

# **Instrument Shelter**

## [Temp.&Humi.&Luxmeter]

### **[RS485 OUTPUT]**

## **User Manual**

*Ver1.0*

Powered By GinGer

### Chapter 1: Introduction

#### 1.1. Overview

**Weather instrument shelter** is widely used in urban environment measurement, agricultural monitoring, industrial governance and other environments so as to collect more abundant and effective monitoring data. Can also integrate multiple parameters.

#### 1.2. Main Functions

The product uses the high sensitivity digital probe with stable signal and high accuracy. It has the features of wide measuring range, good linear shape, good waterproof performance, easy to use, easy to install and long transmission distance.

Adopting waterproof weather instrument shelter structure, the data acquisition system has accurate accuracy and stable operation. Excellent technology, good corrosion resistance.

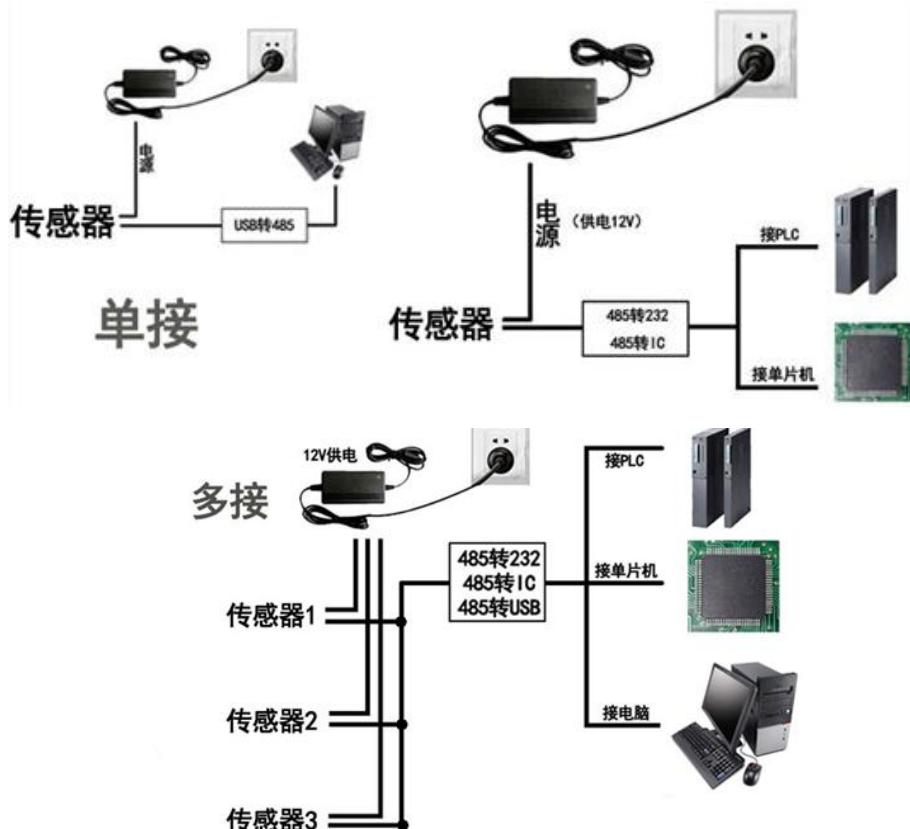
#### 1.3. Main Parameters

| Sensors    | Measure Range | Resolution | Accuracy | Unit |
|------------|---------------|------------|----------|------|
| Temp.      | -40-80        | 0.1        | ±0.2     | °C   |
| Humi.      | 0-100         | 0.1        | ±3       | %RH  |
| Iluminance | 0-200,000     | 1          | ±7%      | Lux  |

#### 1.4. System Parameters

| Parameter    | Index                     |
|--------------|---------------------------|
| DC Input     | 12-24V                    |
| Comm. Port   | RS485                     |
| Working Temp | -40-70°C                  |
| Working Humi | 0-95%RH [No Condensation] |

