

USER GUIDE FOR CDG-10B SOLAR RADIATION SENSORS

CDG-10B-01-MN-10

SEP-2024

This document is applied for the following products

SKU	CDG	HW Ver.	1.0	FW Ver.	1.0
Item Code	CDG-10B	Solar Radiation Sensor, 4-20mA RS485 0-5V 0-2V Output, Aluminum alloy, 0-1500W/m ²			

1. Introductions

Solar Radiation Sensor is designed on basis of optical principle. It is mainly used for measuring solar radiation within 300-1100nm wavelength. If the sensing face is downwards, it can test the reflected radiation and Solar radiation on the incident to the inclined plane. If shade is added, it can test the scattered radiation. It is widely used to monitor the solar radiation in meteorology, solar energy, agriculture, construction materials aging and atmospheric pollution and etc.



2. Specification

Item	Specifications
Spectral range	300~1100nm
Supply	12-24VDC
Range	0-1500W/m ²
Output	0-2V,0-2.5V,0-5V,4-20mA,RS485
Response time	≤5s
Cosine correction	±10%(Solar elevation angle=10°)
Non-linear	≤±3%
Temperature effect	±0.08%/°C
Stability	≤±2%/year
Operating Temperature	-40°C~+80°C
Ingress Protection	IP65
Weight(unpacked)	420g
Shell material	Aluminum alloy or ABS optional
Storage Condition	10°C-60°C@20%-90%RH

3. Working Process

The wavelength range of solar radiation energy that can be measured is usually between 0.3 and 1.1μ m, which can meet the observation needs of solar radiation.

With a temperature compensation unit or good temperature characteristics, accurate measurement data can be obtained over a wide temperature range. It has good waterproof and dust-proof performance and can work normally in various harsh environments.

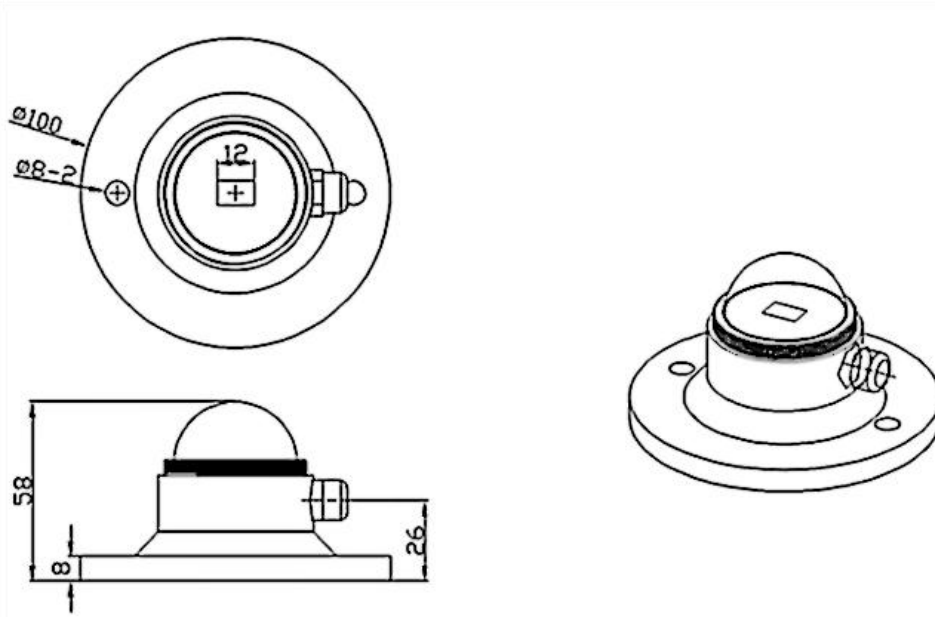


4. Electrical Connections

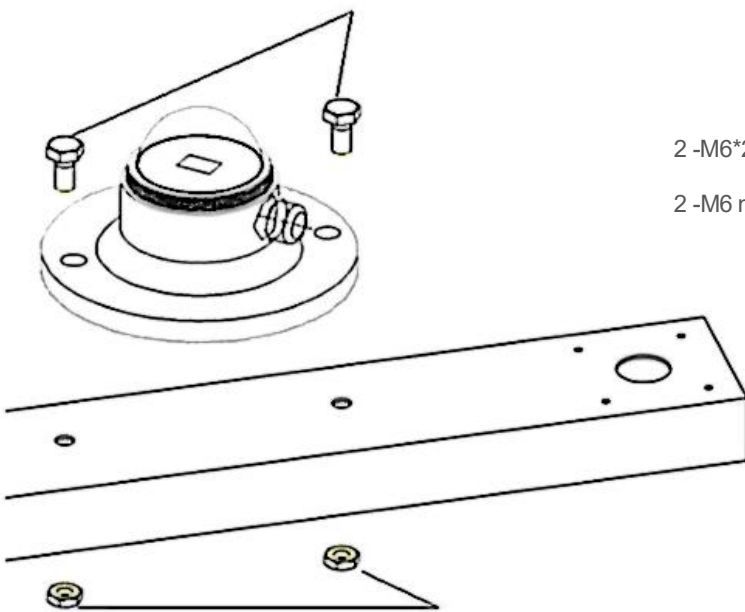
Cable	Voltage	Current	RS485
Red	V+	V+	V+
Black	V-	V-	V-
Yellow	Vout	Iout	RS485A
Blue/Green			RS485B



