

# Rain and snow sensor

Ver 2.0



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## No.1Product Introduction

### 1.1Product Overview

The rain and snow sensor is mainly used to detect whether there is rain or snow in nature. This sensor adopts AC impedance measurement, the electrode has a long service life and will not have oxidation problems. This rain and snow sensor can be widely used in the qualitative measurement of rain and snow in the environment, greenhouses, breeding, construction, buildings, etc. It is safe and reliable, beautiful in appearance, and easy to install.

### 1.2Features

The AC impedance measurement method can effectively prevent the electrode from oxidative electrolysis, greatly improving its lifespan. The rain and snow measurement results are accurate, and the false alarm rate is almost zero.

The optional heating function automatically activates the snow heating function to speed up snow and ice removal when the temperature is low, making the measurement faster.

### 1.3Main parameters

Power supply:10~30V DC

Normal working power:0.4W

Storage environment: -40°C~80°C Working

Typical power consumption when heating:3.4W

environment temperature: -40°C~60°C DefaultModBus

Output signal:485, Relay

address:01 Heating start ambient temperature: <15°C  
(default)

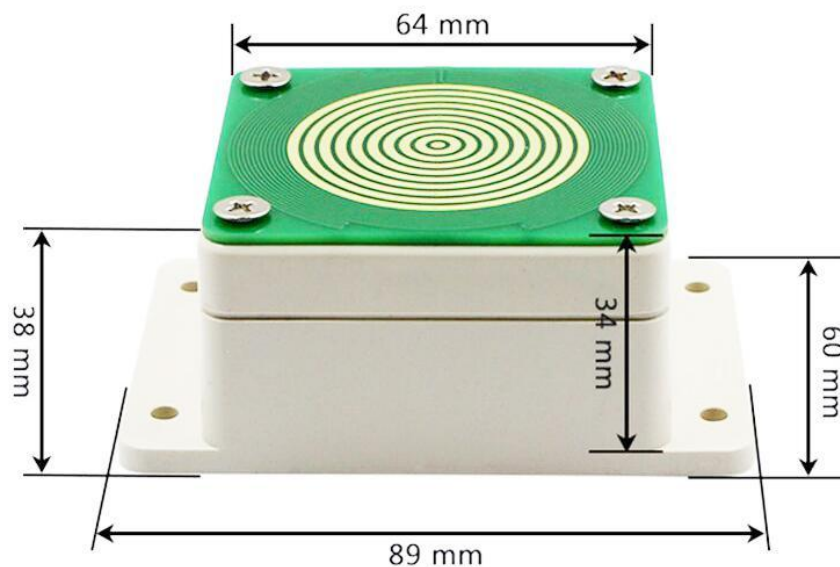
Supported function codes:03,06

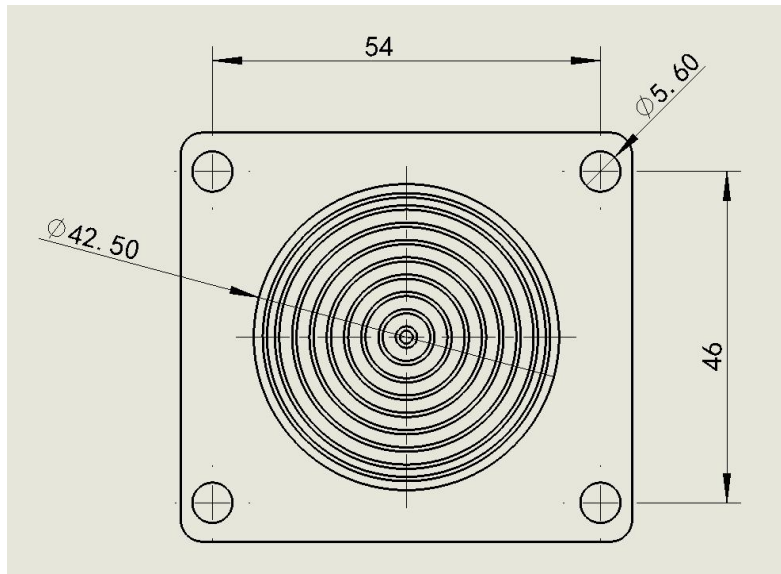
Maximum heating temperature:40°C (default)

