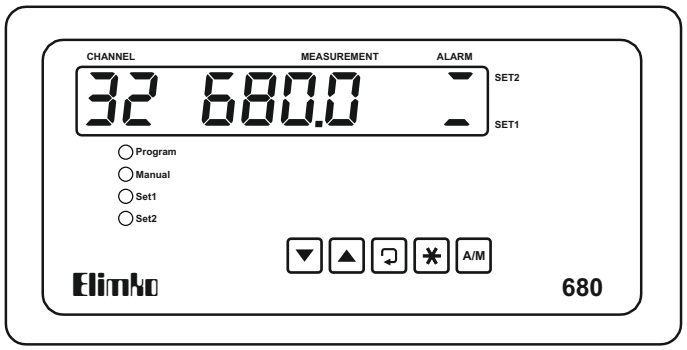
E-680 Series
Universal Data Loggers / Scanners



CE

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User Manual

E-680 scanners / data loggers are designed for panel mounting and should be used in an industrial environment.

- The package of E-680 device contains;
  Device
  2 pieces of mounting clamps
  User manual
  Guarantee certificate
- After opening the package, please check the contents with the above list. If the delivered product is wrong type, any item is missing or there are visible defects, contact the vendor from which you purchased the product.
- Before installing and operating the device, please read the user manual thoroughly.
- The installation and configuration of the controller must only be performed by a person qualified in instrumentation.
- Keep the unit away from flamable gases, that could cause explosion.
- Do not use alcohol or other solvents to clean the device. Use a clean cloth soaked in water tightly squeezed to gently wipe the outer surface of the device.
- It is not used in medical applications.

EU DIRECTIVE COMPLIANCE

Low Voltage Directive
EN 61010-1
EMC Directive
EN 61326-1

KY-680-1123-1

Index

1. 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 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.

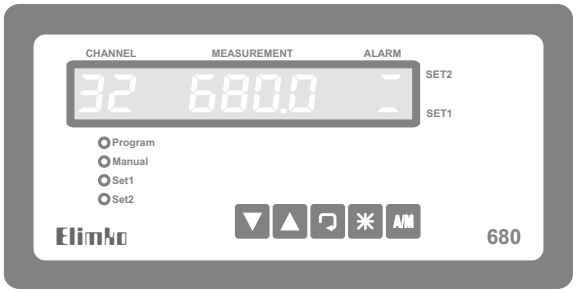

Figure 1.1. E-680 front view

(continue on next page)

1. Introduction

- ❑ High reading sensivity with 16 bit resolution
- ❑ Infinite life time and high isolation voltage semiconductor multiplexer relay
- ❑ Standart 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 compansation 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

1.1. 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 ±1ºC of indicated value) ±1 digit max. **Pt-100:** (±%0.5 or ±1ºC 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

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1.1. Technical Specification

Operating Temperature	-10ºC, +55ºC (14ºF, 131ºF) (With no condensation or icing)
Storage Temperature	-25ºC, +65ºC (-13ºF, +149ºF) (With no condensation or icing)
T/C Temperature Compansation	0ºC-50ºC
Power Supply	85-265 V_{AC} / 85-375 V_{DC} 20-60 V_{AC} / 20-85 V_{DC}
Power Consumption	4 W (7 VA)
Protection Class	IP 66 Front Panel (NEMA 4X) IP 20 Rear Case
Contact Capacity	NA Contact 250 V_{AC} 3 A
Relay Mechanical Life	10.000.000 operation*
Relay Electrical Life	>1.000.000 operation (1/10 load)
Memory	EEPROM max. 10^5 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.

