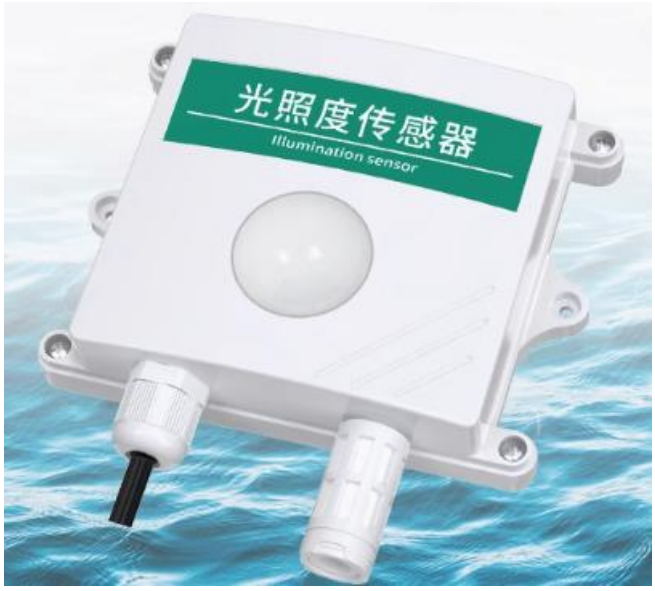
GZ02 temperature and humidity transmitter
Instruction manual (type 485)



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1. product description

1.1 product description

It is a high-precision photosensitive transmitter, the output value measurement unit is Lux, the device adopts a wall-mounted waterproof shell, wall-mounted installation, and high protection level. 485 communication, standard ModBus-RTU communication protocol, communication address and baud rate can be set, the longest communication distance is 2000 meters, the product power supply is 10-30V wide voltage power supply, mainly used in agricultural greenhouses, flower cultivation greenhouses, agricultural fields, electronics Equipment production lines and other occasions that require light intensity monitoring.

1.2 Features

1. High-precision illuminance detection measurement range of 0-6 million Lux, 0-20 million Lux optional.

2.485 communication, standard ModBus-RTU communication protocol, communication address and baud rate can be set, the longest communication distance is 2000 meters

