GO SYSTEMELEKTRONIK

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# Manual
# BlueConnect Modules


**with Supplement BlueConnect Plus Board**

Blue Connect

**Version of this manual: 3.9 en**

www.go-sys.de

## Copyright



## Changes

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## Manufacturer's declaration

When installing the system, it is necessary to ensure correct electrical connection, protection against moisture and foreign bodies and excessive condensation, and system heating which can arise from both correct and incorrect use. It is the responsibility of the installer to ensure that the correct installation conditions are provided.

**© GO Systemelektronik GmbH**
**Faluner Weg 1**
**24109 Kiel**
**Germany**
**Tel.: +49 431 58080-0**
**Fax: +49 431 58080-11**
**www.go-sys.de**
**info@go-sys.de**

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## Table of Contents

# 1 Introduction

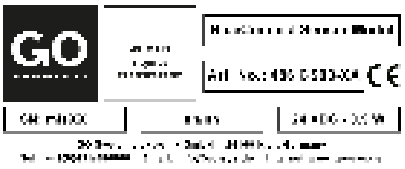
This manual describes the BlueConnect Modules of GO Systemelektronik. BlueConnect Modules are available in two basic variants, as Sensor Module and as Input-Output Module (I/O Module).

At the completion of this manual, the following types of design were available:

| Sensor-Modules | Article No. |
|---|---|
| Oxygen + Temp. | 486 CS00-4 |
| pH + Temp. | 486 CS00-5 |
| ISE + Temp. | 486 CS00-7 |
| ORP (Redox) + Temp. | 486 CS00-9 |
| Bus Module | 486 CS00-MOD |
| Bus Module Turb. flow through | 486 CS00-FNU |

| Input-Output Modules | Article No. |
|---|---|
| Current Input | 486 CI00-AI2 |
| Current Output | 486 CI00-AO2 |
| RS232 Output Voltage 5 V | 486 CI00-S05 |
| RS232 Output Voltage 12 V | 486 CI00-S12 |
| RS485 Output Voltage 5 V | 486 CI00-M05 |
| RS485 Output Voltage 12 V | 486 CI00-M12 |
| RS485 Output Voltage 24 V | 486 CI00-M24 |
| Relay | 486 CI00-REL |
| Pulse Input | 486 CI00-PI2 |


The type of version can be found on the sticker on the front of the housing ① or via the article number on the type plate on the right-hand side ② of the housing.




**Note on the article numbers**
With the beginning of the year 2022, the BlueConnect Modules have been reassigned the article numbers listed above. The old article numbers are listed in Appendix B - Old Article Numbers.

**Note on Text References**

References to passages in this document or to passages in other documents are marked in italics.

- *4.5 The Calibration Window* e.g. refers to the section 4.5 in this document.
  The short form is *4.5.*

The products of GO Systemelektronik are constantly being developed, therefore deviations between this manual and the delivered product can result. Please understand that no legal claims can be derived from the contents of this manual.

**Caution:** The BlueConnect Modules must be installed in such a way that they are not exposed to direct sunlight, rain or snow. Direct sunlight can lead to extreme temperatures, which significantly reduces the service life of electronic components.

# 2 Description of the BlueConnect Modules

The BlueConnect Modules

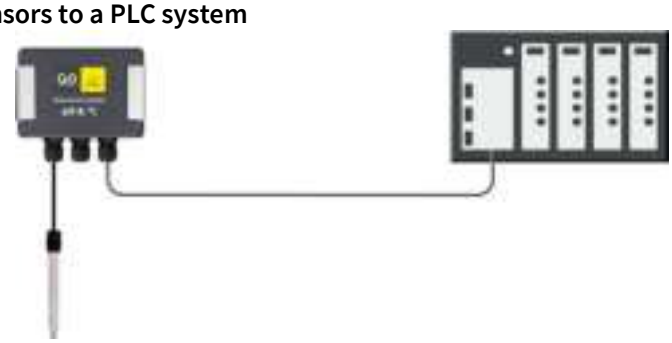
- Transmit the measured values of analog sensors via CAN bus and Modbus.
- Transmit the measured values of Modbus sensors via CAN bus.
- Transmit the measured values of sensors to a PLC.
- Transmit the current values of analog current outputs via CAN bus and Modbus.
- Generate current values from measured values.
- Control an RS232 and RS485 interface via CAN bus.
- Enable the control of relays with freely definable switching conditions.
- Generate measurement values from pulsed signals.

BlueConnect Modules are available in two basic variants, as Sensor Module and as Input-Output Module (I/O Module).

The necessary settings are made on the BlueConnect board and with the enclosed BlueConnect configuration programme using a PC. see *4 Configuring the BlueConnect Modules with the Program Modbus Tool.exe*
The necessary settings for BlueConnect boards **without a Modbus connection** are made on the board and with the AMS program as part of the BlueBox PC software (and partly also via the BlueBox display).

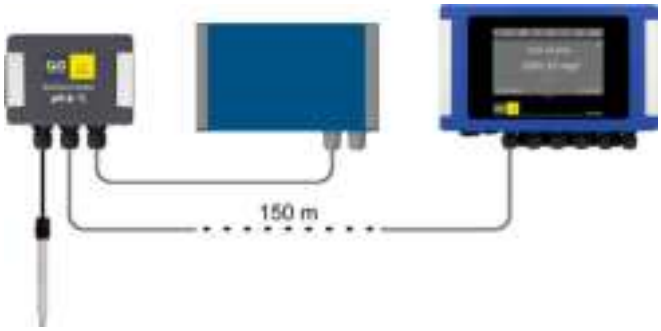
## 2.1 System Setup Examples

**Connection of analog sensors to a PLC system**



**Connection of analog sensors and Modbus sensors to a BlueBox System**

**Connection of analog sensors with additional power supply to a BlueBox System**



## 3 Technical Data and Connections

| General Information | |
|---|---|
| Voltage supply | 10 – 32 VDC |
| Power consumption | Sensor Modules: typical 0.9 W *<br>Current Output Module: typical 0.9 W *<br>RS232 and RS485 Module: typical 0.9 W *<br>* plus Sensor consumption<br>Current Output Module: typical 1.1 W plus load<br>Relay Module: Pull-in power typical 0.9 W<br>Pulse Input Module: typical 0.9 W |
| Dimensions (LxWxH) | 124 x 115 x 63 mm |
| Weight | 0.35 kg |
| IP protection code | IP66 |
| Ambient temperature | -10 to +45 °C |

| Interfaces – depending on version | |
|---|---|
| CAN bus | Protocol is subset of CAN 2.0 |
| Modbus | Modbus RTU via serial interface RS485 |
| RS232/RS485 | Serial interface RS232/RS485 |
| Current input | Resistance 50 Ω 4 – 20 mA |
| Current Output | Resistance < 600 Ω 4 – 20 mA |
| Relay output | Umax 48 V Imax per Relay 2 A |
| Pulse Input | Frequency (rising edge) or static |

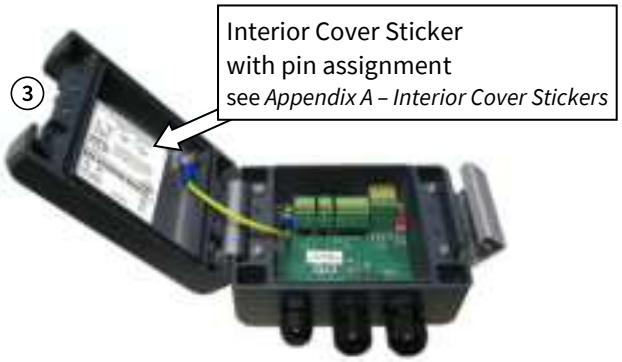
- **Bus Module:** Modbus and CAN bus are galvanically isolated.
- **Current Input and Current Output Module:** he two current inputs/outputs are galvanically isolated from the system, but not from each other.
- **RS232 and RS485 Module:** RS232/RS485 and CAN bus are galvanically isolated.
- **Pulse Input Module:** The two pulse inputs are galvanically isolated from the system, but not from each other.

**Earth the module.**
This is the only way to ensure trouble-free measuring operation.
The earth connection is located on the left side of the housing.

### 3.1 Opening the Module Housing


(1) Turn the housing bracket to the right.
If necessary, use a suitable tool.

(2) Loosen the screws (Torx T20).




(3) Open housing cover to the left.

## 3.2 Cable Connections, Switch Positions and LEDs

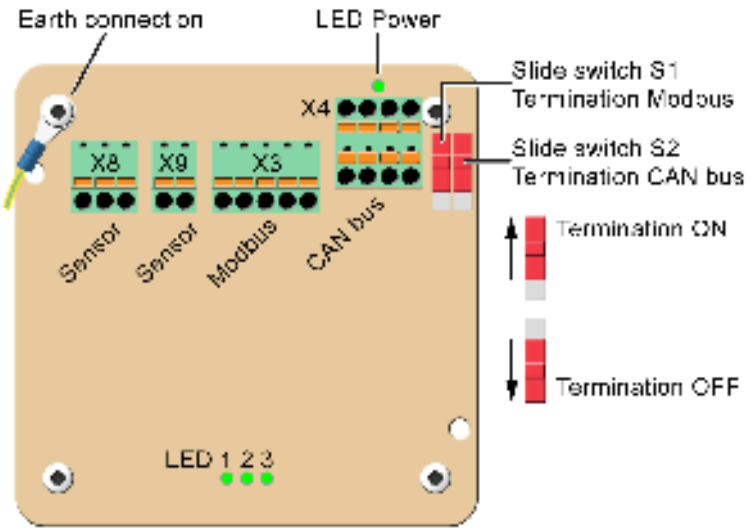
see also *Appendix A – Interior Cover Stickers*

- **The module-specific assignment is shown on the sticker on the inside of the housing cover.**
- **The termination depends on the position of the module in the CAN bus/Modbus.**
  see also *3.3 Notes on termination of older BlueConnect Modules*

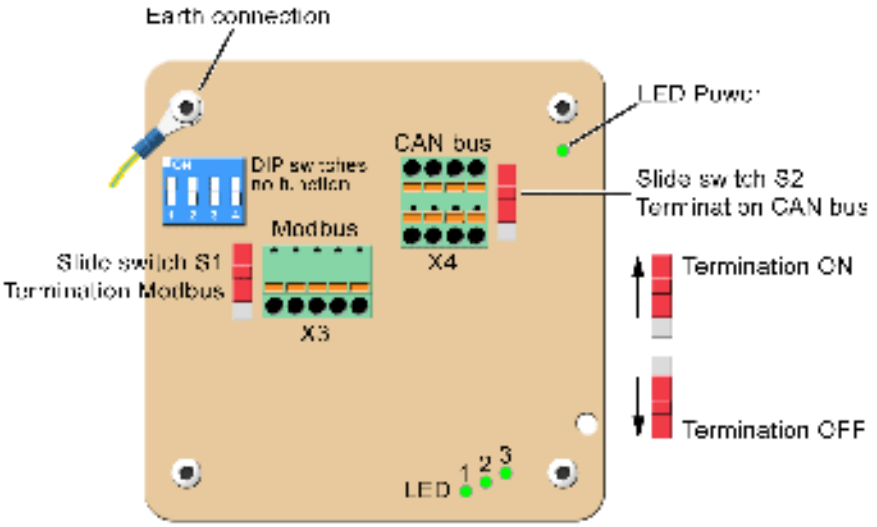
Earth the module. This is the only way to ensure trouble-free measuring operation.

**Sensor Module**
**O2, pH, ISE, ORP**

The Modbus interface is optional.

