



Elimko E-680 Series Universal Data Loggers / Scanners User Manual

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Elimko E-680 Series Universal Data Loggers / Scanners



Product Information

Specifications:

- **Input Types:** Analog, Digital
- Alarm Outputs
- **Display Resolution:** 16-bit Analog, 12-bit Digital
- **Display Type:** Digital
- **Accuracy:** 120 dB at 50 Hz
- **Operating Temperature:** NA
- **Storage Temperature:** NA
- T/C Temperature Compensation
- **Power Supply:** 85-265 VAC / 85-375 VDC
- **Power Consumption:** NA
- **Protection Class:** IP 66 Front Panel (NEMA 4X), IP 20 Rear Case
- **Contact Capacity Relay Mechanical Life:** 250 VAC 3 A 10.000.000 operations
- **Relay Electrical Life Memory:** >1.000.000 operations (1/10 load) EEPROM max. 105 writing
- **Weight:** 650 g

Product Usage Instructions

Installation and Setup:

- The E-680 controller should be installed inside a suitable grounded metal enclosure (panel) in an industrial environment.
- Ensure live parts are not accessible to human hands and metal tools.
- Wire the power supply of the controller and power outputs through a proper fuse or circuit breaker.

Wiring Guidelines:

- Route low-voltage lines, especially sensor inputs, away from high-current power cables to minimize electrical

noise pickup.

- If routing near high-current cables is unavoidable, use screened cables and ensure proper grounding.
- Use cables conforming to standards IEC 60245 and IEC 60227 for powering the controller and power outputs.

Cleaning and Maintenance:

- Do not use alcohol or solvents to clean the device; use a clean cloth soaked in water instead.
- Avoid using the device for medical applications.

FAQ:

• **Q: Can the E-680 be used in medical applications?**

A: No, the E-680 is not recommended for medical applications as per the user manual instructions.

Introduction

E-680 series universal data loggers/scanners are advanced new generation microcontroller-based industrial instruments, dimensions of 96×192 mm compatible with IEC/TR 60668 standards. Universal inputs and outputs of the device can be programmed easily by the user. E-680 series indicate measurements from 32 different points on the instrument display and determines alarm conditions according to the result of comparison of two set points for each channel. The alarm conditions can be directed to the common alarm relays and/or to the independent relays. The instruments can be connected to an RS-485 communication line and the data can be collected and stored in a centrally located PC.

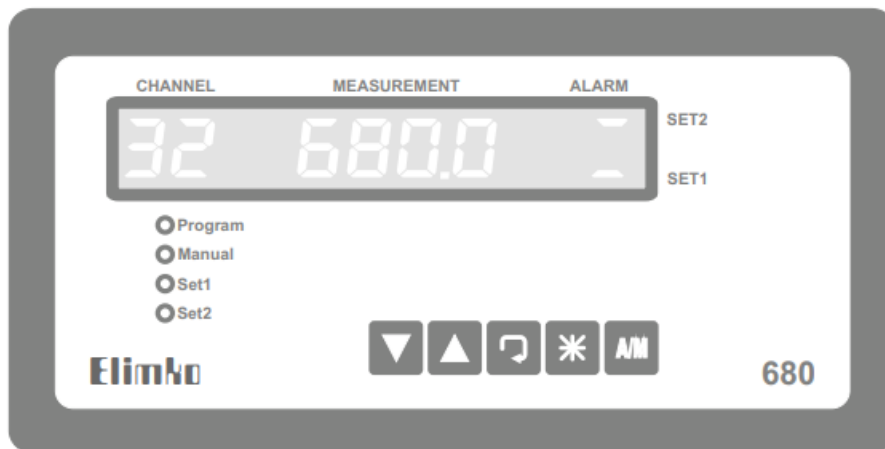


Figure 1.1. E-680 front view

- High reading sensitivity with 16 bit resolution
- Infinite life time and high isolation voltage semiconductor multiplexer relay
- Standard RS-485 Modbus communication interface
- 2 common alarm relays and 16 independent alarm relay output
- Up to 2 configurable analog outputs for retransmission output
- Each channel can be programmed independently
- 2 set points for each input
- Possibility of defining alarm types for each set point
- Possibility of defining hysteresis for each set point
- Directing alarm states to a common or independent relay
- Programmable display and scan intervals

- Flow rate calculation with compensation up to 10 channels
- Arithmetic operations (add, subtract, multiply or divide with a constant) on physical channels
- Possibility of connecting up to 31 instruments to a PC by the same communication line
- Distributed system structure

Technical Specification

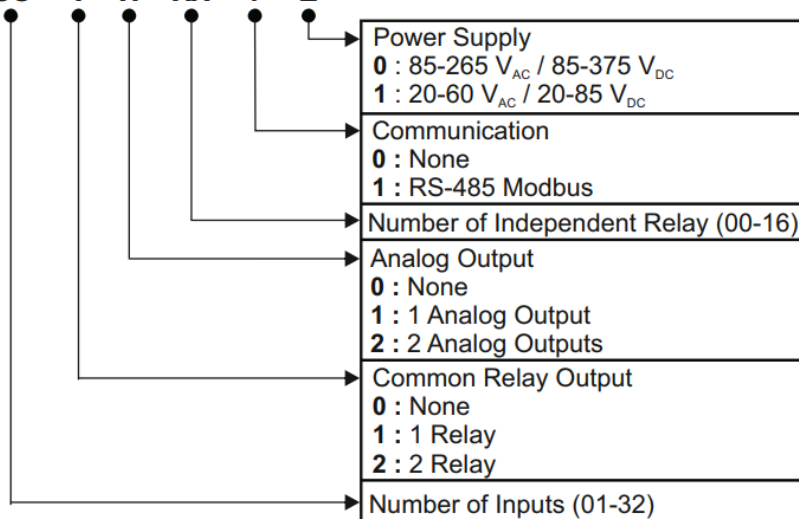
Input Types	Thermocouple: B, E, J, K, L, N, R, S, T, U Resistance Thermometer: Pt-100, CUST Voltage: 0-50 mV, 0-1 V, 0.2-1 V, 0-10 V (Linear) Current: 0-20 mA, 4-20 mA (Linear)
Alarm Outputs	SPST-NO 250 V AC 3A relay
Display Resolution	1/9999
Display Type	9 digit, 14mm 7 segment led display
Accuracy	Thermocouple: (± 0.5 or $\pm 1^{\circ}\text{C}$ of indicated value) ± 1 digit max. Pt-100: (± 0.5 or $\pm 1^{\circ}\text{C}$ of indicated value) ± 1 digit max. Voltage/Current: ± 0.5 FS ± 1 digit max.
Analog Digital Converter	16 bit
Digital Analog Converter	12 bit
Input Scan Time	0.2-9.9 sec.
Display Scan Time	1-99 sec.
Noise Suppression	120 dB at 50 Hz

Operating Temperature	-10°C, +55°C (14°F, 131°F) (With no condensation or icing)
Storage Temperature	-25°C, +65°C (-13°F, +149°F) (With no condensation or icing)
T/C Temperature Compansation	0°C-50°C
Power Supply	85-265 VAC / 85-375 VDC 20-60 VAC / 20-85 VDC
Power Consumption	4 W (7 VA)
Protection Class	IP 66 Front Panel (NEMA 4X) IP 20 Rear Case
Contact Capacity	NA Contact 250 VAC 3 A
Relay Mechanical Life	10.000.000 operation*
Relay Electrical Life	>1.000.000 operation (1/10 load)
Memory	EEPROM max. 105 writing
Weight	650 g

* The relay life differs according to the usage configuration. When the relays are old, their contacts could melt or burn out.

