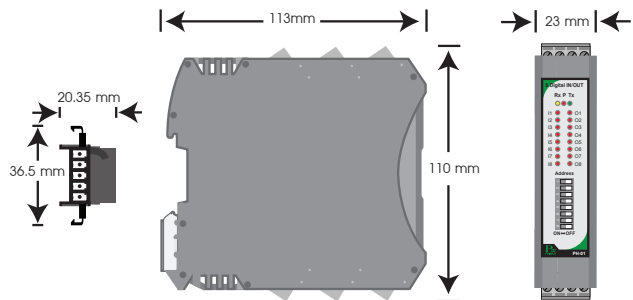




TECHNICAL SPECIFICATION

Power Supply		9-30 VDC/VAC
Power Consumption		2 VA
Display		LED
Input	Digital Input	
	Inputs Points	4
	Input Voltage Range	12-24 VDC
	Input Current Per Input	5 mA @12 VDC 11 mA @ 24 VDC
	Isolation	1500 Vrms Between Field And Logic
	Input NTC & PTC	2 K, 10 K
	Inputs Points	4
Output	Input Range	NTC/PTC (-40 to 130 °C)
	Output Points	8
	Maximum Voltage	36 VDC
	Maximum Current	100 mA Per Output
Communication	Isolation	1500 Vrms Between Field And Logic
	PROTOCOL	MODBUS RTU
	Baud Rate	2400, 4800, 9600,19200
	Parity	None, Even, Odd
	Stop Bits	1, 2
	Data Bits	8
Ambient Operation	Maximum Support Node	255
	Temperature	-10 °C to 60 °C
	Humidity	<85% RH Non-Condensing
	Temperature	-20 °C to 80 °C
Ambient Storage	Humidity	<85% RH Non-Condensing
	Protection Degree	IP20
Installation		DIN RAIL
Enclosure		ABS-V0
Size		23 x 113 x 110 mm.
Weight		155 g.

DIMENSION



DESCRIPTION

- is device which uses with RS-485 MODBUS PROTOCOL .
- Digital Input support NPN and PNP Open Collector, Isolated.
- Input Sensor NTC & PTC measure and display range -40 to 130 °C.
- Output NPN Open Collector, Isolated.
- 4 Mode for counter are Disable, Count Up and Count Up+Down, Count person through door.
- Operation via RS-485 MODBUS PROTOCOL.
- LED show Input and Output status

OPERATION

PH-09 has 4 isolate Input, 4NTC & PTC and 8 isolate output inside device. It can read and write data via RS-485 MODBUS PROTOCOL and Input can operate as Counter Function 32 Bit for Input from reading.

Digital Input Operation

PH-09 Input can use with Proximity Switch, Photo switch, Encoder etc. in NPN and PNP. Counter Function operation there are 4 modes
Mode 0: work as Digital Input read ON/OFF status only no count.
Mode 1: work as Digital Input read ON/OFF status and Function Counter up of each Input work on counted value. The value will save in 32 Bit Register of Counter 1 to Counter 8 Register.
Mode 2: work as Digital Input read status ON/OFF and Function Counter Up/Down by in this mode will use 2 Input for counting are
Input 1 to count up and Input 2 to count down. The value will be collected in Counter 1 register.
Input 3 to count up and Input 4 to count down. the value will be collected in Counter 2 Register.

Mode 3: for counting people pass through door by use Input channel 1 and 2 In case people walk through channel 1 firstly then walk through channel 2 by sort. Sum Counter A will plus one and time between Sensor Input 1 and 2 will less than time from setting or case of people walk pass Sensor channel 2 before then walk pass Input channel 1 by sort. Sum Counter A will minus one and Input channel 3 and 4 the value will be collected in Sum Counter B.

Input Filter (Input Filter operation form)

0 is able to read Input frequency maximum 1 KHz.
1 is able to read Input frequency maximum 10 KHz. if Input frequency over 10 Hz. The device cannot count value suit to count Switch type Input.

