

CWT-SI Solar irradiance sensor (RS485 type) manual



Parameters:

- Power supply range :10V~30V DC
- Output: RS 485 (standard Modbus-RTU protocol)
- Power consumption :0.08W
- Working humidity: 0%~100%RH
- Working temperature: -40 C ~ 60 C
- Spectral range: 0.3~3 μ m
- Measuring range: 0~1800W/m²
- Resolution :1W/m²
- Response time: \leq 10S
- Nonlinear: $<\pm 2\%$
- Annual stability: $\leq \pm 2\%$
- Cosine response: $\leq \pm 10\%$
- Cable length: default is 60cm (can be customized)

Wiring

	Cable color	Description
Power	Brown	Power + (10~30V DC)
	Black	Power-
Communication	Yellow	485+
	Blue	485-

Installation method

1. After the installation is complete, remove the protective cover
2. Make sure the bracket is installed and the irradiance sensor is parallel to the ground.
3. Secure the sensor to the mounting bracket by using a screw through the mounting hole on the sensor.
4. Please note that the dust cover should not be damaged during the installation process, so as not to affect the measurement accuracy.

Product size



RS485 communication Default parameters: 4800,n,8,1

Default device address is 1

Modbus RTU protocol

Read status registers, read function code: 0x30					
Register address (Hex)	PLC Address (decimal)	meaning	Number of bytes	unit	remark
0000H	40001	Solar irradiance value	2	1 W/m ²	Read
0052H	40083	Calibration value	2	1 W/m ²	Read/Write
Parameters registers, read function code: 0x30, write function code: 0x60					
07D0H	42001	Slave ID	2	1-254	Read/Write
07D1H	42002	baud rate	2	0: 2400 1: 4800 2: 9600 Default 4800	Read/Write

Read solar irradiance values

Master send request:

Address	Function Code	Start Address (Hi)	Start Address (Lo)	Number of Points (Hi)	Number of Points (Lo)	Error Check (Lo)	Error Check (Hi)
0x01	0x03	0x00	0x00	0x00	0x01	0x84	0X0A

Sensor responds:

Address	Function Code	Number of byte	Solar irradiance value	Error Check (Lo)	Error Check (Hi)
0x01	0x03	0x02	0x00 0x64	0x9B	0xAF

Solar irradiance value:

0064 (hex) =100 (DEC) => Solar irradiance =100W/m²

Write calibration value:

Address	Function Code	Register address	Calibration value	Error Check (Lo)	Error Check (Hi)
0x01	0x06	0x00 0x52	0x00 0x0A	0xA8	0x1C

Sensor responds:

Address	Function Code	Register address	deviation value	Error Check (Lo)	Error Check (Hi)
0x01	0x06	0x00 0x52	0x00 0x0A	0xA8	0x1C

Write the current calibration value

000A (hex) =10 (DEC)=> Solar irradiance calibration=10W/m²

Set slave ID

E.g., set slave ID=2, Master sends

Address	Function Code	Start Address (Hi)	Start Address (Lo)	ID	Error Check (Lo)	Error Check (Hi)
0x01	0x06	0x07	0xD0	0x00 0x02	0x08	0x86

Sensor responds:

Address	Function Code	Start Address (Hi)	Start Address (Lo)	ID	Error Check (Lo)	Error Check (Hi)
0x01	0x06	0x07	0xD0	0x00 0x02	0x08	0x86

Set baud rate

E.g., set baud rate to 9600, Master sends

Address	Function Code	Start Address (Hi)	Start Address (Lo)	command	Error Check (Lo)	Error Check (Hi)
0x01	0x06	0x07	0xD1	0x00 0x02	0x59	0x46

Sensor responds:

Address	Function Code	Start Address (Hi)	Start Address (Lo)	command	Error Check (Lo)	Error Check (Hi)
0x01	0x06	0x07	0xD1	0x00 0x02	0x59	0x46

Enquiry slave ID

Master sends

Address	Function Code	Start Address (Hi)	Start Address (Lo)	Number of Points (Hi)	Number of Points (Lo)	Error Check (Lo)	Error Check (Hi)
0xFF	0x03	0x07	0xD0	0x00	0x01	0x91	0x59

Sensor responds:

Address	Function Code	Number of Points	address	Error Check (Lo)	Error Check (Hi)
0xFF	0x03	0x02	0x00 0x01	0x50	0x50