Ultrasonic anemometer user's Guide

JXBS-3001-FSFX

Ver1.0

威海精讯畅通电子科技有限公司

Weihai JXCT Electronics Co., Ltd.

Chapter 1 Product Introduction

1.1 Product overview

Ultrasonic anemometer is a wind speed and direction measuring instrument developed based on the principle of ultrasonic waves. It uses the transmitted sound pulses to measure the time or frequency difference at the receiving end to calculate wind speed and direction. The shell of the whole machine is made of ABS material, which has the characteristics of light weight, no moving parts, sturdiness and durability, and does not require maintenance and on-site calibration. It can output wind speed and direction at the same time. It can be used in conjunction with a computer, data collector or other collection equipment with RS485 compliance. It is widely used in wind direction measurement in greenhouses, environmental protection, weather stations, ships, docks, and breeding.

1.2 Main parameters

parameters	**Technical index**
Wind speed measurement range	0~60m/s
Wind speed measurement	±2%

accuracy	
Wind direction measurement range	0~360°
Wind direction measurement accuracy	±3°
Response time	Less than 5 seconds
Baud rate	9600
Communication port	RS485/GPRS/4G/4-20mA
Power supply	12VDC
Working current	70mA
Operating temperature	-30~80℃
Working humidity environment	0~100%RH（15~95%RH）

1.3 4G parameters

Parameters name	Parameters content
Transmission interface	4G wireless signal transmission
Frequency band system	FDD-LTE、TDD-LTD、TD-SCDMA、UMTS、EV-DO、CDMA、GSM
Operations Support	China Mobile, China Unicom, China Telecom's 4G, 3G, 2G full Netcom

1.4 Features

◆ No start-up wind speed limit, zero wind speed work, no angle limit, 360 ° full Azimuth, wind speed and wind direction data can be obtained at the same time;

◆ No moving parts, low wear and long service life;

◆ Adopt acoustic wave phase compensation technology, high precision and fast response speed;

◆ Using random error recognition technology, it can ensure low dispersion error of measurement even under strong wind, making the output more stable;

◆ Engineering plastic shell, lightweight design, portable, easy to install and disassemble

◆ Convenient signal access, support 485-RTU;

◆ No need for maintenance and on-site calibration.

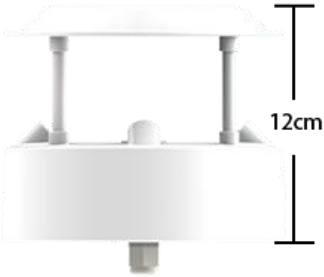
Chapter 2 Hardware Connection

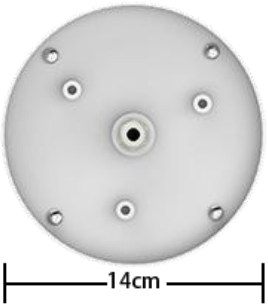
2.1Inspection before equipment installation

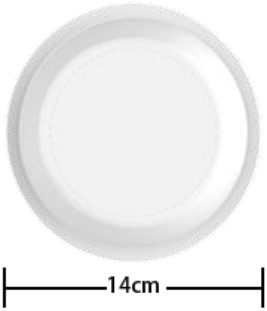
Please check the equipment list before installing the equipment:

name	**Quantity**

High precision sensor	1set
2G module sensor	1set（Optional）
USB to 485 device	1set（Optional）
12V waterproof power supply	1set（Optional）
Warranty card/certificate	1 serving







2.2 485 wiring method

The power interface is a wide voltage power input of 12V.

When wiring the 485 signal line, pay attention to the two wires A\B not to be reversed, and the address between multiple set devices on the bus cannot be conflicted.

	Thread color	Description
power supply	red	Power is positive
	black	Power negative
Communication	yellow	485A
	green	485B

2.3Analog wiring mode

The power interface is a wide voltage power input of 12V. For analog products, pay attention to the positive and negative signal wires, and do not reverse the positive and negative current/voltage signal wires.

	Thread color	Description
power supply	brown	Power is positive（12V DC）
	black	Power negative
Communication	Yellow (gray) color	Current output positive (wind speed)
	blue	Current output positive (wind direction)

Precautions:

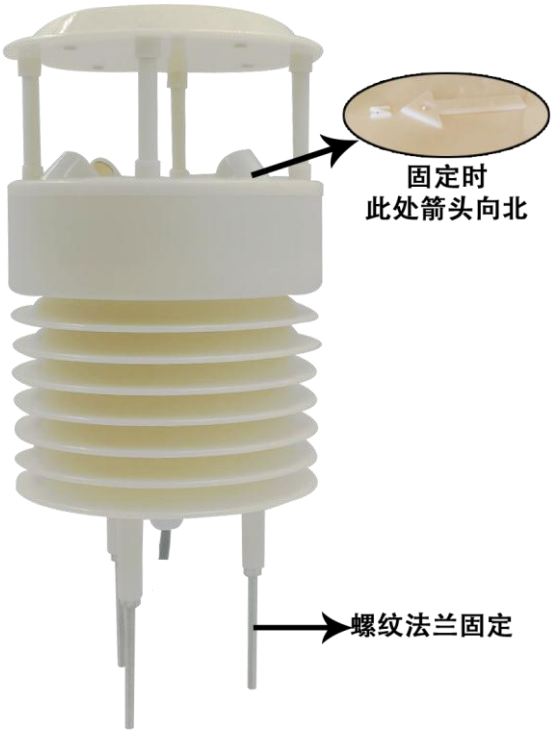
(1) Please be careful not to connect the wrong wiring sequence, the wrong wiring will cause the equipment to burn