How to choose type of Input
- NPN : Input count when change from +12V to +24V go to 0V (Active Low)
- PNP : Input count when change from 0V to +24V go to 0V (Active High)

Digital Output operation
Output of PH-09 has 8 Output is NPN

Hour Counter Output (Minute Unit)
Enable Hour Counter

0 = Disable (Set Hour Counter Off)
1 = Enable (SetHour Counter On)

By Hour Counter Output each channel can set Set point when Hour Counter value equal to Set point. Hour Counter value will be reset equal to zero if set Set Point equal to zero the Hour Counter will count up continuously.

Device Address ID setting

OFF(0)	1	2	3	4	5	6	7	8
ON(1)	X1	X2	X3	X4	X5	X6	X7	X8
	1	2	4	8	16	32	64	128

Address = X1 + X2 + X3 + X4 + X5 + X6 + X7 + X8

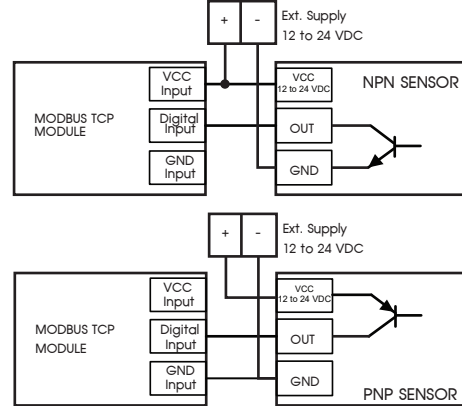
Example Device Address ID setting

Request to set Address to be 21 by choose switch as picture below

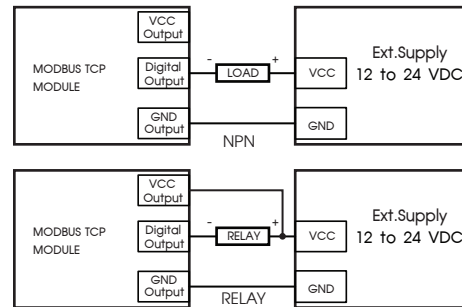
OFF(0)	1	2	3	4	5	6	7	8
ON(1)								

Address = 1 + 4 + 16 = 21

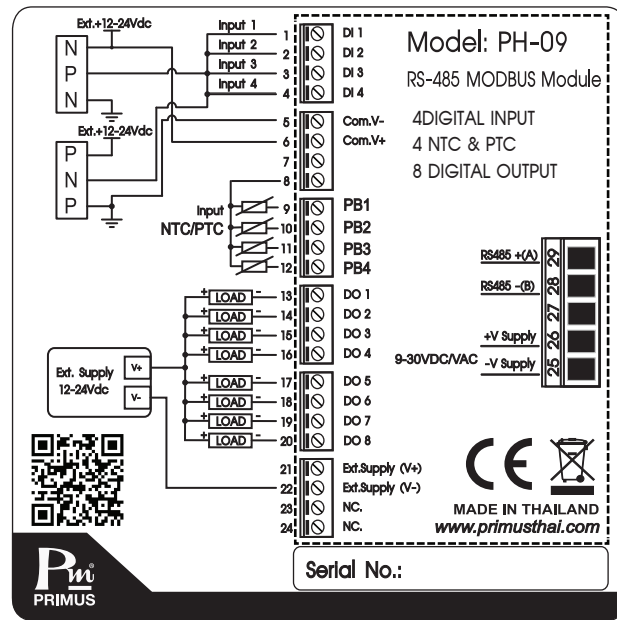
Input Wiring Diagram



Output Wiring Diagram

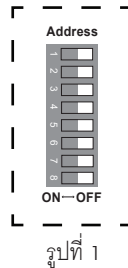


WIRING DIAGRAM



Reset Buad Rate, Parity, Stop bits

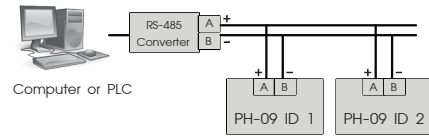
1. Set all Dip Switch Address of PH-09 Device to be OFF as picture 1 after slide Dip Switch to OFF wait 4 seconds until LED all ON continuously.
2. Start value after reset is
Buad Rate 9600, Parity None, Stop Bits 1



