

Temperature and Humidity Sensor with Built-in RS485 Transmitter



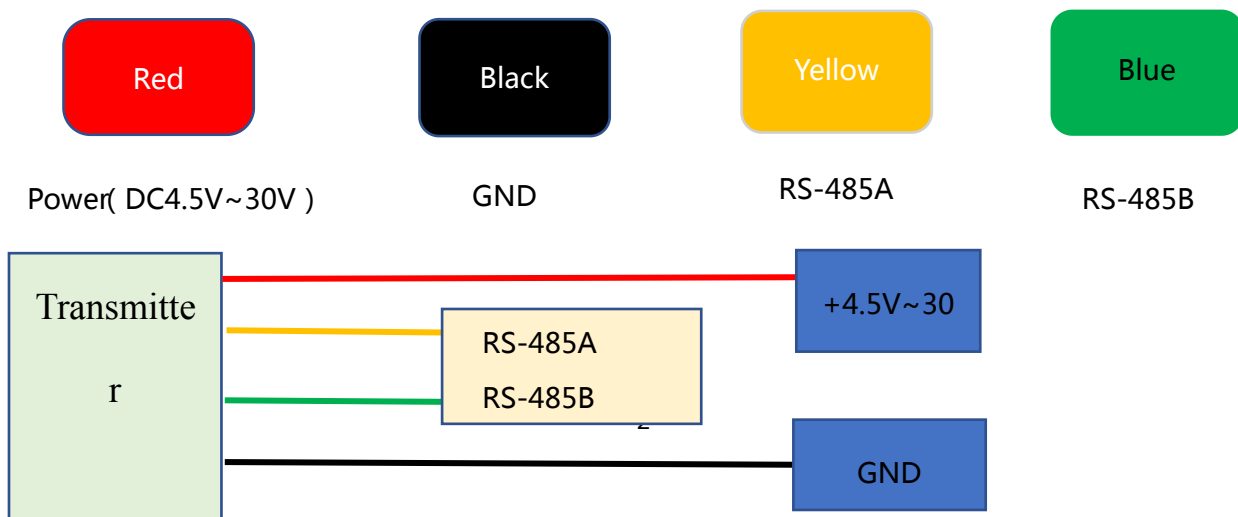
1. Product Profiles

HT-800 series temperature and humidity sensor adopts RHTx series sensors imported from Sensirion. It can collect temperature and humidity data at the same time. Also, it has the characteristics of high precision, low power consumption and good consistency. The collected temperature and humidity signal data and the dew point data can be calculated at the same time, which can be output through the RS485 interface. It adopts Modbus-RTU communication, can be networked with PLC, man-machine screen, DCS and various configuration software to realize temperature and humidity data acquisition. This product can be used for cold storage temperature and humidity data collection, vegetable greenhouses, animal breeding, industrial environment monitoring, granary temperature and humidity monitoring, all kinds of environmental temperature and humidity data collection and control, etc.

2. Product Features

- 1) Original ultra-small and integrated high temperature and humidity sensor module, easy to install, convenient for system networking and wiring;
- 2) RHTx series sensors imported from Sensirion, with high precision and good consistency;
- 3) Standard Modbus-RTU communication, can easily realize the interface between PLC, man-machine screen, DCS and various configuration software;
- 4) Communication protection : RS485 communication signal output interface adopts double over-voltage and over-current protection;
- 5) 4.5V~30V extra wide voltage input;
- 6) Power polarity protection, with anti-reverse connection function.

3 . Wiring Methods



4 . Communication Protocol

Modbus-RTU communication, default mode of communication: 9600pbs , n , 8 , 1 , address: default is 1

<03 function code-reading temperature and humidity datas>

Host query frame format (hexadecimal):

| Function code | Start address (high-order first) | Data length (high-order first) | Check code (high-order first) |
|----------------------|---|---|--|
| 0X03 | 0X00 , 0X00 | 0X00 , 0X03 | 0X05 , 0XCB |

Transmitter reply frame format

(Hexadecimal, e.g. : Temperature 26.7°C, Humidity 30.5%RH, Dew Point 8 °C)

| Address code | Function code | Data length | data | | | Check code (high-order first) |
|---------------------|----------------------|--------------------|--------------------------|-----------------------|------------------------|--|
| | | | Temperature value | Humidity value | Dew point value | |
| 0X01 | 0X03 | 0X06 | 0X00 , 0X0B | 0X01,0X31 | 0X00,0X50 | 0XD5 , 0X6A |

Calculation examples of temperature and humidity are as follows:

After dividing by 10 by converting hexadecimal to decimal, the corresponding temperature and humidity values can be obtained.

