

Wind Speed Sensor

JW-FS01-X(YN02)



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1. Introduction

The wind speed sensor adopts the traditional three wind cup structure, the wind cup is made of ABS material, and has high strength and small starting wind speed. The cup body built-in signal processing unit can output the corresponding wind speed signal according to the user demand.

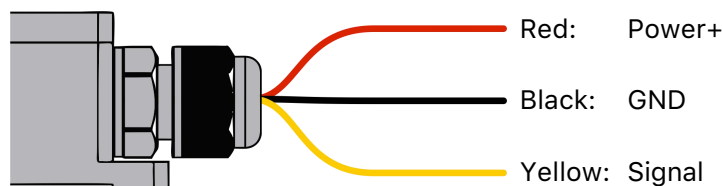
It has variety of output method such as RS485/RS232, pulse, voltage and current, which can be widely used in advertising barrier, meteorology, ocean, environment, airports, ports, laboratories, Industry and agriculture and transportation and other fields.

2. Technical Parameters

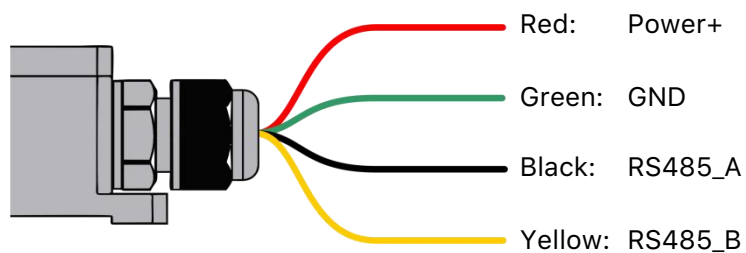
Measuring Range	0 ~ 45m/s (Current,voltage output) 0 ~ 70m/s (Pulse, RS485/RS232 output)
Resolution	0.1m/s
Accuracy	$\pm(0.3+0.03V)$ m/s (V: real-time wind speed)
Starting Wind Speed	≤ 0.5 m/s
Load Capacity	Current output impedance $\leq 350\ \Omega$ (DC12V power supply) Current output impedance $\leq 900\ \Omega$, Voltage output impedance $\geq 1K\ \Omega$. (DC24V power supply)
Operating Environment	Temperature $-35^{\circ}\text{C} \sim 60^{\circ}\text{C}$; Humidity $\leq 100\%\text{RH}$, No condensation.
Ingress Protection	IP64
Product Weight	510g
Cable Grade	Rated voltage: 300V, 80°C
Maximum Power Consumption	0.48W
Cable Length	0.8m standard or other
Power Supply	DC5V / DC9~30V
Output	Current (4~20mA/0~20mA); Voltage (0~2.5V/1~5V/0~5V); RS485(Modbus/ASCII); RS232 (Modbus/ASCII); Other

