# Air temperature and humidity sensor Introduce

**Type NO.: RD-ATHP-R**

HONDE TECHNOLOGY CO.,LTD

# 1. Product Introduce

The pen-type temperature, humidity sensor can simultaneously measure ambient temperature, relative humidity and after circuit processing, directly outputs the RS485 through the main control chip.

This product is designed with a pen-like appearance structure, exquisite and compact. The main application places of the product are in the fields of indoor computer room, environmental control and outdoor weather monitoring, with high integration and convenient application. The product can be equipped with an outdoor protective cover for outdoor measurement of ambient temperature, relative humidity.

The product directly outputs the RS485 communication interface, and the user can directly use the wireless DTU module to realize the wireless transmission of data.

# 2. Product Features

1. Wide voltage design, high cost performance.
2. Digital linearization correction, high precision and high stability.
3. Full range temperature and humidity compensation, wide temperature and humidity measurement range, optional measurement range.
4. Flexible installation and convenient use.
5. Small size, light weight and anti-vibration.
6. It can be made into a variety of shapes to meet different needs of customers.

# 3. Product application

It is widely used in building automation, telecommunications room, papermaking and printing, warehousing and logistics, shopping malls, hotel housing, agricultural greenhouses, cinemas, railway stations, museums, theaters, clean workshops and other fields where temperature and humidity need to be measured.

# 4. Product Parameter

- Measure range
  - Temperature: -40 ~ 60℃
  - Humidity : 0 ~ 100%RH (non-condensing state)
- Accuracy:
  - Temperature:±0.3℃(@25℃);
  - Humidity :±3%RH(10% ~ 90%);
- Resolution
  - Temperature: 0.01℃

- Humidity : 0.01%RH

- Power supply voltage: 9V ~ 24V
- Output signal: RS485
- Response time: <1S
- Working environment: temperature: -40℃ ~ 60℃; humidity: ≤95%RH
- Working current: DC12V <20ma (485);
- Power consumption: DC12V <0.24W (485);
- Cable length: 3 meters (customizable)
- The farthest lead length: current 200 meters, RS485 100 meters, voltage 50 meters
- Shell material: ABS engineering plastic
- Product weight: <100g
- Protect level: IP65

## 5. Line connection diagram

- Red line: positive power supply
- Black wire: negative power supply
- Yellow wire: RS485 A
- Blue wire: RS485 B

## 6. Data conversion method

**1. Standard Modbus-RTU protocol**

Baud rate: 2400bit/s, 4800bit/s, 9600 bit/s can be set, the factory default is 9600bit/s

Check digit: none;

Data bit: 8; Stop bit: 1

**2.Communication protocol examples and explanations**

1. Modify the address, for example: change the address of the transmitter with address 00 to 33, host → slave

| Original address | Function code | Starting register address | Number of registers | Data length | New address | CRC16 low | CRC16 high |
|---|---|---|---|---|---|---|---|
| 00 | 10 | 00 01 | 00 01 | 02 | 00 33 | EA | 04 |

If success, the slave will send: 00 10 00 01 00 01 51 D8

2. Read sensor address

| Original address | Function code | Starting register address | Number of registers | CRC16 low | CRC16 high |
|---|---|---|---|---|---|
| 00 | 03 | 00 01 | 00 01 | D4 | 1B |

Feedback: 00 03 02 00 FF C5 C4

The sensor address is FF.

3. Read air temperature and humidity and pressure at device address 0x01(The default address is 01)

- Inquiry frame

| Address code | Function code | Register start address | Number of registers | Low check bit | Check code high |
|---|---|---|---|---|---|
| 01 | 03 | 00 00 | 00 02 | C4 | 0B |

- Response frame

| Address code | Function code | Data length | Air temperature | Air humidity | Low check bit | Check code high |
|---|---|---|---|---|---|---|
| 01 | 03 | 04 | 19 AD | 1B E4 | 66 | 35 |

Note: Temperature: 4th and 5th bytes , 19 AD(Hexadecimal )= 6573 ( Decimal) , 65.73-40=25.73℃

Humidity: 6th and 7th byte , 1B E4(Hexadecimal )= 7140 ( Decimal), 7140/100=71.4%

## 7. Instructions

1. When receiving the product, please check whether the packaging is intact and check whether the model and specifications of the transmitter are consistent with the product you purchased;

2. The installation place should be away from the chemical corrosion environment;

3. Transmitters and wires should be kept away from high voltage electricity and heat sources;

4. The transmitter is a precision instrument and should be stored in a dry, ventilated and indoor environment.

5. The sensor is a precision device. Please do not disassemble it by yourself when using it to avoid product damage