                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|--|------------------------|
| Default                                                                                                                                                                                                                          | Min | Max | Unit |  | Logic Diagram          |
| DEV18: Inp.asg.el.ctrl.open                                                                                                                                                                                                      |     |     |      |  | 213 119                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |
| DEV19: Inp.asg.el.ctrl.open                                                                                                                                                                                                      |     |     |      |  | 213 169                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |
| DEV20: Inp.asg.el.ctrl.open                                                                                                                                                                                                      |     |     |      |  | 213 219                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |
| DEV21: Inp.asg.el.ctrl.open                                                                                                                                                                                                      |     |     |      |  | 214 019                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |
| DEV22: Inp.asg.el.ctrl.open                                                                                                                                                                                                      |     |     |      |  | 214 069                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |
| DEV23: Inp.asg.el.ctrl.open                                                                                                                                                                                                      |     |     |      |  | 214 119                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |
| DEV24: Inp.asg.el.ctrl.open                                                                                                                                                                                                      |     |     |      |  | 214 169                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |
| <p>This setting defines the binary signal that will be used as the control signal to move the switchgear unit to the open position.</p> <p>Note: Only signals that are defined in the DEVxx function groups can be selected.</p> |     |     |      |  |                        |
| DEV01: Inp.asg.el.ctr.close                                                                                                                                                                                                      |     |     |      |  | 210 020                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  | Fig. 3-129, (p. 3-176) |
| DEV02: Inp.asg.el.ctr.close                                                                                                                                                                                                      |     |     |      |  | 210 070                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |
| DEV03: Inp.asg.el.ctr.close                                                                                                                                                                                                      |     |     |      |  | 210 120                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |
| DEV04: Inp.asg.el.ctr.close                                                                                                                                                                                                      |     |     |      |  | 210 170                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |
| DEV05: Inp.asg.el.ctr.close                                                                                                                                                                                                      |     |     |      |  | 210 220                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |
| DEV06: Inp.asg.el.ctr.close                                                                                                                                                                                                      |     |     |      |  | 211 020                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |
| DEV07: Inp.asg.el.ctr.close                                                                                                                                                                                                      |     |     |      |  | 211 070                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |
| DEV08: Inp.asg.el.ctr.close                                                                                                                                                                                                      |     |     |      |  | 211 120                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |
| DEV09: Inp.asg.el.ctr.close                                                                                                                                                                                                      |     |     |      |  | 211 170                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |
| DEV10: Inp.asg.el.ctr.close                                                                                                                                                                                                      |     |     |      |  | 211 220                |
| 060 000: MAIN: Without function                                                                                                                                                                                                  |     |     |      |  |                        |

| Parameter                                                                                                                                                                                                                            |     |     |      | Address       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                                                              | Min | Max | Unit | Logic Diagram |
| DEV11: Inp.asg.el.ctr.close                                                                                                                                                                                                          |     |     |      | 212 020       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |
| DEV12: Inp.asg.el.ctr.close                                                                                                                                                                                                          |     |     |      | 212 070       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |
| DEV13: Inp.asg.el.ctr.close                                                                                                                                                                                                          |     |     |      | 212 120       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |
| DEV14: Inp.asg.el.ctr.close                                                                                                                                                                                                          |     |     |      | 212 170       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |
| DEV15: Inp.asg.el.ctr.close                                                                                                                                                                                                          |     |     |      | 212 220       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |
| DEV16: Inp.asg.el.ctr.close                                                                                                                                                                                                          |     |     |      | 213 020       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |
| DEV17: Inp.asg.el.ctr.close                                                                                                                                                                                                          |     |     |      | 213 070       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |
| DEV18: Inp.asg.el.ctr.close                                                                                                                                                                                                          |     |     |      | 213 120       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |
| DEV19: Inp.asg.el.ctr.close                                                                                                                                                                                                          |     |     |      | 213 170       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |
| DEV20: Inp.asg.el.ctr.close                                                                                                                                                                                                          |     |     |      | 213 220       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |
| DEV21: Inp.asg.el.ctr.close                                                                                                                                                                                                          |     |     |      | 214 020       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |
| DEV22: Inp.asg.el.ctr.close                                                                                                                                                                                                          |     |     |      | 214 070       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |
| DEV23: Inp.asg.el.ctr.close                                                                                                                                                                                                          |     |     |      | 214 120       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |
| DEV24: Inp.asg.el.ctr.close                                                                                                                                                                                                          |     |     |      | 214 170       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |
| <p>This setting defines the binary signal that will be used as the control signal to move the switchgear unit to the "Closed" position.</p> <p>Note: Only signals that are defined in the DEVxx function groups can be selected.</p> |     |     |      |               |
| DEV01: Block cmd open                                                                                                                                                                                                                |     |     |      | 218 120       |
| 060 000: MAIN: Without function <span style="color: green;">Fig. 3-133, (p. 3-180)</span>                                                                                                                                            |     |     |      |               |
| DEV02: Block cmd open                                                                                                                                                                                                                |     |     |      | 218 121       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |
| DEV03: Block cmd open                                                                                                                                                                                                                |     |     |      | 218 122       |
| 060 000: MAIN: Without function                                                                                                                                                                                                      |     |     |      |               |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV04: Block cmd open           |     |     |      |  |               |  | 218 123 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV05: Block cmd open           |     |     |      |  |               |  | 218 124 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV06: Block cmd open           |     |     |      |  |               |  | 218 125 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV07: Block cmd open           |     |     |      |  |               |  | 218 126 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV08: Block cmd open           |     |     |      |  |               |  | 218 127 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV09: Block cmd open           |     |     |      |  |               |  | 218 128 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV10: Block cmd open           |     |     |      |  |               |  | 218 129 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV11: Block cmd open           |     |     |      |  |               |  | 218 135 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV12: Block cmd open           |     |     |      |  |               |  | 218 136 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV13: Block cmd open           |     |     |      |  |               |  | 218 137 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV14: Block cmd open           |     |     |      |  |               |  | 218 138 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV15: Block cmd open           |     |     |      |  |               |  | 218 139 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV16: Block cmd open           |     |     |      |  |               |  | 218 140 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV17: Block cmd open           |     |     |      |  |               |  | 218 141 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV18: Block cmd open           |     |     |      |  |               |  | 218 142 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV19: Block cmd open           |     |     |      |  |               |  | 218 143 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV20: Block cmd open           |     |     |      |  |               |  | 218 144 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV21: Block cmd open           |     |     |      |  |               |  | 218 145 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV22: Block cmd open           |     |     |      |  |               |  | 218 146 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |

| Parameter                                                              |     |     |      | Address                |
|------------------------------------------------------------------------|-----|-----|------|------------------------|
| Default                                                                | Min | Max | Unit | Logic Diagram          |
| DEV23: Block cmd open                                                  |     |     |      | 218 147                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| DEV24: Block cmd open                                                  |     |     |      | 218 148                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| Select whether open commands for the switchgear unit shall be blocked. |     |     |      |                        |
| DEV01: Block cmd close                                                 |     |     |      | 218 160                |
| 060 000: MAIN: Without function                                        |     |     |      | Fig. 3-133, (p. 3-180) |
| DEV02: Block cmd close                                                 |     |     |      | 218 161                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| DEV03: Block cmd close                                                 |     |     |      | 218 162                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| DEV04: Block cmd close                                                 |     |     |      | 218 163                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| DEV05: Block cmd close                                                 |     |     |      | 218 164                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| DEV06: Block cmd close                                                 |     |     |      | 218 165                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| DEV07: Block cmd close                                                 |     |     |      | 218 166                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| DEV08: Block cmd close                                                 |     |     |      | 218 167                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| DEV09: Block cmd close                                                 |     |     |      | 218 168                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| DEV10: Block cmd close                                                 |     |     |      | 218 169                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| DEV11: Block cmd close                                                 |     |     |      | 218 170                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| DEV12: Block cmd close                                                 |     |     |      | 218 171                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| DEV13: Block cmd close                                                 |     |     |      | 218 172                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| DEV14: Block cmd close                                                 |     |     |      | 218 173                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| DEV15: Block cmd close                                                 |     |     |      | 218 174                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |
| DEV16: Block cmd close                                                 |     |     |      | 218 175                |
| 060 000: MAIN: Without function                                        |     |     |      |                        |

| Parameter                                                               |     |       |      |  | Address                |  |         |
|-------------------------------------------------------------------------|-----|-------|------|--|------------------------|--|---------|
| Default                                                                 | Min | Max   | Unit |  | Logic Diagram          |  |         |
| DEV17: Block cmd close                                                  |     |       |      |  |                        |  | 218 176 |
| 060 000: MAIN: Without function                                         |     |       |      |  |                        |  |         |
| DEV18: Block cmd close                                                  |     |       |      |  |                        |  | 218 177 |
| 060 000: MAIN: Without function                                         |     |       |      |  |                        |  |         |
| DEV19: Block cmd close                                                  |     |       |      |  |                        |  | 218 178 |
| 060 000: MAIN: Without function                                         |     |       |      |  |                        |  |         |
| DEV20: Block cmd close                                                  |     |       |      |  |                        |  | 218 179 |
| 060 000: MAIN: Without function                                         |     |       |      |  |                        |  |         |
| DEV21: Block cmd close                                                  |     |       |      |  |                        |  | 218 180 |
| 060 000: MAIN: Without function                                         |     |       |      |  |                        |  |         |
| DEV22: Block cmd close                                                  |     |       |      |  |                        |  | 218 181 |
| 060 000: MAIN: Without function                                         |     |       |      |  |                        |  |         |
| DEV23: Block cmd close                                                  |     |       |      |  |                        |  | 218 182 |
| 060 000: MAIN: Without function                                         |     |       |      |  |                        |  |         |
| DEV24: Block cmd close                                                  |     |       |      |  |                        |  | 218 183 |
| 060 000: MAIN: Without function                                         |     |       |      |  |                        |  |         |
| Select whether close commands for the switchgear unit shall be blocked. |     |       |      |  |                        |  |         |
| DEV01: Oper.count.limit                                                 |     |       |      |  |                        |  | 218 211 |
| Blocked                                                                 | 1   | 65000 |      |  | Fig. 3-138, (p. 3-186) |  |         |
| DEV02: Oper.count.limit                                                 |     |       |      |  |                        |  | 218 212 |
| Blocked                                                                 | 1   | 65000 |      |  |                        |  |         |
| DEV03: Oper.count.limit                                                 |     |       |      |  |                        |  | 218 213 |
| Blocked                                                                 | 1   | 65000 |      |  |                        |  |         |
| DEV04: Oper.count.limit                                                 |     |       |      |  |                        |  | 218 214 |
| Blocked                                                                 | 1   | 65000 |      |  |                        |  |         |
| DEV05: Oper.count.limit                                                 |     |       |      |  |                        |  | 218 215 |
| Blocked                                                                 | 1   | 65000 |      |  |                        |  |         |
| DEV06: Oper.count.limit                                                 |     |       |      |  |                        |  | 218 216 |
| Blocked                                                                 | 1   | 65000 |      |  |                        |  |         |
| DEV07: Oper.count.limit                                                 |     |       |      |  |                        |  | 218 217 |
| Blocked                                                                 | 1   | 65000 |      |  |                        |  |         |
| DEV08: Oper.count.limit                                                 |     |       |      |  |                        |  | 218 218 |
| Blocked                                                                 | 1   | 65000 |      |  |                        |  |         |
| DEV09: Oper.count.limit                                                 |     |       |      |  |                        |  | 218 219 |
| Blocked                                                                 | 1   | 65000 |      |  |                        |  |         |
| DEV10: Oper.count.limit                                                 |     |       |      |  |                        |  | 218 220 |
| Blocked                                                                 | 1   | 65000 |      |  |                        |  |         |



| Parameter                                                                                      |     |       |      |  | Address                |
|------------------------------------------------------------------------------------------------|-----|-------|------|--|------------------------|
| Default                                                                                        | Min | Max   | Unit |  | Logic Diagram          |
| DEV11: Oper.count.limit                                                                        |     |       |      |  | 218 221                |
| Blocked                                                                                        | 1   | 65000 |      |  |                        |
| DEV12: Oper.count.limit                                                                        |     |       |      |  | 218 222                |
| Blocked                                                                                        | 1   | 65000 |      |  |                        |
| DEV13: Oper.count.limit                                                                        |     |       |      |  | 218 223                |
| Blocked                                                                                        | 1   | 65000 |      |  |                        |
| DEV14: Oper.count.limit                                                                        |     |       |      |  | 218 224                |
| Blocked                                                                                        | 1   | 65000 |      |  |                        |
| DEV15: Oper.count.limit                                                                        |     |       |      |  | 218 225                |
| Blocked                                                                                        | 1   | 65000 |      |  |                        |
| DEV16: Oper.count.limit                                                                        |     |       |      |  | 218 226                |
| Blocked                                                                                        | 1   | 65000 |      |  |                        |
| DEV17: Oper.count.limit                                                                        |     |       |      |  | 218 227                |
| Blocked                                                                                        | 1   | 65000 |      |  |                        |
| DEV18: Oper.count.limit                                                                        |     |       |      |  | 218 228                |
| Blocked                                                                                        | 1   | 65000 |      |  |                        |
| DEV19: Oper.count.limit                                                                        |     |       |      |  | 218 229                |
| Blocked                                                                                        | 1   | 65000 |      |  |                        |
| DEV20: Oper.count.limit                                                                        |     |       |      |  | 218 230                |
| Blocked                                                                                        | 1   | 65000 |      |  |                        |
| DEV21: Oper.count.limit                                                                        |     |       |      |  | 218 231                |
| Blocked                                                                                        | 1   | 65000 |      |  |                        |
| DEV22: Oper.count.limit                                                                        |     |       |      |  | 218 232                |
| Blocked                                                                                        | 1   | 65000 |      |  |                        |
| DEV23: Oper.count.limit                                                                        |     |       |      |  | 218 233                |
| Blocked                                                                                        | 1   | 65000 |      |  |                        |
| DEV24: Oper.count.limit                                                                        |     |       |      |  | 218 234                |
| Blocked                                                                                        | 1   | 65000 |      |  |                        |
| Setting a limit value for the number of switching commands for the respective switchgear unit. |     |       |      |  |                        |
| DEV01: Inp. asg. end Open                                                                      |     |       |      |  | 210 015                |
| 060 000: MAIN: Without function                                                                |     |       |      |  | Fig. 3-139, (p. 3-189) |
| DEV02: Inp. asg. end Open                                                                      |     |       |      |  | 210 065                |
| 060 000: MAIN: Without function                                                                |     |       |      |  |                        |
| DEV03: Inp. asg. end Open                                                                      |     |       |      |  | 210 115                |
| 060 000: MAIN: Without function                                                                |     |       |      |  |                        |
| DEV04: Inp. asg. end Open                                                                      |     |       |      |  | 210 165                |
| 060 000: MAIN: Without function                                                                |     |       |      |  |                        |

| Parameter                       |     |     |      |  | Address       |     |  |
|---------------------------------|-----|-----|------|--|---------------|-----|--|
| Default                         | Min | Max | Unit |  | Logic Diagram |     |  |
| DEV05: Inp. asg. end Open       |     |     |      |  | 210           | 215 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV06: Inp. asg. end Open       |     |     |      |  | 211           | 015 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV07: Inp. asg. end Open       |     |     |      |  | 211           | 065 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV08: Inp. asg. end Open       |     |     |      |  | 211           | 115 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV09: Inp. asg. end Open       |     |     |      |  | 211           | 165 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV10: Inp. asg. end Open       |     |     |      |  | 211           | 215 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV11: Inp. asg. end Open       |     |     |      |  | 212           | 015 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV12: Inp. asg. end Open       |     |     |      |  | 212           | 065 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV13: Inp. asg. end Open       |     |     |      |  | 212           | 115 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV14: Inp. asg. end Open       |     |     |      |  | 212           | 165 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV15: Inp. asg. end Open       |     |     |      |  | 212           | 215 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV16: Inp. asg. end Open       |     |     |      |  | 213           | 015 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV17: Inp. asg. end Open       |     |     |      |  | 213           | 065 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV18: Inp. asg. end Open       |     |     |      |  | 213           | 115 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV19: Inp. asg. end Open       |     |     |      |  | 213           | 165 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV20: Inp. asg. end Open       |     |     |      |  | 213           | 215 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV21: Inp. asg. end Open       |     |     |      |  | 214           | 015 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV22: Inp. asg. end Open       |     |     |      |  | 214           | 065 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |
| DEV23: Inp. asg. end Open       |     |     |      |  | 214           | 115 |  |
| 060 000: MAIN: Without function |     |     |      |  |               |     |  |

| Parameter                                                                                 |     |     |      | Address                |
|-------------------------------------------------------------------------------------------|-----|-----|------|------------------------|
| Default                                                                                   | Min | Max | Unit | Logic Diagram          |
| DEV24: Inp. asg. end Open                                                                 |     |     |      | 214 165                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| This setting defines the binary signal that will be used to terminate the “Open” command. |     |     |      |                        |
| DEV01: Inp. asg. end Close                                                                |     |     |      | 210 016                |
| 060 000: MAIN: Without function                                                           |     |     |      | Fig. 3-139, (p. 3-189) |
| DEV02: Inp. asg. end Close                                                                |     |     |      | 210 066                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| DEV03: Inp. asg. end Close                                                                |     |     |      | 210 116                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| DEV04: Inp. asg. end Close                                                                |     |     |      | 210 166                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| DEV05: Inp. asg. end Close                                                                |     |     |      | 210 216                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| DEV06: Inp. asg. end Close                                                                |     |     |      | 211 016                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| DEV07: Inp. asg. end Close                                                                |     |     |      | 211 066                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| DEV08: Inp. asg. end Close                                                                |     |     |      | 211 116                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| DEV09: Inp. asg. end Close                                                                |     |     |      | 211 166                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| DEV10: Inp. asg. end Close                                                                |     |     |      | 211 216                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| DEV11: Inp. asg. end Close                                                                |     |     |      | 212 016                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| DEV12: Inp. asg. end Close                                                                |     |     |      | 212 066                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| DEV13: Inp. asg. end Close                                                                |     |     |      | 212 116                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| DEV14: Inp. asg. end Close                                                                |     |     |      | 212 166                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| DEV15: Inp. asg. end Close                                                                |     |     |      | 212 216                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| DEV16: Inp. asg. end Close                                                                |     |     |      | 213 016                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |
| DEV17: Inp. asg. end Close                                                                |     |     |      | 213 066                |
| 060 000: MAIN: Without function                                                           |     |     |      |                        |

| Parameter                                                                                  |     |     |      | Address                |
|--------------------------------------------------------------------------------------------|-----|-----|------|------------------------|
| Default                                                                                    | Min | Max | Unit | Logic Diagram          |
| DEV18: Inp. asg. end Close                                                                 |     |     |      | 213 116                |
| 060 000: MAIN: Without function                                                            |     |     |      |                        |
| DEV19: Inp. asg. end Close                                                                 |     |     |      | 213 166                |
| 060 000: MAIN: Without function                                                            |     |     |      |                        |
| DEV20: Inp. asg. end Close                                                                 |     |     |      | 213 216                |
| 060 000: MAIN: Without function                                                            |     |     |      |                        |
| DEV21: Inp. asg. end Close                                                                 |     |     |      | 214 016                |
| 060 000: MAIN: Without function                                                            |     |     |      |                        |
| DEV22: Inp. asg. end Close                                                                 |     |     |      | 214 066                |
| 060 000: MAIN: Without function                                                            |     |     |      |                        |
| DEV23: Inp. asg. end Close                                                                 |     |     |      | 214 116                |
| 060 000: MAIN: Without function                                                            |     |     |      |                        |
| DEV24: Inp. asg. end Close                                                                 |     |     |      | 214 166                |
| 060 000: MAIN: Without function                                                            |     |     |      |                        |
| This setting defines the binary signal that will be used to terminate the "Close" command. |     |     |      |                        |
| DEV01: Open w/o stat.interl                                                                |     |     |      | 210 025                |
| 0: No                                                                                      |     |     |      | Fig. 3-131, (p. 3-178) |
| DEV02: Open w/o stat.interl                                                                |     |     |      | 210 075                |
| 0: No                                                                                      |     |     |      |                        |
| DEV03: Open w/o stat.interl                                                                |     |     |      | 210 125                |
| 0: No                                                                                      |     |     |      |                        |
| DEV04: Open w/o stat.interl                                                                |     |     |      | 210 175                |
| 0: No                                                                                      |     |     |      |                        |
| DEV05: Open w/o stat.interl                                                                |     |     |      | 210 225                |
| 0: No                                                                                      |     |     |      |                        |
| DEV06: Open w/o stat.interl                                                                |     |     |      | 211 025                |
| 0: No                                                                                      |     |     |      |                        |
| DEV07: Open w/o stat.interl                                                                |     |     |      | 211 075                |
| 0: No                                                                                      |     |     |      |                        |
| DEV08: Open w/o stat.interl                                                                |     |     |      | 211 125                |
| 0: No                                                                                      |     |     |      |                        |
| DEV09: Open w/o stat.interl                                                                |     |     |      | 211 175                |
| 0: No                                                                                      |     |     |      |                        |
| DEV10: Open w/o stat.interl                                                                |     |     |      | 211 225                |
| 0: No                                                                                      |     |     |      |                        |
| DEV11: Open w/o stat.interl                                                                |     |     |      | 212 025                |
| 0: No                                                                                      |     |     |      |                        |

| Parameter                                                                                                                   |     |     |      | Address                |
|-----------------------------------------------------------------------------------------------------------------------------|-----|-----|------|------------------------|
| Default                                                                                                                     | Min | Max | Unit | Logic Diagram          |
| DEV12: Open w/o stat.interl                                                                                                 |     |     |      | 212 075                |
| 0: No                                                                                                                       |     |     |      |                        |
| DEV13: Open w/o stat.interl                                                                                                 |     |     |      | 212 125                |
| 0: No                                                                                                                       |     |     |      |                        |
| DEV14: Open w/o stat.interl                                                                                                 |     |     |      | 212 175                |
| 0: No                                                                                                                       |     |     |      |                        |
| DEV15: Open w/o stat.interl                                                                                                 |     |     |      | 212 225                |
| 0: No                                                                                                                       |     |     |      |                        |
| DEV16: Open w/o stat.interl                                                                                                 |     |     |      | 213 025                |
| 0: No                                                                                                                       |     |     |      |                        |
| DEV17: Open w/o stat.interl                                                                                                 |     |     |      | 213 075                |
| 0: No                                                                                                                       |     |     |      |                        |
| DEV18: Open w/o stat.interl                                                                                                 |     |     |      | 213 125                |
| 0: No                                                                                                                       |     |     |      |                        |
| DEV19: Open w/o stat.interl                                                                                                 |     |     |      | 213 175                |
| 0: No                                                                                                                       |     |     |      |                        |
| DEV20: Open w/o stat.interl                                                                                                 |     |     |      | 213 225                |
| 0: No                                                                                                                       |     |     |      |                        |
| DEV21: Open w/o stat.interl                                                                                                 |     |     |      | 214 025                |
| 0: No                                                                                                                       |     |     |      |                        |
| DEV22: Open w/o stat.interl                                                                                                 |     |     |      | 214 075                |
| 0: No                                                                                                                       |     |     |      |                        |
| DEV23: Open w/o stat.interl                                                                                                 |     |     |      | 214 125                |
| 0: No                                                                                                                       |     |     |      |                        |
| DEV24: Open w/o stat.interl                                                                                                 |     |     |      | 214 175                |
| 0: No                                                                                                                       |     |     |      |                        |
| This setting specifies whether switching to "Open" position is permitted without a check by the station interlock function. |     |     |      |                        |
| DEV01: Close w/o stat. int.                                                                                                 |     |     |      | 210 026                |
| 0: No                                                                                                                       |     |     |      | Fig. 3-131, (p. 3-178) |
| DEV02: Close w/o stat. int.                                                                                                 |     |     |      | 210 076                |
| 0: No                                                                                                                       |     |     |      |                        |
| DEV03: Close w/o stat. int.                                                                                                 |     |     |      | 210 126                |
| 0: No                                                                                                                       |     |     |      |                        |
| DEV04: Close w/o stat. int.                                                                                                 |     |     |      | 210 176                |
| 0: No                                                                                                                       |     |     |      |                        |
| DEV05: Close w/o stat. int.                                                                                                 |     |     |      | 210 226                |
| 0: No                                                                                                                       |     |     |      |                        |

| Parameter                   |     |     |      | Address       |  |  |         |
|-----------------------------|-----|-----|------|---------------|--|--|---------|
| Default                     | Min | Max | Unit | Logic Diagram |  |  |         |
| DEV06: Close w/o stat. int. |     |     |      |               |  |  | 211 026 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV07: Close w/o stat. int. |     |     |      |               |  |  | 211 076 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV08: Close w/o stat. int. |     |     |      |               |  |  | 211 126 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV09: Close w/o stat. int. |     |     |      |               |  |  | 211 176 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV10: Close w/o stat. int. |     |     |      |               |  |  | 211 226 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV11: Close w/o stat. int. |     |     |      |               |  |  | 212 026 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV12: Close w/o stat. int. |     |     |      |               |  |  | 212 076 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV13: Close w/o stat. int. |     |     |      |               |  |  | 212 126 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV14: Close w/o stat. int. |     |     |      |               |  |  | 212 176 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV15: Close w/o stat. int. |     |     |      |               |  |  | 212 226 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV16: Close w/o stat. int. |     |     |      |               |  |  | 213 026 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV17: Close w/o stat. int. |     |     |      |               |  |  | 213 076 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV18: Close w/o stat. int. |     |     |      |               |  |  | 213 126 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV19: Close w/o stat. int. |     |     |      |               |  |  | 213 176 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV20: Close w/o stat. int. |     |     |      |               |  |  | 213 226 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV21: Close w/o stat. int. |     |     |      |               |  |  | 214 026 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV22: Close w/o stat. int. |     |     |      |               |  |  | 214 076 |
| 0: No                       |     |     |      |               |  |  |         |
| DEV23: Close w/o stat. int. |     |     |      |               |  |  | 214 126 |
| 0: No                       |     |     |      |               |  |  |         |

| Parameter                                                                                                                     |     |     |      | Address                |
|-------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|------------------------|
| Default                                                                                                                       | Min | Max | Unit | Logic Diagram          |
| DEV24: Close w/o stat. int.                                                                                                   |     |     |      | 214 176                |
| 0: No                                                                                                                         |     |     |      |                        |
| This setting specifies whether switching to “Closed” position is permitted without a check by the station interlock function. |     |     |      |                        |
| DEV01: Fct.assig.BlwSI open                                                                                                   |     |     |      | 210 039                |
| 060 000: MAIN: Without function                                                                                               |     |     |      | Fig. 3-130, (p. 3-177) |
| DEV02: Fct.assig.BlwSI open                                                                                                   |     |     |      | 210 089                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |
| DEV03: Fct.assig.BlwSI open                                                                                                   |     |     |      | 210 139                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |
| DEV04: Fct.assig.BlwSI open                                                                                                   |     |     |      | 210 189                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |
| DEV05: Fct.assig.BlwSI open                                                                                                   |     |     |      | 210 239                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |
| DEV06: Fct.assig.BlwSI open                                                                                                   |     |     |      | 211 039                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |
| DEV07: Fct.assig.BlwSI open                                                                                                   |     |     |      | 211 089                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |
| DEV08: Fct.assig.BlwSI open                                                                                                   |     |     |      | 211 139                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |
| DEV09: Fct.assig.BlwSI open                                                                                                   |     |     |      | 211 189                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |
| DEV10: Fct.assig.BlwSI open                                                                                                   |     |     |      | 211 239                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |
| DEV11: Fct.assig.BlwSI open                                                                                                   |     |     |      | 212 039                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |
| DEV12: Fct.assig.BlwSI open                                                                                                   |     |     |      | 212 089                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |
| DEV13: Fct.assig.BlwSI open                                                                                                   |     |     |      | 212 139                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |
| DEV14: Fct.assig.BlwSI open                                                                                                   |     |     |      | 212 189                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |
| DEV15: Fct.assig.BlwSI open                                                                                                   |     |     |      | 212 239                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |
| DEV16: Fct.assig.BlwSI open                                                                                                   |     |     |      | 213 039                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |
| DEV17: Fct.assig.BlwSI open                                                                                                   |     |     |      | 213 089                |
| 060 000: MAIN: Without function                                                                                               |     |     |      |                        |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      | Address       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Min | Max | Unit | Logic Diagram |
| DEV18: Fct.assig.BlwSI open                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | 213 139       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |      |               |
| DEV19: Fct.assig.BlwSI open                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | 213 189       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |      |               |
| DEV20: Fct.assig.BlwSI open                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | 213 239       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |      |               |
| DEV21: Fct.assig.BlwSI open                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | 214 039       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |      |               |
| DEV22: Fct.assig.BlwSI open                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | 214 089       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |      |               |
| DEV23: Fct.assig.BlwSI open                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | 214 139       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |      |               |
| DEV24: Fct.assig.BlwSI open                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | 214 189       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |      |               |
| <p>This setting defines which output will issue the “Open” enable to the interlocking logic when there is “bay interlock with substation interlock”.</p> <p>Note: The interlock conditions for bay interlock with station interlock are included in the bay type definitions (see “List of Bay Types” in the Appendix). If the interlock condition is to be modified, this is possible by modifying the corresponding Boolean equation in the interlocking logic or by defining a new interlocking logic equation. Only in the latter case is it necessary to change the function assignment.</p> |     |     |      |               |
| DEV01: Fct.assig.BlwSI clos                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | 210 040       |
| 060 000: MAIN: Without function <span style="color: green;">Fig. 3-130, (p. 3-177)</span>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| DEV02: Fct.assig.BlwSI clos                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | 210 090       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |      |               |
| DEV03: Fct.assig.BlwSI clos                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | 210 140       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |      |               |
| DEV04: Fct.assig.BlwSI clos                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | 210 190       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |      |               |
| DEV05: Fct.assig.BlwSI clos                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | 210 240       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |      |               |
| DEV06: Fct.assig.BlwSI clos                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | 211 040       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |      |               |
| DEV07: Fct.assig.BlwSI clos                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | 211 090       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |      |               |
| DEV08: Fct.assig.BlwSI clos                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |      | 211 140       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |      |               |



| Parameter                       |     |     |      | Address       |
|---------------------------------|-----|-----|------|---------------|
| Default                         | Min | Max | Unit | Logic Diagram |
| DEV09: Fct.assig.BlwSI clos     |     |     |      | 211 190       |
| 060 000: MAIN: Without function |     |     |      |               |
| DEV10: Fct.assig.BlwSI clos     |     |     |      | 211 240       |
| 060 000: MAIN: Without function |     |     |      |               |
| DEV11: Fct.assig.BlwSI clos     |     |     |      | 212 040       |
| 060 000: MAIN: Without function |     |     |      |               |
| DEV12: Fct.assig.BlwSI clos     |     |     |      | 212 090       |
| 060 000: MAIN: Without function |     |     |      |               |
| DEV13: Fct.assig.BlwSI clos     |     |     |      | 212 140       |
| 060 000: MAIN: Without function |     |     |      |               |
| DEV14: Fct.assig.BlwSI clos     |     |     |      | 212 190       |
| 060 000: MAIN: Without function |     |     |      |               |
| DEV15: Fct.assig.BlwSI clos     |     |     |      | 212 240       |
| 060 000: MAIN: Without function |     |     |      |               |
| DEV16: Fct.assig.BlwSI clos     |     |     |      | 213 040       |
| 060 000: MAIN: Without function |     |     |      |               |
| DEV17: Fct.assig.BlwSI clos     |     |     |      | 213 090       |
| 060 000: MAIN: Without function |     |     |      |               |
| DEV18: Fct.assig.BlwSI clos     |     |     |      | 213 140       |
| 060 000: MAIN: Without function |     |     |      |               |
| DEV19: Fct.assig.BlwSI clos     |     |     |      | 213 190       |
| 060 000: MAIN: Without function |     |     |      |               |
| DEV20: Fct.assig.BlwSI clos     |     |     |      | 213 240       |
| 060 000: MAIN: Without function |     |     |      |               |
| DEV21: Fct.assig.BlwSI clos     |     |     |      | 214 040       |
| 060 000: MAIN: Without function |     |     |      |               |
| DEV22: Fct.assig.BlwSI clos     |     |     |      | 214 090       |
| 060 000: MAIN: Without function |     |     |      |               |
| DEV23: Fct.assig.BlwSI clos     |     |     |      | 214 140       |
| 060 000: MAIN: Without function |     |     |      |               |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |     |      | Address       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Min | Max | Unit | Logic Diagram |
| DEV24: Fct.assig.BlwSI clos                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 214 190       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| <p>This setting defines which output will issue the “Close” enable to the interlocking logic when there is “bay interlock with substation interlock”.</p> <p>Note: The interlock conditions for bay interlock with station interlock are included in the bay type definitions (see “List of Bay Types” in the Appendix). If the interlock condition is to be modified, this is possible by modifying the corresponding Boolean equation in the interlocking logic or by defining a new interlocking logic equation. Only in the latter case is it necessary to change the function assignment.</p> |     |     |      |               |
| DEV01: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 210 041       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| Fig. 3-130, (p. 3-177)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      |               |
| DEV02: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 210 091       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| DEV03: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 210 141       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| DEV04: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 210 191       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| DEV05: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 210 241       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| DEV06: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 211 041       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| DEV07: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 211 091       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| DEV08: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 211 141       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| DEV09: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 211 191       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| DEV10: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 211 241       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| DEV11: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 212 041       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| DEV12: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 212 091       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| DEV13: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 212 141       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| DEV14: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      | 212 191       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      | Address       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Min | Max | Unit | Logic Diagram |
| DEV15: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 212 241       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| DEV16: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 213 041       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| DEV17: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 213 091       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| DEV18: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 213 141       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| DEV19: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 213 191       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| DEV20: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 213 241       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| DEV21: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 214 041       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| DEV22: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 214 091       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| DEV23: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 214 141       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| DEV24: Fct.asg.BI w/o SI op                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 214 191       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| <p>This setting defines which output will issue the “Open” enable to the interlocking logic when there is “bay interlock without substation interlock”.</p> <p>Note: The interlock conditions for bay interlock without station interlock are included in the bay type definitions (see “List of Bay Types” in the Appendix). If the interlock condition is to be modified, this is possible by modifying the corresponding Boolean equation in the interlocking logic or by defining a new interlocking logic equation. Only in the latter case is it necessary to change the function assignment.</p> |     |     |      |               |
| DEV01: Fct.asg.BI w/o SI cl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 210 042       |
| 060 000: MAIN: Without function <span style="color: green;">Fig. 3-130, (p. 3-177)</span>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |               |
| DEV02: Fct.asg.BI w/o SI cl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 210 092       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| DEV03: Fct.asg.BI w/o SI cl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 210 142       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| DEV04: Fct.asg.BI w/o SI cl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 210 192       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |
| DEV05: Fct.asg.BI w/o SI cl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |     |      | 210 242       |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |      |               |

| Parameter                       |     |     |      |  | Address       |  |         |
|---------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                         | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV06: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 211 042 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV07: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 211 092 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV08: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 211 142 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV09: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 211 192 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV10: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 211 242 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV11: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 212 042 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV12: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 212 092 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV13: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 212 142 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV14: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 212 192 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV15: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 212 242 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV16: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 213 042 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV17: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 213 092 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV18: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 213 142 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV19: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 213 192 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV20: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 213 242 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV21: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 214 042 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV22: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 214 092 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |
| DEV23: Fct.asg.BI w/o SI cl     |     |     |      |  |               |  | 214 142 |
| 060 000: MAIN: Without function |     |     |      |  |               |  |         |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |     |      | Address       |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|---------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Min | Max | Unit | Logic Diagram |         |
| DEV24: Fct.asg.BI w/o SI cl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |     |      |               | 214 192 |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |     |      |               |         |
| <p>This setting defines which output will issue the “Close” enable to the interlocking logic when there is “bay interlock without substation interlock”.</p> <p>Note: The interlock conditions for bay interlock without station interlock are included in the bay type definitions (see “List of Bay Types” in the Appendix). If the interlock condition is to be modified, this is possible by modifying the corresponding Boolean equation in the interlocking logic or by defining a new interlocking logic equation. Only in the latter case is it necessary to change the function assignment.</p> |     |     |      |               |         |

## External device

| Parameter                                |     |      |      |  | Address       |  |         |
|------------------------------------------|-----|------|------|--|---------------|--|---------|
| Default                                  | Min | Max  | Unit |  | Logic Diagram |  |         |
| DEV11: StartCmdTime superv.              |     |      |      |  |               |  | 212 007 |
| Blocked                                  | 0.0 | 10.0 | s    |  |               |  |         |
| DEV12: StartCmdTime superv.              |     |      |      |  |               |  | 212 057 |
| Blocked                                  | 0.0 | 10.0 | s    |  |               |  |         |
| DEV13: StartCmdTime superv.              |     |      |      |  |               |  | 212 107 |
| Blocked                                  | 0.0 | 10.0 | s    |  |               |  |         |
| DEV14: StartCmdTime superv.              |     |      |      |  |               |  | 212 157 |
| Blocked                                  | 0.0 | 10.0 | s    |  |               |  |         |
| DEV15: StartCmdTime superv.              |     |      |      |  |               |  | 212 207 |
| Blocked                                  | 0.0 | 10.0 | s    |  |               |  |         |
| DEV16: StartCmdTime superv.              |     |      |      |  |               |  | 213 007 |
| Blocked                                  | 0.0 | 10.0 | s    |  |               |  |         |
| DEV17: StartCmdTime superv.              |     |      |      |  |               |  | 213 057 |
| Blocked                                  | 0.0 | 10.0 | s    |  |               |  |         |
| DEV18: StartCmdTime superv.              |     |      |      |  |               |  | 213 107 |
| Blocked                                  | 0.0 | 10.0 | s    |  |               |  |         |
| DEV19: StartCmdTime superv.              |     |      |      |  |               |  | 213 157 |
| Blocked                                  | 0.0 | 10.0 | s    |  |               |  |         |
| DEV20: StartCmdTime superv.              |     |      |      |  |               |  | 213 207 |
| Blocked                                  | 0.0 | 10.0 | s    |  |               |  |         |
| DEV21: StartCmdTime superv.              |     |      |      |  |               |  | 214 007 |
| Blocked                                  | 0.0 | 10.0 | s    |  |               |  |         |
| DEV22: StartCmdTime superv.              |     |      |      |  |               |  | 214 057 |
| Blocked                                  | 0.0 | 10.0 | s    |  |               |  |         |
| DEV23: StartCmdTime superv.              |     |      |      |  |               |  | 214 107 |
| Blocked                                  | 0.0 | 10.0 | s    |  |               |  |         |
| DEV24: StartCmdTime superv.              |     |      |      |  |               |  | 214 157 |
| Blocked                                  | 0.0 | 10.0 | s    |  |               |  |         |
| Setting for the chatter monitoring time. |     |      |      |  |               |  |         |

## Interlocking logic

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |      |                        | Address       |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|------------------------|---------------|---------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Min | Max  | Unit                   | Logic Diagram |         |
| ILOCK: Rset ILOCK violation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |                        |               | 221 123 |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1   | 10   | s                      |               |         |
| The interlock violation signal (221 018) MAIN: Interlock equ. viol. will be automatically reset after the time period set here. (The default value <i>Blocked</i> disables the automatic reset.)                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |      |                        |               |         |
| ILOCK: Cycle t interl.check                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |                        |               | 221 104 |
| Blocked                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1 | 10.0 | s                      |               |         |
| The interlock conditions are also transmitted together with reporting in the “phase 2” of the IEC 61850 communication protocol. Therefore it is a requirement that these interlock conditions are cyclically checked and not, as with software versions that still implement “phase 1”, only with the request for a switching operation.                                                                                                                                                                                                                                                                                                          |     |      |                        |               |         |
| This parameter sets the cycle time, after which a check of the interlock conditions is carried out.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |      |                        |               |         |
| As additional processor capacity must be provided for each of these checks it must be ensured that a favorable compromise is found for the cycle time setting value. On the one hand it is desirable to select a cycle time value which is as short as possible so that changes in the interlock conditions are updated without any notable delays, but on the other hand this cycle time value should not be so short that the C434 will be under too much strain. As the CPU load of the C434 is dependent on the total number of function groups having been configured it is not possible to suggest a generally acceptable cycle time value. |     |      |                        |               |         |
| ILOCK: Fct.assignm. outp. 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |                        |               | 250 000 |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      | Fig. 3-145, (p. 3-196) |               |         |
| ILOCK: Fct.assignm. outp. 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |                        |               | 250 001 |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |                        |               |         |
| ILOCK: Fct.assignm. outp. 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |                        |               | 250 002 |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |                        |               |         |
| ILOCK: Fct.assignm. outp. 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |                        |               | 250 003 |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |                        |               |         |
| ILOCK: Fct.assignm. outp. 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |                        |               | 250 004 |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |                        |               |         |
| ILOCK: Fct.assignm. outp. 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |                        |               | 250 005 |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |                        |               |         |
| ILOCK: Fct.assignm. outp. 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |                        |               | 250 006 |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |                        |               |         |
| ILOCK: Fct.assignm. outp. 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |                        |               | 250 007 |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |                        |               |         |
| ILOCK: Fct.assignm. outp. 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |      |                        |               | 250 008 |
| 060 000: MAIN: Without function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |                        |               |         |

| Parameter                       |     |     |      |  | Address       |
|---------------------------------|-----|-----|------|--|---------------|
| Default                         | Min | Max | Unit |  | Logic Diagram |
| ILOCK: Fct.assignm. outp.10     |     |     |      |  | 250 009       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.11     |     |     |      |  | 250 010       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.12     |     |     |      |  | 250 011       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.13     |     |     |      |  | 250 012       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.14     |     |     |      |  | 250 013       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.15     |     |     |      |  | 250 014       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.16     |     |     |      |  | 250 015       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.17     |     |     |      |  | 250 016       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.18     |     |     |      |  | 250 017       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.19     |     |     |      |  | 250 018       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.20     |     |     |      |  | 250 019       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.21     |     |     |      |  | 250 020       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.22     |     |     |      |  | 250 021       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.23     |     |     |      |  | 250 022       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.24     |     |     |      |  | 250 023       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.25     |     |     |      |  | 250 024       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.26     |     |     |      |  | 250 025       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.27     |     |     |      |  | 250 026       |
| 060 000: MAIN: Without function |     |     |      |  |               |
| ILOCK: Fct.assignm. outp.28     |     |     |      |  | 250 027       |
| 060 000: MAIN: Without function |     |     |      |  |               |



| Parameter                               |     |     |      | Address       |         |
|-----------------------------------------|-----|-----|------|---------------|---------|
| Default                                 | Min | Max | Unit | Logic Diagram |         |
| ILOCK: Fct.assignm. outp.29             |     |     |      |               | 250 028 |
| 060 000: MAIN: Without function         |     |     |      |               |         |
| ILOCK: Fct.assignm. outp.30             |     |     |      |               | 250 029 |
| 060 000: MAIN: Without function         |     |     |      |               |         |
| ILOCK: Fct.assignm. outp.31             |     |     |      |               | 250 030 |
| 060 000: MAIN: Without function         |     |     |      |               |         |
| ILOCK: Fct.assignm. outp.32             |     |     |      |               | 250 031 |
| 060 000: MAIN: Without function         |     |     |      |               |         |
| Definition of the interlock conditions. |     |     |      |               |         |



## 8 Information and Control Functions

### 8.1 Operation

The C434 generates a large number of signals, processes binary input signals, and acquires measured data during fault-free operation of the protected object as well as fault-related data. A number of counters are available for statistical purposes. This information can be read out from the integrated local control panel or via the operating program.

All this information can be found in the “Operation” and “Events” folders in the menu tree.

#### Note

*Detailed information about all parameters, including complete selection tables and IEC 60870-5-103 protocol properties, are separately available as a set of interlinked PDF files for user-friendly navigation, packed in one ZIP archive named DataModelExplorer\_C434\_en\_P01.zip.*

*A list of the Logical Nodes that have been implemented for the IEC 61850 protocol can be found in a separate document.*

## 8.1.1 Cyclic Values

### 8.1.1.1 Measured Operating Data

MODBUS master,  
analog command

| Parameter             |        |       |      |               | Address |  |
|-----------------------|--------|-------|------|---------------|---------|--|
| Default               | Min    | Max   | Unit | Logic Diagram |         |  |
| MM_AC: Command AC 001 |        |       |      |               | 243 000 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 002 |        |       |      |               | 243 005 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 003 |        |       |      |               | 243 010 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 004 |        |       |      |               | 243 015 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 005 |        |       |      |               | 243 020 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 006 |        |       |      |               | 243 025 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 007 |        |       |      |               | 243 030 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 008 |        |       |      |               | 243 035 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 009 |        |       |      |               | 243 040 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 010 |        |       |      |               | 243 045 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 011 |        |       |      |               | 243 050 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 012 |        |       |      |               | 243 055 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 013 |        |       |      |               | 243 060 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 014 |        |       |      |               | 243 065 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 015 |        |       |      |               | 243 070 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 016 |        |       |      |               | 243 075 |  |
| 0                     | -32768 | 32767 |      |               |         |  |
| MM_AC: Command AC 017 |        |       |      |               | 243 080 |  |
| 0                     | -32768 | 32767 |      |               |         |  |

| Parameter             |        |       |      |  | Address       |
|-----------------------|--------|-------|------|--|---------------|
| Default               | Min    | Max   | Unit |  | Logic Diagram |
| MM_AC: Command AC 018 |        |       |      |  | 243 085       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 019 |        |       |      |  | 243 090       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 020 |        |       |      |  | 243 095       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 021 |        |       |      |  | 243 100       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 022 |        |       |      |  | 243 105       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 023 |        |       |      |  | 243 110       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 024 |        |       |      |  | 243 115       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 025 |        |       |      |  | 243 120       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 026 |        |       |      |  | 243 125       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 027 |        |       |      |  | 243 130       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 028 |        |       |      |  | 243 135       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 029 |        |       |      |  | 243 140       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 030 |        |       |      |  | 243 145       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 031 |        |       |      |  | 243 150       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 032 |        |       |      |  | 243 155       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 033 |        |       |      |  | 243 160       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 034 |        |       |      |  | 243 165       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 035 |        |       |      |  | 243 170       |
| 0                     | -32768 | 32767 |      |  |               |
| MM_AC: Command AC 036 |        |       |      |  | 243 175       |
| 0                     | -32768 | 32767 |      |  |               |

| Parameter             |        |       |      |  | Address       |  |         |
|-----------------------|--------|-------|------|--|---------------|--|---------|
| Default               | Min    | Max   | Unit |  | Logic Diagram |  |         |
| MM_AC: Command AC 037 |        |       |      |  |               |  | 243 180 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 038 |        |       |      |  |               |  | 243 185 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 039 |        |       |      |  |               |  | 243 190 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 040 |        |       |      |  |               |  | 243 195 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 041 |        |       |      |  |               |  | 243 200 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 042 |        |       |      |  |               |  | 243 205 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 043 |        |       |      |  |               |  | 243 210 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 044 |        |       |      |  |               |  | 243 215 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 045 |        |       |      |  |               |  | 243 220 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 046 |        |       |      |  |               |  | 243 225 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 047 |        |       |      |  |               |  | 243 230 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 048 |        |       |      |  |               |  | 243 235 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 049 |        |       |      |  |               |  | 243 240 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 050 |        |       |      |  |               |  | 243 245 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 051 |        |       |      |  |               |  | 243 250 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 052 |        |       |      |  |               |  | 243 255 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 053 |        |       |      |  |               |  | 244 004 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 054 |        |       |      |  |               |  | 244 009 |
| 0                     | -32768 | 32767 |      |  |               |  |         |
| MM_AC: Command AC 055 |        |       |      |  |               |  | 244 014 |
| 0                     | -32768 | 32767 |      |  |               |  |         |

| Parameter             |        |       |      |  | Address       |  |  |         |
|-----------------------|--------|-------|------|--|---------------|--|--|---------|
| Default               | Min    | Max   | Unit |  | Logic Diagram |  |  |         |
| MM_AC: Command AC 056 |        |       |      |  |               |  |  | 244 019 |
| 0                     | -32768 | 32767 |      |  |               |  |  |         |
| MM_AC: Command AC 057 |        |       |      |  |               |  |  | 244 024 |
| 0                     | -32768 | 32767 |      |  |               |  |  |         |
| MM_AC: Command AC 058 |        |       |      |  |               |  |  | 244 029 |
| 0                     | -32768 | 32767 |      |  |               |  |  |         |
| MM_AC: Command AC 059 |        |       |      |  |               |  |  | 244 034 |
| 0                     | -32768 | 32767 |      |  |               |  |  |         |
| MM_AC: Command AC 060 |        |       |      |  |               |  |  | 244 039 |
| 0                     | -32768 | 32767 |      |  |               |  |  |         |

MODBUS master,  
analog signal

| Parameter            |        |       |      |  | Address              |  |  |         |
|----------------------|--------|-------|------|--|----------------------|--|--|---------|
| Default              | Min    | Max   | Unit |  | Logic Diagram        |  |  |         |
| MM_AS: Signal AS 001 |        |       |      |  |                      |  |  | 245 000 |
| 0                    | -32768 | 32767 |      |  | Fig. 3-28, (p. 3-36) |  |  |         |
| MM_AS: Signal AS 002 |        |       |      |  |                      |  |  | 245 006 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 003 |        |       |      |  |                      |  |  | 245 012 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 004 |        |       |      |  |                      |  |  | 245 018 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 005 |        |       |      |  |                      |  |  | 245 024 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 006 |        |       |      |  |                      |  |  | 245 030 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 007 |        |       |      |  |                      |  |  | 245 036 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 008 |        |       |      |  |                      |  |  | 245 042 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 009 |        |       |      |  |                      |  |  | 245 048 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 010 |        |       |      |  |                      |  |  | 245 054 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 011 |        |       |      |  |                      |  |  | 245 060 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 012 |        |       |      |  |                      |  |  | 245 066 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 013 |        |       |      |  |                      |  |  | 245 072 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 014 |        |       |      |  |                      |  |  | 245 078 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 015 |        |       |      |  |                      |  |  | 245 084 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 016 |        |       |      |  |                      |  |  | 245 090 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 017 |        |       |      |  |                      |  |  | 245 096 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |
| MM_AS: Signal AS 018 |        |       |      |  |                      |  |  | 245 102 |
| 0                    | -32768 | 32767 |      |  |                      |  |  |         |



| Parameter            |        |       |      |  | Address       |         |
|----------------------|--------|-------|------|--|---------------|---------|
| Default              | Min    | Max   | Unit |  | Logic Diagram |         |
| MM_AS: Signal AS 019 |        |       |      |  |               | 245 108 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 020 |        |       |      |  |               | 245 114 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 021 |        |       |      |  |               | 245 120 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 022 |        |       |      |  |               | 245 126 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 023 |        |       |      |  |               | 245 132 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 024 |        |       |      |  |               | 245 138 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 025 |        |       |      |  |               | 245 144 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 026 |        |       |      |  |               | 245 150 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 027 |        |       |      |  |               | 245 156 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 028 |        |       |      |  |               | 245 162 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 029 |        |       |      |  |               | 245 168 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 030 |        |       |      |  |               | 245 174 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 031 |        |       |      |  |               | 245 180 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 032 |        |       |      |  |               | 245 186 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 033 |        |       |      |  |               | 245 192 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 034 |        |       |      |  |               | 245 198 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 035 |        |       |      |  |               | 245 204 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 036 |        |       |      |  |               | 245 210 |
| 0                    | -32768 | 32767 |      |  |               |         |
| MM_AS: Signal AS 037 |        |       |      |  |               | 245 216 |
| 0                    | -32768 | 32767 |      |  |               |         |

| Parameter            |        |       |      |  | Address       |  |         |
|----------------------|--------|-------|------|--|---------------|--|---------|
| Default              | Min    | Max   | Unit |  | Logic Diagram |  |         |
| MM_AS: Signal AS 038 |        |       |      |  |               |  | 245 222 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 039 |        |       |      |  |               |  | 245 228 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 040 |        |       |      |  |               |  | 245 234 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 041 |        |       |      |  |               |  | 245 240 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 042 |        |       |      |  |               |  | 245 246 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 043 |        |       |      |  |               |  | 245 252 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 044 |        |       |      |  |               |  | 246 002 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 045 |        |       |      |  |               |  | 246 008 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 046 |        |       |      |  |               |  | 246 014 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 047 |        |       |      |  |               |  | 246 020 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 048 |        |       |      |  |               |  | 246 026 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 049 |        |       |      |  |               |  | 246 032 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 050 |        |       |      |  |               |  | 246 038 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 051 |        |       |      |  |               |  | 246 044 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 052 |        |       |      |  |               |  | 246 050 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 053 |        |       |      |  |               |  | 246 056 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 054 |        |       |      |  |               |  | 246 062 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 055 |        |       |      |  |               |  | 246 068 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 056 |        |       |      |  |               |  | 246 074 |
| 0                    | -32768 | 32767 |      |  |               |  |         |

| Parameter            |        |       |      |  | Address       |  |         |
|----------------------|--------|-------|------|--|---------------|--|---------|
| Default              | Min    | Max   | Unit |  | Logic Diagram |  |         |
| MM_AS: Signal AS 057 |        |       |      |  |               |  | 246 080 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 058 |        |       |      |  |               |  | 246 086 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 059 |        |       |      |  |               |  | 246 092 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 060 |        |       |      |  |               |  | 246 098 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 061 |        |       |      |  |               |  | 246 104 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 062 |        |       |      |  |               |  | 246 110 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 063 |        |       |      |  |               |  | 246 116 |
| 0                    | -32768 | 32767 |      |  |               |  |         |
| MM_AS: Signal AS 064 |        |       |      |  |               |  | 246 122 |
| 0                    | -32768 | 32767 |      |  |               |  |         |

## Measured data input

| Parameter                                                                                                        | Address |       |         |                      |
|------------------------------------------------------------------------------------------------------------------|---------|-------|---------|----------------------|
| Default                                                                                                          | Min     | Max   | Unit    | Logic Diagram        |
| MEASI: Current IDC                                                                                               |         |       |         | 004 134              |
| Not measured                                                                                                     | 0.00    | 24.00 | mA      | Fig. 3-44, (p. 3-70) |
| Display of the input current.                                                                                    |         |       |         |                      |
| MEASI: Current IDC p.u.                                                                                          |         |       |         | 004 135              |
| Not measured                                                                                                     | 0.00    | 1.20  | IDC,nom | Fig. 3-44, (p. 3-70) |
| Display of the input current referred to $I_{DC,nom}$ .                                                          |         |       |         |                      |
| MEASI: Curr. IDC,lin. p.u.                                                                                       |         |       |         | 004 136              |
| Not measured                                                                                                     | 0.00    | 1.20  | IDC,nom | Fig. 3-44, (p. 3-70) |
| Display of the linearized input current referred to $I_{DC,nom}$ .                                               |         |       |         |                      |
| MEASI: Scaled value IDC,lin                                                                                      |         |       |         | 004 180              |
| Not measured                                                                                                     | -32000  | 32000 |         | Fig. 3-45, (p. 3-71) |
| Display of the scaled linearized value.                                                                          |         |       |         |                      |
| MEASI: Temperature T                                                                                             |         |       |         | 004 133              |
| Not measured                                                                                                     | -40.0   | 215.0 | °C      | Fig. 3-46, (p. 3-72) |
| Display of the temperature measured at the "PT 100" temperature input on the analog p/c board.                   |         |       |         |                      |
| MEASI: Temperature Tmax                                                                                          |         |       |         | 004 233              |
| Not measured                                                                                                     | -40.0   | 215.0 | °C      | Fig. 3-46, (p. 3-72) |
| Display of the maximum temperature measured at the "PT 100" temperature input on the analog p/c board.           |         |       |         |                      |
| MEASI: Temperature p.u. T                                                                                        |         |       |         | 004 221              |
| Not measured                                                                                                     | -0.40   | 2.15  | 100°C   | Fig. 3-46, (p. 3-72) |
| Display of the temperature measured at the "PT 100" temperature input on the analog p/c board referred to 100°C. |         |       |         |                      |

## Measured data output

| Parameter                                                                                 | Address |       |      |                      |
|-------------------------------------------------------------------------------------------|---------|-------|------|----------------------|
| Default                                                                                   | Min     | Max   | Unit | Logic Diagram        |
| MEASO: Current A-1                                                                        |         |       |      | 005 100              |
| 0.00                                                                                      | 0.00    | 20.00 | mA   | Fig. 3-54, (p. 3-85) |
| MEASO: Current A-2                                                                        |         |       |      | 005 099              |
| 0.00                                                                                      | 0.00    | 20.00 | mA   |                      |
| Display of the current on the analog measured data output (A1: channel 1; A2: channel 2). |         |       |      |                      |

