USB/RS232/RS485 to TPUNB Wireless Serial Port Data Transceiver

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I. Product Overview

This product is a long-distance wireless data transmission transceiver. It adopts domestic TPUNB spread spectrum modulation for data transmission, featuring high performance, high reliability, high stability and low power consumption. It provides a high-performance and low-cost solution for complex environments where on-site wiring cannot be implemented. Its most prominent advantages are ultra-long transmission distance and low power consumption. It breaks the limitation of traditional on-site wiring, enabling on-site requirements to be met without laying cables. It is widely applied in various IoT scenarios. The product supports one-to-one, one-to-many and many-to-many data transmission modes, with no need to distinguish between transmitter and receiver.

1.Wireless meter reading: smart electric meters, smart water meters, smart gas meters, heat meters, etc.

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

3.Wireless alarm devices (smoke detectors, passive infrared sensors).

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

5.Industrial equipment connection: CNC machine tools, industrial automation instruments, long-distance irrigation equipment, access control systems, security monitoring systems, highway weighbridge data transmission and other industrial devices.

II. Functional Parameters

1. Operating Frequency: 410.11~510.11MHz (Default: 410MHz), Number of Wireless Channels: 500.

2. Wireless Distance (Open Area): 3Km (Rubber Antenna), 8Km (Suction Cup Antenna).

3. Maximum Transmit Power: 30±2dB (Default: 30dB), Receiver Sensitivity: -120dBm.

4. Modulation Mode: S-FSK; Maximum Transmission Bytes: 1280.

5. Air Rate: Supports 1.2/2.4/4.8/9.6/19.2/76.8kbps.

6. Serial Baud Rate: 2400/4800/9600/19200/38400/57600/115200bps.

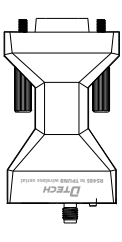
7. Data Bits: 7, 8; Stop Bits: 1, 1.5, 2; Parity Bits: None, Even, Odd.

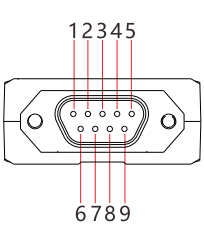
8. Voltage: DC 5V; Current: Below 200mA; Operating Temperature: -20~85°C; Humidity: 5%~95%RH.

9. Supports one-to-one, one-to-many, or many-to-many data transmission modes, with no need to distinguish between the transmitter and receiver.

III. Interface Description

RS232 DB9 Interface





Signal Antenna

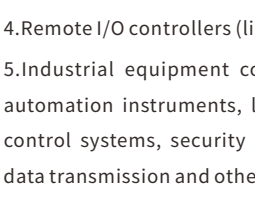
Pin No	Signal
1	NC
2	RXD
3	TXD
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC

Reset Button
Indicator Light

Communication & Power Port

Indicator Light Working Status:
1.Red Indicator: Power Indication
2.Green Indicator: Signal Transmission
3.Yellow Indicator: Signal Reception

RS485 Pin Connector

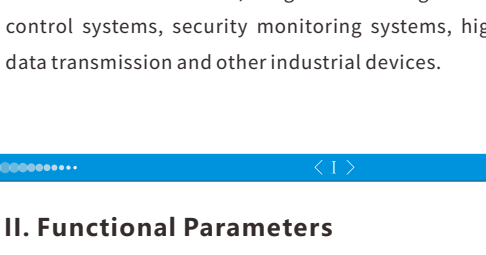


Signal Antenna

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

Indicator Light Status:
1.Red Indicator: Power Indication
2.Green Indicator: Signal Transmission
3.Yellow Indicator: Signal Reception

USB



Signal Antenna

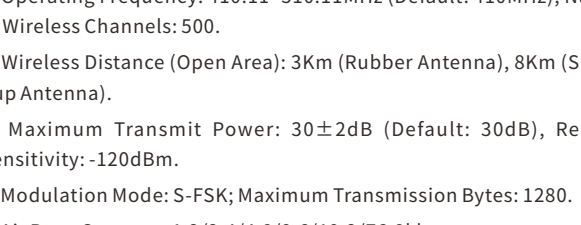
Reset Button
Indicator Light

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

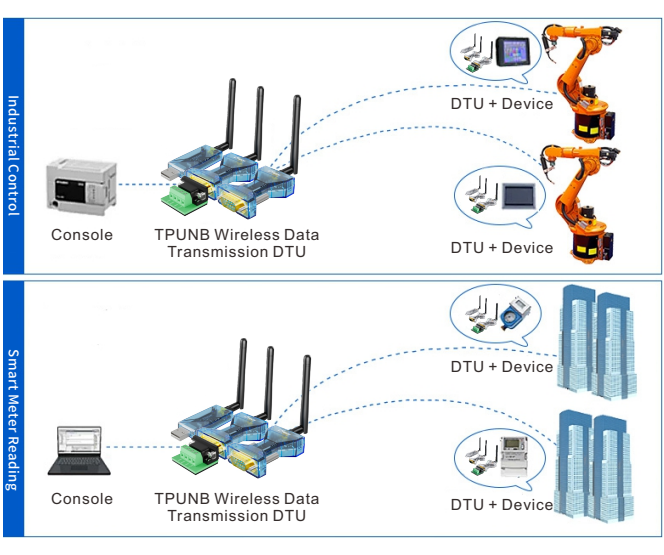
Indicator Light Status:
1.Red Indicator: Power Indication
2.Green Indicator: Signal Transmission
3.Yellow Indicator: Signal Reception

