



# USER MANUAL

 ONE-STOP SOLUTION

 ONE-STOP SERVICE

## W70S Polycarbonate Wind Speed Transmitter User Manual (485 Type)

### 1. Product Introduction

#### 1.1 Product Overview



W70S wind speed transmitter adopts the traditional three-cup wind speed sensor structure. The wind cups are made of carbon fiber material with high strength and good start-up. The built-in signal processing unit in the cup can output the corresponding wind speed signal according to user needs. It can be widely used in meteorology, ocean, environment, airports, ports, laboratories, industry, agriculture and transportation.

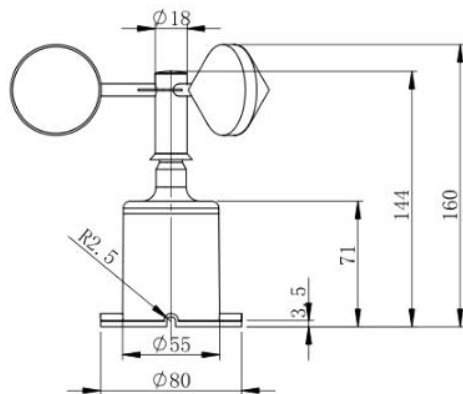
#### 1.2 Features

- Wide measuring range of 0-30m/s, resolution 0.1m/s
- Bottom cable outlet design completely eliminates aging issues of aviation plug rubber gaskets, ensuring long-term waterproof performance
- High-performance imported bearings for low rotational resistance and precise measurement
- Polycarbonate housing with high mechanical strength, hardness, corrosion resistance, and rust-free properties, suitable for long-term outdoor use
- Device structure and weight are carefully designed and distributed for low rotational inertia and quick response
- Standard ModBus-RTU communication protocol for easy integration

### 1.3 Main Technical Indicators

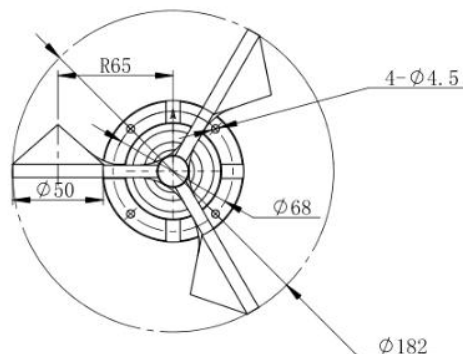
|                                      |                                                                                                                                                                                      |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DC power supply (default)            | 5~12V DC                                                                                                                                                                             |
| Resolution                           | 0.1m/s                                                                                                                                                                               |
| Communication Interface              | 485 communication (modbus) protocol<br>Baud rate: 2400, 4800, 9600 (default), 19200, 38400, 57600, 115200<br>Default Modbus communication address: 3<br>Support function code: 03/06 |
| Parameter settings                   | Configure via 485 interface with provided configuration software                                                                                                                     |
| Working temp. of transmitter circuit | -40°C~+60°C, 0%RH~80%RH                                                                                                                                                              |
| Measuring range                      | 0~30m/s, other ranges by customized                                                                                                                                                  |
| Dynamic response time                | <100ms                                                                                                                                                                               |
| Accuracy                             | ±0.5m/s                                                                                                                                                                              |
| Start wind speed                     | ≤0.5m/s                                                                                                                                                                              |

### 1.4 Dimensions



Overall height : 160  
Spindle height : 144  
Base height : 71  
Base diameter : Ø80

Unit ( mm )



Installation aperture : Ø4.5  
Distribution diameter : Ø68

Unit ( mm )

## 2 Hardware Connection

### 2.1 Port Description

Wide voltage 5~12 V DC power input. When wiring the 485 signal line, pay attention that the A\B lines cannot be reversed, and the addresses of multiple devices on the bus cannot conflict.

### 2.2 Electrical Wiring

|              | Wire Color | Description |
|--------------|------------|-------------|
| Power supply | Red        | Positive    |
|              | Black      | Negative    |
| Output       | Yellow     | 485-A       |
|              | Green      | 485-B       |

### 2.3 Installation Method

Flange installation is adopted. The threaded flange connection ensures that the lower pipe of the wind speed sensor is securely fixed onto the flange plate. The base plate has a diameter of  $\varnothing 65$  mm, with four  $\varnothing 6$  mm mounting holes arranged on a  $\varnothing 47.1$  mm pitch circle. Bolts are used to firmly secure the sensor to the bracket, keeping the entire instrument level to ensure accurate wind speed measurements. The flange connection is convenient to use and capable of withstanding high pressure.



