

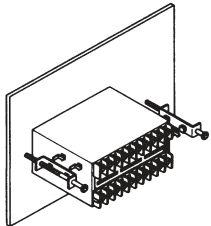
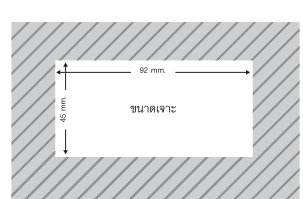
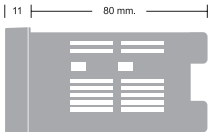


TECHNICAL SPECIFICATION

Power Supply		220 VAC ±15% 50/60 Hz
		24 VAC/VDC ±15%
Power Consumption		max 10VA
Display	7-Segment	Size 0.56 Inch, 6 Digits, 1 Rows
	LED	3 Alarm Output, 2 Status, 1 Comm
Input	Sensor	4 strain-gauge (350 Ω) 4wire
	Excitation Voltage	5VDC, 10VDC 100 mA
	Sensitivity	1.5, 2, 2.5, 3, 3.3 mV/V
	Max. Sensitivity *	>0.25 μV/D
	Maximum Count *	60000
	Resolution *	1/50000
	Sampling rate	2, 10, 30, 60, 120 msec
	Accuracy	0.1% FS ±1 Digit
	Linear scale range	-199999 to 999999
	Decimal Piont	4
	Thermal drift	0.0005% F.S./C
Output	Alarm Relay	3 Relay contact, 5A/250VAC
	Analog Transmission	0-10 VDC Minimum 1kΩ 4-20 mA Maximum 500 Ω
	Accuracy	± 0.2% of Output Range
Communication	Protocol	RS485 Modbus RTU Protocol
	Baud Rate	4800, 9600, 19200, 38400, 57600 bps
	Parity	None, Even, Odd
	Data Bit	8 bits
	Stop Bit	1, 2
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 Mounting
Material		ABS-V0
Size		36 x 100 x 90 mm.
Weigth		215 g.

*รายละเอียดเพิ่มเติม (INFORMATION)

DIMENSION CUTTING AND INSTALLATION



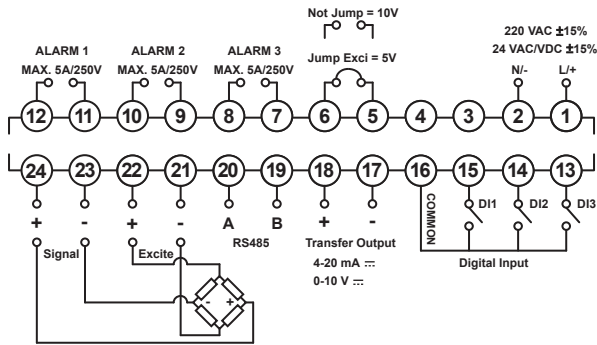
DESCRIPTION

- Convert weight or voltage from Load Cell (Strain-Gauge) to be Digital analog signal with Display to easy for operation.
- Receive input from Strain-Gauge 1.5, 2, 2.5, 3, 3.3 mV/V by Excite Voltage 5V or 10V.
- Standard analog output.
- Voltage : 0-10 VDC
- Current : 4-20 mA
- Input and Output separete from each other (Isolation).
- Input and Output can adjust source with High-Low Limit by Push Button. It can set Range to convert signal as require.
- Can program to choose Output to operate in Direct or Inverse.
- Display shows Digital 7-Segment 1 row 6 digits can display signal result from Input and Output.
- Function Peak Hold show maximum and Tare Zero
- Digital Input for Contact command.
- DIN Rail Mounting Installation.
- 3 Alarm Relay Output 4 Alarm Function
- Decimal 4 position.
- Sensor correction -199999 to 999999 to adjust Input.
- Can communicate Computer via RS485 MODBUS RTU Protocol

