



## Process Indicators

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



**ESM-4400** (48x48mm DIN 1/16)

**ESM-4900** (96x48mm DIN 1/8)

**ESM-7700** (72x72mm DIN 1/8)

**ESM-9900** (96x96mm DIN 1/4)

- 4 digits Process (PV) Display
- Universal Process Input (TC, RTD, mV $\pm$ , V $\pm$ , mA $\pm$ )
- Dual or Multi Point Calibration for $\pm$ Voltage / $\pm$ Current Input
- Smart Output Module System
- Programmable Alarm Functions
- Retransmission of Process Value or Process Control by Using 0/4...20 mA $\pm$ Current Output Module
- Hardware Configuration With Output Modules
- RS-232 (standard) or RS-485 (optional) Serial Communication with Modbus RTU Protocol

ESM series process indicators are designed for measuring temperature and any process value. They can be used in many applications with their universal process input, alarm functions and serial communication unit. They are mainly used in glass, plastic, petro-chemistry, textile, automotive, machine production industries.

### SPECIFICATIONS

#### PROCESS INPUT

**Universal Input:** TC, RTD $\pm$ Voltage/Current

**Thermocouple (TC):** L (DIN 43710) , J , K , R , S , T , B , E ve N (IEC584.1)(ITS90) , C (ITS90)

**Thermoresistance (RTD):** PT-100 (IEC751)(ITS90)

**Input:** mV, V, mA

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

#### Accuracy:

$\pm 0.25\%$  of full scale for thermocouple, thermoresistance, mV and V

$\pm 0.70\%$  of full scale for mA

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

**Line Compensation:** Maximum 10 Ohm

**Sensor Break Protection:** Upscale

**Sampling Cycle:** 3 samples per second

**Input Filter:** 0.0 to 900.0 seconds

#### OUTPUT

**Standard Relay Output:** 5A@250V $\sim$ (at resistive load) (Programmable as Alarm output)

**Output Modules:** Two output modules can be plugged in sockets for using as an alarm output

**Relay Output Module**

- SSR Output Module (Max.20mA @18V $\sim$ )
- Digital(Transistor) Output Module(Max.40 mA @18V $\sim$ )
- 0/4...20 mA $\sim$ Current Output Module

**SUPPLY VOLTAGE**

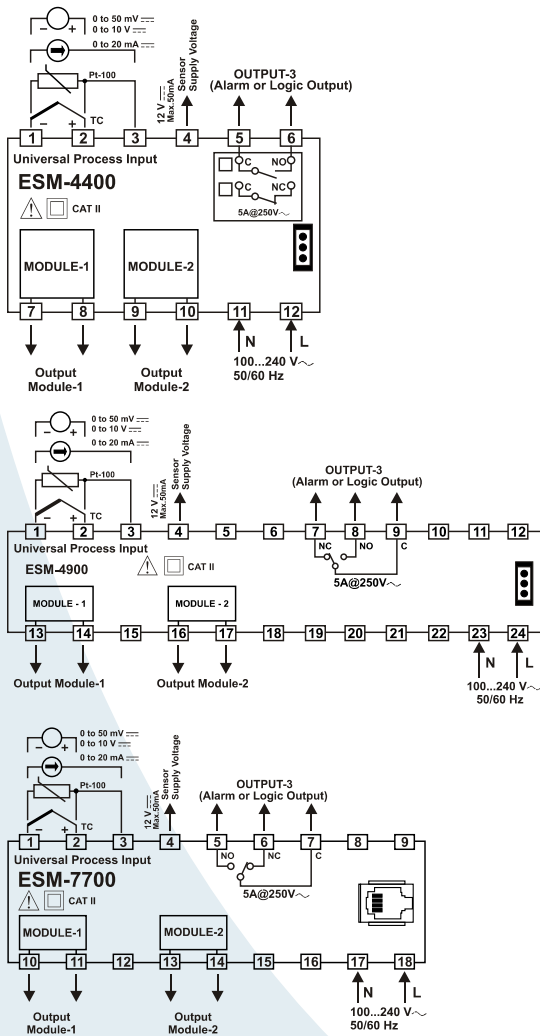
100-240V $\sim$ 50/60 Hz (-15%;+10%) -6VA Universal  
 24V $\sim$ 50/60 Hz (-15% ; +10%) -6VA Optional  
 24V $\sim$ (-15% ; +10%) -6W Optional  
 (Must be determined in order)

