



CMP-72TN

DIGITAL PRESET COUNTER



TECHNICAL SPECIFICATION

Power Supply	220 VAC ±15% 50/60 Hz	
Power Consumption	3VA	
Display	TV 7 Segment, 8 Digit, Size 0.32 Inch, 1 Row PV and SV 7 Segment, 6 Digit, Size 0.36 Inch, 2 Row	
Input	Range Display and Setting	Measurement Range -199999 to 999999
	Input Frequency	0 to 10 kHz
	Input Type	Photo Switch, Proximity, Contact, Encoder, NPN, PNP
	DC Source for Sensor	24 VDC 100 mA
	Decimal Point Setting	0 to 0.00000
	Timer (Input Filter)	0.00 to 10.00 Sec
	Timer Accuracy	±10 ms
Output	Relay Output	3 Relay Output 5A/250VAC
	Protocol	MODBUS RTU
Communication	Baud Rate	4800, 9600, 19200, 38400, 57600 bps
	Parity	None, Even, Odd
	Stop Bits	1,2
	Data Bits	8 Bits
	Address	1 - 255
	Ambient Operation	Temperature Humidity
Ambient Storage	Temperature Humidity	-20 °C to 80 °C 85 % RH Non-Condensing
Protection Degree	Front Protection Rating	IP52
	Case Protection Rating	IP30
Installation	Panel Mounting	
Material	ABS-V0	
Size (mm.)	72 x 72 x 80 mm	
Weight	240 g.	

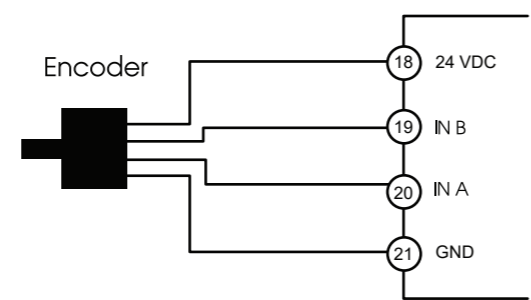
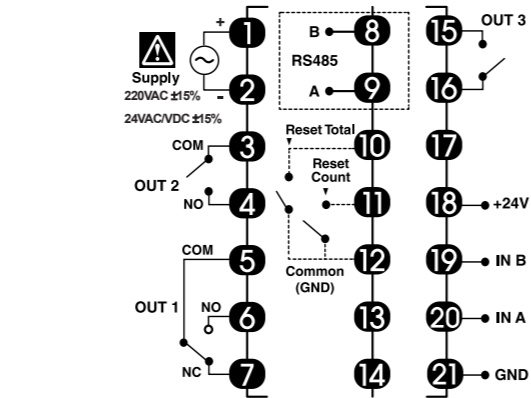
DESCRIPTION

- Digital Counting Machine
- 7-segment display
- Get input from sensor devices such as Photo Switch, Proximity Switch, Encoder, Contact, NPN, PNP
- Can communicate to computer via port RS485 MODBUS RTU
- Can set Set Point Value by press Mode button on screen.
- Can reset count value by pressing Reset button on screen.
- Digital Input (Dry Contact) for Reset value.

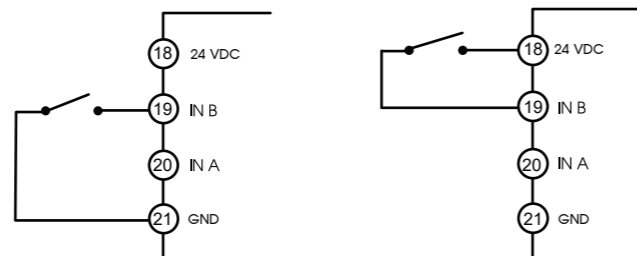
OPERATION

Digital display devices displaying results with 7-Segment in Real Time format, receiving input from. Various sensor devices such as Proximity Switch, Encoder, Mechanical Contact, NPN, PNP. It can accept input as fast as 10kHz. 11 operating modes are available. with FRAM can link with Computer or PLC Logging, Edit values via RS485 and can monitor.

WIRING DIAGRAM



Active Low (NPN) Active High (PNP)



WARNING

- Make sure the correct wiring connection before turning on electricity. Mis-wiring may cause malfunction of the unit and fire.
- Never modify the unit to prevent damage or incident such as malfunction and fire etc.

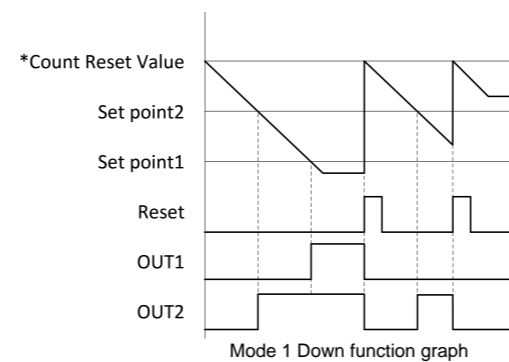
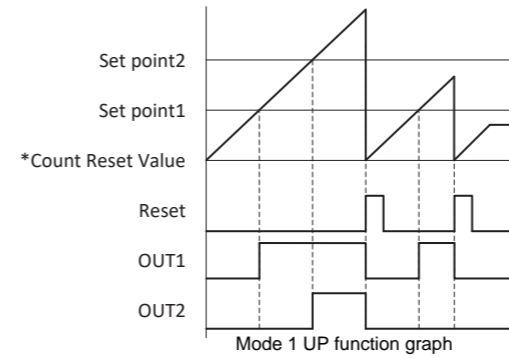
FUNCTION OUTPUT MODE

*Count Reset Value is Count after Reset

MODE 1

When count up or count down to Set Point 1 from setting. It will made OUT 1 ON until press Reset and when Count value count up or count down to Set Point 2 from setting until Reset pressing.

