User Manual of Model 485 Temperature and Humidity Transmitter

Document version: V2.3

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1. product description

1.1product description

RS-WS-N01-6 series temperature and humidity transmission recorder adopts large-screen LCD display, with automatic temperature and humidity recording, temperature and humidity upper and lower limits dual control, limit free setting, temperature and humidity calibration by password, RS485 data transmission and other functions. The product adopts the original high-quality temperature and humidity measurement unit imported from Switzerland. The sensor has the characteristics of high measurement accuracy and strong anti-interference ability, which ensures the excellent measurement performance of the product.

This product is equipped with a high-definition LCD display, real-time display of temperature and humidity values; real-time recording and storage inside the monitoring equipment, convenient to retrieve monitoring data at any time, can also be synchronized with our monitoring platform software; internal integrated alarm function module (buzzer Or relay), which can realize high and low temperature alarms and high and low humidity alarms; RS485 signal output, standard MODBUS-RTU communication protocol, communication distance up to 2000 meters (measured); support for the installation of multiple networked temperature and humidity monitoring systems, group The maximum number of nets can reach 254, which is an excellent intelligent industrial-grade temperature and humidity transmission recorder.

RS-WS-N01-6 series temperature and humidity transmission recorder is widely used in production workshops and experiments in cold chain logistics, food and medicine, biological products, special storage, electronic chemicals, health and medical systems, server rooms and scientific research laboratories. Room, computer room, warehouse, clean room and other environments, 24 hours monitoring of temperature and humidity data.

1.2Features

1. The temperature measurement unit imported from Switzerland is adopted, which has high measurement accuracy and strong anti-interference ability.

2. The device has a built-in memory, real-time recording of temperature and humidity data, and a maximum of 65,535 groups can be recorded.

3. Various alarm parameters, communication parameters, time and date can be set through the LCD buttons.

4. LCD real-time display temperature, humidity, time and date, stored capacity, device address and baud rate, etc.

5. The temperature and humidity alarm parameters, time and date, recording parameters and other

parameters can be remotely called and set through the monitoring platform.

6. Built-in temperature and humidity alarm function, can set the upper and lower limits and return difference of temperature and humidity alarm.

7. It has 2 switch signal outputs, which can be arbitrarily associated with alarm output.

8. One way built-in buzzer alarm, one way extended sound and light alarm alarm.

9. Multiple recording modes, after the equipment is connected to the monitoring platform, the temperature and humidity recorded data can be automatically spliced in chronological order.

10. RS485 signal output, the longest communication distance can reach 2000 meters, adopts lightning protection design, safe and reliable.

11. 10~30V wide power supply voltage input.

1.3The main technical parameters

DC power supply (default)	DC 10-30V	
Maximum power consumption	0.4W	
A precision	humidity	±2%RH(60%RH,25℃)
	temperature	±0.4℃（25℃）
B quasi-accuracy	humidity	±3%RH(60%RH,25℃)
	temperature	±0.5℃（25℃）
Transmitter circuit operating temperature and humidity	-20℃~+60℃, 0%RH~95%RH (non-condensing)	
Probe working temperature	-40℃~+120℃, default -40℃~+80℃	
Probe working humidity	0%RH-100%RH	
Temperature display resolution	0.1℃	
Humidity display resolution	0.1%RH	
Humidity display resolution Temperature and humidity refresh time	1s	
Long-term stability	humidity	≤1%RH/y
	temperature	≤0.1℃/y
Response time	humidity	≤8s (1m/s wind speed)
	temperature	≤25s (1m/s wind speed)
output signal	RS485 (Modbus protocol)	
Time and date	Built-in clock, real-time display	
Alarm function	Built-in buzzer, external sound and light alarm, relay optional	
Recording interval (minutes)	Adjustable interval, 30 minutes by default	
Record points	65535 records, if you record once in 30 minutes by default, it can be stored for 4 years	
Record mode	Off/on/auto	
Installation method	Wall-mounted	