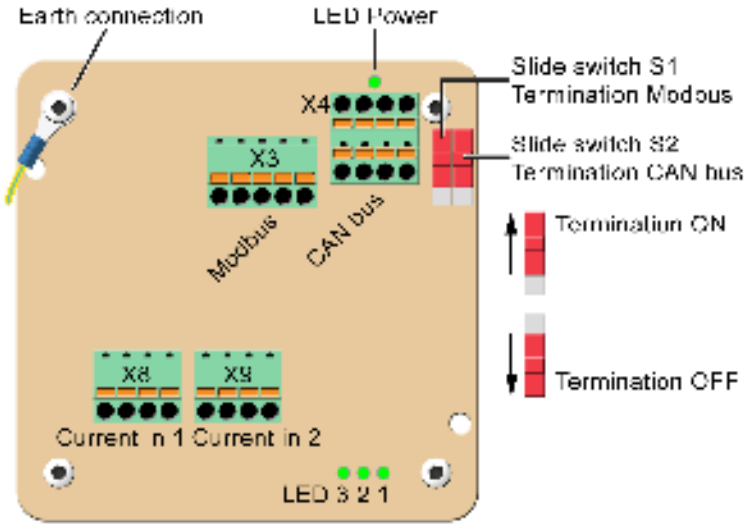



**Bus Module**



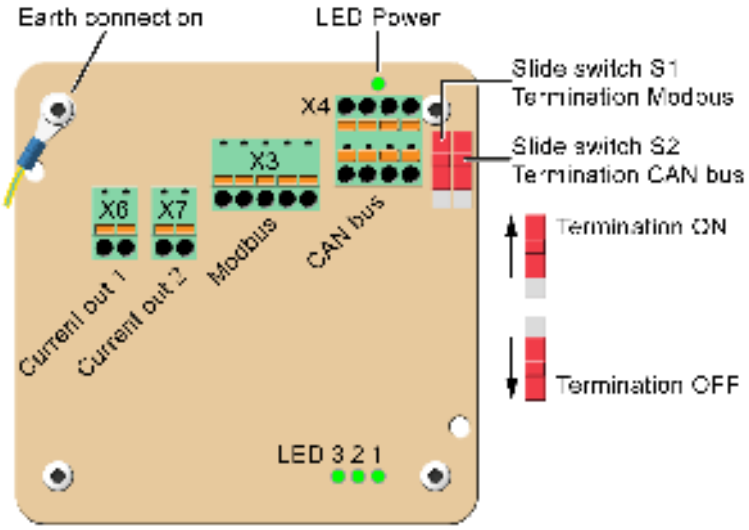

**Current Input Module**
**2x 4 – 20 mA**

The Modbus interface is optional.



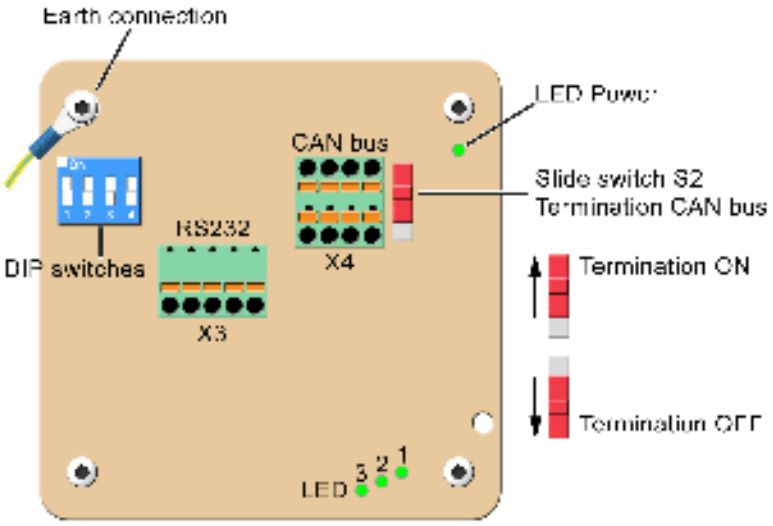
## Current Output Module
## 2x 4 – 20 mA

The Modbus interface
is optional.




## RS232 Module

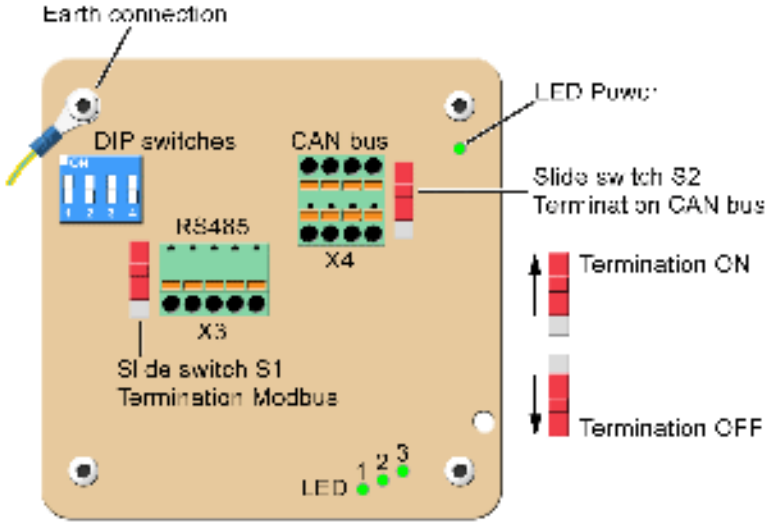
| | OFF | | ON | |
|---|---|---|---|---|
| A | B | C | D | |
| ↓ | ↓ | ↓ | ↓ | COM1 |
| ↑ | ↓ | ↓ | ↓ | COM2 |
| ↓ | ↑ | ↓ | ↓ | COM3 |
| ↑ | ↑ | ↓ | ↓ | COM4 |
| ↓ | ↓ | ↑ | ↓ | COM5 |
| ↑ | ↓ | ↓ | ↓ | COM6 |




**Setting the COM Port with the DIP switches** **Factory setting: COM2 (COM Port 2)**

## RS485 Module

| | OFF | | ON | |
|---|---|---|---|---|
| A | B | C | D | |
| ↓ | ↓ | ↓ | ↓ | COM1 |
| ↑ | ↓ | ↓ | ↓ | COM2 |
| ↓ | ↑ | ↓ | ↓ | COM3 |
| ↑ | ↑ | ↓ | ↓ | COM4 |
| ↓ | ↓ | ↑ | ↓ | COM5 |
| ↑ | ↓ | ↓ | ↓ | COM6 |

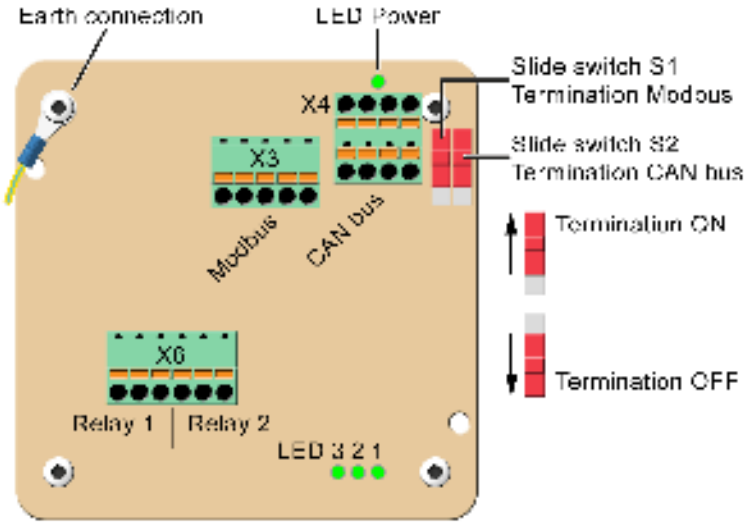



**Setting the COM Port with the DIP switches** **Factory setting: COM2 (COM Port 2)**

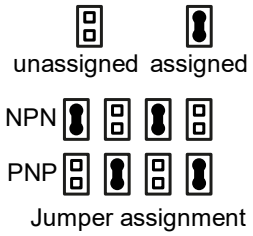
## Relay Module

The Modbus interface is optional.

Relay outputs
Umax = 48 V
Imax = 2 A per Relay



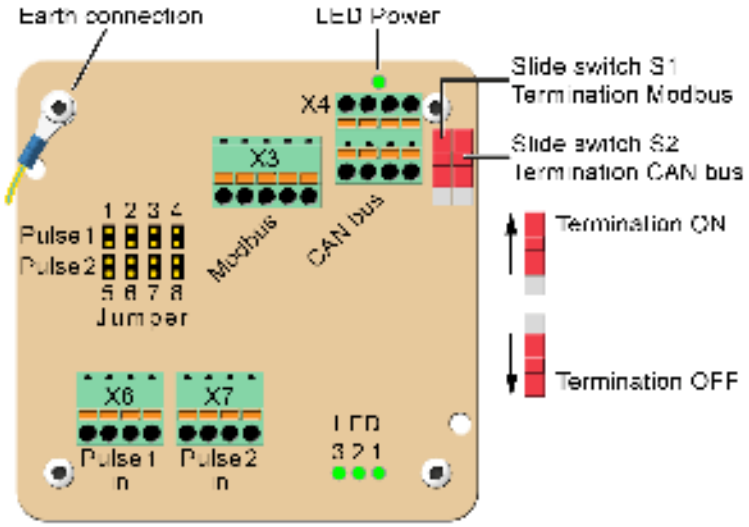

## Pulse Input Module




Jumper assignment

Factory setting: NPN

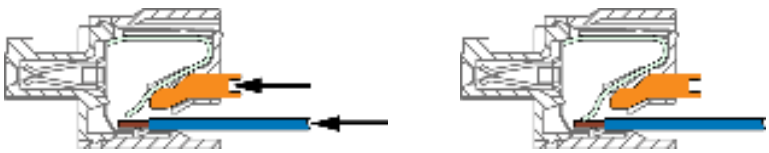
The Modbus interface is optional.




## LED-Functions

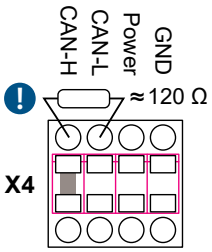
- **LED Power:** Supply voltage is present
- **LED 1:** Flashing – frequency 0.5 Hz, main processor is in operation
- **LED 2:** Data transmission Modbus/RS232/RS485
- **LED 3:** Data transmission CAN bus

## Functionality of a cable clamp



## 3.3 Notes on Termination of Older BlueConnect Modules

- **Older modules have no slide switches on the board.**
  With older BlueConnect Senor and Bus Modules, the termination of CAN bus and Modbus is done via the configuration program Modbus Tool.exe.
  see *4.13 Configuring Older Bus Modules*
- **Older modules are not terminated at the factory.**
  If there is no possibility to terminate the CAN bus via the configuration program:
  CAN bus termination by means of a resistor of approx. 120 Ω on the open terminals for CAN-H and CAN-L on slot X4. Modbus termination by means of a resistor of approx. 120 Ω on the open terminals for TX/RX+ and TX/RX- on slot X3.

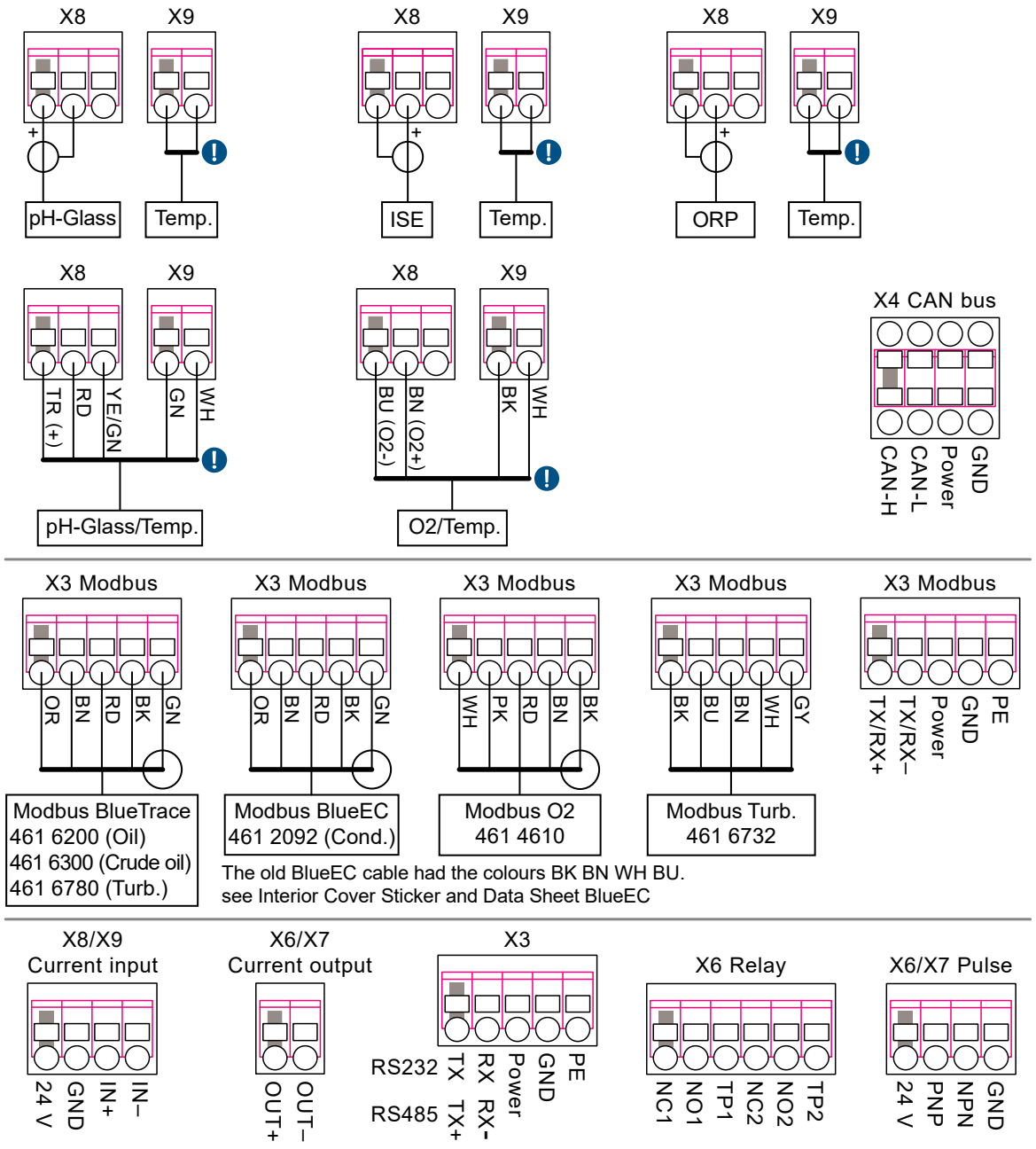


**Example CAN bus**

## 3.3 PIN Assignment

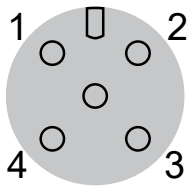
see also *Appendix A – Interior Cover Stickers*

If the two terminals of slot X9 are not occupied, the open input must be terminated with a resistance of approx. 1.2 kΩ (except for O2/Temp, here approx. 27 kΩ).



