



renatta RN-WN-N01 Series Temperature and Humidity Transmitter Instruction Manual

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renatta RN-WN-N01 Series Temperature and Humidity Transmitter



Product Information

The Temperature and Humidity Transmitter (Type 485) is a compact device with a built-in temperature and humidity sensor. It utilizes imported industrial-grade microprocessor chips and high-precision temperature sensors to ensure reliability and precision. The transmitter adopts the 485 communication interface with the ModBus-RTU communication protocol, allowing for customizable communication address and baud rate. It has a communication distance of up to 2000 meters and features anti-reverse connection protection.

The transmitter has a built-in temperature and humidity sensor with a compact size. The circuit uses imported industrial-grade microprocessor chips and imported high-precision temperature sensors to ensure excellent reliability and high precision of the product. The product adopts 485 communication interface standard ModBus-RTU communication protocol, the communication address and baud rate can be set, and the communication distance is up to 2000 meters. The product has anti-reverse connection protection function, the connection will not burn the device.

Features

1. 485 communication interface, standard ModBus-RTU protocol, communication address and baud rate can be set, the communication line can be up to 2000 meters;
2. Temperature accuracy $\pm 0.5\text{ }^{\circ}\text{C}$, humidity accuracy $\pm 4\%\text{ RH}$, high precision, low drift;
3. Adopt special EMC anti-interference device, can withstand strong electromagnetic interference on site, industrial grade processing chip, wide range of use;
4. 5 ~ 28V wide voltage range power supply, long-distance centralized power supply can still work normally;
5. Anti-connection and reverse protection function of power supply, reverse connection of positive and negative poles will not burn the device.

- 485 communication interface with Modbus-RTU protocol

- Customizable communication address and baud rate
- Communication line distance of up to 2000 meters
- Special EMC anti-interference device for strong electromagnetic interference resistance
- Wide voltage range power supply (5-28V)
- Anti-connection and reverse protection function






Main Specifications

- DC power supply (default): 5-28V
- Maximum power consumption: 0.05W
- Accuracy: humidity $\pm 1\%$, temperature $\pm 0.1^{\circ}\text{C}$
- Operating temperature: -40°C to $+80^{\circ}\text{C}$
- Output signal: Modbus-RTU communication protocol 485 signal
- Temperature display resolution: 0.1°C
- Humidity display resolution: $0.1\%\text{RH}$
- Temperature and humidity refresh time: 2 seconds
- Long-term stability: temperature $\pm 1\%\text{RH}/\text{year}$, humidity $\pm 15\%/\text{year}$
- Response time: 4 seconds for 1 m/s wind speed
- Parameter settings: Software-based

DC power supply (default)	5-28V DC	
Maximum power consumption	$\leq 0.05\text{W}$	
Accuracy	humidity	$\pm 4\%\text{RH}$ (5%RH~95%RH, 25°C)
	temperature	$\pm 0.5^{\circ}\text{C}$ (25°C)
Transmitter circuit operating temperature	$-40^{\circ}\text{C} \sim +80^{\circ}\text{C}$, 0%RH~100%RH	
letter of agreement	Modbus-RTU communication protocol	
output signal	485 signal	
Temperature display resolution	0.1°C	
Humidity display resolution	$0.1\%\text{RH}$	
Temperature and humidity refresh time	2S	
Long-term stability	temperature	$\leq 0.1^{\circ}\text{C}/\text{y}$
	humidity	$\leq 1\%\text{RH}/\text{y}$
Response time	temperature	$\leq 15\text{s}$ (1m/s Wind speed)
	humidity	$\leq 4\text{s}$ (1m/s Wind speed)
parameter settings	Setting via software	

Product Number

RN WNN01-

RN-				Company code
	WN-			Temperature and humidity transmission,
		N01-		RS485 (Modbus protocol)
			PE	
			PVC	
			MW	
			QT	
			CS	

Equipment Installation Instructions

Check before installation

Equipment List:

- 1 transmitter device
- Conformity certificate, warranty card, calibration report, etc.
- USB to 485 (optional)
- 485 terminal resistance (gift from multiple devices)
- One buckle

Interface Description

Power supply and 485 signal

The transmitter supports a wide voltage power input of 5-28V. When connecting the 485 signal line, please note the two lines A \ B cannot be reversed, and the addresses of multiple devices on the bus must not conflict

wiring

Thread color	Explanation
brown	Positive power supply (5 ~ 28V DC)
black	Negative power supply
green	485-A
blue	485-B

485Field wiring instructions

When multiple 485 model devices are connected to the same bus, there are certain requirements for field wiring. For details, please consult the after-sales engineer.

letter of agreement

Communication basic parameters

Coding	8-bit binary
Data bit	8 bit
Parity bit	no
Stop bit	1 person
Error checking	CRC (Redundant Cyclic Code)
Baud rate	2400bit / s, 4800bit / s, 9600 bit / s can be set, the factory default is 4800bit / s