Type Coding

E – 680 – UU – V – W – XX – Y – Z

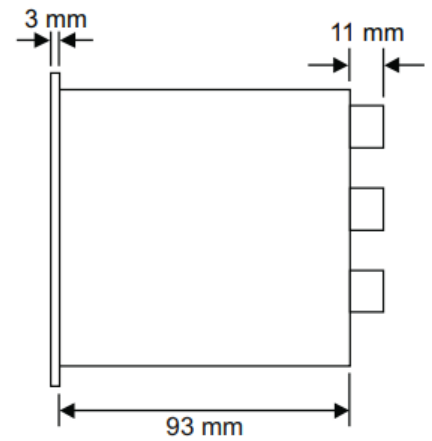
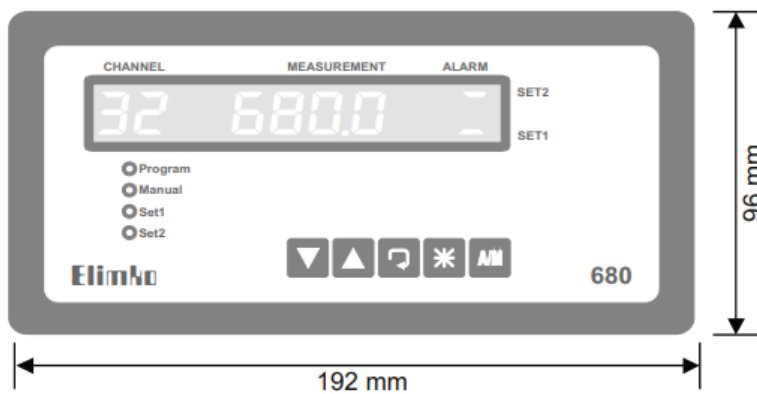


Coding Example:

E-680-16-2-0-08-1-0
 - 16 input, 2 common relay
 - 8 independent relay output
 - RS-485 communication
 - 85-265 V_{AC} / 85-375 V_{DC} supply

Note: XX must be coded as '0' for devices having more than 16 channels.

Dimensions



Note: Drawings are not in real scale. Do not use for scaling.

Panel Mounting

- E-680 controller should be installed inside a suitable grounded metal enclosure (panel). This must prevent the live parts being accessible to human hands and metal tools.
- E-680 controller does not include a power switch. Therefore, the power supply of the controller and power outputs must be wired through the proper fuse or circuit breaker.
- To minimize the pick-up of electrical noise, the wiring of low voltage lines, particularly the sensor inputs should be routed away from the high-current power cables. If this is not possible use screened cables and apply grounding.
- The cables used for powering the controller and the power outputs must conform to the standards IEC 60245 and IEC 60227.

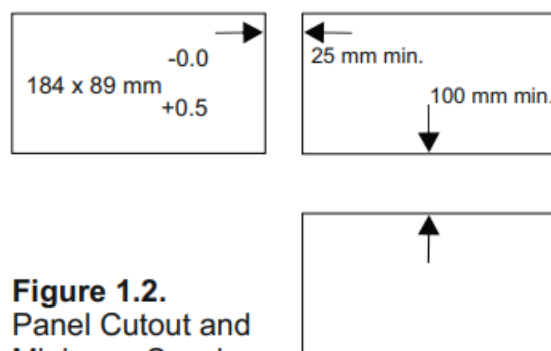
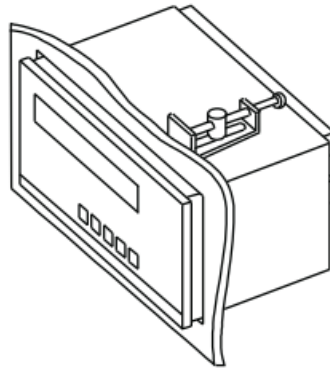


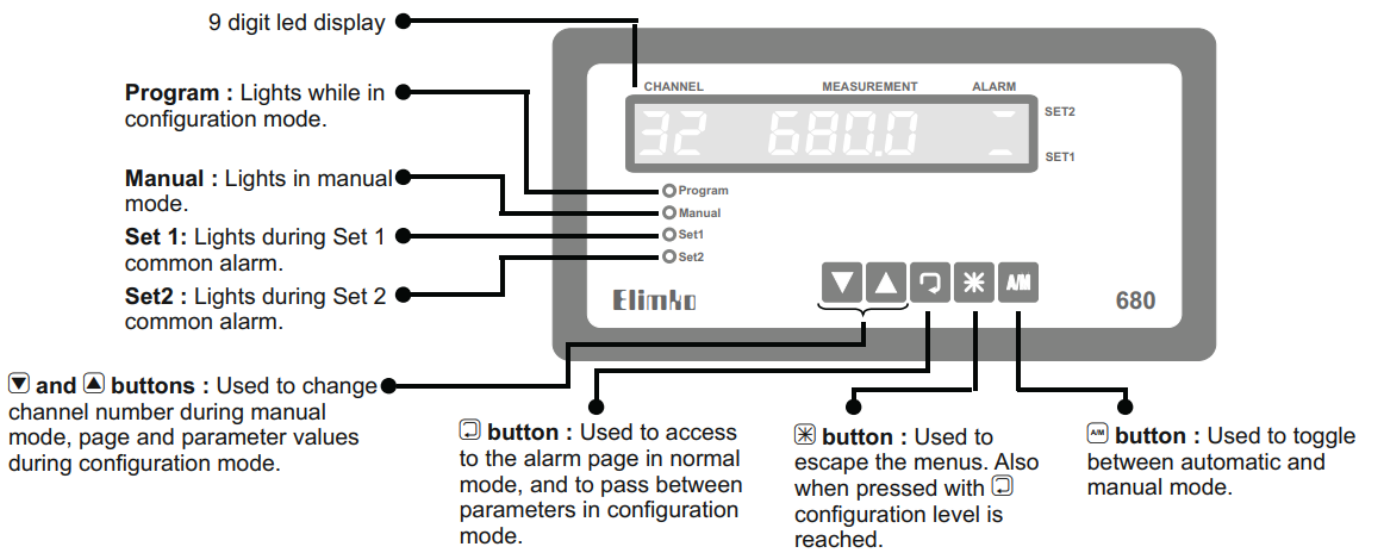
Figure 1.2.
Panel Cutout and
Minimum Spacing

- Cut a hole in the panel. (See the figure for overall dimensions.)
- Slide the controller into the cutout from the front of the panel.
- There are three clamp holes located at the top and the bottom side of the device. Use the convenient ones and fit the mounting clamps to the controller ensuring the lugs are located in their slots.
- Fasten the mounting clamps using the retaining screws.