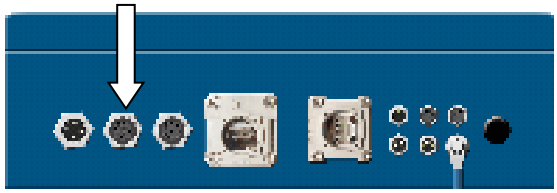

## 3.4 PIN Assignment CAN Bus at the BlueBox

### BlueBox T4




Panel socket (M12, female)

| | |
|---|---|
| **1** | CAN-H |
| **2** | CAN-L |
| **3** | +24 VDC |
| **4** | GND 24 V |



### Mainboard of the BlueBox R1 and BlueBox Panel

**Slot X07 (BlueBox R1) or Slot X4 (BlueBox Panel)**

see *Manual BlueBox R1 and Panel*

# 4 Configuring the BlueConnect Modules with the Program Modbus Tool.exe

This chapter describes the operation of the BlueConnect configuration program Modbus Tool.exe of GO Systemelektronik with the article number 420 6500 in **software version 1.10**. For example, you can use it (depending on the type of module and sensor) to read out sensor information, assign a Modbus address, calibrate the sensor and display measurement values.
On older Sensor and Bus Modules without slide switches, the Modbus (RS485) and the CAN bus can be terminated.[1]

- The **configuration of the Bus Module** is done automatically. The exception here are older bus modules, see *4.13 Configuring Older Bus Modules*.
  The **configuration of the Bus Module Turbidity flow through** is done at the BlueBox and is not described here.
- The configuration of the Relay and Sensor Modules can also be done via the menu operation on the BlueBox and with the BlueBox PC Software.
- The configuration of the Current Modules can also be done via the menu operation on the BlueBox and with the BlueBox PC Software.
- The **configuration of the RS232 Modules** is done via DIP switches.
  see *3.2 Cable Connections, Switch Positions and LEDs* there *RS232 Module* and *RS485 Module*
- Decimal separator is the comma.

The program is executable under Windows 7 and newer. An Installation is not necessary, the program starts when Modbus Tool.exe is called up.

The program automatically detects the connected modules with their sensors.

Modbus Tool.exe is included with every BlueConnect Module. [2]

In the program windows, the internal designations of the modules are used:

- | pH + Temp. = BlueConnect pH | ISE + Temp. = BlueConnect ISE |
  | ORP + Temp. = BlueConnect Redox |
- | Oxygen = BlueConnect O2 | Conductivity = Conductivity | Oil in Water = BlueTrace Oil in Water |
  | Turbidity = BlueTrace Turbidity |
- | Current Input Module = BlueConnect Current In | Current Output Module = BlueConnect Current Out |
  | Relay Module = BlueConnect Relay | Pulse Input Module = BlueConnect Pulse Input |

## 4.1 Preparation

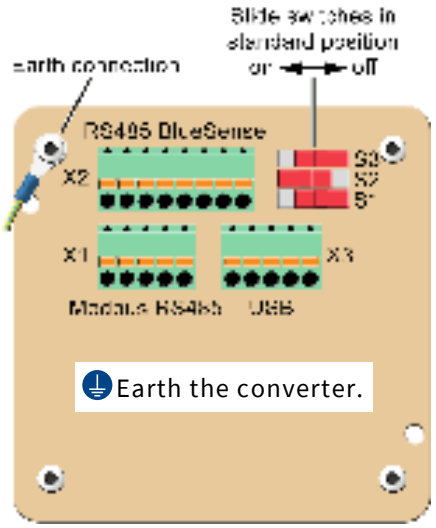
In order for your PC to communicate with a Modbus sensor, you need a **converter from RS485 to USB** and **driver software**.
As an example, here is the Modbus USB[3] converter of GO Systemelektronik (Article No. 486 S810) with the driver software at:
https://ftdichip.com/drivers/d2xx-drivers there „D2XX Drivers“
The driver software creates a virtual COM Port in the Windows system – e.g. "USB Serial Port (COM*n*)".

Converter Slot X1
connected with
BlueConnect Module Slot X3

In case of communication problems:

- Check the earthing of the converter.
- Install the latest driver software.

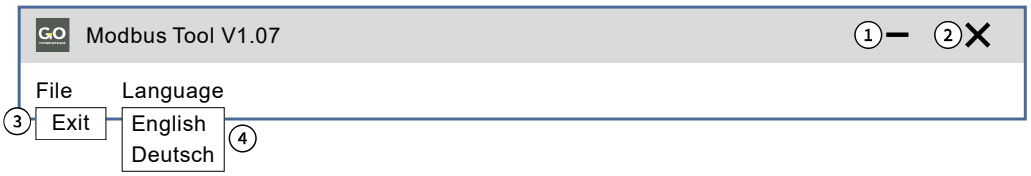
**Board of the converter**




**Opening the converter housing: see *3.1 Opening the Module Housing***

[1] see also *3.3 Notes on Termination of Older BlueConnect Modules*
[2] If not, contact GO Systemelektronik.
[3] USB 2.0 and newer

## 4.2 Title Bar and Menu Bar




① minimises the window – ②③ closes the program – ④ selects the program language

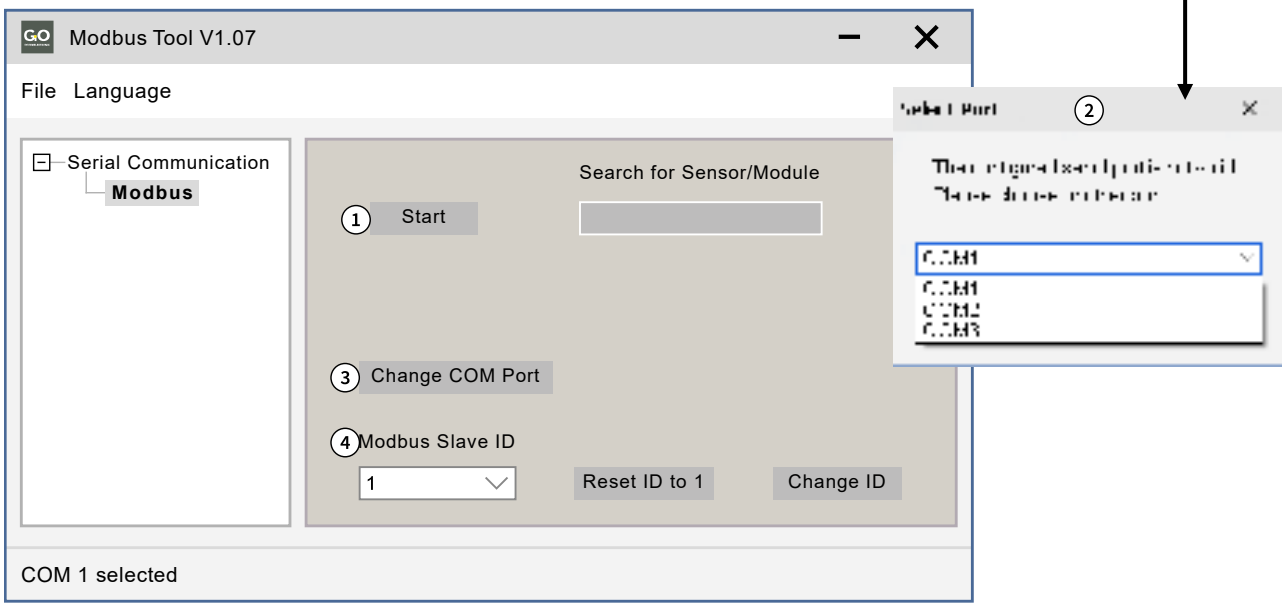
## 4.3 The Start Window (Modbus Connection)

The Modbus connection window opens. Click on button <Start> ①.
The Select Port window ② opens with a selection option for the CON Ports existing on your computer. Here you must select the correct COM Port for communication with the converter.

The COM Port of the converter is displayed in the Windows Device Manager: **USB Serial Port (COM*n*)**

**The program detects the connected BlueConnect Module.**

Via ③ <Change COM Port> you can change the COM Port.

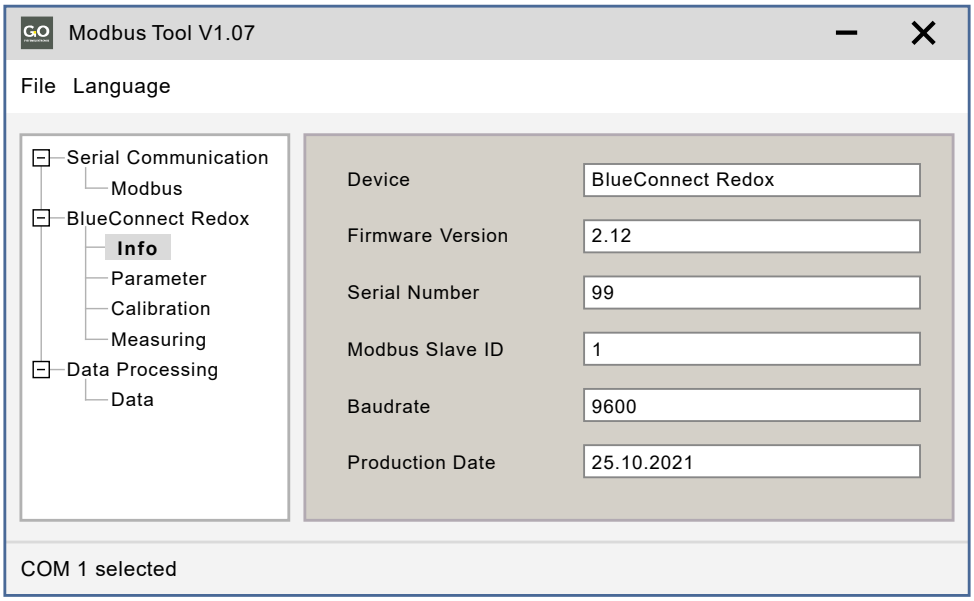



④ The default Modbus Slave ID of a BlueConnect Sensor Module is 1 and does not need to be changed.*

* In special cases contact GO Systemelektronik.

