Instructions for optical rain sensor

JXBS-3001-GXYL

Ver1.0

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第 1 章 Product profile

1.1 Product Overview

　　The optical rainfall sensor adopts the principle of optical induction to measure the rainfall, and takes the infrared light as the measurement medium. A number of optical probes are built-in to avoid the detection interference of the external light and the fog water, making the measurement results more accurate.With traditional mechanical sensors, optical rainfall is small, high sensitivity, intelligent and easy to maintain.Both 485 output and 5V pulse output are supported.

1.2 Main parameter

Parameters	技术指标
Accuracy	≤5%
Resolution	0.1mm
Maximum instantaneous rainfall	0.4mm/s
Rain diameter	4.7CM
Potter rate	2400/4800/9600
Output mode	RS485/5V pulse output
Power supply	12V-24V DC
Power	≤0.2W（12V DC， 25℃）

consumption	
Work temperature	−30℃ 至 +50℃
Work humidity environment	0%-99%RH （ Relative humidity), non-condensation
Working pressure range	standard atmosphere ± 10%
Device mounting dimensions	6.2-8.0CM
Overall dimensions	75.94*64*45.5mm（Long * wide * high）

1.3 Product appearance and size
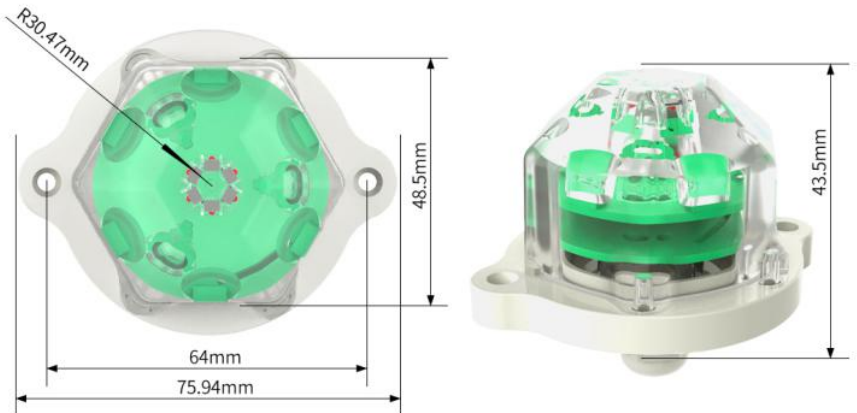
第 2 章 Hardware connection

Check the equipment before installation

Name	Number
Optical rainfall sensor	One
12V waterproof power supply	1 (Optional)
USB to 485 equipment	1 (Optional)
Warranty card / qualification certificate	One

Interface specification

The wide voltage supply input 12-24V. During 485 signal line wiring, A/B lines can not be connected and the address between multiple devices on the bus can not be conflicting, as shown in the table:

	Line color	说明
Power supply	Brown color	Power supply is positive

Commu nication	Black color	(12-24VCC) inNegative power supply
Power supply	Yellow (grey) color	485-A
	Blue color	in485-B
	White color	in5VPulse output port

2.1 Note:

2.2 Be careful not to connect the wrong line order, the wrong wiring will cause the equipment to burn down.

2.3 Sensors shall avoid contact with organic solvents, alcohol, coatings, oils and high concentrations of gases, also including silicone gel and other adhesives.

2.4 Senssensor cannot be used long term in environments containing corrosive gases that can damage the sensor.

2.5 It is not recommended to test sensors in unstandard methods, such as a lighter near the sensor, near alcohol, etc.

2.6 When 0.85 meters long wire is supplied by default, the customer can extend the wire or sequential wiring as required. Assembly and installation instructions

Assemblyinstructions

感雨罩子

螺丝钉
(4-M3x16)

控制检测电路板

底盖

防水垫圈

防水接头

螺丝钉
(4-M3x8)
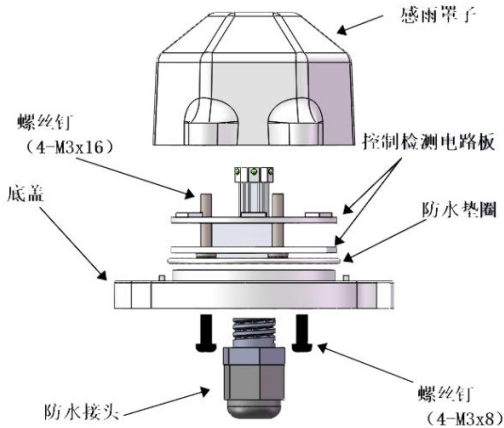
（1）Assembly the sensor according to the figure above and pull the waterproof washers several times during installation so that it can easily fit. Apply some waterproof silicone grease to the waterproof washers and screws.

（2）The rain sensor must ensure that the cover surface is dry before installation. Any water droplets can cause a measurement error. You can selectively use some desiccant inside. If the rainfall sensor can not drain the water in time, a small hole can be drilled at the bottom of the cover.