IV. Product Connection Diagram

USB/RS485/RS232 Point-to-Multipoint Bidirectional Transmission

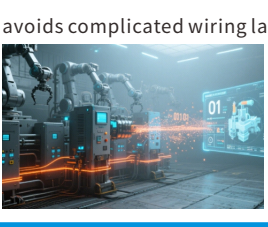


It supports wireless applications such as USB to TPUNB, RS485 to TPUNB, and RS232 to TPUNB.



V. Application Scenarios

Distributed devices in factories, including temperature and humidity sensors, pressure sensors, motor controllers, PLCs (Programmable Logic Controllers), inverters and other equipment, usually transmit data through RS232/RS485 serial ports.Serial-to-wireless conversion realizes wireless data transmission back to the monitoring center and avoids complicated wiring layout in the workshop.



VI. Product Accessories

1.1 unit of main product.

2.1 piece of data cable.

3.1 piece of antenna.

4.1 RS485 wiring terminal (for applicable models).

VII. Notes

- When configuring the product, it must be switched to configuration mode. After modifying the configuration parameters, you can read the information with one click to verify if the settings are correct. After configuration, switch back to transparent transmission mode; otherwise, communication errors will occur.
- If communication fails, check whether the antenna is properly connected and whether the device is within the effective transmission range.
- When transmitting data via the Modbus protocol, confirm that the slave address is matched correctly, and refer to the sensor manual for the format of returned data.
- When configuring directional transmission mode, set the local addresses to be identical.

VIII. Operation Guide

1. Connect the sensor

1.1 Software Preparation

1. Configuration tool: It is used to configure the product's baud rate, parity bit, stop bit, frequency point, transmission rate and transmit power, as well as to switch among configuration mode, transparent transmission mode, AT sending mode and on-demand mode. It also supports factory reset and firmware upgrade.

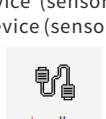
2.The Friendly Debug Assistant (Serial Port Debug Assistant) can communicate with external devices through the serial port. It provides an interface to monitor and control the sending and receiving of serial port data.Serial communication debugging: The serial port assistant can help you verify whether serial communication works properly. Open the serial port with the assistant, send commands or data to external devices, then check the response from the devices to confirm normal communication and correct data interaction.

SerialPortUtility.exe

3.Modscan is an analog and digital signal detection tool, which can detect the strength and difference of analog and digital signals. In this test, it is used to simulate the master station to send commands to the slave station (sensor) via the ModBus protocol and acquire data from the slave station (sensor).

ModScan32.exe

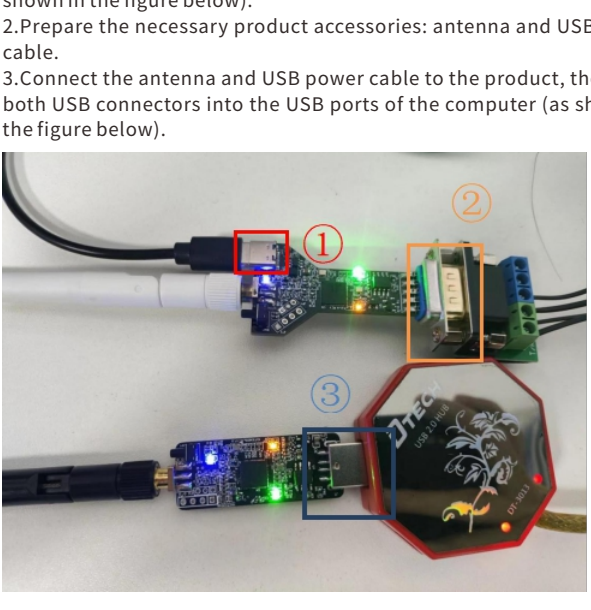
4. Modbus Poll is a debugging tool that helps users detect and manage devices. In this test, it is used to simulate the master device sending commands to the slave device (sensor) via the Modbus protocol to obtain data from the slave device (sensor).



