USB/RS232/RS485 to TPUNB Wireless Serial Data Transceiver

Scan the QR code to configure the product.

I. Product Overview

This product is a long-distance wireless data transmission transceiver that utilizes domestically produced TPUNB spread-spectrum modulation. It offers high-performance, high-reliability, high-stability, and low-power wireless data transmission. It provides a high-performance, low-cost solution for complex environments where on-site wiring is impractical. Its most notable features are its long distance and low power consumption, transcending the previous requirements of on-site wiring, enabling on-site solutions without wiring. Its application scenarios in the Internet of Things are becoming increasingly widespread. This product enables one-to-one, one-to-many, or many-to-many data transmission, eliminating the need to distinguish between transmitters and receivers.

1. Wireless meter reading, such as smart electricity, water, gas, and heat meters.

2. Ultra-low-power sensors for slowly changing physical quantities (temperature, water pressure, PM2.5, geomagnetic sensors).

3. Wireless alarms (smoke detectors, pyro-infrared).

4. Remote I/O controllers (lighting control, air conditioning control).

5. Industrial applications: connecting industrial machine tools, industrial automation equipment, remote irrigation equipment, access control systems, security control systems, and highway scale data transmission.

II. Functional parameters

1. Operating frequency: 410.11-510.11 MHz (default: 410 MHz), number of wireless channels: 500.

2. Wireless range (open air): 5 km (rubber stick antenna), 10 km (suction cup antenna).

3. Maximum transmit power: 30 ± 2 dB (default: 30 dB), receive sensitivity: -120 dBm.

4. Modulation: S-FSK; maximum number of transmitted bytes: 1280.

5. Data rate: 1.2/2.4/4.8/9.6/19.2/76.8 kbps.

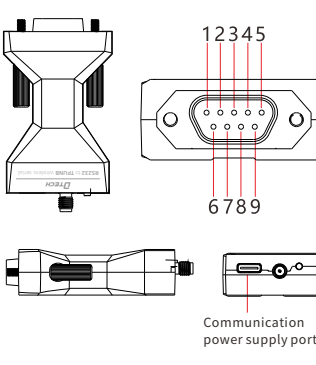
6. Serial port baud rate: 2400/4800/9600/19200/38400/57600/115200 bps. 7. Data bits: 7, 8; Stop bits: 1, 1.5, 2; Parity: None, Even, Odd.

8. Voltage: DC 5V; Current: ≤ 200mA; Operating temperature: -20°C to 85°C; Humidity: 5% to 95% RH.

9. Supports one-to-one, one-to-many, or many-to-many data transmission, eliminating the need to distinguish between transmitter and receiver.

III. Interface Description

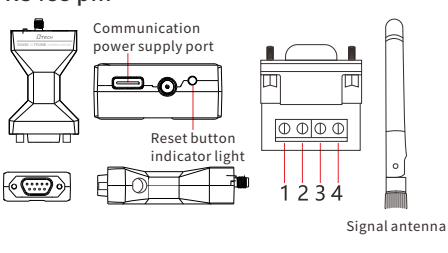
RS232-DB9 pin



Pin No	Signal
1	DCD
2	RXD
3	TXD
4	DTR
5	CND
6	DSR
7	RTS
8	CTS
9	RI

Indicator light working status
1. Red light: Power supply
2. Green light: Signal transmission
3. Yellow light: Signal reception

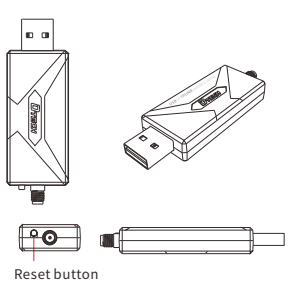
RS485 pin



Pin No	Signal
1	RS485 A
2	RS485 B
3	GND
4	DC5V IN

Indicator light working status
1. Red light: Power supply
2. Green light: Signal transmission
3. Yellow light: Signal reception