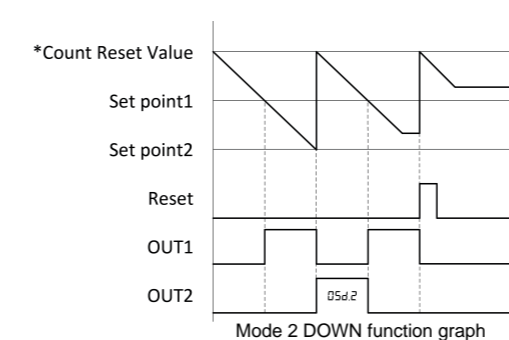
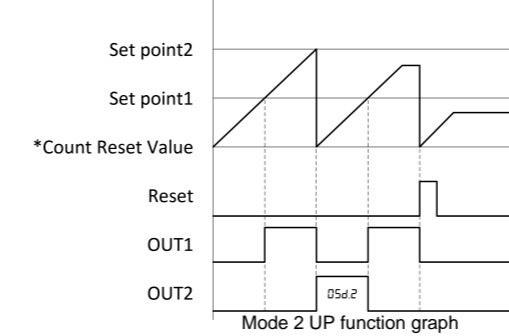
- OUT1 Retentive output / Count Continuation Relay ON all time even stay in condition.
- OUT2 Retentive output / Count Continuation Relay ON all time even stay in condition.



MODE 2

When Count up or down to Set Point 1 from setting will made OUT 1 ON until press Reset and Count up or count down to Set Point 2 from setting will Reset count and OUT 2 ON follow time of One shot duration 2

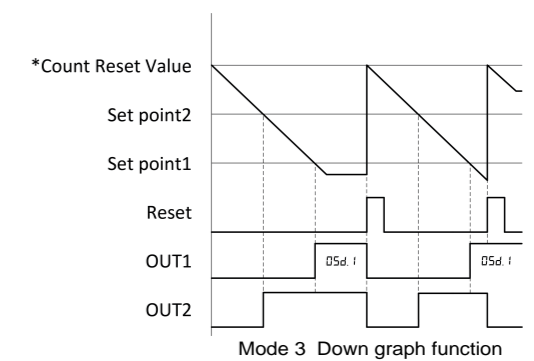
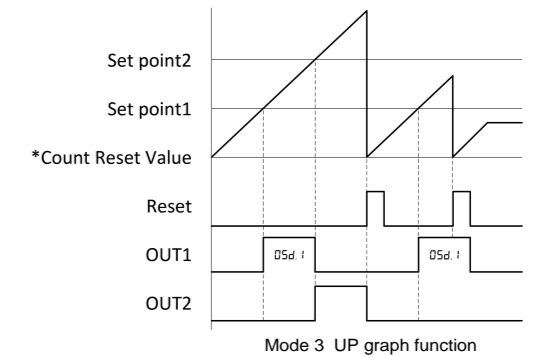
- OUT1 Retentive output / Count Continuation relay ON all time when stay in condition.
- OUT2 One-Shot output / Count Resetting relay ON follow time 0.5d.2



MODE 3

When count up or count down to Set Point 1 from setting. It will made OUT 1 ON follow time of One Shot duration 1(OSD.1) and when Count value count up or count down to Set Point 2 from setting. It will made OUT 2 ON until press Reset.

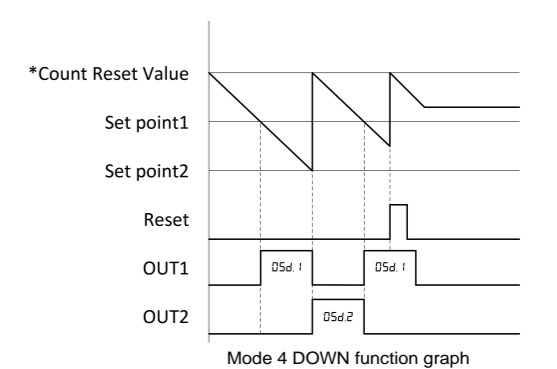
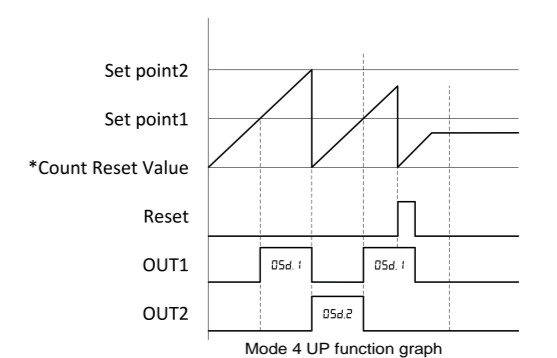
- OUT1 One-Shot output / Count Continuation Relay ON follow time 0.5d. 1
- OUT2 Retentive output / Count Continuation Relay ON on time when stay in condition.



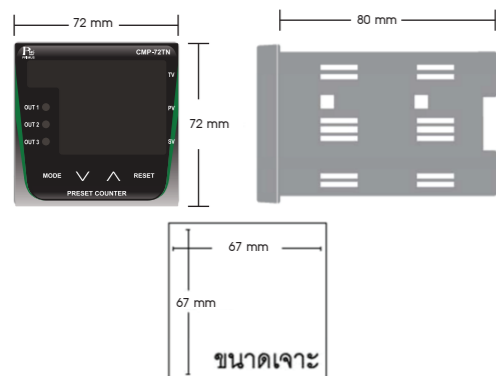
MODE 4

When count up or count down to Set Point 1 from setting. It will made OUT 1 ON follow time of One Shot duration 1 and when Count value count up or count down to Set Point 2 from setting will Reset count and OUT2 ON follow time of One shot duration 2.