mbpoll.exe

1.2. Hardware Preparation

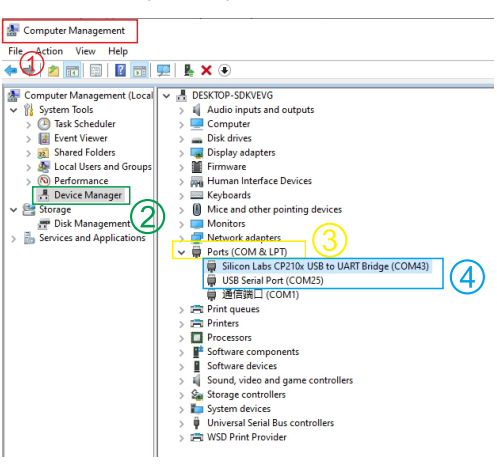
1.Prepare the required TPUNB wireless serial port transceiver (as shown in the figure below).
2.Prepare the necessary product accessories: antenna and USB power cable.
3.Connect the antenna and USB power cable to the product, then plug both USB connectors into the USB ports of the computer (as shown in the figure below).



1.3. Product Configuration

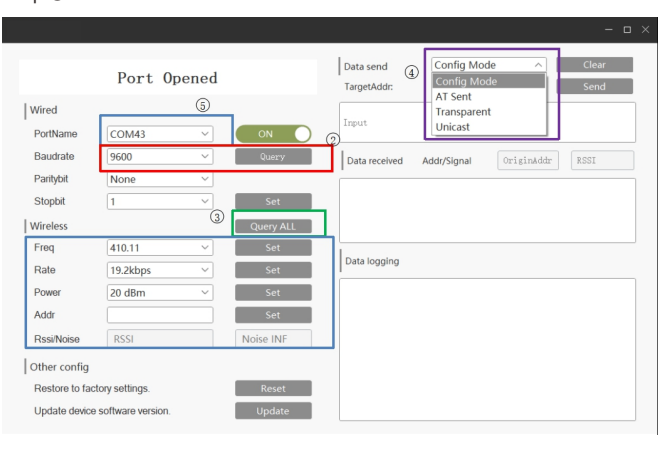
1.3.1 Check the product port number

Open ① Computer Management → ② Device Manager → ③ Ports (COM and LPT) → ④ Check the product port number.



1.3.2 Configure Product Information

Open the configuration tool and set up the TPUNB wireless serial port transceiver.
① Select the corresponding serial port number.
② Click to query the current baud rate of the product. If the baud rate needs to be modified, switch to configuration mode (Step ③), then click Wired Configuration.
③ Switch to the sending mode for data mode switching.
④ Click One-click Query to view the current product information.
⑤ Set the same frequency point and transmission rate for both TPUNB wireless serial port transceivers. Click Configure in configuration mode to verify whether the configuration is successful. After configuration is completed, switch back to transparent transmission mode following Step ③.



The data transmission mode must be transparent transmission mode; otherwise, an error will be reported.
1.4 Transparent Transmission Test

- Perform a transparent transmission test with the 485 sensor based on the Modbus protocol.
- Complete the configuration steps in section 1.3 first.
- Connect the configured TPUNB wireless serial port transceiver (with the same baud rate as the sensor) to the sensor and set it as the slave device.
- Connect another TPUNB wireless serial port transceiver to the computer and set it as the master device. Test whether the slave device returns data when the master sends commands.

Use ModScan32 and ModBus Poll software respectively to simulate the master device sending command data to the sensor based on the Modbus protocol, and obtain the return data from the sensor.

1.4. Transparent Transmission Test

Transparent transmission protocol test means that when multiple devices of this product are configured with the same frequency point, baud rate and transmission rate, all devices under the same configuration can transmit data to each other. It supports one-to-one and one-to-many transmission modes.
One transmitter (TX) and two receivers (RX): one receiver (RX) is connected to a computer, and the other receiver (RX) is connected to a sensor.

The following tests are conducted by using a serial port debugging assistant and based on the Modbus protocol respectively.

- Use Friendly Debug Assistant for transparent transmission.
- Conduct a transparent transmission test with the 485 sensor based on the Modbus protocol.
- Complete the configuration procedures in section 1.3 first.
- Connect the configured TPUNB wireless serial port transceiver (with the same baud rate as the sensor) to the sensor as the slave device.
- Connect another TPUNB wireless serial port transceiver to the computer as the master device. Test whether the receiver returns data when the master sends commands to the slave.
- Use the Friendly Debug Assistant to verify normal data sending and receiving in transparent transmission mode.
- Based on the Modbus protocol, use ModScan32 and ModBus Poll software respectively to simulate the master station sending command data to the sensor, and acquire the response data returned by the sensor.