Output relay load capacity:250VAC 1A/30VDC 1A

Parameter configuration: software settings

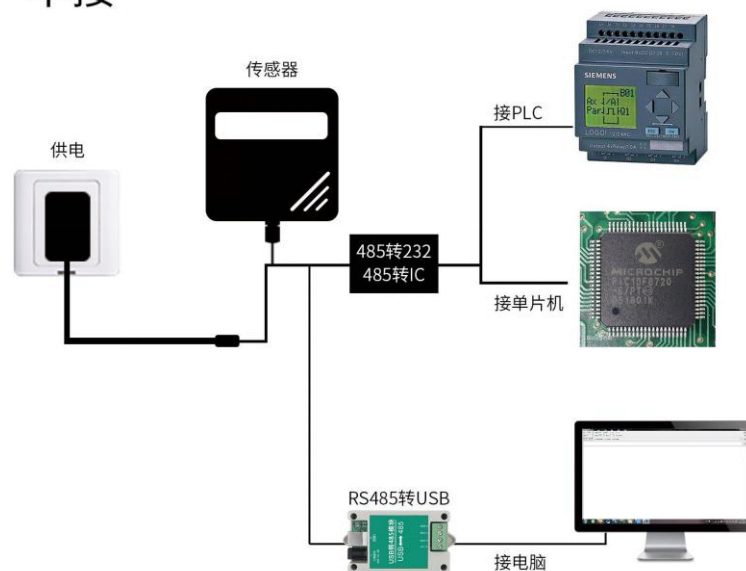
### Shell size





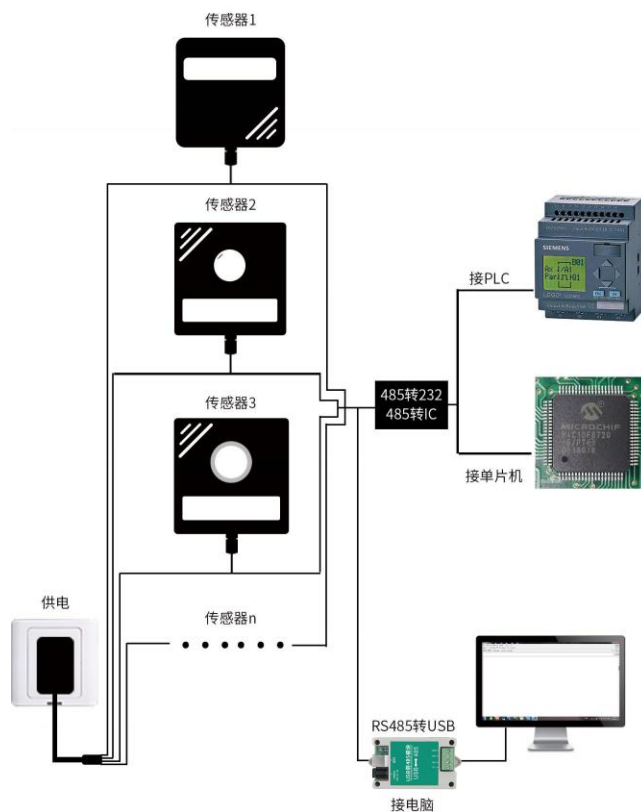
#### 1.4 System framework diagram

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This product can also combine multiple sensors in one 485Bus usage, theoretically a bus can 254 individual 485. The other end of the sensor is connected to 485 Interface PLC, pass 485 Interface chip connected to the microcontroller, or use USB change 485. It can be connected to the computer and use the sensor configuration tool provided by our company to configure and test (only one device can be connected when using this configuration software).

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### 1.5Product Selection

SN-				Company Code
	YUX-			Rain and snow sensor
		R01-		Relay (normally open) output
		N01-		485 (ModBus-RTUProtocol) Output
		N01R01-		485/Relay (normally open) output
			null	No heating function
			H	Automatic heating

### 1.6 Product Appearance



## No.2Chapter Hardware Connection

### 2.1Equipment pre-installation inspection

Equipment List:

- Rain and snow sensor equipment 1 tower
- Expansion plug 4 pcs. Self-tapping screws 4 individual
- Certificate of conformity, warranty card