（3）Installation instructions

（4）Install the optical rain sensor as the correct method, place it horizontally in place, noting that there cannot be any shelter above the sensor waterproof cover, incorrect installation will lead to measurement errors.

（5）From the waterproof hole under the sensor, be sure to use the outdoor waterproof sealing wire. When fixed outdoors

in the open air, please secure the product steadily, or any shaking in the sun will cause additional errors.

2.7 Dial-up switch description

The operating mode of the rainfall sensor can be selected, as well as the output function. After removing the base, you can find the code dial-up switch on the PCB surface. The code selection function can only read the configuration when electrified.
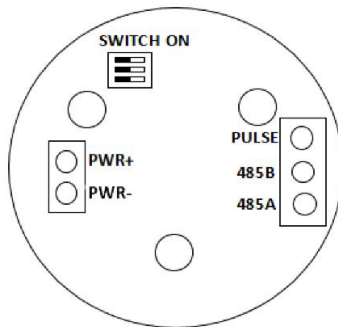
The SWITCH ON position in the figure is the dial-up switch position, which represents the b3,b2,b1. from top to bottom The operating mode of the rainfall sensor can be selected, as well as the output function.
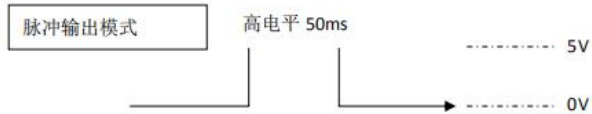
Note: 0 represents Open (ON), 1 represents Close (OFF), and X represents anywhere

Rain measuring mode:

b1	b2	b3
1	1	×

A rain measurement mode produces an effective pulse for every 0.1mm of accumulated rainfall.485 Output rainfall, which can be cleared by writing 0 to the register address of 1a.

Output

waveform:

Rain mode:b1	b2	b3
0	1	×

Discharge   waveform

In   rain sensing mode, an effective pulse was output for 1 minute for about 0.05ml raindrops perceived.After 1 minute, every 10 seconds, if a rain drop is detected, otherwise the output was terminated.

第 3 章 Communicating protocol；

3.1 Basic communication parameters

Parameters	Content
Cocoding	Eight-bit binary
Data bit	Eight bits
Parity check bit	None
Stop the bit	The 1-bit is available
Error calibration	CRC lengthy cycle code
The Porter rate	The 2400bps/4800bps/9600 bps is available, with a factory default of 9600bps
Code	Eight-bit binary

3.2 Data frame format definition

The Modbus-RTU general inquiry protocol is adopted in the following format:

Time of the initial structure> =4 bytes

Address code: = 1 bytes

Function code = 1 bytes

Data Zone = N bytes

Error check the = 16-bit CRC code

Time to end the structure> =4 bytes

Address code: The address of the transmitter, unique in the polling network (factory default 0x01).Function code: the command sent by the host function prompt, this transmitter only uses the

function code 0x03(to read the memory data).

Data area: the data area is the specific polling area, noting that 16bits data high bytes are in frontCRC Code: A two-byte check code.

Ask about the frames

Addres code	Addres code	Address code	Address code	Address code
Functio	Functio	Function	Function	Function code

Acknowledgement frame

Addres code	Addres code	Address	Address	Address code	Address code
Functio	Functio	Function	Function	Function	Function code

3.3 Register address

Register address	Register address	Register address			Register address
0001H	40002	24 / 2 rainfall (in 0.1mm)		24 / 2 rainfall (in 0.1mm)	
0003H	40004	Read-only		Read-only	
0105H	40106	Rainfall (in 0.1mm)		Rainfall (in 0.1mm)	
0100H	40101	Read-only		Read-only	

0101H	40102	Clear the rain to zero	Clear the rain to zero

3.4 Communication protocol examples and interpretation

Read the rainfall value of the device address, 0x01

Ask the frame

Address code	Address code	Address code	Address code	Address code	Address code
0x01	0x03	0x00, 0x03	0x00, 0x01	0x74	0x0A

Address code	Address code	Address code	Address code	Address code	Address code
0x01	0x03	0x02	0x00, 0x03	0xF8	0x45

3.4.1 Rainfall:

3.4.2 0003 H(hexadecimal) =3=> rainfall =0.3mm**Manual clear the rainfall at the equipment address 0x01**

Ask the frame

Address code	Address code	Address code	Address code	Address code	Address code
0x01	0x06	0x00, 0x105	0x00, 0x00	0x98	0x37

Acknowledgement frame

Address	Address	Address	Address	Address	Address

s code	ss code	code	code	code	code
0x01	0x06	0x00, 0x10 5	0x00 0x00	0x98	0x37

Note: The rain is automatically started and recalculated after each outage. The rain within 24 hours is automatically cleared after 24 hours and power-off.