## 1.5. System Topology



传感器 means instrument shelter 电源 means cable

## Chapter 2: Installation Instructions

### 2.1. Packaging Contents

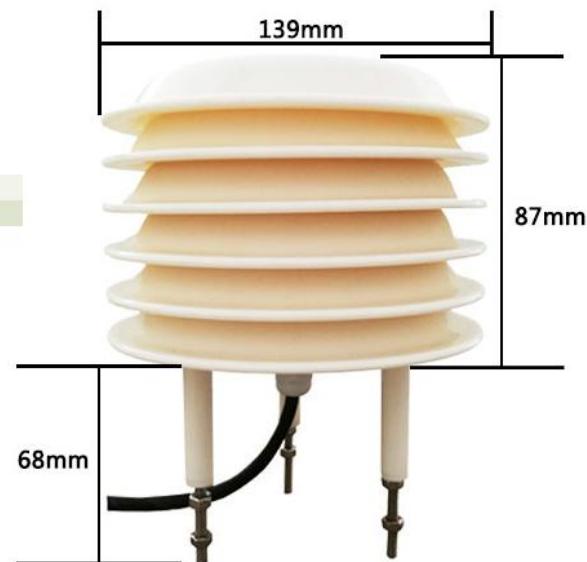
| Contents                    | Quantity         |
|-----------------------------|------------------|
| Sensor Device               | 1 set            |
| RS485 Cable                 | 1 set            |
| 12V Waterproof Power Source | 1 set (optional) |
| USB TO RS485 Converter      | 1 set (optional) |
| Warranty Card &             |                  |

## Qualification Certificate

1 set

### 2.2. Installation of Cables

When wiring 485 signal lines, please note that two lines A/B should not be connected opposite, and the addresses of multiple devices on the bus should not conflict.

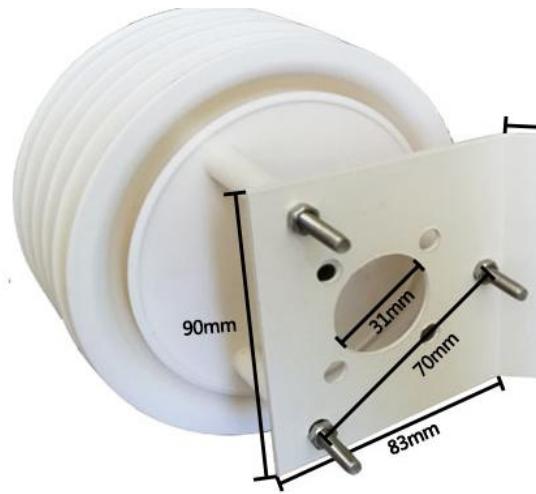


| Cables               | Colors | Index    |
|----------------------|--------|----------|
| <b>Power</b>         | Brown  | Positive |
|                      | Black  | Negative |
| <b>Communication</b> | Blue   | 485+     |
|                      | White  | 485 -    |

We provide 0.6M RS485 communicate cable by default. You can extend the cable as needed or connect the cables in sequence.

### 2.3. Device Installation

The device is fixed with three screws installed on the bottom. Customers can use screws to keep shelter with fixed holes as shown below:



Installation location should pay attention to the following matters:

1. The equipment shall be placed horizontally as far as possible to ensure that the installation is perpendicular to the horizontal plane.
2. The installation height is the sitting height of human body or the environment area which is mainly required to be measured.

Please also note the following precautions:

1. Avoid installation in the zone where heat transfer is easy and temperature difference will occur between the area to be tested, or the temperature and humidity measurement will be inaccurate.
2. Install it in an area with stable environment, avoid direct sunlight, stay away from Windows, air conditioning, heating and other equipment, and avoid directly facing Windows and doors.
3. try to stay away from high-power interference equipment, so as to avoid inaccurate measurement, such as frequency converter, motor, etc.

## Chapter 3: Configuration Software Install And Use

We provide the *Sensor Monitoring Software* to help you read the parameter of device and modify the device ID and address,etc.

### 3.1. Connect with PC

Connect the sensor to the computer with the **USB to 485 Convertor** and then you can find the correct COM port in the computer (" My computer -- Properties -- Device manager -- Port "check the COM port).



As shown in the figure above, at this point your serial port number is COM10, please remember this serial port, you need to fill in this serial port number in the **Sensor Monitoring Software**.

If the COM port is not found in the device manager, it means that you did not insert the USB to 485 or did not install the driver correctly. Please contact to our technician for help.

### 3.2.How to use the monitoring software

The software interface is shown in the figure. First, get the serial port number and select the correct serial port according to the method in section 3.1, and then click to automatically get the current baud rate and address to automatically detect all devices and baud rate on the current 485 bus. Note that you need to ensure that there is only one sensor on the 485 bus when using the software for automatic acquisition.



