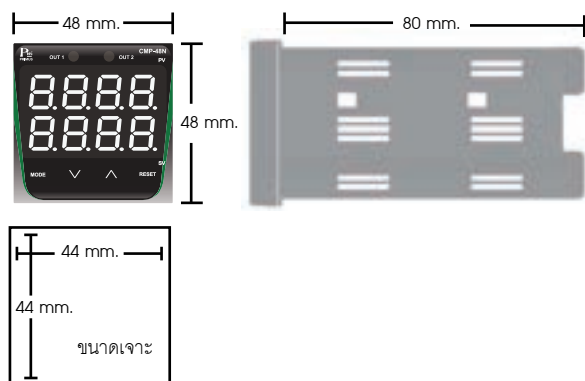




TECHNICAL SPECIFICATION

Power Supply		220 VAC ±15% 50/60 Hz
		24 VAC/VDC ±15%
Power Consumption		3VA
Display		7 Segment, 4 Digit, Size 0.56 Inch, 2 Rows
Input	Range Display and Setting	Measurement Range -1999 to 9999
	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 0.000
	Timer (Input Filter)	0.00 to 10.00 Sec
	Timer Accuracy	±10 ms
Output	Relay Output	2 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	-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	Front Protection Rating	IP52
	Case Protection Rating	IP30
Installation		Panel Mounting
Material		ABS-V0
Size (mm.)		48 x 48 x 80 mm
Weight		148 g.

DIMENSION CUTTING AND INSTALLATION



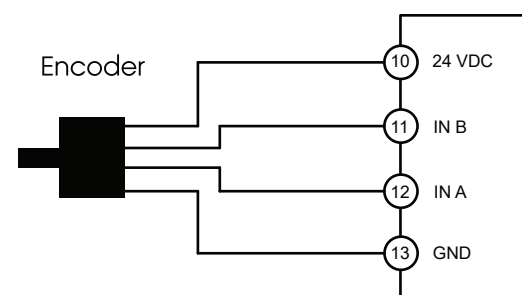
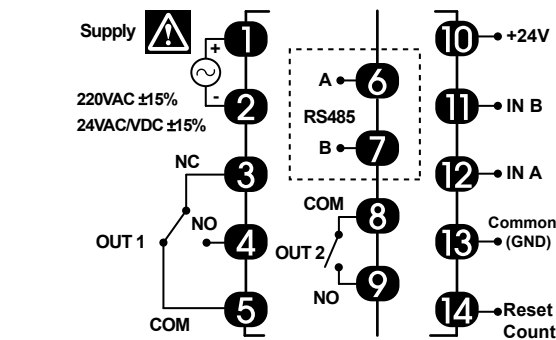
DESCRIPTION

- Digital Counting Machine
- 7-segment display
- Get input from sensor devices such as Photo Switch, Proximity Switch, Encoder, Contact, NPN, PNP
- Available operating modes: 7 operating modes
- Can operate in count up and count down
- EEPROM memory keeps counts in case of power failure.
- Can set the count sensitivity.
- Easy to use program through screen.
- Can communicate with computer through RS485 port, MODBUS RTU

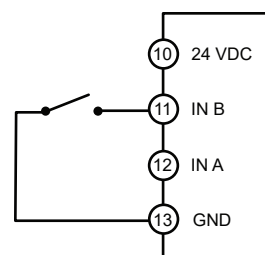
OPERATION

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.

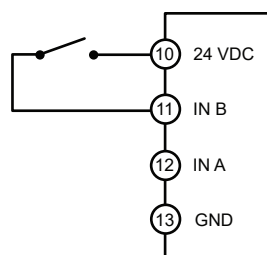
WIRING DIAGRAM



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

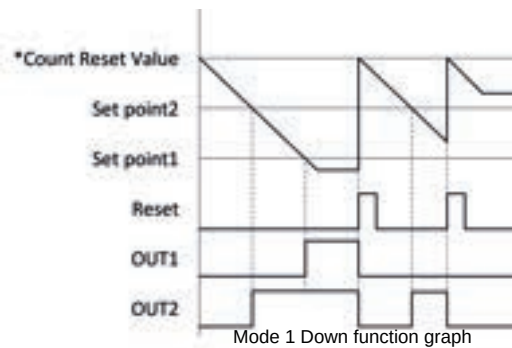
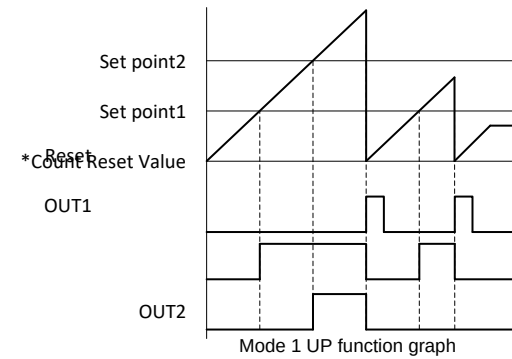
*Count Reset Value is Count after Reset

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.

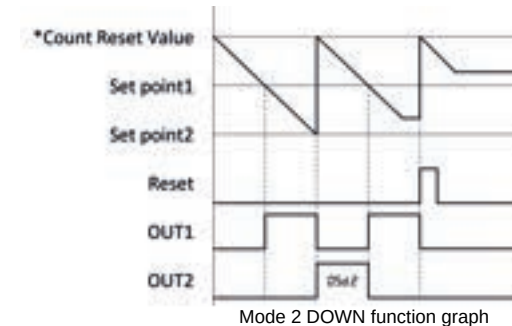
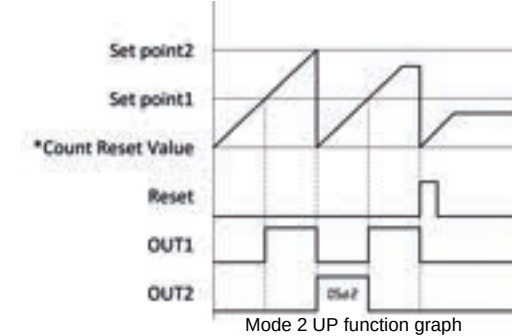


MODE 2

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 0.5s.2

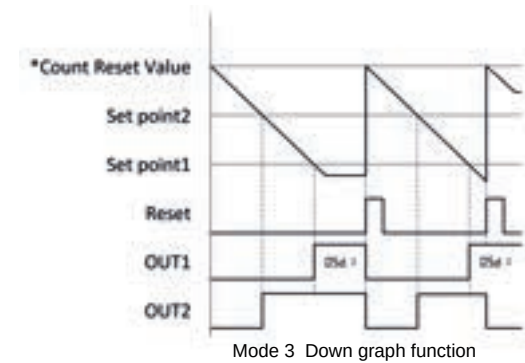
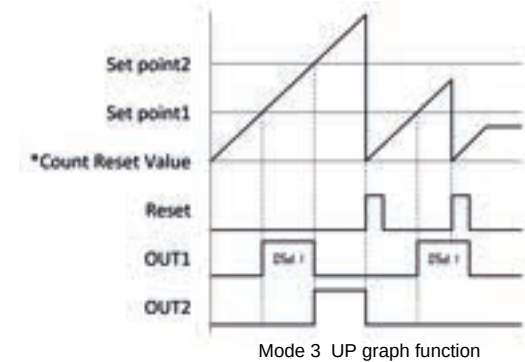


MODE 3

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 0.5s.1

- OUT2 Retentive output / Count Continuation Relay ON on time when stay in condition.

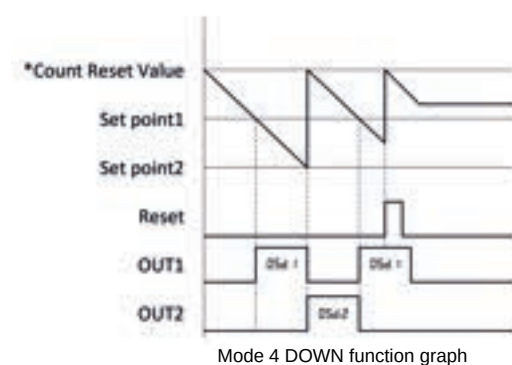
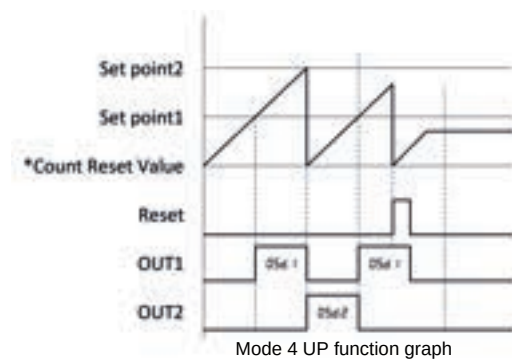


MODE 4

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 0.5s.1

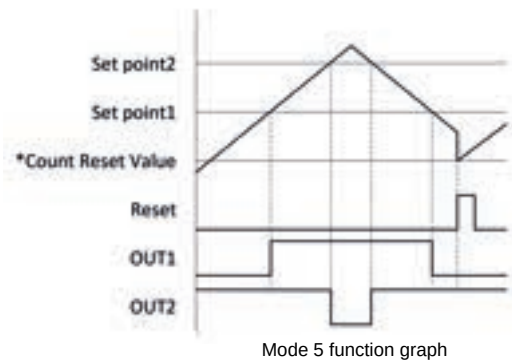
- OUT2 One-Shot output / Count Resetting Relay ON follow time 0.5s.2



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

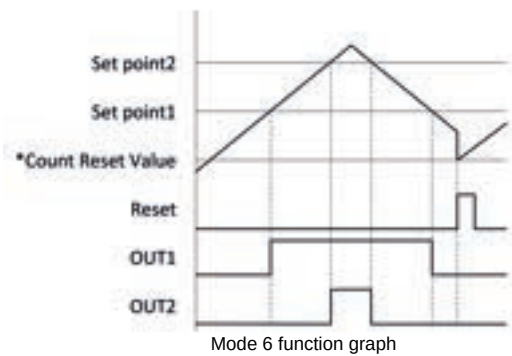
- OUT1 Count Value $\geq$ Set point 1
- OUT2 Count Value $\leq$ Set point 2



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 Point2 ON until Count less than Set Point 2 will made OUT 2 OFF.

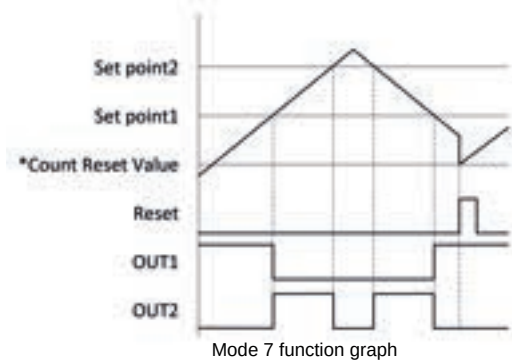
- OUT1 Count Value $\geq$ Set point 1
- OUT2 Count Value $\geq$ Set point 2



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.

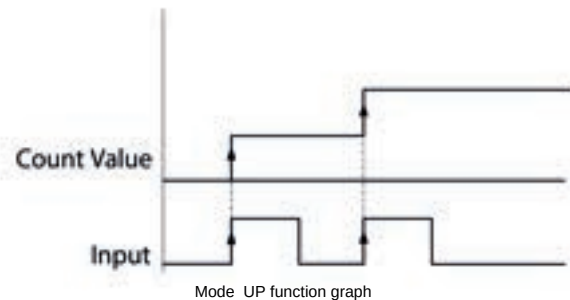
- OUT1 Count Value < Set point 1
- OUT2 Count Value $\geq$ Set point 1 and Count Value $\leq$ Set point 2



DIRECTION INPUT MODE

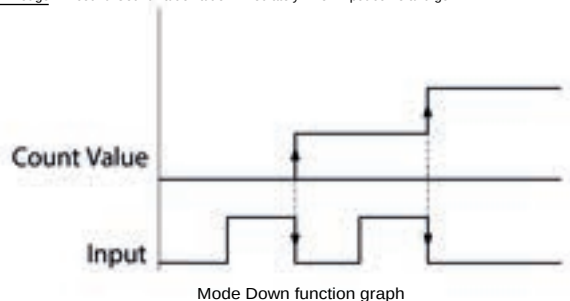
MODE UP

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



MODE DOWN

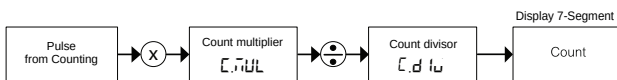
Count the down edge will count Count Value value immediately when Input come and go.



