# Polycarbon wind direction transmitter (Model 485)

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# Chapter 1 product introduction

## 1.1 product overview

The wind direction sensor is compact and light in appearance, easy to carry and assemble, the three-cup design concept can effectively obtain external environmental information, the shell is made of polycarbonate composite material, and the exterior is treated by electroplating and plastic spraying, it has good anti-corrosion, anti-corrosion and other characteristics, can ensure the long-term use of the instrument without rust, and with the internal smooth bearing system to ensure the accuracy of information collection. It is widely used in greenhouse, environmental protection, weather stations, ships, docks, aquaculture and other environmental wind direction measurement.

## 1.2 functional characteristics

Range: 8 directions

Anti-electromagnetic interference treatment

Adopt high-performance imported bearings, small rotational resistance, accurate

measurement

Polycarbonate shell, mechanical strength, high hardness, corrosion resistance, non-rust can be used outdoors for a long time

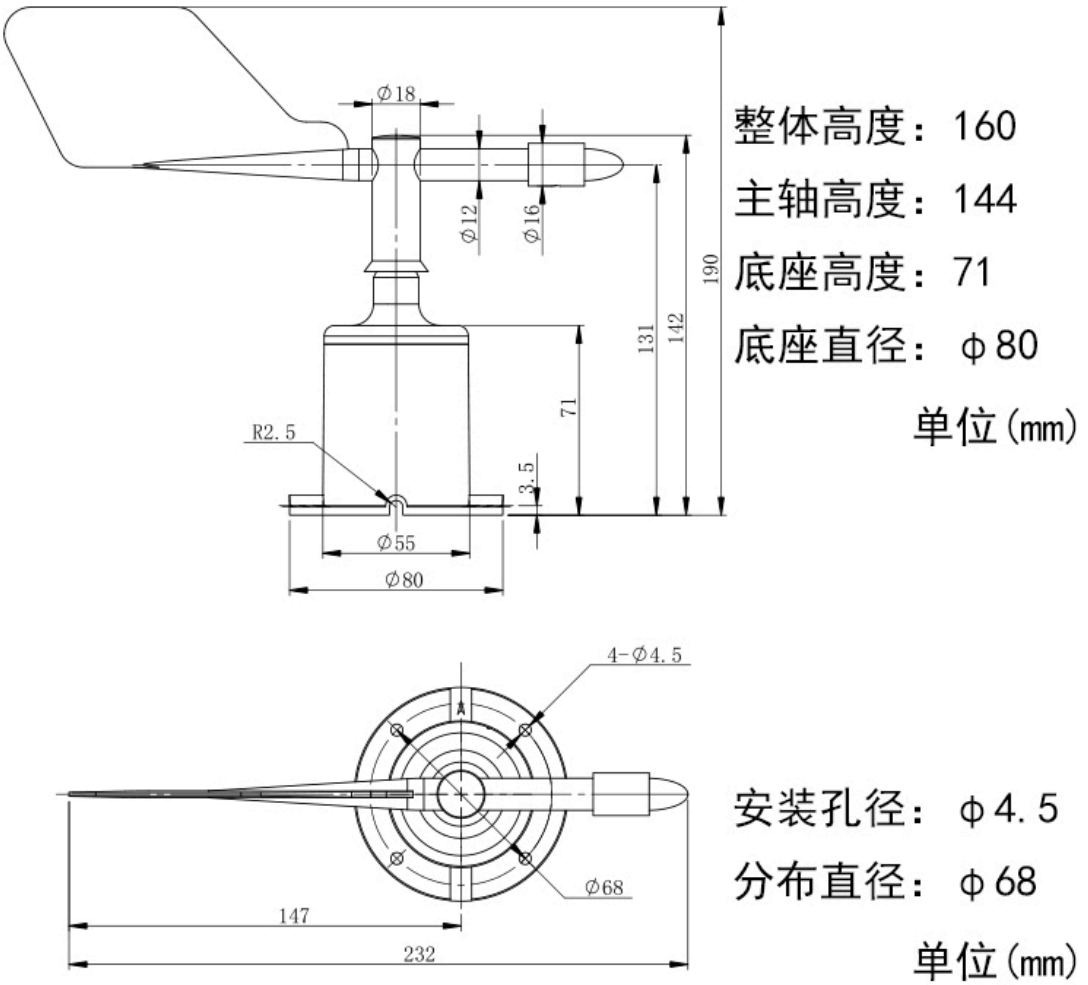
The structure and weight of the equipment are carefully designed and distributed, with small moment of inertia and sensitive response