3. Wall-mounted waterproof shell, high protection level, can be used in outdoor or harsh on-site environment

4.10-30V DC wide voltage power supply

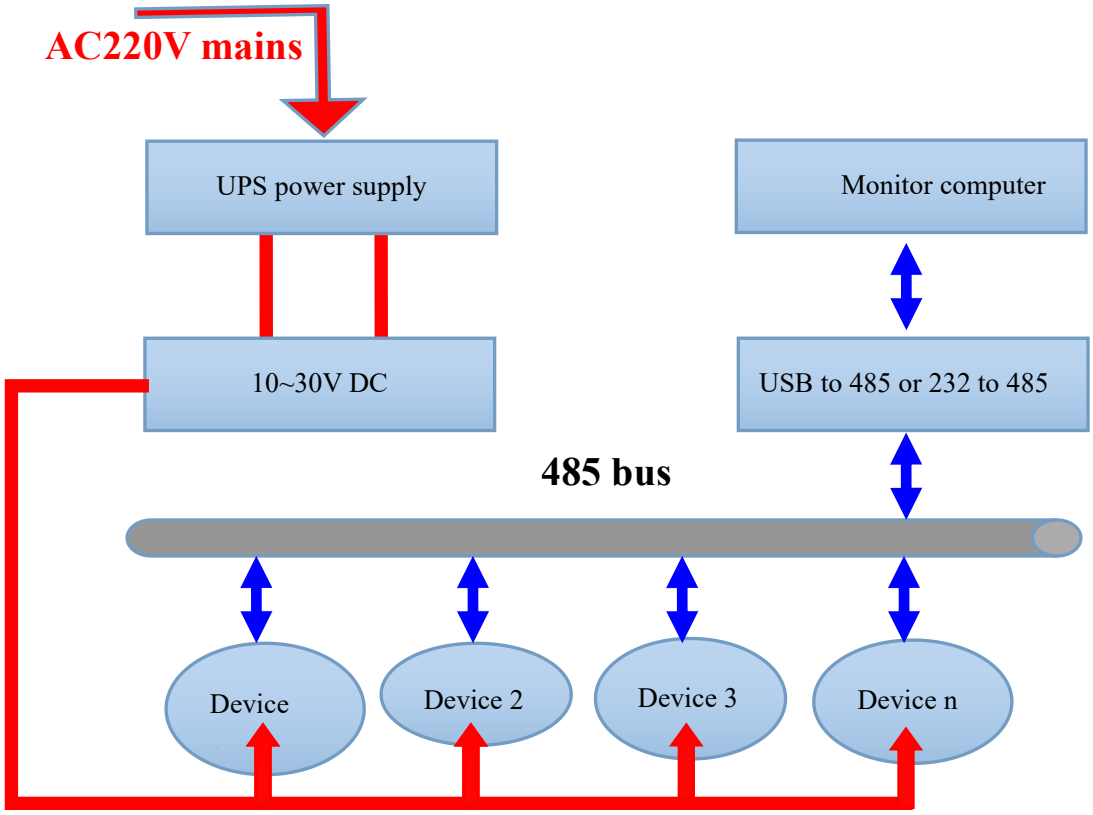
1.3 Main Specifications

DC power supply (default)	10-30VDC	
Maximum power consumption	0.4W	
Accuracy	humidity	±3%RH(5%RH~95%RH,25℃)
	temperature	±0.5℃（25℃）
	Light intensity	±7%(25℃)
Light intensity range	0-65535Lux；0-200000Lux	
Temperature and humidity range	-40℃~+60℃，0%RH~80%RH	
Long-term stability	temperature	≤0.1℃/y
	humidity	≤1%/y
	Light intensity	≤5%/y
Response time	temperature	≤18s(1m/s Wind speed)
	humidity	≤6s(1m/s Wind speed)
	Light intensity	0.1s
Output signal	RS485(Modbus protocol)	

1.4product model

GZ02-				Light intensity transmission sensor
GZ02WS-				Light intensity, temperature and humidity three in one transmission, sensor
	N01-			RS485 (M0dbus protocol)
		2-		Wall-mounted king character shell
			65535	Range 0-65535
			200000	Range 0-20W

