

THD/THDV/THPD/DPD Display Screen For Temp./ Humidity / Diff. Pressure



Applications & Features

- Temperature/humidity: good for monitoring temperature/humidity in factories, libraries, museums, computer rooms, laboratories, warehouses, etc.
- Differential pressure: good for monitoring differential pressure in clean rooms, laboratories, pharmaceutical plants, operating rooms, infectious wards, isolation rooms, etc.
- High accuracy digital sensor, field changeable without any re-calibration
- Large, high light LED display
- Multiple inputs and outputs selection
- Light and up-to-date enclosure
- Single point temperature, humidity or DP measurement and display
- Multiple points temperature, humidity and DP measurement, display and network collection
- Compatible to DDC and PLC systems
- Built-in alarm buzzer

Models

Model	THD	THDV	THPD	DPD	Temp/Hum Display Screen(Horizontal) Temp/Hum Display Screen(Vertical) Temp/Hum /DP Display Screen DP Display Screen
Input			0		Remote sensor, 1.5m cable 0-10V/4-20mA input, without sensor Built-in sensor (differential pressure, only for DPD) RS485/Modbus RTU input, without sensor
			1		
			2		
			8		
Output			0		without any output 0-10V/4-20mA* RS485, Modbus RTU 0-10V/4-20mA*, RS485/Modbus RTU
			1		
			8		
			B		
Relay			0		N/A 1xSPDT+ inside buzzer
			1		

*All products are factory set to 4-20mA as output default, and can be ordered as 0-10V.

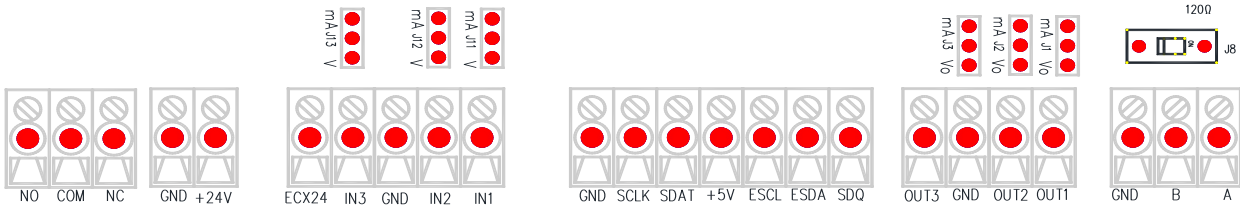
Specifications

	THD	THDV	THPD	DPD
Application	Clean room, library, museum, lab, etc.		Clean room, lab, pharmaceutical plant, infectious ward, isolation room, etc.	
Function	Single point or multiple points network data measurement and display			
Power	85~265VAC			
Consumption	<15W		<15W	
Display	3 Bit 4 inch red LED			
Display Resolution	0.1°C,0.1%RH		0.1°C,0.1%RH,0.1Pa	
Display Range	0~50.0°C,0~99.9%RH		0~50.0°C,0~99.9%RH,0~99.9 Pa	
Display Accuracy (with matched sensors)	<±0.4°C @5-50°C <±3%RH@20-80%RH, 25°C		<±0.4°C @5~50°C <±3%RH@20~80%RH, 25°C <±1Pa @0~99.9Pa, 25°C	
Display Accuracy (with standard inputs)	1%FS			
Response Time (with matched sensors)	Temp. 30s, Hum.10s		Temp. 30s, Hum. 10s, DP 5s	
Sensor	THD-S T/RH sensor		THD-S T/RH sensor, DPT DP transmitter	
Standard Input	2x0-10V/4-20mA(2-10V)		3x0-10V/4-20mA(2-10V)	
Standard Output	2x0-10V/4-20mA		3x0-10V/4-20mA	
Communication	RS485/Modbus RTU, 9600-n-8-1, support read/output and write/input parameters			
Dimension	W715*H285*D50mm	W470*H400*D50mm	W470*H650*D50mm	W470*H285*D50mm
Weight	3.8kg	3.9kg	5.2kg	2.5kg
Material	Dull silver color aluminum alloy frame, PC panel with PVC film			
Protection	IP30			
Installation	Wall mount or suspend from ceiling			
Buttons & Functions	Three buttons with parameters calibration, buzzer/relay parameters set, RS485 address set, input signals/ranges set, output ranges set, LED inspection, restore default set, etc.			