## 4.4 The Info Window

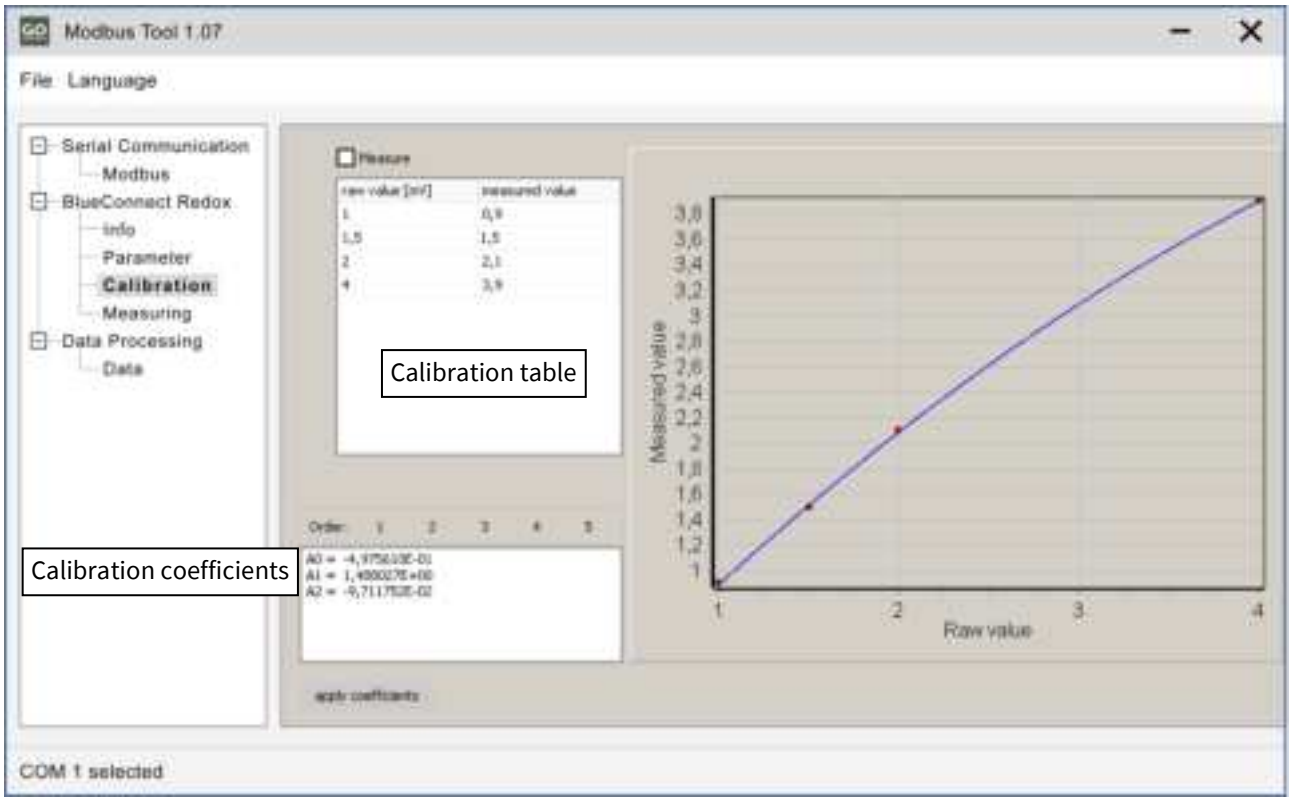
After the program has detected the connected module (here Redox/ORP), the module info window opens.




## 4.5 The Calibration Window

A calibration compares the **value pairs** of the measured **sensor raw values*** and allocated **reference values** from calibration liquids. These value pairs are taken as points in a coordinate system. The curve of a 1. to 5. Order polynomial is placed through these points as accurately as possible; this is how the calibration polynomial is created.

**Example with a 2. Order polynomial:**




* A raw sensor value is the uncalibrated sensor measurement value or the uncalibrated current input value.

### 4.5.1 The Calibration Table

There are two ways to enter the raw values:

- **manual input** – gives the possibility to calculate hypothetical calibrations
- **measurement value transfer** – current measured raw values for the actual calibration

The reference values are always entered manually. You can set up to 10 value pairs.

„**measured value [ppm]**“ is the reference value from a calibration liquid.

**Note:** Decimal separator is the comma; dots are not accepted.

**Manual input:** not activated: ☐ **Measure**

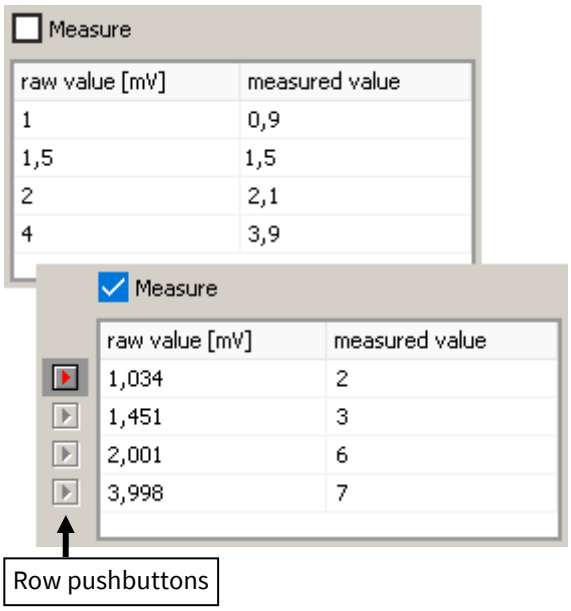
After opening the calibration view the calibration table has only one row. Click the cursor into the “raw value” cell and enter the first raw value, click the cursor into the “measured value” cell and enter the first reference value, or vice versa.

**Measurement value transfer:** activated: ☑ **Measure**

After first opening the calibration view the calibration table has only one row. Click the cursor on the first row pushbutton ▶: As long as the row pushbutton is active ▶ the current measurement raw value appears in the “raw value” cell. Click the cursor into the “measured value cell” and enter the first reference value.

To **create a new row**, click the cursor into the last row with an entry and press the ENTER-key.

To **delete a row**, delete all row entries and click in another row.

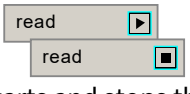



**Order:** Order means the order/degree of the calibration polynomial.
Click on one of the Order buttons 1 to 5 to get the best fit.

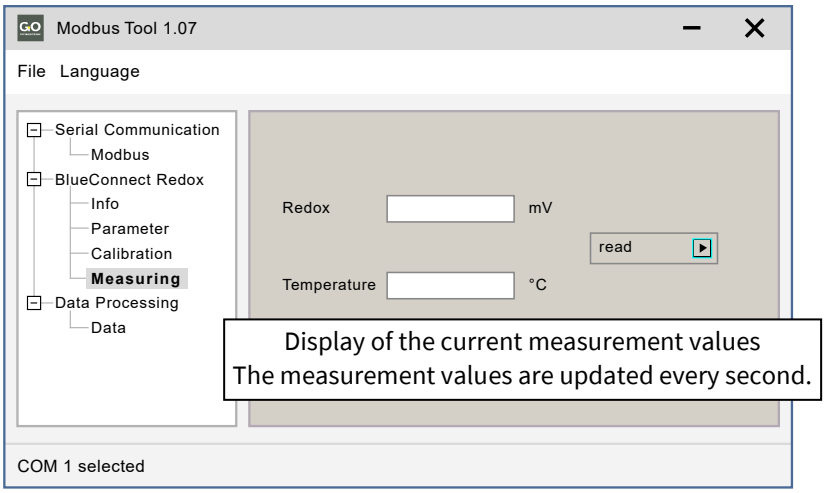
The graph of the calibration polynomial is displayed.


Writes the calculated coefficient values into the sensor.

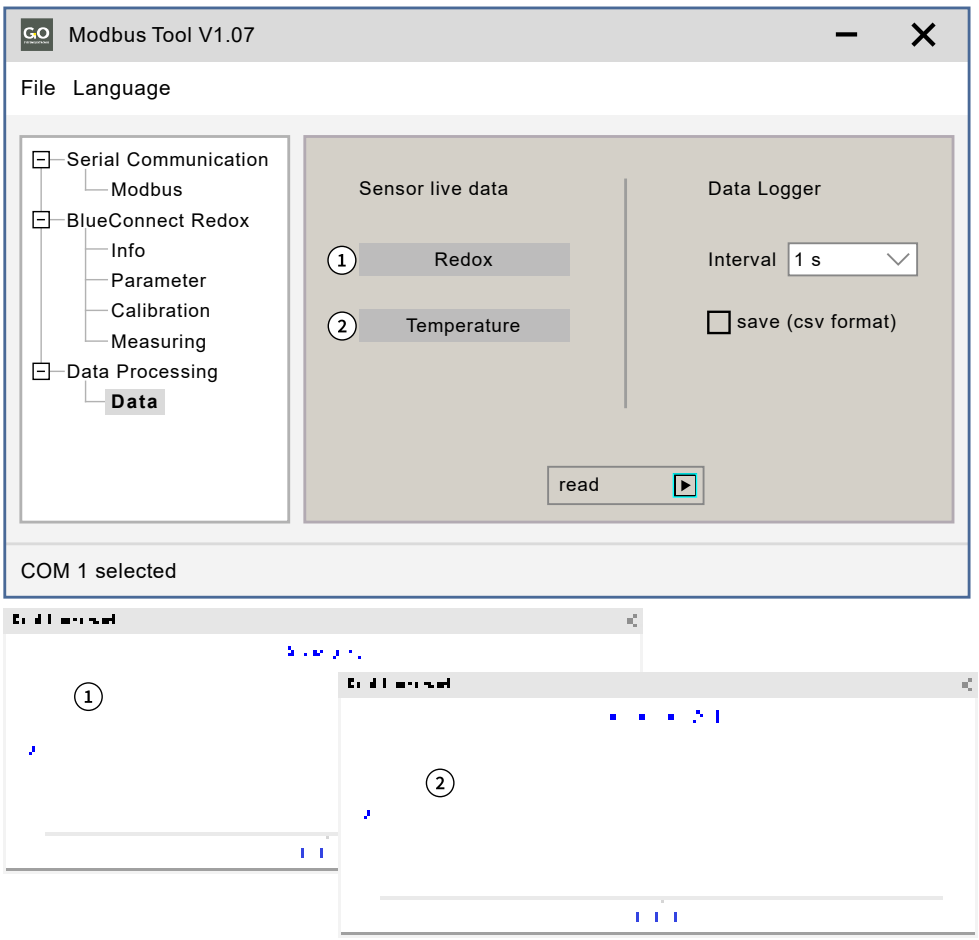
## 4.6 The Measurement Value Window

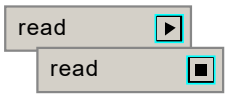



Starts and stops the measurement value display.



## 4.7 The Measurement Value Recording Window




Starts and stops the running measurement value display.

**Interval** 1 s

Drop-down field for input/selection of the recording interval

☐ save (csv format)

Opens a window for entering the storage path of a csv file. After the file has been created, the recording of the measurement values into the csv file starts.

The button changes to:
☑ save (csv format)

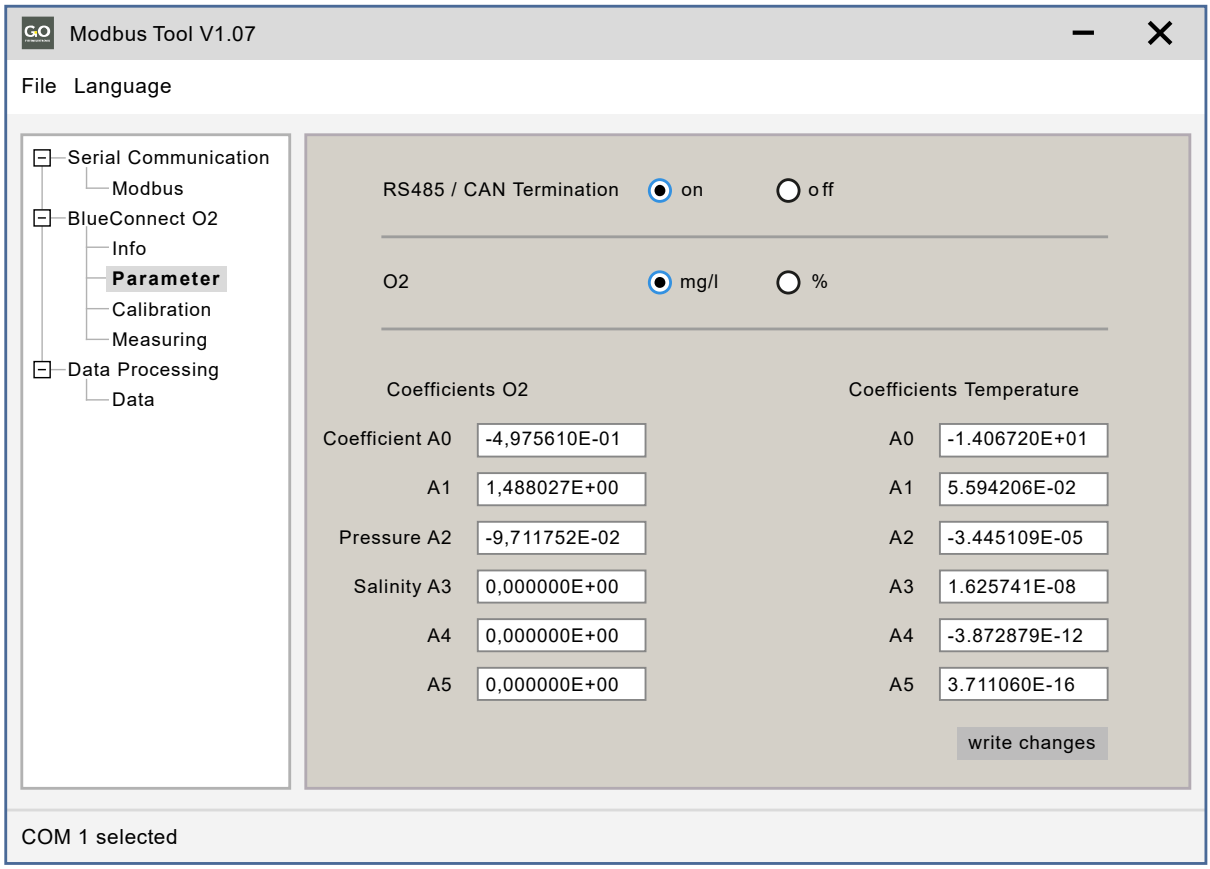
At the bottom right of the program window this appears:

Data Logger running **Stop**

Click on <Stop> stops the data recording.

