RS-WS-N01-2D-LCD

Industrial wall-mounted LCD Temperature and Humidity Transmitter User Manual (Type 485)

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1. product description

1.1product description

The product is an industrial wall-mounted high-protection grade enclosure, with a protection grade of IP65, rain and snow proof and good air permeability. The circuit adopts American imported industrial-grade microprocessor chips and imported high-precision temperature and humidity sensors to ensure excellent product reliability, high precision and interchangeability. The output signal type is RS485, the farthest can communicate 2000 meters, the standard modbus protocol, supports secondary development.

1.2Features

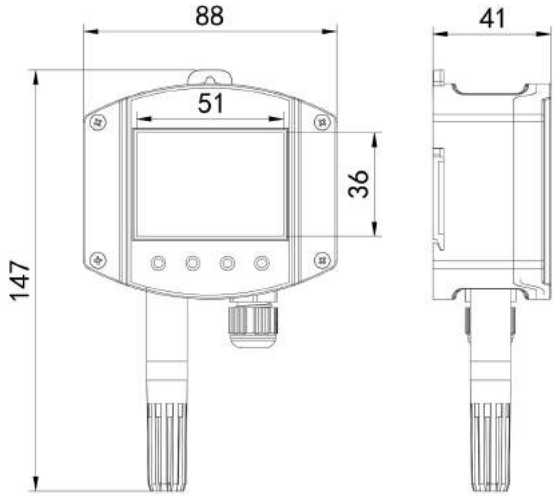
1. Using high-precision temperature and humidity measurement unit, long-term stability and small drift
2. Using dedicated 485 circuit, standard ModBus-RTU communication protocol, communication address and baud rate can be set
3.10~30V wide voltage range power supply
4. Easy to install, can be wall-mounted or rail-mounted
5. High anti-dust protection level (IP65)
6. LCD liquid crystal display, beautiful and generous
7. Buttons can set parameters, easy to operate

1.3The main technical parameters

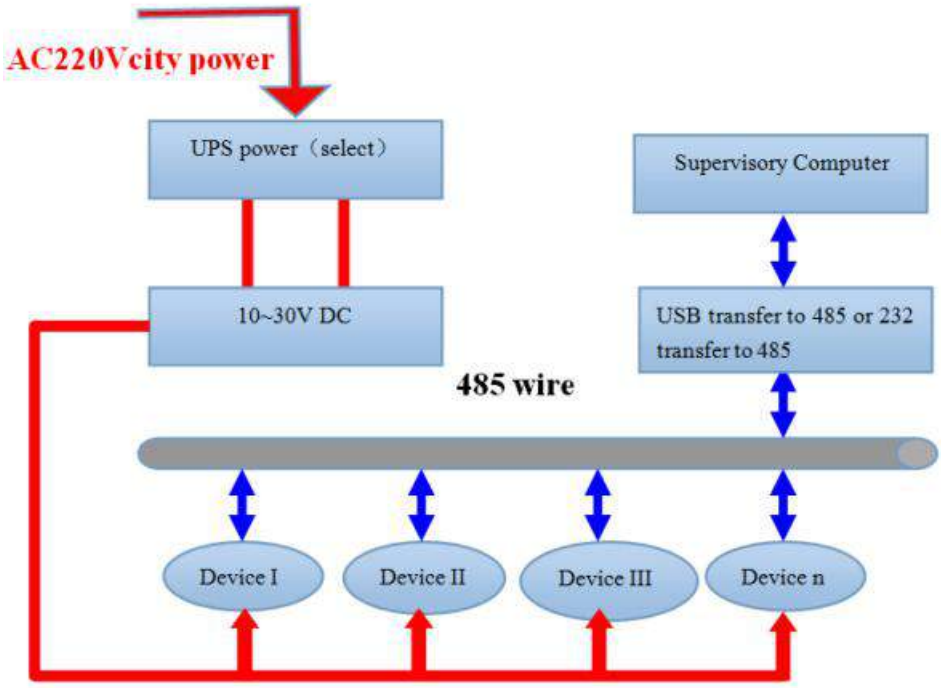
DC power supply (default)	DC 10-30V	
Maximum power consumption	0.4W	
A precision	humidity	±2%RH(60%RH,25℃)
	temperature	±0.4℃（25℃）
B quasi-accuracy	humidity	±3%RH(60%RH,25℃)
	temperature	±0.5℃（25℃）
(default)	-20℃~+60℃，0%RH~95%RH（Non-condensing）	
	-40℃~+120℃ default：-40℃~+80℃	
Transmitter circuit operating temperature and humidity	0%RH-100%RH	
Probe working temperature	Modbus-RTU letter of agreement	
Probe working humidity	485 Signal	
letter of agreement	0.1℃	
output signal	0.1%RH	
Temperature display resolution	1s	