Connection

Different models have different electrical terminals. Please wire specific model according to the wiring diagram inside the front cover.

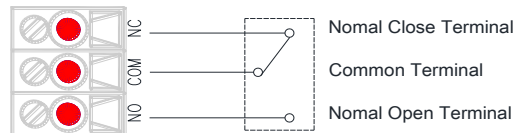
1.THD/THDV/THPD Internal terminal



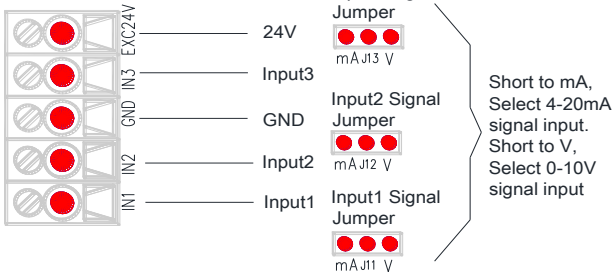
Power(Connect to inside power)



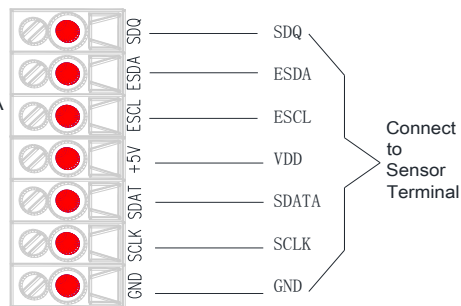
Relay output



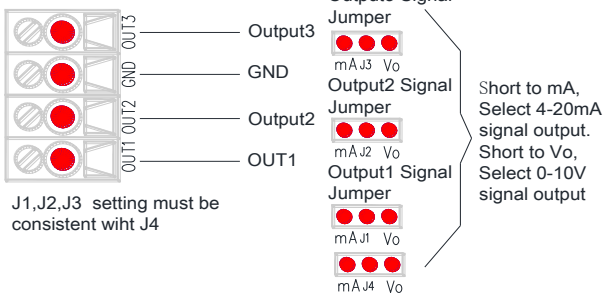
Universal Input



Temperature/Humidity Sensor Input



Universal Output



RS485

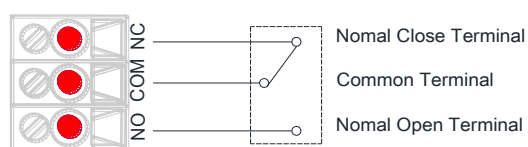


DPD Internal terminal

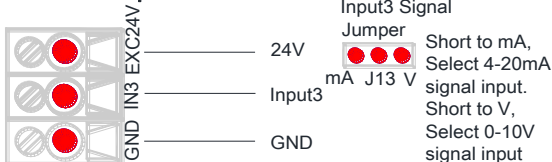
Power(Connect to inside power)



Relay output



Universal Input



Universal Output



RS485



2. External cable

The internal terminals of the product are connected to the outside facilities through a multi-core external cable.

Different models should have different external cables with different core numbers. Please wire specific model according to the wiring diagram inside the front cover.

Power cable: Input voltage 110V/220VAC

3. THD/THDV/THPD/DPD matched sensors

THD0xx/THDV0xx/THPD0xx has a matched T/RH sensor. The sensor has the same terminals as the THD0xx/ THDV0xx/ THPD0xx. So user can connect the two easily.

THPD0xx /DPD0xx also has a matched differential pressure sensor, 4-20mA (2 wires) (accuracy, ± 1 Pa). It should connect to the inside terminal AIN3 with power supply connected to EXC+ (+24V) and the jumper of J13 setted to mA position.

4. External universal input signal (default 4~20mA)

External universal input signals use AIN1/2 for THD/THDV and AIN1/2/3 for THPD respectively, and DPD only needs to connect AIN3. J11/12/13 should be at the mA position for 4-20mA signals and at the V position for 0-10V signals.

If the factory default value is changed, the corresponding parameters such as the parameters in P111, P112, and P113(DPD only needs to set P113) need to be modified. See the user instruction for details.

