

INSTRUCTION MANUAL

LEAF SURFACE HUMIDITY TRANSMITTER

TYPE RS485

JXBS-3001-YMSD
Ver1.1

威海精讯畅通电子科技有限公司

Weihai JXCT Electronics Co., Ltd.

Chapter one :Brief Introduction

1.1 Product Overview

The humidity of the plant leaf surface is very important for the growth of the leaves. In the past, people often monitored the air temperature and humidity, but ignored the monitoring of the leaf surface temperature and humidity. However, the leaf temperature and humidity can better reflect the growth index of the real leaf. The leaf surface temperature and humidity sensor accurately measures the temperature and humidity of the leaf surface to detect the growth environment of plant leaves and achieve the purpose of preventing pests and diseases.

The shape of the sensor adopts the shape design of the blade, which simulates the real characteristics of the leaf surface, so it can more accurately reflect the situation of the leaf surface environment.

The leaf surface temperature and humidity sensor measures the residual of water or ice crystals of the leaf by detecting the change of the dielectric constant on the leaf. More suitable for long-term monitoring.

1.2 Primary Parameters

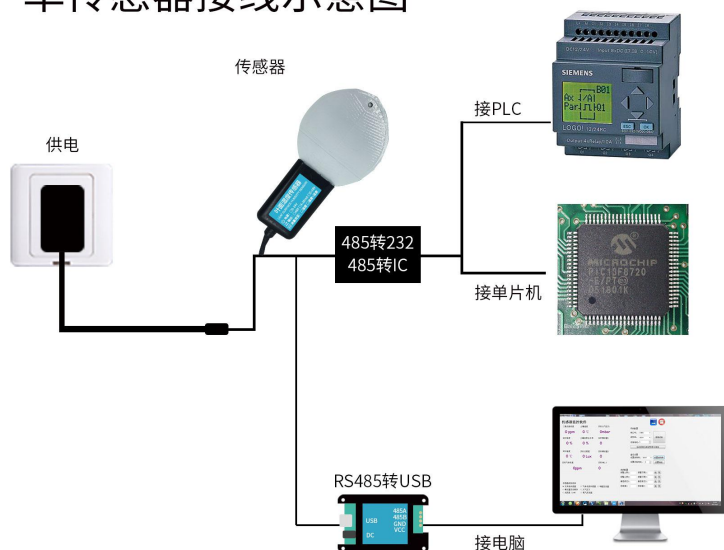
PARAMETERS	TECHNICAL SPECIFICATIONS
POWER SUPPLY	DC9-24V
OUTPUT SIGNAL	RS-485
TEMPERATURE RANGE	LEAF SURFACE TEMPERATURE $-20^{\circ}\text{C} \sim 80^{\circ}\text{C}$
HUMIDITY RANGE	LEAF SURFACE HUMIDITY $0\% \sim 100\%$
TEMPERATURE RESOLUTION	0.01°C
HUMIDITY RESOLUTION	$0.1\%\text{RH}$
TEMPERATURE ACCURACY	$\pm 1^{\circ}\text{C}$ ($@25^{\circ}\text{C}$)
HUMIDITY ACCURACY	$\pm 5\%\text{RH}$ ($@25^{\circ}\text{C}$)
OPERATING ENVIRONMENT	$-40^{\circ}\text{C} \sim 80^{\circ}\text{C}$

1.3 System frame Diagram

This sensor can be connected and used alone. First, it is powered by 12V DC power supply. The device can be directly connected to a PLC with a 485 interface, and can be connected to a single chip microcomputer through a 485 interface chip. Program the microcontroller and PLC through the modbus protocol specified later to cooperate with the sensor. At the same time, you can use USB to 485 to connect with a computer, and use the sensor configuration tool provided by our company

for configuration and testing.