1.4system framework
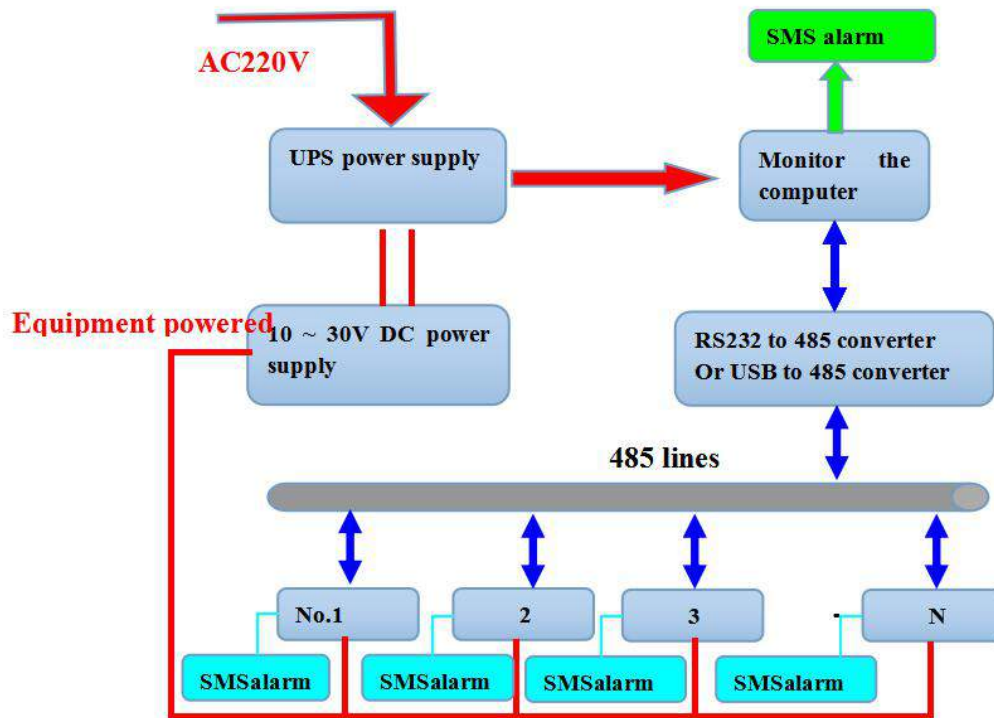
1.5product model

RS-					Company code
	WS-				Temperature and humidity transmission,
		N01-			RS485 (M0dbus protocol)
			6-		Large LCD case epitaxial power supply
				0	Built-in probe

					5	Epitaxial hardcover probe
					6	Extension waterproof probe
					9	Epitaxial metal waterproof probe
					A	Extension four-point pipe thread probe
					B	Epitaxial wide temperature probe