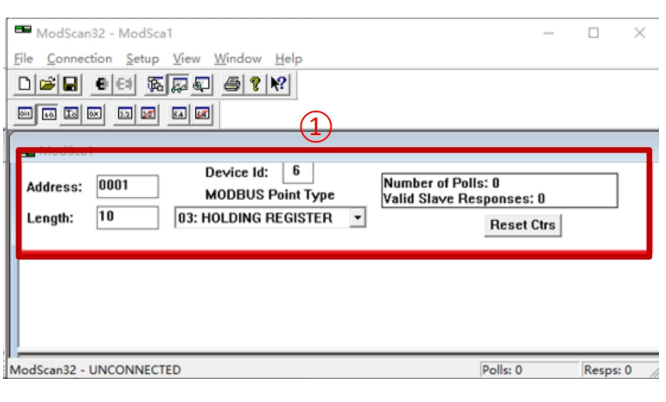
1.4.1.Serial Port Debug Assistant Test

1.4.2Modbus Protocol Based Transmission Test

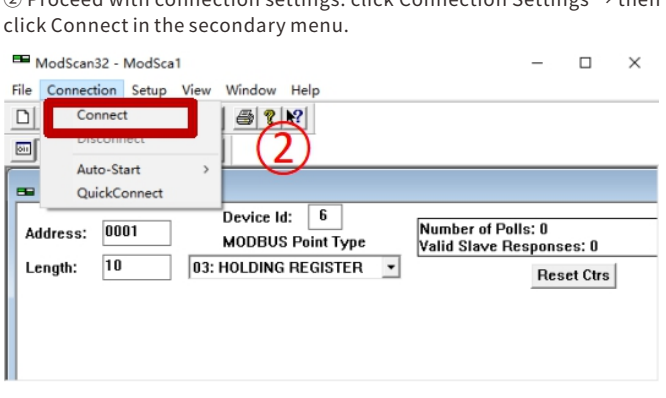
1.4.2.1 ModScan32 Software

Open ModScan32 software and click the Display Traffic icon button, then configure the sensor parameters as follows:
① Set the parameters for acquiring data from the slave (sensor):

- Enter 0001 in the register Address.
- Input the corresponding sensor ID in the Device ID field; enter 6 in this case.
- Enter 10 for the read Length.
- Select 03:HOLDING REGISTER as the reading type.

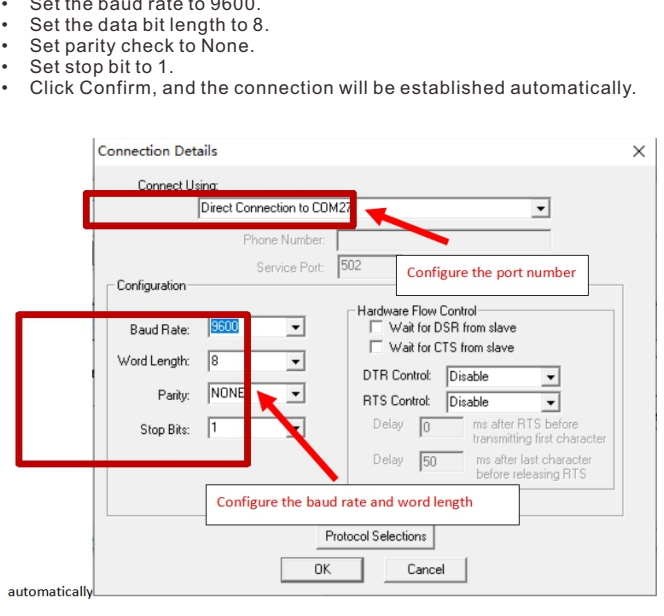


② Proceed with connection settings: click Connection Settings → then click Connect in the secondary menu.

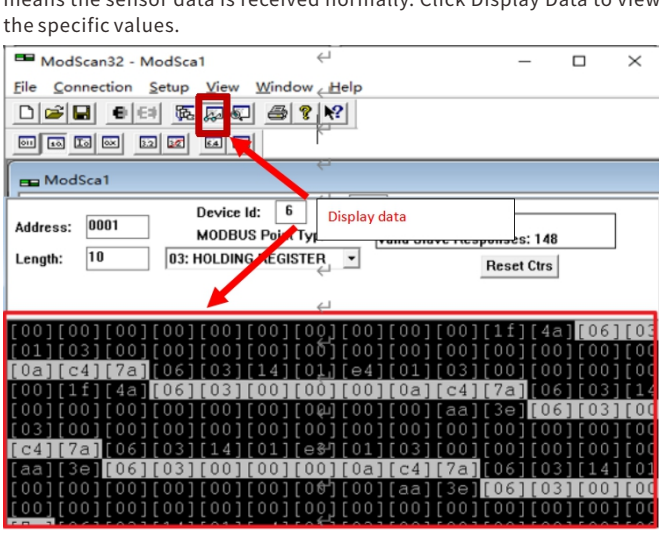


③ After clicking Connect, configure the connection information as follows:

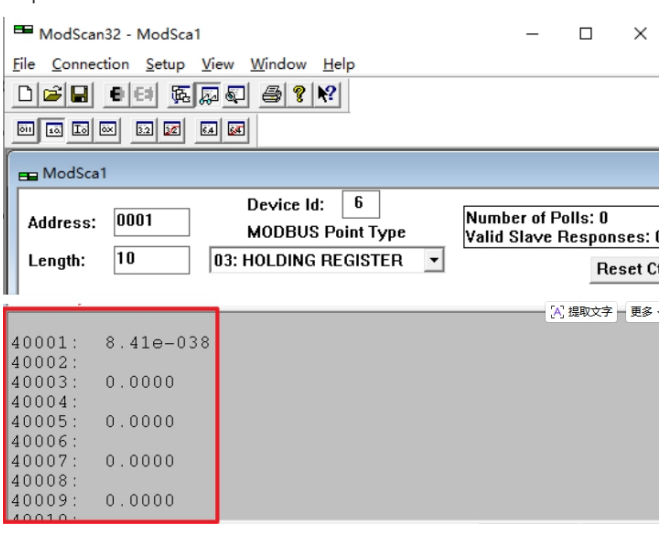
- Select the port number corresponding to the TPUNB wireless serial port transceiver for the connection; here it is COM27.
- Set the baud rate to 9600.
- Set the data bit length to 8.
- Set parity check to None.
- Set stop bit to 1.
- Click Confirm, and the connection will be established automatically.



④ In the traffic data area, the content with a white background indicates sent data, and the content with a black background indicates received data.One sending frame matched with one receiving frame means the sensor data is received normally. Click Display Data to view the specific values.



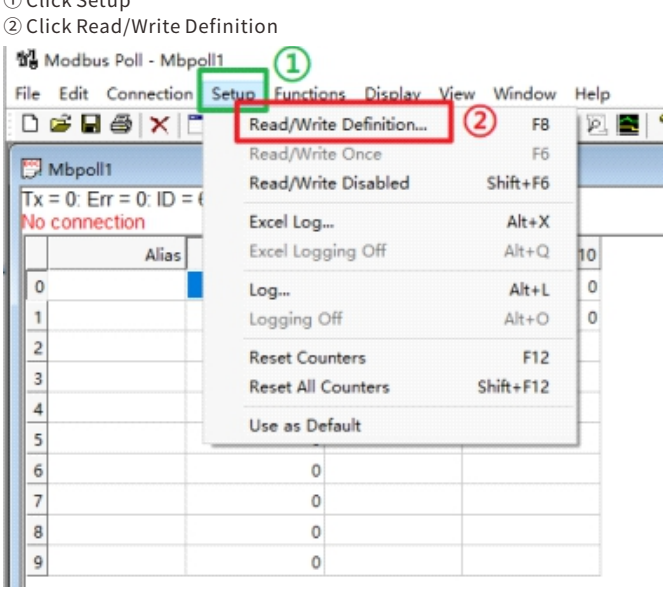
⑤ Click the Display Data button at the top to view the register values acquired from the slave device.



1.4.2.2 ModBus Poll software.

1.4.2.2.1 Open the ModBus Poll software.

① Click Setup
② Click Read/Write Definition



1.4.2.2.2 Set parameters for acquiring slave device data.

Configure the parameters of the slave (sensor) as follows:
①

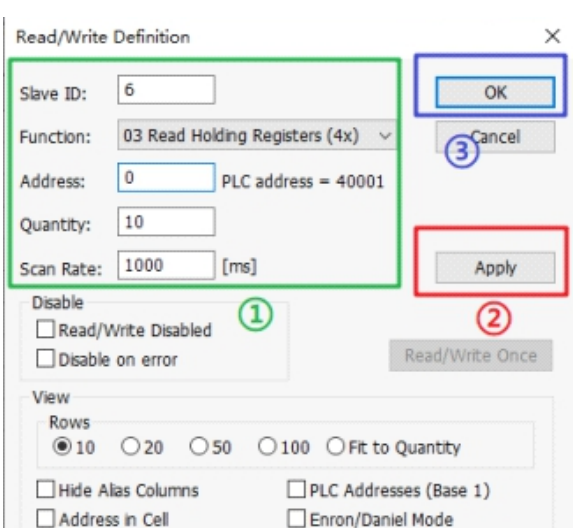
- Enter the corresponding sensor ID in Slave ID, enter 6 in this case.
- Select 03 Read Holding Registers (4x) for Function.
- Enter 0 in Address.
- Enter 10 in Quantity.

②

- Click Apply to save and apply the configured settings.

③

- Click OK to complete the configuration.