- OUT1 One-Shot output / Count Continuation Relay ON follow time 0.5d. 1
- OUT2 One-Shot output / Count Resetting Relay ON follow time 0.5d.2



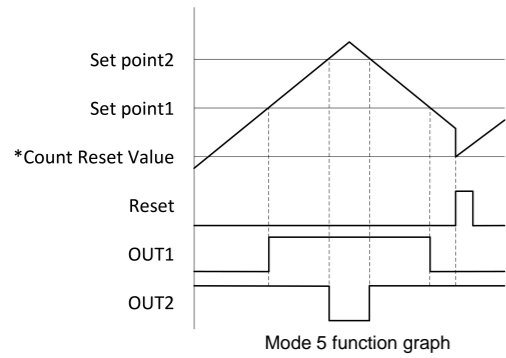
DIMENSION CUTTING AND INSTALLATION



MODE 5

When Count value more or equal to Set Point 1 from setting will made OUT 1 ON until Count value less than Set Point 1 will made OUT 1 OFF and when Count value more than Set Point 2 will made OUT2 OFF until Count value less or equal to Set Point 2 will made OUT2 ON

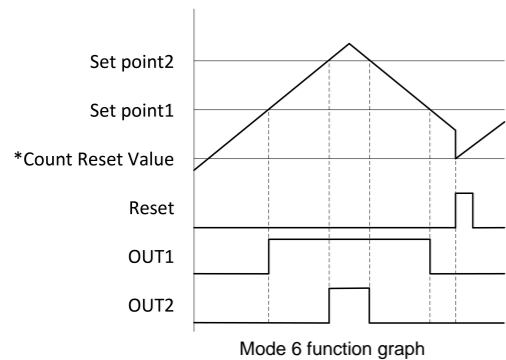
- OUT1 Count Value \geq Set point 1
- OUT2 Count Value \leq Set point 2



MODE 6

When Count more or equal to Set Point 1 from setting. It will made OUT 1 ON until Count less Set Point 1 will made OUT 1 OFF and when Count more or equal to Set Point 2 ON until Count less than Set Point 2 will made OUT 2 OFF.

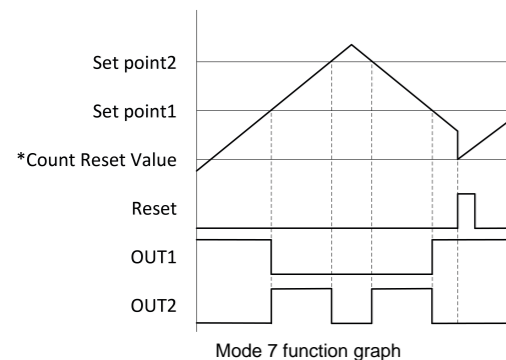
- OUT1 Count Value \geq Set point 1
- OUT2 Count Value \geq Set point 2



MODE 7

When Count less than Set Point 1 from setting. It will made OUT 1 ON until Count more or equal to Set Point 1 will made OUT 1 OFF and OUT 2 ON when Count more than Set Point 2 will made OUT 2 OFF.

- OUT1 Count Value $<$ Set point 1
- OUT2 Count Value \geq Set point 1 และ Count Value \leq Set point 2



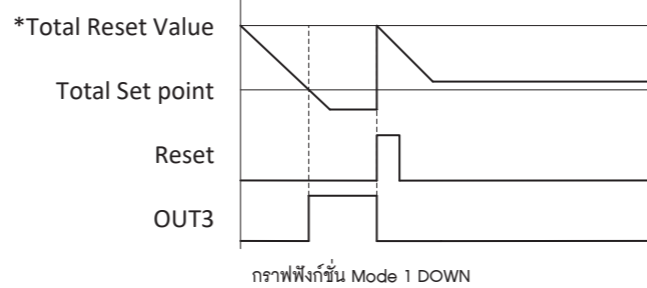
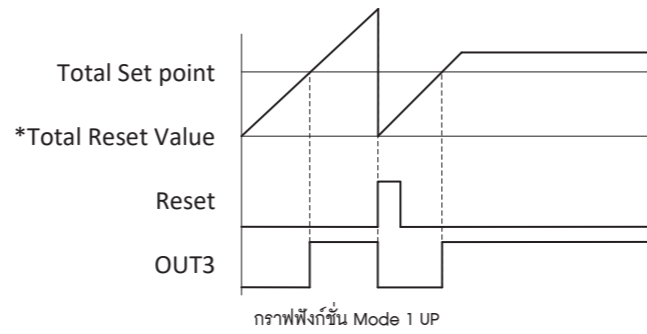
FUNCTION TOTAL MODE

*Total Reset Value คือค่า Total เริ่มต้นหลังจาก Reset

MODE 1

เมื่อค่า Total นับขึ้นหรือนับลงจนถึงค่า Total Set Point ที่ตั้งไว้จะทำให้ OUT 3 ON จนกว่าจะมีการกด Reset

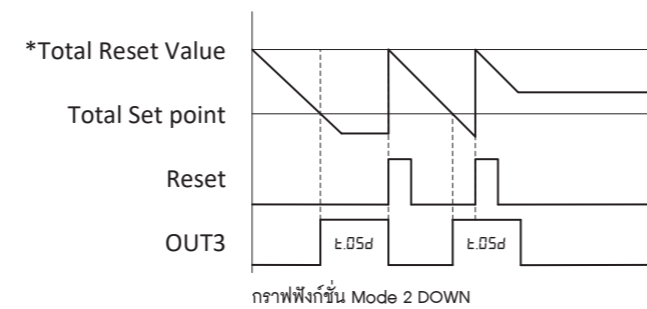
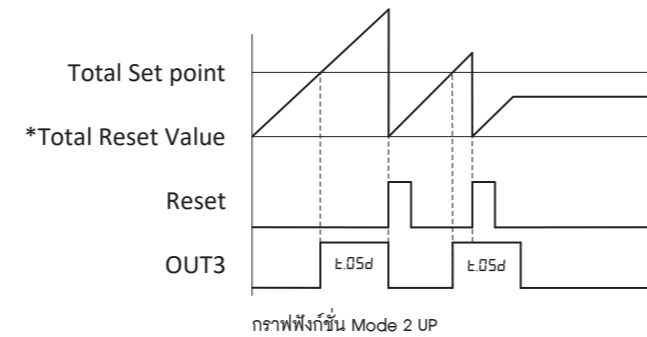
- OUT 3 Retentive output / Count Continuation รีเลย์ ON ตลอดเมื่ออยู่ในเงื่อนไข