## 4.8 Configuring the Sensor Modules

### 4.8.1 The Parameter Window




**RS485 / CAN Termination** Switches the termination of the Modbus (RS485) and the CAN bus on/off.

Applies only to older BlueConnect Modules, the newer ones are terminated with slide switches on the board, see *3.2 Cable Connections, Switch Positions and LEDs* there also *Note on termination of older BlueConnect Modules*. Newer modules with slide switches ignore the setting.

**O2** **Only visible with O2 Sensor Modules.**
Selection **mg/l** or **% Saturation**
This selection determines the type of calibration (see *4.8.2 The Calibration Window O2*) and how the measurement value is stored and displayed

**Coefficients O2** Calibration coefficients, the displayed values are from the Calibration function, see *4.4 The Calibration Window*.

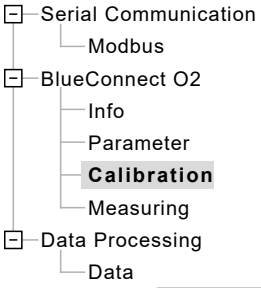
**Coefficients Temperature** **Only visible with Sensor Modules.**
Factory calibration coefficients of an assigned temperature sensor*.
If necessary, you can determine the offset here via the Coefficient A0.

write changes Writes the input settings into the module memory.
**Settings that have not yet been saved are marked in red.**

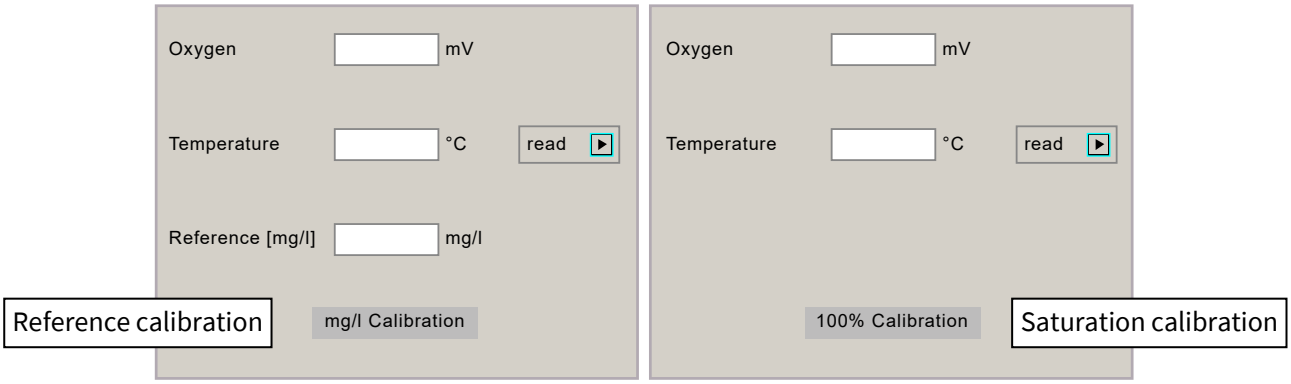
**Note:** Decimal separator is the comma; if a dot is entered, an error message appears.

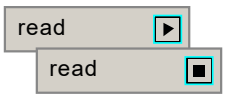
* In this case, the internal temperature sensor of the O2 Sensor.

## 4.8.2 The Calibration Window O2




The calibration of the O2 sensor is a two-point calibration (calibration degree 0 polynomial). One point is the zero point, the other is determined by the **saturation in air** (100 %) or a pair of measured values from the measurement value of the sensor and the measurement value of a **reference measurement device** in the same measurement medium.




Starts and stops the measurement display, the measurement values are displayed every second.

**Reference calibration**

Prerequisite: Setting **O2 Unit** ◉ **mg/l** see *4.8.1The Parameter Window*

1. Click on <Start>
2. Immerse the oxygen sensor in your measurement medium and wait, until the displayed values are stable.
3. Entering[1] the oxygen content of the measurement medium according to the reference measuring device
4. Click on <mg/l Calibration>.
5. The calibration is completed.

**Saturation calibration**

Prerequisite: Setting **O2 Unit** ◉ **%** see *4.8.1 The Parameter Window*

1. Click on <Start>.
2. Hold the oxygen sensor in the air.[2]
   Wait at least 10 minutes until the displayed values are stable.
3. Click on <100% Calibration>.
4. The calibration is completed.

**Note:** Decimal separator is the comma; if a dot is entered, an error message appears.

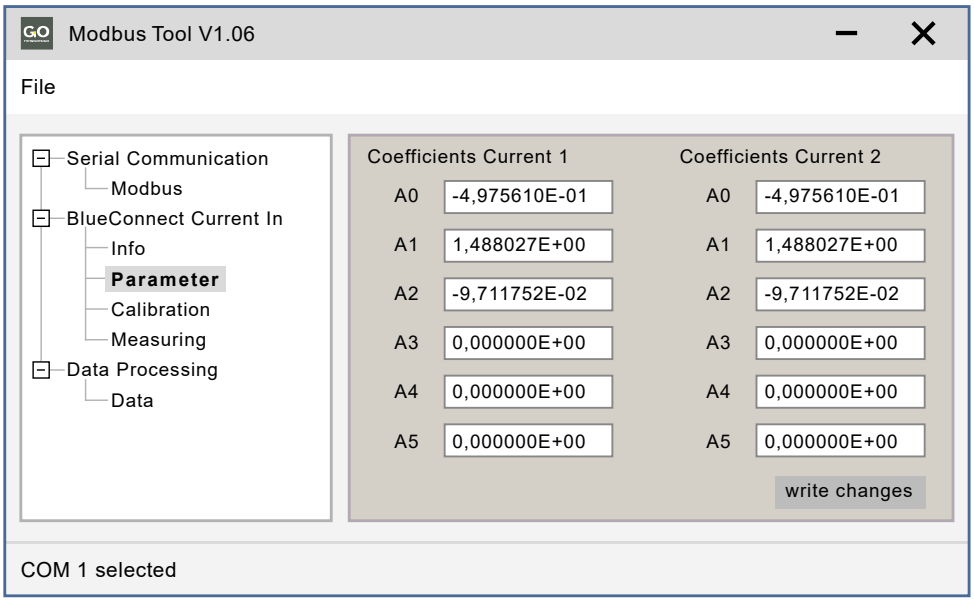
[1] Decimal separator is the comma; if a full stop is entered, an error message appears.

[2] The galvanic cell for oxygen measurement is located at the bottom of the sensor body, the temperature sensor is near the center. Therefore, a saturation calibration in the air can only be carried out when the entire sensor body has reached the temperature of the ambient air. The larger the difference in temperature between the measuring medium and the ambient air, the greater the time required for a temperature adjustment (30 minutes or more, if applicable).
The temperature adjustment can be accelerated by immersing the sensor in water, which has approximately the temperature of the ambient air, before performing the saturation calibration.
Moreover, abrupt temperature changes (e.g., by direct exposure to the sun) must be avoided.

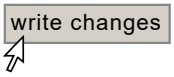
## 4.9 Configuring the Current Input Module

The Current Input Module has two current inputs with 4 – 20 mA. For calibration of the current inputs see *4.5* and *4.5.1*.

**Parameter window of the Current Input Module**




**Coefficients Current 1** Calibration coefficients, the displayed values are from the
**Coefficients Current 2** Calibration function, see *4.4 The Calibration Window*.



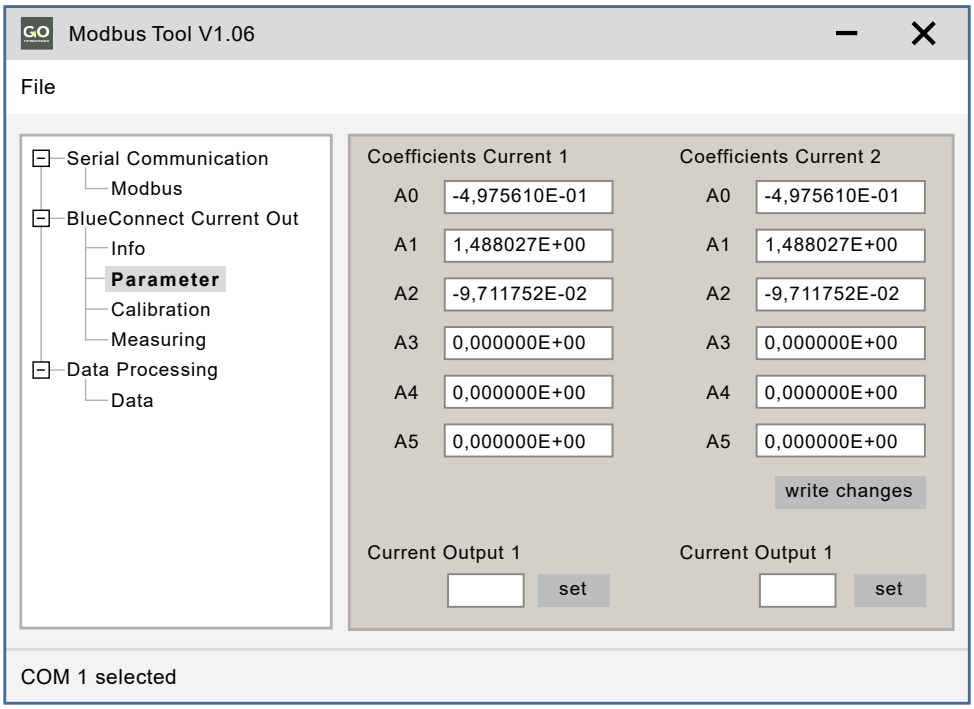

Writes the input settings into the module memory.
**Settings that have not yet been saved are marked in red.**

**Note:** Decimal separator is the comma; if a dot is entered, an error message appears.

## 4.10 Configuring the Current Output Module

The Current Output Module has two current outputs with 4 – 20 mA. For calibration of the current outputs see *4.5* and *4.5.1*.

**Parameter window of the Current Output Module**




**Coefficients Current 1**
**Coefficients Current 2**
Calibration coefficients, the displayed values are from the Calibration function, see *4.5 The Calibration Window*.

write changes

Writes the input settings into the module memory.
**Settings that have not yet been saved are marked in red.**

**Current Output 1**
**Current Output 1**
For test purposes, you can enter input values here.
By clicking on set the module outputs the corresponding current value.