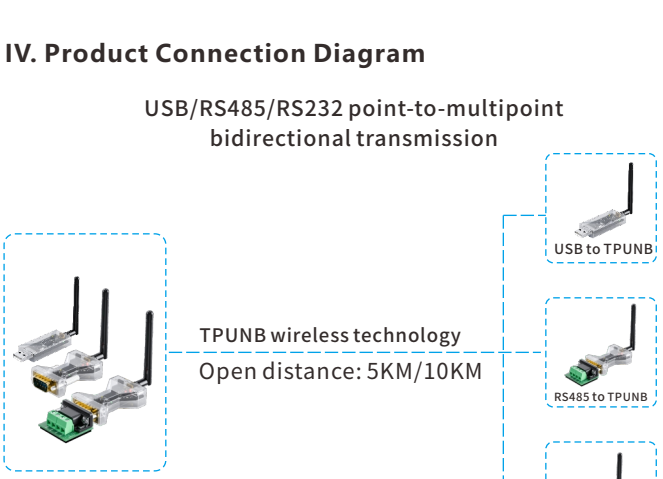
USB



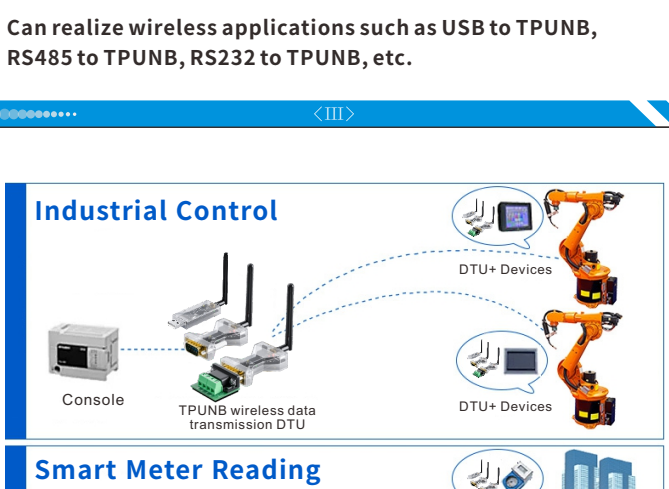
Pin No	Signal
1	USB 5V
2	D-
3	D+
4	GND

Indicator light working status
1. Red light: Power supply
2. Green light: Signal transmission
3. Yellow light: Signal reception

IV. Product Connection Diagram

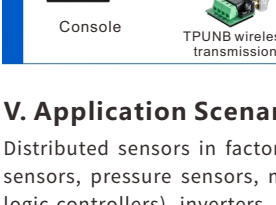


Can realize wireless applications such as USB to TPUNB, RS485 to TPUNB, RS232 to TPUNB, etc.



V. Application Scenarios

Distributed sensors in factories (such as temperature and humidity sensors, pressure sensors, motor controllers), PLCs (programmable logic controllers), inverters, and other devices usually transmit data through serial ports (RS232/RS485). Serial-to-wireless conversion allows wireless data transmission back to the monitoring center, avoiding complex wiring in the workshop.



VI. Product accessories

1. One product.

2. One data cable.

3. One antenna.

4. One RS485 terminal (for compatible models).

VII. Precautions

- During product configuration, you must switch to configuration mode. After modifying the configuration information, you can read the information with one click to verify that it is configured correctly. After configuration is complete, you must switch to transparent transmission mode. If you do not, a communication error will be reported.
- If communication fails, check that the antenna is connected and within the effective range.
- When using the Modbus protocol for transmission, ensure that the slave address is paired successfully. Refer to the sensor manual for the return data format.
- When configuring directional transmission mode, the local address must be configured to be the same.

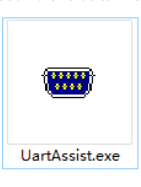
VIII. Operation Instructions

1. Access to the sensor test

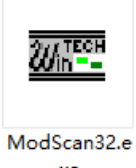
1.1 Software Preparation

1. Configuration Tool: Used to configure the product's baud rate, parity, stop bits, frequency, data rate, transmit power, and switch between configuration, transparent transmission, AT transmission, and on-demand modes. It also allows for factory reset and firmware updates.

2. The friendly debugging assistant (serial interface debugging assistant) can communicate with external devices through the serial interface, providing an interface to monitor and control the transmission and receiving of the serial interface data. Serial port communication debugging: The serial port assistant can help you verify that the serial port communication is working properly. Use the serial port assistant to open the serial port and send instructions or data to the external device, and then observe the response of the external device to verify that the communication is successful and the data interacts correctly.



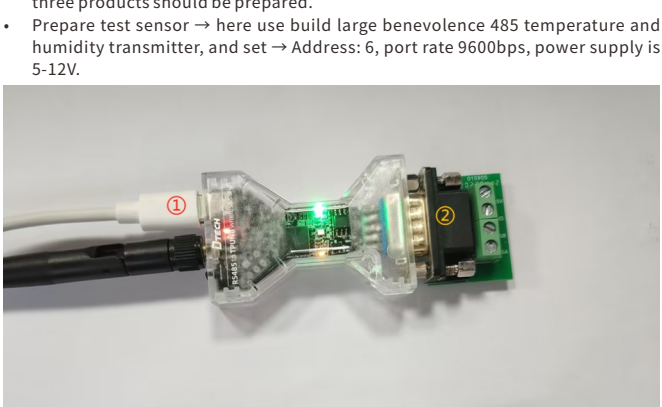
3. Modscan Is an analog and digital signal detection tool that detects the intensity and differences in both analog and digital signals. In this test, it is used to simulate the host to send instructions → to the slave (sensor) to obtain the slave (sensor) data.



4. Modbus Poll Is a debugging tool that can help users detect and manage devices. In this test, simulate the host to use ModBus protocol to the slave (sensor) command → to obtain the slave (sensor).

