Temperature and Humidity Transmitter

(Flat rail housing type 485)

SM-HT-N01-8 Ver 2.1

Content

Chapter 1 Product Introduction

1.1 product description

The transmitter is widely used in agricultural greenhouses/flower cultivation and other occasions requiring temperature and humidity monitoring. The input power supply, induction probe and signal output in the sensor are completely isolated. Safe and reliable, beautiful appearance, easy installation.

1.2 Features

This product adopts high-sensitivity digital probe with stable signal and high precision. It has the characteristics of wide measurement range, good linearity, good waterproof performance, convenient use, easy installation, and long transmission distance.

1.3 The main parameters

DC power supply（default）	5-30V DC	
Maximum power consumption	0.3W	
precision	humidity	±2%RH（60%RH，25℃）
	temperature	±0.2℃（25℃）
Transmitter circuit operating temperature	-40℃~+60℃，0%RH~95%RH（non-condensing）	
Temperature display resolution	0.1℃	
Humidity Display Resolution	0.1%RH	
Temperature and humidity refresh time	1S	
long term stability	temperature	≤0.1℃/y
	humidity	≤1%RH/y
Response time	temperature	≤25s（1m/s wind speed）
	humidity	≤8s（1m/s wind speed）
letter of agreement	Modbus-RTU letter of agreement	
output signal	485 Signal	
parameter settings	Set by software	

flat rail：65×46×28.5mm
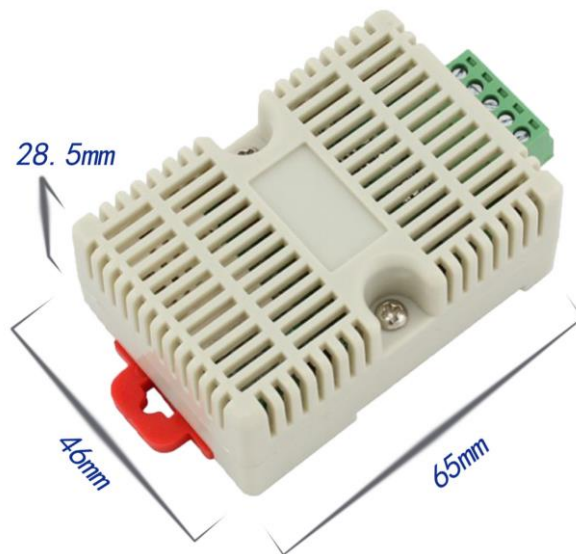
1.4 System frame diagram

单接
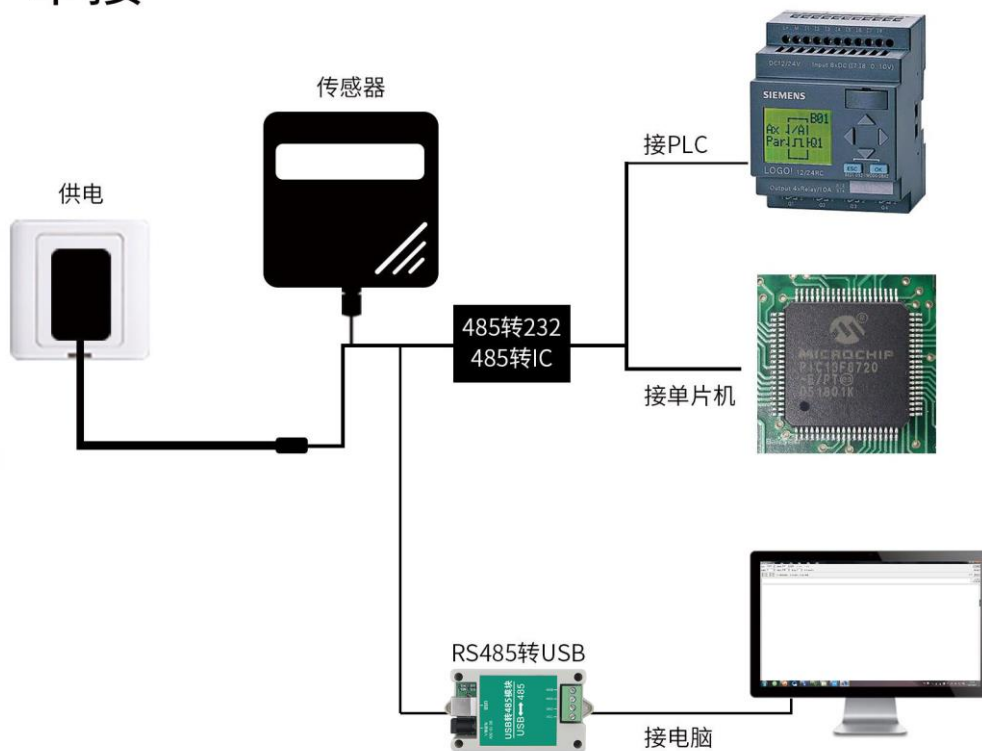
This product can also be used in combination of multiple sensors on a 485 bus. In theory, one bus can be connected to 254 485 sensors, the other end can be connected to a PLC with a 485 interface, a single-chip microcomputer is connected through a 485 interface chip, or USB to 485 can be used. Connect to the computer, use the sensor configuration tool provided by our company for configuration and

testing (only one device can be connected when using this configuration software).

