WideIOT

WD140

IOT Terminals

User Manual

Document Version： V1.3

Email: Info@wideiot.com

Website: www.wideiot.com

Xiamen WideIOT Technology Co., Ltd.

Contents

1. Product Overview

1.1. Overview

The WD140-GM0211 module is an industrial-grade intelligent data acquisition terminal, featuring 2 analog input channels, 1 digital input channel, 1 digital output channel. It supports 4G wireless transmission, Modbus RTU protocol, and wireless 485 transparent transmission.

1.2. Technical Specifications

Product Interfaces

NO	Port	Description
1	A+	485+
2	B-	485-
3	GND	Signal Ground
4	AI1	Analog Input
5	AI0	Analog Input
6	GND	Signal Ground
7	DI	Digital Input
8	GND	Signal Ground
9	DO	Digital Output
10	1L	Ground Wire

11	GND	Power -
12	VIN	Power +

Note: Accessories and interfaces may vary by model; please refer to the actual product.

Power

Item	Details
Input Voltage	DC 12V
Acceptable Voltage Range	DC 6~35V

Power Consumption

Operating Mode	Power Consumption
Standby	200mA~240mA@12V
Communication	250mA~290mA@12V
Peak	300mA@12.0V

Physical Characteristics

Item	Details
Housing	Black shell, IP30 protection rating, suitable for most industrial control applications.
Dimensions	93x54x22 (mm)
Weight	260g

Others

Item	Details
Operating Temperature	-40℃ ~ 85℃
Storage Temperature	-40℃ ~ 85℃
Relative Humidity	5% ~ 95% (no condensation)

2. Installation Guide

2.1. Installation Overview

The iot terminal can only operate normally after correct wiring and installation. If you have any questions during the process, please contact our engineers for guidance.

⚠ Warning:

Do not install the device while it is powered on.

2.2. Package Contents

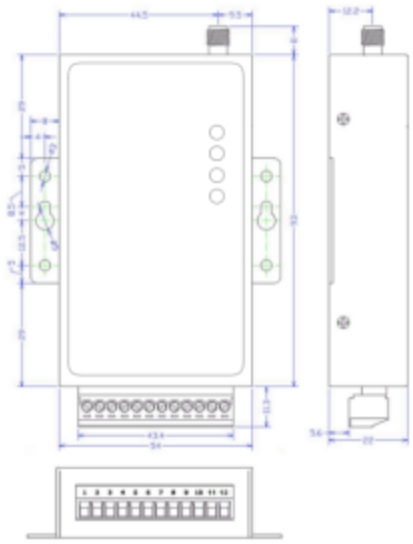
To ensure transportation safety, proper packaging is required. After unpacking the device, retain the packaging materials for future transportation needs.

The package includes the following components:

- ✧ 1 IOT terminal
- ✧ 1 wireless cellular antenna (if the model supports 4G)
- ✧ 1 WIFI antenna (if the model supports WIFI)
- ✧ 1 power cable
- ✧ 1 DIN rail clip
- ✧ Product certification
- ✧ Warranty card

2.3. Installation and Wiring Connection

Dimensions (Unit: mm)



Antenna Installation :

The wireless 4G antenna interface is a standard SMA female connector (top). Insert the cellular antenna into this interface and ensure it is tightly fastened to avoid affecting signal quality.

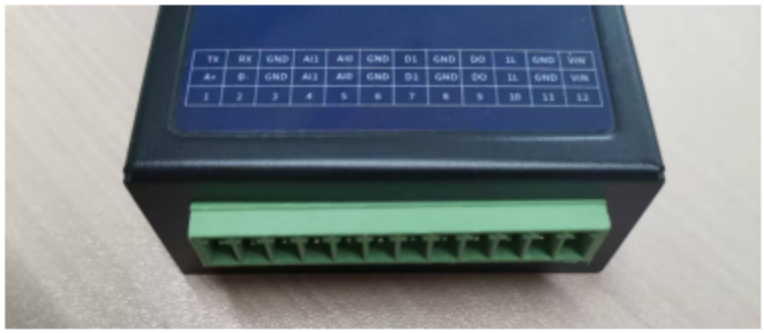
The wireless WIFI antenna interface is a standard SMA male connector (top). Insert the WIFI antenna into this interface and ensure it is tightly fastened to avoid affecting signal quality.

Note: Do not mix 4G antennas with WIFI antennas; otherwise, the device may not work properly.

SIM/UIM Card Installation Steps :

Gently press the circular eject button on the left side of the card slot; the SIM/UIM card tray will pop out automatically. During installation, place the SIM/UIM card into the tray with the metal chip facing outward, then insert the tray back into the device.

(The following is an example for the single-card version)



3.5mm Terminal Block Interface Definition：

This 12-pin terminal block includes POWER (power supply) and RS485 (RS232) functions. The specific definitions are as follows:

Power Wiring		
Terminal	GND	VIN

Description	Connect to DC6-35V negative pole	Connect to DC6-35V positive pole

RS485 Wiring		
Terminal	B-	A+
Description	Connect to device RS485-	Connect to device RS485+

RS232 Wiring			
Terminal	B-	A+	GND
Description	Connect to device RS232 RX	Connect to device RS232 TX	Connect to device RS232 GND

2.4. Power Supply Description

The WD140 is typically used in complex external environments. To adapt to the environment and improve system stability, this IOT terminal adopts advanced power supply technology. Users can power the device using the standard 12V DC / 1A power adapter included with the device, or directly use a 6 – 35V wide-voltage DC power supply.

If users use other power supplies, ensure the output is stable (ripple less than 300mV, instantaneous voltage not exceeding 35V) and the power is greater than 8W. We recommend using the standard 12V DC / 1A power adapter included with the device.

2.5. Indicator Light Description

The terminal is equipped with the following LED indicators:

Indicator	Status	Description
PWR	Steady On	Normal power supply
LIVE	Blinking	Normal operation
NET	Steady On	Normal network but not connected to the server
	Blinking	Normal network and

		connected to the server
	Off	Network abnormality
COM	Blinking	Serial port data communication in progress
	Off	No serial port data communication

2.6. Reset Function

The IOT terminal is equipped with a reset button marked "Reset", which is used to restore the device to factory settings.

Operation Steps

Power on the IOT terminal;

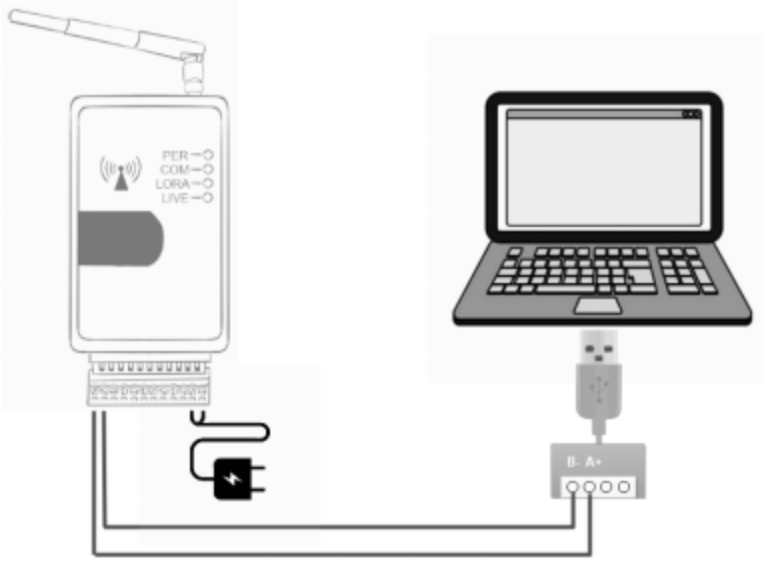
Press and hold the "RESET" button for more than 5 seconds;

The terminal will then start automatic reset.

3. Configuration and Management

3.1. Configuration Connection

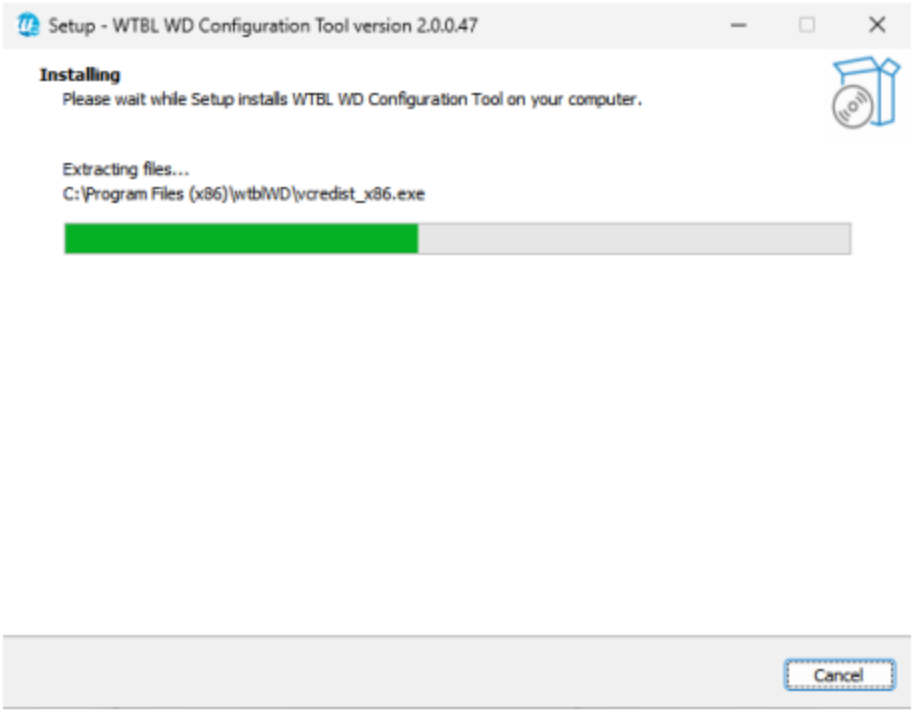
Power on the device and use a USB-to-RS485 serial cable to connect the computer to the RS485 serial port of the device.



(Figure 2: Wiring Diagram)

3.2. Software Installation

Install the configuration tool "WDConfigToolPackage".

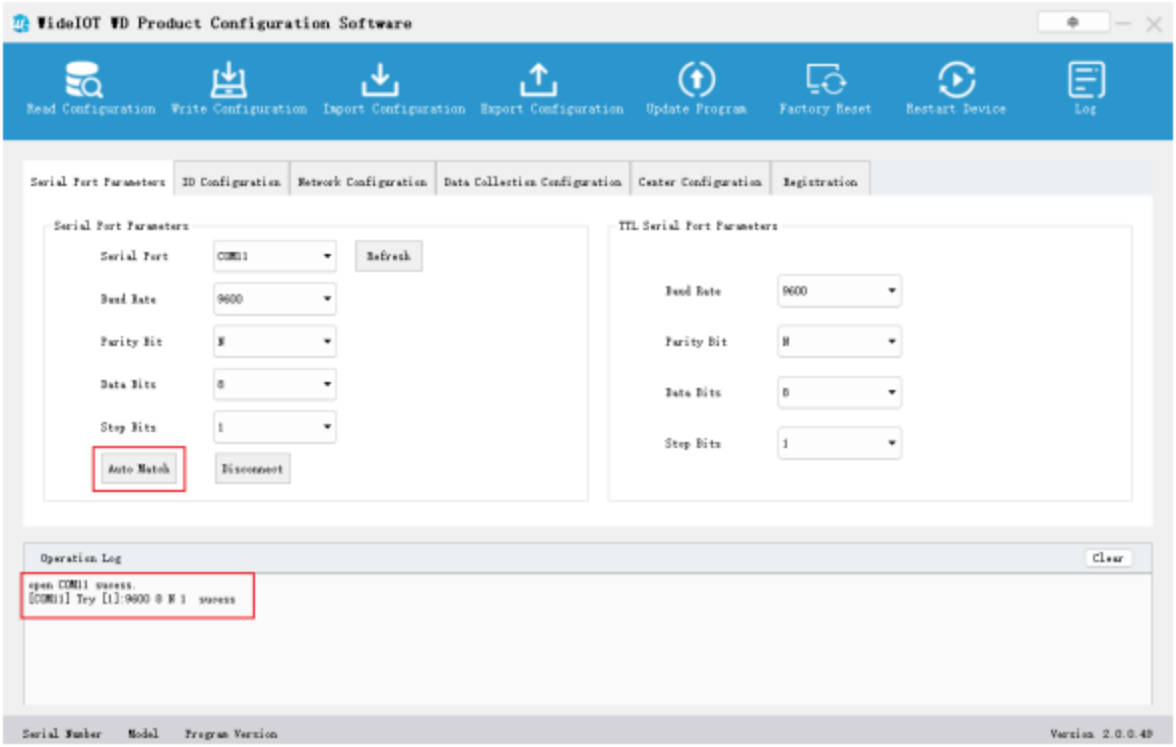


(Figure 3: Software Installation)

3.3. Quick Configuration

3.3.1. Device Connection

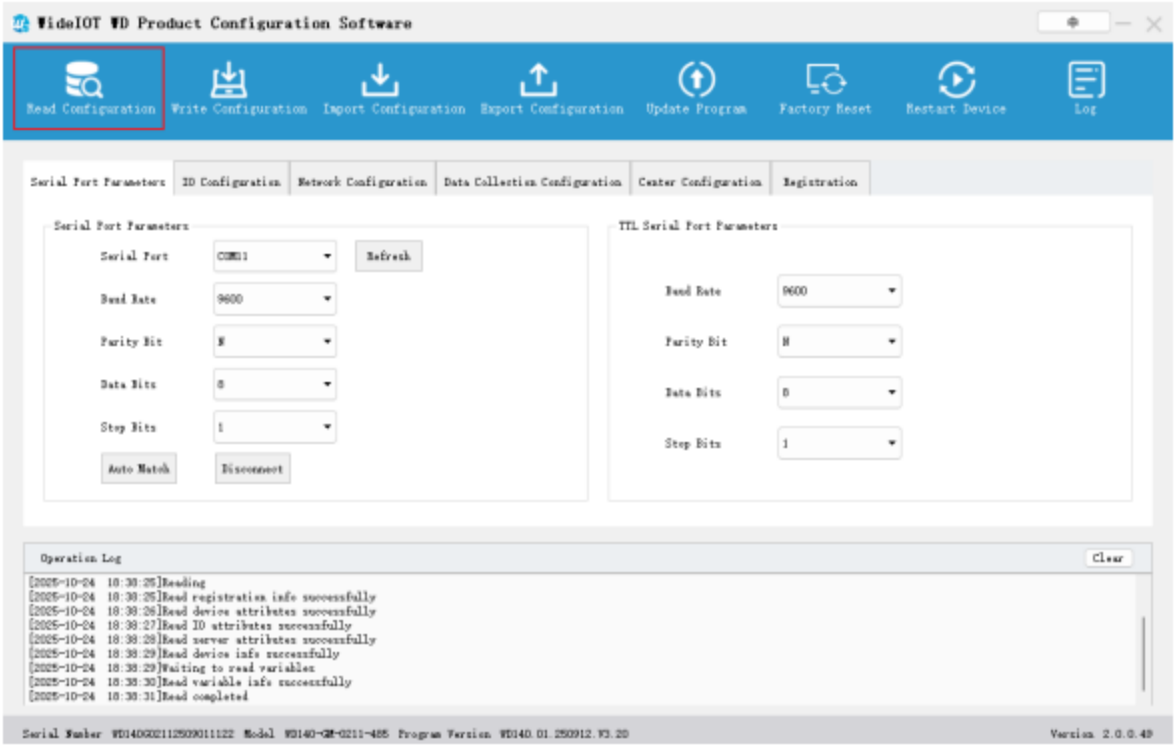
Open the configuration tool "WTBL WD Product Configuration Software", select the USB serial port number on the PC, and click "Auto Match". If the operation log shows "success", the device is connected successfully, as shown in the figure below.



(Figure 4: Successful Device Connection)

3.3.2. Read Configuration

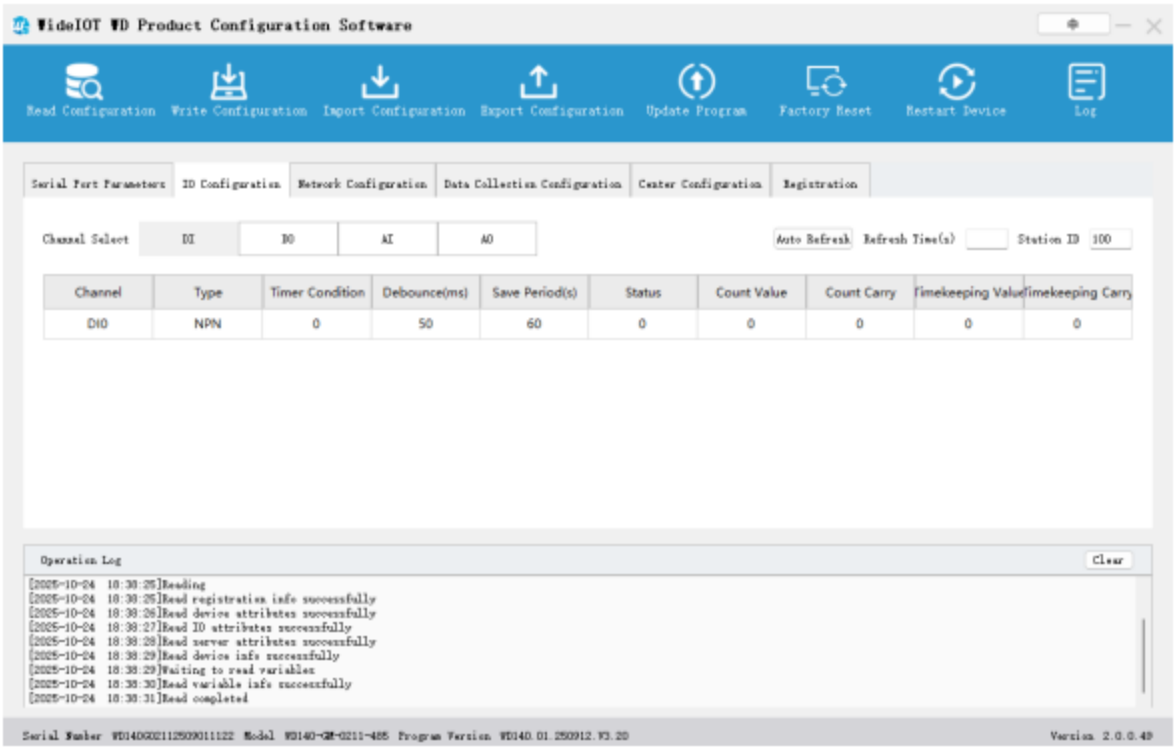
After successfully connecting to the device, click "Read Configuration" to upload the device configuration.