1.2. Hardware preparation

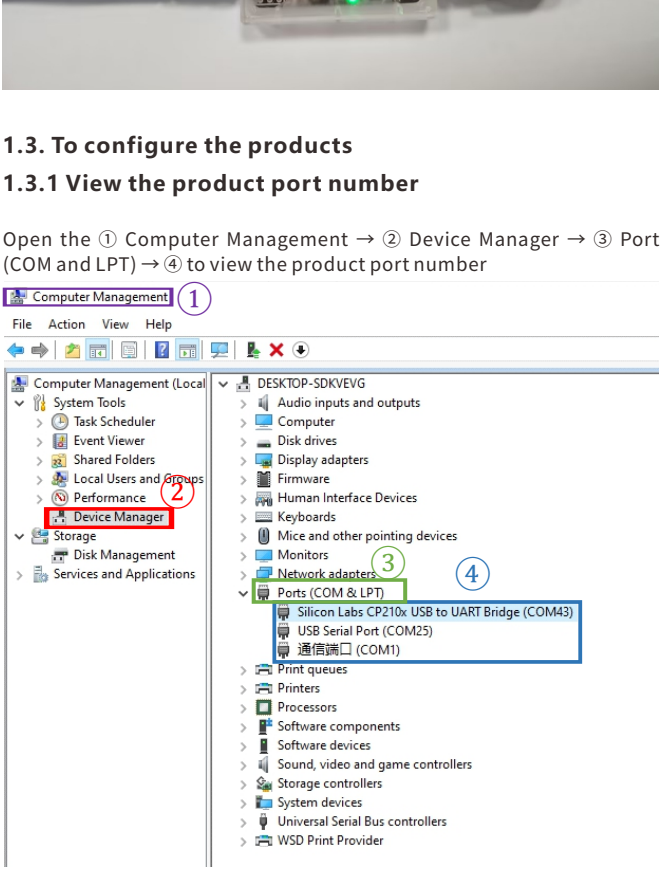
- Here, two IOT5060SA and IOT5060S products are used for testing, and these three products should be prepared.
- Prepare test sensor → here use build large benevolence 485 temperature and humidity transmitter, and set → Address: 6, port rate 9600bps, power supply is 5-12V.



1.3. To configure the products

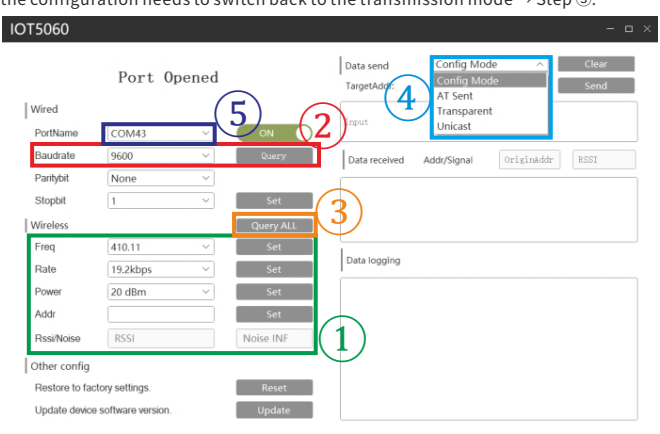
1.3.1 View the product port number

Open the ① Computer Management → ② Device Manager → ③ Port (COM and LPT) → ④ to view the product port number



1.3.2 Configuration Of Product Information

Open the configuration tool to configure the 5060S and 5060SA
① Select the corresponding string slogan
② Click to query the current port rate of the product, if you need to change the port rate, you need to switch to configuration mode = " Step ③, and then click wired configuration
③ Switch to switch data mode sending
④ Click one to query the current information of the product
①The ⑤ 5060S and 506SA setting frequency point and rate remain the same, click Configure in configuration mode., Verify that the configuration is successful, after the configuration needs to switch back to the transmission mode → Step ③.



Note: After the configuration, the product data transmission mode should be: through transmission mode, otherwise Error error will be reported1.4. Transparent transmission test.

- Transparent transmission test with Model 485 sensor based on Modbus protocol.
- The configuration steps of 1.3 are to be completed.
- Connect the configured 5060SA product (the port rate coincides with the sensor port rate) to the sensor as the slave.
- 5060S access computer as the host. Test whether the host sends instructions to the slave and the slave returns data.Based on Modbus, the protocol uses ModScan32 \ ModBus Poll software to simulate the host to send command data to the sensor. Get the data returned by the sensor.

1.4. Transparent transmission test

Transparent transmission protocol test refers to the same frequency point, wave rate and rate configuration information set between the product. All products under this configuration information can transmit data to each other. It can be a one-to-one mode or a one-to-many mode.
One transmitter (TX) and two receiver (RX): one receiver (RX) access to the computer and one receiver (RX) access sensor.

The following is tested using the serial port debugging assistant and the Modbus-based protocol

- Use a friendly debugging assistant for transparent transmission
- Transparent transmission test with Model 485 sensor based on Modbus protocol.
- The configuration steps of 1.3 are to be completed
- Connect the configured 5060SA product (the port rate is consistent with the sensor port rate) to the sensor as the slave,
- 5060S access computer as the host. Test whether the host sends instructions to the slave and whether the receiving end returns data.
- Use the friendly debugging assistant to test whether you can send and receive the transmitted data normally in the transparent transmission mode.
- Based on Modbus, the protocol uses ModScan32 \ ModBus Poll software to simulate the command data to the sensor. Get the data returned by the sensor.

