



NO: 13040204.0112.01

YD877Y-N2/YD877-N2 Temperature and humidity sensor Instructions



Guangdong Yada Electronics Co.,Ltd.



Danger and warning

Before installing, operating or maintaining the equipment, please read this manual carefully, get it and gradually get familiar with the equipment. This document is not an operating manual for non-trainees, and our company are not responsible for any problems arising out of its normal use.



Risk of electric shock, fire or explosion

- **There is a power hazard in some parts of this equipment. Please operate in strict accordance with the specifications.**
- **Before maintenance and overhaul, the equipment must be powered off and grounded.**
- **All mechanical parts, doors and covers should be returned to their original position before the equipment is energized.**
- **Equipment maintenance and installation work can only be performed by qualified personnel.**

If you do not pay attention to these precautions, it may cause serious injury.

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Chapter I Introduction

1.1 General

The YD877Y-N2/YD877-N2 temperature and humidity sensor adopts the SHT20 digital temperature and humidity integrated sensor design scheme of Shengshi Ryan, which is used to measure the temperature and humidity of indoor environment. The product not only has the characteristics of visual display, high precision, low cost, beautiful appearance and convenient installation, but also has the functions of self-calibration and automatic networking. Product measurement accuracy is high, long-term stability is good. With RS485 interface, double-headed crystal network cable direct connection, can be used in communication room, IDC data room, warehouse and other continuous multi-point application of temperature and humidity measurement.

1.2 Function Description

large proportion high brightness LCD display or run, communication indication.

With temperature unit selection: degrees Celsius (°C), Fahrenheit (°F) can be set up, can be used worldwide.

With temperature, humidity error correction settings, easy to check regularly.

With RS485 interface, standard MODBUS protocol is adopted to facilitate the integration of remote monitoring system.

The external port has anti-electromagnetic interference design and high reliability.

Power input has anti-reverse function, power input positive and negative reverse connection does not damage the equipment.

Magnetic suction and wall mount installation, crystal wire direct connection, easy installation, maintenance.

1.3 Model selection

Model selection	Picture of real products	Model specification
YD877Y-N2		Temperature and Temperature Measurement RS485 Communication LCD display, address, communication status display
YD877-N2		Temperature and Temperature Measurement RS485 Communication Running,Communication instructions

Chapter II Installation

2.1 Installation prevention, preparation

Please read before starting the installation

This chapter contains important safety precautions that you must follow before installing, servicing, or servicing electrical equipment. Read and follow the following safety precautions carefully.



Danger of electric shock, burn or explosion, so only qualified operators can install this equipment. This should be done after reading all the instructions. Disconnect all power connections prior to visual inspection, testing, or maintenance.

2.2 Installation Information

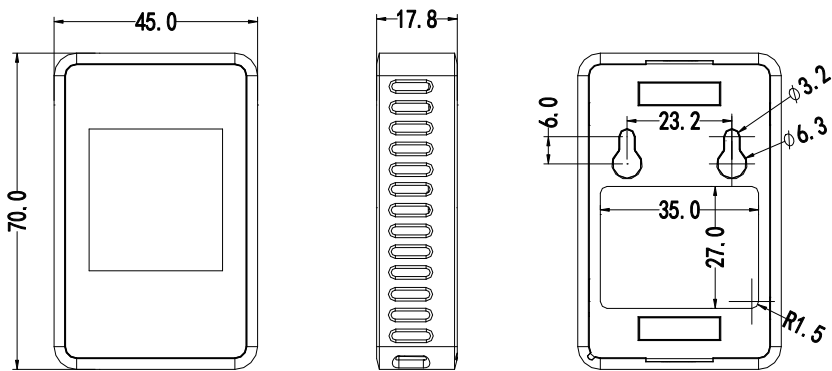
2.2.1 Installation environment and location

The meter should be installed in dry, clean, away from heat and strong electromagnetic fields. The meter location is usually installed in the switch cabinet, which can protect the device from oil, dirt, dust, corrosive gas or other harmful substances. During installation, please pay attention to the convenience of maintenance. There is enough space to place the relevant lines, terminal blocks, short boards and other necessary equipment.