Data frame format definition

Using Modbus-RTU communication protocol, the format is as follows:

- Time of initial structure ≥ 4 bytes
- Address code = 1 byte
- Function code = 1 byte
- Data area = N bytes
- Error check = 16-bit CRC code
- End structure time ≥ 4 bytes
- Address code: It is the address of the transmitter, which is unique in the communication network (factory default 0x01).
- Function code: instruction function instruction issued by the host, this transmitter only uses function code 0x03 (read register data).
- Data area: The data area is specific communication data, pay attention to the high byte of 16bits data first!
- CRC code: two-byte check code.
- Host inquiry frame structure

address code	function code	Register start address	Register length	Check digit low	Check digit high
1byte	1byte	2byte	2byte	1byte	1byte

- Slave response frame structure:

address code	function code	Effective bytes	Data area	Second data area	Nth data area	Check code
1byte	1byte	1byte	2byte	2byte	2byte	2byte

Register address

Register address (hex)	PLC or configuration address	content	operating	Support function code
0000 H	40001	Humidity (10 times actual value)	Read only	03、04
0001 H	40002	Temperature (10 times actual value)	Read only	03、04
07D0H	42001	address	Read and write	03、04、06、16
07D1H	42002	Baud rate (0 for 2400, 1 for 4800, and 2 for 9600)	Read and write	03、04、06、16
0050 H	40081	Temperature calibration value (10 times the actual value)	Read and write	03、04、06、16
0051 H	40082	Humidity calibration value (10 times actual value)	Read and write	03、04、06、16

Communication protocol example and explanation

Read the temperature and humidity value of device address 0x01

Inquiry frame (hexadecimal):

address code	function code	starting addresses	Data length	Check digit low	Check digit high
0x01	0x03	0x00 0x00	0x00 0x02	0xC4	0x0B

Response frame (hexadecimal): (for example, read temperature is -20.5 °C, humidity is 25.8% RH)

address code	function code	Returns the number of valid bytes	Humidity value	Temperature value	Check digit low	Check digit high
0x01	0x03	0x04	0x01 0x02	0xFF 0x33	0x5B	0xEA

Temperature calculation:

When the temperature is lower than 0 °C, the temperature data is uploaded in the form of complement.

Temperature: FF37 H (Hexadecimal) = -205 => Temperature = -20.5 °C

Humidity calculation:

Humidity: 102H (Hexadecimal) = 258 => Humidity = 25.8% RH

Read the temperature calibration value of device address 0x01

Inquiry frame (hexadecimal):

address code	function code	starting address	Data length	Check digit low	Check digit high
0x01	0x03	0x00 0x50	0x00 0x01	0x84	0x1B

Response frame (hexadecimal): (for example, the temperature calibration value read is -1.0 °C)

address code	function code	Returns the number of valid bytes	Temperature calibration value	Check digit low	Check digit high
0x01	0x03	0x02	0xFF 0xF6	0x79	0xF2

Calculation of temperature calibration value:

When the temperature calibration value is less than 0, the temperature calibration value data is uploaded in the form of complement.

Temperature calibration value: FF F6 H (hexadecimal) = -10 => temperature calibration value = -1.0 °C

Set the temperature calibration value of device address 0x01

The temperature calibration value is issued at -1.0 degrees. When the temperature calibration value is less than 0, the temperature calibration value data is delivered in the form of a complement.

Temperature calibration value: FF F6 H (hexadecimal) = -10 => temperature calibration value = -1.0 °C

Request frame (hexadecimal):

address code	function code	Register address	Temperature calibration value content	Check digit low	Check digit high
0x01	0x06	0x00 0x50	0xFF 0xF6	0x48	0x6D

Humidity calibration value operation is similar to temperature calibration value operation.

Change the device with address 01 to 02

Request frame (hexadecimal):

address code	function code	Register address	Temperature calibration value content	Check digit low	Check digit high
0x01	0x06	0x07 0xD0	0x00 0x02	0x08	0x86

Request frame (hexadecimal):

address code	function code	Register address	Temperature calibration value content	Check digit low	Check digit high
0x01	0x06	0x07 0xD0	0x00 0x02	0x08	0x86

Set the baud rate of device address 0x01 to 4800

Change the baud rate of device 01 to 4800 (00 stands for 2400, 01 stands for 4800, 02 stands for 9600, and 03 stands for unknown baud rate)

Request frame (hexadecimal):

address code	function code	Register address	Baud rate value content	Check digit low	Check digit high
0x01	0x06	0x07 0xD1	0x00 0x01	0x19	0x47

Reply Frame (Hexadecimal)

address code	function code	Register address	Baud rate value content	Check digit low	Check digit high
0x01	0x06	0x07 0xD1	0x00 0x01	0x19	0x47

Read device address**Inquiry frame (hexadecimal):**

address code	function code	starting address	Data length	Check digit low	Check digit high
0xFF	0x03	0x07 0xD0	0x00 0x01	0x91	0x159