5. Dimensions

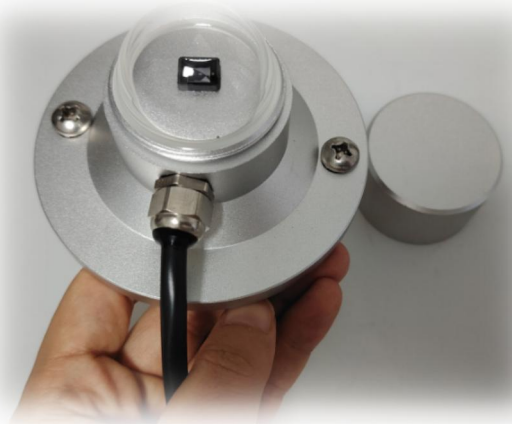


6. Installation



2 -M6*20 outer hex screws

2 -M6 nuts,2-M6 flat mat,2-M6 Spring washers



7. Communication Protocol (MODBUS)

Transmission mode: MODBUS-RTU, **Baud rate:** 9600bps, **Data bits:** 8, **Stop bit:** 1, **Check bit:** no

Slave address: the factory default is 01H (set according to the need, 00H to FFH)

7.1 The 03H Function Code Example: Read Radiation Value

Host Scan Order(slave address:0x01)

01 03 00 00 00 01 840A

Slave Response

01 03 02 03 B4 91E7

Solar Radiation:(03B4)H=(984)D=948(W/m²)

7.2 The 10H Function Code Example: Modify the slave address

Host Scan Order (Changed to 01H, read and write address must be 00H):

00 10 01 BD C0

Slave Response:

00 10 007C

7.3 The 20H Function Code Example: Read The Slave Address

Host Scan Order:

00 20 00 68

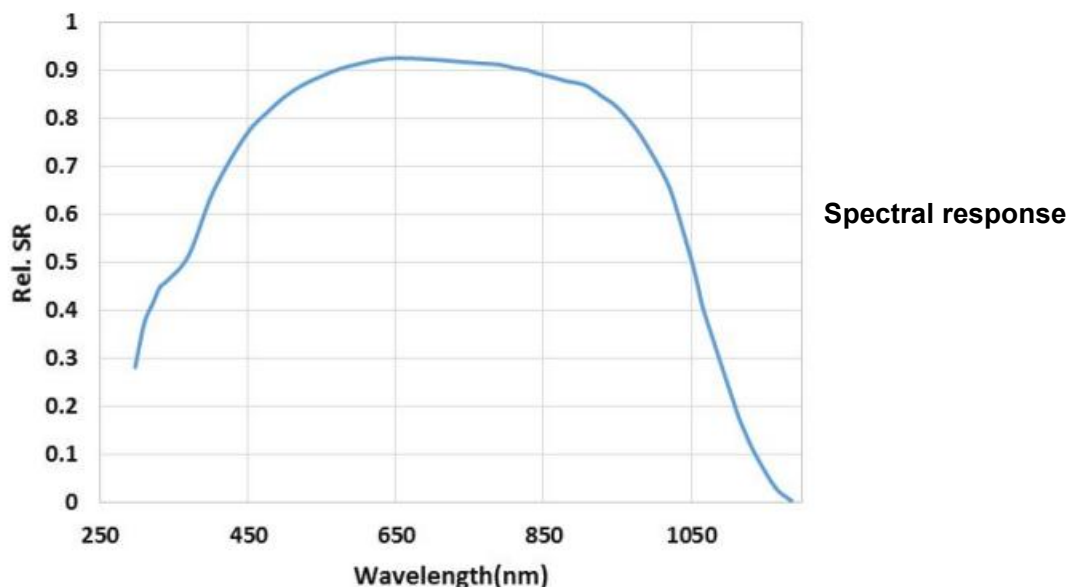
Slave Response(addr.=01H):

00 20 01 A9C0

Note:

1. All underlined is fixed bit;
2. The last two bytes is CRC check command.

Note: This product has been tested and complies with European CE requirements for EMC directive.



7.3 OUTPUT CHARACTERISTICS

- **Voltage(0-5V,0-2.5V)**

0-5V:Solar radiation values(W/m^2)= $(V/5)*1500$ (Where V is output voltage value,unit:V)

0-2.5V:Solar radiation values(W/m^2)= $(V/2.5)*1500$ (Where V is output voltage value,unit:V)

- **Current(4-20mA)**

Solar radiation values(W/m^2)= $(I-4)/16*1500$ (Where I is output current value,unit:mA)

- **RS485**

MODBUS-RTU,See appendix for communication protocol.

8. Troubleshooting

If some error occurs, such as no output or unreliable. Please disconnect the sensor first, then check if the sensor installation and connection is correct with the instruction manual.

If still not successful, please contact our company.

9. Support contacts:



Complies with applicable CE directives.

Manual subject to change without notice. Version 1.0

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