UV Radiation Sensor Datasheet

Module：S-ZW-01

Version：V1.0
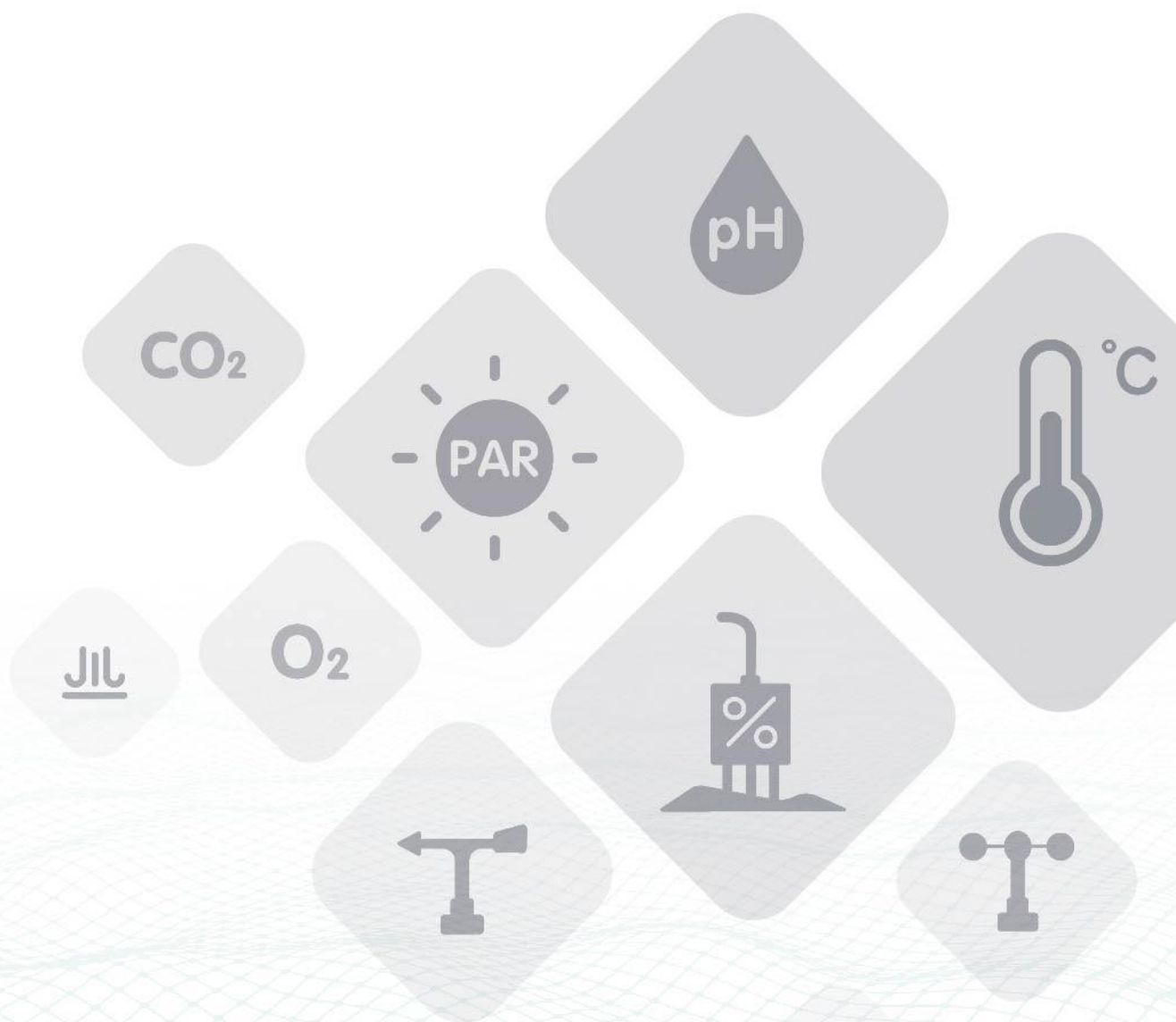
Directory

1. Introduction

An ultraviolet radiation meter is primarily used to measure ultraviolet radiation values. It employs a photoelectric detector and utilizes optical filters. When exposed to ultraviolet radiation, it generates a current signal that is directly proportional to the intensity of the incident radiation. Additionally, its sensitivity is proportional to the cosine of the angle of direct incidence of the incoming light. Each ultraviolet radiation meter provides its own sensitivity value and allows for direct reading of measurement values in units of W/m². It is user-friendly and can be easily connected to data collectors, suitable for use under all weather conditions. It finds extensive applications in agricultural meteorology, crop growth analysis, and ecological research.

Technical Parameters	
Measurement Parameters	Ultraviolet radiation
Measuring unit	W/m²
Measuring range	0～200W/m²
Accuracy	±3%
Resolution	1W/m²
Response spectrum	240~395nm
Linearity	Maximum offset 1%
Operating Temperature	-30℃～75℃
Response Time	200ms
Stability	Change＜2% within one year

| Other Parameters	
Output Signal	Digital Signal Modbus RS485
Supply voltage	5 to 24V DC (12VDC typical)
Cable length	2m