Standard Modbus-rtu communication protocol, easy access

## 1.3 main parameters

| | |
|---|---|
| DC power supply (default) | 10-30 V DC |
| Power consumption | ≤0.15 W |
| Transmitter circuit operating temperature | -40 ° C ~ + 60 ° C, 0% RH ~ 80% Rh |
| Communication interface | 485 communication (Modbus) protocol<br>Baud rate: 2,400,4,800(default) , 9,600<br>Data bit length: 8 bits<br>Parity: None<br>Stop bit length: 1 bit<br>Default Modbus address: 1<br>Support function code: 03 |
| Parameter setting | Configure with the provided configuration software through the 485 interface |
| Measurement range | Eight directions |
| Dynamic response speed | ≤0.5 s |

**Shell dimensions**




## 1.4 system framework diagram

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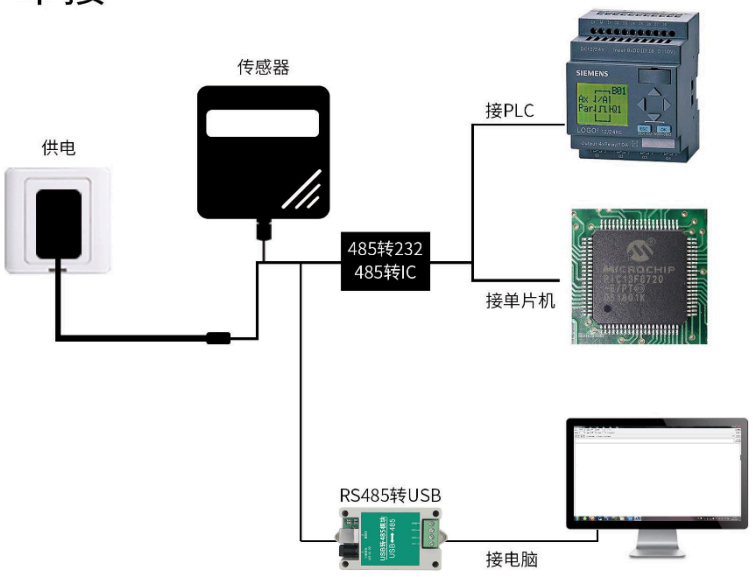
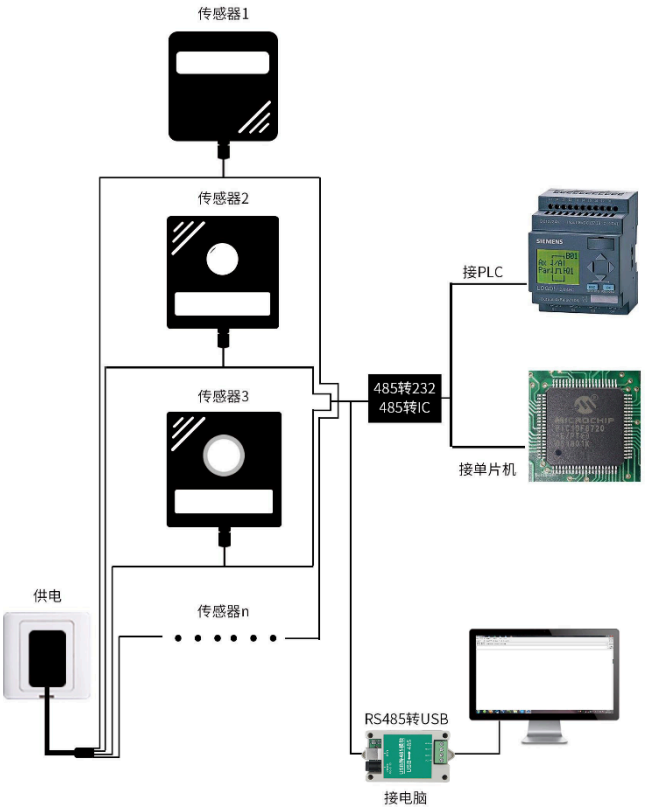



The product can also be used in a combination of multiple sensors in a 485 bus,

in theory a bus can be 254485 sensors, the other end with a 485 interface PLC, 485 interface chip connected with the MCU, or use USB to 485 can be connected to the computer, the use of my company's sensor configuration tools for configuration and testing (use the configuration software can only be connected to one device) .