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 come in at n Pulse

$$\text{Count} = (n \times \text{multiplier}) / (n \times \text{divisor})$$

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

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

$$\text{Decimal}(\text{Decimal Point}) = 0.00$$

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

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

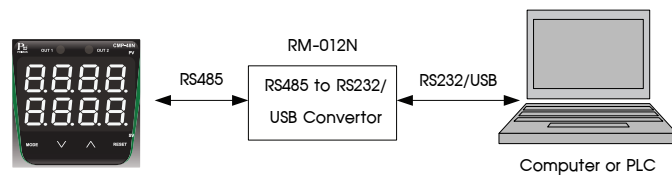
$$\text{Multiplier}(\text{Multiplier}) = 1, \text{divisor}(\text{Divisor}) = 12$$

$$\text{Decimal}(\text{Decimal Point}) = 0$$

$$\text{Input}(\text{Input}) = \text{H1SPd}$$

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

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

Ex.1 If needs set Time Setting at 5 seconds

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

Ex.2 If needs set OSD at 10 seconds

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

Ex.3 If needs to calculate OSD time from setting

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

*Relay Status

Out 1 = 1

Out 2 = 2

Out 3 = 4

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

MODBUS DATA REGISTER

Register	Register Name	Access	Format	Min	Max		
0	Count	R/W	Long AB CD	-1999	9999		
1							
2	Total	Not USE					
3							
4	Input Mode	R/W	Integer	0	2		
5	Encoder Direction	R/W	Integer	0	1		
6	Input Type	R/W	Integer	0	1		
7	Direction Input 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	3		
12	Count Multiplier	R/W	Long AB CD	1	9999		
13							
14	Count Divisor	R/W	Long AB CD	1	9999		
15							
16	Count Reset	R/W	Long AB CD	-1999	9999		
17							
18	Total Multiplier	Not USE					
19							
20	Total Divisor	Not USE					
21							
22	Total Reset	Not USE					
23							
24	Button Reset	R/W	Integer	0	1		
25	Output Mode	R/W	Integer	0	11		
26	Output Total Mode	Not USE					
27	Setpoint 1	R/W	Long AB CD	-1999	9999		
28							
29	Setpoint 2	R/W	Long AB CD	-1999	9999		
30							
31	Total Setpoint	Not USE					
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	Not USE					
36	Relay Status*	R	Integer	0	3		
37	Slave Address	R/W	Integer	1	255		
38	Baud rate	R/W	Integer	0	4		
39	Communication	R/W	Integer	0	5		
40	Lock	R/W	Integer	0	1		