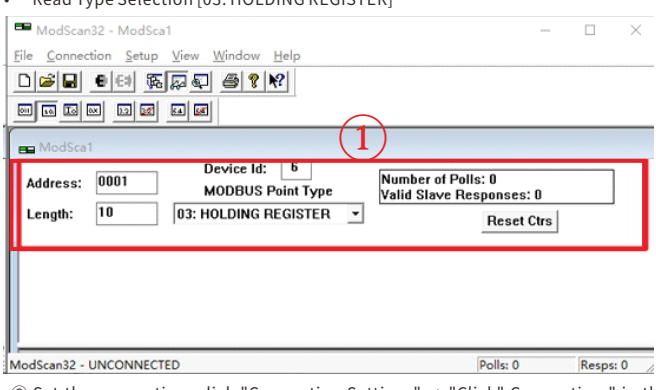
1.4.1. Serial port debugging assistant test

1.4.2 Transmission and transmission test based on the Modbus protocol

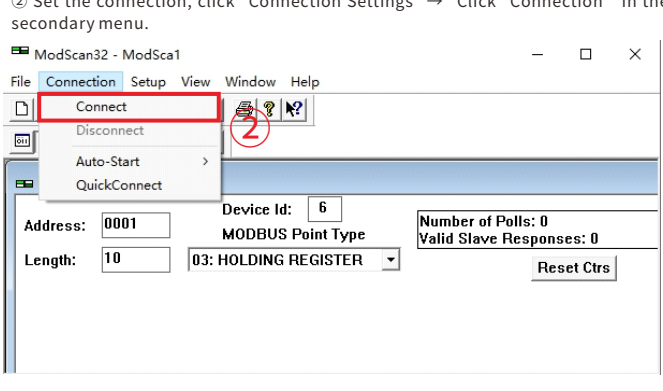
1.4.2.1 ModScan32 software

Open the ModScan32 software, click the [Display Flow] icon button, and set the sensor parameters as follows:
① Set the parameters for obtaining the slave (sensor):

- Register address Address Enter "0001"
- The sensor device ID input is the corresponding sensor ID, here is "6"
- Read length Length input "10"
- Read Type Selection [03: HOLDING REGISTER]

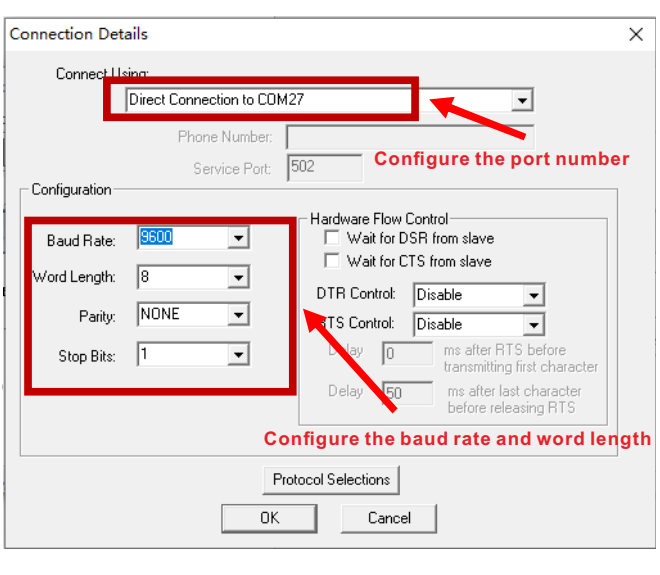


② Set the connection, click "Connection Settings" → "Click" Connection " in the secondary menu.

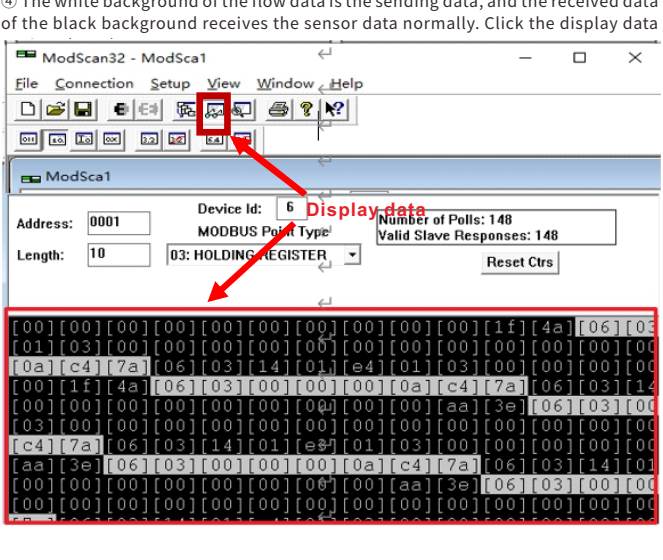


③ Click the connection, set the connection information as follows:

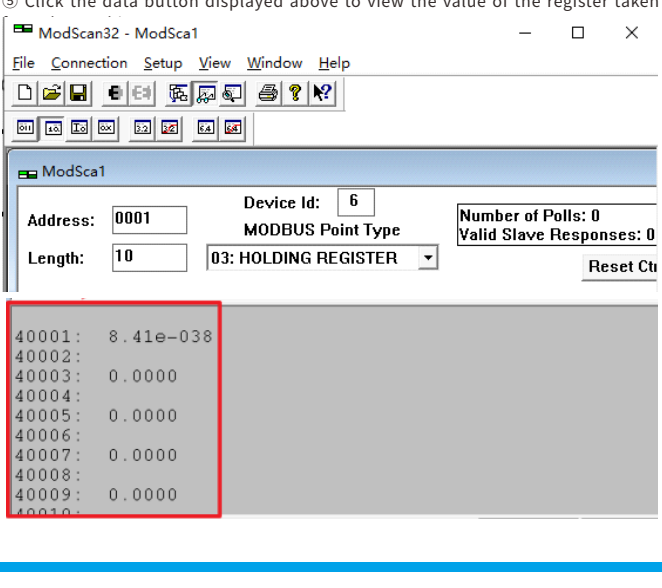
- The connection used selects the port number of 5060, here is "COM27"
- Baud rate is selected "9600"
- Word length, select "8""
- Parity selection "None"
- Stop the bit selection '1'
- [Confirm] to connect



④ The white background of the flow data is the sending data, and the received data of the black background receives the sensor data normally. Click the display data



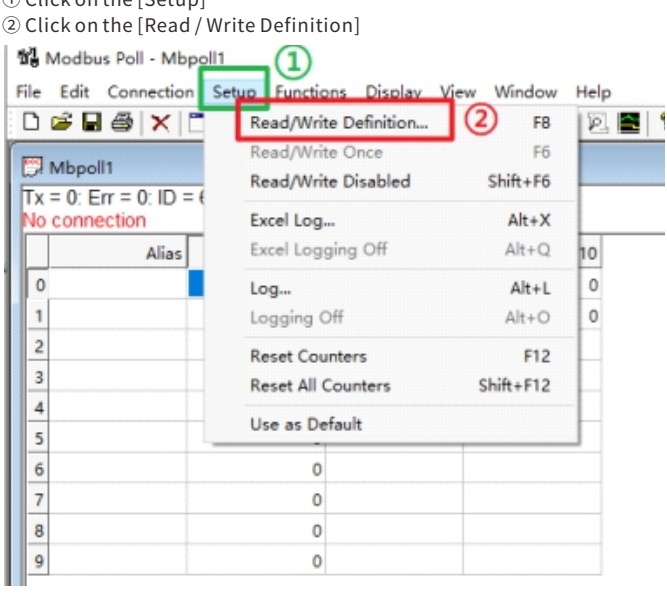
⑤ Click the data button displayed above to view the value of the register taken



1.4.2.2 ModBus Poll software

1.4.2.2.1 Open the ModBus Poll software

① Click on the [Setup]
② Click on the [Read / Write Definition]



1.4.2.2.2 Set up to acquire the slave parameters

The slave (sensor) parameters are set as follows:
①

- Slave ID Enter the corresponding sensor ID, here is "6"
- Function Select "03 Read Holding Registers (4x)"
- Address Enter '0'
- Quantity Enter "10"

②

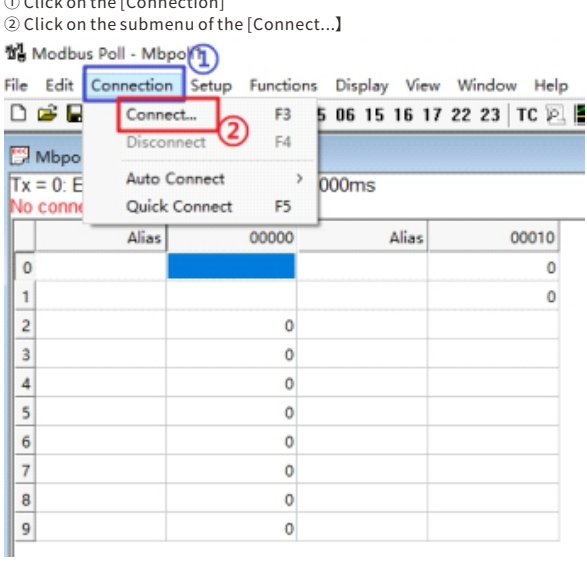
- Click [Apply] to apply the configured settings

③

- Click [OK] to complete

1.4.2.2.3 Configure the connection settings

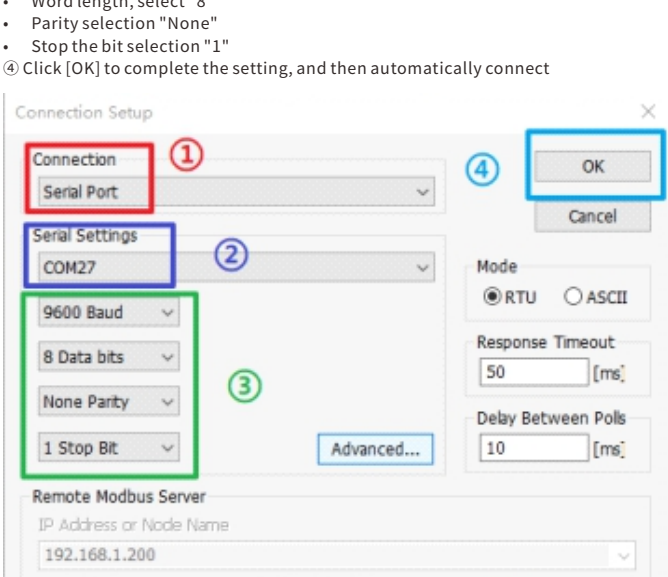
① Click on the [Connection]
② Click on the submenu of the [Connect...】