MODE 2

เมื่อค่า Total นับขึ้นหรือนับลง จนถึงค่า Total Set Point ที่ตั้งไว้ จะทำให้ OUT 3 ON ตามเวลาของ Total One shot duration

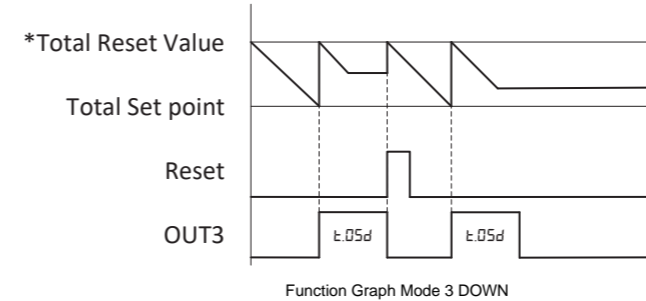
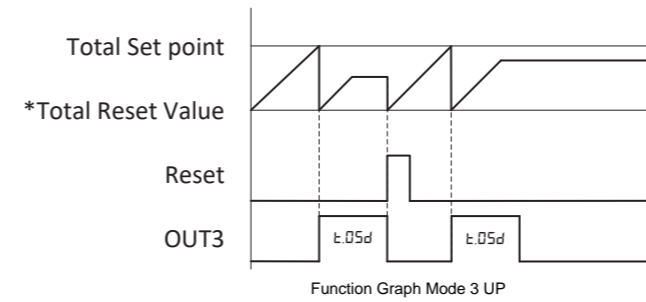
- OUT 3 One-Shot output / Count Continuation รีเลย์ ON ตามเวลา $t_{0.5d}$



MODE 3

When count up or count down to Total Set Point. It will Reset Total and OUT3 ON follow time of Total One shot duration.

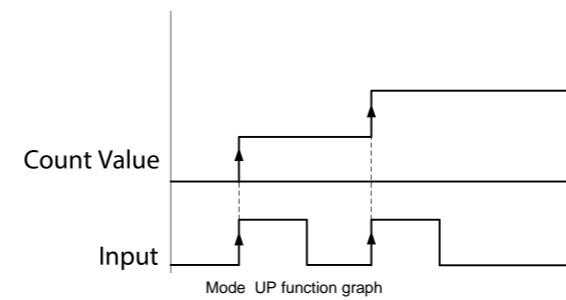
- OUT3 One-Shot output / Count Resetting relay ON follow time $t_{0.5d}$



DIRECTION INPUT MODE

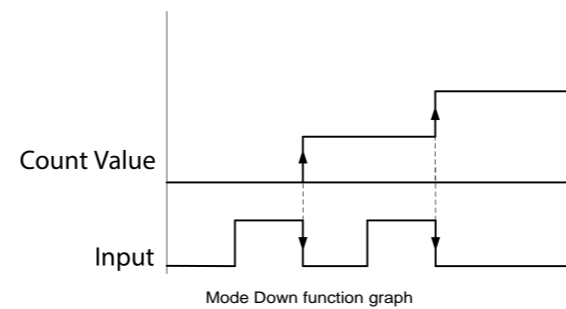
MODE UP

Count the rising edge will count Count Value value immediately when Input come.



MODE DOWN

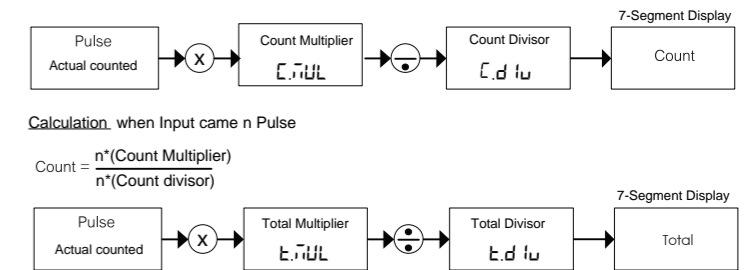
Count the down edge will count Count Value value immediately when Input come and go.



PRESCALING

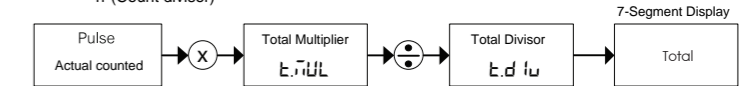
We can scale pulse value that come by setting count multiplier such as request count up to pulse and 0.7 so scale in form divisor.

scale = multiplier/divisor, scale = 0.7 = 7/10.
:: so multiplier = 7, divisor = 10



Calculation when Input came n Pulse

$$\text{Count} = \frac{n \times (\text{Count Multiplier})}{n \times (\text{Count divisor})}$$



Calculation when Input came n Pulse

$$\text{Total} = \frac{n \times (\text{Total Multiplier})}{n \times (\text{Total divisor})}$$

EXAMPLE

1. Encoder wheel type 100 pulse/round when run complete 1 round will have 0.45 metre. User needs to show in metre unit decimal 2 position.

Calculation

$$\text{Display value} = \text{Pulse from actual counted} \times \text{Scale}$$

$$0.45 = 100 \times \text{Scale} = \text{multiplier/Divisor}$$

$$\text{Multiplier}(\text{Multiplier}) = 45, \text{Divisor}(\text{Divisor}) = 10000, 45/10000$$

$$\text{make multiplier, divisor to be simplest form } 45/10000 = 9/2000$$

Setting

$$\text{Multiplier}(\text{Multiplier}) = 9, \text{divisor}(\text{Divisor}) = 2000$$

$$\text{Decimal}(\text{d.P}) = 0.00$$

$$\text{Input}(\text{Input}) = \text{Encoder}$$

2. Production line install Sensor NPN type count product to pack in the boxes. 12 pcs. per box by display quantity of boxes.

