

Industrial Cellular IP Modem TD210

User Guide

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Thank you for choosing the Bivocom Cellular IP Modem. Please read this guide carefully before use; it will help you install, configure, and manage the device safely and efficiently.

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HQ: 27-28/F, Building F14, Software Park Phase III, Xiamen, 361022, China

Factory: 6/F, Building No.18, Anren Industrial Park, No.1068 Jimei North Avenue, Jimei District, Xiamen, 361023, China

W: www.bivocom.com P: +86 158 8026 2905

E: sales@bivocom.com E: support@bivocom.com

About This Guide

Thank you for choosing BIVOCOM Industrial Cellular IP Modem TD210 Series.

Please thoroughly read this user guide before you configure and install the device.

This manual is compatible with below models:

Model	Description
TD210-LF	Industrial LTE/WCDMA IP Modem
TD210-M	Industrial LTE CAT M1/NB-IoT IP Modem

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1. Introduction

1.1 Overview

TD210 Series IP Modem is a type of industrial wireless IP Modem (Also called DTU, Data Transfer Unit), designed to fully meet the needs of industrial standards and industrial users. It adopts high-powered industrial 32-bits CPU, multi-layer software detection and hardware protection mechanism to ensure reliability and stability of the device. It supports worldwide carrier 4G/3G cellular network FDD-LTE, TD-LTE, and WCDMA, EVDO, TD-SCDMA, EDGE, CDMA 1X and GPRS. With rich and flexible interfaces, such as RS232, RS485 and ADC/DI are also customizable.

TD210 Series IP Modem can help users to quickly access the Internet, to ensure secure and reliable data transmission. It's ideal for IOT (Internet of Things) and M2M (Machine to Machine) applications, and has been widely used in many applications, such as Intelligent Transportation, Smart Grid, Vending Machine, Agricultural Irrigation, Environmental Protection, Industrial Automation, Energy Saving, Smart Home, etc.

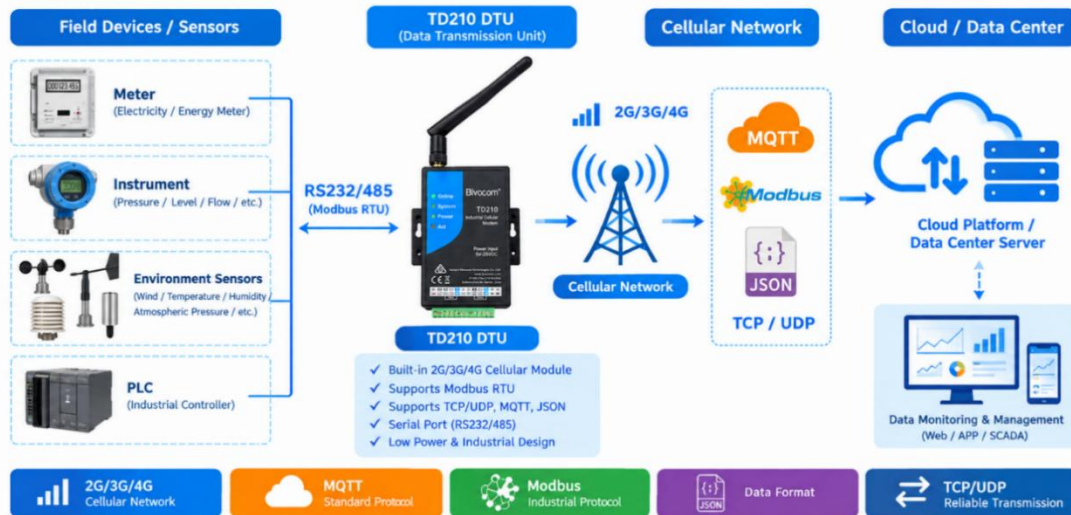
For more device information, please check the official Bivocom [TD210 Datasheet](#).



1.2 Applications

TD210 Series IP Modem utilizes cellular network for remote data acquisition and transmission, and has been used for industrial remote monitor and control.

A typical application is as follows:



The topology illustrates a complete Industrial IoT (IIoT) architecture for remote data acquisition, wireless transmission, and multi-center monitoring. The Bivocom TD210, an industrial-grade IoT wireless DTU, sits at the critical junction between the edge data acquisition layer and the cloud/network layer.

The topology demonstrates how the TD210 connects field devices such as meters, instruments, environmental sensors, and PLCs through serial RS232/RS485 and collects industrial transparent or Modbus RTU data, and transmits it remotely through 2G/3G/4G cellular networks.

The TD210 acts as a communication bridge between field devices and cloud/data-center platforms, supporting TCP/UDP, MQTT, and JSON for flexible data transmission and integration. This enables remote monitoring, centralized data collection, and real-time management of distributed industrial equipment.

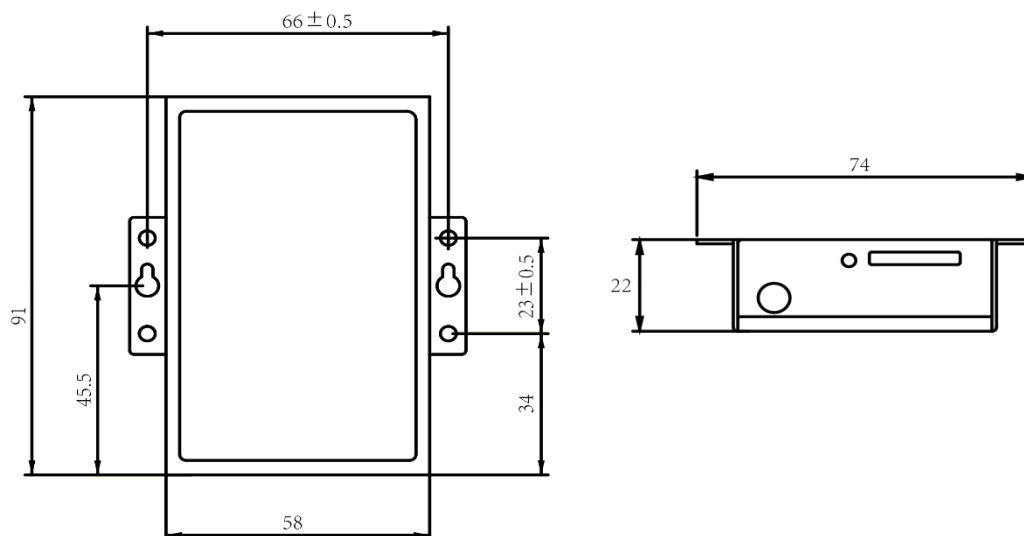
With its industrial serial interfaces, Modbus RTU support, built-in cellular communication, and multiple standard network protocols, the TD210 provides a simple, flexible, and cost-effective solution for Industrial IoT and remote monitoring applications.

1.3 Key Advantages

- **Industrial-Grade Reliability:** Powered by a high-performance 32-bit industrial MCU, it ensures low power consumption. The industrial design ensures high reliability, and wide operating temperature adaptability for harsh environments.
- **Global High-Speed Connectivity:** Supports global coverage of 2G/3G/4G cellular networks, enabling fast and stable wireless data transmission, also high-accuracy GPS position.
- **Serial Communication:** TD210 features robust serial Communication with RS232/RS485 ports, supporting both transparent transmission and Modbus protocol to ensure fast, stable, and reliable data transmission.
- **Seamless Protocol Integration:** Natively supports standard industrial protocols (e.g., Modbus) and mainstream network protocols (TCP/UDP, MQTT), ensuring easy integration with diverse devices and platforms.
- **Flexible & Cost-Effective Deployment:** Its compact size allows for flexible deployment across various industries. It is highly cost-effective and easy to install.
- **User-Friendly Management:** Features dedicated configuration tools and supports the Bivocom Device Management Platform(DMP) for efficient remote configuration and management.
- **Comprehensive Support:** Comes with complete documentation (Quick Guides, videos, Data Sheet, User Manuals), professional technical support, and reliable pre-sales and after-sales service.

1.4 Dimensions

There are 3 holes for installation at each side of TD210 (Unit: mm)



1.5 Hardware Specifications

Physical Characteristics	
Ingress Protection	IP30
Housing & Weight	Metal, 218 g (0.48 lbs), without accessories
Dimensions	91 x 58 x 22 mm (3.58 x 2.28 x 0.87 in), Antenna and other accessories not included.
Mounting	Desktop, Wall mounting
Power Supply and Consumption	
Standard Adapter	DC 12V/1.5A
Input Voltage	5-35V DC
Power Consumption	Working Mode: <1W (85mA@12VDC, 155mA@5VDC) Idle Mode: <0.4W (30mA@12VDC, 55mA@5VDC) *NOTE: Power consumption is measured under laboratory conditions and is for reference only
Environmental	
Operating Temperature	-35°C to +75°C (-31°F to +167°F)
Storage Temperature	-40°C to +80°C (-40°F to +176°F)
Relative Humidity	5% to 95% (non-condensing)
Cellular Interfaces	
Antenna	1 x 50 Ω SMA Female
SIM Slot	1
ESD Protection	15KV
Serial Interfaces	
Connector	Terminal block, 3.5mm female socket with lock
Ports	2-RS232 (1-Debug, 1-Communication), 1-RS485
Baud Rate	300bps - 460800bps
Data bit, Stop bit, Parity bit	Data bit: 7, 8 Stop bit: 1, 2 Parity bit: None, Odd, Even
ESD Protection	8KV for RS232, 15KV for RS485

2. Getting Started

WARNING: Please make sure the device is powered off before you install and configure it.

2.1 Package Checklist

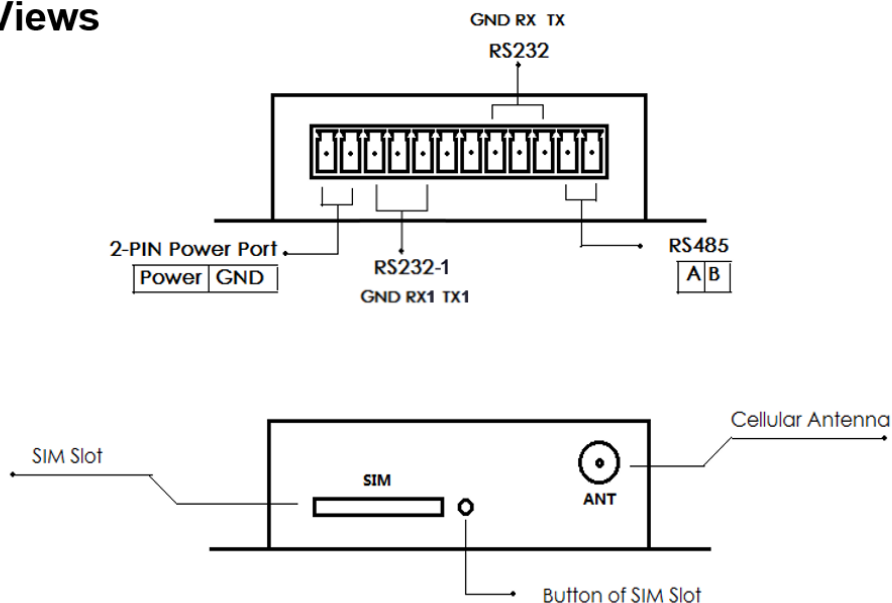
Check the package before you configure and install the device. The following components are included in the TD210 package:

Standard Accessories			
No.	Item	Quantity (Unit: pcs)	Description
1	TD210	1	TD210 IP Modem (TD210 DTU)
2	4G Cellular Antenna	1	4G cellular antenna (SMA Male), default length:1m
3	Power Adapter	1	Power output 12VDC/1.5A
4	RS232 Female Cable	1	3- Pin RS232 female cable with DB9 connector
5	Industrial Terminal Block	1	12-Pin industrial terminal block
Optional Accessories			
1	GPS Antenna	1	*GPS is an optional feature on TD210. When you select GPS build-in cellular module, the accessories will be equipped with a GPS antenna.

NOTE: Please check the list before installation. If you find anything missing, please feel free to contact Bivocom team.

2.2 Installation

Side Views



2.2.1 SIM/UIM Card

TD210 supports normal SIM/UIM only, so if you're using a Micro SIM or Nano SIM card, you may need to use a Micro SIM or Nano SIM to Normal SIM adapter.

Make sure your IP Modem is powered off, then use a needle object (such as a pen) to push the yellow button near the SIM/UIM card holder, it will flick out immediately. Put the SIM/UIM card to card holder with chipset upside, insert it to IP Modem and make sure it's tightly matched.



Warning: Never install SIM/UIM card when Modem is powered on.

2.2.2 Cellular Antenna

Screw the SMA male cellular antenna to TD210 (SMA female interface), make sure it is screwed tightly to ensure the strength of signal.



2.2.3 Terminal Block, Power Cable and Console Cable

(1) Insert the 12-Pin terminal block to modem correctly.



(2) Definition of Terminal Block Interfaces (TD210-B).



PIN No.	Interface Name	Default Function	Extended Function(Optional)
1	PWR	Power Input anode	NA
2	GND	Power Ground	NA
3	GND	Ground for RS232-1	NA
4	RX1	RS232-1 Communication port RX1	*NOTE: RS232-1 and RS485-1 are multiplexed interfaces, and cannot be used simultaneously. If you select RS485-1, RS232-1 will be disabled.
5	TX1	RS232-1 Communication port TX1	
6	RFU	Reserved RS485-1(Optional)	Customizable for ADC or digital input/pulse input
7	RFU	Reserved RS485-1(Optional)	Customizable for ADC or digital input/pulse input
8	GND	Ground for RS232-0	NA
9	RX0	RS232-0 Debug port RX0	NA
10	TX0	RS232-0 Debug port TX0	NA
11	A0	RS485-0 anode A0	NA
12	B0	RS485-0 cathode B0	NA

*RFU: Reserved for Future Use

(3) Definition of Terminal Block Interfaces(TD210-C).



PIN No.	Interface Name	Default Function	Extended Function(Optional)
1	PWR	Power Input anode	NA
2	GND	Power Ground	NA
3	DI2	Digital Input	NA
4	ADC1	Analog Input, Default 4-20 mA (Optional 0-5 V)	RX1/A1/TTL_RX

5	ADC0	Analog Input, Default 4-20 mA (Optional 0-5 V)	TX1/B1/TTL_TX
6	DI1	Digital Input	PI1 or D0(3.3V unisolated)
7	DI0	Digital Input	PI0 or D0(3.3V unisolated)
8	GND	Ground for RS232-0	NA
9	RX0	RS232-0 Debug port RX0	NA
10	TX0	RS232-0 Debug port TX0	NA
11	A0	RS485-0 anode A0	NA
12	B0	RS485-0 cathode B0	NA

NOTE:

1. Bivocom currently manufactures and sells TD210-B and TD210-C, while the TD210-A has already reached its EOL. Please jump to [Differences](#) to figure out the different hardware versions.
2. For TD210-C I/O configuration, please jump to [Scenario 4: DI and ADC Configuration for TD210-C](#).

(4) Connect Power Cable and Console Cable.

The interface of TD210 is industrial terminal block, we suggest you use 28-16AWG power cable and console cable. Definition of power cable and console cable in this package are as below:

Power Cable (Output 12VDC/1.5A)

Color of cable	Power Output Polarity
Red	Anode
Black	Cathode

RS232 Cable (with DB9 female interface)

Color of Cable	Corresponding DB9 Pin Number
Blue	3
Brown	2
Black	5

2.3 Power Supply

After all the accessories and cables mentioned above are connected correctly, then plug the power supply to TD210, connect red cable to PWR, and black cable to GND.

TD210 adopts advanced power technology to improve the stability and adapt to complex external environment. You can use Bivocom standard power adapter(12VDC/1.5A), or use DC power ranging at 5-35VDC, please make sure the power supply is stable enough(Ripple shall be less than 300mV, and Instantaneous voltage shall not larger than 35V), meanwhile, power shall larger than 4W.

NOTE: We suggest you use Bivocom standard power adapter (1.5A/12VDC).

2.4 LED Indicators

TD210 has 4 LED indicators, 'Online', 'System', 'Power', 'ACT'. LED description is as follows.

LED Indicator	Status	Content
Online	Off	TD210 isn't connected to server
	On	TD210 is connected to server
System	Off	System error
	Blink	System work
Power	Off	Power Off
	On	Power On
ACT	Off	No data transfer
	Blink	Sending or receiving data/message

3. Configuration

In this chapter, you'll learn more details about how to configure and setup the TD210 via the config tool. If you're familiar with Bivocom config tool, and know how to enter the tool, then you can start to change the device parameters. Or directly jump to [Common Scenario Configuration](#)

3.1 Tools Required

Before configure the TD210, please make sure the following tools are ready:

- RS232 Cable in the package



- Serial to USB converter



- Computer(Windows)
- SIM card(insert to TD210)

3.2 Connect TD210 to Computer

To start configuring the modem, you need to follow these steps.

3.2.1 Bivocom TD210 Config Tool

Bivocom TD210 config tool is a software developed based on Windows system. It can connect to TD210 via RS232 serial port, enabling user to configure, debug, download historical data, and upgrade firmware for the DTU through an intuitive, user-friendly interface.

You can go to BIVOCOM website to [download](#) the config tool and firmware. Or you can contact Bivocom support team, and let us know the device information(model, SN, PN or label) and firmware version, team will share the correct config tool with you.

NOTE: The config tool only support Windows OS, Mac OS is not supported.

3.2.2 Connect RS232 Cable

We recommend using the original RS232 female cable from [Package](#) to connect the RS232-0(DEBUG) of TD210(TX0-Blue, RX0-Brown, GND-Black). Then connect TD210 RS232-0 to your computer via Serial to USB converter(male). The connection example is shown in the below figure :



3.3 Enter Config Software

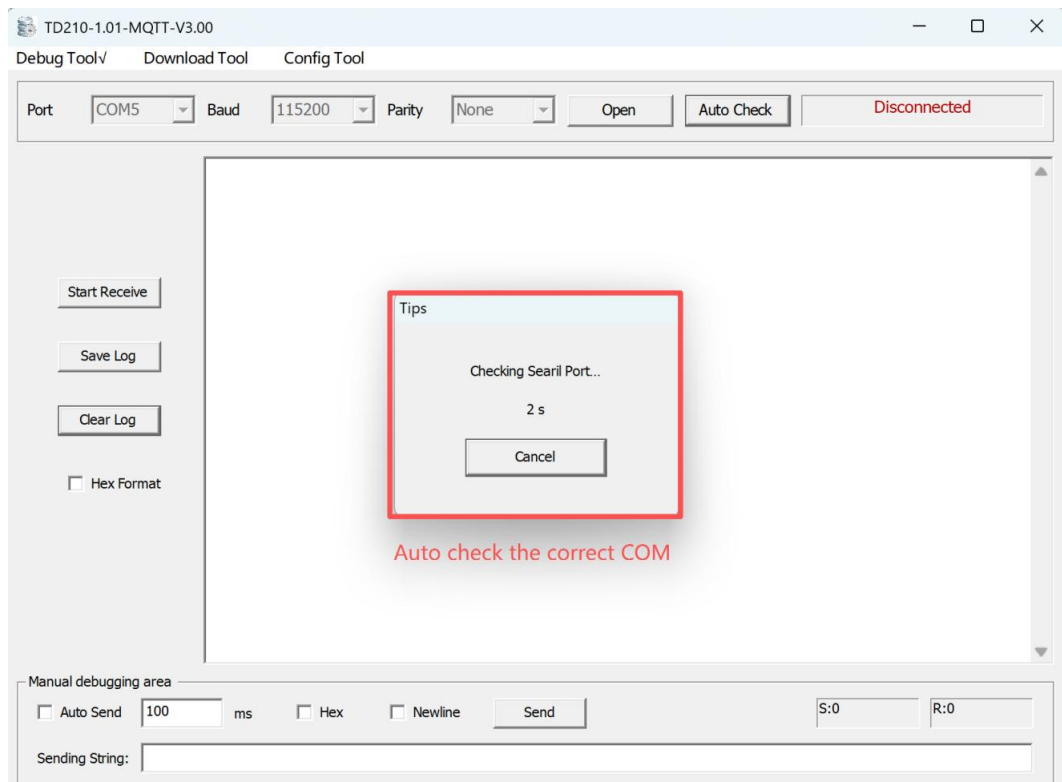
After completing the device installation and cable connection, now it's time to configure the TD210.

There are different versions(Transparent and MQTT) of config tool, each config tool has corresponding firmware. In this user manual, the demo config tool is based on the version "TD210-1.01-MQTT-EN-V3.00.exe", and firmware version is "TD210B1-CQB000-18.2.bin" for MQTT.

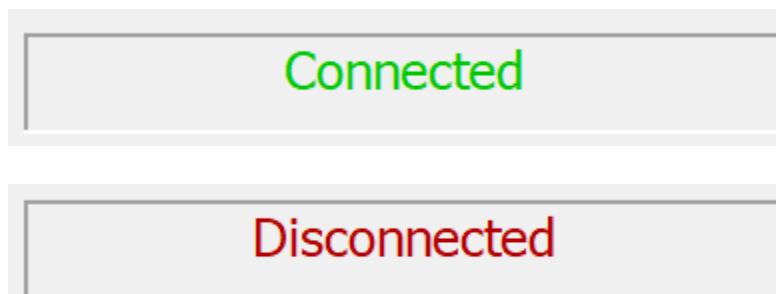


TD210-1.01-MQTT-EN-V3.00.exe

Power on the TD210, then open the config tool, normally it will pop up a tips "Checking Serial Port...". It can automatically identify and connect the available serial COM port that connect with TD210.