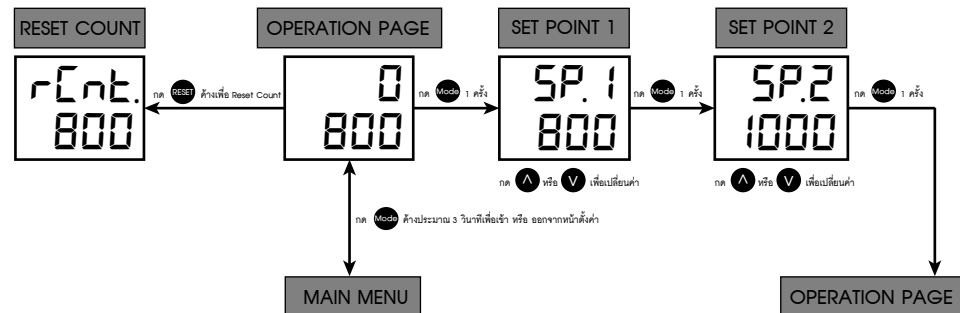
*Relay Status

Out 1 = 1

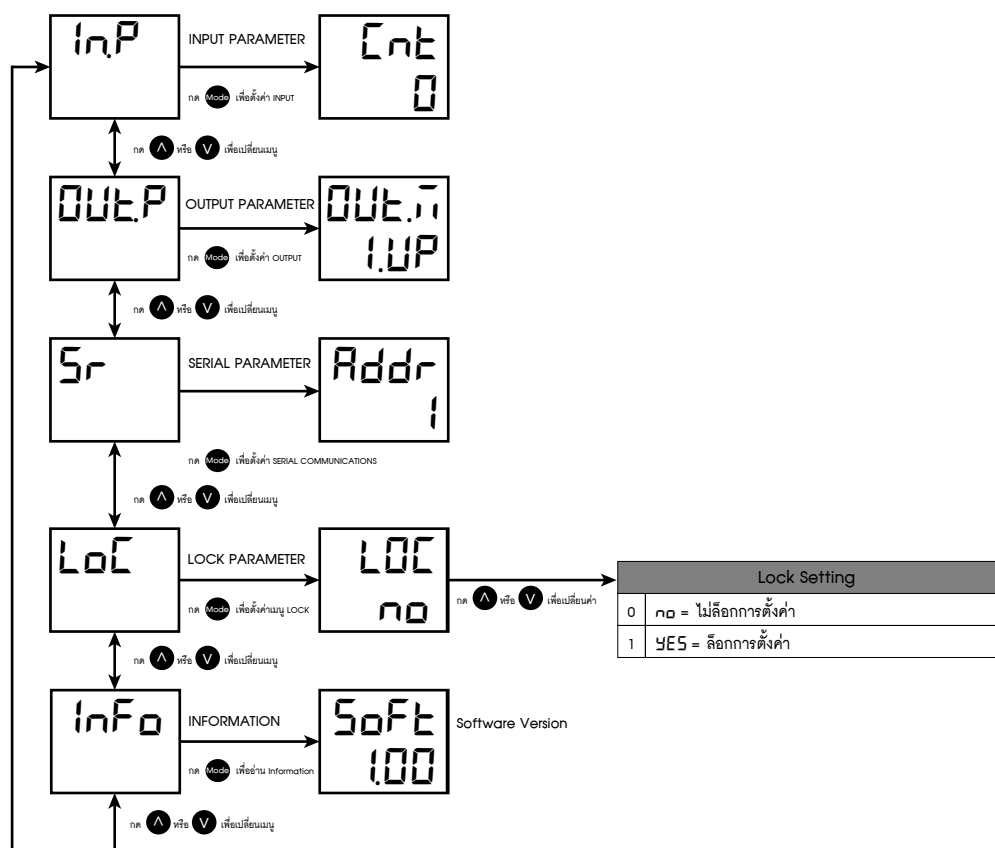
Out 2 = 2

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

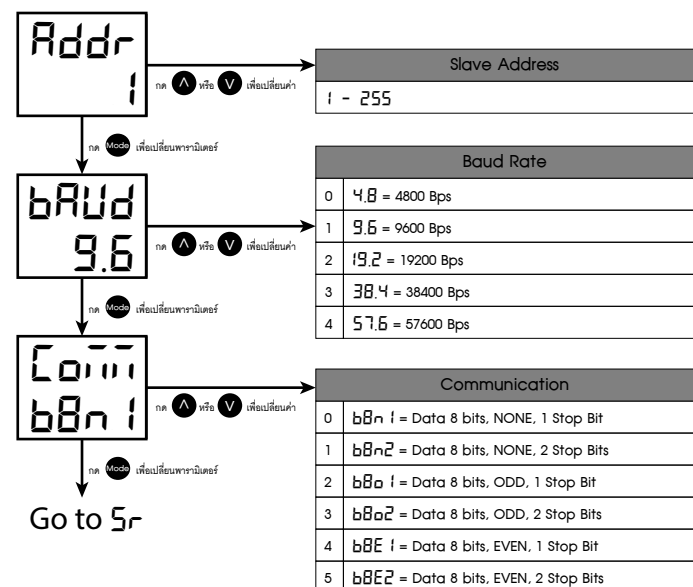
การตั้งค่าพารามิเตอร์ CMP-48N



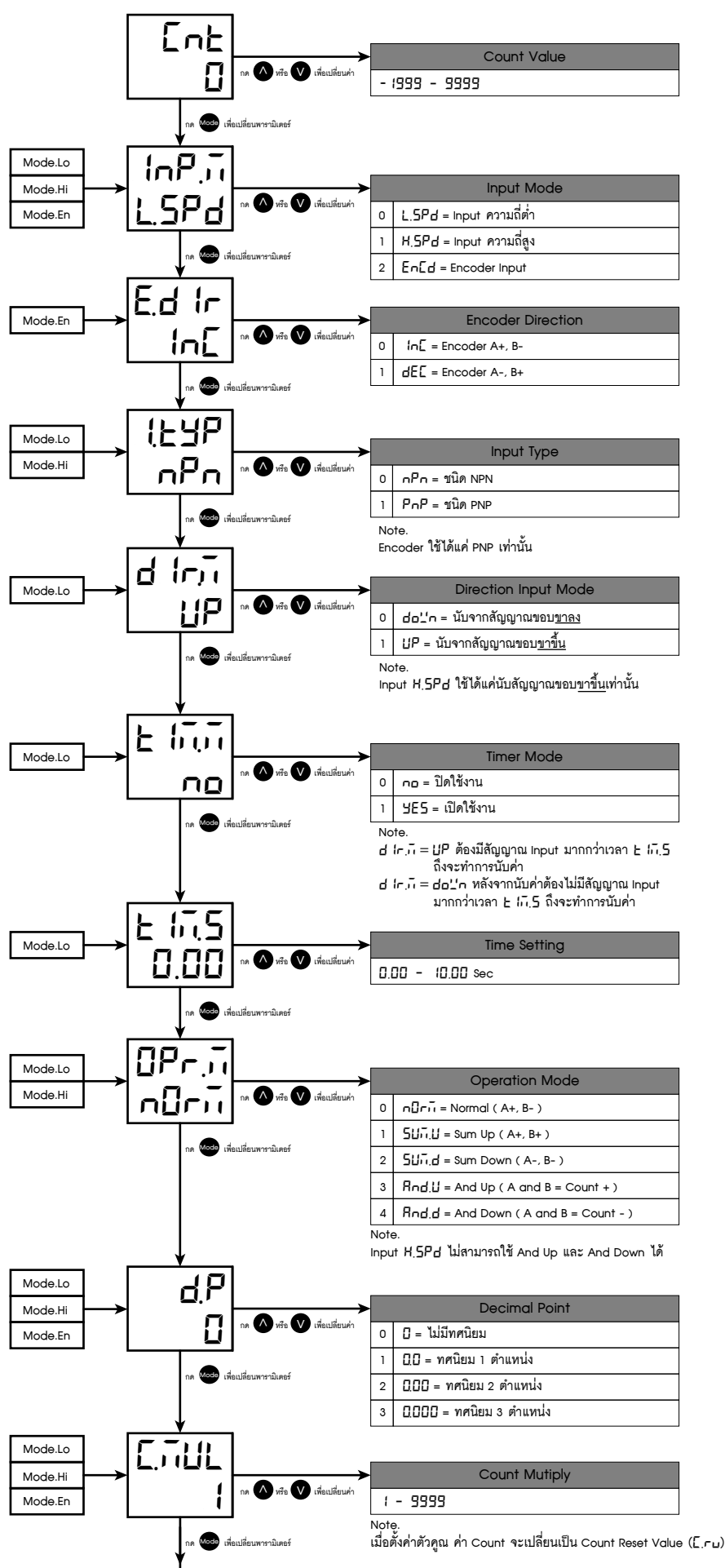
MAIN MENU



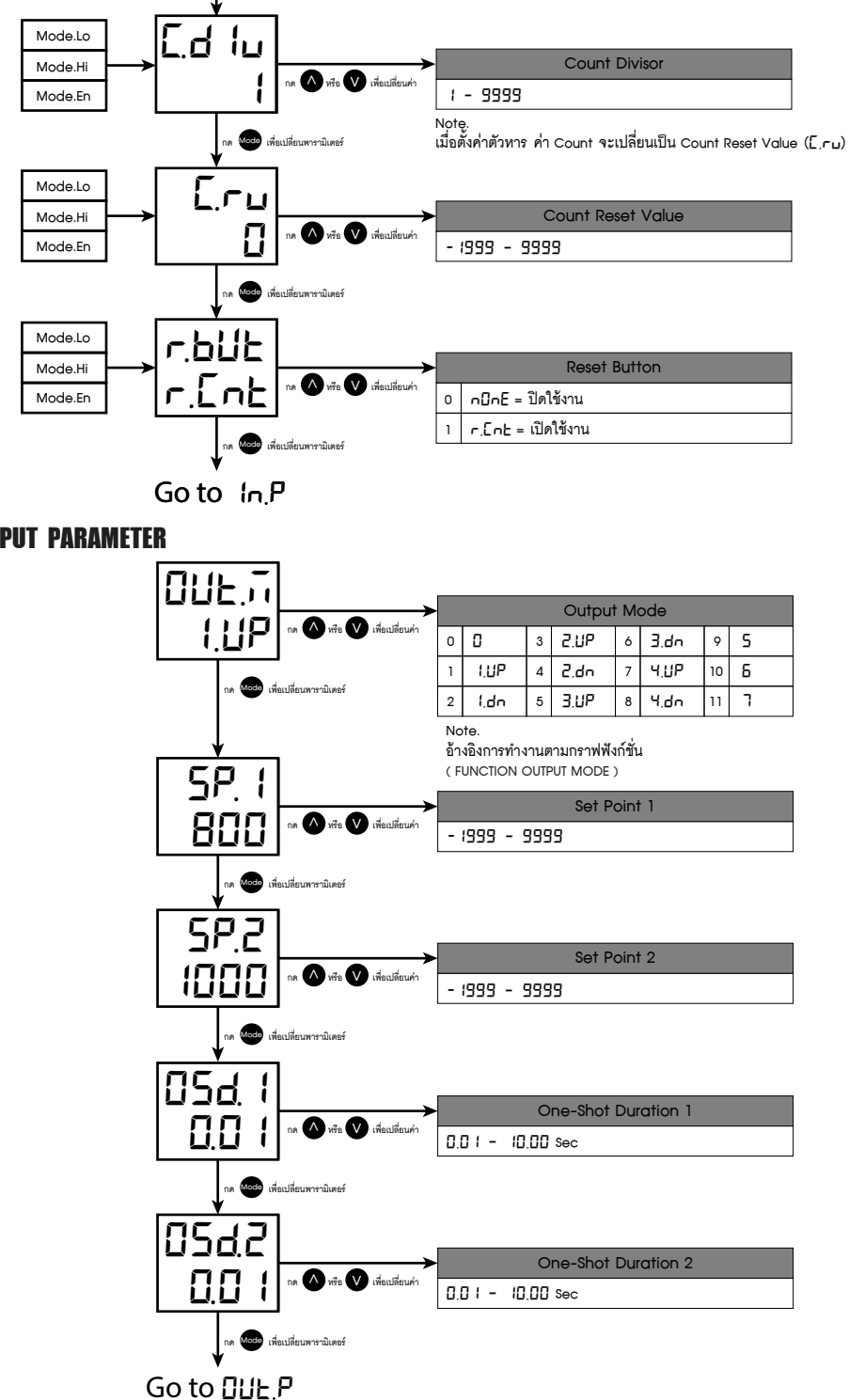
SERIAL PARAMETER



INPUT PARAMETER



OUTPUT PARAMETER



ORDERING CODE

OUTPUT		OPTION		SUPPLY	
R	1 Relay Output	NONE	NONE	220	220 VAC ±15%
RR	2 Relay Output	M	RS485	24	24 VAC/VDC ±15%



บริษัท ไพรมัส จำกัด

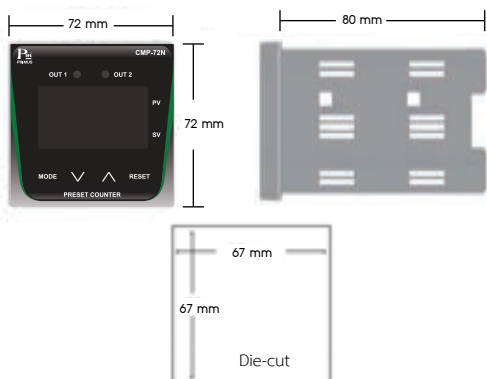
119 ซ.สีม่วงอนุสรณ์ ถ.สุทธิสารวินิจฉัย แขวงดินแดง
เขตดินแดง กรุงเทพฯ 10400
โทร 0-2693-7005, 0-2277-8027 แฟกซ์ 0-2277-3565
E-mail : sales@primusthai.com



■ TECHNICAL SPECIFICATION

Power Supply		220 VAC $\pm$ 15% 50/60 Hz
		24 VAC/VDC $\pm$ 15%
Power Consumption		3VA
Display		7 Segment, 6 Digit, Size 0.36 Inch, 2 Rows
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	$\pm$ 10 ms
Input Resistance		Dry Contact
Output	Relay Output	2 Relay Output 5A/250VAC
Communication	Protocol	MODBUS RTU
	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	-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	Front Protection Rating	IP52
	Case Protection Rating	IP30
Installation		Panel Mounting
Material		ABS-V0
Size (mm.)		72 x 72 x 80 mm
Weight		230 g.

■ DIMENSION CUTTING AND INSTALLATION



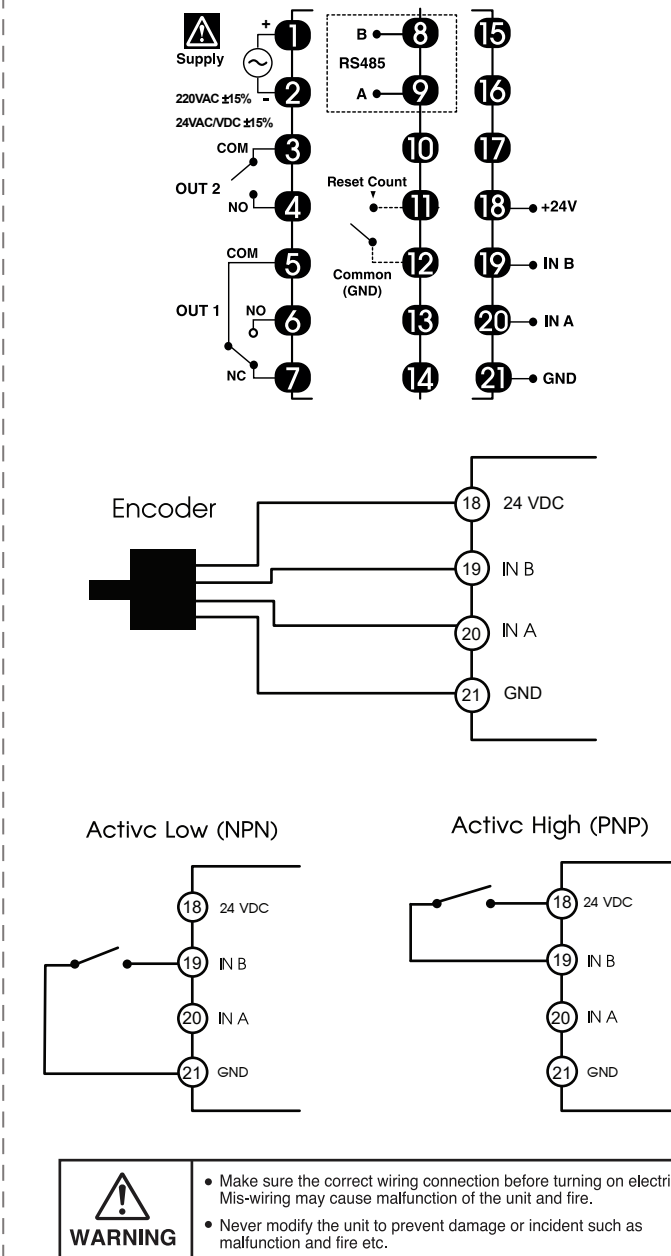
■ DESCRIPTION

- Digital Counting Machine
- 7-segment display
- Receive input from sensor devices such as Photo Switch, Proximity Switch, Proximity Switch, Encoder, Contact, NPN, PNP
- Can communicate with computer through RS485 port, MOSBUS RTU
- Can set Set Point by pressing Mode keypad at screen.
- Can reset count value by pressing Reset keypad at screen.
- Digital Input (Dry Contact) to reset value.

■ OPERATION

Digital display devices displaying results with 7-Segment in Real Time. Receiving input from. Various sensor devices such as Proximity Switch, Encoder, Mechanical Contact, NPN, PNP. It can receive fast input 10KHz. Device has 11 operation modes are available. Save count value by FRAM which can link with Computer or PLC via RS-485 and monitor, Logging, Edit value.

■ WIRING DIAGRAM



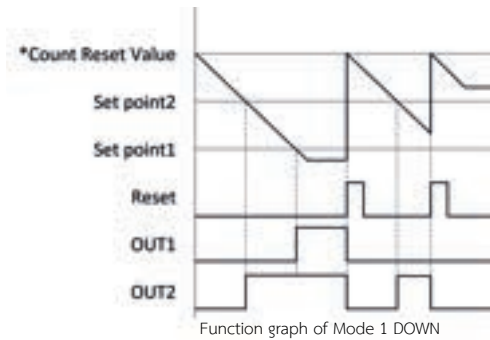
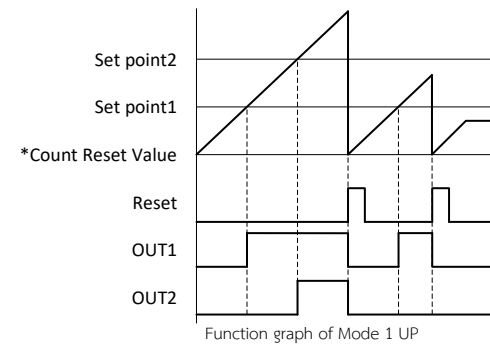
■ FUNCTION OUTPUT MODE

*Cout Reset Value is Count after Reset

MODE 1

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

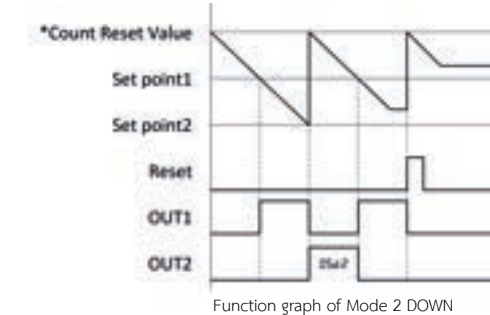
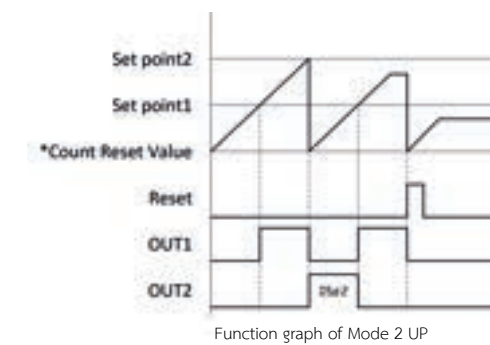
- OUT1 Retentive output / Count Continuation Relay ON all time and stay in condition.
- OUT2 Retentive output / Count Continuation Relay ON all time and stay in condition.



MODE 2

When Count up or down to Set Point 1 from setting. It will make OUT 1 ON until press Reset and when Count value count up or count down to Set Point 2 from setting it will Reset count and OUT 2 ON as One shot duration 2 time.

