Pro!Range

Aluminium wind direction transmitter (Model 485)

SN-3000-FXA-N01

Ver 2.0

directory

Chapter 1 Product Introduction

1.1 Product Overview

SN-3000-FXA-N01 Wind Direction Transmitter, the equipment is compact and lightweight, easy to carry and assemble. Through the new design concept, the wind direction information can be effectively obtained, and the shell is made of high-quality aluminum alloy profiles, and the outside is sprayed with plastic technology, which has a good anti-corrosion and anti-erosion effect, and can ensure that the transmitter is rust-free for long-term use. At the same time, the internal smooth bearing system ensures the accuracy of information collection. It is widely used in wind direction measurement in greenhouses, environmental protection, weather stations, ships, docks, aquaculture and other environments.

1.2 Functional features

- Anti-electromagnetic interference treatment
- Using high-performance bearings, the rotational resistance is small and the measurement is accurate
- All-aluminum shell, high mechanical strength, high hardness, corrosion resistance, no rust and can be used outdoors for a long time
- The structure and weight of the equipment are carefully designed and distributed, with small moment of inertia and sensitive response
- Standard ModBus-RTU communication protocol, easy access

1.3 Main parameters

DC Power Supply (Default)	5~30V DC
Maximum power consumption	0.2W (12V power supply)
The operating temperature of the transmitter circuit	-40℃~+60℃，0%RH~80%RH
Communication interfaces	485 communication (ModBus) protocol Data bit length: 8 bits Parity mode: None Stop bit length: 1 bit Default ModBus communication address: 1

	Baud rate: 2400, 4800 (default), 9600, 19200, 38400, 57600, 115200
Measuring range	8 directions, 16 directions, 360°
Dynamic response speed	≤0.5s

Equipment Dimensions:
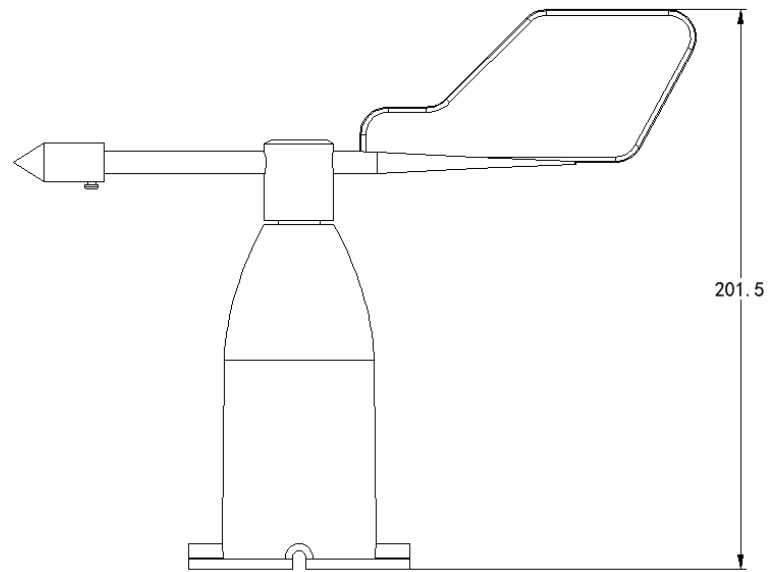
单位：mm
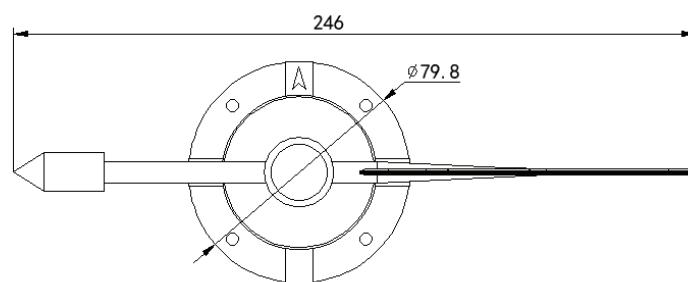
1.4 System Framework Diagram