Calculation

$$\text{Display} = \text{Pulse from actual counted} \times \text{Scale}$$

$$1 = 12 \times \text{Scale} = \text{multiplier/divisor}$$

$$\text{Multiplier}(\text{Multiplier}) = 1, \text{divisor}(\text{Divisor}) = 12, 1/12$$

Setting

$$\text{Multiplier}(\text{Multiplier}) = 1, \text{divisor}(\text{Divisor}) = 12$$

$$\text{Decimal}(\text{d.P}) = 0$$

$$\text{Input}(\text{Input}) = \text{NPN Sensor}$$

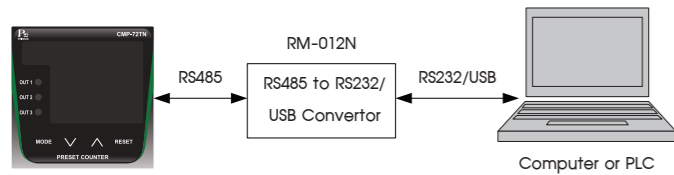


CMP-72TN

DIGITAL PRESET COUNTER

SERIAL COMMUNICATION

The CMP series are equipped with a RS485 serial communications interface to allow connection to computer or PLC. MODBUS protocol is provided as standard communication. The user can connect CMP series as network up to 255 meters.



MODBUS PROTOCOL
This MODBUS Protocol has been implemented 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 bits, 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

How to calculate Register

$$\begin{aligned} \text{Count} &= \frac{\text{Count}_{REG}}{10^{\text{Decimal Point}}_{REG}} \\ &= \frac{1000}{10^1} \\ &= 100.0 \end{aligned} \quad \begin{aligned} \text{Total} &= \frac{\text{Total}_{REG}}{10^{\text{Decimal Point}}_{REG}} \\ &= \frac{32000}{10^3} \\ &= 32.000 \end{aligned}$$

Ex.1 If needs set Time Setting at 5 seconds

$$\begin{aligned} \text{Time Setting} &= \frac{5 \text{ seconds} \times 1000 \text{ ms}}{10} \\ \therefore \text{Set Time Setting}_{REG} &= 500 \end{aligned}$$

Ex.2 If needs set OSD at 10 seconds

$$\begin{aligned} \text{One Shot Duration} &= \frac{10 \text{ วินาที} \times 1000 \text{ ms}}{10} \\ \therefore \text{Set OSD}_{REG} &= 1000 \end{aligned}$$

Ex.3 If needs to calculate OSD time from setting

$$\begin{aligned} \text{One Shot Duration} &= \text{OSD}_{REG} \times 10 \\ &= 20 \times 10 \\ &= 200 \text{ ms} \end{aligned}$$

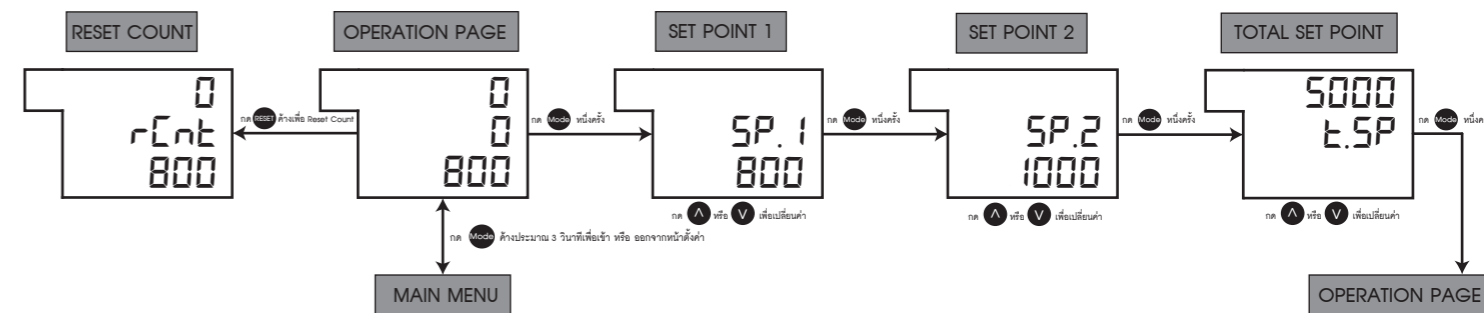
MODBUS DATA REGISTER

Register	Register Name	Access	Format	Min	Max
0	Count	R/W	Long AB CD	-199999	999999
1					
2	Total	R/W	Long AB CD	-19999999	99999999
3					
4	Input Mode	R/W	Integer	0	2
5	Encoder Direc	R/W	Integer	0	1
6	Sensor Type	R/W	Integer	0	1
7	Direction Mode	R/W	Integer	0	1
8	Timer Mode	R/W	Integer	0	1
9	Time Setting	R/W	Integer	0	1000
10	Operate Mode	R/W	Integer	0	4
11	Decimal Point	R/W	Integer	0	5
12	Count Multiplier	R/W	Long AB CD	1	999999
13					
14	Count Divisor	R/W	Long AB CD	1	999999
15					
16	Count Reset	R/W	Long AB CD	-199999	999999
17					
18	Total Multiplier	R/W	Long AB CD	1	999999
19					
20	Total Divisor	R/W	Long AB CD	1	999999
21					
22	Total Reset	R/W	Long AB CD	-19999999	99999999
23					
24	Front Button Reset	R/W	Integer	0	3
25	Output Mode	R/W	Integer	0	11
26	Output Total Mode	R/W	Integer	0	6
27	Setpoint 1	R/W	Long AB CD	-199999	999999
28					
29	Setpoint 2	R/W	Long AB CD	-199999	999999
30					
31	Total Setpoint	R/W	Long AB CD	-19999999	99999999
32					
33	One Shot Duration 1	R/W	Integer	1	1000
34	One Shot Duration 2	R/W	Integer	1	1000
35	Total One Shot Duration	R/W	Integer	1	1000
36	Relay Status*	R	Integer	0	7
37	Slave Address	R/W	Integer	1	255
38	Baudrate	R/W	Integer	0	4
39	Communication	R/W	Integer	0	5
40	Lock	R/W	Integer	0	1