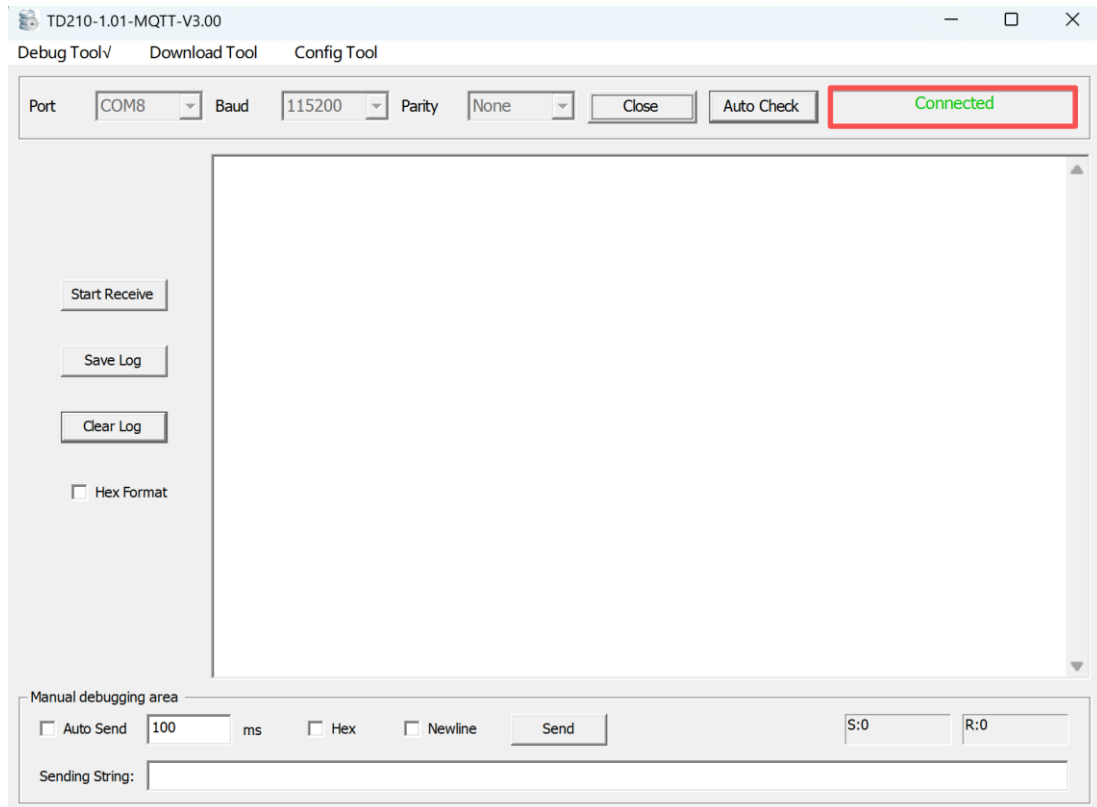
After a few seconds of automatic checking, the indicator in the upper right corner will turn green and display "Connected" when the COM port is recognized and connected successfully, while the red "Disconnected" indicates a connection failure.



If it fails to connect COM, you can click "Auto Check" again, it'll detect the COM port again. Or you can manually select the correct COM port which connect with TD210. Then select the specific "Baud rate" and "Parity" parameters, and click "Open" to connect your COM port.

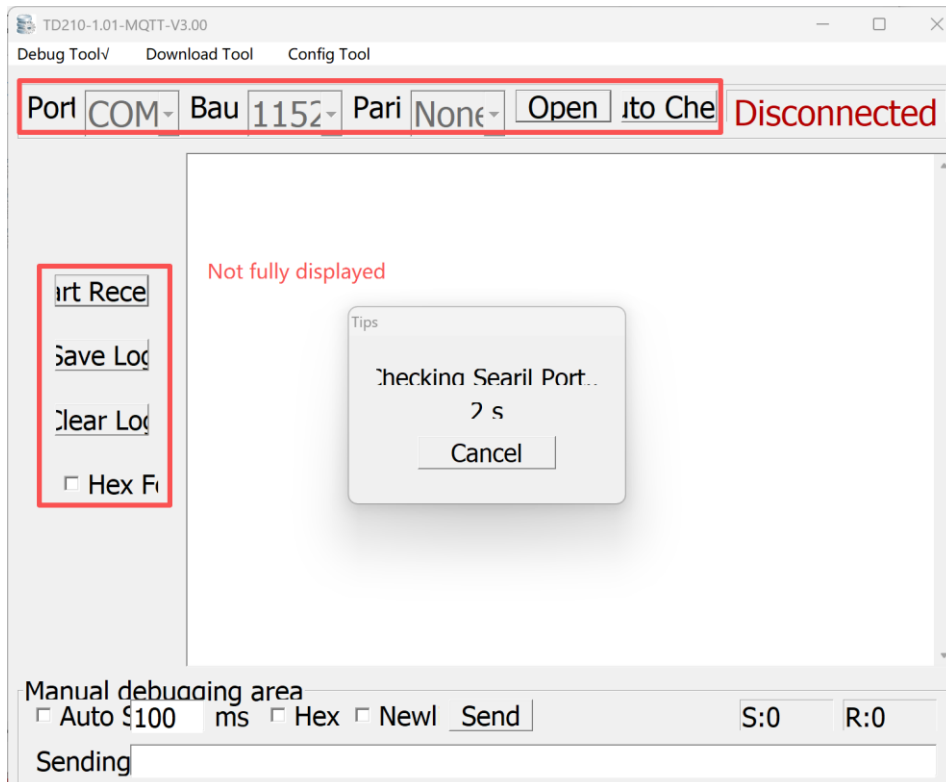


NOTE: Only when the indicator in the upper right corner turns green does it mean the correct COM port is connected with software, then you can start to configure the device. Connected status, as shown in the figure below:



Common Issues:

- Can't enter the config tool even the RS232 is connected with computer: Check if the RS232 cable is connected with the RS232-0(DEBUG) of TD210, do not connect to RS232-1(Communication port). And ensure the wiring sequence is correct(TX0-BLUE, RX0-Brown, GND-Black).
- When I open COM port, nothing response in the config tool: You may select a wrong COM port, or set incorrect baud rate and parity. Make sure the COM port No. is correct and set the baud rate, parity the same as COM parameters.
- When you open the config tool for the first time, you may encounter an abnormal issue: each option in the software is not fully displayed, as shown in the figure below:



This is a problem comes with your computer resolution, the software tool is not adapted to the computer resolution. You can refer to the following solution:

Right click the config tool, select the “compatibility” menu, change the DPI setting to “System”, and apply this modification. Then open the config tool again, this abnormal issue will be resolved, the setting as shown in figure below:



3.4 Config Tool

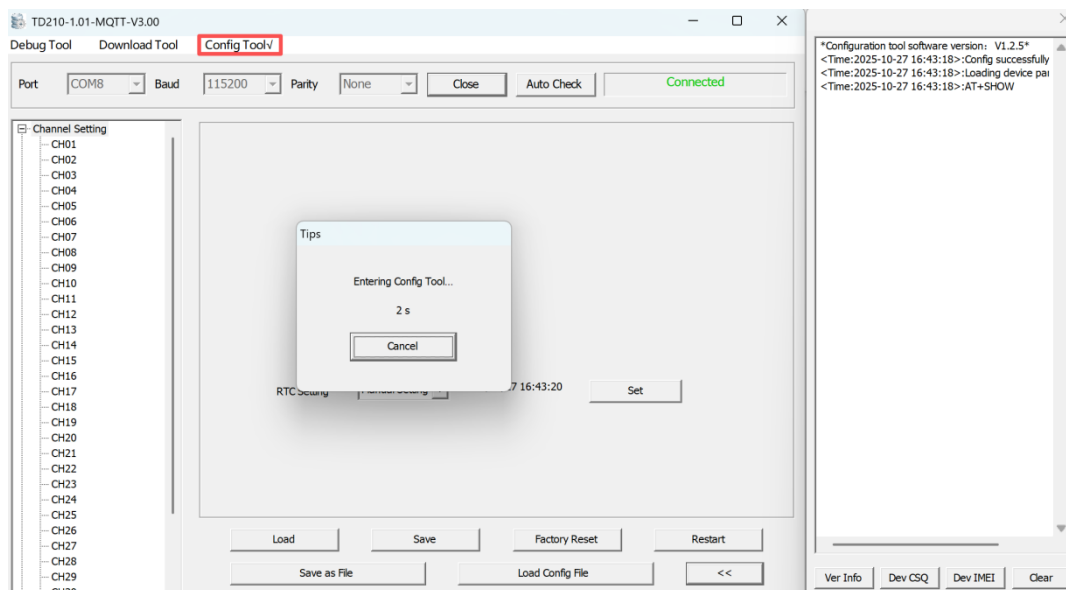
There are 3 tools, Config Tool, Download Tool and Debug Tool, each with a different function as shown below:

Debug Tool Download Tool Config Tool✓

Tool	Function
Config Tool	Configure TD210 and setup parameters
Download Tool	Firmware download and upgrade
Debug Tool	Debug TD210, System log output, Send AT commands

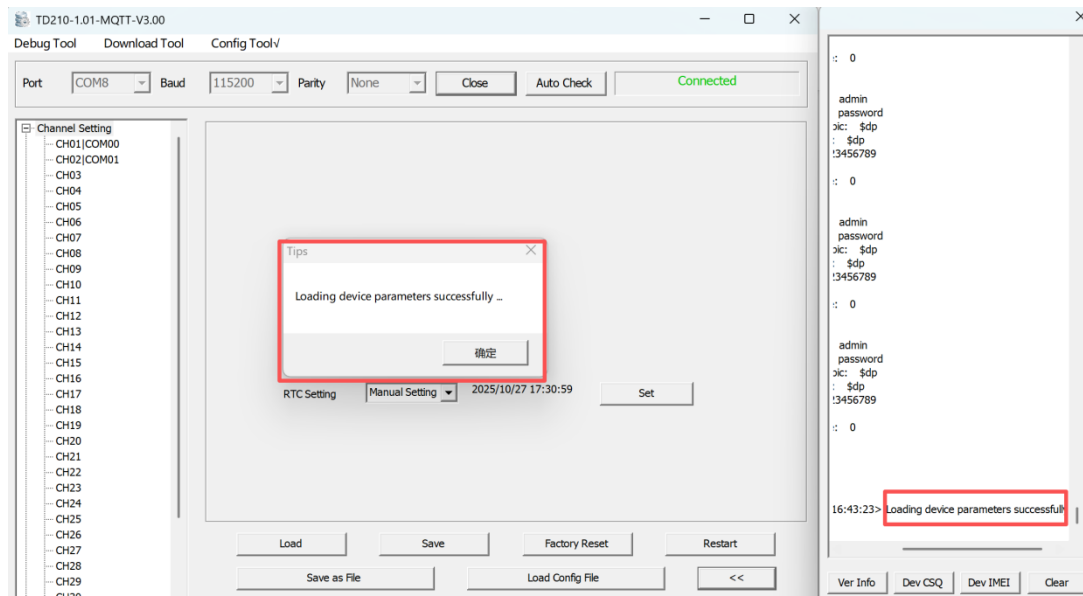
3.4.1 Enter Config Mode

Click “Config Tool”, it’ll be ticked “✓”, then a pop-up tips will appear, displaying “Enter Config Tool...”. It’s entering config mode, will take 3-10 seconds.



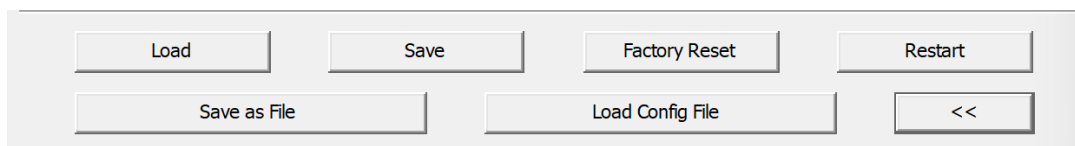
After successfully entering the config tool, it’ll automatically load the device parameters, and show “Loading device parameters successfully”.

NOTE: Parameter settings can only be configured after successfully entering config mode.



3.4.2 Basic Config Option Description

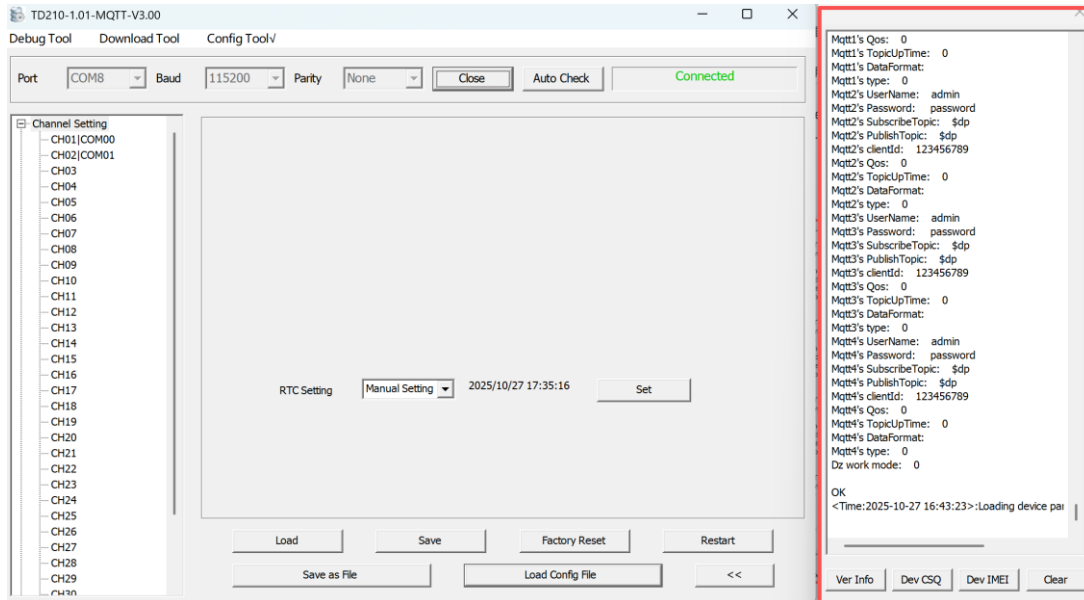
There are several common config options in the config tool. Below are descriptions of each config option.



Config Option	Function
Load	Load the current parameters of TD210 and display in the config tool.
Save	Save and apply parameter changes.
Factory Reset	Reset all parameters to factory setting.
Restart	Restart device
Save as File	Save current configuration of TD210 in config file format(.cfg), which can use to upload in other TD210.
Load Config File	Load config file to TD210, then it'll load parameters in the config file.

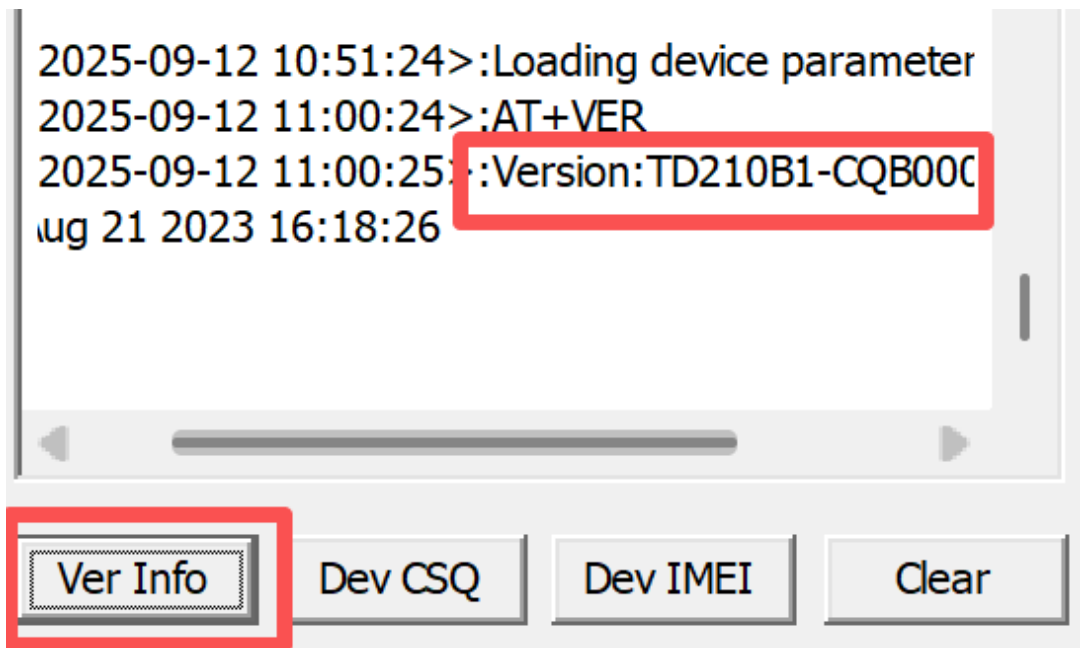
3.4.3 Config Information Box

There is a configuration information display box on the right side of the config tool. It's used to display basic configuration information. When you modify parameters and save them, the corresponding operation will be output in the box. Click the "<<" button, the box will be hidden.

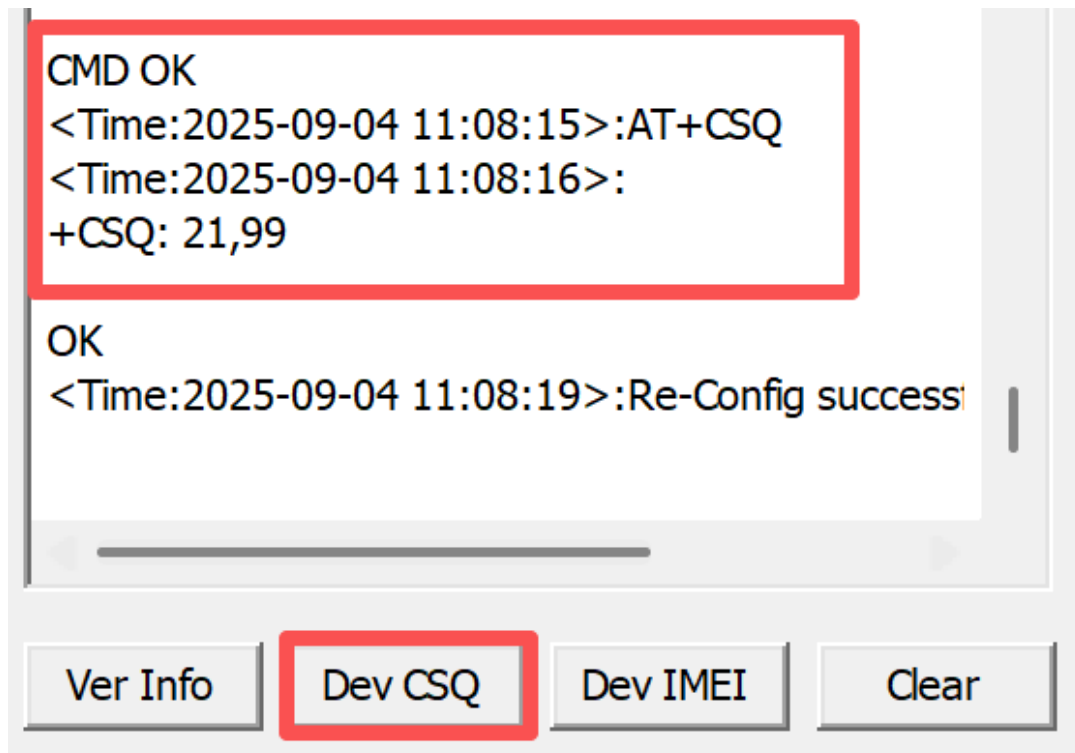


Below is the description of each option:

- **Ver Info:** Check the firmware version of TD210, it'll show specific firmware version and release time.