## Main function

| Parameter                                                                                                                                                                                                                            | Address    |            |          |                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|----------|-----------------------|
| Default                                                                                                                                                                                                                              | Min        | Max        | Unit     | Logic Diagram         |
| MAIN: Date                                                                                                                                                                                                                           |            |            |          | 003 090               |
| 1997-01-01                                                                                                                                                                                                                           | 1997-01-01 | 2098-11-08 | dd.mm.yy | Fig. 3-77, (p. 3-111) |
| Date display. The date can also be set here. The centuries are not displayed. The supported dates range from January 1st, 1997, until November 7th, 2098.                                                                            |            |            |          |                       |
| MAIN: Time of day                                                                                                                                                                                                                    |            |            |          | 003 091               |
| 00:00:00                                                                                                                                                                                                                             | 00:00:00   | 24:00:00   | hh:mm:ss | Fig. 3-77, (p. 3-111) |
| Display of the time of day. The time can also be set here.                                                                                                                                                                           |            |            |          |                       |
| MAIN: Time switching                                                                                                                                                                                                                 |            |            |          | 003 095               |
| 0: Standard time                                                                                                                                                                                                                     |            |            |          | Fig. 3-77, (p. 3-111) |
| Setting for standard time or daylight saving time.<br>This setting is necessary in order to avoid misinterpretation of the times assigned to signals and event data that can be read out through the PC or communication interfaces. |            |            |          |                       |
| MAIN: Frequency f,1                                                                                                                                                                                                                  |            |            |          | 004 040               |
| Not measured                                                                                                                                                                                                                         | 40.00      | 70.00      | Hz       | Fig. 3-68, (p. 3-102) |
| Display of system frequency.                                                                                                                                                                                                         |            |            |          |                       |
| MAIN: Curr. IP max,1 prim.                                                                                                                                                                                                           |            |            |          | 005 050               |
| Not measured                                                                                                                                                                                                                         | 0.0        | 6550.0     | A        | Fig. 3-58, (p. 3-95)  |
| Display of the maximum phase current as a primary quantity.                                                                                                                                                                          |            |            |          |                       |
| MAIN: IP max,1 prim.,delay                                                                                                                                                                                                           |            |            |          | 005 036               |
| Not measured                                                                                                                                                                                                                         | 0          | 25000      | A        | Fig. 3-59, (p. 3-96)  |
| Display of the delayed maximum phase current as a primary quantity.                                                                                                                                                                  |            |            |          |                       |
| MAIN: IPmax,1 prim.,stored                                                                                                                                                                                                           |            |            |          | 005 034               |
| Not measured                                                                                                                                                                                                                         | 0          | 25000      | A        | Fig. 3-59, (p. 3-96)  |
| Display of the delayed stored maximum phase current as a primary quantity.                                                                                                                                                           |            |            |          |                       |
| MAIN: Curr. IP min,1 prim.                                                                                                                                                                                                           |            |            |          | 005 055               |
| Not measured                                                                                                                                                                                                                         | 0.0        | 6550.0     | A        | Fig. 3-58, (p. 3-95)  |
| Display of the minimum phase current as a primary quantity.                                                                                                                                                                          |            |            |          |                       |
| MAIN: Current A,1 prim.                                                                                                                                                                                                              |            |            |          | 005 040               |
| Not measured                                                                                                                                                                                                                         | 0.0        | 6550.0     | A        | Fig. 3-58, (p. 3-95)  |
| Display of phase current A as a primary quantity.                                                                                                                                                                                    |            |            |          |                       |
| MAIN: Current B,1 prim.                                                                                                                                                                                                              |            |            |          | 006 040               |
| Not measured                                                                                                                                                                                                                         | 0.0        | 6550.0     | A        | Fig. 3-58, (p. 3-95)  |
| Display of phase current B as a primary quantity.                                                                                                                                                                                    |            |            |          |                       |

| Parameter                                                                                                                |     |        |      |                       | Address |         |  |
|--------------------------------------------------------------------------------------------------------------------------|-----|--------|------|-----------------------|---------|---------|--|
| Default                                                                                                                  | Min | Max    | Unit | Logic Diagram         |         |         |  |
| MAIN: Current C,1 prim.                                                                                                  |     |        |      |                       |         | 007 040 |  |
| Not measured                                                                                                             | 0.0 | 6550.0 | A    | Fig. 3-58, (p. 3-95)  |         |         |  |
| Display of phase current C as a primary quantity.                                                                        |     |        |      |                       |         |         |  |
| MAIN: Current $\Sigma$ (IP),1 prim                                                                                       |     |        |      |                       |         | 005 010 |  |
| Not measured                                                                                                             | 0.0 | 6550.0 | A    | Fig. 3-58, (p. 3-95)  |         |         |  |
| Display of the calculated resultant current as a primary quantity.                                                       |     |        |      |                       |         |         |  |
| MAIN: Current IN,1 prim.                                                                                                 |     |        |      |                       |         | 004 043 |  |
| Not measured                                                                                                             | 0.0 | 6550.0 | A    | Fig. 3-60, (p. 3-96)  |         |         |  |
| Display of the updated value for the residual current as a primary quantity. The measured residual current is displayed. |     |        |      |                       |         |         |  |
| MAIN: Volt. VPG,max,1 prim                                                                                               |     |        |      |                       |         | 008 042 |  |
| Not measured                                                                                                             | 0.0 | 2500.0 | kV   | Fig. 3-63, (p. 3-99)  |         |         |  |
| Display of the maximum phase-to-ground voltage as a primary quantity.                                                    |     |        |      |                       |         |         |  |
| MAIN: Volt.VPG min,1 prim.                                                                                               |     |        |      |                       |         | 009 042 |  |
| Not measured                                                                                                             | 0.0 | 2500.0 | kV   | Fig. 3-63, (p. 3-99)  |         |         |  |
| Display of the minimum phase-to-ground voltage as a primary quantity.                                                    |     |        |      |                       |         |         |  |
| MAIN: Voltage A-G,1 prim.                                                                                                |     |        |      |                       |         | 005 042 |  |
| Not measured                                                                                                             | 0.0 | 2500.0 | kV   | Fig. 3-63, (p. 3-99)  |         |         |  |
| Display of the updated value for phase-to-ground voltage A-G as a primary quantity.                                      |     |        |      |                       |         |         |  |
| MAIN: Voltage B-G,1 prim.                                                                                                |     |        |      |                       |         | 006 042 |  |
| Not measured                                                                                                             | 0.0 | 2500.0 | kV   | Fig. 3-63, (p. 3-99)  |         |         |  |
| Display of the updated value for phase-to-ground voltage B-G as a primary quantity.                                      |     |        |      |                       |         |         |  |
| MAIN: Voltage C-G,1 prim.                                                                                                |     |        |      |                       |         | 007 042 |  |
| Not measured                                                                                                             | 0.0 | 2500.0 | kV   | Fig. 3-63, (p. 3-99)  |         |         |  |
| Display of the updated value for phase-to-ground voltage C-G as a primary quantity.                                      |     |        |      |                       |         |         |  |
| MAIN: Volt. $\Sigma$ (VPG)/3,1prim.                                                                                      |     |        |      |                       |         | 005 012 |  |
| Not measured                                                                                                             | 0.0 | 2500.0 | kV   | Fig. 3-63, (p. 3-99)  |         |         |  |
| Display of the calculated neutral-displacement voltage as a primary quantity.                                            |     |        |      |                       |         |         |  |
| MAIN: Voltage VNG/Vx,1prim                                                                                               |     |        |      |                       |         | 004 041 |  |
| Not measured                                                                                                             | 0.0 | 2500.0 | kV   | Fig. 3-64, (p. 3-100) |         |         |  |
| Display of the neutral displacement voltage measured at transformer T 91 as a primary quantity.                          |     |        |      |                       |         |         |  |

| Parameter                                                                          |         |        |      |                       | Address |
|------------------------------------------------------------------------------------|---------|--------|------|-----------------------|---------|
| Default                                                                            | Min     | Max    | Unit | Logic Diagram         |         |
| MAIN: Voltage Vref,1 prim.                                                         |         |        |      | 005 046               |         |
| Not measured                                                                       | 0.0     | 3000.0 | kV   | Fig. 3-65, (p. 3-100) |         |
| Display of the reference voltage measured at Slot 03-04 as a primary quantity.     |         |        |      |                       |         |
| MAIN: Volt. VPP,max,1 prim                                                         |         |        |      | 008 044               |         |
| Not measured                                                                       | 0.0     | 2500.0 | kV   | Fig. 3-63, (p. 3-99)  |         |
| Display of the maximum phase-to-phase voltage as a primary quantity.               |         |        |      |                       |         |
| MAIN: Volt. VPP min,1 prim                                                         |         |        |      | 009 044               |         |
| Not measured                                                                       | 0.0     | 2500.0 | kV   | Fig. 3-63, (p. 3-99)  |         |
| Display of the minimum phase-to-phase voltage as a primary quantity.               |         |        |      |                       |         |
| MAIN: Voltage A-B,1 prim.                                                          |         |        |      | 005 044               |         |
| Not measured                                                                       | 0.0     | 2500.0 | kV   | Fig. 3-63, (p. 3-99)  |         |
| Display of the updated value for phase-to-phase voltage A-B as a primary quantity. |         |        |      |                       |         |
| MAIN: Voltage B-C,1 prim.                                                          |         |        |      | 006 044               |         |
| Not measured                                                                       | 0.0     | 2500.0 | kV   | Fig. 3-63, (p. 3-99)  |         |
| Display of the updated value for phase-to-phase voltage B-C as a primary quantity. |         |        |      |                       |         |
| MAIN: Voltage C-A,1 prim.                                                          |         |        |      | 007 044               |         |
| Not measured                                                                       | 0.0     | 2500.0 | kV   | Fig. 3-63, (p. 3-99)  |         |
| Display of the updated value for phase-to-phase voltage C-A as a primary quantity. |         |        |      |                       |         |
| MAIN: Appar. powerS,1 prim                                                         |         |        |      | 005 025               |         |
| Not measured                                                                       | -3199.9 | 3200.0 | MVA  | Fig. 3-66, (p. 3-101) |         |
| Display of the updated apparent power value as a primary quantity.                 |         |        |      |                       |         |
| MAIN: Appar. powerS,2 prim                                                         |         |        |      | 007 019               |         |
| Not measured                                                                       | -1399.9 | 1400.0 | MVA  |                       |         |
| MAIN: Activepower P,1 prim                                                         |         |        |      | 004 050               |         |
| Not measured                                                                       | -3199.9 | 3200.0 | MW   | Fig. 3-66, (p. 3-101) |         |
| Display of the updated active power value as a primary quantity.                   |         |        |      |                       |         |
| MAIN: Reac.power Q,1 prim.                                                         |         |        |      | 004 052               |         |
| Not measured                                                                       | -3199.9 | 3200.0 | Mvar | Fig. 3-66, (p. 3-101) |         |
| Display of the updated reactive power value as a primary quantity.                 |         |        |      |                       |         |
| MAIN: Activepower factor,1                                                         |         |        |      | 004 054               |         |
| Not measured                                                                       | -1.000  | 1.000  |      | Fig. 3-66, (p. 3-101) |         |
| Display of the updated active power factor.                                        |         |        |      |                       |         |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |        |        |                       | Address       |  |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|-----------------------|---------------|--|---------|
| Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Min    | Max    | Unit   |                       | Logic Diagram |  |         |
| MAIN: Act.energ yout.,1prim                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |        |        |                       |               |  | 005 061 |
| 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.00   | 655.35 | MWh    | Fig. 3-69, (p. 3-103) |               |  |         |
| MAIN: Act.energ yinp.,1prim                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |        |        |                       |               |  | 005 062 |
| 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.00   | 655.35 | MWh    | Fig. 3-69, (p. 3-103) |               |  |         |
| MAIN: React.en. outp.,1prim                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |        |        |                       |               |  | 005 063 |
| 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.00   | 655.35 | Mvar h | Fig. 3-69, (p. 3-103) |               |  |         |
| MAIN: React.en. inp.,1prim                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |        |        |                       |               |  | 005 064 |
| 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.00   | 655.35 | Mvar h | Fig. 3-69, (p. 3-103) |               |  |         |
| <p>Display of the updated active energy output (or active energy input, reactive energy output, reactive energy input, respectively) as a primary quantity.</p> <p>The value is displayed as a number with 16 bit precision.</p> <p>The setting at MAIN: Op. mode energy cnt. decides which procedure shall be used to determine the active and reactive energy:</p> <ul style="list-style-type: none"> <li>● If procedure 1 is selected, active and reactive energy are determined every 2 s (approximately).</li> <li>● If procedure 2 is selected, active and reactive energy are determined every 100 ms (approximately).</li> </ul> <p>Procedure 2 obviously gives more precise results but puts more strain on the system.</p> <p>Whenever the maximum value of 655.35 MWh or 655.35 MVar h is exceeded, the determination of the energy output is restarted, and the value that exceeded the range is transferred to the new cycle. Moreover, a counter is incremented:</p> <ul style="list-style-type: none"> <li>● (009 090) MAIN: No.ovfl.act.en.out,1: Counter for value overflow of MAIN: Act.energ yout.,1prim</li> <li>● (009 091) MAIN: No.ovfl.act.en.inp,2: Counter for value overflow of MAIN: Act.energ yinp.,1prim</li> <li>● (009 092) MAIN: No.ovfl.reac.en.out1: Counter for value overflow of MAIN: React.en. outp.,1prim</li> <li>● (009 093) MAIN: No.ovfl.reac.en.inp1: Counter for value overflow of MAIN: React.en. inp.,1prim</li> </ul> <p>Note that the maximum value of these counters is 10000.</p> |        |        |        |                       |               |  |         |
| MAIN: Load angle phi A,1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |        |        |                       |               |  | 004 055 |
| Not measured                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -180.0 | 180.0  | °      | Fig. 3-66, (p. 3-101) |               |  |         |
| Display of the updated load angle value in phase A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |                       |               |  |         |
| MAIN: Load angle phi B,1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |        |        |                       |               |  | 004 056 |
| Not measured                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -180.0 | 180.0  | °      | Fig. 3-66, (p. 3-101) |               |  |         |
| Display of the updated load angle value in phase B.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |                       |               |  |         |
| MAIN: Load angle phi C,1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |        |        |                       |               |  | 004 057 |
| Not measured                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -180.0 | 180.0  | °      | Fig. 3-66, (p. 3-101) |               |  |         |
| Display of the updated load angle value in phase C.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |                       |               |  |         |



| Parameter                                                                                                                                                | Address |        |      |                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------|------|-----------------------|
| Default                                                                                                                                                  | Min     | Max    | Unit | Logic Diagram         |
| MAIN: Angle phi N,1                                                                                                                                      |         |        |      | 004 072               |
| Not measured                                                                                                                                             | -180.0  | 180.0  | °    | Fig. 3-66, (p. 3-101) |
| Display of the angle between the measured residual current system quantities $I_N$ and $V_{NG}$ .                                                        |         |        |      |                       |
| MAIN: Ph.rel.,IN vs $\Sigma IP$ ,1                                                                                                                       |         |        |      | 004 073               |
| ....: Not measured                                                                                                                                       |         |        |      | Fig. 3-67, (p. 3-102) |
| Display of the phase relation of measured and calculated residual current. (The phase relation is displayed as either "Equal phase" or "Reverse phase".) |         |        |      |                       |
| MAIN: Current IPmax,1 p.u.                                                                                                                               |         |        |      | 005 051               |
| Not measured                                                                                                                                             | 0.0000  | 4.0000 | Inom | Fig. 3-58, (p. 3-95)  |
| Display of the maximum phase current referred to $I_{nom}$ .                                                                                             |         |        |      |                       |
| MAIN: IP max,1 p.u.,delay                                                                                                                                |         |        |      | 005 037               |
| Not measured                                                                                                                                             | 0.000   | 25.000 | Inom | Fig. 3-59, (p. 3-96)  |
| Display of the delayed maximum phase current referred to $I_{nom}$ .                                                                                     |         |        |      |                       |
| MAIN: IP max,1p.u.,stored.                                                                                                                               |         |        |      | 005 035               |
| Not measured                                                                                                                                             | 0.000   | 25.000 | Inom | Fig. 3-59, (p. 3-96)  |
| Display of the delayed stored maximum phase current referred to $I_{nom}$ .                                                                              |         |        |      |                       |
| MAIN: Current IP min,1 p.u                                                                                                                               |         |        |      | 005 056               |
| Not measured                                                                                                                                             | 0.0000  | 4.0000 | Inom | Fig. 3-58, (p. 3-95)  |
| Display of the minimum phase current referred to $I_{nom}$ .                                                                                             |         |        |      |                       |
| MAIN: Current A,1 p.u.                                                                                                                                   |         |        |      | 005 041               |
| Not measured                                                                                                                                             | 0.0000  | 4.0000 | Inom | Fig. 3-58, (p. 3-95)  |
| Display of phase current A referred to $I_{nom}$ .                                                                                                       |         |        |      |                       |
| MAIN: Current B,1 p.u.                                                                                                                                   |         |        |      | 006 041               |
| Not measured                                                                                                                                             | 0.0000  | 4.0000 | Inom | Fig. 3-58, (p. 3-95)  |
| Display of phase current B referred to $I_{nom}$ .                                                                                                       |         |        |      |                       |
| MAIN: Current C,1 p.u.                                                                                                                                   |         |        |      | 007 041               |
| Not measured                                                                                                                                             | 0.0000  | 4.0000 | Inom | Fig. 3-58, (p. 3-95)  |
| Display of phase current C referred to $I_{nom}$ .                                                                                                       |         |        |      |                       |
| MAIN: Current $\Sigma(IP)$ ,1 p.u.                                                                                                                       |         |        |      | 005 011               |
| Not measured                                                                                                                                             | 0.0000  | 4.0000 | Inom | Fig. 3-58, (p. 3-95)  |
| Display of the calculated residual current referred to $I_{nom}$ .                                                                                       |         |        |      |                       |

| Parameter                                                                                                         |        |        |              |                       | Address       |  |         |
|-------------------------------------------------------------------------------------------------------------------|--------|--------|--------------|-----------------------|---------------|--|---------|
| Default                                                                                                           | Min    | Max    | Unit         |                       | Logic Diagram |  |         |
| MAIN: Current $I_N$ , 1 p.u.                                                                                      |        |        |              |                       |               |  | 004 044 |
| Not measured                                                                                                      | 0.0000 | 2.0000 | $I_{N,nom}$  | Fig. 3-60, (p. 3-96)  |               |  |         |
| Display of the updated residual current value referred to $I_{nom}$ . The measured residual current is displayed. |        |        |              |                       |               |  |         |
| MAIN: Voltage $V_{PGmax}$ , 1 p.u.                                                                                |        |        |              |                       |               |  | 008 043 |
| Not measured                                                                                                      | 0.000  | 25.000 | $V_{nom}$    | Fig. 3-63, (p. 3-99)  |               |  |         |
| Display of the maximum phase-to-ground voltage referred to $V_{nom}$ .                                            |        |        |              |                       |               |  |         |
| MAIN: Volt. $V_{PGmin}$ , 1 p.u.                                                                                  |        |        |              |                       |               |  | 009 043 |
| Not measured                                                                                                      | 0.000  | 25.000 | $V_{nom}$    | Fig. 3-63, (p. 3-99)  |               |  |         |
| Display of the minimum phase-to-ground voltage referred to $V_{nom}$ .                                            |        |        |              |                       |               |  |         |
| MAIN: Voltage A-G, 1 p.u.                                                                                         |        |        |              |                       |               |  | 005 043 |
| Not measured                                                                                                      | 0.000  | 25.000 | $V_{nom}$    | Fig. 3-63, (p. 3-99)  |               |  |         |
| Display of the updated value for phase-to-ground voltage A-G referred to $V_{nom}$ .                              |        |        |              |                       |               |  |         |
| MAIN: Voltage B-G, 1 p.u.                                                                                         |        |        |              |                       |               |  | 006 043 |
| Not measured                                                                                                      | 0.000  | 25.000 | $V_{nom}$    | Fig. 3-63, (p. 3-99)  |               |  |         |
| Display of the updated value for phase-to-ground voltage B-G referred to $V_{nom}$ .                              |        |        |              |                       |               |  |         |
| MAIN: Voltage C-G, 1 p.u.                                                                                         |        |        |              |                       |               |  | 007 043 |
| Not measured                                                                                                      | 0.000  | 25.000 | $V_{nom}$    | Fig. 3-63, (p. 3-99)  |               |  |         |
| Display of the updated value for phase-to-ground voltage C-G referred to $V_{nom}$ .                              |        |        |              |                       |               |  |         |
| MAIN: Volt. $\Sigma(V_{PG})/\sqrt{3}$ , 1 p.u.                                                                    |        |        |              |                       |               |  | 005 013 |
| Not measured                                                                                                      | 0.000  | 12.000 | $V_{nom}$    | Fig. 3-63, (p. 3-99)  |               |  |         |
| Display of the calculated neutral-point displacement voltage referred to $V_{nom}$ .                              |        |        |              |                       |               |  |         |
| MAIN: Voltage $V_{NG/Vx}$ , 1 p.u.                                                                                |        |        |              |                       |               |  | 004 042 |
| Not measured                                                                                                      | 0.000  | 25.000 | $V_{NG,nom}$ | Fig. 3-64, (p. 3-100) |               |  |         |
| Display of the neutral displacement voltage measured at transformer T 91 and referred to $V_{nom}$ .              |        |        |              |                       |               |  |         |
| MAIN: Voltage $V_{ref}$ , 1 p.u.                                                                                  |        |        |              |                       |               |  | 005 047 |
| Not measured                                                                                                      | 0.000  | 3.000  | $V_{nom}$    | Fig. 3-65, (p. 3-100) |               |  |         |
| Display of the reference voltage measured at transformer T 19 referred to $V_{nom}$ .                             |        |        |              |                       |               |  |         |
| MAIN: Voltage $V_{PPmax}$ , 1 p.u.                                                                                |        |        |              |                       |               |  | 008 045 |
| Not measured                                                                                                      | 0.000  | 25.000 | $V_{nom}$    | Fig. 3-63, (p. 3-99)  |               |  |         |
| Display of the maximum phase-to-phase voltage referred to $V_{nom}$ .                                             |        |        |              |                       |               |  |         |

| Parameter                                                                                      |         |        |         |                       | Address |
|------------------------------------------------------------------------------------------------|---------|--------|---------|-----------------------|---------|
| Default                                                                                        | Min     | Max    | Unit    | Logic Diagram         |         |
| MAIN: Volt. VPP min,1 p.u.                                                                     |         |        |         | 009 045               |         |
| Not measured                                                                                   | 0.000   | 25.000 | Vnom    | Fig. 3-63, (p. 3-99)  |         |
| Display of the minimum phase-to-phase voltage referred to $V_{nom}$ .                          |         |        |         |                       |         |
| MAIN: Voltage A-B,1 p.u.                                                                       |         |        |         | 005 045               |         |
| Not measured                                                                                   | 0.000   | 25.000 | Vnom    | Fig. 3-63, (p. 3-99)  |         |
| Display of the updated value for phase-to-phase voltage A-B referred to $V_{nom}$ .            |         |        |         |                       |         |
| MAIN: Voltage B-C,1 p.u.                                                                       |         |        |         | 006 045               |         |
| Not measured                                                                                   | 0.000   | 25.000 | Vnom    | Fig. 3-63, (p. 3-99)  |         |
| Display of the updated value for phase-to-phase voltage B-C referred to $V_{nom}$ .            |         |        |         |                       |         |
| MAIN: Voltage C-A,1 p.u.                                                                       |         |        |         | 007 045               |         |
| Not measured                                                                                   | 0.000   | 25.000 | Vnom    | Fig. 3-63, (p. 3-99)  |         |
| Display of the updated value for phase-to-phase voltage C-A referred to $V_{nom}$ .            |         |        |         |                       |         |
| MAIN: Appar. powerS,1 p.u.                                                                     |         |        |         | 005 026               |         |
| Not measured                                                                                   | -10.700 | 10.700 | Snom    | Fig. 3-66, (p. 3-101) |         |
| Display of the updated apparent power value referred to nominal apparent power $S_{nom}$ .     |         |        |         |                       |         |
| MAIN: Activepower P,1 p.u.                                                                     |         |        |         | 004 051               |         |
| Not measured                                                                                   | -7.500  | 7.500  | Snom    | Fig. 3-66, (p. 3-101) |         |
| Display of the updated active power value referred to nominal apparent power $S_{nom}$ .       |         |        |         |                       |         |
| MAIN: Reac.power Q,1 p.u.                                                                      |         |        |         | 004 053               |         |
| Not measured                                                                                   | -7.500  | 7.500  | Snom    | Fig. 3-66, (p. 3-101) |         |
| Display of the updated value for reactive power referred to nominal apparent power $S_{nom}$ . |         |        |         |                       |         |
| MAIN: Loadangle phi A,1p.u                                                                     |         |        |         | 005 073               |         |
| Not measured                                                                                   | -1.80   | 1.80   | phi,ref | Fig. 3-66, (p. 3-101) |         |
| Display of the updated load angle value in phase A referred to 100°C.                          |         |        |         |                       |         |
| MAIN: Loadangle phi B,1p.u                                                                     |         |        |         | 005 074               |         |
| Not measured                                                                                   | -1.80   | 1.80   | phi,ref | Fig. 3-66, (p. 3-101) |         |
| Display of the updated load angle value in phase B referred to 100°C.                          |         |        |         |                       |         |
| MAIN: Loadangle phi C,1p.u                                                                     |         |        |         | 005 075               |         |
| Not measured                                                                                   | -1.80   | 1.80   | phi,ref | Fig. 3-66, (p. 3-101) |         |
| Display of the updated load angle value in phase C referred to 100°C.                          |         |        |         |                       |         |

| Parameter                                                                                                                                                  | Address |        |              |                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------|--------------|-----------------------|
| Default                                                                                                                                                    | Min     | Max    | Unit         | Logic Diagram         |
| MAIN: Angle $\phi_{N,1}$ p.u.                                                                                                                              |         |        |              | 005 076               |
| Not measured                                                                                                                                               | -1.80   | 1.80   | $\phi_{ref}$ | Fig. 3-66, (p. 3-101) |
| Display of the angle between the measured residual current system quantities $I_N$ and $V_{NG}$ referred to 100°.                                          |         |        |              |                       |
| MAIN: Angle $\Sigma VPG/I_N,1$ p.u.                                                                                                                        |         |        |              | 005 072               |
| Not measured                                                                                                                                               | -1.80   | 1.80   | $\phi_{ref}$ | Fig. 3-66, (p. 3-101) |
| Display of the angle between the calculated neutral-point displacement voltage and the measured residual current system quantities $I_N$ referred to 100°. |         |        |              |                       |
| MAIN: Current $\Sigma I,1$ unfilt.                                                                                                                         |         |        |              | 004 074               |
| Not measured                                                                                                                                               | 0.000   | 25.000 | Inom         |                       |
| Display of calculated unfiltered resultant current.                                                                                                        |         |        |              |                       |
| MAIN: Frequency $f,2$                                                                                                                                      |         |        |              | 101 000               |
| Not measured                                                                                                                                               | 40.00   | 70.00  | Hz           |                       |
| Display of system frequency.                                                                                                                               |         |        |              |                       |
| MAIN: Curr. IP max,2 prim.                                                                                                                                 |         |        |              | 101 001               |
| Not measured                                                                                                                                               | 0.0     | 6550.0 | A            |                       |
| Display of the maximum phase current as a primary quantity.                                                                                                |         |        |              |                       |
| MAIN: IP max,2 prim.,delay                                                                                                                                 |         |        |              | 101 002               |
| Not measured                                                                                                                                               | 0       | 25000  | A            |                       |
| Display of the delayed maximum phase current as a primary quantity.                                                                                        |         |        |              |                       |
| MAIN: IPmax,2 prim.,stored                                                                                                                                 |         |        |              | 101 003               |
| Not measured                                                                                                                                               | 0       | 25000  | A            |                       |
| Display of the delayed stored maximum phase current as a primary quantity.                                                                                 |         |        |              |                       |
| MAIN: Curr. IP min,2 prim.                                                                                                                                 |         |        |              | 101 004               |
| Not measured                                                                                                                                               | 0.0     | 6550.0 | A            |                       |
| Display of the minimum phase current as a primary quantity.                                                                                                |         |        |              |                       |
| MAIN: Current A,2 prim.                                                                                                                                    |         |        |              | 101 005               |
| Not measured                                                                                                                                               | 0.0     | 6550.0 | A            |                       |
| Display of phase current A as a primary quantity.                                                                                                          |         |        |              |                       |
| MAIN: Current B,2 prim.                                                                                                                                    |         |        |              | 101 006               |
| Not measured                                                                                                                                               | 0.0     | 6550.0 | A            |                       |
| Display of phase current B as a primary quantity.                                                                                                          |         |        |              |                       |
| MAIN: Current C,2 prim.                                                                                                                                    |         |        |              | 101 007               |
| Not measured                                                                                                                                               | 0.0     | 6550.0 | A            |                       |
| Display of phase current C as a primary quantity.                                                                                                          |         |        |              |                       |

| Parameter                                                                                       |     |        |      | Address       |
|-------------------------------------------------------------------------------------------------|-----|--------|------|---------------|
| Default                                                                                         | Min | Max    | Unit | Logic Diagram |
| MAIN: Current $\Sigma$ (IP), 2 prim.                                                            |     |        |      | 101 008       |
| Not measured                                                                                    | 0.0 | 6550.0 | A    |               |
| Display of the calculated resultant current as a primary quantity.                              |     |        |      |               |
| MAIN: Current IN, 2 prim.                                                                       |     |        |      | 101 009       |
| Not measured                                                                                    | 0.0 | 6550.0 | A    |               |
| Display of the updated value for the residual current as a primary quantity.                    |     |        |      |               |
| MAIN: Volt.VPG max, 2 prim.                                                                     |     |        |      | 101 010       |
| Not measured                                                                                    | 0.0 | 2500.0 | kV   |               |
| Display of the maximum phase-to-ground voltage as a primary quantity.                           |     |        |      |               |
| MAIN: Volt.VPG min, 2 prim.                                                                     |     |        |      | 101 011       |
| Not measured                                                                                    | 0.0 | 2500.0 | kV   |               |
| Display of the minimum phase-to-ground voltage as a primary quantity.                           |     |        |      |               |
| MAIN: Voltage A-G, 2 prim.                                                                      |     |        |      | 101 012       |
| Not measured                                                                                    | 0.0 | 2500.0 | kV   |               |
| Display of the updated value for the phase-to-ground voltage A-G as a primary quantity.         |     |        |      |               |
| MAIN: Voltage B-G, 2 prim.                                                                      |     |        |      | 101 013       |
| Not measured                                                                                    | 0.0 | 2500.0 | kV   |               |
| Display of the updated value for the phase-to-ground voltage B-G as a primary quantity.         |     |        |      |               |
| MAIN: Voltage C-G, 2 prim.                                                                      |     |        |      | 101 014       |
| Not measured                                                                                    | 0.0 | 2500.0 | kV   |               |
| Display of the updated value for the phase-to-ground voltage C-G as a primary quantity.         |     |        |      |               |
| MAIN: Volt. $\Sigma$ (VPG)/3, 2 prim.                                                           |     |        |      | 101 015       |
| Not measured                                                                                    | 0.0 | 2500.0 | kV   |               |
| Display of the calculated neutral displacement voltage as a primary quantity.                   |     |        |      |               |
| MAIN: Voltage VNG/Vx, 2 prim                                                                    |     |        |      | 101 016       |
| Not measured                                                                                    | 0.0 | 2500.0 | kV   |               |
| Display of the neutral displacement voltage measured at transformer T 92 as a primary quantity. |     |        |      |               |
| MAIN: Volt.VPP max, 2 prim.                                                                     |     |        |      | 101 017       |
| Not measured                                                                                    | 0.0 | 2500.0 | kV   |               |
| Display of the maximum phase-to-phase voltage as a primary quantity.                            |     |        |      |               |

| Parameter                                                                              |        |        |        | Address       |         |
|----------------------------------------------------------------------------------------|--------|--------|--------|---------------|---------|
| Default                                                                                | Min    | Max    | Unit   | Logic Diagram |         |
| MAIN: Voltage VPPmin,2 pri                                                             |        |        |        |               | 101 018 |
| Not measured                                                                           | 0.0    | 2500.0 | kV     |               |         |
| Display of the minimum phase-to-phase voltage as a primary quantity.                   |        |        |        |               |         |
| MAIN: Voltage A-B,2 prim.                                                              |        |        |        |               | 101 020 |
| Not measured                                                                           | 0.0    | 2500.0 | kV     |               |         |
| Display of the updated value for the phase-to-phase voltage A-B as a primary quantity. |        |        |        |               |         |
| MAIN: Voltage B-C,2 prim.                                                              |        |        |        |               | 101 021 |
| Not measured                                                                           | 0.0    | 2500.0 | kV     |               |         |
| Display of the updated value for the phase-to-phase voltage B-C as a primary quantity. |        |        |        |               |         |
| MAIN: Voltage C-A,2 prim.                                                              |        |        |        |               | 101 022 |
| Not measured                                                                           | 0.0    | 2500.0 | kV     |               |         |
| Display of the updated value for the phase-to-phase voltage B-C as a primary quantity. |        |        |        |               |         |
| MAIN: Activepower P,2 prim                                                             |        |        |        |               | 101 023 |
| Not measured                                                                           | -999.9 | 1000.0 | MW     |               |         |
| Display of the updated active power value as a primary quantity.                       |        |        |        |               |         |
| MAIN: Reac.power Q,2 prim.                                                             |        |        |        |               | 101 024 |
| Not measured                                                                           | -999.9 | 1000.0 | Mvar   |               |         |
| Display of the updated reactive power value as a primary quantity.                     |        |        |        |               |         |
| MAIN: Act.energyout.,2prim                                                             |        |        |        |               | 101 025 |
| 0.00                                                                                   | 0.00   | 655.35 | MWh    |               |         |
| Display of the updated active energy output as a primary quantity.                     |        |        |        |               |         |
| MAIN: Act.energyinp.,2prim                                                             |        |        |        |               | 101 026 |
| 0.00                                                                                   | 0.00   | 655.35 | MWh    |               |         |
| Display of the updated active energy input as a primary quantity.                      |        |        |        |               |         |
| MAIN: React.en.outp.,2prim                                                             |        |        |        |               | 101 027 |
| 0.00                                                                                   | 0.00   | 655.35 | Mvar h |               |         |
| Display of the updated reactive energy output as a primary quantity.                   |        |        |        |               |         |
| MAIN: React. en.inp.,2prim                                                             |        |        |        |               | 101 028 |
| 0.00                                                                                   | 0.00   | 655.35 | Mvar h |               |         |
| Display of the updated reactive energy output as a primary quantity.                   |        |        |        |               |         |

| Parameter                                                              |        |        |            | Address       |  |  |         |
|------------------------------------------------------------------------|--------|--------|------------|---------------|--|--|---------|
| Default                                                                | Min    | Max    | Unit       | Logic Diagram |  |  |         |
| MAIN: Current $I_{pmax,2}$ p.u.                                        |        |        |            |               |  |  | 101 029 |
| Not measured                                                           | 0.0000 | 4.0000 | Inom       |               |  |  |         |
| Display of the maximum phase current referred to Inom.                 |        |        |            |               |  |  |         |
| MAIN: $I_P$ max,2 p.u.,delay                                           |        |        |            |               |  |  | 101 030 |
| Not measured                                                           | 0.000  | 4.000  | Inom       |               |  |  |         |
| Display of the delayed maximum phase current referred to Inom.         |        |        |            |               |  |  |         |
| MAIN: $I_P$ max,2 p.u.,stored                                          |        |        |            |               |  |  | 101 031 |
| Not measured                                                           | 0.000  | 4.000  | Inom       |               |  |  |         |
| Display of the delayed stored maximum phase current referred to Inom.  |        |        |            |               |  |  |         |
| MAIN: Current $I_P$ min,2 p.u.                                         |        |        |            |               |  |  | 101 032 |
| Not measured                                                           | 0.0000 | 4.0000 | Inom       |               |  |  |         |
| Display of the minimum phase current referred to Inom.                 |        |        |            |               |  |  |         |
| MAIN: Current A,2 p.u.                                                 |        |        |            |               |  |  | 101 033 |
| Not measured                                                           | 0.0000 | 4.0000 | Inom       |               |  |  |         |
| Display of phase current A referred to Inom.                           |        |        |            |               |  |  |         |
| MAIN: Current B,2 p.u.                                                 |        |        |            |               |  |  | 101 034 |
| Not measured                                                           | 0.0000 | 4.0000 | Inom       |               |  |  |         |
| Display of phase current B referred to Inom.                           |        |        |            |               |  |  |         |
| MAIN: Current C,2 p.u.                                                 |        |        |            |               |  |  | 101 035 |
| Not measured                                                           | 0.0000 | 4.0000 | Inom       |               |  |  |         |
| Display of phase current C referred to Inom.                           |        |        |            |               |  |  |         |
| MAIN: Current $\Sigma(I_P)$ ,2 p.u.                                    |        |        |            |               |  |  | 101 036 |
| Not measured                                                           | 0.0000 | 4.0000 | Inom       |               |  |  |         |
| Display of the calculated resultant current referred to Inom.          |        |        |            |               |  |  |         |
| MAIN: Current $\Sigma I$ ,2 unfilt.                                    |        |        |            |               |  |  | 101 037 |
| Not measured                                                           | 0.000  | 16.000 | Inom       |               |  |  |         |
| Display of calculated unfiltered resultant current.                    |        |        |            |               |  |  |         |
| MAIN: Current $I_N$ ,2 p.u.                                            |        |        |            |               |  |  | 101 038 |
| Not measured                                                           | 0.0000 | 2.0000 | $I_N$ ,nom |               |  |  |         |
| Display of the updated residual current value referred to Inom.        |        |        |            |               |  |  |         |
| MAIN: Voltage $V_{PGmax,2}$ p.u.                                       |        |        |            |               |  |  | 101 039 |
| Not measured                                                           | 0.000  | 25.000 | $V_{nom}$  |               |  |  |         |
| Display of the maximum phase-to-ground voltage referred to $V_{nom}$ . |        |        |            |               |  |  |         |

| Parameter                                                                                       |     |     |      | Address       |  |  |         |
|-------------------------------------------------------------------------------------------------|-----|-----|------|---------------|--|--|---------|
| Default                                                                                         | Min | Max | Unit | Logic Diagram |  |  |         |
| MAIN: Voltage VPGmin,2 p.u.                                                                     |     |     |      |               |  |  | 101 040 |
| Not measured0.00025.000Vnom                                                                     |     |     |      |               |  |  |         |
| Display of the minimum phase-to-ground voltage referred to Vnom.                                |     |     |      |               |  |  |         |
| MAIN: Voltage A-G,2 p.u.                                                                        |     |     |      |               |  |  | 101 041 |
| Not measured0.00025.000Vnom                                                                     |     |     |      |               |  |  |         |
| Display of the updated value for phase-to-ground voltage A-G referred to Vnom.                  |     |     |      |               |  |  |         |
| MAIN: Voltage B-G,2 p.u.                                                                        |     |     |      |               |  |  | 101 042 |
| Not measured0.00025.000Vnom                                                                     |     |     |      |               |  |  |         |
| Display of the updated value for phase-to-ground voltage B-G referred to Vnom.                  |     |     |      |               |  |  |         |
| MAIN: Voltage C-G,2 p.u.                                                                        |     |     |      |               |  |  | 101 043 |
| Not measured0.00025.000Vnom                                                                     |     |     |      |               |  |  |         |
| Display of the updated value for phase-to-ground voltage C-G referred to Vnom.                  |     |     |      |               |  |  |         |
| MAIN: Volt.Σ(VPG)/√3,2 p.u.                                                                     |     |     |      |               |  |  | 101 044 |
| Not measured0.00012.000Vnom                                                                     |     |     |      |               |  |  |         |
| Display of the calculated neutral displacement voltage referred to Vnom.                        |     |     |      |               |  |  |         |
| MAIN: Voltage VNG/Vx,2 p.u.                                                                     |     |     |      |               |  |  | 101 045 |
| Not measured0.00025.000VNG,nom                                                                  |     |     |      |               |  |  |         |
| Display of the neutral displacement voltage measured at transformer T 92 and referred to Vnom . |     |     |      |               |  |  |         |
| MAIN: Voltage VPPmax,2 p.u.                                                                     |     |     |      |               |  |  | 101 046 |
| Not measured0.00025.000Vnom                                                                     |     |     |      |               |  |  |         |
| Display of the maximum phase-to-phase voltage referred to Vnom.                                 |     |     |      |               |  |  |         |
| MAIN: Voltage VPPmin,2 p.u.                                                                     |     |     |      |               |  |  | 101 047 |
| Not measured0.00025.000Vnom                                                                     |     |     |      |               |  |  |         |
| Display of the minimum phase-to-phase voltage referred to Vnom.                                 |     |     |      |               |  |  |         |
| MAIN: Voltage A-B,2 p.u.                                                                        |     |     |      |               |  |  | 101 048 |
| Not measured0.00025.000Vnom                                                                     |     |     |      |               |  |  |         |
| Display of the updated value for phase-to-phase voltage A-B referred to Vnom.                   |     |     |      |               |  |  |         |
| MAIN: Voltage B-C,2 p.u.                                                                        |     |     |      |               |  |  | 101 049 |
| Not measured0.00025.000Vnom                                                                     |     |     |      |               |  |  |         |
| Display of the updated value for phase-to-phase voltage A-B referred to Vnom.                   |     |     |      |               |  |  |         |
| MAIN: Voltage C-A,2 p.u.                                                                        |     |     |      |               |  |  | 101 050 |
| Not measured0.00025.000Vnom                                                                     |     |     |      |               |  |  |         |
| Display of the updated value for phase-to-phase voltage A-B referred to Vnom.                   |     |     |      |               |  |  |         |



| Parameter                                                                                |         |        |      | Address       |
|------------------------------------------------------------------------------------------|---------|--------|------|---------------|
| Default                                                                                  | Min     | Max    | Unit | Logic Diagram |
| MAIN: Appar. power S, 2 p.u.                                                             |         |        |      | 007 020       |
| Not measured                                                                             | -10.700 | 10.700 | Snom |               |
| MAIN: Activepower P, 2 p.u.                                                              |         |        |      | 101 051       |
| Not measured                                                                             | -4.000  | 4.000  | Snom |               |
| Display of the updated value for active power referred to nominal apparent power Snom.   |         |        |      |               |
| MAIN: Reac. power Q, 2 p.u.                                                              |         |        |      | 101 052       |
| Not measured                                                                             | -4.000  | 4.000  | Snom |               |
| Display of the updated value for reactive power referred to nominal apparent power Snom. |         |        |      |               |
| MAIN: Activepower factor, 2                                                              |         |        |      | 101 053       |
| Not measured                                                                             | -1.000  | 1.000  |      |               |
| Display of the updated active power factor.                                              |         |        |      |               |
| MAIN: Load angle phi A, 2                                                                |         |        |      | 101 055       |
| Not measured                                                                             | -180.0  | 180.0  | °    |               |
| Display of the updated load angle value in phase A.                                      |         |        |      |               |
| MAIN: Load angle phi B, 2                                                                |         |        |      | 101 056       |
| Not measured                                                                             | -180.0  | 180.0  | °    |               |
| Display of the updated load angle value in phase B.                                      |         |        |      |               |
| MAIN: Load angle phi C, 2                                                                |         |        |      | 101 057       |
| Not measured                                                                             | -180.0  | 180.0  | °    |               |
| Display of the updated load angle value in phase C.                                      |         |        |      |               |
| MAIN: Angle phi N, 2                                                                     |         |        |      | 101 058       |
| Not measured                                                                             | -180.0  | 180.0  | °    |               |
| Display of the angle between the measured residual current system quantities IN and VNG. |         |        |      |               |
| MAIN: Ph.rel.IN vs ΣIP, 2                                                                |         |        |      | 101 059       |
| ....: Not measured                                                                       |         |        |      |               |
| The phase relations of measured and calculated residual current are compared.            |         |        |      |               |

## Binary counts

| Parameter       |     |       |      |  | Address                |  |         |
|-----------------|-----|-------|------|--|------------------------|--|---------|
| Default         | Min | Max   | Unit |  | Logic Diagram          |  |         |
| COUNT: Count 1  |     |       |      |  |                        |  | 217 100 |
| 0               | 0   | 65535 |      |  | Fig. 3-152, (p. 3-205) |  |         |
| COUNT: Count 2  |     |       |      |  |                        |  | 217 080 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 3  |     |       |      |  |                        |  | 217 081 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 4  |     |       |      |  |                        |  | 217 082 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 5  |     |       |      |  |                        |  | 217 104 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 6  |     |       |      |  |                        |  | 217 105 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 7  |     |       |      |  |                        |  | 217 106 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 8  |     |       |      |  |                        |  | 217 107 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 9  |     |       |      |  |                        |  | 217 108 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 10 |     |       |      |  |                        |  | 217 109 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 11 |     |       |      |  |                        |  | 217 110 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 12 |     |       |      |  |                        |  | 217 111 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 13 |     |       |      |  |                        |  | 217 112 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 14 |     |       |      |  |                        |  | 217 113 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 15 |     |       |      |  |                        |  | 217 114 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 16 |     |       |      |  |                        |  | 217 115 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 17 |     |       |      |  |                        |  | 217 116 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 18 |     |       |      |  |                        |  | 217 117 |
| 0               | 0   | 65535 |      |  |                        |  |         |
| COUNT: Count 19 |     |       |      |  |                        |  | 217 118 |
| 0               | 0   | 65535 |      |  |                        |  |         |

| Parameter                                                 |     |       |      |  | Address       |  |         |
|-----------------------------------------------------------|-----|-------|------|--|---------------|--|---------|
| Default                                                   | Min | Max   | Unit |  | Logic Diagram |  |         |
| COUNT: Count 20                                           |     |       |      |  |               |  | 217 119 |
| 0                                                         | 0   | 65535 |      |  |               |  |         |
| COUNT: Count 21                                           |     |       |      |  |               |  | 217 120 |
| 0                                                         | 0   | 65535 |      |  |               |  |         |
| COUNT: Count 22                                           |     |       |      |  |               |  | 217 121 |
| 0                                                         | 0   | 65535 |      |  |               |  |         |
| COUNT: Count 23                                           |     |       |      |  |               |  | 217 122 |
| 0                                                         | 0   | 65535 |      |  |               |  |         |
| COUNT: Count 24                                           |     |       |      |  |               |  | 217 123 |
| 0                                                         | 0   | 65535 |      |  |               |  |         |
| Display of the updated count.                             |     |       |      |  |               |  |         |
| Note: The count value can be set here (Preload-Function). |     |       |      |  |               |  |         |

## 8.1.1.2 Physical State Signals

## Virtual Inputs

| Parameter            |     |     |      |  | Address       |  |         |
|----------------------|-----|-----|------|--|---------------|--|---------|
| Default              | Min | Max | Unit |  | Logic Diagram |  |         |
| VINP: Input 1 state  |     |     |      |  |               |  | 115 010 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 2 state  |     |     |      |  |               |  | 115 011 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 3 state  |     |     |      |  |               |  | 115 012 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 4 state  |     |     |      |  |               |  | 115 013 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 5 state  |     |     |      |  |               |  | 115 014 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 6 state  |     |     |      |  |               |  | 115 015 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 7 state  |     |     |      |  |               |  | 115 016 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 8 state  |     |     |      |  |               |  | 115 017 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 9 state  |     |     |      |  |               |  | 115 018 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 10 state |     |     |      |  |               |  | 115 019 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 11 state |     |     |      |  |               |  | 115 020 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 12 state |     |     |      |  |               |  | 115 021 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 13 state |     |     |      |  |               |  | 115 022 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 14 state |     |     |      |  |               |  | 115 023 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 15 state |     |     |      |  |               |  | 115 024 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 16 state |     |     |      |  |               |  | 115 025 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 17 state |     |     |      |  |               |  | 115 026 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 18 state |     |     |      |  |               |  | 115 027 |
| 0: 0                 |     |     |      |  |               |  |         |

| Parameter            |     |     |      | Address       |
|----------------------|-----|-----|------|---------------|
| Default              | Min | Max | Unit | Logic Diagram |
| VINP: Input 19 state |     |     |      | 115 028       |
| 0: 0                 |     |     |      |               |
| VINP: Input 20 state |     |     |      | 115 029       |
| 0: 0                 |     |     |      |               |
| VINP: Input 21 state |     |     |      | 115 030       |
| 0: 0                 |     |     |      |               |
| VINP: Input 22 state |     |     |      | 115 031       |
| 0: 0                 |     |     |      |               |
| VINP: Input 23 state |     |     |      | 115 032       |
| 0: 0                 |     |     |      |               |
| VINP: Input 24 state |     |     |      | 115 033       |
| 0: 0                 |     |     |      |               |
| VINP: Input 25 state |     |     |      | 115 034       |
| 0: 0                 |     |     |      |               |
| VINP: Input 26 state |     |     |      | 115 035       |
| 0: 0                 |     |     |      |               |
| VINP: Input 27 state |     |     |      | 115 036       |
| 0: 0                 |     |     |      |               |
| VINP: Input 28 state |     |     |      | 115 037       |
| 0: 0                 |     |     |      |               |
| VINP: Input 29 state |     |     |      | 115 038       |
| 0: 0                 |     |     |      |               |
| VINP: Input 30 state |     |     |      | 115 039       |
| 0: 0                 |     |     |      |               |
| VINP: Input 31 state |     |     |      | 115 040       |
| 0: 0                 |     |     |      |               |
| VINP: Input 32 state |     |     |      | 115 041       |
| 0: 0                 |     |     |      |               |
| VINP: Input 33 state |     |     |      | 115 042       |
| 0: 0                 |     |     |      |               |
| VINP: Input 34 state |     |     |      | 115 043       |
| 0: 0                 |     |     |      |               |
| VINP: Input 35 state |     |     |      | 115 044       |
| 0: 0                 |     |     |      |               |
| VINP: Input 36 state |     |     |      | 115 045       |
| 0: 0                 |     |     |      |               |
| VINP: Input 37 state |     |     |      | 115 046       |
| 0: 0                 |     |     |      |               |

| Parameter            |     |     |      |  | Address       |  |         |
|----------------------|-----|-----|------|--|---------------|--|---------|
| Default              | Min | Max | Unit |  | Logic Diagram |  |         |
| VINP: Input 38 state |     |     |      |  |               |  | 115 047 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 39 state |     |     |      |  |               |  | 115 048 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 40 state |     |     |      |  |               |  | 115 049 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 41 state |     |     |      |  |               |  | 115 050 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 42 state |     |     |      |  |               |  | 115 051 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 43 state |     |     |      |  |               |  | 115 052 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 44 state |     |     |      |  |               |  | 115 053 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 45 state |     |     |      |  |               |  | 115 054 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 46 state |     |     |      |  |               |  | 115 055 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 47 state |     |     |      |  |               |  | 115 056 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 48 state |     |     |      |  |               |  | 115 057 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 49 state |     |     |      |  |               |  | 115 058 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 50 state |     |     |      |  |               |  | 115 059 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 51 state |     |     |      |  |               |  | 115 060 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 52 state |     |     |      |  |               |  | 115 061 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 53 state |     |     |      |  |               |  | 115 062 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 54 state |     |     |      |  |               |  | 115 063 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 55 state |     |     |      |  |               |  | 115 064 |
| 0: 0                 |     |     |      |  |               |  |         |
| VINP: Input 56 state |     |     |      |  |               |  | 115 065 |
| 0: 0                 |     |     |      |  |               |  |         |

| Parameter            |     |     |      |  | Address       |
|----------------------|-----|-----|------|--|---------------|
| Default              | Min | Max | Unit |  | Logic Diagram |
| VINP: Input 57 state |     |     |      |  | 115 066       |
| 0: 0                 |     |     |      |  |               |
| VINP: Input 58 state |     |     |      |  | 115 067       |
| 0: 0                 |     |     |      |  |               |
| VINP: Input 59 state |     |     |      |  | 115 068       |
| 0: 0                 |     |     |      |  |               |
| VINP: Input 60 state |     |     |      |  | 115 069       |
| 0: 0                 |     |     |      |  |               |
| VINP: Input 61 state |     |     |      |  | 115 070       |
| 0: 0                 |     |     |      |  |               |
| VINP: Input 62 state |     |     |      |  | 115 071       |
| 0: 0                 |     |     |      |  |               |
| VINP: Input 63 state |     |     |      |  | 115 072       |
| 0: 0                 |     |     |      |  |               |
| VINP: Input 64 state |     |     |      |  | 115 073       |
| 0: 0                 |     |     |      |  |               |

Generic Object  
Orientated  
Substation Events

| Parameter                                         |     |     |      |  | Address       |
|---------------------------------------------------|-----|-----|------|--|---------------|
| Default                                           | Min | Max | Unit |  | Logic Diagram |
| GOOSE: Output 1 state                             |     |     |      |  | 106 010       |
| 0: 0                                              |     |     |      |  |               |
| GOOSE: Output 32 state                            |     |     |      |  | 106 072       |
| 0: 0                                              |     |     |      |  |               |
| Display of the virtual binary GOOSE output state. |     |     |      |  |               |
| GOOSE: Input 1 state                              |     |     |      |  | 106 200       |
| 0: 0                                              |     |     |      |  |               |
| GOOSE: Input 128 state                            |     |     |      |  | 112 195       |
| 0: 0                                              |     |     |      |  |               |
| Display of the virtual binary GOOSE input state.  |     |     |      |  |               |

Configurable function keys

| Parameter                                                                                                                                                                                                                                                     |     |     |      |  | Address       |  |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                                                                                                                                                                                                                                                       | Min | Max | Unit |  | Logic Diagram |  |         |
| F_KEY: State F1                                                                                                                                                                                                                                               |     |     |      |  |               |  | 080 122 |
| 0: "Off"                                                                                                                                                                                                                                                      |     |     |      |  |               |  |         |
| F_KEY: State F2                                                                                                                                                                                                                                               |     |     |      |  |               |  | 080 123 |
| 0: "Off"                                                                                                                                                                                                                                                      |     |     |      |  |               |  |         |
| F_KEY: State F3                                                                                                                                                                                                                                               |     |     |      |  |               |  | 080 124 |
| 0: "Off"                                                                                                                                                                                                                                                      |     |     |      |  |               |  |         |
| F_KEY: State F4                                                                                                                                                                                                                                               |     |     |      |  |               |  | 080 125 |
| 0: "Off"                                                                                                                                                                                                                                                      |     |     |      |  |               |  |         |
| F_KEY: State F5                                                                                                                                                                                                                                               |     |     |      |  |               |  | 080 126 |
| 0: "Off"                                                                                                                                                                                                                                                      |     |     |      |  |               |  |         |
| F_KEY: State F6                                                                                                                                                                                                                                               |     |     |      |  |               |  | 080 127 |
| 0: "Off"                                                                                                                                                                                                                                                      |     |     |      |  |               |  |         |
| The state of the function keys is displayed as follows:                                                                                                                                                                                                       |     |     |      |  |               |  |         |
| <ul style="list-style-type: none"><li>● <i>Without function</i>: No functions are assigned to the function key.</li><li>● <i>"Off"</i>: The function key is in the "Off" position.</li><li>● <i>"On"</i>: The function key is in the "On" position.</li></ul> |     |     |      |  |               |  |         |



## Binary input

| Parameter        |     |     |      |               | Address |
|------------------|-----|-----|------|---------------|---------|
| Default          | Min | Max | Unit | Logic Diagram |         |
| INP: State U 501 |     |     |      |               | 181 001 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 502 |     |     |      |               | 181 005 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 503 |     |     |      |               | 181 009 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 504 |     |     |      |               | 181 013 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 505 |     |     |      |               | 181 017 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 506 |     |     |      |               | 181 021 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 507 |     |     |      |               | 181 025 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 508 |     |     |      |               | 181 029 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 509 |     |     |      |               | 181 033 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 510 |     |     |      |               | 181 037 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 511 |     |     |      |               | 181 041 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 512 |     |     |      |               | 181 045 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 513 |     |     |      |               | 181 049 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 514 |     |     |      |               | 181 053 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 515 |     |     |      |               | 181 057 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 516 |     |     |      |               | 181 061 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 517 |     |     |      |               | 181 065 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 518 |     |     |      |               | 181 069 |
| 0: "Low"         |     |     |      |               |         |
| INP: State U 519 |     |     |      |               | 181 073 |
| 0: "Low"         |     |     |      |               |         |

| Parameter        |     |     |      |  | Address       |  |         |
|------------------|-----|-----|------|--|---------------|--|---------|
| Default          | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: State U 520 |     |     |      |  |               |  | 181 077 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 521 |     |     |      |  |               |  | 181 081 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 522 |     |     |      |  |               |  | 181 085 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 523 |     |     |      |  |               |  | 181 089 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 524 |     |     |      |  |               |  | 181 093 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 601 |     |     |      |  |               |  | 152 090 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 602 |     |     |      |  |               |  | 152 093 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 603 |     |     |      |  |               |  | 152 096 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 604 |     |     |      |  |               |  | 152 099 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 605 |     |     |      |  |               |  | 152 102 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 606 |     |     |      |  |               |  | 152 105 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 607 |     |     |      |  |               |  | 182 025 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 608 |     |     |      |  |               |  | 182 029 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 609 |     |     |      |  |               |  | 182 033 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 610 |     |     |      |  |               |  | 182 037 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 611 |     |     |      |  |               |  | 182 041 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 612 |     |     |      |  |               |  | 182 045 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 613 |     |     |      |  |               |  | 182 049 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 614 |     |     |      |  |               |  | 182 053 |
| 0: "Low"         |     |     |      |  |               |  |         |

| Parameter        |     |     |      | Address       |
|------------------|-----|-----|------|---------------|
| Default          | Min | Max | Unit | Logic Diagram |
| INP: State U 615 |     |     |      | 182 057       |
| 0: "Low"         |     |     |      |               |
| INP: State U 616 |     |     |      | 182 061       |
| 0: "Low"         |     |     |      |               |
| INP: State U 617 |     |     |      | 182 065       |
| 0: "Low"         |     |     |      |               |
| INP: State U 618 |     |     |      | 182 069       |
| 0: "Low"         |     |     |      |               |
| INP: State U 619 |     |     |      | 182 073       |
| 0: "Low"         |     |     |      |               |
| INP: State U 620 |     |     |      | 182 077       |
| 0: "Low"         |     |     |      |               |
| INP: State U 621 |     |     |      | 182 081       |
| 0: "Low"         |     |     |      |               |
| INP: State U 622 |     |     |      | 182 085       |
| 0: "Low"         |     |     |      |               |
| INP: State U 623 |     |     |      | 182 089       |
| 0: "Low"         |     |     |      |               |
| INP: State U 624 |     |     |      | 182 093       |
| 0: "Low"         |     |     |      |               |
| INP: State U 701 |     |     |      | 152 108       |
| 0: "Low"         |     |     |      |               |
| INP: State U 702 |     |     |      | 152 111       |
| 0: "Low"         |     |     |      |               |
| INP: State U 703 |     |     |      | 152 114       |
| 0: "Low"         |     |     |      |               |
| INP: State U 704 |     |     |      | 152 117       |
| 0: "Low"         |     |     |      |               |
| INP: State U 705 |     |     |      | 152 120       |
| 0: "Low"         |     |     |      |               |
| INP: State U 706 |     |     |      | 152 123       |
| 0: "Low"         |     |     |      |               |
| INP: State U 707 |     |     |      | 183 025       |
| 0: "Low"         |     |     |      |               |
| INP: State U 708 |     |     |      | 183 029       |
| 0: "Low"         |     |     |      |               |
| INP: State U 709 |     |     |      | 183 033       |
| 0: "Low"         |     |     |      |               |

| Parameter        |     |     |      |  | Address       |  |         |
|------------------|-----|-----|------|--|---------------|--|---------|
| Default          | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: State U 710 |     |     |      |  |               |  | 183 037 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 711 |     |     |      |  |               |  | 183 041 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 712 |     |     |      |  |               |  | 183 045 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 713 |     |     |      |  |               |  | 183 049 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 714 |     |     |      |  |               |  | 183 053 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 715 |     |     |      |  |               |  | 183 057 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 716 |     |     |      |  |               |  | 183 061 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 717 |     |     |      |  |               |  | 183 065 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 718 |     |     |      |  |               |  | 183 069 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 719 |     |     |      |  |               |  | 183 073 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 720 |     |     |      |  |               |  | 183 077 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 721 |     |     |      |  |               |  | 183 081 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 722 |     |     |      |  |               |  | 183 085 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 723 |     |     |      |  |               |  | 183 089 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 724 |     |     |      |  |               |  | 183 093 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 801 |     |     |      |  |               |  | 184 001 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 802 |     |     |      |  |               |  | 184 005 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 803 |     |     |      |  |               |  | 184 009 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 804 |     |     |      |  |               |  | 184 013 |
| 0: "Low"         |     |     |      |  |               |  |         |

| Parameter        |     |     |      | Address       |
|------------------|-----|-----|------|---------------|
| Default          | Min | Max | Unit | Logic Diagram |
| INP: State U 805 |     |     |      | 184 017       |
| 0: "Low"         |     |     |      |               |
| INP: State U 806 |     |     |      | 184 021       |
| 0: "Low"         |     |     |      |               |
| INP: State U 807 |     |     |      | 184 025       |
| 0: "Low"         |     |     |      |               |
| INP: State U 808 |     |     |      | 184 029       |
| 0: "Low"         |     |     |      |               |
| INP: State U 809 |     |     |      | 184 033       |
| 0: "Low"         |     |     |      |               |
| INP: State U 810 |     |     |      | 184 037       |
| 0: "Low"         |     |     |      |               |
| INP: State U 811 |     |     |      | 184 041       |
| 0: "Low"         |     |     |      |               |
| INP: State U 812 |     |     |      | 184 045       |
| 0: "Low"         |     |     |      |               |
| INP: State U 813 |     |     |      | 184 049       |
| 0: "Low"         |     |     |      |               |
| INP: State U 814 |     |     |      | 184 053       |
| 0: "Low"         |     |     |      |               |
| INP: State U 815 |     |     |      | 184 057       |
| 0: "Low"         |     |     |      |               |
| INP: State U 816 |     |     |      | 184 061       |
| 0: "Low"         |     |     |      |               |
| INP: State U 817 |     |     |      | 184 065       |
| 0: "Low"         |     |     |      |               |
| INP: State U 818 |     |     |      | 184 069       |
| 0: "Low"         |     |     |      |               |
| INP: State U 819 |     |     |      | 184 073       |
| 0: "Low"         |     |     |      |               |
| INP: State U 820 |     |     |      | 184 077       |
| 0: "Low"         |     |     |      |               |
| INP: State U 821 |     |     |      | 184 081       |
| 0: "Low"         |     |     |      |               |
| INP: State U 822 |     |     |      | 184 085       |
| 0: "Low"         |     |     |      |               |
| INP: State U 823 |     |     |      | 184 089       |
| 0: "Low"         |     |     |      |               |

| Parameter        |     |     |      |  | Address       |  |         |
|------------------|-----|-----|------|--|---------------|--|---------|
| Default          | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: State U 824 |     |     |      |  |               |  | 184 093 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 901 |     |     |      |  |               |  | 152 144 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 902 |     |     |      |  |               |  | 152 147 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 903 |     |     |      |  |               |  | 152 150 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 904 |     |     |      |  |               |  | 152 153 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 905 |     |     |      |  |               |  | 153 001 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 906 |     |     |      |  |               |  | 153 005 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 907 |     |     |      |  |               |  | 153 009 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 908 |     |     |      |  |               |  | 153 013 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 909 |     |     |      |  |               |  | 153 017 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 910 |     |     |      |  |               |  | 153 021 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 911 |     |     |      |  |               |  | 153 025 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 912 |     |     |      |  |               |  | 153 029 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 913 |     |     |      |  |               |  | 153 033 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 914 |     |     |      |  |               |  | 153 037 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 915 |     |     |      |  |               |  | 153 041 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 916 |     |     |      |  |               |  | 153 045 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 917 |     |     |      |  |               |  | 153 049 |
| 0: "Low"         |     |     |      |  |               |  |         |
| INP: State U 918 |     |     |      |  |               |  | 153 053 |
| 0: "Low"         |     |     |      |  |               |  |         |

| Parameter         |     |     |      | Address       |
|-------------------|-----|-----|------|---------------|
| Default           | Min | Max | Unit | Logic Diagram |
| INP: State U 919  |     |     |      | 153 057       |
| 0: "Low"          |     |     |      |               |
| INP: State U 920  |     |     |      | 153 061       |
| 0: "Low"          |     |     |      |               |
| INP: State U 921  |     |     |      | 153 065       |
| 0: "Low"          |     |     |      |               |
| INP: State U 922  |     |     |      | 153 069       |
| 0: "Low"          |     |     |      |               |
| INP: State U 923  |     |     |      | 153 073       |
| 0: "Low"          |     |     |      |               |
| INP: State U 924  |     |     |      | 153 077       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1001 |     |     |      | 152 162       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1002 |     |     |      | 152 165       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1003 |     |     |      | 152 168       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1004 |     |     |      | 152 171       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1005 |     |     |      | 152 174       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1006 |     |     |      | 152 177       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1007 |     |     |      | 186 025       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1008 |     |     |      | 186 029       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1009 |     |     |      | 186 033       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1010 |     |     |      | 186 037       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1011 |     |     |      | 186 041       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1012 |     |     |      | 186 045       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1013 |     |     |      | 186 049       |
| 0: "Low"          |     |     |      |               |

| Parameter         |     |     |      |  | Address       |  |         |
|-------------------|-----|-----|------|--|---------------|--|---------|
| Default           | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: State U 1014 |     |     |      |  |               |  | 186 053 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1015 |     |     |      |  |               |  | 186 057 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1016 |     |     |      |  |               |  | 186 061 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1017 |     |     |      |  |               |  | 186 065 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1018 |     |     |      |  |               |  | 186 069 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1019 |     |     |      |  |               |  | 186 073 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1020 |     |     |      |  |               |  | 186 077 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1021 |     |     |      |  |               |  | 186 081 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1022 |     |     |      |  |               |  | 186 085 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1023 |     |     |      |  |               |  | 186 089 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1024 |     |     |      |  |               |  | 186 093 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1101 |     |     |      |  |               |  | 187 001 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1102 |     |     |      |  |               |  | 187 005 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1103 |     |     |      |  |               |  | 187 009 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1104 |     |     |      |  |               |  | 187 013 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1105 |     |     |      |  |               |  | 187 017 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1106 |     |     |      |  |               |  | 187 021 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1107 |     |     |      |  |               |  | 187 025 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1108 |     |     |      |  |               |  | 187 029 |
| 0: "Low"          |     |     |      |  |               |  |         |



| Parameter         |     |     |      | Address       |  |  |         |
|-------------------|-----|-----|------|---------------|--|--|---------|
| Default           | Min | Max | Unit | Logic Diagram |  |  |         |
| INP: State U 1109 |     |     |      |               |  |  | 187 033 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1110 |     |     |      |               |  |  | 187 037 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1111 |     |     |      |               |  |  | 187 041 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1112 |     |     |      |               |  |  | 187 045 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1113 |     |     |      |               |  |  | 187 049 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1114 |     |     |      |               |  |  | 187 053 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1115 |     |     |      |               |  |  | 187 057 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1116 |     |     |      |               |  |  | 187 061 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1117 |     |     |      |               |  |  | 187 065 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1118 |     |     |      |               |  |  | 187 069 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1119 |     |     |      |               |  |  | 187 073 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1120 |     |     |      |               |  |  | 187 077 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1121 |     |     |      |               |  |  | 187 081 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1122 |     |     |      |               |  |  | 187 085 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1123 |     |     |      |               |  |  | 187 089 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1124 |     |     |      |               |  |  | 187 093 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1201 |     |     |      |               |  |  | 152 198 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1202 |     |     |      |               |  |  | 152 201 |
| 0: "Low"          |     |     |      |               |  |  |         |
| INP: State U 1203 |     |     |      |               |  |  | 152 204 |
| 0: "Low"          |     |     |      |               |  |  |         |

| Parameter         |     |     |      |  | Address       |  |         |
|-------------------|-----|-----|------|--|---------------|--|---------|
| Default           | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: State U 1204 |     |     |      |  |               |  | 152 207 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1205 |     |     |      |  |               |  | 152 210 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1206 |     |     |      |  |               |  | 152 213 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1207 |     |     |      |  |               |  | 188 025 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1208 |     |     |      |  |               |  | 188 029 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1209 |     |     |      |  |               |  | 188 033 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1210 |     |     |      |  |               |  | 188 037 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1211 |     |     |      |  |               |  | 188 041 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1212 |     |     |      |  |               |  | 188 045 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1213 |     |     |      |  |               |  | 188 049 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1214 |     |     |      |  |               |  | 188 053 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1215 |     |     |      |  |               |  | 188 057 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1216 |     |     |      |  |               |  | 188 061 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1217 |     |     |      |  |               |  | 188 065 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1218 |     |     |      |  |               |  | 188 069 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1219 |     |     |      |  |               |  | 188 073 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1220 |     |     |      |  |               |  | 188 077 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1221 |     |     |      |  |               |  | 188 081 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1222 |     |     |      |  |               |  | 188 085 |
| 0: "Low"          |     |     |      |  |               |  |         |