◇ Note

1. When installing, please do not face the air outlet and avoid places with water and fog;
2. Do not install in dusty places, so as not to affect the measurement accuracy;
3. Avoid exposing sensors to pollution, especially volatile chemicals such as solvents or organic compounds. Long term exposure to polluted environments can lead to measurement drift and severe damage to sensors;
4. The service environment shall be free from conductive dust and corrosive metal and insulating gas, and the altitude shall be less than 2500M;
5. For the first time, please measure after 30 minutes of power balance in the environment to ensure the accuracy of measurement.

2.2.2 Mounting dimensions (Units:mm,Tolerance:±0.5)



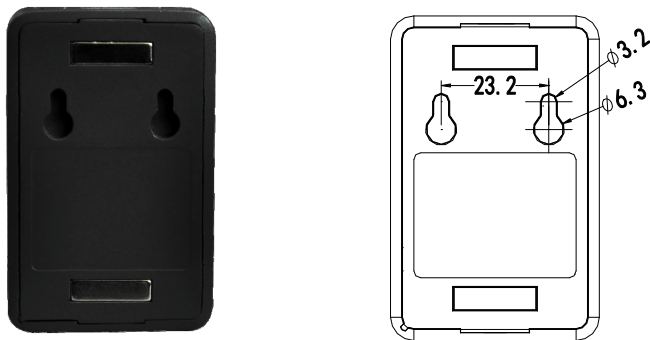
Shape dimensions: length * width * thickness (70±0.5)mm*(45±0.5)mm*(17.8±0.5)mm

Weight: about 45g

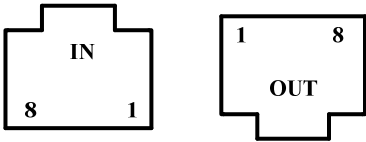
2.2.3 Installation method

Method 1: Magnetic suction installation.

Method 2: wall mount,2 M3 screws fixed to panel or wall, specific mounting dimensions as shown below.



2.3 Terminal definition



1	2	3	4	5	6	7	8
D+	D-	IO	12V	12V	NC	GND	GND

Terminal number	Terminal definition	Notes	Terminal number	Terminal definition	Notes
1	D+	RS485Communications A	5	12V	Positive of power supply
2	D-	RS485Communications B	6	NC	Null
3	IO	Communication networking control enable	7	GND	Negative of power supply
4	12V	Positive of power supply	8	GND	Negative of power supply

Note: IO communication network control enable pin, There's no need for external connection.

2.4 Wiring Instructions



- 1) The front and rear connection of the sensor adopts 8-core wire crystal head connection, the two ends of the crystal head wire do not cross.
- 2) Connection wire can be used ordinary network wire, with shielding layer is the best.
- 3) Taking into account the connection line loss, it is generally recommended to use 12V of power supply, and the total connection line length of the network should be less than 30m.
- 4) The maximum number of networking is 32. Considering the field situation, if the network line is longer, the power supply voltage can be adjusted appropriately, but not more than 30V, and the terminal power supply should not be less than 9V.

2.4.1 power

DC power supply, rated voltage 12V, power range DC9V~30V.

2.4.2 Communications

The terminals are marked as D+ and D-, corresponding interface A,B. respectively.

RS-485 communication mode allows up to 32 instruments on a bus to be connected to the host computer through a RS-485 converter.

