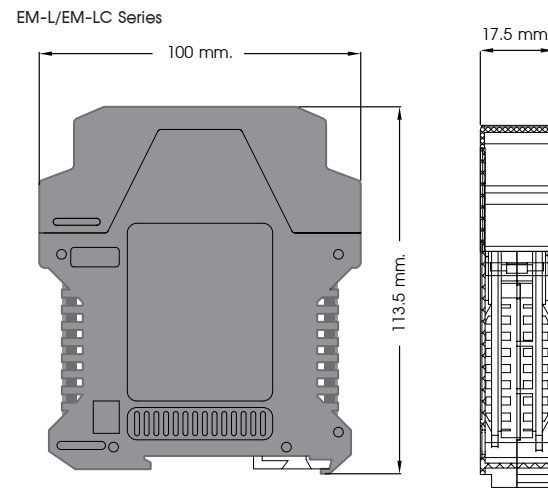
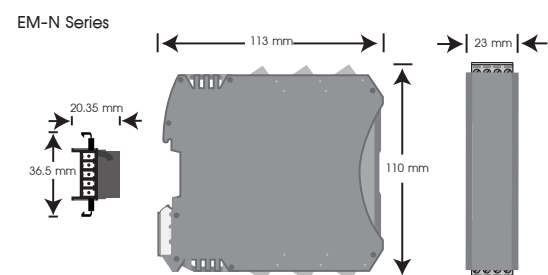




TECHNICAL SPECIFICATION

Model		EM-N Series	EM-L Series	EM-LC Series
Power Supply		100-250 VAC 50-60 Hz	10-30 VDC	
		10-30 VDC		
Power Consumption		4 VA Max.		0.6 VA
Input	Channel	1 Input Channel		
	Thermocouple	Type K, J, R, T, N, S, E		
	RTD	PT100		
	Resistance	0-100 Ohm, 0-1kOhm, 0-10kOhm, 0-100kOhm		
	DC Current	0-20 mA, 4-20 mA, 0-100 mA		
	AC Current	0-5 A	-	
	DC Voltage	0-75 mV, 0-150 mV, 0-1 V, 0-10 V, 0- 500 V		
	AC Voltage	500 V	-	
	Sampling Time	250 mS		
Output	Channel	2 Output Max.	1 Output	2 Output Max.
	Analog Output	4-20 mA Maximum 500 Ohm		Current Loop 4-20 mA Max 500 Ohm
		0-10 VDC Min.1 kOhm		-
	Accuracy	± 0.2% F.S		
Communication	Protocol	Modbus RTU, RS-485		
	Baud Rate	4800, 9600, 19200, 38400, 57600		
	Stop Bits	1, 2		
	Parity Bits	None, Even, Odd		
	Support Node	255 Max.		
Ambient Operation	Temperature	-10 °C to 60 °C		
	Humidity	<85% RH Non-Condensing		
Ambient Storage	Temperature	-20 °C to 80 °C		
	Humidity	<85% RH Non-Condensing		
Protection Degree		IP20		
Installation		DIN RAIL		
Material		ABS-V0		
Size		23x113x110 mm.	17.5x100x113.5 mm.	
Weight		118 g.	93 g.	83 g.

DIMENSION



DESCRIPTION

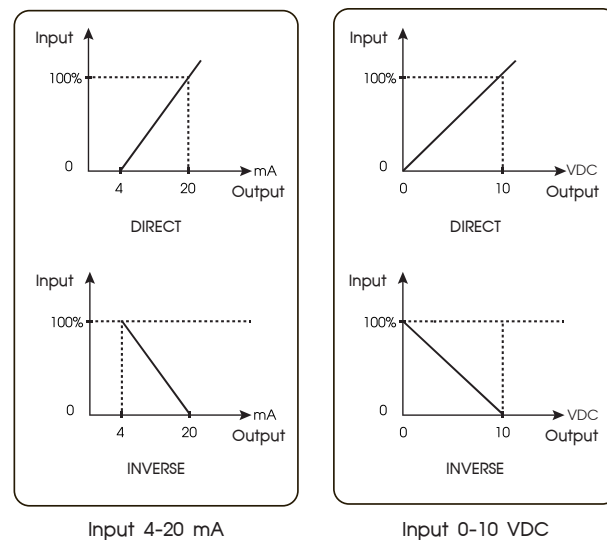
- Convert electrical signal to be standard analog signal.
- Receive input type DC/AC Current, DC/AC Voltage, Resistance and Multi Input for Thermocouple, PT100 (RTD).
- Can program choose Range in one device.
- Stand Analog Signal Output
- Input, Output isolate from each other(Isolation).
- Output has maximum 2 output.
- DIN RAIL Mounting installation.
- LED shows status power supply.

