

Integrated Wind Speed And Direction Sensor

FST200-205

Product Manual

(V1.5)



● Important statement

Thank you very much for choosing our products, we will serve you sincerely forever. The company pursues excellent quality and pays more attention to excellent after-sales service.

Operation errors will shorten the life of the product, reduce its performance, and may cause accidents in severe cases. Please hand over this manual to the end user and read it carefully before using the product. And please keep it in a safe place for reference when needed. The company reserves the right to modify this manual due to product technology and process updates. If there is any change, no further notice will be given, and the final interpretation of this manual is reserved.

● Product overview

The integrated wind speed and wind direction sensor is used to measure the wind speed and wind direction value, and convert it into an electrical signal, which can be directly transmitted to the recording device for processing.

The sensor housing is made of aluminum alloy, using special mold precision die-casting process, the dimensional tolerance is very small, the surface precision is very high, and it has high weather resistance, high strength, corrosion resistance and water resistance; the internal circuit has been protected, and the whole sensor has Good adaptability to harsh environments. The cable connector is a military plug, which has good anti-corrosion and anti-corrosion performance, which can ensure the long-term use of the instrument. At the same time, it cooperates with the internal imported bearing system to ensure the accuracy of wind speed and wind direction collection.

The circuit module PCB is made of military-grade A-grade materials, ensuring the stability of parameters and the quality of electrical performance; the electronic components are all imported industrial-grade chips, so that the whole has a very reliable anti-electromagnetic interference ability, and can ensure that the host is at -20°C~ + It can work normally within the range of 50°C and humidity of 35%-85% (non-condensing).

● Scope of application

This product can measure indoor and outdoor environment in sixteen directions including Middle East, West, South, North, Southeast, Southwest, Northeast, Northwest, etc. It can be widely used in the field of construction machinery (crane, crawler crane, door crane, tower crane, etc.), railway, Wind speed and direction measurement in ports, docks, power plants, meteorology, cableways, environment, greenhouses, farming, air conditioning, energy-saving monitoring, agriculture, medical care, clean spaces, etc.

● Technical indicators

Voltage output type	0-5VDC, 0-10VDC
Current output type	4-20mA
Digital	RS485 (Modbus RTU)
Power supply	DC12~30V, DC15~30V (0-10VDC output)
Range	Wind speed: 0-50m/s Wind direction: 16 directions (0-360 degrees)
Precision	Wind speed: $\pm 0.5\text{m/s}$ ($<5\text{m/s}$); $\pm 3\%\text{FS}$ ($\geq 5\text{m/s}$) Wind direction: 16 directions $\pm 3^\circ$, resolution 22.5°
Maximum power consumption (DC24V)	Voltage type $\text{MAX} \leq 300\text{mW}$; Current type $\text{MAX} \leq 500\text{mW}$; RS485 type $\text{MAX} \leq 300\text{mW}$
Start the wind	$\geq$ Grade 1 wind

Note: If you have special specifications, please inform us separately.

● Features

- ◇ Small size, easy to carry, easy to install, beautiful appearance.
- ◇ Strong corrosion resistance and weather resistance.
- ◇ High measurement accuracy, wide range and good stability.
- ◇ Low power consumption, strong anti-interference ability, can work stably for a long time.
- ◇ Wide power supply range, good linearity of data information, and long signal transmission Distance.

● Signal output definition

Definition of current or voltage output:

- 1 pin: +Vcc brown
- 2 pins: +Iout1/+Vout1 white (wind speed)
- 3 pins: GND blue
- 4 pins: +Iout2/+Vout2 black (wind direction)

RS485 output definition:

- 1 pin: +Vcc brown
- 3 pin: GND blue
- 2 pins: RS485A white
- 4 pins: RS485B black

● Installation Notes

1. When installing, please align the electrical interface with the north direction;
2. Please install the sensor horizontally. The angle between the installation base and the horizontal

plane should not exceed 5° to ensure that the sensor can accurately measure the wind speed and direction at low wind speeds;

3. When installing the sensor, the wind cup should be facing upward and the base should be installed perpendicular to the installation surface.

4. The position and shape of the wind cup, windmill arm, wind direction rod and tail fin directly affect the accuracy of the sensor. During installation, please do not grasp the wind cup, windmill arm, wind direction rod and tail fin to avoid damage to the sensor;

5. The position of the counterweight has been adjusted before leaving the factory. If it needs to be readjusted, please ensure that both ends of the wind direction rod are balanced, otherwise it will affect the accuracy of the product under low wind speed.