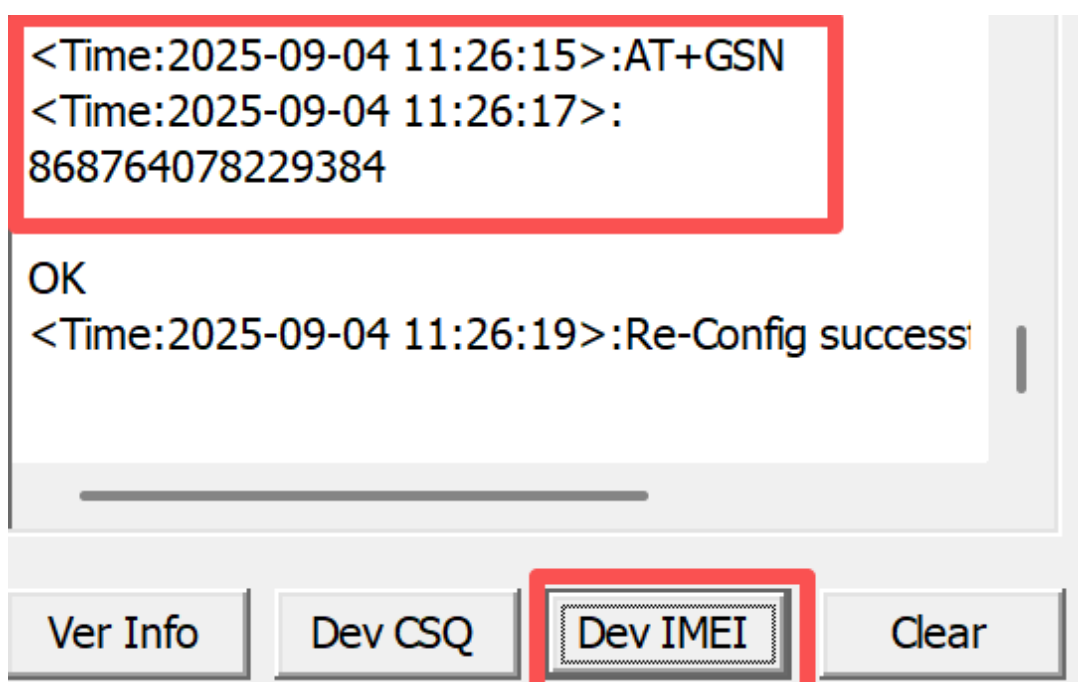


- **Dev CSQ:** Check the network signal strength of TD210. In this case, “21” is the RSSI(Received Signal Strength Indication).



NOTE: The rssi value range is typically from 0 to 31, a larger value indicates a stronger signal. When the rssi is 99, it indicates unknown or not available(usually indicates no network signal is detected).

- **Dev IMEI:** Check the device IMEI of cellular module.

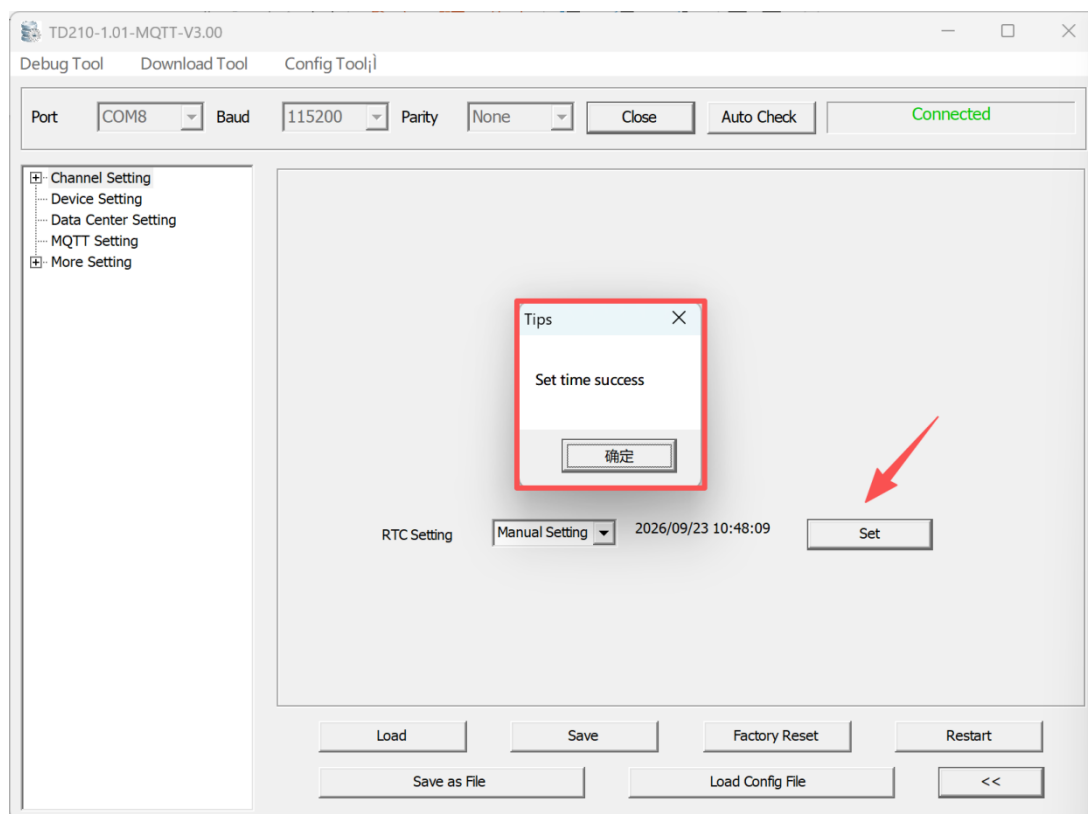


- **Clear:** Clear all output information in the box.

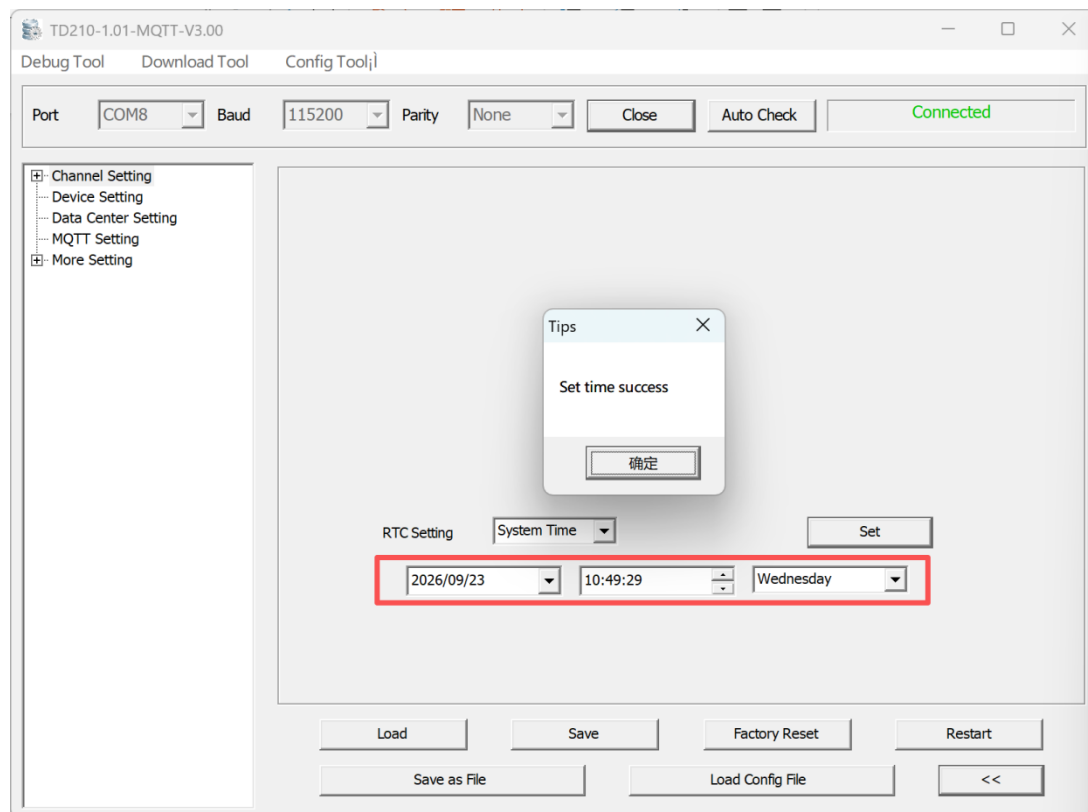


3.4.4 RTC Setting

The TD210 has a RTC clock inside, user can calibrate the system time using the RTC Setting. Click "Set" button, you can setup the system time according to the hardware clock.

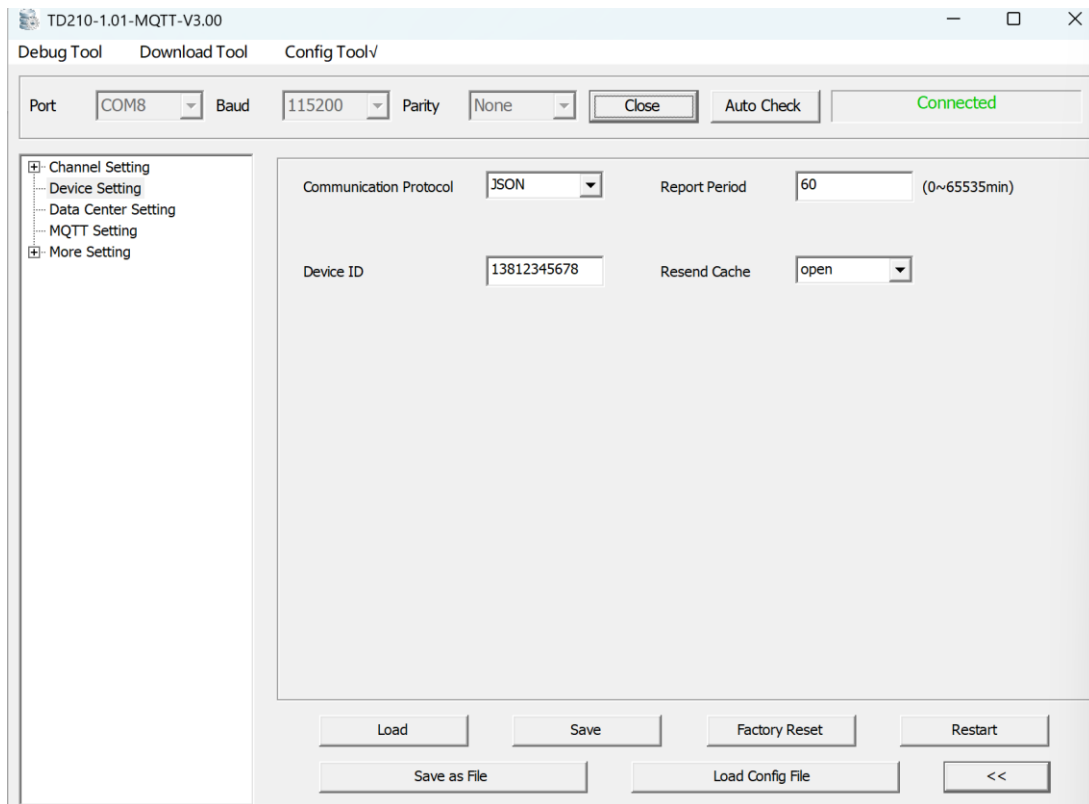


In another way, you can set system time manually.



3.4.5 Device Setting

User can set basic parameters in the Device Setting.

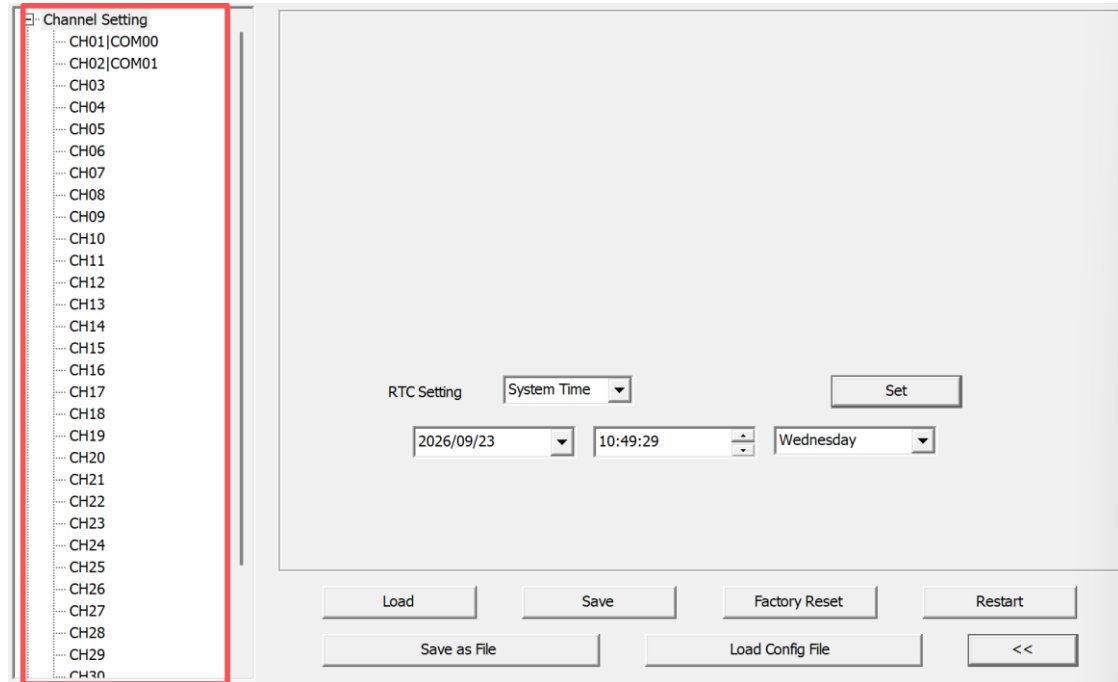


Parameter Name	Description
Device ID	Setting the TD210 device ID, it is used for recognizing the device during register and keep alive with server.
Communication Protocol	Data encapsulation type, JSON is the default data format.
Report Period	Time interval for reporting data to the server regularly(0~65535min)
Resend Cache	Open or Close, when the device disconnects network or server connection, TD210 will cache data in the system storage, and resend data after network recover.

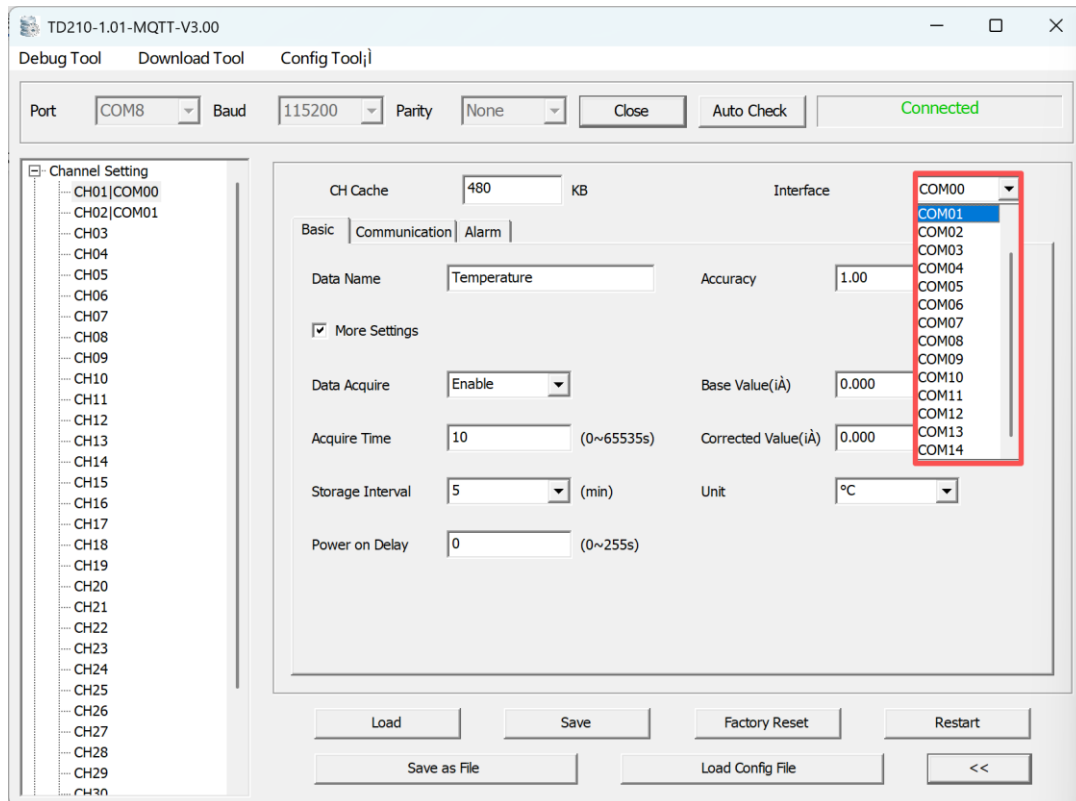
NOTE: Remember to click “Save” after each parameter change to make the configuration take effect. Then you can click “Load” to check if the parameters have been modified.

3.4.6 Channel Setting

The standard TD210 has 30 reserved channels for data acquisition, it can collect data through serial port(RS232-1 and RS485-0). When you add a new channel, you have to select a COM interface in the right box. Each channel represents a specific data element, and can be configured with independent parameters and alarm information.



There are 15 COM interfaces(COM00~COM14) which can use to collect serial data. The standard TD210 has 2 RS232(RS232-0 for debug, RS232-1 for communication) and 1 RS485. If you need to collect Modbus data, you have to add COM channel. Below are the descriptions of COM parameters:



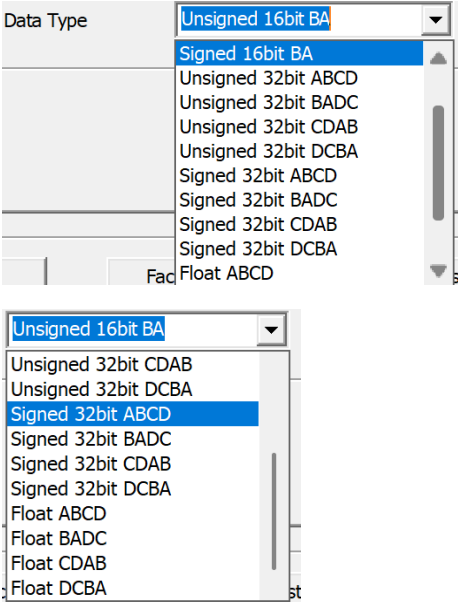
- **Basic**

Parameter Name	Description
Data Name	Data factor name.
Accuracy	Data accuracy, when you need to collect decimal data, you can change the accuracy. If set as "1.00", the collected data will be multiplied by 1.00, which means two decimal values will be retained.
Data Acquire	Enable or Disable, enable to activate data collect feature.
Acquire Time	Data collection interval.
Storage Interval	Data storage interval, cache data can be stored in the system memory.
Power on Delay	When the sensor is powered by the RTU, it'll take some time delay after power is turned on before it starts collecting data.

Base Value	You can define a base value, the collected data will be calculated(+ or -) with this base value, and report data after calculated.
Corrected Value	Correct collected value.
Unit	Data unit(m/cm/m³/s), or you manually input, such as "°C".
CH Cache	Data cache storage size in this channel, up to 480 KB.

• Communication

Parameter Name	Description
COM Type	Select which COM for collecting data, there is only RS232-1 and RS485-0 can be used in standard TD210.
Baud Rate	Communication baud rate for this COM, must set the same as sensor or slave device.

Parity Bit	Data bit, stop bit and parity bit for this COM, must set the same as sensor or slave device.
Sensor Type	Communication protocol of your sensor or slave device, normally it's Modbus RTU or other customized protocols.
Slave ID	Modbus device ID of your sensor or slave.
Function Code	Function code for reading different registers.
Register Address	Modbus register start address.
Register Number	Modbus register number or count.
Data Type	Modbus data type of your sensor register, normally is signed, unsigned or float data as below:  NOTE: If there is no suitable data type for your sensor data, you may need to contact Bivocom support team and check if that's possible to customize.

NOTE: Alarm menu is not available in COM Setting.

3.4.7 Data Center Setting

Data center is used to receive the data transmitted by TD210. It can support various communication protocols, such as TCP, UDP, MQTT...etc, which depends on your server protocol. Here you can configure up to 4 servers(Server1-Server4) for reporting data. And you can report data to different servers at the same time. Below are the descriptions of data center parameters:

The screenshot shows the 'Config Tool' window for 'TD210-1.01-MQTT-V3.00'. The 'Data Center Setting' tab is selected in the left sidebar. The main area shows settings for 'Server No. 1'. It includes fields for 'Server Status' (set to 'open'), 'Server Protocol' (set to 'TCP'), 'Server Address' (set to 'isodev.picp.net'), and 'Server Port' (set to '10122'). Below these are fields for 'Backup Server' with 'Server Status' (set to 'open'), 'Server Protocol' (set to 'TCP'), 'Server Address' (set to 'isodev.picp.net'), and 'Server Port' (set to '21222'). At the bottom, there are fields for 'Main DNS Server' and 'Backup DNS Server'. Navigation buttons like 'Load', 'Save', 'Factory Reset', 'Restart', 'Save as File', 'Load Config File', and '<<' are visible at the bottom of the window.

Parameter Name	Description	
Server No	There are 4 servers, if you enable 2 servers, the "Server No" should be set as "2", 4 servers should be "4". NOTE: When you set as "0", the TD210 won't connect to cellular network and data center, so the "Online" LED won't turn on.	
Server1~Server4	Each server setting is configured separately.	
Main Server	Server Status	Open or Close, open to enable main server.
	Server Protocol	Server communication protocol, common TCP/UDP and MQTT, set the same as your server.