| Parameter         |     |     |      | Address       |
|-------------------|-----|-----|------|---------------|
| Default           | Min | Max | Unit | Logic Diagram |
| INP: State U 1223 |     |     |      | 188 089       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1224 |     |     |      | 188 093       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1301 |     |     |      | 189 001       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1302 |     |     |      | 189 005       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1303 |     |     |      | 189 009       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1304 |     |     |      | 189 013       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1305 |     |     |      | 189 017       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1306 |     |     |      | 189 021       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1307 |     |     |      | 189 025       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1308 |     |     |      | 189 029       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1309 |     |     |      | 189 033       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1310 |     |     |      | 189 037       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1311 |     |     |      | 189 041       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1312 |     |     |      | 189 045       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1313 |     |     |      | 189 049       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1314 |     |     |      | 189 053       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1315 |     |     |      | 189 057       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1316 |     |     |      | 189 061       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1317 |     |     |      | 189 065       |
| 0: "Low"          |     |     |      |               |

| Parameter         |     |     |      |  | Address       |  |         |
|-------------------|-----|-----|------|--|---------------|--|---------|
| Default           | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: State U 1318 |     |     |      |  |               |  | 189 069 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1319 |     |     |      |  |               |  | 189 073 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1320 |     |     |      |  |               |  | 189 077 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1321 |     |     |      |  |               |  | 189 081 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1322 |     |     |      |  |               |  | 189 085 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1323 |     |     |      |  |               |  | 189 089 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1324 |     |     |      |  |               |  | 189 093 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1401 |     |     |      |  |               |  | 190 001 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1402 |     |     |      |  |               |  | 190 005 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1403 |     |     |      |  |               |  | 190 009 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1404 |     |     |      |  |               |  | 190 013 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1405 |     |     |      |  |               |  | 190 017 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1406 |     |     |      |  |               |  | 190 021 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1407 |     |     |      |  |               |  | 190 025 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1408 |     |     |      |  |               |  | 190 029 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1409 |     |     |      |  |               |  | 190 033 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1410 |     |     |      |  |               |  | 190 037 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1411 |     |     |      |  |               |  | 190 041 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1412 |     |     |      |  |               |  | 190 045 |
| 0: "Low"          |     |     |      |  |               |  |         |

| Parameter         |     |     |      | Address       |
|-------------------|-----|-----|------|---------------|
| Default           | Min | Max | Unit | Logic Diagram |
| INP: State U 1413 |     |     |      | 190 049       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1414 |     |     |      | 190 053       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1415 |     |     |      | 190 057       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1416 |     |     |      | 190 061       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1417 |     |     |      | 190 065       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1418 |     |     |      | 190 069       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1419 |     |     |      | 190 073       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1420 |     |     |      | 190 077       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1421 |     |     |      | 190 081       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1422 |     |     |      | 190 085       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1423 |     |     |      | 190 089       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1424 |     |     |      | 190 093       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1501 |     |     |      | 191 001       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1502 |     |     |      | 191 005       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1503 |     |     |      | 191 009       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1504 |     |     |      | 191 013       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1505 |     |     |      | 191 017       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1506 |     |     |      | 191 021       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1507 |     |     |      | 191 025       |
| 0: "Low"          |     |     |      |               |

| Parameter         |     |     |      |  | Address       |  |         |
|-------------------|-----|-----|------|--|---------------|--|---------|
| Default           | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: State U 1508 |     |     |      |  |               |  | 191 029 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1509 |     |     |      |  |               |  | 191 033 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1510 |     |     |      |  |               |  | 191 037 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1511 |     |     |      |  |               |  | 191 041 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1512 |     |     |      |  |               |  | 191 045 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1513 |     |     |      |  |               |  | 191 049 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1514 |     |     |      |  |               |  | 191 053 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1515 |     |     |      |  |               |  | 191 057 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1516 |     |     |      |  |               |  | 191 061 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1517 |     |     |      |  |               |  | 191 065 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1518 |     |     |      |  |               |  | 191 069 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1519 |     |     |      |  |               |  | 191 073 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1520 |     |     |      |  |               |  | 191 077 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1521 |     |     |      |  |               |  | 191 081 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1522 |     |     |      |  |               |  | 191 085 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1523 |     |     |      |  |               |  | 191 089 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1524 |     |     |      |  |               |  | 191 093 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1601 |     |     |      |  |               |  | 192 001 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1602 |     |     |      |  |               |  | 192 005 |
| 0: "Low"          |     |     |      |  |               |  |         |

| Parameter         |     |     |      | Address       |  |
|-------------------|-----|-----|------|---------------|--|
| Default           | Min | Max | Unit | Logic Diagram |  |
| INP: State U 1603 |     |     |      | 192 009       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1604 |     |     |      | 192 013       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1605 |     |     |      | 192 017       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1606 |     |     |      | 192 021       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1607 |     |     |      | 192 025       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1608 |     |     |      | 192 029       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1609 |     |     |      | 192 033       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1610 |     |     |      | 192 037       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1611 |     |     |      | 192 041       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1612 |     |     |      | 192 045       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1613 |     |     |      | 192 049       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1614 |     |     |      | 192 053       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1615 |     |     |      | 192 057       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1616 |     |     |      | 192 061       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1617 |     |     |      | 192 065       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1618 |     |     |      | 192 069       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1619 |     |     |      | 192 073       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1620 |     |     |      | 192 077       |  |
| 0: "Low"          |     |     |      |               |  |
| INP: State U 1621 |     |     |      | 192 081       |  |
| 0: "Low"          |     |     |      |               |  |

| Parameter         |     |     |      |  | Address       |  |         |
|-------------------|-----|-----|------|--|---------------|--|---------|
| Default           | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: State U 1622 |     |     |      |  |               |  | 192 085 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1623 |     |     |      |  |               |  | 192 089 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1624 |     |     |      |  |               |  | 192 093 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1701 |     |     |      |  |               |  | 193 001 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1702 |     |     |      |  |               |  | 193 005 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1703 |     |     |      |  |               |  | 193 009 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1704 |     |     |      |  |               |  | 193 013 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1705 |     |     |      |  |               |  | 193 017 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1706 |     |     |      |  |               |  | 193 021 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1707 |     |     |      |  |               |  | 193 025 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1708 |     |     |      |  |               |  | 193 029 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1709 |     |     |      |  |               |  | 193 033 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1710 |     |     |      |  |               |  | 193 037 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1711 |     |     |      |  |               |  | 193 041 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1712 |     |     |      |  |               |  | 193 045 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1713 |     |     |      |  |               |  | 193 049 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1714 |     |     |      |  |               |  | 193 053 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1715 |     |     |      |  |               |  | 193 057 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1716 |     |     |      |  |               |  | 193 061 |
| 0: "Low"          |     |     |      |  |               |  |         |



| Parameter         |     |     |      | Address       |
|-------------------|-----|-----|------|---------------|
| Default           | Min | Max | Unit | Logic Diagram |
| INP: State U 1717 |     |     |      | 193 065       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1718 |     |     |      | 193 069       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1719 |     |     |      | 193 073       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1720 |     |     |      | 193 077       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1721 |     |     |      | 193 081       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1722 |     |     |      | 193 085       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1723 |     |     |      | 193 089       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1724 |     |     |      | 193 093       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1801 |     |     |      | 194 001       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1802 |     |     |      | 194 005       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1803 |     |     |      | 194 009       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1804 |     |     |      | 194 013       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1805 |     |     |      | 194 017       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1806 |     |     |      | 194 021       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1807 |     |     |      | 194 025       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1808 |     |     |      | 194 029       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1809 |     |     |      | 194 033       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1810 |     |     |      | 194 037       |
| 0: "Low"          |     |     |      |               |
| INP: State U 1811 |     |     |      | 194 041       |
| 0: "Low"          |     |     |      |               |

| Parameter         |     |     |      |  | Address       |  |         |
|-------------------|-----|-----|------|--|---------------|--|---------|
| Default           | Min | Max | Unit |  | Logic Diagram |  |         |
| INP: State U 1812 |     |     |      |  |               |  | 194 045 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1813 |     |     |      |  |               |  | 194 049 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1814 |     |     |      |  |               |  | 194 053 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1815 |     |     |      |  |               |  | 194 057 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1816 |     |     |      |  |               |  | 194 061 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1817 |     |     |      |  |               |  | 194 065 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1818 |     |     |      |  |               |  | 194 069 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1819 |     |     |      |  |               |  | 194 073 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1820 |     |     |      |  |               |  | 194 077 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1821 |     |     |      |  |               |  | 194 081 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1822 |     |     |      |  |               |  | 194 085 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1823 |     |     |      |  |               |  | 194 089 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 1824 |     |     |      |  |               |  | 194 093 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 2001 |     |     |      |  |               |  | 153 086 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 2002 |     |     |      |  |               |  | 153 089 |
| 0: "Low"          |     |     |      |  |               |  |         |
| INP: State U 2003 |     |     |      |  |               |  | 153 092 |
| 0: "Low"          |     |     |      |  |               |  |         |

| Parameter                                                                                                                                                                                                                                                                                                                                                            |     |     |      | Address       |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|---------|
| Default                                                                                                                                                                                                                                                                                                                                                              | Min | Max | Unit | Logic Diagram |         |
| INP: State U 2004                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               | 153 095 |
| 0: "Low"                                                                                                                                                                                                                                                                                                                                                             |     |     |      |               |         |
| <div>The state of the binary signal inputs is displayed as follows:<ul style="list-style-type: none"><li>● <i>Without function</i>: No functions are assigned to the binary signal input.</li><li>● <i>"Low"</i>: Not energized.</li><li>● <i>"High"</i>: Energized.</li></ul>This display appears regardless of the setting for the binary signal input mode.</div> |     |     |      |               |         |

Binary and analog  
output

| Parameter          |     |     |      |  | Address       |         |
|--------------------|-----|-----|------|--|---------------|---------|
| Default            | Min | Max | Unit |  | Logic Diagram |         |
| OUTP: State K 0501 |     |     |      |  |               | 150 096 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0502 |     |     |      |  |               | 150 099 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0503 |     |     |      |  |               | 150 102 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0504 |     |     |      |  |               | 150 105 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0505 |     |     |      |  |               | 150 108 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0506 |     |     |      |  |               | 150 111 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0507 |     |     |      |  |               | 150 114 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0508 |     |     |      |  |               | 150 117 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0601 |     |     |      |  |               | 150 120 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0602 |     |     |      |  |               | 150 123 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0603 |     |     |      |  |               | 150 126 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0604 |     |     |      |  |               | 150 129 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0605 |     |     |      |  |               | 150 132 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0606 |     |     |      |  |               | 150 135 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0607 |     |     |      |  |               | 150 138 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0608 |     |     |      |  |               | 150 141 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0701 |     |     |      |  |               | 150 144 |
| 0: Inactive        |     |     |      |  |               |         |
| OUTP: State K 0702 |     |     |      |  |               | 150 147 |
| 0: Inactive        |     |     |      |  |               |         |

| Parameter          |     |     |      | Address       |
|--------------------|-----|-----|------|---------------|
| Default            | Min | Max | Unit | Logic Diagram |
| OUTP: State K 0703 |     |     |      | 150 150       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0704 |     |     |      | 150 153       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0705 |     |     |      | 150 156       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0706 |     |     |      | 150 159       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0707 |     |     |      | 150 162       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0708 |     |     |      | 150 165       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0801 |     |     |      | 150 168       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0802 |     |     |      | 150 171       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0803 |     |     |      | 150 174       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0804 |     |     |      | 150 177       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0805 |     |     |      | 150 180       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0806 |     |     |      | 150 183       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0807 |     |     |      | 150 186       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0808 |     |     |      | 150 189       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0901 |     |     |      | 150 192       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0902 |     |     |      | 150 195       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0903 |     |     |      | 150 198       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0904 |     |     |      | 150 201       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 0905 |     |     |      | 150 204       |
| 0: Inactive        |     |     |      |               |

| Parameter          |     |     |      |  | Address       |  |         |
|--------------------|-----|-----|------|--|---------------|--|---------|
| Default            | Min | Max | Unit |  | Logic Diagram |  |         |
| OUTP: State K 0906 |     |     |      |  |               |  | 150 207 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 0907 |     |     |      |  |               |  | 150 210 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 0908 |     |     |      |  |               |  | 150 213 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1001 |     |     |      |  |               |  | 150 216 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1002 |     |     |      |  |               |  | 150 219 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1003 |     |     |      |  |               |  | 150 222 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1004 |     |     |      |  |               |  | 150 225 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1005 |     |     |      |  |               |  | 150 228 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1006 |     |     |      |  |               |  | 150 231 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1007 |     |     |      |  |               |  | 150 234 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1008 |     |     |      |  |               |  | 150 237 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1101 |     |     |      |  |               |  | 150 240 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1102 |     |     |      |  |               |  | 150 243 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1103 |     |     |      |  |               |  | 150 246 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1104 |     |     |      |  |               |  | 150 249 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1105 |     |     |      |  |               |  | 150 252 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1106 |     |     |      |  |               |  | 150 255 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1107 |     |     |      |  |               |  | 151 002 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1108 |     |     |      |  |               |  | 151 005 |
| 0: Inactive        |     |     |      |  |               |  |         |

| Parameter          |     |     |      | Address       |
|--------------------|-----|-----|------|---------------|
| Default            | Min | Max | Unit | Logic Diagram |
| OUTP: State K 1201 |     |     |      | 151 008       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1202 |     |     |      | 151 011       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1203 |     |     |      | 151 014       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1204 |     |     |      | 151 017       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1205 |     |     |      | 151 020       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1206 |     |     |      | 151 023       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1207 |     |     |      | 151 026       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1208 |     |     |      | 151 029       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1301 |     |     |      | 168 001       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1302 |     |     |      | 168 005       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1303 |     |     |      | 168 009       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1304 |     |     |      | 168 013       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1305 |     |     |      | 168 017       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1306 |     |     |      | 168 021       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1307 |     |     |      | 168 025       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1308 |     |     |      | 168 029       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1401 |     |     |      | 169 001       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1402 |     |     |      | 169 005       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1403 |     |     |      | 169 009       |
| 0: Inactive        |     |     |      |               |

| Parameter          |     |     |      |  | Address       |  |         |
|--------------------|-----|-----|------|--|---------------|--|---------|
| Default            | Min | Max | Unit |  | Logic Diagram |  |         |
| OUTP: State K 1404 |     |     |      |  |               |  | 169 013 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1405 |     |     |      |  |               |  | 169 017 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1406 |     |     |      |  |               |  | 169 021 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1407 |     |     |      |  |               |  | 169 025 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1408 |     |     |      |  |               |  | 169 029 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1501 |     |     |      |  |               |  | 170 001 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1502 |     |     |      |  |               |  | 170 005 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1503 |     |     |      |  |               |  | 170 009 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1504 |     |     |      |  |               |  | 170 013 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1505 |     |     |      |  |               |  | 170 017 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1506 |     |     |      |  |               |  | 170 021 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1507 |     |     |      |  |               |  | 170 025 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1508 |     |     |      |  |               |  | 170 029 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1601 |     |     |      |  |               |  | 171 001 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1602 |     |     |      |  |               |  | 171 005 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1603 |     |     |      |  |               |  | 171 009 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1604 |     |     |      |  |               |  | 171 013 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1605 |     |     |      |  |               |  | 171 017 |
| 0: Inactive        |     |     |      |  |               |  |         |
| OUTP: State K 1606 |     |     |      |  |               |  | 171 021 |
| 0: Inactive        |     |     |      |  |               |  |         |



| Parameter          |     |     |      | Address       |
|--------------------|-----|-----|------|---------------|
| Default            | Min | Max | Unit | Logic Diagram |
| OUTP: State K 1607 |     |     |      | 171 025       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1608 |     |     |      | 171 029       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1701 |     |     |      | 172 001       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1702 |     |     |      | 172 005       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1703 |     |     |      | 172 009       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1704 |     |     |      | 172 013       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1705 |     |     |      | 172 017       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1706 |     |     |      | 172 021       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1707 |     |     |      | 172 025       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1708 |     |     |      | 172 029       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1801 |     |     |      | 173 001       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1802 |     |     |      | 173 005       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1803 |     |     |      | 173 009       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1804 |     |     |      | 173 013       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1805 |     |     |      | 173 017       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1806 |     |     |      | 173 021       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1807 |     |     |      | 173 025       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 1808 |     |     |      | 173 029       |
| 0: Inactive        |     |     |      |               |
| OUTP: State K 2001 |     |     |      | 151 200       |
| 0: Inactive        |     |     |      |               |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                 |     |     |      |  | Address       |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|--|---------------|--|
| Default                                                                                                                                                                                                                                                                                                                                                                                                   | Min | Max | Unit |  | Logic Diagram |  |
| OUTP: State K 2002                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      |  | 151 203       |  |
| 0: Inactive                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |  |               |  |
| OUTP: State K 2003                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      |  | 151 206       |  |
| 0: Inactive                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |  |               |  |
| OUTP: State K 2004                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      |  | 151 209       |  |
| 0: Inactive                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |  |               |  |
| OUTP: State K 2005                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      |  | 151 212       |  |
| 0: Inactive                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |  |               |  |
| OUTP: State K 2006                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      |  | 151 215       |  |
| 0: Inactive                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |  |               |  |
| OUTP: State K 2007                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      |  | 151 218       |  |
| 0: Inactive                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |  |               |  |
| OUTP: State K 2008                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      |  | 151 221       |  |
| 0: Inactive                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |  |               |  |
| OUTP: State K 2101                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      |  | 151 224       |  |
| 0: Inactive                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |  |               |  |
| OUTP: State K 2102                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      |  | 151 227       |  |
| 0: Inactive                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |  |               |  |
| OUTP: State K 2103                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      |  | 151 230       |  |
| 0: Inactive                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |  |               |  |
| OUTP: State K 2104                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      |  | 151 233       |  |
| 0: Inactive                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |  |               |  |
| OUTP: State K 2105                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      |  | 151 236       |  |
| 0: Inactive                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |  |               |  |
| OUTP: State K 2106                                                                                                                                                                                                                                                                                                                                                                                        |     |     |      |  | 151 239       |  |
| 0: Inactive                                                                                                                                                                                                                                                                                                                                                                                               |     |     |      |  |               |  |
| <p>The state of the output relays is displayed as follows:</p> <ul style="list-style-type: none"> <li>● <i>Without function</i>: No functions are assigned to the output relay.</li> <li>● <i>Inactive</i>: The output relay is not energized.</li> <li>● <i>Active</i>: The output relay is energized.</li> </ul> <p>This display appears regardless of the operating mode set for the output relay.</p> |     |     |      |  |               |  |

## LED indicators

| Parameter            |     |     |      |               | Address |
|----------------------|-----|-----|------|---------------|---------|
| Default              | Min | Max | Unit | Logic Diagram |         |
| LED: State H 1 green |     |     |      |               | 085 180 |
| 1: Active            |     |     |      |               |         |
| LED: State H 2 yell. |     |     |      |               | 085 000 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H 3 yell. |     |     |      |               | 085 003 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H 4 red   |     |     |      |               | 085 006 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H 5 red   |     |     |      |               | 085 009 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H 6 red   |     |     |      |               | 085 012 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H 7 red   |     |     |      |               | 085 015 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H 8 red   |     |     |      |               | 085 018 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H 9 red   |     |     |      |               | 085 021 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H10 red   |     |     |      |               | 085 024 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H11 red   |     |     |      |               | 085 027 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H12 red   |     |     |      |               | 085 030 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H13 red   |     |     |      |               | 085 033 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H14 red   |     |     |      |               | 085 036 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H15 red   |     |     |      |               | 085 039 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H16 red   |     |     |      |               | 085 042 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H17 red.  |     |     |      |               | 085 181 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H18 red   |     |     |      |               | 085 130 |
| 0: Inactive          |     |     |      |               |         |
| LED: State H19 red   |     |     |      |               | 085 133 |
| 0: Inactive          |     |     |      |               |         |

| Parameter            |     |     |      |  | Address       |  |         |
|----------------------|-----|-----|------|--|---------------|--|---------|
| Default              | Min | Max | Unit |  | Logic Diagram |  |         |
| LED: State H20 red   |     |     |      |  |               |  | 085 136 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H21 red   |     |     |      |  |               |  | 085 139 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H22 red   |     |     |      |  |               |  | 085 142 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H23 red   |     |     |      |  |               |  | 085 145 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H 4 green |     |     |      |  |               |  | 085 056 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H 5 green |     |     |      |  |               |  | 085 059 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H 6 green |     |     |      |  |               |  | 085 062 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H 7 green |     |     |      |  |               |  | 085 065 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H 8 green |     |     |      |  |               |  | 085 068 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H 9 green |     |     |      |  |               |  | 085 071 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H10 green |     |     |      |  |               |  | 085 074 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H11 green |     |     |      |  |               |  | 085 077 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H12 green |     |     |      |  |               |  | 085 080 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H13 green |     |     |      |  |               |  | 085 083 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H14 green |     |     |      |  |               |  | 085 086 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H15 green |     |     |      |  |               |  | 085 089 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H16 green |     |     |      |  |               |  | 085 092 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H18 green |     |     |      |  |               |  | 085 160 |
| 0: Inactive          |     |     |      |  |               |  |         |
| LED: State H19 green |     |     |      |  |               |  | 085 163 |
| 0: Inactive          |     |     |      |  |               |  |         |

| Parameter                                                                                                                                                       |     |     |      | Address       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                         | Min | Max | Unit | Logic Diagram |
| LED: State H20 green                                                                                                                                            |     |     |      | 085 166       |
| 0: Inactive                                                                                                                                                     |     |     |      |               |
| LED: State H21 green                                                                                                                                            |     |     |      | 085 169       |
| 0: Inactive                                                                                                                                                     |     |     |      |               |
| LED: State H22 green                                                                                                                                            |     |     |      | 085 172       |
| 0: Inactive                                                                                                                                                     |     |     |      |               |
| LED: State H23 green                                                                                                                                            |     |     |      | 085 176       |
| 0: Inactive                                                                                                                                                     |     |     |      |               |
| The state of the LED indicators is displayed as follows:                                                                                                        |     |     |      |               |
| <ul style="list-style-type: none"><li>● <i>Inactive</i>: The LED indicator is not energized.</li><li>● <i>Active</i>: The LED indicator is energized.</li></ul> |     |     |      |               |

## 8.1.1.3

## Logic State Signals

## Cyber Security

| Parameter                                                             |     |     |      |  | Address       |
|-----------------------------------------------------------------------|-----|-----|------|--|---------------|
| Default                                                               | Min | Max | Unit |  | Logic Diagram |
| CS: HMI pincode changed                                               |     |     |      |  | 180 100       |
| 0: No                                                                 |     |     |      |  |               |
| The signal shows the PIN code of HMI is changed.                      |     |     |      |  |               |
| CS: COMM passw. change                                                |     |     |      |  | 180 101       |
| 0: No                                                                 |     |     |      |  |               |
| The signal shows the password of communication interface is changed.  |     |     |      |  |               |
| CS: HMI pincode invalid                                               |     |     |      |  | 180 102       |
| 0: No                                                                 |     |     |      |  |               |
| The signal shows the PIN code via HMI is invalid.                     |     |     |      |  |               |
| CS: COMM passw. invalid                                               |     |     |      |  | 180 103       |
| 0: No                                                                 |     |     |      |  |               |
| The signal shows the password via communication interface is invalid. |     |     |      |  |               |
| CS: reset token generate                                              |     |     |      |  | 180 104       |
| 0: No                                                                 |     |     |      |  |               |
| The signal shows the reset token is generated.                        |     |     |      |  |               |
| CS: RBAC reset success                                                |     |     |      |  | 180 105       |
| 0: No                                                                 |     |     |      |  |               |
| Display when the RBAC reset is successful.                            |     |     |      |  |               |
| CS: RBAC reset failed                                                 |     |     |      |  | 180 106       |
| 0: No                                                                 |     |     |      |  |               |
| Display when the RBAC reset is failed.                                |     |     |      |  |               |
| CS: User01 blocked                                                    |     |     |      |  | 180 107       |
| 0: No                                                                 |     |     |      |  |               |
| CS: User02 blocked                                                    |     |     |      |  | 180 108       |
| 0: No                                                                 |     |     |      |  |               |
| CS: User03 blocked                                                    |     |     |      |  | 180 109       |
| 0: No                                                                 |     |     |      |  |               |
| CS: User04 blocked                                                    |     |     |      |  | 180 110       |
| 0: No                                                                 |     |     |      |  |               |
| CS: User05 blocked                                                    |     |     |      |  | 180 111       |
| 0: No                                                                 |     |     |      |  |               |
| CS: User06 blocked                                                    |     |     |      |  | 180 112       |
| 0: No                                                                 |     |     |      |  |               |

| Parameter                                                           |     |     |      | Address       |
|---------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                             | Min | Max | Unit | Logic Diagram |
| CS: User07 blocked                                                  |     |     |      | 180 113       |
| 0: No                                                               |     |     |      |               |
| CS: User08 blocked                                                  |     |     |      | 180 114       |
| 0: No                                                               |     |     |      |               |
| CS: User09 blocked                                                  |     |     |      | 180 115       |
| 0: No                                                               |     |     |      |               |
| CS: User10 blocked                                                  |     |     |      | 180 116       |
| 0: No                                                               |     |     |      |               |
| CS: User11 blocked                                                  |     |     |      | 180 117       |
| 0: No                                                               |     |     |      |               |
| CS: User12 blocked                                                  |     |     |      | 180 118       |
| 0: No                                                               |     |     |      |               |
| CS: User13 blocked                                                  |     |     |      | 180 119       |
| 0: No                                                               |     |     |      |               |
| CS: User14 blocked                                                  |     |     |      | 180 120       |
| 0: No                                                               |     |     |      |               |
| CS: User15 blocked                                                  |     |     |      | 180 121       |
| 0: No                                                               |     |     |      |               |
| The signal shows the user is blocked.                               |     |     |      |               |
| CS: HMI logged in                                                   |     |     |      | 180 122       |
| 0: No                                                               |     |     |      |               |
| The signal shows the user is logged in via HMI.                     |     |     |      |               |
| CS: COMMS logged in                                                 |     |     |      | 180 123       |
| 0: No                                                               |     |     |      |               |
| The signal shows the user is logged in via communication interface. |     |     |      |               |
| CS: IEC CS brick faulty                                             |     |     |      | 180 124       |
| 1: Yes                                                              |     |     |      |               |

## Real Timer

| Parameter            |                        |     |      | Address       |  |  |         |
|----------------------|------------------------|-----|------|---------------|--|--|---------|
| Default              | Min                    | Max | Unit | Logic Diagram |  |  |         |
| TIMER: Monday        |                        |     |      |               |  |  | 014 139 |
| 0: No                | Fig. 3-153, (p. 3-206) |     |      |               |  |  |         |
| TIMER: Tuesday       |                        |     |      |               |  |  | 014 148 |
| 0: No                |                        |     |      |               |  |  |         |
| TIMER: Wednesday     |                        |     |      |               |  |  | 014 149 |
| 0: No                |                        |     |      |               |  |  |         |
| TIMER: Thursday      |                        |     |      |               |  |  | 014 158 |
| 0: No                |                        |     |      |               |  |  |         |
| TIMER: Friday        |                        |     |      |               |  |  | 014 159 |
| 0: No                |                        |     |      |               |  |  |         |
| TIMER: Saturday      |                        |     |      |               |  |  | 014 168 |
| 0: No                |                        |     |      |               |  |  |         |
| TIMER: Sunday        |                        |     |      |               |  |  | 014 169 |
| 0: No                | Fig. 3-153, (p. 3-206) |     |      |               |  |  |         |
| TIMER: Timer stage 1 |                        |     |      |               |  |  | 015 006 |
| 0: No                | Fig. 3-153, (p. 3-206) |     |      |               |  |  |         |
| TIMER: Timer stage 2 |                        |     |      |               |  |  | 015 007 |
| 0: No                |                        |     |      |               |  |  |         |
| TIMER: Timer stage 4 |                        |     |      |               |  |  | 015 013 |
| 0: No                |                        |     |      |               |  |  |         |
| TIMER: Timer stage 3 |                        |     |      |               |  |  | 015 010 |
| 0: No                |                        |     |      |               |  |  |         |



## Virtual Inputs

| Parameter             |     |     |      |  | Address       |
|-----------------------|-----|-----|------|--|---------------|
| Default               | Min | Max | Unit |  | Logic Diagram |
| VINP: Input 1 faulty  |     |     |      |  | 115 080       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 2 faulty  |     |     |      |  | 115 081       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 3 faulty  |     |     |      |  | 115 082       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 4 faulty  |     |     |      |  | 115 083       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 5 faulty  |     |     |      |  | 115 084       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 6 faulty  |     |     |      |  | 115 085       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 7 faulty  |     |     |      |  | 115 086       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 8 faulty  |     |     |      |  | 115 087       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 9 faulty  |     |     |      |  | 115 088       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 10 faulty |     |     |      |  | 115 089       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 11 faulty |     |     |      |  | 115 090       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 12 faulty |     |     |      |  | 115 091       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 13 faulty |     |     |      |  | 115 092       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 14 faulty |     |     |      |  | 115 093       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 15 faulty |     |     |      |  | 115 094       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 16 faulty |     |     |      |  | 115 095       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 17 faulty |     |     |      |  | 115 096       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 18 faulty |     |     |      |  | 115 097       |
| 0: No                 |     |     |      |  |               |
| VINP: Input 19 faulty |     |     |      |  | 115 098       |
| 0: No                 |     |     |      |  |               |

| Parameter             |     |     |      |  | Address       |  |         |
|-----------------------|-----|-----|------|--|---------------|--|---------|
| Default               | Min | Max | Unit |  | Logic Diagram |  |         |
| VINP: Input 20 faulty |     |     |      |  |               |  | 115 099 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 21 faulty |     |     |      |  |               |  | 115 100 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 22 faulty |     |     |      |  |               |  | 115 101 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 23 faulty |     |     |      |  |               |  | 115 102 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 24 faulty |     |     |      |  |               |  | 115 103 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 25 faulty |     |     |      |  |               |  | 115 104 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 26 faulty |     |     |      |  |               |  | 115 105 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 27 faulty |     |     |      |  |               |  | 115 106 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 28 faulty |     |     |      |  |               |  | 115 107 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 29 faulty |     |     |      |  |               |  | 115 108 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 30 faulty |     |     |      |  |               |  | 115 109 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 31 faulty |     |     |      |  |               |  | 115 110 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 32 faulty |     |     |      |  |               |  | 115 111 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 33 faulty |     |     |      |  |               |  | 115 112 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 34 faulty |     |     |      |  |               |  | 115 113 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 35 faulty |     |     |      |  |               |  | 115 114 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 36 faulty |     |     |      |  |               |  | 115 115 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 37 faulty |     |     |      |  |               |  | 115 116 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 38 faulty |     |     |      |  |               |  | 115 117 |
| 0: No                 |     |     |      |  |               |  |         |

| Parameter             |     |     |      | Address       |
|-----------------------|-----|-----|------|---------------|
| Default               | Min | Max | Unit | Logic Diagram |
| VINP: Input 39 faulty |     |     |      | 115 118       |
| 0: No                 |     |     |      |               |
| VINP: Input 40 faulty |     |     |      | 115 119       |
| 0: No                 |     |     |      |               |
| VINP: Input 41 faulty |     |     |      | 115 120       |
| 0: No                 |     |     |      |               |
| VINP: Input 42 faulty |     |     |      | 115 121       |
| 0: No                 |     |     |      |               |
| VINP: Input 43 faulty |     |     |      | 115 122       |
| 0: No                 |     |     |      |               |
| VINP: Input 44 faulty |     |     |      | 115 123       |
| 0: No                 |     |     |      |               |
| VINP: Input 45 faulty |     |     |      | 115 124       |
| 0: No                 |     |     |      |               |
| VINP: Input 46 faulty |     |     |      | 115 125       |
| 0: No                 |     |     |      |               |
| VINP: Input 47 faulty |     |     |      | 115 126       |
| 0: No                 |     |     |      |               |
| VINP: Input 48 faulty |     |     |      | 115 127       |
| 0: No                 |     |     |      |               |
| VINP: Input 49 faulty |     |     |      | 115 128       |
| 0: No                 |     |     |      |               |
| VINP: Input 50 faulty |     |     |      | 115 129       |
| 0: No                 |     |     |      |               |
| VINP: Input 51 faulty |     |     |      | 115 130       |
| 0: No                 |     |     |      |               |
| VINP: Input 52 faulty |     |     |      | 115 131       |
| 0: No                 |     |     |      |               |
| VINP: Input 53 faulty |     |     |      | 115 132       |
| 0: No                 |     |     |      |               |
| VINP: Input 54 faulty |     |     |      | 115 133       |
| 0: No                 |     |     |      |               |
| VINP: Input 55 faulty |     |     |      | 115 134       |
| 0: No                 |     |     |      |               |
| VINP: Input 56 faulty |     |     |      | 115 135       |
| 0: No                 |     |     |      |               |
| VINP: Input 57 faulty |     |     |      | 115 136       |
| 0: No                 |     |     |      |               |

| Parameter             |     |     |      |  | Address       |  |         |
|-----------------------|-----|-----|------|--|---------------|--|---------|
| Default               | Min | Max | Unit |  | Logic Diagram |  |         |
| VINP: Input 58 faulty |     |     |      |  |               |  | 115 137 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 59 faulty |     |     |      |  |               |  | 115 138 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 60 faulty |     |     |      |  |               |  | 115 139 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 61 faulty |     |     |      |  |               |  | 115 140 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 62 faulty |     |     |      |  |               |  | 115 141 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 63 faulty |     |     |      |  |               |  | 115 142 |
| 0: No                 |     |     |      |  |               |  |         |
| VINP: Input 64 faulty |     |     |      |  |               |  | 115 143 |
| 0: No                 |     |     |      |  |               |  |         |

|                     | Parameter                                                                                                          |     |     |      | Address              |         |
|---------------------|--------------------------------------------------------------------------------------------------------------------|-----|-----|------|----------------------|---------|
|                     | Default                                                                                                            | Min | Max | Unit | Logic Diagram        |         |
| Local control panel | LOC: Edit mode                                                                                                     |     |     |      |                      | 080 111 |
|                     | 0: No                                                                                                              |     |     |      |                      |         |
|                     | Signal that the protection unit is in edit mode. As a standard this signal is linked to LED: Fct. assign. H17 red. |     |     |      |                      |         |
|                     | LOC: Trig. menu jmp 1 EXT                                                                                          |     |     |      |                      | 030 230 |
|                     | 0: No                                                                                                              |     |     |      |                      |         |
|                     | Signal that menu jump list 1 is being triggered. (See the corresponding setting at LOC: Fct. menu jmp list 1.)     |     |     |      |                      |         |
|                     | LOC: Trig. menu jmp 2 EXT                                                                                          |     |     |      |                      | 030 231 |
|                     | 0: No                                                                                                              |     |     |      |                      |         |
|                     | Signal that menu jump list 2 is being triggered. (See the corresponding setting at LOC: Fct. menu jmp list 2.)     |     |     |      |                      |         |
|                     | LOC: Illumination on EXT                                                                                           |     |     |      |                      | 037 101 |
|                     | 0: No                                                                                                              |     |     |      |                      |         |
|                     | This signal shows that the backlighting for the front panel LCD is switched on.                                    |     |     |      |                      |         |
|                     | LOC: Loc.acc.block.active                                                                                          |     |     |      |                      | 221 005 |
|                     | 0: No                                                                                                              |     |     |      | Fig. 3-11, (p. 3-18) |         |
|                     | LOC: Rem.acc.block.active                                                                                          |     |     |      |                      | 221 004 |
|                     | 0: No                                                                                                              |     |     |      | Fig. 3-11, (p. 3-18) |         |
|                     | LOC: Chg.Sig.Panel stat.                                                                                           |     |     |      |                      | 221 076 |
|                     | 0: No                                                                                                              |     |     |      | Fig. 3-8, (p. 3-15)  |         |
|                     | LOC: Chg.Sig.Panel flash.                                                                                          |     |     |      |                      | 221 077 |
|                     | 0: No                                                                                                              |     |     |      | Fig. 3-8, (p. 3-15)  |         |

“Logical”  
communication  
interface 1

| Parameter                   |     |     |      |  | Address                                                              |         |
|-----------------------------|-----|-----|------|--|----------------------------------------------------------------------|---------|
| Default                     | Min | Max | Unit |  | Logic Diagram                                                        |         |
| COMM1: Command block. EXT   |     |     |      |  |                                                                      | 003 173 |
| 0: No                       |     |     |      |  |                                                                      |         |
| COMM1: Sig./meas. block EXT |     |     |      |  |                                                                      | 037 074 |
| 0: No                       |     |     |      |  |                                                                      |         |
| COMM1: Command blocking     |     |     |      |  |                                                                      | 003 174 |
| 0: No                       |     |     |      |  | Fig. 3-13, (p. 3-21)                                                 |         |
| COMM1: Sig./meas.val.block. |     |     |      |  |                                                                      | 037 075 |
| 0: No                       |     |     |      |  | Fig. 3-14, (p. 3-23)<br>Fig. 3-15, (p. 3-24)<br>Fig. 3-16, (p. 3-25) |         |
| COMM1: IEC 870-5-103        |     |     |      |  |                                                                      | 003 219 |
| 0: No                       |     |     |      |  |                                                                      |         |
| COMM1: IEC 870-5-101        |     |     |      |  |                                                                      | 003 218 |
| 0: No                       |     |     |      |  |                                                                      |         |
| COMM1: IEC 870-5, ILS       |     |     |      |  |                                                                      | 003 221 |
| 0: No                       |     |     |      |  |                                                                      |         |
| COMM1: MODBUS               |     |     |      |  |                                                                      | 003 223 |
| 0: No                       |     |     |      |  |                                                                      |         |
| COMM1: DNP3                 |     |     |      |  |                                                                      | 003 230 |
| 0: No                       |     |     |      |  |                                                                      |         |
| COMM1: COURIER              |     |     |      |  |                                                                      | 103 041 |
| 0: No                       |     |     |      |  |                                                                      |         |

“Logical”  
communication  
interface 2

| Parameter                  |     |     |      |  | Address              |  |  |         |
|----------------------------|-----|-----|------|--|----------------------|--|--|---------|
| Default                    | Min | Max | Unit |  | Logic Diagram        |  |  |         |
| COMM2: IEC 870-5-103       |     |     |      |  |                      |  |  | 103 106 |
| 0: No                      |     |     |      |  |                      |  |  |         |
| COMM2: MODBUS master       |     |     |      |  |                      |  |  | 103 078 |
| 0: No                      |     |     |      |  |                      |  |  |         |
| COMM2: Comm. error slave 1 |     |     |      |  |                      |  |  | 103 087 |
| 1: Yes                     |     |     |      |  | Fig. 3-23, (p. 3-32) |  |  |         |
| COMM2: Comm. error slave 2 |     |     |      |  |                      |  |  | 103 088 |
| 1: Yes                     |     |     |      |  | Fig. 3-23, (p. 3-32) |  |  |         |
| COMM2: Comm. error slave 3 |     |     |      |  |                      |  |  | 103 089 |
| 1: Yes                     |     |     |      |  | Fig. 3-23, (p. 3-32) |  |  |         |
| COMM2: Comm. error slave 4 |     |     |      |  |                      |  |  | 103 090 |
| 1: Yes                     |     |     |      |  | Fig. 3-23, (p. 3-32) |  |  |         |

IEC 61850  
Communication

| Parameter                                                                                                                                       | Address |     |      |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                         | Min     | Max | Unit | Logic Diagram |
| IEC: Command block. EXT                                                                                                                         |         |     |      | 104 086       |
| 0: No                                                                                                                                           |         |     |      |               |
| IEC: Sig./meas. block EXT                                                                                                                       |         |     |      | 104 089       |
| 0: No                                                                                                                                           |         |     |      |               |
| IEC: Multiple ctrl level                                                                                                                        |         |     |      | 221 124       |
| 0: No                                                                                                                                           |         |     |      |               |
| Display when control from multiple levels is allowed, i.e. (225 208) LOC: Fct. assign. L/R key is set to R & L<->L, and relay is in 'R&L' mode. |         |     |      |               |
| IEC: Command blocking                                                                                                                           |         |     |      | 104 087       |
| 0: No                                                                                                                                           |         |     |      |               |
| IEC: Sig./meas.val.block.                                                                                                                       |         |     |      | 104 090       |
| 0: No                                                                                                                                           |         |     |      |               |
| IEC: Port A/B blocked                                                                                                                           |         |     |      | 104 075       |
| 0: No                                                                                                                                           |         |     |      |               |
| Display when Port A for SEB or Port A&B for REB is blocked.                                                                                     |         |     |      |               |
| IEC: Port C blocked                                                                                                                             |         |     |      | 104 076       |
| 0: No                                                                                                                                           |         |     |      |               |
| Display when Port C is blocked.                                                                                                                 |         |     |      |               |
| IEC: Port A faulty                                                                                                                              |         |     |      | 104 197       |
| 0: No                                                                                                                                           |         |     |      |               |
| IEC: Port B faulty                                                                                                                              |         |     |      | 104 198       |
| 0: No                                                                                                                                           |         |     |      |               |
| IEC: IEC 61850 ED2                                                                                                                              |         |     |      | 104 081       |
| 0: No                                                                                                                                           |         |     |      |               |
| IEC: IEC 61850 ED1                                                                                                                              |         |     |      | 104 082       |
| 0: No                                                                                                                                           |         |     |      |               |
| IEC: IEC 60870-5-104                                                                                                                            |         |     |      | 104 083       |
| 0: No                                                                                                                                           |         |     |      |               |
| IEC: VLAN enabled                                                                                                                               |         |     |      | 104 196       |
| 0: No                                                                                                                                           |         |     |      |               |
| IEC: Comm. link faulty                                                                                                                          |         |     |      | 105 180       |
| 0: No                                                                                                                                           |         |     |      |               |
| Fig. 3-31, (p. 3-53)                                                                                                                            |         |     |      |               |
| Display when an Ethernet module is not operational, i.e. if the MAC address is missing or there is a non-plausible parameter setting.           |         |     |      |               |



| Parameter                                                                                                                                  |     |     |      | Address       |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                    | Min | Max | Unit | Logic Diagram |
| IEC: Control reservation                                                                                                                   |     |     |      | 221 082       |
| 0: No                                                                                                                                      |     |     |      |               |
| Display when a client has made a reservation to control an external device ("select" for control by control mode "select before operate"). |     |     |      |               |
| IEC: Control blocked                                                                                                                       |     |     |      | 221 126       |
| 0: No                                                                                                                                      |     |     |      |               |
| Display when control via communication is blocked, i.e. (221 125) IEC: Ctrl blocked user is set to Yes.                                    |     |     |      |               |

Fig. 3-31, (p. 3-53)

Generic Object  
Orientated  
Substation Events

| Parameter                                                                                                                                                                                                                                                                                                                                                          |     |     |      | Address       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                                                                                                                                                                                            | Min | Max | Unit | Logic Diagram |
| GOOSE: Ext.Dev01 position                                                                                                                                                                                                                                                                                                                                          |     |     |      | 109 000       |
| 0: Interm. pos.                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| GOOSE: Ext.Dev128 position                                                                                                                                                                                                                                                                                                                                         |     |     |      | 114 124       |
| 0: Interm. pos.                                                                                                                                                                                                                                                                                                                                                    |     |     |      |               |
| State of the virtual two-pole GOOSE input, representing the state of an external device.                                                                                                                                                                                                                                                                           |     |     |      |               |
| GOOSE: Ext.Dev01 open                                                                                                                                                                                                                                                                                                                                              |     |     |      | 109 001       |
| 0: No                                                                                                                                                                                                                                                                                                                                                              |     |     |      |               |
| GOOSE: Ext.Dev128 open                                                                                                                                                                                                                                                                                                                                             |     |     |      | 114 125       |
| 0: No                                                                                                                                                                                                                                                                                                                                                              |     |     |      |               |
| Binary open state of the virtual two-pole GOOSE input, representing the state of an external device.                                                                                                                                                                                                                                                               |     |     |      |               |
| GOOSE: Ext.Dev01 closed                                                                                                                                                                                                                                                                                                                                            |     |     |      | 109 002       |
| 0: No                                                                                                                                                                                                                                                                                                                                                              |     |     |      |               |
| GOOSE: Ext.Dev128 closed                                                                                                                                                                                                                                                                                                                                           |     |     |      | 114 126       |
| 0: No                                                                                                                                                                                                                                                                                                                                                              |     |     |      |               |
| Binary closed state of the virtual two-pole GOOSE input, representing the state of an external device.                                                                                                                                                                                                                                                             |     |     |      |               |
| GOOSE: Ext.Dev01 interm.pos                                                                                                                                                                                                                                                                                                                                        |     |     |      | 109 003       |
| 0: No                                                                                                                                                                                                                                                                                                                                                              |     |     |      |               |
| GOOSE: Ext.Dev128 interm.po                                                                                                                                                                                                                                                                                                                                        |     |     |      | 114 127       |
| 0: No                                                                                                                                                                                                                                                                                                                                                              |     |     |      |               |
| Binary intermediate position state of the virtual two-pole GOOSE input, representing the state of an external device.                                                                                                                                                                                                                                              |     |     |      |               |
| GOOSE: IED link faulty                                                                                                                                                                                                                                                                                                                                             |     |     |      | 107 250       |
| 0: No                                                                                                                                                                                                                                                                                                                                                              |     |     |      |               |
| Display which appears as soon as receipt of at least one of the configured GOOSEs is faulty or not available. To each GOOSE the GOOSE sending device will attach a validity stamp, up to which a repetition of GOOSE will be carried out independent of a change of state. Thus the unit monitors the time period at which the next state signal must be received. |     |     |      |               |
| GOOSE: IED01-16 linked                                                                                                                                                                                                                                                                                                                                             |     |     |      | 107 251       |
| 2:                                                                                                                                                                                                                                                                                                                                                                 |     |     |      |               |
| GOOSE: IED17-32 linked                                                                                                                                                                                                                                                                                                                                             |     |     |      | 107 252       |
| 2:                                                                                                                                                                                                                                                                                                                                                                 |     |     |      |               |
| GOOSE: Input 01 faulty                                                                                                                                                                                                                                                                                                                                             |     |     |      | 111 100       |
| 0: No                                                                                                                                                                                                                                                                                                                                                              |     |     |      |               |

| Parameter              |     |     |      | Address       |
|------------------------|-----|-----|------|---------------|
| Default                | Min | Max | Unit | Logic Diagram |
| GOOSE: Input 02 faulty |     |     |      | 111 101       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 03 faulty |     |     |      | 111 102       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 04 faulty |     |     |      | 111 103       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 05 faulty |     |     |      | 111 104       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 06 faulty |     |     |      | 111 105       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 07 faulty |     |     |      | 111 106       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 08 faulty |     |     |      | 111 107       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 09 faulty |     |     |      | 111 108       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 10 faulty |     |     |      | 111 109       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 11 faulty |     |     |      | 111 110       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 12 faulty |     |     |      | 111 111       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 13 faulty |     |     |      | 111 112       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 14 faulty |     |     |      | 111 113       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 15 faulty |     |     |      | 111 114       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 16 faulty |     |     |      | 111 115       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 17 faulty |     |     |      | 111 116       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 18 faulty |     |     |      | 111 117       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 19 faulty |     |     |      | 111 118       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 20 faulty |     |     |      | 111 119       |
| 0: No                  |     |     |      |               |

| Parameter              |     |     |      |  | Address       |  |
|------------------------|-----|-----|------|--|---------------|--|
| Default                | Min | Max | Unit |  | Logic Diagram |  |
| GOOSE: Input 21 faulty |     |     |      |  | 111 120       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 22 faulty |     |     |      |  | 111 121       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 23 faulty |     |     |      |  | 111 122       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 24 faulty |     |     |      |  | 111 123       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 25 faulty |     |     |      |  | 111 124       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 26 faulty |     |     |      |  | 111 125       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 27 faulty |     |     |      |  | 111 126       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 28 faulty |     |     |      |  | 111 127       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 29 faulty |     |     |      |  | 111 128       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 30 faulty |     |     |      |  | 111 129       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 31 faulty |     |     |      |  | 111 130       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 32 faulty |     |     |      |  | 111 131       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 33 faulty |     |     |      |  | 111 132       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 34 faulty |     |     |      |  | 111 133       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 35 faulty |     |     |      |  | 111 134       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 36 faulty |     |     |      |  | 111 135       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 37 faulty |     |     |      |  | 111 136       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 38 faulty |     |     |      |  | 111 137       |  |
| 0: No                  |     |     |      |  |               |  |
| GOOSE: Input 39 faulty |     |     |      |  | 111 138       |  |
| 0: No                  |     |     |      |  |               |  |

| Parameter              |     |     |      | Address       |
|------------------------|-----|-----|------|---------------|
| Default                | Min | Max | Unit | Logic Diagram |
| GOOSE: Input 40 faulty |     |     |      | 111 139       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 41 faulty |     |     |      | 111 140       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 42 faulty |     |     |      | 111 141       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 43 faulty |     |     |      | 111 142       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 44 faulty |     |     |      | 111 143       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 45 faulty |     |     |      | 111 144       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 46 faulty |     |     |      | 111 145       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 47 faulty |     |     |      | 111 146       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 48 faulty |     |     |      | 111 147       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 49 faulty |     |     |      | 111 148       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 50 faulty |     |     |      | 111 149       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 51 faulty |     |     |      | 111 150       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 52 faulty |     |     |      | 111 151       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 53 faulty |     |     |      | 111 152       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 54 faulty |     |     |      | 111 153       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 55 faulty |     |     |      | 111 154       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 56 faulty |     |     |      | 111 155       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 57 faulty |     |     |      | 111 156       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 58 faulty |     |     |      | 111 157       |
| 0: No                  |     |     |      |               |

| Parameter              |     |     |      |  | Address       |  |         |
|------------------------|-----|-----|------|--|---------------|--|---------|
| Default                | Min | Max | Unit |  | Logic Diagram |  |         |
| GOOSE: Input 59 faulty |     |     |      |  |               |  | 111 158 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 60 faulty |     |     |      |  |               |  | 111 159 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 61 faulty |     |     |      |  |               |  | 111 160 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 62 faulty |     |     |      |  |               |  | 111 161 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 63 faulty |     |     |      |  |               |  | 111 162 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 64 faulty |     |     |      |  |               |  | 111 163 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 65 faulty |     |     |      |  |               |  | 111 164 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 66 faulty |     |     |      |  |               |  | 111 165 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 67 faulty |     |     |      |  |               |  | 111 166 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 68 faulty |     |     |      |  |               |  | 111 167 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 69 faulty |     |     |      |  |               |  | 111 168 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 70 faulty |     |     |      |  |               |  | 111 169 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 71 faulty |     |     |      |  |               |  | 111 170 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 72 faulty |     |     |      |  |               |  | 111 171 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 73 faulty |     |     |      |  |               |  | 111 172 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 74 faulty |     |     |      |  |               |  | 111 173 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 75 faulty |     |     |      |  |               |  | 111 174 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 76 faulty |     |     |      |  |               |  | 111 175 |
| 0: No                  |     |     |      |  |               |  |         |
| GOOSE: Input 77 faulty |     |     |      |  |               |  | 111 176 |
| 0: No                  |     |     |      |  |               |  |         |

| Parameter              |     |     |      | Address       |
|------------------------|-----|-----|------|---------------|
| Default                | Min | Max | Unit | Logic Diagram |
| GOOSE: Input 78 faulty |     |     |      | 111 177       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 79 faulty |     |     |      | 111 178       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 80 faulty |     |     |      | 111 179       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 81 faulty |     |     |      | 111 180       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 82 faulty |     |     |      | 111 181       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 83 faulty |     |     |      | 111 182       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 84 faulty |     |     |      | 111 183       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 85 faulty |     |     |      | 111 184       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 86 faulty |     |     |      | 111 185       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 87 faulty |     |     |      | 111 186       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 88 faulty |     |     |      | 111 187       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 89 faulty |     |     |      | 111 188       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 90 faulty |     |     |      | 111 189       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 91 faulty |     |     |      | 111 190       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 92 faulty |     |     |      | 111 191       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 93 faulty |     |     |      | 111 192       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 94 faulty |     |     |      | 111 193       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 95 faulty |     |     |      | 111 194       |
| 0: No                  |     |     |      |               |
| GOOSE: Input 96 faulty |     |     |      | 111 195       |
| 0: No                  |     |     |      |               |

| Parameter               |     |     |      |  | Address       |  |         |
|-------------------------|-----|-----|------|--|---------------|--|---------|
| Default                 | Min | Max | Unit |  | Logic Diagram |  |         |
| GOOSE: Input 97 faulty  |     |     |      |  |               |  | 111 196 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 98 faulty  |     |     |      |  |               |  | 111 197 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 99 faulty  |     |     |      |  |               |  | 111 198 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 100 faulty |     |     |      |  |               |  | 111 199 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 101 faulty |     |     |      |  |               |  | 111 200 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 102 faulty |     |     |      |  |               |  | 111 201 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 103 faulty |     |     |      |  |               |  | 111 202 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 104 faulty |     |     |      |  |               |  | 111 203 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 105 faulty |     |     |      |  |               |  | 111 204 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 106 faulty |     |     |      |  |               |  | 111 205 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 107 faulty |     |     |      |  |               |  | 111 206 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 108 faulty |     |     |      |  |               |  | 111 207 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 109 faulty |     |     |      |  |               |  | 111 208 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 110 faulty |     |     |      |  |               |  | 111 209 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 111 faulty |     |     |      |  |               |  | 111 210 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 112 faulty |     |     |      |  |               |  | 111 211 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 113 faulty |     |     |      |  |               |  | 111 212 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 114 faulty |     |     |      |  |               |  | 111 213 |
| 0: No                   |     |     |      |  |               |  |         |
| GOOSE: Input 115 faulty |     |     |      |  |               |  | 111 214 |
| 0: No                   |     |     |      |  |               |  |         |



| Parameter                |     |     |      | Address       |
|--------------------------|-----|-----|------|---------------|
| Default                  | Min | Max | Unit | Logic Diagram |
| GOOSE: Input 116 faulty  |     |     |      | 111 215       |
| 0: No                    |     |     |      |               |
| GOOSE: Input 117 faulty  |     |     |      | 111 216       |
| 0: No                    |     |     |      |               |
| GOOSE: Input 118 faulty  |     |     |      | 111 217       |
| 0: No                    |     |     |      |               |
| GOOSE: Input 119 faulty  |     |     |      | 111 218       |
| 0: No                    |     |     |      |               |
| GOOSE: Input 120 faulty  |     |     |      | 111 219       |
| 0: No                    |     |     |      |               |
| GOOSE: Input 121 faulty  |     |     |      | 111 220       |
| 0: No                    |     |     |      |               |
| GOOSE: Input 122 faulty  |     |     |      | 111 221       |
| 0: No                    |     |     |      |               |
| GOOSE: Input 123 faulty  |     |     |      | 111 222       |
| 0: No                    |     |     |      |               |
| GOOSE: Input 124 faulty  |     |     |      | 111 223       |
| 0: No                    |     |     |      |               |
| GOOSE: Input 125 faulty  |     |     |      | 111 224       |
| 0: No                    |     |     |      |               |
| GOOSE: Input 126 faulty  |     |     |      | 111 225       |
| 0: No                    |     |     |      |               |
| GOOSE: Input 127 faulty  |     |     |      | 111 226       |
| 0: No                    |     |     |      |               |
| GOOSE: Input 128 faulty  |     |     |      | 111 227       |
| 0: No                    |     |     |      |               |
| GOOSE: IED33-48 linked   |     |     |      | 112 200       |
| 2:                       |     |     |      |               |
| GOOSE: IED49-64 linked   |     |     |      | 112 201       |
| 2:                       |     |     |      |               |
| GOOSE: IED65-80 linked   |     |     |      | 112 202       |
| 2:                       |     |     |      |               |
| GOOSE: IED81-96 linked   |     |     |      | 112 203       |
| 2:                       |     |     |      |               |
| GOOSE: IED97-112 linked  |     |     |      | 112 204       |
| 2:                       |     |     |      |               |
| GOOSE: IED113-128 linked |     |     |      | 112 205       |
| 2:                       |     |     |      |               |

| Parameter                 |     |       |      | Address       |
|---------------------------|-----|-------|------|---------------|
| Default                   | Min | Max   | Unit | Logic Diagram |
| GOOSE: OrdRun01-16 linked |     |       |      | 107 248       |
| 2:                        |     |       |      |               |
| GOOSE: OrdRun17-32 linked |     |       |      | 107 249       |
| 2:                        |     |       |      |               |
| GOOSE: Uniqueness 1-16    |     |       |      | 007 217       |
| Not measured              | 0   | 65535 |      |               |
| GOOSE: Uniqueness 17-32   |     |       |      | 007 218       |
| Not measured              | 0   | 65535 |      |               |

## IRIG-B interface

| Parameter                  |     |     |      | Address              |
|----------------------------|-----|-----|------|----------------------|
| Default                    | Min | Max | Unit | Logic Diagram        |
| IRIGB: Enabled             |     |     |      | 023 201              |
| 0: No                      |     |     |      | Fig. 3-38, (p. 3-62) |
| IRIGB: Synchron. ready     |     |     |      | 023 202              |
| 0: No                      |     |     |      | Fig. 3-38, (p. 3-62) |
| IRIGB: EBR Synchron. ready |     |     |      | 023 203              |
| 0: No                      |     |     |      | Fig. 3-38, (p. 3-62) |

MODBUS master,  
binary command

| Parameter             |     |     |      |  | Address       |
|-----------------------|-----|-----|------|--|---------------|
| Default               | Min | Max | Unit |  | Logic Diagram |
| MM_BC: Command BC 001 |     |     |      |  | 208 000       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 002 |     |     |      |  | 208 005       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 003 |     |     |      |  | 208 010       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 004 |     |     |      |  | 208 015       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 005 |     |     |      |  | 208 020       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 006 |     |     |      |  | 208 025       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 007 |     |     |      |  | 208 030       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 008 |     |     |      |  | 208 035       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 009 |     |     |      |  | 208 040       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 010 |     |     |      |  | 208 045       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 011 |     |     |      |  | 208 050       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 012 |     |     |      |  | 208 055       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 013 |     |     |      |  | 208 060       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 014 |     |     |      |  | 208 065       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 015 |     |     |      |  | 208 070       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 016 |     |     |      |  | 208 075       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 017 |     |     |      |  | 208 080       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 018 |     |     |      |  | 208 085       |
| 0: No                 |     |     |      |  |               |

| Parameter             |     |     |      |  | Address       |
|-----------------------|-----|-----|------|--|---------------|
| Default               | Min | Max | Unit |  | Logic Diagram |
| MM_BC: Command BC 019 |     |     |      |  | 208 090       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 020 |     |     |      |  | 208 095       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 021 |     |     |      |  | 208 100       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 022 |     |     |      |  | 208 105       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 023 |     |     |      |  | 208 110       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 024 |     |     |      |  | 208 115       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 025 |     |     |      |  | 208 120       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 026 |     |     |      |  | 208 125       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 027 |     |     |      |  | 208 130       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 028 |     |     |      |  | 208 135       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 029 |     |     |      |  | 208 140       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 030 |     |     |      |  | 208 145       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 031 |     |     |      |  | 208 150       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 032 |     |     |      |  | 208 155       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 033 |     |     |      |  | 208 160       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 034 |     |     |      |  | 208 165       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 035 |     |     |      |  | 208 170       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 036 |     |     |      |  | 208 175       |
| 0: No                 |     |     |      |  |               |
| MM_BC: Command BC 037 |     |     |      |  | 208 180       |
| 0: No                 |     |     |      |  |               |

| Parameter             |     |     |      | Address       |  |  |         |
|-----------------------|-----|-----|------|---------------|--|--|---------|
| Default               | Min | Max | Unit | Logic Diagram |  |  |         |
| MM_BC: Command BC 038 |     |     |      |               |  |  | 208 185 |
| 0: No                 |     |     |      |               |  |  |         |
| MM_BC: Command BC 039 |     |     |      |               |  |  | 208 190 |
| 0: No                 |     |     |      |               |  |  |         |
| MM_BC: Command BC 040 |     |     |      |               |  |  | 208 195 |
| 0: No                 |     |     |      |               |  |  |         |