1.4.2.2.3 Configure Connection Settings

① Click Connection
② Click Connect... in the submenu

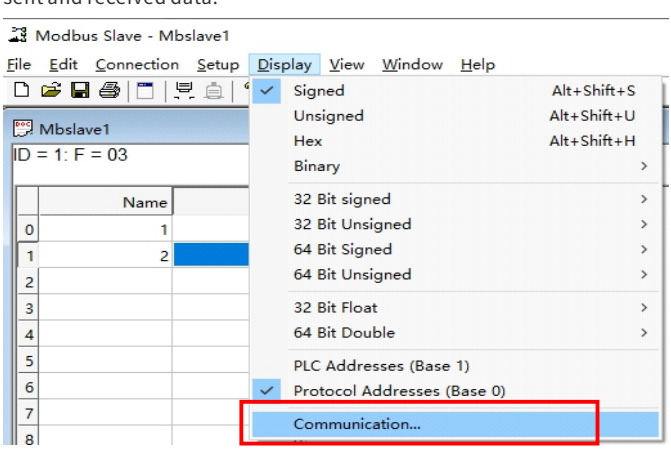
Configure the connection parameters as follows:
① Select Serial Port for Connection.
② Choose the port number corresponding to model 5095S; here it is COM27.
③

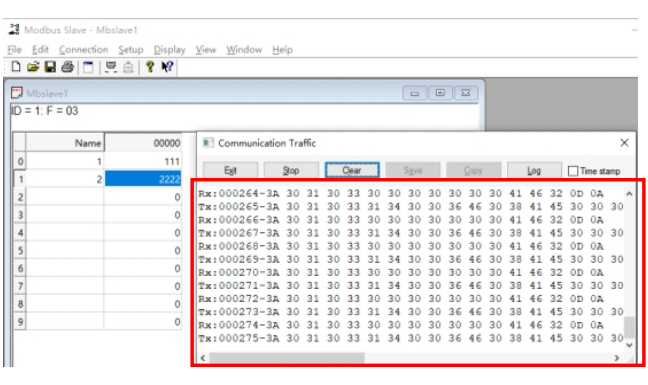
- Baud rate: select 9600
- Data bits: select 8
- Parity: select None
- Stop bits: select 1

④ Click OK to finish the configuration, and the connection will be established automatically.

1.4.2.2.4 View Acquired Slave Device Data

After the connection is successful, you can view the received sensor data.Click Display → Communication Traffic icon button to check the sent and received data.



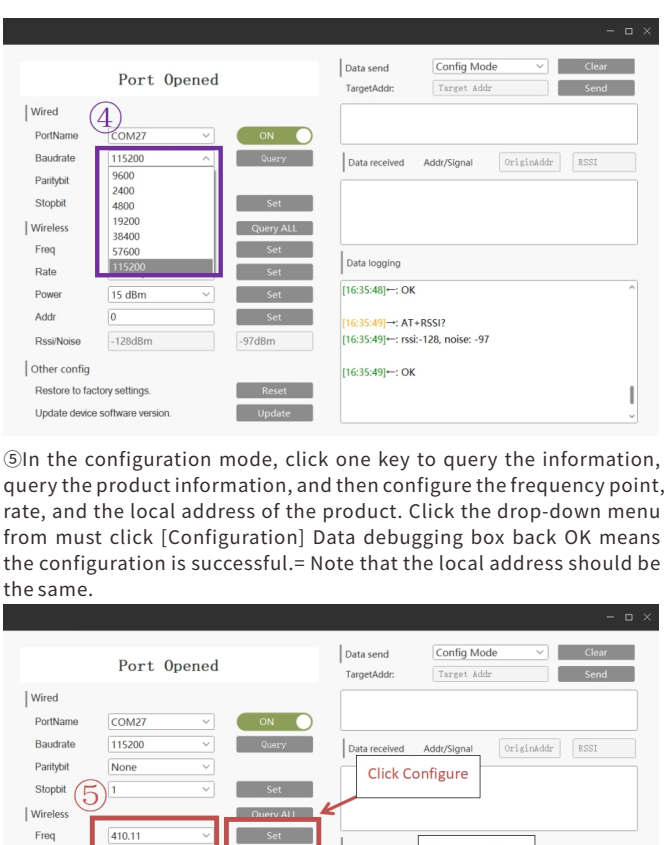


1.5. Directed Transmission Test

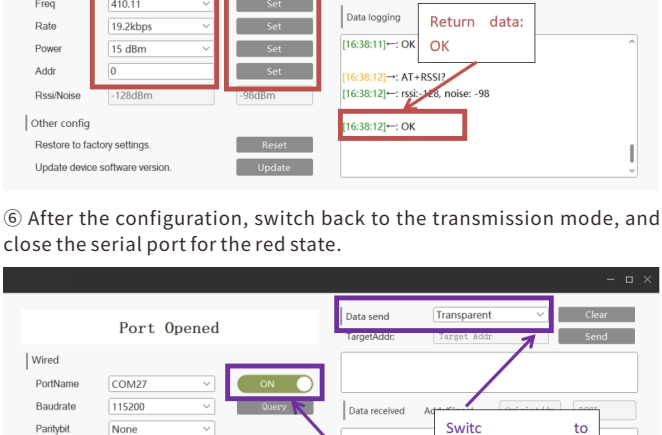
- Application Scenario:Directed transmission is applicable to scenarios where two pairs of transceivers need to work without mutual interference.
- For directed transmission, devices with the same local address, baud rate, frequency point and air rate can transmit data to each other.Devices with identical parameters but different local addresses cannot receive data from one another.