Usage

General



The front panel is formed by 9 digit 7 segment led display, Program, Manual, Set 1, Set 2 leds and ▼, ▲, □, *, A/M button which are used for programming and manual controls. Program led lights when entered to the configuration mode, and Manual led lights during Manual mode, Set 1 led lights during SET 1 common alarm and Set 2 led lights during SET 2 common alarm period. During normal mode, channel numbers are displayed in the first two digits, measured values in the digits 4-7 and alarm information in the last digit of the 9 digit LED display. Channel information can be watched automatically or manually. In automatic mode, channel information can be monitored consecutively. The display time of a channel data is equal to GA parameter in seconds. A/M button is used for switching from automatic to manual or manual to automatic mode. In manual mode only one channel can be monitored, channel number is selected by ▼ and ▲ buttons. ▼, ▲, □, *, A/M

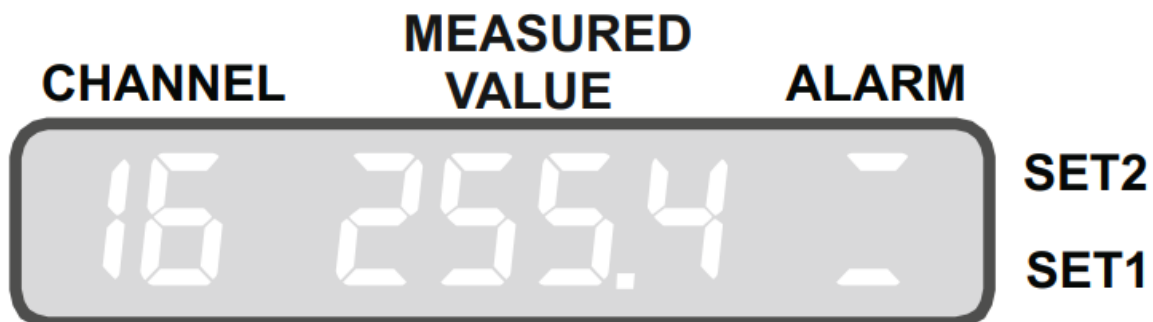
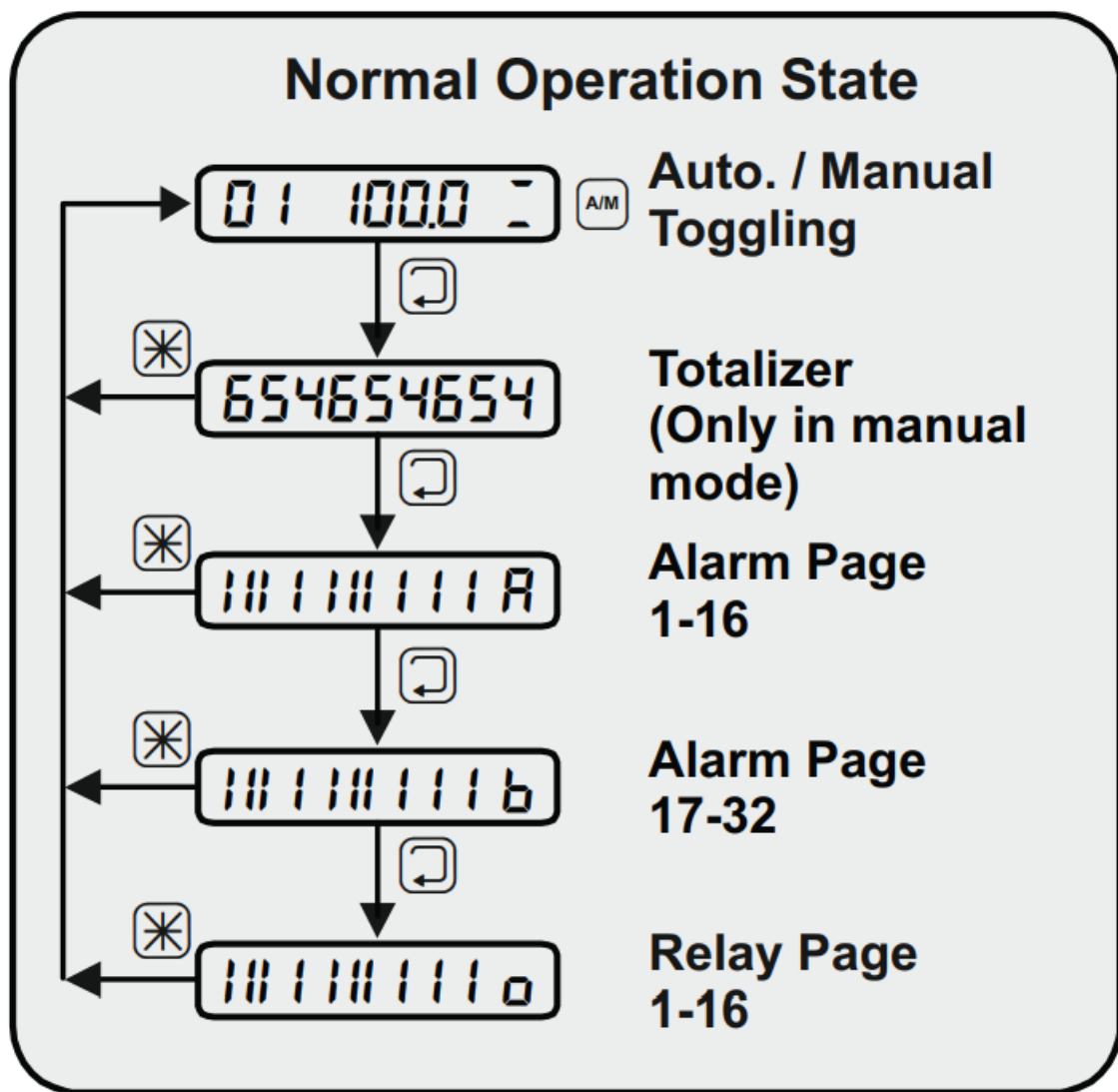







Figure 2.1. Operator Page



When the device is in normal operation state, the  button can be used to switch to the totalizer and the alarm pages. When the device is in manual mode and the  button is pressed, totalizer value is displayed. In this page, simultaneously pressing  and  buttons reset totalizer. Next to the totalizer page, alarm pages are reached. All alarms (Set 1, Set 2) can be seen together in these pages. In the first alarm page, alarms of channels 1 to 16 are displayed and letter A is shown in the last digit. In the second alarm page, alarms of channels 17 to 32 are displayed and letter B is shown in the last digit. In the third alarm page, status of the output relays R1 to R16 are displayed and letter O is shown in the last digit. Figure 2.2. shows the display format of the alarm pages. While in the totalizer or alarm pages pressing the  button reverts to the normal operation page. Alarm status of the channel that are not active or closed for scanning are shown as empty.

