

Smart Process Controllers

FEATURES :

- Smart I/O Module System
- 4 Digits process (PV) & 4 digits process set (SV) display
- Universal process input (TC, RTD, mV \pm , V \pm , mA \pm)
- Optional secondary sensor input
- Dual or multi point calibration for \pm Voltage / Current input
- Configurable ON/OFF, P, PI, PD & PID control forms
- Auto-tune and Self-tune PID
- Manual/Automatic mode selection for control outputs
- Programmable heating, cooling and alarm functions for control outputs
- Motorized valve control function (Optional)
- 8 steps profile control (Ramp & Soak) function & start-hold-stop by using logic input module
- Remote set point function by using analogue input modules
- Retransmission of process value or process control by using 0/4...20mA \pm Current Output Module
- Detection of heater failure by using 0...5A~CT input module
- RS-232 (standard) or RS-485 (optional) serial communication with Modbus RTV protocol
- Auxiliary Power supply 15VDC 50mA

ESM series process controllers are designed for measuring and controlling temperature and any process value. They can be used in many applications with their universal process input, multifunction control outputs, selectable alarm functions, serial communication unit and input/output modules.

SPECIFICATIONS :

Process Input : TC, RTD, \pm Voltage/Current
Thermocouple (TC): L(DIN 43710), J, K, R, S, T, B, E and N (IEC584.1) (ITS90), C (ITS90)

Thermoresistance (RTD): PT-100 (IEC751) (IS90)

\pm Input : mV, V, mA

Measurement Range : Please refer Table-1 for selection of input type and scale

Accuracy : \pm 0.25% of full scale for thermocouple, Thermoresistance, mV,

\pm 0.70% of full scale for mA input

Cold Junction Compensation : Automatically \pm 0.1 $^{\circ}$ C/1 $^{\circ}$ C

Line Compensation: Maximum 10 Ohm

Sensor Break Protection: Upscale

Sampling Cycle : 3 samples per second

Input Filter: 0.0 to 900.0 seconds

CONTROL

Control Form: ON/OFF, P, PI, PD or PID

OUTPUT

Standard Relay Output : 5A@250V~"for resistive load"
(It can be configured as control or alarm output)

Input/Output Modules : Two input/Output Modules can be plugged in sockets.

Output Modules : Relay Output Module, SSR Output Module (Max. 20mA@18V \pm), Digital (Transistor) Output Module (Max.40mA @ 18V \pm), 0/4...20mA \pm Current Output Module.

Input Module : Digital input Module, 0/4...20mA \pm Current input Module, 0...5A ~ CT input module, TC or 0...50mV \pm input module, PT-100 input module, 0...10V \pm input module.



ESM-9950



ESM-4450



DISPLAY : Red 4 Digits LED Display

Process Display

ESM-4450 : 10mm

ESM-9950 : 14mm

Set Value Display : Green 4 digits LED Display

ESM-4450, ESM-9450 & ESM-9450 : 8 mm

ESM-9950 : 9 mm

Leds : AT (Auto Tune), SV (Set value), Man (Manual Mode), Auto (Automatic Mode), OP1/2/3 (Outputs Status Leds), $^{\circ}$ C, $^{\circ}$ F, V Ramp and Remote Leds

SUPPLY VOLTAGE

100-240V ~ 50/60 Hz (-15%; +10%)-6VA Standard

24 V ~ 50/60 Hz (-15%; +10%)-6VA Optional

24 V \pm (-15%; +10%)-6W Optional

12 V \pm (-15%; +10%)-6W Optional

(Must be determined in order)

Operating Temperature: 0...50 $^{\circ}$ C

Humidity : 0-90%RH (none condensing)

Protection Class : IP65 at front, IP20 at rear

Weight: ESM-4450 : 210 gr.,

ESM-9950 : 340 gr.