(2) The voltage/current positive output is an active output. Never connect the voltage/current positive output to the positive position of the power supply, which will definitely cause burnout.

(3) The factory default provides 0.6 meters long wire, customers can extend the wire as needed or wire in order.

(4) Note that there is no yellow line in the line sequence that may be provided in some factory batches. At this time, the gray line is equivalent to replacing the yellow line.

2.4Installation method



Flange installation is adopted. The threaded flange connection makes the lower pipe fitting of the wind direction sensor firmly fixed on the flange. Four mounting holes are opened on the circumference of the chassis, and bolts are used to tightly fix it on the bracket to keep the entire instrument on The best levelness ensures the accuracy of the wind direction data, the flange connection is convenient to use and can withstand greater pressure.

Note: When the sensor is installed, there is a letter N on

the top surface, which should be facing the north direction.

Chapter 3 485 Communication Protocol

3.1Basic communication parameters

parameters	content
coding	8-bit binary
Data bit	8-bit
Parity bit	无
Stop bit	1-bit
Wrong calibration	CRC lengthy cyclic code
Baud rate	2400bps/4800bps/9600 bps can be set, the factory default is 9600bps
coding	8-bit binary

3.2Data frame format definition

Adopt Modbus-RTU communication protocol, the format is as follows:

Initial structure >= 4 byte time

Address code = 1 byte

Function code = 1 byte

Data area = N bytes

Error check = 16-bit CRC code

End structure >= 4 bytes time

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

Function code: The command function prompt issued by the host, this transmitter only uses function code 0x03 (read

memory data).

Data area: The data area is the specific query data area, pay attention to the 16bits data high byte first

CRC code: two-byte check code.

Interrogation frame

address code	function code	Register address	Register length	Check code low	Check code high
1byte	1byte	2byte	2byte	1byte	1byte

Reply frame

address code	function code	Effective bytes	Data area	Second data area	Nth data area
1byte	1byte	1byte	2byte	2byte	2byte

3.3Register address

Register address	PLC configuration address	content	operating
0000H	40001	Wind direction (unit 0.1°)	read only
0001H	40002	Wind speed (unit 0.01m/s)	read only
0100H	40101	Device address (0-252)	read and write
0101H	40102	Baud rate (2400/4800/9600)	read and write

3.4 Communication protocol example and explanation

3.4.1 Read the wind speed value of device address 0x01

Interrogation frame

address code	unction code	initial address	Data length	Check code low bit	Check code high
0x01	0x03	0x00,0x01	0x00,0x01	0xD5	0xCA

Reply frame

address code	unction code	Effective bytes	Wind speed value	Check code Low	Check code High position
0x01	0x03	0x02	0x00 0x7b	0xF8	0x4A

Wind speed:

007b H (hexadecimal)=123=>wind speed=1.23m/s

3.4.2Read the wind direction value of the device address 0x01

Interrogation frame

address code	unction code	initial address	Data length	Check code low bit	Check code high
0x01	0x03	0x00, 0x00	0x00, 0x01	0x84	0x0A

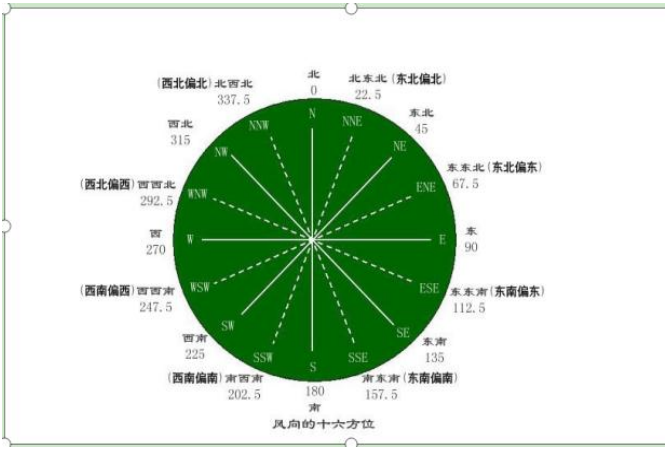
Reply frame

address code	unction code	Effective bytes	Wind direction value	Check code Low	Check code High position
0x01	0x03	0x02	0x00 0x8A	0xFD	0xA0

wind direction:

