TQ01
Weather multi-element shutters Instruction Manual (Type 485)

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1. product description

1.1product description

This integrated louver box can be widely used in environmental detection, integrating noise collection, PM2.5 and PM10, temperature and humidity, atmospheric pressure, and light. It is installed in the louver box. The equipment adopts standard MODBUS-RTU communication protocol and RS485 signal output. , The maximum communication distance can reach 2000 meters (measured). The transmitter is widely used in various occasions that need to measure environmental temperature and humidity, noise, air quality, atmospheric pressure and illumination, etc. It is safe and reliable, beautiful in appearance, easy to install, and durable.

1.2 Features

This product is small in size and light in weight. It is made of high-quality anti-ultraviolet materials and has a long service life. It uses a high-sensitivity probe with stable signal and high accuracy. The key components adopt imported components, which are stable and reliable, and have the characteristics of wide measurement range, good linearity, good waterproof performance, convenient use, easy installation, and long transmission distance.

1. Noise collection, accurate measurement, range up to 30dB~120dB.
2. PM2.5 and PM10 are collected at the same time, range: 0-1000ug/m3, resolution 1ug/m3, unique dual-frequency data collection and automatic calibration technology, the consistency can reach ±10%.
3. Measure the environmental temperature and humidity, the measurement unit is imported from Switzerland, the measurement is accurate, and the range is -40 to 120 degrees.
4. Wide range 0-120Kpa air pressure range, applicable to various altitudes.
5. The light collection module adopts a high-sensitivity photosensitive probe, and the light intensity range is 0~200,000 Lux.
6. Using dedicated 485 circuit, stable communication, 10~30V wide voltage range power supply.

1.3 Main Specifications

DC power supply (default)	10-30VDC	
Maximum power consumption	RS485 output	0.8W
precision	humidity	±3%RH(60%RH,25℃)
	temperature	±0.5℃（25℃）
	light intensity	±7%(25℃)
	Atmospheric	±0.15Kpa@25℃ 101Kpa

	pressure	
	noise	±0.5dB (at reference pitch, 94dB@1kHz)
	CO2	±(50ppm+ 3%F·S) (25℃)
range	humidity	0%RH~99%RH
	temperature	-40℃~+120℃
	light intensity	0~200000 Lux
	Atmospheric pressure	0-120Kpa
	noise	30dB~130dB
	CO2	0-5000ppm
long term stability	temperature	≤0.1℃/y
	humidity	≤1%/y
	light intensity	≤5%/y
	Atmospheric pressure	-0.1Kpa/y
	noise	≤3db/y
	CO2	≤1%/y
Response time	Temperature and humidity	≤1s
	light intensity	≤0.1s
	Atmospheric pressure	≤1s
	noise	≤1s
	CO2	≤2S
output signal	RS485 output	RS485 (standard Modbus communication protocol)

2. Equipment installation instructions

2.1 Inspection before equipment installation

Equipment List:

1 transmitter equipment

USB to 485 (optional)

Warranty card, certificate of conformity, after-sales service card, etc.

2.2 Interface Description

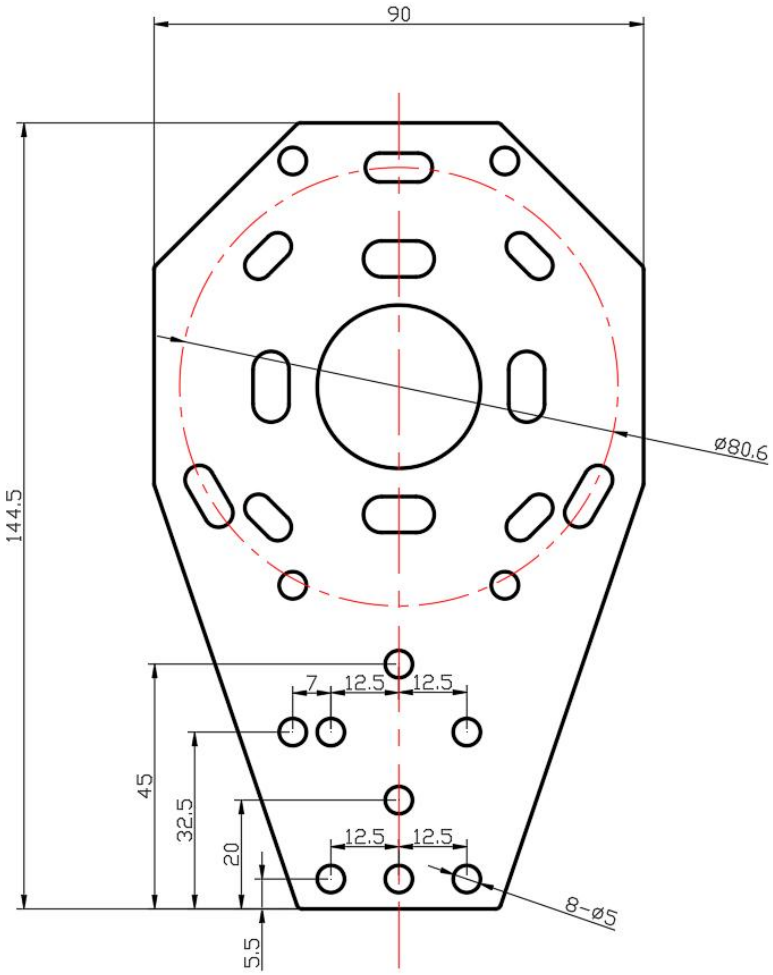
The wide voltage power input range is 10~30V. When wiring the 485 signal line, pay attention to the two lines A and B not to be reversed, and the addresses of multiple devices on the bus must not conflict.