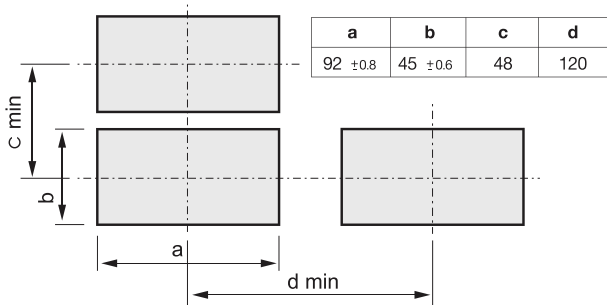
OPERATION

CM-013N is digital indicator shows result from Load Cell convert weight signal or voltage from Load Cell (Strain-Gauge) to be standard analog signal 0-10 VDC or 4-20 mA by separate Ground from each other and can use output signal connect to measure instrument. And user can program choose signal output side in Direct is Input and Output vary follow each other or Inverse is Input and Output will vary opposite from each other as picture(1) include CM-013N can connect to Load Cell parallel 4 devices no need Junction Box with Alarm Relay all 3 Channel and Output can choose several type 0-10VDC, 4-20mA and RS485 follow Order Code.

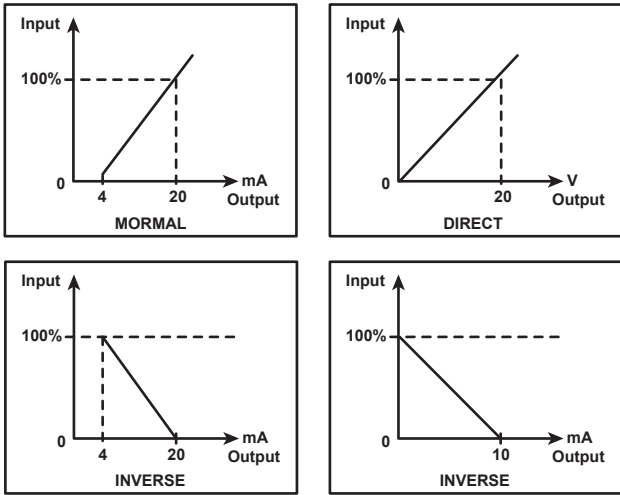
WIRING DIAGRAM



CUTTING PANEL

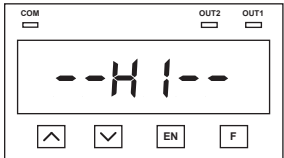


Output signal operation graph

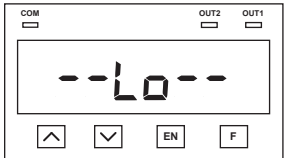


รูปที่(1)

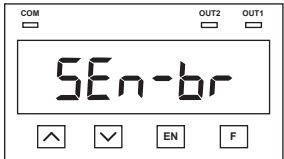
ERROR CODE***



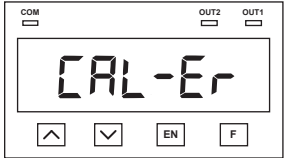
1. PV has more value than High Limit Setting (SLH) 5%



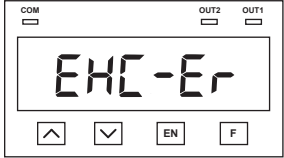
2. PV has less value than Low Limit Setting (SLH) 5%



3. Sensor Break



4. Calibrate has error.



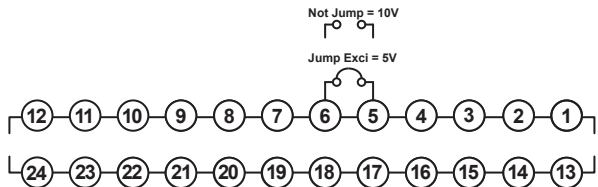
5. The error from Excitation voltage supply.

LOAD CELL SUPPLY

Can choose Excite 5 VDC by connecting wire at terminal ⑤ and ⑥ .

Excite 5 VDC made its unplug at terminal ⑤ and ⑥ .