	Server Address	Server address The default address is "isodev.picp.net:10122", you can change to your server address.
	Server Port	Server Port for communication.
Backup Server	Server Status	Open or Close, open to enable backup server. NOTE: TD210 will connect to the backup server when main server goes offline.
	Server Protocol	Server communication protocol, common TCP/UDP and MQTT, set the same as your backup server.
	Server Address	Server address of your backup server.
	Server Port	Server port of your backup server.
DNS Server	Main DNS Server	When you set server address as a domain, it requires a DNS server to analyze the domain name to a specific IP address. It's empty by default, which means TD210 will use the DNS server from network operator.
	Backup DNS Server	Backup DNS server for analyzing your server domain.

NOTE: When you enable main server and backup server at the same time, the TD210 will connect to the main server as priority, if the connection fails or disconnected, it'll automatically switch to backup server connection. Besides, you can set the backup server the same as main server setting. This mechanism is like a network watchdog, ensuring that the DTU can always be online.

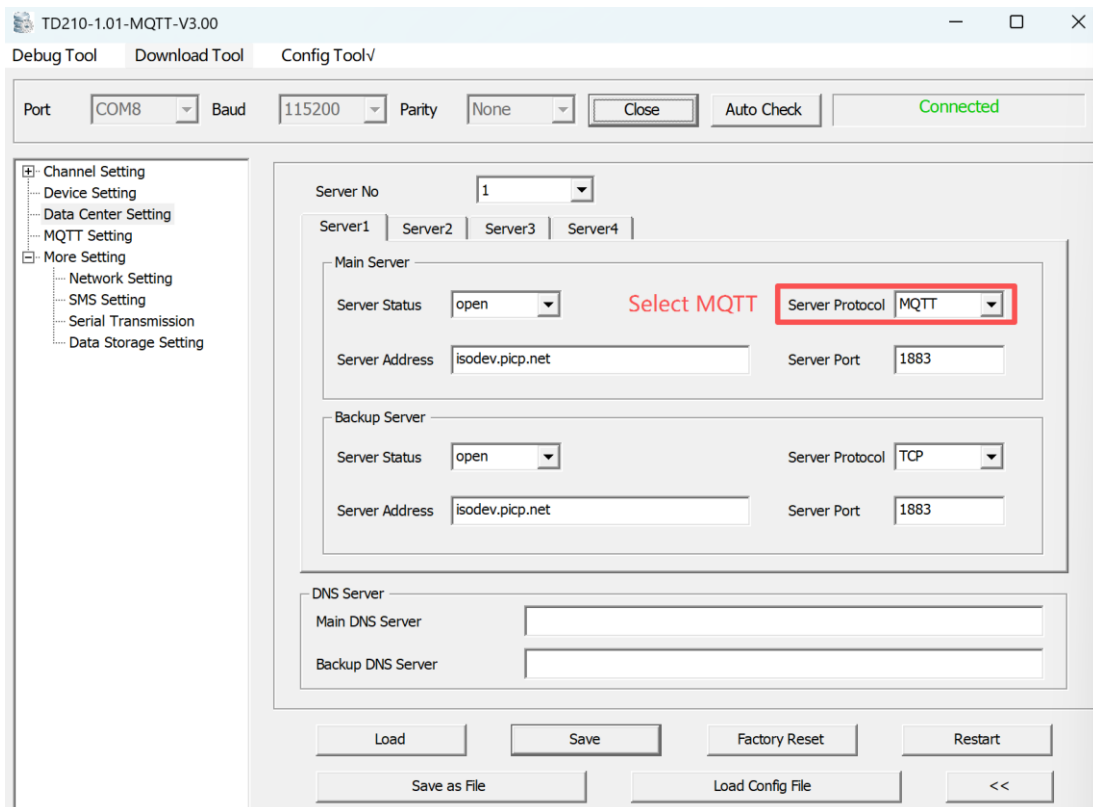
Common Issues:

- Server status is opened, and server address/port are configured, but the DTU still can't connect to the server: When you enable Server1~Server4, the "Server No" must be selected according to your server numbers, can't be set as "0". It won't connect any servers when "Server No" is 0.

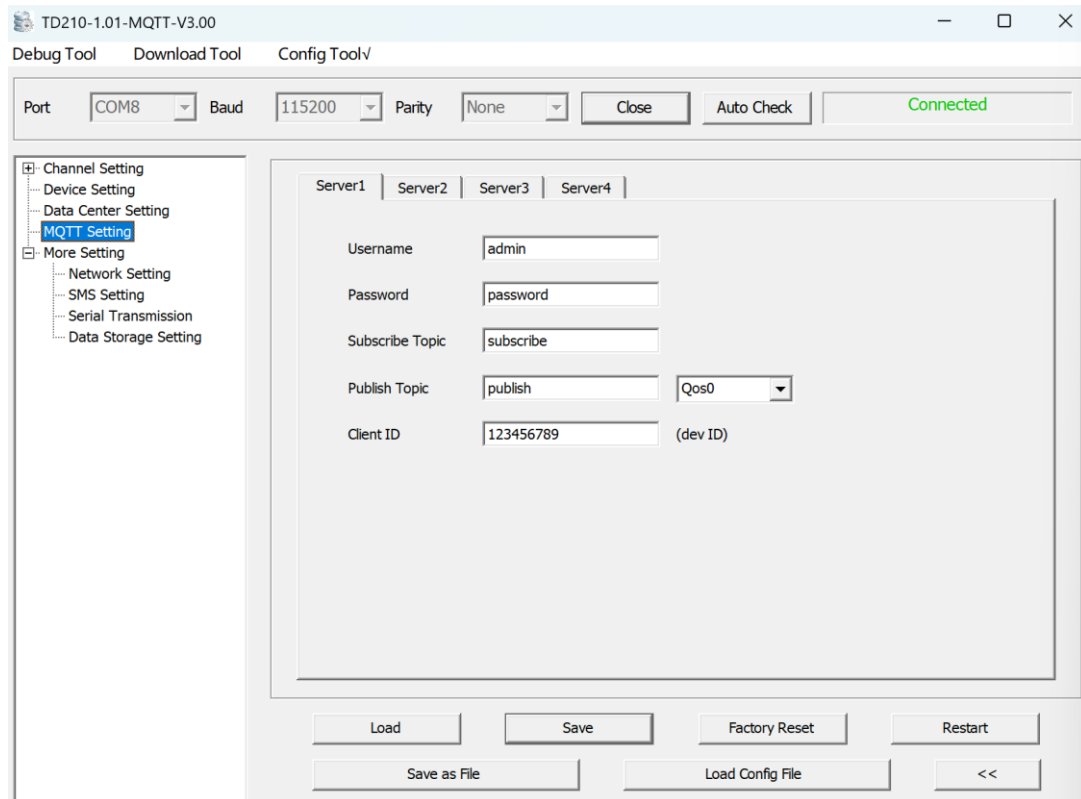
3.4.8 MQTT Setting

TD210 can support MQTT protocol, allowing user publish sensor or slave data to MQTT broker. It can support username and password connection, but TLS connection is not available in TD210. Before configuring the MQTT parameters, you have to enable one server for MQTT broker connection in “Data Center Setting”.

Open a main server, select “Server Protocol” as MQTT, then you have to set the server address and port of your MQTT broker.



Below is the description of MQTT Setting:



Parameter Name	Description
Server1~Server4	Each server setting is configured separately, you can connect multiple MQTT servers at the same time.
Username	Username of MQTT broker.
Password	Password of MQTT broker.
Subscribe Topic	Set a subscribe topic, then TD210 can subscribe the specific topic publish from MQTT broker.
Publish Topic	Set a publish topic to publish the collecting data to MQTT broker.
Client ID	Set a unique client ID to connect MQTT broker.
Qos	Qos0, Qos1, Qos2. It defines the level of guarantee for delivering a message between a sender and a receiver.

3.4.9 More Setting

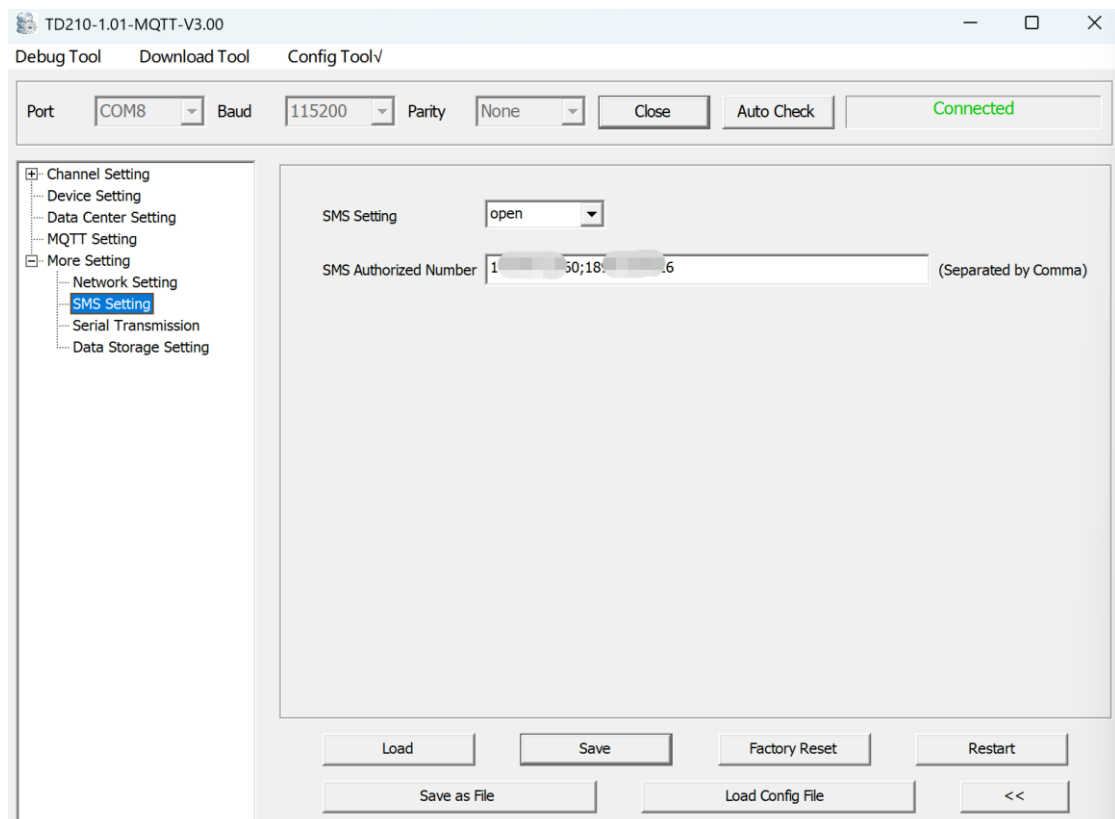
(1) Network Setting

Parameter Name	Description
APN	APN of SIM card from your network operator, set the specific APN parameters if your SIM card required.
Username	Authentication username of APN.
Password	Authentication password of APN.
Call Center	Call center number of cellular network, normally is empty.
Reconnect Time Interval	Cellular network reconnection time.
LCP Heartbeat Interval	LCP Heartbeat interval between TD210 and server.
Heartbeat Interval	Heartbeat interval, 60 seconds is suggested for TCP mode, and 31 seconds for UDP.

Common Issues:

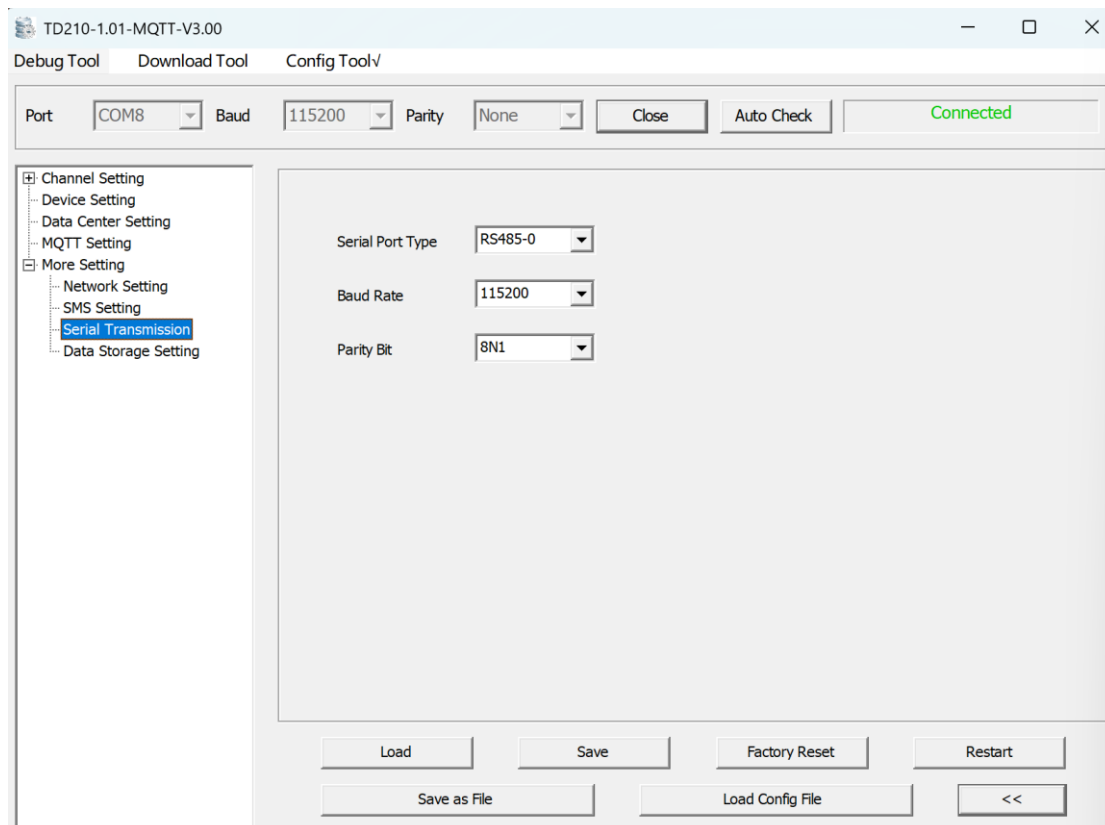
- SIM card inserted and LTE antenna also connected, but device can't be online: Please check if your SIM card requires APN authentication. If your SIM card is private network, you may need to obtain the APN parameters from the SIM operator. Set the correct APN parameters, then check network connection again.
- If the APN parameters are correct, but the device still cannot connect to the network, you can share the system log with Bivocom support team for troubleshooting.

(2) SMS Setting



Parameter Name	Description
SMS Setting	Open or Close, open to enable SMS feature.
SMS Authorized Number	Set the target phone number as SMS receiver, different numbers should be separated by Comma “;”, up to 5 numbers.

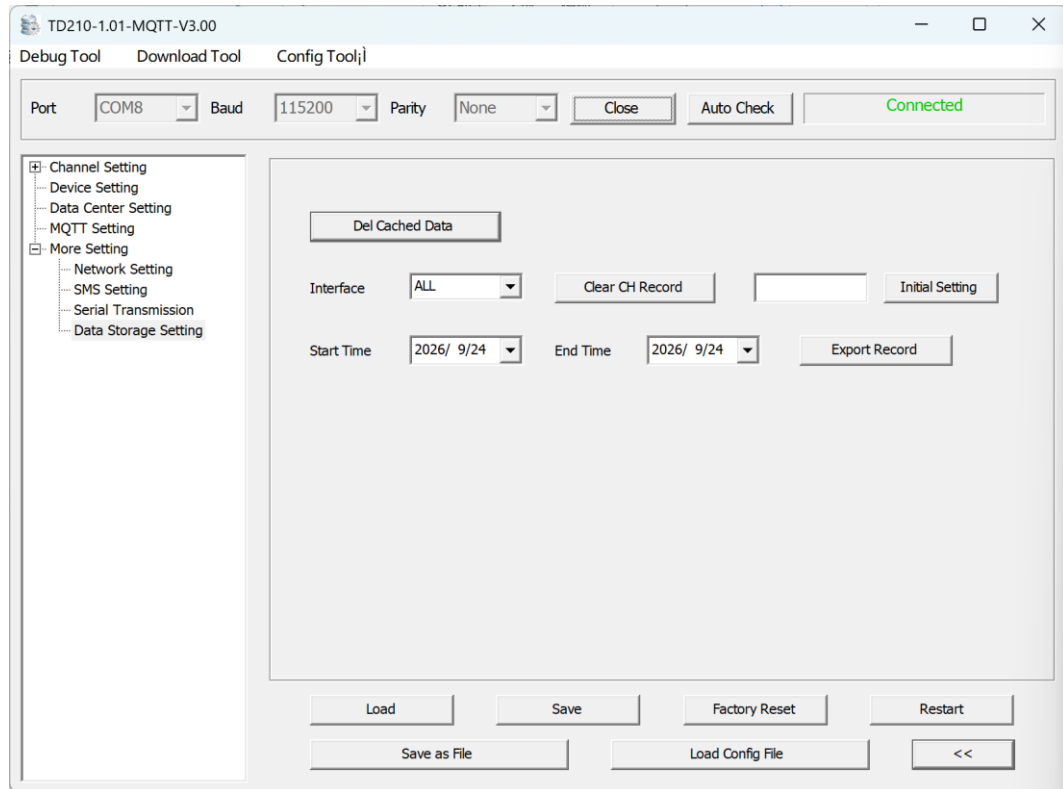
(3) Serial Transmission



Parameter	Description
Serial Port Type	Select which COM for connecting with your sensor or slave device. Or you can directly set COM in “Channel Setting”.
Baud Rate	Communication baud rate for this COM, must set the same as sensor or slave device.
Parity Bit	Data bit, stop bit and parity bit for this COM, must set the same as sensor or slave device.

(3) Data Storage Setting

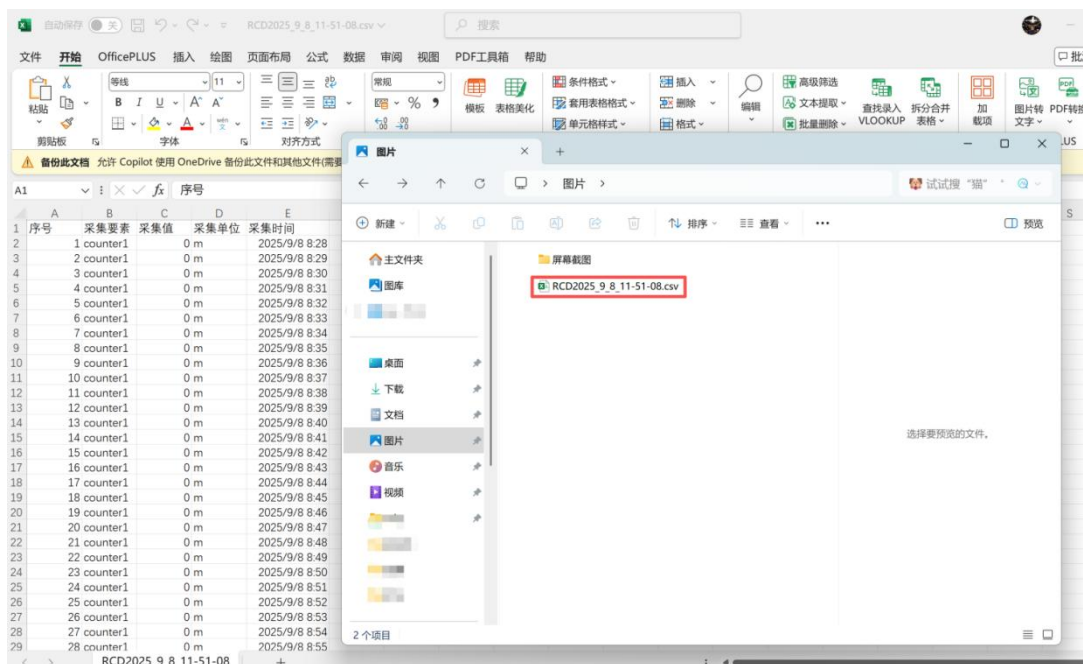
TD210 can store cache data when network or server disconnected, and resend data after connection recovered. Below are the descriptions of data storage parameters:



Parameter	Description
Interface	Select which channel for storing cache data, you can check the hardware interface in “Channel Setting”. Or you can select “All” for storing all collected data.
Clear CH Record	Delete cache data for selected or all channel.
Start Time/End Time	Select a start and end time period, record data can be exported to file in the setting interval.
Export Record	Export data to csv file.
Del Cached Data	Delete all cache data.

Click “Export Record”, then cache data can be exported as csv file.

- Example csv file



4. Common Scenario Configuration

Scenario 1: Modbus RTU Data Collection

Objective: Collect sensor or slave data through Modbus RTU protocol.

Prerequisites: Modbus register information/description of your sensor; RS232-1 or RS485-0 connected with sensor(Or simulated Modbus slave); TD210 and sensor are powered on; TD210-B config tool(TD210-1.01-MQTT-EN-V3.00); Firmware version(TD210B1-CQB000-18.2).