1.5 System framework diagram



System solution block diagram

2. Equipment installation instructions

2.1 Check before installation

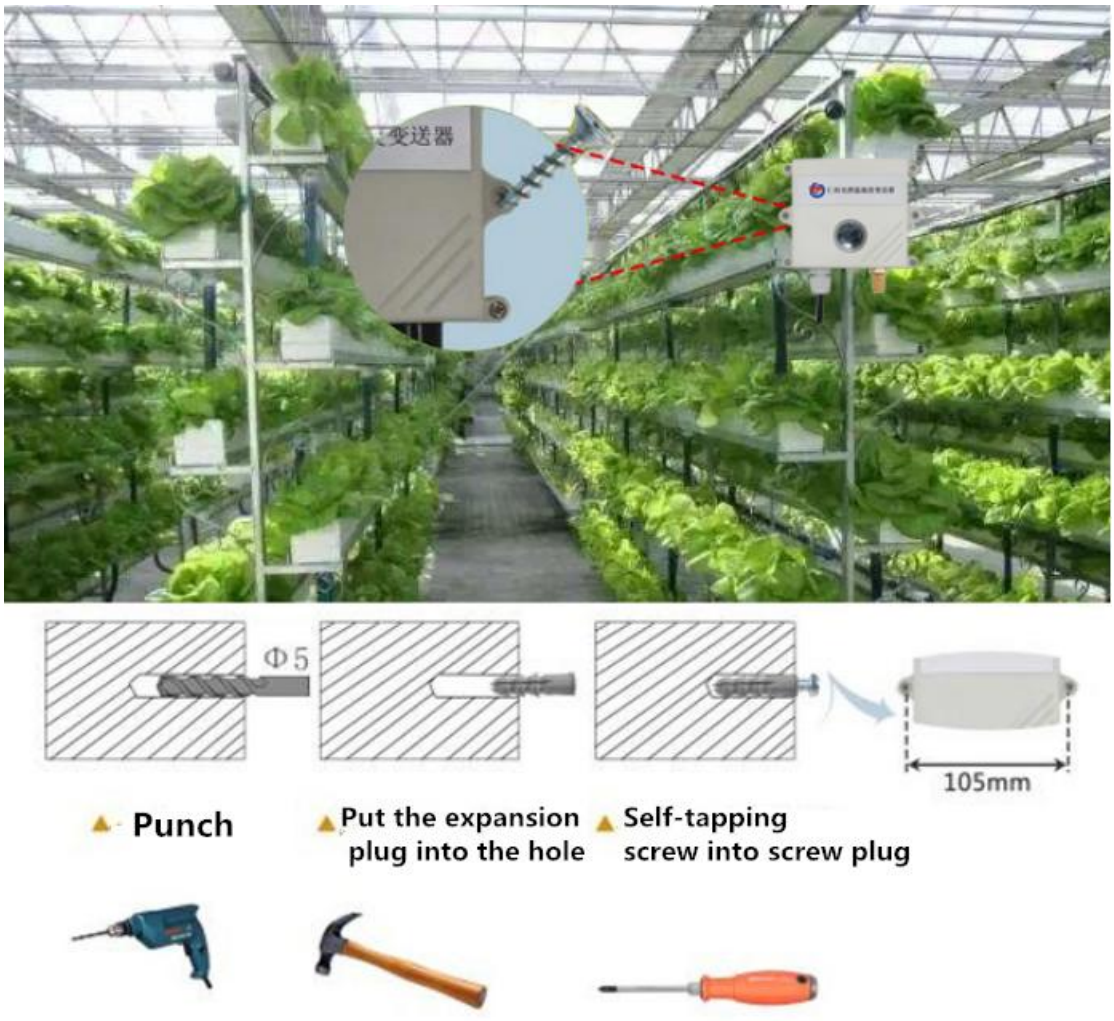
Equipment List:

1. 1 transmitter device

2. USB to 485 (optional)

3. Warranty card, certificate, wiring instructions, etc.

2.2installation method



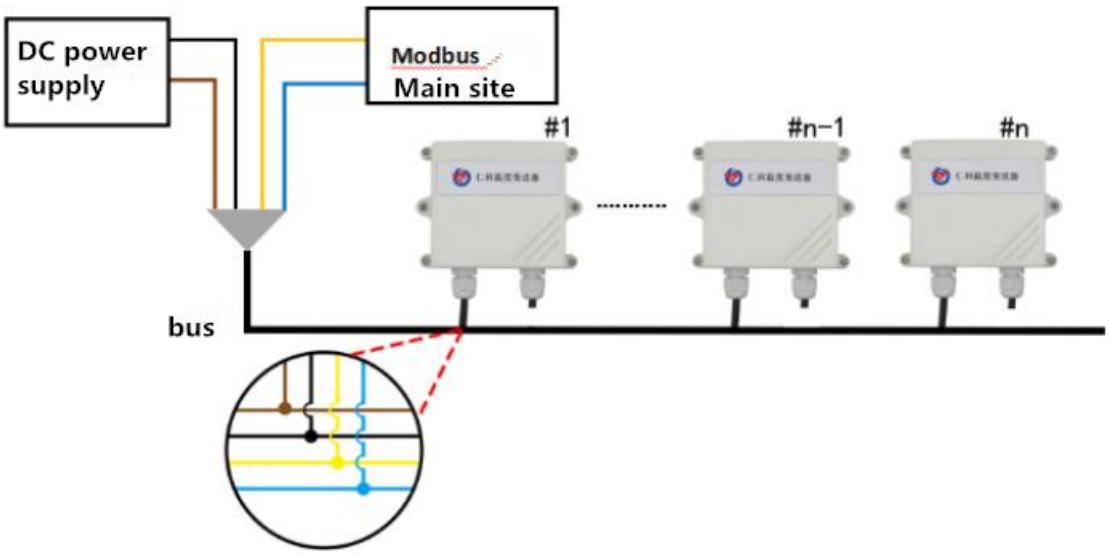
2.3Interface Description

Wide voltage power input can be 10 ~ 30V. When connecting the 485 signal line, please note that the A / B lines cannot be reversed, and the addresses of multiple devices on the bus must not conflict.