1.2. Type Coding

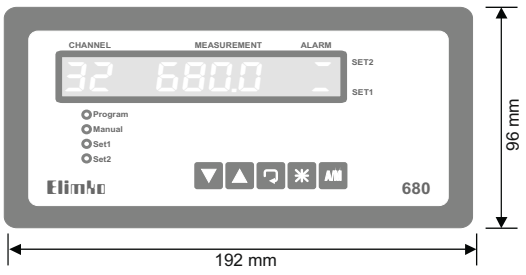
E – 680 – UU - V - W - XX – Y - Z

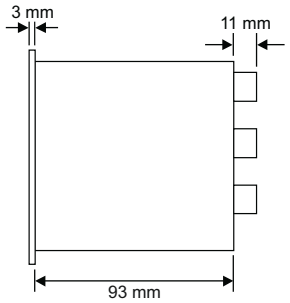
Power Supply **0** : 85-265 V_{AC} / 85-375 V_{DC} **1** : 20-60 V_{AC} / 20-85 V_{DC}
Communication **0 :** None **1 :** RS-485 Modbus
Number of Independent Relay (00-16)
Analog Output **0 :** None **1 :** 1 Analog Output **2 :** 2 Analog Outputs
Common Relay Output **0 :** None **1 :** 1 Relay **2 :** 2 Relay
Number of Inputs (01-32)

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 codded as '0' for devices having more than 16 channels.

1.3. Dimensions





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

1.4 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 standarts IEC 60245 and IEC 60227.

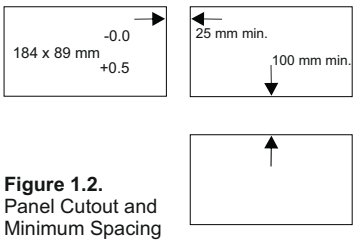
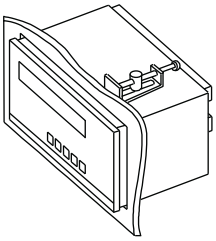


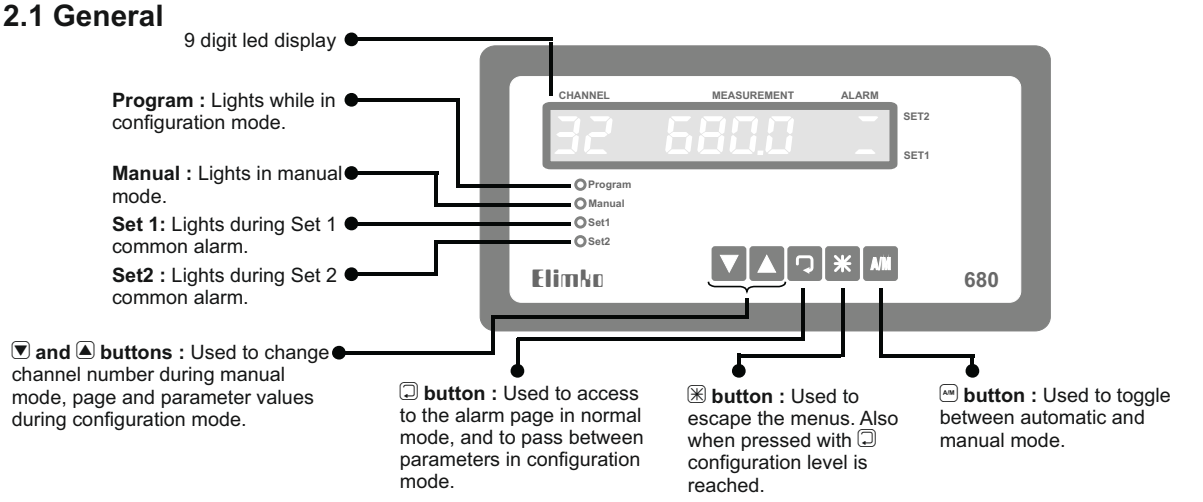
Figure 1.2. Panel Cutout and Minimum Spacing

- ❑ 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.



2. Usage

2.1 General



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2.1 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 *dA* 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.

Figure 2.1. Operator Page

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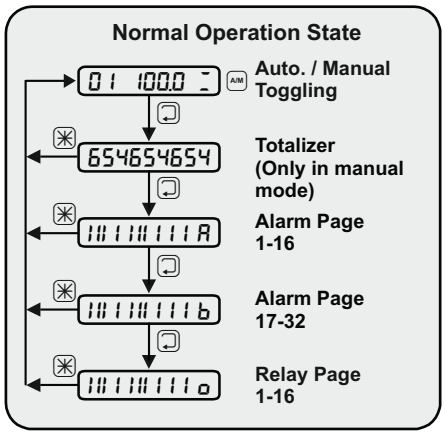
2.1 General



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 the 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 which are not active or closed for scanning are shown as empty.