(Figure 5: Obtain Current Device Configuration)

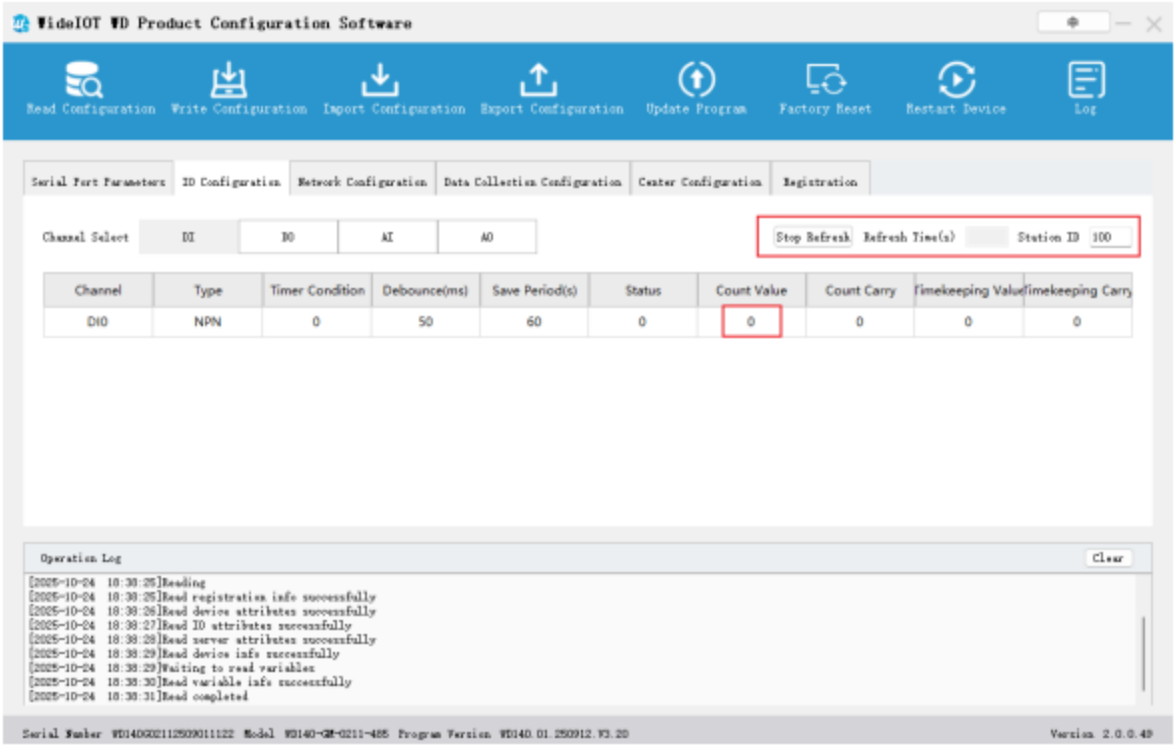
3.3.3. IO Configuration

Device IO settings can be viewed or modified on this interface.



(Figure 6: IO Configuration)

Click "Auto Refresh" to refresh the status of IO points according to the set refresh time.

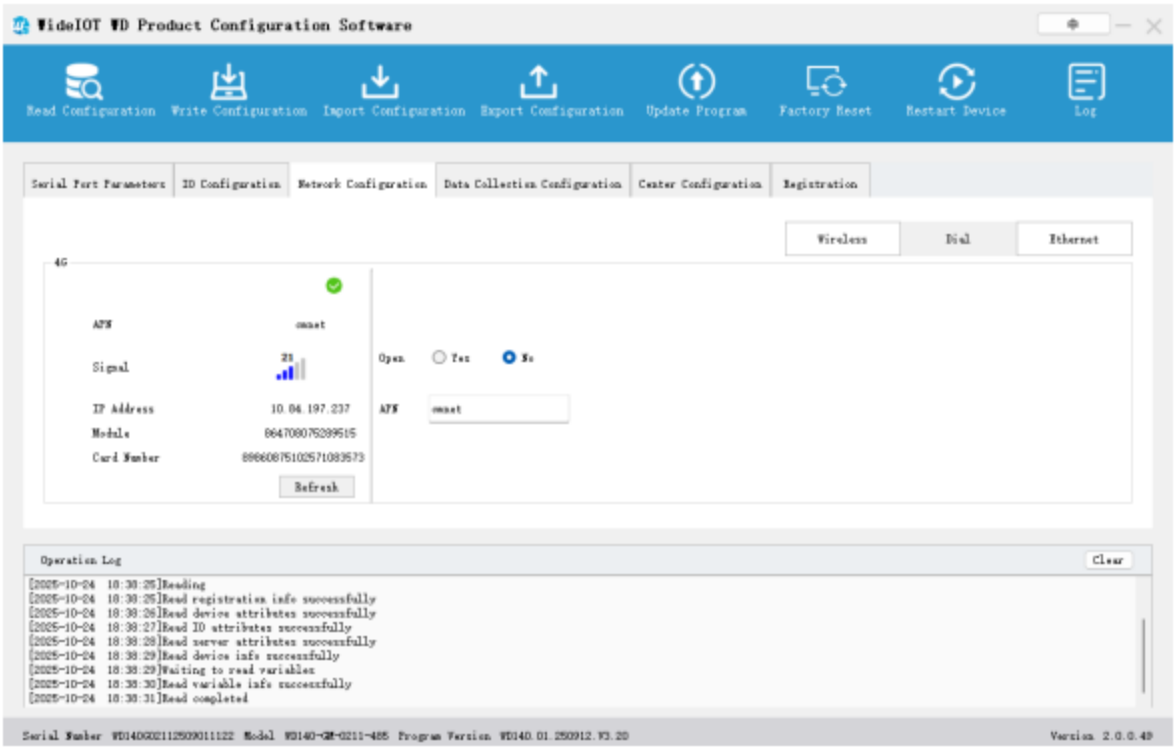


(Figure 7: Auto Refresh IO Status)

3.3.4. Network Configuration

1) 4G Internet Access

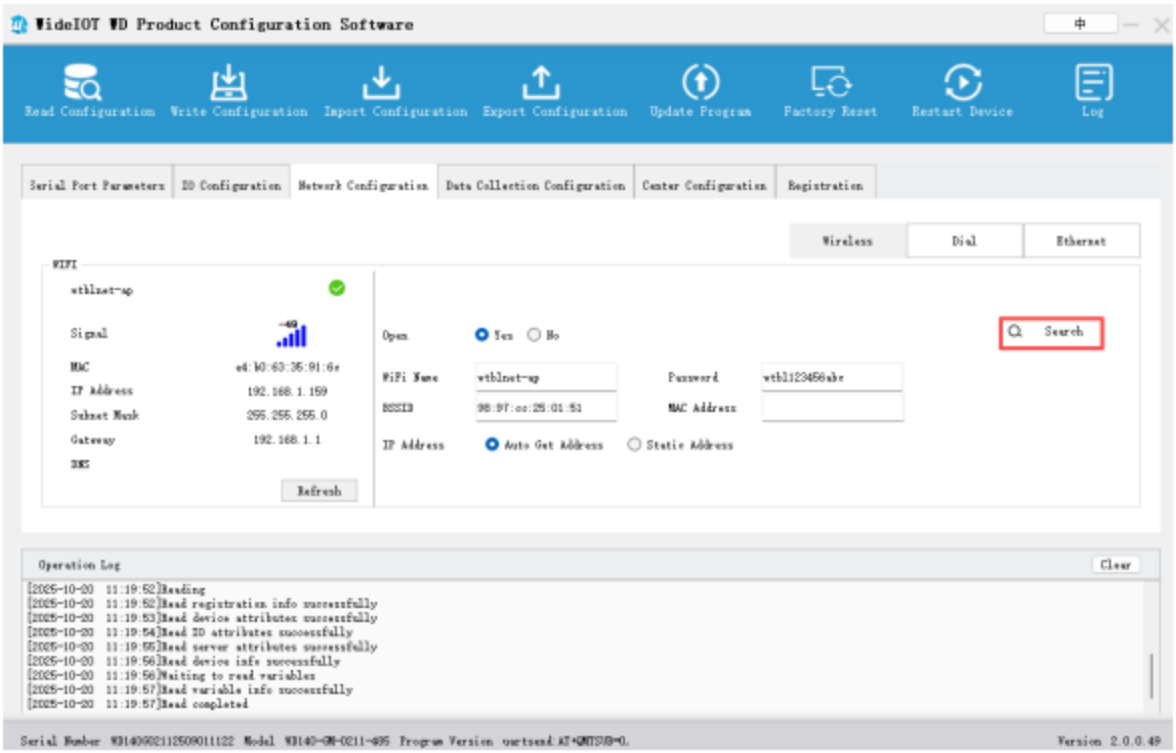
The device enables 4G Internet access by default, supporting APN settings and viewing parameters such as signal value and card number.



(Figure 8: 4G Network Configuration)

2) WIFI Internet Access

The device supports WIFI Internet access. Click "Search WiFi".



(Figure 9: Search WiFi)

络 Click "Select" to join the network.

(Figure 10: Select Network)

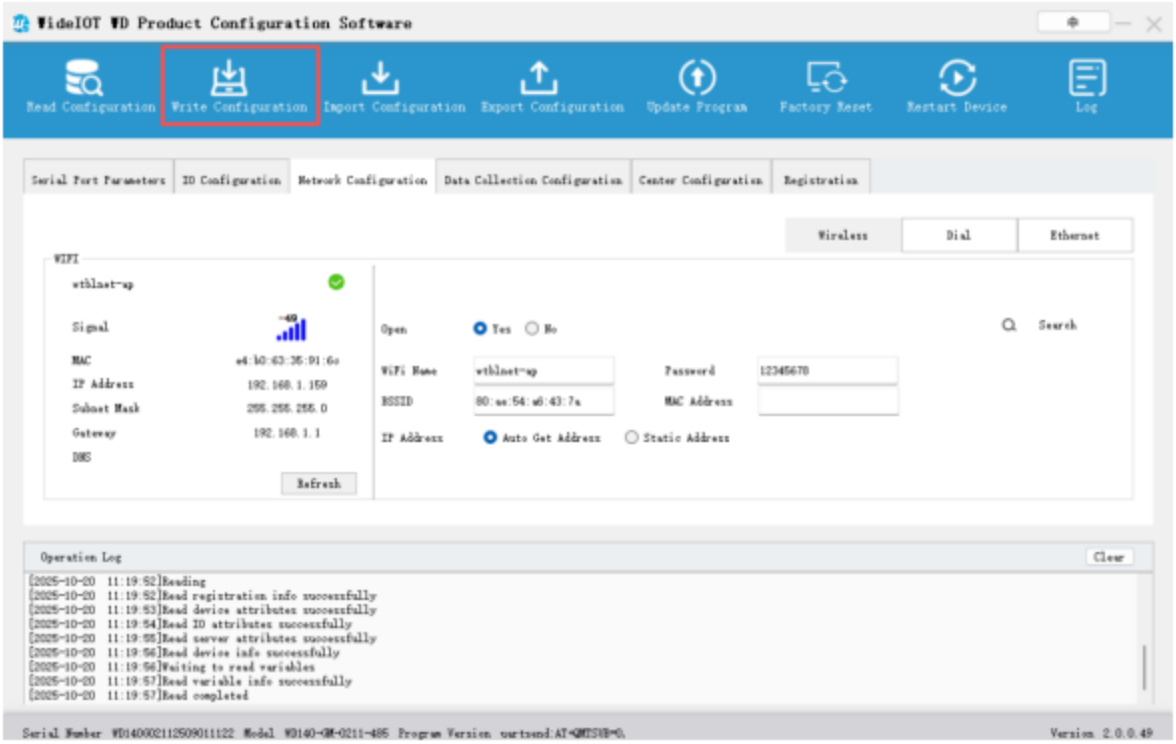
Enter the WiFi password.

(Figure 11: Enter Password)

You can choose to obtain an IP automatically or set a static IP, then click "OK".

(Figure 12: Set Static IP; Figure 13: Obtain IP Automatically)

Finally, click "Write Configuration" to write the WiFi settings to the device; the device will restart automatically.



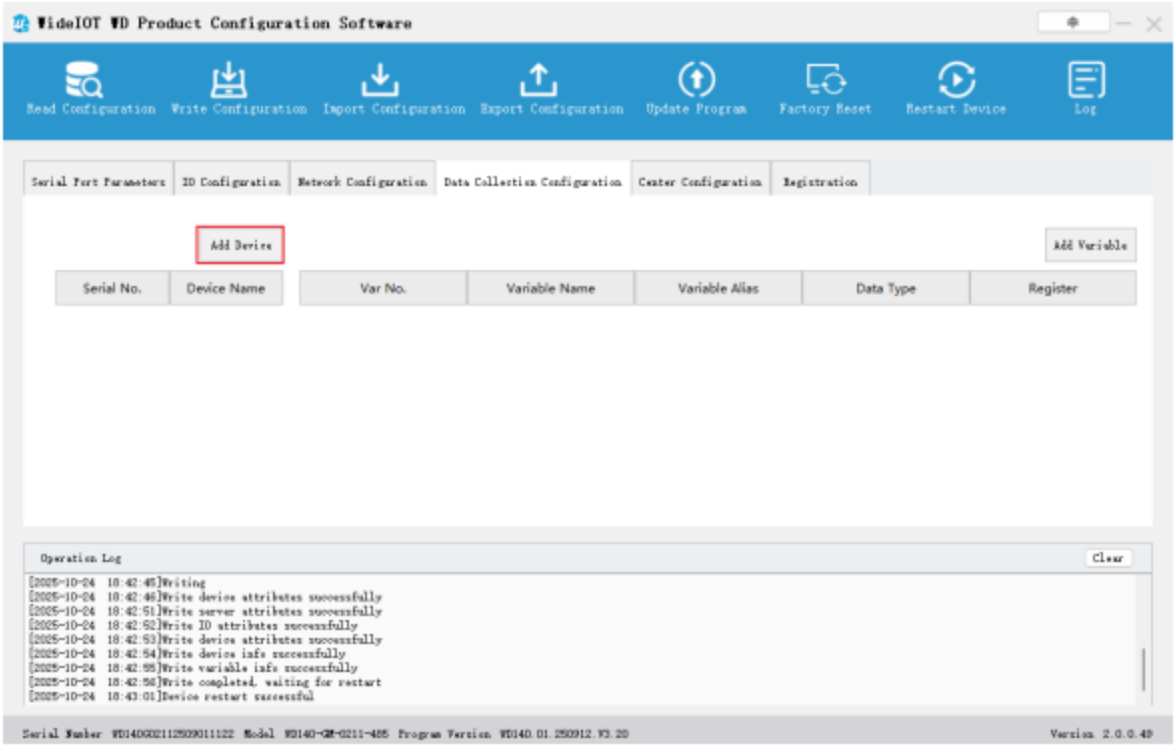
(Figure 14: Write Configuration)

3.3.5. Data Acquisition Configuration

It supports the acquisition of various Modbus instruments, water meters, and electricity meters, including the acquisition of the device's own IO data.

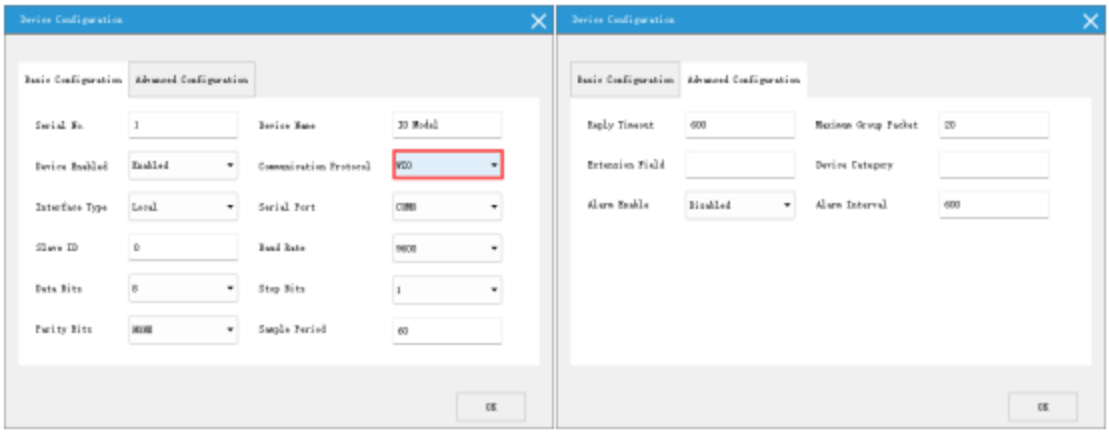
1) Add Device

Click "Add Device" on the interface.



(Figure 15: Add Device)

Configure device information, protocol, serial port parameters, etc.



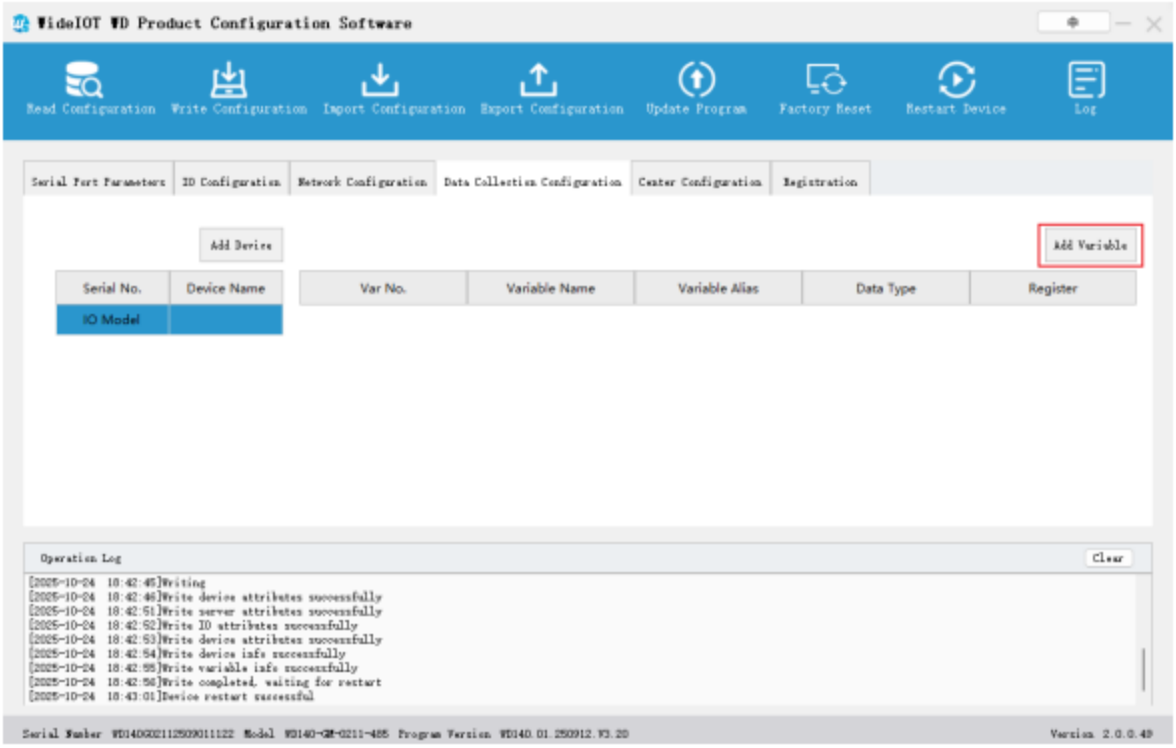
(Figure 16: Basic Configuration; Figure 17: Advanced Options)

Communication Protocols

Currently supported protocols include Modbus RTU, DLT645-07, CJ/T188, DLT645-97, WIO, and Trans. Among them, WIO indicates that the device collects its own IO data.

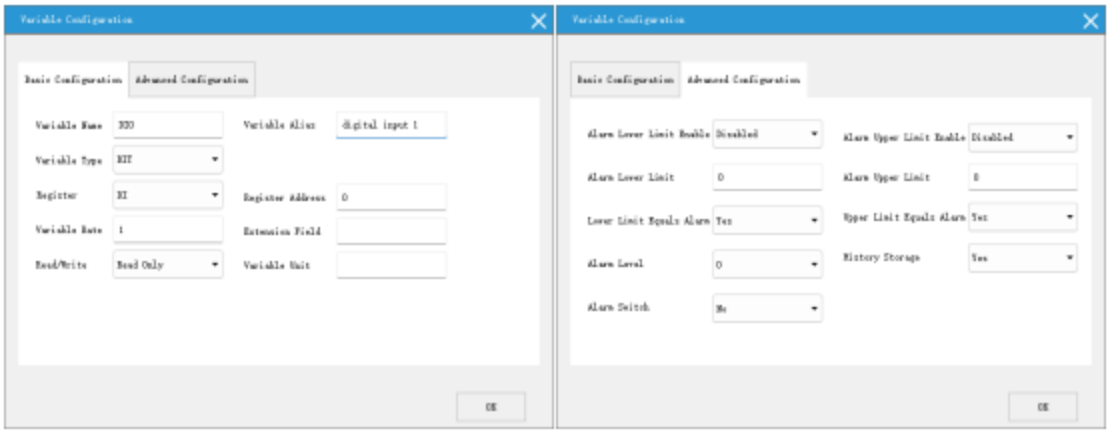
2) Add Variable

Click "Add Variable".