Configuration Steps:

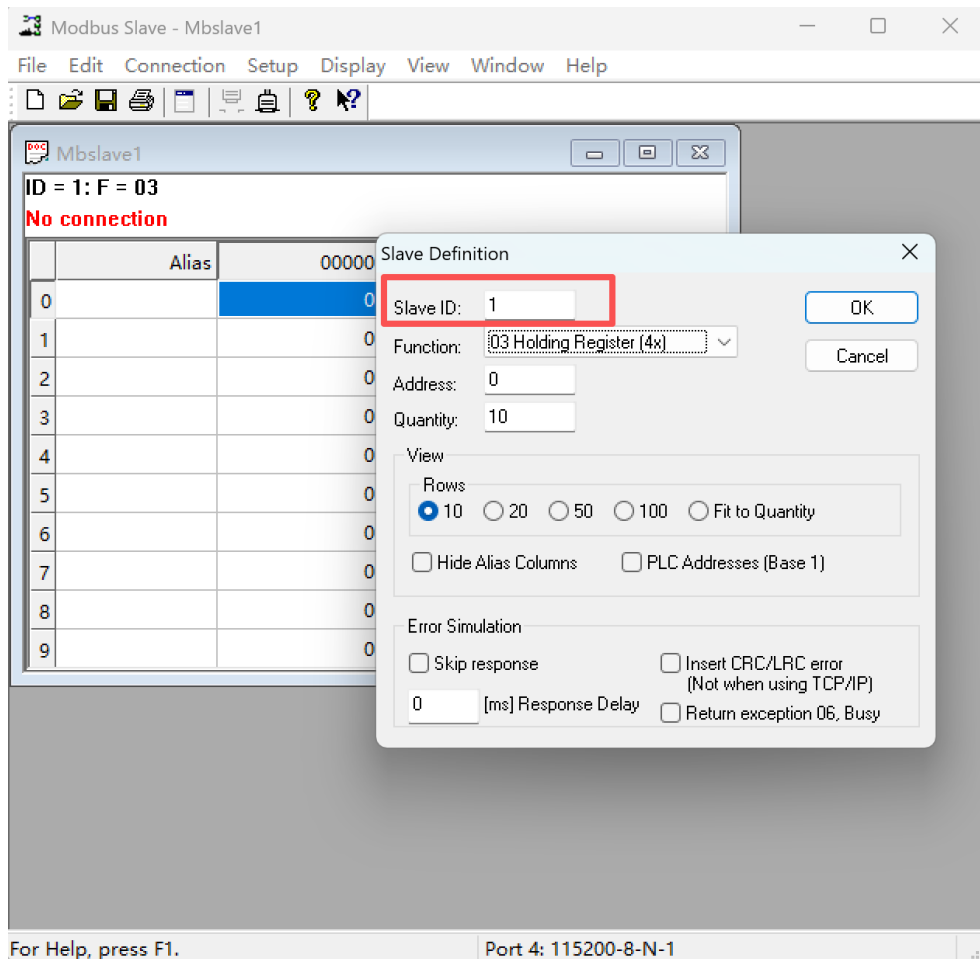
In this demo case, I'm going to use software "**Mbslave**" to simulate a Modbus slave.

TD210 acts as a Modbus master, and connect with my computer for reading Modbus RTU data from Mbslave.

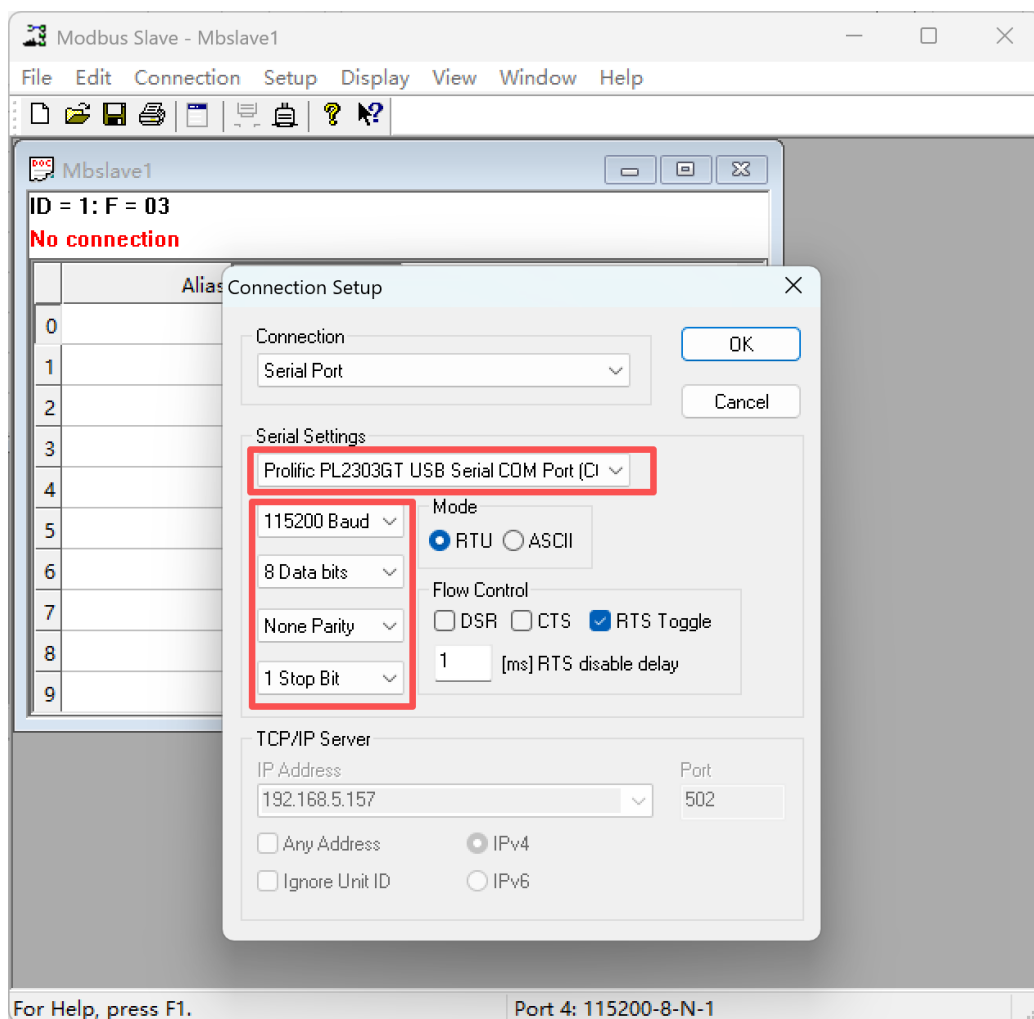
1. Select one of the communication COMs(**RS232-1 or RS485-0**) for TD210, in this case, RS485-0 is the target COM. Then connect RS485-0 to computer through a USB to Serial converter.



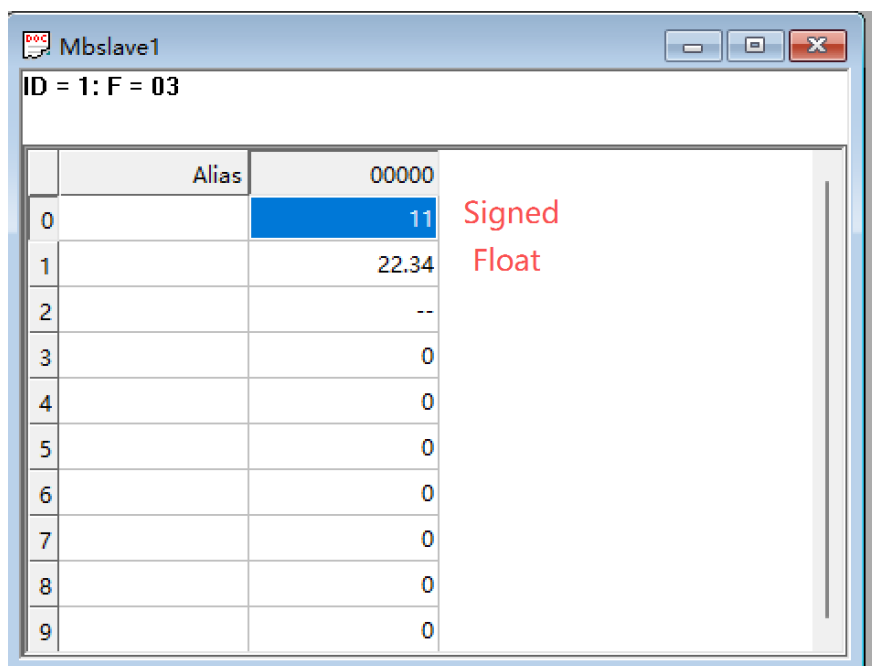
2. Open the “Mbslave” software, set a Slave ID, select function code as “03” for holding register.



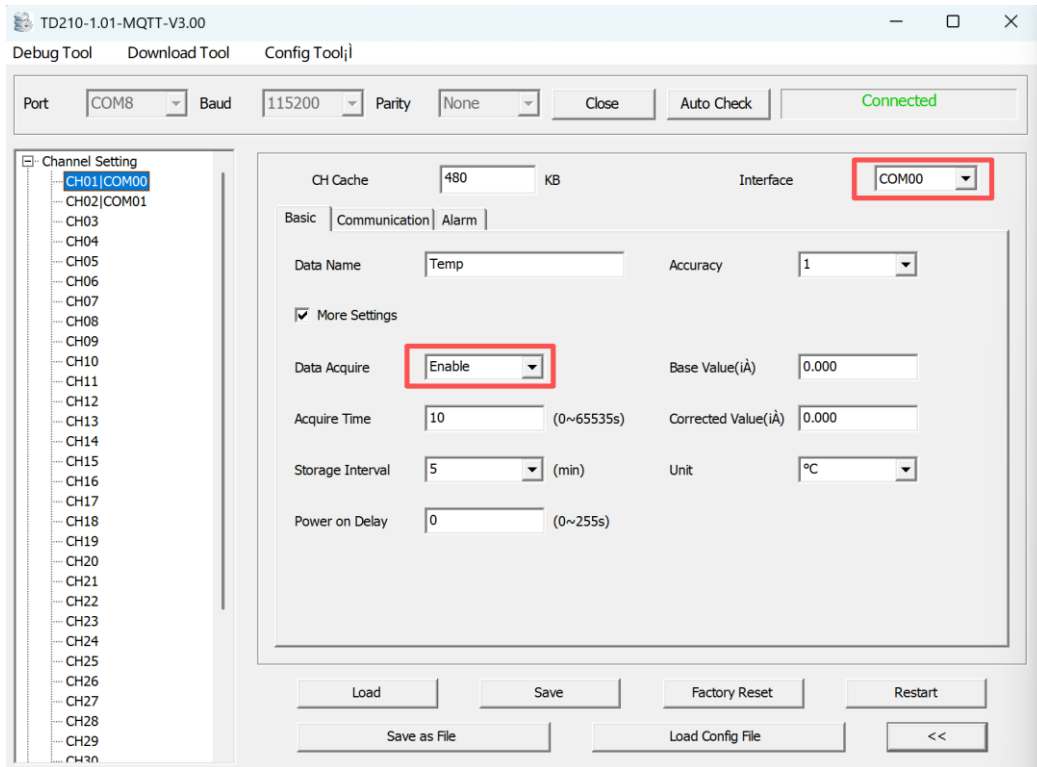
Set COM parameters and connect to this COM.



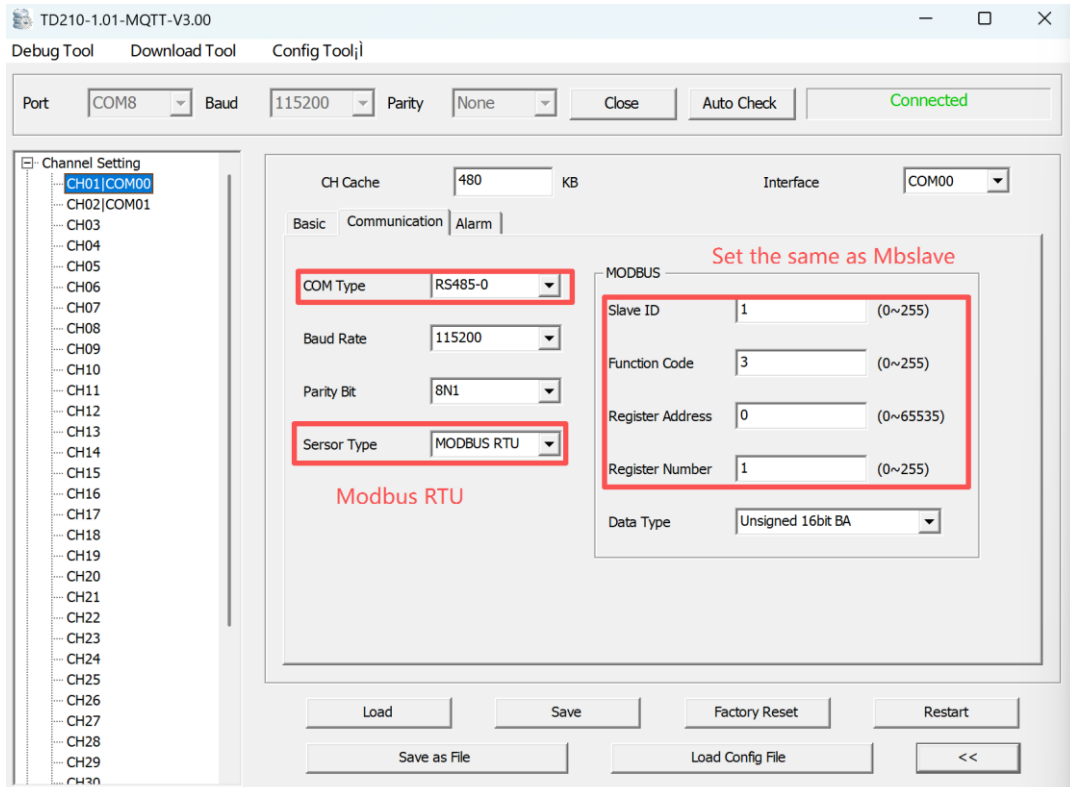
3. Select data format, then edit register value.



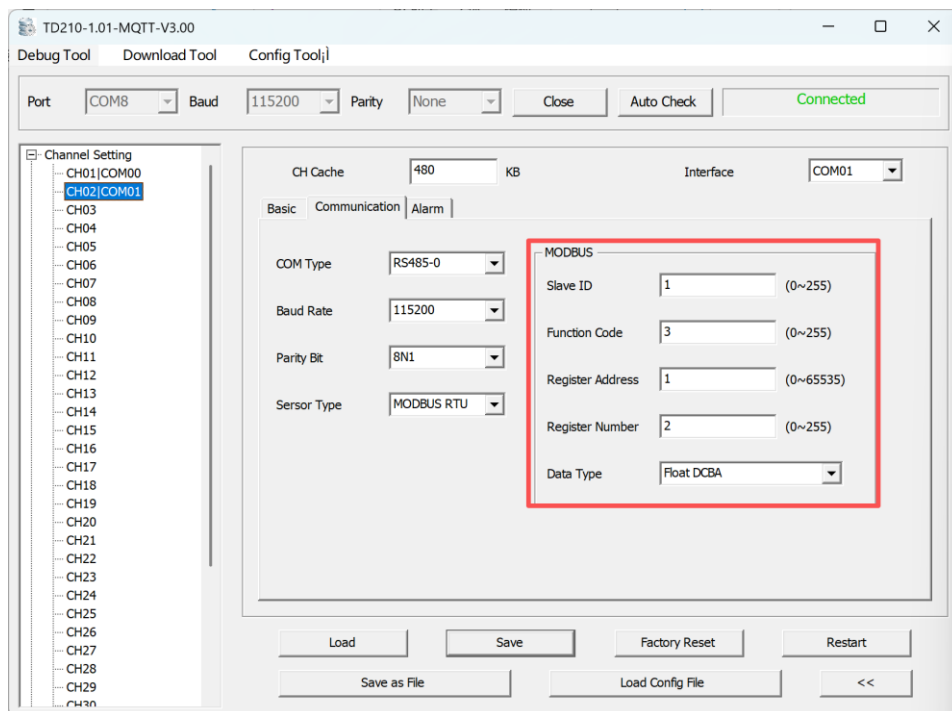
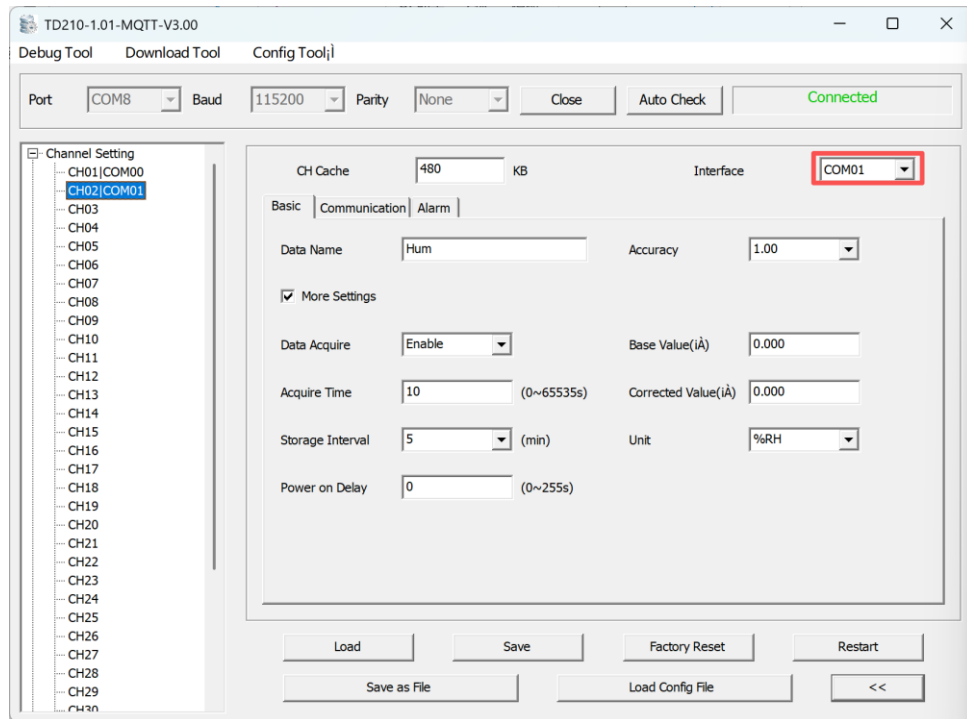
- Go to **Config tool -> Channel Setting**, add new channel and COM interface. Enable COM00 for channel 01. For the parameter descriptions, you can check [3.4.6 Channel Setting](#) for more details.



“COM Type” should be RS485-0, “Sensor Type” should be MODBUS RTU. Configure the register parameters according to Mbslave setting.



Enable another COM01 for channel 2, then configure Modbus parameters according to Mbslave setting.

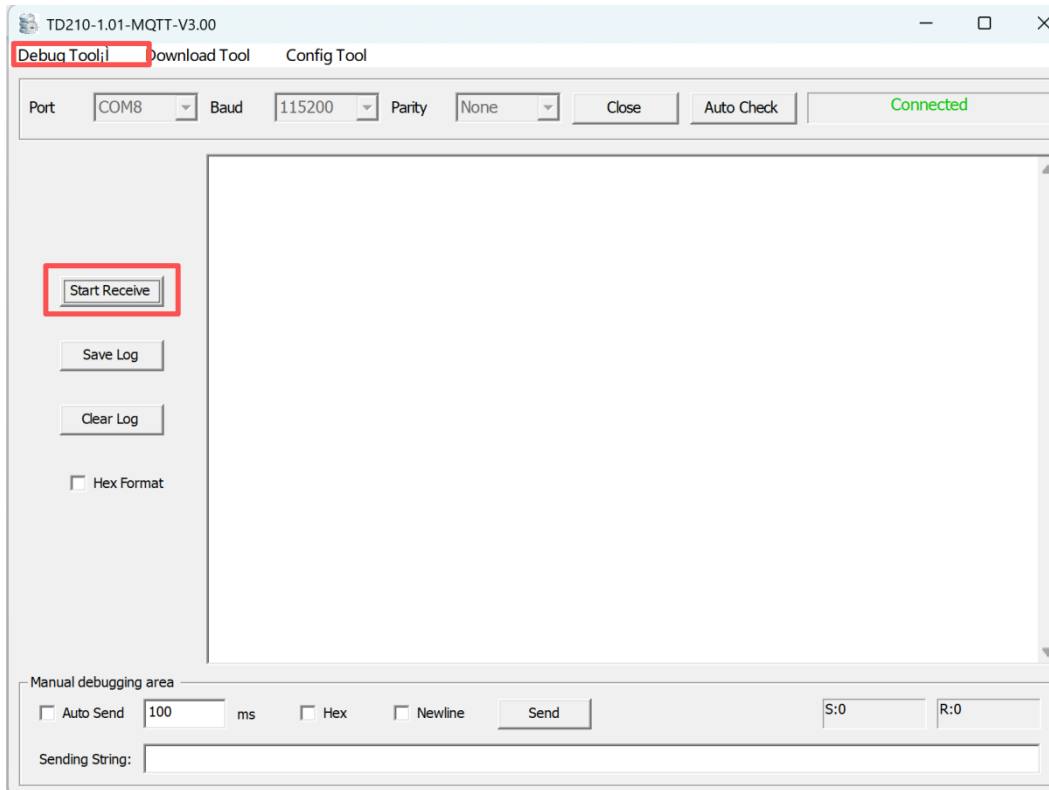


NOTE: Each channel corresponds to a unique COM interface, one COM cannot be configured by 2 channels. Besides, only one Modbus factor can be configured per channel, if you need to collect more Modbus registers, you have to add multiple channels.