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2.1 General

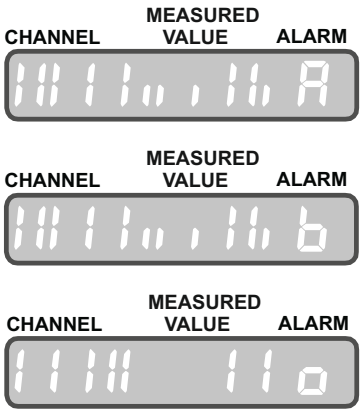
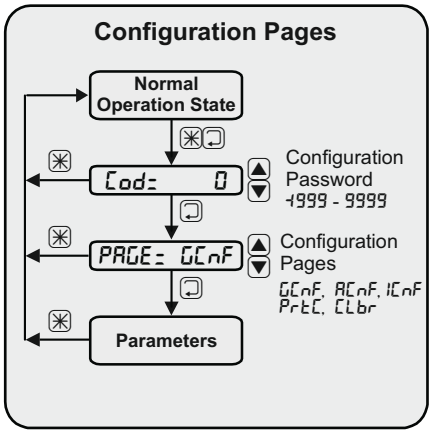


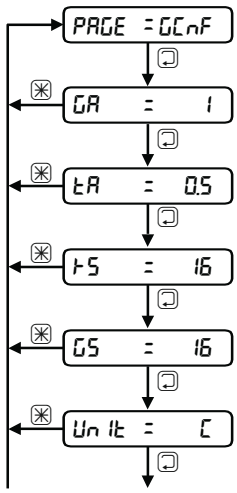
Figure 2.2. Alarm Pages

2.2 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 ▼ and ▲ buttons are used. To exit from any page the ✳ button is used.

2.2.1 General Configuration Page



GENERAL CONFIGURATION PAGE
Display Interval (1 - 99 sec) : Channel information display time in automatic mode.
Scan Time (0.2 - 9.9 sec) : The sampling time of the channels.
Number of Channel (1 - 32) : The total number of the physical and the virtual channels. The virtual channels are used for the results of the arithmetic operation (add, subtract, etc.) on the physical channels
Number of Analog Inputs (1 - I-S) : Indicates the number of inputs that will be used. Number of inputs shouldn't be more than 16 for the devices containing relay card. Otherwise relay card will not be functional.
Temperature Unit (°C / °F) : Indicates the measuring unit of TC and RT inputs. It will be inactive for other inputs..

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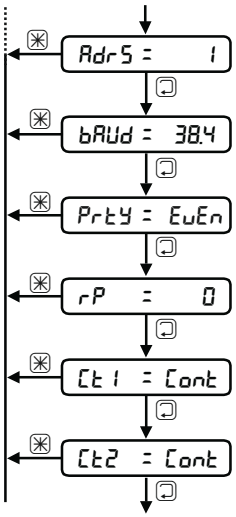
2.2.1 General Configuration Page



Device Communication Address (1 - 31)
Communication Speed (9.6 / 19.2 / 38.4) : Indicates the number of bits that will be sent in one second as ×1000.
Parity (nonE / odd / EuEn) : Determines the communication parity
Number of Repeat (0 - 12) : Determines the number of scan that is required before any alarm indication.
Control Type 1 (PULS / Cont) : PULS : When an alarm is detected, relay RO1 energized for a duration of PLnG. Cont : While in alarm state, RO1 energized continuously.
Control Type 2 (PULS / Cont) : PULS : When an alarm is detected, relay RO2 energized for a duration of PLnG. Cont : While in alarm state, RO2 energized continuously.

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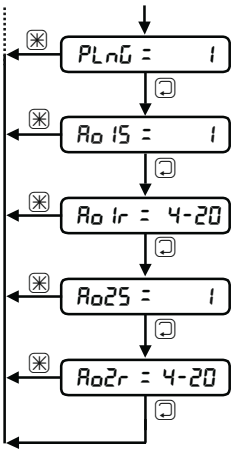
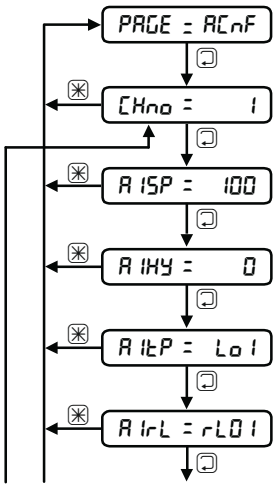
2.2.1 General Configuration Page