多接




# Chapter 2 hardware connectivity

## 2.1 equipment pre-installation inspection

Equipment list:

‖ transmitter equipment 1

‖ install 4 screws

‖ Certificate of Conformity and Warranty Card

## 2.2

Wide voltage input 10-30V. 485 signal line wiring attention to a B two lines can not be connected back, the bus address between multiple devices can not conflict.

### 2.2.1 sensor wiring

| | Color | Description |
|---|---|---|
| 电源 | Brown | Power supply positive (10 ~ 30V DC) |
| | Black | The power supply is negative |
| 通信 | Yellow (green) | 485-A |
| | Blue | 485-B |

## 2.3 installation

The lower pipe of the wind direction sensor is firmly fixed on the flange plate by means of flange installation and threaded flange connection. The chassis ø80mm is provided with four mounting holes of ø4.5 mm in the circumference of the ø68mm, use Bolts to fasten it on the bracket, so that the whole set of instruments, to maintain the best level, to ensure the accuracy of wind direction data, flange connection easy to use, can withstand greater pressure.



## 2.4 precautions

1. Users are not allowed to disassemble or touch the sensor core to prevent damage to the product.

2. As far as possible away from high-power interference equipment, so as not to cause inaccurate measurement, such as inverter, motor, etc. .

3. To prevent chemical reagents, oil, dust and other direct damage to the sensor, do

not dew, limit temperature environment for long-term use, prevent cold and heat shock.

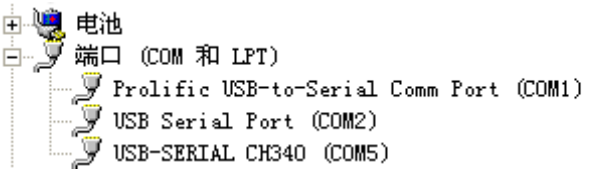
# Chapter 3 configuration software installation and use

We provide the supporting“485 parameter configuration software”, can easily use the computer to read the parameters of the sensor, while flexible modification of the sensor device ID and address.

Note that when using software for automatic access, you need to ensure that there is only one sensor on the 485 bus.

## 3.1 the sensor is connected to the computer

After connecting the sensor to the 485 via USB and powering it properly, you can see the correct COM port on your computer (see the COM port in my pc-properties-device manager-port) .




Open the package, select“Debugging software”-“485 parameter configuration software”, find to open.

If you do not find a COM port in device manager, it means that you do not have a USB to 485 driver installed (in the package) or you do not have the driver installed correctly, please contact a technical person for help.

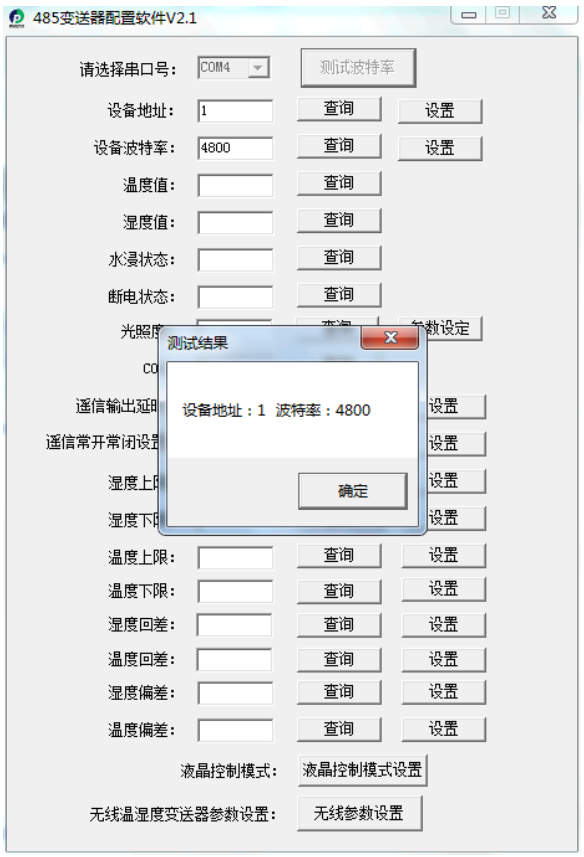
## 3.2 use of sensor monitoring software

Configuration interface as shown in the figure, first according to Section 3.1 method to get the serial port number and select the correct serial port.