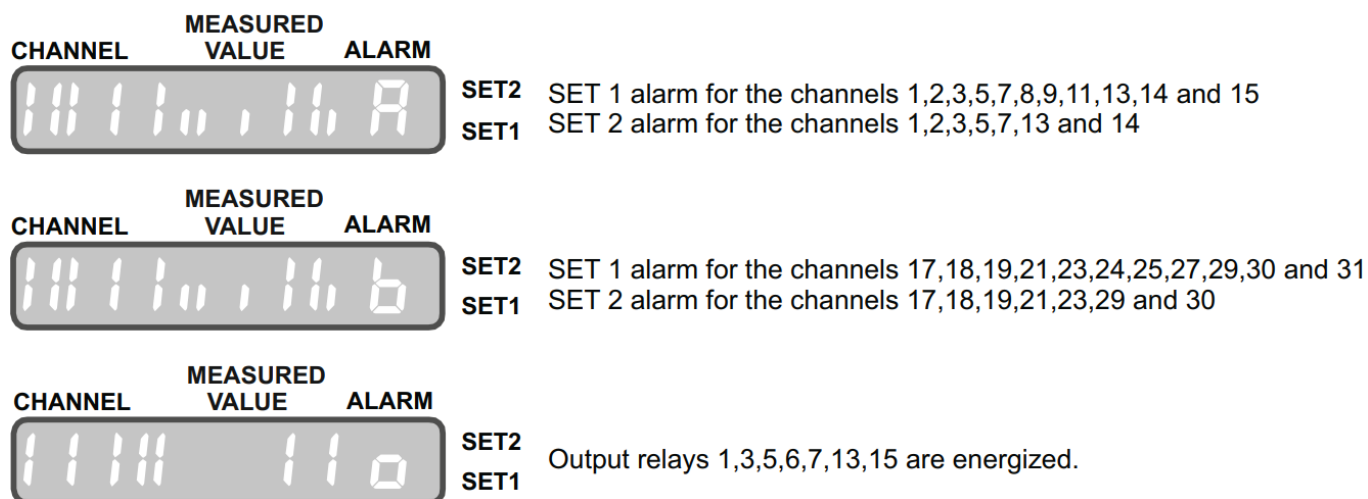
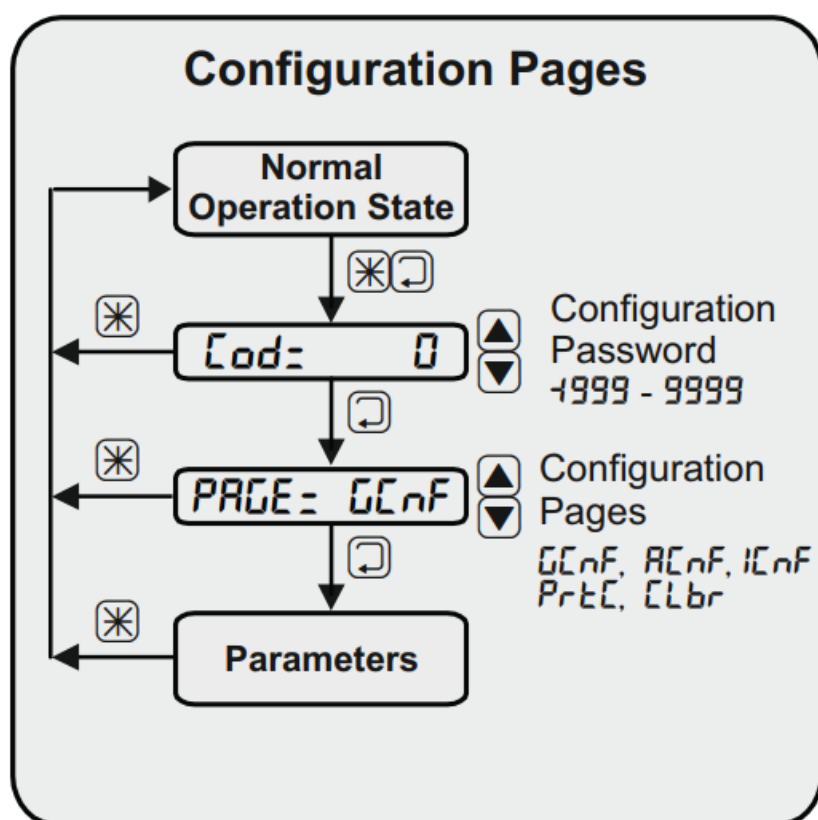


Figure 2.2. Alarm Pages

Configuration Pages



When the device is in the normal operation state, pressing the and buttons simultaneously enters the configuration mode. When the configuration mode is entered, “COD” message is displayed for the security code.

Security code is entered by using the buttons and . The factory setting of the security code is “10”. If the correct code is entered, the user is authorized to change all the device settings including the calibration.

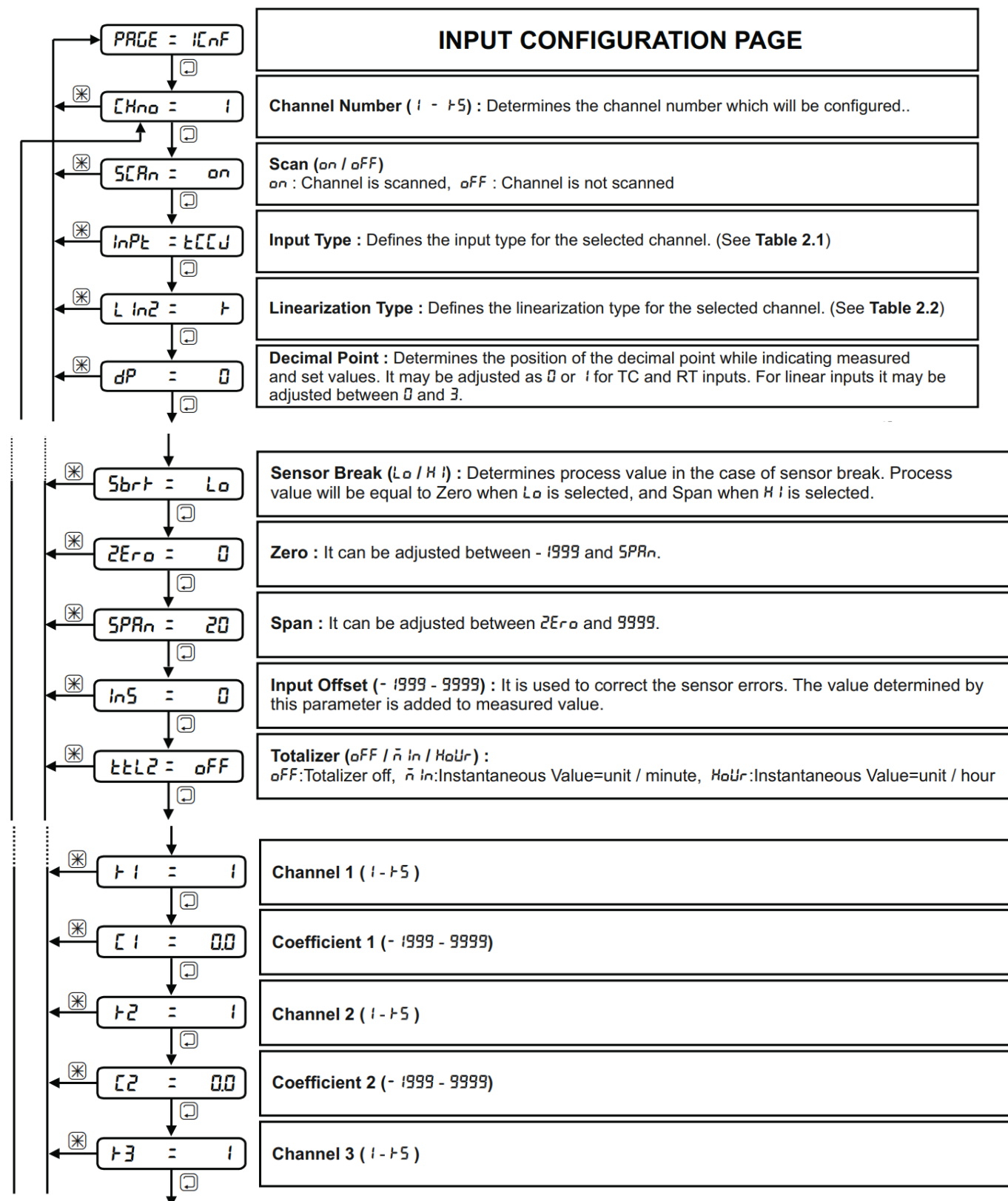
Otherwise, the rights are only restricted to the settings of the “PRTC” page. After this process, PAGE = is written to first 5 digit of display and the name of the page is displayed in the last 4 digit. To pass between menus the and buttons are used. In order to return to the normal operation state, the button should be pressed. In order