Pulse Length (1 - 2 sec) : If control type is selected as PULS, this parameter determines the energizing period of the alarm relay
1. Analog Output Source (1 - I-S) : Determines the number of the channel to be retransmitted from 1. Analog Output.
1. Analog Output Range (0-20, 20-0, 4-20, 20-4)
2. Analog Output Source (1 - I-S) : Determines the number of the channel to be retransmitted from 2. Analog Output.
2. Analog Output Range (0-20, 20-0, 4-20, 20-4)

2.2.2 Alarm Configuration Page



ALARM CONFIGURATION PAGE
Channel Number (1 - 16) : Determines the channel number which will be configured.
Alarm 1 Set Point (2Ero / SPAn)
Alarm 1 Hysteresis (0 - 9999)
Alarm 1 Type (oFF / Lo1 / H11 / Lo2 / H12 / Lo12 / H112) : If CHno >16 then choices Lo2, H12, Lo12 and H112 are not available.
Alarm 1 Relay No : It determines which independent relay will be energized at alarm condition. Different alarms can be forwarded to the same independent relay. If CHno< 16 and A1tP selected as Lo2, H12, Lo12 or H112 this parameter can be accessed.

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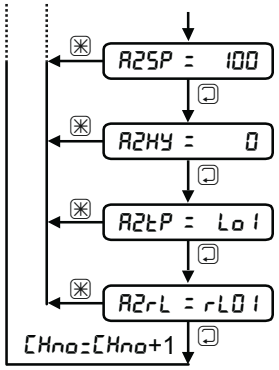
2.2.2 Alarm Configuration Page



Alarm 2 Set Point (2Ero / SPAn)
Alarm 2 Hysteresis (0 - 9999)
Alarm 2 Type (oFF / Lo1 / H11 / Lo2 / H12 / Lo12 / H112) : If CHno >16 then choices Lo2, H12, Lo12 ve H112 are not available.
Alarm 2 Relay No : It determines which independent relay will be energized at alarm condition. Different alarms can be forwarded at the same time independent relay. If CHno < 16 and A2tP selected as Lo2, H12, Lo12 or H112 this parameter can be accessed.

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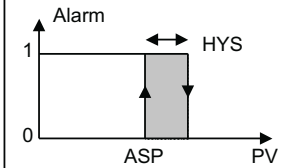
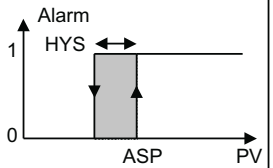
2.2.2 Alarm Configuration Page

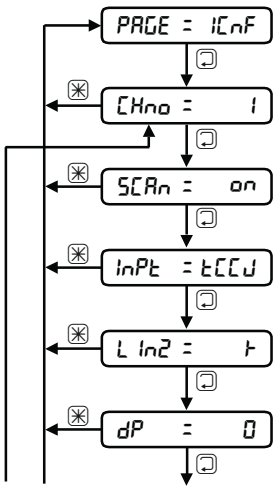
The alarm types and the principle of generating alarms are given in the figure on the right. Alarm parameters are rP, Ct1, Ct2, PLnG, A1SP, A1HY, A1tP, A1rL, A2SP, A2HY, A2tP and A2rL.For each channel, set points A1SP and A2SP are defined. Those can be directed to common and independent alarm relays according to the values selected for A1tP and A2tP. When A1tP and A2tP is selected as oFF, the alarms will not be activated. When alarm type is choosen as Lo1 or H11 related alarm can only be directed to common alarm relays. Those relays are RO1 for Set 1 and RO2 for Set 2. When alarm type is selected as Lo2 or H12, alarm can only be directed to independent relays determined by A1rL and A2rL parameters. Independent relays are R1, R2,...,R16. When alarm type is selected as Lo12 or H112, related alarm is directed to the common and independent alarm relay described as above. Different alarms can be forwarded to the same independent relay. In this case related relay is used commonly by those alarms. rP is valid for all defined alarms, and defines the number of scans for alarm condition. As an example, if rP is selected as 3, alarm will be triggered, if the alarm condition persists at least three scan period. Ct1 and Ct2 are only valid for common alarms and at alarm conditions it defines whether the relay is energized continuously or during the defined pulse length. Ct1 determines control type of RO1, and Ct2 determines control type of RO2 relay.

