Industrial grade high-precision temperature and humidity signal conversion to RS485 and Modbus RTU acquisition module WJ801

Product features:

- Supports reading temperature and humidity using Modbus RTU protocol
- Typical relative humidity accuracy ± 3% RH
- Relative humidity measurement range 0~100% RH
- Typical temperature accuracy ± 0.3 ℃
- Temperature measurement range -40~+85 ℃
- Wide power supply range: 5~30VDC
- High reliability, easy programming, and easy application
- Users can program module addresses, baud rates, etc
- Supports screw installation and DIN35 rail installation
- Dimensions: 70mm x 45mm x 30mm

Diagram 1 WJ801 Module Appearance

Typical applications:

Smart Factory

- Agricultural greenhouse
- Cold chain warehousing
- Weather Station
- Hospital
- High end residential properties

Product Overview:

The WJ801 product realizes the collection of humidity and temperature signals, and supports accessing temperature and humidity data through Modbus RTU protocol.

The WJ801 product can be applied to the smart factory MES system, temperature and humidity collection in agricultural greenhouses, temperature and humidity monitoring in smart warehouses, data reporting from small weather stations, real-time monitoring of hospital environments, comfort testing in high-end residences, and more.

The product includes a high-precision temperature and humidity sensor and a high-performance MCU main control chip. Each serial port can connect up to 255 WJ801 series modules, and the communication method adopts MODBUS RTU communication protocol. The baud rate can be set by communication, and it can be hung on the same RS-485 bus with control modules from other manufacturers for easy computer programming.

The WJ801 series products are designed and manufactured according to industrial standards, with strong anti-interference ability and high reliability. The working temperature range is -40 ℃ to+85 ℃.

Function Introduction:

The WJ801 remote I/O module can be used to measure humidity and temperature.

（1） Signal input

Humidity and temperature.

（2） Communication Protocol

Communication interface: 1 standard RS-485 communication interface.

Communication protocol: MODBUS RTU communication protocol.

Data format: 10 digits. 1 start bit, 8 data bits, and 1 stop bit. No verification.

The communication address (0-255) and baud rate (2400, 4800, 9600, 19200, 38400, 57600, 115200bps) can be set;

The communication network can reach a maximum distance of 1200 meters and is connected through

twisted pair shielded cables.

High anti-interference design of communication interface, ± 15KV ESD protection, communication response time less than 100mS.

（3） anti-interference

Parity check can be set as needed. There is a transient suppression diode inside the module, which can effectively suppress various surge pulses, protect the module, and the internal digital filter can also effectively suppress power frequency interference from the power grid.

Product model:

WJ801- □

Communication interface

485: Output as RS-485 interface

WJ801 General Parameters:

Typical relative humidity accuracy: ± 3% RH

Relative humidity measurement range: 0~100% RH

Typical temperature accuracy: ± 0.3 ℃

Temperature measurement range: -40~+85 ℃

Communication: MODBUS RTU communication protocol

Baud rates (2400, 4800, 9600, 19200, 38400, 57600, 115200bps) can be selected by software

The address (0-255) can be selected by software

Communication response time: 100 ms maximum

Working power supply:+5~30VDC wide power supply range, with internal anti reverse and overvoltage protection circuits

Power consumption: less than 1W

Working temperature: -40~+85 ℃

Working humidity: 0~100%

Storage temperature: -40~+85 ℃

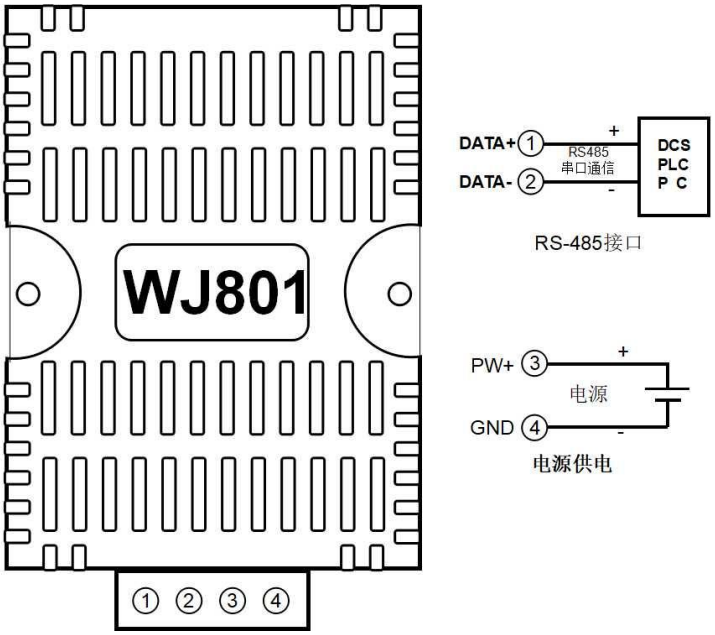
Storage humidity: 0~100%

Dimensions: 70mm x 45mm x 30mm

Pin definition:

Pin	name	Description	Pin	name	Description
one	DATA+	RS-485 signal positive terminal	**three**	PW+	Positive end of power supply
two	DATA-	RS-485 signal negative terminal	**four**	GND	Negative end of power supply

Table 1 Pin Definition



Modbus RTU communication protocol:

The factory initial settings of the module are as follows:

The Modbus address is 01

Baud rate 9600 bps

Data format: 10 digits. 1 start bit, 8 data bits, and 1 stop bit. No verification.