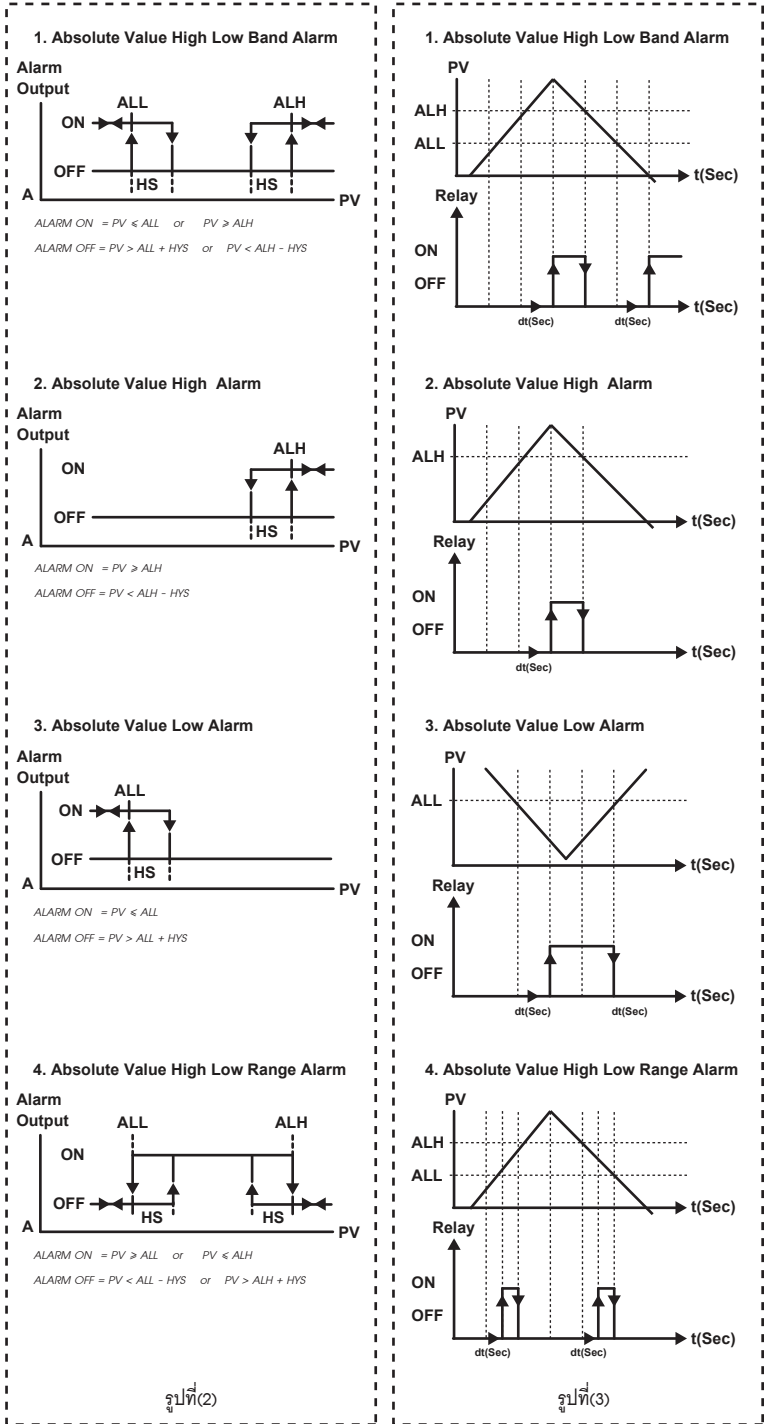
Warning! Unplug supply wire every time before adjust.



ALARM OUTPUT

Hysteresis Mode : By Absolute value or time

1. Hysteresis by Absolute Value (Fig.2)
2. Hysteresis by Time(Sec) (Fig.3)



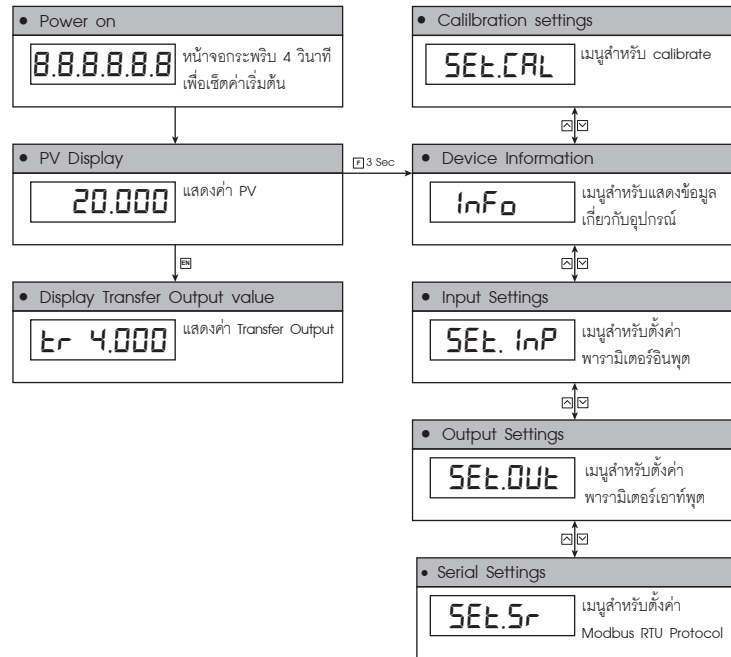
รูปที่(2)

