

## SC7210B

# RS485 interface with communication function temperature and humidity controller User Manual

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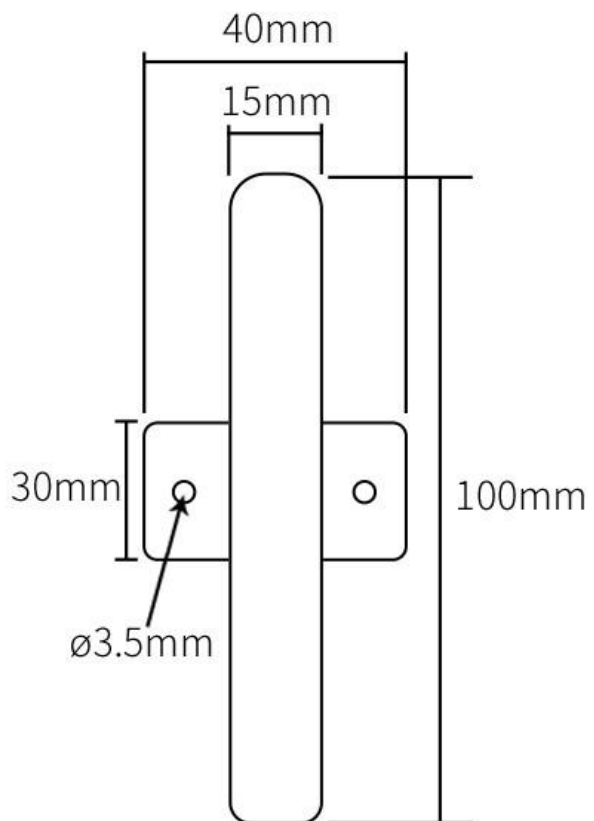
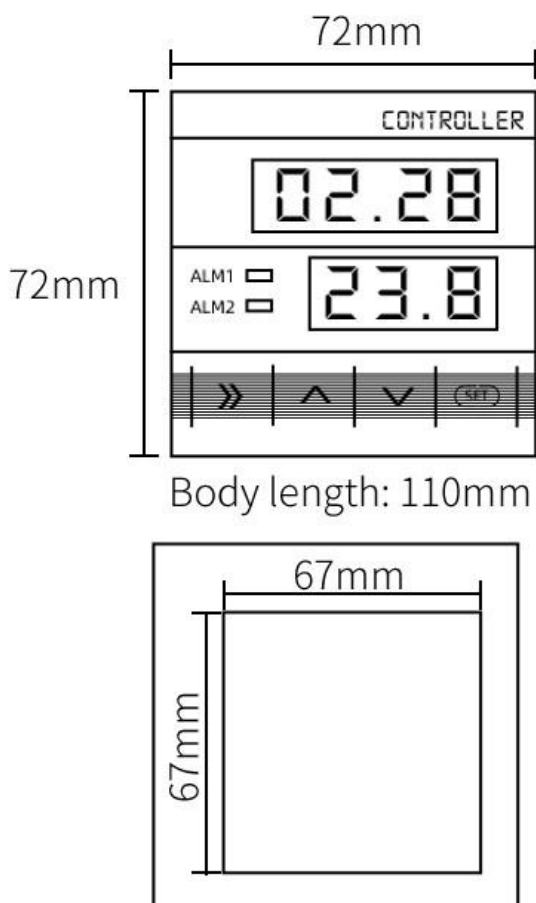
SC7210B using the standard RS485 bus MODBUS-RTU protocol, easy access to PLC, DCS and other instruments or systems for monitoring temperature, humidity state quantities. The internal use of high-precision sensing core and related devices to ensure high reliability and excellent long-term

stability, can be customized RS232, RS485, CAN, 4-20mA, DC0~5V/10V, ZIGBEE, Lora, WIFI, GPRS and other output methods.