单接
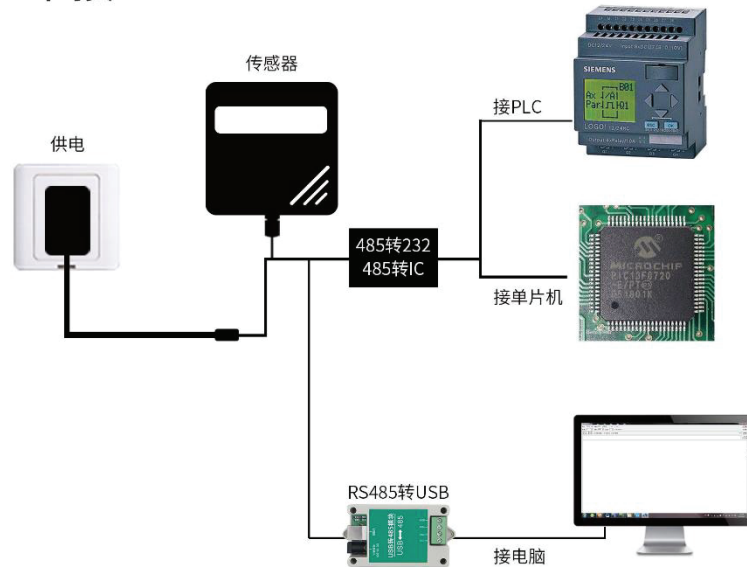
This product can also be used in a combination of multiple sensors in a 485 bus, theoretically a bus can be 254 485 sensors, the other end is connected to the PLC with a 485 interface, connected to a single-chip microcomputer through the 485 interface chip, or can be connected to the computer by using USB to 485Use the sensor configuration tool provided by our company for configuration and testing (only one device can be connected when using this configuration software).

多接

传感器1
传感器2
传感器3
供电
传感器n
485转232
485转IC
接PLC
接单片机
RS485转USB
接电脑
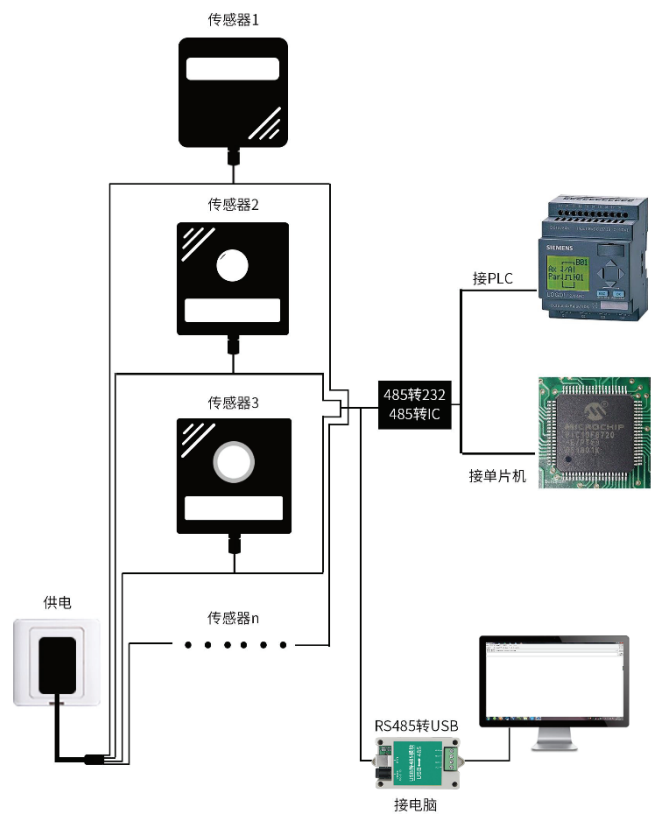
1.5 Product selection

SN-					Company code
	3000-				
		FXA-			Aluminum shell wind direction
			N01-		485 (ModBus protocol) output
				empty	8 directions
				16	16 directions
				360	360 degrees

1.6 Product appearance

Chapter 2 Hardware Connections

2.1 Inspection before installation of the equipment

Equipment list:

■1 transmitter

■Four mounting screws

■Certificate of conformity, warranty card

■Install 1 drag blade

2.2 Interface Description

Wide voltage power supply input 10~30V is acceptable. When wiring the 485 signal line, pay attention to the two lines of A and B cannot be reversed, and the addresses of multiple devices on the bus cannot conflict.

2.2.1 Sensor wiring

	Line color	illustrate
electricity source	brown	Power supply (10~30V DC)
	black	Power supply negative
open	Yellow (green) color	485-A
letter	blue	485-B

2.3 Installation

Flange installation, threaded flange connection makes the wind direction sensor firmly fixed on the flange, chassis Ø79.8mm, evenly open four Ø6mm mounting holes on the circumference of Ø68mm, and use bolts to tightly fix it on the bracket, so that the whole set of instruments, keep at the best level, ensure the accuracy of wind direction data, flange connection is easy to use, can withstand greater pressure.