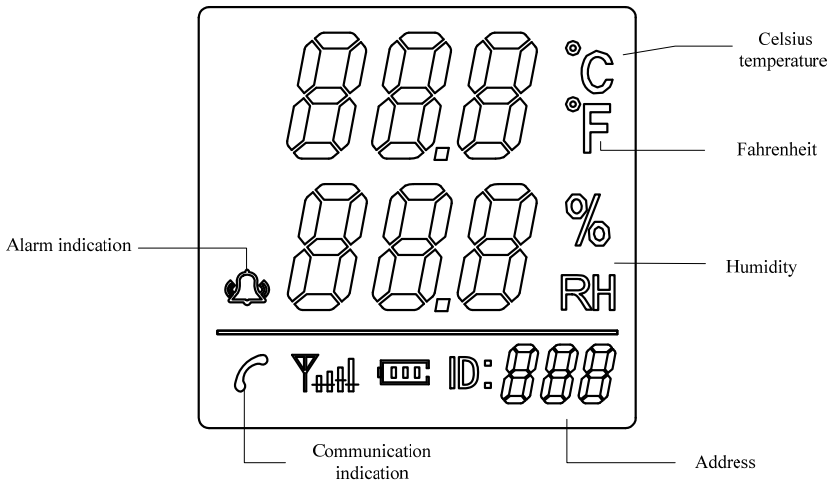


Chapter III Display and Operation

3.1 Display interface

3.1.1 Display instructions

YD877Y-N2 have LCD display, can display temperature value, humidity value and address, communication indication, alarm indication, as follows:



- The default display temperature is Celsius temperature, can be set to display Fahrenheit temperature value.
- ID for the local address display.
- Communication instructions: when communication shows.
- Alarm indication, flashing when an alarm event occurs.

3.1.2 Indicator light description

YD877-N2 has two indicator lights as follows:

- RUN(run)(green light): when working normally, the interval of 0.5S flashes once.
- RX (communication)(green light): communication flashes, usually extinguished.

3.2 Operational instructions

3.2.1 Functional operations

- Communication data frame format adopts "N,8,1" format, when using, please set the serial port to 1 bit start bit, no check 8 bit data bit and 1 bit stop bit;
- °C/°F display mode settings;
- Temperature and humidity alarm setting;
- Temperature and humidity correction calibration;

Note: When calibrating temperature and humidity, if the calibration value is not up to the expected value, the calibration value should be Write 0 before correcting again.

3.2.2 Communication operations

Command format

(1) Host sends commands

Address	Functional code	Data starting address High	Data starting address Low	Number of data High	Number of data Low	CRC16 Check
1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	2 bytes

(2) Return information

Address	Functional code	Length of bytes	Data 1	Data 2	...	CRC16 checks
1 byte	1 byte	1 byte	1 byte	1 byte		2 bytes

(3) Message information

Function code	Data starting address	Number of data	Content description
04H	0000H	1	Temperature value
	0001H	1	Humidity value
04H	0002	1	Temperature and humidity alarm status (high byte indicates humidity alarm status, low byte indicates temperature alarm status):00 is normal ,01 is alarm
04H/06H	0100	1	(°C/°F) of temperature correction

04H/06H	0101	1	Humidity corrected value (%RH)
04H/06H	0102	1	Temperature alarm threshold (beyond the upper limit)
04H/06H	0103	1	Humidity alarm threshold (beyond the upper limit)
04H/06H	0104	1	Celsius temperature /Fahrenheit temperature display :0x0000 for Celsius temperature (°C),0xFF00 for degrees Fahrenheit temperature (°F), default for Celsius temperature

Instructions:

1. Each data is represented by two byte integers,high in the front,low in the back.
2. Symbolic integer range -32768~32767, upload data must be divided by ten, negative numbers are represented by complement.
3. Such as temperature upload hexadecimal 0xFF9C, high position of 1, negative number ,show : -10.0°C.
4. Such as temperature upload hexadecimal 0x00FA, corresponding to decimal 250, show: 25.0°C.
5. If humidity uploads hexadecimal 0x0258, corresponding decimal 600, show: 60.0%.
6. Unit Conversion :1 Fahrenheit = -17.2222222222 Celsius [Celsius (°C) and Fahrenheit (°F) temperatures The conversion relationship is: Fahrenheit (°F)= 32+ Celsius (°C)*1.8, Celsius (°C)=(Fahrenheit (°F)-32)÷1.8.]