MODBUS master,  
binary signal

| Parameter            |     |     |      |  | Address              |         |
|----------------------|-----|-----|------|--|----------------------|---------|
| Default              | Min | Max | Unit |  | Logic Diagram        |         |
| MM_BS: Signal BS 001 |     |     |      |  |                      | 206 000 |
| 0: No                |     |     |      |  | Fig. 3-27, (p. 3-35) |         |
| MM_BS: Signal BS 002 |     |     |      |  |                      | 206 006 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 003 |     |     |      |  |                      | 206 012 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 004 |     |     |      |  |                      | 206 018 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 005 |     |     |      |  |                      | 206 024 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 006 |     |     |      |  |                      | 206 030 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 007 |     |     |      |  |                      | 206 036 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 008 |     |     |      |  |                      | 206 042 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 009 |     |     |      |  |                      | 206 048 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 010 |     |     |      |  |                      | 206 054 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 011 |     |     |      |  |                      | 206 060 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 012 |     |     |      |  |                      | 206 066 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 013 |     |     |      |  |                      | 206 072 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 014 |     |     |      |  |                      | 206 078 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 015 |     |     |      |  |                      | 206 084 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 016 |     |     |      |  |                      | 206 090 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 017 |     |     |      |  |                      | 206 096 |
| 0: No                |     |     |      |  |                      |         |
| MM_BS: Signal BS 018 |     |     |      |  |                      | 206 102 |
| 0: No                |     |     |      |  |                      |         |

| Parameter            |     |     |      | Address       |
|----------------------|-----|-----|------|---------------|
| Default              | Min | Max | Unit | Logic Diagram |
| MM_BS: Signal BS 019 |     |     |      | 206 108       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 020 |     |     |      | 206 114       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 021 |     |     |      | 206 120       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 022 |     |     |      | 206 126       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 023 |     |     |      | 206 132       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 024 |     |     |      | 206 138       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 025 |     |     |      | 206 144       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 026 |     |     |      | 206 150       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 027 |     |     |      | 206 156       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 028 |     |     |      | 206 162       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 029 |     |     |      | 206 168       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 030 |     |     |      | 206 174       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 031 |     |     |      | 206 180       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 032 |     |     |      | 206 186       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 033 |     |     |      | 206 192       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 034 |     |     |      | 206 198       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 035 |     |     |      | 206 204       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 036 |     |     |      | 206 210       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 037 |     |     |      | 206 216       |
| 0: No                |     |     |      |               |

| Parameter            |     |     |      |  | Address       |
|----------------------|-----|-----|------|--|---------------|
| Default              | Min | Max | Unit |  | Logic Diagram |
| MM_BS: Signal BS 038 |     |     |      |  | 206 222       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 039 |     |     |      |  | 206 228       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 040 |     |     |      |  | 206 234       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 041 |     |     |      |  | 206 240       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 042 |     |     |      |  | 206 246       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 043 |     |     |      |  | 206 252       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 044 |     |     |      |  | 207 002       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 045 |     |     |      |  | 207 008       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 046 |     |     |      |  | 207 014       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 047 |     |     |      |  | 207 020       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 048 |     |     |      |  | 207 026       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 049 |     |     |      |  | 207 032       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 050 |     |     |      |  | 207 038       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 051 |     |     |      |  | 207 044       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 052 |     |     |      |  | 207 050       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 053 |     |     |      |  | 207 056       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 054 |     |     |      |  | 207 062       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 055 |     |     |      |  | 207 068       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 056 |     |     |      |  | 207 074       |
| 0: No                |     |     |      |  |               |



| Parameter            |     |     |      | Address       |
|----------------------|-----|-----|------|---------------|
| Default              | Min | Max | Unit | Logic Diagram |
| MM_BS: Signal BS 057 |     |     |      | 207 080       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 058 |     |     |      | 207 086       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 059 |     |     |      | 207 092       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 060 |     |     |      | 207 098       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 061 |     |     |      | 207 104       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 062 |     |     |      | 207 110       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 063 |     |     |      | 207 116       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 064 |     |     |      | 207 122       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 065 |     |     |      | 207 128       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 066 |     |     |      | 207 134       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 067 |     |     |      | 207 140       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 068 |     |     |      | 207 146       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 069 |     |     |      | 207 152       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 070 |     |     |      | 207 158       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 071 |     |     |      | 207 164       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 072 |     |     |      | 207 170       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 073 |     |     |      | 207 176       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 074 |     |     |      | 207 182       |
| 0: No                |     |     |      |               |
| MM_BS: Signal BS 075 |     |     |      | 207 188       |
| 0: No                |     |     |      |               |

| Parameter            |     |     |      |  | Address       |
|----------------------|-----|-----|------|--|---------------|
| Default              | Min | Max | Unit |  | Logic Diagram |
| MM_BS: Signal BS 076 |     |     |      |  | 207 194       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 077 |     |     |      |  | 207 200       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 078 |     |     |      |  | 207 206       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 079 |     |     |      |  | 207 212       |
| 0: No                |     |     |      |  |               |
| MM_BS: Signal BS 080 |     |     |      |  | 207 218       |
| 0: No                |     |     |      |  |               |

Measured data input

| Parameter                   |     |     |      |  | Address                                      |
|-----------------------------|-----|-----|------|--|----------------------------------------------|
| Default                     | Min | Max | Unit |  | Logic Diagram                                |
| MEASI: Reset Tmax EXT       |     |     |      |  | 006 076                                      |
| 0: No                       |     |     |      |  |                                              |
| MEASI: Enabled              |     |     |      |  | 035 008                                      |
| 0: No                       |     |     |      |  | Fig. 3-41, (p. 3-67)<br>Fig. 3-49, (p. 3-75) |
| MEASI: I/O HW Failure       |     |     |      |  | 006 103                                      |
| 0: No                       |     |     |      |  |                                              |
| MEASI: Open circ. PT100     |     |     |      |  | 040 190                                      |
| 0: No                       |     |     |      |  | Fig. 3-46, (p. 3-72)                         |
| MEASI: Overload 20mA input  |     |     |      |  | 040 191                                      |
| 0: No                       |     |     |      |  | Fig. 3-44, (p. 3-70)                         |
| MEASI: Open circ. 20mA inp. |     |     |      |  | 040 192                                      |
| 0: No                       |     |     |      |  | Fig. 3-44, (p. 3-70)                         |

Binary and analog output

| Parameter                  |     |     |      |                      | Address       |
|----------------------------|-----|-----|------|----------------------|---------------|
| Default                    | Min | Max | Unit |                      | Logic Diagram |
| OUTP: Block outp.rel. EXT  |     |     |      |                      | 040 014       |
| 0: No                      |     |     |      |                      |               |
| OUTP: Reset latch. EXT     |     |     |      |                      | 040 015       |
| 0: No                      |     |     |      |                      |               |
| OUTP: Outp. relays blocked |     |     |      |                      | 021 015       |
| 1: Yes                     |     |     |      | Fig. 3-47, (p. 3-73) |               |
| OUTP: Latching reset       |     |     |      |                      | 040 088       |
| 0: No                      |     |     |      | Fig. 3-47, (p. 3-73) |               |

Measured data  
output

| Parameter                   | Address |     |      |                      |
|-----------------------------|---------|-----|------|----------------------|
| Default                     | Min     | Max | Unit | Logic Diagram        |
| MEASO: Outp. enabled EXT    |         |     |      | 036 085              |
| 1: Yes                      |         |     |      |                      |
| MEASO: Reset output EXT     |         |     |      | 036 087              |
| 0: No                       |         |     |      |                      |
| MEASO: Enabled              |         |     |      | 037 102              |
| 0: No                       |         |     |      |                      |
| MEASO: Output reset         |         |     |      | 037 117              |
| 0: No                       |         |     |      | Fig. 3-51, (p. 3-76) |
| MEASO: Valid BCD value      |         |     |      | 037 050              |
| 0: No                       |         |     |      | Fig. 3-52, (p. 3-79) |
| MEASO: 1-digit bit 0 (BCD)  |         |     |      | 037 051              |
| 0: No                       |         |     |      | Fig. 3-52, (p. 3-79) |
| MEASO: 1-digit bit 1 (BCD)  |         |     |      | 037 052              |
| 0: No                       |         |     |      | Fig. 3-52, (p. 3-79) |
| MEASO: 1-digit bit 2 (BCD)  |         |     |      | 037 053              |
| 0: No                       |         |     |      | Fig. 3-52, (p. 3-79) |
| MEASO: 1-digit bit 3 (BCD)  |         |     |      | 037 054              |
| 0: No                       |         |     |      | Fig. 3-52, (p. 3-79) |
| MEASO: 10-digit bit 0 (BCD) |         |     |      | 037 055              |
| 0: No                       |         |     |      | Fig. 3-52, (p. 3-79) |
| MEASO: 10-digit bit 1 (BCD) |         |     |      | 037 056              |
| 0: No                       |         |     |      | Fig. 3-52, (p. 3-79) |
| MEASO: 10-digit bit 2 (BCD) |         |     |      | 037 057              |
| 0: No                       |         |     |      | Fig. 3-52, (p. 3-79) |
| MEASO: 10-digit bit 3 (BCD) |         |     |      | 037 058              |
| 0: No                       |         |     |      | Fig. 3-52, (p. 3-79) |
| MEASO: 100-dig. bit 0 (BCD) |         |     |      | 037 059              |
| 0: No                       |         |     |      | Fig. 3-52, (p. 3-79) |
| MEASO: 100-dig. bit 1 (BCD) |         |     |      | 037 060              |
| 0: No                       |         |     |      | Fig. 3-52, (p. 3-79) |
| MEASO: Value A-1 valid      |         |     |      | 069 014              |
| 0: No                       |         |     |      | Fig. 3-54, (p. 3-85) |
| MEASO: Value A-1 output     |         |     |      | 037 118              |
| 0: No                       |         |     |      | Fig. 3-54, (p. 3-85) |
| MEASO: Value A-2 valid      |         |     |      | 069 015              |
| 0: No                       |         |     |      |                      |

| Parameter               |     |     |      | Address       |  |  |         |
|-------------------------|-----|-----|------|---------------|--|--|---------|
| Default                 | Min | Max | Unit | Logic Diagram |  |  |         |
| MEASO: Value A-2 output |     |     |      |               |  |  | 037 119 |
| 0: No                   |     |     |      |               |  |  |         |

## Main function

| Parameter                                                                                                      | Address |     |      |                       |
|----------------------------------------------------------------------------------------------------------------|---------|-----|------|-----------------------|
| Default                                                                                                        | Min     | Max | Unit | Logic Diagram         |
| MAIN: General reset EXT                                                                                        |         |     |      | 005 255               |
| 0: No                                                                                                          |         |     |      |                       |
| MAIN: Group reset 1 EXT                                                                                        |         |     |      | 005 209               |
| 0: No                                                                                                          |         |     |      |                       |
| MAIN: Group reset 2 EXT                                                                                        |         |     |      | 005 252               |
| 0: No                                                                                                          |         |     |      |                       |
| MAIN: Reset indicat. EXT                                                                                       |         |     |      | 065 001               |
| 0: No                                                                                                          |         |     |      |                       |
| MAIN: Res.IP,max,st.,1 EXT                                                                                     |         |     |      | 005 211               |
| 0: No                                                                                                          |         |     |      | Fig. 3-79, (p. 3-115) |
| MAIN: Res.IP,max,st.,2 EXT                                                                                     |         |     |      | 016 238               |
| 0: No                                                                                                          |         |     |      |                       |
| MAIN: Res.meas.v.en.,1 EXT                                                                                     |         |     |      | 005 212               |
| 0: No                                                                                                          |         |     |      |                       |
| MAIN: Res.meas.v.en.,2 EXT                                                                                     |         |     |      | 016 239               |
| 0: No                                                                                                          |         |     |      |                       |
| MAIN: CB1 faulty EXT                                                                                           |         |     |      | 221 086               |
| 0: No                                                                                                          |         |     |      |                       |
| MAIN: CB2 faulty EXT                                                                                           |         |     |      | 221 090               |
| 0: No                                                                                                          |         |     |      |                       |
| MAIN: Blocking 1 EXT                                                                                           |         |     |      | 040 060               |
| 0: No                                                                                                          |         |     |      |                       |
| MAIN: Blocking 2 EXT                                                                                           |         |     |      | 040 061               |
| 0: No                                                                                                          |         |     |      |                       |
| MAIN: M.c.b. trip V EXT                                                                                        |         |     |      | 004 061               |
| 0: No                                                                                                          |         |     |      |                       |
| MAIN: M.c.b. trip Vref EXT                                                                                     |         |     |      | 036 086               |
| 0: No                                                                                                          |         |     |      |                       |
| MAIN: Test mode EXT                                                                                            |         |     |      | 037 070               |
| 0: No                                                                                                          |         |     |      |                       |
| MAIN: Time switching EXT                                                                                       |         |     |      | 003 096               |
| 0: Standard time                                                                                               |         |     |      |                       |
| MAIN: Min-pulse clock EXT                                                                                      |         |     |      | 060 060               |
| 0: No                                                                                                          |         |     |      |                       |
| MAIN: Healthy                                                                                                  |         |     |      | 060 001               |
| 1: Yes                                                                                                         |         |     |      |                       |
| Signal that the protection unit is operational. By default this signal is linked to LED: Fct.assig. H 1 green. |         |     |      |                       |

| Parameter                                                                                                                                                                                                                                                                                |     |     |      | Address                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|------------------------|
| Default                                                                                                                                                                                                                                                                                  | Min | Max | Unit | Logic Diagram          |
| MAIN: Time synchronized                                                                                                                                                                                                                                                                  |     |     |      | 009 109                |
| 0: No                                                                                                                                                                                                                                                                                    |     |     |      |                        |
| MAIN: Blocked/faulty                                                                                                                                                                                                                                                                     |     |     |      | 004 065                |
| 1: Yes                                                                                                                                                                                                                                                                                   |     |     |      | Fig. 3-73, (p. 3-108)  |
| MAIN: Device not ready                                                                                                                                                                                                                                                                   |     |     |      | 004 060                |
| 1: Yes                                                                                                                                                                                                                                                                                   |     |     |      | Fig. 3-73, (p. 3-108)  |
| MAIN: Test mode                                                                                                                                                                                                                                                                          |     |     |      | 037 071                |
| 0: No                                                                                                                                                                                                                                                                                    |     |     |      | Fig. 3-81, (p. 3-117)  |
| MAIN: Auxiliary address                                                                                                                                                                                                                                                                  |     |     |      | 038 000                |
| 0: No                                                                                                                                                                                                                                                                                    |     |     |      |                        |
| MAIN: Enable control                                                                                                                                                                                                                                                                     |     |     |      | 221 058                |
| 1: Yes                                                                                                                                                                                                                                                                                   |     |     |      | Fig. 3-125, (p. 3-170) |
| MAIN: XSWI2 available                                                                                                                                                                                                                                                                    |     |     |      | 221 095                |
| 0: No                                                                                                                                                                                                                                                                                    |     |     |      |                        |
| MAIN: Bay interlock. act.                                                                                                                                                                                                                                                                |     |     |      | 221 001                |
| 0: No                                                                                                                                                                                                                                                                                    |     |     |      | Fig. 3-125, (p. 3-170) |
| MAIN: Subst. interl. act.                                                                                                                                                                                                                                                                |     |     |      | 221 000                |
| 0: No                                                                                                                                                                                                                                                                                    |     |     |      | Fig. 3-125, (p. 3-170) |
| MAIN: Fct. block. 1 active                                                                                                                                                                                                                                                               |     |     |      | 221 015                |
| 0: No                                                                                                                                                                                                                                                                                    |     |     |      | Fig. 3-72, (p. 3-107)  |
| MAIN: Fct. block. 2 active                                                                                                                                                                                                                                                               |     |     |      | 221 023                |
| 0: No                                                                                                                                                                                                                                                                                    |     |     |      | Fig. 3-72, (p. 3-107)  |
| MAIN: Mon. mot. drives tr.                                                                                                                                                                                                                                                               |     |     |      | 221 056                |
| 0: No                                                                                                                                                                                                                                                                                    |     |     |      | Fig. 3-137, (p. 3-186) |
| MAIN: Interlock equ. viol.                                                                                                                                                                                                                                                               |     |     |      | 221 018                |
| 0: No                                                                                                                                                                                                                                                                                    |     |     |      | Fig. 3-126, (p. 3-171) |
| MAIN: CB trip internal                                                                                                                                                                                                                                                                   |     |     |      | 221 006                |
| 0: No                                                                                                                                                                                                                                                                                    |     |     |      | Fig. 3-75, (p. 3-110)  |
| MAIN: CB tripped                                                                                                                                                                                                                                                                         |     |     |      | 221 016                |
| 0: No                                                                                                                                                                                                                                                                                    |     |     |      | Fig. 3-75, (p. 3-110)  |
| MAIN: DEV op.time exceeded                                                                                                                                                                                                                                                               |     |     |      | 221 110                |
| 0: No                                                                                                                                                                                                                                                                                    |     |     |      |                        |
| In the case of direct motor control by motor relay K200 this fault signal is issued (as a group signal) when no positive position signal (status signal) has been received from the external device after it has been issued a close command and the set running time-delay has elapsed. |     |     |      |                        |

| Parameter                                                                                                                                                             |     |     |      | Address       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                               | Min | Max | Unit | Logic Diagram |
| MAIN: DC fail. cmd. End                                                                                                                                               |     |     |      | 221 108       |
| 0: No                                                                                                                                                                 |     |     |      |               |
| In the case of direct motor control by motor relay K200 this signal is issued if the K200 contacts have not reopened after the set monitoring time-delay has elapsed. |     |     |      |               |
| MAIN: DC fail. cmd.start                                                                                                                                              |     |     |      | 221 109       |
| 0: No                                                                                                                                                                 |     |     |      |               |
| In the case of direct motor control by motor relay K200 this signal is issued if the K200 contacts have not closed after the set monitoring time-delay has elapsed.   |     |     |      |               |
| MAIN: Startcmdtime exceed.                                                                                                                                            |     |     |      | 221 112       |
| 0: No <span style="float: right;">Fig. 3-134, (p. 3-182)</span>                                                                                                       |     |     |      |               |
| If the monitoring, set by DEV01: StartCmdTime superv. (or DEV02: StartCmdTime superv. etc.), is active then an exceeded timer is flagged by this logic state signal.  |     |     |      |               |
| MAIN: Shunt trip overrun                                                                                                                                              |     |     |      | 221 114       |
| 0: No                                                                                                                                                                 |     |     |      |               |
| Signal that any of the operated switchgear units happens to end up in a faulty position after termination of the switching command.                                   |     |     |      |               |
| MAIN: Mult. sig. 1 active                                                                                                                                             |     |     |      | 221 017       |
| 0: No <span style="float: right;">Fig. 3-74, (p. 3-108)</span>                                                                                                        |     |     |      |               |
| MAIN: Mult. sig. 1 stored                                                                                                                                             |     |     |      | 221 054       |
| 0: No <span style="float: right;">Fig. 3-74, (p. 3-108)</span>                                                                                                        |     |     |      |               |
| MAIN: Mult. sig. 2 active                                                                                                                                             |     |     |      | 221 053       |
| 0: No <span style="float: right;">Fig. 3-74, (p. 3-108)</span>                                                                                                        |     |     |      |               |
| MAIN: Mult. sig. 2 stored                                                                                                                                             |     |     |      | 221 055       |
| 0: No <span style="float: right;">Fig. 3-74, (p. 3-108)</span>                                                                                                        |     |     |      |               |
| MAIN: Communication error                                                                                                                                             |     |     |      | 221 019       |
| 1: Yes <span style="float: right;">Fig. 3-76, (p. 3-111)</span>                                                                                                       |     |     |      |               |
| MAIN: SI commu. disturbed                                                                                                                                             |     |     |      | 221 031       |
| 1: Yes                                                                                                                                                                |     |     |      |               |
| MAIN: Cmd. fr. comm.interf                                                                                                                                            |     |     |      | 221 101       |
| 0: No                                                                                                                                                                 |     |     |      |               |
| MAIN: Cmd. fr. electr.ctrl                                                                                                                                            |     |     |      | 221 103       |
| 0: No                                                                                                                                                                 |     |     |      |               |
| MAIN: Command from HMI                                                                                                                                                |     |     |      | 221 102       |
| 0: No                                                                                                                                                                 |     |     |      |               |
| MAIN: Device selection key                                                                                                                                            |     |     |      | 006 001       |
| 0: No                                                                                                                                                                 |     |     |      |               |



| Parameter              |     |     |      | Address       |
|------------------------|-----|-----|------|---------------|
| Default                | Min | Max | Unit | Logic Diagram |
| MAIN: Device OPEN key  |     |     |      | 006 002       |
| 0: No                  |     |     |      |               |
| MAIN: Device CLOSE key |     |     |      | 006 003       |
| 0: No                  |     |     |      |               |
| MAIN: Local/Remote key |     |     |      | 006 004       |
| 0: No                  |     |     |      |               |
| MAIN: Dummy entry      |     |     |      | 004 129       |
| 0: No                  |     |     |      |               |
| MAIN: Without function |     |     |      | 060 000       |
| 0: No                  |     |     |      |               |
| MAIN: Without function |     |     |      | 061 000       |
| 0: No                  |     |     |      |               |

Parameter subset  
selection

| Parameter                 |     |     |      |  | Address               |  |
|---------------------------|-----|-----|------|--|-----------------------|--|
| Default                   | Min | Max | Unit |  | Logic Diagram         |  |
| PSS: Control via user EXT |     |     |      |  | 036 101               |  |
| 0: No                     |     |     |      |  |                       |  |
| PSS: Activate PS 1 EXT    |     |     |      |  | 065 002               |  |
| 2: Not configured         |     |     |      |  |                       |  |
| PSS: Activate PS 2 EXT    |     |     |      |  | 065 003               |  |
| 2: Not configured         |     |     |      |  |                       |  |
| PSS: Activate PS 3 EXT    |     |     |      |  | 065 004               |  |
| 2: Not configured         |     |     |      |  |                       |  |
| PSS: Activate PS 4 EXT    |     |     |      |  | 065 005               |  |
| 2: Not configured         |     |     |      |  |                       |  |
| PSS: Control via user     |     |     |      |  | 036 102               |  |
| 0: No                     |     |     |      |  | Fig. 3-82, (p. 3-119) |  |
| PSS: Ext.sel.param.subset |     |     |      |  | 003 061               |  |
| 0: No param. subset sel   |     |     |      |  | Fig. 3-82, (p. 3-119) |  |
| PSS: PS 1 activated ext.  |     |     |      |  | 036 094               |  |
| 0: No                     |     |     |      |  | Fig. 3-82, (p. 3-119) |  |
| PSS: PS 2 activated ext.  |     |     |      |  | 036 095               |  |
| 0: No                     |     |     |      |  | Fig. 3-82, (p. 3-119) |  |
| PSS: PS 3 activated ext.  |     |     |      |  | 036 096               |  |
| 0: No                     |     |     |      |  | Fig. 3-82, (p. 3-119) |  |
| PSS: PS 4 activated ext.  |     |     |      |  | 036 097               |  |
| 0: No                     |     |     |      |  | Fig. 3-82, (p. 3-119) |  |
| PSS: Actual param. subset |     |     |      |  | 003 062               |  |
| 1: Parameter subset 1     |     |     |      |  | Fig. 3-82, (p. 3-119) |  |
| PSS: PS 1 active          |     |     |      |  | 036 090               |  |
| 1: Yes                    |     |     |      |  | Fig. 3-82, (p. 3-119) |  |
| PSS: PS 2 active          |     |     |      |  | 036 091               |  |
| 0: No                     |     |     |      |  | Fig. 3-82, (p. 3-119) |  |
| PSS: PS 3 active          |     |     |      |  | 036 092               |  |
| 0: No                     |     |     |      |  | Fig. 3-82, (p. 3-119) |  |
| PSS: PS 4 active          |     |     |      |  | 036 093               |  |
| 0: No                     |     |     |      |  | Fig. 3-82, (p. 3-119) |  |

## Self-monitoring

| Parameter                   |     |     |      |  | Address               |
|-----------------------------|-----|-----|------|--|-----------------------|
| Default                     | Min | Max | Unit |  | Logic Diagram         |
| SFMON: Warning (LED)        |     |     |      |  | 036 070               |
| 0: No                       |     |     |      |  | Fig. 3-83, (p. 3-120) |
| SFMON: Warning (relay)      |     |     |      |  | 036 100               |
| 0: No                       |     |     |      |  | Fig. 3-83, (p. 3-120) |
| SFMON: Warm restart exec.   |     |     |      |  | 041 202               |
| 0: No                       |     |     |      |  |                       |
| SFMON: Cold restart exec.   |     |     |      |  | 041 201               |
| 0: No                       |     |     |      |  |                       |
| SFMON: Cold restart         |     |     |      |  | 093 024               |
| 0: No                       |     |     |      |  |                       |
| SFMON: Cold rest./SW update |     |     |      |  | 093 025               |
| 0: No                       |     |     |      |  |                       |
| SFMON: Blocking/ HW failure |     |     |      |  | 090 019               |
| 0: No                       |     |     |      |  |                       |
| SFMON: Relay Kxx faulty     |     |     |      |  | 041 200               |
| 0: No                       |     |     |      |  |                       |
| SFMON: Hardware clock fail. |     |     |      |  | 093 040               |
| 0: No                       |     |     |      |  |                       |
| SFMON: Battery failure      |     |     |      |  | 090 010               |
| 0: No                       |     |     |      |  |                       |
| SFMON: Invalid SW d.loaded  |     |     |      |  | 096 121               |
| 0: No                       |     |     |      |  |                       |
| SFMON: Invalid type of bay  |     |     |      |  | 096 122               |
| 0: No                       |     |     |      |  |                       |
| SFMON: +15V supply faulty   |     |     |      |  | 093 081               |
| 0: No                       |     |     |      |  |                       |
| SFMON: +24V supply faulty   |     |     |      |  | 093 082               |
| 0: No                       |     |     |      |  |                       |
| SFMON: -15V supply faulty   |     |     |      |  | 093 080               |
| 0: No                       |     |     |      |  |                       |
| SFMON: Wrong module slot 01 |     |     |      |  | 096 100               |
| 0: No                       |     |     |      |  |                       |
| SFMON: Wrong module slot 02 |     |     |      |  | 096 101               |
| 0: No                       |     |     |      |  |                       |
| SFMON: Wrong module slot 03 |     |     |      |  | 096 102               |
| 0: No                       |     |     |      |  |                       |
| SFMON: Wrong module slot 04 |     |     |      |  | 096 103               |
| 0: No                       |     |     |      |  |                       |

| Parameter                   |     |     |      |  | Address       |
|-----------------------------|-----|-----|------|--|---------------|
| Default                     | Min | Max | Unit |  | Logic Diagram |
| SFMON: Wrong module slot 05 |     |     |      |  | 096 104       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 06 |     |     |      |  | 096 105       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 07 |     |     |      |  | 096 106       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 08 |     |     |      |  | 096 107       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 09 |     |     |      |  | 096 108       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 10 |     |     |      |  | 096 109       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 11 |     |     |      |  | 096 110       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 12 |     |     |      |  | 096 111       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 13 |     |     |      |  | 096 112       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 14 |     |     |      |  | 096 113       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 15 |     |     |      |  | 096 114       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 16 |     |     |      |  | 096 115       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 17 |     |     |      |  | 096 116       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 18 |     |     |      |  | 096 117       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 19 |     |     |      |  | 096 118       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 20 |     |     |      |  | 096 119       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module slot 21 |     |     |      |  | 096 120       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module Dig.Bus |     |     |      |  | 096 123       |
| 0: No                       |     |     |      |  |               |
| SFMON: Wrong module HMI     |     |     |      |  | 096 124       |
| 0: No                       |     |     |      |  |               |

| Parameter                   |     |     |      | Address       |
|-----------------------------|-----|-----|------|---------------|
| Default                     | Min | Max | Unit | Logic Diagram |
| SFMON: Wrong module Comm    |     |     |      | 096 125       |
| 0: No                       |     |     |      |               |
| SFMON: Wrong module Ana.Bus |     |     |      | 096 126       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot01 |     |     |      | 097 000       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot02 |     |     |      | 097 001       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot03 |     |     |      | 097 002       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot04 |     |     |      | 097 003       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot05 |     |     |      | 097 004       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot06 |     |     |      | 097 005       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot07 |     |     |      | 097 006       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot08 |     |     |      | 097 007       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot09 |     |     |      | 097 008       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot10 |     |     |      | 097 009       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot11 |     |     |      | 097 010       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot12 |     |     |      | 097 011       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot13 |     |     |      | 097 012       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot14 |     |     |      | 097 013       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot15 |     |     |      | 097 014       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot16 |     |     |      | 097 015       |
| 0: No                       |     |     |      |               |
| SFMON: Defect.module slot17 |     |     |      | 097 016       |
| 0: No                       |     |     |      |               |

| Parameter                   |     |     |      |  | Address       |
|-----------------------------|-----|-----|------|--|---------------|
| Default                     | Min | Max | Unit |  | Logic Diagram |
| SFMON: Defect.module slot18 |     |     |      |  | 097 017       |
| 0: No                       |     |     |      |  |               |
| SFMON: Defect.module slot19 |     |     |      |  | 097 018       |
| 0: No                       |     |     |      |  |               |
| SFMON: Defect.module slot20 |     |     |      |  | 097 019       |
| 0: No                       |     |     |      |  |               |
| SFMON: Defect.module slot21 |     |     |      |  | 097 020       |
| 0: No                       |     |     |      |  |               |
| SFMON: Module Y DPR faulty  |     |     |      |  | 093 110       |
| 0: No                       |     |     |      |  |               |
| SFMON: Module Y RAM faulty  |     |     |      |  | 093 111       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 0601         |     |     |      |  | 097 070       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 0602         |     |     |      |  | 097 071       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 0603         |     |     |      |  | 097 072       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 0604         |     |     |      |  | 097 073       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 0605         |     |     |      |  | 097 074       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 0606         |     |     |      |  | 097 075       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 0607         |     |     |      |  | 097 076       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 0608         |     |     |      |  | 097 077       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 0701         |     |     |      |  | 097 078       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 0702         |     |     |      |  | 097 079       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 0703         |     |     |      |  | 097 080       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 0704         |     |     |      |  | 097 081       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 0705         |     |     |      |  | 097 082       |
| 0: No                       |     |     |      |  |               |

| Parameter           |     |     |      | Address       |
|---------------------|-----|-----|------|---------------|
| Default             | Min | Max | Unit | Logic Diagram |
| SFMON: Error K 0706 |     |     |      | 097 083       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0707 |     |     |      | 097 084       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0708 |     |     |      | 097 085       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0801 |     |     |      | 097 086       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0802 |     |     |      | 097 087       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0803 |     |     |      | 097 088       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0804 |     |     |      | 097 089       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0805 |     |     |      | 097 090       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0806 |     |     |      | 097 091       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0807 |     |     |      | 097 092       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0808 |     |     |      | 097 093       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0901 |     |     |      | 097 094       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0902 |     |     |      | 097 095       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0903 |     |     |      | 097 096       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0904 |     |     |      | 097 097       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0905 |     |     |      | 097 098       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0906 |     |     |      | 097 099       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0907 |     |     |      | 097 100       |
| 0: No               |     |     |      |               |
| SFMON: Error K 0908 |     |     |      | 097 101       |
| 0: No               |     |     |      |               |

| Parameter           |     |     |      |  | Address       |  |         |
|---------------------|-----|-----|------|--|---------------|--|---------|
| Default             | Min | Max | Unit |  | Logic Diagram |  |         |
| SFMON: Error K 1001 |     |     |      |  |               |  | 097 102 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1002 |     |     |      |  |               |  | 097 103 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1003 |     |     |      |  |               |  | 097 104 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1004 |     |     |      |  |               |  | 097 105 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1005 |     |     |      |  |               |  | 097 106 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1006 |     |     |      |  |               |  | 097 107 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1007 |     |     |      |  |               |  | 097 108 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1008 |     |     |      |  |               |  | 097 109 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1201 |     |     |      |  |               |  | 097 118 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1202 |     |     |      |  |               |  | 097 119 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1203 |     |     |      |  |               |  | 097 120 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1204 |     |     |      |  |               |  | 097 121 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1205 |     |     |      |  |               |  | 097 122 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1206 |     |     |      |  |               |  | 097 123 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1207 |     |     |      |  |               |  | 097 124 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1208 |     |     |      |  |               |  | 097 125 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1401 |     |     |      |  |               |  | 097 134 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1402 |     |     |      |  |               |  | 097 135 |
| 0: No               |     |     |      |  |               |  |         |
| SFMON: Error K 1403 |     |     |      |  |               |  | 097 136 |
| 0: No               |     |     |      |  |               |  |         |



| Parameter           |     |     |      | Address       |
|---------------------|-----|-----|------|---------------|
| Default             | Min | Max | Unit | Logic Diagram |
| SFMON: Error K 1404 |     |     |      | 097 137       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1405 |     |     |      | 097 138       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1406 |     |     |      | 097 139       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1407 |     |     |      | 097 140       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1408 |     |     |      | 097 141       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1601 |     |     |      | 097 150       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1602 |     |     |      | 097 151       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1603 |     |     |      | 097 152       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1604 |     |     |      | 097 153       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1605 |     |     |      | 097 154       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1606 |     |     |      | 097 155       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1607 |     |     |      | 097 156       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1608 |     |     |      | 097 157       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1801 |     |     |      | 097 166       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1802 |     |     |      | 097 167       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1803 |     |     |      | 097 168       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1804 |     |     |      | 097 169       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1805 |     |     |      | 097 170       |
| 0: No               |     |     |      |               |
| SFMON: Error K 1806 |     |     |      | 097 171       |
| 0: No               |     |     |      |               |

| Parameter                   |     |     |      |  | Address       |
|-----------------------------|-----|-----|------|--|---------------|
| Default                     | Min | Max | Unit |  | Logic Diagram |
| SFMON: Error K 2001         |     |     |      |  | 097 182       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 2002         |     |     |      |  | 097 183       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 2003         |     |     |      |  | 097 184       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 2004         |     |     |      |  | 097 185       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 2005         |     |     |      |  | 097 186       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 2006         |     |     |      |  | 097 187       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 2007         |     |     |      |  | 097 188       |
| 0: No                       |     |     |      |  |               |
| SFMON: Error K 2008         |     |     |      |  | 097 189       |
| 0: No                       |     |     |      |  |               |
| SFMON: Undef. operat. code  |     |     |      |  | 093 010       |
| 0: No                       |     |     |      |  |               |
| SFMON: Abnormal termination |     |     |      |  | 093 030       |
| 0: No                       |     |     |      |  |               |
| SFMON: Bad arg. system call |     |     |      |  | 093 031       |
| 0: No                       |     |     |      |  |               |
| SFMON: Mutex deadlock       |     |     |      |  | 093 032       |
| 0: No                       |     |     |      |  |               |
| SFMON: Invalid memory ref.  |     |     |      |  | 093 033       |
| 0: No                       |     |     |      |  |               |
| SFMON: Unexpected exception |     |     |      |  | 093 034       |
| 0: No                       |     |     |      |  |               |
| SFMON: Invalid arithm. op.  |     |     |      |  | 093 011       |
| 0: No                       |     |     |      |  |               |
| SFMON: Undefined interrupt  |     |     |      |  | 093 012       |
| 0: No                       |     |     |      |  |               |
| SFMON: Exception oper.syst. |     |     |      |  | 093 013       |
| 0: No                       |     |     |      |  |               |
| SFMON: Protection failure   |     |     |      |  | 090 021       |
| 0: No                       |     |     |      |  |               |
| SFMON: Checksum error param |     |     |      |  | 090 003       |
| 0: No                       |     |     |      |  |               |

| Parameter                   |     |     |      | Address               |
|-----------------------------|-----|-----|------|-----------------------|
| Default                     | Min | Max | Unit | Logic Diagram         |
| SFMON: Clock sync. error    |     |     |      | 093 041               |
| 0: No                       |     |     |      |                       |
| SFMON: Interm.volt.fail.RAM |     |     |      | 093 026               |
| 0: No                       |     |     |      |                       |
| SFMON: Overflow MT_RC       |     |     |      | 090 012               |
| 0: No                       |     |     |      | Fig. 3-85, (p. 3-124) |
| SFMON: Checksum DMOD        |     |     |      | 093 023               |
| 0: No                       |     |     |      |                       |
| SFMON: Semaph. MT_RC block. |     |     |      | 093 015               |
| 0: No                       |     |     |      |                       |
| SFMON: Inval. SW COMM1/IEC  |     |     |      | 093 075               |
| 0: No                       |     |     |      |                       |
| SFMON: Inval. Config. IEC   |     |     |      | 093 079               |
| 0: No                       |     |     |      |                       |
| SFMON: Invalid SW vers. Y   |     |     |      | 093 113               |
| 0: No                       |     |     |      |                       |
| SFMON: Time-out module Y    |     |     |      | 093 112               |
| 0: No                       |     |     |      |                       |
| SFMON: IRIGB faulty         |     |     |      | 093 117               |
| 0: No                       |     |     |      |                       |
| SFMON: M.c.b. trip V        |     |     |      | 098 000               |
| 0: No                       |     |     |      |                       |
| SFMON: M.c.b. trip Vref     |     |     |      | 098 011               |
| 0: No                       |     |     |      |                       |
| SFMON: FF, Vref triggered   |     |     |      | 098 022               |
| 0: No                       |     |     |      |                       |
| SFMON: M.circ. V,Vref flty. |     |     |      | 098 023               |
| 0: No                       |     |     |      |                       |
| SFMON: Meas. circ. V faulty |     |     |      | 098 017               |
| 0: No                       |     |     |      |                       |
| SFMON: Invalid SW vers DHMI |     |     |      | 093 145               |
| 0: No                       |     |     |      |                       |
| SFMON: Invalid scaling BCD  |     |     |      | 093 124               |
| 0: No                       |     |     |      |                       |
| SFMON: Invalid scaling A-1  |     |     |      | 093 114               |
| 0: No                       |     |     |      | Fig. 3-54, (p. 3-85)  |
| SFMON: Invalid scaling A-2  |     |     |      | 093 115               |
| 0: No                       |     |     |      |                       |

| Parameter                   |                      |     |      | Address       |
|-----------------------------|----------------------|-----|------|---------------|
| Default                     | Min                  | Max | Unit | Logic Diagram |
| SFMON: Invalid scaling IDC  |                      |     |      | 093 116       |
| 0: No                       | Fig. 3-44, (p. 3-70) |     |      |               |
| SFMON: PT100 open circuit   |                      |     |      | 098 024       |
| 0: No                       | Fig. 3-46, (p. 3-72) |     |      |               |
| SFMON: Overload 20 mA input |                      |     |      | 098 025       |
| 0: No                       | Fig. 3-44, (p. 3-70) |     |      |               |
| SFMON: Open circ. 20mA inp. |                      |     |      | 098 026       |
| 0: No                       | Fig. 3-44, (p. 3-70) |     |      |               |
| SFMON: Inv.inp.f.clock sync |                      |     |      | 093 120       |
| 0: No                       |                      |     |      |               |
| SFMON: Output 30            |                      |     |      | 098 053       |
| 0: No                       |                      |     |      |               |
| SFMON: Output 30 (t)        |                      |     |      | 098 054       |
| 0: No                       |                      |     |      |               |
| SFMON: Output 31            |                      |     |      | 098 055       |
| 0: No                       |                      |     |      |               |
| SFMON: Output 31 (t)        |                      |     |      | 098 056       |
| 0: No                       |                      |     |      |               |
| SFMON: Output 32            |                      |     |      | 098 057       |
| 0: No                       |                      |     |      |               |
| SFMON: Output 32 (t)        |                      |     |      | 098 058       |
| 0: No                       |                      |     |      |               |

Monitoring signal  
recording

| Parameter                |     |     |      | Address       |
|--------------------------|-----|-----|------|---------------|
| Default                  | Min | Max | Unit | Logic Diagram |
| MT_RC: Reset record. EXT |     |     |      | 005 240       |
| 0: No                    |     |     |      |               |

## Fault recording

| Parameter                  |     |     |      |  | Address               |
|----------------------------|-----|-----|------|--|-----------------------|
| Default                    | Min | Max | Unit |  | Logic Diagram         |
| FT_RC: Reset record. EXT   |     |     |      |  | 005 243               |
| 0: No                      |     |     |      |  |                       |
| FT_RC: Trigger EXT         |     |     |      |  | 036 089               |
| 0: No                      |     |     |      |  |                       |
| FT_RC: I> triggered        |     |     |      |  | 040 063               |
| 0: No                      |     |     |      |  | Fig. 3-86, (p. 3-125) |
| FT_RC: Record.trig active  |     |     |      |  | 002 002               |
| 0: No                      |     |     |      |  | Fig. 3-86, (p. 3-125) |
| FT_RC: Record. in progress |     |     |      |  | 035 000               |
| 0: No                      |     |     |      |  | Fig. 3-86, (p. 3-125) |
| FT_RC: Fault mem. overflow |     |     |      |  | 035 001               |
| 0: No                      |     |     |      |  | Fig. 3-87, (p. 3-126) |
| FT_RC: Faulty time tag     |     |     |      |  | 035 002               |
| 0: No                      |     |     |      |  |                       |

Automatic  
synchronism check

| Parameter                                                                                                                                                                                                                          | Address |     |      |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                                                            | Min     | Max | Unit | Logic Diagram |
| ASC: Meas.V(T9x) EXT                                                                                                                                                                                                               |         |     |      | 016 221       |
| 0: No                                                                                                                                                                                                                              |         |     |      |               |
| This parameter allows to select the ASC input source via binary input, communication protocol signal or programmable logic. (See setting (016 222) ASC: Meas.V(T9x) USER PSx for details.)                                         |         |     |      |               |
| ASC: Meas.V(T9x) active                                                                                                                                                                                                            |         |     |      | 016 240       |
| 0: No <span style="float: right;">Fig. 3-91, (p. 3-132)</span>                                                                                                                                                                     |         |     |      |               |
| Signal that reports which voltage(s) the ASC function is currently using for the operating modes “voltage-checked close enable” and “voltage/synchronism-checked close enable”.                                                    |         |     |      |               |
| <ul style="list-style-type: none"> <li>● The value No means that the three phase-to-ground voltages are checked.</li> <li>● The value Yes means that the (single-phase) voltage measured at transformer T9x is checked.</li> </ul> |         |     |      |               |
| (See also parameters (016 222) ASC: Meas.V(T9x) USER PSx, (016 221) ASC: Meas.V(T9x) EXT.)                                                                                                                                         |         |     |      |               |
| ASC: Reset counters EXT                                                                                                                                                                                                            |         |     |      | 006 074       |
| 0: No                                                                                                                                                                                                                              |         |     |      |               |
| ASC: Enable EXT                                                                                                                                                                                                                    |         |     |      | 037 049       |
| 2: Not configured                                                                                                                                                                                                                  |         |     |      |               |
| ASC: Disable EXT                                                                                                                                                                                                                   |         |     |      | 037 061       |
| 2: Not configured                                                                                                                                                                                                                  |         |     |      |               |
| ASC: Blocking EXT                                                                                                                                                                                                                  |         |     |      | 037 048       |
| 0: No                                                                                                                                                                                                                              |         |     |      |               |
| ASC: Test AR close r. EXT                                                                                                                                                                                                          |         |     |      | 000 106       |
| 0: No                                                                                                                                                                                                                              |         |     |      |               |
| Close request via external signal for a test triggering of the ASC in operating mode automatic reclosure.                                                                                                                          |         |     |      |               |
| ASC: Test MC close r. EXT                                                                                                                                                                                                          |         |     |      | 037 064       |
| 0: No                                                                                                                                                                                                                              |         |     |      |               |
| Close request via external signal for a test triggering of the ASC in operating mode manual reclosure.                                                                                                                             |         |     |      |               |
| ASC: Enabl.close requ.EXT                                                                                                                                                                                                          |         |     |      | 037 063       |
| 1: Yes                                                                                                                                                                                                                             |         |     |      |               |
| ASC: MC Close request EXT                                                                                                                                                                                                          |         |     |      | 037 062       |
| 0: No                                                                                                                                                                                                                              |         |     |      |               |
| Close request via external signal for a triggering of the ASC in operating mode manual reclosure.                                                                                                                                  |         |     |      |               |

| Parameter                                                                                            |     |     |      | Address                                                                                           |
|------------------------------------------------------------------------------------------------------|-----|-----|------|---------------------------------------------------------------------------------------------------|
| Default                                                                                              | Min | Max | Unit | Logic Diagram                                                                                     |
| ASC: AR close request EXT                                                                            |     |     |      | 008 236                                                                                           |
| 0: No                                                                                                |     |     |      |                                                                                                   |
| Close request via external signal for a triggering of the ASC in operating mode automatic reclosure. |     |     |      |                                                                                                   |
| ASC: Ext./user enabled                                                                               |     |     |      | 037 092                                                                                           |
| 1: Yes                                                                                               |     |     |      | Fig. 3-92, (p. 3-133)                                                                             |
| ASC: Enabled                                                                                         |     |     |      | 018 024                                                                                           |
| 0: No                                                                                                |     |     |      | Fig. 3-92, (p. 3-133)                                                                             |
| ASC: Blocked                                                                                         |     |     |      | 038 018                                                                                           |
| 0: No                                                                                                |     |     |      | Fig. 3-93, (p. 3-134)                                                                             |
| ASC: Ready                                                                                           |     |     |      | 037 079                                                                                           |
| 0: No                                                                                                |     |     |      | Fig. 3-93, (p. 3-134)                                                                             |
| ASC: Not ready                                                                                       |     |     |      | 037 082                                                                                           |
| 1: Yes                                                                                               |     |     |      | Fig. 3-93, (p. 3-134)                                                                             |
| ASC: Test AR close requ.                                                                             |     |     |      | 008 240                                                                                           |
| 0: No                                                                                                |     |     |      | Fig. 3-94, (p. 3-135)                                                                             |
| Signaling of a close request for a test triggering of the ASC in operating mode automatic reclosure. |     |     |      |                                                                                                   |
| ASC: Test MC close requ.                                                                             |     |     |      | 034 019                                                                                           |
| 0: No                                                                                                |     |     |      | Fig. 3-95, (p. 3-136)                                                                             |
| Signaling of a close request for a test triggering of the ASC in operating mode manual reclosure.    |     |     |      |                                                                                                   |
| ASC: AR Close request                                                                                |     |     |      | 008 239                                                                                           |
| 0: No                                                                                                |     |     |      | Fig. 3-94, (p. 3-135)                                                                             |
| Signaling of a close request for a triggering of the ASC in operating mode automatic reclosure.      |     |     |      |                                                                                                   |
| ASC: MC Close request                                                                                |     |     |      | 034 018                                                                                           |
| 0: No                                                                                                |     |     |      | Fig. 3-95, (p. 3-136)                                                                             |
| Signaling of a close request for a triggering of the ASC in operating mode manual reclosure.         |     |     |      |                                                                                                   |
| ASC: Cycle running                                                                                   |     |     |      | 038 019                                                                                           |
| 0: No                                                                                                |     |     |      | Fig. 3-97, (p. 3-137)<br>Fig. 3-98, (p. 3-139)<br>Fig. 3-99, (p. 3-140)<br>Fig. 3-107, (p. 3-150) |
| ASC: Operat.time running                                                                             |     |     |      | 037 093                                                                                           |
| 0: No                                                                                                |     |     |      | Fig. 3-97, (p. 3-137)<br>Fig. 3-98, (p. 3-139)<br>Fig. 3-99, (p. 3-140)                           |

| Parameter                 |     |     |      | Address                                                                                            |
|---------------------------|-----|-----|------|----------------------------------------------------------------------------------------------------|
| Default                   | Min | Max | Unit | Logic Diagram                                                                                      |
| ASC: Close enable         |     |     |      | 037 083                                                                                            |
| 0: No                     |     |     |      | Fig. 3-98, (p. 3-139)<br>Fig. 3-99, (p. 3-140)<br>Fig. 3-101, (p. 3-142)<br>Fig. 3-102, (p. 3-144) |
| ASC: Close enable,volt.ch |     |     |      | 037 085                                                                                            |
| 0: No                     |     |     |      | Fig. 3-98, (p. 3-139)<br>Fig. 3-99, (p. 3-140)<br>Fig. 3-101, (p. 3-142)<br>Fig. 3-102, (p. 3-144) |
| ASC: Close enable,sync.ch |     |     |      | 037 084                                                                                            |
| 0: No                     |     |     |      | Fig. 3-98, (p. 3-139)<br>Fig. 3-99, (p. 3-140)<br>Fig. 3-103, (p. 3-145)<br>Fig. 3-104, (p. 3-147) |
| ASC: Close rejection      |     |     |      | 037 086                                                                                            |
| 0: No                     |     |     |      | Fig. 3-97, (p. 3-137)<br>Fig. 3-98, (p. 3-139)<br>Fig. 3-99, (p. 3-140)                            |



Limit value  
monitoring

| Parameter                 |     |     |      |  | Address                |  |  |         |
|---------------------------|-----|-----|------|--|------------------------|--|--|---------|
| Default                   | Min | Max | Unit |  | Logic Diagram          |  |  |         |
| LIMIT: Enabled            |     |     |      |  |                        |  |  | 040 074 |
| 0: No                     |     |     |      |  |                        |  |  |         |
| LIMIT: Starting IDC,lin>  |     |     |      |  |                        |  |  | 040 180 |
| 0: No                     |     |     |      |  | Fig. 3-109, (p. 3-152) |  |  |         |
| LIMIT: Starting IDC,lin>> |     |     |      |  |                        |  |  | 040 181 |
| 0: No                     |     |     |      |  | Fig. 3-109, (p. 3-152) |  |  |         |
| LIMIT: tIDC,lin> elapsed  |     |     |      |  |                        |  |  | 040 182 |
| 0: No                     |     |     |      |  | Fig. 3-109, (p. 3-152) |  |  |         |
| LIMIT: tIDC,lin>> elapsed |     |     |      |  |                        |  |  | 040 183 |
| 0: No                     |     |     |      |  | Fig. 3-109, (p. 3-152) |  |  |         |
| LIMIT: Starting IDC,lin<  |     |     |      |  |                        |  |  | 040 184 |
| 0: No                     |     |     |      |  | Fig. 3-109, (p. 3-152) |  |  |         |
| LIMIT: Starting IDC,lin<< |     |     |      |  |                        |  |  | 040 185 |
| 0: No                     |     |     |      |  | Fig. 3-109, (p. 3-152) |  |  |         |
| LIMIT: tIDC,lin< elapsed  |     |     |      |  |                        |  |  | 040 186 |
| 0: No                     |     |     |      |  | Fig. 3-109, (p. 3-152) |  |  |         |
| LIMIT: tIDC,lin<< elapsed |     |     |      |  |                        |  |  | 040 187 |
| 0: No                     |     |     |      |  | Fig. 3-109, (p. 3-152) |  |  |         |
| LIMIT: Starting T>        |     |     |      |  |                        |  |  | 040 170 |
| 0: No                     |     |     |      |  | Fig. 3-110, (p. 3-153) |  |  |         |
| LIMIT: Starting T>>       |     |     |      |  |                        |  |  | 040 171 |
| 0: No                     |     |     |      |  | Fig. 3-110, (p. 3-153) |  |  |         |
| LIMIT: tT> elapsed        |     |     |      |  |                        |  |  | 040 172 |
| 0: No                     |     |     |      |  | Fig. 3-110, (p. 3-153) |  |  |         |
| LIMIT: tT>> elapsed       |     |     |      |  |                        |  |  | 040 173 |
| 0: No                     |     |     |      |  | Fig. 3-110, (p. 3-153) |  |  |         |
| LIMIT: Starting T<        |     |     |      |  |                        |  |  | 040 174 |
| 0: No                     |     |     |      |  | Fig. 3-110, (p. 3-153) |  |  |         |
| LIMIT: Starting T<<       |     |     |      |  |                        |  |  | 040 175 |
| 0: No                     |     |     |      |  | Fig. 3-110, (p. 3-153) |  |  |         |
| LIMIT: tT< elapsed        |     |     |      |  |                        |  |  | 040 176 |
| 0: No                     |     |     |      |  | Fig. 3-110, (p. 3-153) |  |  |         |
| LIMIT: tT<< elapsed       |     |     |      |  |                        |  |  | 040 177 |
| 0: No                     |     |     |      |  | Fig. 3-110, (p. 3-153) |  |  |         |

## Limit value monitoring

| Parameter              |     |     |      | Address                                                                                              |  |  |         |
|------------------------|-----|-----|------|------------------------------------------------------------------------------------------------------|--|--|---------|
| Default                | Min | Max | Unit | Logic Diagram                                                                                        |  |  |         |
| LIM_1: Enabled         |     |     |      |                                                                                                      |  |  | 102 202 |
| 0: No                  |     |     |      | Fig. 3-111, (p. 3-154)<br>Fig. 3-112, (p. 3-156)<br>Fig. 3-113, (p. 3-157)<br>Fig. 3-114, (p. 3-158) |  |  |         |
| LIM_1: tI> elapsed     |     |     |      |                                                                                                      |  |  | 040 220 |
| 0: No                  |     |     |      | Fig. 3-111, (p. 3-154)                                                                               |  |  |         |
| LIM_1: tI>> elapsed    |     |     |      |                                                                                                      |  |  | 040 221 |
| 0: No                  |     |     |      | Fig. 3-111, (p. 3-154)                                                                               |  |  |         |
| LIM_1: tI< elapsed     |     |     |      |                                                                                                      |  |  | 040 222 |
| 0: No                  |     |     |      | Fig. 3-111, (p. 3-154)                                                                               |  |  |         |
| LIM_1: tI<< elapsed    |     |     |      |                                                                                                      |  |  | 040 223 |
| 0: No                  |     |     |      | Fig. 3-111, (p. 3-154)                                                                               |  |  |         |
| LIM_1: tVPG> elapsed   |     |     |      |                                                                                                      |  |  | 040 224 |
| 0: No                  |     |     |      | Fig. 3-112, (p. 3-156)                                                                               |  |  |         |
| LIM_1: tVPG>> elapsed  |     |     |      |                                                                                                      |  |  | 040 225 |
| 0: No                  |     |     |      | Fig. 3-112, (p. 3-156)                                                                               |  |  |         |
| LIM_1: tVPG< elapsed   |     |     |      |                                                                                                      |  |  | 040 226 |
| 0: No                  |     |     |      | Fig. 3-112, (p. 3-156)                                                                               |  |  |         |
| LIM_1: tVPG<< elapsed  |     |     |      |                                                                                                      |  |  | 040 227 |
| 0: No                  |     |     |      | Fig. 3-112, (p. 3-156)                                                                               |  |  |         |
| LIM_1: tVPP> elapsed   |     |     |      |                                                                                                      |  |  | 040 228 |
| 0: No                  |     |     |      | Fig. 3-112, (p. 3-156)                                                                               |  |  |         |
| LIM_1: tVPP>> elapsed  |     |     |      |                                                                                                      |  |  | 040 229 |
| 0: No                  |     |     |      | Fig. 3-112, (p. 3-156)                                                                               |  |  |         |
| LIM_1: tVPP< elapsed   |     |     |      |                                                                                                      |  |  | 040 230 |
| 0: No                  |     |     |      | Fig. 3-112, (p. 3-156)                                                                               |  |  |         |
| LIM_1: tVPP<< elapsed  |     |     |      |                                                                                                      |  |  | 040 231 |
| 0: No                  |     |     |      | Fig. 3-112, (p. 3-156)                                                                               |  |  |         |
| LIM_1: tVNG> elapsed   |     |     |      |                                                                                                      |  |  | 040 168 |
| 0: No                  |     |     |      | Fig. 3-113, (p. 3-157)                                                                               |  |  |         |
| LIM_1: tVNG>> elapsed  |     |     |      |                                                                                                      |  |  | 040 169 |
| 0: No                  |     |     |      | Fig. 3-113, (p. 3-157)                                                                               |  |  |         |
| LIM_1: tVref> elapsed  |     |     |      |                                                                                                      |  |  | 042 152 |
| 0: No                  |     |     |      | Fig. 3-114, (p. 3-158)                                                                               |  |  |         |
| LIM_1: tVref>> elapsed |     |     |      |                                                                                                      |  |  | 042 153 |
| 0: No                  |     |     |      | Fig. 3-114, (p. 3-158)                                                                               |  |  |         |

| Parameter                |                        |     |      | Address       |
|--------------------------|------------------------|-----|------|---------------|
| Default                  | Min                    | Max | Unit | Logic Diagram |
| LIM_1: tVref< elapsed    |                        |     |      | 042 154       |
| 0: No                    | Fig. 3-114, (p. 3-158) |     |      |               |
| LIM_1: tVref<< elapsed   |                        |     |      | 042 155       |
| 0: No                    | Fig. 3-114, (p. 3-158) |     |      |               |
| LIM_1: tIPxx triggered   |                        |     |      | 221 232       |
| 0: Not triggered         |                        |     |      |               |
| LIM_1: tVPGxx triggered  |                        |     |      | 221 233       |
| 0: Not triggered         |                        |     |      |               |
| LIM_1: tVPPxx triggered  |                        |     |      | 221 234       |
| 0: Not triggered         |                        |     |      |               |
| LIM_1: tVNGxx triggered  |                        |     |      | 221 235       |
| 0: Not triggered         |                        |     |      |               |
| LIM_1: tVrefxx triggered |                        |     |      | 221 237       |
| 0: Not triggered         |                        |     |      |               |

Limit value  
monitoring

| Parameter                 |     |     |      |  | Address       |  |         |
|---------------------------|-----|-----|------|--|---------------|--|---------|
| Default                   | Min | Max | Unit |  | Logic Diagram |  |         |
| LIM_2: Enabled            |     |     |      |  |               |  | 102 050 |
| 0: No                     |     |     |      |  |               |  |         |
| LIM_2: tI>,2 elapsed      |     |     |      |  |               |  | 102 051 |
| 0: No                     |     |     |      |  |               |  |         |
| LIM_2: tI>>,2 elapsed     |     |     |      |  |               |  | 102 052 |
| 0: No                     |     |     |      |  |               |  |         |
| LIM_2: tI<,2 elapsed      |     |     |      |  |               |  | 102 053 |
| 0: No                     |     |     |      |  |               |  |         |
| LIM_2: tI<<,2 elapsed     |     |     |      |  |               |  | 102 054 |
| 0: No                     |     |     |      |  |               |  |         |
| LIM_2: tVPG>,2 elapsed    |     |     |      |  |               |  | 102 055 |
| 0: No                     |     |     |      |  |               |  |         |
| LIM_2: tVPG>>,2 elapsed   |     |     |      |  |               |  | 102 056 |
| 0: No                     |     |     |      |  |               |  |         |
| LIM_2: tVPG<,2 elapsed    |     |     |      |  |               |  | 102 057 |
| 0: No                     |     |     |      |  |               |  |         |
| LIM_2: tVPG<<,2 elapsed   |     |     |      |  |               |  | 102 058 |
| 0: No                     |     |     |      |  |               |  |         |
| LIM_2: tVPP>,2 elapsed    |     |     |      |  |               |  | 102 059 |
| 0: No                     |     |     |      |  |               |  |         |
| LIM_2: tVPP>>,2 elapsed   |     |     |      |  |               |  | 102 060 |
| 0: No                     |     |     |      |  |               |  |         |
| LIM_2: tVPP<,2 elapsed    |     |     |      |  |               |  | 102 061 |
| 0: No                     |     |     |      |  |               |  |         |
| LIM_2: tVPP<<,2 elapsed   |     |     |      |  |               |  | 102 062 |
| 0: No                     |     |     |      |  |               |  |         |
| LIM_2: tVNG>,2 elapsed    |     |     |      |  |               |  | 102 063 |
| 0: No                     |     |     |      |  |               |  |         |
| LIM_2: tVNG>>,2 elapsed   |     |     |      |  |               |  | 102 064 |
| 0: No                     |     |     |      |  |               |  |         |
| LIM_2: tIPxx,2 triggered  |     |     |      |  |               |  | 102 068 |
| 0: Not triggered          |     |     |      |  |               |  |         |
| LIM_2: tVPGxx,2 triggered |     |     |      |  |               |  | 102 065 |
| 0: Not triggered          |     |     |      |  |               |  |         |
| LIM_2: tVPPxx,2 triggered |     |     |      |  |               |  | 102 066 |
| 0: Not triggered          |     |     |      |  |               |  |         |

| Parameter                 |     |     |      | Address       |
|---------------------------|-----|-----|------|---------------|
| Default                   | Min | Max | Unit | Logic Diagram |
| LIM_2: tVNGxx,2 triggered |     |     |      | 102 067       |
| 0: Not triggered          |     |     |      |               |

## Programmable Logic

| Parameter                                    |     |     |      | Address       |
|----------------------------------------------|-----|-----|------|---------------|
| Default                                      | Min | Max | Unit | Logic Diagram |
| LOG_2: Enabled                               |     |     |      | 011 138       |
| 0: No <a href="#">Fig. 3-117, (p. 3-162)</a> |     |     |      |               |
| LOG_2: Output 1                              |     |     |      | 052 032       |
| 0: No <a href="#">Fig. 3-117, (p. 3-162)</a> |     |     |      |               |
| LOG_2: Output 1 (t)                          |     |     |      | 052 033       |
| 0: No <a href="#">Fig. 3-117, (p. 3-162)</a> |     |     |      |               |
| LOG_2: Output 2                              |     |     |      | 052 034       |
| 0: No                                        |     |     |      |               |
| LOG_2: Output 2 (t)                          |     |     |      | 052 035       |
| 0: No                                        |     |     |      |               |
| LOG_2: Output 3                              |     |     |      | 052 036       |
| 0: No                                        |     |     |      |               |
| LOG_2: Output 3 (t)                          |     |     |      | 052 037       |
| 0: No                                        |     |     |      |               |
| LOG_2: Output 4                              |     |     |      | 052 038       |
| 0: No                                        |     |     |      |               |
| LOG_2: Output 4 (t)                          |     |     |      | 052 039       |
| 0: No                                        |     |     |      |               |