北

注意：
安装时，让传感器上的箭头冲着正北方，以免造成测量误差。

2.4 Precautions

1. The user shall not disassemble it by himself, let alone touch the sensor core, so as not to cause damage to the product.

2. Try to stay away from high-power interference equipment, so as not to cause inaccurate measurement, such as inverter, motor, etc., when installing and disassembling the transmitter, the power supply must be disconnected first, and water entering the transmitter can lead to irreversible changes.

3. Prevent chemical reagents, oil, dust, etc. from directly infringing on the sensor, do not use it for a long time in condensation and extreme temperature environment, and strictly prevent cold and heat shock.

Chapter 3 Configuring Software Installation and Use

Our company provides a supporting "485 parameter configuration software", which can easily use the computer to read the parameters of the sensor, and flexibly modify the device ID and address of the sensor.

Note that when using software auto-acquisition, you need to ensure that there is only one sensor on the 485 bus.

3.1 The sensor is connected to the computer

After the sensor is properly connected to the computer via USB to 485 and provided with power, you can see the correct COM port in the computer ("My Computer - Properties - Device Manager - Ports" to see the COM port).
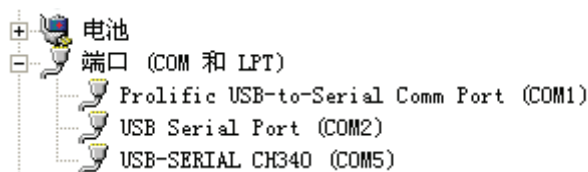
Open the package, select "Debugging Software" --- "485 Parameter Configuration

Software", and find and [RS485ControlV 21.exe] open it.

If you don't see the COM port in Device Manager, it means that you don't have the USB to 485 driver installed (in the package) or you haven't installed the driver correctly, contact a technician for assistance.

3.2 Use of sensor monitoring software

(1) The configuration interface is as shown in the figure, first obtain the serial slogan according to the method in chapter 3.1 and select the correct serial port.

(2) Click on the test baud rate of the software, the software will test the baud rate and address of the current device, the default baud rate is 4800bit/s, and the default address is 0x01.

(3) Modify the address and baud rate according to the needs of use, and query the current functional status of the equipment at the same time.

(4) If the test is not successful, please re-check the wiring of the equipment and the installation of the 485 driver.
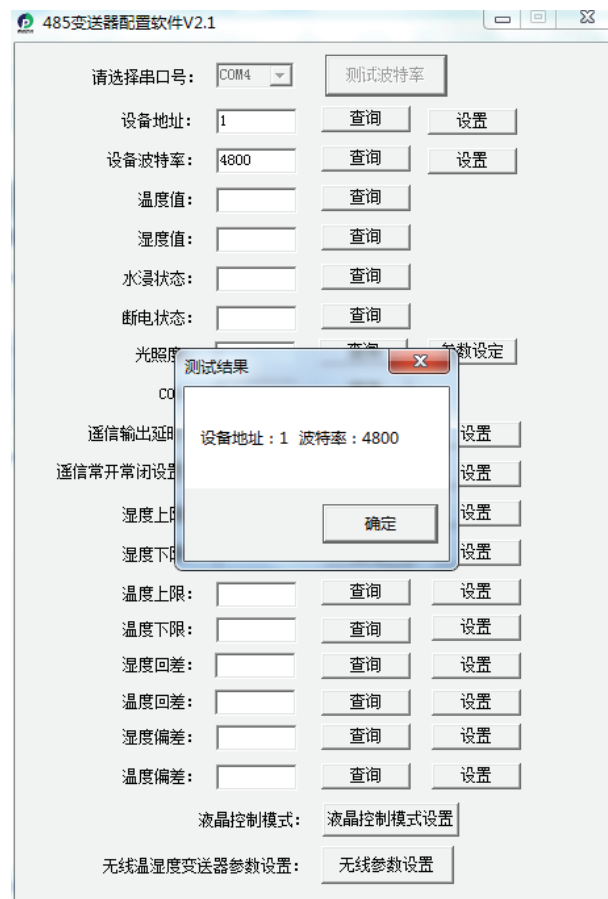
Chapter 4 Communication Protocols