(Figure 18: Add Variable)

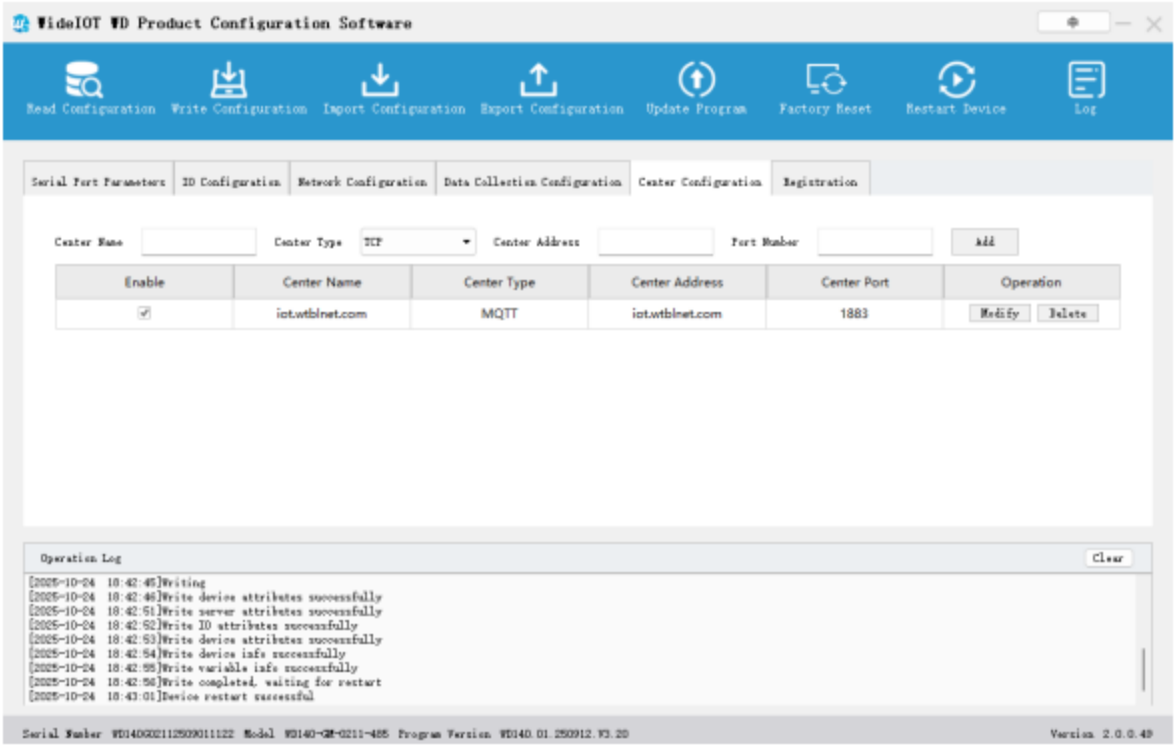
Add acquisition point information.



(Figure 19: Basic Configuration; Figure 20: Advanced Options)

3.3.6. Center Configuration

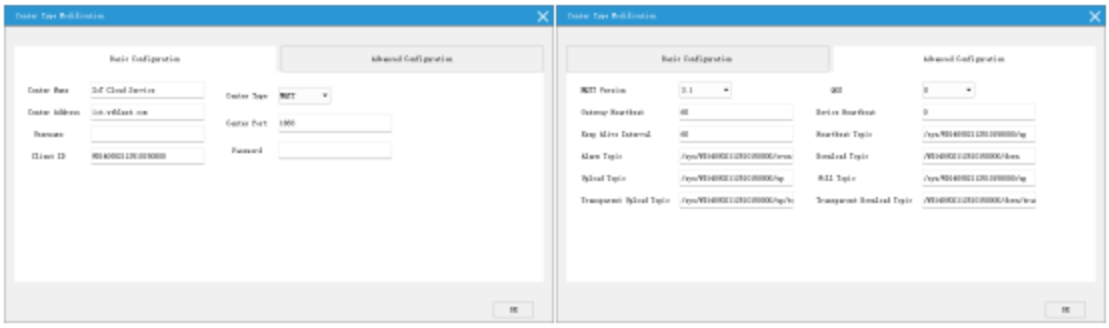
The device supports MQTT/TCP/UDP protocols for uplink and only allows configuration of one server connection.



(Figure 21: Center Configuration)

MQTT Configuration

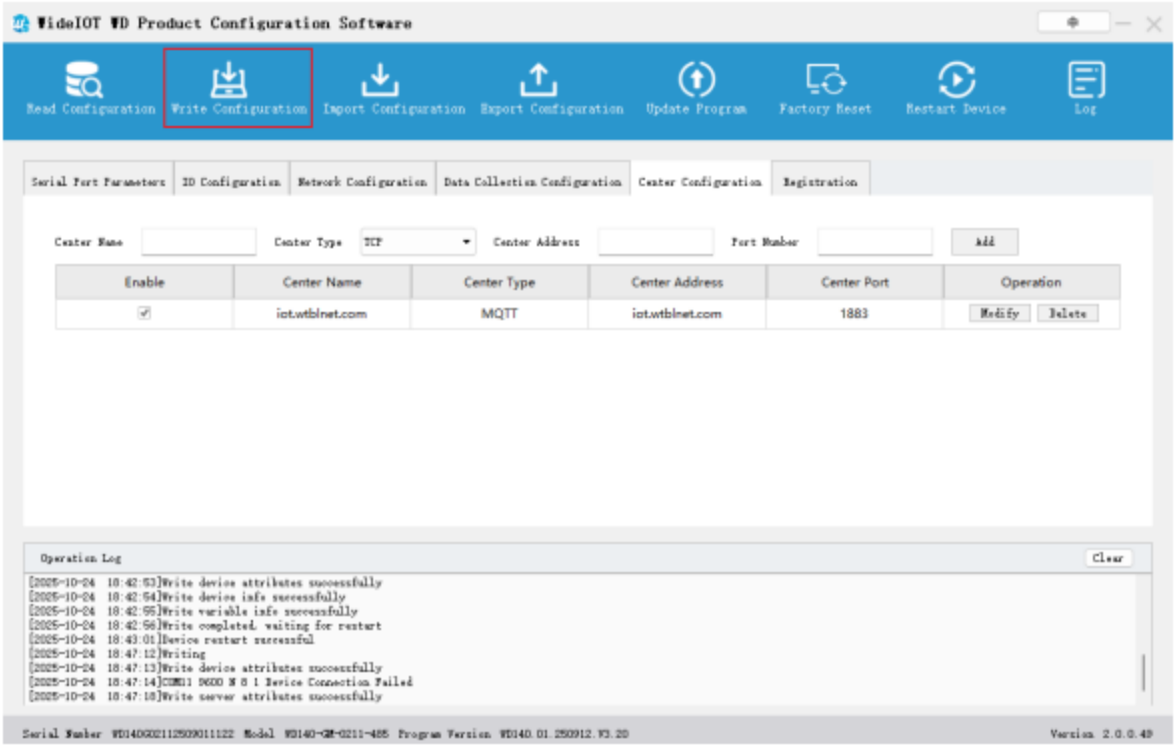
Configure the device to connect to the MQTT server and push the collected data to the server.



(Figure 22: MQTT Basic Configuration; Figure 23: MQTT Advanced Configuration)

3.3.7. Write Configuration

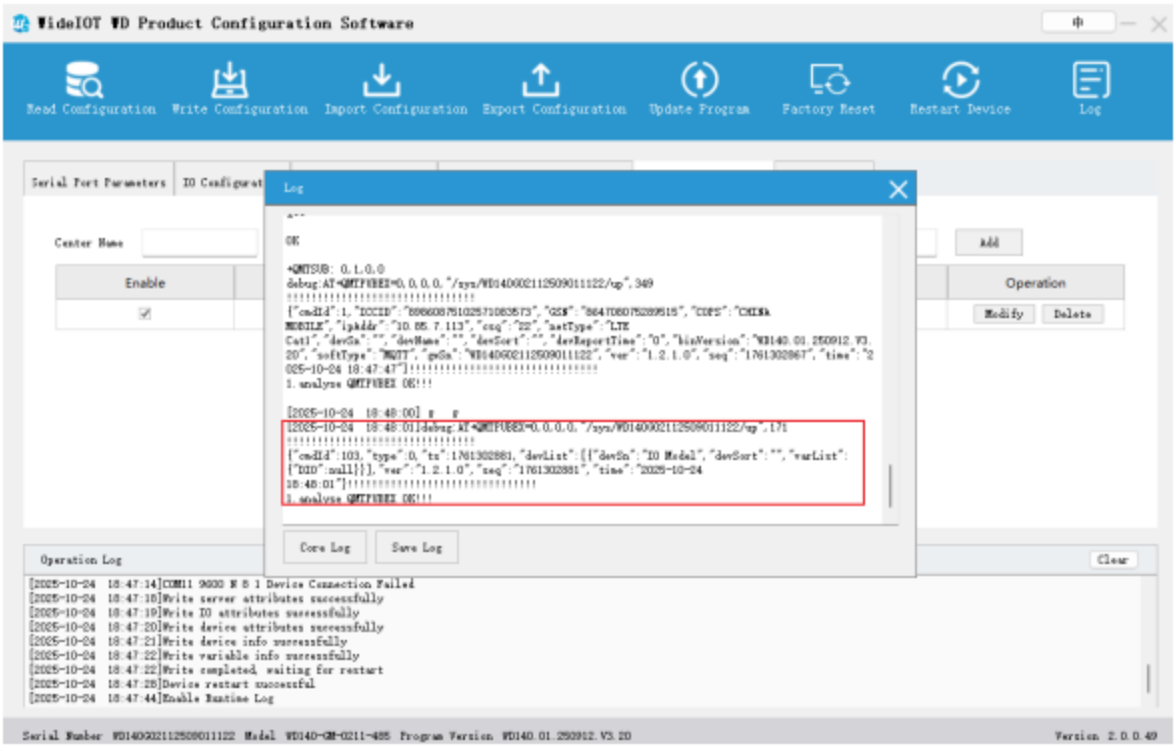
Click "Write Configuration" to write the configuration to the device, and wait for the log to indicate that the writing is completed.



(Figure 24: Write Configuration to Device)

3.3.8. Example Demonstration

Click "Log" to view real-time data reported by the device to the MQTT server.



3.4. IO Acquisition

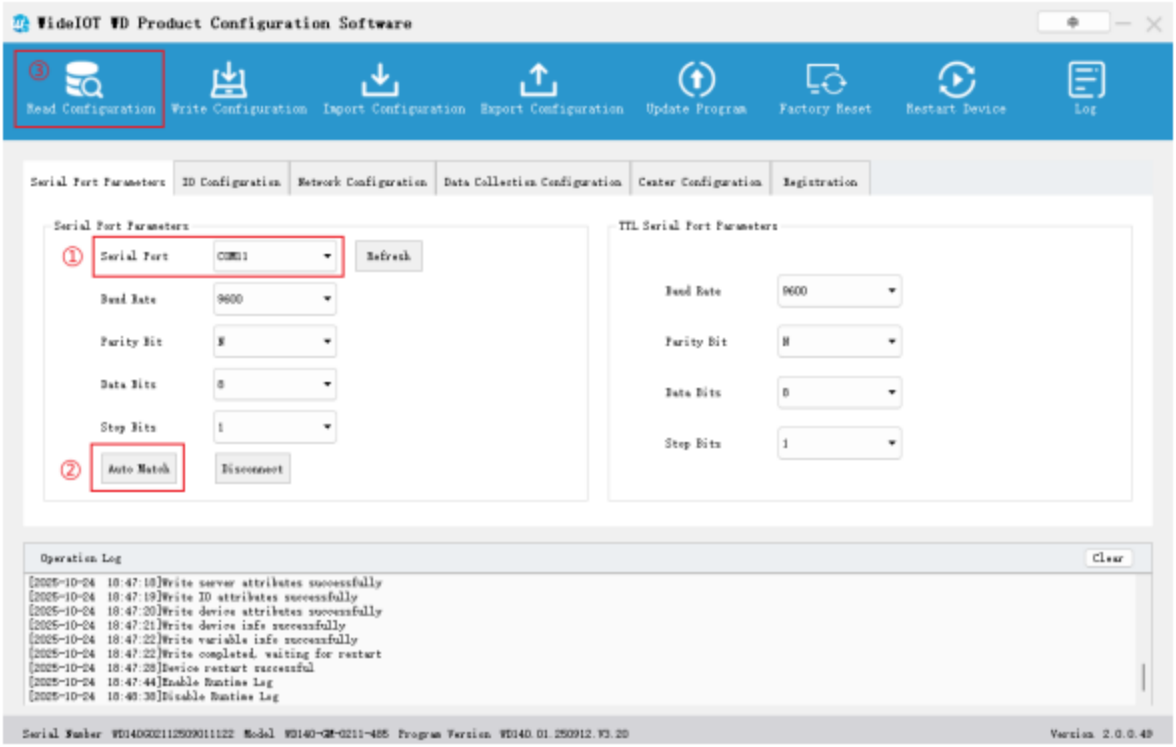
Configure data acquisition to collect the device's own IO data and report it to the MQTT server.

3.4.1. Operation Guide

1) Read Configuration

Open the configuration tool, select the serial port number, and click "Auto Match". After successful connection, click "Read Configuration" to upload the current device configuration, and wait for the log to indicate that the reading is completed.

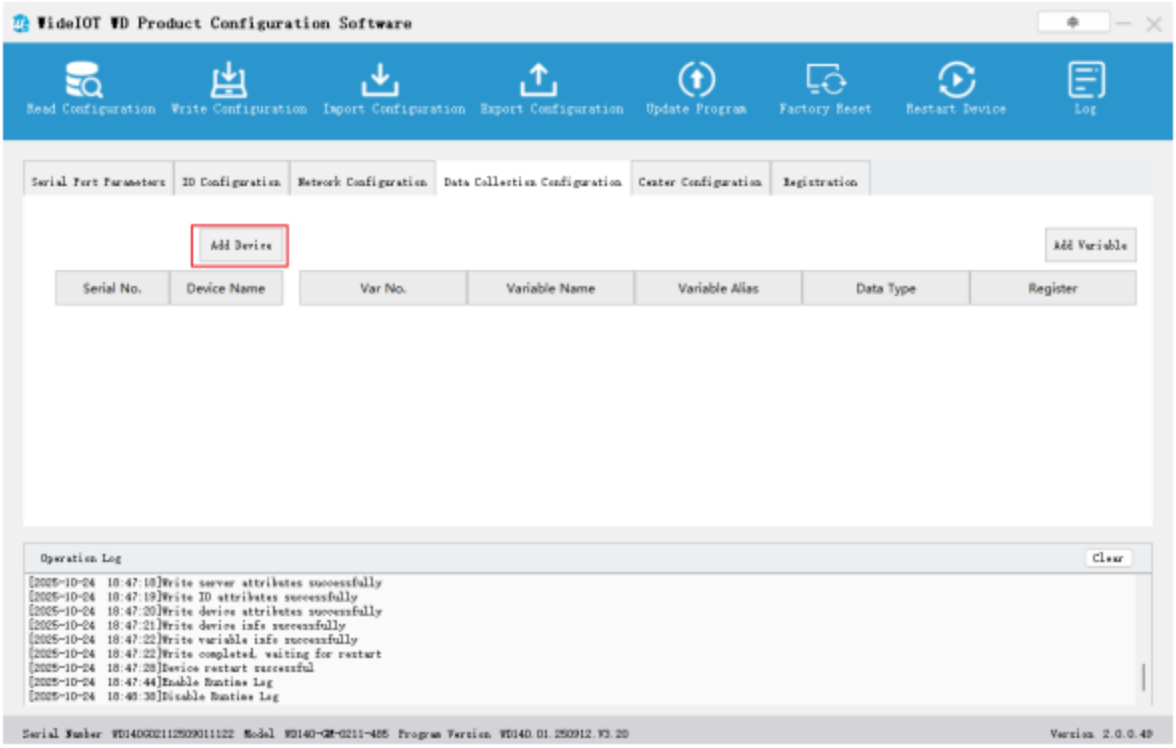
Note: If the configuration has already been read, this step can be skipped.



(Figure 25: Obtain Current Device Configuration)

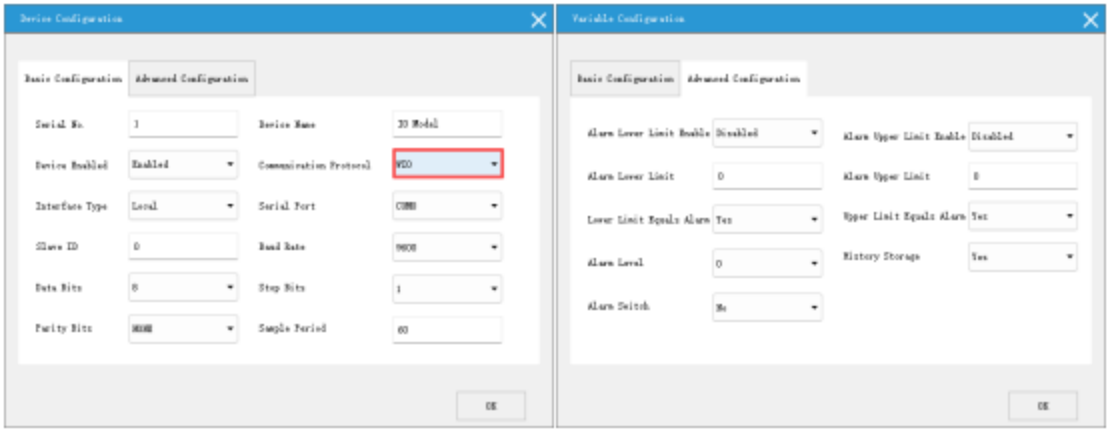
2) Add Device

Click "Data Acquisition Configuration" → "Add Device".



