Rain and snow sensor user's manual

Document version：V2.1

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1. product description

1.1 product description

The rain sensor is a qualitative measuring device that measures whether there is rain or snowfall outdoors or in nature. It can be widely used in the qualitative measurement of rain and snow in environment, greenhouse, aquaculture, construction, building, etc. It is safe and reliable, beautiful in appearance and convenient to install.

1.2 Features

1.Whether there is rain or snow measurement, response time ≤ 0.5S.

2.Unique AC measurement technology prevents oxidation of the induction disk and ensures long-term sensitivity.

3.IP68 protection grade design, can work outdoors for a long time.

4.Multiple transmission modes are available, providing 485 mode upload or switch output for easy centralized monitoring.

5.Optional automatic heating function, can be used for snow detection, in the case of long-term below 0 degrees and high humidity environment, to prevent icing condensation.

6.When heating, the temperature is strictly controlled within 40 ° C (default) to prevent dry oxidation and prolong the service life.

7.The sensitivity of the sensor is adjustable and the use is more flexible.

8.You can set alarm and reset delay to avoid frequent alarms on site.

1.3 Main Specifications

Power supply：10~30V DC　　Normal working power：0.4W

Storage environment：-40℃~80℃　　Operating power when heating：2.4W

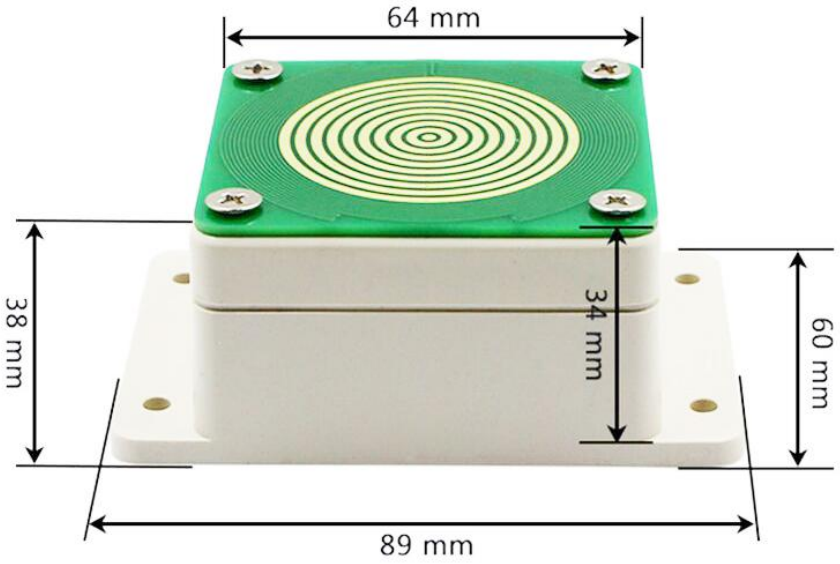
output signal：485、Relay　　Parameter configuration: software settings