รูปที่(3)

ORDERING CODE

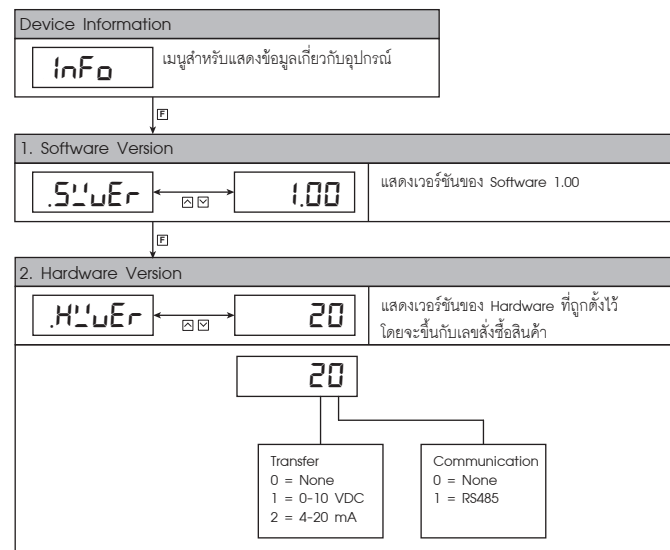
CM-013N -	Transfer	Communication	Power Supply
TRANSFER OUTPUT		POWER SUPPLY	
NONE	NONE	220	220 VAC ±15%
G	0-10VDC	24	24 VAC/VDC ±15%
I	4-20mA		
COMMUNICATION			
NONE		NONE	
M		RS485	