1.5.1 Configuration Steps

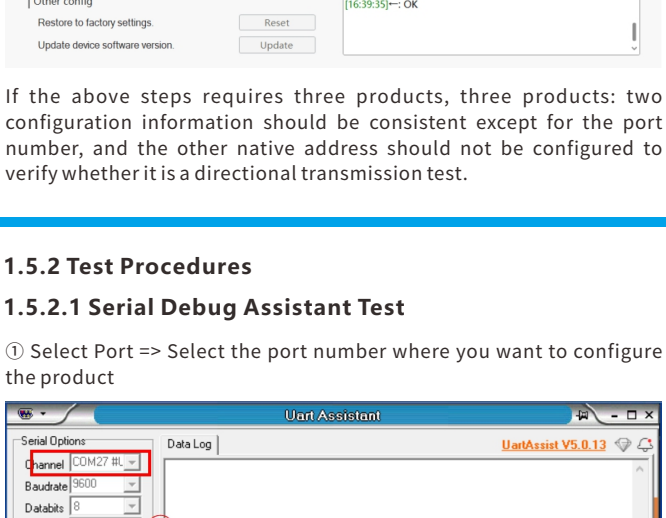
① Select the string slogan corresponding to the product.



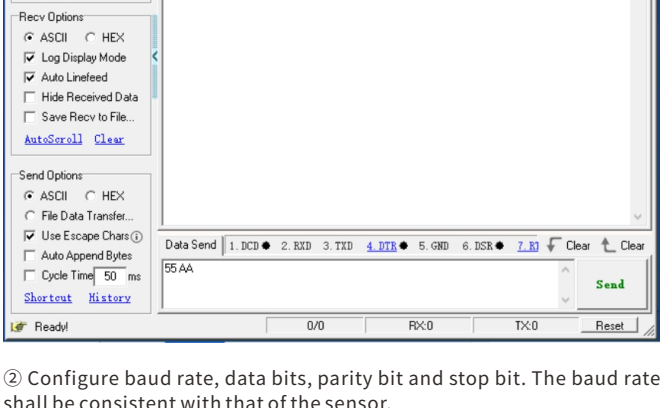
② Query the port rate, the query will automatically open the serial port.



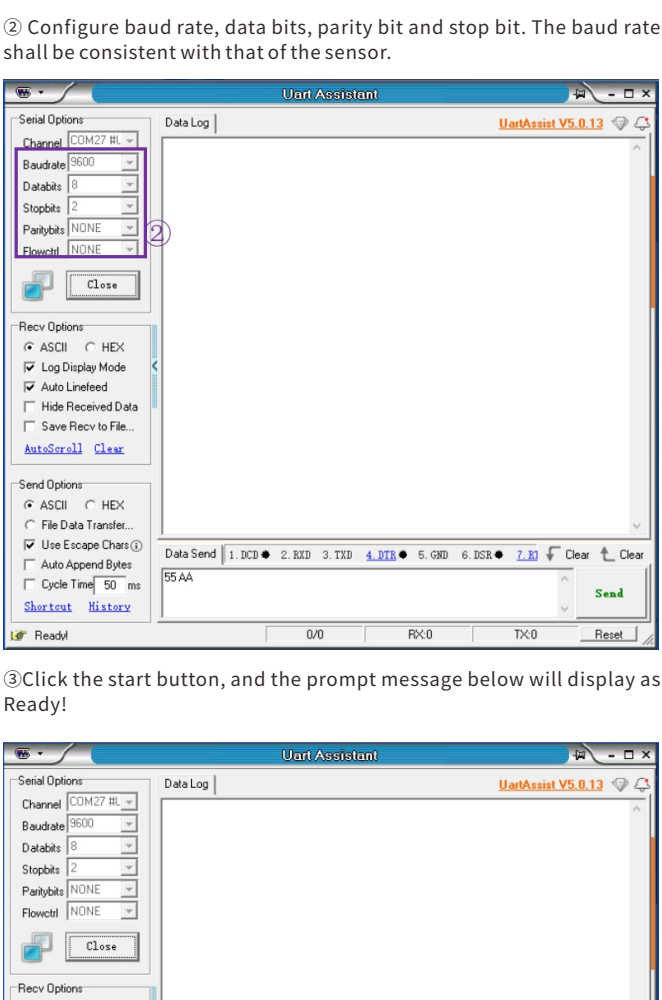
③ Configure the data transmission mode: switch to configuration mode.



④Click 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.



⑤In 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.