3. Wiring Diagrams

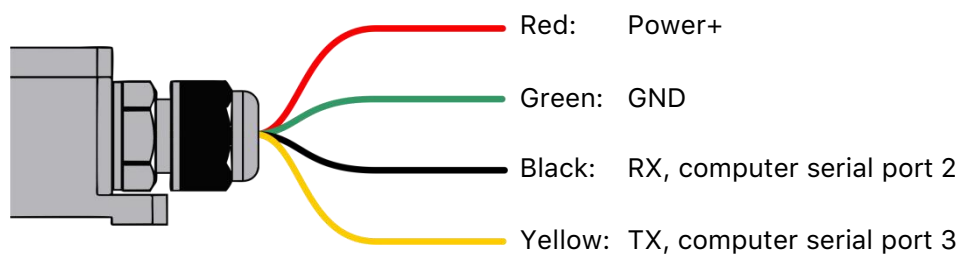
3.1 Voltage/Current/Pulse Output



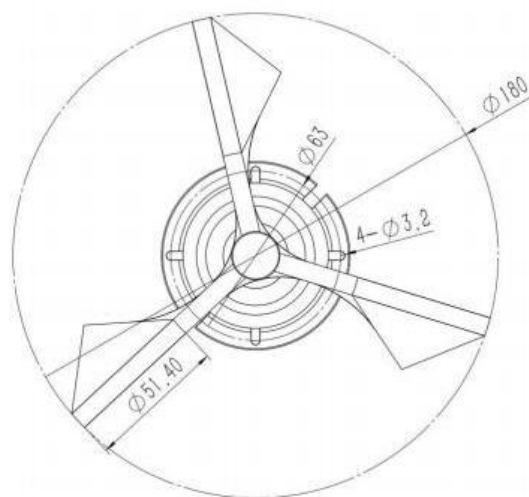
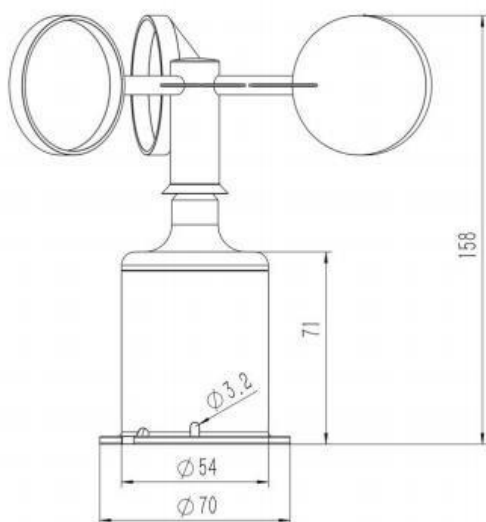
3.2 RS485 Output



3.3 RS232 Output



4. Structure Size



Installation aperture: 3.2mm Distribution diameter: 63mm

Interface dimension: 15mm (suggest reserving 25mm for wiring, fix sensor after wiring and installing)

5. Output Signal Conversion

Output	Conversion Formula
Pulse Type	$W = 0.2 + 0.096 \times F$ W: value of wind speed, m/s ; F : The number of pulses in one second
Current type (Range 45m/s)	$W = (I - 4) \times 45 / 16$ (W: value of wind speed m/s ; I : current type 4-20mA)
Voltage type (Range 45m/s):	$W = V / 5 \times 45$ (W: Range m/s ; V : voltage signal 0-5V)

6. Protocol Instruction

- 1.If you are using a single sensor connected to the computer to read data directly, it is recommended to use the ASCII private protocol (see page 4), you can visual display in ASCII (hex send, non-hex receive);
- 2.If you are multi-sensor connected to the PLC, configuration or access programmable collector, it is recommended to use the Standard ModBus-RTU protocol (see below, hex send and receive).
- 3.If there is no special requirement, the default address of the device in the sensor parameters is 1, baud rate =9600, and the protocol is ModBus-RTU.

7. Standard ModBus-RTU Protocol

7.1 Serial Format

8 data bits, 1 stop bit, no parity bit.

Baud rate 9600 bps, serial debugging software set to send and receive hex, the two communication intervals of at least 500ms, the instructions in the CRC for the parity bit, two bytes. The default device address is 1.

7.2 Communication Format

7.2.1 Write device address (eg: write address 01)

Send	00	06	00	20	00	01	48	11
Description	Address	Write	Start address		New address		CRC check	
Return	00	06	00	20	00	01	48	11
Description		Write	Start address		New address		CRC check	

If returns 01 86 ****, it indicates that the configuration was not successful.

7.2.2 Read device address (eg: read address 01)

Send	00	03	00	20	00	01	84	11
Description	Address	Write	Start address		New address		CRC check	
Return	00	03	02		00		44	44
Description	Address	Read	Data length		Device data		CRC check	

7.2.3 Read register data (eg: read address 01)

Send	01	03	00	00	00	01	84	0A
Description	Address	Read	Start address		Read points		CRC check	
Return	01	03	02		00	26	39	9E
Description	Address	Read	Data bytes		Device data		CRC check	

The sensor returns data 0x0026 converted to decimal 38, indicating a wind speed of 3.8m/s, with a decimal place.