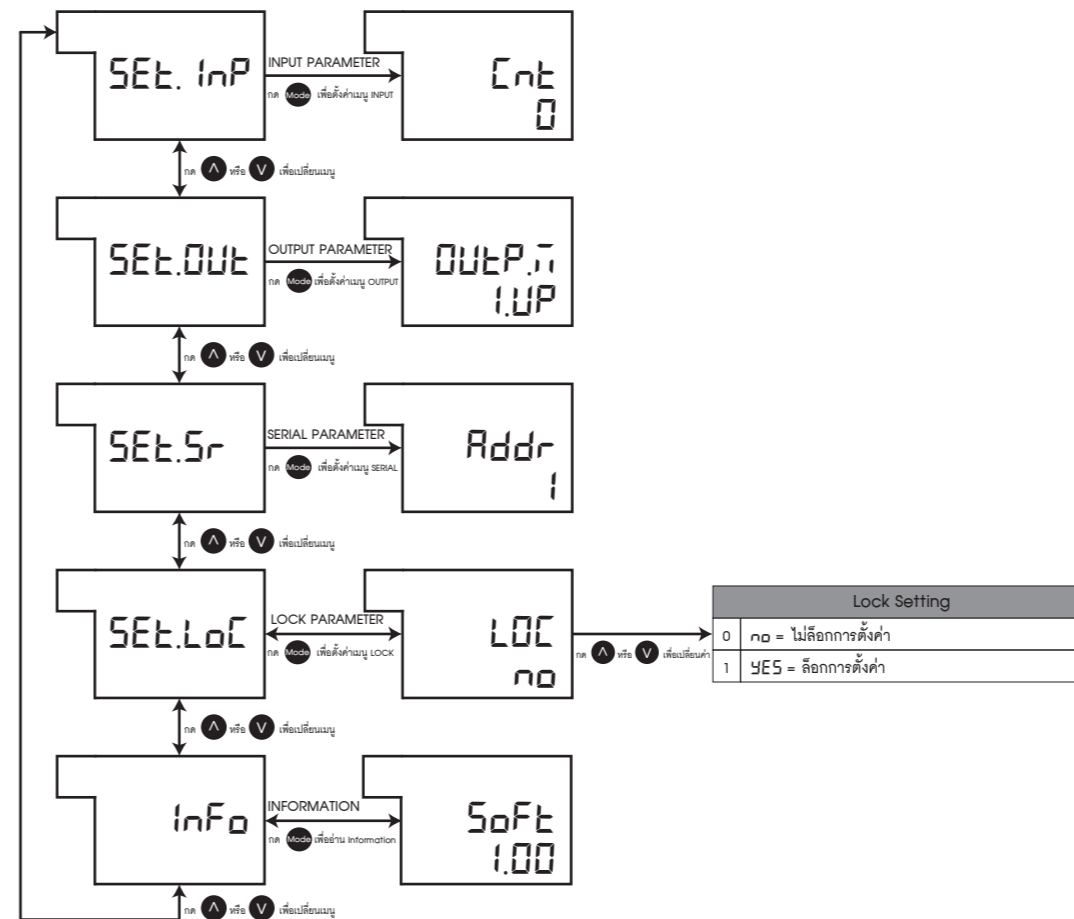
*Relay Status

- Out 1 = 1
- Out 2 = 2
- Out 3 = 4
- Ex. Out 1 ON, Out 2 ON = 1+2 = 3