	Thread color	Description
power supply	brown	Positive power supply (10~30V DC)
	black	Power negative
Communication	yellow	485-A
	blue	485-B

2.3 485Field wiring instructions

When multiple 485 devices are connected to the same bus, there are certain requirements for field wiring. For details, please refer to the "485 Device Field Wiring Manual" in the information package.

2.4Installation example



Installation pallet size drawing (unit: mm)

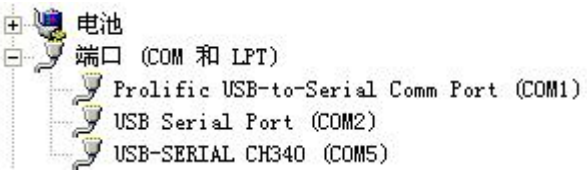
3. Configuration software installation and use

4. 3.1 Software selection

Open the data package, select "Debugging Software" --- "485 Parameter Configuration Software", find "485 Parameter Configuration Tool"Just open it.

3.2 parameter settings

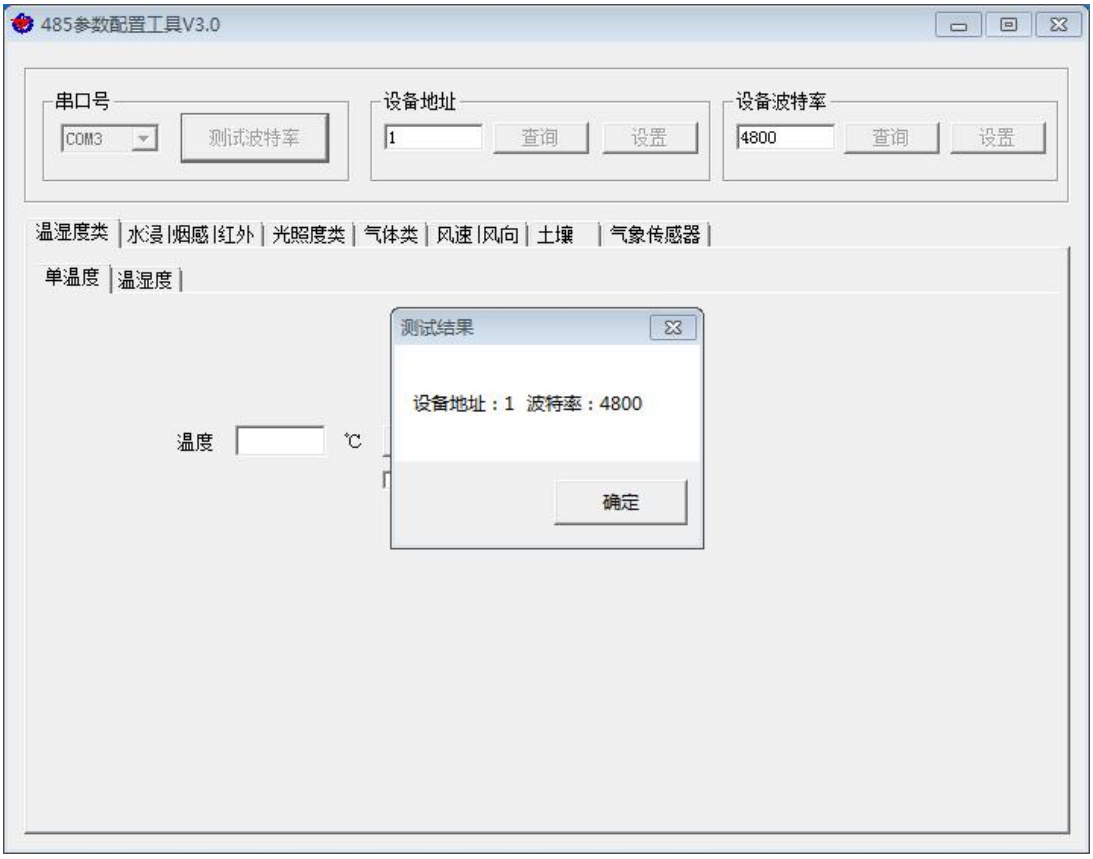
① Select the correct COM port (check the COM port in "My Computer—Properties—Device Manager—Port"). The following figure lists the driver names of several different 485 converters.