2. Product dimensions

3. Menu and display description

3.1 Panel description

3.2 LCD description
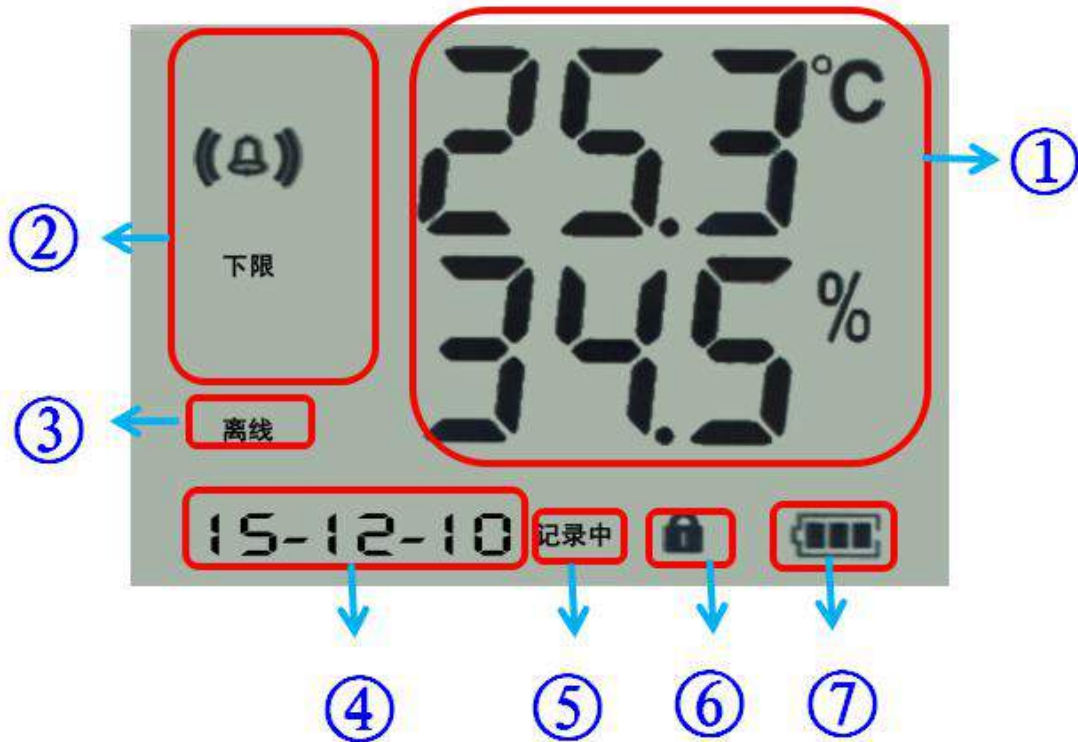
Serial number	Description
①	Real-time temperature and humidity display
②	Temperature or humidity alarm prompt
③	Device and host communication disconnected prompt
④	Rotate display of address, baud rate, stored quantity, year, month, day, hour, minute and second
⑤	Prompt whether it is in storage mode
⑥	Prompt whether it is in parameter modification mode
⑦	Electricity, this model often shows