OPERATION

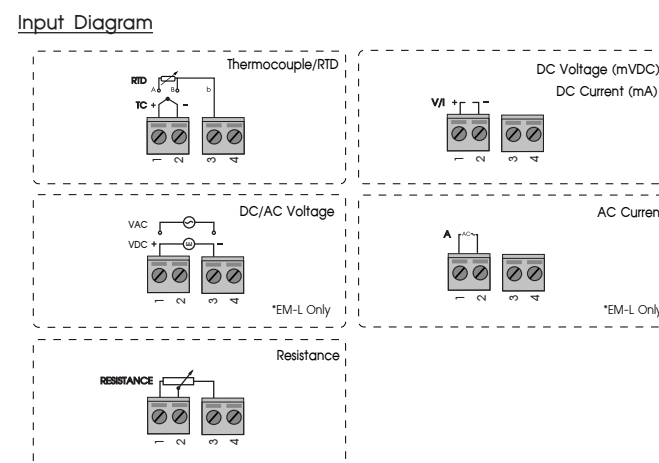
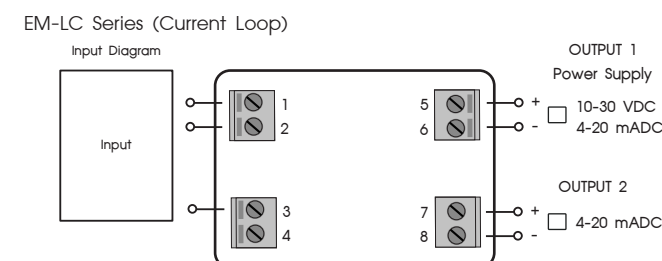
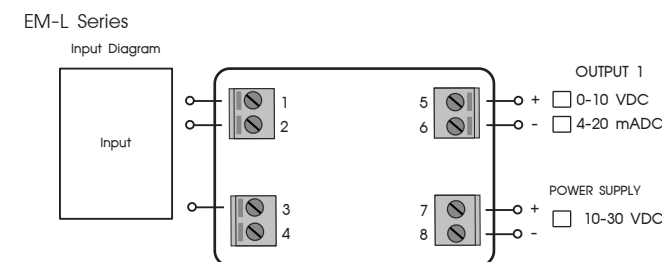
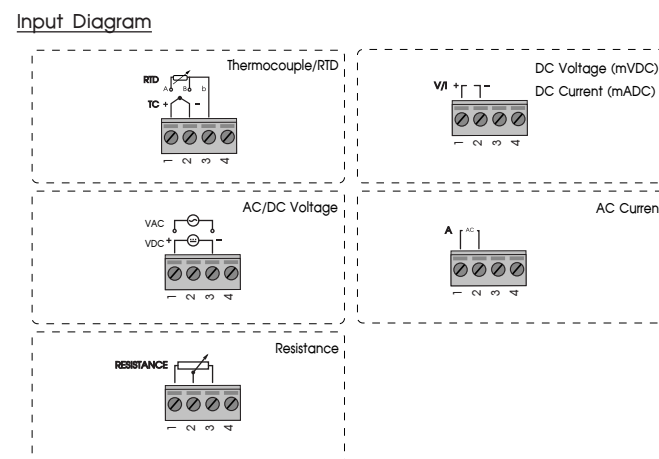
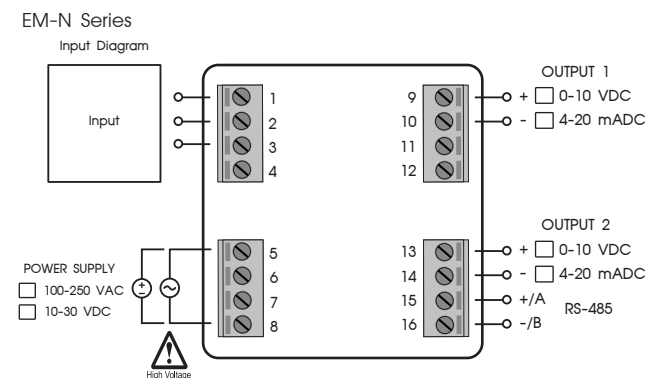
EM-N/EM-L/EM-LC Series convert input signal to be standard analog signal 4-20 mA or 0-10 VDC and can communication RS-485 Modbus Protocol. Input and Output separate ground from each other. User can use output signal to measure instrument. User can choose range in each input and output to operate Direct or Inverse in one device via program EM-SERIES Config Software.