5. MODBUS/RS485 communication

RS485 communication inputs/outputs use terminals A/B/GND and the 120 Ω terminal resistance jumper J8.

RS485 interface can be networked with other devices, and can also be used to modify the product parameters. See the Modbus RTU/RS485 communication register address and instructions for details.

THD/THDV/THPD/DPD Modbus Register Address

Register	R/W	Define	Remark
40001, 00000	R	Product code	Product code
40002, 00001	R	Chanel 1 value	Chanel 1 value, temperature for matched sensor
40003, 00002	R	Chanel 2 value	Chanel 2 value, humidity for matched sensor
40004, 00003	R	Chanel 3 value	Chanel 3 value, pressure for matched sensor

Remarks: 40001...PLC ADDRESS (BASE 1) 00000...PROTOCOL ADDRESS (BASE 0). Both address types are applicable for our products

6. External universal output signal (default 4~20mA)

External universal output signals use OUT1/2 for THD/THDV, OUT1/2/3 for THPD and OUT3 for DPD respectively, J1/2/3 should be at the mA position for 4-20mA signals and at the Vo position for 0-10V signals.

If the factory default value is changed, the corresponding parameters such as the parameters in P091, P092, and P093, need to be modified. See the user instruction for details.

Installation

- The product is limited to install in indoor environment for wall mount or from the ceiling.
- It has been calibrated in factory. Install the T/RH and pressure sensor away from the screen with the cable downward. Sensors must be far away from frequent human activity area and source of cold, heat, humidity and air-condition outlet. And make sure the ventilation of the sensor is good. Please note that the displays are temperature, humidity or pressure at the location of sensors, not the location of screen. Therefore suitable location of the sensor box is important for using the product correctly.
- Temperature and humidity sensor cable or pressure sensor cable is 1.5m long preinstalled in factory. It's not recommended to extend the cables. But if necessary, user can extend the cables no more than 10m long following connection guideline while power off the product.
- The product will work normally and steadily after power on about 30s.
- At the side frame of the screen, there are 3 buttons used for parameters setting and calibration. Although the product has been calibrated in factory, if necessary, the calibration can be operated by experience customer following operating guideline.
- After long period of working, the sensor perhaps will have little drift. User should re-calibrate the sensor in every one or two years.
- Standard manometer is needed to calibrate the sensor. The manometers must be within warranty period and have high accuracy (better than 1.0%RH, 0.15 $^{\circ}$ C and 0.25Pa). Otherwise calibration should be invalid. If standard manometers are not available, we recommend user to replace new sensors. User doesn't need to re-calibrate these new sensors after replacing old ones in field. This feature is one of the advantages of the product that other traditional products cannot offer.

Warranty

Device has limited warranty for 18 months

User operation instructions

Buttons and define: ● set/confirm ▲(Bit) select ▼ adjust

Operation process:

- Push ● to enter process and display "P000",
- Push ▲ and ▼ to enter corresponding code,
- Push ● to confirm and then display corresponding parameter,
- Push ▲ and ▼ to adjust parameter,
- Push ● to confirm and exit process.
- Quit process if idle exceed about 10s.