Example of debugging

- (1) YD877Y(YD877)-N2 address is 1, read all data
 - The host gives the command:
01 04 0000 0002 71CB (read 2 analog quantities starting with data starting address 0000H)
 - YD877Y(YD877)-N2 returns:
01 04 04 Temperature H, temperature L, humidity H, humidity L,CRCL,CRCH.
- (2) YD877Y(YD877)-N2 address 2, read all data
 - The host gives the command:

02 04 0000 0002 71F8 (read 2 analog quantities starting with data starting address 0000H)

- YD877Y(YD877)-N2 returns:

02 04 04, Temperature H, temperature L, humidity H, humidity L, CRCL, CRCH

- (3) YD877Y(YD877)-N2 Multi - machine cascade automatic address assignment

The following is an example of automatic allocation of 3 instrument addresses (from 1 to 3)

- The host gives the command: (Turn on automatic address assignment without answering from slave)

FF 06 00E0 FF02 5DD3

Note: This instruction assigns address enablement for enable. The address cannot be set without executing this command.

- The host gives the command: (Assign the first slave address as 1)

FF 06 00E1 0100 CDB2

- Answer the command from the slave: (The slave address is assigned as 1 and successfully responded)

01 06 00E1 0000 D9FC

- The host gives the command: (Assign the second slave address as 2)

FF 06 00E1 0200 CD42

- Answer the command from the slave: (The slave address is assigned as 2 and successfully responded)

02 06 00E1 0000 D9CF

- The host gives the command: (Assign the third slave address to 03)

FF 06 00E1 0300 CCD2

- Answer the command from the slave: (The slave address is assigned as 3 and successfully responded)

03 06 00E1 0000 D81E

(4) YD877Y(YD877)-N2 Single machine setting address

- The host gives the command: (Open the Settings address enable,slave machine does not respond)

FF 06 00E0 FF02 5DD3

Note: This command is to enable the address allocation. If this command is not executed, the address cannot be set.

- The host gives the command: (Set a slave address as 3)

FF 06 00E1 0300 CCD2

- Answer the command from the slave: (The slave address is set to 3 successfully answered)

03 06 00E1 0000 D81E

(5) YD877Y(YD877)-N2 Restore initial address

- The host gives the command: (Restore the initial address to 01, the slave does not respond)

FF 06 00E0 FFAA 5C6D

Note: The function of this instruction is to restore the machine address to 01.

Chapter IV Technical indicators

4.1 Accuracy

Parameter	Accuracy	Measuring range
Temperature	$\pm 0.5^{\circ}\text{C}$ (at 25°C)	$-20^{\circ}\text{C}\sim 80^{\circ}\text{C}$
Humidity	$\pm 3\% \text{RH}$ ($20\sim 80\% \text{RH}$ 25°C)	$5\%\sim 95\% \text{RH}$

4.2 Working conditions and Power supply

Working conditions	
Storage temperature: -40℃~80℃	Working temperature: -20℃~80℃
Humidity: 5%RH~95%RH	
Power supply	
Input range: DC9V~DC30V	The meter power consumption: ≤0.2W

4.3 Communication

Communication parameters	
Communication port: RS485 2-wire half-duplex	Baud rate: 9600bps
Correspondence address: 1~247	Communication protocol: Modbus-RTU
Check bit: no parity	Data bits: 8bits, stop bits: 1bits

Chapter V Quality Assurance

5.1 Quality Assurance

All new meters sold to customers shall be provided with free quality assurance for the faults caused by design, materials and process within 12 months after power-on or 18 months after receiving the goods. If the products are determined to meet the above quality guarantee conditions, our company shall be responsible for free maintenance.

5.2 The quality of limit

Problems with the following devices are not covered by free warranty:

- Damage due to incorrect installation, use, and storage.
- Excessive operating and application conditions beyond the product specifications.
- The meter that has been repaired by an organization or person that is not authorized by the company.
- The meter that exceeds the free warranty period.

Note: The above pictures are for reference only, the products are subject to the actual product.



Address: Yada industry park, Gaopugang, Heyuan city,
Guangdong Province.

Domestic market: 86-762-3493871 3493872 3493873

International market: 86-762-3496222

Technical support: 86-762-3493926 3493989 (400-830-0868)

Fax: 86-762-3493912 3493830

Zip code: 517000

http: //www.yada.com.cn

E-mail: market@yada.com.cn

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