Solar radiation and the sunshine hours 2 in 1 sensor Introduce

RD-SRS-02

1. Product introduction

The solar radiation sensor is mainly used to measure solar short-wave radiation in the wavelength range of 400-1100nm, and it is simple to use and cost-effective. It can be used continuously all-weather and can be inverted or tilted. The product can also be used to measure the number of hours of sunshine. It is widely used in the solar energy monitoring of plant growth, heat conversion box and total soil moisture evapotranspiration loss.

2. Product Principle

The solar radiation sensor is used to measure the short-wave radiation of the sun. It uses a silicon photodetector to generate a voltage output signal proportional to the incident light. In order to reduce the cosine error, a cosine corrector is installed in the instrument. The radiometer can be directly connected to the Digital voltmeter or digital logger is connected to measure radiation intensity.

3. Scope of application

This product can be widely used in agricultural and forestry ecological radiation monitoring, solar thermal utilization research, tourism environmental protection ecology, agricultural meteorology research, crop growth monitoring, greenhouse control.

4. Product furthers

➢ Conforms to WMO World Meteorological Organization specifications (CIMO Guide)

➢ Suitable for various harsh environments

➢ High cost performance

➢ high sensitivity

➢ Passive precision measurement

➢ Simple structure, easy to use

5. Technical Parameters

Spectral range	0-2000W/m2
Wavelength range	400-1100nm
Measurement accuracy	5% (ambient temperature 25℃, compared with SPLITE2 meter, radiation 1000W/m2)
Sensitivity	200 ~ 500μv•w-1•m2
Signal output	RS485 /4-20mA
Response time	＜1s（99%）

Cosine correction	< 10% (up to 80°)
Non-linear	≤±3%
Stability	≤±3% (annual stability)
Working environment	Temperature -30～60℃, working humidity: <90%

6. Product size
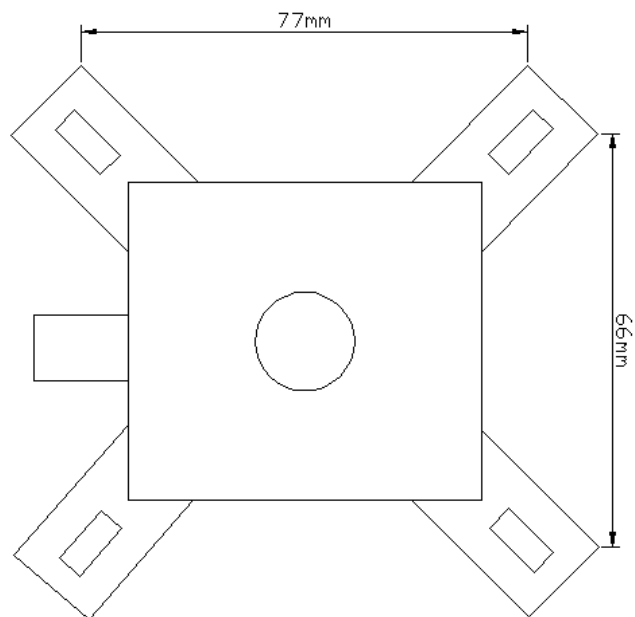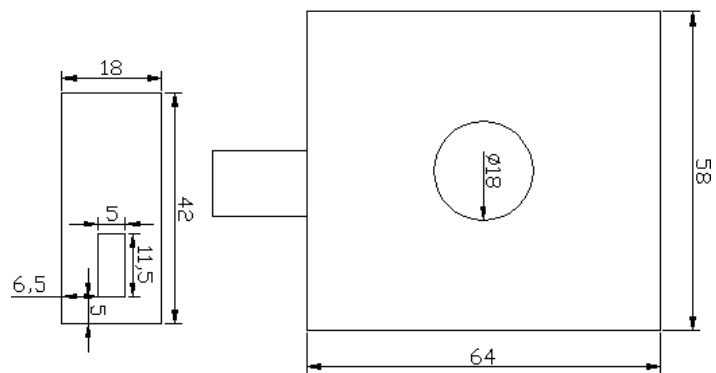
7. Wiring definition

1.RS485 output

Wire colour	Interface
Red	Power positive　(12-24VDC)
Black	Power negative
Yellow	RS485A
Blue	RS485B

8. Data conversion method

1. RS485 Digital output

1. Basic agreement

RS485 signal, standard Modbus-RTU protocol

Baud rate: 9600bps can be set, factory default is 9600bps; Check digit: none; Data bit: 8; Stop bit: 1

2. Communication protocol examples and explanations

(1) Modify the address, for example: change the address of the transmitter address to 33, host → slave

Original address	Function code	Starting register address	Number of registers	Data length	New address	CRC16 low	CRC16 high
00	10	0001	0001	02	0033	EA	04

If success, the slave will send to the host:

Original address	Function code	Starting register address	Number of registers		CRC16 low	CRC16 high
00	10	0001	0001		0X51	0XD8

(2) Read Sensor address

Host send command format (For example the address is FF)

Device address	Function code	Starting register address	Number of registers	CRC Check
00	03	0001	0001	D4 1B

Slave response command format

Device address	Function code	Data length	Address data	CRC Check
00	03	02	00FF	C5 C4

(3) Read solar radiation, sunshine hours at device address 0xFF

➢ Inquiry frame

Address code	Function code	Register start address	Number of registers	CRC Check
FF	03	0000	0002	D1 D5

➢ Response frame

Address code	Function code	Data length	Sunshine hours	Solar radiation	CRC Check
FF	03	04	003C	0122	A479

Calculation instructions:

Sunshine hours: 00 3C(HEX) =6.0h;

Solar radiation: 0122(HEX)=290 W•M-2

Remarks: The sunshine hours will not be automatically cleared to 0, and the clearing command needs to be sent after sunset every day: AT+RZSS=0, the output is the daily sunshine hours.

9. Cautions

Correct maintenance and maintenance will help protect the performance of the instrument and prolong the service life of the instrument. Please pay attention to the following points:

1. Please use the instruction correctly according to the requirements of the instruction manual. Incorrect may cause damage to the instrument.

2. Do not connect the wires with power, and only after the wiring is checked and correct, the power can be connected;

3. The sensor cable length will affect the output signal of the product. Do not change the components or wires that have been welded when the product leaves the factory. If you need to change it, please contact the manufacturer;

4. The sensor is a precision device. The user should not disassemble it by himself or touch the surface of the sensor with sharp objects or corrosive liquids to avoid damage to the product;