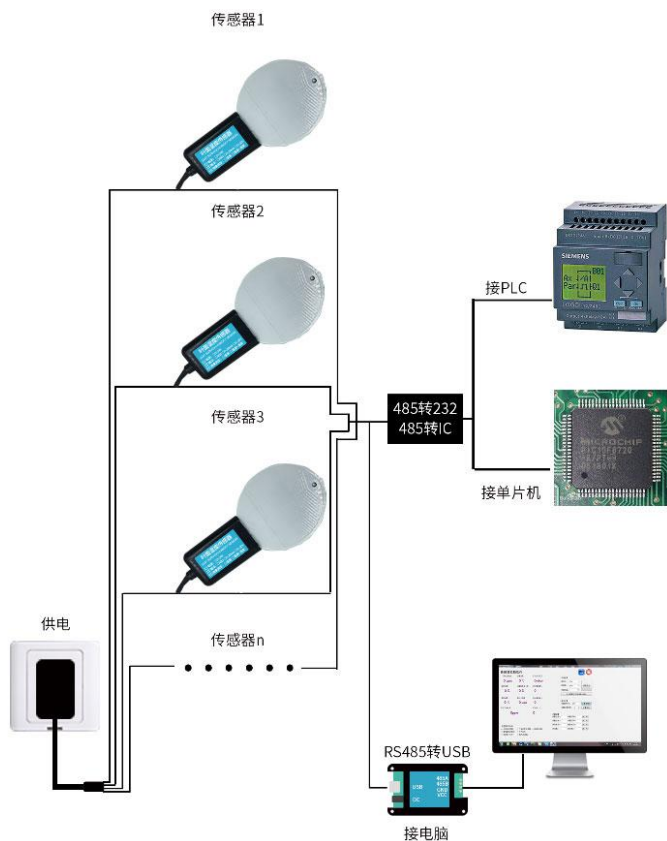
单传感器接线示意图



This product can also be used in combination with multiple sensors on a 485 bus. When combining 485 buses, please follow the "485 Bus Field Wiring Code" (see Appendix). In theory, one bus can connect more than 16 485 sensors. If you need to connect more 485 sensors, you can use a 485 repeater to expand more 485 devices. Connect to a single chip microcomputer, or use USB to 485 to connect to a computer. Use the sensor configuration tool provided by our company for

configuration and testing.

多传感器接线示意图



Chapter2 Hardware Connections

2.1 CHECKING BEFORE INSTALLATION

Check the list of devices before installation:

Name	Number
THE SENSOR DEVICE	1
12V POWER ADAPTER (Optional)	1
THE USB TO 485 DEVICE (Optional)	1
WARRANTY CARD / CERTIFICATE	1

2.2 Interface Description

Wide voltage power input can be 12-24V. When wiring the 485 signal line, pay attention that the two A / B lines cannot be reversed, and the addresses between multiple devices on the bus cannot conflict.

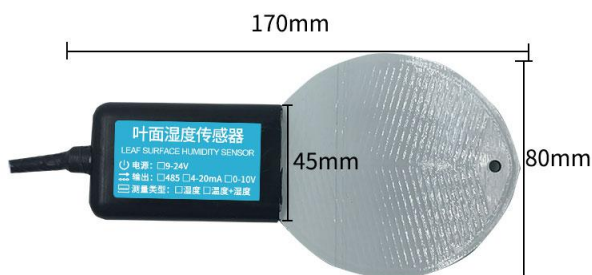
	Line Color	Description
Power	Brown	Power supply Positive (12-24V DC)
	Black	Power supply Negative
Communication	Yellow	485-A
	Blue	485-B

Note: Please be careful not to connect the wrong wire sequence, the wrong wiring will cause the equipment to burn out.

The factory provides 0.6m long wire by default, and the customer can extend the wire or connect the wires in sequence as needed.

Note that there may not be a yellow line in the line sequence that may be provided in some factory batches. At this time, the gray line is equivalent to replace the yellow line.

2.3 Product size and installation instructions



Choose the site: The ideal position of the foliar humidity sensor should be installed at a height of more than 1 meter from the ground. It can be hung above the plants to avoid direct sunlight as much as possible.

Product installation: It is recommended that users check the delivered products for damage caused by transportation before installation, and they should contact the manufacturer in time. The product can be installed by hanging.

Product maintenance: Check at least once a month during continuous work. The content of the inspection mainly depends on whether the surface of the equipment is clean. If ice, snow, dust, etc. appear, you should try to remove these deposits.