4.1 Basic communication parameters

Encoding	8-bit binary
Data bits	8 bits
Parity bits	not

Stop bits	1 bit
Error checks	CRC (Redundant Cycle Code).
baud rate	1200bit/s, 2400bit/s, 4800bit/s, 9600bit/s, 19200bit/s, 38400bit/s, 5760 0bit/s, 115200bit/sbit/s can be set, and the factory default is 4800bit/ s

4.2 Data Frame Format Definition

The ModBus-RTU communication protocol is used in the following format:

The initial structure ≥ 4 bytes of time

Address code = 1 byte

Feature code = 1 byte

Data area = N bytes

Error check = 16-digit CRC code

The time at which the end structure ≥4 bytes

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

Function code: The function indication of the instruction sent by the host computer, this transmitter only uses the function code 0x03 (read register data).

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

CRC code: a two-byte check code.

Host query frame structure:

Address code	Feature codes	Register start address	Register length	The check sum is low	The check digit is high
1 byte	1 byte	2 bytes	2 bytes	1 byte	1 byte

Slave Response Frame Structure:

Address code	Feature codes	Number of valid bytes	Data Zone 1	Second data area	N data area	Checksum
1 byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes	2 bytes

4.3 Register address

The 8-azimuth device registers are as follows:

Register address	PLC or configuration	content	operate

	address		
0000 H	40001	Wind direction (0-7) The uploaded data is the real value	read only
0001 H	40002	Wind direction (0-315°)	read only
0002 H	40003	Wind direction (0-359.9°).	read only

The 16 azimuth type wind direction sensor registers are as follows:

Register address	PLC or configuration address	content	operate
0000 H	40001	Wind direction (0-359.9°)	read only
0001 H	40002	(0-15 gears)	read only

The 360° wind direction sensor registers are as follows:

Register address	PLC or configuration address	content	operate
0000 H	40001	Angle values that keep one decimal place (0-3599) The uploaded data is expanded by 10 times for the angle value that retains one decimal place	read only
0001 H	40002	Integer Bit Angle Value (0- 359) The uploaded data is the actual value	read only

4.4 Corresponding to the conversion relationship

8 Directions:

Collected value (0-7 stops)	Collected value (0-360°)	Corresponding direction
0	0°	north wind
1	45°	Northeast winds

2	90°	East wind
3	135°	Southeasterly wind
4	180°	southerly
5	225°	Southwesterly winds
6	270°	zephyr
7	315°	Northwest wind

16 directions:

Collected value (0-15 steps)	Collected value (0-360°)	Corresponding direction
0	348.75° ---11.25°	north wind
1	11.25° ---33.75°	North north-northeast wind
2	33.75° ---56.25°	Northeast winds
3	56.25° ---78.75°	East to east
4	78.75° ---101.25°	East wind
5	101.25---123.75°	East-southeast wind
6	123.75° ---146.25°	Southeasterly wind
7	146.25° ---168.75°	South-southeast wind
8	168.75° ---191.25°	southerly
9	191.25° ---213.75°	South-southwest wind
10	213.75° ---236.25°	Southwesterly winds
11	236.25° ---258.75°	West southwest wind
12	258.75° ---281.25°	zephyr
13	281.25° ---303.75°	West northwest wind
14	303.75° ---326.25°	northwest
15	326.25° ---348.75°	North northwest wind

4.5 Examples and Explanations of Communication Protocols

For example, read the 0x01 wind direction of the device address

Query frame:

Address code	Feature codes	Start address	The length of the data	The check sum is low	The check digit is high
0x01	0x03	0x00 0x00	0x00 0x02	0xC4	0x0B

Response frame: (e.g. read wind direction (0-7) is 2, (0-360°) is 90°)

Address code	Feature codes	Returns the number of valid bytes	Wind (0-7 gears)	Wind （0-360°）	The check sum is low	The check digit is high
0x01	0x03	0x04	0x00 0x02	0x00 0x5A	0xDB	0xC8

Wind Direction Calculation:

(0-7 gears): 0002H (hexadecimal) = 2=> Wind direction = east wind

(0-360°): 005AH (hexadecimal) = 90=> Wind direction = east wind

Chapter 5 Common Problems and Solutions

No output or output errors

Possible causes:

(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 reversed.

(4) If the number of devices is too large or the wiring is too long, the nearest power supply should be added, 485 booster should be added, and 120Ω terminal resistance should be increased at the same time.

(5) The USB to 485 driver is not installed or damaged.

(6) The equipment is damaged.