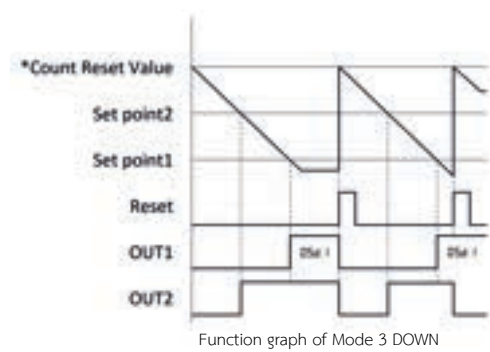
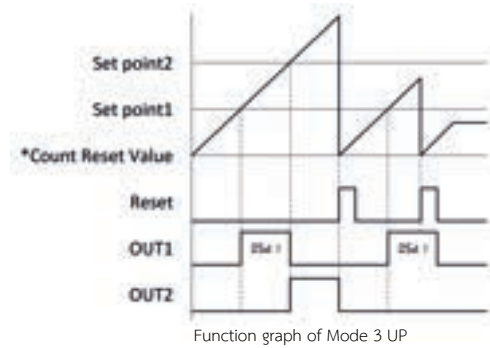
- OUT1 Retentive output / Count Continuation relay ON all time when stay in condition.
- OUT2 One-Shot output / Count Resetting relay ON follow time **0.5s**



MODE 3

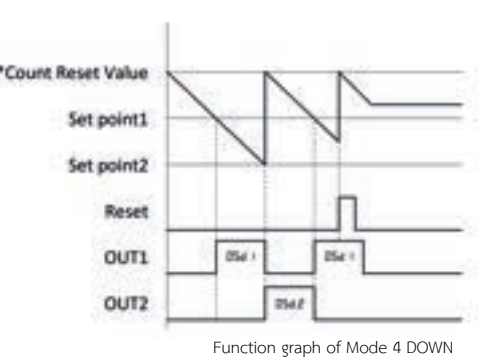
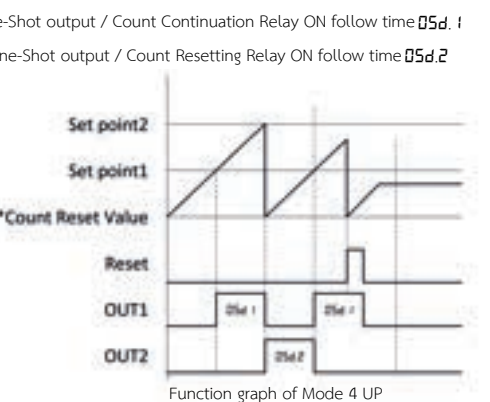
When count up or count down to Set Point 1 from setting. It will make OUT 1 ON as One Shot duration 1 time(OSd.1) and when Count value count up or count down to Set Point 2 from setting. It will make OUT 2 ON until Reset is pressed.

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



MODE 4

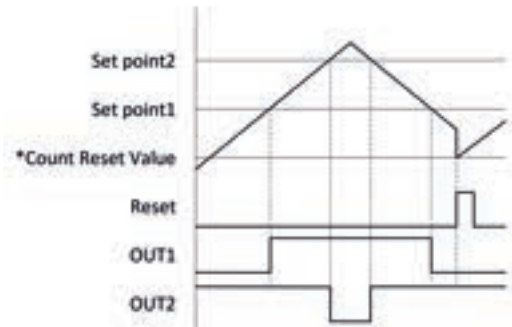
When count value count up or count down to Set Point 1 from setting. It will made
OUT 1 ON as One Shot duration time 1 and when Count value count up or count down to Set Point 2
from setting. It will Reset count and OUT2 ON as One shot duration 2 time.



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 ≥ Set point 1
- OUT2 Count Value ≤ Set point 2

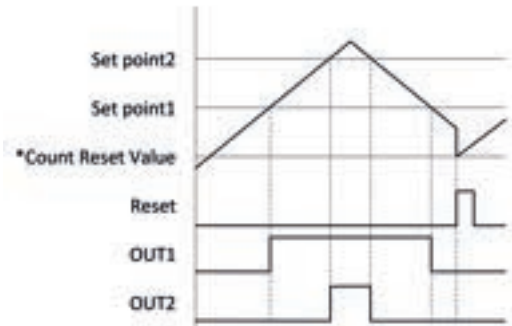


Function graph of 5 Mode

MODE 6

When Count more or equal to Set Point 1 from setting. It will make OUT 1 ON until Count less Set Point 1 will made OUT 1 OFF and when Count more or equal to Set Point2 ON until Count less than Set Point 2 will made OUT 2 OFF.

- OUT1 Count Value ≥ Set point 1
- OUT2 Count Value ≥ Set point 2

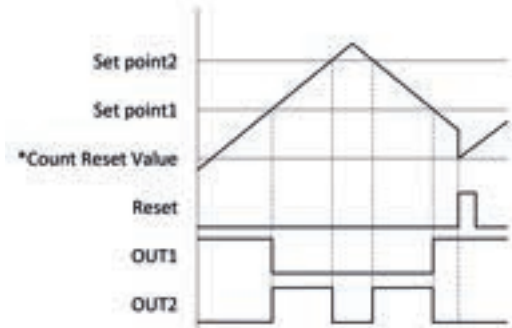


Function graph of 6 Mode

MODE 7

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 Point2 ON until Count less than Set Point 2 will made OUT 2 OFF.

- OUT1 Count Value ≥ Set point 1
- OUT2 Count Value ≥ Set point 2

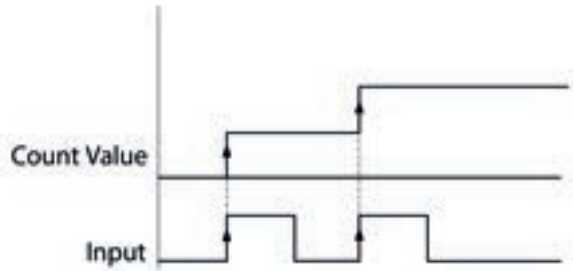


Function graph of Mode 7

DIRECTION INPUT MODE

MODE UP

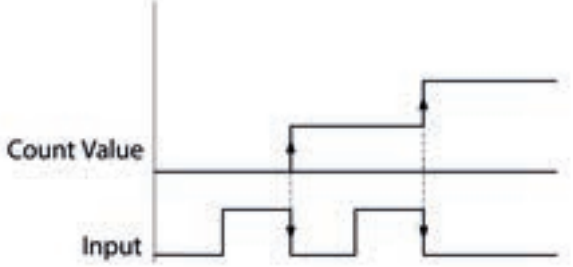
Count the rising edge will count Count Value value immediately when Input come.



Function graph of Mode UP

MODE DOWN

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

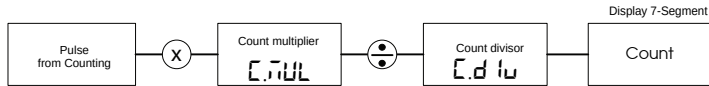


Function graph of Mode DOWN

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 come in at n Pulse
Count = (n * multiplier) / (n * 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

Display value = Pulse from actual counted * Scale

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

Multiplier($\overline{C.MUL}$) = 45, Divisor($\overline{C.DIV}$) = 10000, 45/10000

make multiplier, divisor to be simplest form 45/10000 = 9/2000

Setting

Multiplier ($\overline{C.MUL}$) = 9, divisor($\overline{C.DIV}$) = 2000

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

Input($\overline{InPulse}$) = 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

Display = Pulse from actual counted * Scale.

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

Multiplier($\overline{C.MUL}$) = 1, divisor($\overline{C.DIV}$) = 12, 1/12

Setting

Multiplier($\overline{C.MUL}$) = 1, divisor($\overline{C.DIV}$) = 12

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

Input($\overline{InPulse}$)= H I SPD

MODBUS DATA REGISTER (Old Version Table)

Register	Register Name	Access	Format	Min	Max
0-1	Count	R/W	Long AB CD	-199999	999999
2-3	Total	Not Use			
4-5	Dicimal Point	R/W	Long AB CD	0	5
6-7	Count Multiplier	R/W	Long AB CD	1	999999
8-9	Count Divisor	R/W	Long AB CD	1	999999
10-11	Total Multiplier	Not Use			
12-13	Total Divisor				
14-15	Button Reset	R/W	Long AB CD	0	1
16-17	Not Use				
18-19	Count Reset Value	R/W	Long AB CD	-199999	999999
20-21	Total Reset Value	Not Use			
22-23	Input Mode	R/W	Long AB CD	0	2
24-25	Direction Input Mode	R/W	Long AB CD	0	1
26-27	Sensor Type	R/W	Long AB CD	0	1
28-29	Encoder Directions	R/W	Long AB CD	0	1
30-31	Output Mode	R/W	Long AB CD	0	11
32-33	Output Total Mode	Not Use			
34-35	Set Point 1	R/W	Long AB CD	-199999	999999
36-37	Set Point 2	R/W	Long AB CD	-199999	999999
38-39	Total Set Point	Not Use			
40-41	One-Shot Duration 1	R/W	Long AB CD	1	1000
42-43	One-Shot Duration 2	R/W	Long AB CD	1	1000
44-45	Total One Shot Duration	Not Use			
46-47	Not Use				
48-49	Baudrate	R/W	Long AB CD	0	4
50-51	Slave Address	R/W	Long AB CD	1	255
52-53	Lock	R/W	Long AB CD	0	1
54-55	Relay Status	R	Long AB CD	0	3
56-57	Operate Mode	R/W	Long AB CD	0	5
58-59	Not Use				
60	Timer Mode	R/W	Integer	0	1
61	Time Setting	R/W	Integer	0	1000
62	Communication	R/W	Integer	0	5
63	Reset Count	R/W	Integer	0	1
64	Reset Total	Not Use			
65	DI Reset Count Status	R	Integer	0	1
66	DI Reset Total Status	Not Use			
67	DI Show Total Status				
68	Firmware Version	R	Integer	100	999

MODBUS DATA REGISTER (New Version Table)

Register	Register Name	Access	Format	Min	Max
0-1	Count	R/W	Long AB CD	-199999	999999
2-3	Total	Not Use			
4	Input Mode	R/W	Integer	0	2
5	Encoder Direction	R/W	Integer	0	1
6	Sensor Type	R/W	Integer	0	1
7	Direction Input 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	5
11	Decimal Point	R/W	Integer	0	5
12-13	Count Multiplier	R/W	Long AB CD	1	999999
14-15	Count Divisor	R/W	Long AB CD	1	999999
16-17	Count Reset	R/W	Long AB CD	-199999	999999
18-19	Total Multiplier	Not Use			
20-21	Total Divisor				
22-23	Total Reset				
24	Button Reset	R/W	Integer	0	1
25	Output Mode	R/W	Integer	0	11
26	Output Total Mode	Not Use			
27-28	Setpoint1	R/W	Long AB CD	-199999	999999
29-30	Setpoint 2	R/W	Long AB CD	-199999	999999
31-32	Total Setpoint	Not Use			
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	Not Use			
36	Relay Status*	R	Integer	0	3
37	Slave Address	R/W	Integer	1	255
38	Baud rate	R/W	Integer	0	4
39	Communication	R/W	Integer	0	5
40	Lock	R/W	Integer	0	1
41	Reset Count	R/W	Integer	0	1
42	Reset Total	Not Use			
43	DI Reset Count Status	R	Integer	0	1
44	DI Reset Total Status	Not Use			
45	DI Show Total Status				
46	Firmware Version	R	Integer	100	999