Analog Output can program to operate in Direct is Input vary direct to output as graph picture (1)

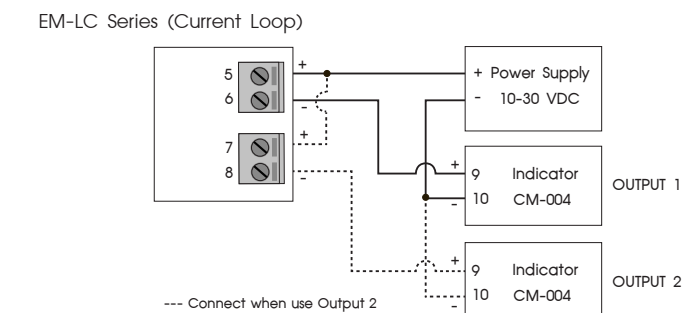
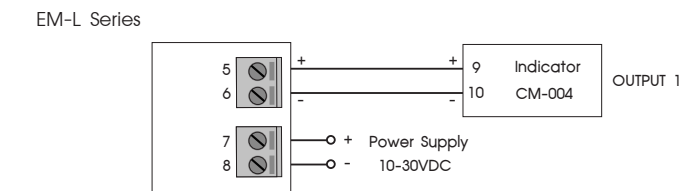
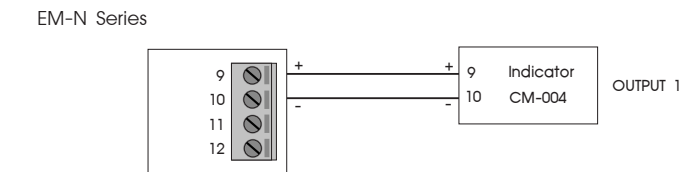
Picture 1.



WIRING DIAGRAM



Output Diagram



SERIAL COMMUNICATIONS

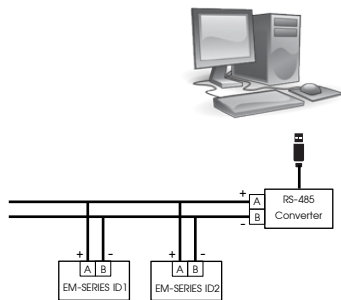
EM-N/EM-L can communicate with computer or PLC via RS-485, modbus RTU Protocol.

Modbus Table for EM-N

Address		Contents	Format	Word	Access
Decimal	Hex				
0	0	PV	Signed Int	1	Read Only
1	1	Output 1	Signed Int	1	Read Only
2	2	Output 2	Signed Int	1	Read Only
3	3	Input Type	Signed Int	1	Read/Write
4	4	Output 1 Type	Signed Int	1	Read Only
5	5	Output 2 Type	Signed Int	1	Read Only
6	6	Scale Limit Low	Signed Int	1	Read/Write
7	7	Scale Limit High	Signed Int	1	Read/Write
8	8	Output 1 Polarity	Signed Int	1	Read/Write
9	9	Output 1 Limit Low	Signed Int	1	Read/Write
10	A	Output 1 Limit High	Signed Int	1	Read/Write
11	B	Output 1 Adjust	Signed Int	1	Read/Write
12	C	Output 2 Polarity	Signed Int	1	Read/Write
13	D	Output 2 Limit Low	Signed Int	1	Read/Write
14	E	Output 2 Limit High	Signed Int	1	Read/Write
15	F	Output 2 Adjust	Signed Int	1	Read/Write
16	10	PV Filter	Signed Int	1	Read/Write
17	11	PV Gain	Signed Int	1	Read/Write
18	12	PV Adjust	Signed Int	1	Read/Write
19	13	Cojunction Temperature	Signed Int	1	Read Only
20	14	Unit	Signed Int	1	Read/Write
21	15	Model	Signed Int	1	Read Only
22	16	Baud Rate	Signed Int	1	Read/Write
23	17	Communication Type	Signed Int	1	Read/Write
24	18	Slave address	Signed Int	1	Read Only
25	19	10% Enable	Signed Int	1	Read/Write
26	1A	Factory Reset	Signed Int	1	Read/Write

Modbus Function Codes

Function Code	Operation	Broadcast
03	Read Holding Registers	No
04	Read Input Registers	Yes
06	Preset Single Register	Yes
16	Preset Multiple Registers	No



1. Input Type can set as Table 1 Code 1.

2. Scale Limit Low/High (minimum/maximum of Input signal setting) set as Table 1 PV/Setting Range or from Input Signal *Prescale*

