



## Product Description

The integrated wind speed and direction sensor is composed of wind speed sensor and wind direction sensor. The wind speed sensor adopts the traditional three-cup wind speed sensor structure, and the wind cup is made of carbon fiber material with high strength and good start-up; the signal processing unit embedded in the cup can output the corresponding wind speed signal according to the user's demand, and the wind direction sensor adopts precision potentiometer inside and chooses low inertia light metal wind vane to respond to the wind direction with good dynamic characteristics. The product has the advantages of large range, good linearity, strong resistance to lightning strikes, convenient observation, stability and reliability, etc. It can be widely used in meteorology, marine, environment, airport, port, laboratory, industry and agriculture and transportation, etc.

## Technical parameters

Wind speed sensor.

Measuring range:

0~45m/s

0~70m/s

Accuracy:  $\pm(0.3+0.03V)$ m/s (V:wind speed)

Discrimination rate: 0.1m/s

Start wind speed:  $\leq 0.8$ m/s

Power supply mode:

DC 5V

DC 12V

DC 24V

Output:

Current: 4~20mA

Voltage: 0~5V

Voltage: 0~2.5V

RS485

Load capacity: Current type output  
impedance $\leq 600\Omega$

Voltage type output impedance $\geq 1K\Omega$

Working environment:

Temperature  $-40^{\circ}\text{C} \sim 50^{\circ}\text{C}$

Humidity $\leq 100\%RH$

Protection grade: IP45

Cable rating: rated voltage: 300V Temperature  
rating:  $80^{\circ}\text{C}$

Product weight: 130 g

Product power consumption: 50 mW

Wind direction sensor.

Measuring range:  $0 \sim 360^{\circ}$

Discrimination rate:  $1^{\circ}$

Accuracy:  $\pm 3^{\circ}$

Start wind speed:  $\leq 0.5$ m/s

Power supply:

DC 5V

DC 12V

DC 24V

Output:

Current: 4~20mA

Voltage: 0~5V

RS485

Load capacity: Current type output

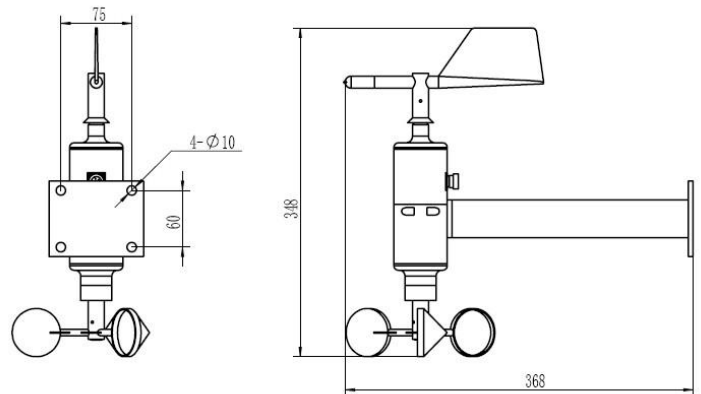
impedance $\leq$ 250 $\Omega$   
 Voltage output impedance $\geq$ 1K $\Omega$   
 Working environment:  
 Temperature -40 $^{\circ}$ C $\sim$ 50 $^{\circ}$ C  
 Humidity $\leq$ 100%RH  
 Protection grade: IP45  
 Cable rating: rated voltage: 300V Temperature rating: 80 $^{\circ}$ C  
 Product weight: 210 g  
 Product power consumption: 5.5 mW

**Calculation formula**

Wind speed sensor.  
 Current type (4~20mA).  
 $W = (I-4) \times L / 16$   
 (W: wind speed indication value (m/s); I: current signal (4-20mA); L: wind speed measurement range (m/s))  
 Voltage type ( 0~5V):  
 $W = V / 5 \times L$   
 (W: wind speed indication value (m/s); V: voltage signal (0-5V); L: wind speed measurement range (m/s))  
 Voltage type (0-2.5V):  
 $W = V / 2.5 \times L$   
 (W: wind speed indication value (m/s); V: voltage signal (0-2.5V); L: wind speed measurement range (m/s))

Wind direction sensor.  
 Voltage type (0 to 5V output).  
 $D = 360^{\circ} \times V / 5$   
 (D is the wind direction indication value, V is the output voltage (V))  
 Current type (4 to 20mA output):  $D = 360^{\circ} \times (I-4) / 16$   
 $D = 360^{\circ} \times (I-4) / 16$   
 (D is the wind direction of the indicated value, I is the output current (mA))

**Structure Dimension**



**Wiring method**

- 1、 If equipped with the collector produced by our company, directly use the sensor sensor cable to connect the sensor to the corresponding interface on the collector, that is can be.
- 2、 If the transmitter is purchased separately, the cable sequence of the transmitter supporting cable is are as follows

Line Color	Output Signal		
	voltage	Current	Communication
Red	+	+	+
Black (Green)	-	-	-
Yellow	Wind speed signal	Wind speed signal	A+/TX
Blue	Wind direction Signal	Wind direction Signal	B-/RX