SERIAL COMMUNICATION

The PH-09 are Equipped With a RS-485 Series Communication Interface to Allow Connection to Computer or PLCs. MODBUS PROTOCOL is Provided as Standard Communication. The User Can Connect PH-01 as Network Up to 128 Meters.

Wiring Diagram



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 Can Selected Refer 22. Speed Setting The Format Is MODBUS RTU Refer 22. Speed Setting The Format Is MODBUS RTU UART Data Can Selected Refer 23. Communication Setting Data Is Considered To Be Half Duplex Using 2 Wire.

Modbus Function code

Function code	Operation	Broadcast
0x01	Read Coil Status	No
0x02	Read Input Status	No
0x03	Read Holding Registers	No
0x04	Read Multiple Registers	No
0x05	Force Single Coil	Yes
0x06	Preset Single Registers	Yes
0x0F	Force Multiple Coil	Yes
0x10	Preset Multiple Registers	Yes

Modbus Exception code

Code	Name	Meaning
01	ILLEGAL FUNCTION	The function code received in the query is not an allowable action for the server (or slave).
02	ILLEGAL DATA ADDRESS	The data address received in the data field is not an allowable value for server (or slave).
03	ILLEGAL DATA VALUE	A value contained in the query data field is not an allowable value for server (or slave).

Example of a client request and server exception response

Request		Response	
Field Name	(Hex)	Field Name	(Hex)
Slave Address	01	Slave Address	01
Function	04	Function	84
Starting Address Hi	00	Exception Code	02
Starting Address Lo	00	CRC Hi	C2
Quantity of Input Reg. Hi	00	CRC Lo	C1
Quantity of Input Reg. Lo	1E		
CRC Hi	70		
CRC Lo	02		

Input Registers

Modbus Address	Register Name	Low Limit	High Limit	Access
0	Digital Input 1	0	1	R
1	Digital Input 2	0	1	R
2	Digital Input 3	0	1	R
3	Digital Input 4	0	1	R

Coil Registers

Modbus Address	Register Name	Low Limit	High Limit	Access
0	Digital Output 1	0	1	R/W
1	Digital Output 2	0	1	R/W
2	Digital Output 3	0	1	R/W
3	Digital Output 4	0	1	R/W
4	Digital Output 5	0	1	R/W
5	Digital Output 6	0	1	R/W
6	Digital Output 7	0	1	R/W
7	Digital Output 8	0	1	R/W