Alarm Type: Lo1, Lo2 or Lo12	Alarm Type: H11, H12 or H112
	

HYS=Hysteresis, ASP=Alarm Set Point, PV=Process Value

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

2.2.3 Input Configuration Page



INPUT CONFIGURATION PAGE
Channel Number (1 - 5**) :** Determines the channel number which will be configured..
Scan (on / oFF**)** on : Channel is scanned, oFF : Channel is not scanned
Input Type : Defines the input type for the selected channel. (See **Table 2.1**)
Linearization Type : Defines the linearization type for the selected channel. (See **Table 2.2**)
Decimal Point : Determines the position of the decimal point while indicating measured and set values. It may be adjusted as 0 or 1 for TC and RT inputs. For linear inputs it may be adjusted between 0 and 3.

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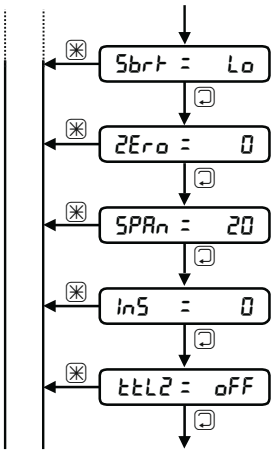
2.2.3 Input Configuration Page



Sensor Break (Lo / Hi**) :** Determines process value in the case of sensor break. Process value will be equal to Zero when Lo is selected, and Span when Hi is selected.
Zero : It can be adjusted between - 1999 and SPAn.
Span : It can be adjusted between 2Ero and 9999.
Input Offset (- 1999 - 9999**) :** It is used to correct the sensor errors. The value determined by this parameter is added to measured value.
Totalizer (oFF / n In / HoUr**) :** oFF:Totalizer off, n In:Instantaneous Value=unit / minute, HoUr:Instantaneous Value=unit / hour

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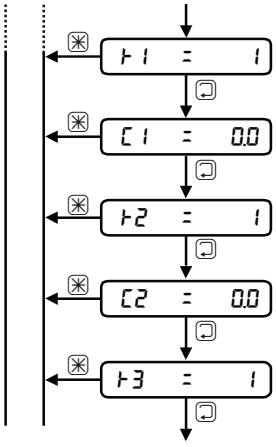
2.2.3 Input Configuration Page



Channel 1 (1 - 5 **)**
Coefficient 1 (- 1999 - 9999**)**
Channel 2 (1 - 5 **)**
Coefficient 2 (- 1999 - 9999**)**
Channel 3 (1 - 5 **)**

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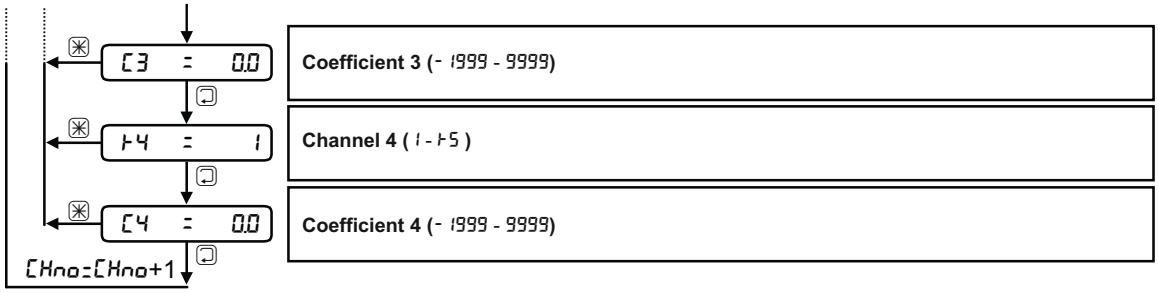
2.2.3 Input Configuration Page



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2.2.3 Input Configuration Page

The SCAn parameter of unused channels should be adjusted as oFF. This reduces the overall channell 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.
Incase 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 removedby 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)
0u50 (0-50 mV)
00u 1 (0-1 V)
0.2u 1 (0.2-1 V)
0u 10 (0-10 V)
Avg (Average)
CUSt (Special)

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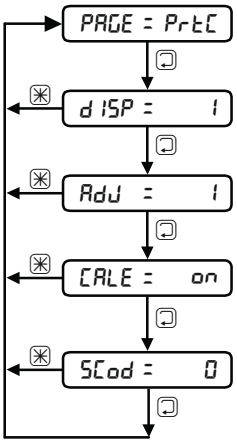
2.2.3 Input Configuration Page

Table 2.2.