4. Department menu and settings

4.1 Button function description

butto n	Features	Description	Key operation method
	Clear key	●Exit operation during parameter setting	dog
	return key	●Return to the main menu when setting or viewing the interface	dog
	Add key	●Page forward key when viewing menu	dog
	Page forward	●Data increase button when parameter is modified	dog
	turn on	●The shortcut key to open the alarm in the main interface	Press
	Page backward	●Page forward key when viewing menu	dog
	Reduce key	●Data reduction button when parameter is modified	dog
	shut down	●Shortcut key to turn off the alarm in the main interface	Press
	menu	●Menu selection key to enter the setting interface	dog
	Shift key	●Shift key for parameter modification	dog
	Enter	●Confirm key after parameter modification is completed	Press
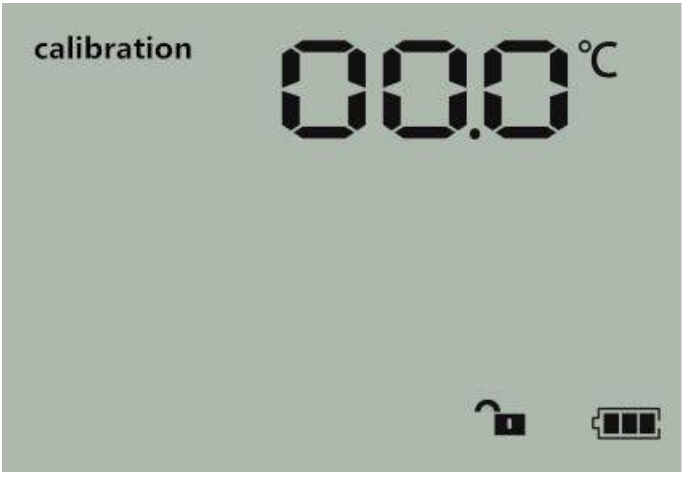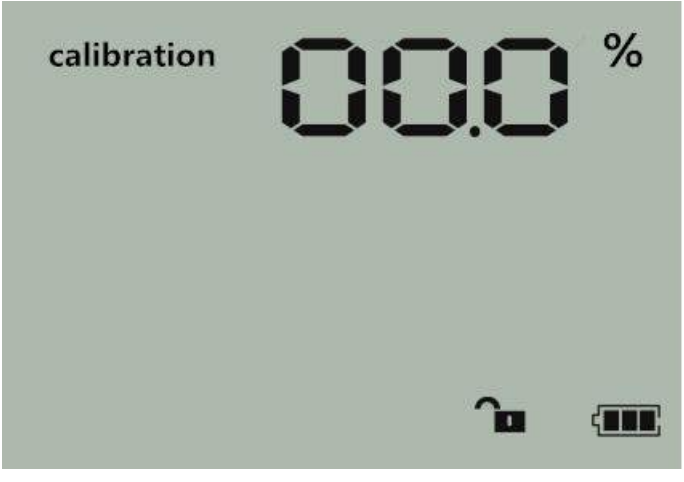
4.2 Introduction to key operation
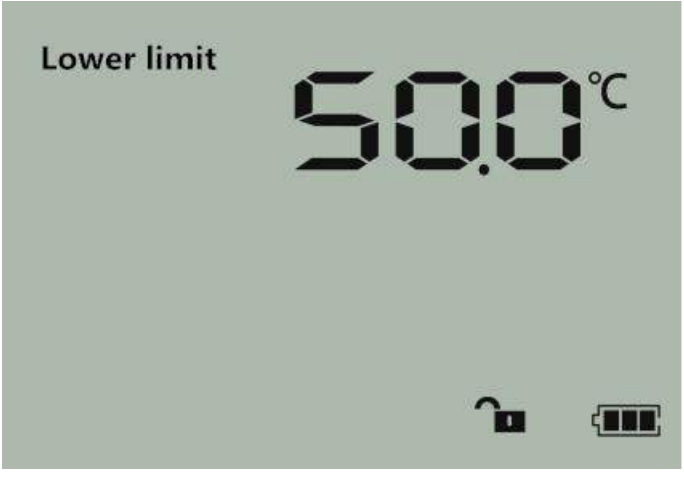
1) Short press to enter the password input interface, short press , , , to enter the password (the default password is 888), after the input is completed, long press the "" key again, enter the main setting menu after 3s, the main menu will be returned if the password is incorrect.
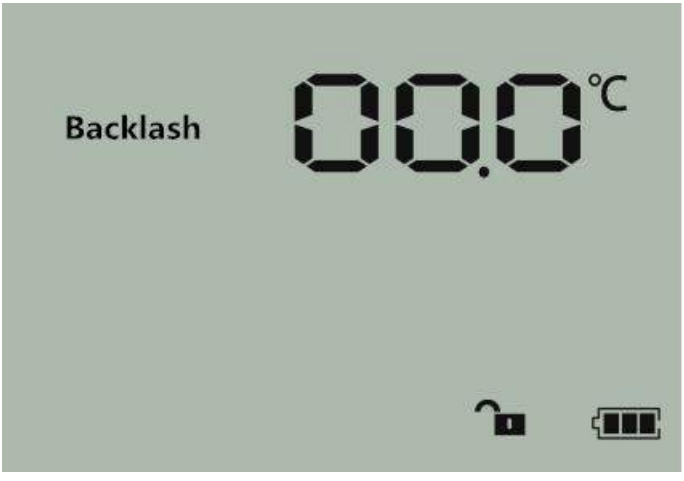
2) After entering the setting main menu, you can short press [▲] or [▼] turn the page

forward and backward, and short press [OK] to enter the parameter setting interface.

3) Short press, [▲], [▼], [OK] to modify the parameter, long press [OK] after the parameter

modification is completed, the parameter flashes for 3s and saves automatically.

4) During the setting process, press [↺] to abandon this setting, and press again [↺] to return

to the main interface.