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

2.4 485Field wiring instructions

When multiple 485 model devices are connected to the same bus, there are certain requirements for field wiring. For details, please refer to
Examination data package "485 equipment field wiring manual".



3. Configuration software installation and use

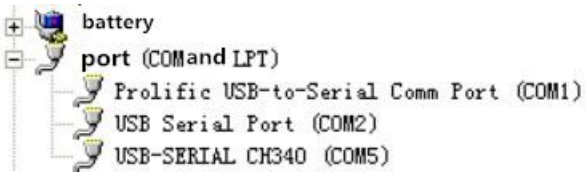
3.1 Software selection

Open the data package, select "Debug software" --- "485 parameter configuration software", find "485 parameter configuration tool"

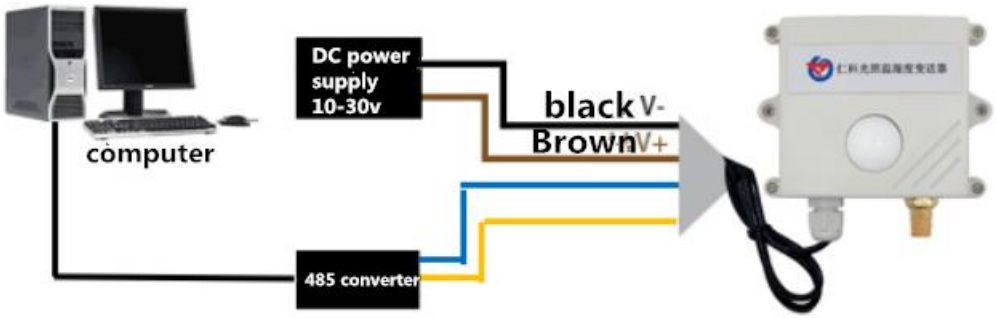
Just open it.

3.2parameter settings

①, select the correct COM port ("COM"-"Properties-Device Manager-Port" to view the COM port), the following figure lists the driver names of several different 485 converters.

