



Process Controllers

“Smart I/O Module” System RS-232/485
Modbus RTU Serial Communication

ESM-4450 (48x48 DIN 1/16)

ESM-4950 (96x48 DIN 1/8)

ESM-7750 (72x72 DIN 1/8)

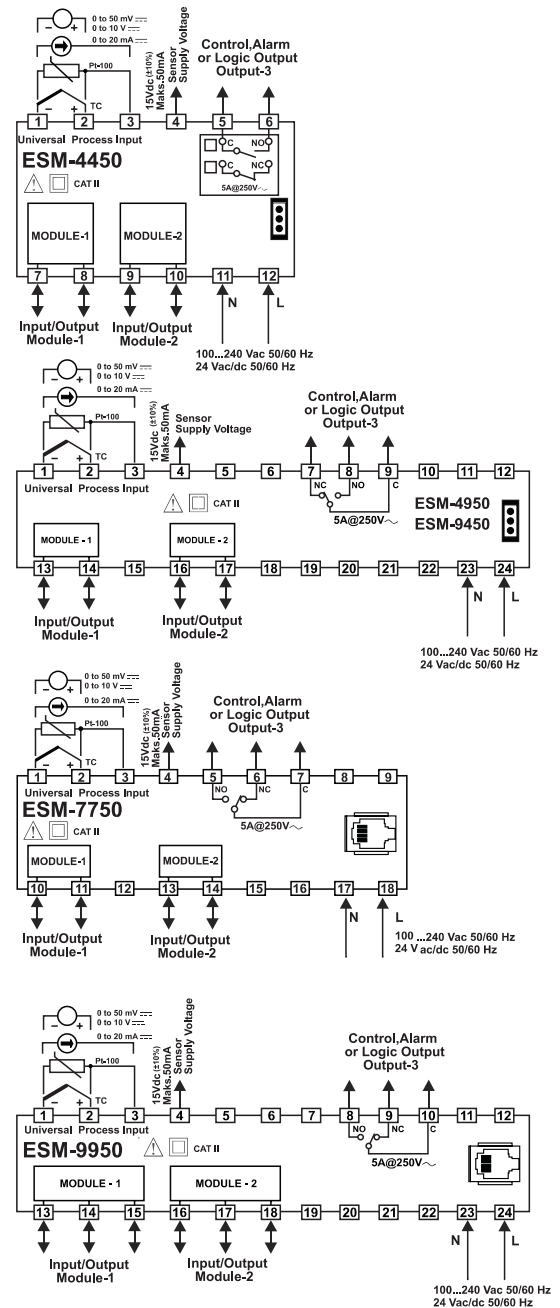
ESM-9950 (96x96 DIN 1/4)

ESM-9450 (48x96 DIN 1/8)

- 4 digits process (PV) and 4 digits set (SV) display
- Universal process input (TC, RTD, mVdc, Vdc, mAdc)
- Optional secondary sensor input
- Dual or multi point calibration for dc Voltage/Current input
- Configurable ON/OFF, P, PI, PD and PID control forms
- Auto-tune and Self-tune PID
- Manual/Automatic mode selection for control outputs
- Bumpless transfer
- Smart I/O module system
- Programmable heating, cooling and alarm functions for control outputs
- Motorized valve control function
- 8 steps profile control (Ramp & Soak) function and start-hold-stop by using logic input module
- Remote set point function by using analogue input modules
- Re-transmission of process value or process control by using 0/4...20 mAdc Current Output Module
- Detection of heater failure by using 0...5Aac CT input module
- Hardware configuration by using input/output modules
- RS-232 (standard) or RS-485 (optional) serial communication with Modbus RTU protocol

ESM-XX50 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. They are mainly used in glass, plastic, petro-chemistry, textile, automotive and machine production industries. Sensitive and developed controlling is done with it's selectable ON/OFF, P, PI, PD, PID, AutoTune and Self Tune PID properties.

Electrical Wiring



Specifications

Process Input

Universal Input: TC, RTD, dc 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)(ITS90)

dc Input: mV, V, mA

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

Accuracy: ± 0.25% of full scale for thermocouple, thermoresistance, mV, V ± 0.70% of full scale for mA input

Cold Junction Compensation: Automatically ±0.1°C/1°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, PID or Heating PID and Cooling PID together (Control form is programmable)

Output

Standard Relay Output: 5A@250Vac (at 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 @18Vdc), Digital(Transistor) Output Module (Max.40 mA @18Vdc), 0/4...20 mAdc Current Output Module

Input Modules: Digital Input Module, 0/4...20 mAdc Current Input Module, 0...5Aac CT Input Module, TC or 0...50mVdc Input Module, PT-100 Input Module, 0...10Vdc Input Module

Supply Voltage

100-240Vac 50/60 Hz (-15%;+10%) -6VA Universal

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

24Vdc (-15% ; +10%) -6W Optional

(Must be determined in order)

Environmental Ratings and Physical Specification

Operating Temperature: 0...50°C

Humidity: 0-90%RH (none condensing)