Temperature : 0X010B=267/10=26.7°C , with directed number

Humidity : 0X0131=305/10=30.5%RH , no directed number

Dew point humidity : 0X050=80/10=8°C , with directed number

When the temperature value is negative, the data is uploaded as a complement.

For example: humidity=0XFF37, converted to decimal system: -205, divided by 10,

temperature : -20.5°C

<03 function code-reading transmitter address>

Host query frame format:

| Address code | Function code | Register address (high-order first) | Data length (high-order first) | Check code (high-order first) |
|---------------------|----------------------|--|---|--|
| 0X01 | 0X03 | 0X01 , 0X00 | 0X00 , 0X01 | 0X85 , 0XF7 |

Transmitter query frame format:

| Address code | Function code | Data length | Transmitter address | | Check code (high-order first) |
|---------------------|----------------------|--------------------|----------------------------|--------------------------|--|
| | | | Address high level | Address low level | |
| 0X01 | 0X03 | 0X02 | 0X00 | 0X01 | 0X79 , 0X84 |

<06 function code-address setting>

Host query frame format:(For example, the address is set to 0X08=8):

| Address code | Function code | Register address (high-order first) | Register value (high-order first) | Check code (high-order first)) |
|---------------------|----------------------|--|--|--|
| 0X00 | 0X06 | 0X01 , 0X00 | 0X00 , 0X08 | 0X88 , 0X21 |

Transmitter response frame same as the host sending frame:

| Address code | Function code | Register address (high-order first) | Register value (high-order first) | Check code (high-order first) |
|---------------------|----------------------|--|--|--|
| 0X00 | 0X06 | 0X01 , 0X00 | 0X00 , 0X08 | 0X88 , 0X21 |

Explanation :

1) The address of the transmitter should be kept at the register address of 0X100, and the communication address can be set in the range of 1-247

2) When reading the transmitter address, the address code of the downlink message is fixed at 0X01.

<06 function code-baud rate setting>

Host frame format (For example, set the baud rate at 9600bps) :

| Address code | Function code | Start address (high-order first) | Register value (high-order first) | Check code (high-order first) |
|---------------------|----------------------|---|--|--|
| 0X00 | 0X06 | 0X01 , 0X01 | 0X00 , 0X04 | 0XD9 , 0XE4 |

Transmitter response frame same as the host sending frame:

| Address code | Function code | Start address (high-order first) | Register value (high-order first) | Check code (high-order first) |
|---------------------|----------------------|---|--|--|
| 0X00 | 0X06 | 0X01 , 0X01 | 0X00 , 0X04 | 0XD9 , 0XE4 |

Note : The baud rate holds the register address at 0X1010. The following is a table of register values and baud rates:

| Register value | baud rate |
|-----------------------|------------------|
| =1 | 1200bps |
| =2 | 2400pbs |
| =3 | 4800pbs |
| =4 | 9600pbs |
| =5 | 19200bps |

Note: After modifying the baud rate, it needs to be repowered to take effect.

5 . Technical Specifications

| Type | Specifications | |
|---------------------|--|---------|
| Power | DC 4.5V~24V | |
| Power consumption | <0.1W | |
| Measurement range | -30~80°C , 0~90%RH | |
| Accuracy | temperature | ±0.1°C |
| | humidity | ±1.5%RH |
| Long-term stability | humidity : <1%RH/Y temperature : <0.1°C/Y | |
| Response time | 10S (1m/s wind speed) | |
| Communication port | RS485/MODBUS-RTU | |
| Baud rate | 1200、2400、4800、9600、19200 ,default 9600pbs | |
| Byte format | 8 data bits, 1 stop bit、 no calibration | |