RK400-02 Rain & Snow Sensor

Revision Time	Reviser	Current Version	Remarks
20250427	SUN	V5.0	

User Notice

Pre-Use Instructions

- Thoroughly read this manual before operation and retain it for future reference.
- Strictly comply with the operating procedures and safety precautions outlined in this manual.

Unpacking Inspection

- Upon receipt, carefully inspect the sensor device and accessories for any shipping damage.
- If damage is detected,immediately notify the manufacturer and distributor.
- Retain all packaging materials for return or replacement processing.

Troubleshooting Protocol

- Do not attempt unauthorized disassembly or repairs.
- Contact the manufacturer's after-sales department directly for technical support.

Parts List

Item	Quantity	Remarks
Rain & Snow Sensor	1	
Cable(Non-detachable cable)	1	The length depends on the order
Mounting screw	1	Set

1. Product Introduction

RK400-02 Rain & Snow Sensor is a high sensitive detector to achieve qualitative detection of rain and snow. It adopts the principle of capacitive measurement. Products are optional automatic melting snow and melting ice function (automatic heating). When it rains or snows, it will output switch signal.

2. Product Features

- High sensitivity
- Strong anti-interference ability
- High protection class
- Easy installation

3. Specifications

Item	Specifications
Supply voltage	12-24VDC
Automatic	Heating power:10W max.
Output	Relay(NO),4-20mA,RS485,0-2V,0-5V,0-10V,NPN
Load capacity(Relay)	AC220V/1A ,DC24V/2A
Ingress protection	IP67
Operating temperature	-30℃-+70℃
Weight(Unpacked)	150g
Dimension	90*58*37mm
Shell material	ABS
Storage condition	10℃-60℃@20%-90%RH

4. Electrical Connections

Connector（Cable）	RS485/Current	Relay(NO/NC)	220VAC-Relay(NO/NC)
Red	V+	V+	220VAC_L
Black / Blue	V-	V-	220VAC_N
Yellow	RS485A		R1
Green	RS485B		R2
Brown		R1	
White	Signal+	R2	

5. Output Types & Formulas

Current Type	4-20mA	4mA:No rain or snow , 20mA: rain or snow
Voltage Type	0-5V	1V:No rain or snow , 5V: rain or snow

6. Product Dimensions

Figure 6.1

7. Communication Protocol（MODBUS-RTU）

Parameter	Value
Data Bits	8 bits
Parity	None
Stop Bit	1 bit
Baud Rate	9600 bps
Slave Address	0x01 (Factory Default)

7.1 Read Real-time Data

Client sends:

01 03 00 00 00 01 840A

Return:

01 03 02 00 0A 3843

7.1.1 Description of Return Data Format

No.	Conception	Byte Number	Description	Remarks
1	Address block	1	Address(0x01)	0x01
2	Function code	1	Only read(0x03)	0x03
3	Number of bytes	1	0x02	2bytes
4	Data block	2	Rain or Snow Data	0x000A(No rain or snow)
5	Check block	2		0x38 0x43

7.1.2 Modify Slave Address

Client sends:(Change slave address from 01H to 02H.)

Slave id	Function code	Address_H	Address_L	New id_H	New id_L	CRC_L	CRC_H
0x01	0x06	0x00	0x30	0x00	0x02	0x08	0x04

Response:

Slave id	Function code	Address_H	Address_L	New id_H	New id_L	CRC_L	CRC_H
0x01	0x06	0x00	0x30	0x00	0x02	0x08	0x04

Note:If you forget the original address, you should use the broadcast address(FEH) (ensure that no other devices on the bus at this time).

7.1.3 Set or Query the Start and Stop Temperatures for Automatic Heating.

Client sends:(Set the start temperature for heating.)

Slave id	Function code	Address_H	Address_L	Temp_H	Temp_L	CRC_L	CRC_H
0x01	0x06	0x00	0x6B	0x00	0x0A	0x78	0x11

Response:

Slave id	Function code	Address_H	Address_L	Temp_H	Temp_L	CRC_L	CRC_H
0x01	0x06	0x00	0x6B	0x00	0x0A	0x78	0x11

Explanation: 0x000A indicates that the start heating temperature is set to 1℃. When the temperature drops below 1℃, heating will start.

Client sends:(Set the stop temperature for heating.)

Slave id	Function code	Address_H	Address_L	Temp_H	Temp_L	CRC_L	CRC_H
0x01	0x06	0x00	0x6C	0x00	0xFA	0xC9	0x94

Response:

Slave id	Function code	Address_H	Address_L	Temp_H	Temp_L	CRC_L	CRC_H
0x01	0x06	0x00	0x6C	0x00	0xFA	0xC9	0x94

Explanation: 0X00FA indicates that the stop heating temperature is set to 25℃. When the temperature rises above 25℃, heating will stop.