4.3 Function display item description
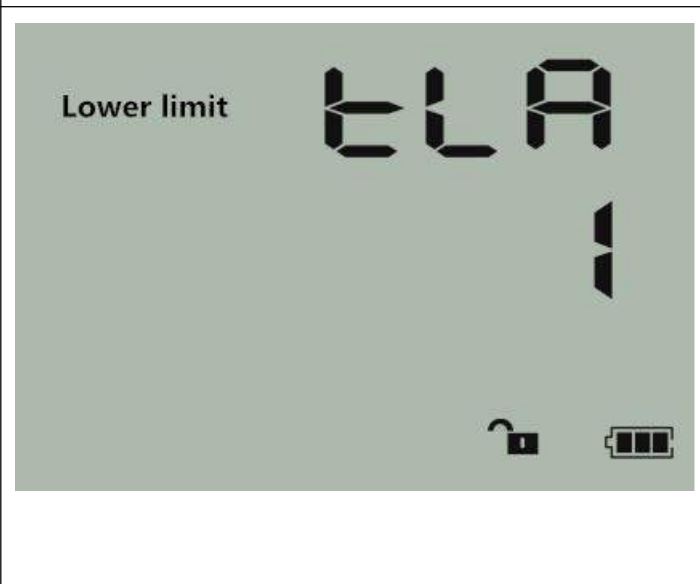
Display item	Features	Scope and description	default
address 001	address	1~255	1
Baud rate 4800	Baud rate	2400 4800 9600	4800
password 888	password	0~999	888
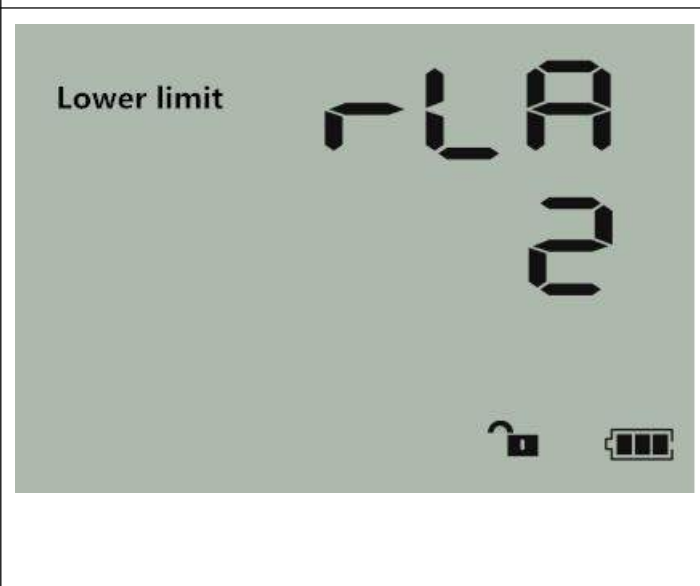
	Temperature calibration value	-100~+100	0
	Humidity calibration value	-100~+100	0
	Temperature upper limit alarm value	-40~+120	100
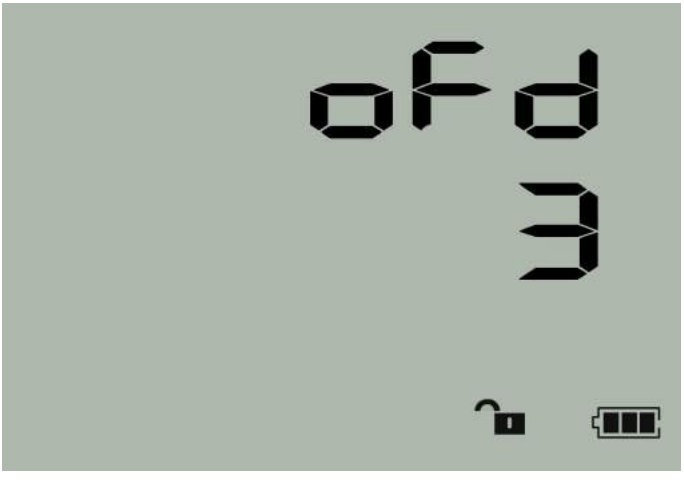
upper limit 75.0 %	Humidity upper limit alarm value	0~100	100
Lower limit 50.0 ℃	Temperature lower limit alarm value	-40~+120	0
Lower limit 15.0 %	Humidity lower limit alarm value	0~100	0

Backlash **00.0**℃	Temperature alarm return difference	0~120	0
Backlash **00.0**%	Humidity alarm return difference	0~100	0
16: 49: 05	time	Minutes and seconds	

	time	year month day	
15-12-12			
Upper limit tHA 1	Temperature upper limit associated relay number	1~2 1: Represents this alarm item is connected to the first relay 2: Represents this alarm item is connected to the second relay	1
Lower limit tLA 1	Temperature lower limit associated relay number	1~2 1: Represents this alarm item is connected to the first relay 2: Represents this alarm item is connected to the second relay	1