2. Sensor wiring

The UV radiation sensor can be connected to a variety of devices containing differential input data collectors, data acquisition cards, remote data acquisition modules and other equipment. The specific wiring is shown in the figure to the right:
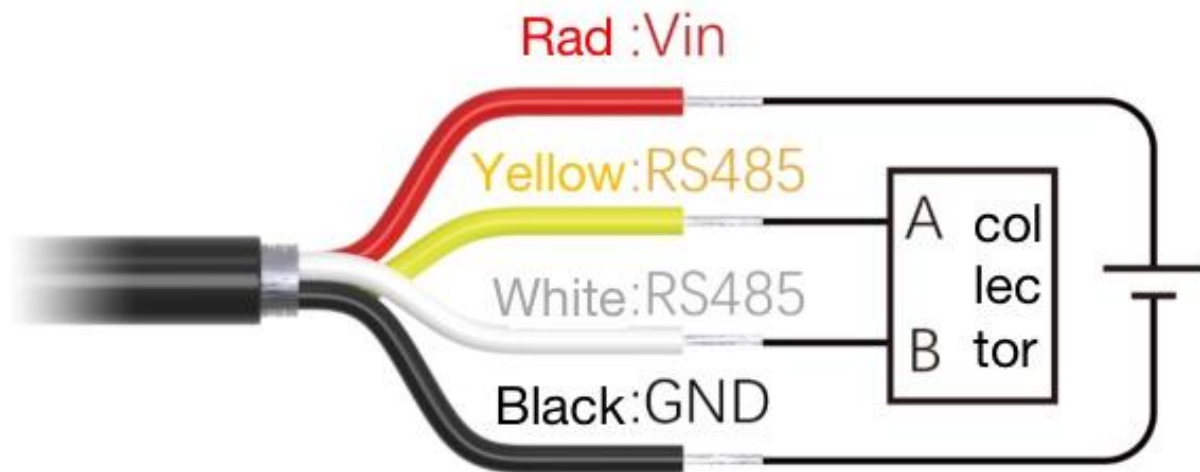
Wiring diagram of RS485 signal

3. External Dimensions
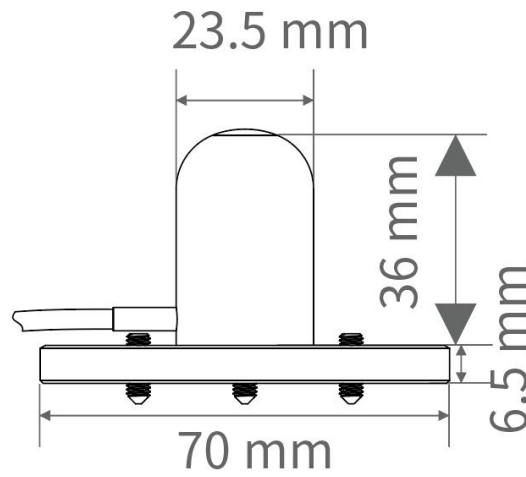
4.RS485 communication and protocols

4.1. Modbus communication protocol

Modbus is a serial communication protocol, is a variety of instrumentation as well as intelligent sensors in the communication interface of the standard, in the intelligent sensor has a wide range of applications.Modbus protocol is a master-slave architecture of the protocol. There is a master node and other nodes that participate in communication using the Modbus protocol are slave nodes. Each slave device has a unique device address.

The sensor has an RS485 interface and supports the Modbus protocol. The factory default values for the communication parameters are: baud rate 9600 bps, one start bit, 8 data bits, no parity, and one stop bit. The communication protocol is Modbus RTU. The communication parameters can be changed by the setup program or Modbus commands, and the sensor needs to be re-powered to take effect after the communication parameters are changed.

4.2. Address Modification

For example: Changing the address of Sensor 01 to 02.

Default UV Radiation Sensor Address (Decimal): 47

Original Address	Function Code	High Data Address	Low Data Address	High Data	Low Data	Low CRC16	High CRC16
01	06	01	00	00	02	08	0B

4.3. Address Modification via Broadcast Command

If you forget the address of the sensor, you can use the broadcast command FE
to change it to a new address, for example, the new address being 03.

Broadcast Command	Function Code	High Data Address	Low Data Address	High Data	Low Data	Low CRC16	High CRC16
FE	06	01	00	00	03	DD	C4

If the sensor receives the command correctly, it will return it as-is.

Note: When using the broadcast address FE, the master can communicate with only one slave at a time.

4.4. Data Inquiry

Inquire data from sensor (address 01) for ultraviolet radiation. Master → Slave:

Address	Function Code	High Start Register Address	Low Start Register Address	High Register Length	Low Register Length	Low CRC16	High CRC16
01	03	00	00	00	01	84	0A

If the sensor receives correctly, it returns the following data. Slave → Master:

Address	Function Code	Data Length	Register 0 High Data	Register 0 Low Data	Low CRC16	High CRC16
01	03	02	00	50	B8	78
			Ultraviolet Radiation Unit: W/m²			

The above data indicates an ultraviolet radiation value of: 80 W/m².

4.5. Communication Using Serial Debugging Software

Users can utilize any serial debugging software to communicate with the sensor. During communication, it is essential to select the correct serial port, baud rate, and other serial communication parameters. The data to be sent and received should be transmitted and displayed in hexadecimal format.

5. Precautions for Use

1. Upon receiving the product, please inspect the packaging for any damage and verify that the sensor model and specifications match your purchased product.

2. The installation location should be far from chemically corrosive environments.

3. Keep the sensor and wires away from high-voltage electricity, heat sources, and similar hazards.

4. The sensor is a precision device; please refrain from disassembling it on your own to prevent potential damage to the product.

5. Do not connect wires while they are powered. Only power on after completing the connections and ensuring everything is correct.

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