008A H (hexadecimal) = 138 => wind direction = south-southeast

The wind direction sensor output value corresponds to the wind direction position

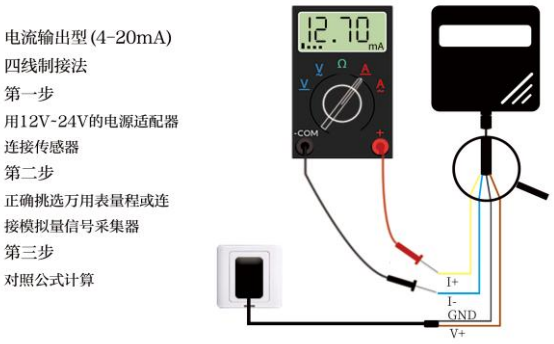


Chapter 4 Analog Communication

The analog sensor wiring is simple, only need to connect

the wire to the designated port of the device.

The following figure shows the wiring method of the current sensor. When measuring, first adjust the multimeter to the "DC mA" position, and then connect the sensor's power cord (brown wire and black wire) to the power supply; the sensor's yellow (The gray) colored wire means that the signal is connected to the red lead of the multimeter, and the other end of the black lead of the multimeter is connected to the black wire of the sensor. At this time, the measurement is "wind speed"; the blue wire of the sensor means that the signal is connected to the red lead of the multimeter and the black lead of the multimeter. The other end is connected to the black wire of the sensor, and the "wind direction" is measured at this time.



4.1Analog value conversion

Wind speed：

Current value	variable
4mA	0
20mA	60

The formula is wind speed=(I-4)*3.75

The unit of I is mA. 4mA represents 0 point and 20mA represents the maximum range linear conversion.

wind direction:

Current value	variable
4mA	0
20mA	360°

The formula is wind direction=(I-4)*22.5

The unit of I is mA; 4mA represents 0 point and 20mA represents the maximum range linear conversion.

Chapter 5 Jingxun Cloud

5.1How to access Jingxun Cloud

There are two ways to access Jingxun cloud server:

For networked devices that support the Jingxun unblocked ecosystem.

(1) Use the account to log in to the cloud server on the PC side, add the device ID to the account, and then view the device upload data through the PC side server;

(2) In the WeChat applet, scan the QR code ID of the device and add the device to the account to view the uploaded data of the device.

If you use a third-party product that is not Jingxuntong. Data can be uploaded to our cloud server according to the report docking agreement of our cloud server. Please contact pre-sales or after-sales for the specific protocol used for the cloud report.

5.2Use of Jingxun Cloud

First, you need to enter the domain name (www.sennor.net) to enter the login interface of Pingset, as shown in the figure below:

Fill in the account password in the corresponding position to enter the main interface of the cloud server; the main interface contains the specific function items of the server and instructions for use. as the picture shows:

Figure Jingxun Cloud Management Interface

The functions of Jingxun cloud server include: data center, equipment center, camera management, trigger management, monitoring large screen, system language selection and setting and other functions.

"Data Center -> Map Display" can view the device binding location and device name in the form of a map. This method can observe the number of bound devices at one time, which is very intuitive and suitable for display to government agencies.

"Data Center -> List Display" can view the number of bound devices and the name of the device, suitable for statistical use.

"Data Center -> Graphical Display" can view the data through the ID of the searched device.

"Data Center -> Historical Data" can enter the ID of the device, and you can view the data uploaded

by the device at any time.

"Device Center -> Device Management" can search device ID to view device data; click "Add Device" in the upper left corner to add devices, as shown in the following figure:

Figure Jingxun Cloud Device Adding Interface

Follow the prompts on the interface to add devices.

(1) "name" can fill in what you need;

(2) "Equipment number" is the ID of the device, for example: 16F3F88714BB, just fill in this set of values in the "Equipment Number" column;

(3) The "Initial Password" column can be filled in or omitted, depending on your own needs;

(4) "Equipment grouping" is to add equipment to the groups you have divided, and the specific grouping is based on your needs;

(5) "Device Address" click the blue coordinate arrow on the right to enter the map, and then drag a blue arrow inside the map to locate the coordinates. After the coordinates are determined, click "confirm", and finally click " Add" to complete the addition of the device.

GPRS signal quality description:

Signal range	0-5	5-10	10-15	15-31
Signal state	Unable to connect to the network, data transmission is interrupted	Data reporting is unstable and data transmission will be interrupted	Data can be reported normally, occasionally lost data	Data upload is stable, no packet loss

Precautions

Please check whether the packaging is intact, and check whether the transmitter model and specifications are consistent with the product you purchased; if you have any questions, please contact our company as soon as possible.

Please confirm before use: whether the output voltage of the power supply is correct; the positive and negative of the power supply and the positive

and negative wiring of the product; and read the product manual or consult our company. Any error in the wiring will cause irreversible damage to the transmitter.