**MODBUS-RTU Communication protocols**

1. Serial port format  
 Data bit 8 bits  
 1 or 2 stop bits  
 Check digit None  
 Baud rate 9600 The interval between two communications is at least 1000ms
2. Communication format

**【1】 Write device address**  
Send: 00 10 Address CRC (5 bytes)  
Return: 00 10 CRC (4 bytes)  
Note: 1. The address bit of the read/write address command must be 00.  
2. Address is 1 byte, ranging from 0-255.  
Example: send 00 10 01 BD C0  
return 00 10 00 7C

**【2】 Read device address**  
Send: 00 20 CRC (4 bytes)  
Return: 00 20 Address CRC (5 bytes)  
Description: Address is 1 byte, the range is 0-255  
Example: Send 00 20 00 68  
return 00 20 01 A9 C0

**【3】 Read real-time data**  
Send: Address 03 00 00 00 02 XX XX  
Description: As shown in the figure below:

Code	Functional definition	Remark
Address	Station number (address)	
03	Function code	
00 00	Start address	
00 02	Read Points	
XX XX	CRC check code, low in front and high in back	

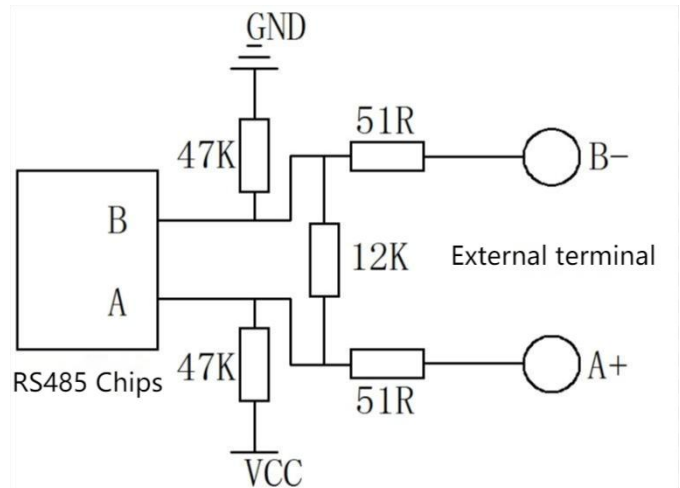
Return: Address 03 04 XX XX YY YY XX XX  
Description:

Code	Functional definition	Remark
Address	Station number (address)	
03	Function code	
04	Read Unit Bytes	
XX XX	Wind speed data (high in the front and low in the back)	HEX
YY YY	Wind direction data (high front and low back)	HEX
XX XX	CRC check code	

**Wind speed, resolution 0.1m/s, wind direction, resolution 1°**

- Steps to calculate CRC code:**
1. The preset 16-bit register is hexadecimal FFFF (that is, all 1). Call this register the CRC register;
  2. XOR the first 8-bit data with the low bit of the 16-bit CRC register, and put the result in the CRC register;
  3. Shift the content of the register to the right by one bit (towards the lower bit), fill the highest bit with 0, and check the lowest bit;
  4. If the lowest bit is 0: repeat step 3 (shift again)  
If the lowest bit is 1: XOR the CRC register with the polynomial A001 (1010 0000 0000 0001);
  5. Repeat steps 3 and 4 until the right shift is 8 times, so that the entire 8-bit data has been processed;
  6. Repeat steps 2 to 5 to process the next 8-bit data;
  7. The final CRC register is the CRC code;
  8. When putting the CRC result into the information frame, exchange the high and low bits, with the low bits first.

### RS485 circuit



### Installation

When installing the sensor, please ensure that the wind direction sensor is on the top, the wind speed sensor is on the bottom, and ensure that the sensor is installed perpendicular to the ground.

There is a white south point on the wind direction sensor. Before use, please refer to the compass attached to the product to align the direction of the wind direction with the geographical south.

## Notice

1. Please check whether the packaging is intact, and check whether the product model is consistent with the selected model;
2. Do not connect live wires, and power on after the wiring is completed and checked;
3. Do not arbitrarily modify the components or wires that have been welded when the product leaves the factory;
4. The sensor is a precision device. When using it, please do not disassemble it by yourself, or touch the surface of the sensor with sharp objects or corrosive liquids, so as not to damage the product;
5. Please keep the inspection certificate and qualification certificate, and return it with the product when repairing.

## Troubleshoot

1. The wind vane does not rotate well and lags behind. There may be foreign matter in the bearing or the lubricating oil has run out due to long-term use. Please inject the instrument oil from the upper bearing of the sensor or send the sensor back to the company for oil filling;
2. During analog output, the display shows that the value is 0 or not within the range. The collector may not be able to obtain information correctly due to wiring problems. Please check whether the wiring is correct and firm;
3. If it is not the above reasons, please contact the manufacturer.

## Contact US

Contact: +8615367865107/+8618073152920

Zip code: 421000

Email: sales@niubol.com

Website: <http://www.niubol.com>

Address: Room 103, Area D, Houhu Industrial Park, Yuelu District, Changsha City, Hunan Province, China