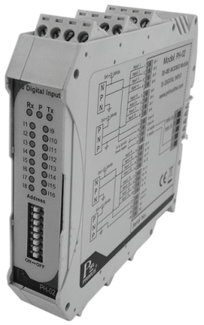
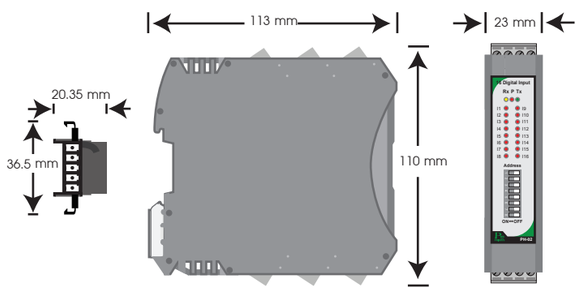
PH-02 16 DIGITAL INPUT MODULE



TECHNICAL SPECIFICATION

Power Supply		9-30 VAC/VDC
Power Consumption		2 VA
Display		LED
Input	Inputs Points	16
	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
Communication	PROTOCOL	MODBUS RTU
	Baud Rate	2400, 4800, 9600, 19200 38400, 57600
	Parity	None , Even , Odd
	Stop Bits	1, 2
	Data Bits	8
	Maximum Support Node	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		IP20
Installation		DIN RAIL
Enclosure		ABS-V0
Size		23 x 113 x 110 mm.
Weight		150 g.

DIMENSION



DESCRIPTION

- is the deivce that use with RS-485 MODBUS PROTOCOL 16 Input system.
- Input support NPN and PNP Open Collector, Isolated
- 3 Mode for Counter are Disable, Count Up and Count Up + Down
- Operate via RS-485 MODBUS PROTOCOL
- LED show status each input

OPERATION

PH-02 has 16 Isolate Input inside can read and write data via RS-485 MODBUS PROTOCOL and Input can operate as Counter Function 32 Bit for counting Input from measuring.

Digital Input Operation

Input of PH-02 can use with Proximity Switch, Photo Switch, Encoder etc. both NPN and PNP by operating of Counter Function. There are 3 mode are

Mode 0 : Operate as Digital Input read status ON/OFF only without counting.

Mode 1 : Operate as Digital Input read status ON/OFF and Function Counter Up of each Input operate too. Measured value will collect in 32 Bit Register of Counter 1 to counter 16 Register.

Mode 2 : Operate as Digital Input read status ON/OFF and Function Counter Up/ Down by this mode will use 2 Input to count are

Input 1 For count up and Input 2 for count down value collected in Counter 1 Register
Input 3 For count up and Input 4 for count down value collected in Counter 2 Register
Input 5 For count up and Input 6 for count down value collected in Counter 3 Register
Input 7 For count up and Input 8 for count down value collected in Counter 4 Register
Input 9 For count up and Input 10 for count down value collected in Counter 5 Register
Input 11 For count up and Input 12 for count down value collected in Counter 6 Register
Input 13 For count up and Input 14 for count down value collected in Counter 7 Register
Input 15 For count up and Input 16 for count down value collected in Counter 8 Register

Input Filter (Functional characteristics of Input Filter)

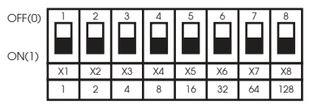
0 is can read frequency Input maximum 1 KHz

1 is can read frequency Input maximum 10 Hz If Input frequency over 10 Hz device can not count the value suitable for counting Input in Switch type.

How to choose Type of Input

- NPN : Input count when it had changed from +12V to +24V to be 0V (Active Low)
- PNP : Input count when it had changed from 0V to be +12V to +24V (Active High)

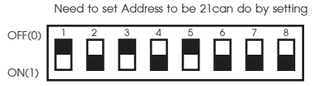
Device Address ID SETTING



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

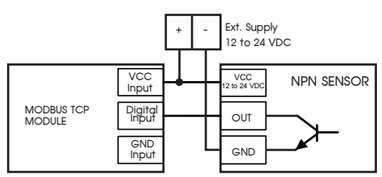
Example Device Address ID setting

Need to set Address to be 21can do by setting switch as below.