多接
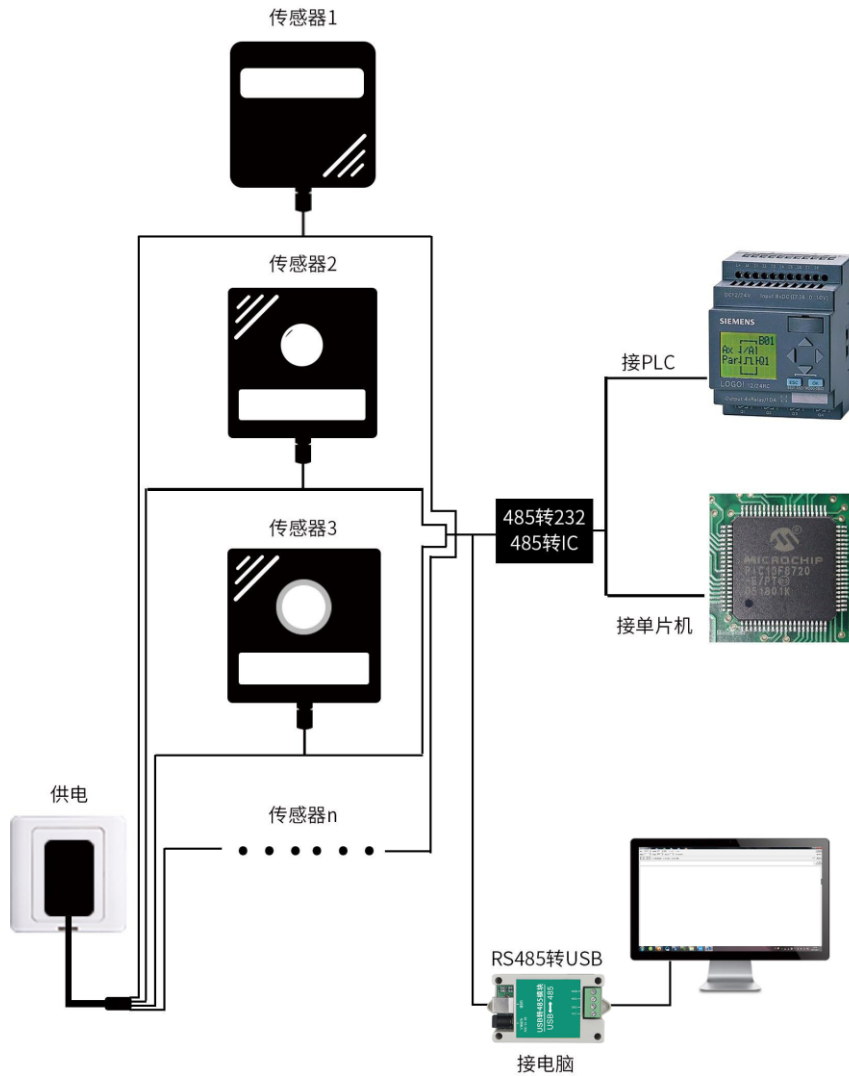
1.5 product model

SM-				company code
	HT-			Temperature and humidity
		N01-		485 communication (Modbus-RTU protocol)
			8	Flat card rail shell

Chapter 2 Hardware Connections

2.1 Equipment pre-installation inspection

Equipment List:

■ 1 transmitter device

■ USB to 485 (optional)

■485 terminal resistance (gifted for multiple devices)