### 2.2Interface Description

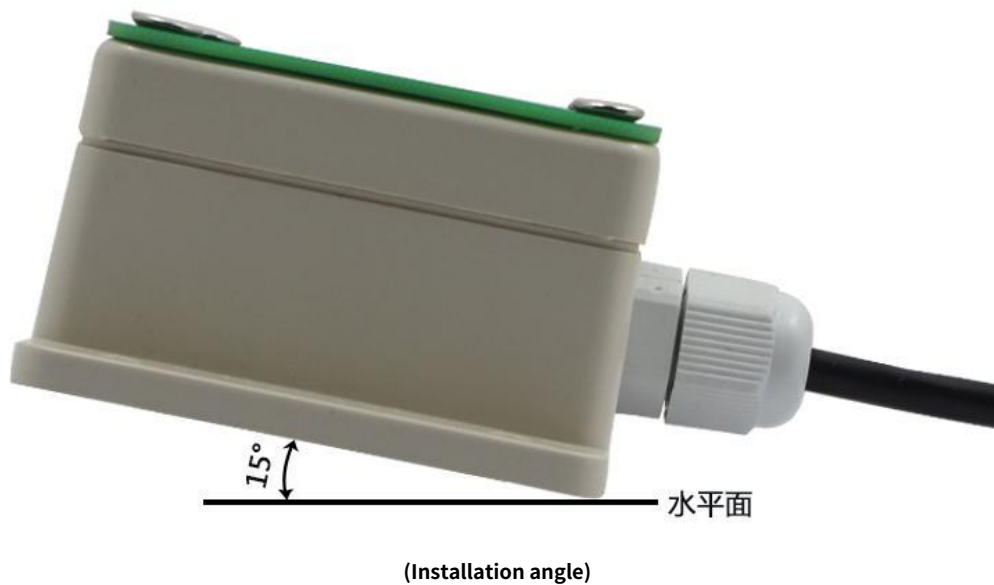
Voltage power input 10~30V Both are acceptable. 485 Pay attention when wiring the signal line A/B The two wires cannot be connected reversely, and the addresses of multiple devices on the bus cannot conflict.

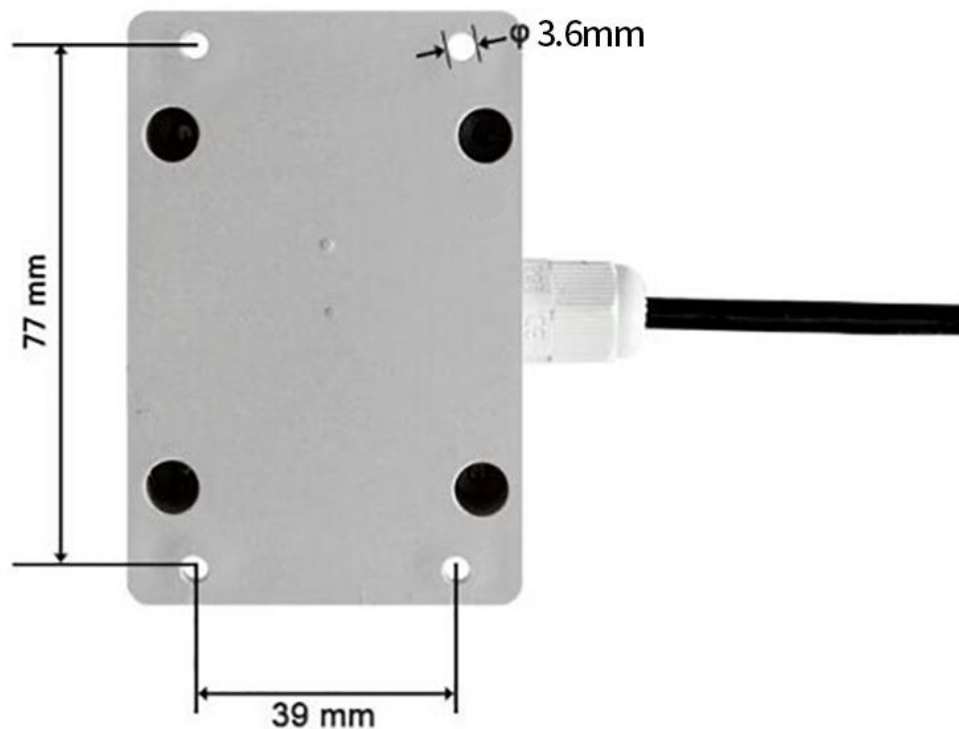
Switching devices are equipped with 13-way relay output, the two output lines (green and white) are normally open contacts.