## Programmable Logic

| Parameter           |     |     |      |  | Address       |  |         |
|---------------------|-----|-----|------|--|---------------|--|---------|
| Default             | Min | Max | Unit |  | Logic Diagram |  |         |
| LOGIC: Input 01 EXT |     |     |      |  |               |  | 034 000 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 02 EXT |     |     |      |  |               |  | 034 001 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 03 EXT |     |     |      |  |               |  | 034 002 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 04 EXT |     |     |      |  |               |  | 034 003 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 05 EXT |     |     |      |  |               |  | 034 004 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 06 EXT |     |     |      |  |               |  | 034 005 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 07 EXT |     |     |      |  |               |  | 034 006 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 08 EXT |     |     |      |  |               |  | 034 007 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 09 EXT |     |     |      |  |               |  | 034 008 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 10 EXT |     |     |      |  |               |  | 034 009 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 11 EXT |     |     |      |  |               |  | 034 010 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 12 EXT |     |     |      |  |               |  | 034 011 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 13 EXT |     |     |      |  |               |  | 034 012 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 14 EXT |     |     |      |  |               |  | 034 013 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 15 EXT |     |     |      |  |               |  | 034 014 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 16 EXT |     |     |      |  |               |  | 034 015 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 17 EXT |     |     |      |  |               |  | 034 086 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 18 EXT |     |     |      |  |               |  | 034 087 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 19 EXT |     |     |      |  |               |  | 034 088 |
| 0: No               |     |     |      |  |               |  |         |

| Parameter           |     |     |      | Address       |
|---------------------|-----|-----|------|---------------|
| Default             | Min | Max | Unit | Logic Diagram |
| LOGIC: Input 20 EXT |     |     |      | 034 089       |
| 0: No               |     |     |      |               |
| LOGIC: Input 21 EXT |     |     |      | 034 090       |
| 0: No               |     |     |      |               |
| LOGIC: Input 22 EXT |     |     |      | 034 091       |
| 0: No               |     |     |      |               |
| LOGIC: Input 23 EXT |     |     |      | 034 092       |
| 0: No               |     |     |      |               |
| LOGIC: Input 24 EXT |     |     |      | 034 093       |
| 0: No               |     |     |      |               |
| LOGIC: Input 25 EXT |     |     |      | 034 094       |
| 0: No               |     |     |      |               |
| LOGIC: Input 26 EXT |     |     |      | 034 095       |
| 0: No               |     |     |      |               |
| LOGIC: Input 27 EXT |     |     |      | 034 096       |
| 0: No               |     |     |      |               |
| LOGIC: Input 28 EXT |     |     |      | 034 097       |
| 0: No               |     |     |      |               |
| LOGIC: Input 29 EXT |     |     |      | 034 098       |
| 0: No               |     |     |      |               |
| LOGIC: Input 30 EXT |     |     |      | 034 099       |
| 0: No               |     |     |      |               |
| LOGIC: Input 31 EXT |     |     |      | 034 100       |
| 0: No               |     |     |      |               |
| LOGIC: Input 32 EXT |     |     |      | 034 101       |
| 0: No               |     |     |      |               |
| LOGIC: Input 33 EXT |     |     |      | 034 102       |
| 0: No               |     |     |      |               |
| LOGIC: Input 34 EXT |     |     |      | 034 103       |
| 0: No               |     |     |      |               |
| LOGIC: Input 35 EXT |     |     |      | 034 104       |
| 0: No               |     |     |      |               |
| LOGIC: Input 36 EXT |     |     |      | 034 105       |
| 0: No               |     |     |      |               |
| LOGIC: Input 37 EXT |     |     |      | 034 106       |
| 0: No               |     |     |      |               |
| LOGIC: Input 38 EXT |     |     |      | 034 107       |
| 0: No               |     |     |      |               |

| Parameter           |     |     |      |  | Address       |  |         |
|---------------------|-----|-----|------|--|---------------|--|---------|
| Default             | Min | Max | Unit |  | Logic Diagram |  |         |
| LOGIC: Input 39 EXT |     |     |      |  |               |  | 034 108 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Input 40 EXT |     |     |      |  |               |  | 034 109 |
| 0: No               |     |     |      |  |               |  |         |
| LOGIC: Set 01 EXT   |     |     |      |  |               |  | 034 051 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Set 02 EXT   |     |     |      |  |               |  | 034 052 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Set 03 EXT   |     |     |      |  |               |  | 034 053 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Set 04 EXT   |     |     |      |  |               |  | 034 054 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Set 05 EXT   |     |     |      |  |               |  | 034 055 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Set 06 EXT   |     |     |      |  |               |  | 034 056 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Set 07 EXT   |     |     |      |  |               |  | 034 057 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Set 08 EXT   |     |     |      |  |               |  | 034 058 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Set 09 EXT   |     |     |      |  |               |  | 024 244 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Set 10 EXT   |     |     |      |  |               |  | 024 245 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Set 11 EXT   |     |     |      |  |               |  | 024 246 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Set 12 EXT   |     |     |      |  |               |  | 024 247 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Set 13 EXT   |     |     |      |  |               |  | 024 248 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Set 14 EXT   |     |     |      |  |               |  | 024 249 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Set 15 EXT   |     |     |      |  |               |  | 024 250 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Set 16 EXT   |     |     |      |  |               |  | 024 251 |
| 2: Not configured   |     |     |      |  |               |  |         |
| LOGIC: Reset 01 EXT |     |     |      |  |               |  | 034 059 |
| 2: Not configured   |     |     |      |  |               |  |         |



| Parameter              |     |     |      | Address                |
|------------------------|-----|-----|------|------------------------|
| Default                | Min | Max | Unit | Logic Diagram          |
| LOGIC: Reset 02 EXT    |     |     |      | 034 060                |
| 2: Not configured      |     |     |      |                        |
| LOGIC: Reset 03 EXT    |     |     |      | 034 061                |
| 2: Not configured      |     |     |      |                        |
| LOGIC: Reset 04 EXT    |     |     |      | 034 062                |
| 2: Not configured      |     |     |      |                        |
| LOGIC: Reset 05 EXT    |     |     |      | 034 063                |
| 2: Not configured      |     |     |      |                        |
| LOGIC: Reset 06 EXT    |     |     |      | 034 064                |
| 2: Not configured      |     |     |      |                        |
| LOGIC: Reset 07 EXT    |     |     |      | 034 065                |
| 2: Not configured      |     |     |      |                        |
| LOGIC: Reset 08 EXT    |     |     |      | 034 066                |
| 2: Not configured      |     |     |      |                        |
| LOGIC: Reset 09 EXT    |     |     |      | 024 252                |
| 2: Not configured      |     |     |      |                        |
| LOGIC: Reset 10 EXT    |     |     |      | 024 253                |
| 2: Not configured      |     |     |      |                        |
| LOGIC: Reset 11 EXT    |     |     |      | 024 254                |
| 2: Not configured      |     |     |      |                        |
| LOGIC: Reset 12 EXT    |     |     |      | 024 255                |
| 2: Not configured      |     |     |      |                        |
| LOGIC: Reset 13 EXT    |     |     |      | 025 008                |
| 2: Not configured      |     |     |      |                        |
| LOGIC: Reset 14 EXT    |     |     |      | 025 012                |
| 2: Not configured      |     |     |      |                        |
| LOGIC: Reset 15 EXT    |     |     |      | 025 013                |
| 2: Not configured      |     |     |      |                        |
| LOGIC: Reset 16 EXT    |     |     |      | 025 014                |
| 2: Not configured      |     |     |      |                        |
| LOGIC: 01 has been set |     |     |      | 034 067                |
| 0: No                  |     |     |      | Fig. 3-115, (p. 3-160) |
| LOGIC: 02 has been set |     |     |      | 034 068                |
| 0: No                  |     |     |      |                        |
| LOGIC: 03 has been set |     |     |      | 034 069                |
| 0: No                  |     |     |      |                        |
| LOGIC: 04 has been set |     |     |      | 034 070                |
| 0: No                  |     |     |      |                        |

| Parameter                |     |     |      |  | Address                |
|--------------------------|-----|-----|------|--|------------------------|
| Default                  | Min | Max | Unit |  | Logic Diagram          |
| LOGIC: 05 has been set   |     |     |      |  | 034 071                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 06 has been set   |     |     |      |  | 034 072                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 07 has been set   |     |     |      |  | 034 073                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 08 has been set   |     |     |      |  | 034 074                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 09 has been set   |     |     |      |  | 025 015                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 10 has been set   |     |     |      |  | 025 016                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 11 has been set   |     |     |      |  | 025 017                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 12 has been set   |     |     |      |  | 025 018                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 13 has been set   |     |     |      |  | 025 019                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 14 has been set   |     |     |      |  | 025 024                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 15 has been set   |     |     |      |  | 025 034                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 16 has been set   |     |     |      |  | 025 038                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 01 set externally |     |     |      |  | 034 075                |
| 0: No                    |     |     |      |  | Fig. 3-115, (p. 3-160) |
| LOGIC: 02 set externally |     |     |      |  | 034 076                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 03 set externally |     |     |      |  | 034 077                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 04 set externally |     |     |      |  | 034 078                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 05 set externally |     |     |      |  | 034 079                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 06 set externally |     |     |      |  | 034 080                |
| 0: No                    |     |     |      |  |                        |
| LOGIC: 07 set externally |     |     |      |  | 034 081                |
| 0: No                    |     |     |      |  |                        |

| Parameter                |     |     |      | Address                |
|--------------------------|-----|-----|------|------------------------|
| Default                  | Min | Max | Unit | Logic Diagram          |
| LOGIC: 08 set externally |     |     |      | 034 082                |
| 0: No                    |     |     |      |                        |
| LOGIC: 09 set externally |     |     |      | 025 039                |
| 0: No                    |     |     |      |                        |
| LOGIC: 10 set externally |     |     |      | 025 040                |
| 0: No                    |     |     |      |                        |
| LOGIC: 11 set externally |     |     |      | 025 046                |
| 0: No                    |     |     |      |                        |
| LOGIC: 12 set externally |     |     |      | 025 056                |
| 0: No                    |     |     |      |                        |
| LOGIC: 13 set externally |     |     |      | 025 058                |
| 0: No                    |     |     |      |                        |
| LOGIC: 14 set externally |     |     |      | 025 068                |
| 0: No                    |     |     |      |                        |
| LOGIC: 15 set externally |     |     |      | 025 072                |
| 0: No                    |     |     |      |                        |
| LOGIC: 16 set externally |     |     |      | 025 073                |
| 0: No                    |     |     |      |                        |
| LOGIC: Enabled           |     |     |      | 034 046                |
| 0: No                    |     |     |      | Fig. 3-116, (p. 3-161) |
| LOGIC: Output 01         |     |     |      | 042 032                |
| 0: No                    |     |     |      | Fig. 3-116, (p. 3-161) |
| LOGIC: Output 01 (t)     |     |     |      | 042 033                |
| 0: No                    |     |     |      | Fig. 3-116, (p. 3-161) |
| LOGIC: Output 02         |     |     |      | 042 034                |
| 0: No                    |     |     |      |                        |
| LOGIC: Output 02 (t)     |     |     |      | 042 035                |
| 0: No                    |     |     |      |                        |
| LOGIC: Output 03         |     |     |      | 042 036                |
| 0: No                    |     |     |      |                        |
| LOGIC: Output 03 (t)     |     |     |      | 042 037                |
| 0: No                    |     |     |      |                        |
| LOGIC: Output 04         |     |     |      | 042 038                |
| 0: No                    |     |     |      |                        |
| LOGIC: Output 04 (t)     |     |     |      | 042 039                |
| 0: No                    |     |     |      |                        |
| LOGIC: Output 05         |     |     |      | 042 040                |
| 0: No                    |     |     |      |                        |

| Parameter            |     |     |      |  | Address       |  |         |
|----------------------|-----|-----|------|--|---------------|--|---------|
| Default              | Min | Max | Unit |  | Logic Diagram |  |         |
| LOGIC: Output 05 (t) |     |     |      |  |               |  | 042 041 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 06     |     |     |      |  |               |  | 042 042 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 06 (t) |     |     |      |  |               |  | 042 043 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 07     |     |     |      |  |               |  | 042 044 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 07 (t) |     |     |      |  |               |  | 042 045 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 08     |     |     |      |  |               |  | 042 046 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 08 (t) |     |     |      |  |               |  | 042 047 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 09     |     |     |      |  |               |  | 042 048 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 09 (t) |     |     |      |  |               |  | 042 049 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 10     |     |     |      |  |               |  | 042 050 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 10 (t) |     |     |      |  |               |  | 042 051 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 11     |     |     |      |  |               |  | 042 052 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 11 (t) |     |     |      |  |               |  | 042 053 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 12     |     |     |      |  |               |  | 042 054 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 12 (t) |     |     |      |  |               |  | 042 055 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 13     |     |     |      |  |               |  | 042 056 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 13 (t) |     |     |      |  |               |  | 042 057 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 14     |     |     |      |  |               |  | 042 058 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 14 (t) |     |     |      |  |               |  | 042 059 |
| 0: No                |     |     |      |  |               |  |         |

| Parameter            |     |     |      | Address       |
|----------------------|-----|-----|------|---------------|
| Default              | Min | Max | Unit | Logic Diagram |
| LOGIC: Output 15     |     |     |      | 042 060       |
| 0: No                |     |     |      |               |
| LOGIC: Output 15 (t) |     |     |      | 042 061       |
| 0: No                |     |     |      |               |
| LOGIC: Output 16     |     |     |      | 042 062       |
| 0: No                |     |     |      |               |
| LOGIC: Output 16 (t) |     |     |      | 042 063       |
| 0: No                |     |     |      |               |
| LOGIC: Output 17     |     |     |      | 042 064       |
| 0: No                |     |     |      |               |
| LOGIC: Output 17 (t) |     |     |      | 042 065       |
| 0: No                |     |     |      |               |
| LOGIC: Output 18     |     |     |      | 042 066       |
| 0: No                |     |     |      |               |
| LOGIC: Output 18 (t) |     |     |      | 042 067       |
| 0: No                |     |     |      |               |
| LOGIC: Output 19     |     |     |      | 042 068       |
| 0: No                |     |     |      |               |
| LOGIC: Output 19 (t) |     |     |      | 042 069       |
| 0: No                |     |     |      |               |
| LOGIC: Output 20     |     |     |      | 042 070       |
| 0: No                |     |     |      |               |
| LOGIC: Output 20 (t) |     |     |      | 042 071       |
| 0: No                |     |     |      |               |
| LOGIC: Output 21     |     |     |      | 042 072       |
| 0: No                |     |     |      |               |
| LOGIC: Output 21 (t) |     |     |      | 042 073       |
| 0: No                |     |     |      |               |
| LOGIC: Output 22     |     |     |      | 042 074       |
| 0: No                |     |     |      |               |
| LOGIC: Output 22 (t) |     |     |      | 042 075       |
| 0: No                |     |     |      |               |
| LOGIC: Output 23     |     |     |      | 042 076       |
| 0: No                |     |     |      |               |
| LOGIC: Output 23 (t) |     |     |      | 042 077       |
| 0: No                |     |     |      |               |
| LOGIC: Output 24     |     |     |      | 042 078       |
| 0: No                |     |     |      |               |

| Parameter            |     |     |      |  | Address       |  |         |
|----------------------|-----|-----|------|--|---------------|--|---------|
| Default              | Min | Max | Unit |  | Logic Diagram |  |         |
| LOGIC: Output 24 (t) |     |     |      |  |               |  | 042 079 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 25     |     |     |      |  |               |  | 042 080 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 25 (t) |     |     |      |  |               |  | 042 081 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 26     |     |     |      |  |               |  | 042 082 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 26 (t) |     |     |      |  |               |  | 042 083 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 27     |     |     |      |  |               |  | 042 084 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 27 (t) |     |     |      |  |               |  | 042 085 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 28     |     |     |      |  |               |  | 042 086 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 28 (t) |     |     |      |  |               |  | 042 087 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 29     |     |     |      |  |               |  | 042 088 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 29 (t) |     |     |      |  |               |  | 042 089 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 30     |     |     |      |  |               |  | 042 090 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 30 (t) |     |     |      |  |               |  | 042 091 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 31     |     |     |      |  |               |  | 042 092 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 31 (t) |     |     |      |  |               |  | 042 093 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 32     |     |     |      |  |               |  | 042 094 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 32 (t) |     |     |      |  |               |  | 042 095 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 33     |     |     |      |  |               |  | 042 180 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 33 (t) |     |     |      |  |               |  | 042 181 |
| 0: No                |     |     |      |  |               |  |         |

| Parameter            |     |     |      | Address       |
|----------------------|-----|-----|------|---------------|
| Default              | Min | Max | Unit | Logic Diagram |
| LOGIC: Output 34     |     |     |      | 042 182       |
| 0: No                |     |     |      |               |
| LOGIC: Output 34 (t) |     |     |      | 042 183       |
| 0: No                |     |     |      |               |
| LOGIC: Output 35     |     |     |      | 042 184       |
| 0: No                |     |     |      |               |
| LOGIC: Output 35 (t) |     |     |      | 042 185       |
| 0: No                |     |     |      |               |
| LOGIC: Output 36     |     |     |      | 042 186       |
| 0: No                |     |     |      |               |
| LOGIC: Output 36 (t) |     |     |      | 042 187       |
| 0: No                |     |     |      |               |
| LOGIC: Output 37     |     |     |      | 042 188       |
| 0: No                |     |     |      |               |
| LOGIC: Output 37 (t) |     |     |      | 042 189       |
| 0: No                |     |     |      |               |
| LOGIC: Output 38     |     |     |      | 042 190       |
| 0: No                |     |     |      |               |
| LOGIC: Output 38 (t) |     |     |      | 042 191       |
| 0: No                |     |     |      |               |
| LOGIC: Output 39     |     |     |      | 042 192       |
| 0: No                |     |     |      |               |
| LOGIC: Output 39 (t) |     |     |      | 042 193       |
| 0: No                |     |     |      |               |
| LOGIC: Output 40     |     |     |      | 042 194       |
| 0: No                |     |     |      |               |
| LOGIC: Output 40 (t) |     |     |      | 042 195       |
| 0: No                |     |     |      |               |
| LOGIC: Output 41     |     |     |      | 042 196       |
| 0: No                |     |     |      |               |
| LOGIC: Output 41 (t) |     |     |      | 042 197       |
| 0: No                |     |     |      |               |
| LOGIC: Output 42     |     |     |      | 042 198       |
| 0: No                |     |     |      |               |
| LOGIC: Output 42 (t) |     |     |      | 042 199       |
| 0: No                |     |     |      |               |
| LOGIC: Output 43     |     |     |      | 042 200       |
| 0: No                |     |     |      |               |

| Parameter            |     |     |      |  | Address       |  |         |
|----------------------|-----|-----|------|--|---------------|--|---------|
| Default              | Min | Max | Unit |  | Logic Diagram |  |         |
| LOGIC: Output 43 (t) |     |     |      |  |               |  | 042 201 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 44     |     |     |      |  |               |  | 042 202 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 44 (t) |     |     |      |  |               |  | 042 203 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 45     |     |     |      |  |               |  | 042 204 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 45 (t) |     |     |      |  |               |  | 042 205 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 46     |     |     |      |  |               |  | 042 206 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 46 (t) |     |     |      |  |               |  | 042 207 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 47     |     |     |      |  |               |  | 042 208 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 47 (t) |     |     |      |  |               |  | 042 209 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 48     |     |     |      |  |               |  | 042 210 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 48 (t) |     |     |      |  |               |  | 042 211 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 49     |     |     |      |  |               |  | 042 212 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 49 (t) |     |     |      |  |               |  | 042 213 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 50     |     |     |      |  |               |  | 042 214 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 50 (t) |     |     |      |  |               |  | 042 215 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 51     |     |     |      |  |               |  | 042 216 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 51 (t) |     |     |      |  |               |  | 042 217 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 52     |     |     |      |  |               |  | 042 218 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 52 (t) |     |     |      |  |               |  | 042 219 |
| 0: No                |     |     |      |  |               |  |         |



| Parameter            |     |     |      | Address       |
|----------------------|-----|-----|------|---------------|
| Default              | Min | Max | Unit | Logic Diagram |
| LOGIC: Output 53     |     |     |      | 042 220       |
| 0: No                |     |     |      |               |
| LOGIC: Output 53 (t) |     |     |      | 042 221       |
| 0: No                |     |     |      |               |
| LOGIC: Output 54     |     |     |      | 042 222       |
| 0: No                |     |     |      |               |
| LOGIC: Output 54 (t) |     |     |      | 042 223       |
| 0: No                |     |     |      |               |
| LOGIC: Output 55     |     |     |      | 042 224       |
| 0: No                |     |     |      |               |
| LOGIC: Output 55 (t) |     |     |      | 042 225       |
| 0: No                |     |     |      |               |
| LOGIC: Output 56     |     |     |      | 042 226       |
| 0: No                |     |     |      |               |
| LOGIC: Output 56 (t) |     |     |      | 042 227       |
| 0: No                |     |     |      |               |
| LOGIC: Output 57     |     |     |      | 042 228       |
| 0: No                |     |     |      |               |
| LOGIC: Output 57 (t) |     |     |      | 042 229       |
| 0: No                |     |     |      |               |
| LOGIC: Output 58     |     |     |      | 042 230       |
| 0: No                |     |     |      |               |
| LOGIC: Output 58 (t) |     |     |      | 042 231       |
| 0: No                |     |     |      |               |
| LOGIC: Output 59     |     |     |      | 042 232       |
| 0: No                |     |     |      |               |
| LOGIC: Output 59 (t) |     |     |      | 042 233       |
| 0: No                |     |     |      |               |
| LOGIC: Output 60     |     |     |      | 042 234       |
| 0: No                |     |     |      |               |
| LOGIC: Output 60 (t) |     |     |      | 042 235       |
| 0: No                |     |     |      |               |
| LOGIC: Output 61     |     |     |      | 042 236       |
| 0: No                |     |     |      |               |
| LOGIC: Output 61 (t) |     |     |      | 042 237       |
| 0: No                |     |     |      |               |
| LOGIC: Output 62     |     |     |      | 042 238       |
| 0: No                |     |     |      |               |

| Parameter            |     |     |      |  | Address       |  |         |
|----------------------|-----|-----|------|--|---------------|--|---------|
| Default              | Min | Max | Unit |  | Logic Diagram |  |         |
| LOGIC: Output 62 (t) |     |     |      |  |               |  | 042 239 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 63     |     |     |      |  |               |  | 042 240 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 63 (t) |     |     |      |  |               |  | 042 241 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 64     |     |     |      |  |               |  | 042 242 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 64 (t) |     |     |      |  |               |  | 042 243 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 65     |     |     |      |  |               |  | 047 128 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 65 (t) |     |     |      |  |               |  | 047 129 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 66     |     |     |      |  |               |  | 047 002 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 66 (t) |     |     |      |  |               |  | 047 003 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 67     |     |     |      |  |               |  | 047 004 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 67 (t) |     |     |      |  |               |  | 047 005 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 68     |     |     |      |  |               |  | 047 006 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 68 (t) |     |     |      |  |               |  | 047 007 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 69     |     |     |      |  |               |  | 047 008 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 69 (t) |     |     |      |  |               |  | 047 009 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 70     |     |     |      |  |               |  | 047 010 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 70 (t) |     |     |      |  |               |  | 047 011 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 71     |     |     |      |  |               |  | 047 012 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 71 (t) |     |     |      |  |               |  | 047 013 |
| 0: No                |     |     |      |  |               |  |         |

| Parameter            |     |     |      | Address       |
|----------------------|-----|-----|------|---------------|
| Default              | Min | Max | Unit | Logic Diagram |
| LOGIC: Output 72     |     |     |      | 047 014       |
| 0: No                |     |     |      |               |
| LOGIC: Output 72 (t) |     |     |      | 047 015       |
| 0: No                |     |     |      |               |
| LOGIC: Output 73     |     |     |      | 047 016       |
| 0: No                |     |     |      |               |
| LOGIC: Output 73 (t) |     |     |      | 047 017       |
| 0: No                |     |     |      |               |
| LOGIC: Output 74     |     |     |      | 047 018       |
| 0: No                |     |     |      |               |
| LOGIC: Output 74 (t) |     |     |      | 047 019       |
| 0: No                |     |     |      |               |
| LOGIC: Output 75     |     |     |      | 047 020       |
| 0: No                |     |     |      |               |
| LOGIC: Output 75 (t) |     |     |      | 047 021       |
| 0: No                |     |     |      |               |
| LOGIC: Output 76     |     |     |      | 047 022       |
| 0: No                |     |     |      |               |
| LOGIC: Output 76 (t) |     |     |      | 047 023       |
| 0: No                |     |     |      |               |
| LOGIC: Output 77     |     |     |      | 047 024       |
| 0: No                |     |     |      |               |
| LOGIC: Output 77 (t) |     |     |      | 047 025       |
| 0: No                |     |     |      |               |
| LOGIC: Output 78     |     |     |      | 047 026       |
| 0: No                |     |     |      |               |
| LOGIC: Output 78 (t) |     |     |      | 047 027       |
| 0: No                |     |     |      |               |
| LOGIC: Output 79     |     |     |      | 047 028       |
| 0: No                |     |     |      |               |
| LOGIC: Output 79 (t) |     |     |      | 047 029       |
| 0: No                |     |     |      |               |
| LOGIC: Output 80     |     |     |      | 047 030       |
| 0: No                |     |     |      |               |
| LOGIC: Output 80 (t) |     |     |      | 047 031       |
| 0: No                |     |     |      |               |
| LOGIC: Output 81     |     |     |      | 047 032       |
| 0: No                |     |     |      |               |

| Parameter            |     |     |      |  | Address       |  |         |
|----------------------|-----|-----|------|--|---------------|--|---------|
| Default              | Min | Max | Unit |  | Logic Diagram |  |         |
| LOGIC: Output 81 (t) |     |     |      |  |               |  | 047 033 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 82     |     |     |      |  |               |  | 047 034 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 82 (t) |     |     |      |  |               |  | 047 035 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 83     |     |     |      |  |               |  | 047 036 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 83 (t) |     |     |      |  |               |  | 047 037 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 84     |     |     |      |  |               |  | 047 038 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 84 (t) |     |     |      |  |               |  | 047 039 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 85     |     |     |      |  |               |  | 047 040 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 85 (t) |     |     |      |  |               |  | 047 041 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 86     |     |     |      |  |               |  | 047 042 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 86 (t) |     |     |      |  |               |  | 047 043 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 87     |     |     |      |  |               |  | 047 044 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 87 (t) |     |     |      |  |               |  | 047 045 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 88     |     |     |      |  |               |  | 047 046 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 88 (t) |     |     |      |  |               |  | 047 047 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 89     |     |     |      |  |               |  | 047 048 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 89 (t) |     |     |      |  |               |  | 047 049 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 90     |     |     |      |  |               |  | 047 050 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output 90 (t) |     |     |      |  |               |  | 047 051 |
| 0: No                |     |     |      |  |               |  |         |

| Parameter            |     |     |      | Address       |
|----------------------|-----|-----|------|---------------|
| Default              | Min | Max | Unit | Logic Diagram |
| LOGIC: Output 91     |     |     |      | 047 052       |
| 0: No                |     |     |      |               |
| LOGIC: Output 91 (t) |     |     |      | 047 053       |
| 0: No                |     |     |      |               |
| LOGIC: Output 92     |     |     |      | 047 054       |
| 0: No                |     |     |      |               |
| LOGIC: Output 92 (t) |     |     |      | 047 055       |
| 0: No                |     |     |      |               |
| LOGIC: Output 93     |     |     |      | 047 056       |
| 0: No                |     |     |      |               |
| LOGIC: Output 93 (t) |     |     |      | 047 057       |
| 0: No                |     |     |      |               |
| LOGIC: Output 94     |     |     |      | 047 058       |
| 0: No                |     |     |      |               |
| LOGIC: Output 94 (t) |     |     |      | 047 059       |
| 0: No                |     |     |      |               |
| LOGIC: Output 95     |     |     |      | 047 060       |
| 0: No                |     |     |      |               |
| LOGIC: Output 95 (t) |     |     |      | 047 061       |
| 0: No                |     |     |      |               |
| LOGIC: Output 96     |     |     |      | 047 062       |
| 0: No                |     |     |      |               |
| LOGIC: Output 96 (t) |     |     |      | 047 063       |
| 0: No                |     |     |      |               |
| LOGIC: Output 97     |     |     |      | 047 064       |
| 0: No                |     |     |      |               |
| LOGIC: Output 97 (t) |     |     |      | 047 065       |
| 0: No                |     |     |      |               |
| LOGIC: Output 98     |     |     |      | 047 066       |
| 0: No                |     |     |      |               |
| LOGIC: Output 98 (t) |     |     |      | 047 067       |
| 0: No                |     |     |      |               |
| LOGIC: Output 99     |     |     |      | 047 068       |
| 0: No                |     |     |      |               |
| LOGIC: Output 99 (t) |     |     |      | 047 069       |
| 0: No                |     |     |      |               |
| LOGIC: Output100     |     |     |      | 047 070       |
| 0: No                |     |     |      |               |

| Parameter            |     |     |      |  | Address       |  |         |
|----------------------|-----|-----|------|--|---------------|--|---------|
| Default              | Min | Max | Unit |  | Logic Diagram |  |         |
| LOGIC: Output100 (t) |     |     |      |  |               |  | 047 071 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output101     |     |     |      |  |               |  | 047 072 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output101 (t) |     |     |      |  |               |  | 047 073 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output102     |     |     |      |  |               |  | 047 074 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output102 (t) |     |     |      |  |               |  | 047 075 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output103     |     |     |      |  |               |  | 047 076 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output103 (t) |     |     |      |  |               |  | 047 077 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output104     |     |     |      |  |               |  | 047 078 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output104 (t) |     |     |      |  |               |  | 047 079 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output105     |     |     |      |  |               |  | 047 080 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output105 (t) |     |     |      |  |               |  | 047 081 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output106     |     |     |      |  |               |  | 047 082 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output106 (t) |     |     |      |  |               |  | 047 083 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output107     |     |     |      |  |               |  | 047 084 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output107 (t) |     |     |      |  |               |  | 047 085 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output108     |     |     |      |  |               |  | 047 086 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output108 (t) |     |     |      |  |               |  | 047 087 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output109     |     |     |      |  |               |  | 047 088 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output109 (t) |     |     |      |  |               |  | 047 089 |
| 0: No                |     |     |      |  |               |  |         |

| Parameter            |     |     |      | Address       |
|----------------------|-----|-----|------|---------------|
| Default              | Min | Max | Unit | Logic Diagram |
| LOGIC: Output110     |     |     |      | 047 090       |
| 0: No                |     |     |      |               |
| LOGIC: Output110 (t) |     |     |      | 047 091       |
| 0: No                |     |     |      |               |
| LOGIC: Output111     |     |     |      | 047 092       |
| 0: No                |     |     |      |               |
| LOGIC: Output111 (t) |     |     |      | 047 093       |
| 0: No                |     |     |      |               |
| LOGIC: Output112     |     |     |      | 047 094       |
| 0: No                |     |     |      |               |
| LOGIC: Output112 (t) |     |     |      | 047 095       |
| 0: No                |     |     |      |               |
| LOGIC: Output113     |     |     |      | 047 096       |
| 0: No                |     |     |      |               |
| LOGIC: Output113 (t) |     |     |      | 047 097       |
| 0: No                |     |     |      |               |
| LOGIC: Output114     |     |     |      | 047 098       |
| 0: No                |     |     |      |               |
| LOGIC: Output114 (t) |     |     |      | 047 099       |
| 0: No                |     |     |      |               |
| LOGIC: Output115     |     |     |      | 047 100       |
| 0: No                |     |     |      |               |
| LOGIC: Output115 (t) |     |     |      | 047 101       |
| 0: No                |     |     |      |               |
| LOGIC: Output116     |     |     |      | 047 102       |
| 0: No                |     |     |      |               |
| LOGIC: Output116 (t) |     |     |      | 047 103       |
| 0: No                |     |     |      |               |
| LOGIC: Output117     |     |     |      | 047 104       |
| 0: No                |     |     |      |               |
| LOGIC: Output117 (t) |     |     |      | 047 105       |
| 0: No                |     |     |      |               |
| LOGIC: Output118     |     |     |      | 047 106       |
| 0: No                |     |     |      |               |
| LOGIC: Output118 (t) |     |     |      | 047 107       |
| 0: No                |     |     |      |               |
| LOGIC: Output119     |     |     |      | 047 108       |
| 0: No                |     |     |      |               |

| Parameter            |     |     |      |  | Address       |  |         |
|----------------------|-----|-----|------|--|---------------|--|---------|
| Default              | Min | Max | Unit |  | Logic Diagram |  |         |
| LOGIC: Output119 (t) |     |     |      |  |               |  | 047 109 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output120     |     |     |      |  |               |  | 047 110 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output120 (t) |     |     |      |  |               |  | 047 111 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output121     |     |     |      |  |               |  | 047 112 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output121 (t) |     |     |      |  |               |  | 047 113 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output122     |     |     |      |  |               |  | 047 114 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output122 (t) |     |     |      |  |               |  | 047 115 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output123     |     |     |      |  |               |  | 047 116 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output123 (t) |     |     |      |  |               |  | 047 117 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output124     |     |     |      |  |               |  | 047 118 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output124 (t) |     |     |      |  |               |  | 047 119 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output125     |     |     |      |  |               |  | 047 120 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output125 (t) |     |     |      |  |               |  | 047 121 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output126     |     |     |      |  |               |  | 047 122 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output126 (t) |     |     |      |  |               |  | 047 123 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output127     |     |     |      |  |               |  | 047 124 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output127 (t) |     |     |      |  |               |  | 047 125 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output128     |     |     |      |  |               |  | 047 126 |
| 0: No                |     |     |      |  |               |  |         |
| LOGIC: Output128 (t) |     |     |      |  |               |  | 047 127 |
| 0: No                |     |     |      |  |               |  |         |



## External device

| Parameter                    |     |     |      |  | Address                                          |
|------------------------------|-----|-----|------|--|--------------------------------------------------|
| Default                      | Min | Max | Unit |  | Logic Diagram                                    |
| DEV01: Open signal EXT       |     |     |      |  | 210 030                                          |
| 0: No                        |     |     |      |  |                                                  |
| DEV01: Closed signal EXT     |     |     |      |  | 210 031                                          |
| 0: No                        |     |     |      |  |                                                  |
| DEV01: Control state         |     |     |      |  | 210 018                                          |
| 0: Intermediate pos.         |     |     |      |  | Fig. 3-128, (p. 3-174)<br>Fig. 3-134, (p. 3-182) |
| DEV01: Switch. device open   |     |     |      |  | 210 036                                          |
| 0: No                        |     |     |      |  | Fig. 3-128, (p. 3-174)<br>Fig. 3-134, (p. 3-182) |
| DEV01: Switch. device closed |     |     |      |  | 210 037                                          |
| 0: No                        |     |     |      |  | Fig. 3-128, (p. 3-174)<br>Fig. 3-134, (p. 3-182) |
| DEV01: Dev. interm./flt.pos  |     |     |      |  | 210 038                                          |
| 0: No                        |     |     |      |  | Fig. 3-128, (p. 3-174)<br>Fig. 3-134, (p. 3-182) |
| DEV01: Open command          |     |     |      |  | 210 028                                          |
| 0: No                        |     |     |      |  | Fig. 3-132, (p. 3-179)                           |
| DEV01: Close command         |     |     |      |  | 210 029                                          |
| 0: No                        |     |     |      |  | Fig. 3-132, (p. 3-179)                           |
| DEV01: Open cmd. received    |     |     |      |  | 218 000                                          |
| 0: No                        |     |     |      |  |                                                  |
| DEV01: Close cmd. received   |     |     |      |  | 218 001                                          |
| 0: No                        |     |     |      |  |                                                  |
| DEV01: Warning op.count.     |     |     |      |  | 219 081                                          |
| 0: No                        |     |     |      |  | Fig. 3-138, (p. 3-186)                           |
| DEV02: Warning op.count.     |     |     |      |  | 219 082                                          |
| 0: No                        |     |     |      |  |                                                  |
| DEV03: Warning op.count.     |     |     |      |  | 219 083                                          |
| 0: No                        |     |     |      |  |                                                  |
| DEV04: Warning op.count.     |     |     |      |  | 219 084                                          |
| 0: No                        |     |     |      |  |                                                  |
| DEV05: Warning op.count.     |     |     |      |  | 219 085                                          |
| 0: No                        |     |     |      |  |                                                  |
| DEV06: Warning op.count.     |     |     |      |  | 219 086                                          |
| 0: No                        |     |     |      |  |                                                  |
| DEV07: Warning op.count.     |     |     |      |  | 219 087                                          |
| 0: No                        |     |     |      |  |                                                  |

| Parameter                                                                       |     |     |      |  | Address       |  |         |
|---------------------------------------------------------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                                                                         | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV08: Warning op.count.                                                        |     |     |      |  |               |  | 219 088 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV09: Warning op.count.                                                        |     |     |      |  |               |  | 219 089 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV10: Warning op.count.                                                        |     |     |      |  |               |  | 219 090 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV11: Warning op.count.                                                        |     |     |      |  |               |  | 219 091 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV12: Warning op.count.                                                        |     |     |      |  |               |  | 219 092 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV13: Warning op.count.                                                        |     |     |      |  |               |  | 219 093 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV14: Warning op.count.                                                        |     |     |      |  |               |  | 219 094 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV15: Warning op.count.                                                        |     |     |      |  |               |  | 219 095 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV16: Warning op.count.                                                        |     |     |      |  |               |  | 219 096 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV17: Warning op.count.                                                        |     |     |      |  |               |  | 219 097 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV18: Warning op.count.                                                        |     |     |      |  |               |  | 219 098 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV19: Warning op.count.                                                        |     |     |      |  |               |  | 219 099 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV20: Warning op.count.                                                        |     |     |      |  |               |  | 219 100 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV21: Warning op.count.                                                        |     |     |      |  |               |  | 219 101 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV22: Warning op.count.                                                        |     |     |      |  |               |  | 219 102 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV23: Warning op.count.                                                        |     |     |      |  |               |  | 219 103 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| DEV24: Warning op.count.                                                        |     |     |      |  |               |  | 219 104 |
| 0: No                                                                           |     |     |      |  |               |  |         |
| Warning that the number of switching commands has exceeded the set limit value. |     |     |      |  |               |  |         |

## External device

| Parameter                    |     |     |      |  | Address       |
|------------------------------|-----|-----|------|--|---------------|
| Default                      | Min | Max | Unit |  | Logic Diagram |
| DEV02: Open signal EXT       |     |     |      |  | 210 080       |
| 0: No                        |     |     |      |  |               |
| DEV02: Closed signal EXT     |     |     |      |  | 210 081       |
| 0: No                        |     |     |      |  |               |
| DEV02: Control state         |     |     |      |  | 210 068       |
| 0: Intermediate pos.         |     |     |      |  |               |
| DEV02: Switch. device open   |     |     |      |  | 210 086       |
| 0: No                        |     |     |      |  |               |
| DEV02: Switch. device closed |     |     |      |  | 210 087       |
| 0: No                        |     |     |      |  |               |
| DEV02: Dev. interm./flt.pos  |     |     |      |  | 210 088       |
| 0: No                        |     |     |      |  |               |
| DEV02: Open command          |     |     |      |  | 210 078       |
| 0: No                        |     |     |      |  |               |
| DEV02: Close command         |     |     |      |  | 210 079       |
| 0: No                        |     |     |      |  |               |
| DEV02: Open cmd. received    |     |     |      |  | 218 002       |
| 0: No                        |     |     |      |  |               |
| DEV02: Close cmd. received   |     |     |      |  | 218 003       |
| 0: No                        |     |     |      |  |               |

## External device

| Parameter                    |     |     |      |  | Address       |  |         |
|------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                      | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV03: Open signal EXT       |     |     |      |  |               |  | 210 130 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV03: Closed signal EXT     |     |     |      |  |               |  | 210 131 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV03: Control state         |     |     |      |  |               |  | 210 118 |
| 0: Intermediate pos.         |     |     |      |  |               |  |         |
| DEV03: Switch. device open   |     |     |      |  |               |  | 210 136 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV03: Switch. device closed |     |     |      |  |               |  | 210 137 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV03: Dev. interm./flt.pos  |     |     |      |  |               |  | 210 138 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV03: Open command          |     |     |      |  |               |  | 210 128 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV03: Close command         |     |     |      |  |               |  | 210 129 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV03: Open cmd. received    |     |     |      |  |               |  | 218 004 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV03: Close cmd. received   |     |     |      |  |               |  | 218 005 |
| 0: No                        |     |     |      |  |               |  |         |

## External device

| Parameter                    |     |     |      |  | Address       |
|------------------------------|-----|-----|------|--|---------------|
| Default                      | Min | Max | Unit |  | Logic Diagram |
| DEV04: Open signal EXT       |     |     |      |  | 210 180       |
| 0: No                        |     |     |      |  |               |
| DEV04: Closed signal EXT     |     |     |      |  | 210 181       |
| 0: No                        |     |     |      |  |               |
| DEV04: Control state         |     |     |      |  | 210 168       |
| 0: Intermediate pos.         |     |     |      |  |               |
| DEV04: Switch. device open   |     |     |      |  | 210 186       |
| 0: No                        |     |     |      |  |               |
| DEV04: Switch. device closed |     |     |      |  | 210 187       |
| 0: No                        |     |     |      |  |               |
| DEV04: Dev. interm./flt.pos  |     |     |      |  | 210 188       |
| 0: No                        |     |     |      |  |               |
| DEV04: Open command          |     |     |      |  | 210 178       |
| 0: No                        |     |     |      |  |               |
| DEV04: Close command         |     |     |      |  | 210 179       |
| 0: No                        |     |     |      |  |               |
| DEV04: Open cmd. received    |     |     |      |  | 218 006       |
| 0: No                        |     |     |      |  |               |
| DEV04: Close cmd. received   |     |     |      |  | 218 007       |
| 0: No                        |     |     |      |  |               |

## External device

| Parameter                    |     |     |      |  | Address       |  |         |
|------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                      | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV05: Open signal EXT       |     |     |      |  |               |  | 210 230 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV05: Closed signal EXT     |     |     |      |  |               |  | 210 231 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV05: Control state         |     |     |      |  |               |  | 210 218 |
| 0: Intermediate pos.         |     |     |      |  |               |  |         |
| DEV05: Switch. device open   |     |     |      |  |               |  | 210 236 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV05: Switch. device closed |     |     |      |  |               |  | 210 237 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV05: Dev. interm./flt.pos  |     |     |      |  |               |  | 210 238 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV05: Open command          |     |     |      |  |               |  | 210 228 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV05: Close command         |     |     |      |  |               |  | 210 229 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV05: Open cmd. received    |     |     |      |  |               |  | 218 008 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV05: Close cmd. received   |     |     |      |  |               |  | 218 009 |
| 0: No                        |     |     |      |  |               |  |         |

## External device

| Parameter                    |     |     |      |  | Address       |
|------------------------------|-----|-----|------|--|---------------|
| Default                      | Min | Max | Unit |  | Logic Diagram |
| DEV06: Open signal EXT       |     |     |      |  | 211 030       |
| 0: No                        |     |     |      |  |               |
| DEV06: Closed signal EXT     |     |     |      |  | 211 031       |
| 0: No                        |     |     |      |  |               |
| DEV06: Control state         |     |     |      |  | 211 018       |
| 0: Intermediate pos.         |     |     |      |  |               |
| DEV06: Switch. device open   |     |     |      |  | 211 036       |
| 0: No                        |     |     |      |  |               |
| DEV06: Switch. device closed |     |     |      |  | 211 037       |
| 0: No                        |     |     |      |  |               |
| DEV06: Dev. interm./flt.pos  |     |     |      |  | 211 038       |
| 0: No                        |     |     |      |  |               |
| DEV06: Open command          |     |     |      |  | 211 028       |
| 0: No                        |     |     |      |  |               |
| DEV06: Close command         |     |     |      |  | 211 029       |
| 0: No                        |     |     |      |  |               |
| DEV06: Open cmd. received    |     |     |      |  | 218 010       |
| 0: No                        |     |     |      |  |               |
| DEV06: Close cmd. received   |     |     |      |  | 218 011       |
| 0: No                        |     |     |      |  |               |

## External device

| Parameter                    |     |     |      |  | Address       |  |         |
|------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                      | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV07: Open signal EXT       |     |     |      |  |               |  | 211 080 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV07: Closed signal EXT     |     |     |      |  |               |  | 211 081 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV07: Control state         |     |     |      |  |               |  | 211 068 |
| 0: Intermediate pos.         |     |     |      |  |               |  |         |
| DEV07: Switch. device open   |     |     |      |  |               |  | 211 086 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV07: Switch. device closed |     |     |      |  |               |  | 211 087 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV07: Dev. interm./flt.pos  |     |     |      |  |               |  | 211 088 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV07: Open command          |     |     |      |  |               |  | 211 078 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV07: Close command         |     |     |      |  |               |  | 211 079 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV07: Open cmd. received    |     |     |      |  |               |  | 218 012 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV07: Close cmd. received   |     |     |      |  |               |  | 218 013 |
| 0: No                        |     |     |      |  |               |  |         |



## External device

| Parameter                    |     |     |      |  | Address       |
|------------------------------|-----|-----|------|--|---------------|
| Default                      | Min | Max | Unit |  | Logic Diagram |
| DEV08: Open signal EXT       |     |     |      |  | 211 130       |
| 0: No                        |     |     |      |  |               |
| DEV08: Closed signal EXT     |     |     |      |  | 211 131       |
| 0: No                        |     |     |      |  |               |
| DEV08: Control state         |     |     |      |  | 211 118       |
| 0: Intermediate pos.         |     |     |      |  |               |
| DEV08: Switch. device open   |     |     |      |  | 211 136       |
| 0: No                        |     |     |      |  |               |
| DEV08: Switch. device closed |     |     |      |  | 211 137       |
| 0: No                        |     |     |      |  |               |
| DEV08: Dev. interm./flt.pos  |     |     |      |  | 211 138       |
| 0: No                        |     |     |      |  |               |
| DEV08: Open command          |     |     |      |  | 211 128       |
| 0: No                        |     |     |      |  |               |
| DEV08: Close command         |     |     |      |  | 211 129       |
| 0: No                        |     |     |      |  |               |
| DEV08: Open cmd. received    |     |     |      |  | 218 014       |
| 0: No                        |     |     |      |  |               |
| DEV08: Close cmd. received   |     |     |      |  | 218 015       |
| 0: No                        |     |     |      |  |               |

## External device

| Parameter                    |     |     |      |  | Address       |  |         |
|------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                      | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV09: Open signal EXT       |     |     |      |  |               |  | 211 180 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV09: Closed signal EXT     |     |     |      |  |               |  | 211 181 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV09: Control state         |     |     |      |  |               |  | 211 168 |
| 0: Intermediate pos.         |     |     |      |  |               |  |         |
| DEV09: Switch. device open   |     |     |      |  |               |  | 211 186 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV09: Switch. device closed |     |     |      |  |               |  | 211 187 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV09: Dev. interm./flt.pos  |     |     |      |  |               |  | 211 188 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV09: Open command          |     |     |      |  |               |  | 211 178 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV09: Close command         |     |     |      |  |               |  | 211 179 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV09: Open cmd. received    |     |     |      |  |               |  | 218 016 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV09: Close cmd. received   |     |     |      |  |               |  | 218 017 |
| 0: No                        |     |     |      |  |               |  |         |

## External device

| Parameter                    |     |     |      |  | Address       |
|------------------------------|-----|-----|------|--|---------------|
| Default                      | Min | Max | Unit |  | Logic Diagram |
| DEV10: Open signal EXT       |     |     |      |  | 211 230       |
| 0: No                        |     |     |      |  |               |
| DEV10: Closed signal EXT     |     |     |      |  | 211 231       |
| 0: No                        |     |     |      |  |               |
| DEV10: Control state         |     |     |      |  | 211 218       |
| 0: Intermediate pos.         |     |     |      |  |               |
| DEV10: Switch. device open   |     |     |      |  | 211 236       |
| 0: No                        |     |     |      |  |               |
| DEV10: Switch. device closed |     |     |      |  | 211 237       |
| 0: No                        |     |     |      |  |               |
| DEV10: Dev. interm./flt.pos  |     |     |      |  | 211 238       |
| 0: No                        |     |     |      |  |               |
| DEV10: Open command          |     |     |      |  | 211 228       |
| 0: No                        |     |     |      |  |               |
| DEV10: Close command         |     |     |      |  | 211 229       |
| 0: No                        |     |     |      |  |               |
| DEV10: Open cmd. received    |     |     |      |  | 218 018       |
| 0: No                        |     |     |      |  |               |
| DEV10: Close cmd. received   |     |     |      |  | 218 019       |
| 0: No                        |     |     |      |  |               |

## External device

| Parameter                    |     |     |      |  | Address       |  |         |
|------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                      | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV11: Open signal EXT       |     |     |      |  |               |  | 212 030 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV11: Closed signal EXT     |     |     |      |  |               |  | 212 031 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV11: Control state         |     |     |      |  |               |  | 212 018 |
| 0: Intermediate pos.         |     |     |      |  |               |  |         |
| DEV11: Switch. device open   |     |     |      |  |               |  | 212 036 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV11: Switch. device closed |     |     |      |  |               |  | 212 037 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV11: Dev. interm./flt.pos  |     |     |      |  |               |  | 212 038 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV11: Open command          |     |     |      |  |               |  | 212 028 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV11: Close command         |     |     |      |  |               |  | 212 029 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV11: Open cmd. received    |     |     |      |  |               |  | 218 020 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV11: Close cmd. received   |     |     |      |  |               |  | 218 021 |
| 0: No                        |     |     |      |  |               |  |         |

## External device

| Parameter                    |     |     |      |  | Address       |
|------------------------------|-----|-----|------|--|---------------|
| Default                      | Min | Max | Unit |  | Logic Diagram |
| DEV12: Open signal EXT       |     |     |      |  | 212 080       |
| 0: No                        |     |     |      |  |               |
| DEV12: Closed signal EXT     |     |     |      |  | 212 081       |
| 0: No                        |     |     |      |  |               |
| DEV12: Control state         |     |     |      |  | 212 068       |
| 0: Intermediate pos.         |     |     |      |  |               |
| DEV12: Switch. device open   |     |     |      |  | 212 086       |
| 0: No                        |     |     |      |  |               |
| DEV12: Switch. device closed |     |     |      |  | 212 087       |
| 0: No                        |     |     |      |  |               |
| DEV12: Dev. interm./flt.pos  |     |     |      |  | 212 088       |
| 0: No                        |     |     |      |  |               |
| DEV12: Open command          |     |     |      |  | 212 078       |
| 0: No                        |     |     |      |  |               |
| DEV12: Close command         |     |     |      |  | 212 079       |
| 0: No                        |     |     |      |  |               |
| DEV12: Open cmd. received    |     |     |      |  | 218 022       |
| 0: No                        |     |     |      |  |               |
| DEV12: Close cmd. received   |     |     |      |  | 218 023       |
| 0: No                        |     |     |      |  |               |

## External device

| Parameter                    |     |     |      |  | Address       |  |         |
|------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                      | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV13: Open signal EXT       |     |     |      |  |               |  | 212 130 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV13: Closed signal EXT     |     |     |      |  |               |  | 212 131 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV13: Control state         |     |     |      |  |               |  | 212 118 |
| 0: Intermediate pos.         |     |     |      |  |               |  |         |
| DEV13: Switch. device open   |     |     |      |  |               |  | 212 136 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV13: Switch. device closed |     |     |      |  |               |  | 212 137 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV13: Dev. interm./flt.pos  |     |     |      |  |               |  | 212 138 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV13: Open command          |     |     |      |  |               |  | 212 128 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV13: Close command         |     |     |      |  |               |  | 212 129 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV13: Open cmd. received    |     |     |      |  |               |  | 218 024 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV13: Close cmd. received   |     |     |      |  |               |  | 218 025 |
| 0: No                        |     |     |      |  |               |  |         |

## External device

| Parameter                   |     |     |      |  | Address       |
|-----------------------------|-----|-----|------|--|---------------|
| Default                     | Min | Max | Unit |  | Logic Diagram |
| DEV14: Open signal EXT      |     |     |      |  | 212 180       |
| 0: No                       |     |     |      |  |               |
| DEV14: Closed signal EXT    |     |     |      |  | 212 181       |
| 0: No                       |     |     |      |  |               |
| DEV14: Control state        |     |     |      |  | 212 168       |
| 0: Intermediate pos.        |     |     |      |  |               |
| DEV14: Switch. device open  |     |     |      |  | 212 186       |
| 0: No                       |     |     |      |  |               |
| DEV14: Switch.device closed |     |     |      |  | 212 187       |
| 0: No                       |     |     |      |  |               |
| DEV14: Dev. interm./flt.pos |     |     |      |  | 212 188       |
| 0: No                       |     |     |      |  |               |
| DEV14: Open command         |     |     |      |  | 212 178       |
| 0: No                       |     |     |      |  |               |
| DEV14: Close command        |     |     |      |  | 212 179       |
| 0: No                       |     |     |      |  |               |
| DEV14: Open cmd. received   |     |     |      |  | 218 026       |
| 0: No                       |     |     |      |  |               |
| DEV14: Close cmd. received  |     |     |      |  | 218 027       |
| 0: No                       |     |     |      |  |               |

## External device

| Parameter                    |     |     |      |  | Address       |  |         |
|------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                      | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV15: Open signal EXT       |     |     |      |  |               |  | 212 230 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV15: Closed signal EXT     |     |     |      |  |               |  | 212 231 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV15: Control state         |     |     |      |  |               |  | 212 218 |
| 0: Intermediate pos.         |     |     |      |  |               |  |         |
| DEV15: Switch. device open   |     |     |      |  |               |  | 212 236 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV15: Switch. device closed |     |     |      |  |               |  | 212 237 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV15: Dev. interm./flt.pos  |     |     |      |  |               |  | 212 238 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV15: Open command          |     |     |      |  |               |  | 212 228 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV15: Close command         |     |     |      |  |               |  | 212 229 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV15: Open cmd. received    |     |     |      |  |               |  | 218 028 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV15: Close cmd. received   |     |     |      |  |               |  | 218 029 |
| 0: No                        |     |     |      |  |               |  |         |



## External device

| Parameter                    |     |     |      |  | Address       |         |
|------------------------------|-----|-----|------|--|---------------|---------|
| Default                      | Min | Max | Unit |  | Logic Diagram |         |
| DEV16: Open signal EXT       |     |     |      |  |               | 213 030 |
| 0: No                        |     |     |      |  |               |         |
| DEV16: Closed signal EXT     |     |     |      |  |               | 213 031 |
| 0: No                        |     |     |      |  |               |         |
| DEV16: Control state         |     |     |      |  |               | 213 018 |
| 0: Intermediate pos.         |     |     |      |  |               |         |
| DEV16: Switch. device open   |     |     |      |  |               | 213 036 |
| 0: No                        |     |     |      |  |               |         |
| DEV16: Switch. device closed |     |     |      |  |               | 213 037 |
| 0: No                        |     |     |      |  |               |         |
| DEV16: Dev. interm./flt.pos  |     |     |      |  |               | 213 038 |
| 0: No                        |     |     |      |  |               |         |
| DEV16: Open command          |     |     |      |  |               | 213 028 |
| 0: No                        |     |     |      |  |               |         |
| DEV16: Close command         |     |     |      |  |               | 213 029 |
| 0: No                        |     |     |      |  |               |         |
| DEV16: Open cmd. received    |     |     |      |  |               | 218 030 |
| 0: No                        |     |     |      |  |               |         |
| DEV16: Close cmd. received   |     |     |      |  |               | 218 031 |
| 0: No                        |     |     |      |  |               |         |

## External device

| Parameter                    |     |     |      |  | Address       |  |         |
|------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                      | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV17: Open signal EXT       |     |     |      |  |               |  | 213 080 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV17: Closed signal EXT     |     |     |      |  |               |  | 213 081 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV17: Control state         |     |     |      |  |               |  | 213 068 |
| 0: Intermediate pos.         |     |     |      |  |               |  |         |
| DEV17: Switch. device open   |     |     |      |  |               |  | 213 086 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV17: Switch. device closed |     |     |      |  |               |  | 213 087 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV17: Dev. interm./flt.pos  |     |     |      |  |               |  | 213 088 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV17: Open command          |     |     |      |  |               |  | 213 078 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV17: Close command         |     |     |      |  |               |  | 213 079 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV17: Open cmd. received    |     |     |      |  |               |  | 218 032 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV17: Close cmd. received   |     |     |      |  |               |  | 218 033 |
| 0: No                        |     |     |      |  |               |  |         |

## External device

| Parameter                    |     |     |      |  | Address       |
|------------------------------|-----|-----|------|--|---------------|
| Default                      | Min | Max | Unit |  | Logic Diagram |
| DEV18: Open signal EXT       |     |     |      |  | 213 130       |
| 0: No                        |     |     |      |  |               |
| DEV18: Closed signal EXT     |     |     |      |  | 213 131       |
| 0: No                        |     |     |      |  |               |
| DEV18: Control state         |     |     |      |  | 213 118       |
| 0: Intermediate pos.         |     |     |      |  |               |
| DEV18: Switch. device open   |     |     |      |  | 213 136       |
| 0: No                        |     |     |      |  |               |
| DEV18: Switch. device closed |     |     |      |  | 213 137       |
| 0: No                        |     |     |      |  |               |
| DEV18: Dev. interm./flt.pos  |     |     |      |  | 213 138       |
| 0: No                        |     |     |      |  |               |
| DEV18: Open command          |     |     |      |  | 213 128       |
| 0: No                        |     |     |      |  |               |
| DEV18: Close command         |     |     |      |  | 213 129       |
| 0: No                        |     |     |      |  |               |
| DEV18: Open cmd. received    |     |     |      |  | 218 034       |
| 0: No                        |     |     |      |  |               |
| DEV18: Close cmd. received   |     |     |      |  | 218 035       |
| 0: No                        |     |     |      |  |               |

## External device

| Parameter                    |     |     |      |  | Address       |  |         |
|------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                      | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV19: Open signal EXT       |     |     |      |  |               |  | 213 180 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV19: Closed signal EXT     |     |     |      |  |               |  | 213 181 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV19: Control state         |     |     |      |  |               |  | 213 168 |
| 0: Intermediate pos.         |     |     |      |  |               |  |         |
| DEV19: Switch. device open   |     |     |      |  |               |  | 213 186 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV19: Switch. device closed |     |     |      |  |               |  | 213 187 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV19: Dev. interm./flt.pos  |     |     |      |  |               |  | 213 188 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV19: Open command          |     |     |      |  |               |  | 213 178 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV19: Close command         |     |     |      |  |               |  | 213 179 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV19: Open cmd. received    |     |     |      |  |               |  | 218 036 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV19: Close cmd. received   |     |     |      |  |               |  | 218 037 |
| 0: No                        |     |     |      |  |               |  |         |

## External device

| Parameter                    |     |     |      |  | Address       |
|------------------------------|-----|-----|------|--|---------------|
| Default                      | Min | Max | Unit |  | Logic Diagram |
| DEV20: Open signal EXT       |     |     |      |  | 213 230       |
| 0: No                        |     |     |      |  |               |
| DEV20: Closed signal EXT     |     |     |      |  | 213 231       |
| 0: No                        |     |     |      |  |               |
| DEV20: Control state         |     |     |      |  | 213 218       |
| 0: Intermediate pos.         |     |     |      |  |               |
| DEV20: Switch. device open   |     |     |      |  | 213 236       |
| 0: No                        |     |     |      |  |               |
| DEV20: Switch. device closed |     |     |      |  | 213 237       |
| 0: No                        |     |     |      |  |               |
| DEV20: Dev. interm./flt.pos  |     |     |      |  | 213 238       |
| 0: No                        |     |     |      |  |               |
| DEV20: Open command          |     |     |      |  | 213 228       |
| 0: No                        |     |     |      |  |               |
| DEV20: Close command         |     |     |      |  | 213 229       |
| 0: No                        |     |     |      |  |               |
| DEV20: Open cmd. received    |     |     |      |  | 218 038       |
| 0: No                        |     |     |      |  |               |
| DEV20: Close cmd. received   |     |     |      |  | 218 039       |
| 0: No                        |     |     |      |  |               |

## External device

| Parameter                    |     |     |      |  | Address       |  |         |
|------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                      | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV21: Open signal EXT       |     |     |      |  |               |  | 214 030 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV21: Closed signal EXT     |     |     |      |  |               |  | 214 031 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV21: Control state         |     |     |      |  |               |  | 214 018 |
| 0: Intermediate pos.         |     |     |      |  |               |  |         |
| DEV21: Switch. device open   |     |     |      |  |               |  | 214 036 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV21: Switch. device closed |     |     |      |  |               |  | 214 037 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV21: Dev. interm./flt.pos  |     |     |      |  |               |  | 214 038 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV21: Open command          |     |     |      |  |               |  | 214 028 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV21: Close command         |     |     |      |  |               |  | 214 029 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV21: Open cmd. received    |     |     |      |  |               |  | 218 040 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV21: Close cmd. received   |     |     |      |  |               |  | 218 041 |
| 0: No                        |     |     |      |  |               |  |         |

## External device

| Parameter                   |     |     |      |  | Address       |
|-----------------------------|-----|-----|------|--|---------------|
| Default                     | Min | Max | Unit |  | Logic Diagram |
| DEV22: Open signal EXT      |     |     |      |  | 214 080       |
| 0: No                       |     |     |      |  |               |
| DEV22: Closed signal EXT    |     |     |      |  | 214 081       |
| 0: No                       |     |     |      |  |               |
| DEV22: Control state        |     |     |      |  | 214 068       |
| 0: Intermediate pos.        |     |     |      |  |               |
| DEV22: Switch. device open  |     |     |      |  | 214 086       |
| 0: No                       |     |     |      |  |               |
| DEV22: Switch.device closed |     |     |      |  | 214 087       |
| 0: No                       |     |     |      |  |               |
| DEV22: Dev. interm./flt.pos |     |     |      |  | 214 088       |
| 0: No                       |     |     |      |  |               |
| DEV22: Open command         |     |     |      |  | 214 078       |
| 0: No                       |     |     |      |  |               |
| DEV22: Close command        |     |     |      |  | 214 079       |
| 0: No                       |     |     |      |  |               |
| DEV22: Open cmd. received   |     |     |      |  | 218 042       |
| 0: No                       |     |     |      |  |               |
| DEV22: Close cmd. received  |     |     |      |  | 218 043       |
| 0: No                       |     |     |      |  |               |

## External device

| Parameter                    |     |     |      |  | Address       |  |         |
|------------------------------|-----|-----|------|--|---------------|--|---------|
| Default                      | Min | Max | Unit |  | Logic Diagram |  |         |
| DEV23: Open signal EXT       |     |     |      |  |               |  | 214 130 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV23: Closed signal EXT     |     |     |      |  |               |  | 214 131 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV23: Control state         |     |     |      |  |               |  | 214 118 |
| 0: Intermediate pos.         |     |     |      |  |               |  |         |
| DEV23: Switch. device open   |     |     |      |  |               |  | 214 136 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV23: Switch. device closed |     |     |      |  |               |  | 214 137 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV23: Dev. interm./flt.pos  |     |     |      |  |               |  | 214 138 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV23: Open command          |     |     |      |  |               |  | 214 128 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV23: Close command         |     |     |      |  |               |  | 214 129 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV23: Open cmd. received    |     |     |      |  |               |  | 218 044 |
| 0: No                        |     |     |      |  |               |  |         |
| DEV23: Close cmd. received   |     |     |      |  |               |  | 218 045 |
| 0: No                        |     |     |      |  |               |  |         |



## External device

| Parameter                    |     |     |      |  | Address       |
|------------------------------|-----|-----|------|--|---------------|
| Default                      | Min | Max | Unit |  | Logic Diagram |
| DEV24: Open signal EXT       |     |     |      |  | 214 180       |
| 0: No                        |     |     |      |  |               |
| DEV24: Closed signal EXT     |     |     |      |  | 214 181       |
| 0: No                        |     |     |      |  |               |
| DEV24: Control state         |     |     |      |  | 214 168       |
| 0: Intermediate pos.         |     |     |      |  |               |
| DEV24: Switch. device open   |     |     |      |  | 214 186       |
| 0: No                        |     |     |      |  |               |
| DEV24: Switch. device closed |     |     |      |  | 214 187       |
| 0: No                        |     |     |      |  |               |
| DEV24: Dev. interm./flt.pos  |     |     |      |  | 214 188       |
| 0: No                        |     |     |      |  |               |
| DEV24: Open command          |     |     |      |  | 214 178       |
| 0: No                        |     |     |      |  |               |
| DEV24: Close command         |     |     |      |  | 214 179       |
| 0: No                        |     |     |      |  |               |
| DEV24: Open cmd. received    |     |     |      |  | 218 046       |
| 0: No                        |     |     |      |  |               |
| DEV24: Close cmd. received   |     |     |      |  | 218 047       |
| 0: No                        |     |     |      |  |               |