*Relay Status

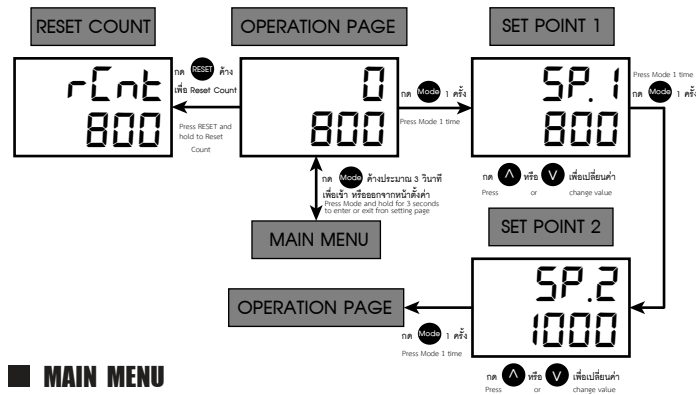
Out 1 = 1

Out 2 = 2

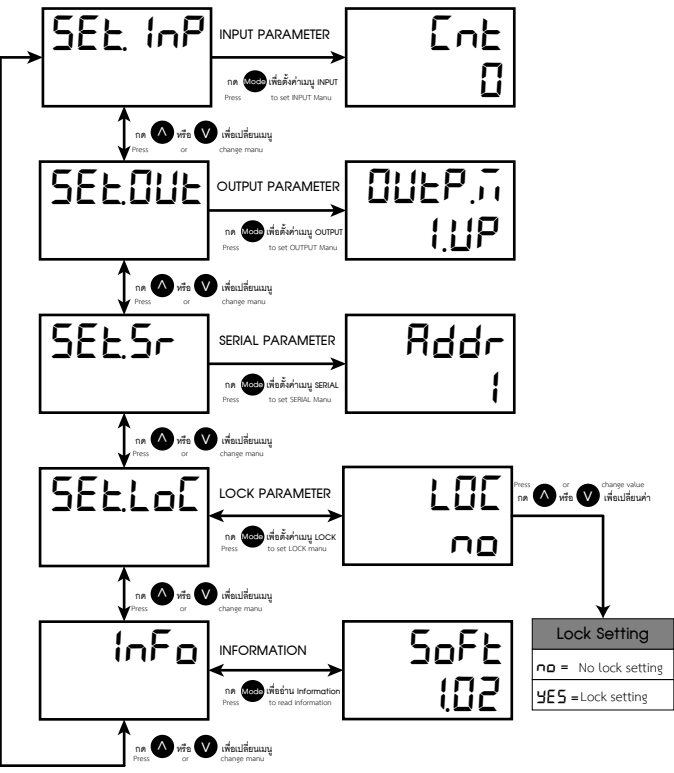
Out 3 = 4

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

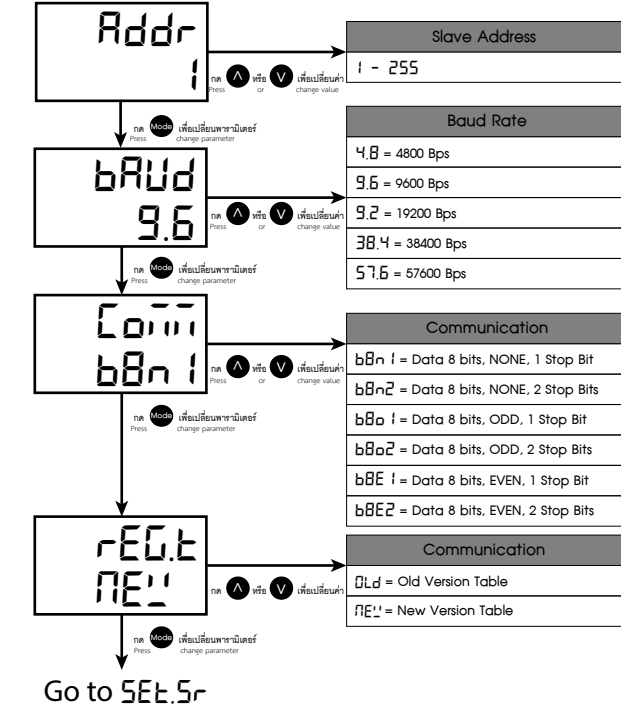
การตั้งค่าพารามิเตอร์ CMP-72N



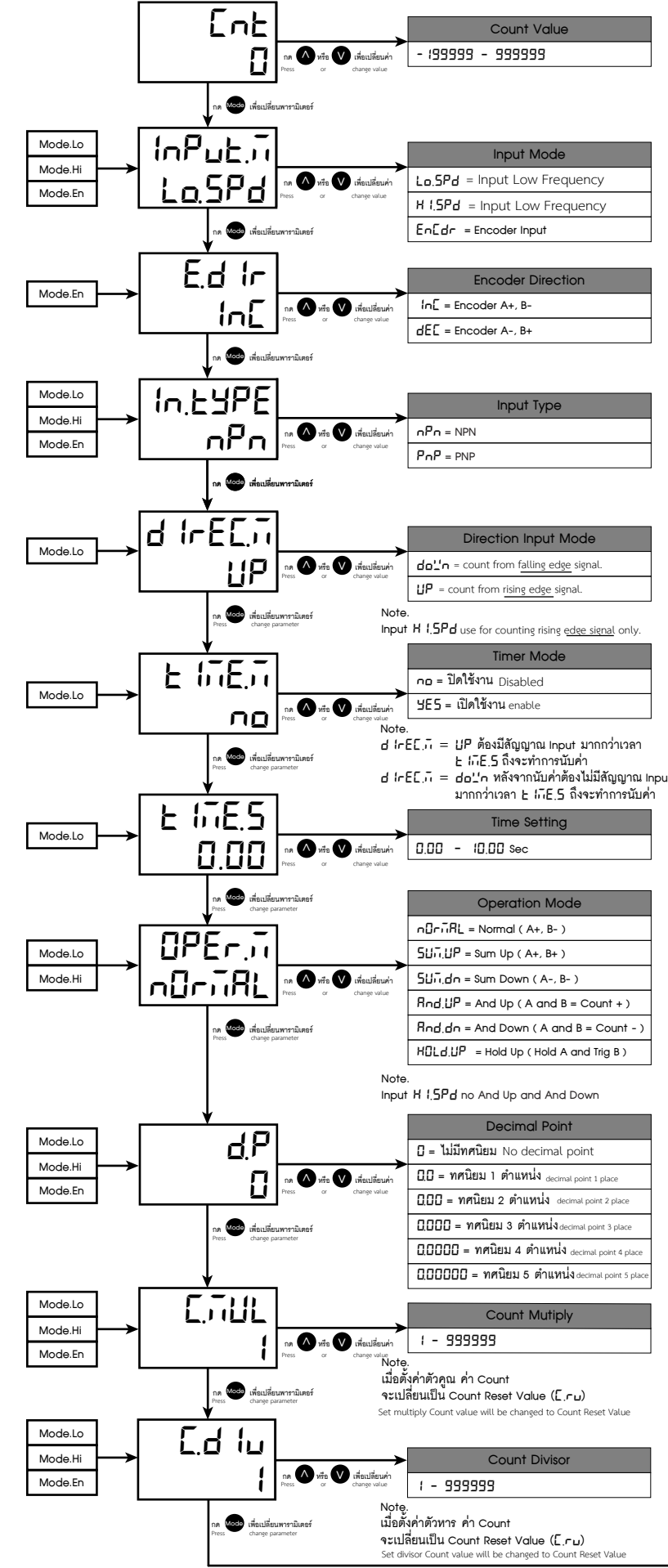
MAIN MENU



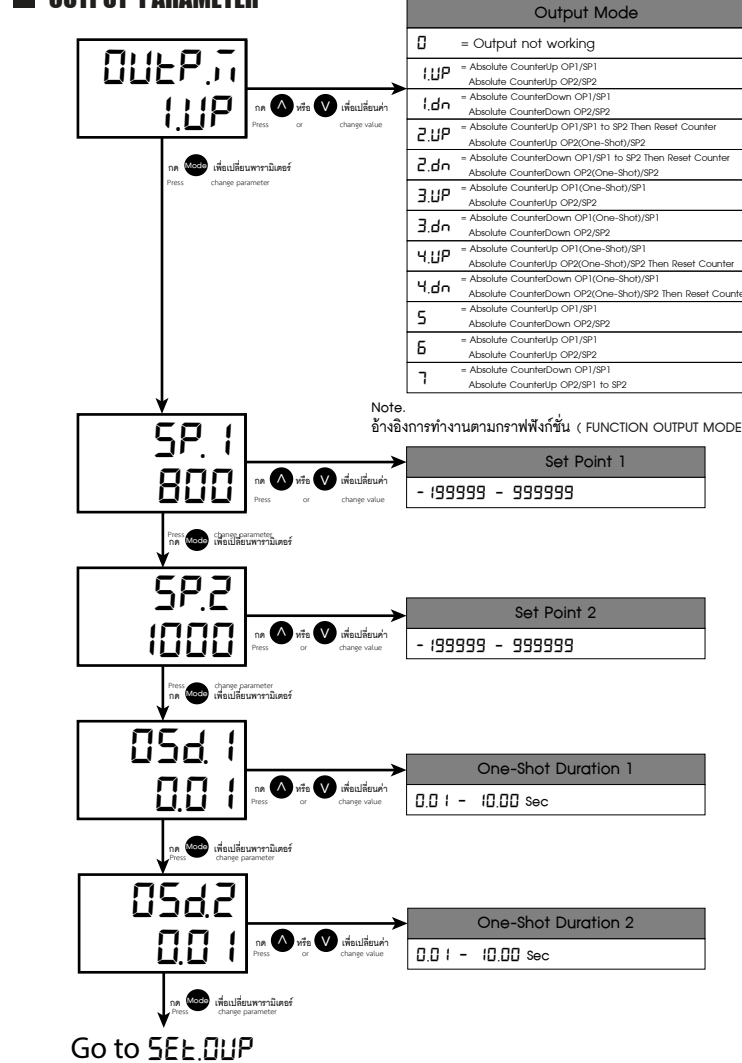
SERIAL PARAMETER



INPUT PARAMETER



OUTPUT PARAMETER

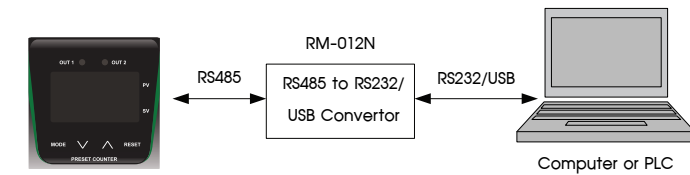


ORDERING CODE

CMP - 72N -		-		-	
OUTPUT		SUPPLY		OPTION	
R	1 Relay Output	220	220 VAC ±15%	NONE	NONE
RR	2 Relay Output	24	24 VAC/VDC ±15%	M	RS485

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

Register Calculation

Count	=	Count REG	Total	=	Total REG
		10			10
		= 1000			= 32000
		= 100.0			= 32.000

Ex.1 If user need set Time Setting at 5 seconds.

Time Setting	=	5 sec x 1000 ms
		10
∴ Set Time Setting REG	=	500

Ex.2 If user need set OSD at 10 seconds.

One Shot Duration	=	10 sec x 1000 ms
		10
∴ Set OSD REG	=	1000

Ex.3 If user need calculate to see OSD time from setting.

One Shot Duration	=	OSD REG x 10
		= 20 x 10
		= 200 ms



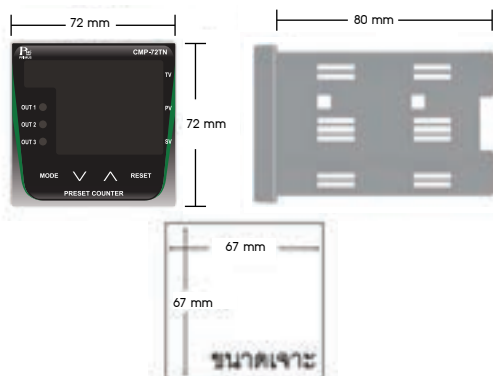
บริษัท ไพรมัส จำกัด (สาขา 00012)
เลขประจำตัวผู้เสียภาษี : 0105536011803
118/60 หมู่ที่ 18 ตำบลคลองหนึ่ง อำเภอคลองหลวง จังหวัดปทุมธานี 12120
118/60 Moo 18 Khlong Nueng, Khlong Luang, Pathum Thani 12120
Tel. : 0-2693-7005 Fax. : 02-147-4206 Hotline : 090-197-9601
E-mail : sales@primusthai.com, www.primusthai.com, www.pm.co.th



TECHNICAL SPECIFICATION

Power Supply		220 VAC $\pm 15\%$ 50/60 Hz
Power Consumption		24 VAC/VDC $\pm 15\%$
Display		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
	Input Resistance	Dry Contact
Output	Relay Output	3 Relay Output 5A/250VAC
Communication	Protocol	MODBUS RTU
	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	-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	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.