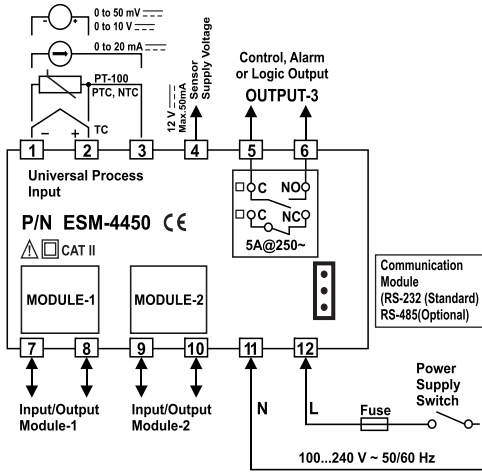
Dimension: ESM-4450 : (48 x 48mm, Depth:116mm)

ESM-9950 : (96 x 96mm, Depth: 87.5 mm)

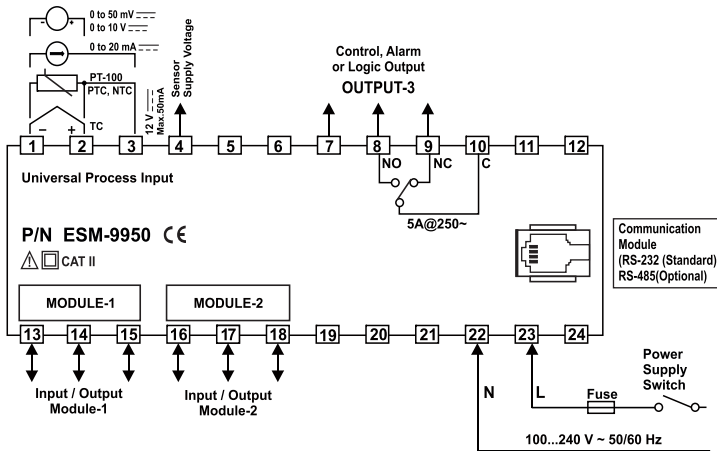
Panel Cut-Out : ESM-4450 : (46 x 46mm)

ESM-9950 : (92 x 92mm)

ESM-4450



ESM-9950



ORDERING INFORMATION

ESM-4450 (48x48 DIN 1/16)	A	BC	D	E	/	FG	HI	/	U	V	W	Z
ESM-9950 (96x96 DIN 1/4)				1	/			/	0	0	0	0

A	Supply Voltage
1	100-240 V ~ (-15%; +10%) 50/60 Hz
2	24 V ~ (-15%; +10%) 50/60 Hz 24V === (-15%; +10%)
6	12 V === (-15%; +10%)
9	Customer (Maximum 240V ~ (-15%; +10%)) 50/60Hz

BC	Input Type	Scale
20	Configurable (Table-1)	Table-1

D	Serial Communication
0	None
1	RS-232
2	RS-485

E	Output - 3
1	Relay Output (5A@250 V ~)

FG	Module-1	Module Codes
00	None	
01	Relay Output Module	EMO-400, EMO-900
02	SSR Driver Output Module (maximum 20mA@18V ===)	EMO-410, EMO-910
03	Digital (Transistor) Output Module (Maximum 40mA@ 18V ===)	EMO-420, EMO-920
04	Current Output Module (0/4...20 mA ===) (or 0...10V=== with appropriate mechanism)	EMO-430, EMO-930
07	Digital Input Module	EMI-400, EMI-900
08	Current Input Module (0/4...20 mA===)	EMI-410, EMI-910
09	~ CT input Module (0...5A ~)	EMI-420, EMI-920
10	TC (Thermocouple) or 0...50mV === Input Module	EMI-430, EMI-930
11	PT-100 Input Module	EMI-440, EMI-940
12	0...10V === Input Module	EMI-450, EMI-950