Lineerization Type	Standart	Measuring Ranges	
		(°C)	(°F)
L In (Linear)	-	-	-
Sqrt (Squareroot)	-	-	-
FCnP(Flowrate-Squareroot)	-	-	-
CnP (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 FCnP or CnP, 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, H1, C1, H2, 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.
Input Value = $(PV_{K1}\times C1+PV_{K2}\times C2+PV_{K3}\times C3+PV_{K4}\times C4)/100.0$
(PV_{KX} : Process Value of X. channel, CX : Coefficient of X. channel)
This input is linearized according to L In2 parameter like other inputs to see the input value as process value L In2 parameter must be set as L In.
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 channels. In these channels input type can only be chosen Avg. Otherwise no calculation can be done.

2.2.4 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 ACnF. **3** : GCnF, ACnF and ICnF. **4** : GCnF,ACnF, ICnF ve PrtC (SCod excluded).

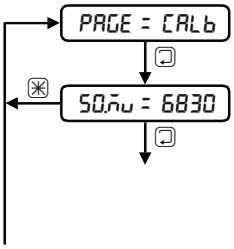
Adjustable Parameter (0 - 4) : Determines.the number of pages can be adjusted with false security code. **0** : None of the pages. **1** : GCnF. **2** : GCnF and ACnF. **3** : GCnF, ACnF and ICnF. **4** : GCnF, ACnF, ICnF and PrtC (SCod excluded).

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.

2.2.5 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 avaible, entering to the CALb page is not advised.

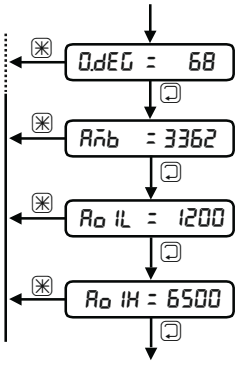


CALIBRATION PAGE

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)**

(continue on next page)

2.2.5 Calibration Page



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)**

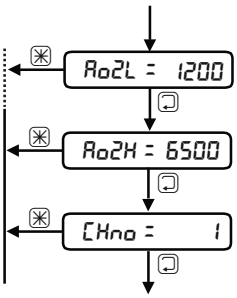
It is done just after 0.dEG calibration. To save this value press the keys ✳ and ▼ together. **(Thermocouple)**

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.

(continue on next page)

2.2.5 Calibration Page



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 - 65) : It determines the channel number which will be calibrated.

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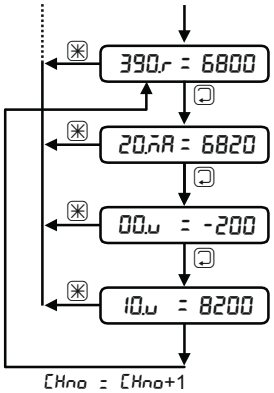
2.2.5 Calibration Page



It is done by connecting 390 Ω to the related channel. To save this value press the keys ✳ and ▼ together. **(Pt 100, Rp23)**

It is done by applying 20 mA to the related channel. Calibration value can be seen. To save this value press the keys ✳ and ▼ together. **(0 - 20 mA, 4 - 20 mA)**

It is done by applying 0 V to the related channel. Calibration value can be seen. To save this value press the keys ✳ and ▼ together. **(0 - 10 V)**

It is done by applying 10 V to the related channel. Calibration value can be seen. To save this value press the keys ✳ and ▼ together. **(0 - 10 V)**

2.3. 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 paremeters dP, ZEro and SPAn. Check input value for linear inputs.
uuuu	Process value under -1999 (without considering dP).	