Upper limit — rHA 2	Humidity upper limit associated relay number	1~2 1: Represents this alarm item is connected to the first relay 2: Represents this alarm item is connected to the second relay	1
Lower limit — rLA 2	Lower limit of humidity associated relay number	1~2 1: Represents this alarm item is connected to the first relay 2: Represents this alarm item is connected to the second relay	1
ntE 030	Storage interval setting	0~1999 minutes	30 minutes

	Storage mode settings	1~3 1: means off 2: On behalf of open 3: stands for automatic	3 (Store only when communication is disconnected)
oFd 3			
CLd 0	Clear stored data	0~1 Set to 1 to clear stored data	0

5．Equipment installation instructions

5.1 Inspection before equipment installation

Equipment List:

■ **1 set of temperature and humidity transmitter equipment**

■ **Certificate, warranty card, calibration report, etc.**

■ **1 pair of wall buckle, 2 expansion plugs, 2 self-tapping screws, 2 countersunk screws**

■ **Sound and light alarm (optional)**

5.2 Interface Description
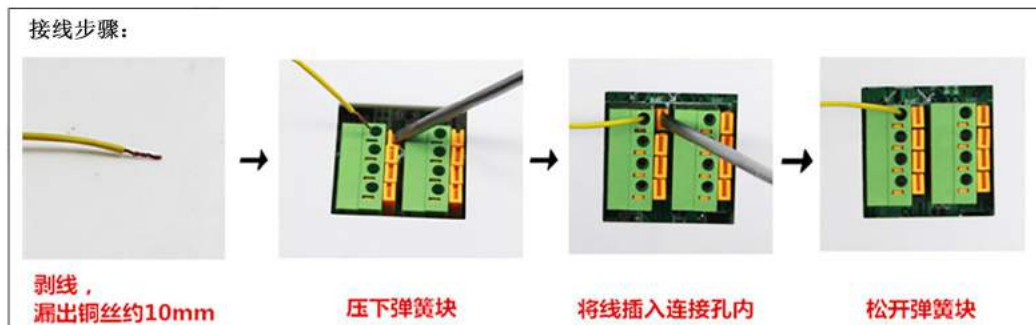
Serial number	Description	Serial number	Description
1	Positive power supply (10~30V DC)	5	485-A
2	Power negative	6	485-B
3	Normally open point of the first relay	7	The second relay normally open point
4		8	

Special Note:

1) There are certain specification requirements for 485 line field wiring. For details, please refer to the data package "485 Equipment Field Wiring Manual".
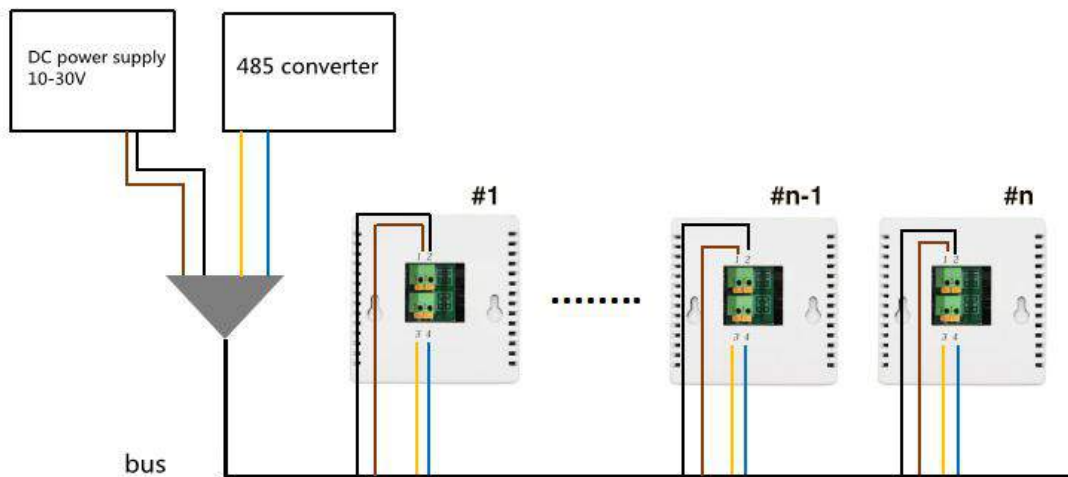
2) When the device is connected to the 485 bus, ensure that the addresses of multiple devices will not be repeated.