Humidity display resolution	70mm	
Temperature and humidity refresh time	humidity	≤1%RH/y
	temperature	≤0.1℃/y
Response time	humidity	≤8s(1m/s Wind speed)
	temperature	≤25s(1m/s Wind speed)
parameter settings	Direct modification through software settings or buttons	

1.4Equipment size



1.5system framework



System scheme block diagram

1.6product model

RS-				Company code
	WS-			Temperature and humidity transmission, sensor
		N01-		485 communication (Modbus-RTU protocol)
			2D-LCD	Industrial wall hanging (liquid crystal display)

2. Equipment installation instructions

2.1Inspection before equipment installation

Equipment List：

1. 1 set of temperature and humidity transmitter equipment

2. Certificate of conformity, warranty card, calibration report, etc.

3. 2 expansion plugs, 2 self-tapping screws

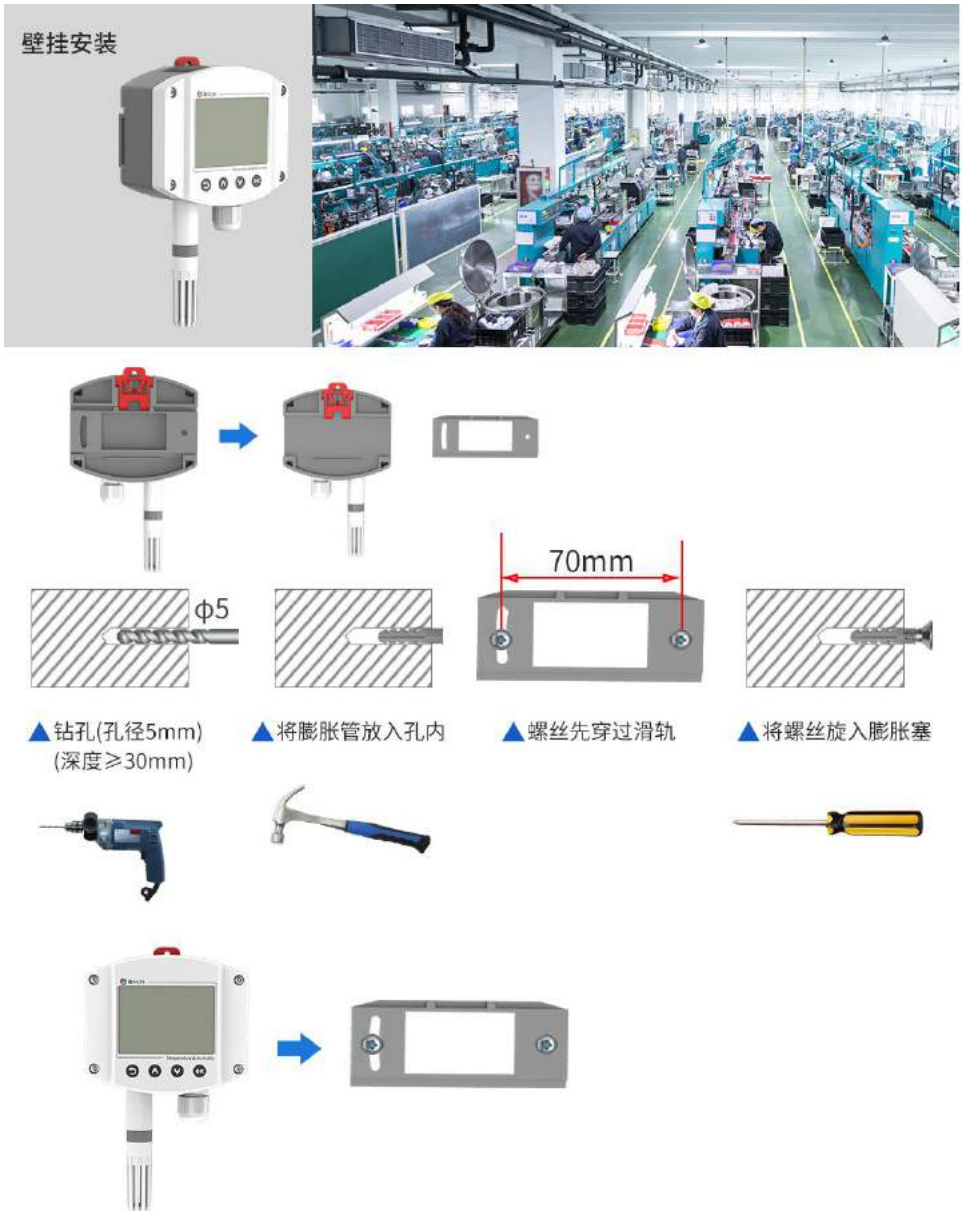
4. USB to 485 (optional)