Arrange the connection parameters as follows:
①Connection Select "Serial Port"
② Port number Select the corresponding 5060S, here "COM27"
③

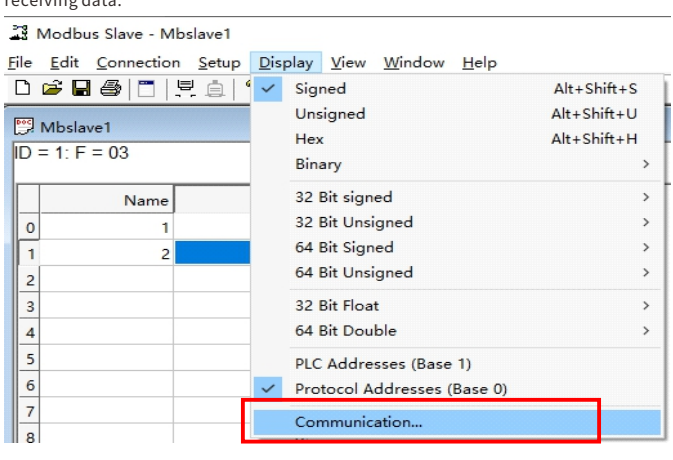
- Baud rate is selected "9600"
- Word length, select "8""
- Parity selection "None"
- Stop the bit selection "1"

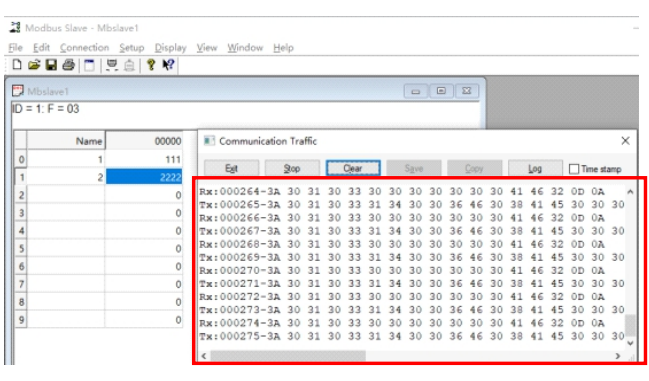
④ Click [OK] to complete the setting, and then automatically connect



1.4.2.2.4 View and obtain the slave data

After successful connection, you can see the received sensor data. Click the button [Display] → " [communication traffic] icon button to view the received and receiving data.



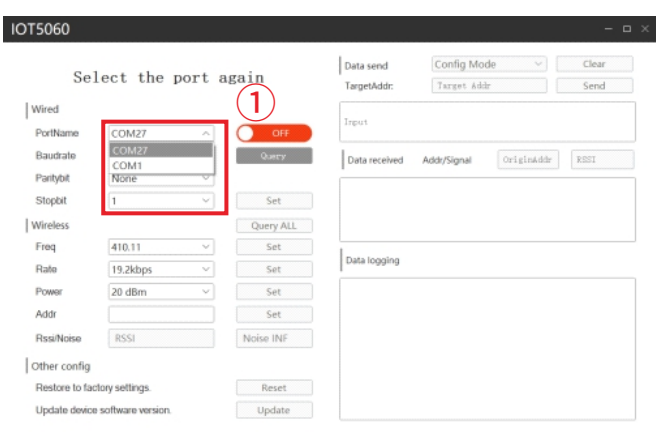


1.5. Directed transmission test

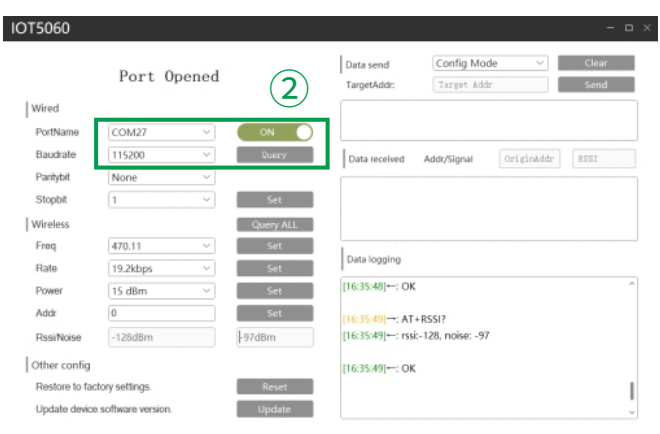
- Use scenarios: directional transmission use scenarios can be used in the case of two pairs of sending and receiving without interference.
- Directed transmission can send data to each other by configuring the product with the same native address, port rate, frequency point, and rate. Data is not accepted for devices with the same configuration but with different native addresses.