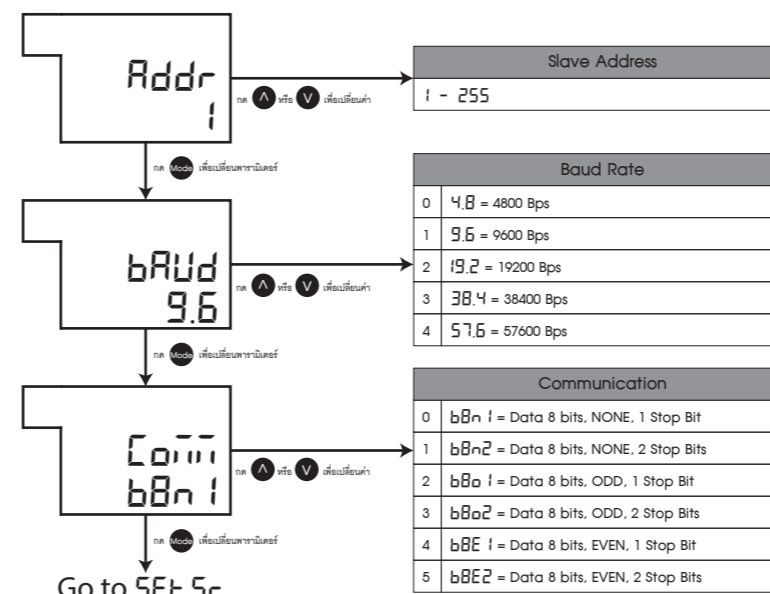
SETTING PARAMETER CMP-72TN



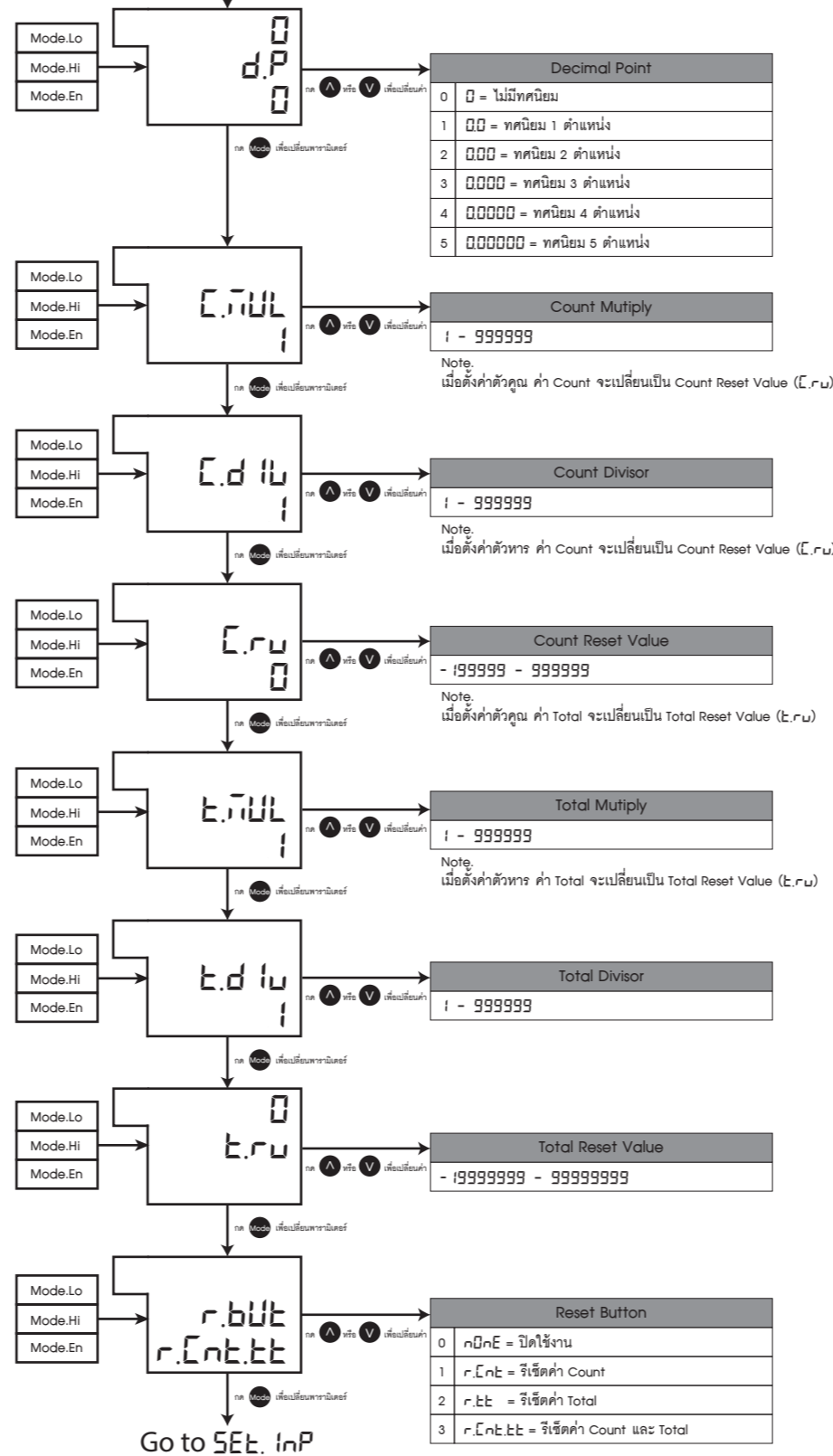
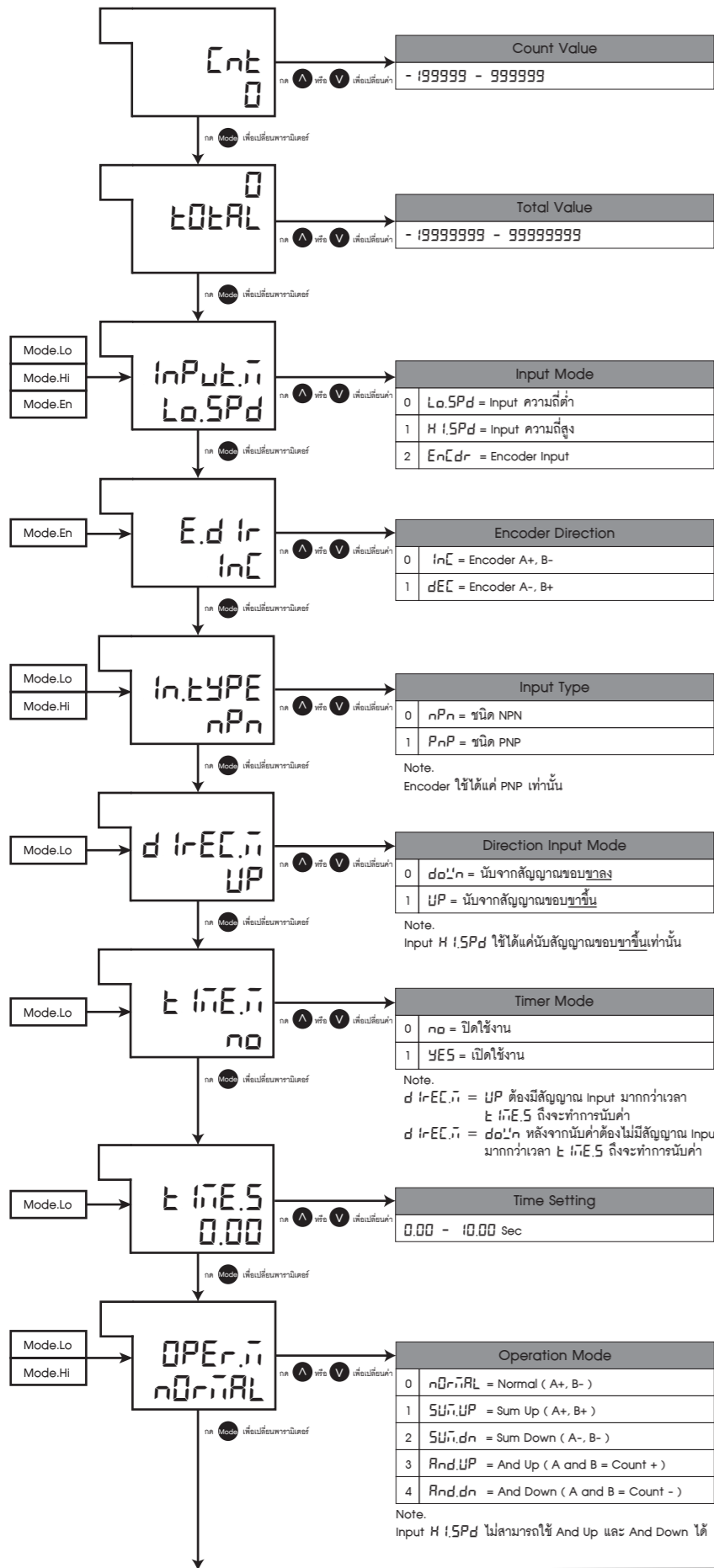
MAIN MENU