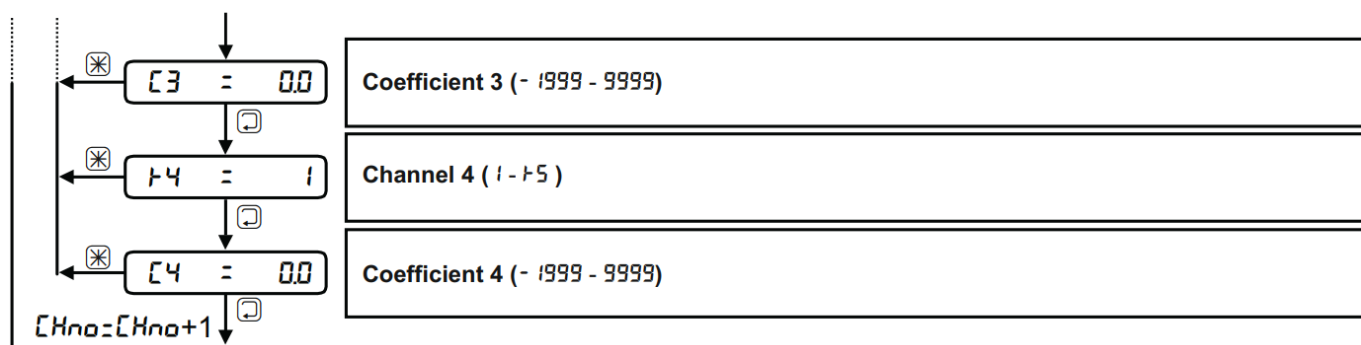
to access to any configuration page, the button is used and by pressing this button, the parameters in this page are displayed one by one. In this step, the parameter name is indicated in the first 4 digits of the display, and the parameter value is indicated in the last 4 digit of led display. In order to change the parameter values, the button is used.



Alarm Configuration Page

Note: When any alarm condition occurs, the device switches to manual mode and indicates the channel information which causes the alarm state.





The SCAN parameter of unused channels should be adjusted as OFF. This reduces the overall channel scan time. If the input type is changed, jumpers on the input multiplexer card must also be organised accordingly. (See Section 2.5 E-680 Jumper Settings) Otherwise reading will be false. In case of any constant measuring error, this error can be removed by giving suitable value to INS parameter.

Example: If the sensor produces 3°C more than normal value, error may be removed by adjusting INS parameter to -3.

Note: When input type is selected as CUST, it will be operate as PT if there is no custom inquiry.



Table 2.1.

Input Types
TCCJ (Thermocouple with cold junction compensation)
TC (Thermocouple without cold junction compensation)
RT (Resistance Thermometer)
0A20 (0-20 mA)
4A20 (4-20 mA)
0V50 (0-50 mV)
00V1 (0-1 V)
0.2V1 (0.2-1 V)
0V10 (0-10 V)
AvG (Average)
CUST (Special)

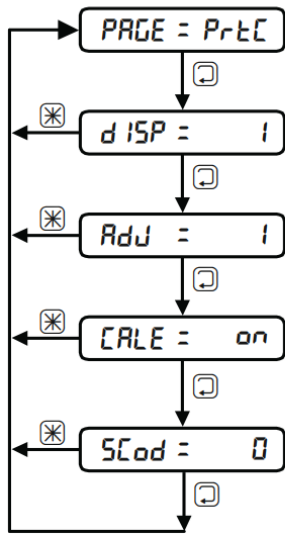
Table 2.2.

Lineerization Type	Standart	Measuring Ranges	
		(°C)	(°F)
LIN (Linear)	–	–	–
SQRT (Squareroot)	–	–	–
FCMP(Flowrate- Squareroot)	–	–	–
Cmp (Flowrate)	–	–	–
B (Type B)	IEC 60584-1	60 , 1820	140 , 3308
E (Type E)	IEC 60584-1	-200 , 840	-328 , 1544
J (Type J)	IEC 60584-1	-200 , 1120	-328 , 1562
K (Type K)	IEC 60584-1	-200 , 1360	-328 , 2480
L (Type L)	DIN 43710	-200 , 900	-328 , 1652
N (Type N)	IEC 60584-1	-200 , 1300	-328 , 2372
R (Type R)	IEC 60584-1	-40 , 1760	104 , 3200
s (Type S)	IEC 60584-1	-40 , 1760	104 , 3200
t (Type T)	IEC 60584-1	-200 , 400	-328 , 752
U (Type U)	DIN 43710	-200 , 600	-328 , 1112
PT (Pt-100)	IEC 60751	-200 , 840	-328 , 1544

When the linearization type selected as FCMP or CMP, related channel can be used for flow rate measurement. Flow rate measurement is calculated using differential pressure principle based on orifice plates with pressure and temperature compensation. In related channel input configuration, K1, C1, K2, C2 parameters determine the pressure channel, design pressure, temperature channel and design temperature respectively. When the INPT parameter is set to AVG, related channel will be a virtual channel and input value belonging to this channel is calculated as below. $\text{Input Value} = (\text{PV} \times \text{C1} + \text{PV} \times \text{C2} + \text{PV} \times \text{C3} + \text{PV} \times \text{C4}) / 100.0$ K1 K2 K3 K4 (PV: Process Value of X. channel, CX: Coefficient of X. channel) KX This input is linearized according to LINZ parameter like other inputs to see the input value as process value LINZ parameter must be set as LIN.

When the channel is on display, pressing  and  together make the sum zero. The channels of which the channel numbers are greater than input numbers are virtual. In these channels input type can only be chosen AVG. Otherwise, no calculation can be done.

Security Configuration Page



SECURITY CONFIGURATION PAGE

Display Parameter (0 - 4) : Determines the number of pages can be accessed with false security code. **0** : None of the pages. **1** : *GCnF*. **2** : *GCnF* and *REnF*. **3** : *GCnF*, *REnF* and *ICnF*. **4** : *GCnFREnF*, *ICnF* ve *PrtC* (*SCod* excluded).