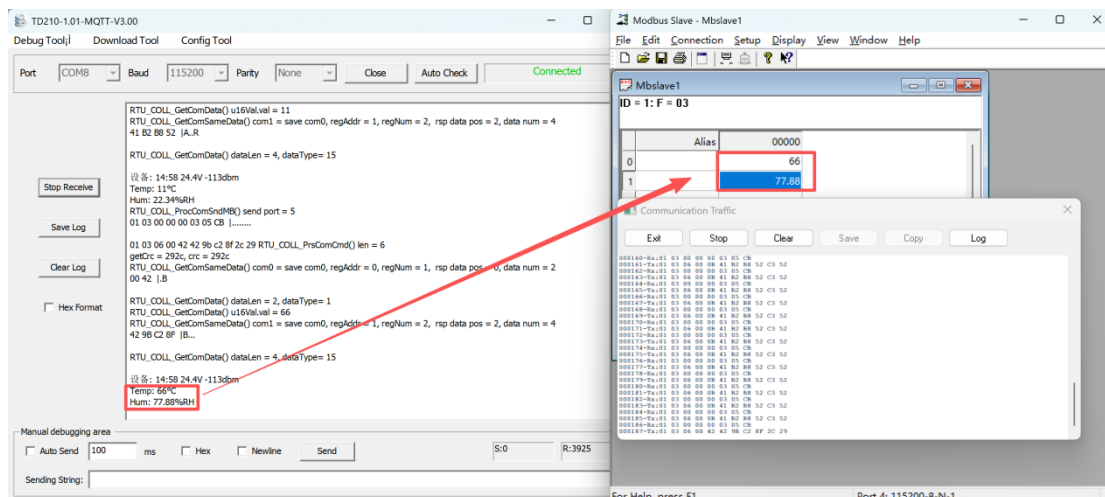
- Click "Save" button after setup all parameters, then click "Load" button to apply the new configuration.

Verification Method:

- Go to **Debug Tool**, then click "Start Receive", it'll output the system log for TD210



- Check the log output, you'll see the Modbus RTU data(Register 0 and Register 1~2) coming from Mbslave.



Scenario 2: Upload Modbus RTU data to MQTT

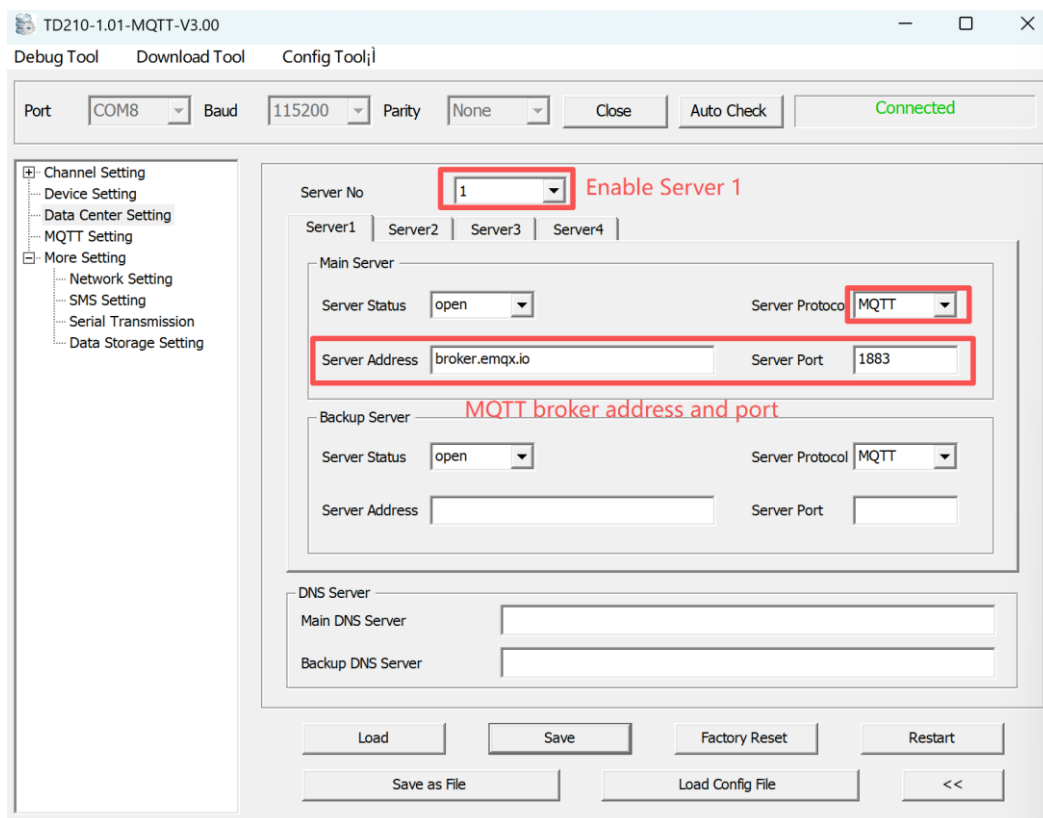
Objective: Upload Modbus data to MQTT broker.

Prerequisites: Collected Modbus data, you have to finish the first step [Scenario 1: Modbus RTU Data Collection](#); TD210 and sensor are powered on; SIM card inserted and can connect to Internet; MQTT broker; MQTT client tool(MQTTX or MQTT.fx); TD210-B config tool(TD210-1.01-MQTT-EN-V3.00); Firmware version(TD210B1-CQB000-18.2).

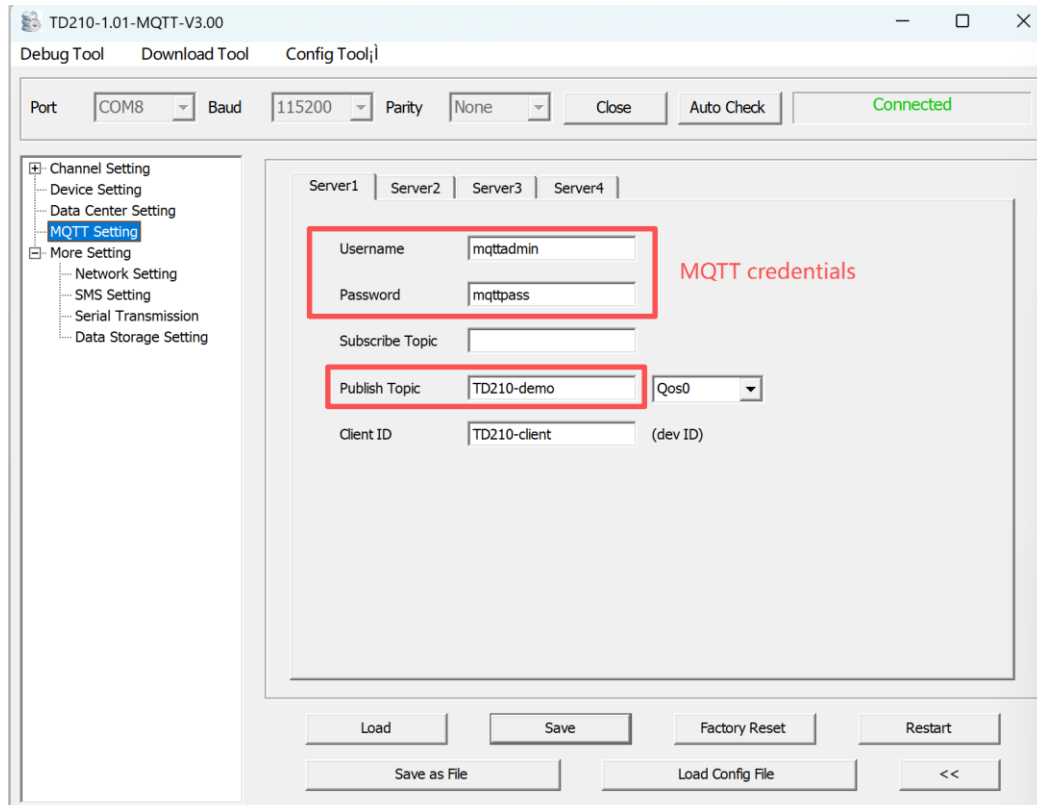
Configuration Steps:

In this demo case, I'm going to use **MQTTX** to subscribe topic, and receive Modbus data published from TD210.

1. Go to **Config Tool -> Data Center Setting**, enable one server for MQTT broker connection. "Server Protocol" should be MQTT. Set your MQTT broker address and port.

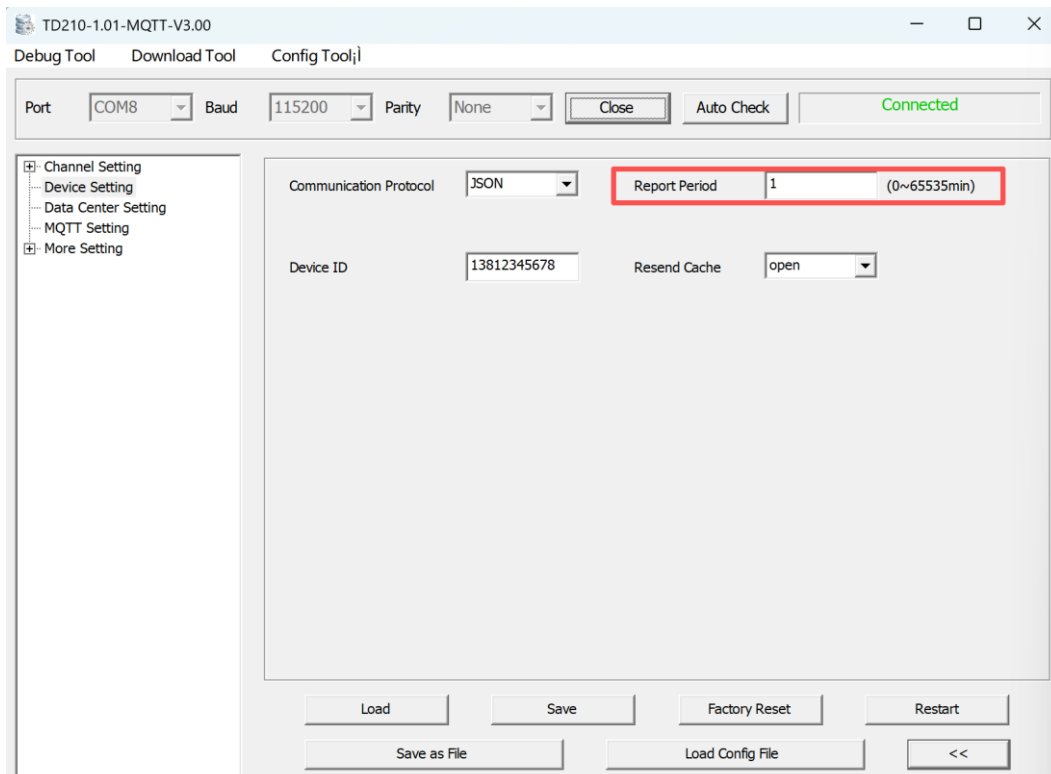


2. Go to **MQTT Setting**, configure the MQTT credentials the same as your MQTT broker. Then set a "Publish Topic", and define a unique "Client ID".



NOTE: The Client ID cannot be the same as other clients.

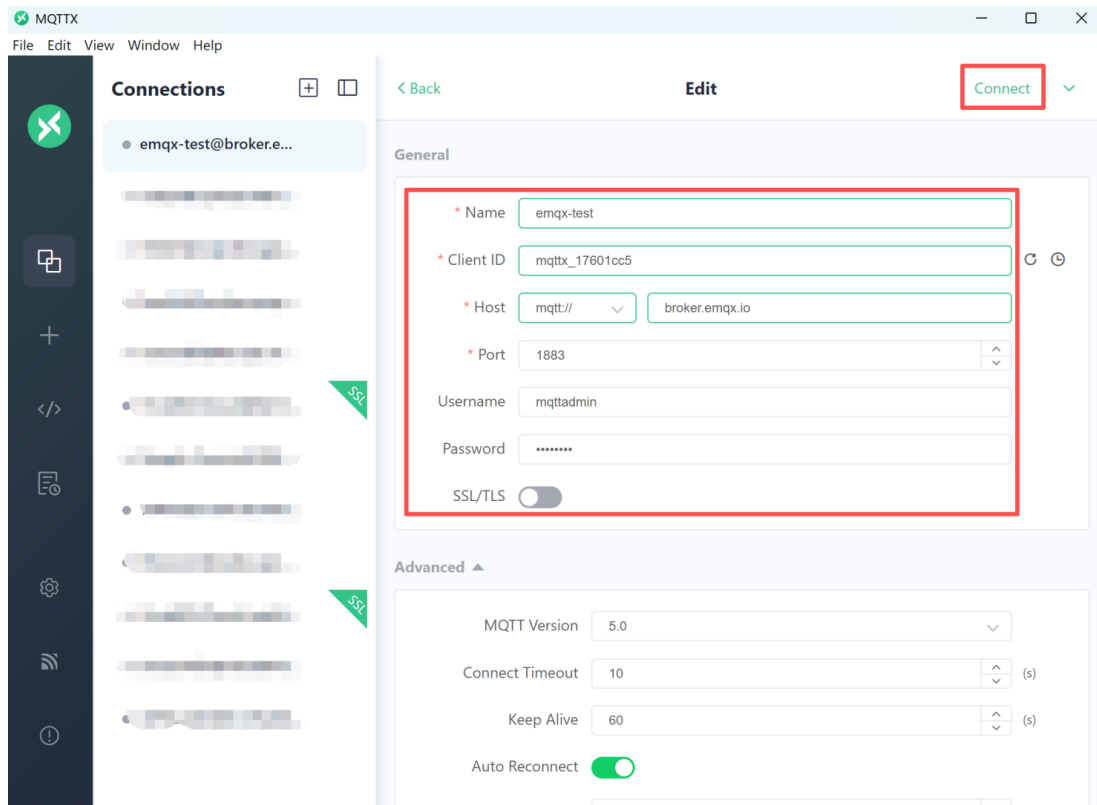
- Go to **Device Setting**, here you can set the MQTT report period. In this setting, TD210 will publish topic every 1 min.



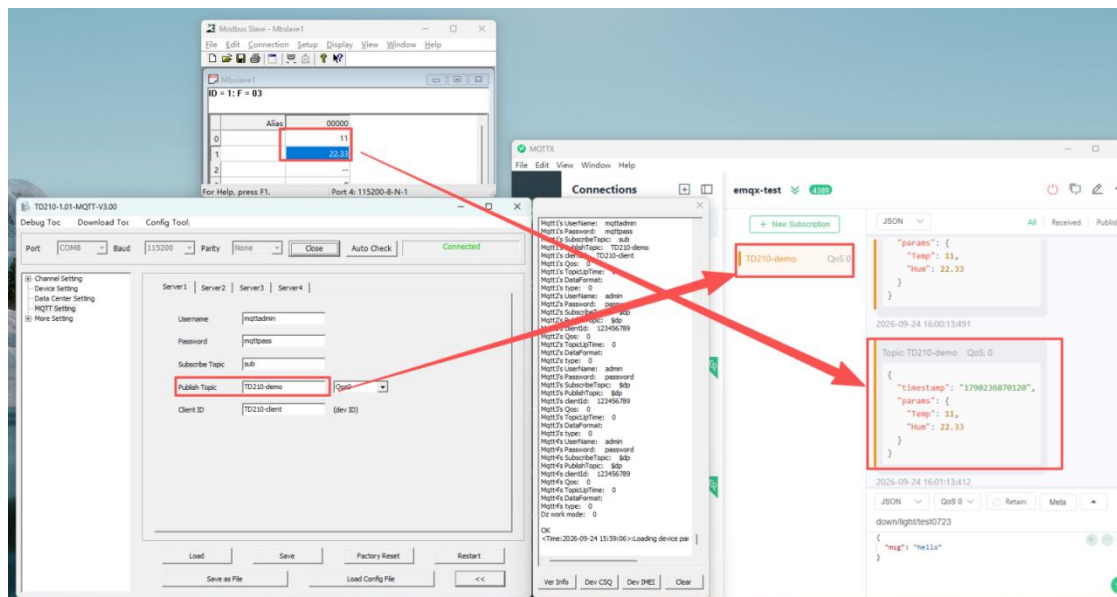
- Click "Save" button after setup all MQTT parameters, then click "Load" button to apply the new configuration.

Verification Method:

1. Open MQTT client software in computer. Then connect to the MQTT broker.



2. Subscribe the specific topic setup in TD210, then Modbus RTU data(Mbslave) will be received in MQTTX with JSON format.



Common Issues:

- Data Center and MQTT Setting are configured, but TD210 doesn't publish data for long time: Check the **"Report Period"** in Device Setting, the default period is 60 mins, you have to change the period according to your application.
- All configurations are complete, but no data receive in MQTT, and device is offline: Go

to **Data Center Setting**, check the “**Server No**”, when you enable server, the “**Server No**” must be selected 1 or more, cannot be 0.



Scenario 3: Upload Modbus RTU data to TCP Server

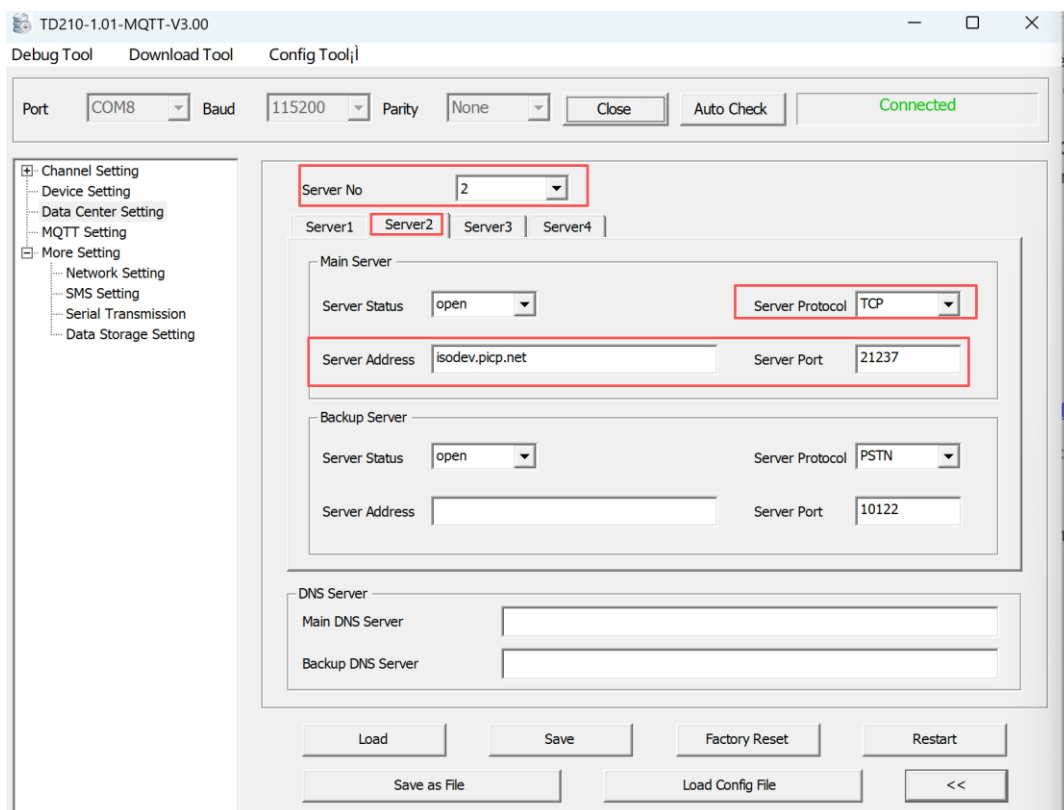
Objective: Upload Modbus data to TCP Server.

Prerequisites: Collected Modbus data, you have to finish the first step [Scenario 1: Modbus RTU Data Collection](#); TD210 and sensor are powered on; SIM card inserted and can connect to Internet; TCP Server(Net Assistant); TD210-B config tool(TD210-1.01-MQTT-EN-V3.00); Firmware version(TD210B1-CQB000-18.2).

Configuration Steps:

In this demo case, I going to connect TD210 to a remote server, the server address is bonded to a specific public domain.