## Single-pole signals

| Parameter                |     |     |      |  | Address                |
|--------------------------|-----|-----|------|--|------------------------|
| Default                  | Min | Max | Unit |  | Logic Diagram          |
| SIG_1: Signal S001 EXT   |     |     |      |  | 226 004                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Logic signal S001 |     |     |      |  | 226 005                |
| 0: No                    |     |     |      |  | Fig. 3-147, (p. 3-199) |
| SIG_1: Signal S002 EXT   |     |     |      |  | 226 012                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Logic signal S002 |     |     |      |  | 226 013                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Signal S003 EXT   |     |     |      |  | 226 020                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Logic signal S003 |     |     |      |  | 226 021                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Signal S004 EXT   |     |     |      |  | 226 028                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Logic signal S004 |     |     |      |  | 226 029                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Signal S005 EXT   |     |     |      |  | 226 036                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Logic signal S005 |     |     |      |  | 226 037                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Signal S006 EXT   |     |     |      |  | 226 044                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Logic signal S006 |     |     |      |  | 226 045                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Signal S007 EXT   |     |     |      |  | 226 052                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Logic signal S007 |     |     |      |  | 226 053                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Signal S008 EXT   |     |     |      |  | 226 060                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Logic signal S008 |     |     |      |  | 226 061                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Signal S009 EXT   |     |     |      |  | 226 068                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Logic signal S009 |     |     |      |  | 226 069                |
| 0: No                    |     |     |      |  |                        |
| SIG_1: Signal S010 EXT   |     |     |      |  | 226 076                |
| 0: No                    |     |     |      |  |                        |

| Parameter                |     |     |      | Address                |
|--------------------------|-----|-----|------|------------------------|
| Default                  | Min | Max | Unit | Logic Diagram          |
| SIG_1: Logic signal S010 |     |     |      | 226 077                |
| 0: No                    |     |     |      |                        |
| SIG_1: Signal S011 EXT   |     |     |      | 226 084                |
| 0: No                    |     |     |      |                        |
| SIG_1: Logic signal S011 |     |     |      | 226 085                |
| 0: No                    |     |     |      |                        |
| SIG_1: Signal S012 EXT   |     |     |      | 226 092                |
| 0: No                    |     |     |      |                        |
| SIG_1: Logic signal S012 |     |     |      | 226 093                |
| 0: No                    |     |     |      | Fig. 3-139, (p. 3-189) |
| SIG_1: Signal S013 EXT   |     |     |      | 226 100                |
| 0: No                    |     |     |      |                        |
| SIG_1: Logic signal S013 |     |     |      | 226 101                |
| 0: No                    |     |     |      |                        |
| SIG_1: Signal S014 EXT   |     |     |      | 226 108                |
| 0: No                    |     |     |      |                        |
| SIG_1: Logic signal S014 |     |     |      | 226 109                |
| 0: No                    |     |     |      |                        |
| SIG_1: Signal S015 EXT   |     |     |      | 226 116                |
| 0: No                    |     |     |      |                        |
| SIG_1: Logic signal S015 |     |     |      | 226 117                |
| 0: No                    |     |     |      |                        |
| SIG_1: Signal S016 EXT   |     |     |      | 226 124                |
| 0: No                    |     |     |      |                        |
| SIG_1: Logic signal S016 |     |     |      | 226 125                |
| 0: No                    |     |     |      |                        |
| SIG_1: Signal S017 EXT   |     |     |      | 226 132                |
| 0: No                    |     |     |      |                        |
| SIG_1: Logic signal S017 |     |     |      | 226 133                |
| 0: No                    |     |     |      |                        |
| SIG_1: Signal S018 EXT   |     |     |      | 226 140                |
| 0: No                    |     |     |      |                        |
| SIG_1: Logic signal S018 |     |     |      | 226 141                |
| 0: No                    |     |     |      |                        |
| SIG_1: Signal S019 EXT   |     |     |      | 226 148                |
| 0: No                    |     |     |      |                        |
| SIG_1: Logic signal S019 |     |     |      | 226 149                |
| 0: No                    |     |     |      |                        |

| Parameter                |     |     |      |  | Address       |  |         |
|--------------------------|-----|-----|------|--|---------------|--|---------|
| Default                  | Min | Max | Unit |  | Logic Diagram |  |         |
| SIG_1: Signal S020 EXT   |     |     |      |  |               |  | 226 156 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S020 |     |     |      |  |               |  | 226 157 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S021 EXT   |     |     |      |  |               |  | 226 164 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S021 |     |     |      |  |               |  | 226 165 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S022 EXT   |     |     |      |  |               |  | 226 172 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S022 |     |     |      |  |               |  | 226 173 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S023 EXT   |     |     |      |  |               |  | 226 180 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S023 |     |     |      |  |               |  | 226 181 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S024 EXT   |     |     |      |  |               |  | 226 188 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S024 |     |     |      |  |               |  | 226 189 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S025 EXT   |     |     |      |  |               |  | 226 196 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S025 |     |     |      |  |               |  | 226 197 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S026 EXT   |     |     |      |  |               |  | 226 204 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S026 |     |     |      |  |               |  | 226 205 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S027 EXT   |     |     |      |  |               |  | 226 212 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S027 |     |     |      |  |               |  | 226 213 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S028 EXT   |     |     |      |  |               |  | 226 220 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S028 |     |     |      |  |               |  | 226 221 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S029 EXT   |     |     |      |  |               |  | 226 228 |
| 0: No                    |     |     |      |  |               |  |         |

| Parameter                |     |     |      | Address       |
|--------------------------|-----|-----|------|---------------|
| Default                  | Min | Max | Unit | Logic Diagram |
| SIG_1: Logic signal S029 |     |     |      | 226 229       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S030 EXT   |     |     |      | 226 236       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S030 |     |     |      | 226 237       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S031 EXT   |     |     |      | 226 244       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S031 |     |     |      | 226 245       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S032 EXT   |     |     |      | 226 252       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S032 |     |     |      | 226 253       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S033 EXT   |     |     |      | 227 004       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S033 |     |     |      | 227 005       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S034 EXT   |     |     |      | 227 012       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S034 |     |     |      | 227 013       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S035 EXT   |     |     |      | 227 020       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S035 |     |     |      | 227 021       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S036 EXT   |     |     |      | 227 028       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S036 |     |     |      | 227 029       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S037 EXT   |     |     |      | 227 036       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S037 |     |     |      | 227 037       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S038 EXT   |     |     |      | 227 044       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S038 |     |     |      | 227 045       |
| 0: No                    |     |     |      |               |

| Parameter                |     |     |      |  | Address       |  |         |
|--------------------------|-----|-----|------|--|---------------|--|---------|
| Default                  | Min | Max | Unit |  | Logic Diagram |  |         |
| SIG_1: Signal S039 EXT   |     |     |      |  |               |  | 227 052 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S039 |     |     |      |  |               |  | 227 053 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S040 EXT   |     |     |      |  |               |  | 227 060 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S040 |     |     |      |  |               |  | 227 061 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S041 EXT   |     |     |      |  |               |  | 227 068 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S041 |     |     |      |  |               |  | 227 069 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S042 EXT   |     |     |      |  |               |  | 227 076 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S042 |     |     |      |  |               |  | 227 077 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S043 EXT   |     |     |      |  |               |  | 227 084 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S043 |     |     |      |  |               |  | 227 085 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S044 EXT   |     |     |      |  |               |  | 227 092 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S044 |     |     |      |  |               |  | 227 093 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S045 EXT   |     |     |      |  |               |  | 227 100 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S045 |     |     |      |  |               |  | 227 101 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S046 EXT   |     |     |      |  |               |  | 227 108 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S046 |     |     |      |  |               |  | 227 109 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S047 EXT   |     |     |      |  |               |  | 227 116 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S047 |     |     |      |  |               |  | 227 117 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S048 EXT   |     |     |      |  |               |  | 227 124 |
| 0: No                    |     |     |      |  |               |  |         |

| Parameter                |     |     |      | Address       |
|--------------------------|-----|-----|------|---------------|
| Default                  | Min | Max | Unit | Logic Diagram |
| SIG_1: Logic signal S048 |     |     |      | 227 125       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S049 EXT   |     |     |      | 227 132       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S049 |     |     |      | 227 133       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S050 EXT   |     |     |      | 227 140       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S050 |     |     |      | 227 141       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S051 EXT   |     |     |      | 227 148       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S051 |     |     |      | 227 149       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S052 EXT   |     |     |      | 227 156       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S052 |     |     |      | 227 157       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S053 EXT   |     |     |      | 227 164       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S053 |     |     |      | 227 165       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S054 EXT   |     |     |      | 227 172       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S054 |     |     |      | 227 173       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S055 EXT   |     |     |      | 227 180       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S055 |     |     |      | 227 181       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S056 EXT   |     |     |      | 227 188       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S056 |     |     |      | 227 189       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S057 EXT   |     |     |      | 227 196       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S057 |     |     |      | 227 197       |
| 0: No                    |     |     |      |               |

| Parameter                |     |     |      |  | Address       |
|--------------------------|-----|-----|------|--|---------------|
| Default                  | Min | Max | Unit |  | Logic Diagram |
| SIG_1: Signal S058 EXT   |     |     |      |  | 227 204       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S058 |     |     |      |  | 227 205       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S059 EXT   |     |     |      |  | 227 212       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S059 |     |     |      |  | 227 213       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S060 EXT   |     |     |      |  | 227 220       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S060 |     |     |      |  | 227 221       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S061 EXT   |     |     |      |  | 227 228       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S061 |     |     |      |  | 227 229       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S062 EXT   |     |     |      |  | 227 236       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S062 |     |     |      |  | 227 237       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S063 EXT   |     |     |      |  | 227 244       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S063 |     |     |      |  | 227 245       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S064 EXT   |     |     |      |  | 227 252       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S064 |     |     |      |  | 227 253       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S065 EXT   |     |     |      |  | 228 004       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S065 |     |     |      |  | 228 005       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S066 EXT   |     |     |      |  | 228 012       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S066 |     |     |      |  | 228 013       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S067 EXT   |     |     |      |  | 228 020       |
| 0: No                    |     |     |      |  |               |



| Parameter                |     |     |      | Address       |
|--------------------------|-----|-----|------|---------------|
| Default                  | Min | Max | Unit | Logic Diagram |
| SIG_1: Logic signal S067 |     |     |      | 228 021       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S068 EXT   |     |     |      | 228 028       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S068 |     |     |      | 228 029       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S069 EXT   |     |     |      | 228 036       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S069 |     |     |      | 228 037       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S070 EXT   |     |     |      | 228 044       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S070 |     |     |      | 228 045       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S071 EXT   |     |     |      | 228 052       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S071 |     |     |      | 228 053       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S072 EXT   |     |     |      | 228 060       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S072 |     |     |      | 228 061       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S073 EXT   |     |     |      | 228 068       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S073 |     |     |      | 228 069       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S074 EXT   |     |     |      | 228 076       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S074 |     |     |      | 228 077       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S075 EXT   |     |     |      | 228 084       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S075 |     |     |      | 228 085       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S076 EXT   |     |     |      | 228 092       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S076 |     |     |      | 228 093       |
| 0: No                    |     |     |      |               |

| Parameter                |     |     |      |  | Address       |
|--------------------------|-----|-----|------|--|---------------|
| Default                  | Min | Max | Unit |  | Logic Diagram |
| SIG_1: Signal S077 EXT   |     |     |      |  | 228 100       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S077 |     |     |      |  | 228 101       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S078 EXT   |     |     |      |  | 228 108       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S078 |     |     |      |  | 228 109       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S079 EXT   |     |     |      |  | 228 116       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S079 |     |     |      |  | 228 117       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S080 EXT   |     |     |      |  | 228 124       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S080 |     |     |      |  | 228 125       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S081 EXT   |     |     |      |  | 228 132       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S081 |     |     |      |  | 228 133       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S082 EXT   |     |     |      |  | 228 140       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S082 |     |     |      |  | 228 141       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S083 EXT   |     |     |      |  | 228 148       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S083 |     |     |      |  | 228 149       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S084 EXT   |     |     |      |  | 228 156       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S084 |     |     |      |  | 228 157       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S085 EXT   |     |     |      |  | 228 164       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S085 |     |     |      |  | 228 165       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S086 EXT   |     |     |      |  | 228 172       |
| 0: No                    |     |     |      |  |               |

| Parameter                |     |     |      | Address       |
|--------------------------|-----|-----|------|---------------|
| Default                  | Min | Max | Unit | Logic Diagram |
| SIG_1: Logic signal S086 |     |     |      | 228 173       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S087 EXT   |     |     |      | 228 180       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S087 |     |     |      | 228 181       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S088 EXT   |     |     |      | 228 188       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S088 |     |     |      | 228 189       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S089 EXT   |     |     |      | 228 196       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S089 |     |     |      | 228 197       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S090 EXT   |     |     |      | 228 204       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S090 |     |     |      | 228 205       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S091 EXT   |     |     |      | 228 212       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S091 |     |     |      | 228 213       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S092 EXT   |     |     |      | 228 220       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S092 |     |     |      | 228 221       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S093 EXT   |     |     |      | 228 228       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S093 |     |     |      | 228 229       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S094 EXT   |     |     |      | 228 236       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S094 |     |     |      | 228 237       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S095 EXT   |     |     |      | 228 244       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S095 |     |     |      | 228 245       |
| 0: No                    |     |     |      |               |

| Parameter                |     |     |      |  | Address       |  |         |
|--------------------------|-----|-----|------|--|---------------|--|---------|
| Default                  | Min | Max | Unit |  | Logic Diagram |  |         |
| SIG_1: Signal S096 EXT   |     |     |      |  |               |  | 228 252 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S096 |     |     |      |  |               |  | 228 253 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S097 EXT   |     |     |      |  |               |  | 229 004 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S097 |     |     |      |  |               |  | 229 005 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S098 EXT   |     |     |      |  |               |  | 229 012 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S098 |     |     |      |  |               |  | 229 013 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S099 EXT   |     |     |      |  |               |  | 229 020 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S099 |     |     |      |  |               |  | 229 021 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S100 EXT   |     |     |      |  |               |  | 229 028 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S100 |     |     |      |  |               |  | 229 029 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S101 EXT   |     |     |      |  |               |  | 229 036 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S101 |     |     |      |  |               |  | 229 037 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S102 EXT   |     |     |      |  |               |  | 229 044 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S102 |     |     |      |  |               |  | 229 045 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S103 EXT   |     |     |      |  |               |  | 229 052 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S103 |     |     |      |  |               |  | 229 053 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S104 EXT   |     |     |      |  |               |  | 229 060 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S104 |     |     |      |  |               |  | 229 061 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S105 EXT   |     |     |      |  |               |  | 229 068 |
| 0: No                    |     |     |      |  |               |  |         |

| Parameter                |     |     |      | Address       |
|--------------------------|-----|-----|------|---------------|
| Default                  | Min | Max | Unit | Logic Diagram |
| SIG_1: Logic signal S105 |     |     |      | 229 069       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S106 EXT   |     |     |      | 229 076       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S106 |     |     |      | 229 077       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S107 EXT   |     |     |      | 229 084       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S107 |     |     |      | 229 085       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S108 EXT   |     |     |      | 229 092       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S108 |     |     |      | 229 093       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S109 EXT   |     |     |      | 229 100       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S109 |     |     |      | 229 101       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S110 EXT   |     |     |      | 229 108       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S110 |     |     |      | 229 109       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S111 EXT   |     |     |      | 229 116       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S111 |     |     |      | 229 117       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S112 EXT   |     |     |      | 229 124       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S112 |     |     |      | 229 125       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S113 EXT   |     |     |      | 229 132       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S113 |     |     |      | 229 133       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S114 EXT   |     |     |      | 229 140       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S114 |     |     |      | 229 141       |
| 0: No                    |     |     |      |               |

| Parameter                |     |     |      |  | Address       |  |         |
|--------------------------|-----|-----|------|--|---------------|--|---------|
| Default                  | Min | Max | Unit |  | Logic Diagram |  |         |
| SIG_1: Signal S115 EXT   |     |     |      |  |               |  | 229 148 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S115 |     |     |      |  |               |  | 229 149 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S116 EXT   |     |     |      |  |               |  | 229 156 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S116 |     |     |      |  |               |  | 229 157 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S117 EXT   |     |     |      |  |               |  | 229 164 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S117 |     |     |      |  |               |  | 229 165 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S118 EXT   |     |     |      |  |               |  | 229 172 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S118 |     |     |      |  |               |  | 229 173 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S119 EXT   |     |     |      |  |               |  | 229 180 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S119 |     |     |      |  |               |  | 229 181 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S120 EXT   |     |     |      |  |               |  | 229 188 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S120 |     |     |      |  |               |  | 229 189 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S121 EXT   |     |     |      |  |               |  | 229 196 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S121 |     |     |      |  |               |  | 229 197 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S122 EXT   |     |     |      |  |               |  | 229 204 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S122 |     |     |      |  |               |  | 229 205 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S123 EXT   |     |     |      |  |               |  | 229 212 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S123 |     |     |      |  |               |  | 229 213 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S124 EXT   |     |     |      |  |               |  | 229 220 |
| 0: No                    |     |     |      |  |               |  |         |

| Parameter                |     |     |      | Address       |
|--------------------------|-----|-----|------|---------------|
| Default                  | Min | Max | Unit | Logic Diagram |
| SIG_1: Logic signal S124 |     |     |      | 229 221       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S125 EXT   |     |     |      | 229 228       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S125 |     |     |      | 229 229       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S126 EXT   |     |     |      | 229 236       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S126 |     |     |      | 229 237       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S127 EXT   |     |     |      | 229 244       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S127 |     |     |      | 229 245       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S128 EXT   |     |     |      | 229 252       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S128 |     |     |      | 229 253       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S129 EXT   |     |     |      | 230 004       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S129 |     |     |      | 230 005       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S130 EXT   |     |     |      | 230 012       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S130 |     |     |      | 230 013       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S131 EXT   |     |     |      | 230 020       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S131 |     |     |      | 230 021       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S132 EXT   |     |     |      | 230 028       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S132 |     |     |      | 230 029       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S133 EXT   |     |     |      | 230 036       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S133 |     |     |      | 230 037       |
| 0: No                    |     |     |      |               |

| Parameter                |     |     |      |  | Address       |
|--------------------------|-----|-----|------|--|---------------|
| Default                  | Min | Max | Unit |  | Logic Diagram |
| SIG_1: Signal S134 EXT   |     |     |      |  | 230 044       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S134 |     |     |      |  | 230 045       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S135 EXT   |     |     |      |  | 230 052       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S135 |     |     |      |  | 230 053       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S136 EXT   |     |     |      |  | 230 060       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S136 |     |     |      |  | 230 061       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S137 EXT   |     |     |      |  | 230 068       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S137 |     |     |      |  | 230 069       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S138 EXT   |     |     |      |  | 230 076       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S138 |     |     |      |  | 230 077       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S139 EXT   |     |     |      |  | 230 084       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S139 |     |     |      |  | 230 085       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S140 EXT   |     |     |      |  | 230 092       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S140 |     |     |      |  | 230 093       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S141 EXT   |     |     |      |  | 230 100       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S141 |     |     |      |  | 230 101       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S142 EXT   |     |     |      |  | 230 108       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Logic signal S142 |     |     |      |  | 230 109       |
| 0: No                    |     |     |      |  |               |
| SIG_1: Signal S143 EXT   |     |     |      |  | 230 116       |
| 0: No                    |     |     |      |  |               |



| Parameter                |     |     |      | Address       |
|--------------------------|-----|-----|------|---------------|
| Default                  | Min | Max | Unit | Logic Diagram |
| SIG_1: Logic signal S143 |     |     |      | 230 117       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S144 EXT   |     |     |      | 230 124       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S144 |     |     |      | 230 125       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S145 EXT   |     |     |      | 230 132       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S145 |     |     |      | 230 133       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S146 EXT   |     |     |      | 230 140       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S146 |     |     |      | 230 141       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S147 EXT   |     |     |      | 230 148       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S147 |     |     |      | 230 149       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S148 EXT   |     |     |      | 230 156       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S148 |     |     |      | 230 157       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S149 EXT   |     |     |      | 230 164       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S149 |     |     |      | 230 165       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S150 EXT   |     |     |      | 230 172       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S150 |     |     |      | 230 173       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S151 EXT   |     |     |      | 230 180       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S151 |     |     |      | 230 181       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S152 EXT   |     |     |      | 230 188       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S152 |     |     |      | 230 189       |
| 0: No                    |     |     |      |               |

| Parameter                |     |     |      |  | Address       |  |         |
|--------------------------|-----|-----|------|--|---------------|--|---------|
| Default                  | Min | Max | Unit |  | Logic Diagram |  |         |
| SIG_1: Signal S153 EXT   |     |     |      |  |               |  | 230 196 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S153 |     |     |      |  |               |  | 230 197 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S154 EXT   |     |     |      |  |               |  | 230 204 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S154 |     |     |      |  |               |  | 230 205 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S155 EXT   |     |     |      |  |               |  | 230 212 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S155 |     |     |      |  |               |  | 230 213 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S156 EXT   |     |     |      |  |               |  | 230 220 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S156 |     |     |      |  |               |  | 230 221 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S157 EXT   |     |     |      |  |               |  | 230 228 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S157 |     |     |      |  |               |  | 230 229 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S158 EXT   |     |     |      |  |               |  | 230 236 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S158 |     |     |      |  |               |  | 230 237 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S159 EXT   |     |     |      |  |               |  | 230 244 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S159 |     |     |      |  |               |  | 230 245 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S160 EXT   |     |     |      |  |               |  | 230 252 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S160 |     |     |      |  |               |  | 230 253 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S161 EXT   |     |     |      |  |               |  | 231 004 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S161 |     |     |      |  |               |  | 231 005 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S162 EXT   |     |     |      |  |               |  | 231 012 |
| 0: No                    |     |     |      |  |               |  |         |

| Parameter                |     |     |      | Address       |
|--------------------------|-----|-----|------|---------------|
| Default                  | Min | Max | Unit | Logic Diagram |
| SIG_1: Logic signal S162 |     |     |      | 231 013       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S163 EXT   |     |     |      | 231 020       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S163 |     |     |      | 231 021       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S164 EXT   |     |     |      | 231 028       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S164 |     |     |      | 231 029       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S165 EXT   |     |     |      | 231 036       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S165 |     |     |      | 231 037       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S166 EXT   |     |     |      | 231 044       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S166 |     |     |      | 231 045       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S167 EXT   |     |     |      | 231 052       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S167 |     |     |      | 231 053       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S168 EXT   |     |     |      | 231 060       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S168 |     |     |      | 231 061       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S169 EXT   |     |     |      | 231 068       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S169 |     |     |      | 231 069       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S170 EXT   |     |     |      | 231 076       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S170 |     |     |      | 231 077       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S171 EXT   |     |     |      | 231 084       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S171 |     |     |      | 231 085       |
| 0: No                    |     |     |      |               |

| Parameter                |     |     |      |  | Address       |  |         |
|--------------------------|-----|-----|------|--|---------------|--|---------|
| Default                  | Min | Max | Unit |  | Logic Diagram |  |         |
| SIG_1: Signal S172 EXT   |     |     |      |  |               |  | 231 092 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S172 |     |     |      |  |               |  | 231 093 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S173 EXT   |     |     |      |  |               |  | 231 100 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S173 |     |     |      |  |               |  | 231 101 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S174 EXT   |     |     |      |  |               |  | 231 108 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S174 |     |     |      |  |               |  | 231 109 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S175 EXT   |     |     |      |  |               |  | 231 116 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S175 |     |     |      |  |               |  | 231 117 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S176 EXT   |     |     |      |  |               |  | 231 124 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S176 |     |     |      |  |               |  | 231 125 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S177 EXT   |     |     |      |  |               |  | 231 132 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S177 |     |     |      |  |               |  | 231 133 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S178 EXT   |     |     |      |  |               |  | 231 140 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S178 |     |     |      |  |               |  | 231 141 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S179 EXT   |     |     |      |  |               |  | 231 148 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S179 |     |     |      |  |               |  | 231 149 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S180 EXT   |     |     |      |  |               |  | 231 156 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S180 |     |     |      |  |               |  | 231 157 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S181 EXT   |     |     |      |  |               |  | 231 164 |
| 0: No                    |     |     |      |  |               |  |         |

| Parameter                |     |     |      | Address       |
|--------------------------|-----|-----|------|---------------|
| Default                  | Min | Max | Unit | Logic Diagram |
| SIG_1: Logic signal S181 |     |     |      | 231 165       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S182 EXT   |     |     |      | 231 172       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S182 |     |     |      | 231 173       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S183 EXT   |     |     |      | 231 180       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S183 |     |     |      | 231 181       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S184 EXT   |     |     |      | 231 188       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S184 |     |     |      | 231 189       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S185 EXT   |     |     |      | 231 196       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S185 |     |     |      | 231 197       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S186 EXT   |     |     |      | 231 204       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S186 |     |     |      | 231 205       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S187 EXT   |     |     |      | 231 212       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S187 |     |     |      | 231 213       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S188 EXT   |     |     |      | 231 220       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S188 |     |     |      | 231 221       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S189 EXT   |     |     |      | 231 228       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S189 |     |     |      | 231 229       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S190 EXT   |     |     |      | 231 236       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S190 |     |     |      | 231 237       |
| 0: No                    |     |     |      |               |

| Parameter                |     |     |      |  | Address       |  |         |
|--------------------------|-----|-----|------|--|---------------|--|---------|
| Default                  | Min | Max | Unit |  | Logic Diagram |  |         |
| SIG_1: Signal S191 EXT   |     |     |      |  |               |  | 231 244 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S191 |     |     |      |  |               |  | 231 245 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S192 EXT   |     |     |      |  |               |  | 231 252 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S192 |     |     |      |  |               |  | 231 253 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S193 EXT   |     |     |      |  |               |  | 232 004 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S193 |     |     |      |  |               |  | 232 005 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S194 EXT   |     |     |      |  |               |  | 232 012 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S194 |     |     |      |  |               |  | 232 013 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S195 EXT   |     |     |      |  |               |  | 232 020 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S195 |     |     |      |  |               |  | 232 021 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S196 EXT   |     |     |      |  |               |  | 232 028 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S196 |     |     |      |  |               |  | 232 029 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S197 EXT   |     |     |      |  |               |  | 232 036 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S197 |     |     |      |  |               |  | 232 037 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S198 EXT   |     |     |      |  |               |  | 232 044 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S198 |     |     |      |  |               |  | 232 045 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S199 EXT   |     |     |      |  |               |  | 232 052 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S199 |     |     |      |  |               |  | 232 053 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S200 EXT   |     |     |      |  |               |  | 232 060 |
| 0: No                    |     |     |      |  |               |  |         |

| Parameter                |     |     |      | Address       |
|--------------------------|-----|-----|------|---------------|
| Default                  | Min | Max | Unit | Logic Diagram |
| SIG_1: Logic signal S200 |     |     |      | 232 061       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S201 EXT   |     |     |      | 232 068       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S201 |     |     |      | 232 069       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S202 EXT   |     |     |      | 232 076       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S202 |     |     |      | 232 077       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S203 EXT   |     |     |      | 232 084       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S203 |     |     |      | 232 085       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S204 EXT   |     |     |      | 232 092       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S204 |     |     |      | 232 093       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S205 EXT   |     |     |      | 232 100       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S205 |     |     |      | 232 101       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S206 EXT   |     |     |      | 232 108       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S206 |     |     |      | 232 109       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S207 EXT   |     |     |      | 232 116       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S207 |     |     |      | 232 117       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S208 EXT   |     |     |      | 232 124       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S208 |     |     |      | 232 125       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S209 EXT   |     |     |      | 232 132       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S209 |     |     |      | 232 133       |
| 0: No                    |     |     |      |               |

| Parameter                |     |     |      |  | Address       |  |         |
|--------------------------|-----|-----|------|--|---------------|--|---------|
| Default                  | Min | Max | Unit |  | Logic Diagram |  |         |
| SIG_1: Signal S210 EXT   |     |     |      |  |               |  | 232 140 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S210 |     |     |      |  |               |  | 232 141 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S211 EXT   |     |     |      |  |               |  | 232 148 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S211 |     |     |      |  |               |  | 232 149 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S212 EXT   |     |     |      |  |               |  | 232 156 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S212 |     |     |      |  |               |  | 232 157 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S213 EXT   |     |     |      |  |               |  | 232 164 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S213 |     |     |      |  |               |  | 232 165 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S214 EXT   |     |     |      |  |               |  | 232 172 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S214 |     |     |      |  |               |  | 232 173 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S215 EXT   |     |     |      |  |               |  | 232 180 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S215 |     |     |      |  |               |  | 232 181 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S216 EXT   |     |     |      |  |               |  | 232 188 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S216 |     |     |      |  |               |  | 232 189 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S217 EXT   |     |     |      |  |               |  | 232 196 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S217 |     |     |      |  |               |  | 232 197 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S218 EXT   |     |     |      |  |               |  | 232 204 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Logic signal S218 |     |     |      |  |               |  | 232 205 |
| 0: No                    |     |     |      |  |               |  |         |
| SIG_1: Signal S219 EXT   |     |     |      |  |               |  | 232 212 |
| 0: No                    |     |     |      |  |               |  |         |



| Parameter                |     |     |      | Address       |
|--------------------------|-----|-----|------|---------------|
| Default                  | Min | Max | Unit | Logic Diagram |
| SIG_1: Logic signal S219 |     |     |      | 232 213       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S220 EXT   |     |     |      | 232 220       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S220 |     |     |      | 232 221       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S221 EXT   |     |     |      | 232 228       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S221 |     |     |      | 232 229       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S222 EXT   |     |     |      | 232 236       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S222 |     |     |      | 232 237       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S223 EXT   |     |     |      | 232 244       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S223 |     |     |      | 232 245       |
| 0: No                    |     |     |      |               |
| SIG_1: Signal S224 EXT   |     |     |      | 232 252       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic signal S224 |     |     |      | 232 253       |
| 0: No                    |     |     |      |               |
| SIG_1: SIG_DC3 EXT       |     |     |      | 233 004       |
| 0: No                    |     |     |      |               |
| SIG_1: Logic SIG_DC3     |     |     |      | 233 005       |
| 0: No                    |     |     |      |               |

Fig. 3-144, (p. 3-194)

Single-pole  
commands

| Parameter           |     |     |      |  | Address                |  |         |
|---------------------|-----|-----|------|--|------------------------|--|---------|
| Default             | Min | Max | Unit |  | Logic Diagram          |  |         |
| CMD_1: Command C001 |     |     |      |  |                        |  | 200 001 |
| 0: No               |     |     |      |  | Fig. 3-146, (p. 3-197) |  |         |
| CMD_1: Command C002 |     |     |      |  |                        |  | 200 006 |
| 0: No               |     |     |      |  |                        |  |         |
| CMD_1: Command C003 |     |     |      |  |                        |  | 200 011 |
| 0: No               |     |     |      |  |                        |  |         |
| CMD_1: Command C004 |     |     |      |  |                        |  | 200 016 |
| 0: No               |     |     |      |  |                        |  |         |
| CMD_1: Command C005 |     |     |      |  |                        |  | 200 021 |
| 0: No               |     |     |      |  |                        |  |         |
| CMD_1: Command C006 |     |     |      |  |                        |  | 200 026 |
| 0: No               |     |     |      |  |                        |  |         |
| CMD_1: Command C007 |     |     |      |  |                        |  | 200 031 |
| 0: No               |     |     |      |  |                        |  |         |
| CMD_1: Command C008 |     |     |      |  |                        |  | 200 036 |
| 0: No               |     |     |      |  |                        |  |         |
| CMD_1: Command C009 |     |     |      |  |                        |  | 200 041 |
| 0: No               |     |     |      |  |                        |  |         |
| CMD_1: Command C010 |     |     |      |  |                        |  | 200 046 |
| 0: No               |     |     |      |  |                        |  |         |
| CMD_1: Command C011 |     |     |      |  |                        |  | 200 051 |
| 0: No               |     |     |      |  | Fig. 3-139, (p. 3-189) |  |         |
| CMD_1: Command C012 |     |     |      |  |                        |  | 200 056 |
| 0: No               |     |     |      |  | Fig. 3-139, (p. 3-189) |  |         |
| CMD_1: Command C013 |     |     |      |  |                        |  | 200 061 |
| 0: No               |     |     |      |  |                        |  |         |
| CMD_1: Command C014 |     |     |      |  |                        |  | 200 066 |
| 0: No               |     |     |      |  |                        |  |         |
| CMD_1: Command C015 |     |     |      |  |                        |  | 200 071 |
| 0: No               |     |     |      |  |                        |  |         |
| CMD_1: Command C016 |     |     |      |  |                        |  | 200 076 |
| 0: No               |     |     |      |  |                        |  |         |
| CMD_1: Command C017 |     |     |      |  |                        |  | 200 081 |
| 0: No               |     |     |      |  |                        |  |         |
| CMD_1: Command C018 |     |     |      |  |                        |  | 200 086 |
| 0: No               |     |     |      |  |                        |  |         |

| Parameter           |     |     |      | Address       |
|---------------------|-----|-----|------|---------------|
| Default             | Min | Max | Unit | Logic Diagram |
| CMD_1: Command C019 |     |     |      | 200 091       |
| 0: No               |     |     |      |               |
| CMD_1: Command C020 |     |     |      | 200 096       |
| 0: No               |     |     |      |               |
| CMD_1: Command C021 |     |     |      | 200 101       |
| 0: No               |     |     |      |               |
| CMD_1: Command C022 |     |     |      | 200 106       |
| 0: No               |     |     |      |               |
| CMD_1: Command C023 |     |     |      | 200 111       |
| 0: No               |     |     |      |               |
| CMD_1: Command C024 |     |     |      | 200 116       |
| 0: No               |     |     |      |               |
| CMD_1: Command C025 |     |     |      | 200 121       |
| 0: No               |     |     |      |               |
| CMD_1: Command C026 |     |     |      | 200 126       |
| 0: No               |     |     |      |               |
| CMD_1: Command C027 |     |     |      | 200 131       |
| 0: No               |     |     |      |               |
| CMD_1: Command C028 |     |     |      | 200 136       |
| 0: No               |     |     |      |               |
| CMD_1: Command C029 |     |     |      | 200 141       |
| 0: No               |     |     |      |               |
| CMD_1: Command C030 |     |     |      | 200 146       |
| 0: No               |     |     |      |               |
| CMD_1: Command C031 |     |     |      | 200 151       |
| 0: No               |     |     |      |               |
| CMD_1: Command C032 |     |     |      | 200 156       |
| 0: No               |     |     |      |               |
| CMD_1: Command C033 |     |     |      | 200 161       |
| 0: No               |     |     |      |               |
| CMD_1: Command C034 |     |     |      | 200 166       |
| 0: No               |     |     |      |               |
| CMD_1: Command C035 |     |     |      | 200 171       |
| 0: No               |     |     |      |               |
| CMD_1: Command C036 |     |     |      | 200 176       |
| 0: No               |     |     |      |               |
| CMD_1: Command C037 |     |     |      | 200 181       |
| 0: No               |     |     |      |               |

| Parameter           |     |     |      |  | Address       |     |
|---------------------|-----|-----|------|--|---------------|-----|
| Default             | Min | Max | Unit |  | Logic Diagram |     |
| CMD_1: Command C038 |     |     |      |  | 200           | 186 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C039 |     |     |      |  | 200           | 191 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C040 |     |     |      |  | 200           | 196 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C041 |     |     |      |  | 200           | 201 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C042 |     |     |      |  | 200           | 206 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C043 |     |     |      |  | 200           | 211 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C044 |     |     |      |  | 200           | 216 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C045 |     |     |      |  | 200           | 221 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C046 |     |     |      |  | 200           | 226 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C047 |     |     |      |  | 200           | 231 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C048 |     |     |      |  | 200           | 236 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C049 |     |     |      |  | 201           | 001 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C050 |     |     |      |  | 201           | 006 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C051 |     |     |      |  | 201           | 011 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C052 |     |     |      |  | 201           | 016 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C053 |     |     |      |  | 201           | 021 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C054 |     |     |      |  | 201           | 026 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C055 |     |     |      |  | 201           | 031 |
| 0: No               |     |     |      |  |               |     |
| CMD_1: Command C056 |     |     |      |  | 201           | 036 |
| 0: No               |     |     |      |  |               |     |

| Parameter           |     |     |      | Address       |
|---------------------|-----|-----|------|---------------|
| Default             | Min | Max | Unit | Logic Diagram |
| CMD_1: Command C057 |     |     |      | 201 041       |
| 0: No               |     |     |      |               |
| CMD_1: Command C058 |     |     |      | 201 046       |
| 0: No               |     |     |      |               |
| CMD_1: Command C059 |     |     |      | 201 051       |
| 0: No               |     |     |      |               |
| CMD_1: Command C060 |     |     |      | 201 056       |
| 0: No               |     |     |      |               |
| CMD_1: Command C061 |     |     |      | 201 061       |
| 0: No               |     |     |      |               |
| CMD_1: Command C062 |     |     |      | 201 066       |
| 0: No               |     |     |      |               |
| CMD_1: Command C063 |     |     |      | 201 071       |
| 0: No               |     |     |      |               |
| CMD_1: Command C064 |     |     |      | 201 076       |
| 0: No               |     |     |      |               |
| CMD_1: Command C065 |     |     |      | 201 081       |
| 0: No               |     |     |      |               |
| CMD_1: Command C066 |     |     |      | 201 086       |
| 0: No               |     |     |      |               |
| CMD_1: Command C067 |     |     |      | 201 091       |
| 0: No               |     |     |      |               |
| CMD_1: Command C068 |     |     |      | 201 096       |
| 0: No               |     |     |      |               |
| CMD_1: Command C069 |     |     |      | 201 101       |
| 0: No               |     |     |      |               |
| CMD_1: Command C070 |     |     |      | 201 106       |
| 0: No               |     |     |      |               |
| CMD_1: Command C071 |     |     |      | 201 111       |
| 0: No               |     |     |      |               |
| CMD_1: Command C072 |     |     |      | 201 116       |
| 0: No               |     |     |      |               |
| CMD_1: Command C073 |     |     |      | 201 121       |
| 0: No               |     |     |      |               |
| CMD_1: Command C074 |     |     |      | 201 126       |
| 0: No               |     |     |      |               |
| CMD_1: Command C075 |     |     |      | 201 131       |
| 0: No               |     |     |      |               |

| Parameter           |     |     |      |  | Address       |  |         |
|---------------------|-----|-----|------|--|---------------|--|---------|
| Default             | Min | Max | Unit |  | Logic Diagram |  |         |
| CMD_1: Command C076 |     |     |      |  |               |  | 201 136 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C077 |     |     |      |  |               |  | 201 141 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C078 |     |     |      |  |               |  | 201 146 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C079 |     |     |      |  |               |  | 201 151 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C080 |     |     |      |  |               |  | 201 156 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C081 |     |     |      |  |               |  | 201 161 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C082 |     |     |      |  |               |  | 201 166 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C083 |     |     |      |  |               |  | 201 171 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C084 |     |     |      |  |               |  | 201 176 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C085 |     |     |      |  |               |  | 201 181 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C086 |     |     |      |  |               |  | 201 186 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C087 |     |     |      |  |               |  | 201 191 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C088 |     |     |      |  |               |  | 201 196 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C089 |     |     |      |  |               |  | 201 201 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C090 |     |     |      |  |               |  | 201 206 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C091 |     |     |      |  |               |  | 201 211 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C092 |     |     |      |  |               |  | 201 216 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C093 |     |     |      |  |               |  | 201 221 |
| 0: No               |     |     |      |  |               |  |         |
| CMD_1: Command C094 |     |     |      |  |               |  | 201 226 |
| 0: No               |     |     |      |  |               |  |         |

| Parameter           |     |     |      | Address                |
|---------------------|-----|-----|------|------------------------|
| Default             | Min | Max | Unit | Logic Diagram          |
| CMD_1: Command C095 |     |     |      | 201 231                |
| 0: No               |     |     |      |                        |
| CMD_1: Command C096 |     |     |      | 201 236                |
| 0: No               |     |     |      |                        |
| CMD_1: CMD_DC1      |     |     |      | 202 001                |
| 0: No               |     |     |      | Fig. 3-142, (p. 3-193) |
| CMD_1: CMD_DC2      |     |     |      | 202 006                |
| 0: No               |     |     |      | Fig. 3-143, (p. 3-193) |
| CMD_1: CMD_DC3      |     |     |      | 202 011                |
| 0: No               |     |     |      | Fig. 3-144, (p. 3-194) |

## Interlocking logic

| Parameter        |     |     |      |  | Address                |  |         |
|------------------|-----|-----|------|--|------------------------|--|---------|
| Default          | Min | Max | Unit |  | Logic Diagram          |  |         |
| ILOCK: Output 01 |     |     |      |  |                        |  | 250 032 |
| 0: No            |     |     |      |  | Fig. 3-145, (p. 3-196) |  |         |
| ILOCK: Output 02 |     |     |      |  |                        |  | 250 033 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 03 |     |     |      |  |                        |  | 250 034 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 04 |     |     |      |  |                        |  | 250 035 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 05 |     |     |      |  |                        |  | 250 036 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 06 |     |     |      |  |                        |  | 250 037 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 07 |     |     |      |  |                        |  | 250 038 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 08 |     |     |      |  |                        |  | 250 039 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 09 |     |     |      |  |                        |  | 250 040 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 10 |     |     |      |  |                        |  | 250 041 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 11 |     |     |      |  |                        |  | 250 042 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 12 |     |     |      |  |                        |  | 250 043 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 13 |     |     |      |  |                        |  | 250 044 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 14 |     |     |      |  |                        |  | 250 045 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 15 |     |     |      |  |                        |  | 250 046 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 16 |     |     |      |  |                        |  | 250 047 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 17 |     |     |      |  |                        |  | 250 048 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 18 |     |     |      |  |                        |  | 250 049 |
| 0: No            |     |     |      |  |                        |  |         |
| ILOCK: Output 19 |     |     |      |  |                        |  | 250 050 |
| 0: No            |     |     |      |  |                        |  |         |



| Parameter                                                                                                                                             |     |     |      | Address       |  |  |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|--|--|---------|
| Default                                                                                                                                               | Min | Max | Unit | Logic Diagram |  |  |         |
| ILOCK: Output 20                                                                                                                                      |     |     |      |               |  |  | 250 051 |
| 0: No                                                                                                                                                 |     |     |      |               |  |  |         |
| ILOCK: Output 21                                                                                                                                      |     |     |      |               |  |  | 250 052 |
| 0: No                                                                                                                                                 |     |     |      |               |  |  |         |
| ILOCK: Output 22                                                                                                                                      |     |     |      |               |  |  | 250 053 |
| 0: No                                                                                                                                                 |     |     |      |               |  |  |         |
| ILOCK: Output 23                                                                                                                                      |     |     |      |               |  |  | 250 054 |
| 0: No                                                                                                                                                 |     |     |      |               |  |  |         |
| ILOCK: Output 24                                                                                                                                      |     |     |      |               |  |  | 250 055 |
| 0: No                                                                                                                                                 |     |     |      |               |  |  |         |
| ILOCK: Output 25                                                                                                                                      |     |     |      |               |  |  | 250 056 |
| 0: No                                                                                                                                                 |     |     |      |               |  |  |         |
| ILOCK: Output 26                                                                                                                                      |     |     |      |               |  |  | 250 057 |
| 0: No                                                                                                                                                 |     |     |      |               |  |  |         |
| ILOCK: Output 27                                                                                                                                      |     |     |      |               |  |  | 250 058 |
| 0: No                                                                                                                                                 |     |     |      |               |  |  |         |
| ILOCK: Output 28                                                                                                                                      |     |     |      |               |  |  | 250 059 |
| 0: No                                                                                                                                                 |     |     |      |               |  |  |         |
| ILOCK: Output 29                                                                                                                                      |     |     |      |               |  |  | 250 060 |
| 0: No                                                                                                                                                 |     |     |      |               |  |  |         |
| ILOCK: Output 30                                                                                                                                      |     |     |      |               |  |  | 250 061 |
| 0: No                                                                                                                                                 |     |     |      |               |  |  |         |
| ILOCK: Output 31                                                                                                                                      |     |     |      |               |  |  | 250 062 |
| 0: No                                                                                                                                                 |     |     |      |               |  |  |         |
| ILOCK: Output 32                                                                                                                                      |     |     |      |               |  |  | 250 063 |
| 0: No                                                                                                                                                 |     |     |      |               |  |  |         |
| Output of the respective equation of the interlocking logic.<br>These logic state signals are transmitted with the request for a switching operation. |     |     |      |               |  |  |         |

## Binary counts

| Parameter                 |     |     |      |  | Address       |  |
|---------------------------|-----|-----|------|--|---------------|--|
| Default                   | Min | Max | Unit |  | Logic Diagram |  |
| COUNT: Set counter 1 EXT  |     |     |      |  | 217 130       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 2 EXT  |     |     |      |  | 217 085       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 3 EXT  |     |     |      |  | 217 086       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 4 EXT  |     |     |      |  | 217 087       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 5 EXT  |     |     |      |  | 217 134       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 6 EXT  |     |     |      |  | 217 135       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 7 EXT  |     |     |      |  | 217 136       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 8 EXT  |     |     |      |  | 217 137       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 9 EXT  |     |     |      |  | 217 138       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 10 EXT |     |     |      |  | 217 139       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 11 EXT |     |     |      |  | 217 140       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 12 EXT |     |     |      |  | 217 141       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 13 EXT |     |     |      |  | 217 142       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 14 EXT |     |     |      |  | 217 143       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 15 EXT |     |     |      |  | 217 144       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 16 EXT |     |     |      |  | 217 145       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 17 EXT |     |     |      |  | 217 146       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 18 EXT |     |     |      |  | 217 147       |  |
| 0: No                     |     |     |      |  |               |  |
| COUNT: Set counter 19 EXT |     |     |      |  | 217 148       |  |
| 0: No                     |     |     |      |  |               |  |

| Parameter                  |     |     |      | Address                |
|----------------------------|-----|-----|------|------------------------|
| Default                    | Min | Max | Unit | Logic Diagram          |
| COUNT: Set counter 20 EXT  |     |     |      | 217 149                |
| 0: No                      |     |     |      |                        |
| COUNT: Set counter 21 EXT  |     |     |      | 217 150                |
| 0: No                      |     |     |      |                        |
| COUNT: Set counter 22 EXT  |     |     |      | 217 151                |
| 0: No                      |     |     |      |                        |
| COUNT: Set counter 23 EXT  |     |     |      | 217 152                |
| 0: No                      |     |     |      |                        |
| COUNT: Set counter 24 EXT  |     |     |      | 217 153                |
| 0: No                      |     |     |      |                        |
| COUNT: Transmit counts EXT |     |     |      | 217 009                |
| 0: No                      |     |     |      |                        |
| COUNT: Reset EXT           |     |     |      | 217 004                |
| 0: No                      |     |     |      |                        |
| COUNT: Enabled             |     |     |      | 217 001                |
| 0: No                      |     |     |      | Fig. 3-152, (p. 3-205) |
| COUNT: Transmit counts     |     |     |      | 217 010                |
| 0: No                      |     |     |      | Fig. 3-152, (p. 3-205) |
| COUNT: Reset               |     |     |      | 217 005                |
| 0: No                      |     |     |      | Fig. 3-152, (p. 3-205) |
| COUNT: Warning count 5     |     |     |      | 027 117                |
| 0: No                      |     |     |      |                        |
| COUNT: Warning count 6     |     |     |      | 027 118                |
| 0: No                      |     |     |      |                        |
| COUNT: Warning count 7     |     |     |      | 027 119                |
| 0: No                      |     |     |      |                        |
| COUNT: Warning count 8     |     |     |      | 027 120                |
| 0: No                      |     |     |      |                        |
| COUNT: Warning count 9     |     |     |      | 027 121                |
| 0: No                      |     |     |      |                        |
| COUNT: Warning count 10    |     |     |      | 027 122                |
| 0: No                      |     |     |      |                        |
| COUNT: Warning count 11    |     |     |      | 027 123                |
| 0: No                      |     |     |      |                        |
| COUNT: Warning count 12    |     |     |      | 027 124                |
| 0: No                      |     |     |      |                        |
| COUNT: Warning count 13    |     |     |      | 027 125                |
| 0: No                      |     |     |      |                        |

| Parameter                                                        |     |     |      |  | Address       |
|------------------------------------------------------------------|-----|-----|------|--|---------------|
| Default                                                          | Min | Max | Unit |  | Logic Diagram |
| COUNT: Warning count 14                                          |     |     |      |  | 027 126       |
| 0: No                                                            |     |     |      |  |               |
| COUNT: Warning count 15                                          |     |     |      |  | 027 127       |
| 0: No                                                            |     |     |      |  |               |
| COUNT: Warning count 16                                          |     |     |      |  | 027 128       |
| 0: No                                                            |     |     |      |  |               |
| COUNT: Warning count 17                                          |     |     |      |  | 027 129       |
| 0: No                                                            |     |     |      |  |               |
| COUNT: Warning count 18                                          |     |     |      |  | 027 130       |
| 0: No                                                            |     |     |      |  |               |
| COUNT: Warning count 19                                          |     |     |      |  | 027 131       |
| 0: No                                                            |     |     |      |  |               |
| COUNT: Warning count 20                                          |     |     |      |  | 027 132       |
| 0: No                                                            |     |     |      |  |               |
| COUNT: Warning count 21                                          |     |     |      |  | 027 133       |
| 0: No                                                            |     |     |      |  |               |
| COUNT: Warning count 22                                          |     |     |      |  | 027 134       |
| 0: No                                                            |     |     |      |  |               |
| COUNT: Warning count 23                                          |     |     |      |  | 027 135       |
| 0: No                                                            |     |     |      |  |               |
| COUNT: Warning count 24                                          |     |     |      |  | 027 136       |
| 0: No                                                            |     |     |      |  |               |
| COUNT: Warning count 1                                           |     |     |      |  | 217 191       |
| 0: No                                                            |     |     |      |  |               |
| COUNT: Warning count 2                                           |     |     |      |  | 217 192       |
| 0: No                                                            |     |     |      |  |               |
| COUNT: Warning count 3                                           |     |     |      |  | 217 193       |
| 0: No                                                            |     |     |      |  |               |
| COUNT: Warning count 4                                           |     |     |      |  | 217 194       |
| 0: No                                                            |     |     |      |  |               |
| Warning that the counter value has exceeded the set limit value. |     |     |      |  |               |

## 8.1.2

## Control and Testing

|        | Parameter                   |     |     |      |  | Address       |
|--------|-----------------------------|-----|-----|------|--|---------------|
|        | Default                     | Min | Max | Unit |  | Logic Diagram |
| Device | DVICE: Service info 031 080 |     |     |      |  | 031 080       |
|        | 0: No                       |     |     |      |  |               |

## Local control panel

| Parameter                                                            | Address |     |      |               |
|----------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                              | Min     | Max | Unit | Logic Diagram |
| LOC: Param. change enabl.                                            |         |     |      | 003 010       |
| 0: No                                                                |         |     |      |               |
| Setting the enable for changing values from the local control panel. |         |     |      |               |

“Logical”  
communication  
interface 1

| Parameter                                                                                                                                              | Address |     |      |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                | Min     | Max | Unit | Logic Diagram |
| COMM1: Sel.spontan.sig.test                                                                                                                            |         |     |      | 003 180       |
| 060 000: MAIN: Without function <span style="color: green;">Fig. 3-20, (p. 3-29)</span>                                                                |         |     |      |               |
| Signal selection for testing purposes.                                                                                                                 |         |     |      |               |
| COMM1: Test spont.sig.start                                                                                                                            |         |     |      | 003 184       |
| 0: don't execute <span style="color: green;">Fig. 3-20, (p. 3-29)</span>                                                                               |         |     |      |               |
| Triggering of transmission of a selected signal as “starting”.                                                                                         |         |     |      |               |
| COMM1: Test spont.sig. end                                                                                                                             |         |     |      | 003 186       |
| 0: don't execute <span style="color: green;">Fig. 3-20, (p. 3-29)</span>                                                                               |         |     |      |               |
| Triggering of transmission of a selected signal as “ending”.                                                                                           |         |     |      |               |
| COMM1: Sel. pos. dev.test                                                                                                                              |         |     |      | 221 105       |
| 0: Not assigned                                                                                                                                        |         |     |      |               |
| Select a device DEVxx for testing the transmission of switchgear device position in monitoring direction.                                              |         |     |      |               |
| COMM1: Test position dev.                                                                                                                              |         |     |      | 221 106       |
| 0: don't execute                                                                                                                                       |         |     |      |               |
| Carry out a test to check the transmission of switchgear device position in monitoring direction for the device selected at COMM1: Sel. pos. dev.test. |         |     |      |               |

“Logical”  
communication  
interface 2

| Parameter                                                      | Address |     |      |               |
|----------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                        | Min     | Max | Unit | Logic Diagram |
| COMM2: St.scan.MOVBUSmaster                                    |         |     |      | 103 104       |
| 0: don't execute                                               |         |     |      |               |
| Restart of the MODBUS master.                                  |         |     |      |               |
| COMM2: Sel.spontan.sig.test                                    |         |     |      | 103 180       |
| 060 000: MAIN: Without function                                |         |     |      |               |
| Signal selection for testing purposes.                         |         |     |      |               |
| COMM2: Test spont.sig.start                                    |         |     |      | 103 184       |
| 0: don't execute                                               |         |     |      |               |
| Triggering of transmission of a selected signal as "starting". |         |     |      |               |
| COMM2: Test spont.sig. end                                     |         |     |      | 103 186       |
| 0: don't execute                                               |         |     |      |               |
| Triggering of transmission of a selected signal as "ending".   |         |     |      |               |

IEC 61850  
Communication

| Parameter                       | Address |     |      |               |
|---------------------------------|---------|-----|------|---------------|
| Default                         | Min     | Max | Unit | Logic Diagram |
| IEC: Sel.spontan.sig.test       |         |     |      | 104 245       |
| 060 000: MAIN: Without function |         |     |      |               |
| IEC: Test spont.sig.start       |         |     |      | 104 246       |
| 0: don't execute                |         |     |      |               |
| IEC: Test spont.sig. end        |         |     |      | 104 247       |
| 0: don't execute                |         |     |      |               |
| IEC: Sel. pos. DEV test         |         |     |      | 104 248       |
| 0: Not assigned                 |         |     |      |               |
| IEC: Test position DEV          |         |     |      | 104 249       |
| 0: don't execute                |         |     |      |               |

Measured data input

| Parameter                               | Address |     |      |               |
|-----------------------------------------|---------|-----|------|---------------|
| Default                                 | Min     | Max | Unit | Logic Diagram |
| MEAS1: Reset Tmax USER                  |         |     |      | 003 045       |
| 0: don't execute                        |         |     |      |               |
| Resetting measured maximum temperature. |         |     |      |               |

## Binary and analog output

| Parameter                                                                                            | Address |     |      |                                      |
|------------------------------------------------------------------------------------------------------|---------|-----|------|--------------------------------------|
| Default                                                                                              | Min     | Max | Unit | Logic Diagram                        |
| OUTP: Reset latch. USER                                                                              |         |     |      | 021 009                              |
| 0: don't execute <a href="#">Fig. 3-47, (p. 3-73)</a>                                                |         |     |      |                                      |
| Reset of latched output relays from the user interface.                                              |         |     |      |                                      |
| OUTP: Relay assign. f.test                                                                           |         |     |      | 003 042                              |
| 060 000: MAIN: Without function <a href="#">Fig. 3-48, (p. 3-74)</a>                                 |         |     |      |                                      |
| Selection of the relay to be tested.                                                                 |         |     |      |                                      |
| OUTP: Relay test                                                                                     |         |     |      | 003 043                              |
| 0: don't execute <a href="#">Fig. 3-48, (p. 3-74)</a>                                                |         |     |      |                                      |
| The relay selected for testing is triggered for the duration set at OUTP: Hold-time for test.        |         |     |      |                                      |
| OUTP: Hold-time for test                                                                             |         |     |      | 003 044                              |
| 1                                                                                                    | 1       | 10  | s    | <a href="#">Fig. 3-48, (p. 3-74)</a> |
| Setting for the time period for which the selected output relay is triggered for functional testing. |         |     |      |                                      |

## Measured data output

| Parameter                                             | Address |     |      |               |
|-------------------------------------------------------|---------|-----|------|---------------|
| Default                                               | Min     | Max | Unit | Logic Diagram |
| MEASO: Reset output USER                              |         |     |      | 037 116       |
| 0: don't execute <a href="#">Fig. 3-51, (p. 3-76)</a> |         |     |      |               |
| Resetting the measured data output function.          |         |     |      |               |

## Main function

| Parameter                                                                                                                                                                                             | Address |     |      |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|---------------|
| Default                                                                                                                                                                                               | Min     | Max | Unit | Logic Diagram |
| MAIN: General reset USER                                                                                                                                                                              |         |     |      | 003 002       |
| 0: don't execute <span>Fig. 3-78, (p. 3-115)</span>                                                                                                                                                   |         |     |      |               |
| Reset of the following memories:                                                                                                                                                                      |         |     |      |               |
| <ul style="list-style-type: none"> <li>● All counters</li> <li>● LED indicators</li> <li>● Operating data memory</li> <li>● All memories for long-term recording</li> <li>● Event counters</li> </ul> |         |     |      |               |
| MAIN: Reset indicat. USER                                                                                                                                                                             |         |     |      | 021 010       |
| 0: don't execute <span>Fig. 3-78, (p. 3-115)</span>                                                                                                                                                   |         |     |      |               |
| Reset of the following displays:                                                                                                                                                                      |         |     |      |               |
| <ul style="list-style-type: none"> <li>● LED indicators</li> <li>● Fault data</li> </ul>                                                                                                              |         |     |      |               |
| MAIN: Res.IP,max,st.1 USER                                                                                                                                                                            |         |     |      | 003 033       |
| 0: don't execute <span>Fig. 3-59, (p. 3-96)</span>                                                                                                                                                    |         |     |      |               |
| The display of the stored maximum phase current is reset.                                                                                                                                             |         |     |      |               |
| MAIN: Res.IP,max,st.2 USER                                                                                                                                                                            |         |     |      | 101 151       |
| 0: don't execute                                                                                                                                                                                      |         |     |      |               |
| The display of the stored maximum phase current is reset.                                                                                                                                             |         |     |      |               |
| MAIN: Reset me.v.en,1 USER                                                                                                                                                                            |         |     |      | 003 032       |
| 0: don't execute <span>Fig. 3-69, (p. 3-103)</span>                                                                                                                                                   |         |     |      |               |
| The display of active and reactive energy output and input is reset.                                                                                                                                  |         |     |      |               |
| MAIN: Reset me.v.en,2 USER                                                                                                                                                                            |         |     |      | 101 150       |
| 0: don't execute                                                                                                                                                                                      |         |     |      |               |
| The display of active and reactive energy output and input is reset.                                                                                                                                  |         |     |      |               |
| MAIN: Group reset 1 USER                                                                                                                                                                              |         |     |      | 005 253       |
| 0: don't execute <span>Fig. 3-79, (p. 3-115)</span>                                                                                                                                                   |         |     |      |               |
| MAIN: Group reset 2 USER                                                                                                                                                                              |         |     |      | 005 254       |
| 0: don't execute <span>Fig. 3-79, (p. 3-115)</span>                                                                                                                                                   |         |     |      |               |
| Group of resetting commands.                                                                                                                                                                          |         |     |      |               |
| MAIN: Soft Warm restart                                                                                                                                                                               |         |     |      | 003 039       |
| 0: don't execute                                                                                                                                                                                      |         |     |      |               |
| A warm restart is carried out. The device functions as it does when the power supply is turned on.                                                                                                    |         |     |      |               |



| Parameter                                                                                                                                                                                                                                   |     |     |      | Address       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                                                                                                                     | Min | Max | Unit | Logic Diagram |
| MAIN: Warm restart                                                                                                                                                                                                                          |     |     |      | 010 166       |
| 0: don't execute                                                                                                                                                                                                                            |     |     |      |               |
| A warm restart is carried out. The device functions as it does when the power supply is turned on.                                                                                                                                          |     |     |      |               |
| MAIN: Soft Cold restart                                                                                                                                                                                                                     |     |     |      | 000 085       |
| 0: don't execute                                                                                                                                                                                                                            |     |     |      |               |
| A cold restart is carried out. A cold restart means that all settings and recordings are cleared. Parameter values used by the C434 after a cold restart have been selected in such a manner that the C434 is blocked after a cold restart. |     |     |      |               |
| MAIN: Cold restart                                                                                                                                                                                                                          |     |     |      | 009 254       |
| 0: don't execute                                                                                                                                                                                                                            |     |     |      |               |
| A cold restart is carried out. A cold restart means that all settings and recordings are cleared. Parameter values used by the C434 after a cold restart have been selected in such a manner that the C434 is blocked after a cold restart. |     |     |      |               |

#### Operating data recording

| Parameter                                                                  |     |     |      | Address       |
|----------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                    | Min | Max | Unit | Logic Diagram |
| OP_RC: Reset record. USER                                                  |     |     |      | 100 001       |
| 0: don't execute <span style="float: right;">Fig. 3-84, (p. 3-123)</span>  |     |     |      |               |
| The operating data memory and the counter for operation signals are reset. |     |     |      |               |

#### Monitoring signal recording

| Parameter                                                                 |     |     |      | Address       |
|---------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                   | Min | Max | Unit | Logic Diagram |
| MT_RC: Reset record. USER                                                 |     |     |      | 003 008       |
| 0: don't execute <span style="float: right;">Fig. 3-85, (p. 3-124)</span> |     |     |      |               |
| Reset of the monitoring signal memory.                                    |     |     |      |               |

Fault recording

| Parameter                                                                                                                                                            |     |     |                       | Address       |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----------------------|---------------|---------|
| Default                                                                                                                                                              | Min | Max | Unit                  | Logic Diagram |         |
| FT_RC: Trigger USER                                                                                                                                                  |     |     |                       |               | 003 041 |
| 0: don't execute                                                                                                                                                     |     |     | Fig. 3-86, (p. 3-125) |               |         |
| Fault recording is enabled from the local control panel for 500 ms.                                                                                                  |     |     |                       |               |         |
| FT_RC: Reset record. USER                                                                                                                                            |     |     |                       |               | 003 006 |
| 0: don't execute                                                                                                                                                     |     |     | Fig. 3-87, (p. 3-126) |               |         |
| Reset of the following memories:                                                                                                                                     |     |     |                       |               |         |
| <ul style="list-style-type: none"><li>● LED indicators</li><li>● Fault memory</li><li>● Fault counter</li><li>● Fault data</li><li>● Recorded fault values</li></ul> |     |     |                       |               |         |