3. Output Polarity, Output Limit Low/High (Output signal variation Setting)

(minimum/maximum of output signal) set as output table below or output signal

as required *Prescale

Output Polarity	Output Type	Output Limit Range	Prescale
0 : Direct	0 : None		
1 : Inverse	1 : 0-10 VDC	0-1000	100
	2 : 4-20 mA	400-2000	100

4. Output Adjust (Output offset value) can set since -200 to 200.

5. PV Filter (Input filter) can set since 0 to 15.

6. PV Gain (Offset input signal) can set PV value by multiply. User can set since 80 to 120.

7. PV Adjust (Offset Input signal vlaue) can set PV value by addition. User can set since -2000 to 200.

8. Unit (Unit of input) can set temperature PV value 0 is °C and value 1 is °F.

9. Baud Rate/Communication Type Modbus Protocol at Output 2 setting.

Baud Rate	Communication Type
0 : 4800	0 : Data size = 8, Parity bit = none, Stop bit = 1
1 : 9600	1 : Data size = 8, Parity bit = none, Stop bit = 2
2 : 19200	2 : Data size = 8, Parity bit = odd, Stop bit = 1
3 : 38400	3 : Data size = 8, Parity bit = odd, Stop bit = 2
4 : 57600	4 : Data size = 8, Parity bit = even, Stop bit = 1
	5 : Data size = 8, Parity bit = even, Stop bit = 2

10. Slave address (Device address setting) can set since 0 to 255 via Dip switch.

11. 10% Enable (10% Overrange/Underange of device) to be 1 when user needs device can convert output signal

over than setting value at 10% of output range when input signal from reading over than the setting scale 10%

except at 0 VDC(EM-N/EM-L) and 4mA(EM-LC).

12. Factory reset (Reset device to be factory value) set it to be 0. When user needs to reset every value to factory default value.

Input signal from PV Calculation.

Example when user needs to know reading temperature
PV =1021

$$\text{Temperature} = \text{PV} / \text{Input Prescale}$$

$$= 1021 / 10$$

$$\text{so temperature is } 102.1^{\circ}\text{C}$$

Output Signal Calculation

Example Output1 parameter shows 1203 for choose

device Output 1 type to be 4-20 mA

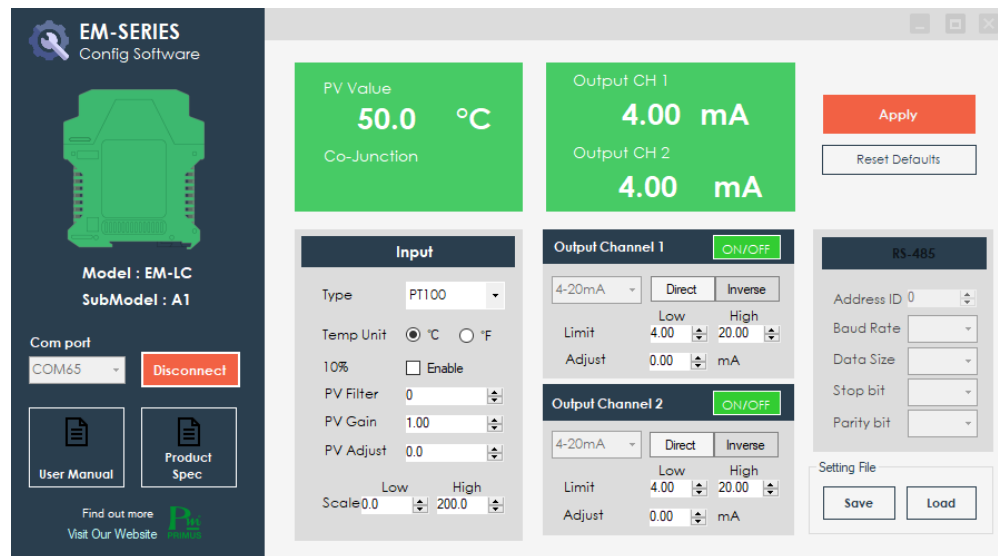
so output signal = 1203 / output Prescale

$$= 1203/100 = 12.03 \text{ mA}$$

■ EM-SERIES CONFIG Software

How to set EM-N-EM-L/EM-LC via EM-SERIES Config Software

1. Plug USB cable between EM-N/EM-L/EM-LC with PC in setting value via program. Device must connect supply all usage.
*** scan QR CODE for Download Software, Driver, Spec and manual or download from www.pm.co.th and Click Menu Downlaod and choose product group and product code.
2. Open profram EM-SERIES Config Software choose com port that connect to device then click connect.
3. When connect success program will show config that read from device. Set value as follow then click Apply program will write value to device.