2.4. E-680 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**)

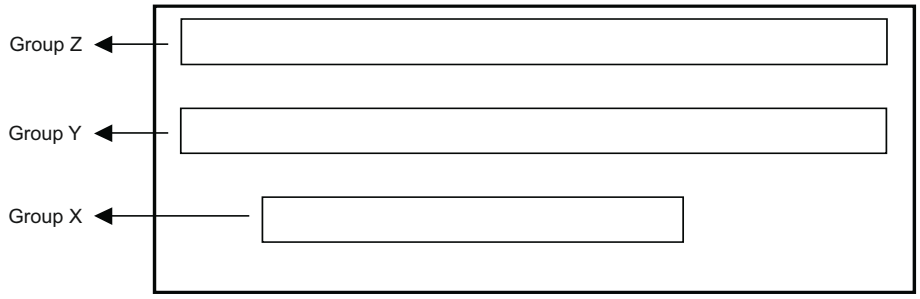


Figure 2.3. E- 680 Back Panel

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2.4. E-680 Connection Diagram

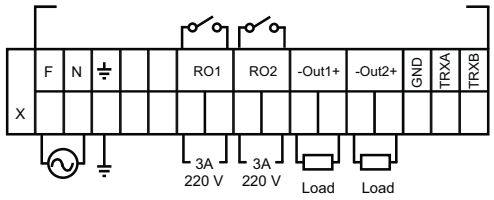

Figure 2.4. Processor Card Connection Diagram

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

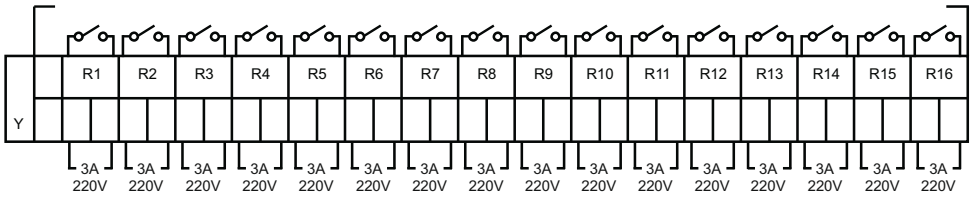

Figure 2.5. Relay Card Connection Diagram

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2.4. E-680 Connection Diagram

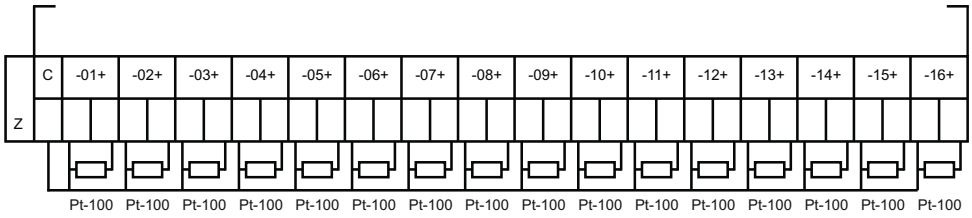

Figure 2.6. Pt-100 Connection Diagram

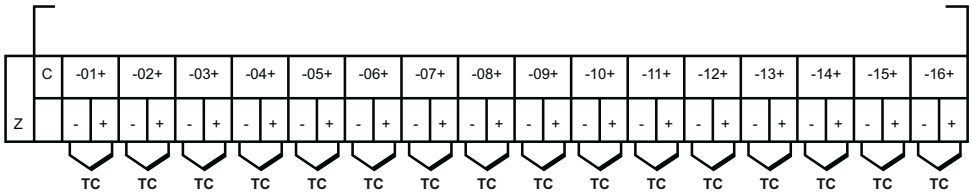

Figure 2.7. Thermocouple Connection Diagram

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2.4. E-680 Connection Diagram