MAIN MENU

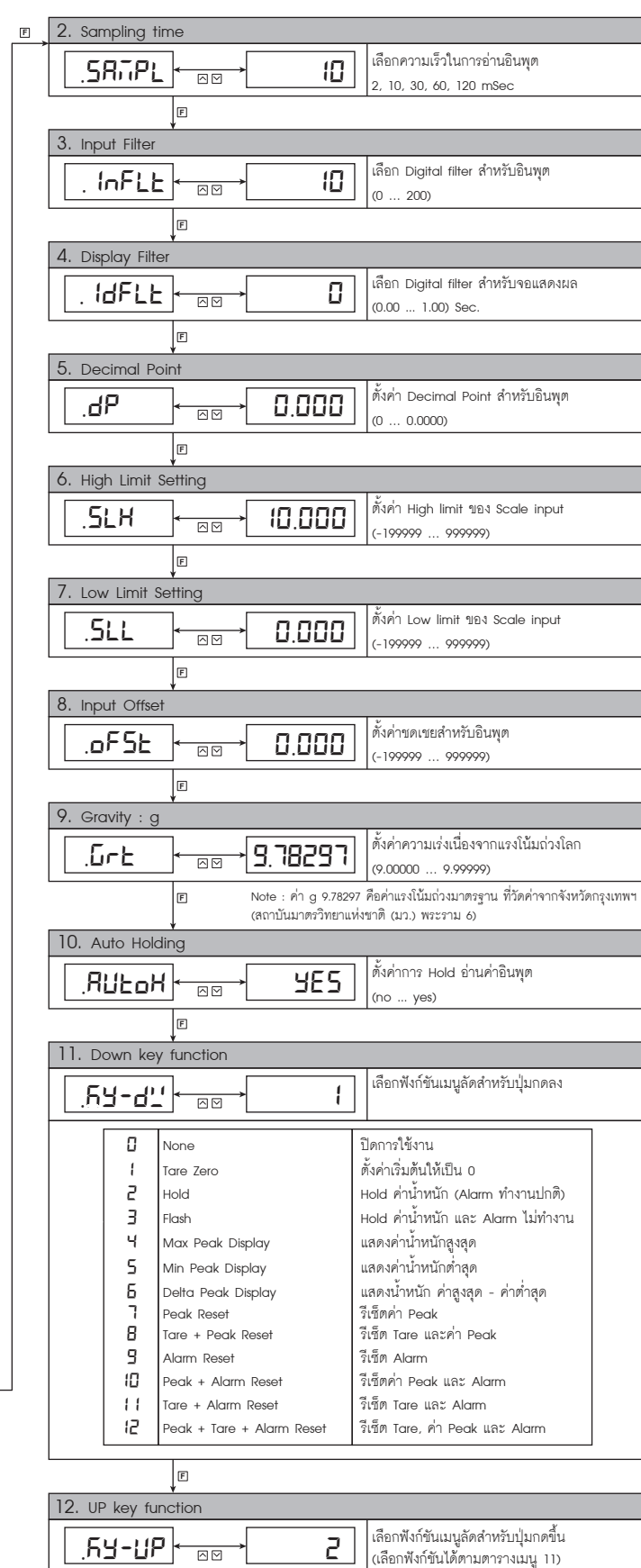
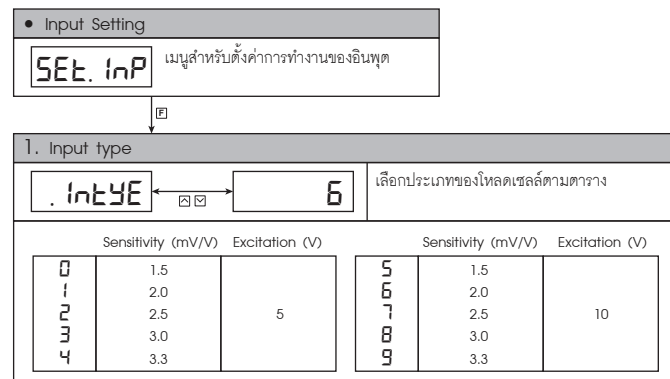


DEVICE INFORMATION