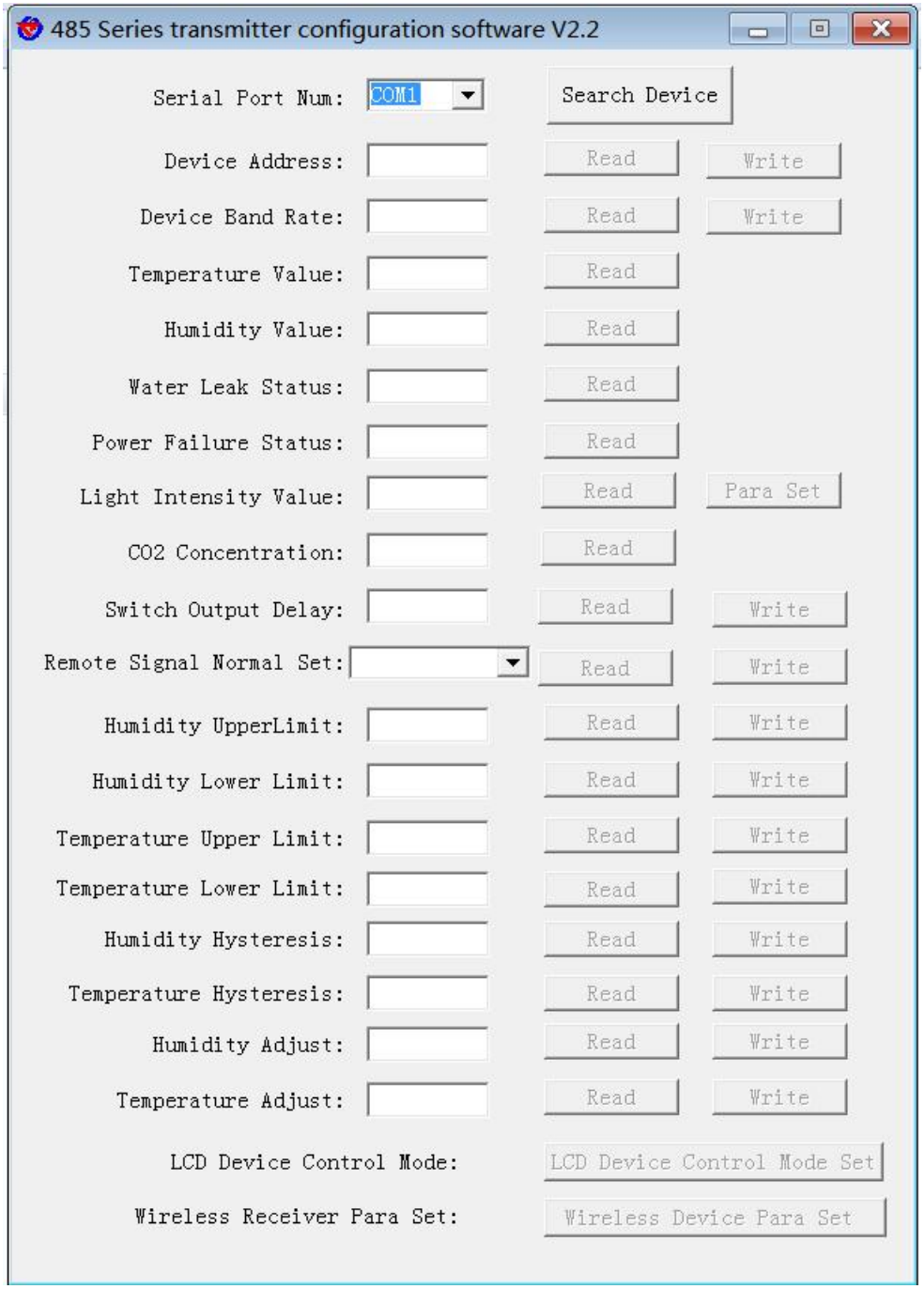


②, only connect one device and power on, click the test baud rate of the software, the software will test the current device baud rate and address, the default baud rate is 4800bit / s, the default address is 0x01.



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

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



4. letter of agreement

4.1 Communication basic parameters

Coding	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:

Time for initial structure ≥ 4 bytes

Address code = 1 byte

Function code = 1 byte

Data area = N bytes

Error check = 16-bit CRC code

End structure ≥ 4 bytes of time

Address code: the address of the transmitter, which is unique in the communication network (factory default 0x01).

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

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

CRC code: two-byte check code.

Host inquiry frame structure:

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

Slave 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 Register address

Register address	PLC or configuration address	content	operating
0000 H	40001	humidity	Read only
0001 H	40002	temperature	Read only
0002 H	40003	Illuminance (Only enabled in 0~200000Lux, unit is 1Lux)	Read only
0003 H	40004		

0006 H	40007	Illuminance (0~65535 unit 1Lux 0~200000 unit hundred Lux)	Read only

4.4 Communication protocol example and explanation

4.4.1 Read the temperature and humidity value of device address 0x01

Inquiry frame

address code	function code	starting address	Data length	Check digit low	Check digit high
0x01	0x03	0x00 0x00	0x00 0x02	0xC4	0x0B

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

address code	function code	Effective bytes	Humidity value	Temperature value	Check digit low	Check digit high
0x01	0x03	0x04	0x02 0x92	0xFF 0x9B	0x5A	0x3D

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

FF9B H (Hexadecimal) = -101 => Temperature = -10.1 ℃

humidity:

292 H (hex) = 658 => humidity = 65.8% RH

4.4.2Read the illuminance value at device address 0x01

(0 ~ 65535 is read in units of 1 Lux or 0 ~ 200000 is read in units of 100 Lux)