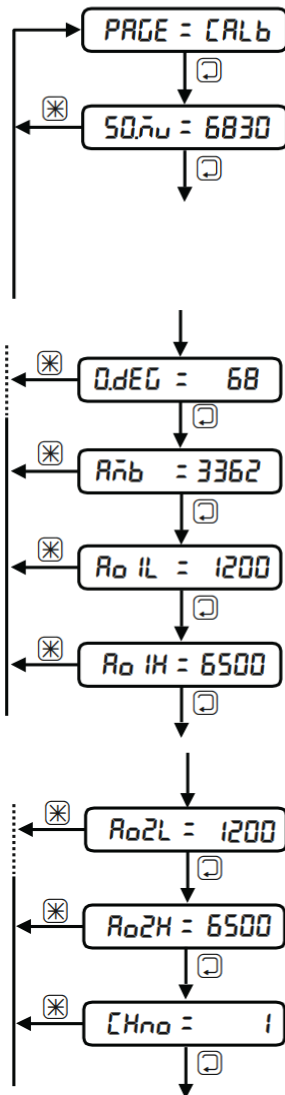
Adjustable Parameter (0 - 4) : Determines the number of pages can be adjusted with false security code. **0** : None of the pages. **1** : *GCnF*. **2** : *GCnF* and *REnF*. **3** : *GCnF*, *REnF* and *ICnF*. **4** : *GCnF*, *REnF*, *ICnF* and *PrtC* (*SCod* excluded).

Calibration (on / off) : Calibration can be done only by correct security code. In order to reach to calibration page, parameter *CALE* must be selected as *on*.

Security Code : It can be adjusted between - 1999 and 9999. When security code is forgotten *SCod* can be reached if , and buttons are pressed together in 25 sec after the device is energized.

Calibration Page

The basic calibration of the controller is highly stable and set in the factory. Any erroneous operation in the CALB page will corrupt the calibration parameter, and measurements will be faulty. The calibration parameters of the controller can be reinstalled in the CALB page. If accurate calibration devices are not available, entering to the CALB page is not advised.



CALIBRATION PAGE

It is done by applying 50 mV to first channel of the device. Calibration value can be seen on the display. To save this value press the keys and together. **(Thermocouple, 0-50 mV, 0-1 V, 0.2-1 V)**

It is done by connecting Type K thermocouple to first channel of the device at 0°C. Calibration value can be seen. To save this value press the keys and together. **(Thermocouple)**

It is done just after *QdEG* calibration. To save this value press the keys and together. **(Thermocouple)**

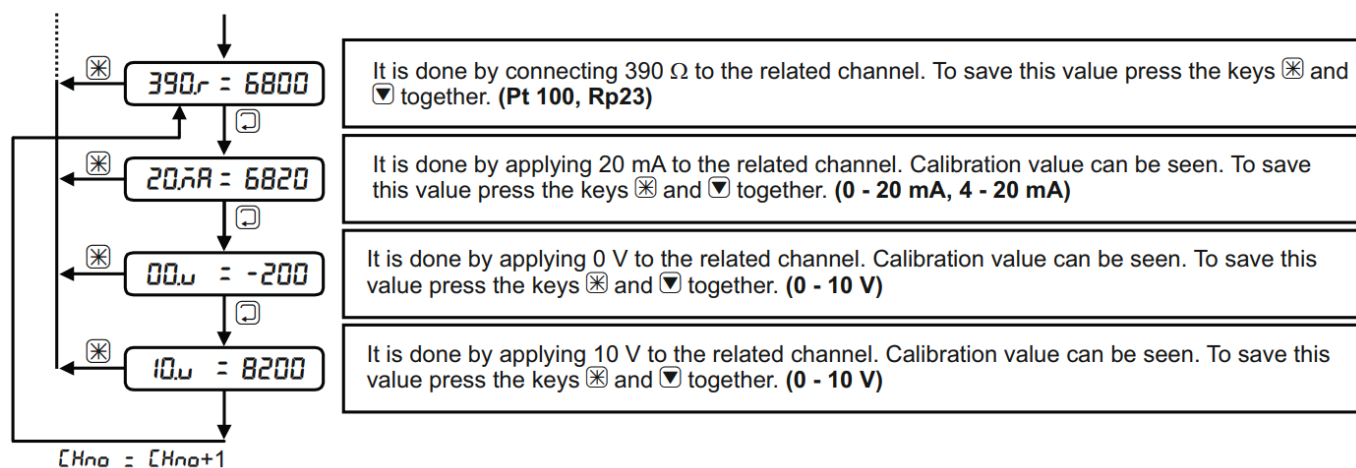
Determines the lower value of 1. Analog output. Connect a ampermeter to 1. Analog output of the device. While this parameter is selected, adjust the parameter value until the meter reading is equal to the desired lower value.

Determines the upper value of 1. Analog output. Connect a ampermeter to 1. Analog output of the device. While this parameter is selected, adjust the parameter value until the meter reading is equal to the desired upper value.

Determines the lower value of 2. Analog output. Connect a ampermeter to 2. Analog output of the device. While this parameter is selected, adjust the parameter value until the meter reading is equal to the desired lower value.

Determines the upper value of 2. Analog output. Connect a ampermeter to 2. Analog output of the device. While this parameter is selected, adjust the parameter value until the meter reading is equal to the desired upper value.

Channel Number (1 - 55) : It determines the channel number which will be calibrated.



Warning Messages

During normal operation, channel numbers are displayed in first two digits of the display, the measured value in digits 4-7 and alarm information in digit 9. If there is any fault at the input information, measured value can not be seen. Instead of it, the messages at the following table are displayed.

Message	Description	What To Do
OPEN	Sensor break or not connected.	Check sensor and sensor connections.
UFL	Process value is below the sensor type measuring range.	Check sensor and input sensor type.
OFL	Process value is over the sensor type measuring range.	
NNNN	Process value exceeds 9999 (without considering DP).	Check the scale determined by the parameters DP, ZERO and SPAN. Check input value for linear inputs.
VVVV	Process value under -1999 (without considering DP).	

Connection Diagram

Back panel view of E-680 device is shown in Figure 2.3.. There are 3 connection blocks X, Y and Z are located on the back panel. Connection group X is used for the processor and the power supply card. Connection group Y is used for multiplexer or relay card. Depending upon the configuration, this block may be used or not. Connection block Z is used only for multiplexer card. The connections of processor and the power supply card is given in Figure 2.4., the connections of relay card that can be used in group Y is given in Figure 2.5. various connections of the multiplexer card that can be used in group Y and Z are given in Figure 2.6., Figure 2.7., Figure 2.8. and Figure 2.9.. The number of terminals on the multiplexer and relay card depends on the type coding. (See Section 1.1. Type Coding)