1.5.1 Configuration steps

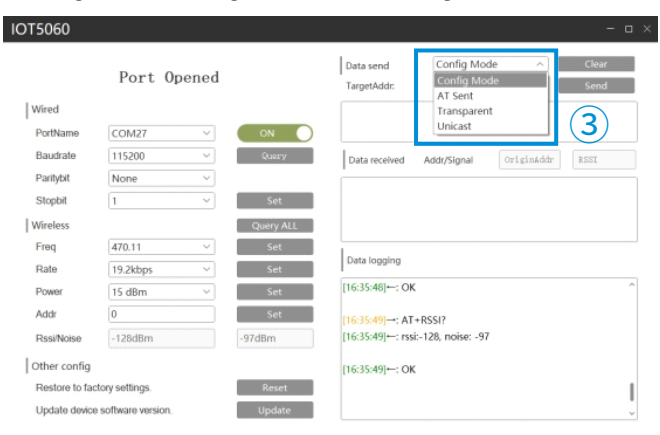
① Select the string slogan corresponding to the product.



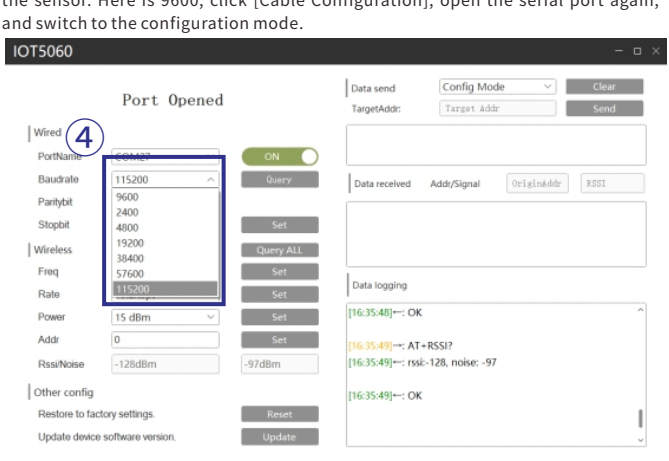
② Query the port rate, the query will automatically open the serial port.



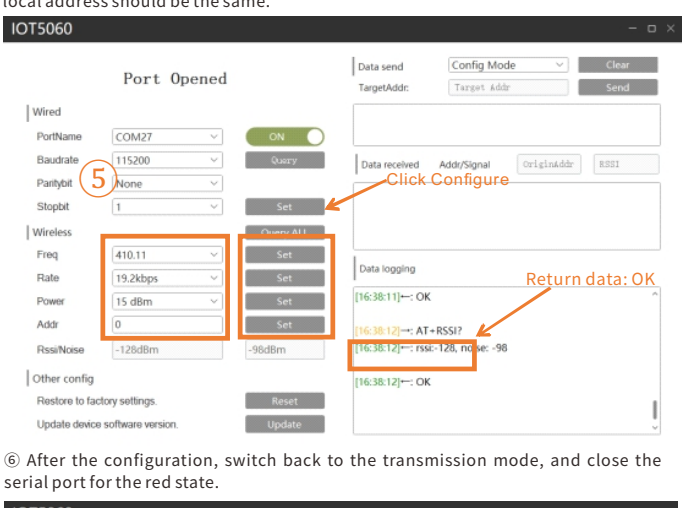
③ Configure data sending mode: switch to configuration mode.



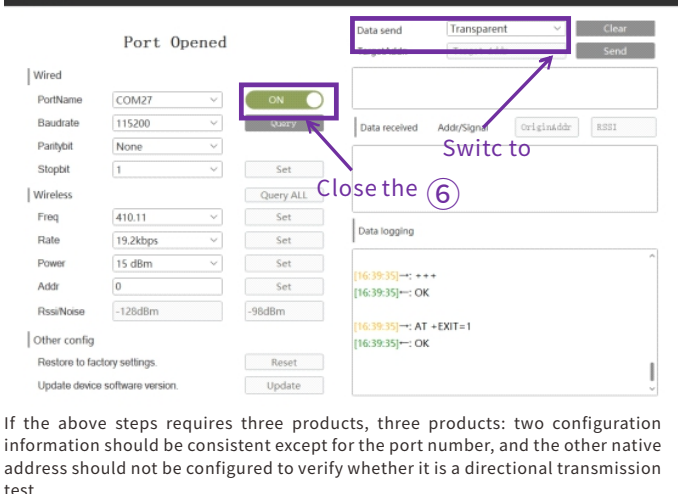
④ Click the [port rate] drop-down menu to switch to the port rate corresponding to the sensor. Here is 9600, click [Cable Configuration], open the serial port again, and switch to the configuration mode.



⑤ In the configuration mode, click one key to query the information, query the product information, and then configure the frequency point, rate, and the local address of the product. Click the drop-down menu from must click [Configuration] Data debugging box back OK means the configuration is successful → Note that the local address should be the same.



⑥ After the configuration, switch back to the transmission mode, and close the serial port for the red state.