#### 2.2.1Sensor Wiring

name	485 type (-N01)	Switch type (-R01)
power supply	Power supply positive (10~30V DC)(brown)	
	Power negative (black)	
Output	485-A(yellow)	Relay normally open contact (white, green)
	485-B(blue)	

### 2.3Installation





(Installation dimensions)

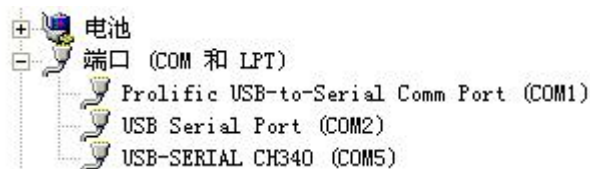
### No.3Chapter Configuration Software Installation and Usage

Our company provides supporting "485"Parameter Configuration Software" can easily use the computer to read the sensor parameters and flexibly modify the sensor equipmentIDand address.

Note that when using software to automatically obtain485There is only one sensor on the bus.

#### 3.1Sensor connected to computer

Pass the sensor throughUSBchange485After correctly connecting to the computer and providing power, you can see the correctCOMPort (check in "My Computer - Properties - Device Manager - Ports" COM port).



Open the data package and select "Debug Software"---"485Parameter Configuration Software", find

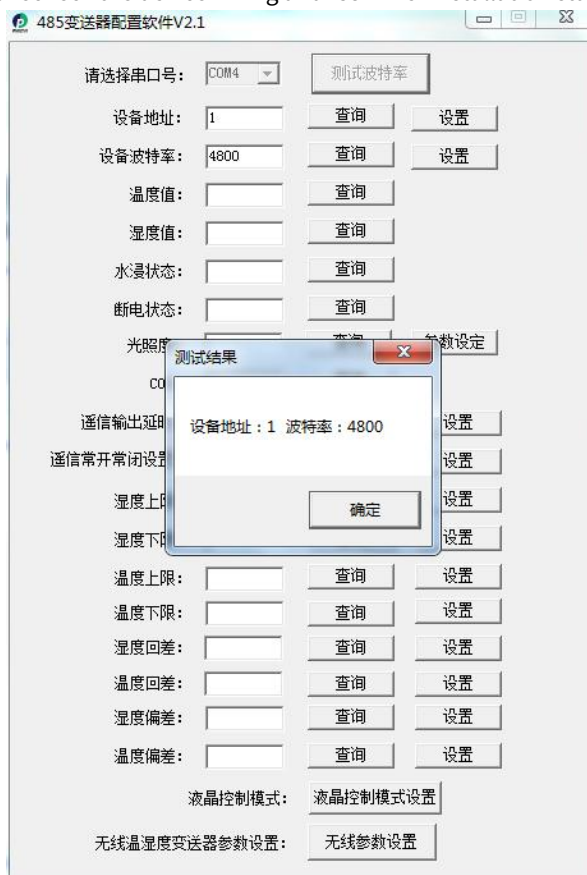
Just open it.

If you don't find it in the device managerCOMport, it means you have not installedUSBchange485 If the driver (included in the data package) is not installed correctly, please contact a technician for help.



## 3.2 Use of sensor monitoring software

- ①、Configure the interface as shown in the figure. First, 3.1 The method in the chapter obtains the serial port number and selects the correct serial port.
- 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 4800bit/s, The default address is 0x01.
- ③ Modify the address and baud rate according to the needs, and query the current functional status of the device.
- ④ If the test fails, please recheck the device wiring and 485Driver installation status.



## No.4 Chapter Communication Protocol

### 4.1 Basic communication parameters

coding	8Bit Binary
Data bits	8Bit
Parity bit	none
Stop bits	1Bit
Error checking	CRC(Redundant Cyclic Code)
Baud rate	2400bit/s, 4800bit/s, 9600 bit/s Can be set, factory default is 4800bit/s

### 4.2 Data frame format definition



useModBus-RTUCommunication protocol, the format is as

follows: Initial structure  $\geq 4$ Bytes of time

Address code =1byte

Function code =1byte

Data Area =Nbyte

Error Check =16BitCRCCode

end structure  $\geq 4$ Bytes of time

Address code: The address of the transmitter, which is unique in the communication network (factory default0x01). Function code: The function indication of the command sent by the host. This transmitter only uses the function code0x03(Read register data).

Data area: The data area is the specific communication data.16 bitsThe data high byte comes

first! CRCCode: Two-byte check code.