Default modbus address：01　　Support function code：03、06

Heating start ambient temperature：＜15℃（default）　　Maximum heating temperature：40℃

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

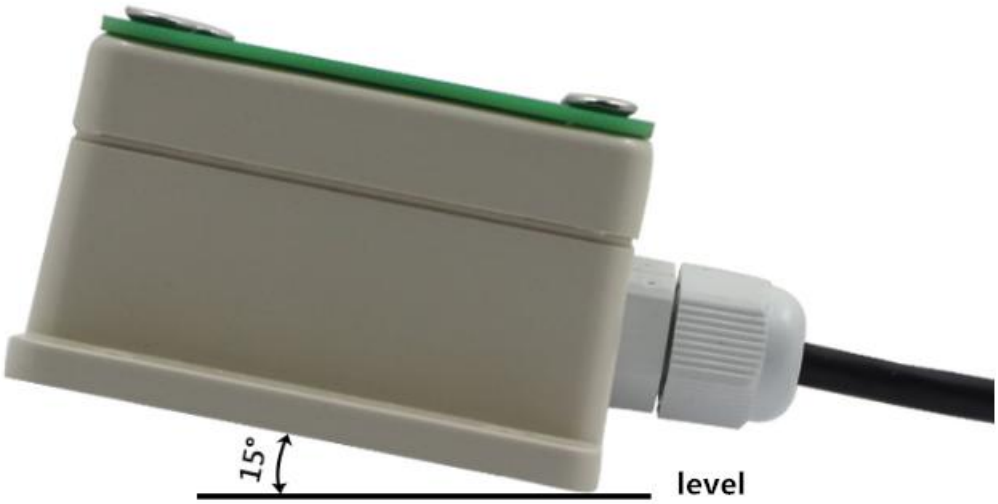
1.4 Equipment size



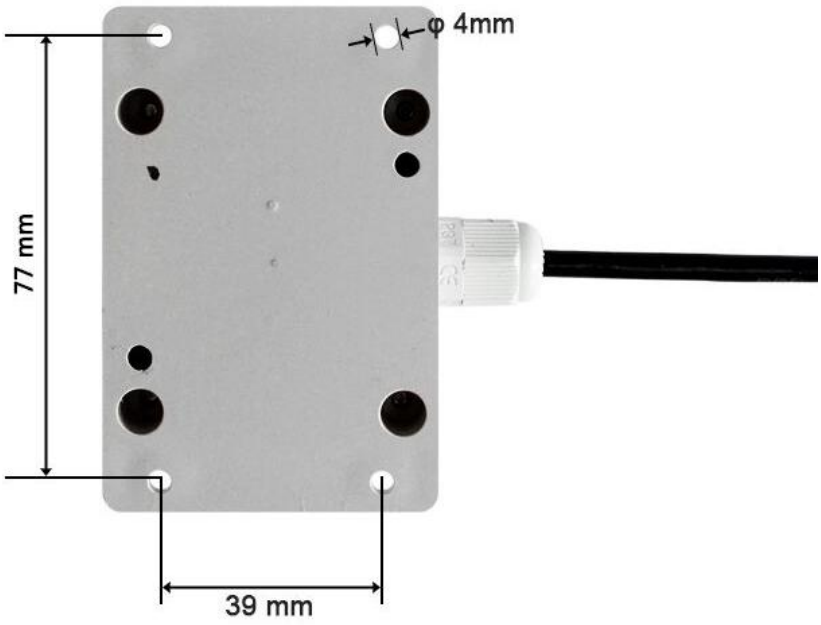
2.product model

RS-				Company code
	-YUX			Rain and snow sensor
		-R01		Relay (normally open) output
		-N01		485 (Modbus-RTU protocol) output
		-N01R01		485/relay (normally open) output
			-H	Automatic heating
				No heating function

3. Equipment installation instructions



(installation angle)



（Installation size）

3.1 Equipment inspection before installation

Equipment List：

■Rain and snow sensor equipment 1

■Certificate, warranty card, wiring instructions, etc.

■12V/1A waterproof power supply 1 (optional)

■4 expansion plugs, 4 self-tapping screws

■USB to 485 (optional)

3.2 Wiring instructions

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

The voltage power input can be 10~30V. When wiring the 485 signal line, note that the A/B lines cannot be connected in reverse, and the addresses between multiple devices on the bus cannot conflict. Switching type devices are equipped with one relay output as standard, and two outgoing lines (green and white) are normally open contacts.

4. Configuration software installation and use

4.1 Software selection

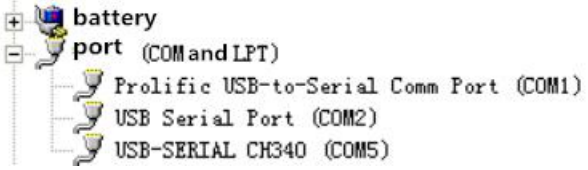
Open the package and select "Debug Software"---"485 Parameter Configuration Software" to