Automatic  
synchronism check

| Parameter                                                                                                                                                                                                                  |     |     |      |               | Address                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|------------------------|
| Default                                                                                                                                                                                                                    | Min | Max | Unit | Logic Diagram |                        |
| ASC: Enable USER                                                                                                                                                                                                           |     |     |      |               | 003 136                |
| 0: don't execute                                                                                                                                                                                                           |     |     |      |               | Fig. 3-92, (p. 3-133)  |
| Automatic synchronism check is enabled from the local control panel.                                                                                                                                                       |     |     |      |               |                        |
| ASC: Disable USER                                                                                                                                                                                                          |     |     |      |               | 003 135                |
| 0: don't execute                                                                                                                                                                                                           |     |     |      |               | Fig. 3-92, (p. 3-133)  |
| Automatic synchronism check is disabled from the local control panel.                                                                                                                                                      |     |     |      |               |                        |
| ASC: AR close requ. USER                                                                                                                                                                                                   |     |     |      |               | 008 238                |
| 0: don't execute                                                                                                                                                                                                           |     |     |      |               | Fig. 3-94, (p. 3-135)  |
| A close request is issued with Automatic Reclose parameters. This will trigger the ASC functional operation. A close command is transmitted to the CB if the check of the ASC is positive.                                 |     |     |      |               |                        |
| ASC: MC close requ. USER                                                                                                                                                                                                   |     |     |      |               | 018 004                |
| 0: don't execute                                                                                                                                                                                                           |     |     |      |               | Fig. 3-95, (p. 3-136)  |
| A close request is issued from the integrated local control panel. This will trigger the ASC functional operation. A close command is transmitted to the CB if the check of the ASC is positive.                           |     |     |      |               |                        |
| ASC: Test AR close r.USER                                                                                                                                                                                                  |     |     |      |               | 008 237                |
| 0: don't execute                                                                                                                                                                                                           |     |     |      |               | Fig. 3-94, (p. 3-135)  |
| A close request is issued with Automatic Reclose parameters. This will trigger the ASC functional operation. No close command is transmitted to the CB if the check of the ASC is positive. Only a signal is issued.       |     |     |      |               |                        |
| ASC: Test MC close r.USER                                                                                                                                                                                                  |     |     |      |               | 018 005                |
| 0: don't execute                                                                                                                                                                                                           |     |     |      |               | Fig. 3-95, (p. 3-136)  |
| A close request is issued from the integrated local control panel. This will trigger the ASC functional operation. No close command is transmitted to the CB if the check of the ASC is positive. Only a signal is issued. |     |     |      |               |                        |
| ASC: Reset counters USER                                                                                                                                                                                                   |     |     |      |               | 003 089                |
| 0: don't execute                                                                                                                                                                                                           |     |     |      |               | Fig. 3-108, (p. 3-150) |
| The ASC counters are reset.                                                                                                                                                                                                |     |     |      |               |                        |

Programmable Logic

| Parameter                                                             |     |     |      |  | Address                |
|-----------------------------------------------------------------------|-----|-----|------|--|------------------------|
| Default                                                               | Min | Max | Unit |  | Logic Diagram          |
| LOGIC: Trigger 1                                                      |     |     |      |  | 034 038                |
| 0: don't execute                                                      |     |     |      |  | Fig. 3-116, (p. 3-161) |
| LOGIC: Trigger 2                                                      |     |     |      |  | 034 039                |
| 0: don't execute                                                      |     |     |      |  |                        |
| LOGIC: Trigger 3                                                      |     |     |      |  | 034 040                |
| 0: don't execute                                                      |     |     |      |  |                        |
| LOGIC: Trigger 4                                                      |     |     |      |  | 034 041                |
| 0: don't execute                                                      |     |     |      |  |                        |
| LOGIC: Trigger 5                                                      |     |     |      |  | 034 042                |
| 0: don't execute                                                      |     |     |      |  |                        |
| LOGIC: Trigger 6                                                      |     |     |      |  | 034 043                |
| 0: don't execute                                                      |     |     |      |  |                        |
| LOGIC: Trigger 7                                                      |     |     |      |  | 034 044                |
| 0: don't execute                                                      |     |     |      |  |                        |
| LOGIC: Trigger 8                                                      |     |     |      |  | 034 045                |
| 0: don't execute                                                      |     |     |      |  | Fig. 3-116, (p. 3-161) |
| Intervention in the logic at the appropriate point by a 100 ms pulse. |     |     |      |  |                        |

Binary counts

| Parameter                   |     |     |      |  | Address                |
|-----------------------------|-----|-----|------|--|------------------------|
| Default                     | Min | Max | Unit |  | Logic Diagram          |
| COUNT: Transmit counts USER |     |     |      |  | 217 008                |
| 0: don't execute            |     |     |      |  | Fig. 3-152, (p. 3-205) |
| Count transmission.         |     |     |      |  |                        |
| COUNT: Reset USER           |     |     |      |  | 217 003                |
| 0: don't execute            |     |     |      |  | Fig. 3-152, (p. 3-205) |
| Count reset.                |     |     |      |  |                        |

8.1.3 Operating Data Recording

Operating data recording

| Parameter                                   |     |      |      |  | Address               |
|---------------------------------------------|-----|------|------|--|-----------------------|
| Default                                     | Min | Max  | Unit |  | Logic Diagram         |
| OP_RC: Operat. data record.                 |     |      |      |  | 003 024               |
| 0                                           | 0   | 1000 |      |  | Fig. 3-84, (p. 3-123) |
| Point of entry into the operating data log. |     |      |      |  |                       |

Monitoring signal recording

| Parameter                                      |     |     |                       | Address       |  |  |         |
|------------------------------------------------|-----|-----|-----------------------|---------------|--|--|---------|
| Default                                        | Min | Max | Unit                  | Logic Diagram |  |  |         |
| MT_RC: Mon. signal record.                     |     |     |                       |               |  |  | 003 001 |
| 0                                              | 0   | 30  | Fig. 3-85, (p. 3-124) |               |  |  |         |
| Point of entry into the monitoring signal log. |     |     |                       |               |  |  |         |

8.2 Events

8.2.1 Event Counters

Main function

| Parameter                                                                                            |     |     |                        | Address       |
|------------------------------------------------------------------------------------------------------|-----|-----|------------------------|---------------|
| Default                                                                                              | Min | Max | Unit                   | Logic Diagram |
| MAIN: CB1 act. oper. cap.                                                                            |     |     |                        | 221 087       |
| 1                                                                                                    | 1   | 99  |                        |               |
| MAIN: CB2 act. oper. cap.                                                                            |     |     |                        | 221 091       |
| 1                                                                                                    | 1   | 99  |                        |               |
| Setting for the maximum number of CB operations for an ARC cycle (or for a limited time period).     |     |     |                        |               |
| MAIN: No. motor drive op.                                                                            |     |     |                        | 221 025       |
| 0: don't execute                                                                                     |     |     | Fig. 3-137, (p. 3-186) |               |
| Number of times external devices with direct motor control are activated during the monitoring time. |     |     |                        |               |
| MAIN: No.ovfl.act.en.out,1                                                                           |     |     |                        | 009 090       |
| 0: don't execute                                                                                     |     |     | Fig. 3-69, (p. 3-103)  |               |
| MAIN: No.ovfl.act.en.out 2                                                                           |     |     |                        | 101 160       |
| 0: don't execute                                                                                     |     |     |                        |               |
| Counter for the number of times the measuring range of the active energy output was exceeded.        |     |     |                        |               |
| Note: The maximum value of this counter is 10000.                                                    |     |     |                        |               |
| MAIN: No.ovfl.act.en.inp,2                                                                           |     |     |                        | 009 091       |
| 0: don't execute                                                                                     |     |     | Fig. 3-69, (p. 3-103)  |               |
| MAIN: No.ovfl.act.en.inp 2                                                                           |     |     |                        | 101 161       |
| 0: don't execute                                                                                     |     |     |                        |               |
| Counter for the number of times the measuring range of the active energy input was exceeded.         |     |     |                        |               |
| Note: The maximum value of this counter is 10000.                                                    |     |     |                        |               |
| MAIN: No.ovfl.reac.en.out1                                                                           |     |     |                        | 009 092       |
| 0: don't execute                                                                                     |     |     | Fig. 3-69, (p. 3-103)  |               |
| MAIN: No.ovfl.reac.en.out2                                                                           |     |     |                        | 101 162       |
| 0: don't execute                                                                                     |     |     |                        |               |
| Counter for the number of times the measuring range of the reactive energy output was exceeded.      |     |     |                        |               |
| Note: The maximum value of this counter is 10000.                                                    |     |     |                        |               |
| MAIN: No.ovfl.reac.en.inp1                                                                           |     |     |                        | 009 093       |
| 0: don't execute                                                                                     |     |     | Fig. 3-69, (p. 3-103)  |               |

Operating data  
recording

| Parameter                                                                                                                                           |     |     |      | Address       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                                                             | Min | Max | Unit | Logic Diagram |
| MAIN: No.ovfl.reac.en.inp2                                                                                                                          |     |     |      | 101 163       |
| 0: don't execute                                                                                                                                    |     |     |      |               |
| Counter for the number of times the measuring range of the reactive energy input was exceeded.<br>Note: The maximum value of this counter is 10000. |     |     |      |               |

Monitoring signal  
recording

| Parameter                                              |     |      |                       | Address       |         |
|--------------------------------------------------------|-----|------|-----------------------|---------------|---------|
| Default                                                | Min | Max  | Unit                  | Logic Diagram |         |
| OP_RC: No. oper. data sig.                             |     |      |                       |               | 100 002 |
| 0                                                      | 0   | 3000 | Fig. 3-84, (p. 3-123) |               |         |
| Number of signals stored in the operating data memory. |     |      |                       |               |         |

| Parameter                                                 |     |     |                       | Address       |         |
|-----------------------------------------------------------|-----|-----|-----------------------|---------------|---------|
| Default                                                   | Min | Max | Unit                  | Logic Diagram |         |
| MT_RC: No. monit. signals                                 |     |     |                       |               | 004 019 |
| 0                                                         | 0   | 30  | Fig. 3-85, (p. 3-124) |               |         |
| Number of signals stored in the monitoring signal memory. |     |     |                       |               |         |

## Fault recording

| Parameter            |     |      |                       | Address       |         |
|----------------------|-----|------|-----------------------|---------------|---------|
| Default              | Min | Max  | Unit                  | Logic Diagram |         |
| FT_RC: No. of faults |     |      |                       |               | 004 020 |
| 0                    | 0   | 9999 | Fig. 3-86, (p. 3-125) |               |         |
| Number of faults.    |     |      |                       |               |         |

Automatic  
synchronism check

| Parameter                                          |     |     |      | Address                |  |  |         |
|----------------------------------------------------|-----|-----|------|------------------------|--|--|---------|
| Default                                            | Min | Max | Unit | Logic Diagram          |  |  |         |
| ASC: No. RC aft. man.clos                          |     |     |      |                        |  |  | 004 009 |
| 0: don't execute                                   |     |     |      | Fig. 3-108, (p. 3-150) |  |  |         |
| Number of reclosures after a manual close request. |     |     |      |                        |  |  |         |
| ASC: No. close requests                            |     |     |      |                        |  |  | 009 033 |
| 0: don't execute                                   |     |     |      | Fig. 3-108, (p. 3-150) |  |  |         |
| Number of close requests.                          |     |     |      |                        |  |  |         |
| ASC: No. close rejections                          |     |     |      |                        |  |  | 009 034 |
| 0: don't execute                                   |     |     |      | Fig. 3-108, (p. 3-150) |  |  |         |
| Number of close rejections.                        |     |     |      |                        |  |  |         |



## External device

| Parameter                |     |       |      |                        | Address       |
|--------------------------|-----|-------|------|------------------------|---------------|
| Default                  | Min | Max   | Unit |                        | Logic Diagram |
| DEV01: Operation counter |     |       |      |                        | 210 043       |
| 0                        | 0   | 65535 |      | Fig. 3-138, (p. 3-186) |               |
| DEV02: Operation counter |     |       |      |                        | 210 093       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV03: Operation counter |     |       |      |                        | 210 143       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV04: Operation counter |     |       |      |                        | 210 193       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV05: Operation counter |     |       |      |                        | 210 243       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV06: Operation counter |     |       |      |                        | 211 043       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV07: Operation counter |     |       |      |                        | 211 093       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV08: Operation counter |     |       |      |                        | 211 143       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV09: Operation counter |     |       |      |                        | 211 193       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV10: Operation counter |     |       |      |                        | 211 243       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV11: Operation counter |     |       |      |                        | 212 043       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV12: Operation counter |     |       |      |                        | 212 093       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV13: Operation counter |     |       |      |                        | 212 143       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV14: Operation counter |     |       |      |                        | 212 193       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV15: Operation counter |     |       |      |                        | 212 243       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV16: Operation counter |     |       |      |                        | 213 043       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV17: Operation counter |     |       |      |                        | 213 093       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV18: Operation counter |     |       |      |                        | 213 143       |
| 0                        | 0   | 65535 |      |                        |               |
| DEV19: Operation counter |     |       |      |                        | 213 193       |
| 0                        | 0   | 65535 |      |                        |               |

| Parameter                                                                                                           |     |       |      | Address       |
|---------------------------------------------------------------------------------------------------------------------|-----|-------|------|---------------|
| Default                                                                                                             | Min | Max   | Unit | Logic Diagram |
| DEV20: Operation counter                                                                                            |     |       |      | 213 243       |
| 0                                                                                                                   | 0   | 65535 |      |               |
| DEV21: Operation counter                                                                                            |     |       |      | 214 043       |
| 0                                                                                                                   | 0   | 65535 |      |               |
| DEV22: Operation counter                                                                                            |     |       |      | 214 093       |
| 0                                                                                                                   | 0   | 65535 |      |               |
| DEV23: Operation counter                                                                                            |     |       |      | 214 143       |
| 0                                                                                                                   | 0   | 65535 |      |               |
| DEV24: Operation counter                                                                                            |     |       |      | 214 193       |
| 0                                                                                                                   | 0   | 65535 |      |               |
| Number of switching operations made. It is also possible to manually set this counter to any value from 0 to 65535. |     |       |      |               |
| DEV01: Dev. op. capability                                                                                          |     |       |      | 210 003       |
| 1                                                                                                                   | 1   | 99    |      |               |
| DEV02: Dev. op. capability                                                                                          |     |       |      | 210 053       |
| 1                                                                                                                   | 1   | 99    |      |               |
| DEV03: Dev. op. capability                                                                                          |     |       |      | 210 103       |
| 1                                                                                                                   | 1   | 99    |      |               |
| DEV04: Dev. op. capability                                                                                          |     |       |      | 210 153       |
| 1                                                                                                                   | 1   | 99    |      |               |
| DEV05: Dev. op. capability                                                                                          |     |       |      | 210 203       |
| 1                                                                                                                   | 1   | 99    |      |               |
| DEV06: Dev. op. capability                                                                                          |     |       |      | 211 003       |
| 1                                                                                                                   | 1   | 99    |      |               |
| DEV07: Dev. op. capability                                                                                          |     |       |      | 211 053       |
| 1                                                                                                                   | 1   | 99    |      |               |
| DEV08: Dev. op. capability                                                                                          |     |       |      | 211 103       |
| 1                                                                                                                   | 1   | 99    |      |               |
| DEV09: Dev. op. capability                                                                                          |     |       |      | 211 153       |
| 1                                                                                                                   | 1   | 99    |      |               |
| DEV10: Dev. op. capability                                                                                          |     |       |      | 211 203       |
| 1                                                                                                                   | 1   | 99    |      |               |
| DEV11: Dev. op. capability                                                                                          |     |       |      | 212 003       |
| 1                                                                                                                   | 1   | 99    |      |               |
| DEV12: Dev. op. capability                                                                                          |     |       |      | 212 053       |
| 1                                                                                                                   | 1   | 99    |      |               |
| DEV13: Dev. op. capability                                                                                          |     |       |      | 212 103       |
| 1                                                                                                                   | 1   | 99    |      |               |

| Parameter                                                                                                             |     |     |      | Address       |
|-----------------------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| Default                                                                                                               | Min | Max | Unit | Logic Diagram |
| DEV14: Dev. op. capability                                                                                            |     |     |      | 212 153       |
| 1                                                                                                                     | 1   | 99  |      |               |
| DEV15: Dev. op. capability                                                                                            |     |     |      | 212 203       |
| 1                                                                                                                     | 1   | 99  |      |               |
| DEV16: Dev. op. capability                                                                                            |     |     |      | 213 003       |
| 1                                                                                                                     | 1   | 99  |      |               |
| DEV17: Dev. op. capability                                                                                            |     |     |      | 213 053       |
| 1                                                                                                                     | 1   | 99  |      |               |
| DEV18: Dev. op. capability                                                                                            |     |     |      | 213 103       |
| 1                                                                                                                     | 1   | 99  |      |               |
| DEV19: Dev. op. capability                                                                                            |     |     |      | 213 153       |
| 1                                                                                                                     | 1   | 99  |      |               |
| DEV20: Dev. op. capability                                                                                            |     |     |      | 213 203       |
| 1                                                                                                                     | 1   | 99  |      |               |
| DEV21: Dev. op. capability                                                                                            |     |     |      | 214 003       |
| 1                                                                                                                     | 1   | 99  |      |               |
| DEV22: Dev. op. capability                                                                                            |     |     |      | 214 053       |
| 1                                                                                                                     | 1   | 99  |      |               |
| DEV23: Dev. op. capability                                                                                            |     |     |      | 214 103       |
| 1                                                                                                                     | 1   | 99  |      |               |
| DEV24: Dev. op. capability                                                                                            |     |     |      | 214 153       |
| 1                                                                                                                     | 1   | 99  |      |               |
| Number of remaining switching operations. It is also possible to manually set this counter to any value from 1 to 99. |     |     |      |               |

8.2.2 Measured Event Data

Automatic  
synchronism check

| Parameter                                                                                                                                                                                                       |        |       |      | Address                                                                    |  |  |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------|------|----------------------------------------------------------------------------|--|--|---------|
| Default                                                                                                                                                                                                         | Min    | Max   | Unit | Logic Diagram                                                              |  |  |         |
| ASC: Voltage Vref                                                                                                                                                                                               |        |       |      |                                                                            |  |  | 004 087 |
| Not measured                                                                                                                                                                                                    | 0.000  | 3.000 | Vnom | Fig. 3-107, (p. 3-150)                                                     |  |  |         |
| ASC: Volt. sel. meas.loop                                                                                                                                                                                       |        |       |      |                                                                            |  |  | 004 088 |
| Not measured                                                                                                                                                                                                    | 0.000  | 3.000 | Vnom | Fig. 3-107, (p. 3-150)                                                     |  |  |         |
| ASC: Volt. magnit. diff.                                                                                                                                                                                        |        |       |      |                                                                            |  |  | 004 091 |
| Not measured                                                                                                                                                                                                    | -3.000 | 3.000 | Vnom | Fig. 3-103, (p. 3-145)<br>Fig. 3-104, (p. 3-147)<br>Fig. 3-107, (p. 3-150) |  |  |         |
| Display of the difference between amplitudes of the measurement loop voltage and the reference voltage during a close request, referred to V <sub>nom</sub> . The display only appears if ASC is operating.     |        |       |      |                                                                            |  |  |         |
| ASC: Angle difference                                                                                                                                                                                           |        |       |      |                                                                            |  |  | 004 089 |
| Not measured                                                                                                                                                                                                    | -180.0 | 180.0 | °    | Fig. 3-103, (p. 3-145)<br>Fig. 3-104, (p. 3-147)<br>Fig. 3-107, (p. 3-150) |  |  |         |
| Display of the angle difference between measured voltage and reference voltage at the time of the close request (in degrees).                                                                                   |        |       |      |                                                                            |  |  |         |
| This display only appears when the automatic synchronism check function is active.                                                                                                                              |        |       |      |                                                                            |  |  |         |
| ASC: Frequ. difference                                                                                                                                                                                          |        |       |      |                                                                            |  |  | 004 090 |
| Not measured                                                                                                                                                                                                    | -5.00  | 5.00  | Hz   | Fig. 3-103, (p. 3-145)<br>Fig. 3-104, (p. 3-147)<br>Fig. 3-107, (p. 3-150) |  |  |         |
| Display of the frequency difference between measured voltage and reference voltage at the time of the close request (in Hz). This display only appears when the automatic synchronism check function is active. |        |       |      |                                                                            |  |  |         |

## 8.2.3 Event Recording

|                 | Parameter                          |     |      |      | Address       |  |  |         |
|-----------------|------------------------------------|-----|------|------|---------------|--|--|---------|
|                 | Default                            | Min | Max  | Unit | Logic Diagram |  |  |         |
| Fault recording | FT_RC: Fault recording 1           |     |      |      |               |  |  | 003 000 |
|                 | 0                                  | 0   | 9999 |      |               |  |  |         |
|                 | FT_RC: Fault recording 2           |     |      |      |               |  |  | 033 001 |
|                 | 0                                  | 0   | 9999 |      |               |  |  |         |
|                 | FT_RC: Fault recording 3           |     |      |      |               |  |  | 033 002 |
|                 | 0                                  | 0   | 9999 |      |               |  |  |         |
|                 | FT_RC: Fault recording 4           |     |      |      |               |  |  | 033 003 |
|                 | 0                                  | 0   | 9999 |      |               |  |  |         |
|                 | FT_RC: Fault recording 5           |     |      |      |               |  |  | 033 004 |
|                 | 0                                  | 0   | 9999 |      |               |  |  |         |
|                 | FT_RC: Fault recording 6           |     |      |      |               |  |  | 033 005 |
|                 | 0                                  | 0   | 9999 |      |               |  |  |         |
|                 | FT_RC: Fault recording 7           |     |      |      |               |  |  | 033 006 |
|                 | 0                                  | 0   | 9999 |      |               |  |  |         |
|                 | FT_RC: Fault recording 8           |     |      |      |               |  |  | 033 007 |
|                 | 0                                  | 0   | 9999 |      |               |  |  |         |
|                 | Point of entry into the fault log. |     |      |      |               |  |  |         |



## 9

## IEC 61850 Settings via IED Configurator

This chapter lists all IEC 61850-specific settings, that are carried out with the configuration tool “IED Configurator”.

The sequence in which the settings are listed and described in this chapter corresponds to their sequence in the menu tree of the “IED Configurator”.

However, only those setting parameters are described that are mandatory for establishing the IEC 61850 communication.

Further setting parameters are listed in the “Settings” chapter under the function groups IEC and GOOSE. A list of all available *Logical Nodes* can be found in a separate document.

9.1 Manage IED

The menu item “Manage IED” allows for establishing a connection between the “IED Configurator” and the device.

The C434 features two memory “banks” one of which includes the active setting parameters. The other memory bank is used with the configuration procedure for parameters via “IED Configurator” or operating program.

Toggling between active and inactive memory bank is carried out either by executing the parameter IEC: Switch Config. Bank or via “IED Configurator” (after the connection has been established) by pressing the “Switch Banks” button.

Active Bank

| Parameter                                                                                                                                                                                                 |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| SCL File ID                                                                                                                                                                                               |  |
| Name of the configuration bank currently valid. Setting is carried out with the <i>IED Configurator</i> , after a connection with the device has been established (via menu item “Manage IED”).           |  |
| SCL File Version                                                                                                                                                                                          |  |
| Version number of the configuration bank currently valid. Setting is carried out with the <i>IED Configurator</i> , after a connection with the device has been established (via menu item “Manage IED”). |  |

Inactive Bank

| Parameter                                                                                                                                                                                          |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| SCL File ID                                                                                                                                                                                        |  |
| Name of the inactive configuration bank. Setting is carried out with the <i>IED Configurator</i> , after a connection with the device has been established (via menu item “Manage IED”).           |  |
| SCL File Version                                                                                                                                                                                   |  |
| Version number of the inactive configuration bank. Setting is carried out with the <i>IED Configurator</i> , after a connection with the device has been established (via menu item “Manage IED”). |  |



9.2

IED Details

The category “IED Details” contains several settings that characterize the device as well as the SCL file, which identifies the IEC 61850 configuration.

| SCL Details                                                                                                                                                                                | Parameter                                                                                                                                                                                                                                                               |  | Default Value |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------|---------|
|                                                                                                                                                                                            | SCL File ID                                                                                                                                                                                                                                                             |  | CX 434        |         |
|                                                                                                                                                                                            | Identification of the .MCL configuration file. If required, this preset value may be modified by, for example, entering a bay name.                                                                                                                                     |  |               |         |
|                                                                                                                                                                                            | SCL File Version                                                                                                                                                                                                                                                        |  | 230.2.01      |         |
| Specific value to identify the IEC 61850 data model and configuration. If required, this preset value may be modified by, for example, identifying the revision states during engineering. |                                                                                                                                                                                                                                                                         |  |               |         |
| IED Details                                                                                                                                                                                | Parameter                                                                                                                                                                                                                                                               |  |               | Address |
|                                                                                                                                                                                            | Name                                                                                                                                                                                                                                                                    |  |               | 104 057 |
|                                                                                                                                                                                            | Explicitly assigned device name for the function in the system (IED); is part of the Logical Device Name.                                                                                                                                                               |  |               |         |
|                                                                                                                                                                                            | Important note: According to the IEC standard the name must consist of only letters (A..Z, a..z), digits (0..9) and underscore characters ( _ ), and the name must start with a letter. Note that a non-standard name causes problems with the IEC 61850 communication. |  |               |         |
| Template Details                                                                                                                                                                           | Parameter                                                                                                                                                                                                                                                               |  |               |         |
|                                                                                                                                                                                            | ICD Template                                                                                                                                                                                                                                                            |  |               |         |
|                                                                                                                                                                                            | SCL Schema Version                                                                                                                                                                                                                                                      |  |               |         |
|                                                                                                                                                                                            | Description                                                                                                                                                                                                                                                             |  |               |         |
|                                                                                                                                                                                            | Type                                                                                                                                                                                                                                                                    |  |               |         |
|                                                                                                                                                                                            | Configuration Revision                                                                                                                                                                                                                                                  |  |               |         |
|                                                                                                                                                                                            | Supported Models                                                                                                                                                                                                                                                        |  |               |         |
| The values listed in the column “Template Details” only provide information. They are preset and cannot be modified.                                                                       |                                                                                                                                                                                                                                                                         |  |               |         |

### 9.3 Communications

The category “Communications” contains the general network-related settings.

#### Connected Sub- Network

| Parameter                                                       | Default Value |  |
|-----------------------------------------------------------------|---------------|--|
| Connected Sub-Network                                           | NONE          |  |
| Optional name available to identify the Ethernet network.       |               |  |
| Access Point                                                    | AP1           |  |
| Part of the communications control; preset, cannot be modified. |               |  |

#### Address Configuration

| Parameter                                                                                                                                           | Default Value | Address |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------|
| IP Address                                                                                                                                          | 0.0.0.0       | 104 001 |
| Assigned IP address of the C434 for the server function in the system.                                                                              |               |         |
| SubNet Mask                                                                                                                                         | 0.0.0.0       | 104 005 |
| The subnet mask defines which part of the IP address is addressed by the sub-network and which part by the device that is logged-on to the network. |               |         |
| Gateway Address                                                                                                                                     | 0.0.0.0       | 104 011 |
| This parameter shows the IPv4 address of the network gateway for communication links to clients outside of the local network.                       |               |         |

#### General Configuration

| Parameter                                                                                                                                                                         | Default Value |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--|
| Media                                                                                                                                                                             | Fibre         |  |
| Network hardware provided as fiber optics (“Fibre”) or twisted pair copper wires (“Copper”).                                                                                      |               |  |
| TCP Keepalive                                                                                                                                                                     | 5 seconds     |  |
| Communication monitoring at TCP level.                                                                                                                                            |               |  |
| Database Lock Timeout                                                                                                                                                             | 2 minutes     |  |
| Return time period for setting procedures that have commenced. (The default value above is in seconds. The <i>IED Configurator</i> , however, displays converts this to minutes.) |               |  |

## 9.4 SNTP

The category “SNTP” contains the clock synchronization settings.

### 9.4.1 General Config

| Client Operation | Parameter                                                                                         | Default Value       |  |
|------------------|---------------------------------------------------------------------------------------------------|---------------------|--|
|                  | Poll Rate (seconds)                                                                               | 64                  |  |
|                  | Polling interval for clock synchronization.                                                       |                     |  |
|                  | Accepted Stratum Level                                                                            | All levels (0 - 15) |  |
|                  | Quality criterion to accept an SNTP server for clock synchronization; preset, cannot be modified. |                     |  |

### 9.4.2 External Server 1

Settings for the primary clock synchronization server.

Note that all values except IP Address and the “Use Anycast” button are usually disabled and may be accepted only when imported from an XML configuration file.

| External Server Parameters | Parameter                                                                                                                                                                                                                                         | Default Value | Address |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------|
|                            | IP Address                                                                                                                                                                                                                                        | 0.0.0.0       | 104 202 |
|                            | IP address of the preferred server used for clock synchronization.<br>Clicking the “Use Anycast” button in the <i>IED Configurator</i> changes the value such that any server in the local network is appointed to provide clock synchronization. |               |         |

### 9.4.3 External Server 2

Settings for the primary clock synchronization server.

Note that all values except IP Address and the “Use Anycast” button are usually disabled and may be accepted only when imported from an XML configuration file.

| External Server Parameters | Parameter                                                                                                                                                                                                                                      | Default Value | Address |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------|
|                            | IP Address                                                                                                                                                                                                                                     | 0.0.0.0       | 104 210 |
|                            | IP address of the backup server used for clock synchronization.<br>Clicking the “Use Anycast” button in the <i>IED Configurator</i> changes the value such that any server in the local network is appointed to provide clock synchronization. |               |         |

9.5 Dataset Definitions

Dataset Definitions

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| Explicitly (and uniquely) assigned name for the dataset.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| Location                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| Saving datasets at System/LLN0 is compulsory.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
| Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| <p>Content (data objects, data attributes) of a dataset.</p> <p>The “GOOSE Capacity” display allows for checking the length of a dataset for less than 1500 bytes to permit transmission in GOOSE messages.</p> <p>Note: It is not possible to read the IEC configuration back from the C434 if the “Dataset” sizes exceed the GOOSE size limit significantly. Therefore it is recommended to limit the “Dataset” size(s) to 100% of the GOOSE capacity. Too large a dataset can spoil IEC61850 communication. Hence, the dataset size limit of 100% of the GOOSE capacity should not be exceeded, neither for GOOSE nor for reports.</p> |  |

## 9.6 GOOSE Publishing

### 9.6.1 System/LLN0

| Network Parameters | Parameter                                                                        | Default Value     |  |
|--------------------|----------------------------------------------------------------------------------|-------------------|--|
|                    | Multicast MAC Address                                                            | 01-0C-CD-01-00-00 |  |
|                    | Virtual MAC address that the sending device provides as the destination; preset. |                   |  |
|                    | Application ID (hex)                                                             | 0000              |  |
|                    | Explicitly (and uniquely) assigned ID-number of the GOOSE.                       |                   |  |
|                    | VLAN Identifier (hex)                                                            | 0                 |  |
|                    | ID-number of the virtual LAN with which the GOOSE is sent; preset.               |                   |  |
|                    | VLAN Priority                                                                    | 4                 |  |
|                    | Priority with which the GOOSE is sent in the virtual LAN; preset.                |                   |  |

| Repeat Message<br>Transmission<br>Parameters | Parameter                                                                                                                         | Default Value |  |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------|--|
|                                              | Minimum Cycle Time                                                                                                                | 10 ms         |  |
|                                              | First send repetition of the GOOSE occurring after the set time period; preset.                                                   |               |  |
|                                              | Maximum Cycle Time                                                                                                                | 1 s           |  |
|                                              | Continuous send repetition of the GOOSE occurring after the set time period; preset.                                              |               |  |
|                                              | Increment                                                                                                                         | 900           |  |
|                                              | Specification factor for the transition of time intervals for GOOSE send repetitions from the first to the continuous repetition. |               |  |

Message Data  
Parameters

| Parameter                                                           |  | Default Value                      |  |
|---------------------------------------------------------------------|--|------------------------------------|--|
| GOOSE Identifier                                                    |  | TEMPLATESystem/<br>LLN0\$GO\$gcb01 |  |
| GOOSE ID consisting of the Device Name and the GOOSE Control Block. |  |                                    |  |
| Dataset Reference                                                   |  |                                    |  |
| Name of the dataset assigned to the GOOSE.                          |  |                                    |  |
| Configuration Revision                                              |  | 1                                  |  |
| Revision status of the configuration.                               |  |                                    |  |

9.7

GOOSE Subscribing

9.7.1

Mapped Inputs

Source Network  
Parameters

| Parameter                                             |  | Default Value     |  |
|-------------------------------------------------------|--|-------------------|--|
| Multicast MAC Address                                 |  | 01-0C-CD-01-00-00 |  |
| Virtual MAC address used as a receive filter; preset. |  |                   |  |
| Application ID (hex)                                  |  | 0                 |  |
| ID-number of the GOOSE.                               |  |                   |  |

GOOSE Source  
Parameters

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Default Value |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--|
| Source Path                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |  |
| Information data attribute in the transmitting device.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |  |
| GOOSE Identifier                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |  |
| ID of the GOOSE in the transmitting device.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |  |
| Dataset Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |  |
| Name of the dataset assigned to the GOOSE in the transmitting device.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |  |
| Configuration Revision                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0             |  |
| Configuration revision status of the transmitting device.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |  |
| Data Obj Index                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1             |  |
| Position index of the data object within the GOOSE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |  |
| Data Obj Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Unknown       |  |
| Structure of the data object; possible settings: <ul style="list-style-type: none"><li>● <i>Unknown</i></li><li>● <i>Boolean</i> (logical value)</li><li>● <i>Int8</i> (Integer, with 8 digits)</li><li>● <i>Int16</i> (Integer, with 16 digits)</li><li>● <i>Int32</i> (Integer, with 32 digits)</li><li>● <i>UInt8</i> (Positive integer, with 8 digits)</li><li>● <i>UInt16</i> (Positive integer, with 16 digits)</li><li>● <i>UInt32</i> (Positive integer, with 32 digits)</li><li>● <i>Float</i> (Floating-point number)</li><li>● <i>BStr2</i> (Binary state, with 2 digits)</li><li>● <i>SPS</i> (Single-pole signal)</li><li>● <i>DPS</i> (Two-pole signal)</li></ul> |               |  |
| Quality Obj Index                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1             |  |
| Distance of the quality descriptor to the data object if not preset. The quality of the received information is to be tested if such has been configured.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |  |



Destination  
Parameters

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Default Value |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Evaluation Expression                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Equal to      |
| <p>Criteria to check the received information content by comparing it with a set integer value; the parameter is not supported in the device.</p> <ul style="list-style-type: none"> <li>● <i>Equal to</i> (Compared to: equal)</li> <li>● <i>Not equal to</i> (Compared to: unequal)</li> <li>● <i>Greater than</i> (Compared to: greater)</li> <li>● <i>Less than</i> (Compared to: less)</li> <li>● <i>Pass through</i> (Do not compare)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                       |               |
| Default Input Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | False         |
| <p>Default value for the information in case GOOSE receipt has failed.</p> <ul style="list-style-type: none"> <li>● <i>False</i> – not set</li> <li>● <i>True</i> – set</li> <li>● <i>Last Known Value</i> – retain last value received</li> <li>● <i>Double Point: intermediate (00)</i> – switching device in intermediate position</li> <li>● <i>Double Point: Off (01)</i> – switching device open</li> <li>● <i>Double Point: On (10)</i> – switching device closed</li> <li>● <i>Double Point: Bad state (11)</i> – switching device in intermediate position</li> </ul>                                                                                                                                                                                                                                                                               |               |
| Invalidity Quality bits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |               |
| <p>Quality criterion, which is to be tested.</p> <ul style="list-style-type: none"> <li>● <i>Invalid / Questionable</i>: Invalid / questionable</li> <li>● <i>Source</i>: Information source is faulty</li> <li>● <i>Relay test</i>: Sending device is set to test mode</li> <li>● <i>OperatorBlocked</i>: Blocked by operator</li> </ul> <p>and</p> <ul style="list-style-type: none"> <li>● <i>Overflow</i>: Measured value has exceeded its capacity</li> <li>● <i>OutOfRange</i>: Measured value has exceeded its range</li> <li>● <i>BadReference</i>: Referenced value is faulty</li> <li>● <i>Oscillatory</i>: Value is volatile</li> <li>● <i>Failure</i>: Faulty</li> <li>● <i>OldData</i>: Information is out-of-date</li> <li>● <i>Inconsistent</i>: Information is unreliable</li> <li>● <i>Inaccurate</i>: Information is inaccurate</li> </ul> |               |

9.8 Report Control Blocks

9.8.1 System/LLN0

Report Parameters

| Parameter                                                                                                                      | Default Value                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Report Type                                                                                                                    |                                                                                                                                                                                    |
| Report type: <ul style="list-style-type: none"><li>● <i>Unbuffered</i> (updating)</li><li>● <i>Buffered</i> (saving)</li></ul> |                                                                                                                                                                                    |
| Report ID                                                                                                                      | TEMPLATESystem/<br>LLN0\$RP<br>\$urcbA, ...,<br>TEMPLATESystem/<br>LLN0\$RP<br>\$urcbP, ...,<br>TEMPLATESystem/<br>LLN0\$BR<br>\$brcbA, ...,<br>TEMPLATESystem/<br>LLN0\$BR\$brcbH |
| Report ID consisting of the Device Name and the Report Control Block.                                                          |                                                                                                                                                                                    |
| Dataset Reference                                                                                                              |                                                                                                                                                                                    |
| Name of the dataset assigned to the report.                                                                                    |                                                                                                                                                                                    |
| Configuration Revision                                                                                                         | 1                                                                                                                                                                                  |
| Revision status of the configuration.                                                                                          |                                                                                                                                                                                    |

## 9.9 Controls

### 9.9.1 Control Objects

#### Control Object Parameters

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Default Value              |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--|
| ctlModel                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | sbo-with-enhanced-security |  |
| To control external devices the following operating modes can be set: <ul style="list-style-type: none"> <li>● <i>Status only</i> (manually operated switching device)</li> <li>● <i>Direct control with enhanced security</i> (direct command issue with extended monitoring of command effecting)</li> <li>● <i>SBO (Select before operate) with enhanced security</i> (switching device selection procedure with extended monitoring of command effecting)</li> </ul> |                            |  |
| sboTimeout                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 120000                     |  |
| Return time period after selection without issuing a command.                                                                                                                                                                                                                                                                                                                                                                                                            |                            |  |

### 9.9.2 Uniqueness of Control

#### Source Network Parameters

| Parameter                                             | Default Value     |  |
|-------------------------------------------------------|-------------------|--|
| Multicast MAC Address                                 | 01-0C-CD-01-00-00 |  |
| Virtual MAC address used as a receive filter; preset. |                   |  |
| Application ID (hex)                                  | 0                 |  |
| ID-number of the GOOSE.                               |                   |  |

## GOOSE Source Parameters

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Default Value |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--|
| Source Path                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |               |  |
| Information data attribute in the transmitting device.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |  |
| GOOSE Identifier                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |               |  |
| ID of the GOOSE in the transmitting device.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |               |  |
| Dataset Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |  |
| Name of the dataset assigned to the GOOSE in the transmitting device.                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |  |
| Configuration Revision                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0             |  |
| Configuration revision status of the transmitting device.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |  |
| Data Obj Index                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1             |  |
| Position index of the data object within the GOOSE.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |  |
| Default Input Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | True          |  |
| Default value for the information in case GOOSE receipt has failed:                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |  |
| <ul style="list-style-type: none"><li>● <i>False</i> – not set</li><li>● <i>True</i> – set</li><li>● <i>Last Known Value</i> – not supported, equivalent to ‘False’ setting</li><li>● <i>Double Point: intermediate (00)</i> – switching device in intermediate position</li><li>● <i>Double Point: Off (01)</i> – switching device open</li><li>● <i>Double Point: On (10)</i> – switching device closed</li><li>● <i>Double Point: Bad state (11)</i> – switching device in intermediate position</li></ul> |               |  |

9.10

Measurements

|                        |                                                                                                                                                                                                                                                                                       |  |               |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------|
| Scaling                | Parameter                                                                                                                                                                                                                                                                             |  |               |
|                        | Unit Multiplier                                                                                                                                                                                                                                                                       |  |               |
|                        | Multiplication factor; not supported.                                                                                                                                                                                                                                                 |  |               |
| Range configuration    | Parameter                                                                                                                                                                                                                                                                             |  |               |
|                        | Scaled Measurement Range: Min                                                                                                                                                                                                                                                         |  |               |
|                        | Scaled Measurement Range: Max                                                                                                                                                                                                                                                         |  |               |
|                        | Lower / Upper measuring range limit value; not supported.                                                                                                                                                                                                                             |  |               |
| Deadband Configuration | Parameter                                                                                                                                                                                                                                                                             |  | Default Value |
|                        | Deadband                                                                                                                                                                                                                                                                              |  | 100           |
|                        | Multiplier for the smallest display value of the measured value. In order to have the current measured value sent when it has changed from the value last sent the result of the set dead band value multiplied by the smallest display value must exceed the smallest display value. |  |               |

9.11 Configurable Data Attributes

9.11.1 System/LLN0

| Mod.measCyc | Parameter                                                                                    |  | Default Value |
|-------------|----------------------------------------------------------------------------------------------|--|---------------|
|             | Value                                                                                        |  | 5             |
|             | Transmission of measured values: Time interval in seconds between two dead band evaluations. |  |               |

| Mod.enCyc | Parameter                                                                                                                                  |  |  |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|           | Value                                                                                                                                      |  |  |
|           | Cyclic transmission of measured values without dead band check: Time interval in seconds between transmissions of two energy count values. |  |  |

| Mod.comtrade | Parameter                                                                       |  |  |
|--------------|---------------------------------------------------------------------------------|--|--|
|              | Value                                                                           |  |  |
|              | Transmission of COMTRADE fault files formatted either as ASCII or binary files. |  |  |

| Mod.distExtr | Parameter                                                           |  |  |
|--------------|---------------------------------------------------------------------|--|--|
|              | Value                                                               |  |  |
|              | Cancelling fault transmission or including it in the configuration. |  |  |

## 10 Commissioning

### 10.1 Safety Instructions

#### DANGER

##### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Only qualified personnel, trained, authorized and familiar with the device and all the safety instructions in the general Safety Guide (SFTY/5LM/L11 or later version) and appropriate Chapter 5, Chapter 10, Chapter 11, Chapter 12 and Chapter 13 of this manual, shall work on installation, connection, commissioning, maintenance or servicing of this device.
- When installing and connecting the device the warning notices at the beginning of Chapter "Installation and Connection" (Chapter 5) must be observed.

Failure to follow these instructions will result in death or serious injury.

#### DANGER

##### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Switch off the auxiliary power supply before any work in the terminal strip area.
- Switch off all the power supplies in connection to the equipment before any work in the terminal strip area to isolate the device.
- Do not touch the terminal strip area when equipment is in operation.
- Do not remove or add wires in the terminal strip area when equipment is in operation.
- Short-circuit the system current transformers before disconnecting wires to the transformer board (valid only for pin terminals, not required for ring terminals which have a shortening block).
- A protective conductor (ground/earth) of at least 1.5 mm<sup>2</sup> must be connected to the protective conductor terminal on the power supply board and on the main relay case.
- Do never remove the protective conductor connection to the device casing as long as other wires are connected to it.
- Where stranded conductors are used, insulated crimped wire end ferrules must be employed.

Failure to follow these instructions will result in death or serious injury.

Note: Regarding the appropriate wiring connections of the equipment refer to the document Px3x\_Grounding\_Application\_Guide\_EN\_h.pdf.

 **DANGER**
**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- The device must be reliably grounded to meet protective equipment grounding requirements.
- The surface-mounted case is grounded using the bolt and nut, appropriately marked, as the ground connection. The flush-mounted case must be grounded in the area of the rear sidepieces at the location provided. The bracket is marked with the protective ground symbol: ⊕. The cross-section of the ground conductor must conform to applicable national standards. A minimum cross section of 2.5 mm<sup>2</sup> (≤ AWG12) is required.
- In addition, a protective ground connection at the terminal contact on the power supply module (identified by the letters “PE” on the terminal connection diagram) is also required for proper operation of the device. The cross-section of this ground conductor must also conform to applicable national standards. A minimum cross section of 1.5 mm<sup>2</sup> (US: AWG14 or thicker) is required.
- If a detachable HMI is installed, a further protective conductor (ground/earth) of at least 1.5 mm<sup>2</sup> (US: AWG14 or thicker) must be connected to the DHMI protective conductor terminal to link the DHMI and the main relay case; these must be located within the same substation.
- All grounding connections must be low-inductance, i.e. it must be kept as short as possible.
- The protective conductor (earth) must always be connected to the protective grounding conductor terminal in order to guarantee the safety given by this setup.

Failure to follow these instructions will result in death or serious injury.

 **DANGER**
**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Application of analog signals to the measuring inputs must be in compliance with the maximum permissible rating of the measuring inputs (see “Technical Data”, Chapter 2).
- Do not open the secondary circuit of live system current transformers! If the secondary circuit of a live CT is opened, there is the danger that the resulting voltages will endanger personnel and damage the insulation.
- For pin-terminal connection devices, the terminal block for system current transformer connection is not a shorting block! Therefore always short-circuit the system current transformers before loosening the threaded terminals.

Failure to follow these instructions will result in death or serious injury.



 **DANGER****HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- The power supply must be turned off for at least 5 s before power supply module V is removed. Otherwise there is the danger of an electric shock.

Failure to follow these instructions will result in death or serious injury.

 **DANGER****HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- When increased-safety machinery is located in a hazardous area the device must always be installed outside of this hazardous area to protect this equipment.

Failure to follow these instructions will result in death or serious injury.

 **DANGER****HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- The PC interface is not designed as a permanent connection. Consequently, the female connector does not have the extra insulation from circuits connected to the system that is required per IEC/EN 60255-27. Therefore DO NOT leave any permanent cable connection on the PC interface connector at the HMI front panel.

Failure to follow these instructions will result in death or serious injury.

 **DANGER****HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Do not connect or disconnect the RS 485 or fiber-optic interface when the supply voltage for the device is under power and in operation.

Failure to follow these instructions will result in death or serious injury.

 **WARNING****HAZARD OF UNINTENDED EQUIPMENT OPERATION**

- When using the programmable logic (function group LOGIC), the user must carry out a functional type test to conform to the requirements of the relevant protection/control application.
- In particular, it is necessary to verify that the requirements for the implementation of logic linking (by setting) as well as the time performance during device startup, during operation and when there is a fault (device blocking) are fulfilled.

Failure to follow these instructions can result in unintended equipment operation.

## 10.2 Commissioning Tests

### 10.2.1 Preparation

After the C434 has been installed and connected as described in [Chapter 5, \(p. 5-1\)](#), the commissioning procedure can begin.

Before turning on the power supply voltage, the following items must be checked again:

- Is the device connected to the protective ground at the specified location?
- Does the nominal voltage of the battery agree with the nominal auxiliary voltage of the device?
- Are the current and voltage transformer connections, grounding, and phase sequences correct?

After the wiring work is completed, check the system to make sure it is properly isolated. The conditions given in IEC/EN 60255-27 must be satisfied.

Once all checks have been made, the power supply voltage may be turned on. After voltage has been applied, the device starts up. During startup, various startup tests are carried out (see [Section 3.15, \(p. 3-120\)](#)). The LED indicators for HEALTHY (H1) and OUT OF SERVICE (H2) will light up. After approximately 15 s, the C434 is ready for operation. By default (factory setting) or after a cold restart, the device type "C434" and the time are displayed on the first line of the LCD after the device has started up. If a bay type has already been selected this bay will then be shown as a single-pole display.

Once the change enabling command has been issued (see [Section 6.8.3, \(p. 6-40\)](#)), all settings can be entered. The procedure for entering settings from the integrated local control panel is described in [Section 6.8.4, \(p. 6-43\)](#).

*First the type of bay wanted is to be set at MAIN: Type of bay, Par/Conf menu branch. When the automatic assignment has been enabled at MAIN: Auto-assignment I/O then selecting the type of bay will automatically configure binary signal inputs and output relays according to the definitions corresponding to the bay type.*

*After pressing the ENTER key to confirm the setting parameter MAIN: Type of bay the signal Bay initialization is displayed on the LCD for a time duration of 20 s. The LED indicator labeled EDIT MODE will light up. A control action is not possible during this time period.*

If either the PC interface or the communication interface will be used for setting the C434 and reading out event records, then the following settings must first be made from the integrated local control panel.

Par/DvID menu branch:

- DVICE: Device password 1
- DVICE: Device password 2

*Par/Conf* menu branch:

- PC: Bay address
- PC: Device address
- PC: Baud rate
- PC: Parity bit
- COMM1: Function group COMM1
- COMM1: General enable USER
- COMM1: Name of manufacturer
- COMM1: Line idle state
- COMM1: Baud rate
- COMM1: Parity bit
- COMM1: Communicat. protocol
- COMM1: Octet comm. address
- COMM1: Octet address ASDU
- COMM2: Function group COMM2
- COMM2: General enable USER
- COMM2: Name of manufacturer
- COMM2: Line idle state
- COMM2: Baud rate
- COMM2: Parity bit
- COMM2: Octet comm. address
- COMM2: Octet address ASDU

*Par/Func/Glob* menu branch:

- PC: Command blocking
- PC: Sig./meas.val.block.
- COMM1: Command block. USER
- COMM1: Sig./meas.block.USER
- COMM2: Command block. USER
- COMM2: Sig./meas.block.USER

Instructions on these settings are given in Chapters “Settings” and “Information and Control Functions”.

*The settings given above apply to the IEC 60870-5-103 communication protocol. If another protocol is being used for the communication interface, additional settings may be necessary. See Chapter “Settings” for further details.*

After the settings have been made, the following checks should be carried out again before the blocking is cancelled:

- Is the correct bay type configured?
- Does the function assignment of the binary signal inputs agree with the terminal connection diagram?
- Has the correct operating mode been selected for the binary signal inputs?
- Does the function assignment of the output relays agree with the terminal connection diagram?
- Has the correct operating mode been selected for the output relays?
- Are the interlocking conditions and the external interlock inputs correctly configured?
- Have all settings been made correctly?

Now blocking can be cleared as follows (*Par/Func/Glob* menu branch):

- OUTP: Outp.rel.block USER = Yes
- MAIN: Device on-line = Yes (= on)

### 10.2.2

#### Cyber Security Commission

For Easergy MiCOM 30 without Cyber Security, password is managed and modified through HMI and Easergy Studio only, as previous password management (see [Section 6.8.9, \(p. 6-55\)](#)).

For device with Cyber Security, access to some parts of the menu is only possible with an user authentication after "Log in" with an user name and password. The user should "Log out" after operation (see [Section 3.3.1, \(p. 3-5\)](#)).

The EcoStruxure™ Cybersecurity Admin Expert (CAE) is used to access to security functions rights with the security administration role (by default). It provides:

- User accounts setting.
- Rights and roles management.
- Rights and roles administration.

User accounts setting button gives access to user informations and authentication tools: you can manage login (user name and password and arrow password), login attempts, inactivity time etc.).

| Login           | First Name    | Last Name     | Phone Num | Email |
|-----------------|---------------|---------------|-----------|-------|
| DefaultEngineer | Engineer      | Engineer      |           |       |
| DefaultOperator | Operator      | Operator      |           |       |
| DefaultViewer   | Viewer        | Viewer        |           |       |
| NewUser         | NewUser       | NewUser       |           |       |
| SecurityAdmin   | SecurityAdmin | SecurityAdmin |           |       |

#### User Information

First Name \* :

Last Name \* :

#### User Authentication

Login \* :

Password :

Confirm Password :

Arrow key password :

#### User Parameters

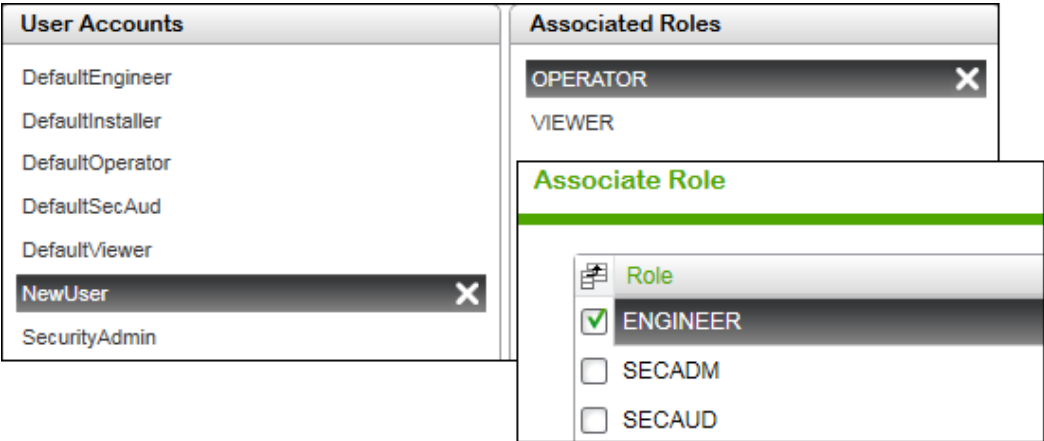
Minimum inactivity period (min) :

Allow user locking : ☒

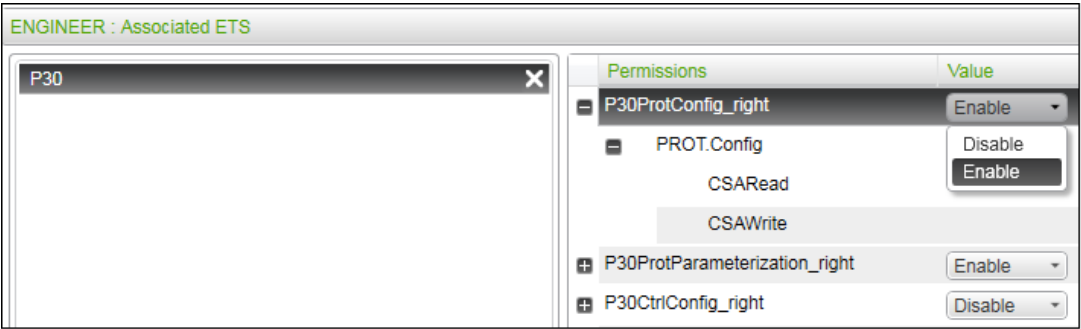
Maximum login attempts :

Password attempts timer (min) :

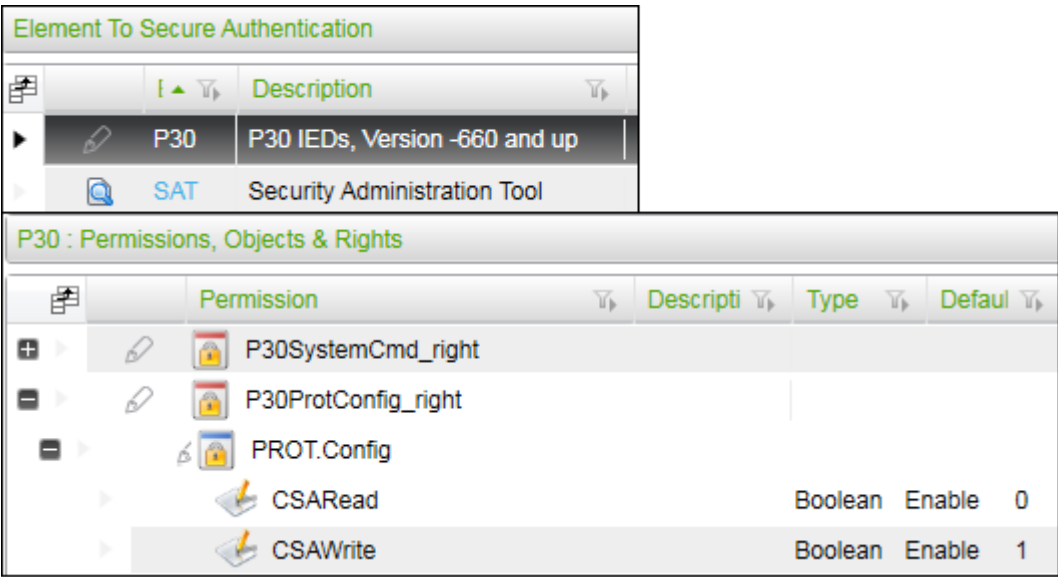
You can associate (add or remove) role(s) to an user account:



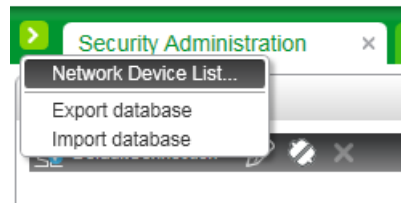
You can edit rights (associated Element To Secure (ETS)) for each role:



You can edit Elements To Secure (ETS) by editing permissions, objects and rights:



Set “Network Device List...” to select file to send to the device.



*Please, refer to the “Security Administration Tool ” for complete information about security administration tool.*

### 10.2.3

#### Testing

By using the signals and displays generated by the C434, it is possible to determine whether the C434 is correctly set and properly interconnected with the station. Signals are signaled by output relays and LED indicators and entered into the event memory. In addition, the signals can be checked by selecting the appropriate signal in the menu tree.

If the C434 is connected at substation control level, the user is advised to activate the test mode via MAIN: Test mode USER (*Par/Func/Glob* menu branch) or an appropriately configured binary signal input. The telegrams are then identified accordingly (reason for transmission: test mode).

### 10.2.4

#### Checking the Binary Signal Inputs

By selecting the corresponding state signal (*Oper/Cycl/Phys* menu branch), it is possible to determine whether the input signal that is present is recognized correctly by the device. The values displayed have the following meanings:

- “Low”: Not energized.
- “High”: Energized.
- *Without function*: No functions are assigned to the binary signal input.

This display appears regardless of the binary signal input mode selected.

### 10.2.5

#### Checking the Output Relays

It is possible to trigger the output relays for a settable time period for test purposes (time setting at OUTP: Hold-time for test in *Oper/Ctrl/Test* menu branch). First select the output relay to be tested (OUTP: Relay assign. f.test, *Oper/Ctrl/Test* menu branch).

Test triggering then occurs via OUTP: Relay test (*Oper/Ctrl/Test* menu branch). It is password-protected (see [Section 6.8.8, \(p. 6-54\)](#)).

#### ⚡ ⚠ DANGER

##### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Before starting the test, open any triggering circuits for external devices so that no inadvertent switching operations will take place.

Failure to follow these instructions will result in death or serious injury.

### 10.2.6 Checking the Current-Measuring Inputs

By injecting appropriate analog test values at the measuring inputs it is possible to check, by taking a readout from the operating data display (see [Chapter 8, \(p. 8-1\)](#)), whether the Time-Overcurrent Protection and Control Unit will detect such analog signals within the required class accuracy (*Oper/Cycl/Data* menu branch).

- MAIN: Current A,1 p.u.: Display of the updated phase A current in reference to the nominal device current  $I_{nom}$ .
- MAIN: Current B,1 p.u.: Display of the updated phase B current in reference to the nominal device current  $I_{nom}$ .
- MAIN: Current C,1 p.u.: Display of the updated phase C current in reference to the nominal device current  $I_{nom}$ .
- MAIN: Current IN,1 p.u.: Display of the updated residual current  $I_N$  in reference to the nominal device current  $I_{nom}$ .

#### DANGER

##### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Application of analog test values to the measuring inputs must be in compliance with the maximum permissible rating of the measuring inputs (see Chapter “Technical Data”, Chapter 2).

Failure to follow these instructions will result in death or serious injury.

### 10.2.7 Checking the Correct Phase Connection of Current and Voltage Transformers with Load Current

The user can check to make sure connection to the system's current and voltage transformers involves the correct phase by consulting the operating data displays for load angle (MAIN: Load angle phi A,1, MAIN: Load angle phi C,1 in the *Oper/Cycl/Data* menu branch). In this test it is required that the connection *Standard* has been made according to the standard schematic connection diagram shown in Chapter “Installation and Connection” and that the parameter at MAIN: Conn. meas. cir.IP,1 (*Par/Func/Glob* menu branch) is set to *Standard*. If there is only an ohmic (resistive) load then the load angles for all three phases toward the line must come to approximately 0°. The load angles are only determined if at least 5% of the nominal device current is flowing.

### 10.2.8 Checking the Correct Phase Connection of the Residual Current Transformer with Load Current

The user can check that the C434 connection to the system's residual current transformer involves the correct phase by consulting the operating data display at MAIN: Angle phi N,1 (*Oper/Cycl/Data* menu branch). For this the required measured variables  $V_{N-G}$  and  $I_N$  must be generated. When the connection *Standard* has been made according to the standard schematic connection diagram shown in Chapter “Installation and Connection” and the parameter at MAIN: Conn. meas. cir.IN,1 (*Par/Func/Glob* menu branch) is set to *Standard*, then one phase-to-ground voltage must be opened and the phase currents of the other two phases must be shorted at the same time (see [Fig. 10-1, \(p. 10-12\)](#)).

The selected phase sequence (alternative terminology: Rotary field) must match the actual phase sequence. If there is only an ohmic (resistive) load then angle



$\phi_N$  must take on the following values (depending whether the energy flow is towards the line or towards the busbar):

| Display                                             | Energy flow towards the line | Energy flow towards the busbar |
|-----------------------------------------------------|------------------------------|--------------------------------|
| MAIN: Angle phi N,1<br>(Oper/Cycl/Data menu branch) | Approx. 0°                   | Approx. 180°                   |

#### 10.2.9

#### Simple Check of the Correct Phase Connection of the Residual Current Transformer with Load Current

In case no system current transformer (e.g. a core balance CT) is available to supply a residual current value then a simple check may be carried out. After a positive check of the correct phase connection of current and voltage transformers and after one of the phase currents has been short-circuited, a phase comparison of the measured residual current value with the total value of all phase currents is carried out. In the event of phase congruence or a positive directional check, the operating panel MAIN: Ph.rel.,IN vs  $\Sigma I_P,1$  (Oper/Cycl/Data menu branch) will display the value "1". A check of the phase relation will only be carried out if the calculated residual current exceeds the value  $0.1 \cdot I_{nom}$ .



*Fig. 10-1: Connection example to generate measured variables.*

### 10.2.10 Checking Communication with MODBUS IEDs

The serial links to connected MODBUS IEDs can be tested using logical state signals. A loss of communication to one or more IEDs is displayed via COMM2: Comm. error slave x (Oper/Cycl/Log menu branch).

In addition, the status of all configured commands and signals can be monitored (MM\_xC: Command xx xxx or MM\_xS: Signal xx xxx, Oper/Cycl/Log menu branch).

### 10.2.11 Checking Control Functions

The selected bay type is displayed on the Bay Panel. The selection of the Bay Panel is described in the Chapter 6. The current switching state of the switchgear units is displayed on the Bay Panel if state signals from such switching devices are connected properly to binary signal inputs on the C434. Should the switching state not be displayed correctly then it can be determined by checking the physical state of binary signal inputs whether the state signals are presented correctly to the C434 (check at parameter INP: State U xxx, Oper/Cycl/Phys menu branch).

#### 10.2.11.1 Local/Remote Selection

Controlling switchgear units may be carried out from keys on the local control panel, remotely via the communication interface or through appropriately configured binary signal inputs. The control site – *Local* or *Remote* – is selected by the L/R key on the local control panel or by an appropriately configured binary signal input. The L/R key has no effect when a binary signal input has been configured. Using the L/R key on the local control panel to switch from “*Remote*” to “*Local*” is only possible after the proper user is logged in (see Chapter “Local Control Panel” for further information). The Bay Panel display will show which control site has been selected.

#### 10.2.11.2 Local Control

The switchgear unit to be controlled is selected by pressing the selection key on the local control panel, and pressing the “Open” or “Close” key will generate a switching request. When control is carried out with binary signal inputs the respective binary signal input is to be triggered.

#### 10.2.11.3 Remote Control

Remote control of switchgear units may be carried out via the communication interface or with appropriately configured binary signal inputs.