(Figure 26: Add Device)

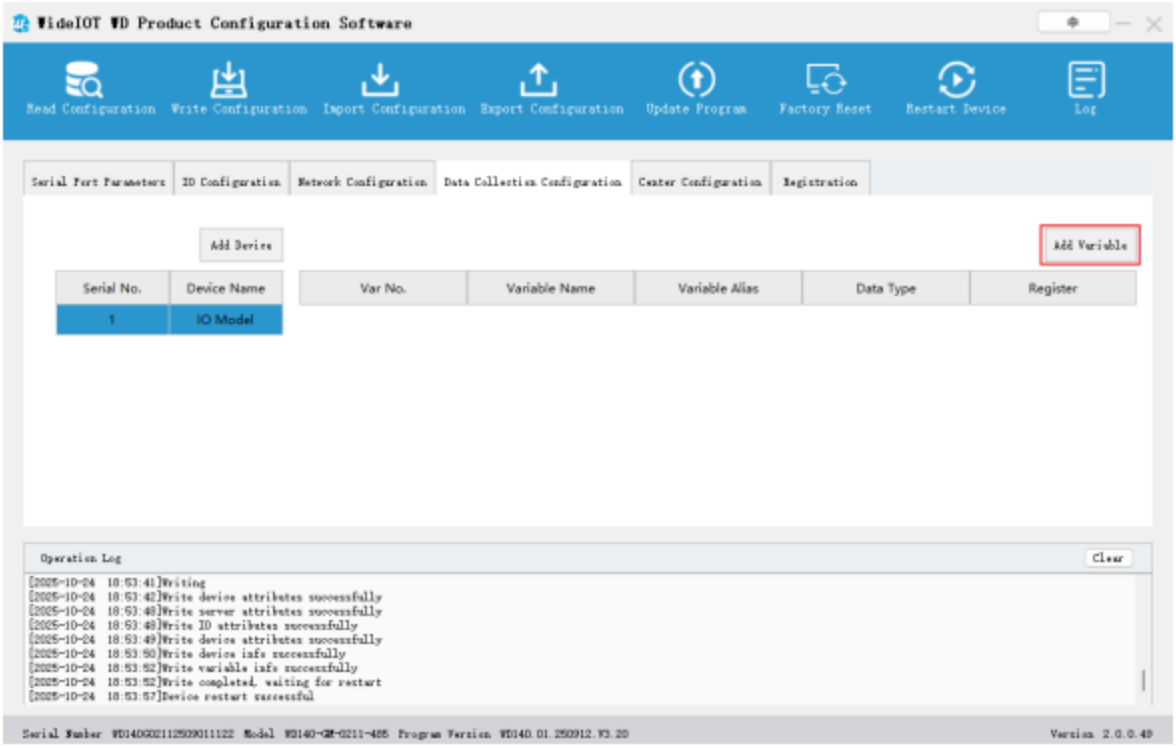
Set as shown in the figure below. The "Device Serial Number", "Device Name", and "Acquisition Period" can be customized.



(Figure 27: Basic Device Configuration; Figure 28: Advanced Device Options)

3) Add Variable

Click "Add Variable".



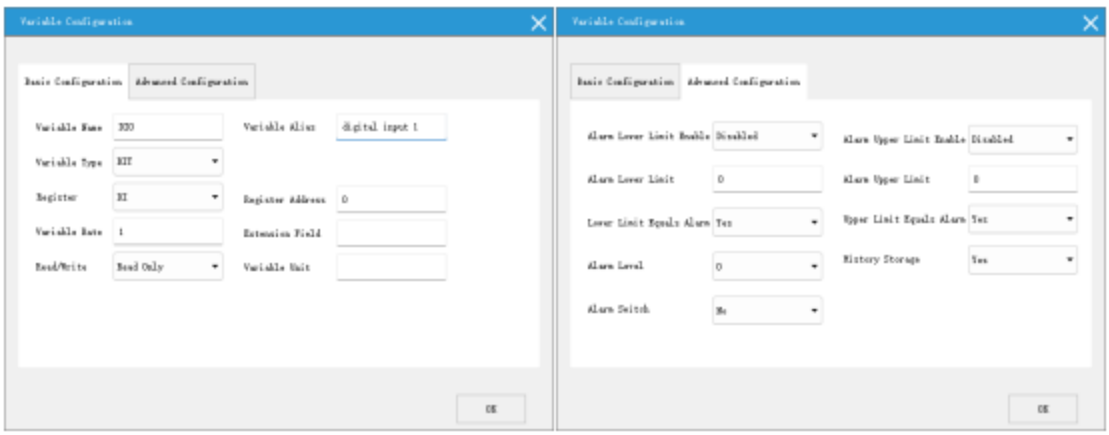
(Figure 29: Add Variable)

Set and add acquisition point information as shown in the figure below.

The register for DI0 is DI, address 0;

The register for DI1 is DI, address 1, and so on.

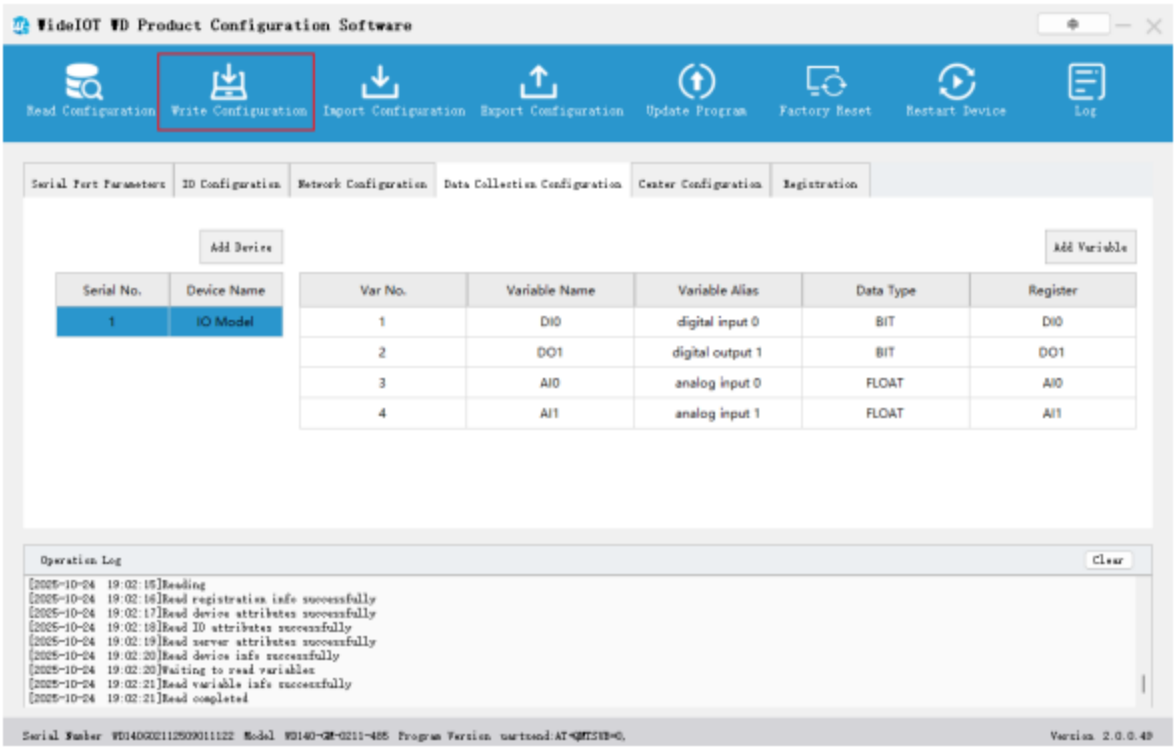
The device has 2 AI channels, 1 DI channel, and 1 DO channel by default, namely AI0, AI1, DI0, and DO1.



(Figure 30: Basic Variable Configuration; Figure 31: Advanced Variable Options)

4) Write Configuration

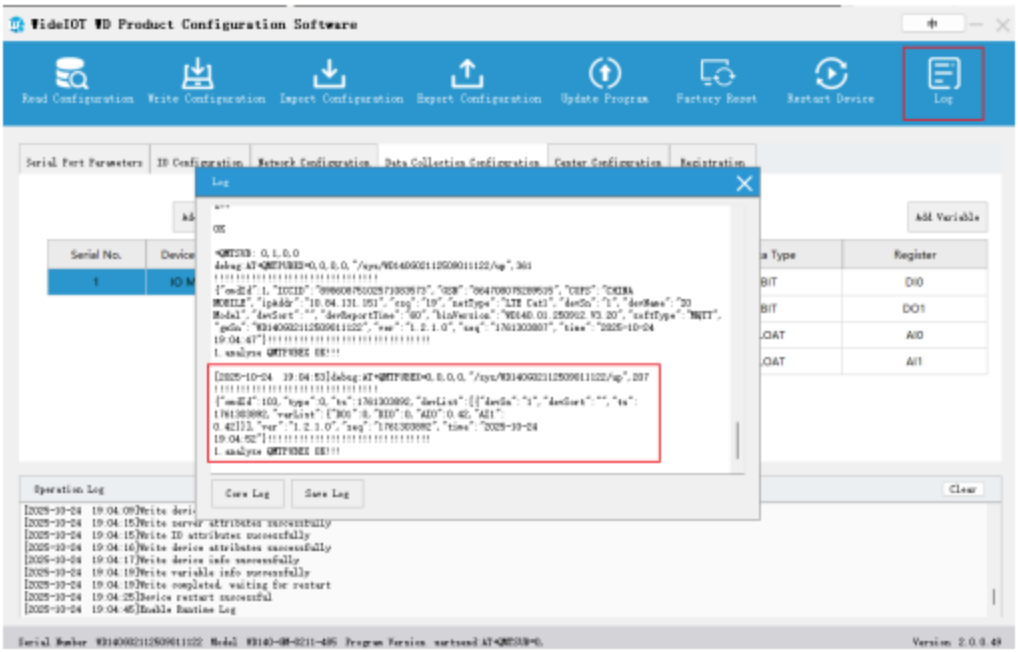
Add all IO points of the device. The final configuration is as follows: Click "Write Configuration" to write the configuration to the device, and wait for the log to indicate that the writing is completed.



(Figure 32: Download Configured Settings to Device)

3.4.2. Example Demonstration

Click "Log" to view real-time data reported by the device.

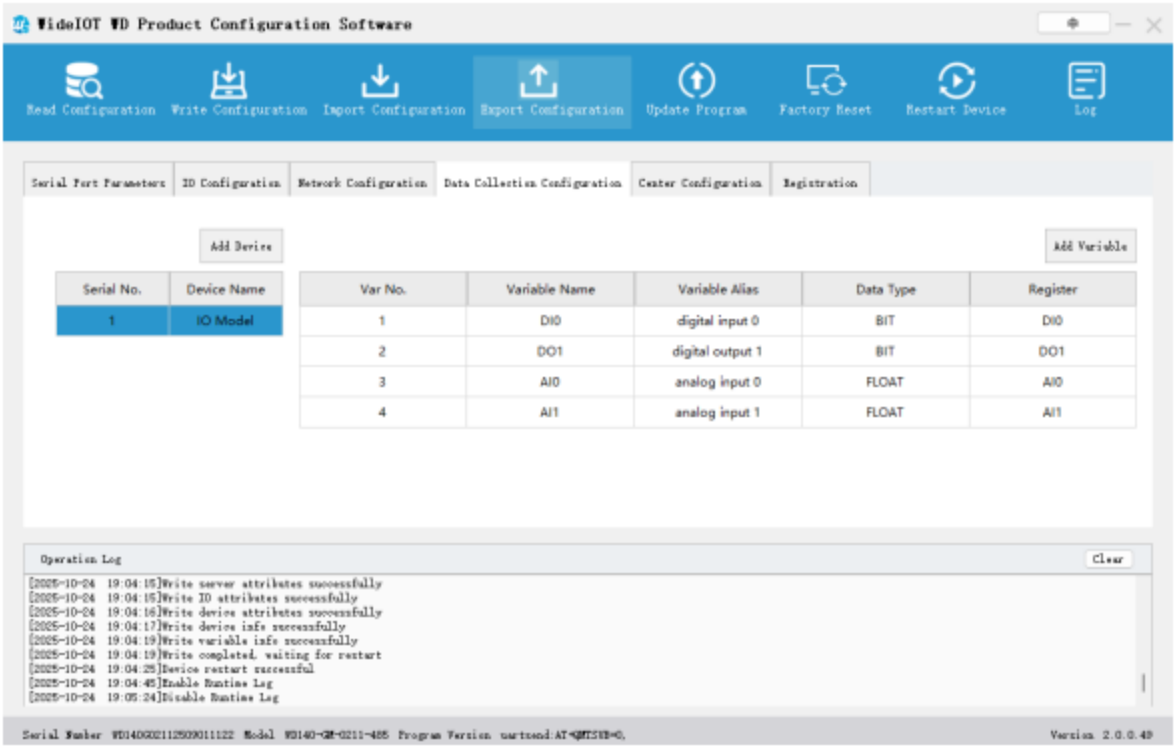


(Figure 33: Real-Time Data Reported by Device)

3.4.3. Supplementary Notes

1) DI Input

Configuration Description



(Figure 34: DI Configuration Interface)

Timing Condition

The condition for the device to start timing, which can be set to 0 or 1:

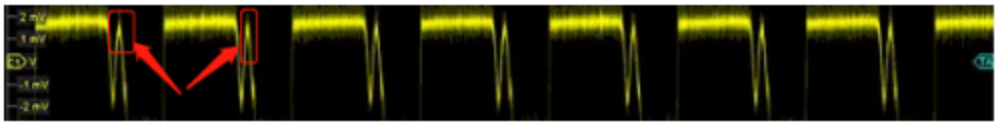
Set to 0: The device starts timing when the DI status is 0 and stops when it is 1;

Set to 1: The device starts timing when the DI status is 1 and stops when it is 0.

Debounce Time

Debounce time refers to the period during which the measurement and control device waits before confirming a status change after receiving a status change signal. It is used to eliminate glitches generated by different devices and improve data accuracy. According to the device mechanism, if glitches occur within a certain period, they can be eliminated by the defined debounce time. If the defined debounce time is longer than the pulse signal speed, the pulse signal cannot be collected. For example, if a pulse signal outputs at 100Hz, the default 10ms debounce time configuration will fail to collect the pulse signal. In this

case, modify the debounce time to less than 10ms (set the debounce time to be less than the glitch elimination period) to collect normally. The figure below shows glitches in the pulse signal.



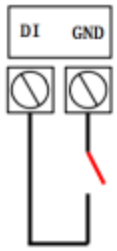
(Figure 35: Glitches in Pulse Signal)

Save Period

The collected pulse signal count value is periodically saved in the register according to the set period.

Wiring Method

Digital input (DI) is divided into dry contact wiring (passive switch) and wet contact wiring (active level), with dry contact as the default. DI adopts a microcontroller real-time interrupt detection mechanism, enabling fast detection and response with high real-time performance.



(Figure 36: Dry Contact Wiring ;

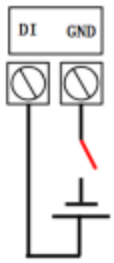


Figure 37: Wet Contact Wiring)

Level Detection

IO status detection and switch signal acquisition are supported:

For dry contacts: The DI status is 1 when closed and connected, and 0 when open (default);

For wet contacts: The DI status is 1 when disconnected (default) and 0 when high voltage is input.

Table 3: Status Value Description for Dry and Wet Contacts

Dry Contact	
Status	Value

Disconnected (Default)	0
Connected	1
Wet Contact	
Voltage 0 or Disconnected (Default)	1
High Voltage Input	0

Pulse Counting

It supports the collection of pulse signal counts and starts counting when a rising edge is detected. The data terminal defaults to dry contact. When collecting counts from wet contact devices, an additional relay is required. When the data terminal is wet contact, pulse signals can be collected directly. The program principle is that the CPU internal program increments the counter by 1 as long as a rising edge is detected. This counter retains data even when power is off, unless it is cleared or reset. The counter is of unsigned Long type (32-bit), with a maximum count value of 2147483648. It automatically resets to zero when full, or can be reset by issuing a write command. The maximum number of pulse signals that can be received and counted per second is 100.

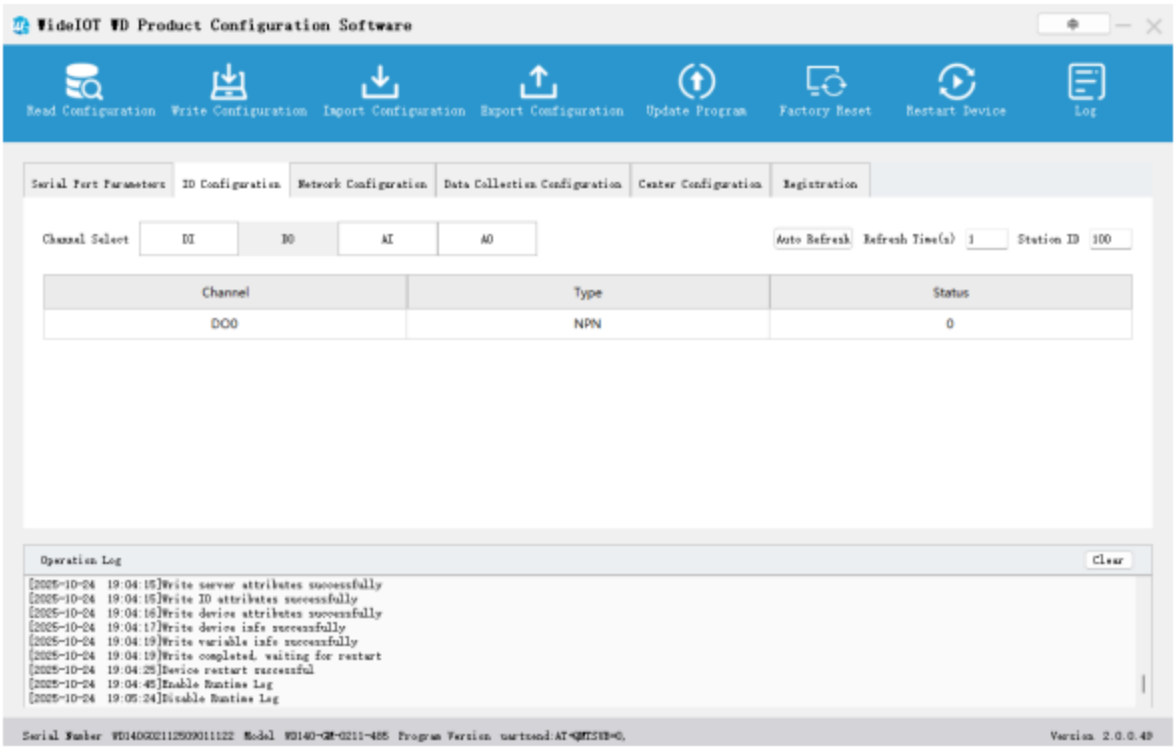
Table 4: Counter Count Description for Dry and Wet Contacts

Dry Contact	
Status	Value
Connected Rising Edge	+1
Disconnected Falling Edge	0
Wet Contact	
Status	Value
High Voltage Falling Edge	0
Low Voltage Rising Edge	+1

2) DO Output

Configuration Description

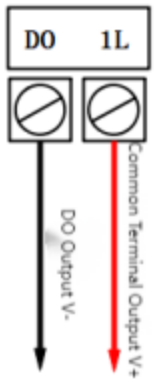
Double-click the status field to change the DO status.

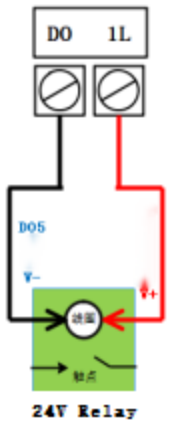


(Figure 38: DO Configuration Interface)

Wiring Method

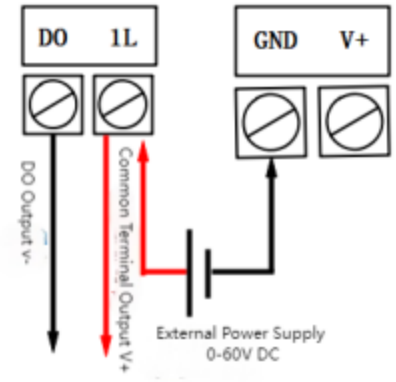
（1）DO adopts a multi-functional circuit, which defaults to internal voltage output (the voltage is the same as the power supply voltage of the data terminal, and the data terminal supports 6-35V DC power supply).

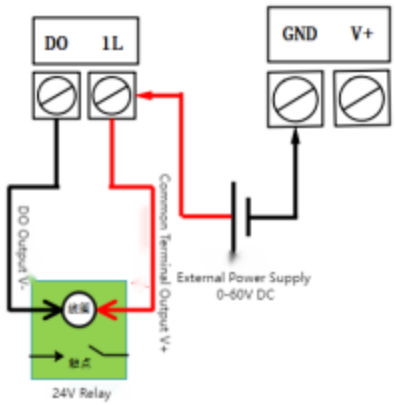




(Figure 39: Internal Power Supply Diagram; Figure 40: External Relay Diagram)

（2）The DO multi-functional circuit defaults to internal voltage output of the data terminal.