■ Certificate, Warranty Card

2.2 Interface Description

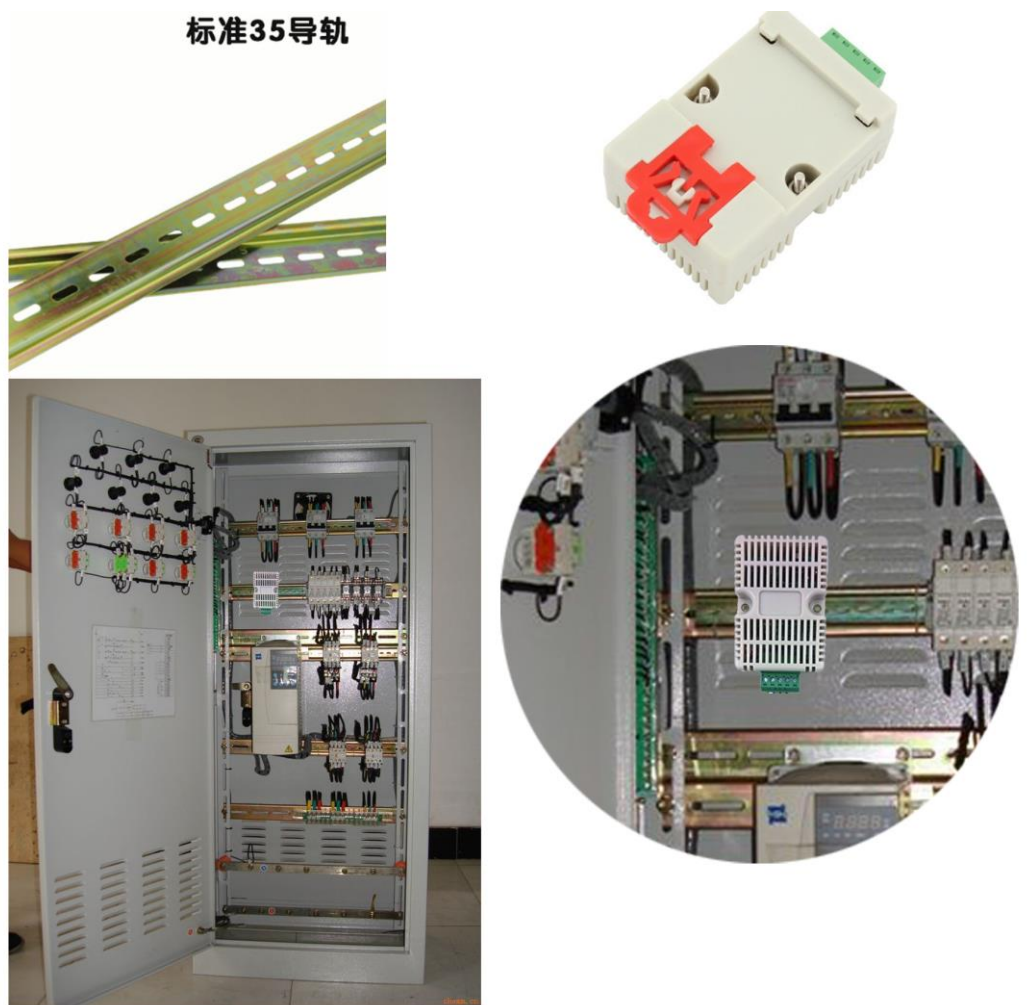The power interface is wide voltage power input 5-30V. When wiring the 485 signal line, pay attention that the two lines A\B cannot be reversed, and the addresses of multiple devices on the bus cannot conflict.

2.2.1 Sensor wiring

Serial number (from left to right)	Instruction
1	485-B
2	485-A
3	negative power supply
4	Power is positive（5~30V DC）

2.3 Installation method

Special Note：

1）There are certain specification requirements for 485 line field wiring.

2）When the device is connected to the 485 bus, ensure that the addresses of multiple devices will not be repeated.

Chapter 3 Configuring Software Installation and Use

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

Note that there is only one sensor on the 485 bus when using automatic acquisition by software.

3.1 Sensor connected to computer

After the sensor is correctly connected to the computer via USB to 485 and provides power, you can see the correct COM port in the computer (check the COM

port in "My Computer - Properties - Device Manager - Port").
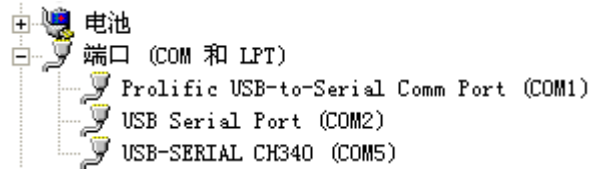
Open the data package, select "Debugging Software"---"485 Parameter

RS485Con
trolV21.ex

Configuration Software", find   e   just open.

If the COM port is not found in the device manager, it means that you have not installed the USB to 485 driver (included in the data package) or the driver has not been installed correctly, please contact a technician for help.

3.2 Use of Sensor Monitoring Software

①、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 chapter 3.1.

②、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 9600bit/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 functional status of the device.