## 2.4 Precautions

Users must not disassemble the device or touch the sensor core to avoid damaging the product.

Keep away from high-power interference equipment such as inverters and motors to prevent inaccurate measurements. Always disconnect the power supply before installing or removing the transmitter. Water ingress can cause irreversible damage to the transmitter.

Prevent direct exposure of the sensor to chemical reagents, oil, or dust. Do not use the sensor for extended periods in environments with condensation or extreme temperatures. Avoid thermal shock.

## 3. Communication Protocol

### 3.1 Basic communication parameters

|                |                           |
|----------------|---------------------------|
| Encoding       | 8-bit binary              |
| Data bits      | 8-bit                     |
| Parity bits    | None                      |
| Stop bits      | 1-bit                     |
| Error checking | CRC                       |
| Baud rate      | Factory default 9600bit/s |

### 3.2 Data Frame Format Definition

The ModBus-RTU communication protocol is used, with the format defined as follows:

Start Structure:  $\geq 4$  bytes of idle time

Address Code: 1 byte

Function Code: 1 byte

Data Field: N bytes

Error Check: 16-bit CRC code

End Structure:  $\geq 4$  bytes of idle time

Address Code: This is the unique address of the transmitter on the communication network (default factory setting: 0x03).

Function Code: Indicates the function requested by the host. This transmitter uses only function code 0x03 (Read Holding Registers).

Data Field: Contains the actual communication data. Note that for 16-bit data, the high byte comes first!

CRC Code: Two-byte checksum used for error checking.

Host inquiry frame structure:

| Address code | Function code | Register start address | Register length | Check code low bit | Check code high bit |
|--------------|---------------|------------------------|-----------------|--------------------|---------------------|
| 1 byte       | 1 byte        | 2 bytes                | 2 bytes         | 1 byte             | 1 byte              |

Slave inquiry frame structure:

| Address code | Function code | Number of valid bytes | Data area 1 | Data area 2 | Data area N | Check code |
|--------------|---------------|-----------------------|-------------|-------------|-------------|------------|
| 1 byte       | 1 byte        | 1 byte                | 2 bytes     | 2 bytes     | 2 bytes     | 2 bytes    |

### 3.3 Register Address

| Register address | Content                                                                | Operation |
|------------------|------------------------------------------------------------------------|-----------|
| 0000H            | Instantaneous wind speed<br>Uploaded data is 10 times the actual value | Read-only |
| 0001H            | Wind level 0~12, unit level                                            | Read-only |

### 3.4 Communication protocol examples and explanations

Example: Read the wind speed of device address 0x03

Inquiry frame

| Address code | Function code | Start address | Data length | Check code low bit | Check code high bit |
|--------------|---------------|---------------|-------------|--------------------|---------------------|
| 0x03         | 0x03          | 0x00 0x00     | 0x00 0x01   | 0x85               | 0xE8                |

Answer frame (For example, the current wind speed is 8.6 m/s)

| Address code | Function code | Number of Valid Bytes Returned | Current wind speed value | Check code low bit | Check code high bit |
|--------------|---------------|--------------------------------|--------------------------|--------------------|---------------------|
| 0x03         | 0x03          | 0x02                           | 0x00 0x56                | 0x41               | 0xBA                |

Wind speed calculation:

Current wind speed: 0056H (hexadecimal) = 86=> Wind speed = 8.6m/s

## 4. Common problems and solutions

No output or output error

Possible reasons:

- ① The computer has a COM port, and the selected port is incorrect.
- ② The baud rate is wrong.
- ③ The 485 bus is disconnected, or the A and B lines are connected in reverse.
- ④ There are too many devices or the wiring is too long. Power should be supplied nearby, a 485 enhancer should be added, and a 120Ω terminal resistor should be added at the same time.
- ⑤ The USB to 485 driver is not installed or damaged.
- ⑥ The device is damaged.