USER GUIDE FOR CDF-21A
ULTRASONIC WIND SPEED & DIRECTION

CDF-21A-01-MN-10	SEP-2024

This document is applied for the following products

SKU	CDF	HW Ver.	1.0	FW Ver.	1.0
Item Code	CDF-21A	Ultrasonic Wind Speed&Direction Sensor, RS485 SDI NMEA Output, ABA,0-45m/s 0-360°, ±0.2m/s ±3°			

1. Introductions

CDF-21A Economical Ultrasonic Wind Sensor is a fully digital detector, high-precision sensors, integrated by the ultrasonic wind speed and direction sensors. it can accurately and quickly detect the wind speed, wind direction; built-in signal processing unit can output a corresponding signal in response to user needs, with the structure lightweight and compact, no moving parts, high-strength structural design can be accurately detected in the harsh climatic conditions,made the accurate and stable elements, low maintenance, an open communications protocol and so on.It can be widely used in meteorology, oceanography, environment, airports, ports, laboratories, industry and agriculture, and transportation and other fields.

2. Specification

Item	**Technical Specification**	
Power Supply	12-24VDC	
Power consumption	24V@60mA	
Output Signal	RS232/RS485(Modbus/NMEA-0183),Voltage(0-5V),Current(4-20mA) optional	
Operating Temperature	-30 - +70℃	
Storage Temperature	-40 - +80℃	
Ingress Protection	IP65	
Main material	Engineering plastic	
Item	**Technical Specification**	
	Wind speed	**Wind direction**
Range	0-45m/s,0-60m/s,0-75m/s	0-360°
Resolution	0.01m/s	1°
Accuracy	≤10m/s：±0.2m/s ＞10m/s：＜±2% the current value	±3°
Starting Threshold	0.1m/s	0.1m/s
Extreme Wind Speed	75m/s	

3.Working Process

It mainly calculates the wind speed by measuring the time difference between the propagation of ultrasonic waves in the air. The sensor generally has two pairs of ultrasonic probes, which are mounted opposite each other. One of the pair of probes transmits ultrasonic waves and the other receives them.

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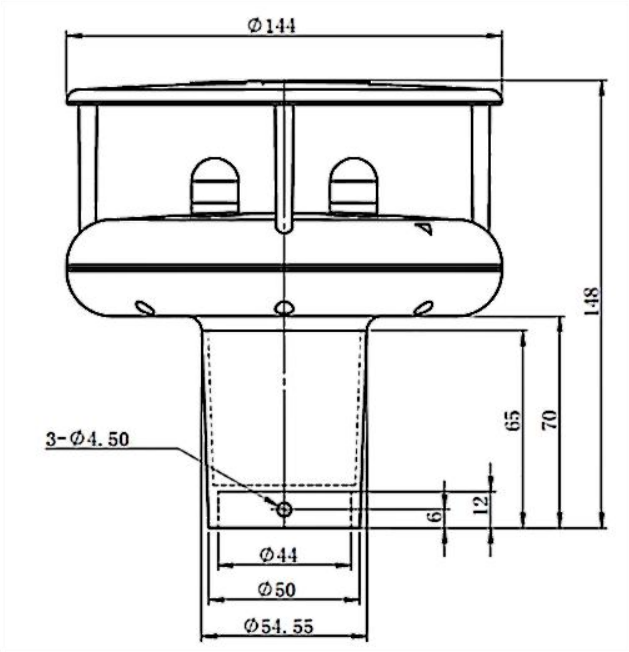
4. Electrical Connections

Cable	Voltage/Current	RS485	RS232	SDI-12
Red(Pin1)	V+	V+	V+	V+
Black/Blue(Pin2)	V-	V-	V-	V-
Yellow(Pin3)	Signal(WD)	RS485A	TXD	
Green/Brown(Pin4)	Signal(WS)	RS485B	RXD	Signal