**ENVIRONMENTAL RATINGS and PHYSICAL SPECIFICATIONS**

**Operating Temperature:** 0...50°C  
**Humidity:** 0-90%RH (none condensing)  
**Protection Class:** IP65 at front, IP20 at rear  
**Dimensions:**

- ESM-4400 : (48 x 48mm, Depth:116 mm)
- ESM-4900 : (96 x 48mm, Depth:86.5 mm)
- ESM-7700 : (72 x 72mm, Depth:87.5 mm)
- ESM-9900 : (96 x 96mm, Depth:87.5 mm)

**ELECTRICAL WIRING**



**ORDERING INFORMATION**

<b>ESM-4400</b> (48x48 DIN 1/16)	A	BC	D	E	/	FG	HI	/	U	V	W	Z
<b>ESM-4900</b> (96x48 DIN 1/8)												
<b>ESM-7700</b> (72x72 DIN Size)				1	/				0	0	0	0
<b>ESM-9900</b> (96x96 DIN 1/4)												

A Supply Voltage	
1	100-240V $\sim$ (-15%;+10%) 50/60Hz
2	24 V $\sim$ (-15%;+10%) 50/60Hz 24V $\sim$ (-15%;+10%)
9	Customer

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

D Serial Communication	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	
1	Relay Output(5A@250V $\sim$ at resistive load)

FG Module-1	Module Codes
00	None
01	Relay Output Module EMO-400,EMO-700,EMO-900
02	SSR Driver Output Module (Maximum 20mA@18V $\sim$ ) EMO-410,EMO-710,EMO-910
03	Digital (Transistor) Output Module (Maximum 40mA@18V $\sim$ ) EMO-420,EMO-720,EMO-920
04	Current Output Module (0/4...20 mA $\sim$ ) (or 0...10V $\sim$ with appropriate mechanism) EMO-430,EMO-730,EMO-930

HI Module-2	Module Codes
00	None
01	Relay Output Module EMO-400,EMO-700,EMO-900
02	SSR Driver Output Module (Maximum 20mA@18V $\sim$ ) EMO-410,EMO-710,EMO-910
03	Digital (Transistor) Output Module (Maximum 40mA@18V $\sim$ ) EMO-420,EMO-720,EMO-920
04	Current Output Module (0/4...20 mA $\sim$ ) (or 0...10V $\sim$ with appropriate mechanism) EMO-430,EMO-730,EMO-930

**Note-1:** EMO-4xx Output Modules are used in ESM-4400 and ESM-4900 devices, EMO-7xx Output Modules are used in ESM-7700 devices, EMO-9xx Output Modules are used in ESM-9900 devices.  
**Note-2:** EMO-400 Relay Output Module's rating is 3A@250V $\sim$ (at resistive load), EMO-700 and EMO-900 Relay Output Module's ratings are 5A@250V $\sim$ (at resistive load)

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 CuNi IEC584.1(ITS90)	-200°C,900°C -328°F,1652°F
24	J, Fe CuNi 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)	44°C,1800°C 111°F,3272°F
32	B, Pt30%Rh Pt6%Rh IEC584.1(ITS90)	44.0°C,999.9°C 111.0°F,999.9°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, Nirosil Nisil IEC584.1(ITS90)	-200°C,1300°C -328°F,2372°F
36	N, Nirosil 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,3261°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( $\sim$ Voltage and Current)	Scale
41	0...50 mV $\sim$ -1999,9999
42	0...5 V $\sim$ -1999,9999
43	0...10 V $\sim$ -1999,9999
44	0...20 mA $\sim$ -1999,9999
45	4...20 mA $\sim$ -1999,9999