④、If the test is unsuccessful, please re-check the equipment wiring and 485 driver installation.
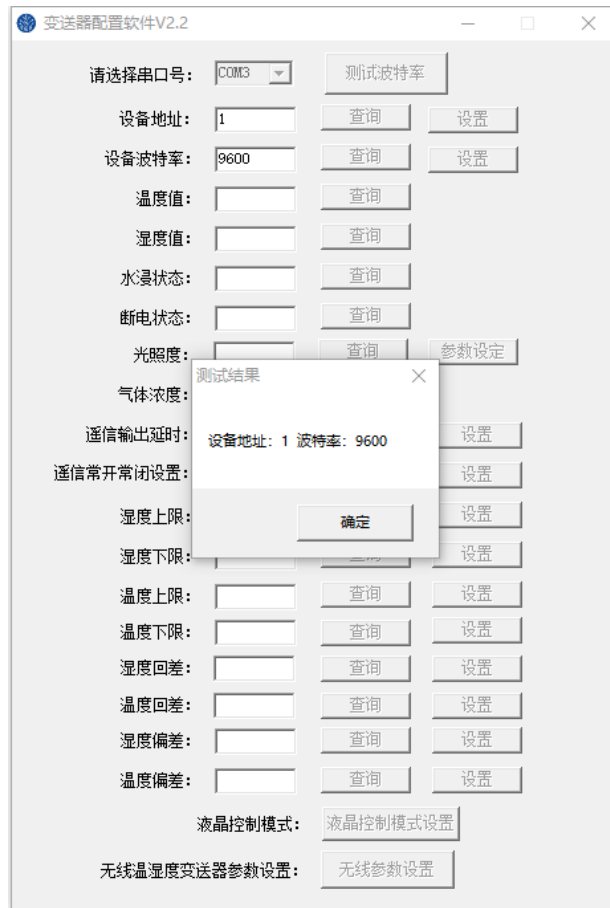
Chapter 4 Communication Protocol

4.1 Communication basic parameters

coding	8 bit binary
data bits	8 bits
parity bit	none
stop bit	One bits
error checking	CRC（redundant cyclic code）
baud rate	2400bit/s、4800bit/s、9600 bit/sCan be set，Factory default is 9600bit/s

4.2 Data Frame Format Definition

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

Initial structure ≥4 bytes of time

Address code = 1 byte

Function code = 1 byte

Data area = N bytes

Error check = 16-bit CRC code

Time to end structure $\geqslant$ 4 bytes

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

function code：

function code	significance	operable register address
0x03	read register data	0x00~0x01、0x100～0x10D
0x10	write multiple registers	0x102～0x10D

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

CRC code: two-byte check code.

Host query frame structure：

address code	function code	register start address	register length	Check code 1 ow	Check code high
1 byte	1 byte	2 bytes	2 bytes	1 byte	1 byte

Slave response frame structure:

address code	function code	number of valid bytes	First data area	second data area	Nth data area	check code
1 byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes	2 bytes

4.3 register address

register address	PLC or configuration address	content	Operatation
0000 H	40001	humidity	read only
0001 H	40002	temperature	read only

register address	quantity	significance	State	data range
0x00	1	humidity	read only	0～0xFFFF
0x01	1	temperature	read only	0～0xFFFF
0x100	1	Device model	read only	0～0xFFFF

0x101	1	Device software version	read only	0~0xFFFF
0x102	10	device name	read and write	0~0xFFFF
0x10C	1	Device address	read and write	0~0xFF
0x10D	1	Serial port properties	read and write	See Serial Port Properties Register

串口属性：

data bits	significance
BIT15~BIT8	Parity check selection 0: No verification (factory default) 1: odd parity 2: Even parity
BIT7~BIT0	Baud rate selection 0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps（Factory default） 4: 19200bps

4.4 Communication protocol example and explanation

Example 1: Read the temperature and humidity value of device address 0x01

Query frame (hexadecimal)：

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

Response frame (hexadecimal): (For example, the temperature is -9.7℃ and the humidity is 48.6%RH)

address code	function code	return valid number of bytes	Humidity value	temperature value	check code low	check code high
0x01	0x03	0x04	0x01 0xE6	0xFF 0x9F	0x1B	0xA0

Temperature calculation:

When the temperature is lower than 0 ℃, the temperature data is uploaded in the form of complement code.

Temperature: FF9F H (hex) = -97 => temperature = -9.7°C

Humidity calculation:

Humidity: 1E6 H (Hex) = 486 => Humidity = 48.6%RH

Example 2: Modify the device address 0x01 to 0x02

Query frame (hexadecimal)：

address code	function code	starting address	Data length	data area word Section number (2*N)	data area	check code
0x01	0x10	0x01 0x0C	0x00 0x01	0x02	0x00 0x02	0x37 0x9D

Response frame (hexadecimal)：

address code	function code	starting address	Data length	check code low	check code high
0x01	0x10	0x01 0x0C	0x00 0x01	0xC0	0x36

Chapter 5 Common Problems and Solutions

No output or output error

possible reason:

①. The computer has a COM port, and the selected port is incorrect.

②, the baud rate is wrong.

③. The 485 bus is disconnected, or the A and B lines are reversed.

④. If the number of devices is too much or the wiring is too long, power supply should be provided nearby, add 485 booster, and increase 120Ω terminal resistance at the same time.

⑤. The USB to 485 driver is not installed or damaged.

⑥, equipment damage.

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