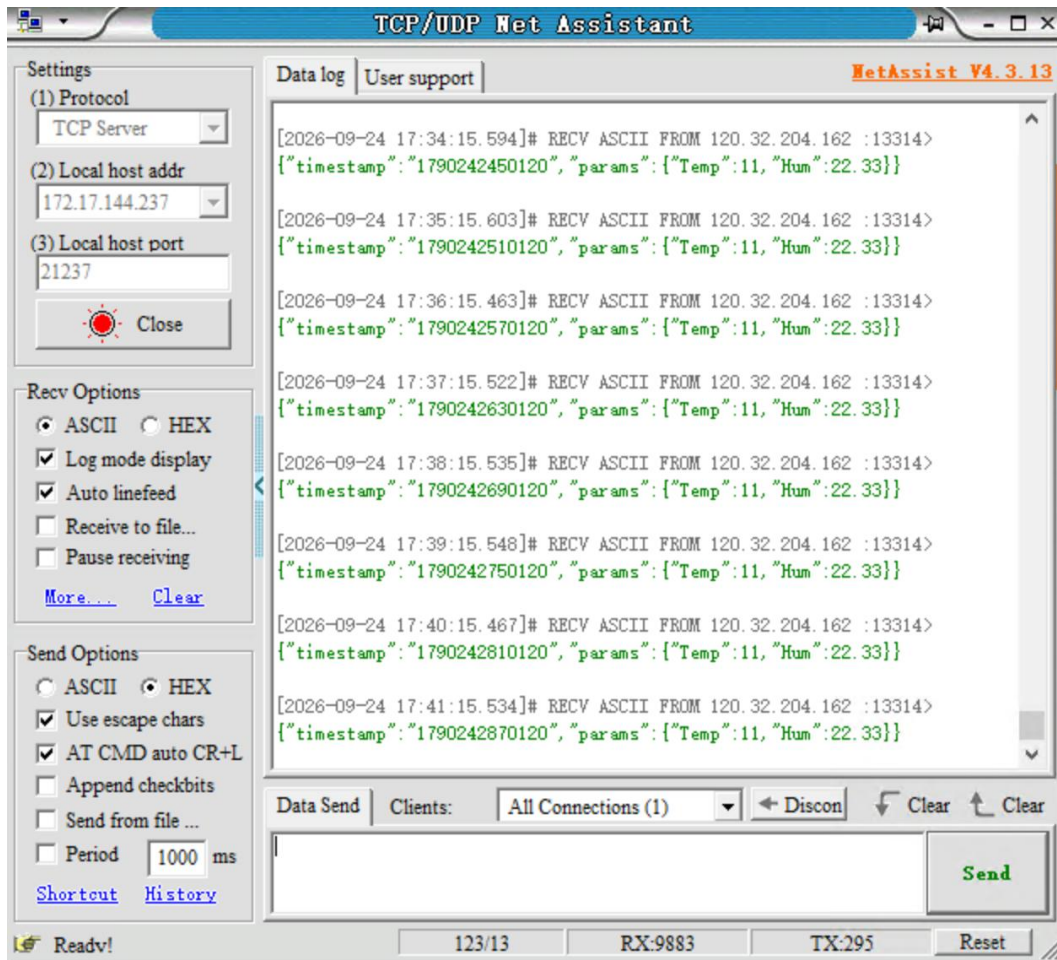
1. Go to **Config Tool -> Data Center Setting**, enable Server 2 for TCP connection. “Server No” should be 2, “Server Protocol” is TCP. Then configure your TCP address and port.



2. Click “Save” button after setup all TCP parameters, then click “Load” button to apply the new configuration.

Verification Method:

1. Go to TCP server, and check the data transmission.

**Scenario 4: DI and ADC Configuration for TD210-C**

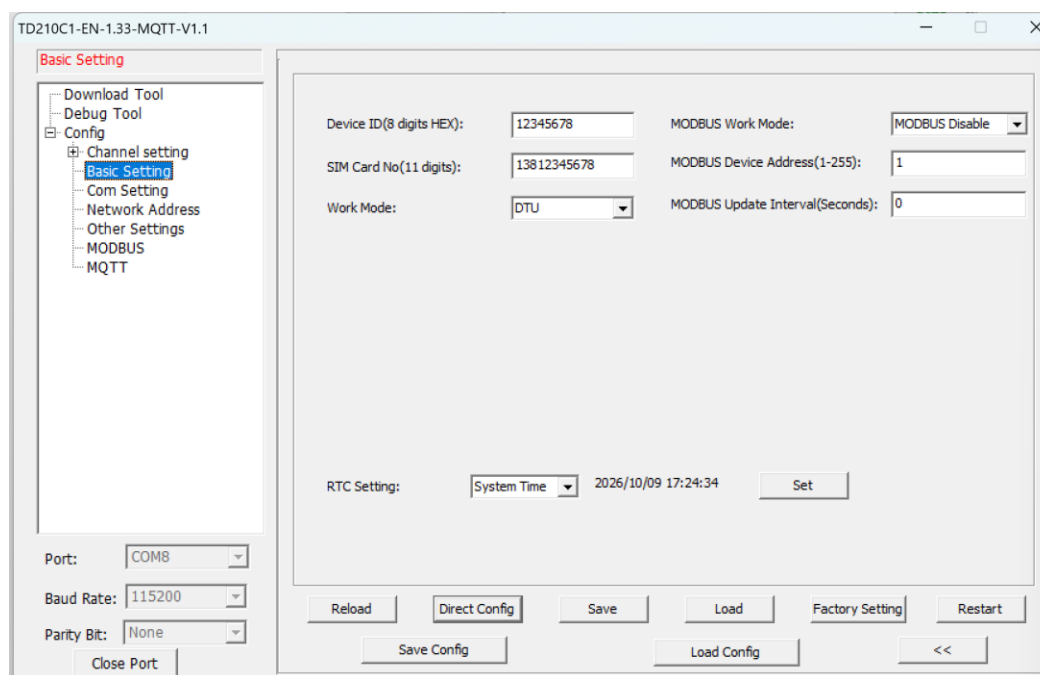
Objective: Enable data acquisition for DI and ADC, and upload data to MQTT.

Prerequisites: TD210 and sensor are powered on; SIM card inserted and can connect to Internet; MQTT broker; MQTT client tool(MQTTX or MQTT.fx); TD210-C config tool(TD210C1-EN-1.33-MQTT-V1.1); Firmware version(TD210B1-CQB000-18.2).

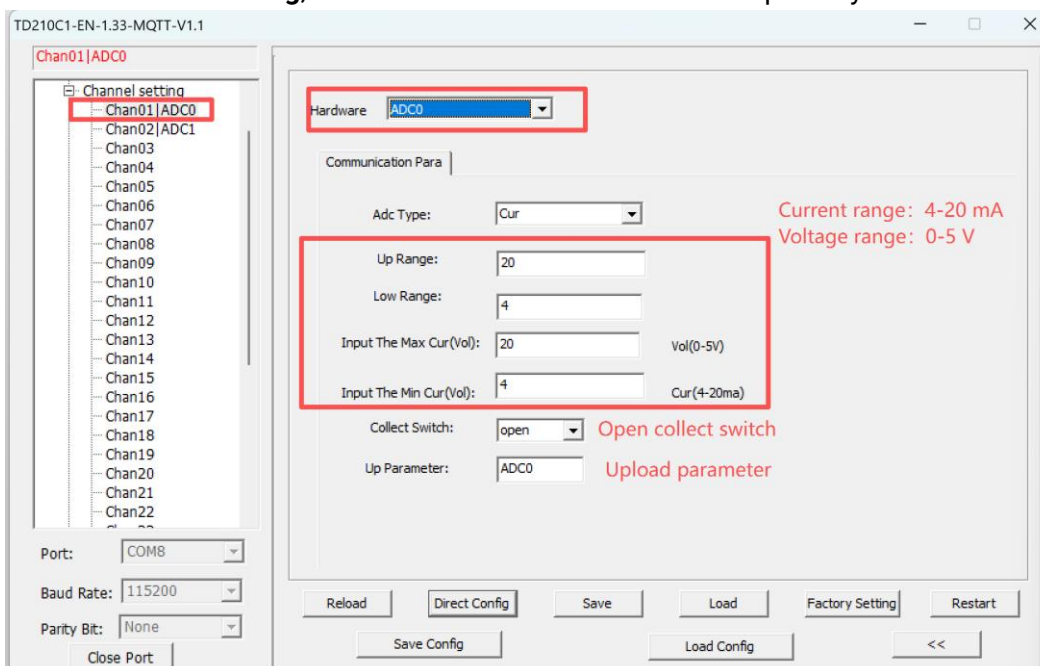
Configuration Steps:

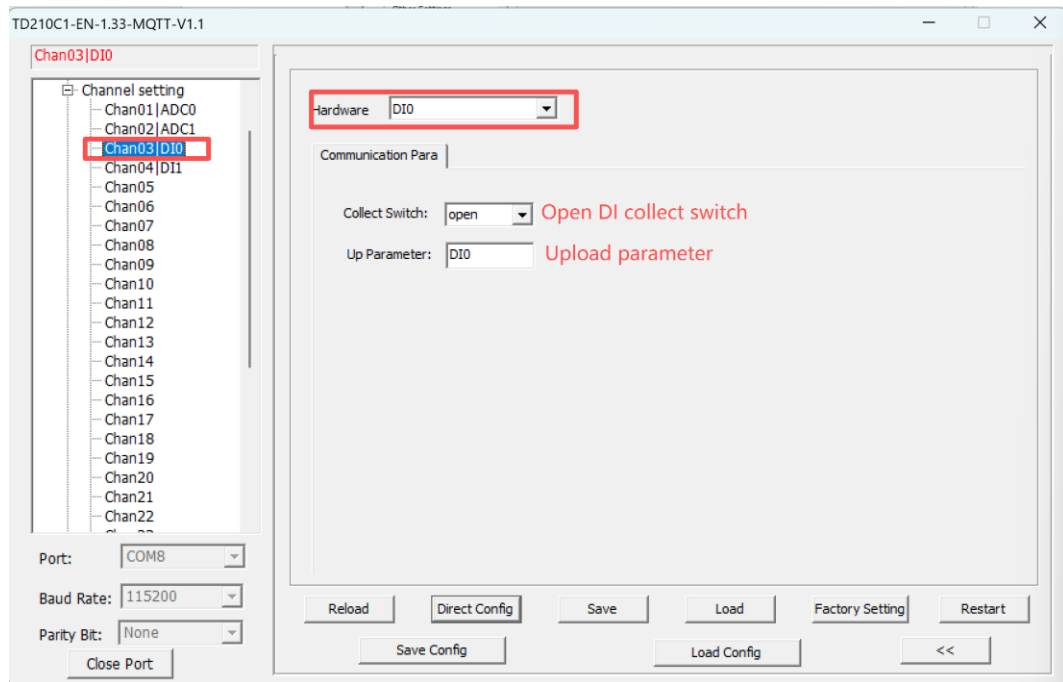
In this demo case, I going to collect DI and ADC data using TD210-C, and upload data to MQTT.

1. Open TD210-C config tool(TD210C1-EN-1.33-MQTT-V1.1), and enter config mode.

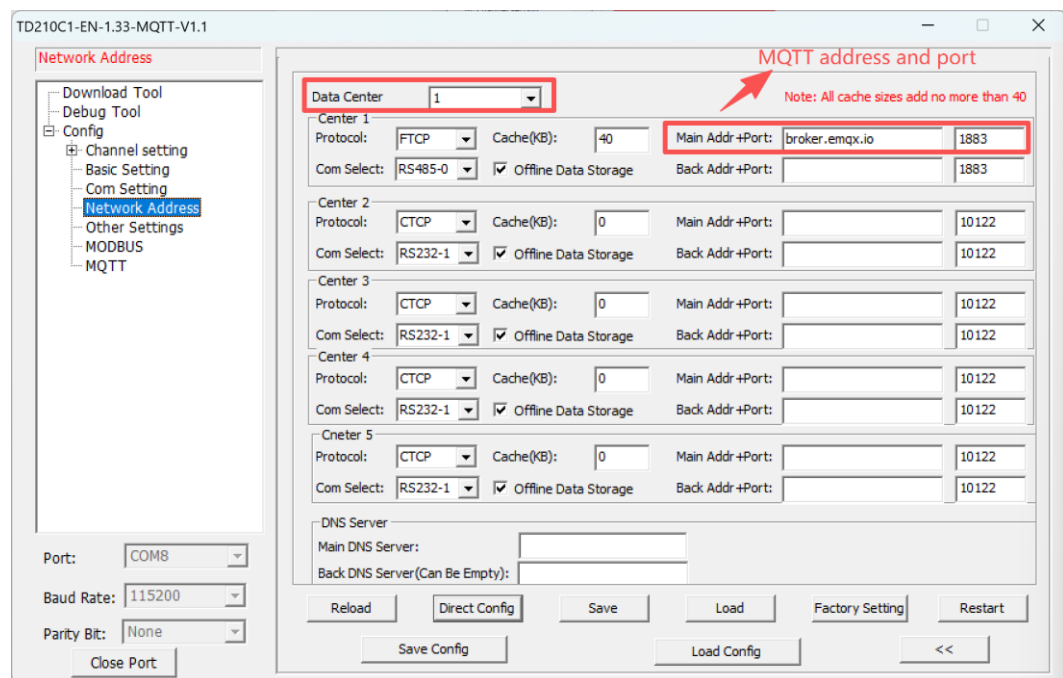


2. Go to **Channel Setting**, add new channels for ADC and DI separately.

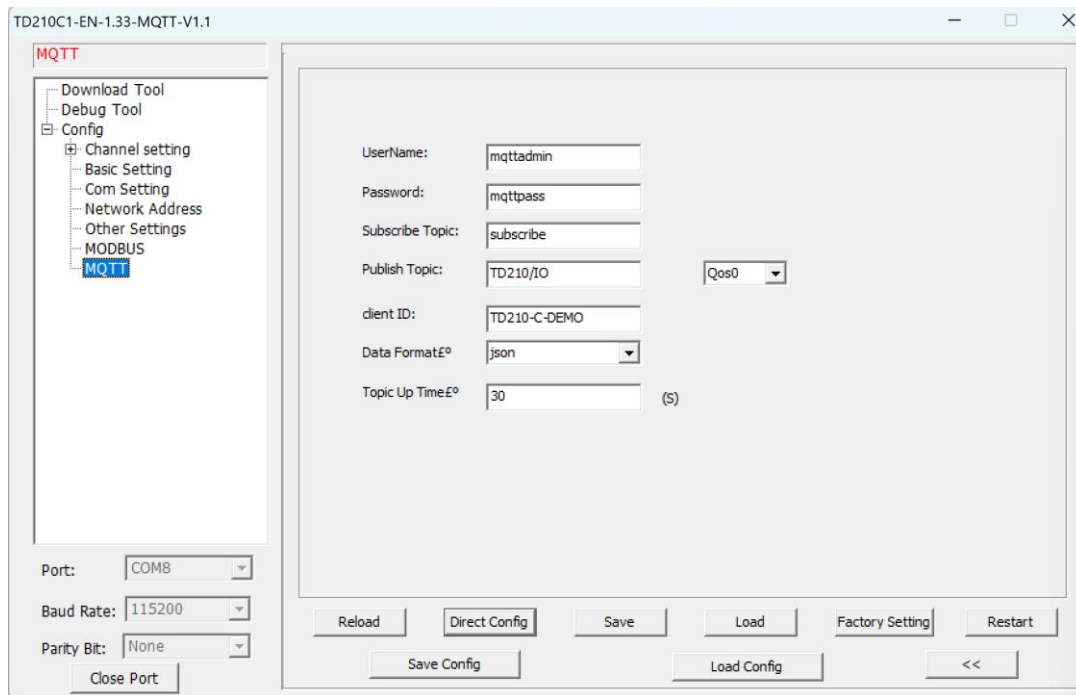




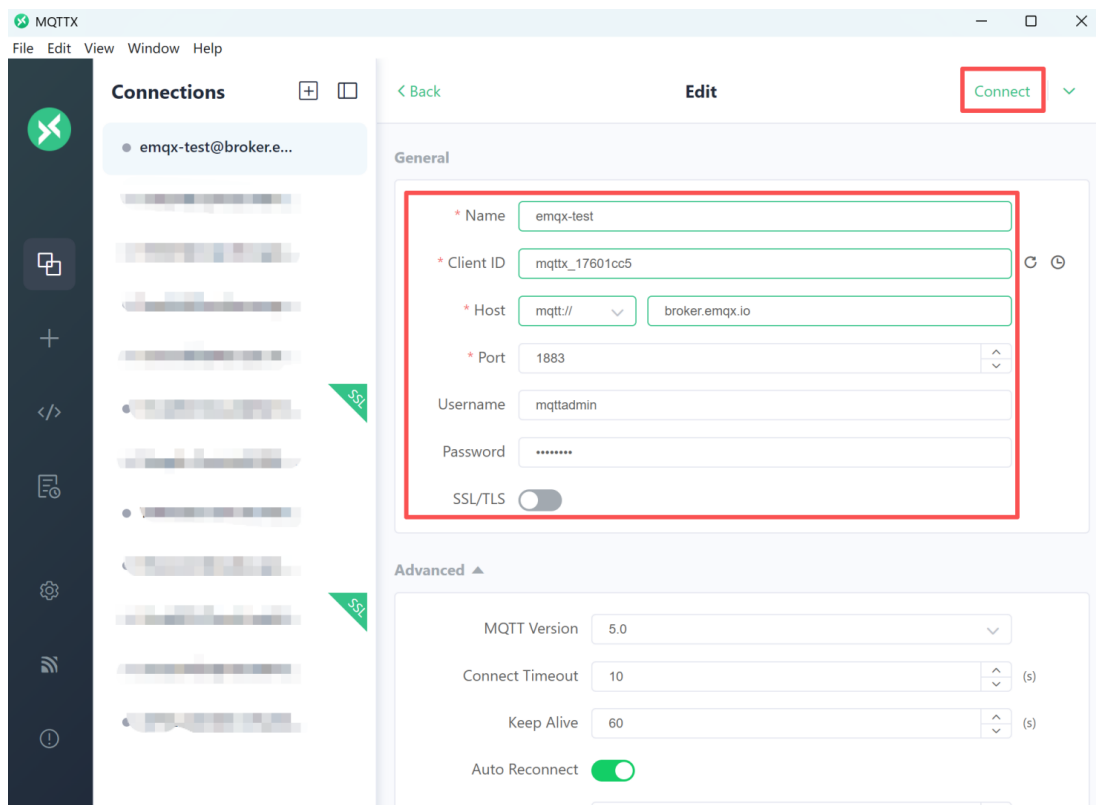
- Go to **Network Address**, enable data center 1 for MQTT connection. Setup your MQTT broker address and port.



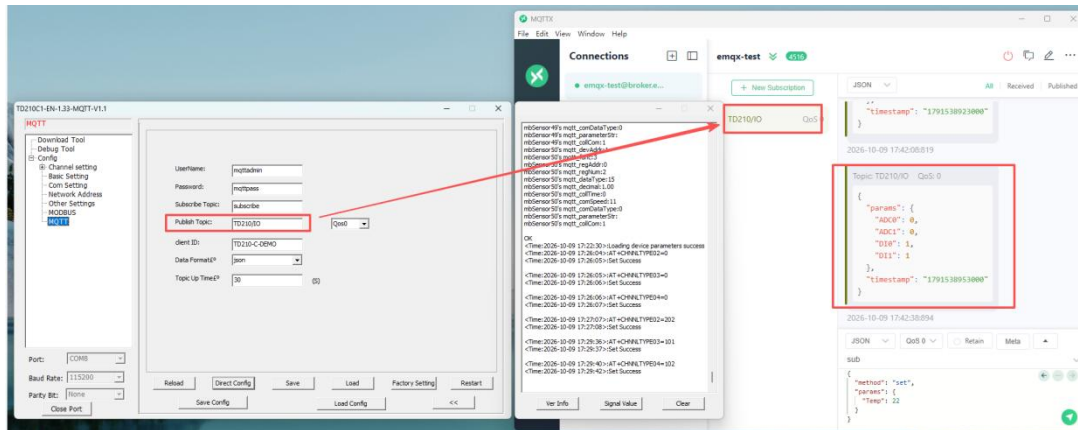
- Go to **MQTT**, configure the MQTT credentials, then setup a publish topic.