5. 485 terminal resistance (gift for multiple devices)

2.2 Installation method

Wall mount

The back of the transmitter is equipped with a slide rail mounting plate. Remove the mounting plate first. There are two expansion plugs and two self-tapping screws in the accessories. First, punch two holes with a diameter of 5mm and a depth of ≥30mm on the wall (the opening spacing is 70mm). After inserting the expansion plug, fix the slide rail mounting plate to the wall with self-tapping screws, and finally slide the transmitter into it.



Slide rail installation

The back of the transmitter is equipped with a slide rail mounting plate. Remove the mounting plate first. The transmitter can be slid directly into the standard 35 rail。

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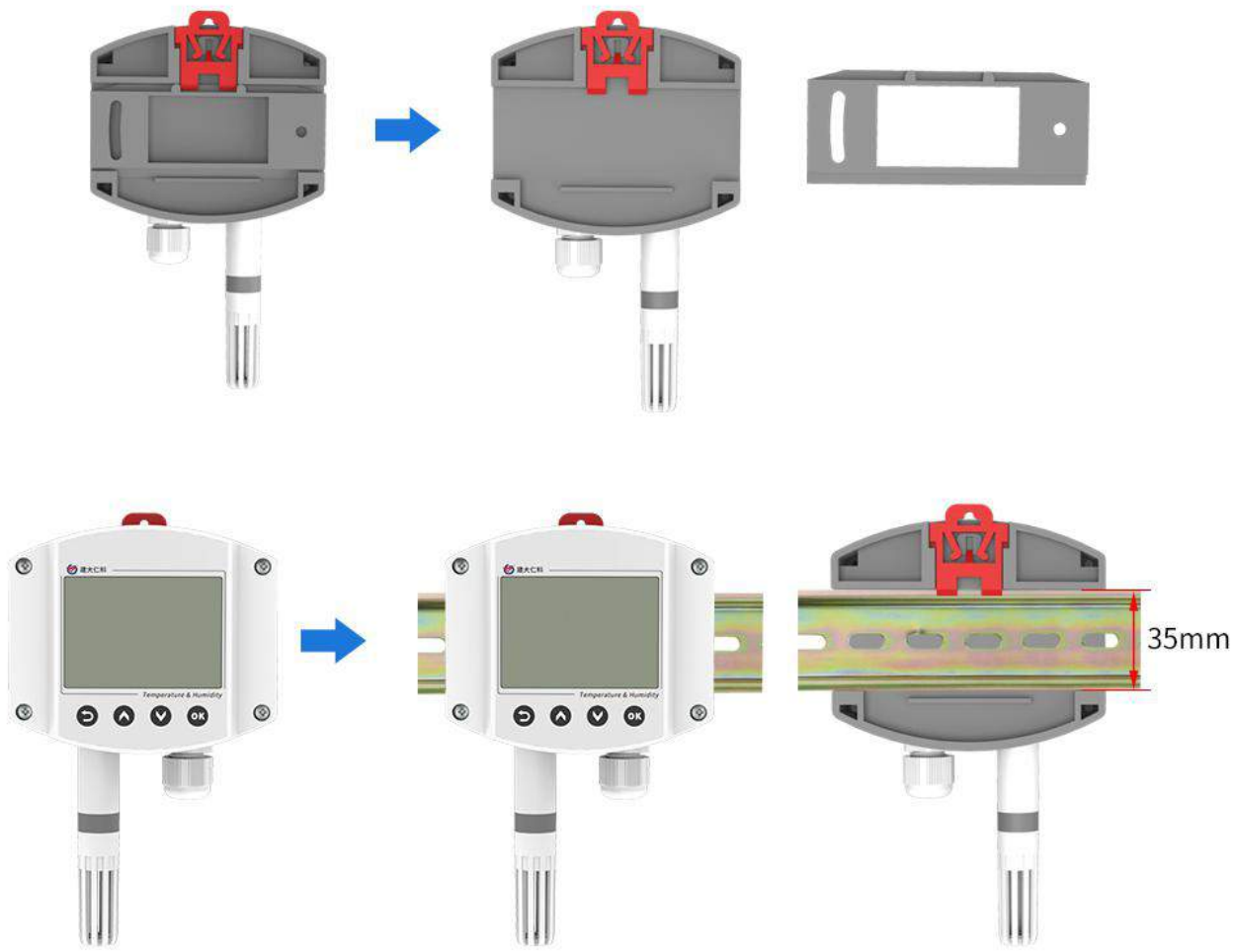