HI	Module-2	Module Codes
00	None	
01	Relay Output Module	EMO-400, EMO-900
02	SSR Driver Output Module (maximum 20mA@18V ===)	EMO-410, EMO-910
03	Digital (Transistor) Output Module (Maximum 40mA@ 18V ===)	EMO-420, EMO-920
04	Current Output Module (0/4...20 mA ===) (or 0...10V=== with appropriate mechanism)	EMO-430, EMO-930
07	Digital Input Module	EMI-400, EMI-900
08	Current Input Module (0/4...20 mA===)	EMI-410, EMI-910
09	~ CT input Module (0...5A ~)	EMI-420, EMI-920
10	TC (Thermocouple) or 0...50mV === Input Module	EMI-430, EMI-930
11	PT-100 Input Module	EMI-440, EMI-940
12	0...10V === Input Module	EMI-450, EMI-950

Note-1 : EMO-4xx, EMI-4xx are used in ESM-4450, ESM-4950 and ESM-9450
EMO-9xx, EMI-9xx are used in ESM-9950

Note-2 : EMO-400 Relay Output Module's rating is 3A@250V ~ (for resistive load)

Note-3 : EMI-410, 430, 440, 450; EMI-710, 740, 750; EMI-910, 930, 940, 950 Input Modules are named Analogue Input Module. Two Analogue Input Modules Can not be plugged in Module-1 and Module-2 sockets.

Table-1

BC	Input Type(TC)	Scale(°C)	Scale(°F)
21	L, Fe Const DIN43710	-100°C 850°C	-148°F 1562°F
22	L, Fe Const DIN43710	-100.0°C 850.0°C	-148.0°F 999.9°F
23	J, Fe CoNi IEC584.1 (ITS90)	-200°C 900°C	-328°F 1652°F
24	J, Fe CoNi IEC584.1 (ITS90)	-199.9°C 900.0°C	-199.9°F 999.9°F
25	K, NiCr Ni IEC584.1 (ITS90)	-200°C 1300°C	-328°F 2372°F
26	K, NiCr Ni IEC584.1 (ITS90)	-199.9°C 999.9°C	-199.9°F 999.9°F
27	R, Pt13%Rh Pt IEC584.1(ITS90)	0°C 1700°C	32°F 3092°F
28	S, Pt10%Rh Pt IEC584.1(ITS90)	0°C 1700°C	32°F 3092°F
29	T, Cu CuNi IEC584.1 (ITS90)	-200°C 400°C	328°F 752°F
30	T, Cu CuNi IEC584.1 (ITS90)	-199.9°C 400.0°C	-199.9°F 752.0°F
31	B, Pt30%Rh Pt6%Rh IEC584.1 (ITS90)	-200°C 400°C	-328°F 752°F
32	B, Pt30%Rh Pt6%Rh IEC584.1 (ITS90)	-199.9°C 400.0°C	-199.9°F 752.0°F
33	E, NiCr CuNi IEC584.1(ITS90)	-150°C 700°C	-238°F 1292°F
34	E, NiCr CuNi IEC584.1(ITS90)	-150.0°C 700.0°C	-199.9°F 999.9°F
35	N, Nicrosil Nisil IEC584.1(ITS90)	-200°C 1300°C	-328°F 2372°F
36	N, Nicrosil Nisil IEC584.1(ITS90)	-199.9°C 999.9°C	-199.9°F 999.9°F
37	C, (ITS90)	0°C 2300°C	32°F 4172°F
38	C, (ITS90)	0.0°C 999.9°C	32.0°F 999.9°F

BC	Input Type(RTD)	Scale(°C)	Scale(°F)
39	PT 100, IEC751 (ITS90)	-200°C 650°C	-328°F 1202°F
40	PT 100, IEC751 (ITS90)	-199.9°C 650.0°C	-199.9°F 999.9°F

BC	Input Type(DC Voltage and Current)	Scale
41	0...50 mV ===	-1999, 9999
42	0...5 V ===	-1999, 9999
43	0...10 V ===	-1999, 9999
44	0...20 mA ===	-1999, 9999
45	4...20 mA ===	-1999, 9999