Inquiry frame

address code	function code	starting address	Data length	Check digit low	Check digit high
0x01	0x03	0x00 0x06	0x00 0x01	0x64	0x0B

Acknowledge frame (for example, read the illuminance of 30000 Lux)

address code	function code	Returns the number of valid bytes	Data area	Check digit low	Check digit high
0x01	0x03	0x02	0x05 0x30	0xBB	0x00

Illumination calculation instructions:

1) The product is a 0~65535 range transmitter, the unit is 1Lux

0530 H (hexadecimal) = 1328 => illuminance = 1328 Lux

2) The product is a 0~200000 range transmitter, the unit is 100 Lux

0530 H (hexadecimal) = 1328 => illuminance = 132800 Lux

4.4.3 Read the illuminance value of the device address 0x01 (0 ~ 200000 is read in units of 1 Lux)

Inquiry frame

address code	function code	starting address	Data length	Check digit low	Check digit high
0x01	0x03	0x00 0x02	0x00 0x02	0x65	0xCB

Acknowledge frame (for example, read the illumination of 200,000 Lux)

address code	function code	Effective bytes	High illumination	Low illumination	Check digit low	Check digit high
0x01	0x03	0x04	0x00 0x03	0x0D 0x40	0x0F	0x53

Illumination calculation instructions:

This protocol is only used under 0 ~ 200000Lux range transmitter, the unit is 1Lux

30D40 H (Hexadecimal) = 200000 => Illumination = 200000 Lux

4.4.4 Read the temperature, humidity and illuminance value of the device address 0x01

(0~65535 are read in units of 1Lux)

Inquiry frame

address code	function code	starting address	Data length	Check digit low	Check digit high
0x01	0x03	0x00 0x00	0x00 0x07	0x04	0x08

Reply frame

address code	function code	Number of bytes	Humidity value	Temperature value	0002	0003	0004	0005	illumination	Check code low bit	High bit of check code
0x01	0x03	0x0E	0x01 0x7E	0x00 0xE7	Invalid data	Invalid data	Invalid data	Invalid data	0x85 0x1F	0xB3	0X4D

humidity

17E H (hexadecimal) = 382 => humidity = 38.2%RH

temperature

0E7 H(hexadecimal)=231=> temperature = 23.1℃

illumination

851F H(Hexadecimal)=34079=> Illumination=34079Lux

(0~200000 is read in units of 1Lux and hundreds of Lux)

Interrogation frame

address code	unction code	initial address	Data length	Check code low bit	High bit of check code
0x01	0x03	0x00 0x00	0x00 0x07	0x04	0x08

Reply frame

address code	function code	Number of bytes	Humidity value	Temperature value	High light	Low light	0004	0005	illumination Hundred Lux	Check code low bit	High bi of check code
0x01	0x03	0x0E	0x01 0x7E	0x00 0xE7	0x00 0x00	0x85 0x1F	Invalid data	Invalid data	0x01 0x54	0x2D	0x2C

humidity

017E H (hexadecimal) = 382 => humidity = 38.2%RH

temperature

00E7 H(hexadecimal)=231=> temperature = 23.1℃

illumination

0000 851F H(Hexadecimal)=34079 => Illumination =34079Lux

Light (100 Lux)

0154H (hexadecimal) = 340 => light = 340 hundred Lux = 34000 Lux

4.4.5 Read the temperature, humidity and illuminance value of device address 0x01(0 ~ 200000 is read in 1 Lux unit)

address code	function code	starting address	Data length	Check digit low	Check digit high
0x01	0x03	0x00 0x00	0x00 0x04	0x44	0x09

Reply frame

address code	function code	Bytes	Humidity value	Temperature value	High light	Low light	Check code
0x01	0x03	0x08	0x02 0x92	0x80 0x65	0x00 0x03	0x0D 0x40	0x01 0x6F

5. Common problems and solutions

5.1 Device cannot be connected to 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) Baud rate, check mode, data bit, stop bit error.

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

5) The 485 bus is disconnected, or the A and B lines are reversed.

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

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

8) The equipment is damaged.

6. Appendix: Shell dimensions

Overall size: 110 × 85 × 44mm