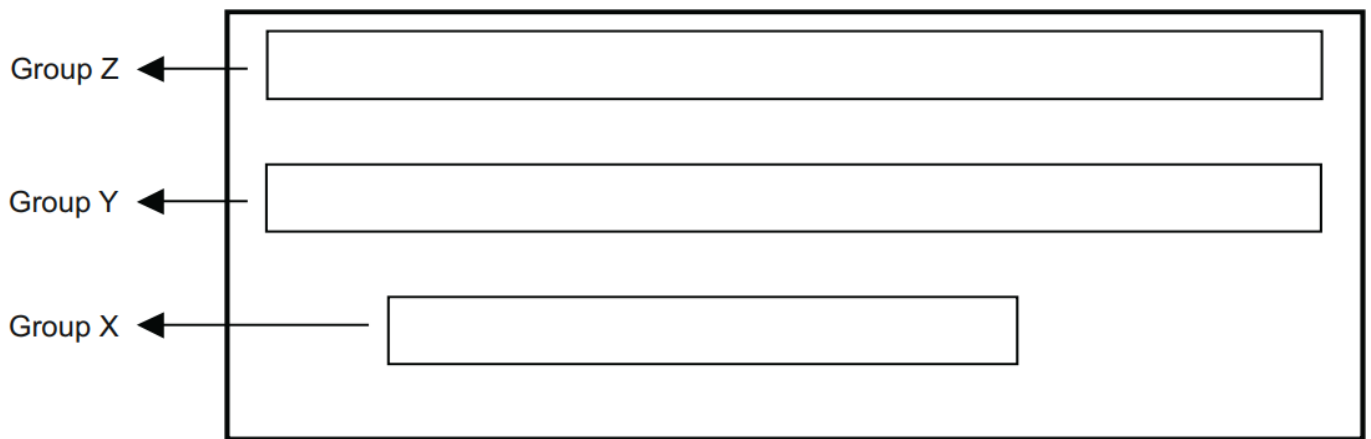


Figure 2.3. E- 680 Back Panel

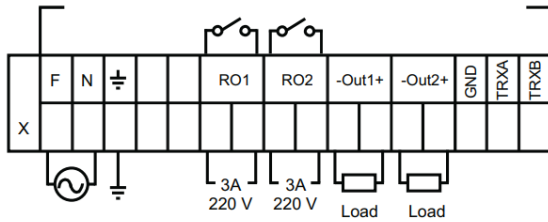


Figure 2.4. Processor Card Connection Diagram

For RS-485 communication line TRXA, TRXB and GND connections are used.

- The terminals F, N, RO1, RO2, OUT1 and OUT2 are electrically live. While the instrument is powered, never touch to these terminals.
- Before operating the controller, ensure that the controller is correctly configured. Incorrect configuration could result malfunction