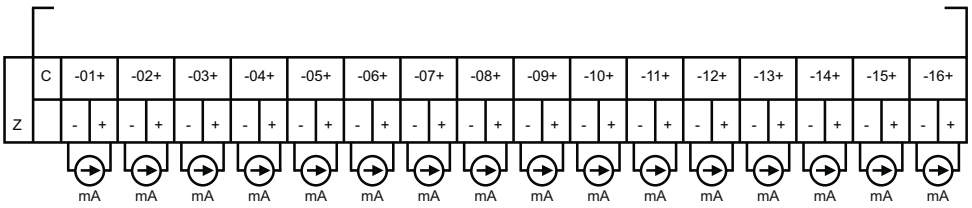


Figure 2.8. mA Source Connection Diagram

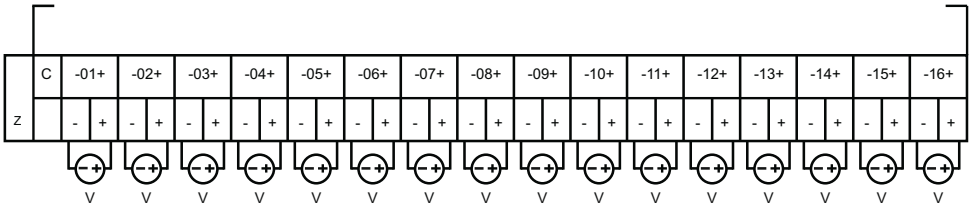


Figure 2.9. Voltage Source Connection Diagram

2.5. E-680 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 arragments, 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.

2.5. E-680 Jumper Settings

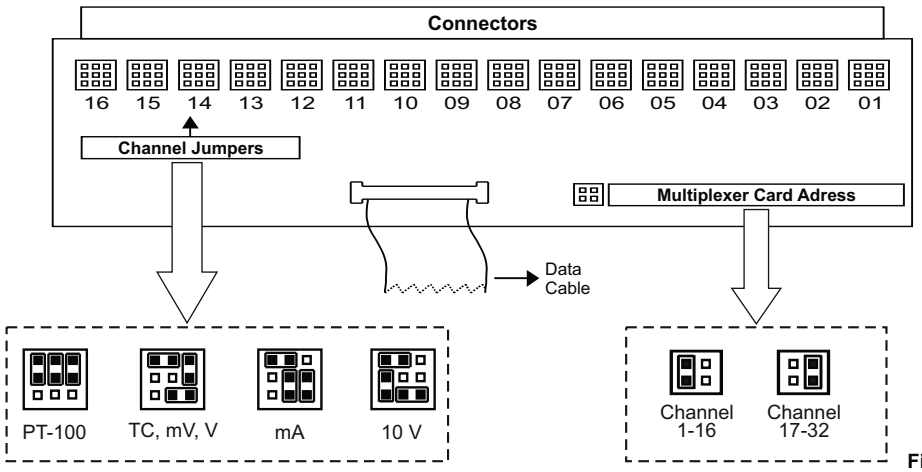
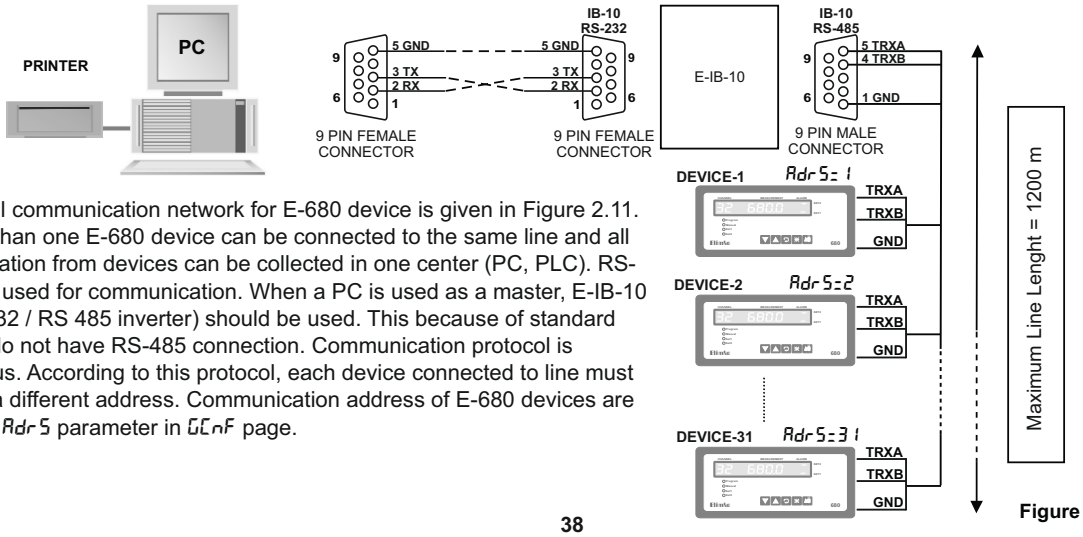


Figure 2.10.

2.6. E-680 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 Adr5 parameter in GCnF page.

Figure 2.11.