Protection Class: IP65 at front, IP20 at rear

Dimensions:

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

ESM-4950 : (96 x 48mm, Depth:86.5 mm)

ESM-7750 : (72 x 72mm, Depth:87.5 mm)

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

ESM-9450 : (48 x 96mm, Depth:86.5 mm)

Ordering Information

ESM-4450 (48x48 DIN 1/16)	A	BC	D	E	/	FG	HI	/	U	V	W	Z
ESM-4950 (96x48 DIN 1/8)												
ESM-7750 (72x72 DIN Size)				1	/				0	0	0	0
ESM-9950 (96x96 DIN 1/4)												
ESM-9450 (48x96 DIN 1/8)												

A	Supply Voltage
1	100..240Vac (-15%; +10%) 50/60Hz
2	24Vac (-15%; +10%) 50/60Hz ; 24Vdc (-15% ; +10%)
9	Customer

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

D	Serial Commucation	Product Code
0	None	
1	RS-232	EMC-400,EMC-700,EMC-900
2	RS-485	EMC-410,EMC-710,EMC-910

E	Output-3
20	Relay Output (5A@250Vac at resistive load)

For FG (Moduel-1) and HI (Module-2)	Module Codes
00	None
01	Relay Output Module EMO-400,EMO-700,EMO-900
02	SSR Driver Output Module (Max. 20mA@18Vdc) EMO-410,EMO-710,EMO-910
03	Digital(Transistor) Output Module (Max. 40mA@18Vdc) EMO-420,EMO-720,EMO-920
04	Current Output Module (0/4..20mAdc) or (0...10Vdc) EMO-430,EMO-730,EMO-930
07	Digital Input Module EMI-400,EMI-700,EMI-900
08	Current Input Module EMI-410,EMI-710,EMI-910
09	CT Input Module (0...5Aac) EMI-420,EMI-720,EMI-920
10	TC(Thermocouple) or 0...50mVdc Input Module EMI-430,EMI-730,EMI-930
11	PT-100 Input Module EMI-440,EMI-740,EMI-940
12	0...10Vdc Input Module EMI-450,EMI-750,EMI-950

Note-1: EMO-4xx, EMI-4xx are used in ESM-4450, ESM-4950 and ESM-9450
EMO-7xx, EMI-7xx are used in ESM-7750
EMO-9xx, EMI-9xx are used in ESM-9950

Note-2: EMO-400 Relay Output Modules rating is 3A@250Vac(at resistive load),
EMO-700 and EMO-900 Relay Output Modules ratings are 5A@250Vac

Note-3: EMI-410, 420, 430, 440, 450; EMI-710, 720, 730, 740, 750; EMI-910, 920, 930, 940, 950 Input Modules are named Analogue Input Module. Two Analogue Input Modules can not be plugged in Module-1 and 2 sockets.

Table-1

BC	Input Type (TC)	Scale (°C)	Scale (°F)
21	L,Fe Const DIN43710	-100...850°C	-148...1562°F
22	L,Fe Const DIN43710	-100.0...850.0°C	-148.0...999.9°F
23	J,Fe CuNi IEC584.1(ITS90)	-200...900°C	-328...1652°F
24	J,Fe CuNi IEC584.1(ITS90)	-199.9...900.0°C	-199.9...999.9°F
25	K,NiCr Ni IEC584.1(ITS90)	-200...1300°C	-328...2372°F
26	K,NiCr Ni IEC584.1(ITS90)	-199...999.0°C	-199.9...999.9°F
27	R,Pt13%Rh Pt IEC584.1(ITS90)	0...1700°C	32...3092°F
28	S,Pt13%Rh Pt IEC584.1(ITS90)	0...1700°C	32...3092°F
29	T,Cu CuNi IEC584.1(ITS90)	-200...400°C	-328...752°F
30	T,Cu CuNi IEC584.1(ITS90)	-199.9...400.0°C	-199.9...752.0°F
31	B,Pt30%Rh Pt6%Rh IEC584.1(ITS90)	44...1800°C	111...3272°F
32	B,Pt30%Rh Pt6%Rh IEC584.1(ITS90)	44.0...999.9°C	111.0...999.9°F
33	E,NiCr CuNi IEC584.1(ITS90)	-150...700°C	-238...1292°F
34	E,NiCr CuNi IEC584.1(ITS90)	-150.0...700.0°C	-199.9...999.9°F
35	N,Nicrosil Nisil EC584.1(ITS90)	-200...1300°C	-328...2372°F
36	N,Nicrosil Nisil EC584.1(ITS90)	-199.9...999.9°C	-199.9...999.9°F
37	C,(ITS90)	0...2300°C	32...3261°F
38	C,(ITS90)	0.0...999.9°C	32.0...999.9°F

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

BC	Input Type(Dc Voltage and Current)	Scale
41	0...50 mVdc	-1999...9999
42	0...5Vdc	-1999...9999
43	0...10 Vdc	-1999...9999
44	0...20 mAdc	-1999...9999
45	4...20 mAdc	-1999...9999