

PAR Sensor (S-PAR-02 / PAR-2.5V)



Features

- 400~700nm spectral range
- High detection accuracy, fast response and good stability
- Output: MODBUS RS485 or 0~2.5V voltage
- Small size, simple installation, quick integration
- Factory calibration, users do not need to calibrate again
- Wide voltage power supply: 5~24V DC

Applications

- Environmental Monitoring
- Plant Growth Research
- Optical Research
- Solar Energy Research
- Other Sensor Applications

Introduction

The SenseCAP photosynthetically effective sensor can monitor the photosynthetically effective radiation value in the environment in real time. It is suitable for crop growth, photosynthetic potential research, tourism environmental protection ecology, greenhouse control, scientific research institute experiment, solar energy research and other fields, usually can be connected to various data collectors, data acquisition cards, remote data acquisition modules and other equipment.

The photosynthetically active radiometer is mainly used to measure the photosynthetically active radiation of natural light in the wavelength range of 400-700nm. It uses a silicon photodetector and passes through an optical filter of 400-700nm. When there is light, it produces a radiation that is proportional to the intensity of the incident radiation. A proportional voltage signal, and its sensitivity is proportional to the cosine of the direct angle of the incident light. Before leaving the factory, each photosynthetically active radiation sensor will be calibrated. The sensor directly outputs the measured value in $\mu\text{mol}/\text{m}^2\cdot\text{s}$. It is simple to use and has a horizontal base for quick installation. The device can work in an outdoor environment around the clock.

Specifications

Photosynthetically Active Radiation (PAR)

Measurement Range 0 ~ 2500 $\mu\text{mol}/\text{m}^2\cdot\text{s}$

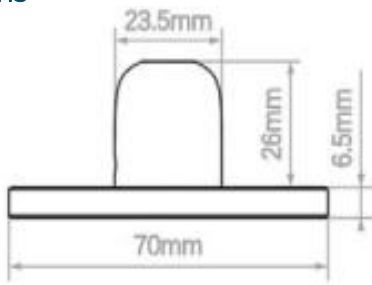
Resolution 1 $\mu\text{mol}/\text{m}^2\cdot\text{s}$

Spectral Range 400 ~ 700nm

General Parameters

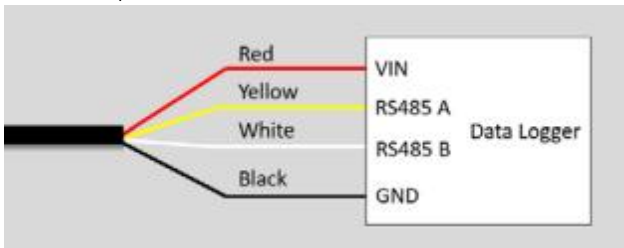
Product Model	RS485: S-PAR-02 Voltage: PAR-2.5V
Power Supply	5V ~24V
Output Signal	MODBUS-RTU RS485 or 0 ~ 2.5V Voltage
Measurement Interval	1s
Linearity	Maximum deviation 1%
Drift	<2%/year
Response Time	10 μs
Operating Temperature	-30 ~ + 75 $^{\circ}\text{C}$
Operating Humidity	0 ~ 100% (non-condensing)
measurement accuracy	$\pm 2\%$
Cable Length	2 meters
Device Weight	300g

Dimensions

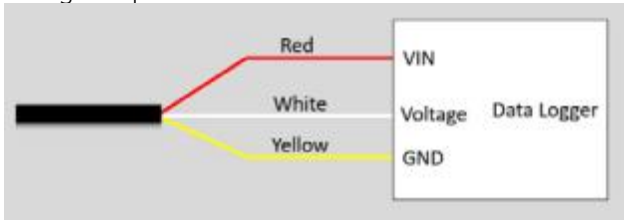


Wiring Diagram

RS485 Output:



Voltage Output:



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Installation

1. The installation site of the solar photosynthetic active radiation sensor should be selected without any obstacles above the plane of the sensing element, ensure that there are no obstacles with an altitude angle of more than 5° in the sunrise and sunset directions, and avoid shadows falling on the sensing surface. phenomenon. The watch should not be near light-colored buildings or other objects that easily reflect sunlight, nor should it be near artificial radiation sources.

2. When installing, the sensor should be leveled first and then fixed.

Other Considerations

1. When you receive the product, please check whether the packaging is intact, and check whether the sensor model and specifications are consistent with the product you purchased;
2. The installation place should be kept away from chemical corrosive environment;
3. Sensors and wires should be far away from high-voltage electricity, heat sources, etc.;
4. The sensor is a precision device, please do not disassemble it yourself when using it to avoid damage to the product;
5. Do not wire with power on, the wire can be turned on after the wiring is completed, and the inspection is correct;

Modbus-RTU RS485

Standard Modbus-RTU protocol, baud rate: 9600; parity bit: none; data bit: 8; stop bit: 1

For example: Change the address 01 sensor to address 02, and the sensor receives the correct address, then it will return as it is.

Modify address							
Original address	Function code	Data address -H	Data address -L	Data -H	Data -L	CRC16-L	CRC16-H
01	06	01	00	00	02	09	F7

If you forget the address of the sensor, you can use the broadcast command 00 to change it to a new address. For example, if the new address is 03 and the sensor receives the correct address, it will return as it is.

Note: When the broadcast address 00 is used, the master can only connect to one slave at the same time.

Modify address (Broadcast Command)							
Command	Function code	Data address -H	Data address -L	Data -H	Data -L	CRC16-L	CRC16-H
00	06	01	00	00	01	48	27

Query the data of the sensor (address 01) (photosynthetic valid), master→slave

Query Data							
Address	Function code	address -H	Start address -L	Register length -H	Register length-L	CRC16-L	CRC16-H
01	03	00	00	00	01	84	0A

If the sensor is received correctly, it will return the following data, slave → master

Address	Function code	Data length	Register 0 data -H	Register 0 data -L	CRC16-L	CRC16-H
01	03	02	04	B3	FB	31
			Measurement Value, Unit:μmol/m ² -s			

Data calculation:

Convert the data to decimal.

As indicated by the above data: 04B3 (HEX) =1203 μmol/m²-s

Voltage Output

0~2.5V corresponds to 0~2500 μmol/m²-s

Value = voltage * 1000

For example: if voltage is 1.25V, the value is 1250 μmol/m²-s