DIMENSION CUTTING AND INSTALLATION



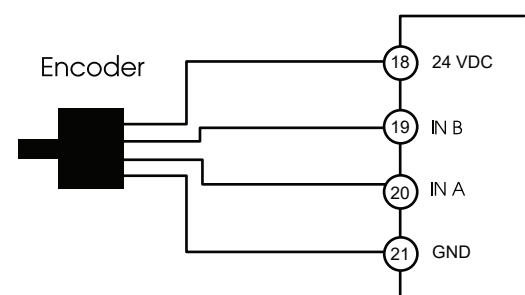
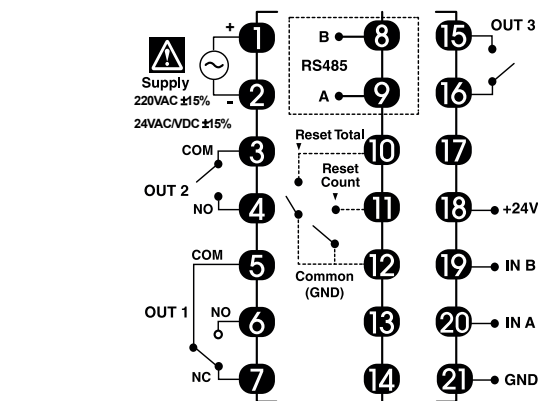
DESCRIPTION

- 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.

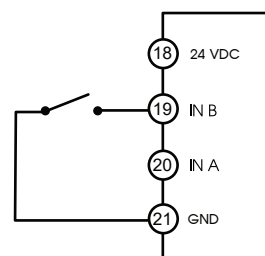
OPERATION

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.

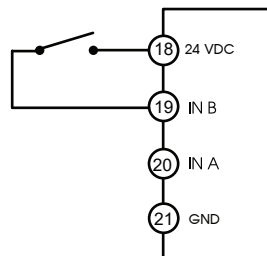
WIRING DIAGRAM



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.

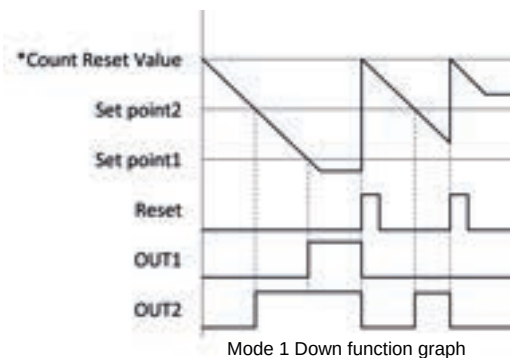
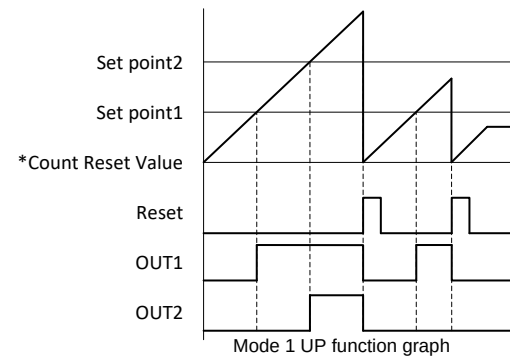
FUNCTION OUTPUT MODE

*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.

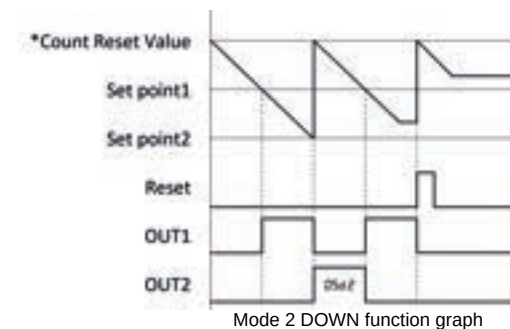
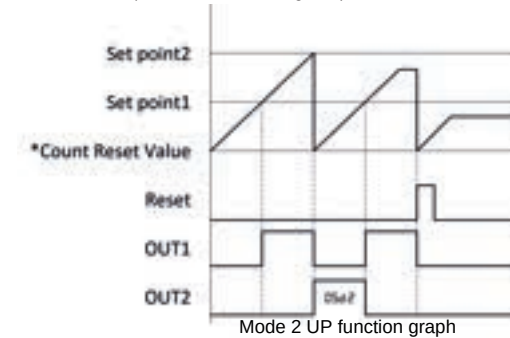
- OUT1 Retentive output / Count Continuation Relay ON all time even stay in condition.
- OUT2 Retentive output / Count Continuation Relay ON all time even stay in condition.



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

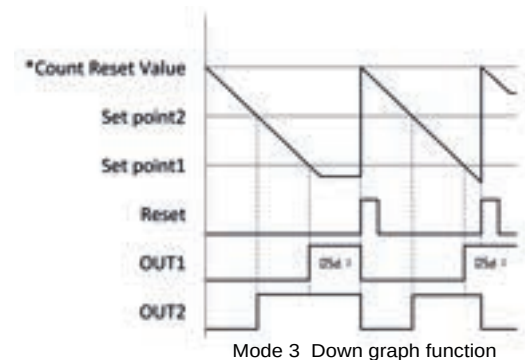
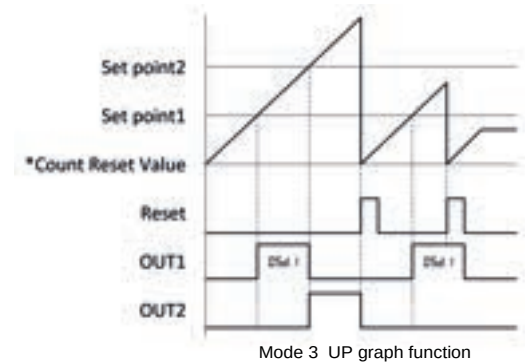
- OUT1 Retentive output / Count Continuation relay ON all time when stay in condition.
- OUT2 One-Shot output / Count Resetting relay ON follow time 0.5d.2



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.

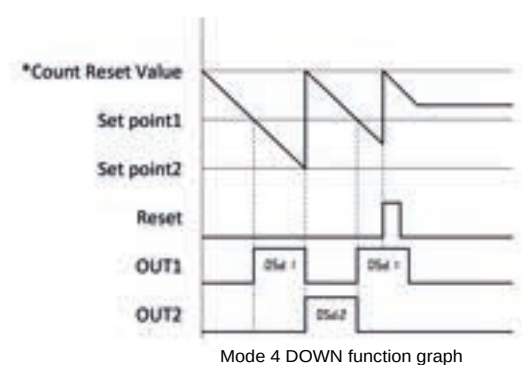
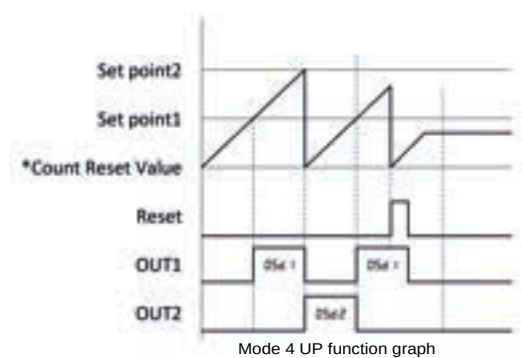
- OUT1 One-Shot output / Count Continuation Relay ON follow time 0.5d.1
- OUT2 Retentive output / Count Continuation Relay ON on time when stay in condition.



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.

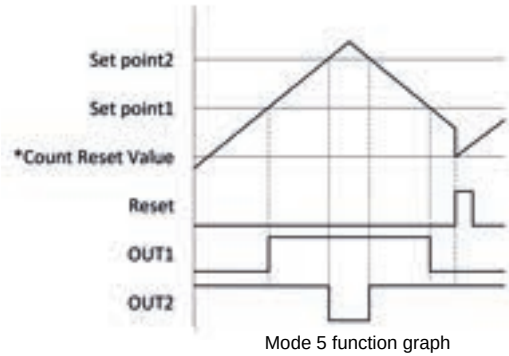
- OUT1 One-Shot output / Count Continuation Relay ON follow time 0.5d.1
- OUT2 One-Shot output / Count Resetting Relay ON follow time 0.5d.2



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

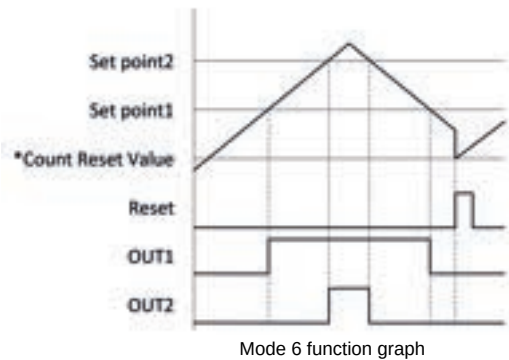
- OUT1 Count Value $\geq$ Set point 1
- OUT2 Count Value $\leq$ Set point 2



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 Point2 ON until Count less than Set Point 2 will made OUT 2 OFF.

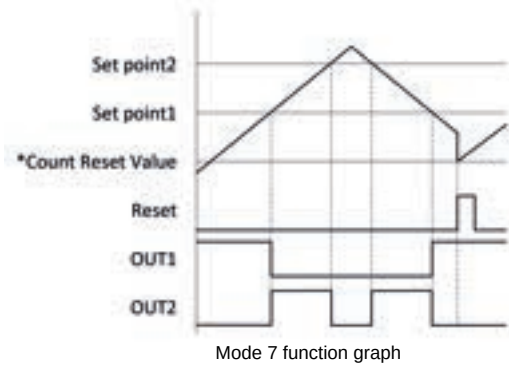
- OUT1 Count Value $\geq$ Set point 1
- OUT2 Count Value $\geq$ Set point 2



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



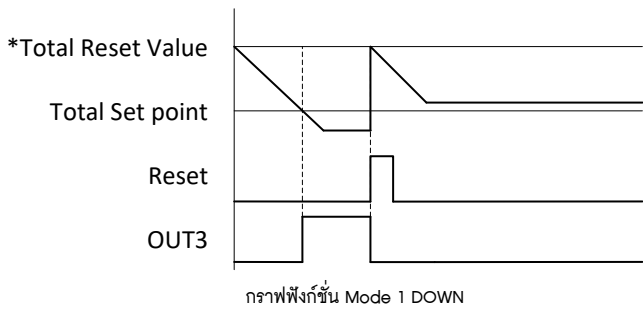
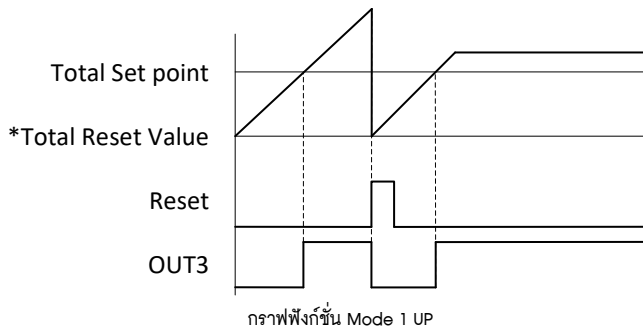
FUNCTION TOTAL MODE

*Total Reset Value คือค่า Total เริ่มต้นหลังจาก Reset

MODE 1

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

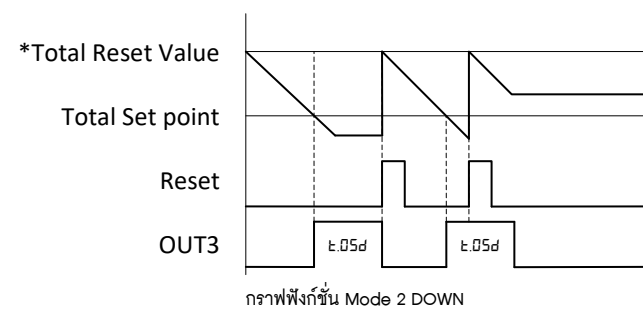
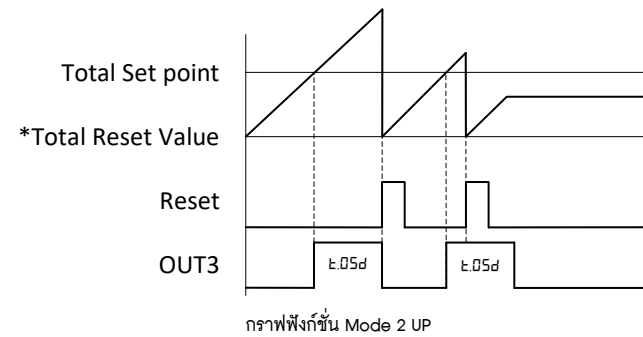
- OUT 3 Retentive output / Count Continuation รีเลย์ ON ตลอดเมื่ออยู่ในเงื่อนไข



MODE 2

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

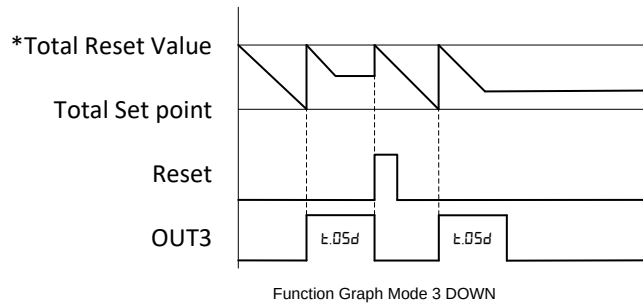
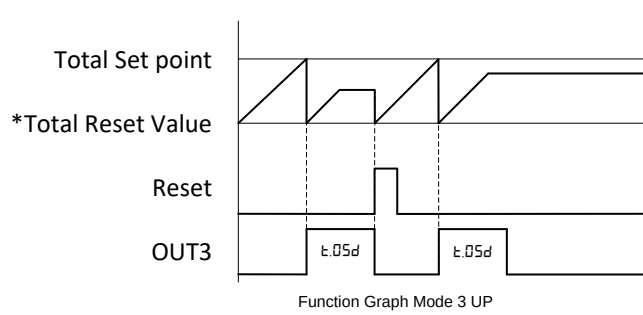
- OUT 3 One-Shot output / Count Continuation รีเลย์ ON ตามเวลา t_{OSd}



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.