(Figure 41: External Power Supply Diagram; Figure 42: External Power Supply with External Relay Diagram)

Status Description

Table 5: Digital Output Status Value Description

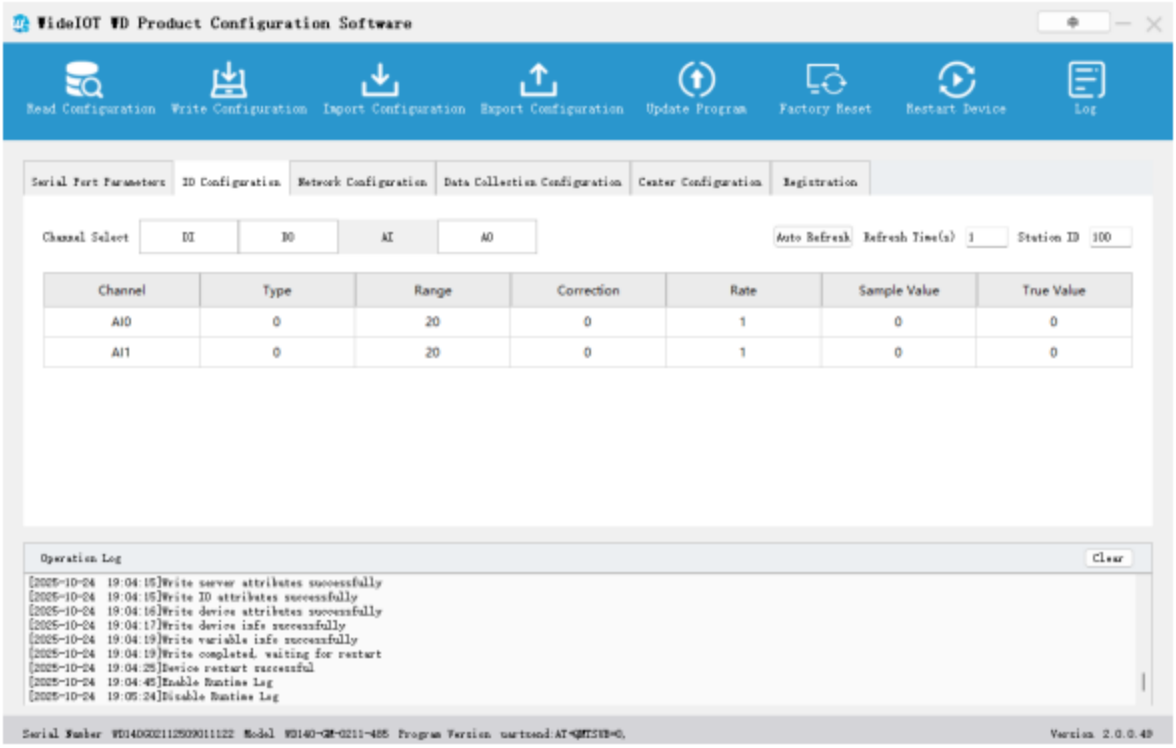
Control Value	Status
0	Connected (with voltage difference)
1	Disconnected (no voltage difference)

3) AI Input

Configuration Description

It supports the access of 020mA/420mA current-type sensors and optional 05V/010V voltage-type sensors. Please select the corresponding model, with current-type as the default.

For example, to collect a 0~20mA liquid level height analog sensor, directly connect the signal wire to AI0/../AI3 (multi-channel selection) and 2M of the data terminal. If a PT100 thermal resistor is connected, an external temperature transmitter is required to realize analog signal acquisition.

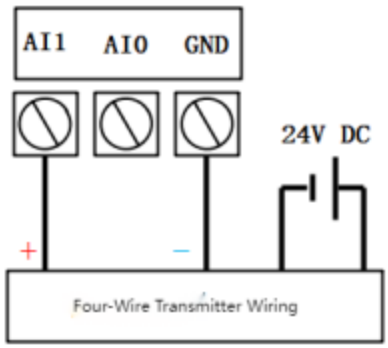


(Figure 43: AI Configuration Interface)

Wiring Method

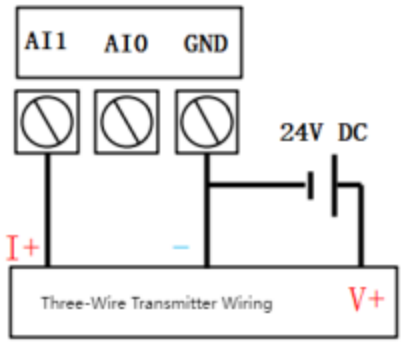
The following are the wiring methods for three commonly used typical transmitters and an introduction to the transmitter current signal circuit:

（1）Connect the positive terminal of the current output of the four-wire transmitter → the positive terminal of AI → the negative terminal of GND → the negative terminal of the transmitter. The data terminal receives the current signal.



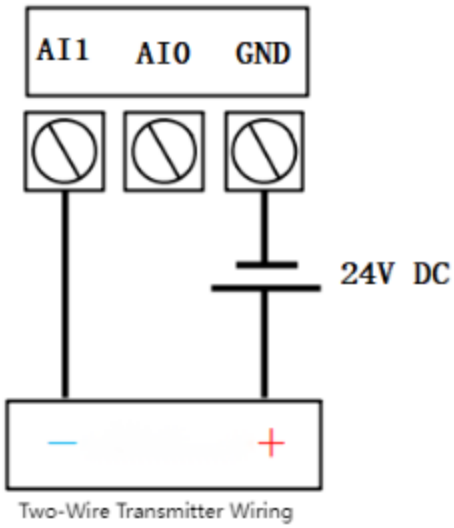
(Figure 44: Four-Wire Transmitter Wiring Description)

（2）Connect the positive terminal of the current output I+ of the three-wire transmitter → the positive terminal of AI0 of the data terminal → the negative terminal of 2M of the data terminal → the negative terminal (common terminal) of the transmitter. The data terminal receives the current signal.



(Figure 45: Three-Wire Transmitter Wiring Description)

（3）Connect the positive terminal of the 24V power supply → the positive terminal of the two-wire transmitter → the negative terminal of the transmitter → the positive terminal of AI0 of the data terminal → the negative terminal of 2M of the data terminal → the negative terminal of the 24V power supply. The data terminal receives the current signal.



(Figure 46: Two-Wire Transmitter Wiring Description)

Table 6: Analog Input Value Range Description

Status	Value Range

0~20mA (Default Current Type)	0-4096
0~10V (Voltage Type)	0-4096

4) Modbus Forwarding

The device supports acting as a Modbus RTU slave to forward collected IO data. For specific mapping addresses, please refer to the Modbus Register Mapping.

3.5. Modbus Sensor Acquisition

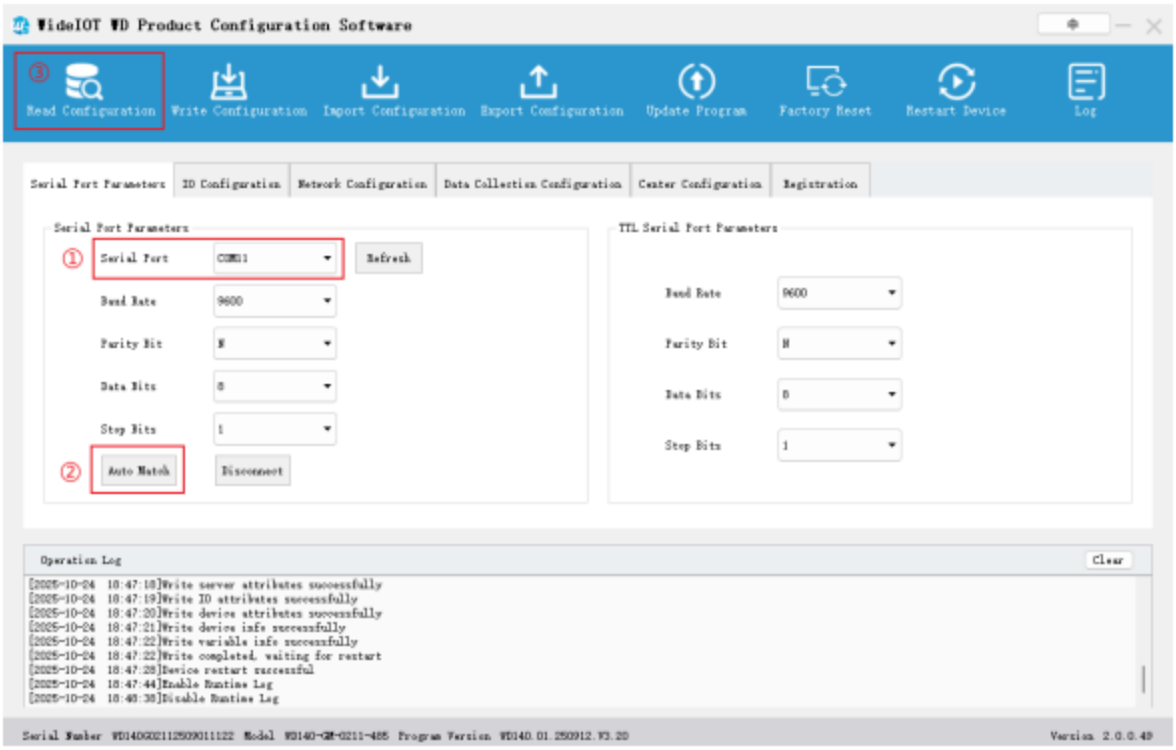
Configure data acquisition to collect data from Modbus sensors connected to the device and report it to the MQTT server.

3.5.1. Operation Guide

1) Read Configuration

Open the configuration tool, select the serial port number, and click "Auto Match". After successful connection, click "Read Configuration" to upload the current device configuration, and wait for the log to indicate that the reading is completed.

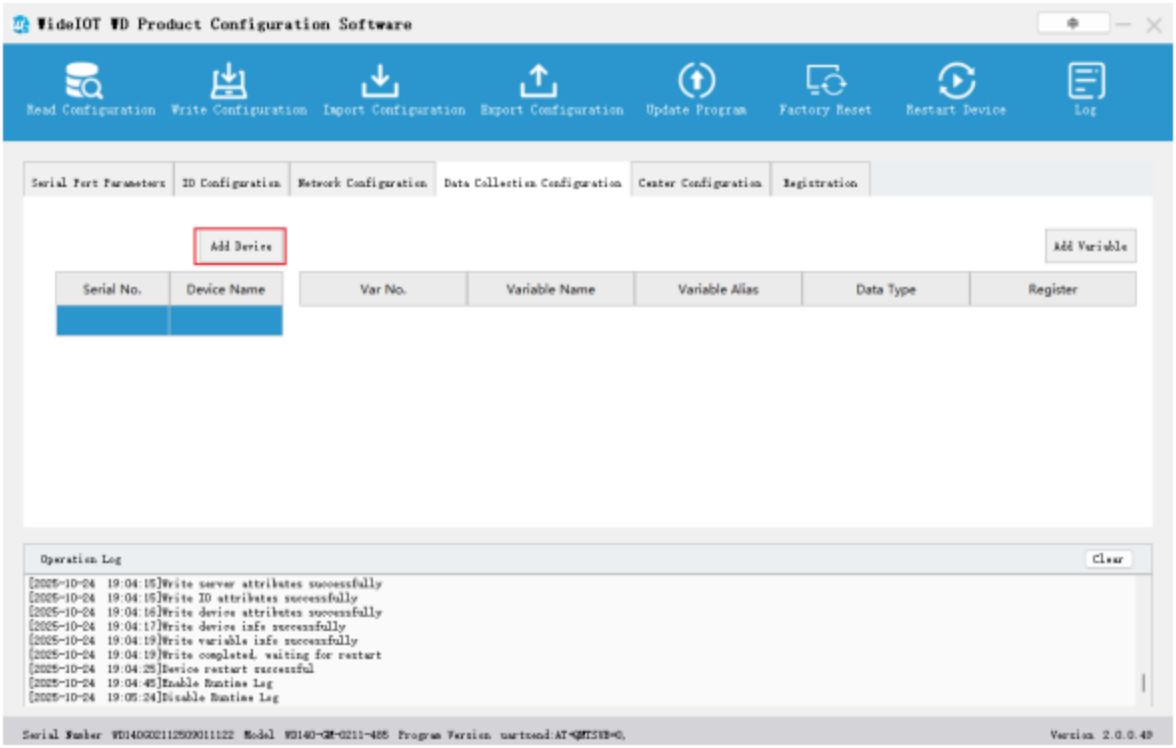
Note: If the configuration has already been read, this step can be skipped.



(Figure 47: Obtain Current Device Configuration)

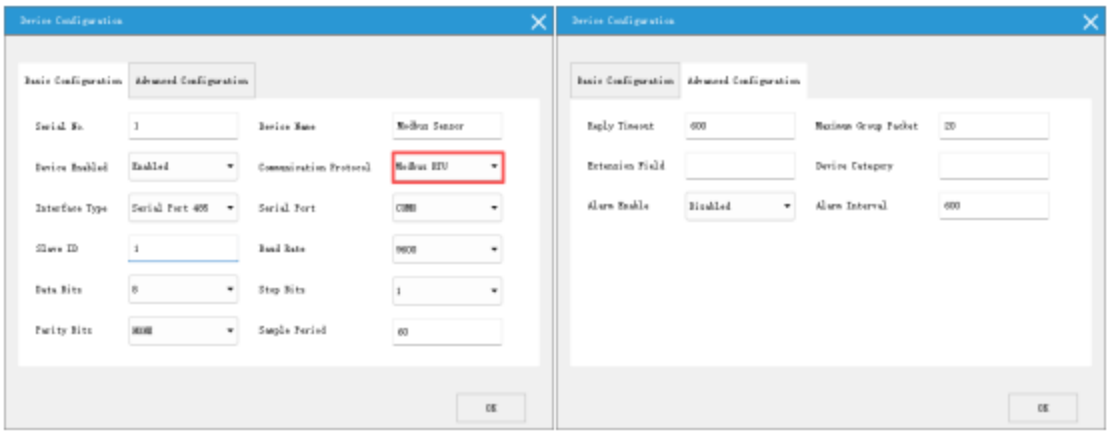
2) Add Device

Click "Data Acquisition Configuration" → "Add Device".



(Figure 48: Add Device)

Set as shown in the figure below. Select Modbus RTU as the communication protocol. Fill in the slave address, baud rate, and other serial port parameters according to the serial port parameters of the connected sensor device. The "Device Serial Number", "Device Name", and "Acquisition Period" can be customized.



(Figure 49: Basic Device Configuration; Figure 50: Advanced Device Options)

Maximum Packet Assembly

The maximum number of register addresses that can be collected at one time when collecting Modbus RTU.

Extended Field

When collecting Modbus RTU, the extended field can be set to a;b;c;d:

a: Based on 0/Based on 1, can be set to 0 or 1 (i.e., the starting address of the device Modbus is 0 or 1);

b: Algorithm, set to 0 by default;

c: Byte order, can be set to 0/1/2/3, representing ABCD/CDAB/BADC/DCBA respectively;

d: Waiting time (unit: ms), representing the interval between multiple requests sent by the device.

3) Add Variable

Click "Add Variable"

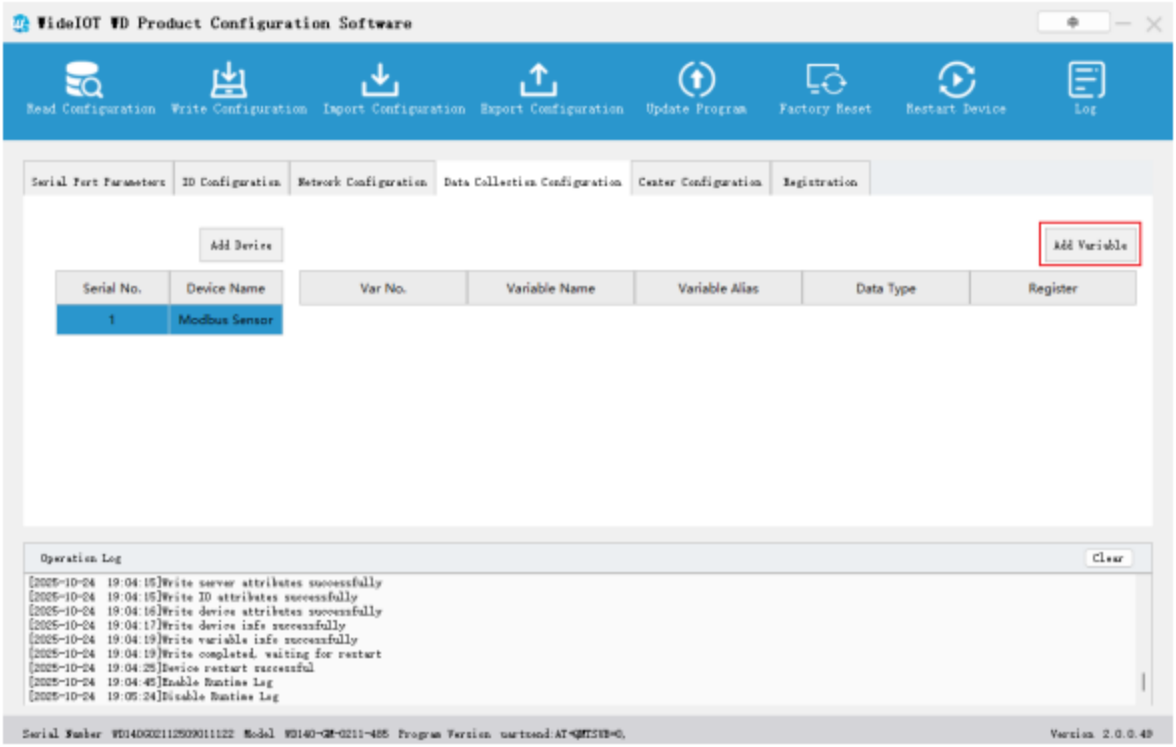
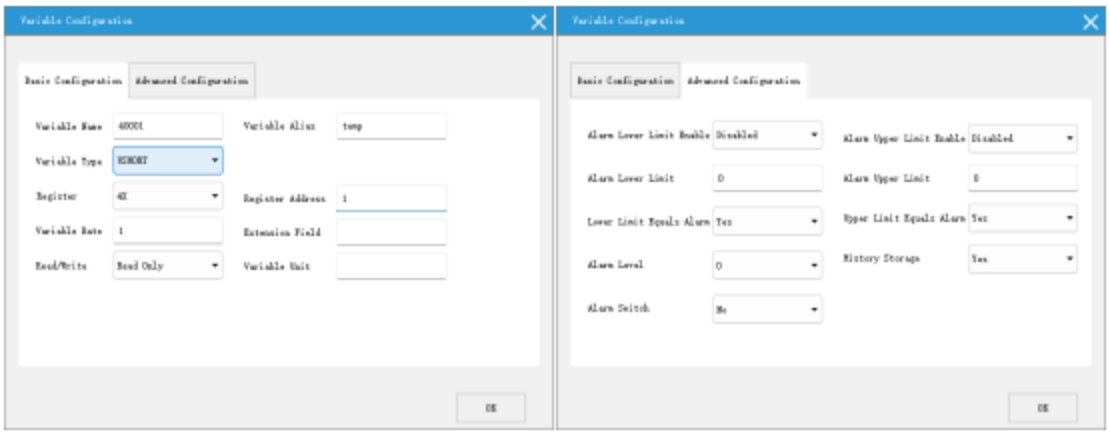


Figure 51:Add Variable

Configure the points according to the sensor Modbus address table. The following figure shows the configuration method when the sensor Modbus address is 40001:

When the Modbus address is 40001, the register is 4X and the address is 1;

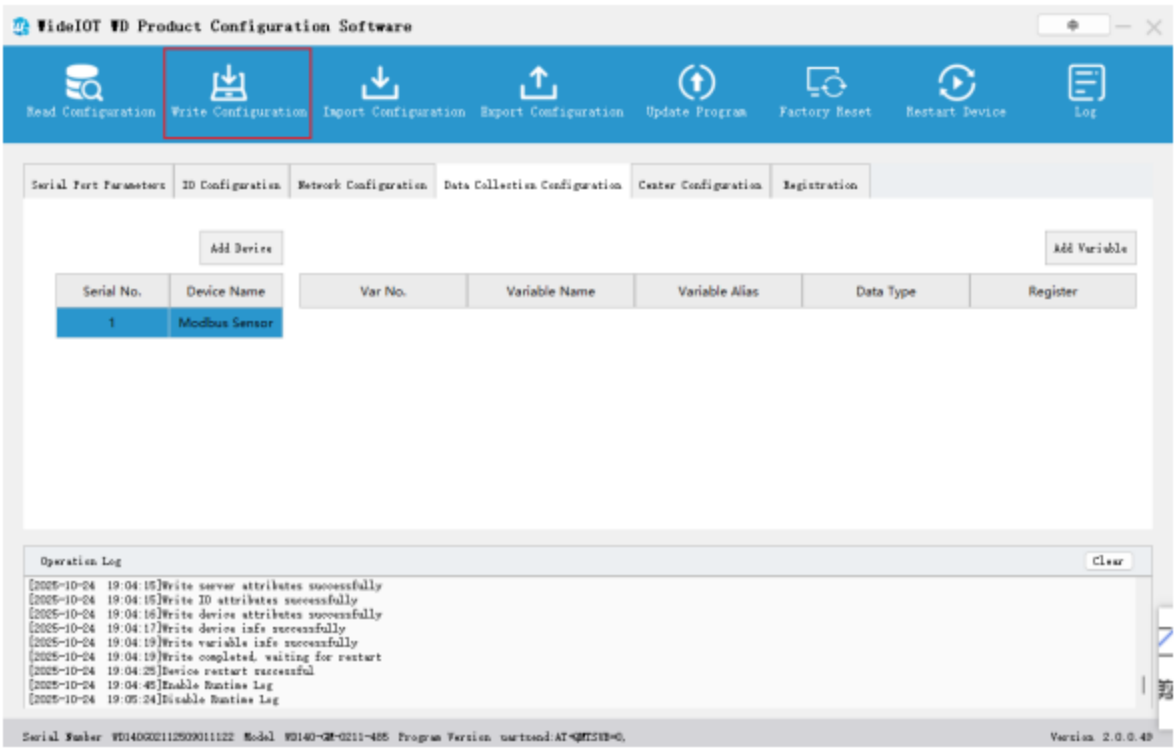
When the Modbus address is 40002, the register is 4X and the address is 2, and so on.