Chapter 3 Configuration Tool Installation and use

Our company provides supporting "sensor monitoring software", which can conveniently use the computer to read the parameters of the sensor, and at the same time flexibly modify the device ID and address of the sensor.

3.1 Sensor Access Computer

After correctly connecting the sensor to the computer via USB to 485 and providing power, you can see the correct COM port in the computer (see the COM port in "My Computer-Properties-Device- Manager-Port").



As shown in the figure above, your serial number is COM10 at this time, please remember this serial port, you need to fill in this serial number in the sensor monitoring software.

If the COM port is not found in the device manager, it means that you have not plugged in the USB to 485 or the driver is not installed properly. Please contact a technician for help.

3.2Use of sensor monitoring software

The configuration interface is shown in the figure. First, obtain the serial port number and select the correct serial port according to the method in section 3.1. Then click Automatically obtain the current baud rate and address to automatically detect all the devices and baud rates on the current 485 bus . Please note that when using software to obtain automatically, you need to ensure that there is only one sensor on the 485 bus.



Then click the connected device to get the sensor data information in real time.

If your device is a gas concentration sensor, please select "Gas concentration sensor" for the sensor type, "Formaldehyde transmitter" for the formaldehyde sensor, "Analog transmission module" for the analog transmitter, and "Atmospheric pressure" for the atmospheric pressure sensor. "Sensor", select "Illuminance 20W" for light sensor, "Oxygen transmitter" for oxygen sensor, and "No other sensor" for other sensors.

3.3 Modify baud rate and device ID

In the case of disconnecting the device, click the device baud rate and set the address in the communication settings to complete the relevant settings. Please note that after setting, please restart the device, and then the address can be found

after "automatically obtain the current baud rate and address"
And the baud rate has been changed to the address and baud rate you need.

If you need to modify the baud rate and address using the modbus instruction, you can refer to the appendix "How to modify the baud rate and address using the modbus instruction".

Chapter4 Communication Protocol

4.1 Communication Basic Parameters

PARAMETERS	CONTENT
Code	8-bit binary
Data bits	8 bit
Parity bit	No
Stop bit	1 bit
Error checking	CRC (redundant loop code)
Baud rate	2400 bps/ 4800 bps/ 9600 bps can be set factory defaults to 9600 bps

4.2 Data frame format definition

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

Time for initial structure \geq 4 bytes

Address code = 1 byte

Function code = 1 byte

Data area = N bytes

Error check = 16-bit CRC

Time to end structure \geq 4 bytes

Address code: It is the function instruction of the transmitter. This transmitter only uses the function code 0x03 (reading register data).

Data area: The data area is the specific address, which is unique in the communication network (factory default 0x01).

Function code: The command communication data sent by the host, pay attention to the high byte of the 16bits data first!

CRC code: two-byte check code.

Inquiry frame

Address Code	Function Code	Start Address	Data Length	CRC_L	CRC_H
1byte	1byte	2byte	2byte	1byte	1byte

Answer Frames

Address Code	Function Code	Number of valid bytes	First data area	Second data area	Nth area	data
1byte	1byte	2byte	2byte	2byte	2byte	

Register Address

Register Address	Plc Configuration Address	Content	Operation
0020H	40021	Humidity(unit 0.1%RH)	Read-Only
0021H	40022	Temperature(unit 0.1℃)	
0100H	40101	Device Address (0-252)	R/W
0101H	40102	Baud Rate (2400/4800/9600)	R/W

Communication example

4.3.1 Read Device Address 0x01's Soil Temperature And Humidity

Inquiry Frame

Address Code	Function Code	Start Address	Data Length	CRC_L	CRC_H
0x01	0x03	0x00,0x20	0x00,0x02	0xC5	0xC1

Inquiry Frame

(For example, read that the temperature is -10.1 ℃ and the humidity is 6.58% RH)

Address Code	Function Code	Number Of Valid Bytes	Humidity Value	Temperature Value	CRC_L	CRC_H
0x01	0x03	0x04	0x02 0x92	0xFF 0x9B	0x5A	0x3D

Temperature:

FF9BH (hexadecimal) = -101 => temperature = -10.1℃

Humidity:

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