Then click the connection device to get real-time sensor data information.

If the concentration sensor equipment is started, at the sensor type, please choose "gas concentration sensor", formaldehyde sensor select "formaldehyde sensor", analog sensors select "analog quantity transmit module ", luxmeter sensor select "illuminance&light 20Wlux", the oxygen sensor select "oxygen sensor", other

sensors are select the default "no other sensors".

### 3.3.Modify baud rate and device ID

Click the baud rate and address of the device in communication Settings to complete relevant Settings when the device is disconnected Please note that after setting, restart the device, and then "automatically get the current baud rate and address", you can find that the address and baud rate have been changed to the address and baud rate you need.

## Chapter 4: Communication Protocol

### 4.1. Basic Communication Parameters

| Parameters        | Contents  |
|-------------------|---|
| Code              | 8bits Binary  |
| Date Bit          | 8bit  |
| Parity Bit        | None  |
| Stop Bit          | 1bit  |
| Error Calibration | CRC Long loop code                                  |
| Baud Rate         | 2400bps/4800bps/9600 bps Optional [Default:9600bps] |

### 4.2.Data Frame Format Definition

Modbus-rtu communication protocol is adopted as follows:

The initial structure >=4 bytes of time

Address code = 1 byte

Function code = 1 byte

Data area = N bytes

Error check = 16 bit CRC code

The time to end the structure >=4 bytes

Address code: the address of the transmitter, which is unique in the polling network (factory default 0x01).

Function code: the instruction sent by the host indicates that the transmitter only USES the function code 0x03 (reads the memory data).

Data area: the data area is the specific query number area. Note that 16bits of data are in the first high byte

CRC code: two-byte check code.

#### Request Frame

| Address | Function | Register Origin | Length | Check Code | Check Code |
|---------|----------|-----------------|--------|------------|------------|
| 1byte   | 1byte    | 2bytes          | 2bytes | 1byte      | 1byte      |

#### Response Frame

| Address | Function | Effective byte | Date 1 | Date 2 | Date N |
|---------|----------|----------------|--------|--------|--------|
| 1byte   | 1byte    | 1byte          | 2bytes | 2bytes | 2bytes |

### 4.3. Register Address

| Address | PLC Config Add. | Contents    | Unit   |
|---------|-----------------|-------------|--------|
| 0000H   | 40001           | Humidity    | 0.1%RH |
| 0001H   | 40002           | Temperature | 0.1°C  |
| 0007H   | 40008           | Lux High    | 1Lux   |
| 0008H   | 40009           | Lux Low     | 1Lux   |

### 4.4. Sample communication protocol and explanation

Read 0x01 Humi&temp data Of Device Address

#### Request Frame

| Address | Function | Register Origin | Length    | Check Code        | Check Code         |
|---------|----------|-----------------|-----------|-------------------|--------------------|
| 0x01    | 0x03     | 0x00,0x00       | 0x00,0x02 | Low Order<br>0xC4 | High Order<br>0x0B |

#### Response Frame

| Address | Function | Effective byte | Humidity  | Temperature | Check Code        | Check Code         |
|---------|----------|----------------|-----------|-------------|-------------------|--------------------|
| 0x01    | 0x03     | 0x04           | 0x02 0x92 | 0xFF 0x9B   | Low Order<br>0x5A | High Order<br>0x3D |

Temperature:

When the temperature is below 0°C, it is uploaded in the form of complement code

FF9B H(hexadecimal)= -101 => temperature = -10.1°C

Humidity:

292 H(hexadecimal)=658=> humidity = 65.8%RH

### 4.5.Notification

Please check whether the package is intact, and check whether the model and specification of the transmitter are consistent with the products you choose and buy; If you have any questions, please contact us as soon as possible.

Please confirm before use: power supply output voltage is correct; Positive and negative connection of power supply and product; And read the product manual in detail or consult our company. Any wrong wiring will cause irreversible damage to the transmitter.

### 4.6.Warranty & After-Sales Service

The warranty terms follow the sensor after-sales terms of Weihai JXCT electronics technology Co.,Ltd. The warranty is two years for the circuit part of the sensor host, one year for the gas-sensitive probe, and three months for the

accessories (shell/plug/cable)