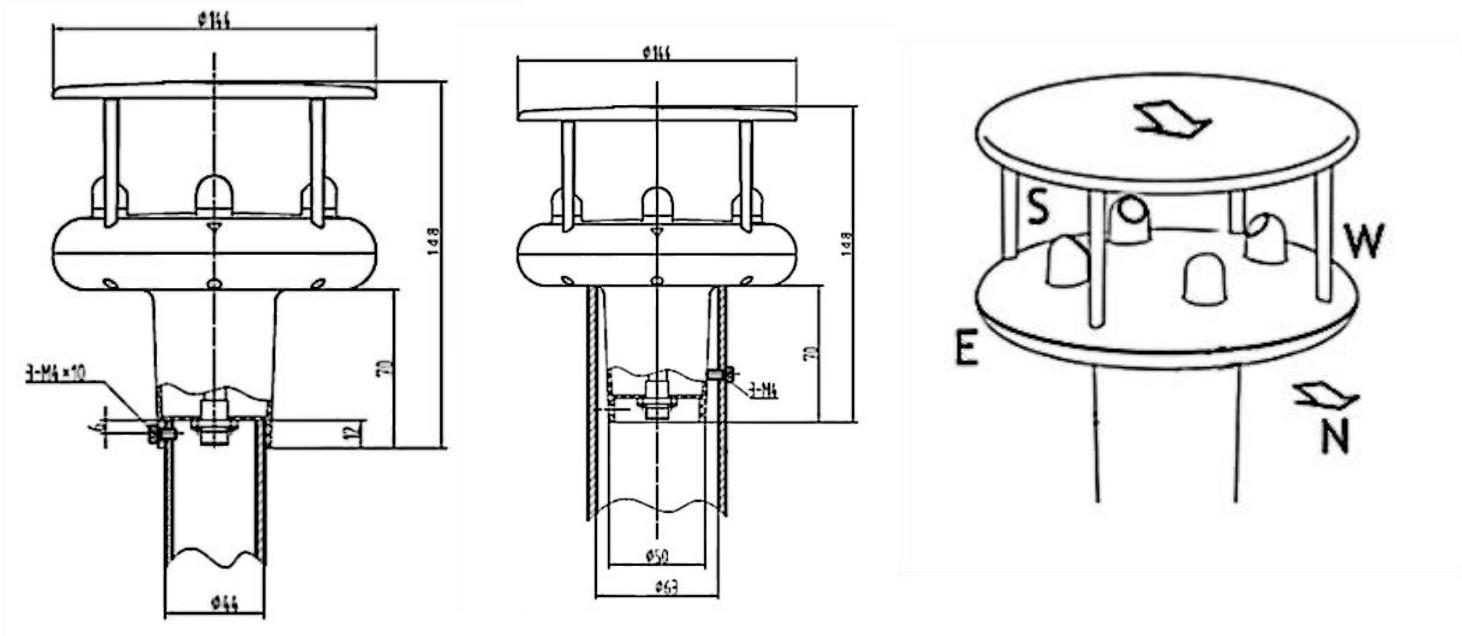
5. Dimensions



6. Installation

Step 1: Open the box and take out the wind sensor.

Step 2: There is rotary adjustable mounting holes at the top of the senor,when mounting the sensor, to ensurethe indicator on ultrasonic wind sensor on the sensor **comply with the geographic north**;



7. Communication Protocol（MODBUS）

Transmission mode: MODBUS-RTU,**Baud rate:** 9600bps,**Data bits:**8,**Stop bit:**1,**Check bit:**Even

Slave address:the factory default is 01H (set according to the need,00H to FFH)

7.1 The 03H Function Code Example: Read The Wind Speed & Direction

Host Scan Order(slave address:0x01)
01 03 00 00 00 04 4409

Slave Response

01 03 08 00 02 00 0E 36 F0 40 89 200B

Wind direction:(000E)H=(14)D=14(°)

Wind speed:(36F04089)H=(4.28)D=4.28(m/s);

7.2 Command one: Enter the Settings mode

Sent

（ASCII） >*\r\n
（Hex） 3E 2A 0D 0A

Response

（ASCII） \n>CONFIGURE MODE\r\n
（Hex） 0A 3E 43 4F 4E 46 49 47 55 52 45 20 4D 4F 44 45 0D 0A

7.3 Command two: Set the address

Sent

（ASCII） >CUS 9600 8-N-1\r\n
（Hex） 3E 43 55 53 20 39 36 30 30 20 38 2D 4E 2D 31 0D 0A

Response

（ASCII） >CMD IS SET\r\n
（Hex） 3E 43 4D 44 20 49 53 20 53 45 54 0D 0A

Note: This 2 is the address you want to set(set according to the need,1-255)，which must be in decimal format, If 'ID' is not followed by address, the command becomes the current query address(Such as sent: >ID\r\n, Response: ID(HEX) : 02\r\n)

7.4 Command three: Manually exit the Settings mode

Sent

（ASCII） >!\r\n
（Hex） 3E 21 0D 0A

Response

（ASCII） \n>NORMAL MODE\r\n

After setting, power off and restart。

Note:
1. All underlined is fixed bit;

2. The last two bytes is CRC check command.

8. Communication Protocol（SDI-12）

①:"a" ,"b" is the sensor address.

Note: Band rate: 1200, Start bit:1,Data bits:7,Check bit: EVEN, Stop bit:1,sensor address: factory default 0

No.	Command	Sensor return	Command name
1	?!	0!	Read sensor address
2	aI!	014HONGYUV 1000002.3000	Distinguish sensor
3	aAb!	b!	Change the address, Change address a to b
4	aM!	00015	Start measuring wind speed and direction
5	aD0!	0+078+03.40+ reserve+ reserve+ 1100	**The value status indicates the validity of the data items in order from left to right** **0- invalid, 1- valid** **1-Wind direction:78°, valid** **1-Wind speed:3.4m/s, valid** **0-** reserve, **invalid** **0-** reserve, **invalid**
6	aM2!	00013<CR><LF>	Start measuring atmospheric pressure
7	aD0!	0+0929.0+0000050.3+11<CR><LF>	Address+pressure+Altitude
8	aM3!	00013<CR><LF>	Start measuring Electronic compass angle
9	aD0!	0+012+11<CR><LF>	Address+ Electronic compass angle

9. Support contacts：

Complies with applicable CE directives.

Manual subject to change without notice. Version 1.0

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