Special Note：

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.

2.31 Wiring instructions.

Power and 485 signal

Wide-voltage power input can be 10~30V. When wiring the 485 signal line, pay attention to the two wires A\B not to be reversed, and the addresses of multiple devices on the bus cannot be conflicted.

2.4 Specific wiring

	Circuit identification	illustrate
power supply	VCC	V+（10~30V DC）
	GND	V-
Communication	485A	485-A
	485B	485-B

2.5Panel display description

If the device address is less than 100, the decimal address is displayed at the display location of the device address; if the device address is greater than 100, the hexadecimal address is displayed at the display location of the device address.

3. Configuration software installation and use

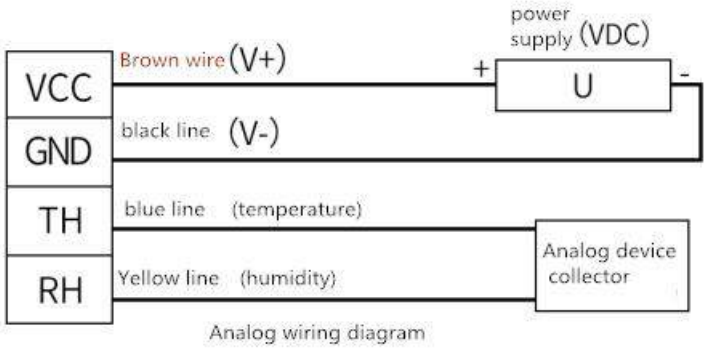
3.1 Software selection

Open the data package, select "Debugging software" --- "485 parameter configuration software",

turn up 

Just open it。

Note: When using the configuration software to change the address and baud rate, only one device can be connected.

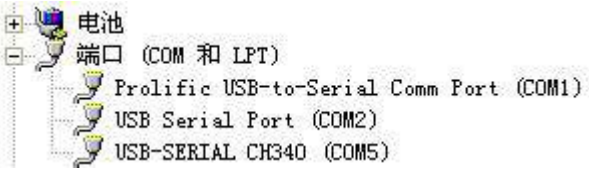


Analog wiring diagram

（The device does not provide a communication line by default, the color of the line is for reference only）

3.2 parameter settings

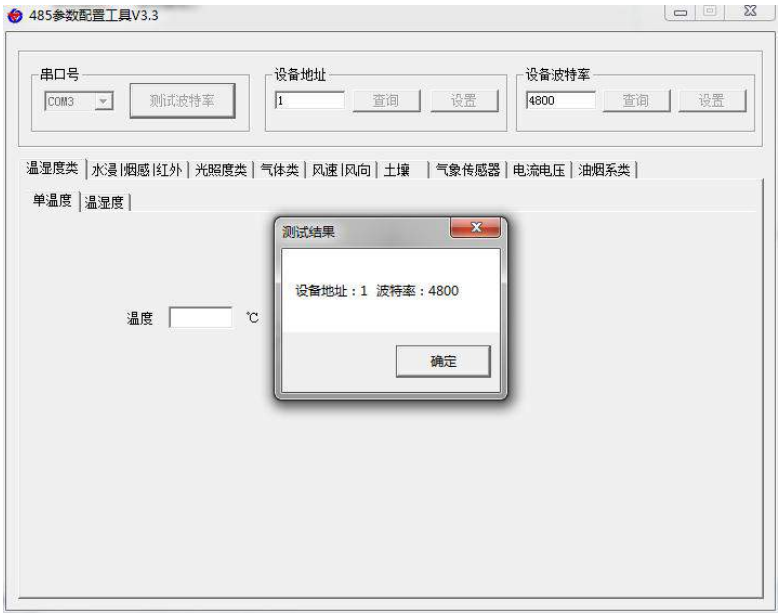
①. Select the correct COM port (check the COM port in "My Computer—Properties—Device Manager—Port"). The following figure lists the driver names of several different 485 converters.