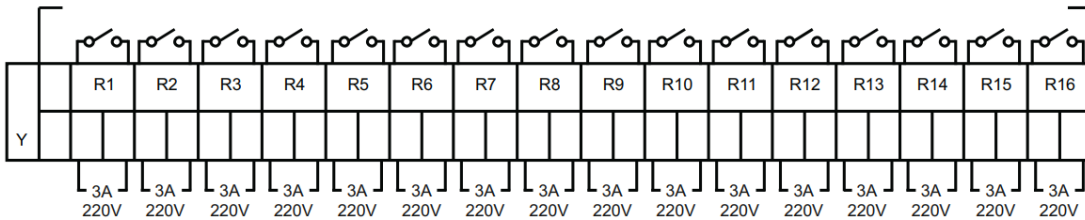


Figure 2.5. Relay Card Connection Diagram

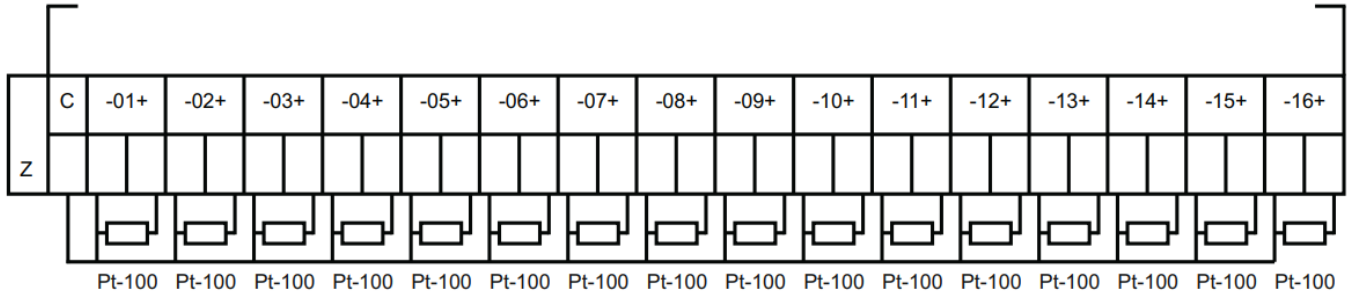


Figure 2.6. Pt-100 Connection Diagram

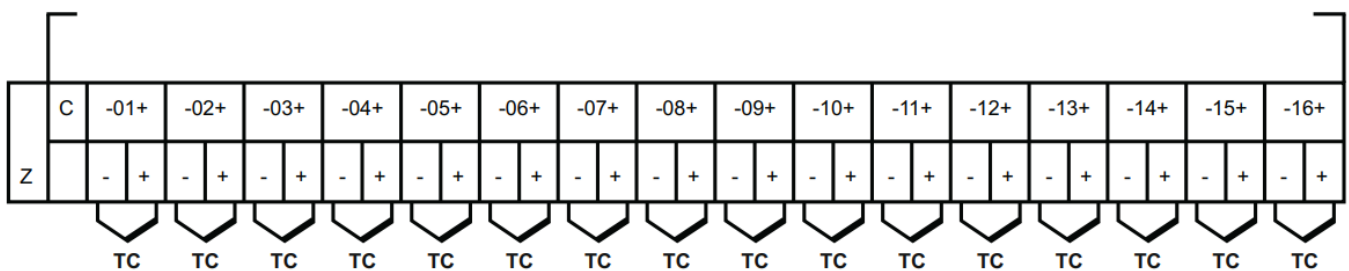


Figure 2.7. Thermocouple Connection Diagram

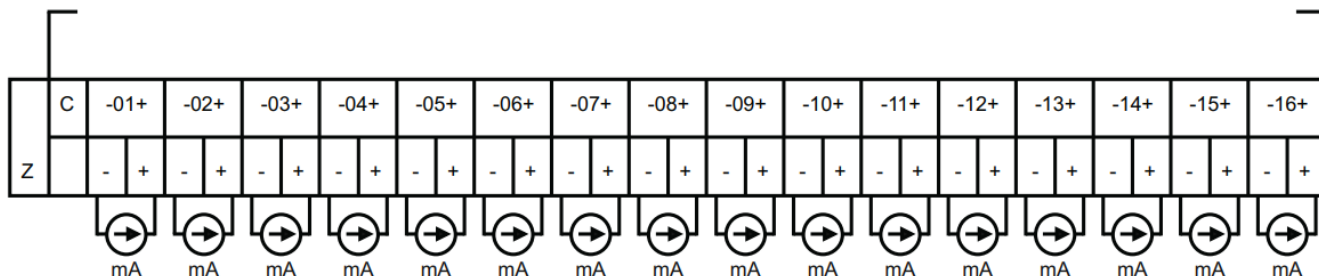


Figure 2.8. mA Source Connection Diagram

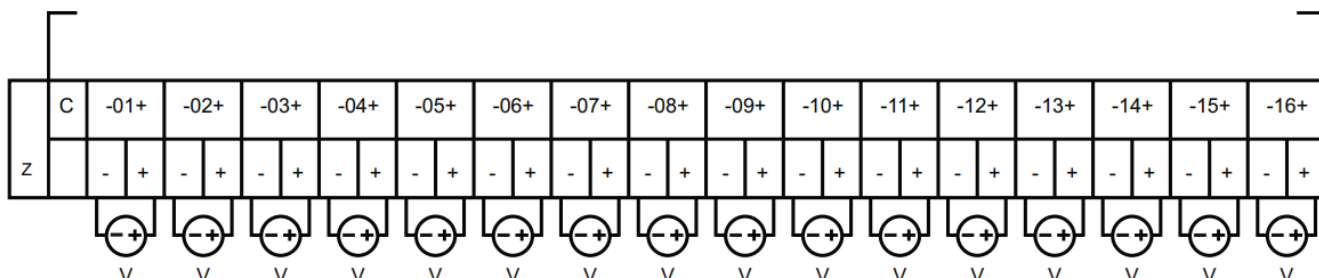


Figure 2.9. Voltage Source Connection Diagram

Jumper Settings

The jumper settings are different for TC (mV / V), RT, mA and 10 V inputs. The input signal applied to any channel must be compatible with INPT parameter of ICNF Input Configuration Page and jumpers on the input multiplexer card. Device has 1 or 2 multiplexer card according to the number of channels. Devices, having channel number up to 16 have a single, devices having more than 16 channels have 2 multiplexer cards. The jumpers are located on the multiplexer cards. Figure 2.10. shows top view of multiplexer card. In order to access to multiplexer cards, dismantle two screws at the back side and remove the cover. Upper connection group Z is the first multiplexer card. It includes the channels 1-16. If device has more than 16 channels, channel 17 to 32 are on the multiplexer card located at the middle slot. In order to reach this card, unscrew the upper two screws and slack the lower two screws and turn the fixing plate. Then remove the cable of first multiplexer card and dismantle it by pulling from rails. After completing necessary arrangements, first multiplexer card is attached by the same way to its place. Screw the plate to fix the cards again. Finally place the cover. Multiplexer card address jumpers must not be changed.

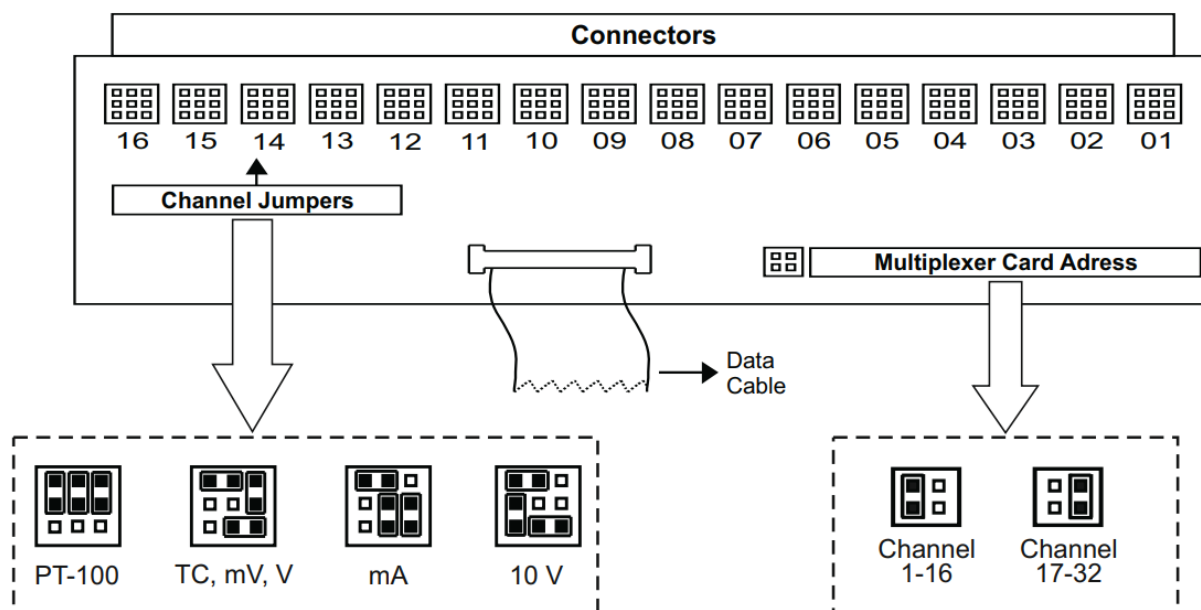


Figure 2.10.

Communication Connection

Typical communication network for E-680 device is given in Figure 2.11. More than one E-680 device can be connected to the same line and all information from devices can be collected in one center (PC, PLC). RS- 485 is

used for communication. When a PC is used as a master, E-IB-10 (RS-232 / RS 485 inverter) should be used. This because of standard PC's do not have RS-485 connection. Communication protocol is Modbus. According to this protocol, each device connected to line must have a different address. Communication address of E-680 devices are set by ADRS parameter in GCNF page.

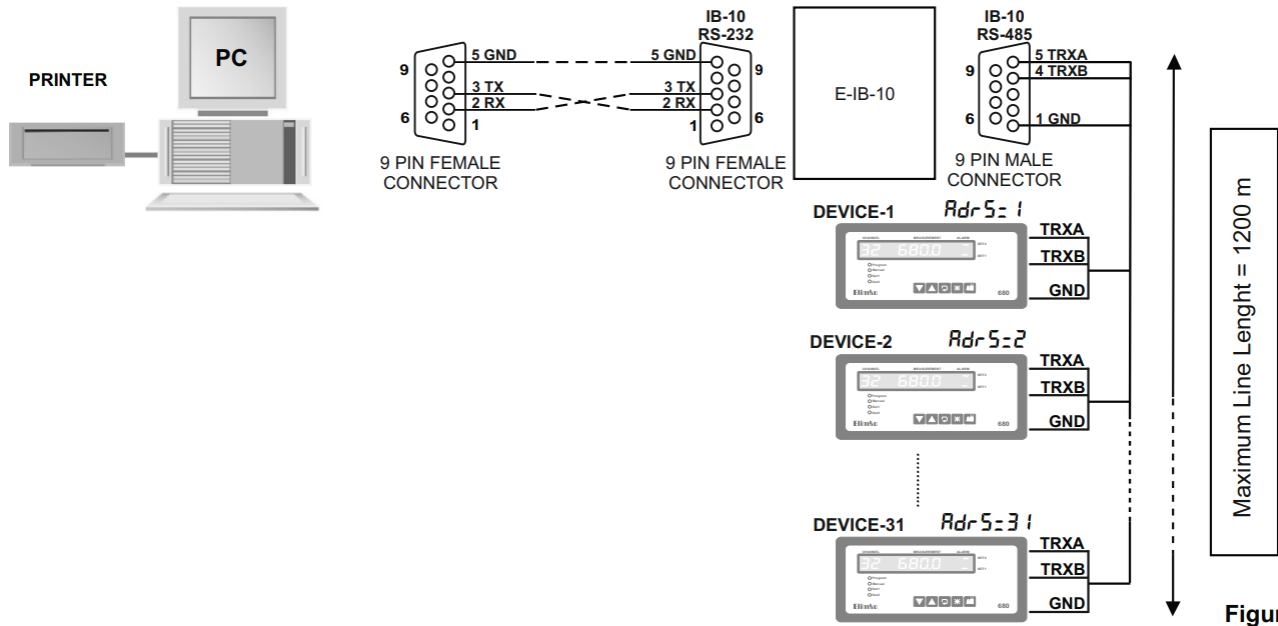


Figure 2.11.

Manufacturer / Technical Support

Elimko Elektronik İmalat ve Kontrol Ltd. Şti.

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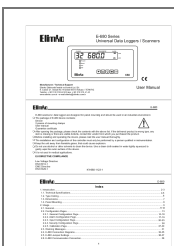
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E-680, E-680 Series Universal Data Loggers Scanners, E-680 Series, Universal Data Loggers Scanners, Data Loggers Scanners, Loggers Scanners, Scanners

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