### Technical Parameters

Technical parameter	Parameter value
Brand	SONBEST
Temperature measuring range	-30℃~80℃
Temperature measuring accuracy	±0.5℃ @25℃
Communication Interface	RS485
Default baud rate	9600 8 n 1
Power	AC185~265V 1A
Control mode	Relay
carrying capacity	10A 220VAC
Running temperature	-30~85℃
Working humidity	5%RH~90%RH

### Product Size



# Key instructions

# DETAILED KEYS

Standard MODBUS-RTU protocol, default baud rate is 9600, invalid check, 8 data bits, software can change threshold and other parameters, and query lighting data in real time through RS485



» : Select setting key

^ : Up key

v : Down key

SET : Set key

The fourth page is the mode setting

Mode 1: Heating humidification control

Mode 2: Cooling and dehumidifying control

※The upper part is the temperature display value  
The lower part is the humidity display value.

## Key operation

◆ Press and hold SET for two seconds and release it to enter the heating and humidifying control setting.

Press "»" to select the position, press "^" and "v" to adjust the value. In mode 1, the controller will act when the value is lower than the lower limit threshold.

Upper threshold: Minimum temperature 0, maximum 99.9

Humidity minimum 0, maximum 99.9

◆ Press SET to enter the cooling and dehumidifying control setting. Press "»" to select the position, press "^" and "v" to adjust the value.

In mode 2, the controller will act when the value is higher than the upper threshold.

Lower limit threshold: Minimum temperature -30, maximum 99.9

Humidity minimum 0, maximum 99.9

◆ Press SET twice to enter the control hysteresis setting.

Press "»" to select the position, press "^" and "v" to adjust the value.

