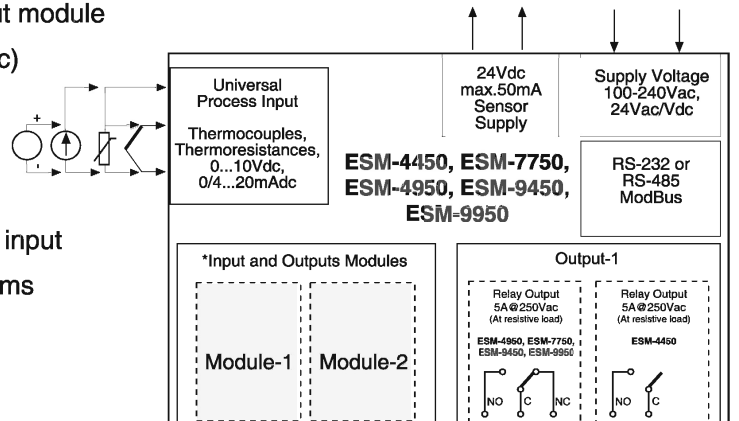




“Smart I/O Module” System  
RS-232/485 Modbus RTU  
Serial Communication  
Process Controller



- 4 digits process (PV) and 4 digits set (SV) display
- Programmable heating, cooling and alarm functions for control outputs
- 8 steps profile control ( Ramp & Soak ) function and start-hold-stop by using logic input module
- 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
- Universal process input (TC, RTD, mVdc, Vdc, mAdc)
- Auto-tune and Self-tune PID
- Bumpless transfer
- Motorized valve control function
- Dual or multi point calibration for dc Voltage/Current input
- Configurable ON/OFF, P, PI, PD and PID control forms



\* Input and output modules can be mounted each modules sockets.  
\* Two input modules can not be plugged in Module-1 and Module-2 socket at the same time

## Specifications

### 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)

### Output

Standard Relay Output: 5A@250Vac (at resistive load)

### Measurement Range

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

### 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...10Vac 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)

## Comparison Table

Order Code										ESM-4450	ESM-4950	ESM-7750	ESM-9450	ESM-9950	ESM-4430	ESM-4930	ESM-7730	ESM-9430	ESM-9930	ESM-4435	ESM-4400	ESM-4900	ESM-7700	ESM-9900	ESM-3700			
A	BC	D	E	/	FG	HI	/	U	V	W	Z																	
	20		1	/			/	0	0	0	0																	
<b>A Supply Voltage</b>																												
1	100...240Vac (-%15, +%10) 50/60Hz											+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	
2	24Vdc/Vac (-%15, +%15) 50/60Hz											+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
3	24Vac (-%15, +%15) 50/60Hz											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
4	115Vac (-%15, +%15) 50/60Hz											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
5	230Vac (-%15, +%15) 50/60Hz											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
9	48Vdc (-%15, +%10) 50/60Hz											-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
<b>BC Input Type</b>																												
20	Configurable Universal inputs											+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<b>D Serial Communication</b>																												
0	None																+	+	+	+	+	+					+	
1	RS-232 ModBus RTU											+	+	+	+	+	-	-	-	-	-	-	-	+	+	+	+	-
2	RS-485 ModBus RTU											+	+	+	+	+	-	-	-	-	-	-	-	+	+	+	+	-
<b>E Process Output</b>																												
0	None																											+
1	Relay Output (At resistive load 5A@250Vac)											+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2	SSR Driver Output (Max. 20mA@12Vdc)											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
<b>FG Input/Output Modules-1</b>																												
00	None											+	+	+	+	+								+	+	+	+	+
01	Relay Output											+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-
02	SSR Driver Output (Max. 20mA@12Vdc)											+	+	+	+	+	-	-	-	-	-	-	-	+	+	+	+	-
03	Transistor Output (Max. 40mA@18Vdc)											+	+	+	+	+	-	-	-	-	-	-	-	+	+	+	+	-
04	Analogue Output (0/4...20mAAdc or 0...10Vdc)											+	+	+	+	+	-	-	-	-	-	-	-	+	+	+	+	-
07	Digital Input											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
08	Analogue Input (0/4...20mAAdc)											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
09	CT Input Module (0...5Aac)											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
10	Thermocouple Input (0...50mVdc)											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
11	Pt-100 Input											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
12	Analogue Input (0...10Vdc)											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
<b>HI Input/Output Module-2</b>																												
00	None											+	+	+	+	+								+	+	+	+	+
01	Relay Output											+	+	+	+	+	-	-	-	-	-	-	+	+	+	+	+	-
02	SSR Driver Output (Max. 20mA@12Vdc)											+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	-
03	Transistor Output (Max. 40mA@18Vdc)											+	+	+	+	+	-	-	-	-	-	-	-	+	+	+	+	-
04	Analogue Output (0/4...20mAAdc or 0...10Vdc)											+	+	+	+	+	-	-	-	-	-	-	+	+	+	+	+	-
07	Digital Input											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
08	Analogue Input (0/4...20mAAdc)											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
09	CT Input Module (0...5Aac)											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
10	Thermocouple Input (0...50mVdc)											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
11	Pt-100 Input											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
12	Analogue Input (0...10Vdc)											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
<b>Specifications</b>																												
"Smart I/O Module" system											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	
"Smart Output Module" system											+	+	+	+	+	-	-	-	-	-	-	+	+	+	+	+	-	
Universal process (TC, RTD, mVdc, Vdc, mAAdc) input											+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	
Bumpless transfer											+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	
Motorized valve control function											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	
8 steps profile control											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	
Remote Set point function											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	
Re-transmission function											+	+	+	+	+	-	-	-	-	-	-	-	+	+	+	+	-	
Detection of heater failure by CT input module											+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Dimension</b>																												
77x35mm DIN											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	
48x48mm DIN 1/16											+	-	-	-	-	+	-	-	-	-	-	+	+	-	-	-	-	
96x48mm DIN 1/8											-	+	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	
72x72mm DIN											-	-	+	-	-	-	-	+	-	-	-	-	-	-	+	-	-	
48x96mm DIN 1/8											-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	
96x96mm DIN 1/4											-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	+	-	