ORDERING CODE

PH -

09

Data Registers

Modbus Address	Register Name	Low Limit	High Limit	Access	Format	Comment
0	Digital Input 1	0	1	R	Int	Status of Digital Inputs
1	Digital Input 2	0	1	R	Int	"
2	Digital Input 3	0	1	R	Int	"
3	Digital Input 4	0	1	R	Int	"
4	Digital Input	0	255	R	Int	"
5	Input Probe 1	-40	130	R	Int	
6	Input Probe 2	-40	130	R	Int	
7	Input Probe 3	-40	130	R	Int	
8	Input Probe 4	-40	130	R	Int	
9	Digital Output 1	0	1	R/W	Int	Status of Digital Outputs
10	Digital Output 2	0	1	R/W	Int	"
11	Digital Output 3	0	1	R/W	Int	"
12	Digital Output 4	0	1	R/W	Int	"
13	Digital Output 5	0	1	R/W	Int	"
14	Digital Output 6	0	1	R/W	Int	"
15	Digital Output 7	0	1	R/W	Int	"
16	Digital Output 8	0	1	R/W	Int	"
17	Digital Output	0	255	R/W	Int	"
18	Counter Mode	0	2	R/W	Int	0 = Disable 1 = Up Counting 2 = Up-Down Count 3 = นับคนผ่านประตู
19	Input Filter	0	1	R/W	Int	0 = Disable 1 = <10Hz
20	Time Delay	1	65535	R/W	Int	หน่วยวินาที
21	Type Input Prob	0	4	R/W	Int	0 : PTC 2K, 3 : NTC 10K 1 : PTC 10K, 4 : NTC 5K 2 : NTC 2K
22	Probe Offset	-200	200	R/W	Int	
23	Units Type	0	1	R/W	Int	0 = °C , 1 = °F
24	Enable Counter	0	1	R/W	Int	
25	Set Point Hour Counter 1	0	65535	R/W	Int	
26	Set Point Hour Counter 2	0	65535	R/W	Int	
27	Set Point Hour Counter 3	0	65535	R/W	Int	
28	Set Point Hour Counter 4	0	65535	R/W	Int	
29	Set Point Hour Counter 5	0	65535	R/W	Int	
30	Set Point Hour Counter 6	0	65535	R/W	Int	
31	Set Point Hour Counter 7	0	65535	R/W	Int	
32	Set Point Hour Counter 8	0	65535	R/W	Int	
33	Baud Rate	2400	57600	R/W	Int	2400, 4800, 9600, 19200, 38400, 57600
34	Parity	0	2	R/W	Int	0 = None 1 = Even 2 = Odd
35	Stop bits	1	2	R/W	Int	1 = 1 Stop bit 2 = 2 Stop bits
36	Delay Reply	0	255	R/W	Int	0 = Disable >0 = Enable.(x10 ms)
37	Software Version	n/a	n/a	R	Int	Software Version = 901

การคำนวณค่า Register ที่อ่านมาได้

Input Probe 1 = $\frac{\text{Input Probe 1 reg}}{10}$

Input Probe 2 = $\frac{\text{Input Probe 2 reg}}{10}$

Input Probe 3 = $\frac{\text{Input Probe 3 reg}}{10}$

Input Probe 4 = $\frac{\text{Input Probe 4 reg}}{10}$

Data Registers

Modbus Address	Register Name	Low Limit	High Limit	Access	Format	Comment
256	Counter 1 MSB	-2147483648	2147483647	R/W	long	Counter MSB and LSB combine to give 32 bit Counter
257	Counter 1 LSB					
258	Counter 2 MSB	-2147483648	2147483647	R/W	long	
259	Counter 2 LSB					
260	Counter 3 MSB	-2147483648	2147483647	R/W	long	
261	Counter 3 LSB					
262	Counter 4 MSB	-2147483648	2147483647	R/W	long	
263	Counter 4 LSB					
264	Sum Counter A MSB	-2147483648	2147483647	R/W	long	
265	Sum Counter A LSB					
266	Sum Counter B MSB	-2147483648	2147483647	R/W	long	
267	Sum Counter B LSB					
268	Hour Counter 1 MSB	0	4294967295	R/W	long	หน่วย, นาที
269	Hour Counter 1 LSB					
270	Hour Counter 2 MSB	0	4294967295	R/W	long	
271	Hour Counter 2 LSB					
272	Hour Counter 3 MSB	0	4294967295	R/W	long	
273	Hour Counter 3 LSB					
274	Hour Counter 4 MSB	0	4294967295	R/W	long	
275	Hour Counter 4 LSB					
276	Hour Counter 5 MSB	0	4294967295	R/W	long	
277	Hour Counter 5 LSB					
278	Hour Counter 6 MSB	0	4294967295	R/W	long	
279	Hour Counter 6 LSB					
280	Hour Counter 7 MSB	0	4294967295	R/W	long	
281	Hour Counter 7 LSB					
282	Hour Counter 8 MSB	0	4294967295	R/W	long	
283	Hour Counter 8 LSB					



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