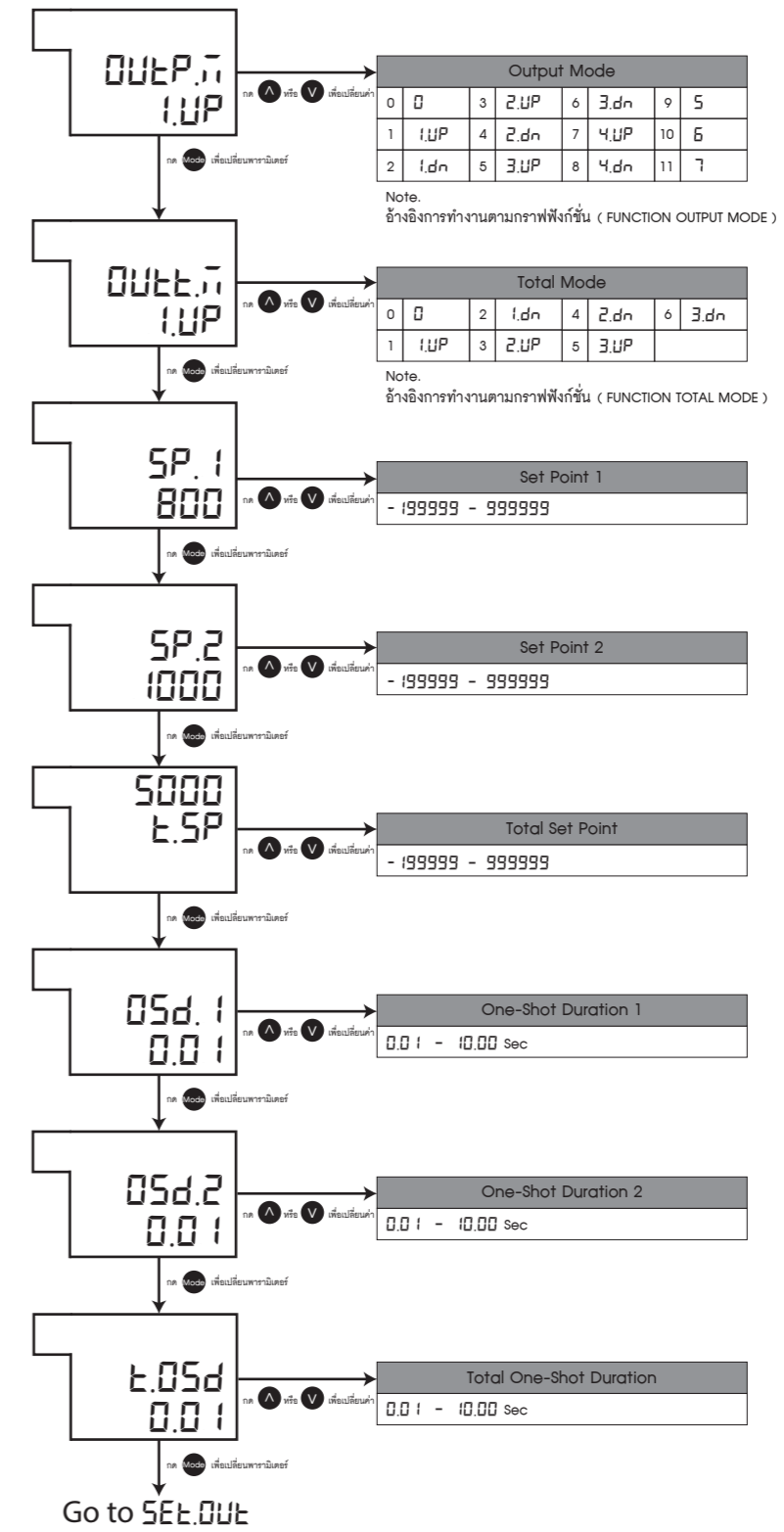
SERIAL PARAMETER



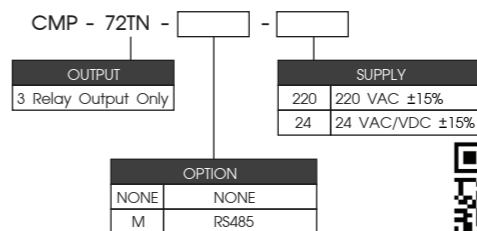
INPUT PARAMETER



OUTPUT PARAMETER



ORDERING CODE



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