find 

Open it

4.2 parameter settings

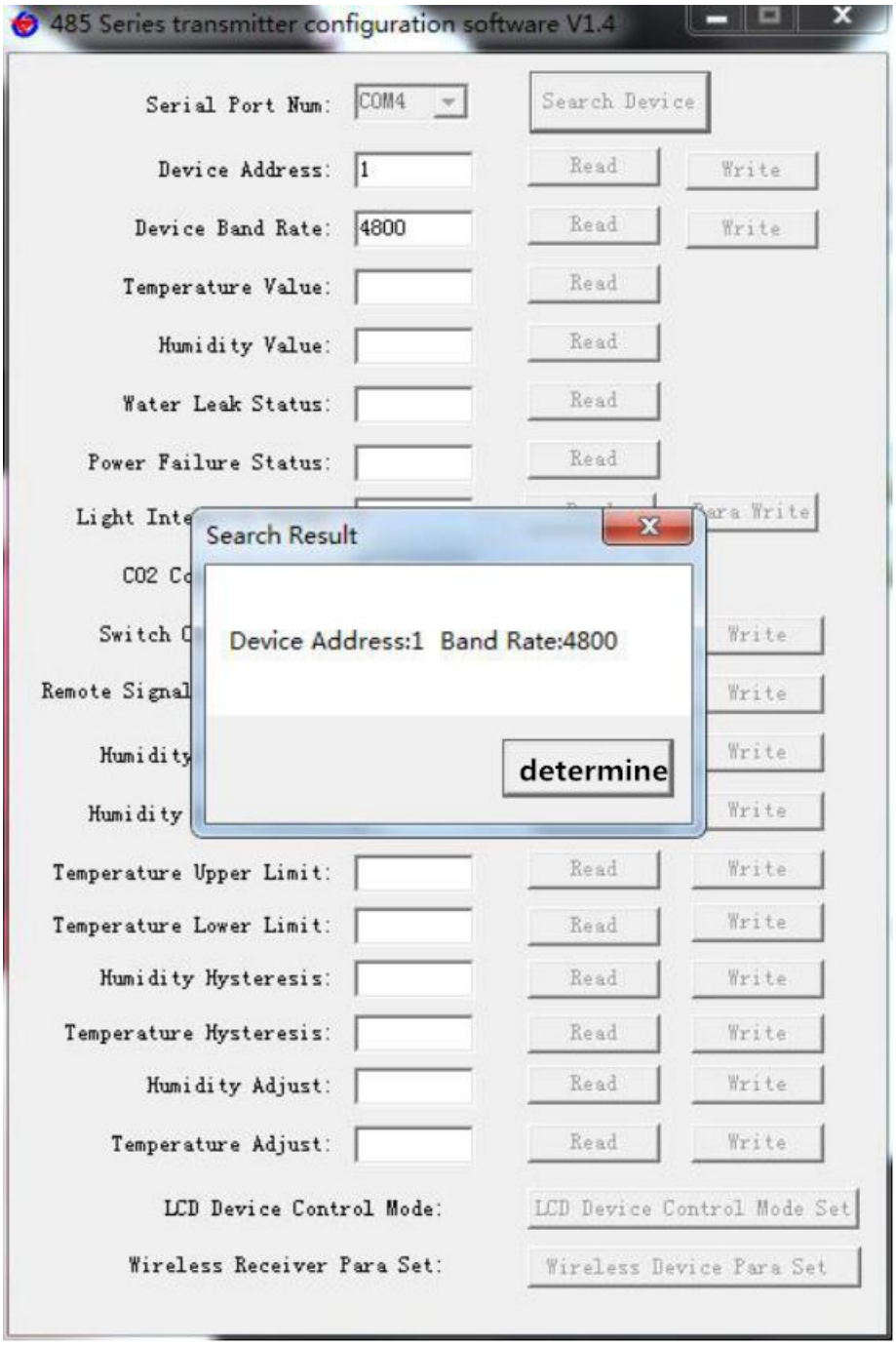
①、 Select the correct COM port ("My Computer - Properties - Device Manager - Port" to view the COM port), the following figure lists the drive names of several different 485 converters.



2. Connect only one device and power on separately. 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 4800 bit/s and the default address is 0x01.

3. Modify the address and baud rate according to the needs of use, and query the current functional status of the device.

4. If the test is not successful, please re-check the equipment wiring and 485 driver installation.



5. letter of agreement

5.1 Basic communication parameters

Code	8-bit binary
Data bit	8 digits
Parity bit	no
Stop bit	1 digits
Error check	CRC (redundant cyclic code)

Baud rate	2400bit/s, 4800bit/s, 9600 bit/s can be set, the factory default is 4800bit/s

5.2 Data frame format definition

Adopt 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

End structure ≥ 4 bytes of time

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

Function code: The instruction function of the command sent by the host. This transmitter only uses function codes 0x03 and 0x06.

Data area: The data area is the specific communication data. Note that the 16-bit data high byte is in front!

CRC code: Two-byte check code.