Response frame (hexadecimal): (for example, the address read is 1)

address code	function code	Returns the number of valid bytes	Current address	Check digit low	Check digit high
0x01	0x03	0x02	0x00 0x01	0x79	0x84

Reading device baud rate**Inquiry frame (hexadecimal):**

address code	function code	starting address	Data length	Check digit low	Check digit high
0x01	0x03	0x07 0xD1	0x00 0x01	0xD5	0x47

Response frame (hexadecimal): For example, the baud rate read is 4800 (00 stands for 2400, 01 stands for 4800, 02 stands for 9600, and 03 stands for unknown baud rate)

address code	function code	Returns the number of valid bytes	Current address	Check digit low	Check digit high
0x01	0x03	0x02	0x00 0x01	0x79	0x84

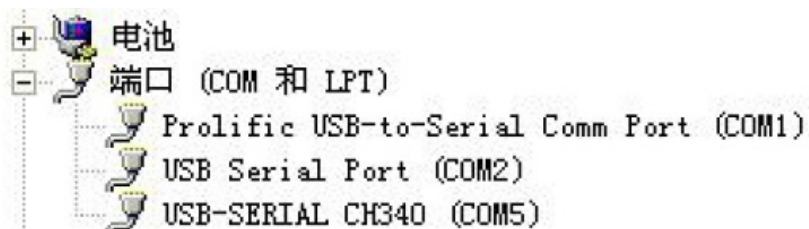
Configure software use

Software selection

Open the data package, select “Debug Software” — “485 Parameter Configuration Software”

parameter settings

1. select the correct COM port (“COM” port in “My Computer-Properties-Device Manager-Port”), the following figure lists the driver names of several different 485 converters.



2. Only connect one device and power it on, click 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, the default address is 0x01.
3. Modify the address and baud rate according to the needs of use, and at the same time can query the current functional status of the device.
4. If the test is unsuccessful, please recheck the device wiring and 485 driver installation.

485 Series transmitter configuration software V2.2

Serial Port Num: COM1 Search Device

Device Address: Read Write

Device Band Rate: Read Write

Temperature Value: Read

Humidity Value: Read

Water Leak Status: Read

Power Failure Status: Read

Light Intensity Value: Read Para Set

CO2 Concentration: Read

Switch Output Delay: Read Write

Remote Signal Normal Set: Read Write

Humidity UpperLimit: Read Write

Humidity Lower Limit: Read Write

Temperature Upper Limit: Read Write

Temperature Lower Limit: Read Write

Humidity Hysteresis: Read Write

Temperature Hysteresis: Read Write

Humidity Adjust: Read Write

Temperature Adjust: Read Write

LCD Device Control Mode: LCD Device Control Mode Set

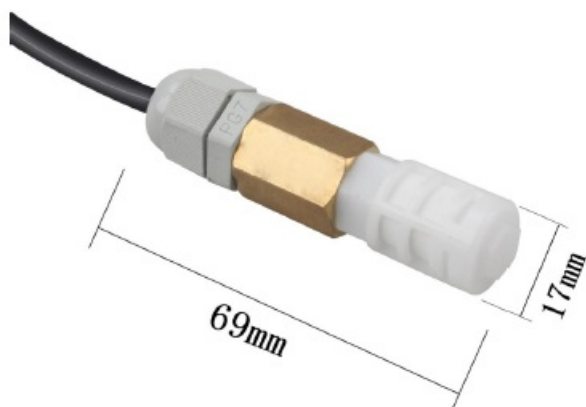
Wireless Receiver Para Set: Wireless Device Para Set

Common problems and solutions

The device cannot be connected to a PLC or computer possible reason:

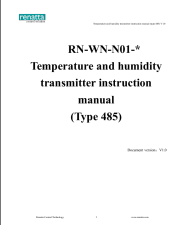
1. The selected COM port is incorrect.
2. The device address is wrong, or there are devices with duplicate addresses (the factory default is all 1).
3. Baud rate, check mode, data bit, stop bit error.
4. The host's polling interval and waiting time for answering are too short, and both need to be set above 200ms.
5. The 485 bus is disconnected, or the A and B lines are reversed.
6. If the number of devices is too large or the wiring is too long, power should be supplied nearby, and a 485 booster should be added, and 120Ω terminal resistance should be added at the same time.
7. The USB to 485 driver is not installed or damaged.
8. The equipment is damaged.

Temperature and humidity transmitter instruction manual (type 485) V1.0



Renatta Control Technology
www.renatta.com

Documents / Resources

	renatta RN-WN-N01 Series Temperature and Humidity Transmitter [pdf] Instruction Manual RN-WN-N01 Series Temperature and Humidity Transmitter, RN-WN-N01 Series, Temperature and Humidity Transmitter, Humidity Transmitter, Temperature Transmitter, Transmitter
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References

- [renatta.com](http://www.renatta.com)