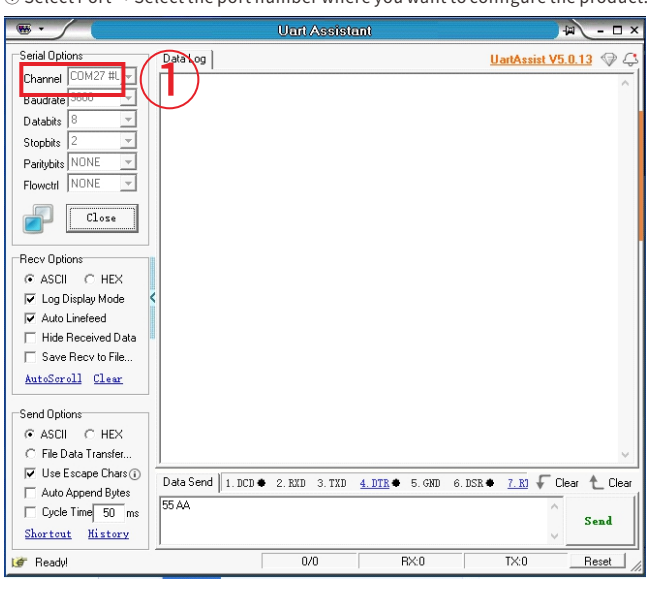


If the above steps requires three products, three products: two configuration information should be consistent except for the port number, and the other native address should not be configured to verify whether it is a directional transmission test.

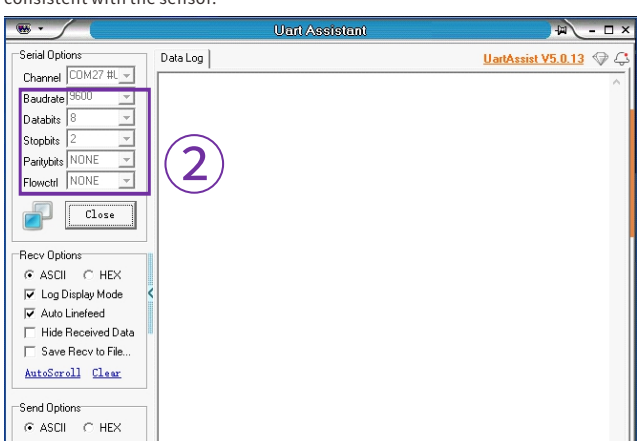
1.5.2 Test steps

1.5.2.1 Serial port debugging assistant test

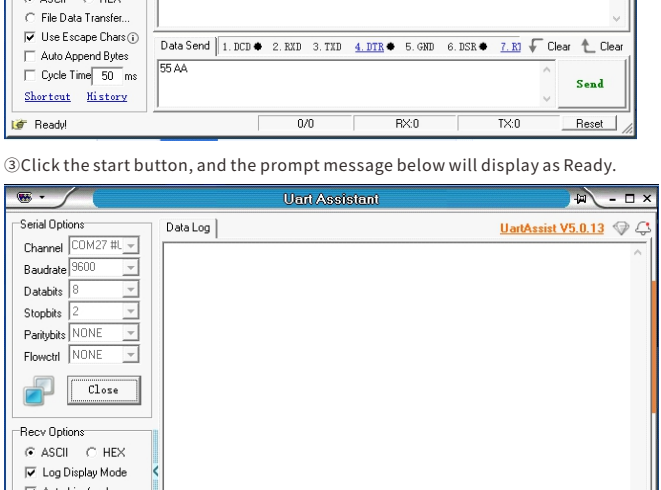
① Select Port → Select the port number where you want to configure the product.



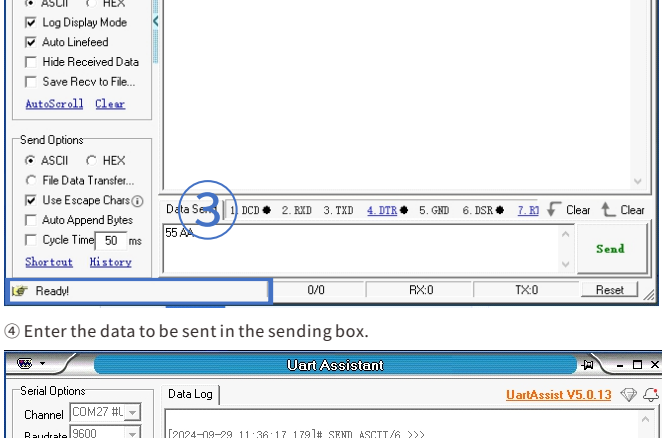
②Configure the port rate, data bit, check bit, stop bit. The baud rate should be consistent with the sensor.



③Click the start button, and the prompt message below will display as Ready.



④ Enter the data to be sent in the sending box.



Configure two transmitters, one with the same native address as the receiver.

Product Warranty Card

Customer Information

Model:	
Date of purchasel:	
User telephone:	
User address:	
Distributor:	
Agency address:	
User telephone:	Dealer stamp valid

Intenance Records

Repair times	Date	Fault	Treatment measures	Repair work NO.

Electronic products are guaranteed for one year, and other products are guaranteed for two years. Damage caused by human factors or product burnout caused by improper operation is not included in the scope of warranty.