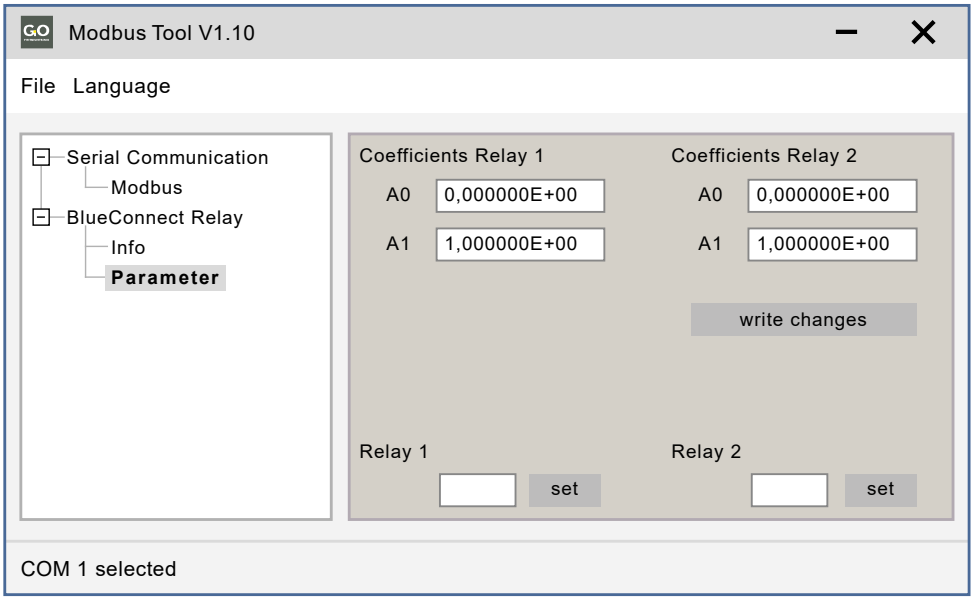
Resetting to the operating state is done by disconnecting the module from the supply voltage.

**Note:** Decimal separator is the comma; if a dot is entered, an error message appears.

## 4.11 Configuring the Relay Module

The Relay Module has two relays.

**Parameter window of the Relay Module**




**Coefficients Relay 1**
**Coefficients Relay 2**
You can change the switching value via these coefficients (y = A0 + A1x).* Factory setting: A0 = 0 A1 = 1

write changes

Writes the input settings into the module memory.
**Settings that have not yet been saved are marked in red.**

**Relay 1**
**Relay 2**
For test purposes, you can enter input values here (usually 0 and 1). These input values correspond to the values transmitted by the BlueBox*.
Click on set switches the relay or not.

Resetting to the operating state is done by disconnecting the module from the supply voltage.

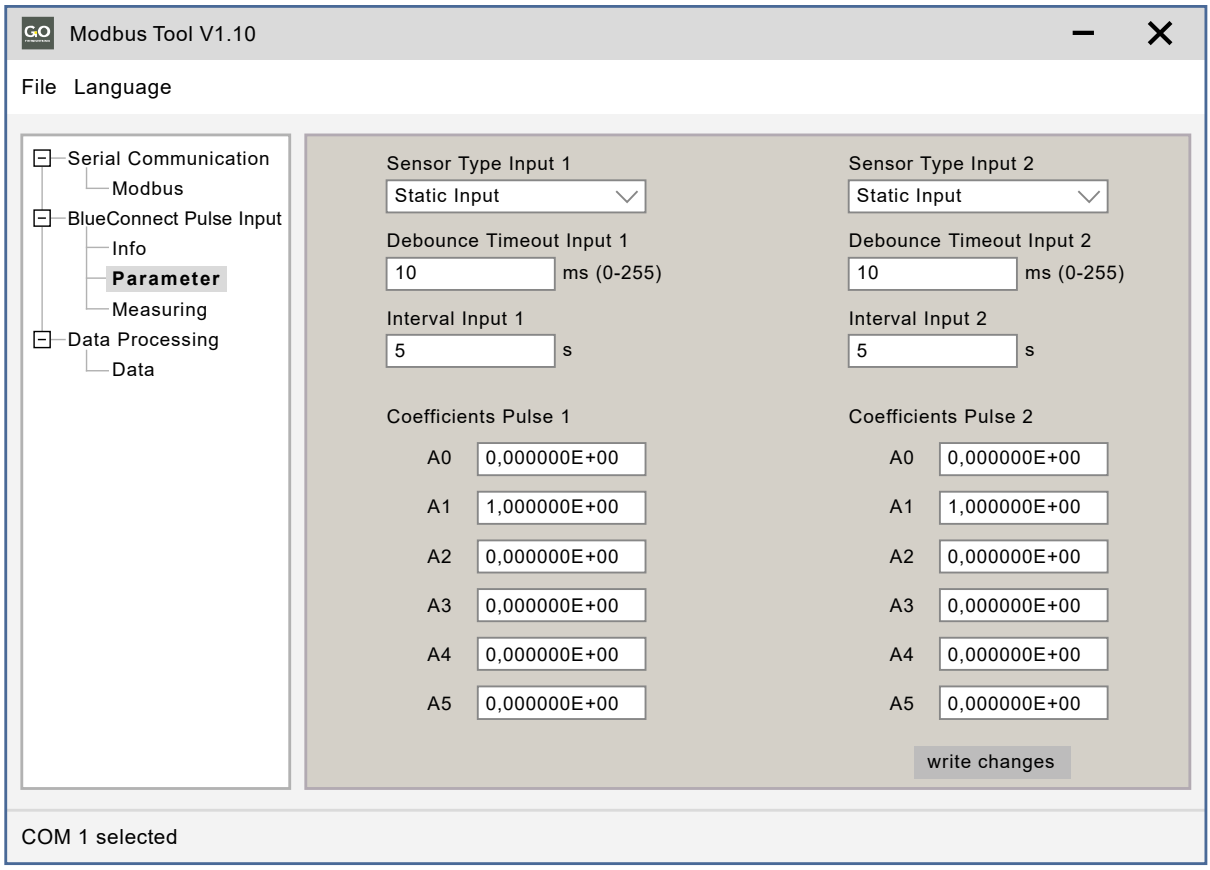
**Note:** Decimal separator is the comma; if a dot is entered, an error message appears.

* The BlueBox transmits values to the relay module. If these values are not changed by the above-mentioned coefficients (i.e. A0 ≠ 0 and/or A1 ≠ 1), a relay switches at transmitted values of ≥ 0.5.
Normally, the transmitted values are limited to 0 and 1 with the BlueBox PC Software and are set with the BlueConnect factory settings (see above).

## 4.12 Configuring the Pulse Input Module

The Pulse Input Module has two pulse inputs.

**Parameter window of the Pulse Input Module (in factory setting)**




**Sensor Type Input 1**
**Sensor Type Input 2**

Clicking on ⌄ opens a drop-down menu for selecting the input type:

- Static input
- Frequency (edge trigger) – Triggering on the rising edge.
- Frequency (debounced) – Triggering on the rising edge with debounce dead time as entered.
- Watchdog (only CAN) – If there is no pulse in the entered measuring interval, a measurement value of 0 is output at the CAN bus interface, otherwise 1.

**Debounce Timeout input 1**
**Debounce Timeout input 2**

Entering the timeout after triggering in ms [0 – 255]

**Interval Input 1**
**Interval Input 2**

Entering the Measurement Interval in s
In the factory setting of the coefficients (see picture above), the measurement value is the number of pulses in the measurement interval.

**Coefficients Pulse 1**
**Coefficients Pulse 2**

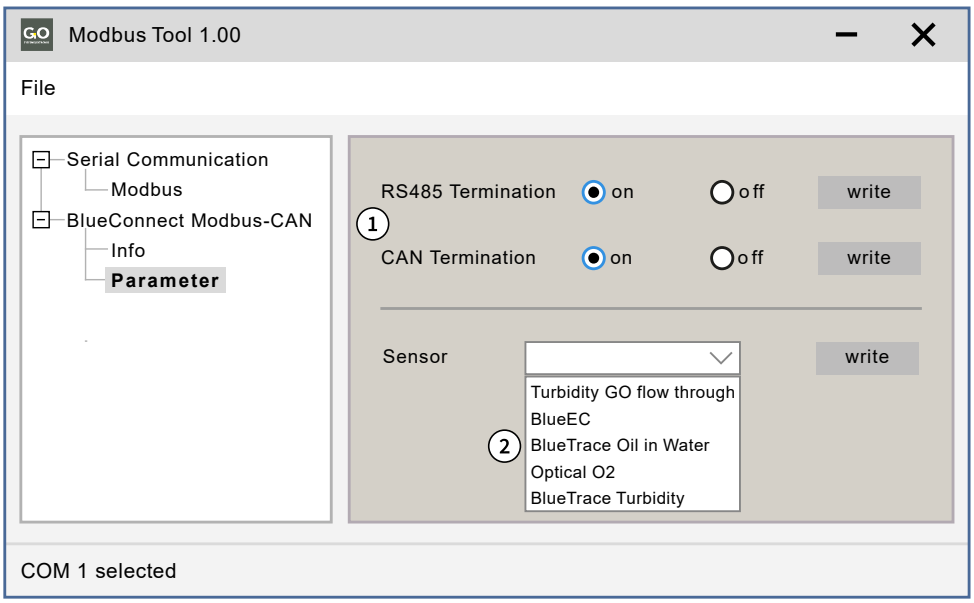
Entering the coefficients
Is used to adapt to the pulse generator and to convert the measured value of the measurement value (e.g. Hz to l/min).

write changes

Writes the input settings into the module memory.
**Settings that have not yet been saved are marked in red.**

**Note:** Decimal separator is the comma; if a dot is entered, an error message appears.

## 4.13 Configuring Older Bus Modules




① Older BlueConnect Bus Modules do not have slide switches on the board. Here, the termination is done via the Parameter Window.

**RS485 Termination** Selection Modbus (RS485) termination selection on/off

**CAN Termination** Selection CAN bus termination on/off

write

Writes the selected termination into the module memory.
**Settings that have not yet been saved are marked in red.**

Only applies to older BlueConnect Bus Modules, the newer ones are terminated with slide switches on the board, see *3.2 Cable Connections, Switch Positions and LEDs* and also *3.3 Notes on Termination of Older BlueConnect Modules*.
Newer modules with slide switches ignore the setting.

② With older BlueConnect Bus Modules, connected Modbus sensors are not automatically detected. The appropriate sensor identifier must be selected via the drop-down menu.

write

Writes the selected sensor identifier into the module memory.
**Settings that have not yet been saved are marked in red.**

## 5 Modbus Addresses Overview of the Sensor Modules

**BlueConnect O2 486 CS00-4 – Modbus Addresses Overview** 31.8.2021

| Address | Parameter name | Range | Meaning | Data type | Authorisation |
|---|---|---|---|---|---|
| 0x00 | Device ID | 104 | 104 – BlueConnect O2 | Short | R |
| 0x01 | Firmware Version | 100 – 9999 | 100 = 1.00, 2410 = 24.1 | Short | R |
| 0x02 | Serial No. | 0 – 65535 | Serial number | Short | R |
| 0x03 | Modbus Slave ID | 1 – 230 | Modbus Address | Short | R/W |
| 0x04 | Baud rate | 0 – 2 | 0 = 9600 8N1 | Short | R |
| 0x05 | Production date | ddmmyyyy | Date | Short x 2 | R |

| Address | Parameter name | Range | Meaning | Data type | Authorisation |
|---|---|---|---|---|---|
| 0x14 | A0 | 0 – 0xffffffff | Cal Coefficient | 32 Bit Float | R/W |
| 0x16 | A1 | 0 – 0xffffffff | | 32 Bit Float | R/W |
| 0x18 | A2 | 0 – 0xffffffff | Air Pressure | 32 Bit Float | R/W |
| 0x1A | A3 | 0 – 0xffffffff | Salinity | 32 Bit Float | R/W |
| 0x1C | A4 | 0 – 0xffffffff | | 32 Bit Float | R/W |
| 0x1E | A5 | 0 – 0xffffffff | | 32 Bit Float | R/W |

| Address | Parameter name | Range | Meaning | Data type | Authorisation |
|---|---|---|---|---|---|
| 0xD0 | Measuring Unit | 0 – 1 | 0: mg/l<br>1: % | Short | R/W |

| Address | Parameter name | Range | Data type | Authorisation |
|---|---|---|---|---|
| 0x101 | O2 [mg/l or %] | 0 – 0xffffffff | 32 Bit Float | R |
| 0x104 | Temperature [°C] | 0 – 0xffffffff | 32 Bit Float | R |

**Note on 32 bit Float data** (MSB = 0xByte4, LSB = 0xByte1),
The Receiving sequence of the values (Hex) is: 0x [Byte2] [Byte1] [Byte4] [Byte3]