(Figure 52: Basic Variable Configuration; Figure 53: Advanced Variable Options)

4) Write Configuration

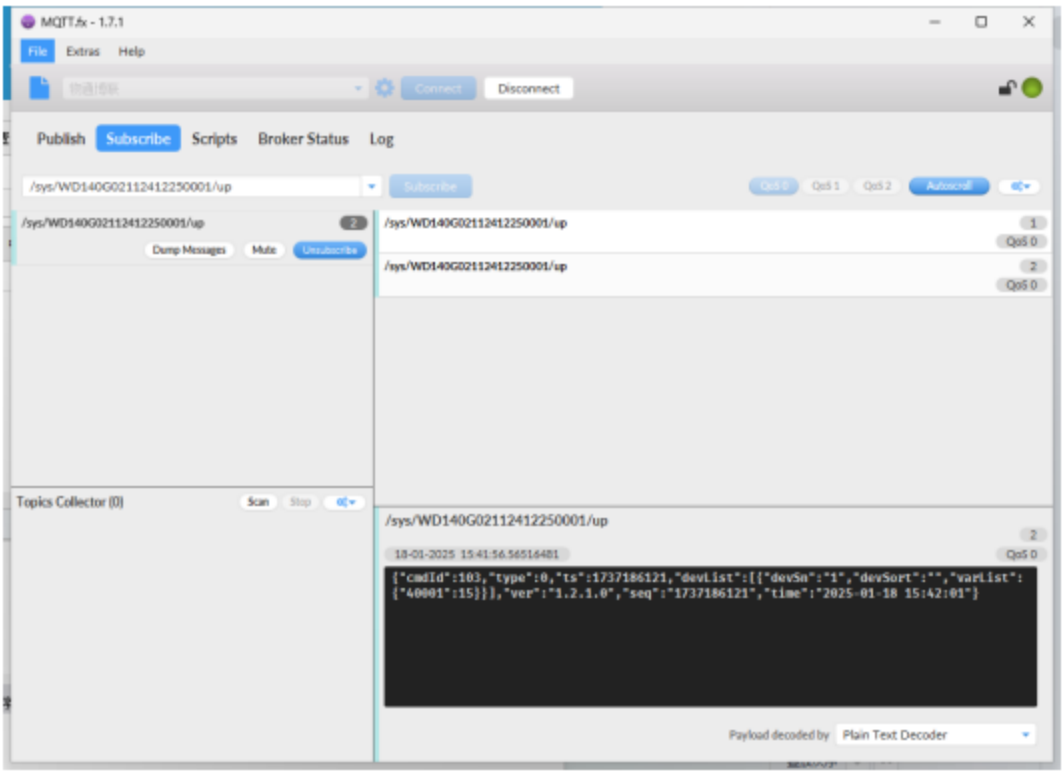
Click "Write Configuration" to write the configuration to the device, and wait for the log to indicate that the writing is completed.



(Figure 54: Write Configuration to Device)

3.5.2. Example Demonstration

Data collected and reported by the terminal can be subscribed to through the MQTT client tool.



(Figure 55: Subscribe to Reported Data Using MQTT Client Tool)

3.6. MQTT Reporting

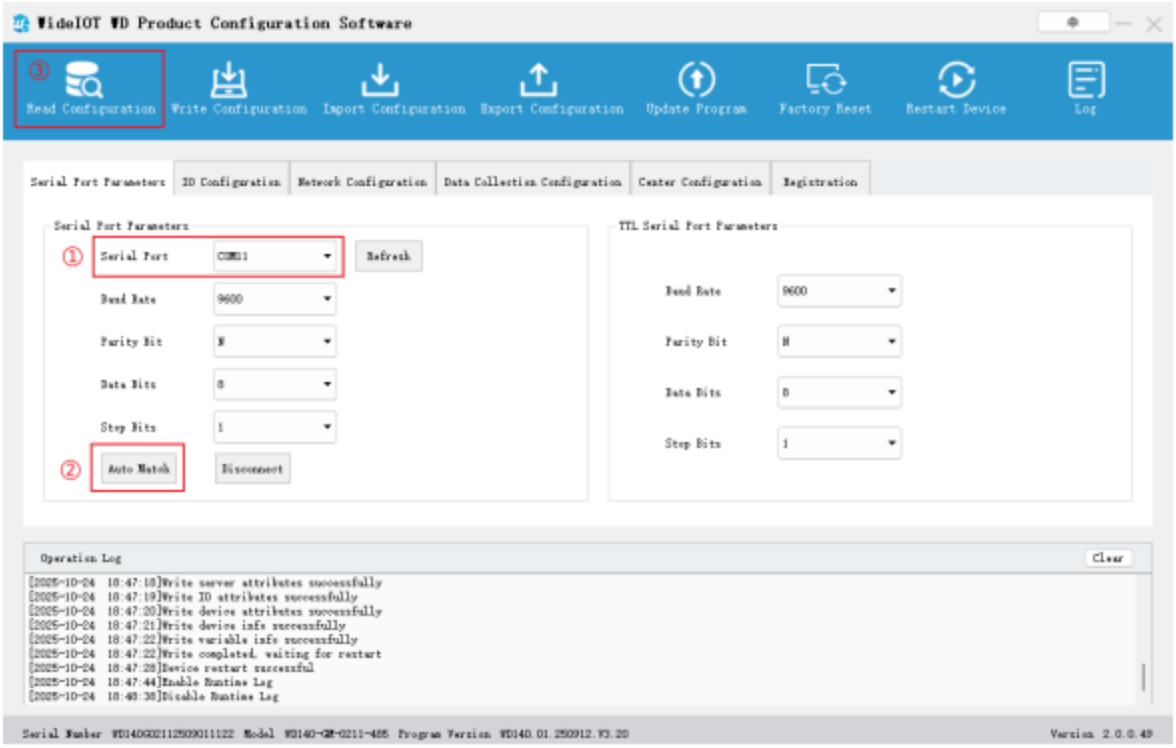
The device supports reporting collected data to the MQTT server.

3.6.1. Operation Guide

1) Read Configuration

Open the configuration tool, select the serial port number, and click "Auto Match". After successful connection, click "Read Configuration" to upload the current device configuration, and wait for the log to indicate that the reading is completed.

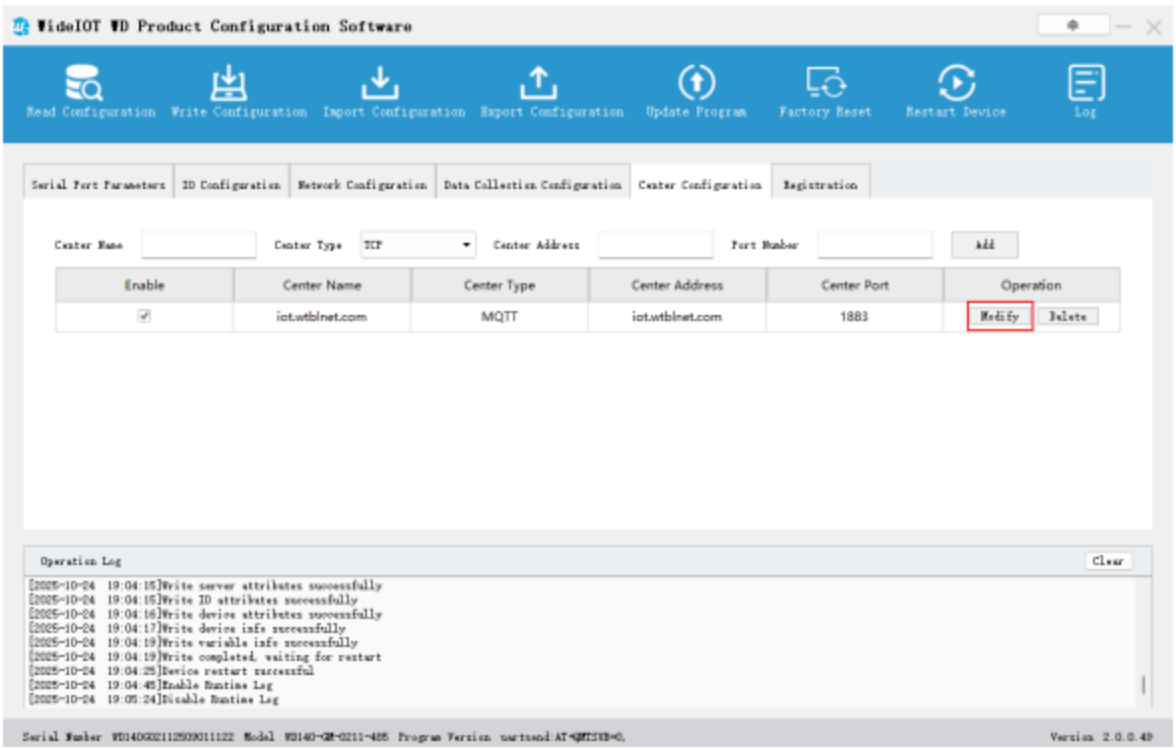
Note: If the configuration has already been read, this step can be skipped.



(Figure 56: Obtain Current Configuration)

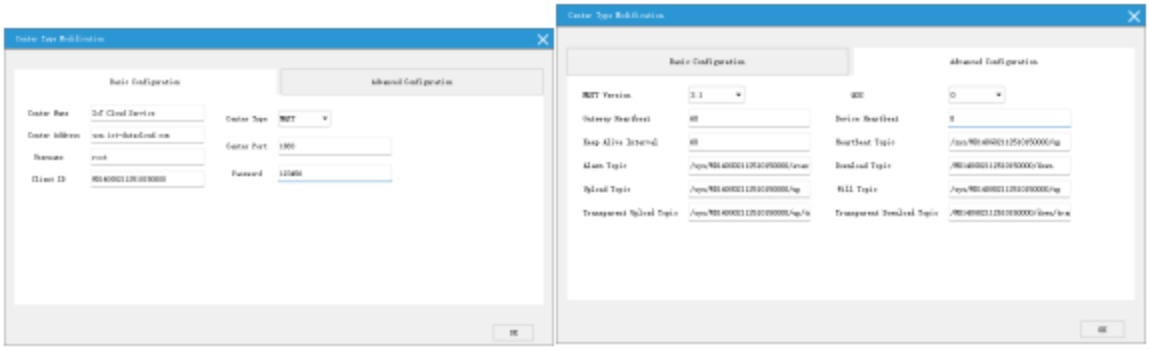
2) Configure Service

Click "Center Configuration" to modify the cloud service configuration.



(Figure 57: Center Configuration)

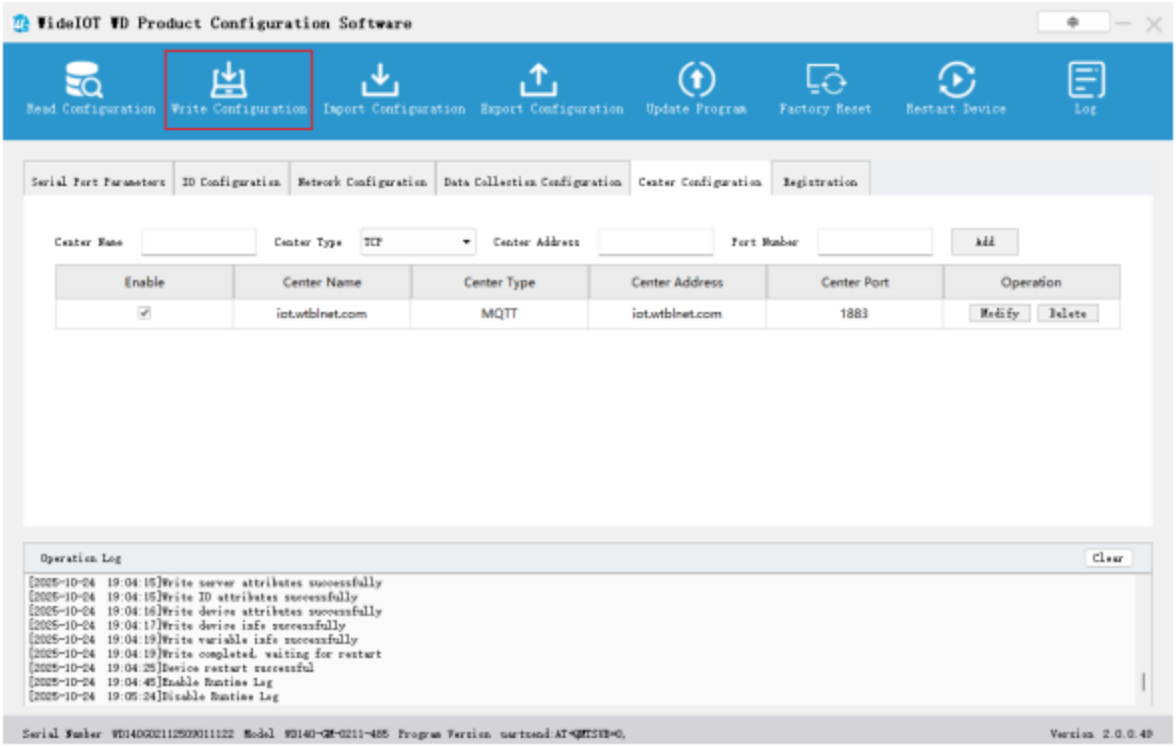
Configure MQTT connection parameters.



(Figure 58: Basic Center Configuration; Figure 59: Advanced Center Configuration)

3) Write Configuration

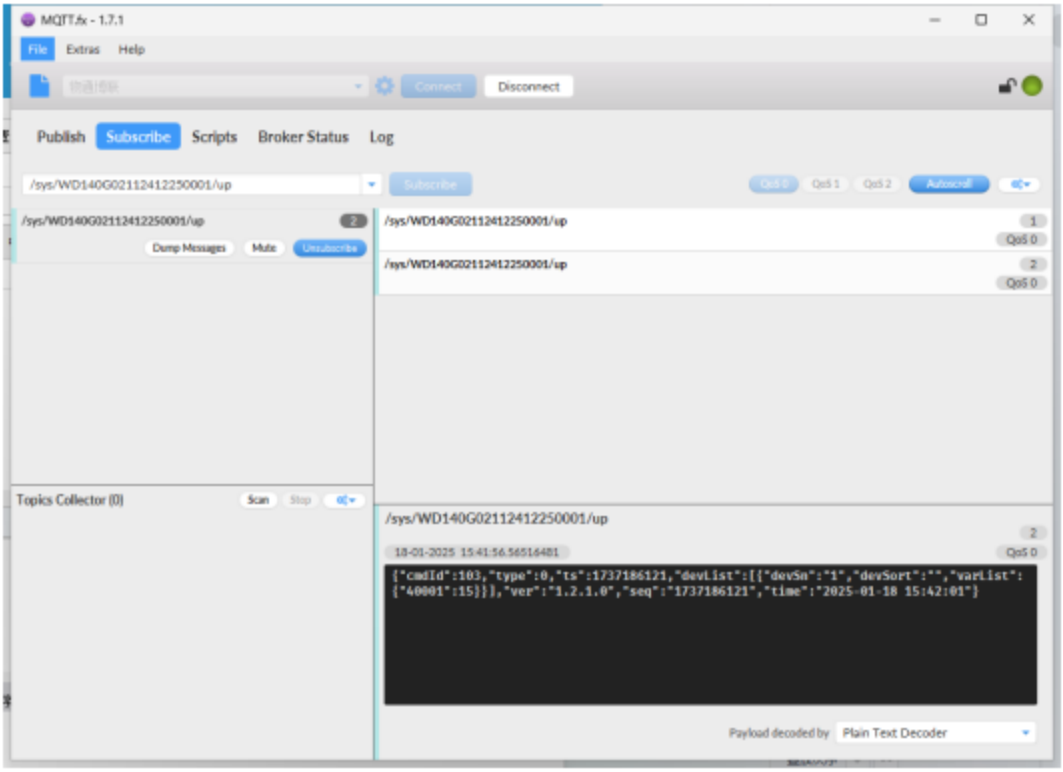
Click "Write Configuration" to write the configuration to the device, and wait for the log to indicate that the writing is completed.



(Figure 60: Write Configuration to Device)

3.6.2. Example Demonstration

Data collected and reported by the device can be subscribed to through the MQTT client tool.