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, you can 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

4.1 Basic communication parameters

Code	8-bit binary
Data bit	8-bit
Parity bit	without
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 of 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 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 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
1byte	1byte	2byte	2byte	1byte	1byte

Slave response frame structure：

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

4.3 Register address

Register address (Hexadecimal)	Register address (10 hex)	PLC or configuration address (10 hex)	content	operate
0000 H	0	40001	humidity (Expanded by 10 times the actual humidity)	Read only
0001 H	1	40002	temperature (Expanded by 10 times the actual temperature)	Read only
07D0H	2000	42001	Device address	Read and write
07D1H	2001	42002	Device baud rate	Read and write

4.4 Communication protocol example and explanation

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

Inquiry frame (hexadecimal):

address code:	function code	initial address	Data length	Check code low bit	High bit of check code
0x01	0x03	0x00 0x00	0x00 0x02	0xC4	0x0B

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

address code:	function code	Returns the number of vali	Humidity value	Temperature value	Check code low bit	High bit of check c

		d bytes				ode
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

5.Key operation instructions

1）short according 

key，Enter the password input interface interface，short according  、  、 

Password input is possible (default password is 888)， Long press again after input 

keyEnter the main interface of settings, the password error prompts ERR.

2） After entering the setting main menu， short according  or  Page forward and backward， short according 

Enter the parameter setting interface。

3）short according  、  、 

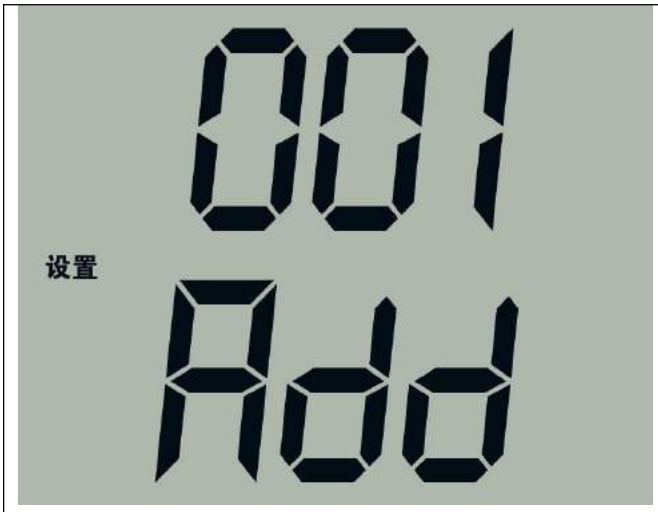
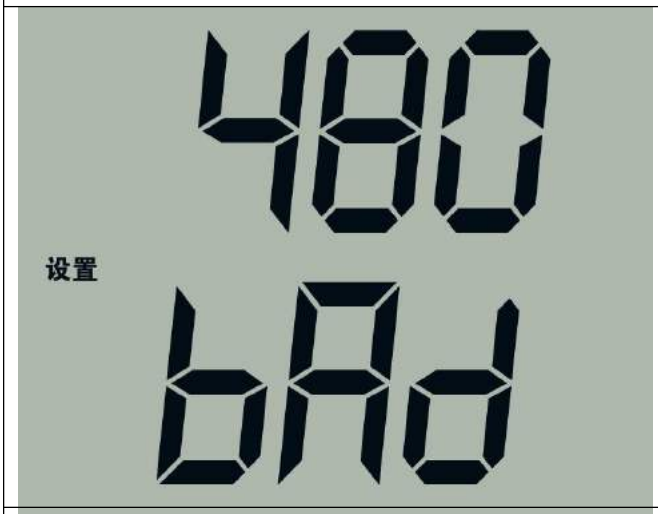
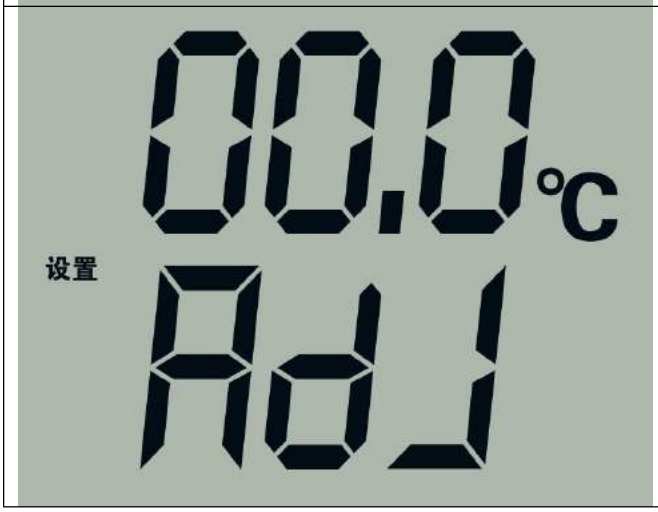
Modifiable parameters，Short press after parameter modification is completed 