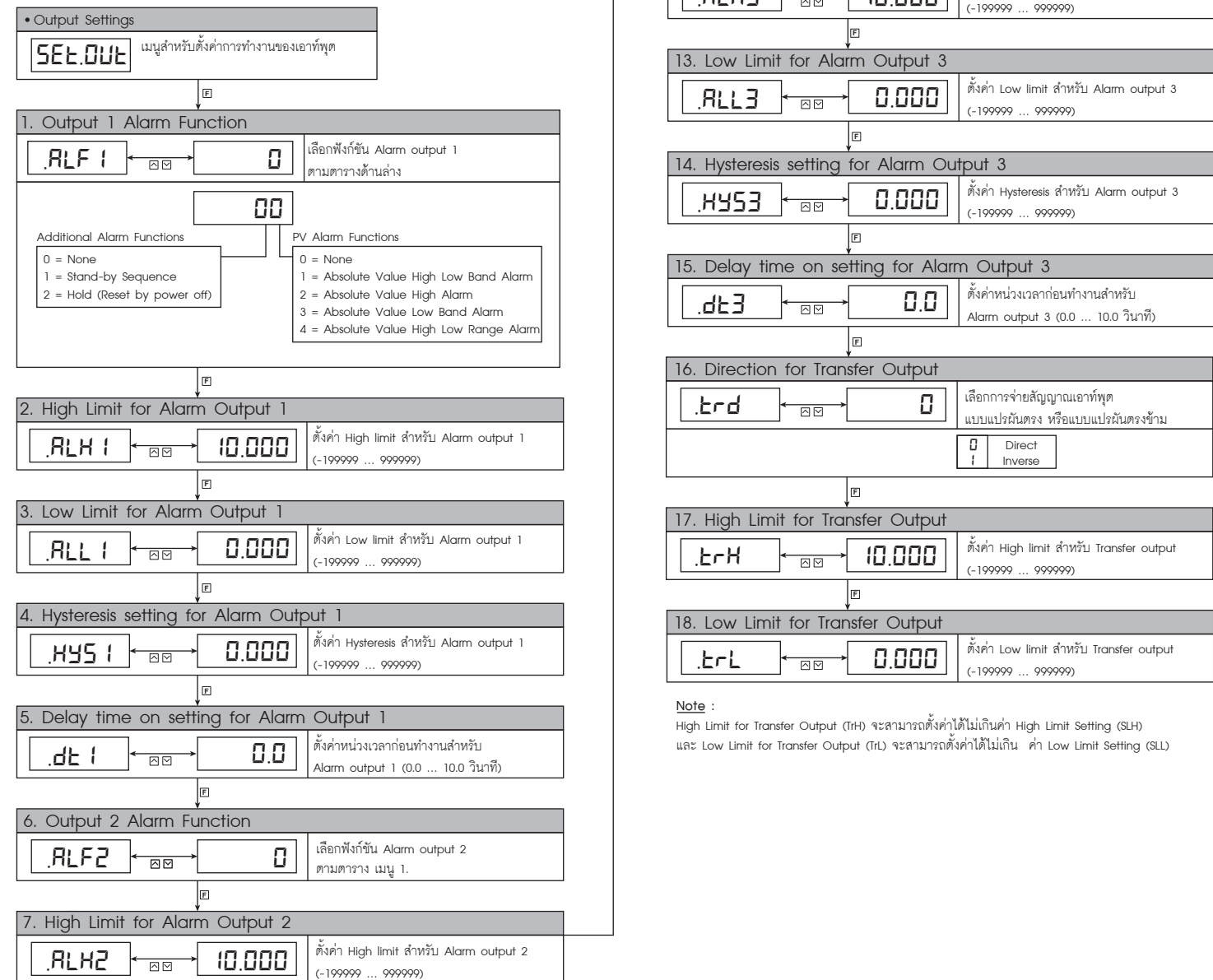
เมนูนี้แสดงข้อมูลของอุปกรณ์เท่านั้น ผู้ใช้ไม่สามารถตั้งค่าได้