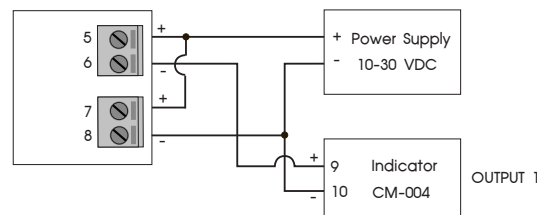


4. User can record config value by click save program will save value to .bin file. And when user needs to use config file in device setting. User can do by click Load program will setting automatic.

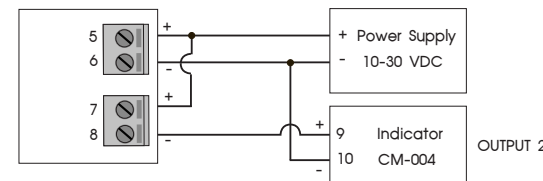
Remark: for model EM-LC that command Output 2 Channel when need to use Output just 1 Channel

user must click ON/OFF button then click Apply to disable Output overtimes or in case that can not set via program

can connect to use as picture below.



Example Connect Output Channel 1 just one Channel



Example Connect Output Channel 2 just one Channel

■ TABLE 1 SELECT INPUT SENSOR

Code1	Code2	Code3	Input Type	Instrument Input Range	PV/Setting Range	Prescale
00	A	A1	Thermocouple Type K	-200 to 1372 °C	-2000 to 13720	10
01			Thermocouple Type J	- 200 to 1200 °C	- 2000 to 12000	10
02			Thermocouple Type R	- 50 to 1680 °C	- 500 to 16800	10
03			Thermocouple Type T	- 200 to 400 °C	- 2000 to 4000	10
04			Thermocouple Type N	- 200 to 1300 °C	- 2000 to 13000	10
05			Thermocouple Type S	- 50 to 1768 °C	- 500 to 17680	10
06			Thermocouple Type E	- 200 to 1000 °C	- 2000 to 10000	10
07			PT100	- 200 to 680 °C	- 2000 to 6800	10
08		A2	0-20 mA	0 to 20 mA	0 to 20000	1000
09			4-20 mA	4 to 20 mA	4 to 20000	1000
10			0-100 mA	0 to 100 mA	0 to 10000	100
11	A3	A3	0-75 mVDC	0 to 75 mVDC	0 to 7500	100
12			0-150 mVDC	0 to 150 mVDC	0 to 15000	100
13			0-1 VDC	0 to 1 VDC	0 to 10000	10000
14	A4	A4	0-10 VDC	0 to 10 VDC	0 to 10000	1000
15			0-500 VDC	0 to 500 VDC	0 to 5000	10
16			0-500 VAC	0 to 500 VAC	0 to 5000	10
17	B	E1	0-5 A.AC	0 to 5 A.AC	0 to 5000	1000
18	C		0-100Ω	0 to 100Ω	0 to 10000	100
19	D		0-1 kΩ	0 to 1 kΩ	0 to 10000	10
20	E	G1	0.01-10 kΩ	0.01 to 10 kΩ	10 to 10000	1000
21	G		0.01-100 kΩ	0.01 to 100 kΩ	1 to 10000	100

■ ORDERING CODE

สำหรับรุ่น Standard Size

Input	Output 1	Output 2	Option	Power Supply
EM - [] N - [] - [] - [] - [] - For Special Range				
X Table 1.(Code 2)	0 None	0 None	0 None	220 100-250 VAC
G 0-10 VDC	G 0-10 VDC	G 0-10 VDC	M RS-485	24 10-30 VDC
I 4-20 mA	I 4-20 mA	I 4-20 mA		
V 10-0 VDC (Inverse)	V 10-0 VDC (Inverse)	V 10-0 VDC (Inverse)		
C 20-4 mA (Inverse)	C 20-4 mA (Inverse)	C 20-4 mA (Inverse)		

*RS-485 Only Available for Programmable Input

สำหรับรุ่น Slim Size (Supply 10-30 VDC)

Input	Current Loop	Output 1	Output 2
EM - [] - L [] - [] - []			
X Table 1.(Code 2)		0 None	0 None
XX Table 1.(Code 3)		G 0-10 VDC	I 4-20 mA
		I 4-20 mA	C 20-4 mA (Inverse)
		V 10-0 VDC (Inverse)	
		C 20-4 mA (Inverse)	
	None Current Loop		
	C Current Loop		

Remark

- None Current Loop (Only available for Output1)
- Current Loop (Only available for 4-20mA/20-4mA)
- X For Programmable Input, Select Order Code 2 (For None Current Loop)
- XX For Programmable Input, Select Order Code 3 (For Current Loop)



EM-N-Series

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