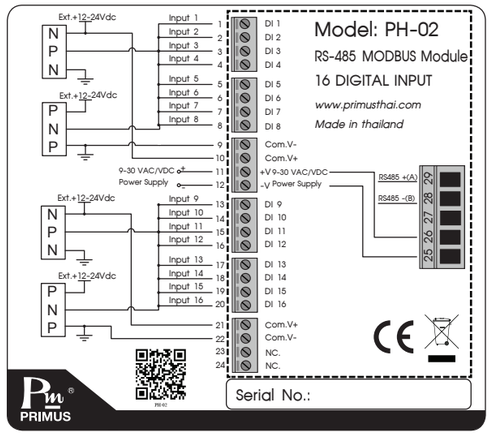


Address = 1 + 4 + 16 = 21

Input Pattern



WIRING DIAGRAM



SERIAL COMMUNICATION

The PH-02 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-02 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	Brodcast
0x02	Read Input Status	No
0x03	Read Holding Registers	No
0x04	Read Multiple Registers	No
0x06	Preset Single Registers	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

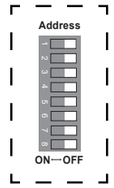
Request		Response	
Field Name	(Hex)	Field Name	(Hex)
Slave Address	01	Slave Address	01
Function	04	Function	84
Starting Address Hi	00	Exception Code	02
Starting Address Lo	00	CRC Hi	C2
Quantity of Input Reg. Hi	00	CRC Lo	C1
Quantity of Input Reg. Lo	1E		
CRC Hi	70		
CRC Lo	02		

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
4	Digital Input 5	0	1	R
5	Digital Input 6	0	1	R
6	Digital Input 7	0	1	R
7	Digital Input 8	0	1	R
8	Digital Input 9	0	1	R
9	Digital Input 10	0	1	R
10	Digital Input 11	0	1	R
11	Digital Input 12	0	1	R
12	Digital Input 13	0	1	R
13	Digital Input 14	0	1	R
14	Digital Input 15	0	1	R
15	Digital Input 16	0	1	R

Reset Buad Rate, Parity, Stop bits

1. Set Dip Switch Address of device PH-02 to be all OFF as picture 1 after slide Dip Switch to be OFF wait for 4 seconds until all LED on
2. The default value after Reset is Buad Rate 9600, Parity None, Stop Bits 1



Picture1

ORDERING CODE

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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 5	0	1	R	Int	"
5	Digital Input 6	0	1	R	Int	"
6	Digital Input 7	0	1	R	Int	"
7	Digital Input 8	0	1	R	Int	"
8	Digital Input 9	0	1	R	Int	"
9	Digital Input 10	0	1	R	Int	"
10	Digital Input 11	0	1	R	Int	"
11	Digital Input 12	0	1	R	Int	"
12	Digital Input 13	0	1	R	Int	"
13	Digital Input 14	0	1	R	Int	"
14	Digital Input 15	0	1	R	Int	"
15	Digital Input 16	0	1	R	Int	"
16	Counter Mode	0	2	R/W	Int	0 = Disable 1 = Up Counting 2 = Up-Down Count
17	Input Filter	0	1	R/W	Int	0 = Disable 1 = <10 Hz
18	Baud Rate	2400	57600	R/W	Int	2400, 4800, 9600, 19200 38400, 57600
19	Parity	0	2	R/W	Int	0 = None 1 = Even 2 = Odd
20	Stop bits	1	2	R/W	Int	1 = 1 Stop bit 2 = 2 Stop bits
21	Delay Reply	0	255	R/W	Int	0 = Disble > 0 = Enable.(x10 ms)
22	Sofware Version	n/a	n/a	R	Int	Sofwaer Version = 201

Data Registers

Modbus Address	Register Name	Low Limit	High Limit	Access	Format	Comment
256	Counter 1 MSB	0	4294967295	R/W	long	Counter MSB and LSB combine to give 32 bit Counter with range 0 to 4294967295.
257	Counter 1 LSB					
258	Counter 2 MSB	0	4294967295	R/W	long	
259	Counter 2 LSB					
260	Counter 3 MSB	0	4294967295	R/W	long	
261	Counter 3 LSB					
262	Counter 4 MSB	0	4294967295	R/W	long	
263	Counter 4 LSB					
264	Counter 5 MSB	0	4294967295	R/W	long	
265	Counter 5 LSB					
266	Counter 6 MSB	0	4294967295	R/W	long	
267	Counter 6 LSB					
268	Counter 7 MSB	0	4294967295	R/W	long	
269	Counter 7 LSB					
270	Counter 8 MSB	0	4294967295	R/W	long	
271	Counter 8 LSB					
272	Counter 9 MSB	0	4294967295	R/W	long	
273	Counter 9 LSB					
274	Counter 10 MSB	0	4294967295	R/W	long	
275	Counter 10 LSB					
276	Counter 11 MSB	0	4294967295	R/W	long	
277	Counter 11 LSB					
278	Counter 12 MSB	0	4294967295	R/W	long	
279	Counter 12 LSB					
280	Counter 13 MSB	0	4294967295	R/W	long	
281	Counter 13 LSB					
282	Counter 14 MSB	0	4294967295	R/W	long	
283	Counter 14 LSB					
284	Counter 15 MSB	0	4294967295	R/W	long	
285	Counter 15 LSB					
286	Counter 16 MSB	0	4294967295	R/W	long	
287	Counter 16 LSB					
288	Digital Inputs MSB	0	4294967295	R/W	long	Digital Input 16 bits. Input 1-16
289	Digital Inputs LSB					

PH-02

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