Supports Modbus RTU communication protocol function codes 03 and 06, with command format following the standard Modbus RTU communication protocol. **When reading**, be **careful not** to **exceed** a **length** of **10, otherwise communication** will **not** be possible.

The **register table** is **as follows (supporting function code 03):**

Address 4X (PLC)	Address (PC, DCS)	Data content	attribute	Data Explanation
forty thousand and one	0	relative humidity	read-only	The data is a 16 bit signed integer (int16), The actual relative humidity value is obtained by dividing the read value by 10, and the unit is "% RH"
forty thousand and two	one	temperature	read-only	The data is a 16 bit signed integer (int16), The actual temperature value is obtained by dividing the read value by 10, and the unit is "℃"

forty-two thousand and one	two thousand	Module address	Read/ Write	Integer, range 0x0001-0x00FE, Please restart after setting up
forty-two thousand and two	two thousand and one	Baud rate	Read/ Write	Integer, range 0x0000-0x0006 0x0000 = 2400 bps， 0x0001 = 4800 bps 0x0002 = 9600 bps， 0x0003 = 19200 bps 0x0004 = 38400 bps， 0x0005 = 57600 bps 0x0006 = 115200bps Please restart after setting up

Communication example 1, reading humidity and temperature: Taking address 01 as an example, send in hexadecimal: **01 03 00 00 02 C4 0B**.

01	03	00	00	00	02	C4	0B
Module address	Read and hold register	Register Address High Bit	Low bit register address	Register quantity high	Low register quantity	CRC check low bit	CRC check high bit

If the module replies: **01 03 04 38 01 2C 7A 0B**, the humidity data read is 0x0238, which is 568 in decimal, divided by 10, it indicates that the current humidity is 56.8%, the temperature data read is 0x012C, which is 300 in decimal, divided by 10, it indicates that the current temperature is 30 degrees.

01	03	04	02	thirty-eight	01	2C	7A	0B
Module address	Read and hold register	The number of bytes in the data	Data 1 high position	Data 1 Low Bit	Data 2 high bit	Data 2 Low Bit	CRC check low bit	CRC check high bit

Communication example 2, modify module address: Taking address 01 as an example, to change the address to 02, send in hexadecimal: **01 06 07 D0 00 02 08 86**.

01	06	07	D0	00	02	08	eighty-six
Module address	Write a single hold register	Register Address High Bit	Low bit register address	data-high	data-low	CRC check low bit	CRC check high bit

If the module replies: 01 06 07 D0 00 02 08 86, it means the setting is successful, and the module address is 2.

01	06	07	D0	00	02	08	eighty-six
Module address	Write a single hold register	Register Address High Bit	Low bit register address	data-high	data-low	CRC check low bit	CRC check high bit

Communication example 3, modify module baud rate: Taking address 01 as an example, to change the baud rate to 115200, send in hexadecimal: **01 06 07 D1 00 06 58 85**.

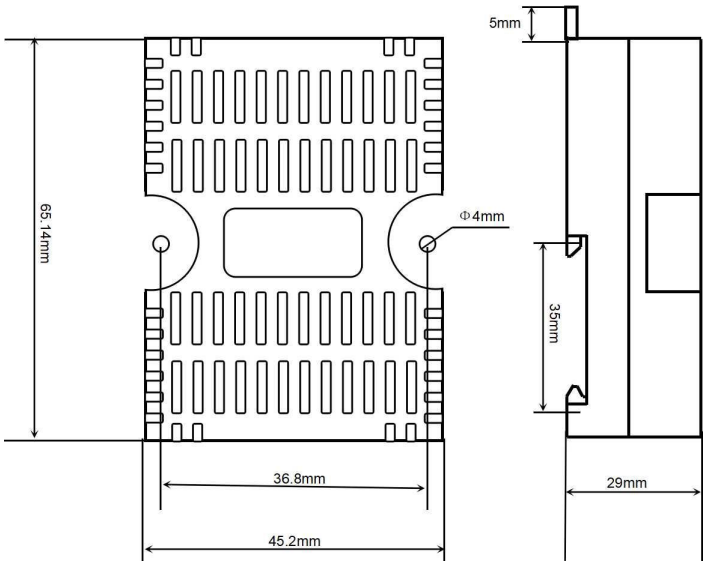
01	06	07	D1	00	06	fifty-eight	eighty-five
Module address	Write a single hold register	Register Address High Bit	Low bit register address	data-high	data-low	CRC check low bit	CRC check high bit

If the **module replies: 01 06 07 D1 00 06 58 85**, it **means** the **setting** is **successful,** and the **module address is 2.**

01	06	07	D1	00	06	fifty-eight	eighty-five
Module address	Write a single hold register	Register Address High Bit	Low bit register address	data-high	data-low	CRC check low bit	CRC check high bit

Search for **module address:** If the module address is unknown, you can send a command to search for the module. Firstly, connect the module separately to the upper computer without any other modules on the RS485 bus. Then, use hexadecimal to send: **FF 03 00 00 01 91 D4**. If the module replies with **63 03 02 01 C3 00 4D**. So the first character 0x63 in the reply is the address of the module.

Dimensions: (Unit: mm)



Can be installed on standard DIN35 rails

guarantee:

Within two years from the date of sale, if the user complies with the storage, transportation, and usage requirements and the product quality is lower than the technical specifications, it can be returned to the factory for free repair. If damage is caused due to violation of operating regulations and requirements, device fees and maintenance fees shall be paid.

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Version number: V1.0

Date: November 2023