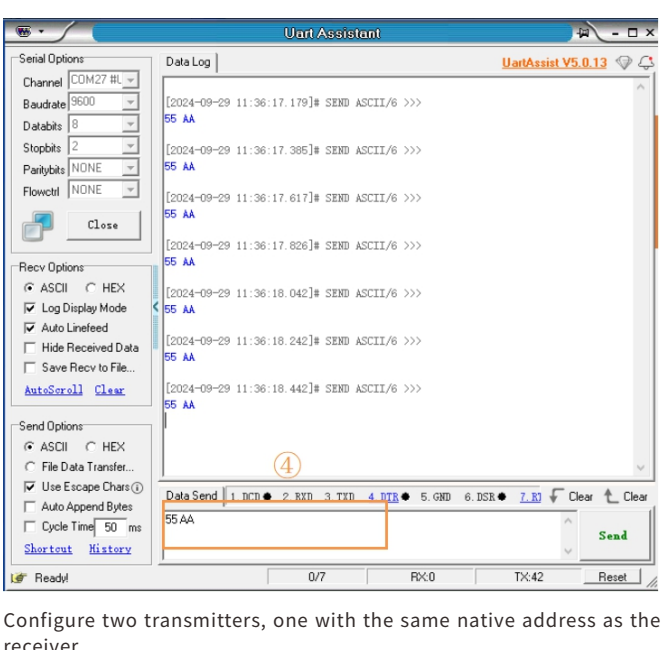
⑥ After the configuration, switch back to the transmission mode, and close the serial port for the red state.

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.

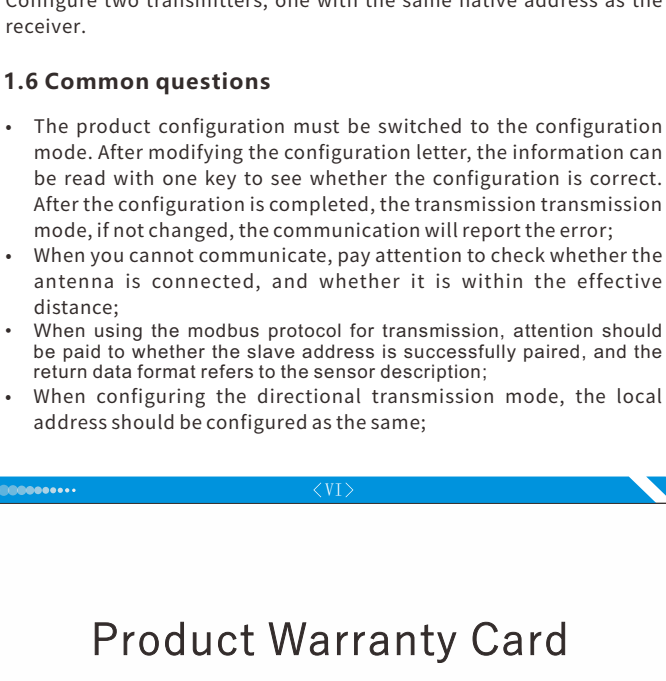
1.5.2 Test Procedures

1.5.2.1 Serial Debug Assistant Test

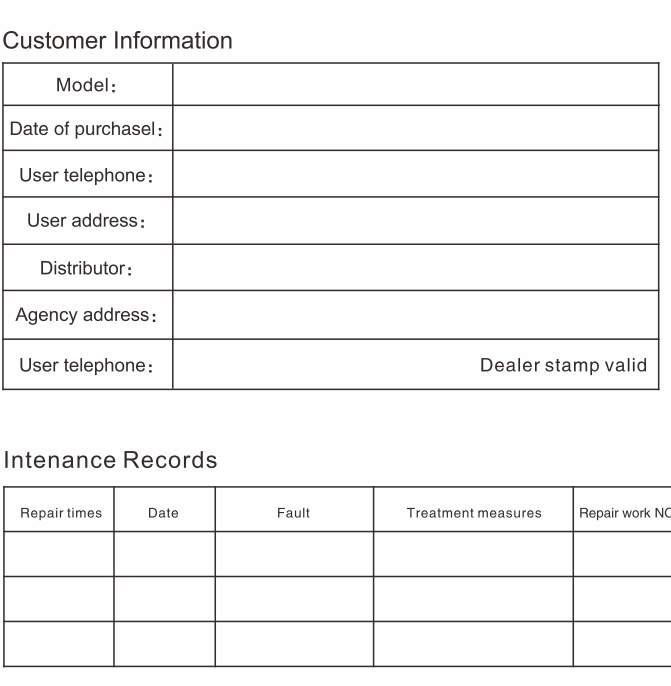
① Select Port => Select the port number where you want to configure the product



② Configure baud rate, data bits, parity bit and stop bit. The baud rate shall be consistent with that of the sensor.



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



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

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

1.6 Common questions

- The product configuration must be switched to the configuration mode. After modifying the configuration letter, the information can be read with one key to see whether the configuration is correct. After the configuration is completed, the transmission transmission mode, if not changed, the communication will report the error;
- When you cannot communicate, pay attention to check whether the antenna is connected, and whether it is within the effective distance;
- When using the modbus protocol for transmission, attention should be paid to whether the slave address is successfully paired, and the return data format refers to the sensor description;
- When configuring the directional transmission mode, the local address should be configured as the same;

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.