YX-Y-001

V1.0

Rain and snow sensor

An instruction manual

Catalogue

1. Product introduction

1.1 Product Overview

The rain and snow sensor is a qualitative measuring device to measure whether it rains or snowfalls outdoors or in nature. It can be widely used in qualitative measurement of rain and snow in environment, greenhouse, aquaculture, building, etc. It is safe, reliable, beautiful and easy to install.

1.2 Functional Characteristics

The response time of rain and snow is less than 0.5S.

The unique AC measurement technology prevents the oxidation reaction of the induction disc and ensures long-term sensitivity.

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

Various transmission modes are available, providing 485 mode upload or switching output to facilitate centralized monitoring.

Selection of automatic heating function, can be used for snow detection, in long-term less than 0 degrees and high humidity environment, to prevent ice condensation.

When heating, the temperature should be strictly controlled within 40 C (default), so as to prevent peroxidation caused by dry burning and prolong service life.

Sensors have adjustable sensitivity and are more flexible to use.

The alarm and return delay can be set to avoid frequent alarm on site.

1.3 Main Technical Indicators

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

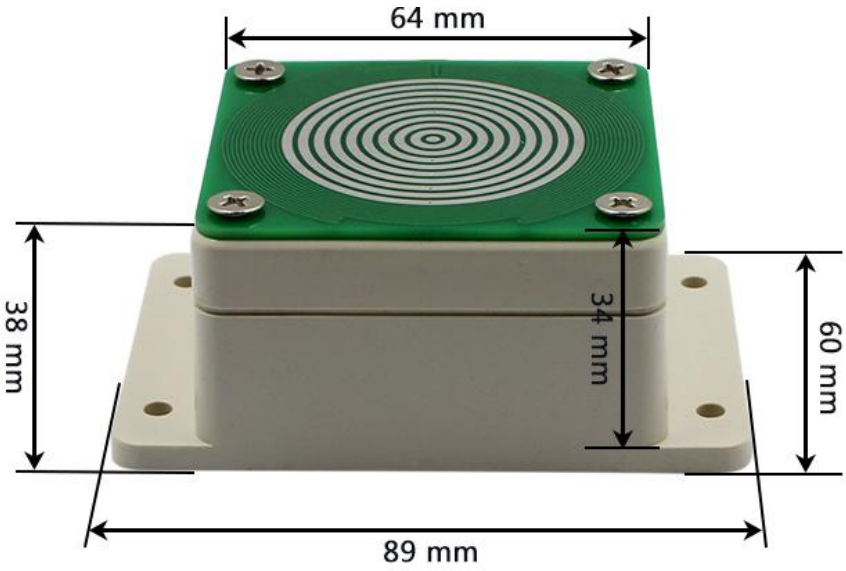
Storage environment: - 40 C~80 C heating power: 2.4W

Output signal: 485, relay parameter configuration: software settings

Default Modbus address: 01 support function code: 03, 06

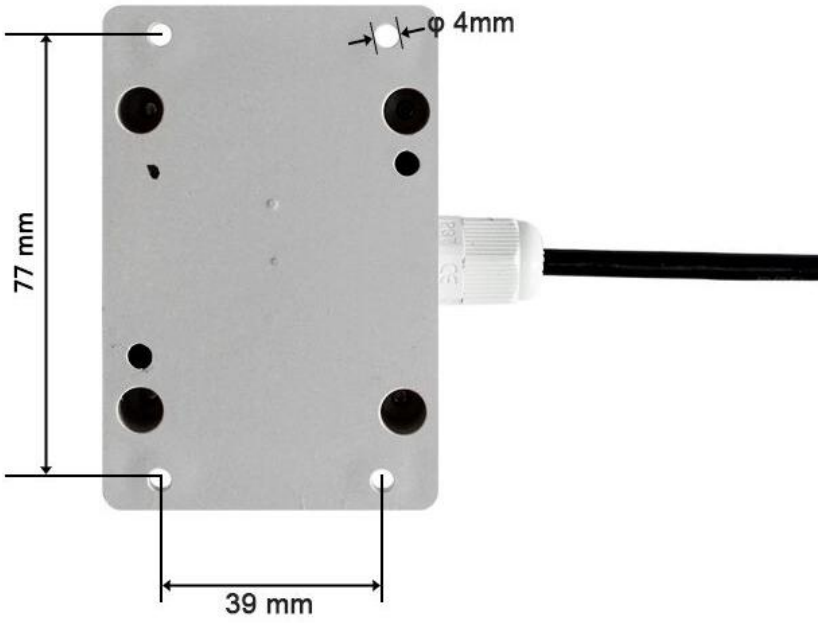
Heating Start Environment Temperature: <15 ("default") Maximum Heating Temperature: 40 ("default")

Output relay with load capacity: 250VAC 1A/30VDC 1A1.4 Device Size



2. Description of equipment installation

（Install Angle）



（Installation Size）

2.1 Pre-installation Inspection of Equipment

Equipment List:

Equipment 1 of Rain and Snow Sensor

Qualification certificate, warranty card, wiring instructions, etc.