Click on the test baud rate of the software, the software will test the current device baud rate and address, the default baud rate is 4800 bit/s, the default address is 0x01.

3. Change the address and baud rate as needed, and query the current function status of the device.

If the test is not successful, please re-check the equipment wiring and 485 driver installation.




# Chapter 4 communication protocols

## 4.1 basic communication parameters

| | |
|---|---|
| Coding | 8-bit binary |
| Data bits | Eight |
| Parity bit | 无 |
| Stop bit | 1 bit |
| Error checking | CRC (redundant cyclic code) |
| Baud rate | 2400 bit/s, 4800 bit/s, 9600 bit/s can be set, the factory default is 4800 bit/s |

## 4.2 data frame format definition

Using the ModBus-RTU protocol, the format is as follows:

Initial structure ≥4 bytes in time

Address code = 1 byte

Function code = 1 byte

Data area = N bytes

Error Check = 16-bit CRC code

Time to end structure ≥4 bytes

Address Code: the address of the transmitter, in the communication network is unique (factory default 0x01) .

Function code: this transmitter only uses the function code 0x03(reads register data) .

Data area: Data area is specific communication data, note that 16bits data high byte in front!

CRC code: two-byte checksum code.

Host query frame structure:

| Address Code | Function codes | Register start address | Register length | Low checksum | High checksum |
|---|---|---|---|---|---|
| 1 byte | 1 byte | 2 bytes | 2 bytes | 1 byte | 1 byte |

Slave response frame structure:

| Address Code | Function codes | The number of valid bytes | Data Area 1 | The second data area | N data area | Check Code |
|---|---|---|---|---|---|---|
| 1 byte | 1 byte | 1 byte | 2 bytes | 2 bytes | 2 bytes | 2 bytes |

## 4.3 register address

| Register address | PLC or configuration address | Content | Operation |
|---|---|---|---|
| 000h | 40001 | Wind direction (0-7 Gear) Uploading the data is the true value | Read only |
| 001h | 40002 | Wind direction (0-360 °) Uploading the data is the true value | Read only |

## 4.4 numeric values correspond to conversion relationships

| Collection values (0-7 files) | Acquisition Values (0-360 °) | Direction |
|---|---|---|
| 0 | 0 ° | North Wind |

| | | |
|---|---|---|
| 1 | 45 degrees | A northeasterly wind |
| 2 | 90 degrees | East Wind |
| 3 | 135 degrees | Southeast wind |
| 4 | 180 ° | South wind |
| 5 | 225 degrees | Southwest wind |
| 6 | 270 degrees | West Wind |
| 7 | 315 degrees | Northwest wind |

## 4.5 communication protocol examples and explanations

**Example: wind direction reading device address 0x01**

Query frame:

| Address Code | Function codes | Starting address | Data Length | Low checksum | High checksum |
|---|---|---|---|---|---|
| 0x01 | 0x03 | 0x000x00 | 0x000x02 | 0xC4 | 0x0B |

Response Frame: (for example, read wind direction value (0-7 stops) is 2, (0-360 °) is 90 °)

| Address Code | Function codes | Returns the number of valid bytes | Wind direction (0-7 Gear) | Wind direction (0-360 ° ) | Low checksum | High checksum |
|---|---|---|---|---|---|---|
| 0x01 | 0x03 | 0x04 | 0x000x02 | 0x000x5a | 0xDB | 0xC8 |

Wind direction:

(range 0-7) : 0002H (hexadecimal) = 2 = > wind direction = easterly

(0-360 °) : 005AH -LRB-hexadecimal) = 90 = > wind directioEasteWindwind

# Chapter 5 common problems and solutions

**No output or output errors**

Possible reasons:

1. The computer has a com port and the port chosen is incorrect.

2. Baud rate error.

The 485 bus is disconnected, or the A and B wires are switched back.

4. If the number of equipment is too large or the wiring is too long, the local power supply should be added with 485 enhancer and 120Ω terminal resistance.

The USB 485 drive is not installed or damaged.

6. Equipment damage.