Hysteresis: Minimum temperature 0, maximum 10

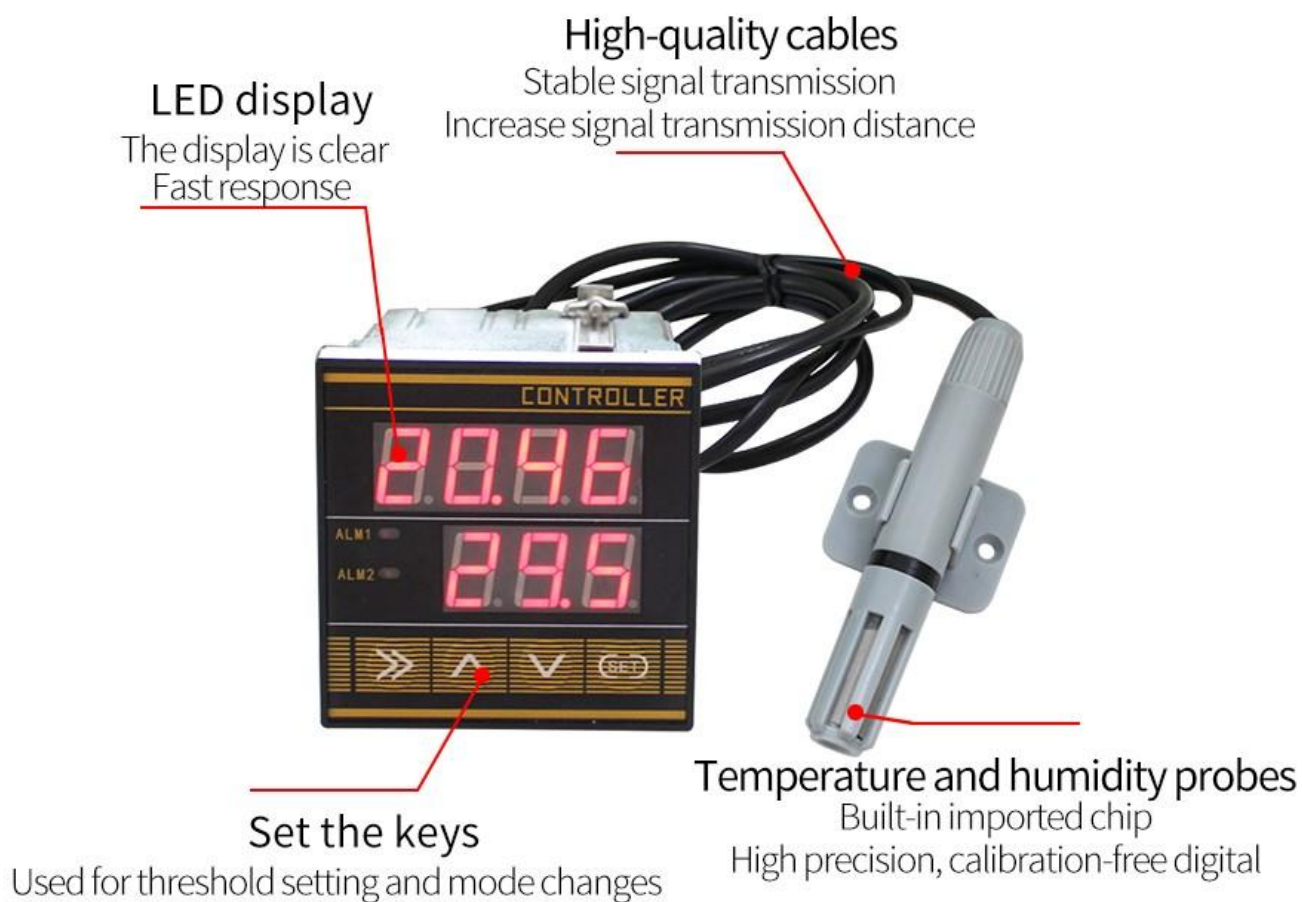
Humidity minimum 0, maximum 10

◆ Press SET three times to enter the control mode setting.

Press "»" to select the position, press "^" and "v" to adjust the value.

Mode 1: Action below the lower limit threshold

Mode 2: Action above the upper threshold





Sensor V+	1	V+RED		LPALM TREE	8	Power supply AC220V
SensorV-	2	V-GREEN		NBLUE	9	
Empty foot NULL	3	EMPTY		COM	10	Public side
SensorB1-	4	B-BLACK		NC1	11	Relay 1 normally closed point
SensorA1+	5	A+YELLOW		NO1	12	Relay 1 normally open point
RS485B-	6	B-		NC2	13	Relay 2 normally closed point
RS485A+	7	A+		NO2	14	Relay 2 normally open point

### Sensor wiring on the left

	(1)RED	SensorV+
	(2)GREEN	SensorV-
	(4)BLUE	SensorB1-
	(5)YELLOW	SensorA1+

### Right power supply AC220V wiring

	(8)PALM TREE	L PALM TREE
	(9)BLUE	N BLUE

### Wiring instructions

In the case of broken wires, wire the wires as shown in the figure. If the product itself has no leads, the core color is for reference.