Host inquiry frame structure:

Address code	Function code	Register start address	Register length	Check code low	Check code high digit
1byte	1byte	2byte	2byte	1byte	1byte

Slave response frame structure:

Address code	Function code	Number of valid bytes	Data Zone 1	Second data area	No.NData Area	Check code
1byte	1byte	1byte	2byte	2byte	2byte	2byte

### 4.3Register Address

Register Address	PLCOr configured	content	operate	Function	default	scope
site	site			code	value	
0000H	40001	Real-time rain and snow status	Read-only	03	0	0or1
0030H	40049	Heating temperature upper limit	Read/Write	03/06	35°C	0~70°C
0031H	40050	Heating temperature lower limit	Read/Write	03/06	15°C	- 30~70°C
0032H	40051	Heating temperature differential	Read/Write	03/06	5°C	0~70°C
0033H	40052	Current alarm, reset delay	Read/Write	03/06	1s	0~60000 s
0034H	40053	Current sensitivity	Read/Write	03/06	800	500~350 0

#### 4.4 Communication protocol examples and explanations

Example:1) Read the device address 0x01 Rain and snow conditions

Inquiry frame:

Address code	Function code	Starting address	Data length	Check code low	Check code high digit
0x01	0x03	0x00 0x00	0x00 0x01	0x84	0x0A

Response frame: Response for normal rain and snow status

Address code	Function code	Returns the number of valid bytes	Data Area	Check code low	Check code high digit
0x01	0x03	0x02	0x00 0x00	0xB8	0x44

Rain and snow status description:

Rain and snow status codes	Rain and snow conditions
0x00	normal
0x01	Call the police

#### 2) Read the device address 0x01 Alarm reset delay

Inquiry frame:

Address code	Function code	Starting address	Data length	Check code low	Check code high digit
0x01	0x03	0x00 0x33	0x00 0x01	0x74	0x05

Response frame: The current alarm reset delay is 1Second

Address code	Function code	Returns the number of valid bytes	Data Area	Check code low	Check code high digit
0x01	0x03	0x02	0x00 0x01	0x79	0x84

#### Set the device address 0x01 The alarm reset delay (in 10s For example)

Inquiry frame:

Address code	Function code	Write address	Data Area	Check code low	Check code high digit
0x01	0x06	0x00 0x33	0x00 0x0A	0xF9	0xC2

Response frame: The current alarm reset delay is 10s

Address code	Function code	Write address	Data Area	Check code low	Check code high digit
0x01	0x06	0x00 0x33	0x00 0x0A	0xF9	0xC2

#### Alarm reset delay setting instructions

If you set this value to 10s, if the duration of rain or snow detected exceeds 10s The device will consider

The device detects rain and snow and outputs an alarm state. If the duration of rain and snow detected is less than 10s The device considers

No rain or snow is detected; the same applies when rain or snow returns to normal.



default value:1s

scope:0~60000s

### 3) Read the device address 0x01 Current sensitivity

Inquiry frame:

Address code	Function code	Starting address	Data length	Check code low	Check code high digit
0x01	0x03	0x00 0x34	0x00 0x01	0xC5	0xC4

Response frame: The current alarm reset delay is 800 Second

Address code	Function code	Returns the number of valid bytes	Data Area	Check code low	Check code high digit
0x01	0x03	0x02	0x03 0x20	0xB9	0x6C

### Set the device address 0x01 The current sensitivity (in 1500 For example)

Inquiry frame:

Address code	Function code	Write address	Data Area	Check code low	Check code high digit
0x01	0x06	0x00 0x34	0x05 0xDC	0xCA	0xCD

Response frame: Current sensitivity bit 1500

Address code	Function code	Write address	Data Area	Check code low	Check code high digit
0x01	0x06	0x00 0x34	0x05 0xDC	0xCA	0xCD

#### Sensitivity Setting Instructions

The sensitivity value is inversely proportional to the actual sensitivity, that is, the larger the setting value, the less sensitive the device detection is, and the smaller the sensitivity value, the more sensitive the device detection is. However, it should be noted that if the sensitivity value is too small, it is easy to cause false alarms, so it is recommended to use the factory default value.

default value: 800

scope: 500-3500

## No.5 Chapter Common Problems and Solutions

### No output or output error

Possible causes:

- ①、Computer has COM The selected port is incorrect.
- ②. The baud rate is wrong.
- ③、485 The bus is disconnected, or A, B The wires are connected reversely.
- ④ If there are too many devices or the wiring is too long, power supply should be provided nearby. 485 Enhancer, while increasing 120Ω Terminal resistance.
- ⑤、USB change 485 The driver is not installed or is damaged.
- ⑥. Equipment damage.