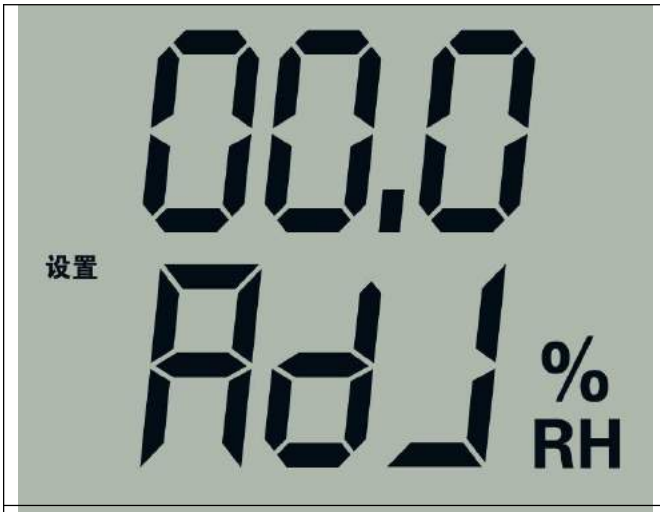
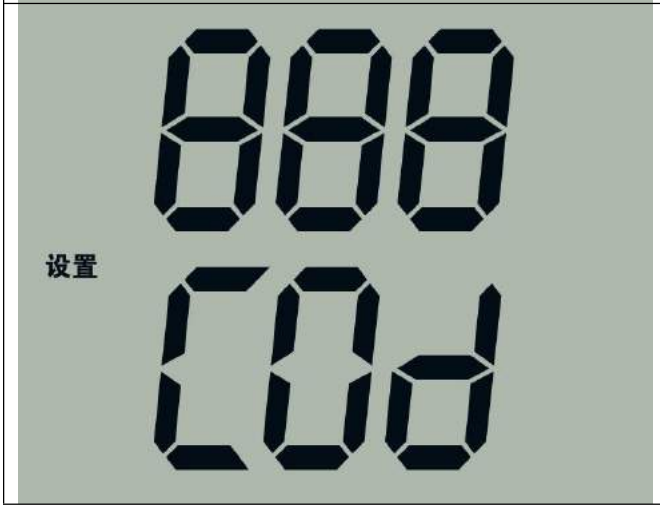
， The parameters are automatically saved.

4）During the setting process, press  Can abandon this setting，Press again  Back to the main interface。

The specific parameter interface is as follows:

show interface	illustrate	Key operation

	Set the address of the device Default value: 1 Range: 1~255	short according Address plus 1，long Press address +10；short according Address minus 1，long Press Address minus10。short according key，Save the displayed address value as the target address。
	Set the baud rate of the device Range: 2400/4800/9600 Default value: 4800	press The baud rate can be switched between 2400, 4800, 9600。short according key，Save the displayed baud rate value as the target baud rate.
	Set the temperature calibration value of the device Range: -100.0~100.0 Default value: 0	short according +1，long Press +10；short according -1，long Press -10。short according key，Save the displayed temperature calibration value as the target temperature calibration value.

	Set the humidity calibration value of the device Range: -100.0~100.0 Default value: 0	short press +1，long Press +10；short press -1，long Press -10。short press key，Save the displayed humidity calibration value as the target humidity calibration value.
	Set device password Range: 000~999 Default: 888	short press +1，long Press +10；short press -1，long Press -10。short press key，Save the displayed password as the target password

6. 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.

7. Contact information

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