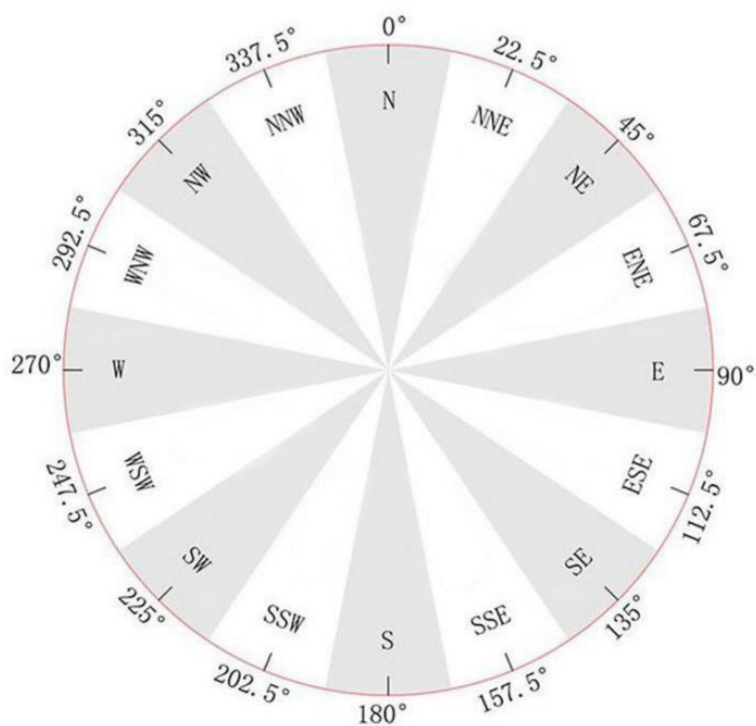
● Classification of wind speed and direction

Wind Classification Table

Wind rating	The name of the wind	Wind speed (m/s)	Wind speed (km/s)	Land condition	Sea conditions
0	No wind	0~0.2	Less than 1	Quiet, smoke straight up	Calm as a mirror
1	Light air	0.3~1.5	1~5	Smoke can indicate the direction of the wind, but the vane cannot be turned	Micro waves
2	Light air	1.6~3.3	6~11	The human face feels the wind, the leaves make a slight noise, and the weathervane can turn	Small waves
3	Breeze	3.4~5.4	12~19	Leaves and twigs are swaying, and the flag is unfolding	Small wave
4	And wind	5.5~7.9	20~28	It can blow dust and paper on the ground, and the branches of the tree move slightly	Light waves
5	Fresh wind	8.0~10.7	29~38	Leafy twigs sway with small waves on inland water	Middle wave
6	Gale	10.8~13.8	39~49	Big tree branches swinging, wires whistling, and it is difficult to lift an umbrella	Big waves
7	Blast	13.9~17.1	50~61	The whole tree shakes, and it is inconvenient to walk against the wind	Huge waves
8	Strong wind	17.2~20.7	62~74	Small branches are broken, people feel great resistance to move forward	Violent waves
9	Gale	20.8~24.4	75~88	Building damage (chimney tops and roof tiles moved)	Raging waves
10	The wind	24.5~28.4	89~102	Rarely seen on land, when seen it can uproot	Raging waves

				trees and seriously damage buildings	
11	Storm	28.5~32.6	103~117	There are few on land, and if there is any, there must be major damage	Extraordinary phenomenon
12	Hurricane	32.7~36.9	118~133	Rarely found on land, its destructive power is great	Extraordinary phenomenon
13	Hurricane	37.0~41.4	134~149	Rarely found on land, its destructive power is great	Extraordinary phenomenon
14	Hurricane	41.5~46.1	150~166	Rarely found on land, its destructive power is great	Extraordinary phenomenon
15	Hurricane	46.2~50.9	167~183	Rarely found on land, its destructive power is great	Extraordinary phenomenon
16	Hurricane	51.0~56.0	184~201	Rarely found on land, its destructive power is great	Extraordinary phenomenon
17	Hurricane	56.1~61.2	202~220	Rarely found on land, its destructive power is great	Extraordinary phenomenon

Wind direction sixteen digit direction map



(RS485) MODBUS communication protocol

• Basic settings of communication protocol

Transmission mode: MODBUS-RTU mode.

Communication parameters: default baud rate 9600bps (optional 2400bps, 4800bps, 9600bps, 19200bps, 38400bps, 57600bps, 115200bps, can be configured according to user requirements), 1 start bit, 8 data bits, no parity (optional odd parity, even parity), 1 stop bit, after changing the communication parameters, the wind direction sensor needs to be powered on again.