**BlueConnect pH 486 CS00-5 – Modbus Addresses Overview** 10.5.2022

| Address | Parameter name | Range | Meaning | Data type | Authorisation |
|---|---|---|---|---|---|
| 0x00 | Device ID | 103 | 103 – BlueConnect pH | Short | R |
| 0x01 | Firmware Version | 100 – 9999 | 100 = 1.00, 2410 = 24.1 | Short | R |
| 0x02 | Serial No. | 0 – 65535 | Serial number | Short | R |
| 0x03 | Modbus Slave ID | 1 – 230 | Modbus Address | Short | R/W |
| 0x04 | Baud rate | 0 – 2 | 0 = 9600 8N1 | Short | R |
| 0x05 | Production date | ddmmyyyy | Date | Short x 2 | R |

| Address | Parameter name | Range | Meaning | Data type | Authorisation |
|---|---|---|---|---|---|
| 0x14 | A0 | 0 – 0xffffffff | Cal Coefficient A0 | 32 Bit Float | R/W |
| 0x16 | A1 | 0 – 0xffffffff | Cal Coefficient A1 | 32 Bit Float | R/W |
| 0x18 | A2 | 0 – 0xffffffff | Cal Coefficient A2 | 32 Bit Float | R/W |
| 0x1A | A3 | 0 – 0xffffffff | Cal Coefficient A3 | 32 Bit Float | R/W |
| 0x1C | A4 | 0 – 0xffffffff | Cal Coefficient A4 | 32 Bit Float | R/W |
| 0x1E | A5 | 0 – 0xffffffff | Cal Coefficient A5 | 32 Bit Float | R/W |

| Address | Parameter name | Range | Data type | Authorisation |
|---|---|---|---|---|
| 0x101 | pH | 0 – 0xffffffff | 32 Bit Float | R |
| 0x104 | Temperature [°C] | 0 – 0xffffffff | 32 Bit Float | R |

**Note on 32 bit Float data** (MSB = 0xByte4, LSB = 0xByte1),
The Receiving sequence of the values (Hex) is: 0x [Byte2] [Byte1] [Byte4] [Byte3]

**BlueConnect ISE 486 CS00-7 – Modbus Addresses Overview** 10.5.2022

| Address | Parameter name | Range | Meaning | Data type | Authorisation |
|---|---|---|---|---|---|
| 0x00 | Device ID | 105 | 103 – BlueConnect ISE | Short | R |
| 0x01 | Firmware Version | 100 – 9999 | 100 = 1.00, 2410 = 24.1 | Short | R |
| 0x02 | Serial No. | 0 – 65535 | Serial number | Short | R |
| 0x03 | Modbus Slave ID | 1 – 230 | Modbus Address | Short | R/W |
| 0x04 | Baud rate | 0 – 2 | 0 = 9600 8N1 | Short | R |
| 0x05 | Production date | ddmmyyyy | Date | Short x 2 | R |

| Address | Parameter name | Range | Meaning | Data type | Authorisation |
|---|---|---|---|---|---|
| 0x14 | A0 | 0 – 0xffffffff | Cal Coefficient A0 | 32 Bit Float | R/W |
| 0x16 | A1 | 0 – 0xffffffff | Cal Coefficient A1 | 32 Bit Float | R/W |
| 0x18 | A2 | 0 – 0xffffffff | Cal Coefficient A2 | 32 Bit Float | R/W |
| 0x1A | A3 | 0 – 0xffffffff | Cal Coefficient A3 | 32 Bit Float | R/W |
| 0x1C | A4 | 0 – 0xffffffff | Cal Coefficient A4 | 32 Bit Float | R/W |
| 0x1E | A5 | 0 – 0xffffffff | Cal Coefficient A5 | 32 Bit Float | R/W |

| Address | Parameter name | Range | Data type | Authorisation |
|---|---|---|---|---|
| 0x101 | ISE [mg/l] | 0 – 0xffffffff | 32 Bit Float | R |
| 0x104 | Temperature [°C] | 0 – 0xffffffff | 32 Bit Float | R |

**Note on 32 bit Float data** (MSB = 0xByte4, LSB = 0xByte1),
The Receiving sequence of the values (Hex) is: 0x [Byte2] [Byte1] [Byte4] [Byte3]

**BlueConnect Redox 486 CS00-9 – Modbus Addresses Overview** 10.5.2022

| Address | Parameter name | Range | Meaning | Data type | Authorisation |
|---|---|---|---|---|---|
| 0x00 | Device ID | 106 | 106 – BlueConnect Redox | Short | R |
| 0x01 | Firmware Version | 100 – 9999 | 100 = 1.00, 2410 = 24.1 | Short | R |
| 0x02 | Serial No. | 0 – 65535 | Serial number | Short | R |
| 0x03 | Modbus Slave ID | 1 – 230 | Modbus Address | Short | R/W |
| 0x04 | Baud rate | 0 – 2 | 0 = 9600 8N1 | Short | R |
| 0x05 | Production date | ddmmyyyy | Date | Short x 2 | R |

| Address | Parameter name | Range | Meaning | Data type | Authorisation |
|---|---|---|---|---|---|
| 0x14 | A0 | 0 – 0xffffffff | Cal Coefficient A0 | 32 Bit Float | R/W |
| 0x16 | A1 | 0 – 0xffffffff | Cal Coefficient A1 | 32 Bit Float | R/W |
| 0x18 | A2 | 0 – 0xffffffff | Cal Coefficient A2 | 32 Bit Float | R/W |
| 0x1A | A3 | 0 – 0xffffffff | Cal Coefficient A3 | 32 Bit Float | R/W |
| 0x1C | A4 | 0 – 0xffffffff | Cal Coefficient A4 | 32 Bit Float | R/W |
| 0x1E | A5 | 0 – 0xffffffff | Cal Coefficient A5 | 32 Bit Float | R/W |

| Address | Parameter name | Range | Data type | Authorisation |
|---|---|---|---|---|
| 0x101 | Redox [mV] | 0 – 0xffffffff | 32 Bit Float | R |
| 0x104 | Temperature [°C] | 0 – 0xffffffff | 32 Bit Float | R |

**Note on 32 bit Float data** (MSB = 0xByte4, LSB = 0xByte1),
The Receiving sequence of the values (Hex) is: 0x [Byte2] [Byte1] [Byte4] [Byte3]

## 6 Modbus Addresses Overview Pulse Input 486 CI00-PI2

10.5.2022

| Address | Parameter name | Range | Meaning | Data type | Authorisation |
|---|---|---|---|---|---|
| 0x00 | Device ID | 112 | 112 – BlueConnect Pulse Input | Short | R |
| 0x01 | Firmware Version | 100 – 9999 | 100 = 1.00, 2410 = 24.1 | Short | R |
| 0x02 | Serial No. | 0 – 65535 | Serial Number | Short | R |
| 0x03 | Modbus Slave ID | 1 – 230 | Modbus Address | Short | R/W |
| 0x04 | Baud rate | 0 – 2 | 0 = 9600 8N1 | Short | R |
| 0x05 | Production date | ddmmyyyy | Date | Short x 2 | R |

**Pulse Input 1**

| Address | Parameter name | Range | Meaning | Data type | Authorisation |
|---|---|---|---|---|---|
| 0x14 | A0 | 0 – 0xffffffff | Cal Coefficient A0 | 32 Bit Float | R/W |
| 0x16 | A1 | 0 – 0xffffffff | Cal Coefficient A1 | 32 Bit Float | R/W |
| 0x18 | A2 | 0 – 0xffffffff | Cal Coefficient A2 | 32 Bit Float | R/W |
| 0x1A | A3 | 0 – 0xffffffff | Cal Coefficient A3 | 32 Bit Float | R/W |
| 0x1C | A4 | 0 – 0xffffffff | Cal Coefficient A4 | 32 Bit Float | R/W |
| 0x1E | A5 | 0 – 0xffffffff | Cal Coefficient A5 | 32 Bit Float | R/W |

**Pulse Input 2**

| Address | Parameter name | Range | Meaning | Data type | Authorisation |
|---|---|---|---|---|---|
| 0x24 | A0 | 0 – 0xffffffff | Cal Coefficient A0 | 32 Bit Float | R/W |
| 0x26 | A1 | 0 – 0xffffffff | Cal Coefficient A1 | 32 Bit Float | R/W |
| 0x28 | A2 | 0 – 0xffffffff | Cal Coefficient A2 | 32 Bit Float | R/W |
| 0x2A | A3 | 0 – 0xffffffff | Cal Coefficient A3 | 32 Bit Float | R/W |
| 0x2C | A4 | 0 – 0xffffffff | Cal Coefficient A4 | 32 Bit Float | R/W |
| 0x2E | A5 | 0 – 0xffffffff | Cal Coefficient A5 | 32 Bit Float | R/W |

| Address | Parameter name | Range | Data type | Authorisation |
|---|---|---|---|---|
| 0x101 | Messwert Puls Input 1 | 0 – 0xffffffff | 32 Bit Float | R |
| 0x104 | Messwert Puls Input 2 | 0 – 0xffffffff | 32 Bit Float | R |

**Note on 32 bit Float data** (MSB = 0xByte4, LSB = 0xByte1),
The Receiving sequence of the values (Hex) is: 0x [Byte2] [Byte1] [Byte4] [Byte3]

## 7 Supplement BlueConnect Plus Board

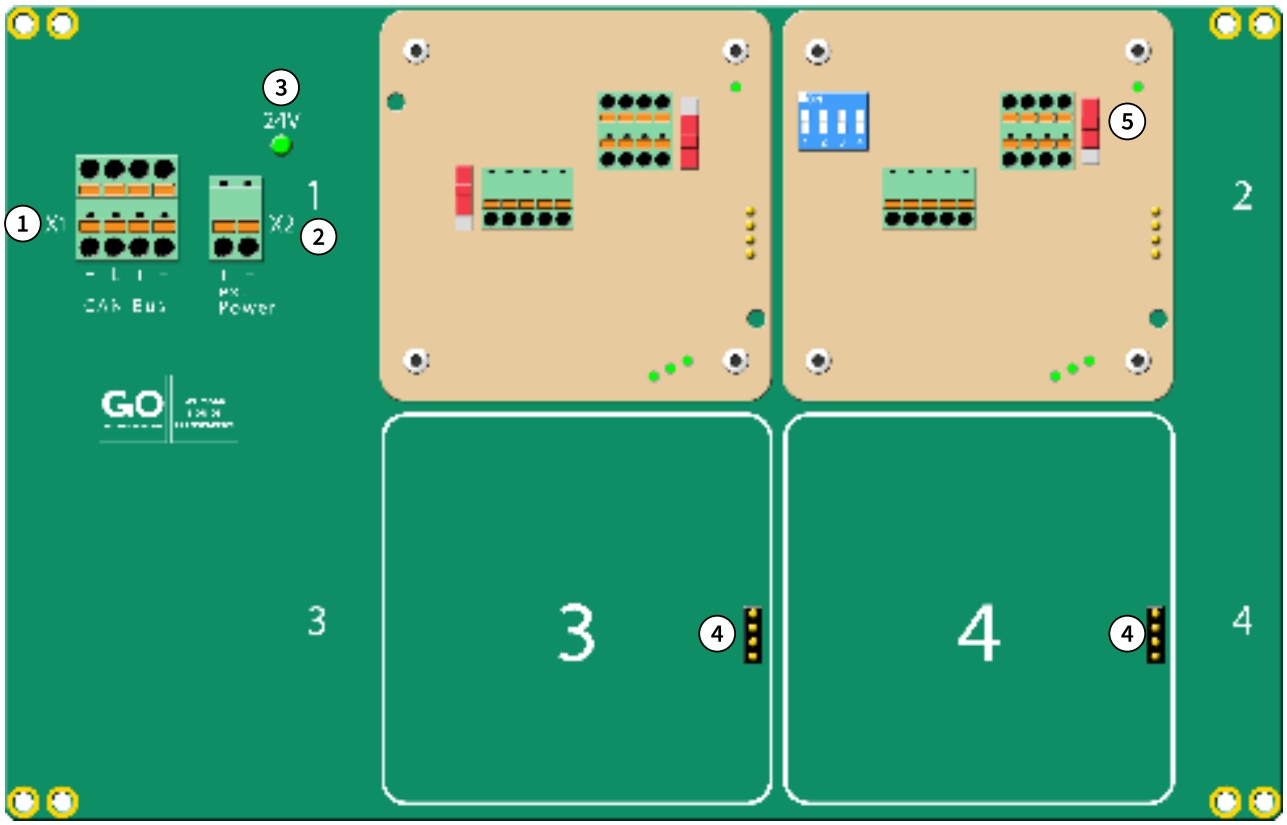
The BlueConnect Plus board can be equipped with up to four BlueConnect boards. The BlueConnect Plus board can be installed internally in a BlueBox as well as in a sensor module.

The connection is made via the CAN bus connection. The individual BlueConnect boards appear as DAM (Data Acquisition Module) in the BlueBox System.