3) The two relays are normally open contact outputs, which can be associated with alarm items arbitrarily. For details, see the button setting section of the manual.

5.3 Installation Notes

To facilitate on-site construction, our company provides two equipment installation methods:

1) Installation in the gourd hole

Note: Drive self-tapping and expansion screws into the fixed position on the wall, and hook it to the gourd hole in the wall-mounted method.
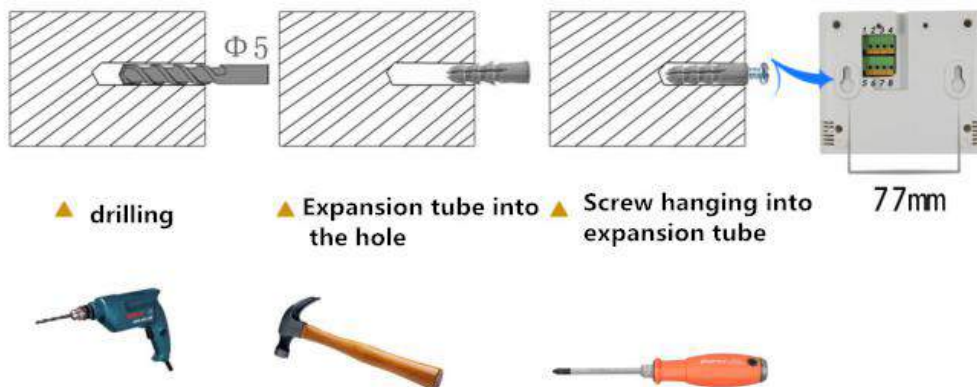
2) Wall-mounted buckle installation

Note: Use countersunk screws on one side of the hook to install on the wall, and use screws on the other side to install on the device, and then hang the two parts together.