Notes:

- When querying the start and stop temperatures for automatic heating, change the function code to 0x03.
- When the temperature is between 1°C and 25°C, start heating if it is raining; do not start heating if it is not raining.

8. Installation Guidelines

During installation, the sensor's sensing surface should be maintained at a 15-degree angle to the horizontal plane to prevent rain and snow accumulation from affecting the sensor's measurement.

8.1 Installation Method

Install at an angle using the installation bracket, as shown in the figure below.

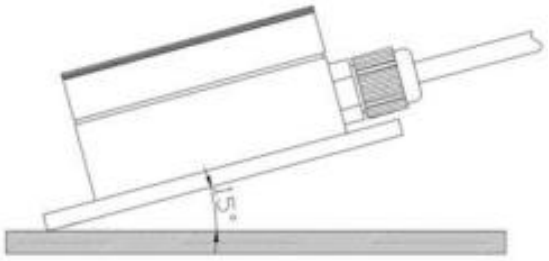

Figure 8.1.1
The angle between sensor and horizontal level should be about 15°.

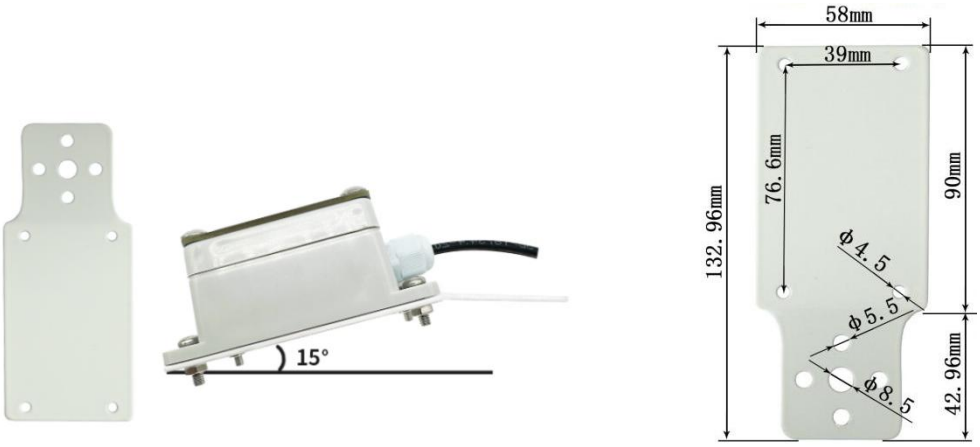

Figure 8.1.2
Installation with a 15° inclined bracket (optional).

9. Precautions

Powered Wiring Prohibition

- Do not connect wires while powered. Only energize the sensor after confirming correct wiring.

Precision Handling Requirement

The sensor is a precision device. Avoid:

- Unauthorized disassembly
- Do not touch internal components to prevent product damage

Installation Location

- The installation site should be kept away from chemical corrosive environments.

Safety Distance

- The sensor and its cables must be positioned at a safe distance from high-voltage electricity, heat sources, and other potential hazards.

Storage Conditions

- As a precision instrument, the sensor should be stored in a dry, well-ventilated, room-temperature indoor environment.

10. Troubleshooting

Incorrect Output Signals (Analog/RS232/RS485):

- Verify wiring correctness and secure connections.
- Check if the serial port is occupied or malfunctioning.
- Confirm serial port settings (baud rate, data/stop bits) match device requirements.

Persistent Issues:

- Contact the manufacturer if the above steps fail to resolve the problem.

11. Product Maintenance

Maintenance and Safety

- Regularly clean and inspect the sensor to maintain performance.
- Do not expose the sensor to extreme temperatures, moisture, or corrosive substances unless explicitly specified.
- Unauthorized disassembly, modification, or repairs may void the warranty and lead to malfunctions.

Troubleshooting Protocol

- In case of malfunction, refer to the troubleshooting section of this manual.
- Do not attempt unauthorized disassembly or repairs.
- Contact the manufacturer's after-sales department directly for technical support.

12. Warranty Terms

This product comes with a one-year warranty, starting from the date of delivery. Within twelve months, the Company shall be responsible for free repair or replacement of any failure caused by sensor quality issues (non-human damage). Fees will be charged for repairs or replacements after the warranty period expires.

CE Complies with applicable CE directives.

Manual subject to change without notice.

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