

YM9608

Integrated Optical Rainfall and Illuminance Sensor

User Manual

File Version: V25.12.16



YM9608 using the standard RS485 bus MODBUS-RTU protocol, easy access to PLC, DCS and other instruments or systems for monitoring rainfall, illuminance state quantities. The internal use of high-precision sensing core and related devices to ensure high reliability and excellent long-term stability, can be customized RS232, RS485, CAN, 4-20mA, DC0~5V\10V, ZIGBEE, Lora, WIFI, GPRS and other output methods.

Technical Parameters

Technical parameter	Parameter value
Accuracy	±5% (@25°C)
Resolution	0.1mm
Maximu rainfall	14.5mm
Sensing diameter	Φ 60mm
Working pressure	Standard atmospheric pressure±10%
Illuminance measuring range	0~65535Lux
Illuminance allow deviation	±7%
Repeatability test	±5%
Illuminance detection chip	Import digital
Wavelength range	380nm~730nm
Communication Interface	RS485
Default baud rate	9600 8 n 1
Power	DC9~24V 1A
Running temperature	-30~80°C

Product Size



Note: Manual measurement, please refer to the actual product

software to test**Read the data function code 03**

All operation commands are hexadecimal data, and the default communication baud rate: 9600,8,N,1

Inquiry frame (hexadecimal), sending example: Query 6 data of device #1, The host computer sends the command: 01 03 00 00 00 06 C5 C8

CMD	ADD	MOD	SA	LEN	CAPTCHA
CMD	01	03	00 00	00 01	84 0A

Response frame (hexadecimal): 01 03 0C 74 4C 01 68 00 1A 06 68 00 0C 01 24 CCB0

CMD	ADD	MOD	DATA1	DATA2	CAPTCHA
CMD	01	03	0C	74 4C ...01 24	CC B0

Data Explanation: The data in the command is in hexadecimal. Taking accumulated and instantaneous rainfall values as examples, 01 68 converted to decimal is 360, so the instantaneous rainfall is $360 * 0.1 \text{mm} = 36.0 \text{mm}$.

1#雨量累积值	2#雨量瞬时值	3#滴水差值	4#光基准	5#光动态	6#光亮度
2977.2	36.0	26	1640	12	292
mm	mm				LUX

A table of common data addresses

ADDR.	REG	TITLE	R/W	NOTE
40001	00 01	ACCUMULATOR REGISTER	R	0~65535
40002	00 02	1-MINUTE VALUE	R	0~600
40003	00 03	DIFFERENCE	R	0~100 SENSITIVITY
40004	00 04	OPTICAL ACCURACY VALUE	R	0~10000
40005	00 05	PHOTODYNAMIC	R	0~1000
40006	00 06	ILLUMINATION	R	0~65535
40101	00 65	TYPE ID	R	0~59999
40102	00 65	POINTS	R	1~20
40103	00 66	ADDRESS	R/W	1~249
40104	00 67	BAUD RATE	R/W	0~6
40105	00 68	MODE	R/W	1. QUERY 2. UPLOAD
40106	00 69	PROTOCOL	R/W	1.MODBUS-RTU
40107	00 6A	TIME INTERVAL	R/W	1~36000
40108	00 6B	SENSITIVITY	R/W	0~100
40109	00 6C	LIGHT THRESHOLD	R/W	LIGHT THRESHOLD SETTING
40110	00 6D	1 HOUR VALUE	R/W	ZERO CLEARING
40111	00 6E	12 HOUR VALUE	R/W	ZERO CLEARING
40112	00 6F	CUMULATIVE VALUE	R/W	ZERO CLEARING

Wiring instructions

In the case of broken wires, wire the wires as shown in the figure. If the product itself has no leads, the core color is for reference.

How to use software?