- (1). "P999": Restore default factory settings.
●→▲/▼→999→●
- (2). "P485": RS485 address set (default 1, range 1~255, suggested range1~32)
●→▲/▼→485→●→▲/▼→XXX→● "XXX" means setting parameter.
- (3). "P111": Chanel 1 input set
●→▲/▼→111→●→▲/▼→XXX^{*1}→●→▲/▼→XXX^{*2}→●→▲/▼→XXX^{*3}→●→▲/▼→ XXX^{*4}→●→▲/▼→XXX^{*5}→●
"XXX" means:
*1: Input mode(0=matched sensor, 1=universal analog input 0-10V, 2= Modbus input, 3=universal analog input 4-20mA,);
*2: Input low voltage(0 for 0-10V input, 4 for 4-20mA input)
*3: Input high voltage(10 for 0-10V input, 20 for 4-20mA input);
*4: Input low range;
*5: Input high range (greater than the low range).
J11/12/13 should be at the mA position for 4-20mA signals and at the V position for 0-10V signals.
- (4). "P112": Chanel 2 input set
●→▲/▼→112→●→▲/▼→XXX^{*1}→●→▲/▼→XXX^{*2}→●→▲/▼→XXX^{*3}→●→▲/▼→ XXX^{*4}→●→▲/▼→XXX^{*5}→●
Refer P111.
- (5). "P113": Chanel 3 input set
●→▲/▼→113→●→▲/▼→XXX^{*1}→●→▲/▼→XXX^{*2}→●→▲/▼→XXX^{*3}→●→▲/▼→ XXX^{*4}→●→▲/▼→XXX^{*5}→●
Refer P111.
- (6). "P161": Chanel 1 calibrate (default 0.0, range-99.9~+99.9)
●→▲/▼→161→●→▲/▼→XXX→● "XXX" means setting parameter.
- (7). "P162": Chanel 2 calibrate (default 0.0, range-99.9~+99.9)
●→▲/▼→162→●→▲/▼→XXX→● "XXX" means setting parameter.
- (8). "P163": Chanel 3 calibrate (default 0.0, range-99.9~+99.9)
●→▲/▼→163→●→▲/▼→XXX→● "XXX" means setting parameter.
- (9). "P091": Chanel 1 Output set(default 4-20mA, 0-50℃)
●→▲/▼→091→●→▲/▼→XXX^{*1}→●→▲/▼→XXX^{*2}→●→▲/▼→XXX^{*3}→●
"XXX" means:
*1: Output mode(0: 0-10V; 1: 4-20mA);
*2: Output low range;
*3: Output high range
J1/2/3 should be at the mA position for 4-20mA signals and at the Vo position for 0-10V signals
- (10). "P092": Chanel 2 Output set(default 4-20mA, 0-100%RH)
●→▲/▼→092→●→▲/▼→XXX^{*1}→●→▲/▼→XXX^{*2}→●→▲/▼→XXX^{*3}→●. Refer P091
- (11). "P093": Chanel 3 Output set(default 4-20mA, 0-125Pa)
●→▲/▼→093→●→▲/▼→XXX^{*1}→●→▲/▼→XXX^{*2}→●→▲/▼→XXX^{*3}→●. Refer P091
- (12). "P301": Chanel 1 alarm buzzer set(default 0, 10 , 40)
●→▲/▼→301→●→▲/▼→XXX^{*1}→●→▲/▼→XXX^{*2}→●→▲/▼→XXX^{*3}→●
"XXX" means:
*1: Alarm mode(0: disable; 1: enable);
*2: Alarm low limit;
*3: Alarm high limit;
The alarm mode: out-of-range, < low limit or > high limit. Keep pushing ▼ 2s to mute buzzer.
- (13). "P302": Chanel 2 alarm buzzer set(default 0, 20 , 80)
●→▲/▼→302→●→▲/▼→XXX^{*1}→●→▲/▼→XXX^{*2}→●→▲/▼→XXX^{*3}→●. Refer P301
- (14). "P303": Chanel 3 alarm buzzer set(default 0, 20 , 80)
●→▲/▼→303→●→▲/▼→XXX^{*1}→●→▲/▼→XXX^{*2}→●→▲/▼→XXX^{*3}→●. Refer P301
- (15). "P401": Chanel 1 alarm relay set(default 0, 10 , 40)
●→▲/▼→401→●→▲/▼→XXX^{*1}→●→▲/▼→XXX^{*2}→●→▲/▼→XXX^{*3}→●
"XXX" means:

- *1: Alarm mode(0: disable; 1: enable);
- *2: Alarm low limit;
- *3: Alarm high limit;

The alarm mode: out-of-range, < low limit or > high limit. Keep pushing ▲ 2s to reset relay.