### How to use?

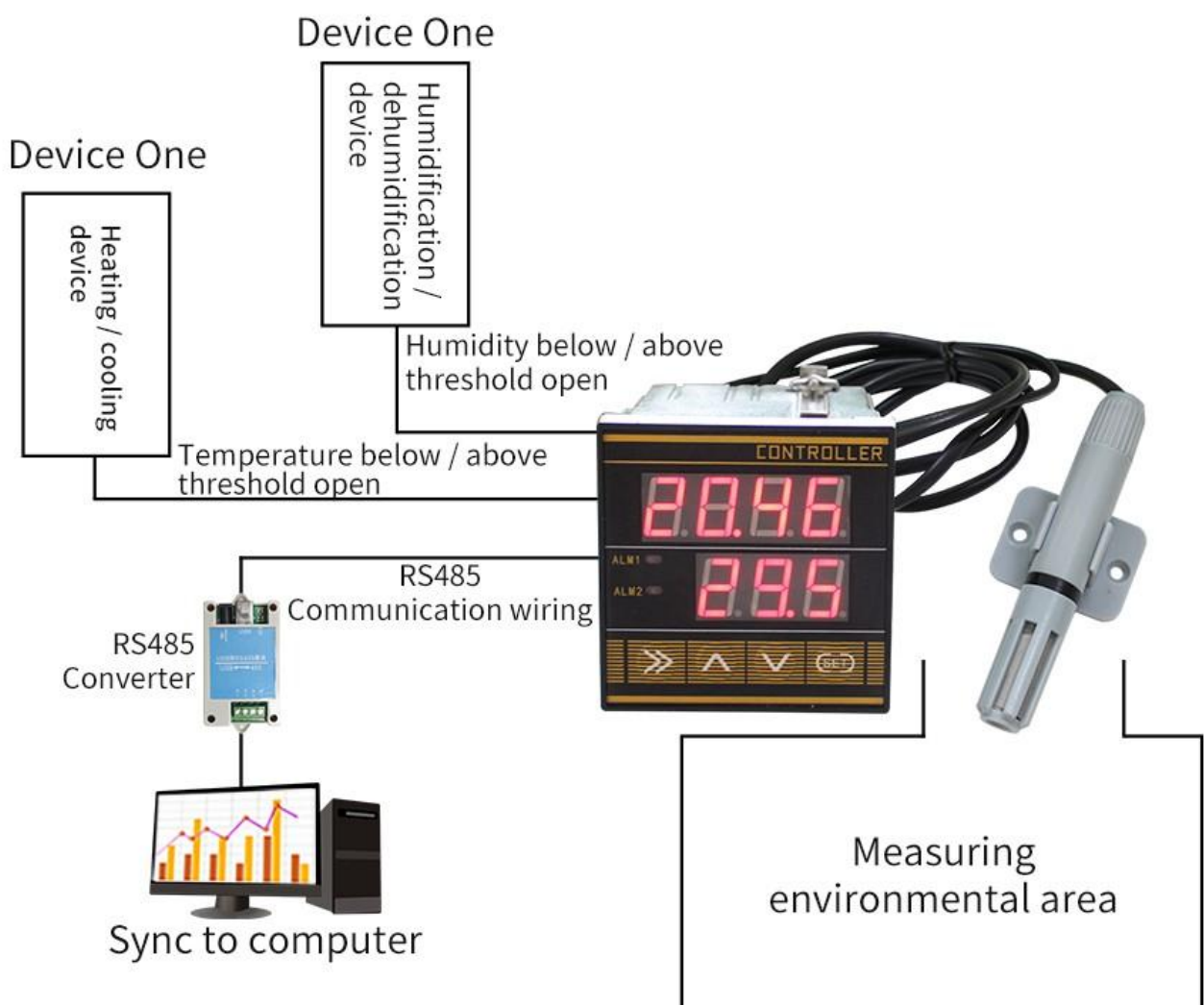
It is widely used in anti-condensation protection and environmental protection of high and low voltage switchgear, terminal boxes, box-type substations, and can also be used in granaries, warehouses, pharmacies, and factories with high requirements for temperature and humidity environment



### Application solution

# APPLICATION OF INTELLIGENT CONTROLLER

Example: During monitoring, if the temperature and humidity exceed / below the threshold, the sensor will transmit the temperature and humidity data to the controller, then the controller will turn off / on the device according to the preset threshold, and the data will be transmitted through the RS485 communication port. Sync to computer