② Connect only one device alone and power it on, click the test baud rate of the software, the software will test the baud rate and address of the current device, the default baud rate is 4800bit/s, and the default address is 0x01.

③. Modify the address and baud rate according to the needs of use, and at the same time query the current function status of the device.

④. If the test is unsuccessful, please recheck the equipment wiring and 485 driver installation.



4. letter of agreement

4.1Basic communication parameters

Code	8-bit binary
Data bit	8-bit
Parity bit	no
Stop bit	1 person
Error checking	CRC (Redundant Cyclic Code)
Baud rate	2400bit/s, 4800bit/s, 9600 bit/s can be set, the factory default is 4800bit/s

4.2 Data frame format definition

Using Modbus-RTU communication protocol, the format is as follows:

Initial structure ≥ 4 bytes time

Address code = 1 byte

Function code = 1 byte

Data area = N bytes

Error check = 16-bit CRC code

Time to end structure ≥ 4 bytes

Address code: the starting address of the transmitter, which is unique in the communication network

(factory default 0x01).

Function code: the command function instruction issued by the host, this transmitter only uses function code 0x03 (read register data).

Data area: The data area is the specific communication data, pay attention to the high byte of 16bits data first!

CRC code: two-byte check code.

Host query frame structure:

address code	function code	Register start address	Register length	Check code low bit	Check code high
1byte	1byte	2byte	2byte	1byte	1byte

Slave machine response frame structure:

address code	function code	Effective bytes	Data area	Second data area	Nth data area	Check code
1byte	1byte	1byte	2byte	2byte	2byte	2byte

4.3 Communication register address description

The contents of the register are shown in the following table (support 03/04 function code):

Register address	PLC or configuration address	content	operating
500	40501	Humidity value (10 times the actual value)	Read only
501	40502	Temperature value (10 times the actual value)	Read only
502	40503	Noise value (10 times the actual value)	Read only
503	40504	PM2.5 value (actual value)	Read only
504	40505	PM10 value (actual value)	Read only
505	40506	Atmospheric pressure value (unit Kpa, actual value 10 times)	Read only
506	40507	20W Lux value high 16-bit value (actual value)	Read only
507	40508	The low 16-bit value of 20W Lux value (actual value)	Read only

4.4 Communication protocol example and explanation

4.4.1Ask about equipment temperature and humidity

For example, inquire about the temperature and humidity value: the device address is 03

address code	function code	initial address	Data length	Check code low bit	Check code high
0x03	0x03	0x01 0xF4	0x00 0x02	0x85	0xE7

Response frame (for example, the temperature is -10.1℃ and the humidity is 65.8%RH)

address code	function code	Effective bytes	Humidity value	Temperature value	Check code low bit	Check code high
0x03	0x03	0x04	0x02 0x92	0xFF 0x9B	0x79	0xFD

Temperature: when the temperature is lower than 0℃, upload in the form of complement

0xFF9B (Hexadecimal) = -101 => Temperature = -10.1℃

humidity:

0x0292 (hexadecimal) = 658 => humidity = 65.8%RH

5. Common problems and solutions

The device cannot connect to the PLC or computer

possible reason:

1) The computer has multiple COM ports, and the selected port is incorrect.

2) The device address is wrong, or there are devices with duplicate addresses (the factory default is all 1).

3) The baud rate, check method, data bit and stop bit are wrong.

4) The host polling interval and waiting response time are too short, and both need to be set above 200ms.

5) The 485 bus is disconnected, or the A and B wires are connected reversely.

6) If the number of equipment is too large or the wiring is too long, power should be supplied nearby, and a 485 booster should be added and a 120Ω terminal resistance should be added.

7) The USB to 485 driver is not installed or damaged.

8) The equipment is damaged.

6.Appendix: Shell size