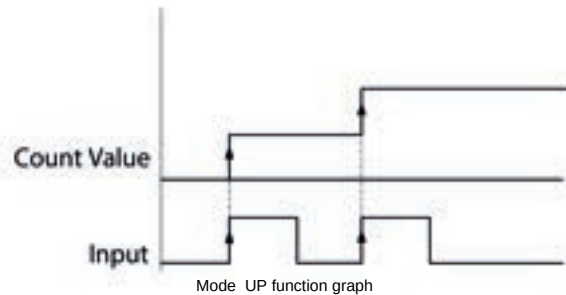
- OUT3 One-Shot output / Count Resetting relay ON follow time t_{OSd}



DIRECTION INPUT MODE

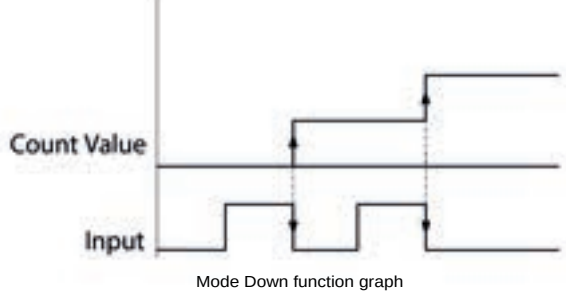
MODE UP

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



MODE DOWN

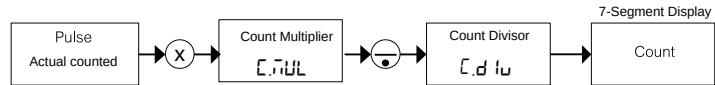
Count the down edge will count Count Value value immediately when Input come and go.



PRESCALING

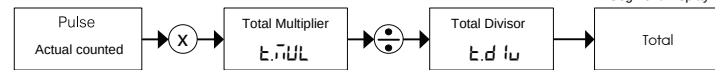
We can scale pulse value that come by setting count multiplier such as request count up to pulse and 0.7 so scale in form divisor.

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



Calculation, when Input came n Pulse

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



Calculation, when Input came n Pulse

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

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

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

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

$$\text{Multiplier}(\text{C.MUL}) = 45, \text{Divisor}(\text{C.DIV}) = 10000, 45/10000$$

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

Setting

$$\text{Multiplier}(\text{C.MUL}) = 9, \text{divisor}(\text{C.DIV}) = 2000$$

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

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

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

Calculation

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

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

$$\text{Multiplier}(\text{C.MUL}) = 1, \text{divisor}(\text{C.DIV}) = 12, 1/12$$

Setting

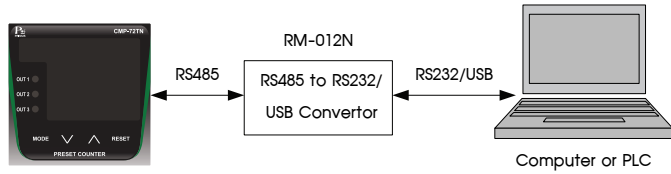
$$\text{Multiplier}(\text{C.MUL}) = 1, \text{divisor}(\text{C.DIV}) = 12$$

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

$$\text{Input}(\text{InPUL}) = \text{H15Pd}$$

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 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

How to calculate Register

Count	=	$\frac{\text{Count REG}}{10^{\text{Decimal Point REG}}}$	Total	=	$\frac{\text{Total REG}}{10^{\text{Decimal Point REG}}}$
	=	$\frac{1000}{10^1}$		=	$\frac{32000}{10^3}$
	=	100.0		=	32.000

Ex.1 If needs set Time Setting at 5 seconds

Time Setting	=	$\frac{5 \text{ seconds} \times 1000 \text{ ms}}{10}$
∴ Set Time Setting REG	=	500

Ex.2 If needs set OSD at 10 seconds

One Shot Duration	=	$\frac{10 \text{ วินาที} \times 1000 \text{ ms}}{10}$
∴ Set OSD REG	=	1000

Ex.3 If needs to calculate OSD time from setting

One Shot Duration	=	OSD REG x 10
	=	20 x 10
	=	200 ms

MODBUS DATA REGISTER

Register	Register Name	Access	Format	Min	Max
0	Count	R/W	Long AB CD	-199999	999999
1					
2					
3	Total	R/W	Long AB CD	-19999999	99999999
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