INPUT SETTINGS



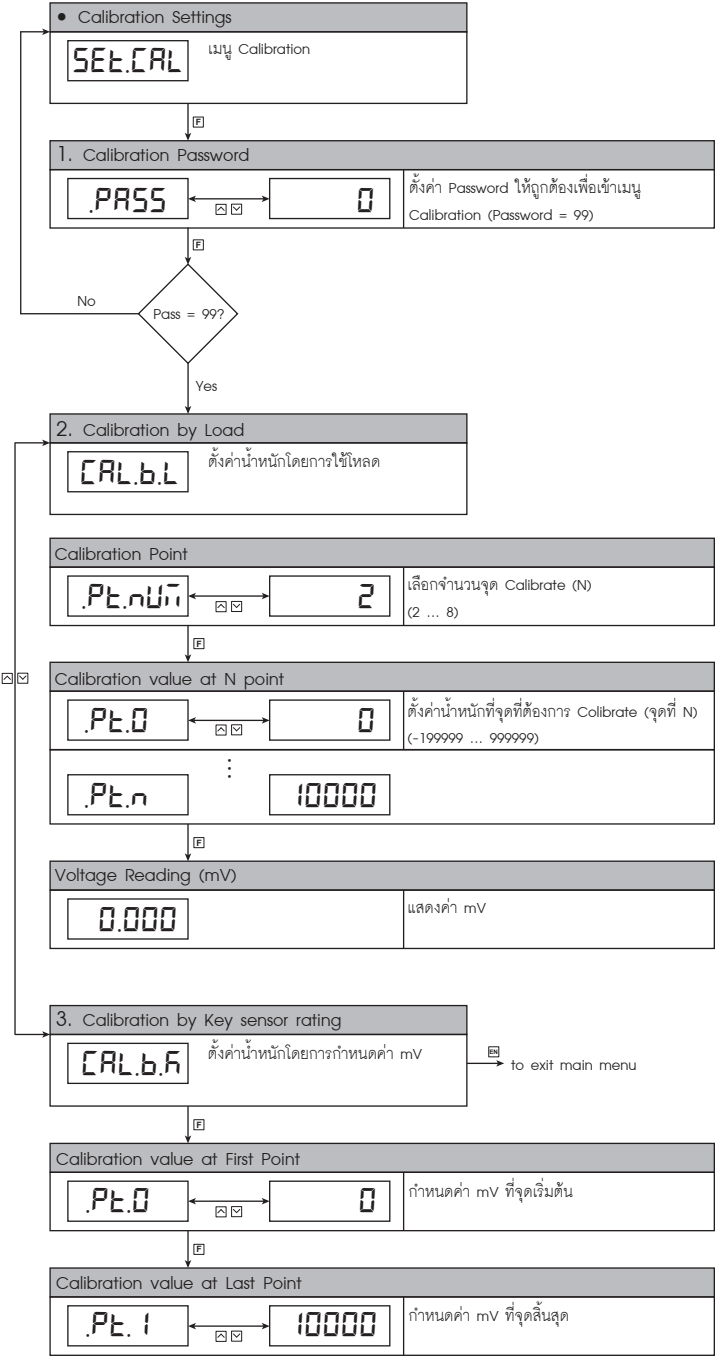
OUTPUT SETTINGS



CALIBRATION SETTINGS

ข้อควรระวัง ควรทำการ Calibration หลังจากเปิดใช้งานอุปกรณ์อย่างน้อย 10-15 นาที
การ Calibration สามารถเลือกได้ 2 วิธีคือ

- การ Calibration by Load (ตั้งค่าน้ำหนักโดยการใช้น้ำหนัก)
- การ Calibration by Key sensor rating (ตั้งค่าน้ำหนักโดยการกำหนดค่า mV)

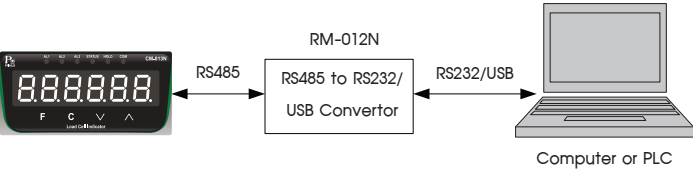


SERIAL Settings



SERIAL COMMUNICATION

The CM-013N are equipped whit a RS485 serial communications interface to allow connection to computer or PLC. MODBUS protocol is provided as standard communication. The user can connect CM-013N as network up to 255 meters.



MODBUS PROTOCOL
This MODBUS Protocol has been implement in accordance with MODBUS.ORG MODBUS Application Protocol Specification V1.1 With the following conditions applying

The following conditions apply
Baudrate must be set for 4800, 9600, 19200, 38400, 57600 bps
The format is MODBUS RTU
UART data 8 bites, 1 stop bit and no parity
Data is considered to be half duplex using 2 wire.

Exception Responses
The following exception codes will be supported only.

- 01 Illegal function
- 02 Illegal data address
- 03 Illegal value

Modbus Function code		
Function code	Operation	Broadcast
0x03	Read Holding Registers	Yes
0x04	Read Multiple Registers	Yes
0x06	Write Single Registers	Yes

MODBUS TABLE

Address	Name	Format	Word	Access	Min	Max
0	PV	Long ABCD	2	R	-199999	999999
1						
2	PV Peak Min	Long ABCD	2	R	-199999	999999
3						
4	PV Peak Max	Long ABCD	2	R	-199999	999999
5						
6	PV Peak Delta	Long ABCD	2	R	-199999	999999
7						
8	Tare/Zero	Long ABCD	2	R	-199999	999999
9						
10	Not use	Signed	1	R	-	-
11	Input Type	Signed	1	R/W	0	9
12	Sampling Time	Signed	1	R/W	0	4
13	Input Filter	Signed	1	R/W	0	200
14	Display Filter	Signed	1	R/W	0	100
15	Decimal Point	Signed	1	R/W	0	4
16	SLH	Long ABCD	2	R/W	-199999	999999
17						
18	SLL	Long ABCD	2	R/W	-199999	999999
19						
20	Offset	Long ABCD	2	R/W	-199999	999999
21						
22	Gravity	Long ABCD	2	R/W	900000	999999
23						
24	Not use	Signed	1	R	-	-
25	Auto Holding	Signed	1	R/W	0	1
26	Key Down Function	Signed	1	R/W	0	12
27	Key Up Function	Signed	1	R/W	0	12
28	Digital Input 1	Signed	1	R/W	0	12
29	Digital Input 2	Signed	1	R/W	0	12
30	Digital Input 3	Signed	1	R/W	0	12
31	Alarm 1 Function	Signed	1	R/W	0	24
32	Alarm 1 High limit	Long ABCD	2	R/W	-199999	999999
33						
34	Alarm 1 Low limit	Long ABCD	2	R/W	-199999	999999
35						
36	Alarm 1 Hysteresis	Long ABCD	2	R/W	-199999	999999
37						
38	Alarm 1 Delay time	Signed	1	R/W	0	100
39	Alarm 2 Function	Signed	1	R/W	0	24
40	Alarm 2 High limit	Long ABCD	2	R/W	-199999	999999
41						
42	Alarm 2 Low limit	Long ABCD	2	R/W	-199999	999999
43						
44	Alarm 2 Hysteresis	Long ABCD	2	R/W	-199999	999999
45						
46	Alarm 2 Delay time	Signed	1	R/W	0	100
47	Alarm 3 Function	Signed	1	R/W	0	24
48	Alarm 3 High limit	Long ABCD	2	R/W	-199999	999999
49						
50	Alarm 3 Low limit	Long ABCD	2	R/W	-199999	999999
51						
52	Alarm 3 Hysteresis	Long ABCD	2	R/W	-199999	999999
53						
54	Alarm 3 Delay time	Signed	1	R/W	0	100