- (16). "P402": Chanel 2 alarm relay set(default 0, 20 , 80)
 ●→▲/▼→402→●→▲/▼→XXX*¹→●→▲/▼→XXX*²→●→▲/▼→XXX*³→●. Refer P401
- (17). "P403": Chanel 3 alarm relay set(default 0, 20 , 80)
 ●→▲/▼→403→●→▲/▼→XXX*¹→●→▲/▼→XXX*²→●→▲/▼→XXX*³→●. Refer P401
- (18). "P097": Relay reset delay time (default 3.0 min, range0.0~99.9 min)
 ●→▲/▼→097→●→▲/▼→XXX→● "XXX" means setting parameter.
- (19). "P801": Chanel 1 display decimal set(default 1, range 0-3)
 ●→▲/▼→801→●→▲/▼→XXX→● "XXX" means setting parameter.
 0: no decimal, 1: one decimal, 2: two decimal, 3: three decimal.
- (20). "P802": Chanel 2 display decimal set(default 1, range 0-3)
 ●→▲/▼→801→●→▲/▼→XXX→● Refer P801
- (21). "P803": Chanel 3 display decimal set(default 1, range 0-3)
 ●→▲/▼→801→●→▲/▼→XXX→● Refer P801
- (22). "P811": Chanel 1 response time set(default 0, range 0-9)
 ●→▲/▼→811→●→▲/▼→XXX→● "XXX" means setting parameter.
 0: 500mS, 1: 1S, 2: 1.5S, 3: 2S, 4: 2.5S, 5: 3S, 6: 3.5S, 7: 4S, 8: 4.5S, 9: 5S.
- (23). "P811": Chanel 2 response time set(default 0, range 0-9)
 ●→▲/▼→811→●→▲/▼→XXX→● Refer P811
- (24). "P811": Chanel 3 response time set(default 0, range 0-9)
 ●→▲/▼→811→●→▲/▼→XXX→● Refer P811

THD/THDV/THPD/DPD Modbus Register Address

Register	R/W	Define	Remark
40001	R	Product code	Product code
40002	R	Chanel 1 value	Temp. = 40002 data / 10 ^x ,x= decimal point
40003	R	Chanel 2 value	Hum.= 40003 data / 10 ^x ,x= decimal point
40004	R	Chanel 3 value	Press = 40004data / 10 ^x ,x= decimal point
40005	R	Chanel 1 display decimal	0: no decimal, 1: one decimal, 2: two decimal, 3: three decimal
40006	R	Chanel 2 display decimal	0: no decimal, 1: one decimal, 2: two decimal, 3: three decimal
40007	R	Chanel 3 display decimal	0: no decimal, 1: one decimal, 2: two decimal, 3: three decimal
...
40016	R/W	Restore default	Write 21845 to restore default
40017	R/W	Chanel 1 output type	0: 0-10Vdc; 1: 4-20mA
40018	R/W	Chanel 1 output low range	40018 data/ 10
40019	R/W	Chanel 1 output high range	40019 data/ 10
40020	R/W	Chanel 1 calibration	40020 data/ 10
40021	R/W	Chanel 1 relay action	0: disable; 1: enable
40022	R/W	Chanel 1 relay low limit	40022 data/ 10
40023	R/W	Chanel 1 relay high limit	40023 data/ 10
40024	R/W	Chanel 1 buzzer alarm	0: disable; 1: enable
40025	R/W	Chanel 1 buzzer low limit	40025 data/ 10
40026	R/W	Chanel 1 buzzer high limit	40026 data/ 10
40027	R/W	Chanel 1 input type	0: matched sensor; 1: external universal analog input
40028	R/W	Chanel 1 input low voltage	40028 data/ 10
40029	R/W	Chanel 1 input high voltage	40029 data/ 10
40030	R/W	Chanel 1 input low range	40030 data/ 10 (external universal analog input)
40031	R/W	Chanel 1 input high range	40031 data/ 10 (external universal analog input)
40032	R/W	RS485 address	Modbus slave address
40033	R/W	Chanel 2 output type	Refer channel 1
40034	R/W	Chanel 2 output low range	Refer channel 1
40035	R/W	Chanel 2 output high range	Refer channel 1
40036	R/W	Chanel 2 calibration	Refer channel 1
40037	R/W	Chanel 2 relay action	Refer channel 1
40038	R/W	Chanel 2 relay low limit	Refer channel 1
40039	R/W	Chanel 2 relay high limit	Refer channel 1
40040	R/W	Chanel 2 buzzer alarm	Refer channel 1