Slave address: The factory default is 1, which can be configured according to user requirements.

• Hold register list

Parameter	MODBUS holding register address (16 bits)
Slave address	Address: 0000H Default: 0x0001
Baud rate	Address: 0001H The default baud rate is 9600, which is saved as 0x0096, and other analogies (all are divided by 100 and saved in hexadecimal), for example, the baud rate is 19200, which is saved as 0x0192
Check Digit	Address: 0002H 0x0000 means no parity, 0x0001 means odd parity, 0x0002 means even parity
Wind speed value	Address: 0004H divided by 100 to get the wind speed value, the unit is m/s, for example, the read value is 0x03E8, and the actual wind speed value is 10.00m/s
Wind direction value	Address: 0005H The corresponding relationship between wind direction value and wind direction is shown in the table below

Note: Access to other addresses is prohibited.

The corresponding conversion relationship of wind direction value:

Wind direction value (0-15)	Wind direction
0	north wind
2	Northeast wind
4	east wind
6	Southeast wind
8	south wind
10	Southwest wind
12	west wind
14	Northwest wind
Note: The wind directions corresponding to wind direction values 1, 3, 5, 7, 9, 11, 13, and 15 are the angles between the wind directions corresponding to adjacent wind direction values. For example: the wind direction corresponding to a wind direction value of 1 is the angle	

between the north wind and the northeast wind, and so on for other wind direction values.

● Modbus RTU command

Supported MODBUS function codes: 0x03, 0x06

03H function code example: read the wind direction data of the wind direction sensor whose slave address is No. 1

★Host query command:

Slave Address	01H	Slave address
Function	03H	Function code
Starting Address Hi	00H	The high 8 bits of the start register address
Starting Address Lo	04H	The lower 8 bits of the start register address
No. of Registers Hi	00H	The upper 8 bits of the number of registers
No. of Registers Lo	01H	The lower 8 bits of the number of registers
CRC Check Lo	C5H	CRC check code lower 8 bits
CRC Check Hi	CBH	CRC check code high 8 bits

★Slave response:

Slave Address	01H	Slave address
Function	03H	Function code
Byte Count	02H	Length is 2 bytes
Data Hi	00H	The wind direction at this time is: southeast
Data Lo	06H	The wind direction at this time is: southeast
CRC Check Lo	38H	CRC check code lower 8 bits
CRC Check Hi	46H	CRC check code high 8 bits

06H function code example: modify the baud rate (in this case, modify it to 57600bps)

★Host query command:

Slave Address	01H	Slave address
Function	06H	Function code
Starting Address Hi	00H	The baud rate holding register address is 0001H
Starting Address Lo	01H	The baud rate holding register address is 0001H

Data Hi	05H	When the baud rate is 57600bps, the value of the register is 0x0576
Data Lo	76H	When the baud rate is 57600bps, the value of the register is 0x0576
CRC Check Lo	5AH	CRC check code lower 8 bits
CRC Check Hi	BCH	CRC check code high 8 bits

★Slave response:

Slave Address	01H	Slave address
Function	06H	Function code
Starting Address Hi	00H	The baud rate holding register address is 0001H
Starting Address Lo	01H	The baud rate holding register address is 0001H
Data Hi	05H	When the baud rate is 57600bps, the value of the register is 0x0576
Data Lo	76H	When the baud rate is 57600bps, the value of the register is 0x0576
CRC Check Lo	5AH	CRC check code lower 8 bits
CRC Check Hi	BCH	CRC check code high 8 bits

● Maintenance and maintenance

This instrument is a precision electronic product. Proper maintenance and maintenance will help protect the performance of the instrument and prolong the service life of the instrument. Please pay attention to the following points:

1. Please use the manual correctly according to the requirements of the manual. Incorrect wiring may cause damage to the instrument.
2. Do not wipe the instrument with volatile liquids, otherwise it may cause discoloration and deformation of the instrument; wipe with a soft cloth to avoid scratches on the outer protective film of the instrument and prolong the service life of the instrument.
3. The instrument should be handled with care, and should not be dropped or pressed heavily, otherwise it will cause deformation of the instrument and damage to the internal circuit board.
4. Do not touch the sensing part when the instrument is charged, so as to affect the measurement result or cause damage to the internal circuit of the instrument.
5. Please do not disassemble or modify the instrument without authorization, so as not to cause damage to the instrument.
6. When the instrument is in use, it should be firmly fixed with screws, otherwise it may damage the instrument.
7. Regularly check the power supply voltage of the instrument to ensure the normal operation of the instrument.