Read the data function code 03

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40006	00 06	ILLUMINATION	R	0~65535
40101	00 65	TYPE ID	R	0~59999
40102	00 65	POINTS	R	1~20
40103	00 66	ADDRESS	R/W	1~249
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40108	00 6B	SENSITIVITY	R/W	0~100
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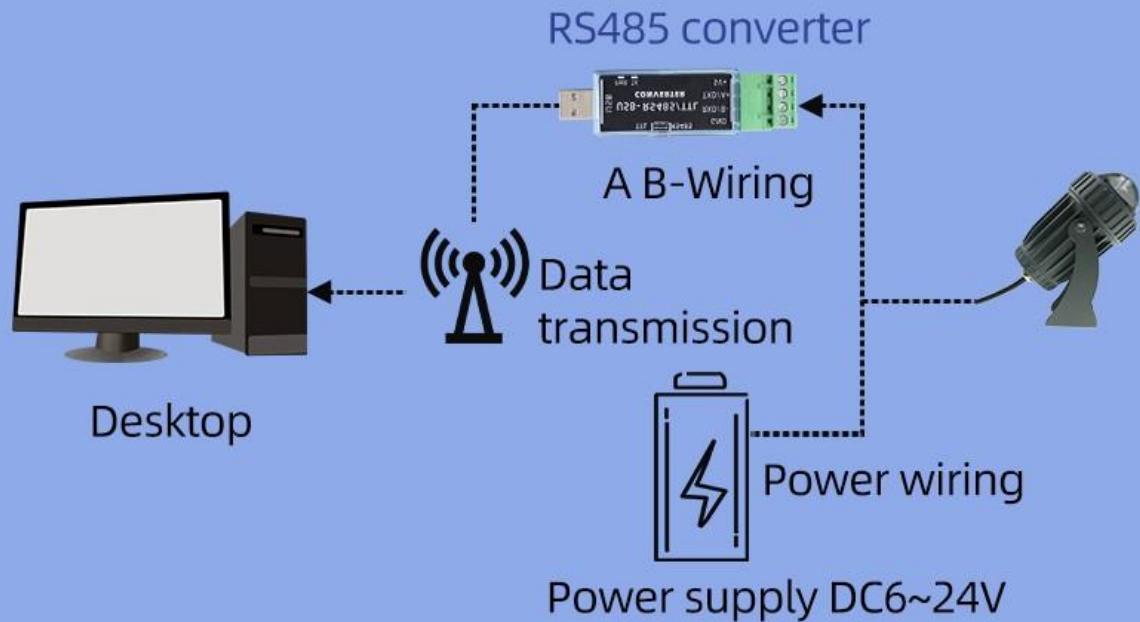
How to use?

Rainfall sensors can be widely used in meteorological monitoring, rainfall detection in scientific research, agriculture, parks, fields and gardens, etc.



Application solution

■ RS485 application scheme



Product List



Certificate

Rainwater microwave sensing Optical rain sensor 1 (The actual delivery is subject to the user's selection)

Communication Protocol

The product uses the RS485 MODBUS-RTU standard protocol format, and all operation or reply commands are in hexadecimal data. When the device leaves the factory, the default device address is 1, and the default baud rate is: for modules and non-recording instruments: 9600, 8, n, 1 (for the recorder series products, the default is: 115200, 8, n, 1).

1. Read data (Function code 0x03)

The inquiry frame (in hexadecimal). Example of sending: To query 1 piece of data of device No. 1, the host computer sends the command: 01 03 00 00 00 02 C4 0B .

Address	Function code	Starting address	Data length	Checksum
01	03	00 00	00 02	C4 0B

For a correct inquiry frame, the device will respond with data: 01 03 04 02 19 00 00 2A 4C , and the response format is:

Address	Function code	Length	Data 1	Data 2	Checksum
01	03	04	02 18	02 19	2A 4C

Data description: The data in the command is in hexadecimal. Taking Data 1 as an example, 02 18 converted to decimal value is 536. Assuming the data magnification factor is 100, then the true value is $536/100 = 5.36$, and the others can be deduced by analogy.

2. Common Data Address Table

Configuration Address	Register Address	Register Description	Data Type	Value Range

40001	00 00	rainfall	Read Only	0~65535
40002	00 01	illuminance	Read Only	0~65535
40101	00 64	Model Code	Read-only	0~59999
40102	00 65	Total Number of Measuring Points	Read-only	1~1600
40103	00 66	Device Address	Read/Write	1~249
40104	00 67	Baud Rate	Read/Write	0~6
40105	00 68	Communication Mode	Read/Write	1 Query
40106	00 69	Protocol Type	Read/Write	1 MODBUS-RTU

3. Read and modify the device address

(1) Read or query the device address

If you don't know the current device address and there is only one device on the bus, you can query the device address through the command FA 03 00 66 00 01 71 9E .