The necessary settings of BlueConnect boards **without Modbus connection** are not made with the BlueConnect configuration program, but with the AMS program as part of the BlueBox PC Software (and partly also via the display control on the BlueBox).

A BlueConnect board is mounted with 4 hex socket screws (⬡ 3 mm) each.

The board slots 1 to 4 can be equipped with BlueConnect boards as desired. In this example, slot 1 is equipped with a bus board and slot 2 with an RS232 board.




(1) The connection to the BlueBox System is made via the CAN bus connection X1.

(2) An additional voltage supply can be connected via connection X2.

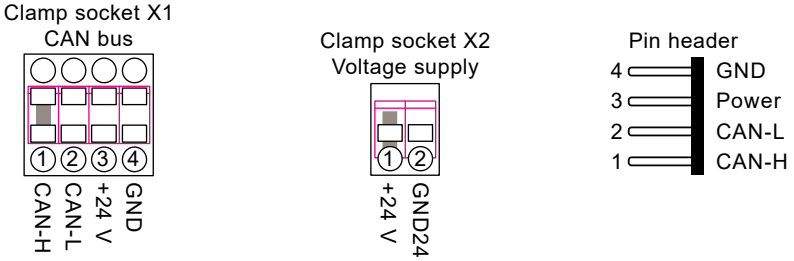
(3) The LED lights up when the BlueConnect Plus board is supplied with voltage.

(4) The CAN bus connection of the BlueConnect boards is made via the pin headers at slots 1 to 4.

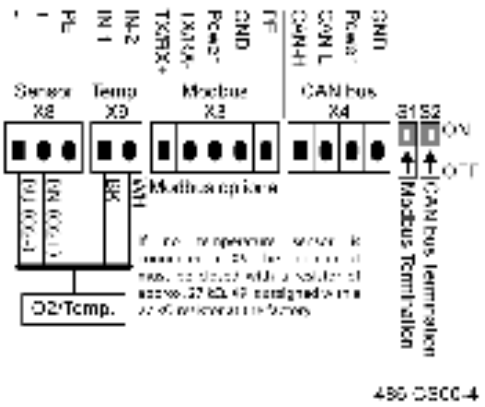


(5) The CAN bus termination of the BlueConnect Plus board is done with the slide switch to the right of the CAN bus connection of the last BlueConnect board in the sequence (here on slot 2).

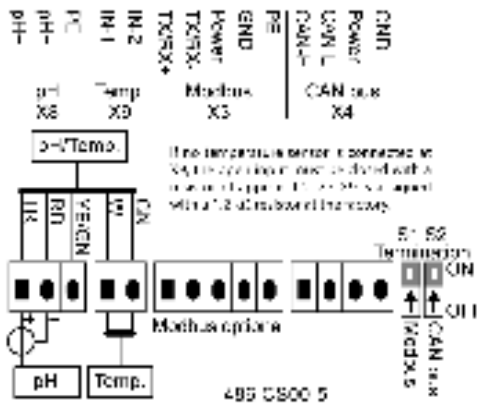

**Terminal assignment:**



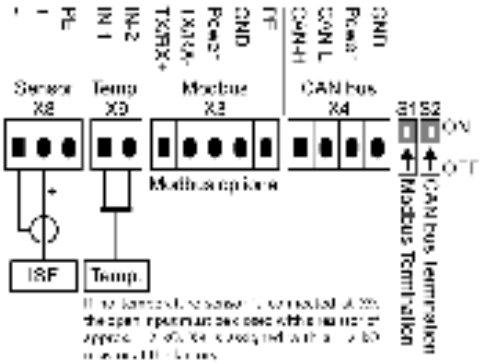
## Appendix A – Interior Cover Stickers



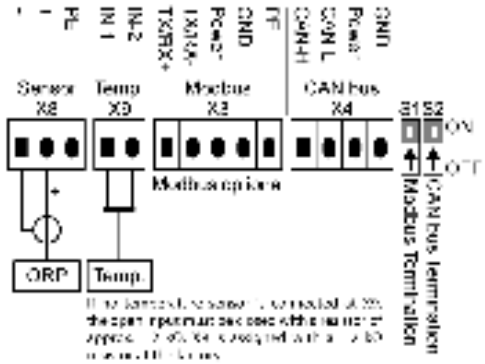

486 CS00-4



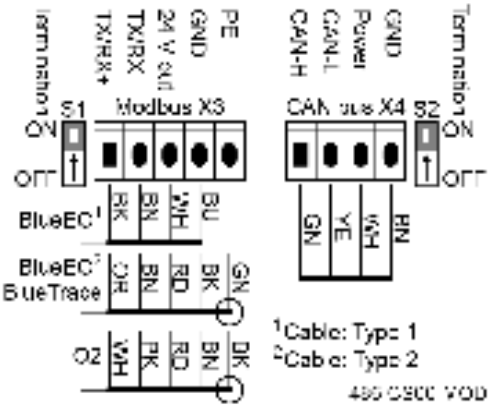

485 CS00-5



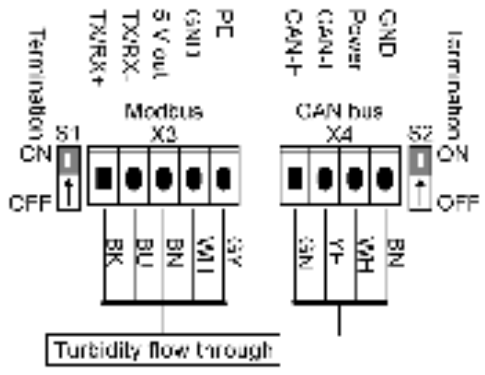

486 CS00-7



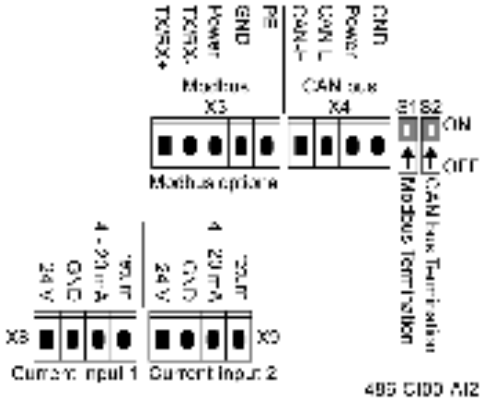

486 CS00-9



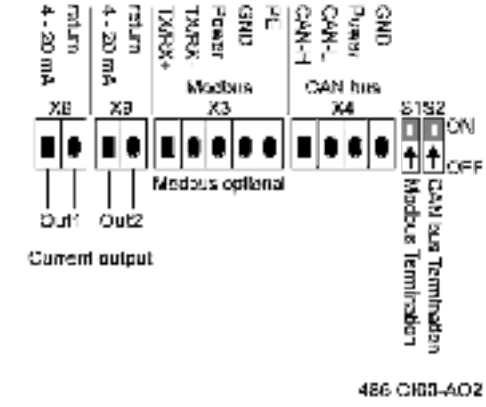

486 CS00-VOD



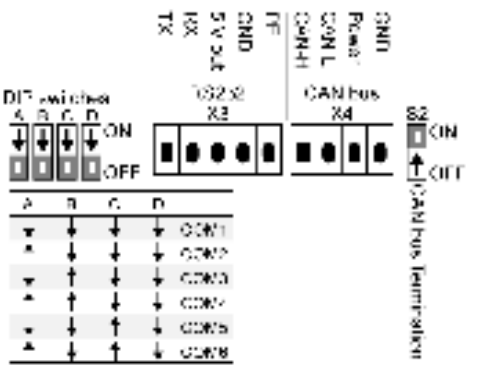

486 CS00-FNU



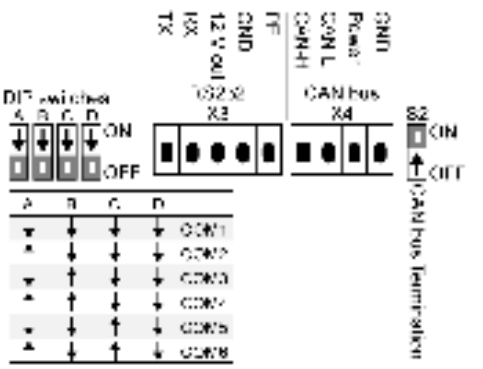

485 CS00-AI2



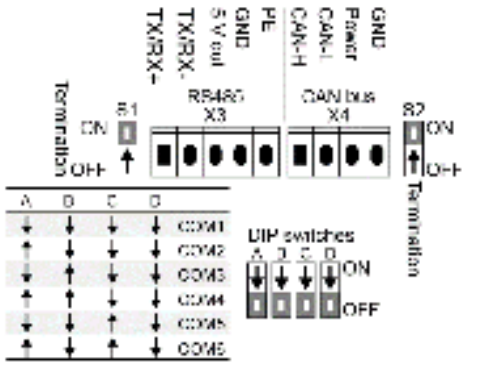

486 CS00-AO2



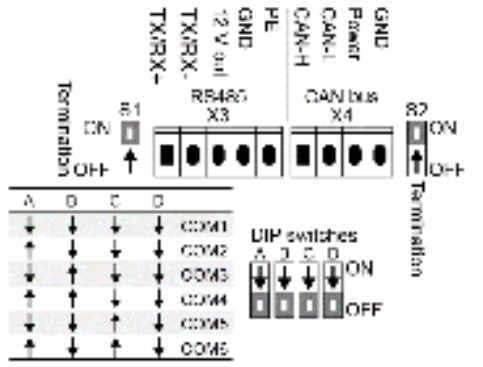

RS232 5 V 485 CI00-S05



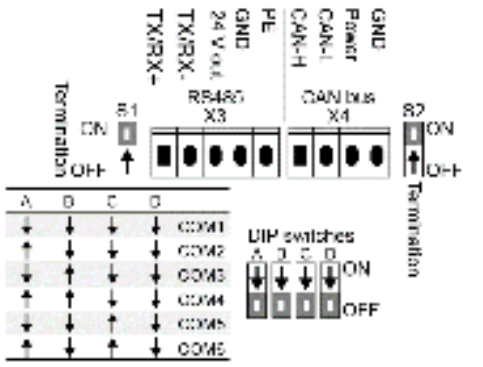

RS232 12 V 485 CI00-S12



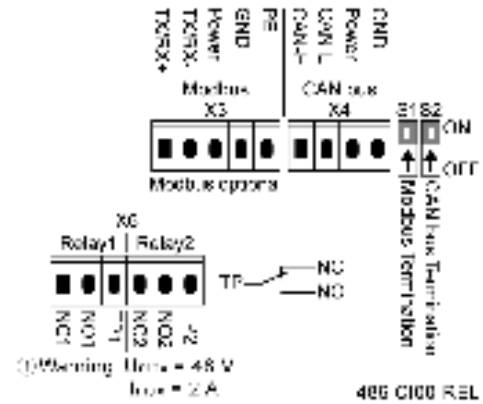

RS485 5 V 486 CI00-M05



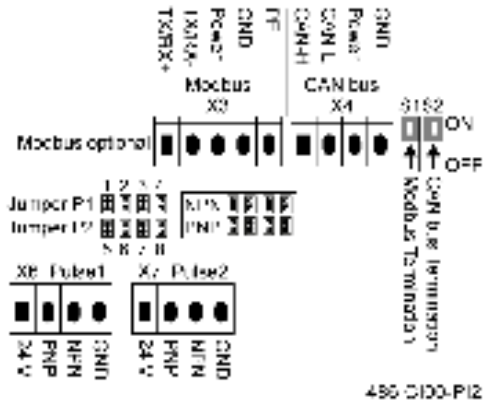

RS485 12 V 486 CI00-M12




RS485 24 V 486 CI00-M21




485 CI00 REL




485 CI00-PI2

## Appendix B – Old Article Numbers

| Sensor Modules | Article No. old |
|---|---|
| Oxygen + Temp. | 486 C000-4 |
| pH + Temp. | 486 C000-5 |
| ISE + Temp. | 486 C000-7 |
| ORP (Redox) + Temp. | 486 C000-9 |

| Bus Module | Article No. old |
|---|---|
| | 486 C000-MOD |

| Bus Module Turbidity | Article No. old |
|---|---|
| (Turbidity flow through) | 486 C000-TURB |

| Current Modules | Article No. old |
|---|---|
| Current Input | 486 C000-mAI |
| Current Output | 486 C000-mAO |

| RS232 Modules | Article No. old |
|---|---|
| Output Voltage 5 V | 486 C000-RS05 |
| Output Voltage 12 V | 486 C000-RS12 |

| Relay Module | Article No. old |
|---|---|
| | 486 C000-REL |