(Figure 61: Subscribe to Device-Reported Data Using MQTT Client Tool)

3.7. MQTT Transparent Transmission

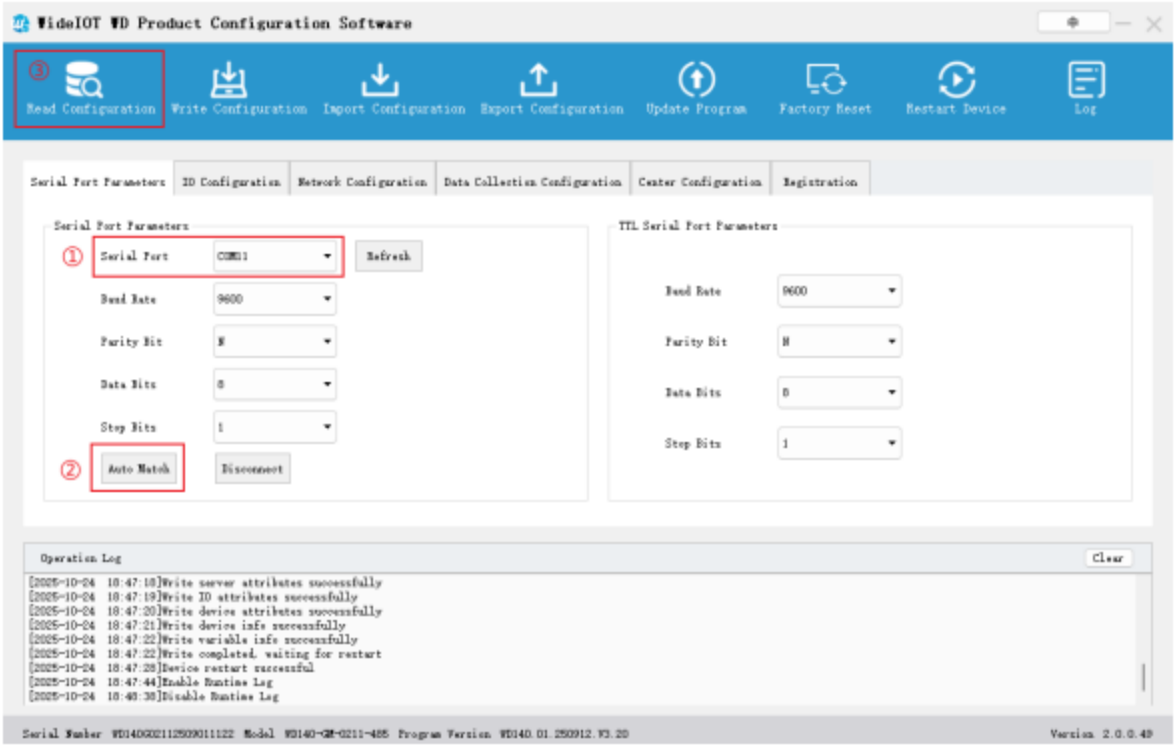
The device supports transparent transmission of serial port data to the MQTT server.

3.7.1. Operation Guide

1) Read Configuration

Open the configuration tool, select the serial port number, and click "Auto Match". After successful connection, click "Read Configuration" to upload the current device configuration, and wait for the log to indicate that the reading is completed.

Note: If the configuration has already been read, this step can be skipped.



(Figure 62: Obtain Current Device Configuration)

2) Add Device

Click "Data Acquisition Configuration" — "Add Device"

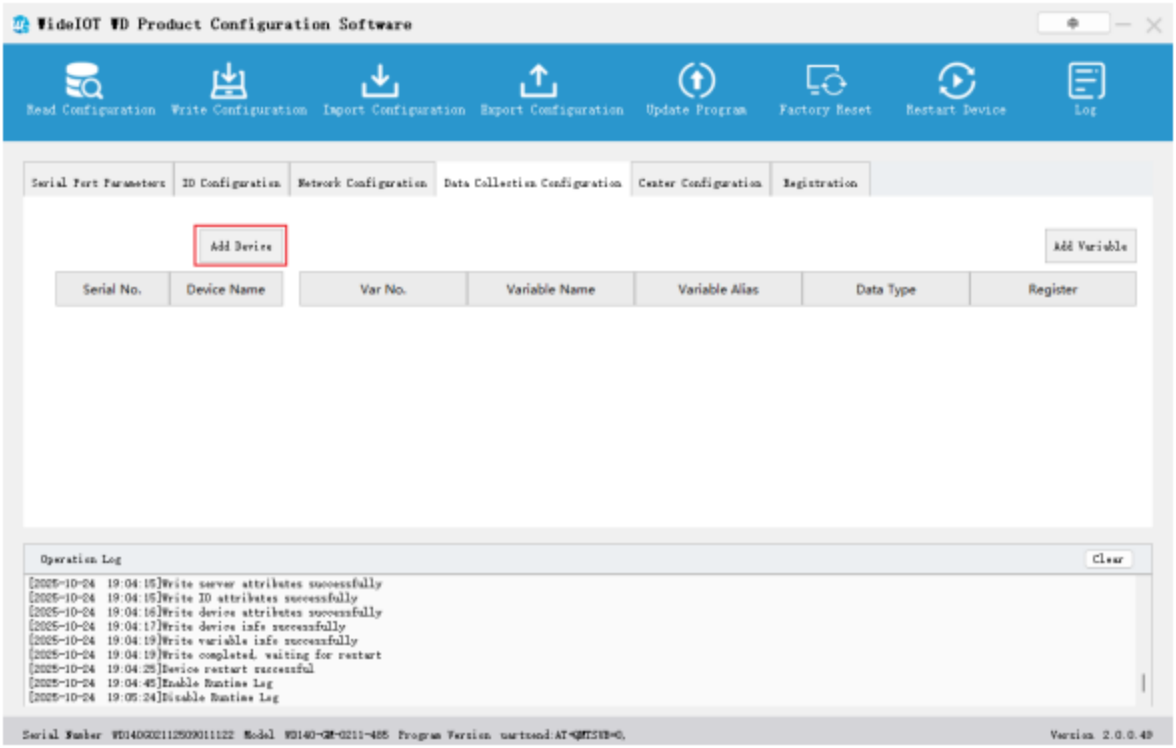
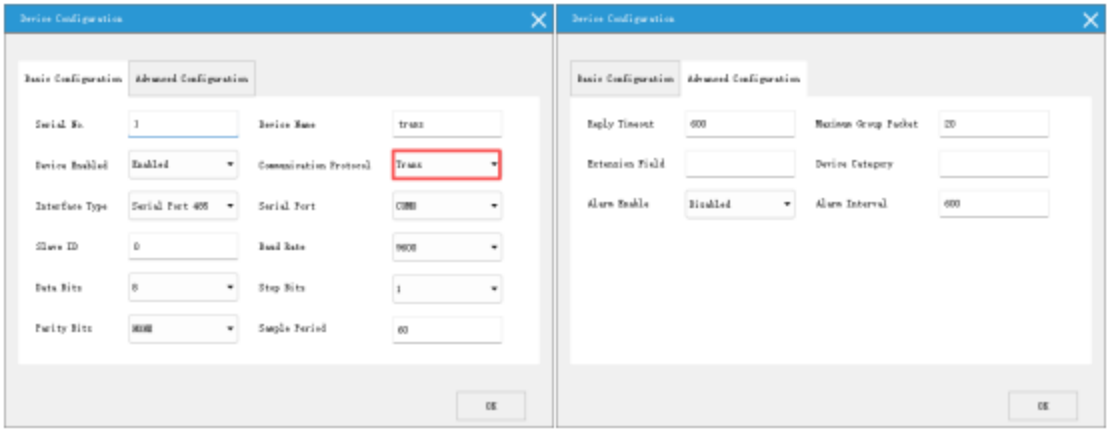


Figure 63: Add Device

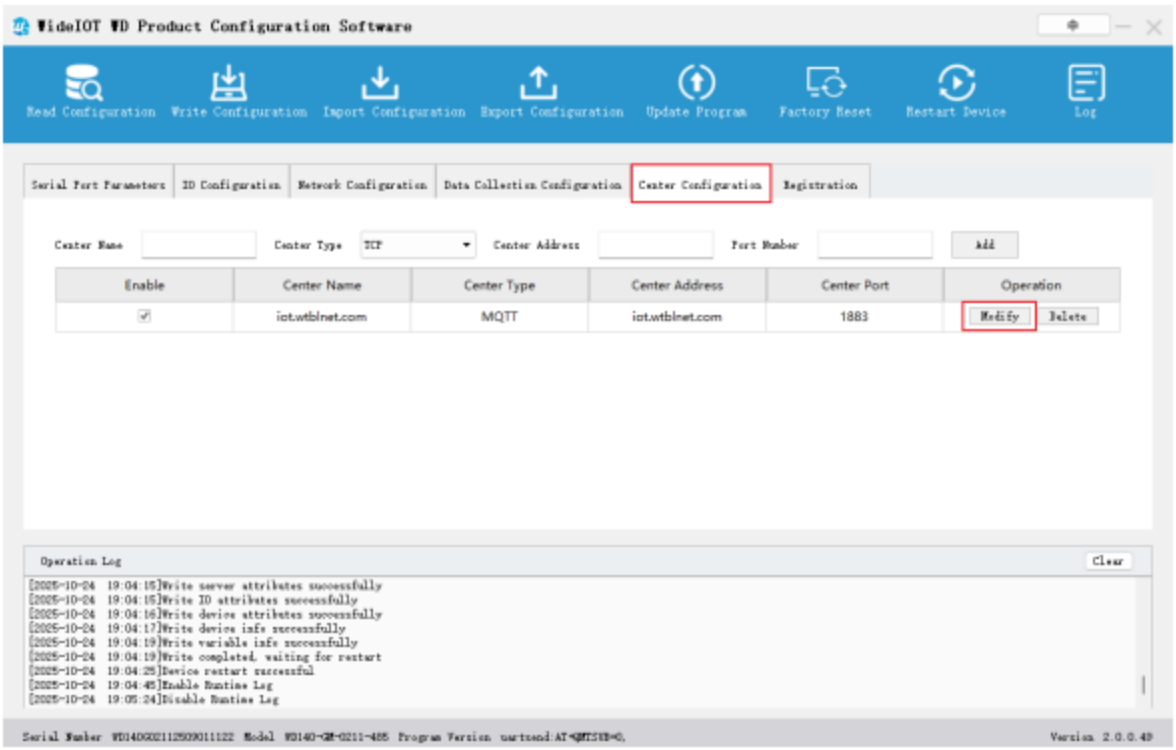
Set as shown in the figure below. Select Trans as the communication protocol. Fill in the slave address, baud rate, and other serial port parameters according to the serial port parameters of the connected sensor device.



(Figure 64: Basic Device Configuration; Figure 65: Advanced Device Options)

3) Configure Service

Click "Center Configuration" to modify the cloud service configuration.

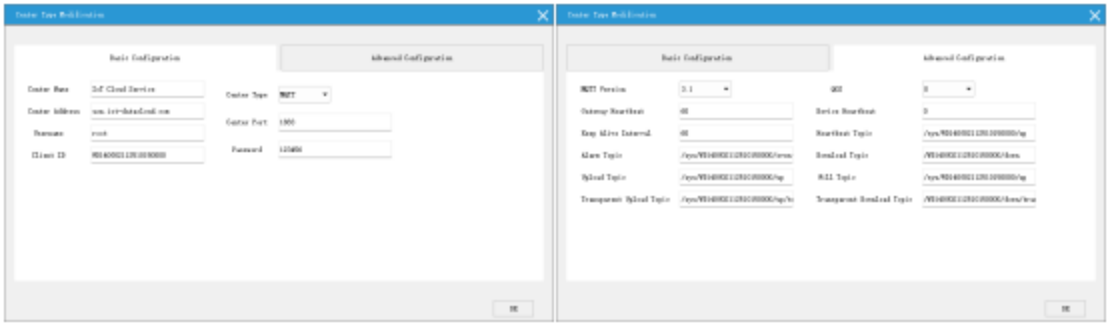


(Figure 66: Center Configuration)

Configure MQTT connection parameters:

Transparent Uplink Topic: Data received by the device from the serial port will be reported to this topic;

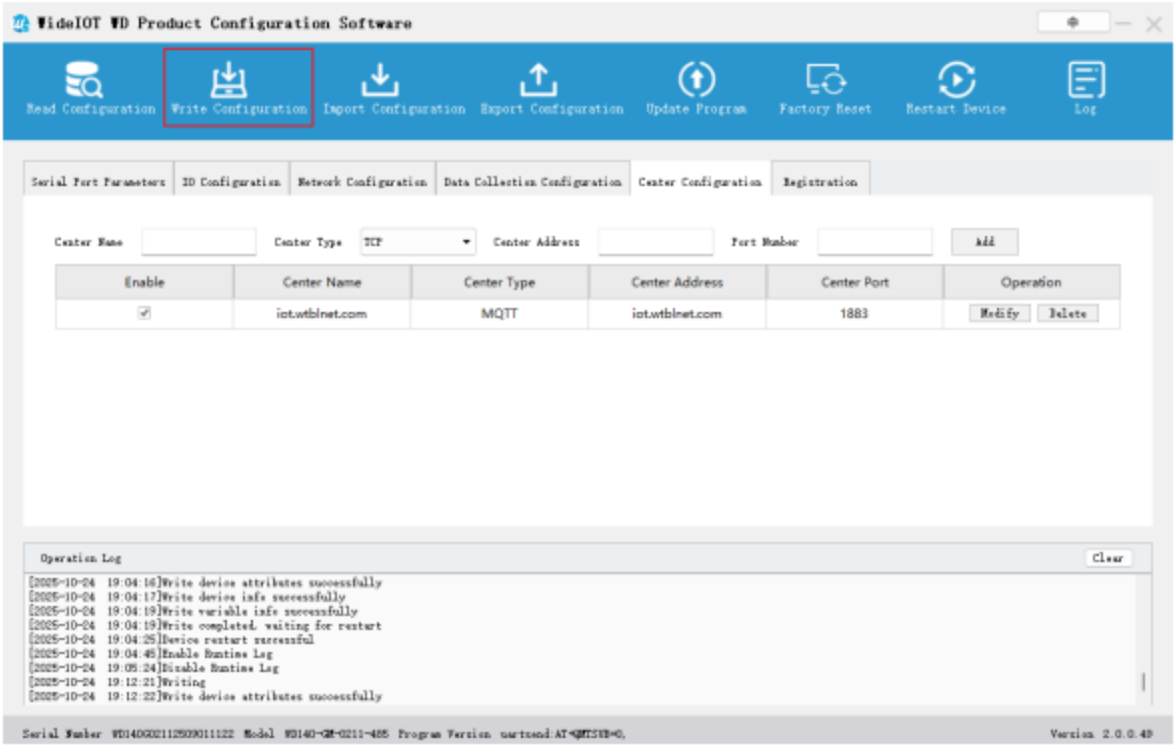
Transparent Downlink Topic: The device will subscribe to this topic. When the MQTT client sends data to this topic, the device will transparently transmit the data to the serial port.



(Figure 67: Basic Center Configuration; Figure 68: Advanced Center Configuration)

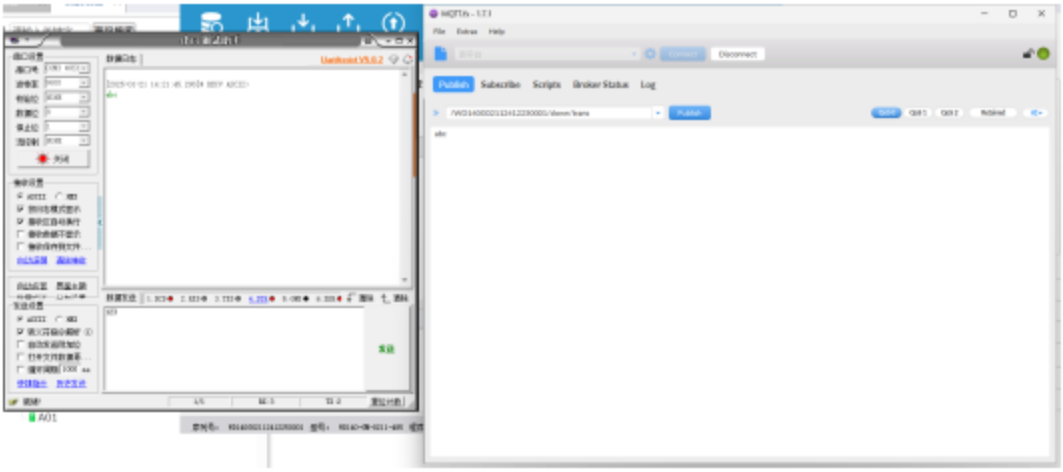
4) Write Configuration

Click "Write Configuration" to write the configuration to the device, and wait for the log to indicate that the writing is completed.

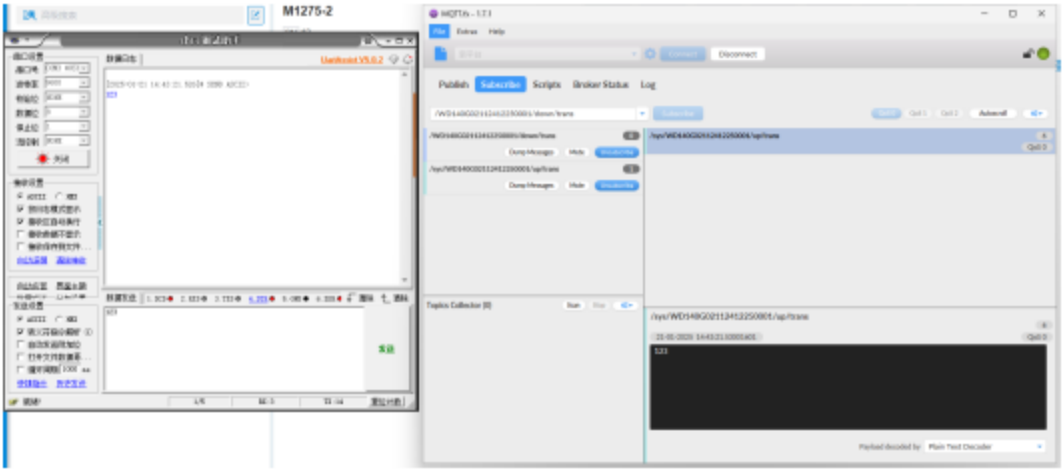


(Figure 69: Write Configuration to Device)

3.7.2. Example Demonstration



(Figure 70: Cloud Data Transparent Transmission to Device Serial Port)



(Figure 71: Device Serial Port Data Transparent Transmission to Cloud)

3.8. TCP/UDP Transparent Transmission

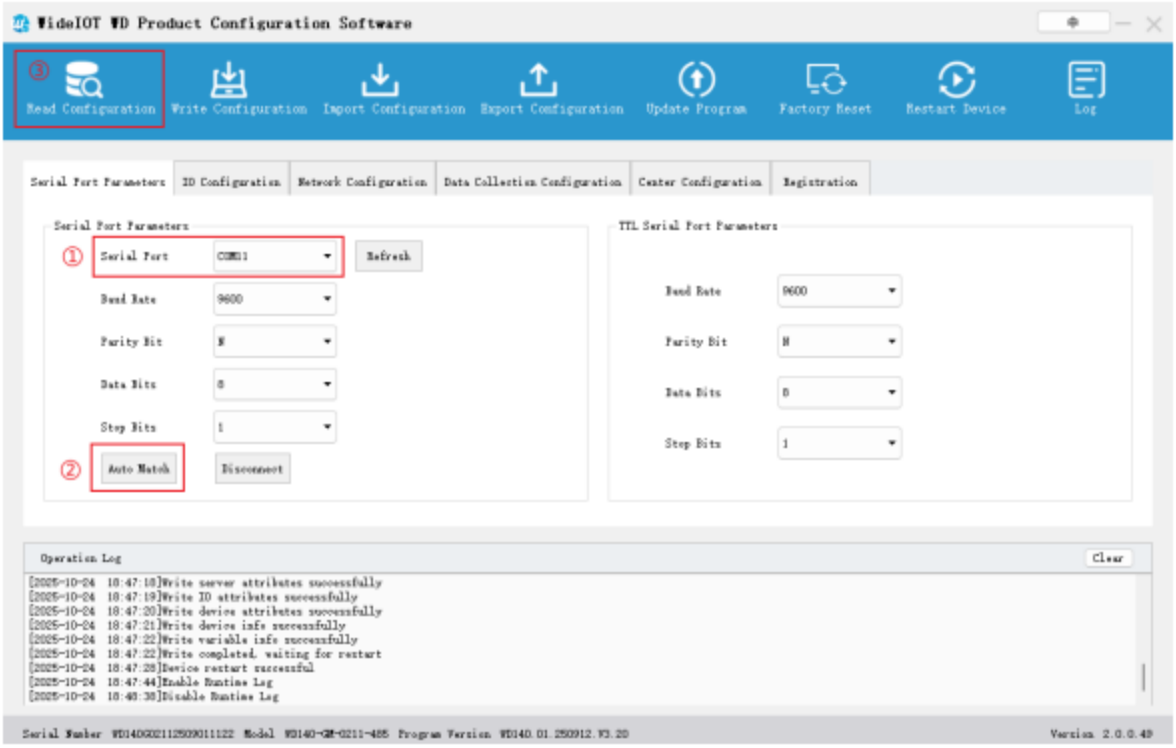
The device supports transparent transmission of serial port data to the TCP server.