Host inquiry frame structure：

address code	function code	Register start address	Register length	Check code low	Check code high
1 byte	1 byte	2 bytes	2 bytes	1 byte	1 byte

Slave response frame structure：

address code	function code	Effective number of bytes	Data area	Second data area	Nth data area	Check code
1 bytes	1 bytes	1 bytes	2 bytes	2 bytes	2 bytes	2 bytes

5.3 Register address

Register address	PLC or configuration address	content	operating	function code	Defaults	range
0000H	40001	Real-time rain and snow status	Read only	03	0	0or1

0031H	40050	Lower limit of heating temperature	Read/ write	03/06	15℃	-30~70℃
0032H	40051	Heating temperature difference	Read/ write	03/06	25℃	0~70℃
0033H	40052	Current alarm, reset delay	Read/ write	03/06	1s	0~60000s
0034H	40053	Current sensitivity	Read/ write	03/06	800	500~3500

5.4 Communication protocol example and explanation

Example: 1) Read the rain and snow status of the device address 0x01

Inquiry frame：

address code	function code	starting address	Data length	Check code low	Check code high
0x01	0x03	0x00 0x00	0x00 0x01	0x84	0x0A

Response frame: Normal response to rain and snow

address code	function code	Returns the number of valid bytes	Data area	Check code low	Check code high
0x01	0x03	0x02	0x00 0x00	0xB8	0x44

Rain and snow state description：

Rain and snow status code	Rain and snow
0x00	normal
0x01	Call the police

2）Read the alarm reset time of device address 0x01

Inquiry frame:

address code	function code	starting address	Data length	Check code low	Check code high
0x01	0x03	0x00 0x33	0x00 0x01	0x74	0x05

Response frame: The current alarm reset delay is 1 second.

address cod	function c	Returns the num	Data area	Check code l	Check code h

e	ode	ber of valid byte s		ow	igh
0x01	0x03	0x02	0x00 0x01	0x79	0x84

Set the alarm reset delay of device address 0x01 (in 10 seconds)

Inquiry frame:

address code	function cod e	Write address	Data area	Check code l ow	Check code h igh
0x01	0x06	0x00 0x33	0x00 0x0A	0xF9	0xC2

Response frame: The current alarm reset delay is 10 seconds.

address cod e	function c ode	Write address	Data area	Check code l ow	Check code hi gh
0x01	0x06	0x00 0x33	0x00 0x0A	0xF9	0xC2

Alarm reset delay setting description

If this value is set to 10S, if the rain and snow are detected for more than 10S, the device will detect that the device has detected rain and snow and output an alarm state. If the rain and snow are detected for less than 10 seconds, the device does not consider it to be detected. To the rain and snow; when the rain and snow return to normal state, the same reason.

Default: 1 second

3）Range: 0~60000 seconds

4) Read the current sensitivity of device address 0x01

5) Inquiry frame:

address code	function cod e	starting addres s	Data length	Check code l ow	Check code h igh
0x01	0x03	0x00 0x34	0x00 0x01	0xC5	0xC4

Answer frame: The current alarm reset delay is 800 seconds.

Address code	function cod e	Returns the nu mber of valid bytes	Data area	Check code low	Check code high

0x01	0x03	0x02	0x03 0x20	0xB9	0x6C

Set the current sensitivity of device address 0x01 (take 1500 as an example)

Inquiry frame：

address code	function code	Write address	Data area	Check code low	Check code high
0x01	0x06	0x00 0x34	0x05 0xDC	0xCA	0xAD

Response frame: Current sensitivity bit 1500

address code	function code	Write address	Data area	Check code low	Check code high
0x01	0x06	0x00 0x34	0x05 0xDC	0xCA	0xAD

Sensitivity setting description

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

Default: 800

Range: 500-3500

6. Common problems and solutions

Device cannot connect to PLC or computer

possible reason:

1) The computer has multiple COM ports, and the selected port is incorrect.

2) The device address is incorrect, or there is a device with a duplicate address (all the factory defaults to 1).

3) Baud rate, check mode, data bit, stop bit error.

4) The host polling interval and the waiting response time are too short and need to be set to more than 200ms.

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

6) If the number of devices is too large or the wiring is too long, the power should be supplied nearby, add 485 enhancer, and increase the resistance of 120Ω terminal.

7) The USB to 485 driver is not installed or damaged.

8) Equipment damage.

7. Contact information

Shandong Renke Control Technology Co., Ltd.

Address: 2886 Fengjing Road, High-tech Zone, Jinan City, Shandong Province

Zip code: 250101

Phone: 400-085-5807

Fax: (86)0531-67805165

Website: www.renkeer.com

Cloud platform address: www.0531yun.cn

www.renkeer.com

Shandong Renke Control Technology Co., Ltd.

8. Document history

The V1.0 documentation was created.

V2.0 documentation update.

V2.1 updates the installation size.

V2.2 adds heating temperature lower limit, heating temperature hysteresis register.