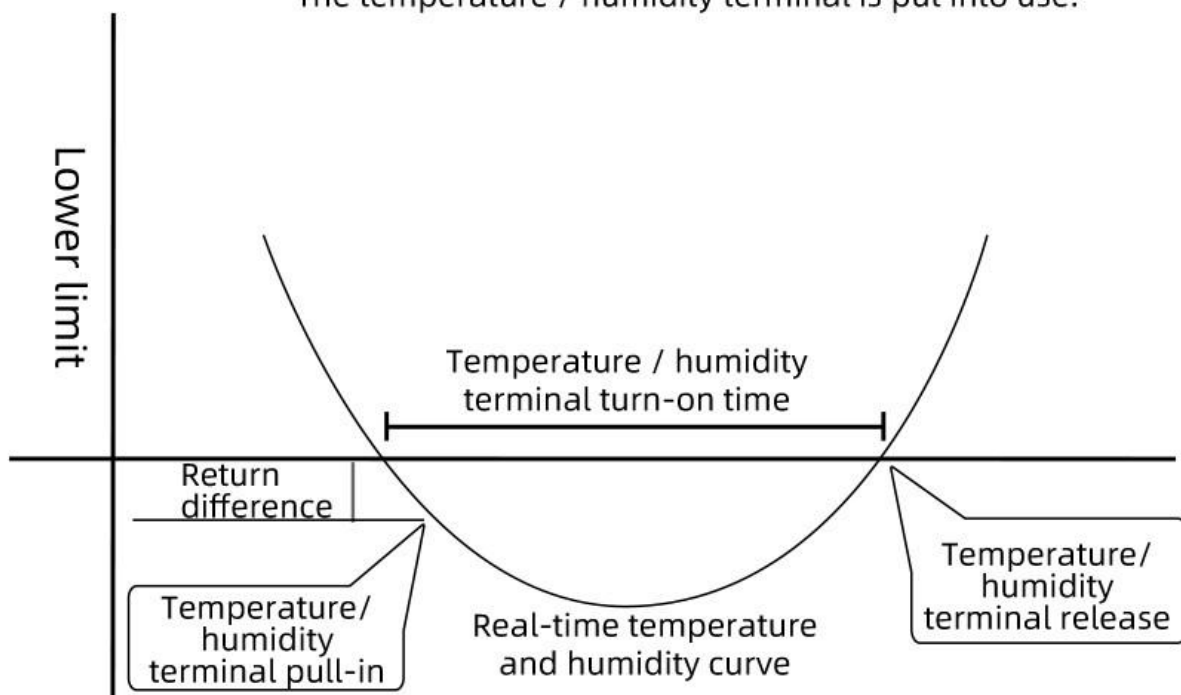




# CONTROL METHOD AND PROCESS

Heating and humidification control, cooling and dehumidification control

**Mode 1: The action is below the lower threshold**  
The temperature / humidity terminal is put into use.



## Opening and closing process of temperature and humidity control equipment

Working condition of temperature / humidity terminal access:

measured value < lower limit threshold - return difference

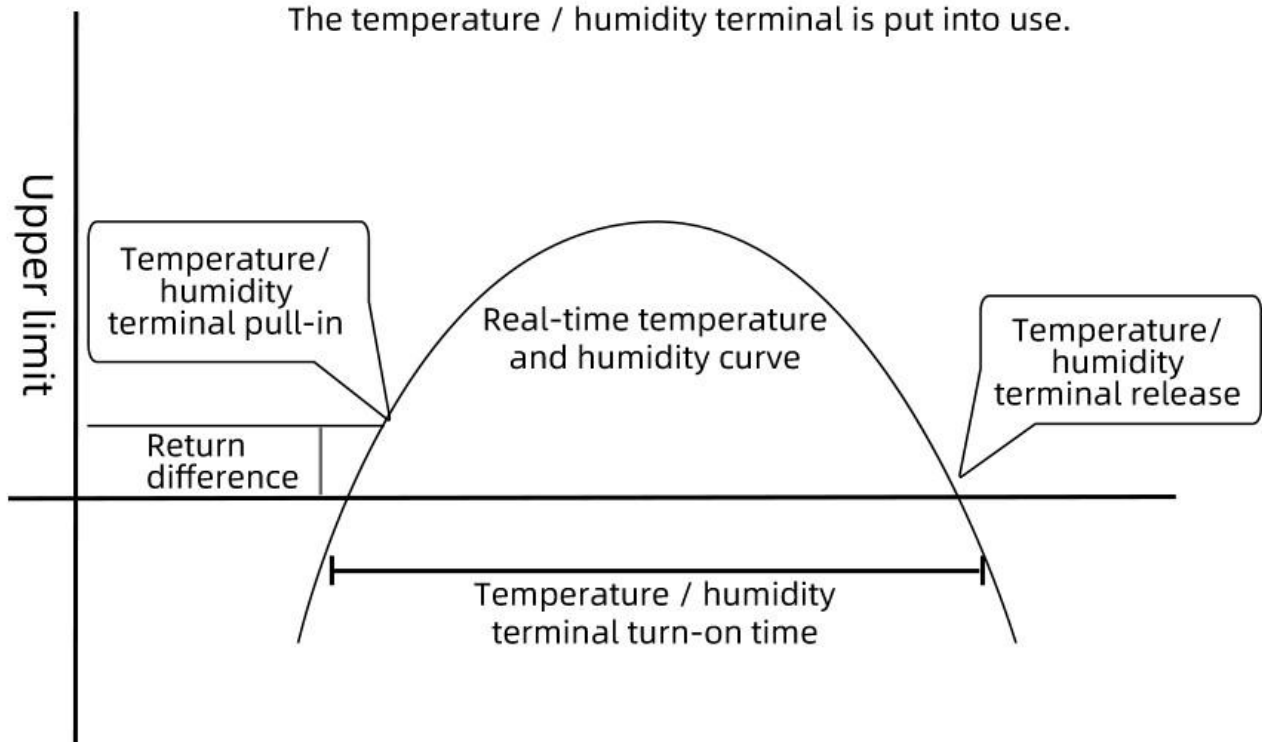
Temperature / humidity terminal release action condition:

measured value > lower limit threshold + return difference value

※As shown in the figure above, when the measured value is lower than the lower threshold minus the return difference, it will be pulled into the internal temperature / humidity terminal of the controller and powered on. When the measured value rises to the sum of the upper limit and the return difference, the temperature / humidity terminal is disconnected. Turn off the device.

## Mode 2: Action above the upper threshold

The temperature / humidity terminal is put into use.



## Opening and closing process of temperature and humidity control equipment

Working conditions for temperature and humidity terminal access:

measured value > upper threshold + hysteresis

Temperature and humidity terminal release action conditions:

measured value < upper limit threshold - return difference

※As shown in the figure above, when the measured value is higher than the upper threshold plus the return difference, the internal temperature / humidity terminal of the controller will pull in and turn on the device; when the measured value drops to the lower limit threshold minus the return difference, the temperature / humidity terminal Disconnect and turn off the device.

### Product List



Intelligent temperature and  
humidity controller  
(including power supply, sensor)



Reminder card



Certificate

## Communication Protocol

The product uses RS485 MODBUS-RTU standard protocol format, all operation or reply commands are hexadecimal data. The default device address is 1 when the device leaves the factory, and the module or NON-Recorder default baud rate is 9600,8,n,1, but data recorder default baud rate is 115200.

### 1. Read data (function code 0x03)

Inquiry frame (hexadecimal), sending example: query 1 data of 1# device, the upper computer sends the command: 01 03 00 00 00 02 C4 0B.

Address	Function Code	Start Address	Data Length	Check Code
01	03	00 00	00 02	C4 0B

For the correct query frame, the device will respond with data: 01 03 04 00 7A 00 00 DB EA, response format:

Address	Function Code	Length	Data 1	Data 2	Check Code
01	03	04	00 79	00 7A	DB EA

Data description: The data in the command is hexadecimal, take data 1 as an example, 00 79 is converted to decimal value as 121, assuming the data magnification is 100, then the real value is  $121/100=1.21$ , Others and so on.

### 2. Common data address table

Configuration Address	Register Address	Register Description	Data Type	Value Range
40001	00 00	temperature	Read Only	0~65535
40002	00 01	humidity	Read Only	0~65535
40101	00 64	Model Code	Read/Write	0~65535
40102	00 65	total number of measuring points	read/write	1~20
40103	00 66	device address	read/write	1~249
40104	00 67	baud rate	read/write	0~6
40105	00 68	communication mode	read/write	1~4
40106	00 69	protocol type	read/write	1~10

### 3 Read and modify device address

#### (1) Read or query device address

If you don't know the current device address and there is only one device on the bus, you can query the device address through the command FA 03 00 66 00 01 71 9E .

Device Address	Function Code	Start Address	Data Length	Check Code
FA	03	00 66	00 01	71 9E

FA means 250 is the general address, when you don't know the address, you can use 250 to get the real device address, 00 66 is the device address register.