7.2.4 Read device baud rate (eg: read baud rate=9600)

Send	01	03	00	10	00	01	85	CF
Description	Address	Read	Start address		Read points		CRC check	
Return	01	03	02		00	02	39	85
Description	Address	Read	Data length		Device data		CRC check	

Baud rate = data *4800. Return data 00 02, then baud rate=4800*2=9600.

7.2.5 Write device communication baud rate (For example: write baud rate of 9600.)

Send	01	06	00	10	00	02	09	CE
Description	Address	Write	Start address		New baud rate		CRC check	
Return	01	06	00	10	00	02	09	CE
Description	Address	write	Start address		New baud rate		CRC check	

Baud rate = data *4800. Return data 00 02, then baud rate=4800*2=9600.

The supported baud rates are 4800, 9600, 14400, 19200, 38400, 57600, 115200.

If other unsupported baud rates are written, they will be automatically restored to 9600 after restart.

If returns 01 86 ****, it indicates that the configuration was not successful.

7.2.6 Change communication protocol (for example, switching to ASCII protocol)

Send	01	06	00	14	00	03	89	CF
Description	Address		Start address		01-MODBUS 03-ASCII		CRC check	
Return	01	06	00	14	00	03	89	CF
Description	Address		Start address		Data		CRC check	

If returns 01 86 ****, it indicates that the configuration was not successful.

Change the protocol from 01-MODBUS to 03-ASCII.

8. ASCII Private Protocol

8.1 Serial Format

Data bit 8, stop bit 1, parity bit none. Baud rate 9600bps, two communication intervals at least 1000ms above.

8.2 Communication Format

8.2.1 Write device address (eg: write address 01)

Send	AA	00	10	00	01
Description	Start	Broadcast address	Write	Write	New address

Return	OK
Description	Write new address successfully

8.2.2 Read device address

Send	AA	00	03	00	00
Description	Start	Broadcast address	Read	Read address	
Return	Address=001				
Description	Address read: 1				

8.2.3 Read real-time data

Send	AA	01	03	0F	00
Description	Start	Device address	Read	Read data	
Return	WS=05.1m/s				
Description	Return wind speed 5.1 m/s				

8.2.4 Read real-time data

Send	AA	01	10	01	01
Description	Start	Address	Write protocol	Write	01-MODBU 03-ASCII
Return	OK				
Description	The new protocol was written successfully				

Change the protocol from 03-ASCII to 01-MODBUS.

In the above description, the transition characters such as spaces are ignored. Serial software (such as SSCOM3.3) check HEX sent, do not check the HEX display, After the device is powered on, it will return start.

9. ModBus CRC Check Steps

- 1.Preset 16-bit register hexadecimal FFFF, said the register for the CRC register.
- 2.The first 8-bit data and CRC register low or XOR, the result placed in the CRC register.
- 3.The contents of the register to the right one (toward the low), with 0 to fill the most significant bit, check the lowest bit.
- 4.If the least significant bit is 0: Repeat step 3 (shift again) If the least significant bit is 1: The CRC register is XOR'ed with the polynomial A001 (1010 0000 0000 0001).
- 5.Repeat steps 3 and 4 until 8 shifts to the right so that the entire 8-bit data is completely processed.
- 6.Repeat step 2 to step 5 for the next 8-bit data processing.
- 7.The resulting CRC register is the CRC code (the resulting CRC code is low after high).

10. Precautions

- 1.Please check the packaging is intact, and check the product model is consistent with the selection.
- 2.Do not live wiring, check the wiring is completed after the correct power.
- 3.Sensor length will affect the product output signal, do not use when changing products, if there is a need to change, please contact with the manufacturer.

4.Sensor is a precision device, the user when in use, please do not disassemble, with sharp objects or corrosive liquid contact with the sensor surface, so as not to damage the product;

11. Trouble Shooting

1.Blade is not rotating, large hysteresis. Due to long-term use of foreign bodies or stuck within the bearing. Please send the sensor back to the company for processing;

2.Analog signal or RS232, RS485 output instrument display value is not correct. May not be able to get the correct data due to wiring problems or communication serial port failure. Please check the wiring is correct, solid, serial port is occupied, the serial port settings are correct; 3.If not for the above reasons, please contact the manufacturer.