drilling ▲ Expansion tube into the hole ▲ Screw hanging into expansion tube

77mm
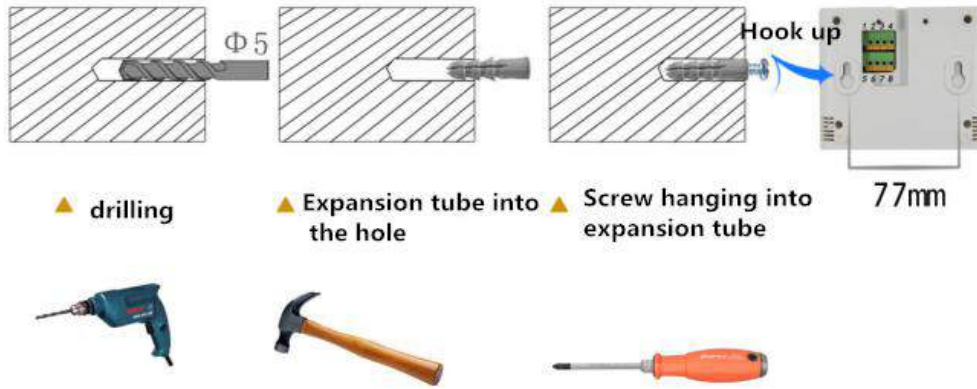
6. Device configuration before use

6.1 Hardware connection
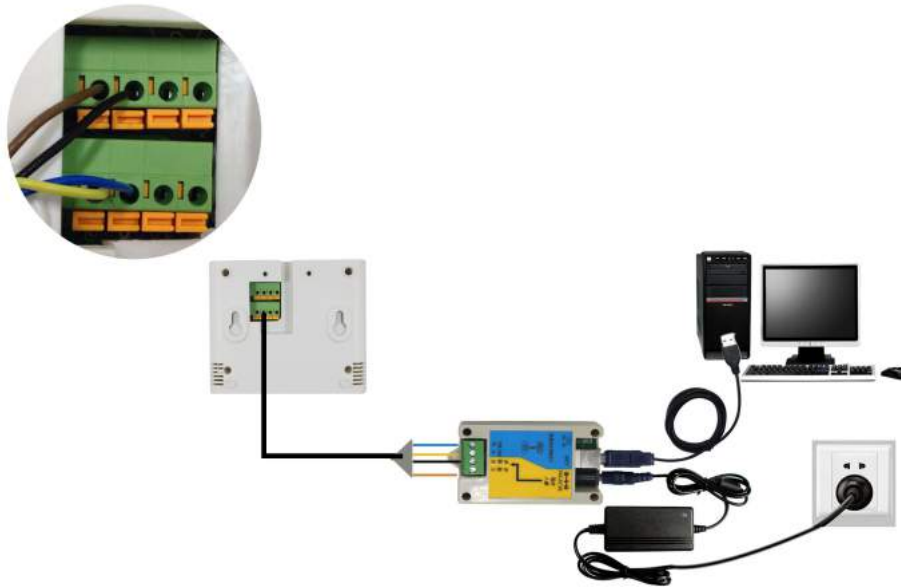
6.2 Software selection

Open the data package, select "Debugging Software" --- "485 Parameter Configuration Software",

485 parameter configuration tool KTControl Micros... find it, and open it.
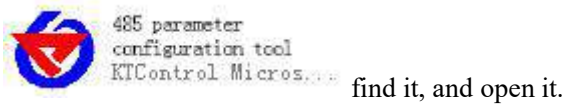
6.3 parameter settings

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

battery
port (COMand LPT)
Prolific USB-to-Serial Comm Port (COM1)
USB Serial Port (COM2)
USB-SERIAL CH340 (COM5)
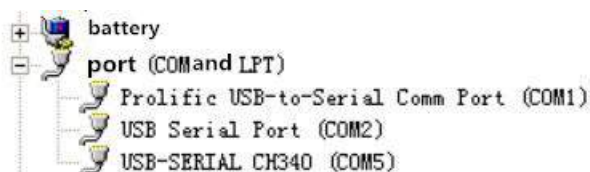
② Connect only one device alone and power it on, click the test baud rate of the software, the software will test the baud rate and address of the current device, the default baud rate is 4800bit/s, and the default address is 0x01.

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

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

7. letter of agreement
7.1 Basic 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

7.2 Data frame format definition

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

Initial structure $\geq$ 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 $\geq$ 4 bytes

Address code: the 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 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 low bit	High bit of check code
1 byte	1 byte	2 bytes	2 bytes	1 byte	1 byte

Slave machine response frame structure:

address code	function code	Number of valid bytes	Data area	Second data area	Nth data area	Check code
1 byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes	2 bytes

7.3 Register address

Register address	PLC or configuration address	content	operating
0000 H	40001	humidity	Read only
0001 H	40002	temperature	Read only

7.4 Communication protocol example and explanation

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

Interrogation frame:

address code	function code	initial address	Data length	Check code low	High bit of

				bit	check code
0x01	0x03	0x00 0x00	0x00 0x02	0xC4	0x0B

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

address code	function code	Returns the number of valid bytes	Humidity value	Temperature value	Check code low bit	High bit of check code
0x01	0x03	0x04	0x02 0x92	0xFF 0x9B	0x5A	0x3D

Temperature calculation:

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

Temperature: FF9B H (hexadecimal) = -101 => temperature = -10.1℃

Humidity calculation:

Humidity: 292 H (hexadecimal) = 658 => Humidity = 65.8%RH

8. 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 defaults are all 1).

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

4) The 485 bus is disconnected, or the A and B wires are reversed

5) If the number of equipment is too long or the wiring is too long, power supply should be nearby, add 485 booster, and add 120Ω terminal resistance at the same time.

6) USB to 485 driver is not installed or damaged

7) The equipment is damaged.

9. contact details

Shandong Renke Measurement and Control Technology Co., Ltd.

Address: 2nd Floor, East Block, Building 8, Shuntai Plaza, High-tech Zone, Jinan City, Shandong Province

Zip code: 250101

Phone: 400-085-5807

Fax: (86)0531-67805165

Website: www.rkckth.com

Cloud platform address: www.0531yun.cn

Web QR:

10. Document history

V1.0 document creation

V2.0 documentation update

V2.1 menu bar update

V2.2 Modified the working humidity of the circuit board

V2.3 removes the alarm enable