12V/1A Waterproof Power Supply 1 (Optional)

Four expansion plugs and four tapping screws

USB to 485 (optional)3.2 Connection instructions

Name	Type 485（-N01）	Switch mode(-R01)
PowerSupply	Positive power supply（10~30V DC）(brown)	
	Negative power supply (black)	
output	485-A (yellow)	Relays often open contacts (white, green)
	485-B (blue)	

Voltage power supply input 10 ~ 30V can be. When connecting 485 signal lines, it should be noted that the two A/B lines can not be connected in reverse, and the addresses of multiple devices on the bus can not conflict. Switch type equipment is standard with one relay output and two outgoing lines (green and white) are constant open contacts.

3. **Communication protocol**

3.1 Basic communications parameters

Code	8-Bit binary
Data bit	8 bits
Parity bit	no
Stop Bit	1 bit
Error Verification	CRC(redundant circular code)

Porter rate	2400 bit/s, 4800 bit/s, 9600 bit/s are available, factory default is 4800 bit/s

3.2 Data Frame Format Definition

Modbus-RTU communication protocol is used in the following format:

Time when the initial structure ≥ 4 bytes

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 number: is the address of the transmitter and is unique in the communication network(factory default 0x01).

Function code: The instruction function instruction issued by the host, this transmitter only uses the function code 0x03 and 0x06.

Data area: The data area is the specific communication data, note the 16 bits data high byte in front!

CRC code: The check code of the two-character section.

Host Inquirer Frame Structure:

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

Attach frame structure:

Function code	Function code	Number of valid bytes	Data Zone 1	Second Data Area	N Data Area	Check code
1 byte	1 byte	1byte	2byte	2byte	2byte	2byte

3.3 Register Address

Function code	PLC or configuration address	content	Operation	Function Code
0000H	40001	Real-time rain and snow state	Read Only	03
0033H	40052	Current alarm, return	Reading	03/06

		delay	/ Writing	
0034H	40053	Current sensitivity	Reading / Writing	03/06

3.4 Examples of communication protocols and interpretations

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

Enquiries Frame：

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

Response Frame： A response to normal rain and snow conditions

Address code	Function code	Returns valid byte number	Data area	Check code low	Check code high
0x01	0x03	0x02	0x00 0x00	0xB8	0x44

Rain and snow state description：

Rain and Snow State Code	Rain and Snow State
0x00	normal
0x01	alarm

2）Warning return delay for reading device address 0x01

Enquiries Frame：

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

Response frame: Current alarm return delay is 1 second

Address code	Function code	Returns valid byte number	Data area	Check code low	Check code high
0x01	0x03	0x02	0x00 0x01	0x79	0x84

Set the alarm return delay for device address 0x01(take 10 seconds as an example)

Enquiries Frame：

Address c	Function	Write addr	Data area	Check co	Check co

ode	code	ess		de low	de high
0x01	0x06	0x00 0x33	0x00 0x0A	0xF9	0xC2

Response frame: Current alarm return delay is 10 seconds

Address code	Functio n code	Write addres s	Data area	Check co de low	Check cod e high
0x01	0x06	0x00 0x33	0x00 0x0A	0xF9	0xC2

Description of delay setting for alarm return

If this value is set to 10S, if the duration detected by rain and snow exceeds 10S equipment, the device will be considered to detect rain and snow and output alarm status. If the duration detected by rain and snow is less than 10S, the device thinks that no rain and snow are detected.; The same thing happens when rain and snow return to normal.

Default: 1 second

Range: 0 ~ 60,000 seconds

Current sensitivity to read device address 0x01Enquiries Frame

Enquiries Frame：

Address c ode	Function code	Start addr ess	Data lengt h	Check co de low	Check co de high
0x01	0x03	0x00 0x34	0x00 0x01	0xC5	0xC4

Response frame: Current alarm return delay is 800 seconds

Address code	Functio n code	Returns vali d byte number	Data area	Check co de low	Check cod e high
0x01	0x03	0x02	0x03 0x20	0xB9	0x6C

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

Enquiries Frame：

Address c ode	Function code	Write addr ess	Data area	Check co de low	Check co de 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

Specification for sensitivity settings

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

Default: 800

Range: 500-3500

4. Common Problem and Solution

Fault situation： no output or wrong output

Reasons possible:

(1)The wrong measure range leads to PLC calculation wrong, the measure range please refer to the technology in the first part.

(2) Wrong connection mode or wrong connection order.

(3) Wrong power voltage (the type 0-10V is all power supplied in 24V).

(4) Over distance between transducer and collector leads to signal disorder.

(5) PLC collection point is damage.

(6) Device is broken.