40041	R/W	Chanel 2 buzzer low limit	Refer channel 1
40042	R/W	Chanel 2 buzzer high limit	Refer channel 1
40043	R/W	Chanel 2 input type	Refer channel 1
40044	R/W	Chanel 2 input low voltage	Refer channel 1
40045	R/W	Chanel 2 input high voltage	Refer channel 1
40046	R/W	Chanel 2 input low range	Refer channel 1
40047	R/W	Chanel 2 input high range	Refer channel 1
40048	R/W	Relay reset delay time	
40049	R/W	Chanel 3 output type	Refer channel 1
40050	R/W	Chanel 3 output low range	Refer channel 1
40051	R/W	Chanel 3 output high range	Refer channel 1
40052	R/W	Chanel 3 calibration	Refer channel 1
40053	R/W	Chanel 3 relay action	Refer channel 1
40054	R/W	Chanel 3 relay low limit	Refer channel 1
40055	R/W	Chanel 3 relay high limit	Refer channel 1
40056	R/W	Chanel 3 buzzer alarm	Refer channel 1
40057	R/W	Chanel 3 buzzer low limit	Refer channel 1
40058	R/W	Chanel 3 buzzer high limit	Refer channel 1
40059	R/W	Chanel 3 input type	Refer channel 1
40060	R/W	Chanel 3 input low voltage	Refer channel 1
40061	R/W	Chanel 3 input high voltage	Refer channel 1
40062	R/W	Chanel 3 input low range	Refer channel 1
40063	R/W	Chanel 3 input high range	Refer channel 1
...
40084	R/W	Channel1 Modbus input value	06 function, data = value *10
40085	R/W	Channel1 Modbus input value	06 function, data = value *10
40086	R/W	Channel1 Modbus input value	06 function, data = value *10
40087	R/W	Chanel 1 display decimal	0: no decimal, 1: one decimal, 2: two decimal, 3: three decimal
40088	R/W	Chanel 2 display decimal	0: no decimal, 1: one decimal, 2: two decimal, 3: three decimal
40089	R/W	Chanel 3 display decimal	0: no decimal, 1: one decimal, 2: two decimal, 3: three decimal
40090	R/W	Channel1 response time	0: 500mS, 1: 1S, 2: 1.5S, 3: 2S,
40091	R/W	Channel2 response time	0: 500mS, 1: 1S, 2: 1.5S, 3: 2S,
40092	R/W	Channel3 response time	0: 500mS, 1: 1S, 2: 1.5S, 3: 2S,

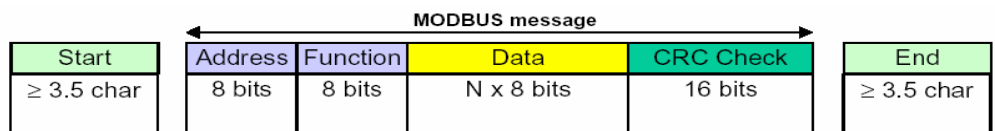
Remarks: 40001...PLC ADDRESS (BASE 1) or 00000...PROTOCOL ADDRESS (BASE 0)

Both address types are applicable for our products.

RS485- Modbus RTU

Communication setting

- 1.1 Band rata: 9600
- 1.2 Data: 8Bit
- 1.3 Stop: 1
- 1.4 Parity: None
- 1.5 Protocol: Modbus RTU



RTU message frame							
Address	Function Code		Data1	...	Data N	CEC high post	CRC low post
Address Domain	Function Domain	Information Data				Wrong Inspection Domain	

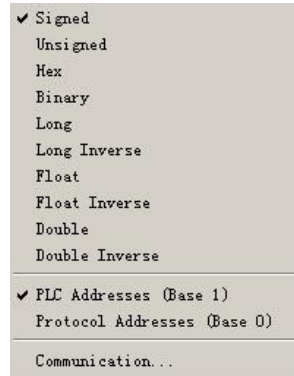
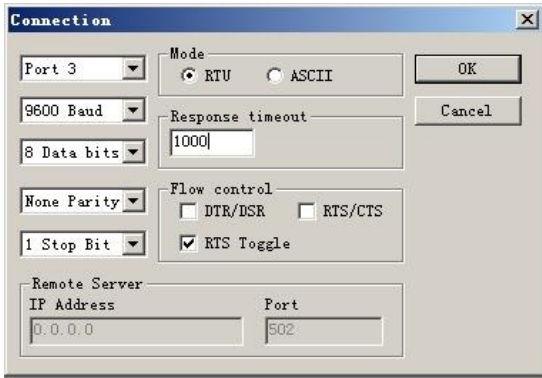
In the mode of Modbus RTU, message starting with a silent interval of at least 3.5 character times implemented as a multiple of character times at the baud rate being used on the network (indicated as above).The first field transmitted is the device address. The allowable characters transmitted for all fields are hexadecimal values 0-9, A-F. Following the last character transmitted, a similar silent interval of 3.5 character times marks the end of the message and a new message can begin after this interval.