#### 10.2.11.4 Switchgear Unit Cannot Be Controlled

Should a switchgear unit refuse to be controlled, then this may be due to the following reasons:

- General enable for switch commands has not been set.  
(Configuration at MAIN: Inp.asg. ctrl.enabl., *Par/Func/Glob* menu branch)
- Interlocking has operated.  
(Check at MAIN: Interlock equ. viol., *Oper/Cycl/Log* menu branch).
- Only with bays for direct motor control:  
The motor protection has operated.  
(Check at parameter MAIN: Mon. mot. drives tr., *Oper/Cycl/Log* menu branch)

Which interlock(s) is(are) activated may be checked at:

- Bay interlock (BI): MAIN: Bay interlock. act., *Oper/Cycl/Log* menu branch
- Substation interlock (SI): MAIN: Subst. interl. act., *Oper/Cycl/Log* menu branch
- With control set to “Local”:  
It is possible to deactivate the interlock through an appropriately configured binary signal input.  
(Configuration at MAIN: Inp.asg.interl.deact, *Par/Func/Glob* menu branch)

*A substation interlock is only effective when a communication link exists from the communication interface to the substation control level. If the communication link is disrupted then the device switches automatically to bay interlock (BI) without substation interlock (SI). Whether or not a communication error is present can be checked at MAIN: Communication error (*Oper/Cycl/Log* menu branch).*

*The substation interlock (SI) can be deactivated selectively for any switchgear unit and in any control direction – “Open” or “Close”. (Check – e.g. for DEV01 – at DEV01: Open w/o stat.interl or DEV01: Close w/o stat. int. (*Par/Func/Cont* menu branch).*

### 10.2.12

#### Completing Commissioning

Before the C434 is released for operation, the user should make sure that the following steps have been taken:

- All memories have been reset.  
(Reset at MAIN: General reset USER (password-protected) and MT\_RC: Reset record. USER, both in *Oper/Ctrl/Test* menu branch.)
- Blocking of output relays has been cancelled.  
(OUTP: Outp.rel.block USER, *Par/Func/Glob* menu branch, setting No.)
- The device is on-line.  
(MAIN: Device on-line, *Par/Func/Glob* menu branch, setting Yes (= on).)
- The correct control point – *Local* or *Remote* – has been activated.
- The required interlock equations have been activated.

After completion of commissioning, only the green LED indicator signaling “HEALTHY” (H1) should be on.

## 11

## Troubleshooting

This chapter describes problems that might be encountered, their causes, and possible methods for eliminating them. It is intended as a general orientation only, and in cases of doubt it is better to return the C434 to the manufacturer. Please follow the packaging instructions in [Section 5.1, \(p. 5-4\)](#) when returning equipment to the manufacturer.

 **DANGER**
**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Only qualified personnel, trained, authorized and familiar with the device and all the safety instructions in the general Safety Guide (SFTY/5LM/L11 or later version) and appropriate Chapter 5, Chapter 10, Chapter 11, Chapter 12 and Chapter 13 of this manual, shall work on installation, connection, commissioning, maintenance or servicing of this device.
- Before checking further, disconnect the C434 from the power supply.
- Switch off all the power supplies in connection to the equipment to isolate the device.

Failure to follow these instructions will result in death or serious injury.

The following instructions apply to surface-mounted cases:

 **WARNING**
**HAZARD OF EQUIPMENT DAMAGE**

- The local control panel (or front element) is connected to processor module P by a plug-in connecting cable. Make sure the connector position is correct. Do not bend the connecting cable!

Failure to follow these instructions can result in equipment damage or unintended equipment operation.

**Problem**

- Lines of text are not displayed on the local control panel.
  - Check to see whether there is supply voltage at the device connection points.
  - Check to see whether the magnitude of the auxiliary voltage is correct. The C434 is protected against damage resulting from polarity reversal.
- The C434 issues an “Alarm” signal on LED H 3.
  - Identify the specific problem by reading out the monitoring signal memory (see [Section 6.8.6.2, \(p. 6-50\)](#)). The table below lists possible monitoring or warning indication (provided that a configuration setting has been entered at SFMON: Fct. assign. warning), the faulty area, the C434's response, and the mode of the output relay configured for “Warning” and “Blocked/faulty”.

Key

- -: No reaction and/or no output relay triggered.
- Yes: The corresponding output relay is triggered.
- Updating: The output relay configured for 'Warning' starts only if the monitoring signal is still present.

Self-monitoring

| Parameter                   |  |  |  | Address |
|-----------------------------|--|--|--|---------|
| SFMON: Fct. assign. warning |  |  |  | 021 030 |
| SFMON: Mon.sig. retention   |  |  |  | 021 018 |

## Self-monitoring

| Parameter                                                                                  | Address |  |  |         |
|--------------------------------------------------------------------------------------------|---------|--|--|---------|
| SFMON: Warning (LED)                                                                       |         |  |  | 036 070 |
| Warning configured for LED H3.                                                             |         |  |  |         |
| SFMON: Warning (relay)                                                                     |         |  |  | 036 100 |
| Warning configured for an output relay.                                                    |         |  |  |         |
| SFMON: Warm restart exec.                                                                  |         |  |  | 041 202 |
| A warm restart has been carried out.                                                       |         |  |  |         |
| SFMON: Cold restart exec.                                                                  |         |  |  | 041 201 |
| A cold restart has been carried out.                                                       |         |  |  |         |
| SFMON: Cold restart                                                                        |         |  |  | 093 024 |
| A cold restart has been carried out on account of a checksum error in the memory (NOVRAM). |         |  |  |         |
| 1st device reaction: Warm restart                                                          |         |  |  |         |
| 2nd device reaction: Device blocking                                                       |         |  |  |         |
| "Warning" output relay: Yes                                                                |         |  |  |         |
| "Blocked/faulty" output relay: Yes                                                         |         |  |  |         |
| SFMON: Cold rest./SW update                                                                |         |  |  | 093 025 |
| A cold restart has been carried out following a software update.                           |         |  |  |         |
| 1st device reaction: Warm restart                                                          |         |  |  |         |
| 2nd device reaction: Device blocking                                                       |         |  |  |         |
| "Warning" output relay: Yes                                                                |         |  |  |         |
| "Blocked/faulty" output relay: Yes                                                         |         |  |  |         |
| SFMON: Blocking/ HW failure                                                                |         |  |  | 090 019 |
| Supplementary warning that this device is blocked.                                         |         |  |  |         |
| "Warning" output relay: Updating                                                           |         |  |  |         |
| "Blocked/faulty" output relay: –                                                           |         |  |  |         |
| SFMON: Relay Kxx faulty                                                                    |         |  |  | 041 200 |
| Multiple signal: output relay defective.                                                   |         |  |  |         |
| Device reaction: –                                                                         |         |  |  |         |
| 'Warning' output relay: Updating                                                           |         |  |  |         |
| 'Blocked/faulty' output relay: Yes                                                         |         |  |  |         |
| SFMON: Hardware clock fail.                                                                |         |  |  | 093 040 |
| The hardware clock has failed.                                                             |         |  |  |         |
| Device reaction: –                                                                         |         |  |  |         |
| "Warning" output relay: Yes                                                                |         |  |  |         |
| "Blocked/faulty" output relay: –                                                           |         |  |  |         |

| Parameter                                                                                                                                                                                                                                                                                     | Address |  |  |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--|--|---------|
| SFMON: Battery failure                                                                                                                                                                                                                                                                        |         |  |  | 090 010 |
| Battery voltage too low. Replace battery.<br>Device reaction: –<br>“Warning” output relay: Updating<br>“Blocked/faulty” output relay: –                                                                                                                                                       |         |  |  |         |
| SFMON: Invalid SW d.loaded                                                                                                                                                                                                                                                                    |         |  |  | 096 121 |
| Wrong or invalid software has been downloaded.<br>1st device reaction: Warm restart<br>2nd device reaction: Device blocking<br>“Warning” output relay: Yes<br>“Blocked/faulty” output relay: Yes                                                                                              |         |  |  |         |
| SFMON: Invalid type of bay                                                                                                                                                                                                                                                                    |         |  |  | 096 122 |
| If the user has selected a bay type that requires a C434 hardware configuration that is not actually fitted, then this signal is generated.<br>1st device reaction: Warm restart<br>2nd device reaction: Device blocking<br>“Warning” output relay: Yes<br>“Blocked/faulty” output relay: Yes |         |  |  |         |
| SFMON: +15V supply faulty                                                                                                                                                                                                                                                                     |         |  |  | 093 081 |
| The +15 V internal supply voltage has dropped below a minimum value.<br>1st device reaction: Warm restart<br>2nd device reaction: Device blocking<br>“Warning” output relay: Yes<br>“Blocked/faulty” output relay: Yes                                                                        |         |  |  |         |
| SFMON: +24V supply faulty                                                                                                                                                                                                                                                                     |         |  |  | 093 082 |
| The +24 V internal supply voltage has dropped below a minimum value.<br>1st device reaction: Warm restart<br>2nd device reaction: Device blocking<br>“Warning” output relay: Yes<br>“Blocked/faulty” output relay: Yes                                                                        |         |  |  |         |
| SFMON: -15V supply faulty                                                                                                                                                                                                                                                                     |         |  |  | 093 080 |
| The –15 V internal supply voltage has dropped below a minimum value.<br>1st device reaction: Warm restart<br>2nd device reaction: Device blocking<br>“Warning” output relay: Yes<br>“Blocked/faulty” output relay: Yes                                                                        |         |  |  |         |
| SFMON: Wrong module slot 01                                                                                                                                                                                                                                                                   |         |  |  | 096 100 |
| SFMON: Wrong module slot 02                                                                                                                                                                                                                                                                   |         |  |  | 096 101 |
| SFMON: Wrong module slot 03                                                                                                                                                                                                                                                                   |         |  |  | 096 102 |



| Parameter                                                                                                                                                                                                                                                                                                                                                                                      | Address |  |  |         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--|--|---------|
| SFMON: Wrong module slot 04                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 103 |
| SFMON: Wrong module slot 05                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 104 |
| SFMON: Wrong module slot 06                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 105 |
| SFMON: Wrong module slot 07                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 106 |
| SFMON: Wrong module slot 08                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 107 |
| SFMON: Wrong module slot 09                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 108 |
| SFMON: Wrong module slot 10                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 109 |
| SFMON: Wrong module slot 11                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 110 |
| SFMON: Wrong module slot 12                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 111 |
| SFMON: Wrong module slot 13                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 112 |
| SFMON: Wrong module slot 14                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 113 |
| SFMON: Wrong module slot 15                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 114 |
| SFMON: Wrong module slot 16                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 115 |
| SFMON: Wrong module slot 17                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 116 |
| SFMON: Wrong module slot 18                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 117 |
| SFMON: Wrong module slot 19                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 118 |
| SFMON: Wrong module slot 20                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 119 |
| SFMON: Wrong module slot 21                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 120 |
| <p>Module in wrong slot.</p> <p>1st device reaction: Warm restart</p> <p>2nd device reaction: Device blocking</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: Yes</p>                                                                                                                                                                                                 |         |  |  |         |
| SFMON: Wrong module Dig.Bus                                                                                                                                                                                                                                                                                                                                                                    |         |  |  | 096 123 |
| <p>The device has been fitted with a wrong digital bus. Since this is checked using the module variant number this signal can also occur after a firmware upgrade to a version that is not compatible with the hardware.</p> <p>1st device reaction: Warm restart</p> <p>2nd device reaction: Device blocking</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: Yes</p> |         |  |  |         |
| SFMON: Wrong module HMI                                                                                                                                                                                                                                                                                                                                                                        |         |  |  | 096 124 |
| <p>The device has been fitted with a wrong HMI. Since this is checked using the module variant number this signal can also occur after a firmware upgrade to a version that is not compatible with the hardware.</p> <p>1st device reaction: Warm restart</p> <p>2nd device reaction: Device blocking</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: Yes</p>         |         |  |  |         |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  | Address |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|---------|
| SFMON: Wrong module Comm                                                                                                                                                                                                                                                                                                                                                                                |  |  |  | 096 125 |
| <p>The device has been fitted with a wrong communication module. Since this is checked using the module variant number this signal can also occur after a firmware upgrade to a version that is not compatible with the hardware.</p> <p>1st device reaction: Warm restart</p> <p>2nd device reaction: Device blocking</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: Yes</p> |  |  |  |         |
| SFMON: Wrong module Ana.Bus                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 096 126 |
| <p>The device has been fitted with a wrong analog bus. Since this is checked using the module variant number this signal can also occur after a firmware upgrade to a version that is not compatible with the hardware.</p> <p>1st device reaction: Warm restart</p> <p>2nd device reaction: Device blocking</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: Yes</p>           |  |  |  |         |
| SFMON: Defect.module slot01                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 000 |
| SFMON: Defect.module slot02                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 001 |
| SFMON: Defect.module slot03                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 002 |
| SFMON: Defect.module slot04                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 003 |
| SFMON: Defect.module slot05                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 004 |
| SFMON: Defect.module slot06                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 005 |
| SFMON: Defect.module slot07                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 006 |
| SFMON: Defect.module slot08                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 007 |
| SFMON: Defect.module slot09                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 008 |
| SFMON: Defect.module slot10                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 009 |
| SFMON: Defect.module slot11                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 010 |
| SFMON: Defect.module slot12                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 011 |
| SFMON: Defect.module slot13                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 012 |
| SFMON: Defect.module slot14                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 013 |
| SFMON: Defect.module slot15                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 014 |
| SFMON: Defect.module slot16                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 015 |
| SFMON: Defect.module slot17                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 016 |
| SFMON: Defect.module slot18                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 017 |
| SFMON: Defect.module slot19                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 018 |
| SFMON: Defect.module slot20                                                                                                                                                                                                                                                                                                                                                                             |  |  |  | 097 019 |

| Parameter                                                                                                                                                                                                |  |  |  | Address |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|---------|
| SFMON: Defect.module slot21                                                                                                                                                                              |  |  |  | 097 020 |
| Defective module in slot x.<br>Device reaction: –<br>“Warning” output relay: Updating<br>“Blocked/faulty” output relay: –                                                                                |  |  |  |         |
| SFMON: Module Y DPR faulty                                                                                                                                                                               |  |  |  | 093 110 |
| The checksum feature of analog I/O module Y has detected a fault in the data transmission of the Dual-Port-RAM.<br>Device reaction: –<br>“Warning” output relay: Yes<br>“Blocked/faulty” output relay: – |  |  |  |         |
| SFMON: Module Y RAM faulty                                                                                                                                                                               |  |  |  | 093 111 |
| Fault in the program or data memory of the analog I/O module.<br>Device reaction: –<br>“Warning” output relay: Yes<br>“Blocked/faulty” output relay: –                                                   |  |  |  |         |
| SFMON: Error K 0601                                                                                                                                                                                      |  |  |  | 097 070 |
| SFMON: Error K 0602                                                                                                                                                                                      |  |  |  | 097 071 |
| SFMON: Error K 0603                                                                                                                                                                                      |  |  |  | 097 072 |
| SFMON: Error K 0604                                                                                                                                                                                      |  |  |  | 097 073 |
| SFMON: Error K 0605                                                                                                                                                                                      |  |  |  | 097 074 |
| SFMON: Error K 0606                                                                                                                                                                                      |  |  |  | 097 075 |
| SFMON: Error K 0607                                                                                                                                                                                      |  |  |  | 097 076 |
| SFMON: Error K 0608                                                                                                                                                                                      |  |  |  | 097 077 |
| SFMON: Error K 0701                                                                                                                                                                                      |  |  |  | 097 078 |
| SFMON: Error K 0702                                                                                                                                                                                      |  |  |  | 097 079 |
| SFMON: Error K 0703                                                                                                                                                                                      |  |  |  | 097 080 |
| SFMON: Error K 0704                                                                                                                                                                                      |  |  |  | 097 081 |
| SFMON: Error K 0705                                                                                                                                                                                      |  |  |  | 097 082 |
| SFMON: Error K 0706                                                                                                                                                                                      |  |  |  | 097 083 |
| SFMON: Error K 0707                                                                                                                                                                                      |  |  |  | 097 084 |
| SFMON: Error K 0708                                                                                                                                                                                      |  |  |  | 097 085 |
| SFMON: Error K 0801                                                                                                                                                                                      |  |  |  | 097 086 |
| SFMON: Error K 0802                                                                                                                                                                                      |  |  |  | 097 087 |
| SFMON: Error K 0803                                                                                                                                                                                      |  |  |  | 097 088 |
| SFMON: Error K 0804                                                                                                                                                                                      |  |  |  | 097 089 |
| SFMON: Error K 0805                                                                                                                                                                                      |  |  |  | 097 090 |

| Parameter           | Address |  |  |         |
|---------------------|---------|--|--|---------|
| SFMON: Error K 0806 |         |  |  | 097 091 |
| SFMON: Error K 0807 |         |  |  | 097 092 |
| SFMON: Error K 0808 |         |  |  | 097 093 |
| SFMON: Error K 0901 |         |  |  | 097 094 |
| SFMON: Error K 0902 |         |  |  | 097 095 |
| SFMON: Error K 0903 |         |  |  | 097 096 |
| SFMON: Error K 0904 |         |  |  | 097 097 |
| SFMON: Error K 0905 |         |  |  | 097 098 |
| SFMON: Error K 0906 |         |  |  | 097 099 |
| SFMON: Error K 0907 |         |  |  | 097 100 |
| SFMON: Error K 0908 |         |  |  | 097 101 |
| SFMON: Error K 1001 |         |  |  | 097 102 |
| SFMON: Error K 1002 |         |  |  | 097 103 |
| SFMON: Error K 1003 |         |  |  | 097 104 |
| SFMON: Error K 1004 |         |  |  | 097 105 |
| SFMON: Error K 1005 |         |  |  | 097 106 |
| SFMON: Error K 1006 |         |  |  | 097 107 |
| SFMON: Error K 1007 |         |  |  | 097 108 |
| SFMON: Error K 1008 |         |  |  | 097 109 |
| SFMON: Error K 1201 |         |  |  | 097 118 |
| SFMON: Error K 1202 |         |  |  | 097 119 |
| SFMON: Error K 1203 |         |  |  | 097 120 |
| SFMON: Error K 1204 |         |  |  | 097 121 |
| SFMON: Error K 1205 |         |  |  | 097 122 |
| SFMON: Error K 1206 |         |  |  | 097 123 |
| SFMON: Error K 1207 |         |  |  | 097 124 |
| SFMON: Error K 1208 |         |  |  | 097 125 |
| SFMON: Error K 1401 |         |  |  | 097 134 |
| SFMON: Error K 1402 |         |  |  | 097 135 |
| SFMON: Error K 1403 |         |  |  | 097 136 |
| SFMON: Error K 1404 |         |  |  | 097 137 |
| SFMON: Error K 1405 |         |  |  | 097 138 |
| SFMON: Error K 1406 |         |  |  | 097 139 |
| SFMON: Error K 1407 |         |  |  | 097 140 |
| SFMON: Error K 1408 |         |  |  | 097 141 |
| SFMON: Error K 1601 |         |  |  | 097 150 |

| Parameter                                                                                                                                                                   | Address |  |  |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--|--|---------|
| SFMON: Error K 1602                                                                                                                                                         |         |  |  | 097 151 |
| SFMON: Error K 1603                                                                                                                                                         |         |  |  | 097 152 |
| SFMON: Error K 1604                                                                                                                                                         |         |  |  | 097 153 |
| SFMON: Error K 1605                                                                                                                                                         |         |  |  | 097 154 |
| SFMON: Error K 1606                                                                                                                                                         |         |  |  | 097 155 |
| SFMON: Error K 1607                                                                                                                                                         |         |  |  | 097 156 |
| SFMON: Error K 1608                                                                                                                                                         |         |  |  | 097 157 |
| SFMON: Error K 1801                                                                                                                                                         |         |  |  | 097 166 |
| SFMON: Error K 1802                                                                                                                                                         |         |  |  | 097 167 |
| SFMON: Error K 1803                                                                                                                                                         |         |  |  | 097 168 |
| SFMON: Error K 1804                                                                                                                                                         |         |  |  | 097 169 |
| SFMON: Error K 1805                                                                                                                                                         |         |  |  | 097 170 |
| SFMON: Error K 1806                                                                                                                                                         |         |  |  | 097 171 |
| SFMON: Error K 2001                                                                                                                                                         |         |  |  | 097 182 |
| SFMON: Error K 2002                                                                                                                                                         |         |  |  | 097 183 |
| SFMON: Error K 2003                                                                                                                                                         |         |  |  | 097 184 |
| SFMON: Error K 2004                                                                                                                                                         |         |  |  | 097 185 |
| SFMON: Error K 2005                                                                                                                                                         |         |  |  | 097 186 |
| SFMON: Error K 2006                                                                                                                                                         |         |  |  | 097 187 |
| SFMON: Error K 2007                                                                                                                                                         |         |  |  | 097 188 |
| SFMON: Error K 2008                                                                                                                                                         |         |  |  | 097 189 |
| Output relay K xxx defective.<br>Device reaction: –<br>“Warning” output relay: Updating<br>“Blocked/faulty” output relay: Yes                                               |         |  |  |         |
| SFMON: Undef. operat. code                                                                                                                                                  |         |  |  | 093 010 |
| Undefined operation code.<br>1st device reaction: Warm restart<br>2nd device reaction: Device blocking<br>“Warning” output relay: Yes<br>“Blocked/faulty” output relay: Yes |         |  |  |         |

| Parameter                                                                                                                                                                                                                                                                                                                                                     | Address |  |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--|---------|
| SFMON: Abnormal termination                                                                                                                                                                                                                                                                                                                                   |         |  | 093 030 |
| <p>The application has been terminated in an unexpected way. If this error occurs during a (re-)start of the device then this message is displayed and the device is blocked.</p> <p>1st device reaction: Warm restart</p> <p>2nd device reaction: Device blocking</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: Yes</p>           |         |  |         |
| SFMON: Bad arg. system call                                                                                                                                                                                                                                                                                                                                   |         |  | 093 031 |
| <p>Invalid parameter when calling a function of the operating system. If this error occurs during a (re-)start of the device then this message is displayed and the device is blocked.</p> <p>1st device reaction: Warm restart</p> <p>2nd device reaction: Device blocking</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: Yes</p>  |         |  |         |
| SFMON: Mutex deadlock                                                                                                                                                                                                                                                                                                                                         |         |  | 093 032 |
| <p>Software threads are locked from each other by mutex. If this error occurs during a (re-)start of the device then this message is displayed and the device is blocked.</p> <p>1st device reaction: Warm restart</p> <p>2nd device reaction: Device blocking</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: Yes</p>               |         |  |         |
| SFMON: Invalid memory ref.                                                                                                                                                                                                                                                                                                                                    |         |  | 093 033 |
| <p>Attempt to access an invalid memory segment. If this error occurs during a (re-)start of the device then this message is displayed and the device is blocked.</p> <p>1st device reaction: Warm restart</p> <p>2nd device reaction: Device blocking</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: Yes</p>                        |         |  |         |
| SFMON: Unexpected exception                                                                                                                                                                                                                                                                                                                                   |         |  | 093 034 |
| <p>Miscellaneous error message from the processor or operating system. If this error occurs during a (re-)start of the device then this message is displayed and the device is blocked.</p> <p>1st device reaction: Warm restart</p> <p>2nd device reaction: Device blocking</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: Yes</p> |         |  |         |

| Parameter                                                                                                                                                                                                                                                      | Address |  |  |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--|--|---------|
| SFMON: Invalid arithm. op.                                                                                                                                                                                                                                     |         |  |  | 093 011 |
| Invalid arithmetic operation.<br>1st device reaction: Warm restart<br>2nd device reaction: Device blocking<br>"Warning" output relay: Yes<br>"Blocked/faulty" output relay: Yes                                                                                |         |  |  |         |
| SFMON: Undefined interrupt                                                                                                                                                                                                                                     |         |  |  | 093 012 |
| Undefined interrupt.<br>1st device reaction: Warm restart<br>2nd device reaction: Device blocking<br>"Warning" output relay: Yes<br>"Blocked/faulty" output relay: Yes                                                                                         |         |  |  |         |
| SFMON: Exception oper.syst.                                                                                                                                                                                                                                    |         |  |  | 093 013 |
| Interrupt of the operating system.<br>1st device reaction: Warm restart<br>2nd device reaction: Device blocking<br>"Warning" output relay: Yes<br>"Blocked/faulty" output relay: Yes                                                                           |         |  |  |         |
| SFMON: Protection failure                                                                                                                                                                                                                                      |         |  |  | 090 021 |
| Watchdog is monitoring the periodic start of protection routines. It has detected an error.<br>1st device reaction: Warm restart<br>2nd device reaction: Device blocking<br>"Warning" output relay: Yes<br>"Blocked/faulty" output relay: Yes                  |         |  |  |         |
| SFMON: Checksum error param                                                                                                                                                                                                                                    |         |  |  | 090 003 |
| A checksum error involving the parameters in the memory (NOVRAM) has been detected.<br>1st device reaction: Warm restart<br>2nd device reaction: Device blocking<br>"Warning" output relay: Yes<br>"Blocked/faulty" output relay: Yes                          |         |  |  |         |
| SFMON: Clock sync. error                                                                                                                                                                                                                                       |         |  |  | 093 041 |
| In 10 consecutive clock synchronization telegrams, the difference between the time of day given in the telegram and that of the hardware clock is greater than 10 ms.<br>Device reaction: –<br>"Warning" output relay: Yes<br>"Blocked/faulty" output relay: – |         |  |  |         |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Address |  |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--|---------|
| SFMON: Interm.volt.fail.RAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |  | 093 026 |
| <p>Faulty test pattern in the RAM. This can occur, for example, if the processor module or the power supply module is removed from the bus module (digital). This fault is only detected during device startup. After the fault is detected, the software initializes the RAM. This means that all records are deleted.</p> <p>1st device reaction: Warm restart</p> <p>2nd device reaction: Device blocking</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: Yes</p> |         |  |         |
| SFMON: Overflow MT_RC                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |  | 090 012 |
| <p>Last entry in the monitoring signal memory in the event of overflow.</p> <p>Device reaction: –</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: –</p>                                                                                                                                                                                                                                                                                                              |         |  |         |
| SFMON: Checksum DMOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |  | 093 023 |
| <p>A checksum that was calculated from the data model in the memory of the device yielded a wrong result. If this error occurs during a (re-)start of the device then this message is displayed and the device is blocked.</p> <p>1st device reaction: Warm restart</p> <p>2nd device reaction: Device blocking</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: Yes</p>                                                                                              |         |  |         |
| SFMON: Semaph. MT_RC block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |  | 093 015 |
| <p>Software overloaded.</p> <p>Device reaction: –</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: –</p>                                                                                                                                                                                                                                                                                                                                                              |         |  |         |
| SFMON: Inval. SW COMM1/IEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |  | 093 075 |
| <p>Incorrect or invalid communication software has been downloaded.</p> <p>Device reaction: –</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: –</p>                                                                                                                                                                                                                                                                                                                  |         |  |         |
| SFMON: Inval. Config. IEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |  | 093 079 |
| <p>Invalid parameters in the IEC configuration.</p> <p>Device reaction: –</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: –</p>                                                                                                                                                                                                                                                                                                                                      |         |  |         |



| Parameter                                                                                                                                                                                                                  |  |  |  | Address |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|---------|
| SFMON: Invalid SW vers. Y                                                                                                                                                                                                  |  |  |  | 093 113 |
| Incorrect or invalid software for analog I/O module Y has been downloaded.<br>Device reaction: –<br>“Warning” output relay: Yes<br>“Blocked/faulty” output relay: –                                                        |  |  |  |         |
| SFMON: Time-out module Y                                                                                                                                                                                                   |  |  |  | 093 112 |
| Watchdog is monitoring the periodic status signal of the analog I/O module Y. It has detected an error.<br>Device reaction: –<br>“Warning” output relay: Yes<br>“Blocked/faulty” output relay: –                           |  |  |  |         |
| SFMON: IRIGB faulty                                                                                                                                                                                                        |  |  |  | 093 117 |
| The IRIGB interface is enabled but there is no plausible input signal.<br>Device reaction: –<br>“Warning” output relay: Yes<br>“Blocked/faulty” output relay: –                                                            |  |  |  |         |
| SFMON: M.c.b. trip V                                                                                                                                                                                                       |  |  |  | 098 000 |
| The line-side voltage transformer m.c.b. has tripped.<br>Device reaction: Blocking of the short-circuit direction determination.<br>“Warning” output relay: Yes<br>“Blocked/faulty” output relay: –                        |  |  |  |         |
| SFMON: M.c.b. trip Vref                                                                                                                                                                                                    |  |  |  | 098 011 |
| The m.c.b. monitoring the reference voltage transformer has tripped.<br>Device reaction: Blocking of automatic synchronism check (ASC).<br>“Warning” output relay: Yes<br>“Blocked/faulty” output relay: –                 |  |  |  |         |
| SFMON: FF, Vref triggered                                                                                                                                                                                                  |  |  |  | 098 022 |
| The fuse failure monitoring function has detected a fault in the reference voltage-measuring circuit.<br>“Warning” output relay: Yes<br>“Blocked/faulty” output relay: –                                                   |  |  |  |         |
| SFMON: M.circ. V,Vref flty.                                                                                                                                                                                                |  |  |  | 098 023 |
| Multiple signal: Voltage-measuring circuits for phase-to-ground voltages or the reference voltage faulty.<br>Device reaction: Depends on type of fault.<br>“Warning” output relay: Yes<br>“Blocked/faulty” output relay: – |  |  |  |         |

| Parameter                                                                                                                                                                                                                                                | Address |  |  |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--|--|---------|
| SFMON: Meas. circ. V faulty                                                                                                                                                                                                                              |         |  |  | 098 017 |
| Multiple signal: Voltage-measuring circuits faulty.<br>Device reaction: Depends on type of fault.<br>"Warning" output relay: Yes<br>"Blocked/faulty" output relay: –                                                                                     |         |  |  |         |
| SFMON: Invalid SW vers DHMI                                                                                                                                                                                                                              |         |  |  | 093 145 |
| Incorrect or invalid software was loaded to operate the detachable display (DHMI).<br>Device reaction: –<br>"Warning" output relay: Yes<br>"Blocked/faulty" output relay: –                                                                              |         |  |  |         |
| SFMON: Invalid scaling BCD                                                                                                                                                                                                                               |         |  |  | 093 124 |
| An invalid characteristic has been set for the BCD output channel of analog I/O module Y.<br>Device reaction: Depends on type of fault detected.<br>"Warning" output relay: Updating<br>"Blocked/faulty" output relay: –                                 |         |  |  |         |
| SFMON: Invalid scaling A-1                                                                                                                                                                                                                               |         |  |  | 093 114 |
| SFMON: Invalid scaling A-2                                                                                                                                                                                                                               |         |  |  | 093 115 |
| An invalid characteristic has been set for one of the analog output channels of analog I/O module Y.<br>Device reaction: Depends on type of fault detected.<br>"Warning" output relay: Updating<br>"Blocked/faulty" output relay: –                      |         |  |  |         |
| SFMON: Invalid scaling IDC                                                                                                                                                                                                                               |         |  |  | 093 116 |
| An invalid characteristic has been set for the analog input channel of analog I/O module Y.<br>Device reaction: Depends on type of fault detected.<br>"Warning" output relay: Updating<br>"Blocked/faulty" output relay: –                               |         |  |  |         |
| SFMON: PT100 open circuit                                                                                                                                                                                                                                |         |  |  | 098 024 |
| The C434 has detected an open circuit in the connection of the resistance thermometer "PT100" to the analog I/O module Y.<br>Device reaction: Depends on type of fault detected.<br>"Warning" output relay: Updating<br>"Blocked/faulty" output relay: – |         |  |  |         |

| Parameter                                                                                                                                                                                                                                                                                                                        | Address |  |  |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--|--|---------|
| SFMON: Overload 20 mA input                                                                                                                                                                                                                                                                                                      |         |  |  | 098 025 |
| <p>The 20 mA input of analog I/O module Y is overloaded.</p> <p>Device reaction: Depends on type of fault detected.</p> <p>“Warning” output relay: Updating</p> <p>“Blocked/faulty” output relay: –</p>                                                                                                                          |         |  |  |         |
| SFMON: Open circ. 20 mA inp.                                                                                                                                                                                                                                                                                                     |         |  |  | 098 026 |
| <p>The C434 has detected an open circuit in the connection of the 20 mA input.</p> <p>Device reaction: Depends on type of fault detected.</p> <p>“Warning” output relay: Updating</p> <p>“Blocked/faulty” output relay: –</p>                                                                                                    |         |  |  |         |
| SFMON: Inv.inp.f.clock sync                                                                                                                                                                                                                                                                                                      |         |  |  | 093 120 |
| <p>The function was configured to a binary signal input on the analog I/O module Y. Such a configuration is not permitted for this function.</p> <p>Device reaction: –</p> <p>“Warning” output relay: Updating</p> <p>“Blocked/faulty” output relay: –</p>                                                                       |         |  |  |         |
| SFMON: Output 30                                                                                                                                                                                                                                                                                                                 |         |  |  | 098 053 |
| SFMON: Output 30 (t)                                                                                                                                                                                                                                                                                                             |         |  |  | 098 054 |
| SFMON: Output 31                                                                                                                                                                                                                                                                                                                 |         |  |  | 098 055 |
| SFMON: Output 31 (t)                                                                                                                                                                                                                                                                                                             |         |  |  | 098 056 |
| SFMON: Output 32                                                                                                                                                                                                                                                                                                                 |         |  |  | 098 057 |
| SFMON: Output 32 (t)                                                                                                                                                                                                                                                                                                             |         |  |  | 098 058 |
| <p>The LOGIC outputs 30 ... 32(t) are mirrored into these SFMON outputs, which can be included in the list of warning signals by selection at SFMON: Fct. assign. warning. The warning signals are also recorded in the monitoring signal memory.</p> <p>“Warning” output relay: Yes</p> <p>“Blocked/faulty” output relay: –</p> |         |  |  |         |



 **DANGER****HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Only qualified personnel, trained, authorized and familiar with the device and all the safety instructions in the general Safety Guide (SFTY/5LM/L11 or later version) and appropriate Chapter 5, Chapter 10, Chapter 11, Chapter 12 and Chapter 13 of this manual, shall work on installation, connection, commissioning, maintenance or servicing of this device.

Failure to follow these instructions will result in death or serious injury.

The C434 is a low-maintenance device. The components used in the units are selected to meet exacting requirements. Recalibration is not necessary.

 **WARNING****HAZARD OF EQUIPMENT DAMAGE OR LIFETIME REDUCTION**

- Before cleaning the equipment ensure that all ac and dc supplies, current transformer and voltage transformer connections are isolated to prevent any chance of an electric shock whilst cleaning.
- The equipment may be cleaned using a lint-free cloth moistened with clean water. The use of detergents, solvents or abrasive cleaners is not recommended as they may damage the relay's surface and leave a conductive residue.

Failure to follow these instructions can result in equipment damage, unintended equipment operation or reduction of equipment lifetime.

12.1 Maintenance Procedures in the Power Supply Area

Replacement of the power supply module must be carried out by trained personnel, and the power supply voltage must be turned off while the work is being performed.

 **DANGER**

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Always disconnect the device from the auxiliary power supply, before removing any hardware module.
- Switch off all the power supplies in connection to the equipment to isolate the device, before removing any hardware module.

Failure to follow these instructions will result in death or serious injury.

 **DANGER**

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- The power supply must be turned off for at least 5 s before power supply module V is removed. Otherwise there is the danger of an electric shock.

Failure to follow these instructions will result in death or serious injury.

The following instructions apply to surface-mounted cases:

 **WARNING**

HAZARD OF EQUIPMENT DAMAGE

- The local control panel (or front element) is connected to processor module P by a plug-in connecting cable. Make sure the connector position is correct. Do not bend the connecting cable!

Failure to follow these instructions can result in equipment damage or unintended equipment operation.

In general, the electronic components used for the device family *Easergy MiCOM 30* are designed for a long service life.

For the power supply, however, dimensioning requirements dictate the use of electrolytic capacitors that are subject to increased wear and tear. The useful life of these capacitors depends on their temperature and thus on the components fitted in the device, the load conditions, device location and environmental conditions.

The internal voltage levels are cyclically checked by the P30 self-monitoring functions. In case the voltage levels deviate from their specified values a warning message will be issued or, for persistent problems, the device will be set to a safe condition (blocking).

Moreover, the power supply module of the C434 is equipped with a lithium battery for non-volatile storage of fault data and for keeping the internal clock running in the event of failure of the auxiliary power supply. The useful life of the lithium battery depends on the auxiliary power supply of the device.

- If the C434 is continuously connected to the auxiliary power supply, then there is no discharging of the battery, and the battery will thus not be depleted during its service life.
- Should the C434 be disconnected from the auxiliary power supply for several years, then the battery capacity would decrease.

During normal operation, the battery voltage is monitored. If the voltage falls below a pre-defined threshold, a warning message will be issued and the battery has to be replaced.

After the maintenance procedures described above have been completed, new commissioning tests as described in [Section 10.2, \(p. 10-5\)](#) must be carried out.

## 12.2 Routine Functional Testing

The C434 is used as a safety device and must therefore be routinely injection tested for proper operation. Functional tests should be carried out according to the Operator instruction and maintenance plan. We recommend to perform the functional tests at intervals of 2 to 4 years. This interval can be extended to 6 years if a functional check is performed at least 3 years after the last functional test.

The C434 incorporates in its system a very extensive self-monitoring function for hardware and software. The internal structure guarantees, for example, that communication within the processor system will be checked on a continuing basis.

Nonetheless, there are a number of subfunctions that cannot be checked by the self-monitoring feature without injection testing from the device terminals. The respective device-specific properties and settings must be observed in such cases.

In particular, none of the control and signaling circuits that are run to the device from the outside are checked by the self-monitoring function.



### 12.3 Analog Input Circuits

The analog inputs are fed through an analog preprocessing feature (anti-aliasing filtering) to a common analog-to-digital converter. In conjunction with the self-monitoring function, the CT/VT supervision function that is available for the device's general functions can detect deviations in many cases. However, it is still necessary to test from the device terminals in order to make sure that the analog measuring circuits are functioning correctly.

The best way to carry out a static test of the analog input circuits is to check the primary measured operating data using the operating data measurement function or to use a suitable testing instrument. A "small" measured value (such as the nominal current in the current path) and a "large" measured value (such as the nominal voltage in the voltage path) should be used to check the measuring range of the A/D converter. This makes it possible to check the entire dynamic range.

The accuracy of operating data measurement is  $<1\%$ . An important factor in evaluating device performance is long-term performance based on comparison with previous measurements.

In addition, a dynamic test can be used to check transmission performance and the phase relation of the current transformers and the anti-aliasing filter. This can best be done by measuring the trigger point of the first zone when there is a two-phase ungrounded fault. For this test, the value of the short-circuit current should be such that a loop voltage of approximately 2 V is obtained at the device's terminals with the set impedance. Furthermore, a suitable testing instrument that correctly replicates the two-phase ungrounded fault should be used for this purpose.

Additional analog testing of such factors as the impedance characteristic or the starting characteristic is not necessary, in our opinion, since information processing is completely digital and is based on the measured analog current and voltage values. Proper operation was checked in conjunction with type testing.

## 12.4 Binary Opto Inputs

The binary inputs are not checked by the self-monitoring function. However, a testing function is integrated into the software so that the trigger state of each input can be read out (*Oper/Cycl/Phys* menu branch). This check should be performed for each input being used and can be done, if necessary, without disconnecting any device wiring.

## 12.5 Binary Outputs

With respect to binary outputs, the integrated self-monitoring function includes even two-phase triggering of the relay coils of all the relays. There is no monitoring function for the external contact circuit. In this case, the all-or-nothing relays must be triggered by way of device functions or integrated test functions. For these testing purposes, triggering of the output circuits is integrated into the software through a special control function (*Oper/CtrlTest* menu branch).

### DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Before starting the test, open any triggering circuits for external devices so that no inadvertent switching operations will take place.

Failure to follow these instructions will result in death or serious injury.

## 12.6 Communication Interfaces

The integrated self-monitoring function for the PC or communication interface also includes the communication module. The complete communication system, including connecting link and fiber-optic module (if applicable), is always totally monitored as long as a link is established through the control program or the communication protocol.

## 13

## Storage

Devices must be stored in a dry and clean environment. A temperature range of -25°C to +70°C (-13°F to +158°F) must be maintained during storage (see chapter entitled "Technical Data"). The relative humidity must be controlled so that neither condensation nor ice formation will result.

If the units are stored without being connected to auxiliary voltage, then the electrolytic capacitors in the power supply area need to be recharged every 4 years. Recharge the capacitors by connecting auxiliary voltage to the C434 for approximately 10 minutes.

If the units are stored during a longer time, the battery of the power supply module is used for the continuous buffering of the event data in the working memory of the processor module. Therefore the battery is permanently required and discharges over time. In order to avoid this continuous discharge, it is recommended to remove the power supply module from the mounting rack during long storage periods. The contents of the event memory should be previously read out and stored separately!

 **WARNING****HAZARD OF EQUIPMENT DAMAGE OR LIFETIME REDUCTION**

- Do not sustain exposure to high humidity during storage, the value shall not exceed 75% relative humidity.
- Once the device has been unpacked, it is recommended to energize it within the three following months.
- The device has to be energized at least once in 4 years, if it is not in permanent operation.
- Where electrical equipment is being installed, sufficient time should be allowed for acclimatization to the ambient temperature of the environment before energization.

Failure to follow these instructions can result in equipment damage, unintended equipment operation or reduction of equipment lifetime.



# 14 Accessories and Spare Parts

| Description                                                             | Order No.                                                            |
|-------------------------------------------------------------------------|----------------------------------------------------------------------|
| Cable bushings                                                          | 88512-4-0337414-301                                                  |
| Resistor 200 $\Omega$                                                   | 255.002.696                                                          |
| Accessory set #1, 40T Rack/Panel/Flush Mounting Set                     | 9652221                                                              |
| Accessory set #2, 84T Rack/Panel/Flush Mounting Set for two 40T devices | 9652236                                                              |
| Accessory set #3, 84T Rack/Panel/Flush Mounting Set                     | 9652222                                                              |
| Operating program for Windows                                           | Use Easergy Studio setting tool or can be downloaded from SE website |

LED indicators and function keys that are not already configured can be labeled by paper strips. The paper labels can be inserted into slot in front membrane at the appropriate location.

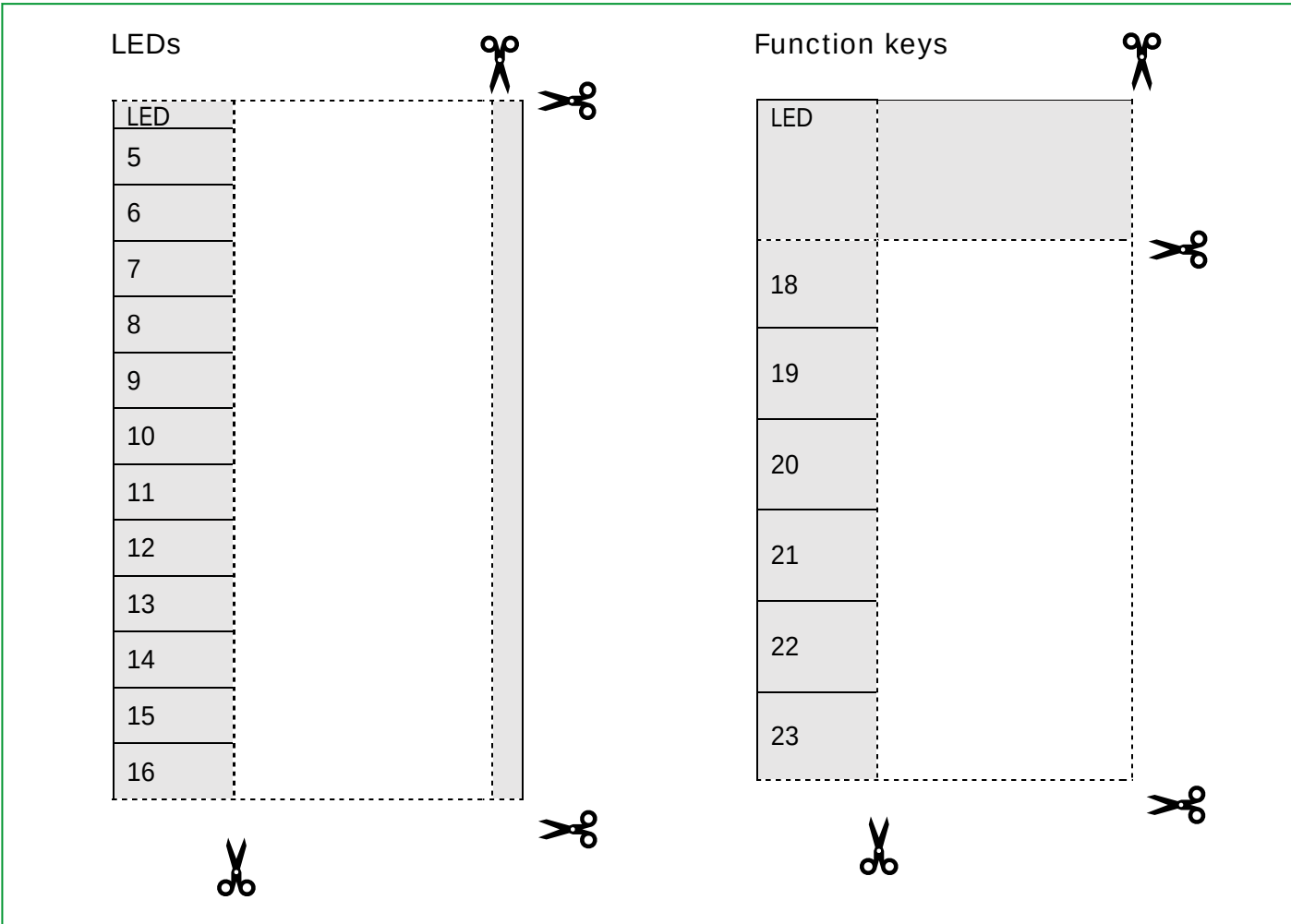


Fig. 14-1: LEDs / Function key LEDs assignment template. (Please cut out the white area between the grey blocks.)





# 15 Order Information

## Basic Configuration Variants

| MiCOM C434                                                                                                                                               |  |  |  |  |     |   |   |   |   |   |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|-----|---|---|---|---|---|---|---|---|----|----|----|--------|------|------|------|------|------|------|-----|---|-----|---|------|
| PCS Cell No.                                                                                                                                             |  |  |  |  | 1   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13, 14 |      | 15   | 16   | 17   | 18   |      |     |   |     |   |      |
| Bay Unit for Control and Monitoring                                                                                                                      |  |  |  |  | C   | 4 | 3 | 4 | - |   |   |   |   |    |    |    |        | -309 | -4xx | -5xx | -671 | -7xx | -46x | -9x | x | -9x | x | -8xx |
| Basic device: <sup>18), 22), 23)</sup>                                                                                                                   |  |  |  |  |     |   |   |   |   |   |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| Basic device 40TE, pin-terminal connection,<br>basic complement with 4 binary inputs, 8 output relays                                                    |  |  |  |  | N=4 | 3 |   |   |   |   |   |   |   |    |    |    |        |      | -416 |      |      |      |      |     |   |     |   |      |
| Basic device 84TE, pin-terminal connection,<br>basic complement with 4 binary inputs, 8 output relays                                                    |  |  |  |  | N=6 | 9 |   |   |   |   |   |   |   |    |    |    |        |      | -417 |      |      |      |      |     |   |     |   |      |
| Basic device 84TE, ring-terminal connection,<br>basic complement with 4 binary inputs, 8 output relays                                                   |  |  |  |  | N=6 | 8 |   |   |   |   |   |   |   |    |    |    |        |      | -418 |      |      |      |      |     |   |     |   |      |
| Mounting option and display:                                                                                                                             |  |  |  |  |     |   |   |   |   |   |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| Surface-mounted, enhanced local control panel, text display                                                                                              |  |  |  |  |     |   |   |   |   | A |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| Flush-mounted, enhanced local control panel, text display                                                                                                |  |  |  |  |     |   |   |   |   | B |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| Surface-mounted, enhanced local control panel, colored graphic display                                                                                   |  |  |  |  |     |   |   |   |   | C |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| Flush-mounted, enhanced local control panel, colored graphic display                                                                                     |  |  |  |  |     |   |   |   |   | D |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| Surface-mounted, with enhanced, colored detachable HMI                                                                                                   |  |  |  |  |     |   |   |   |   | E |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| Flush-mounted, with enhanced, colored detachable HMI                                                                                                     |  |  |  |  |     |   |   |   |   | F |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| Current/Voltage transformer:                                                                                                                             |  |  |  |  |     |   |   |   |   |   |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| Without                                                                                                                                                  |  |  |  |  |     |   |   |   |   |   |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| Inom = $\frac{1}{5}$ A/ 5 A (4-pole) <sup>2)</sup>                                                                                                       |  |  |  |  |     |   |   |   |   |   |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| Vnom = 50 ... 130 V (4-pole)                                                                                                                             |  |  |  |  |     |   |   |   |   |   |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| Inom = $\frac{1}{5}$ A/ 5 A (4-pole) <sup>2)</sup> and Vnom = 50 ... 130 V (4-pole)                                                                      |  |  |  |  |     |   |   |   |   |   |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| Inom = $\frac{1}{5}$ A/ 5 A (4-pole) <sup>2)</sup> and Vnom = 50 ... 130 V (5-pole)                                                                      |  |  |  |  |     |   |   |   |   |   |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| 2 x Inom = $\frac{1}{5}$ A/ 5 A (4-pole) <sup>2) 5)</sup>                                                                                                |  |  |  |  |     |   |   |   |   |   |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| 2 x Vnom = 50 ... 130 V (4-pole) <sup>5)</sup>                                                                                                           |  |  |  |  |     |   |   |   |   |   |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| 2 x (Inom = $\frac{1}{5}$ A/ 5 A (4-pole) <sup>2)</sup> and Vnom = 50 ... 130 V (4-pole)) <sup>5)</sup>                                                  |  |  |  |  |     |   |   |   |   |   |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| 1x (Inom = $\frac{1}{5}$ A/ 5 A (4-pole) <sup>2)</sup> and Vnom = 50 ... 130 V (4-pole)) <sup>5)</sup><br>and 1x Inom = 1 A / 5 A (4-pole) <sup>2)</sup> |  |  |  |  |     |   |   |   |   |   |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |
| 1x (Inom = $\frac{1}{5}$ A/ 5 A (4-pole) <sup>2)</sup> and Vnom = 50 ... 130 V (4-pole)) <sup>5)</sup><br>and 1x Vnom = 50 ... 130 V (4-pole)            |  |  |  |  |     |   |   |   |   |   |   |   |   |    |    |    |        |      |      |      |      |      |      |     |   |     |   |      |

Further Options

| MiCOM C434                                                                         |         |  |  |  |                             |   |   |   |   |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
|------------------------------------------------------------------------------------|---------|--|--|--|-----------------------------|---|---|---|---|----|----|----|--------|--|--|------|------|------|------|------|------|-----|---|-----|---|------|--|
| PCS Cell No.                                                                       | 1 2 3 4 |  |  |  | 5                           | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13, 14 |  |  |      | 15   | 16   | 17   | 18   |      |     |   |     |   |      |  |
| Bay Unit for Control and Monitoring                                                |         |  |  |  | C 4 3 4 -                   |   |   |   |   |    |    |    |        |  |  | -309 | -4xx | -5xx | -671 | -7xx | -46x | -9x | x | -9x | x | -8xx |  |
| Additional binary I/O options:                                                     |         |  |  |  |                             |   |   |   |   |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| Without                                                                            |         |  |  |  |                             |   |   |   | 0 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 1 binary module (add. 6 binary inputs and 8 output relays) <sup>18)</sup>     |         |  |  |  |                             |   |   |   | 1 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 2 binary modules (add. 12 binary inputs and 16 output relays) <sup>18)</sup>  |         |  |  |  |                             |   |   |   | 2 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 3 binary modules (add. 18 binary inputs and 24 output relays) <sup>18)</sup>  |         |  |  |  |                             |   |   |   | 3 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 4 binary modules (add. 24 binary inputs and 32 output relays) <sup>18)</sup>  |         |  |  |  |                             |   |   |   | 4 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 5 binary modules (add. 30 binary inputs and 40 output relays) <sup>18)</sup>  |         |  |  |  |                             |   |   |   | 5 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 6 binary modules (add. 36 binary inputs and 48 output relays) <sup>18)</sup>  |         |  |  |  |                             |   |   |   | 6 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| Additional binary I/O options:                                                     |         |  |  |  |                             |   |   |   |   |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| Without                                                                            |         |  |  |  |                             |   |   |   | 0 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 1 binary module (add. 6 binary inputs and 6 output relays) <sup>18)</sup>     |         |  |  |  |                             |   |   |   | 1 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 2 binary modules (add. 12 binary inputs and 12 output relays) <sup>18)</sup>  |         |  |  |  |                             |   |   |   | 2 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 3 binary modules (add. 18 binary inputs and 18 output relays) <sup>18)</sup>  |         |  |  |  |                             |   |   |   | 3 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 4 binary modules (add. 24 binary inputs and 24 output relays) <sup>18)</sup>  |         |  |  |  |                             |   |   |   | 4 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 5 binary modules (add. 30 binary inputs and 30 output relays) <sup>18)</sup>  |         |  |  |  |                             |   |   |   | 5 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 6 binary modules (add. 36 binary inputs and 36 output relays) <sup>18)</sup>  |         |  |  |  |                             |   |   |   | 6 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| Additional binary I/O options:                                                     |         |  |  |  |                             |   |   |   |   |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| Without                                                                            |         |  |  |  |                             |   |   |   | 0 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 1 binary module (add. 24 binary inputs) <sup>18)</sup>                        |         |  |  |  |                             |   |   |   | 1 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 2 binary modules (add. 48 binary inputs) <sup>18)</sup>                       |         |  |  |  |                             |   |   |   | 2 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 3 binary modules (add. 72 binary inputs) <sup>18)</sup>                       |         |  |  |  |                             |   |   |   | 3 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 4 binary modules (add. 96 binary inputs) <sup>18)</sup>                       |         |  |  |  |                             |   |   |   | 4 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 5 binary modules (add. 120 binary inputs) <sup>18)</sup>                      |         |  |  |  |                             |   |   |   | 5 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 6 binary modules (add. 144 binary inputs) <sup>18)</sup>                      |         |  |  |  |                             |   |   |   | 6 |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| Power supply and additional binary I/O options:                                    |         |  |  |  |                             |   |   |   |   |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| VA , nom = 24 ... 60 VDC                                                           |         |  |  |  |                             |   |   |   |   |    | E  |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| VA,nom = 60 ... 250 VDC / 100 ... 230 VAC                                          |         |  |  |  |                             |   |   |   |   |    | F  |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| VA,nom = 24 ... 60 VDC and 6 output relays <sup>25)</sup>                          |         |  |  |  |                             |   |   |   |   |    | G  |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| VA,nom = 60 ... 250 VDC / 100 ... 230 VAC and 6 output relays <sup>25)</sup>       |         |  |  |  |                             |   |   |   |   |    | H  |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| VA , nom = 24 ... 60 VDC and 6 binary inputs and 3 output relays <sup>25)</sup>    |         |  |  |  |                             |   |   |   |   |    | J  |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| VA,nom = 60 ... 250 VDC / 100 ... 230 VAC                                          |         |  |  |  |                             |   |   |   |   |    | K  |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| and 6 binary inputs and 3 output relays <sup>25)</sup>                             |         |  |  |  |                             |   |   |   |   |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| VA , nom = 24 ... 60 VDC and 4 high break contacts <sup>25)</sup>                  |         |  |  |  |                             |   |   |   |   |    | L  |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| VA,nom = 60 ... 250 VDC / 100 ... 230 VAC and 4 high break contacts <sup>25)</sup> |         |  |  |  |                             |   |   |   |   |    | M  |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| Further add. options:                                                              |         |  |  |  |                             |   |   |   |   |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| Without                                                                            |         |  |  |  |                             |   |   |   |   |    | 0  |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With analog module <sup>18)</sup>                                                  |         |  |  |  |                             |   |   |   |   |    | 1  |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 1 binary module (add. 6 binary inputs and 3 output relays) <sup>18)</sup>     |         |  |  |  |                             |   |   |   |   |    | A  |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 2 binary modules (add. 12 binary inputs and 6 output relays) <sup>18)</sup>   |         |  |  |  |                             |   |   |   |   |    | B  |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 3 binary modules (add. 18 binary inputs and 9 output relays) <sup>18)</sup>   |         |  |  |  |                             |   |   |   |   |    | C  |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 4 binary modules (add. 24 binary inputs and 12 output relays) <sup>18)</sup>  |         |  |  |  |                             |   |   |   |   |    | D  |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| With 5 binary modules (add. 30 binary inputs and 15 output relays) <sup>18)</sup>  |         |  |  |  |                             |   |   |   |   |    | E  |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| Switching threshold on binary inputs:                                              |         |  |  |  |                             |   |   |   |   |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| Standard variant with switching threshold at 65% of 24 VDC (VA,min) <sup>8)</sup>  |         |  |  |  | Without order extension No. |   |   |   |   |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| Special variant with switching threshold at 65% of 127 VDC (VA,nom) <sup>8)</sup>  |         |  |  |  |                             |   |   |   |   |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |
| Special variant with switching threshold at 65% of 250 VDC (VA,nom) <sup>8)</sup>  |         |  |  |  |                             |   |   |   |   |    |    |    |        |  |  |      |      |      |      |      |      |     |   |     |   |      |  |

## Communication Options

| MiCOM C434                                                                              |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      |     |   |      |
|-----------------------------------------------------------------------------------------|--|--|--|---|---|---|---|---|---|---|---|---|----|----|----|--------------------------------|------|------|------|------|------|------|-----|------|-----|---|------|
| PCS Cell No.                                                                            |  |  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13, 14                         |      |      |      | 15   | 16   | 17   | 18  |      |     |   |      |
| Bay Unit for Control and Monitoring                                                     |  |  |  | C | 4 | 3 | 4 | - |   |   |   |   |    |    |    |                                | -309 | -4xx | -5xx | -671 | -7xx | -46x | -9x | x    | -9x | x | -8xx |
| With communication / information interface:                                             |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      |     |   |      |
| Without                                                                                 |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    | Without order extension No.    |      |      |      |      |      |      |     |      |     |   |      |
| Serial communication IEC 60870-5-101/103, Modbus, DNP3, Courier (switchable)            |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      | -92  |     |      |     |   |      |
| all with 2nd RS485 service interface (IEC 60870-5-103) & IRIG-B                         |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      |     |   |      |
| Variant RS485: for connection to wire                                                   |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      | 1   |   |      |
| Variant FSMA: for connection to plastic fiber                                           |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      | 2   |   |      |
| Variant ST: for connection to glass fiber                                               |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      | 4   |   |      |
| IP Ethernet modules IEC 61850 Ed. 1/ Ed. 2/ IEC 60870-5-104 (switchable) <sup>26)</sup> |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      |     |   |      |
| all with IRIG-B                                                                         |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      |     |   |      |
| CSL0: without Cyber Security compatibility                                              |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      | -97 |   |      |
| CSL1: with Cyber Security compatibility (+ additional SAT licence) <sup>27) 31)</sup>   |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      | -99 |   |      |
| Variant SEB RJ45: Single Ethernet, 1 x RJ45 port                                        |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      |     | 1 |      |
| Variant SEB LC: Single Ethernet, 1 LC port + 1 RJ45 port                                |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      |     | 2 |      |
| Variant REB RJ45: Redundant Ethernet RSTP or PRP or HSR, VLAN, 3 RJ45 ports             |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      |     | 3 |      |
| Variant REB LC: Redundant Ethernet RSTP or PRP or HSR, VLAN, 2 LC ports + 1 RJ45 port   |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      |     | 4 |      |
| Serial communication module and additional IP Ethernet module variant <sup>32)</sup>    |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      |     |   |      |
| Variant ST and Variant SEB RJ45                                                         |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      |     | 5 |      |
| Variant ST and Variant SEB LC                                                           |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      |     | 6 |      |
| Variant ST and Variant REB RJ45                                                         |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      |     | 7 |      |
| Variant ST and Variant REB LC                                                           |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      |     | 8 |      |
| Language:                                                                               |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     |      |     |   |      |
| English (German) <sup>4)</sup>                                                          |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    | Without order extension No.    |      |      |      |      |      |      |     |      |     |   |      |
| Px40 English (English) <sup>4)</sup>                                                    |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    | Not yet available - on request |      |      |      |      |      |      |     | -800 |     |   |      |
| German (English) <sup>4)</sup>                                                          |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |                                |      |      |      |      |      |      |     | -801 |     |   |      |
| French (English) <sup>4)</sup>                                                          |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    | Not yet available - on request |      |      |      |      |      |      |     | -802 |     |   |      |
| Spanish (English) <sup>4)</sup>                                                         |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    | Not yet available - on request |      |      |      |      |      |      |     | -803 |     |   |      |
| Polish (English) <sup>4)</sup>                                                          |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    | Not yet available - on request |      |      |      |      |      |      |     | -804 |     |   |      |
| Russian (English) <sup>4) 7)</sup>                                                      |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    | Not yet available - on request |      |      |      |      |      |      |     | -805 |     |   |      |

### Key

- 2) Switching via parameter, default setting is underlined!
- 4) Second included language in brackets.
- 5) For 84 TE version only.
- 7) Hardware option, supports Cyrillic letters instead of special West. European characters (only -303 -604 -706 -805).
- 8) Standard variant recommended if higher pickup threshold not explicitly required by the application.
- 18) The sum of digits 8, 9, 10 and 12 of the Order No. must not exceed the maximum value N, indicated for each case separately.
- 22) Tapchanger function (TAPCH) only up to firmware version -612 available.
- 23) Modbus Master (MM\_xx) only up to firmware version -605 available.
- 25) Only available for 84 TE version if sum of value N < 6.
- 26) Option IEC 60870-5-104 only for German market and on request.
- 27) According BDEW / NERC / IEEE 1686.
- 31) Cyber Security feature is only available for Ethernet communication.
- 32) Serial comm. module module on slot 2; IP Ethernet module variant on slot 8 or slot 7 (if slot 8 is already used) for 40 TE and slot 6 or slot 8 (if slot 6 is already used) for 84 TE.
- 34) Rack/Flush Mounting accessory available separately.

### Information about Ordering Options

#### Language version

In order to display the Russian data model, the corresponding order extension number (-805) must be added upon ordering so that the hardware option supporting Cyrillic characters is integrated. With this ordering option, reference menu texts (English) will be available for display. However, other Western European languages containing extra characters will not be fully supported. Consequently, selecting the “Russian / English” ordering option means that it will not be possible to download Western European data models into the device.

#### Binary Inputs' Switching Threshold

The standard version of binary signal inputs (opto-couplers) is recommended in most applications, as these inputs operate with any voltage from 18 V. Special versions with higher pick-up/drop-off thresholds (see also “Technical Data”, [Chapter 2, \(p. 2-1\)](#)) are provided for applications where a higher switching threshold is expressly required.





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