Device address	Function code	Starting address	Data length	Checksum
FA	03	00 66	00 01	71 9E

FA, which is 250, is the universal address. When you don't know the address, you can use 250 to obtain the real device address. 00 66 is the register of the device address.

For a correct query command, the device will respond. For example, the response data is: 01 03 02 00 01 79 84. The format analysis is shown in the following table:

Device address	Function code	Starting address	Address ID	Checksum
01	03	02	00 01	79 84

In the response data, the first byte 01 represents the real address of the current device.

(2) Change the device address

For example, if the current device address is 1 and you want to change it to 02, the command is: 01 06 00 66 00 02 E8 14 .

Device address	Function code	Register address	Target address	Checksum
01	06	00 66	00 02	E8 14

After the change is successful, the device will return the information: 02 06 00 66 00 02 E8 27. The format analysis is shown in the following table:

Device address	Function code	Register address	Target address	Checksum
02	06	00 66	00 02	E8 27

In the response data, after the modification is successful, the first byte is the new device address. Generally, after the device address is changed, it takes effect immediately. At this time, users need to modify the query commands in their own software accordingly.

4. Read and modify the baud rate

(1) Read the baud rate

The default factory baud rate of the device is 9600. If you need to change it, you can perform the change operation according to the following table and the corresponding communication protocol. For example, to read the baud rate ID of the current device, the command is: 01 03 00 67 00 01 35 D5 . The format analysis is as follows.

Device address	Function code	Starting address	Data length	Checksum
01	03	00 67	00 01	35 D5

Read the baud rate code of the current device. Baud rate codes: 1 for 2400; 2 for 4800; 3 for 9600; 4 for 19200; 5 for 38400; 6 for 115200.

For a correct query command, the device will respond. For example, the response data is: 01 03 02 00 03 F8 45. The format analysis is shown in the following table:

Device address	Function code	Data length	Baud rate code	Checksum
01	03	02	00 03	F8 45

According to the baud rate code, 03 represents 9600, which means the current baud rate of the device is 9600.

(2) Change the baud rate

For example, to change the baud rate from 9600 to 38400, that is, change the code from 3 to 5, the command is: 01 06 00 67 00 05 F8 16 .

Device address	Function code	Register address	Target baud rate	Checksum
01	06	00 67	00 05	F8 16

Change the baud rate from 9600 to 38400, that is, change the code from 3 to 5. The new baud rate will take effect immediately. At this time, the device will stop responding, and the query command for the device's baud rate needs to be modified accordingly.

5. Read and modify the correction value (valid for some products)

(1) Read the correction value

When there is an error between the data and the reference standard, we can reduce the display error by adjusting the “correction value”. The adjustable range of the correction difference is plus or minus 1000, that is, the value range is 0 - 1000 or 64535 - 65535. For example, when the displayed value is 100 less than the actual value, we can correct it by adding 100. The command is: 01 03 00 6B 00 01 F5 D6 . In the command, 100 is the hexadecimal value 0x64. If you need to decrease the value, you can set a negative value. For example, - 100 corresponds to the hexadecimal value FF 9C. The calculation method is 100 - 65535 = 65435, and then convert it to hexadecimal, which is 0x FF 9C. The device correction value starts from 00 6B. We take the first parameter as an example for illustration. When there are multiple parameters, the methods for reading and modifying the correction value are the same.

Device address	Function code	Starting address	Data length	Checksum
01	03	00 6B	00 01	F5 D6

For a correct query command, the device will respond. For example, the response data is: 01 03 02 00 64 B9 AF. The format analysis is shown in the following table:

Device address	Function code	Data length	Correction value	Checksum
01	03	02	00 64	B9 AF

In the response data, the first byte 01 represents the real address of the current device, and 00 6B is the register for the correction value of the first state variable. If the device has multiple parameters, the operation methods for other parameters are the same. Generally, temperature and humidity sensors have this parameter, while light sensors usually do not.

(2) Change the correction value

For example, if the current state variable value is too small and we want to increase its real - value by 1, the command to correct the current value by adding 100 is: 01 06 00 6B 00 64 F9 FD .

Device address	Function code	Register address	Target address	Checksum
01	06	00 6B	00 64	F9 FD

After the operation is successful, the device will return the information: 01 06 00 6B 00 64 F9 FD. After the change is successful, the parameter takes effect immediately.

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