Modbus Address

The Modbus RTU message frame first field is the device address. Valid addresses are from 0-255. A networked device continuously monitors the network, including the silent intervals, and when the first field is received (the address) after a silent interval of at least 3.5 character times, the device decodes it to determine if it is the addressed device. Slave address can be setting with compatible Modbus RTU software. Default address = 1, suggested 1-32.

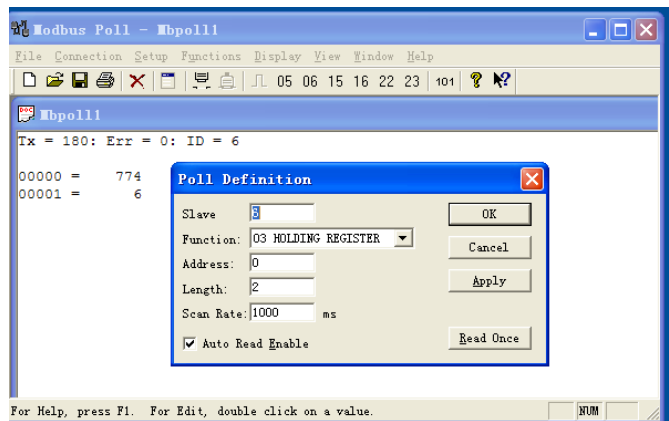
Modbus Function

The function code field of the message frame contains 8 binary bits (in RTU Mode) which tells the slave what kind of action to take. Valid function codes are from 0-127 (01H~7FH). See the relevant Modbus standard. products support 03H/06H function codes. Appendix is the register address table. Or refer specific product instructions.



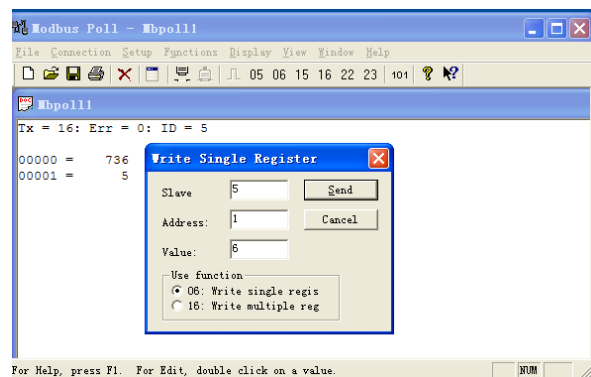
03H Read Holding Registers

Sample: Read device (ID=5) registers 00000-00001
 Set as shown right.
 Slave address: 5
 Function: 03
 Register started address: 0
 Register reading length:2
 Scan rate:1000 ms
 Communication codes:
 Master / PC to SLAVE: 05 03 00 00 00 02 C5 8F
 SLAVE to Master / PC: 05 03 04 02 B5 00 05 6F AE



06H Preset Single Register

Sample: Set device (ID=5) registers 000001
 Set as shown right.
 Slave address: 5
 Function: 06
 Register address: 0001
 Set value: 0006
 Communication codes:
 Master / PC to SLAVE: 05 06 00 01 00 06 59 8C
 SLAVE to Master / PC: 05 06 00 01 00 06 59 8C



Shenzhen TEREN Control Technology Co. Ltd.
 Add: 3F, 2nd Industrial Zone, Nankeng, Longgang District, Shenzhen,Guangdong,P.R.CHINA
 Tel: 0755-23935155 Fax: 0755-23935156
 web: www.teren.com.cn



TEREN website



Alibaba shop