For the correct query command, the device will respond, for example, the response data is: 01 03 02 00 01 79 84, and its format parsing is shown in the following table:

Device Address	Function Code	Start Address	Model Code	Check Code
01	03	02	00 01	79 84

In the response data, the first byte 01 represents the real address of the current device.

#### (2) Change device address

For example, if the current device address is 1 and we want to change it to 02, the command is: 01 06 00 66 00 02 E8 14 .

Device Address	Function Code	Register Address	Target Address	Check Code
01	06	00 66	00 02	E8 14

After the change is successful, the device will return the information: 02 06 00 66 00 02 E8 27 , and its format analysis is shown in the following table:

Device Address	Function Code	Register Address	Target Address	Check Code
02	06	00 66	00 02	E8 27

In the response data, after the modification is successful, the first byte is the new device address. Generally, after the device address is changed, it will take effect immediately. At this time, the user needs to change the query command of his software accordingly. .

### 4 Read and modify baud rate

#### (1) Read baud rate

The default factory baud rate of the device is 9600. If you need to change it, you can change it according to the following table and the corresponding communication protocol. For example, to read the baud rate ID of the current device, the command is: 01 03 00 67 00 01 35 D5 , the format is parsed as follows.

Device Address	Function Code	Start Address	Data Length	Check Code
01	03	00 67	00 01	35 D5

Read the baud rate code of the current device. Baud rate code: 1 is 2400; 2 is 4800; 3 is 9600; 4 is 19200; 5 is 38400; 6 is 115200.

For the correct query command, the device will respond, for example, the response data is: 01 03 02 00 03 F8 45, and its format analysis is shown in the following table:

Device Address	Function Code	Data Length	Baud Rate Code	Check Code
01	03	02	00 03	F8 45

According to the baud rate code, 03 is 9600, that is, the baud rate of the current device is 9600.

## (2) Change the baud rate

For example, change the baud rate from 9600 to 38400, that is, change the code from 3 to 5, the command is: 01 06 00 67 00 05 F8 16 .

Device Address	Function Code	Register Address	Target Baud Rate	Check Code
01	06	00 67	00 05	F8 16

Change the baud rate from 9600 to 38400, that is, change the code from 3 to 5. The new baud rate will take effect immediately, and the device will lose response at this time, and the baud rate of the device needs to be checked accordingly Modified.

## 5 Read and modify correction value

### (1) Read correction value

When there is an error between the data and the reference standard, we can reduce the display error by adjusting the correction value. The correction difference can be modified in a range of plus or minus 1000, that is, the value range is 0-1000 or 64535 -65535. For example, when the displayed value is too small by 100, we can correct it by adding 100. The command is: 01 03 00 6B 00 01 F5 D6 . In the command, 100 is hexadecimal 0x64 ;If you need to reduce it, you can set a negative value, such as -100, the corresponding hexadecimal value is FF 9C, the calculation method is 100-65535=65435, and then converted to hexadecimal, it is 0x FF 9C. Device The correction value starts from 00 6B. We take the first parameter as an example to illustrate. When there are multiple parameters, the correction value is read and modified in the same way.

Device Address	Function Code	Start Address	Data Length	Check Code
01	03	00 6B	00 01	F5 D6

For the correct query command, the device will respond, for example, the response data is: 01 03 02 00 64 B9 AF, and its format parsing is shown in the following table:

Device Address	Function Code	Data Length	Correction Value	Check Code
01	03	02	00 64	B9 AF

In the response data, the first byte 01 represents the real address of the current device, and 00 6B is the first state correction value register. If the device has multiple parameters, other parameters operate in the same way as this The same, generally temperature and humidity have this parameter, and lighting generally does not have this parameter.

### (2) Change the correction value

For example, if the current state is too small, we want to add 1 to its real value, and add 100 to the current value. The correction operation command is: 01 06 00 6B 00 64 F9 FD .

Device Address	Function Code	Register Address	Target Address	Check Code
01	06	00 6B	00 64	F9 FD

After the operation is successful, the device will return the information: 01 06 00 6B 00 64 F9 FD , after



the successful change, the parameters will take effect immediately.

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