3.8.1. Operation Guide

1) Read Configuration

Open the configuration tool, select the serial port number, and click "Auto Match". After successful connection, click "Read Configuration" to upload the current device configuration, and wait for the log to indicate that the reading is completed.

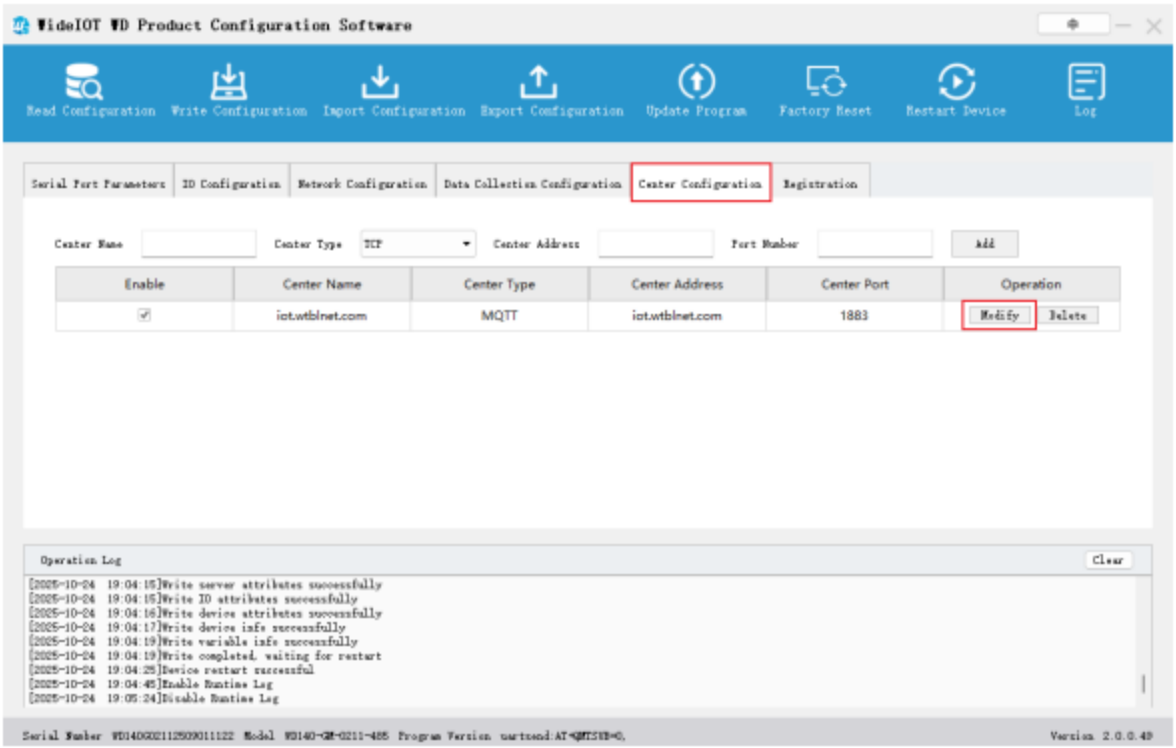
Note: If the configuration has already been read, this step can be skipped.



(Figure 72: Obtain Current Device Configuration)

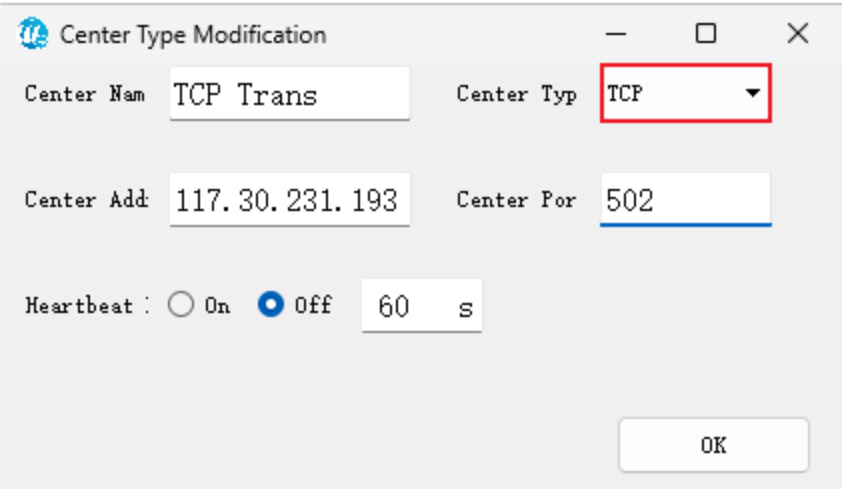
2) Configure Service

Click "Center Configuration" to modify the cloud service configuration.



(Figure 73: Center Configuration)

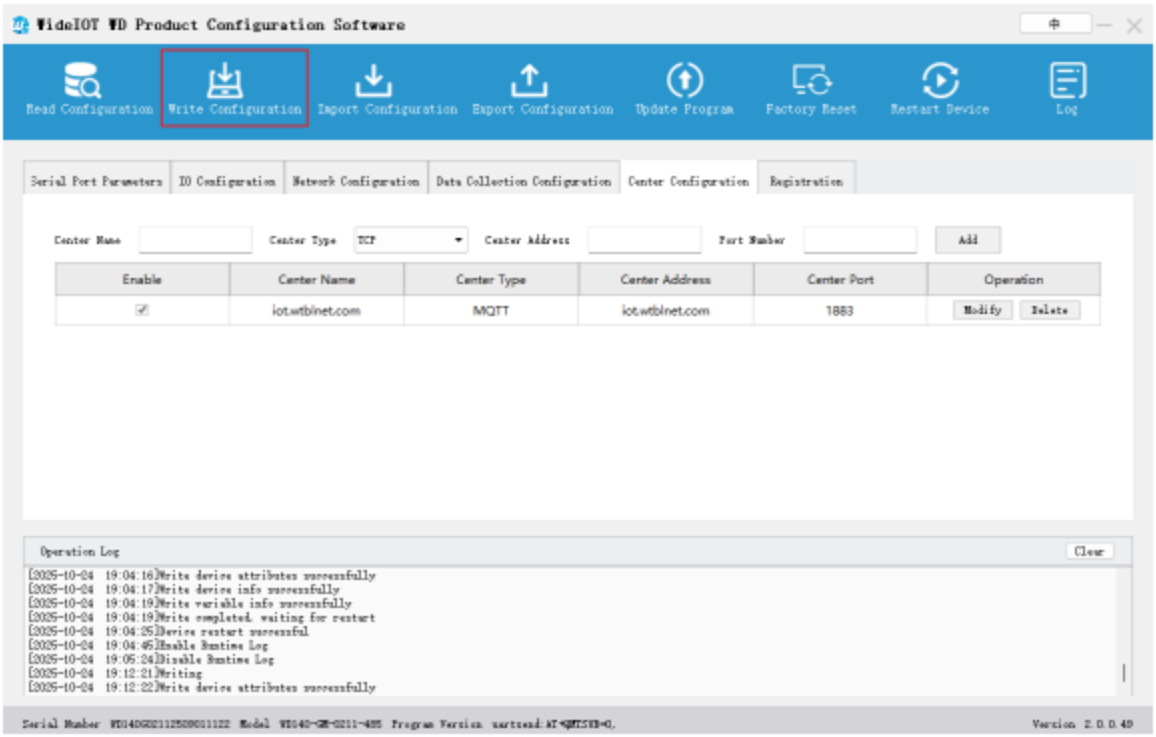
Modify the center type to TCP.



(Figure 74: TCP Connection Settings)

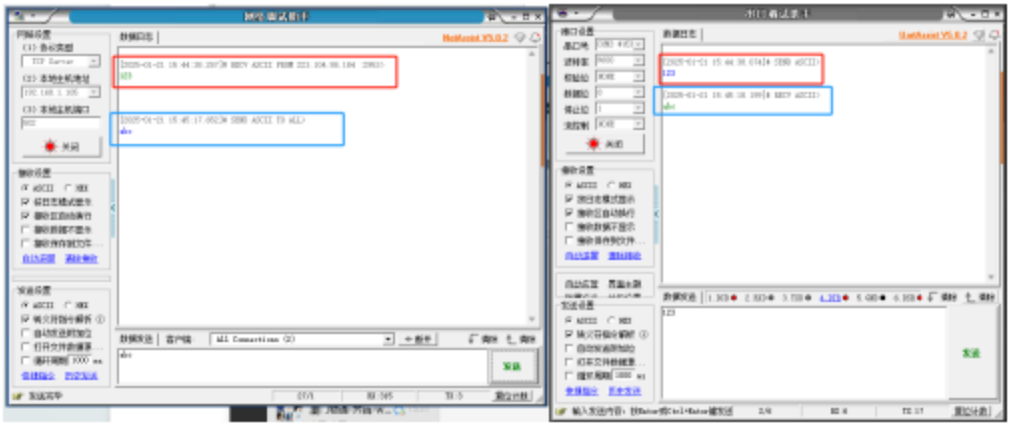
3) Write Configuration

Click "Write Configuration" to write the configuration to the device, and wait for the log to indicate that the writing is completed.

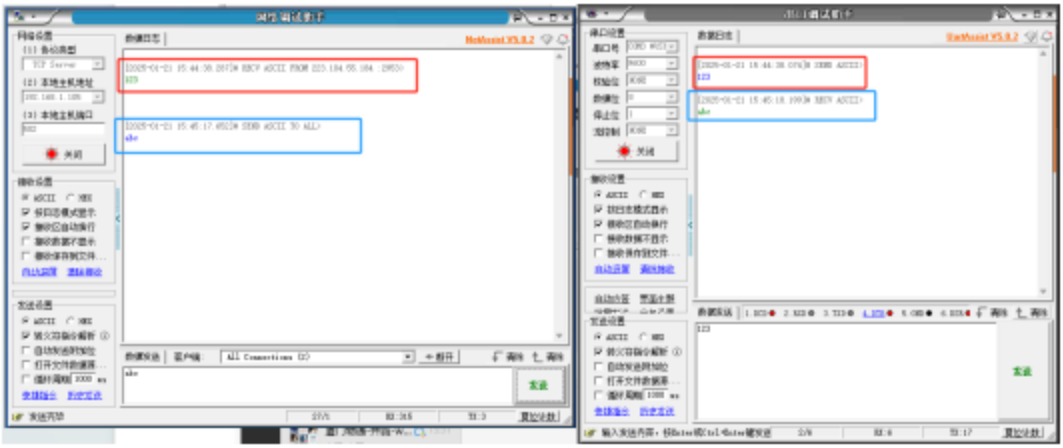


(Figure 75: Write Configuration to Device)

3.8.2. Example Demonstration



(Figure 76: Cloud Transparent Transmission to Serial Port)



(Figure 77: Serial Port Transparent Transmission to Cloud)

4. Appendix

4.1. MQTT Data Format Description

4.1.1. Status Packet

Default Topic: /sys/$gatewaySn/up (Uplink topic, customizable)

Online Notification


```
{
"cmdId": 1,
"ICCID": "898608401024D0022916",
"GSN": "864708075333990",
"COPS": "CHINA MOBILE",
"ipAddr": "10.36.215.91",
"csq": "16",
"netType": "LTE Cat1",
"devSn": "1",
"devName": "IO Acquisition",
"devSort": "",
"devReportTime": "60",
"binVersion": "WD140.01.250109.V3.10",
"softType": "MQTT",
"gwSn": "WD140G02112412250001",
"ver": "1.2.1.0",
"seq": "1738724139",
"time": "2025-02-05 10:55:39"
}
```


Offline Notification (Will Registration Supported)

Default Topic: /sys/$gatewaySn/up (Non-customizable, fixed)


```
{
"cmdId": 2,
"gwSn": "WD140G02112412250001"
}
```


4.1.2. Heartbeat Packet


```
{
"cmdId": 3,
"gwSn": "WD140G02112412250001",
```

```
   "csq": "13",//Signal value
   "cell_location": "59E7,6761A39",//Base station location information
   "ver": "1.2.1.0",
   "seq": "1738725673",
   "time": "2025-02-05 11:21:13"
}
```


4.1.3. Device Heartbeat Packet

Default Topic：/sys/$gatewaySn/up（Uplink topic, customizable）


```
{
   "cmdId": 104,
   "devList": [
      {
         "devSn": "1",
         "devSort": "",
         "ts": 1738725553,
          "online": 1//Online status of the corresponding device (1 = Online, 0 =
Offline)
      }
   ],
   "ver": "1.2.1.0",
   "seq": "1738725553",
   "time": "2025-02-05 11:19:13"
}
```


4.1.4. Data Reporting

Real-time data reporting means that on-site device data is automatically reported to the cloud IOT platform at regular intervals. Each device (corresponding to one devSn) is reported in a separate message.

Message Topic：/sys/$gatewaySn/up (Data reporting topic, customizable)

Example：/sys/WD140G02112412250001/up

Scheduled Data Reporting

The following example shows the reporting of values of four variables: DI0, DO1, AI0, and AI1.


```
{
   "cmdId": 103,
   "type": 0, // 0 = Real-time data
   "ts": 1738724446, // Data collection time of the corresponding device
   "devList": [
      {
```

```
            "devSn": "1", // Corresponding device serial number
            "devSort": "", // Corresponding device category (facilitates platform differentiation of different business systems)
            "ts": 1738724446,
            "varList": {
               "DO1": 0, // Null when collection is empty
               "DI0": 0,
               "AI0": 0.41,
               "AI1": 0.41
            }
         }
      ],
      "ver": "1.2.1.0",
      "seq": "1738724446", // Random value or incremental value
      "time": "2025-02-05 11:00:46" // Message reporting time
   }
```


4.1.5. Data Reading

Device data reading is divided into two types: immediate reading of all variables of a device and reading of specific variables of a specified device. The latter is commonly used in practice.

Message Topic: /$gatewaySn/down (Downlink topic, customizable)

Reading All Variables of a Device

Request Message:


```
{
"cmdId": 85,
"devSn": "1",
"req": "81100000111111"
}
```


Response Topic: /sys/$gatewaySn/up (Uplink topic, customizable)

Response Message:


```
{
"cmdId": 86,
"devSn": "1",
"devSort": "",
"varList": {
   "DO1": 0,
   "DI0": 0,
   "AI0": 0.41,
```

```
        "AI1": 0.41
    },
    "flag": 1,
    "msg": "Success",
    "ver": "1.2.1.0",
    "seq": "81100000111111",
    "time": "2025-02-05 11:10:13"
}
```


Reading Specific Variables of a Device

Message Topic: /$gatewaySn/down (Downlink topic, customizable)

Request Message:


```
{
    "cmdId": 85,
    "devSn": "1",
    "varList": [
        "AI0",
        "AI1"
    ],
    "req": "81100000111111"
}
```


Response Topic: /sys/$gatewaySn/up (Uplink topic, customizable)

Response Message:


```
{
    "cmdId": 86,
    "devSn": "1",
    "devSort": "",
    "varList": {
        "AI0": 0.41,
        "AI1": 0.41
    },
    "flag": 1,
    "msg": "Success",
    "ver": "1.2.1.0",
    "seq": "81100000111111",
    "time": "2025-02-05 11:12:50"
}
```

4.1.6. Remote Writing

Data reverse control refers to the cloud IOT platform sending data to realize direct reverse control of the device.

Message Topic：/$gatewaySn/down（Downlink topic, customizable）

Request Message：


```
{
"cmdId": 87,
"devSn": "1",
"varList": {
   "DO1": 1
},
"req": "81100000111111"
}
```


Response Topic：/sys/$gatewaySn/up（Uplink topic, customizable）

Response Message：


```
{
"cmdId": 88,
"devSn": "1",
"varList": [
   {
      "varName": "DO1",
      "flag": 1
   }
],
"flag": 1,
"msg": "Success",
"ver": "1.2.1.0",
"seq": "81100000111111",
"time": "2025-02-05 11:15:08"
}
```


4.1.7. Management Operations

Including device status, terminal status, time synchronization commands, diagnosis commands, configuration deployment commands, etc.

Default Topic：/sys/$gatewaySn/up（Uplink topic, customizable）

1) Time Synchronization Command

Message Topic：/$gatewaySn/down（Downlink topic, customizable）

Time Synchronization

（1）If the terminal has access to the external network, it will synchronize time automatically;

（2）If the terminal is in an intranet, the server needs to send a command to update the current time.

Request Message:


```
{
"cmdId": 91,
"execmd": "date -s '2025-02-05 11:27:37' "
}
```


Response Topic: /sys/$gatewaySn/up（Uplink topic, customizable）

Response Message:


```
{
"cmdId": 92,
"gwSn": "WD140G02112412250001",
"flag": 1,
"msg": "2025-02-05 11:27:37",
"ver": "1.2.1.0",
"time": "2025-02-05 11:27:37"
}
```


2) Command Issuance

Message Topic: /$gatewaySn/down（Downlink topic, customizable）

Request Message:


```
{
"cmdId": 91,
"execmd": "wtbl_gostatus text",
"req": "81100000111111"
}
```


Response Topic: /sys/$gatewaySn/up（Customizable）

Response Message:


```
{
"cmdId": 92,
"gwSn": "WD140G02112412250001",
"flag": 1,
"msg": "@wtblnet@17@WD140G02112412250001@WD140.01.250109.V3.10@
LTE@1.2.1.0@10@null@null@null@null@null@null@null@null@null@nul
```

1@204",
"ver": "1.2.1.0",
"time": "2025-02-05 11:30:44",
"seq": "81100000111111"
}

Common System Commands:

Command		
1	Get terminal status information	wtbl_gostatus text
2	Reboot terminal	reboot
3	Restart collection program	/etc/init.d/wtblcollector restart
4	Restart access program	/etc/init.d/wtblcloud restart
5	Time synchronization command	date -s '2025-02-05 11:27:37'
6	Obtain terminal interfaces	ifconfig

4.2. Modbus Register Mapping

Register Address	Register Content	Description
00000	DO0	Digital Output
00001	DO1	Digital Output
10000	DI0	Digital Input
10001	DI1	Digital Input
40000	AI0 Acquisition Value	Range: 0~4096
40001	AI1 Acquisition Value	Range: 0~4096
41000	AI0 Actual Value	-

41002	AI1 Actual Value	-
44000	CN0	DI0 Pulse Count
44002	CS0	DI0 Pulse Count Overflow Value
44004	CT0	DI0 High/Low Level Time
44006	TY0	DI0 High/Low Level Time Overflow Value
40008	CN1	DI1 Pulse Count
40010	CS1	DI1 Pulse Count Overflow Value
40012	CT1	DI1 High/Low Level Time
40014	TY1	DI1 High/Low Level Time Overflow Value

WideIOT

-Industrial IoT product and digital solution

Website

Xiamen WideIOT Technology

www.wideiot.com

+86-592-2031080

info@wideiot.com

Xiamen softpark III ,Fujian,China