55	Transfer Direction	Signed	1	R/W	0	1
56	Transfer High limit	Long ABCD	2	R/W	-199999	999999
57						
58	Transfer Low limit	Long ABCD	2	R/W	-199999	999999
59						
60	Not use	Signed	1	R	-	-
61	Ralay status**	Signed	1	R	0	7
62	Transfer status	Signed	1	R	0	20000
63	Slave address	Signed	1	R/W	1	255
64	Baud rate	Signed	1	R/W	0	4
65	Communication	Signed	1	R/W	0	5
66	Factory reset	Signed	1	R/W	0	1
67	Error code***	Signed	1	R	0	5

**Relay Status

Out 1 = 1

Out 2 = 2

Out 3 = 4

Ex. Out 1 ON, Out 2 ON = 1+2 = 3

INFORMATION

ตย.1 ต้องการหาความไวของ Load cell (A) โดยกำหนด Load cell (A) Maximum Capacity 100kg

Spec. Rated output 2mV/V, Maximim division 3000, Excite 5V
Load cell sensitivity = (Excite x Rated output) / Maximim division
= (5 V x 2 mV) / 3000 d
= 0.00333 mV/d
= 3.333 μ V/d

ตย.2 ต้องการชั่งน้ำหนักที่ 80kg จะได้ resolution เท่าไหร่

resolution = 1 / Maximim division
= 1 / 3000
= 0.000333
D = Maximum Capacity x resolution
= 100 kg x 0.000333
= 0.033 kg

ตย.3 ต้องการค่า Maximum Capacity

Maximum Capacity = Maximum Count x D
= 60000 x 0.033 kg
= 1980.0 kg
Count = Capacity / D
= 200 kg / 0.01 kg
= 20000

ตย.4 ต้องการเครื่องชั่งน้ำหนักได้ค่าสูงสุด 200kg โดยต้องการ D = 0.01kg ดังนั้นจำนวน Count คือ

Count = Capacity / D
= 200 kg / 0.01 kg
= 20000

การตั้งค่าความละเอียดของเครื่องวัดเพื่อหาจุดคณิมที่แนะนำตามสเปค โดยค่าที่จะแสดงบนหน้าจะต้งไม่เกิน
ค่า Maximum Count ซึ่งสามารถหาค่าได้จากสูตร Maximum Capacity คูณด้วยค่าความละเอียดค่าสุดของ Load cell

Maximum Capacity = Maximum Count x D
= 60000 x 0.033 kg
= 1980 kg

ดังนั้น ควรตั้งค่าได้ไม่เกิน = 1980 หรือ 1980.0 kg (19800 < 60000)



บริษัท ไพรมัส จำกัด
119 ซ.สีมวงอนุสรณ์ ถ.สุทธิสารวินิจฉัย แขวงดินแดง
เขตดินแดง กรุงเทพฯ 10400
โทร 0-2693-7005, 0-2277-8027 แฟกซ์ 0-2277-3565
E-mail : sales@primusthai.com