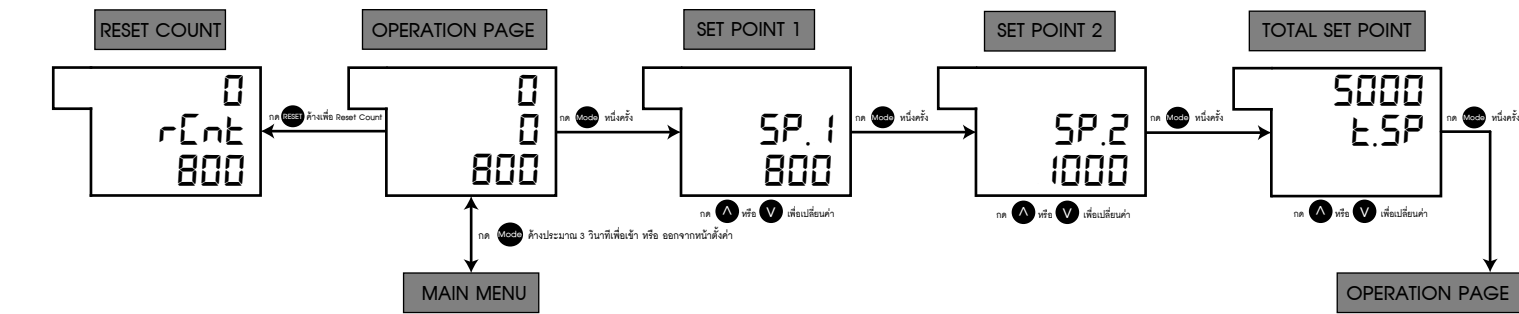
Out 1 = 1

Out 2 = 2

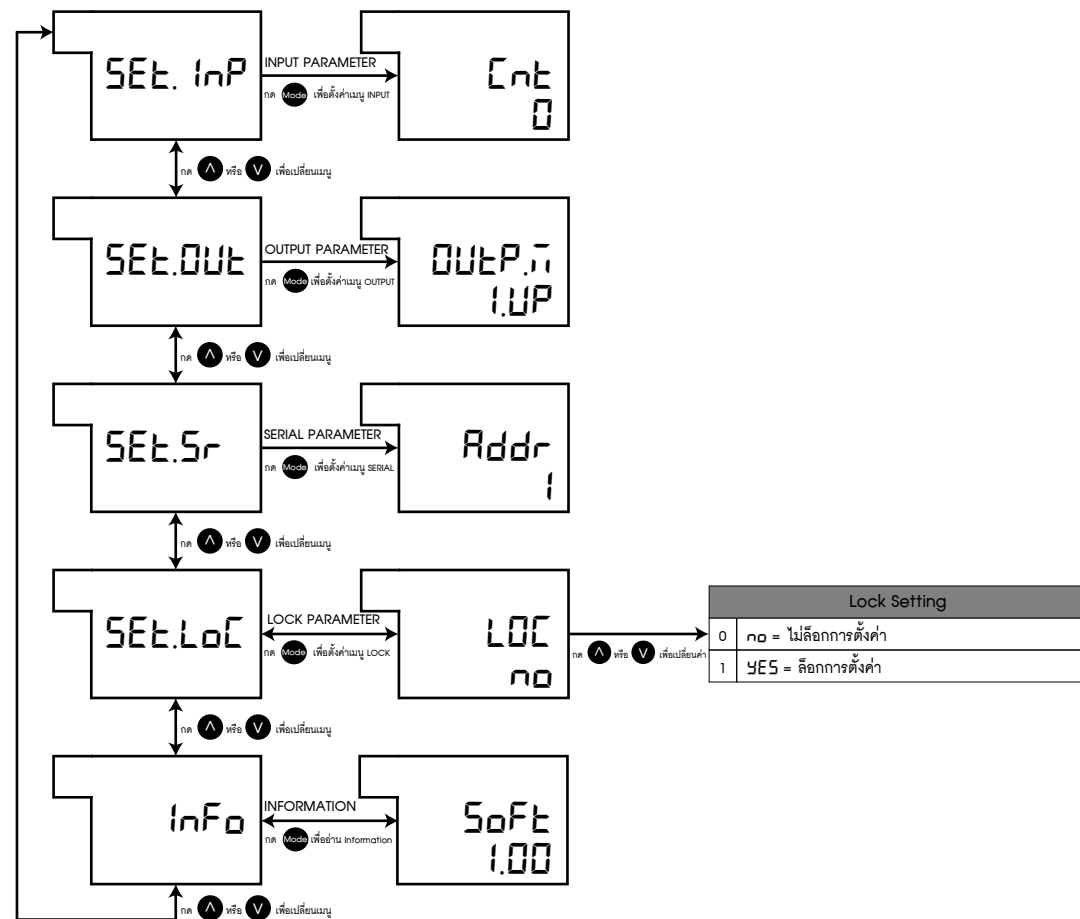
Out 3 = 4

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

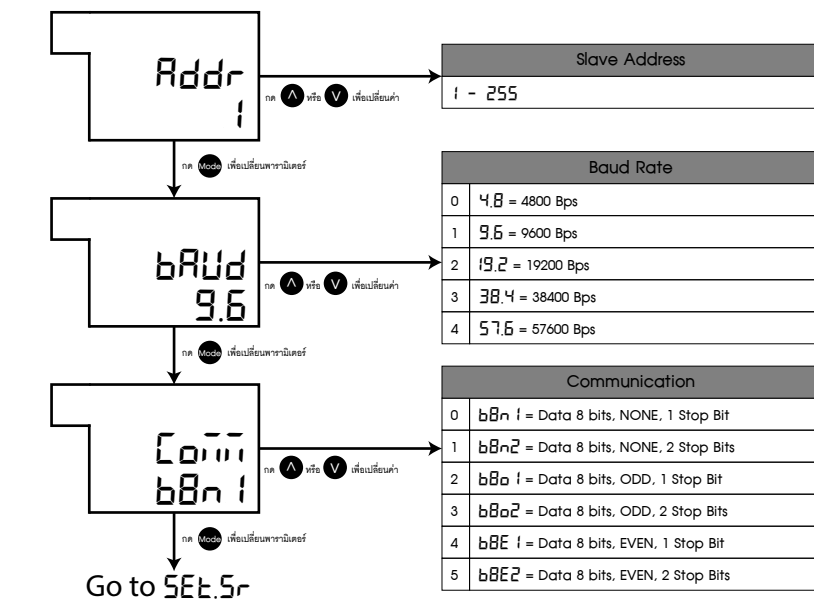
SETTING PARAMETER CMP-72TN



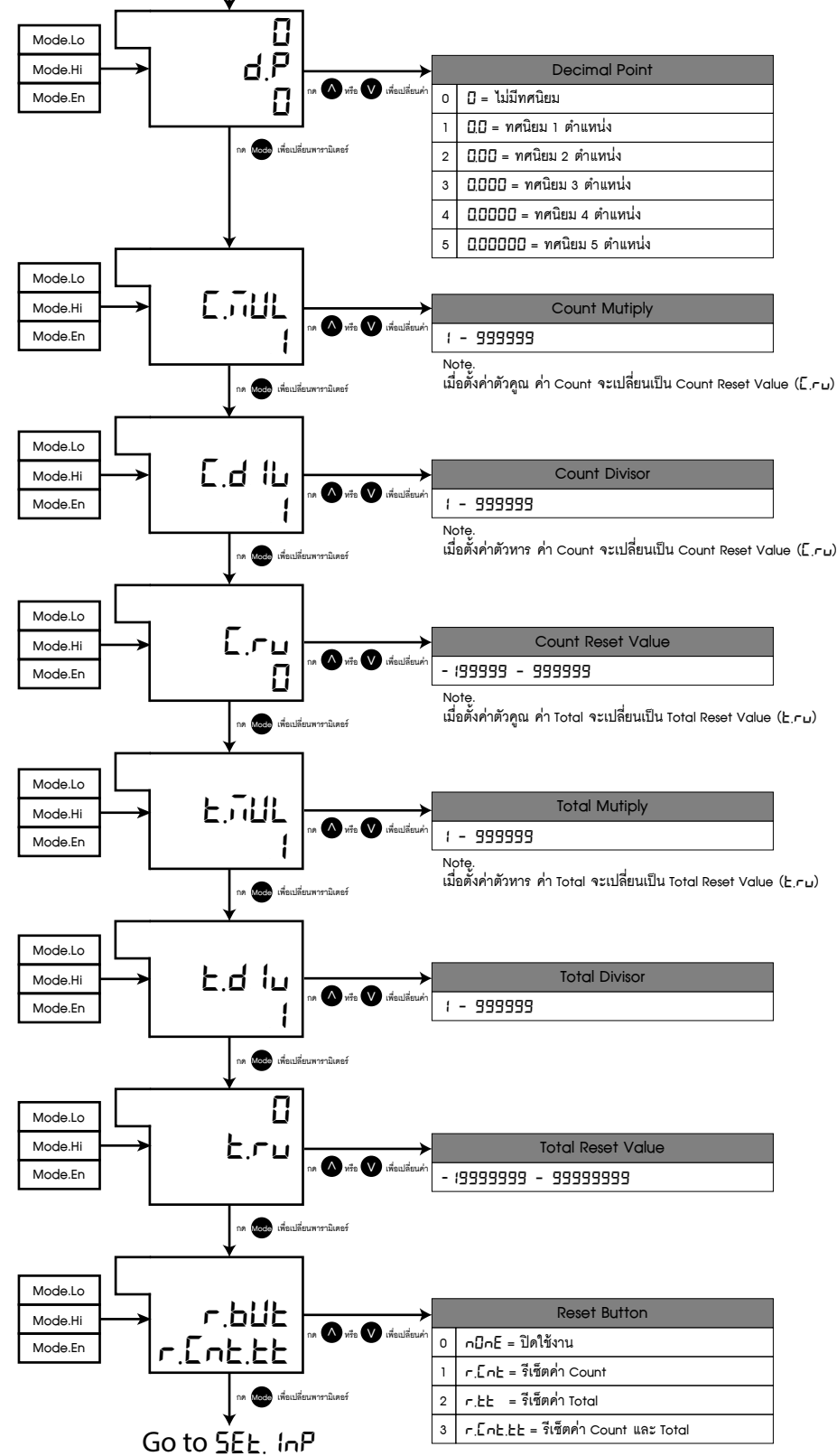
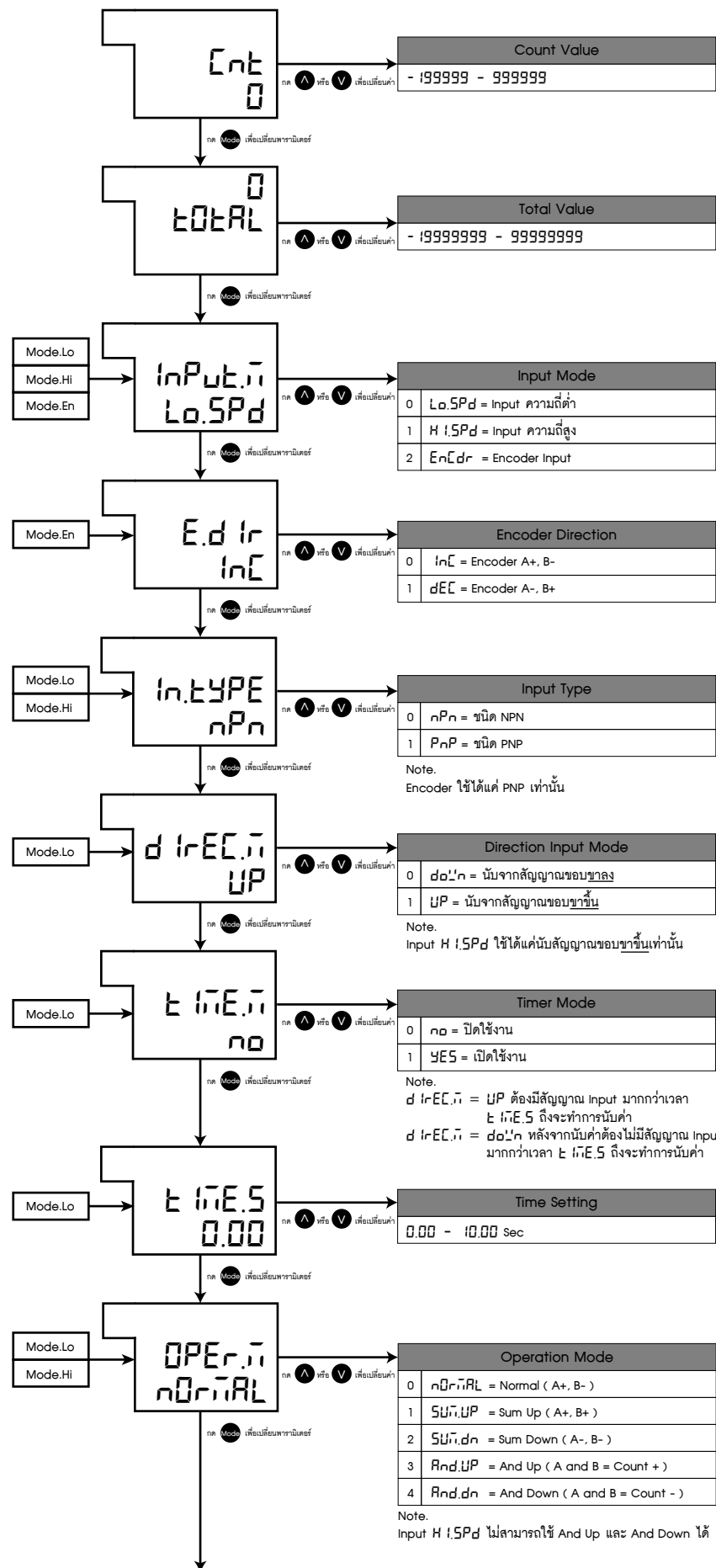
MAIN MENU



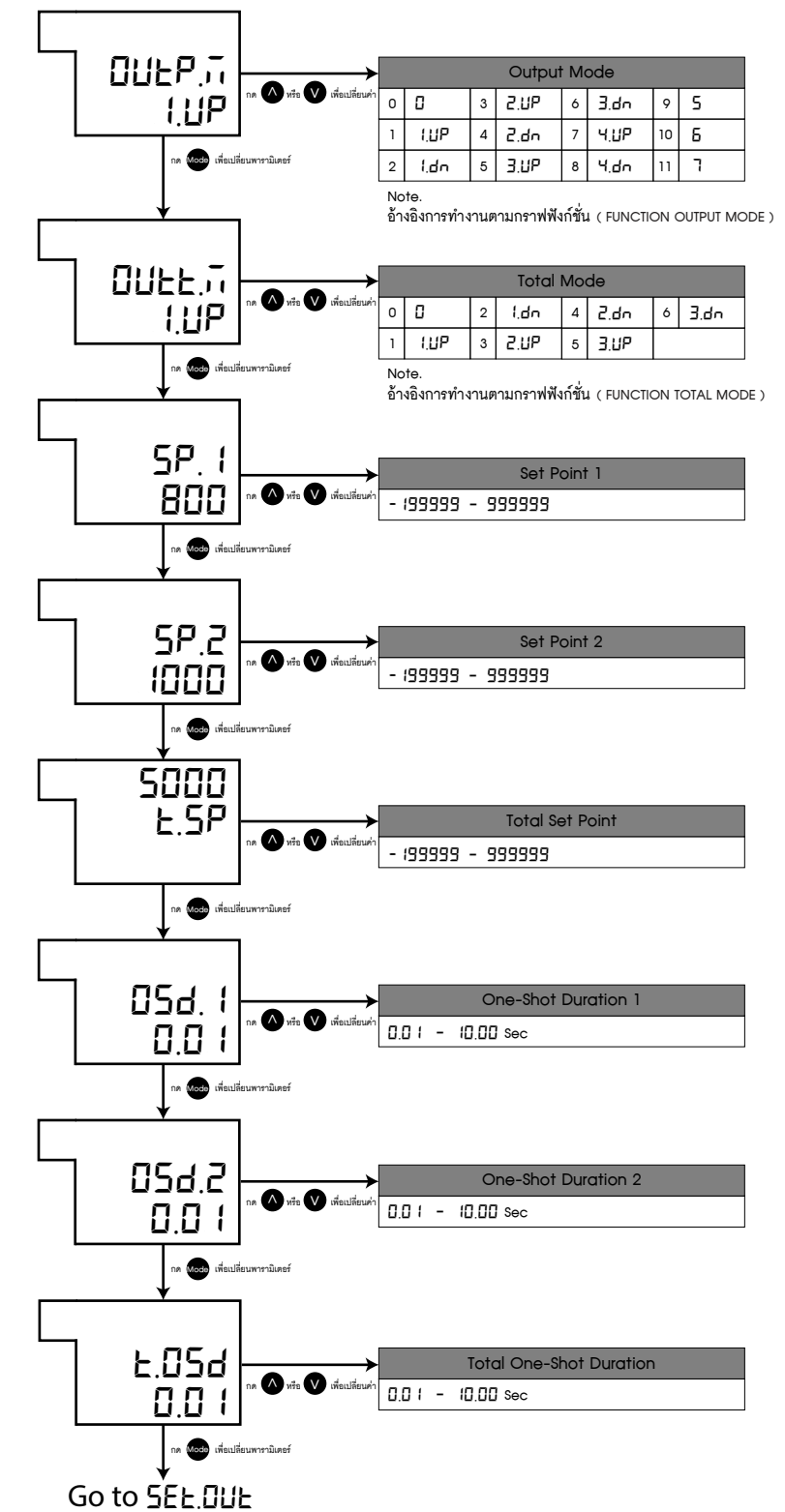
SERIAL PARAMETER



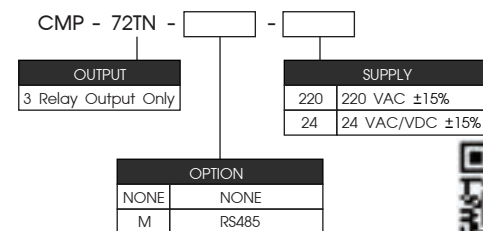
■ INPUT PARAMETER



■ OUTPUT PARAMETER



■ ORDERING CODE



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