**Verification Method:**

1. Open MQTT client software in computer. Then connect to the MQTT broker.



2. Subscribe the specific topic setup in TD210-C, then the DI and ADC data will be received in MQTTX with JSON format.

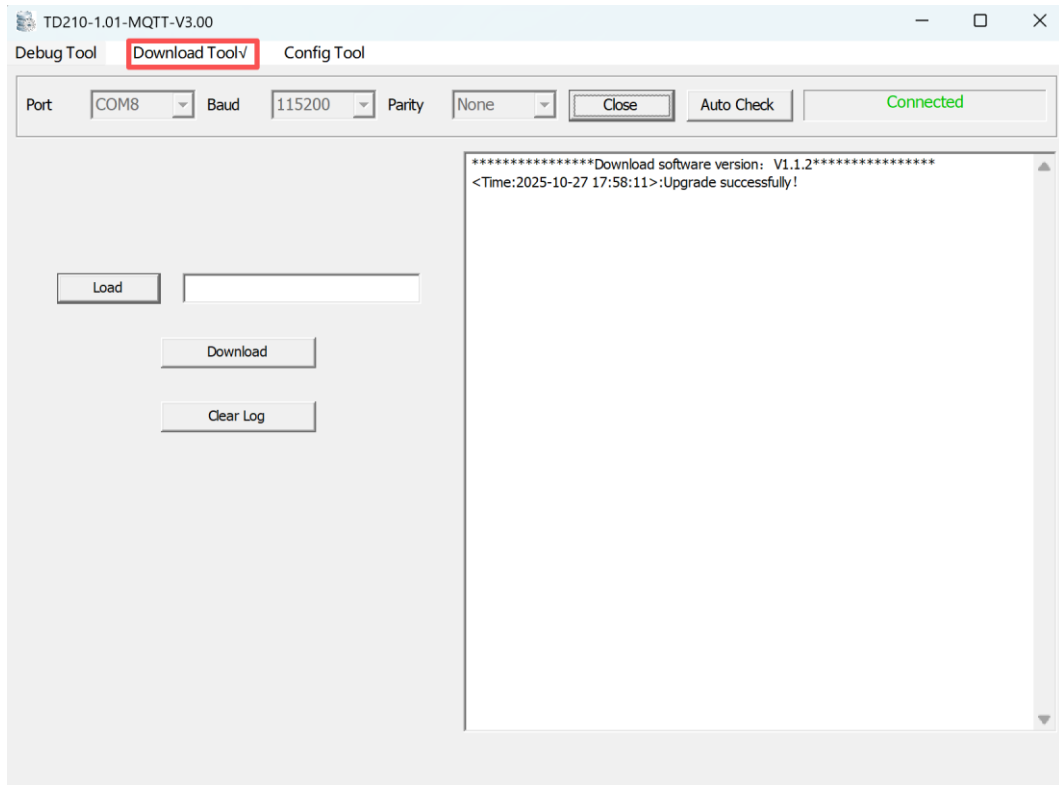


5. Firmware Upgrade

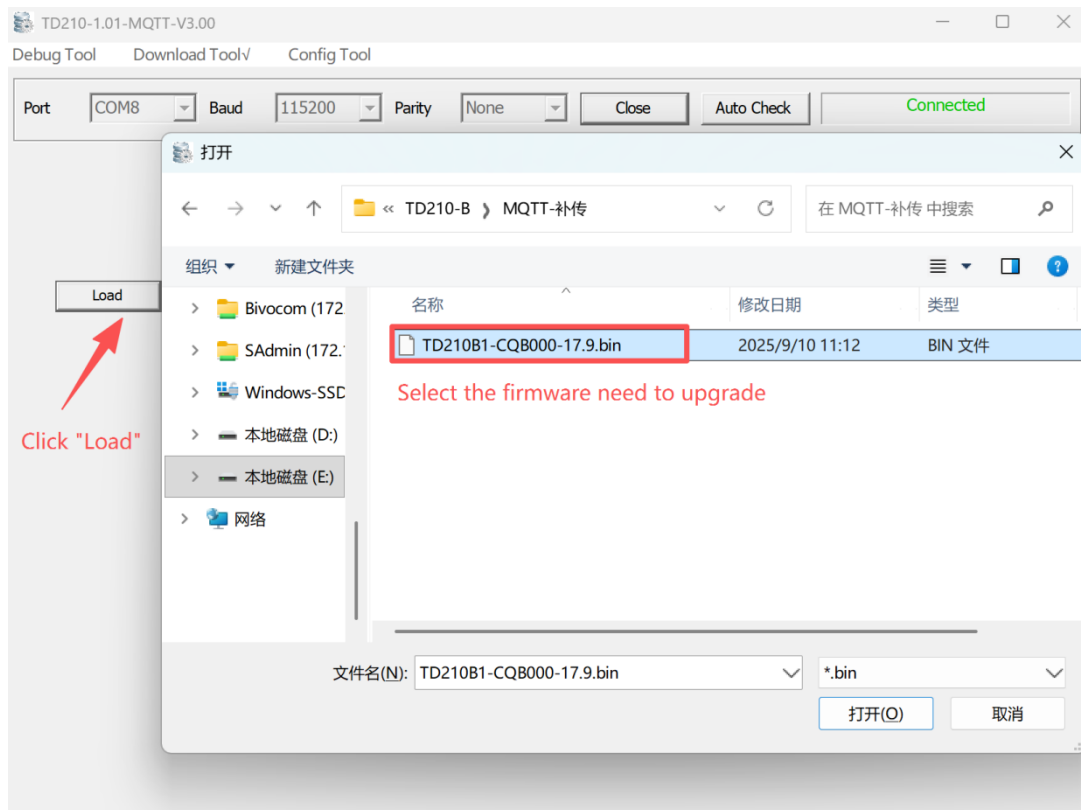
1. Before upgrading firmware, please connect RS232-0(DEBUG) to your computer through Serial to USB converter, as shown in the figure below:

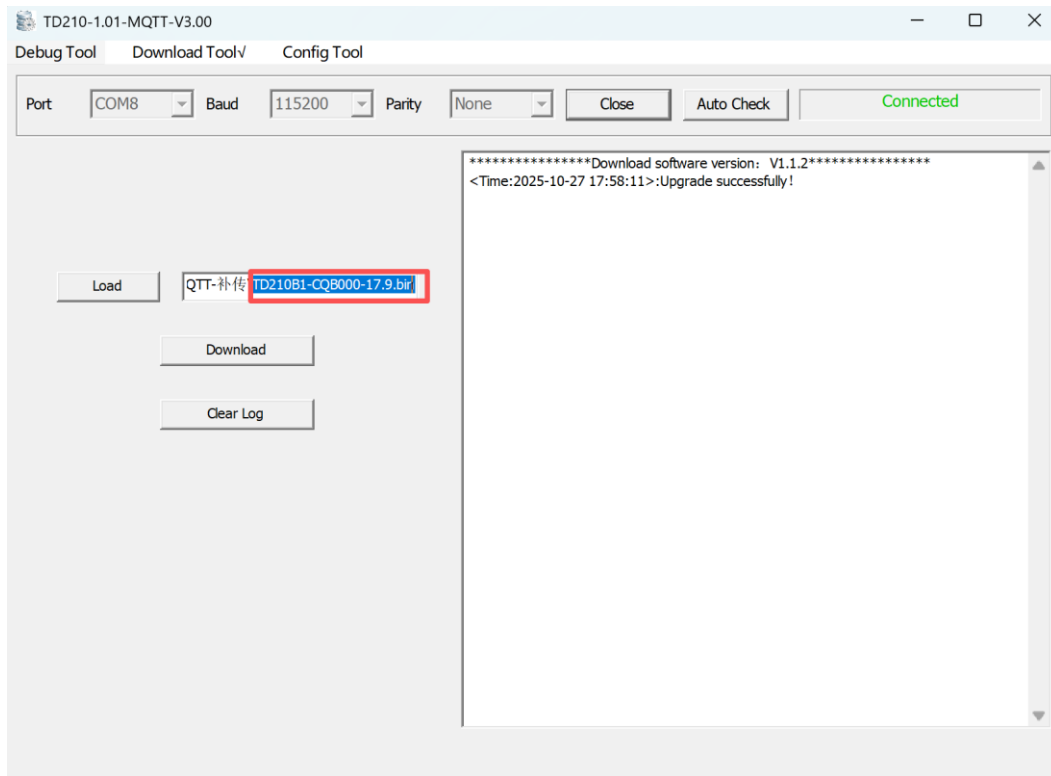


- Click "Download Tool", it'll be ticked "✓", then it'll automatically enter the download tool.

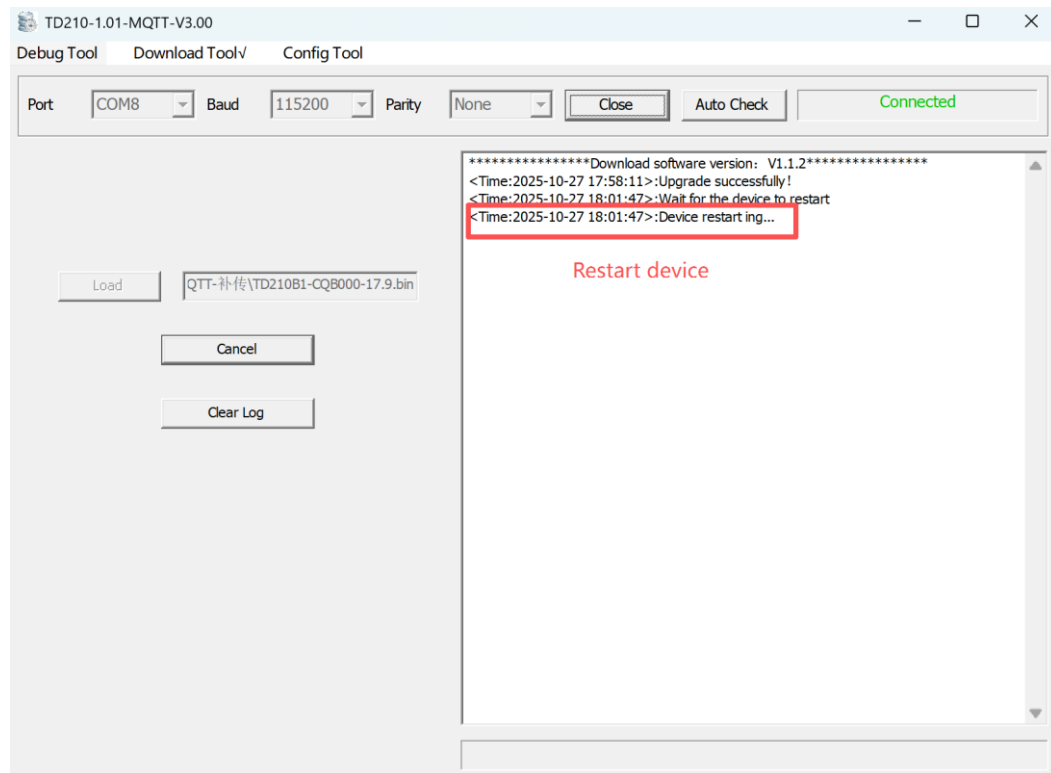


3. Click "Load" button to select a firmware that you need to upgrade, then it'll be uploaded to the download tool.



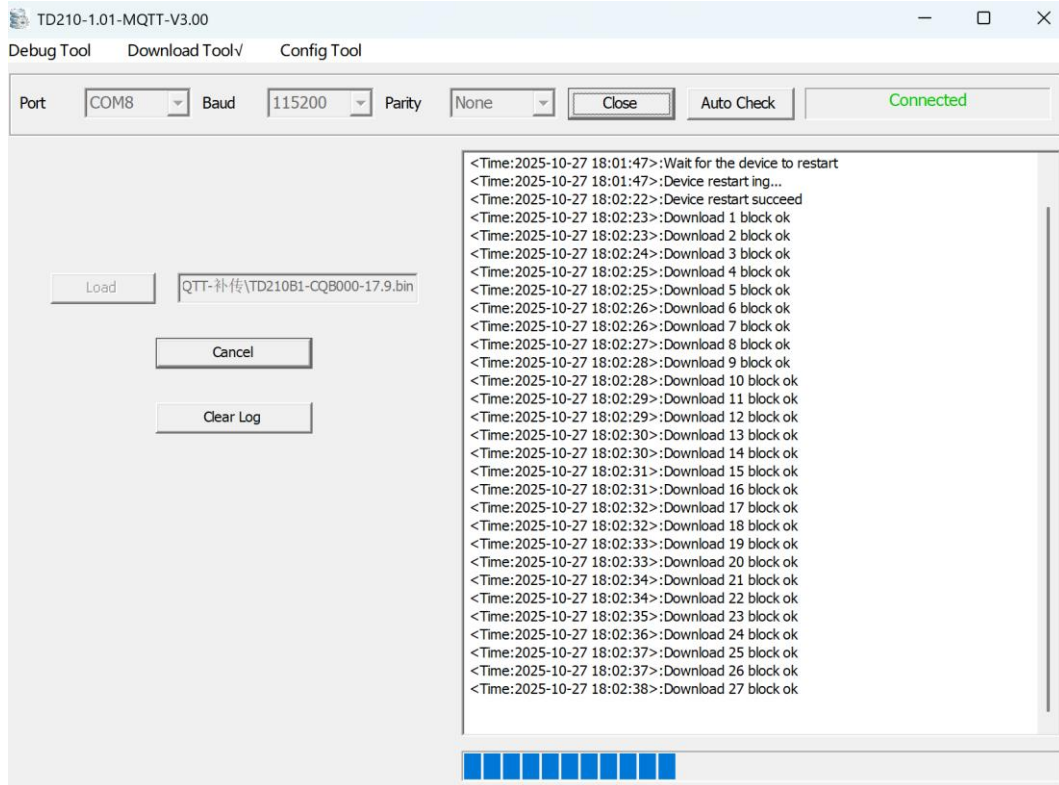


- Click "Download" button to start the firmware upgrade, then you have to restart the device according to the tips.

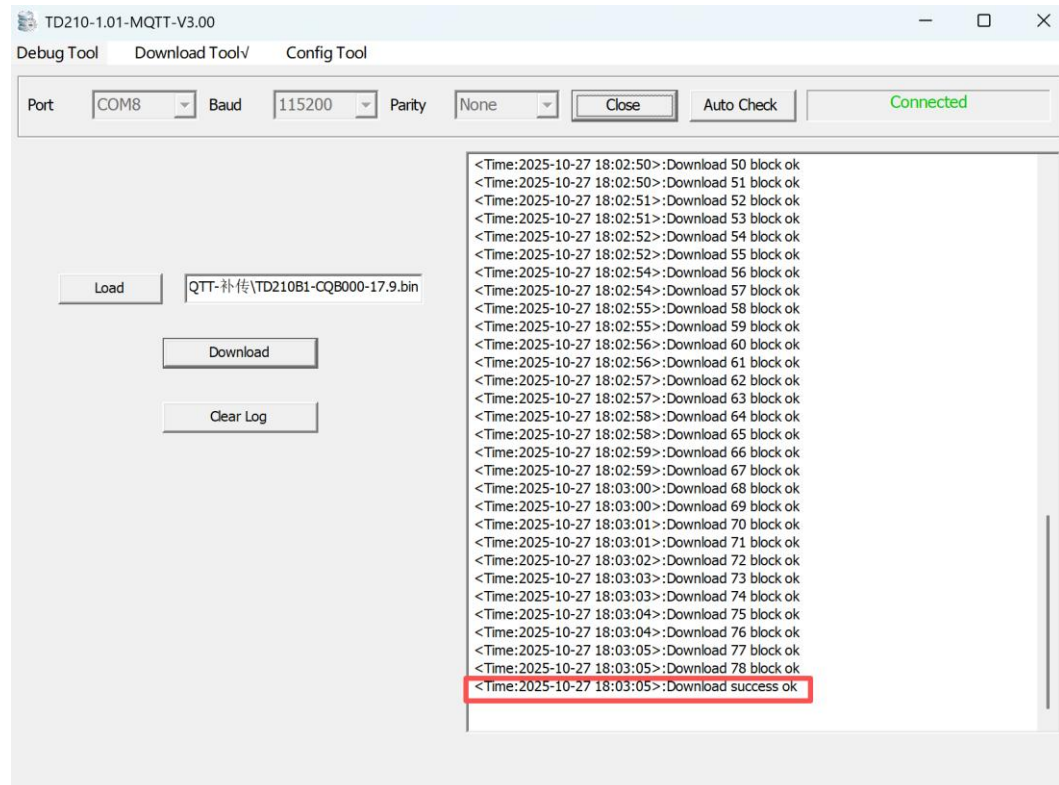


5. After restarted device, it'll start to upgrade the firmware, will take 1-2 mins. Then it'll show **"Download success ok"**, it indicates the firmware has been successfully upgraded.

Firmware upgrading

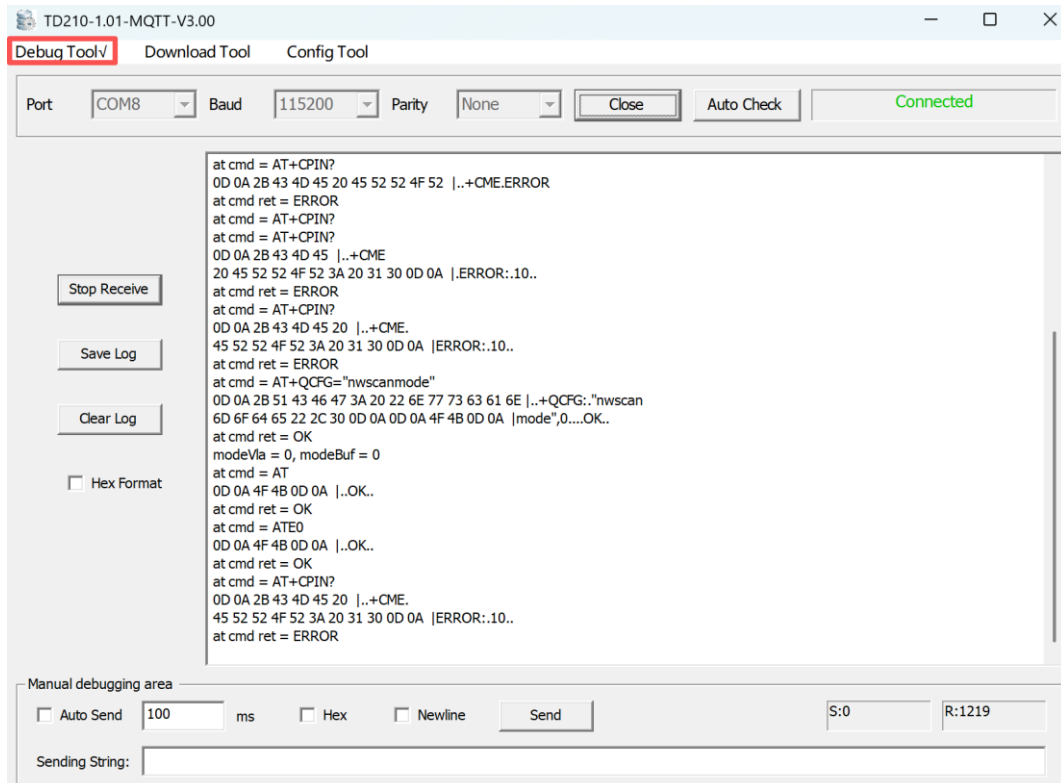


Firmware download complete



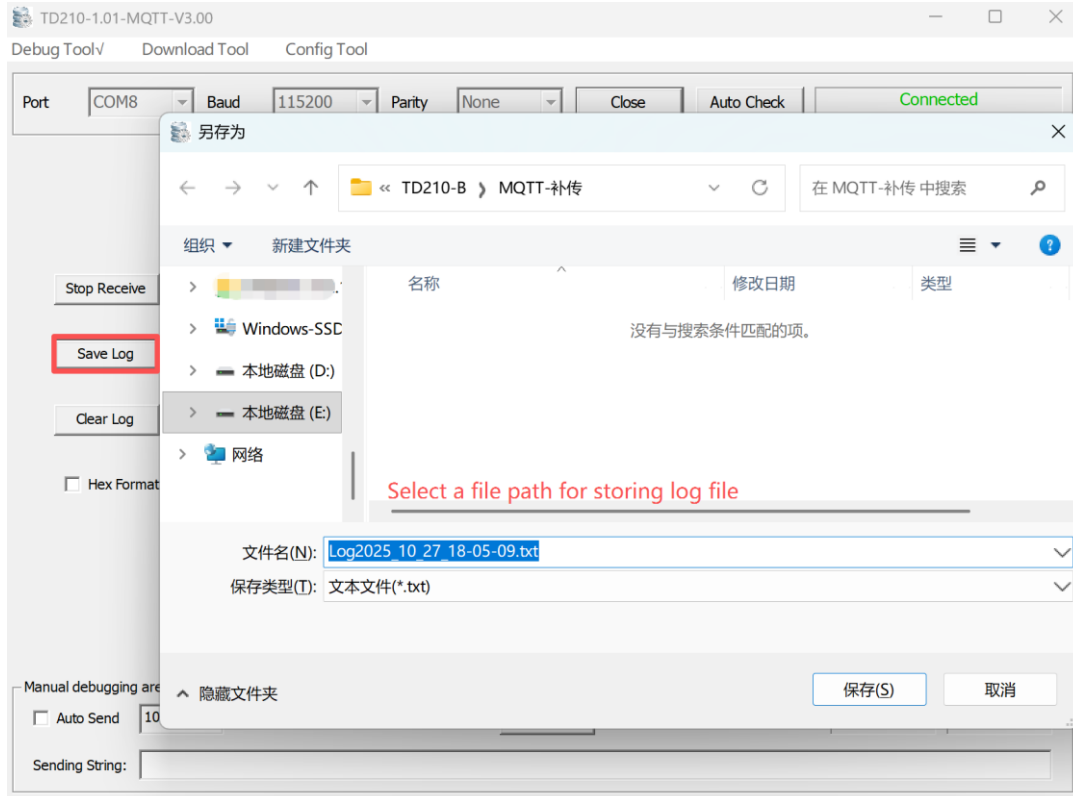
6. Debug Tool

1. Connect **RS232-0(DEBUG)** to your computer through Serial to USB converter. Click "Debug Tool", it'll be ticked "√", then it'll automatically enter the debug mode. Click "Start/Stop Receive" button, it can start or stop the system log output of TD210.



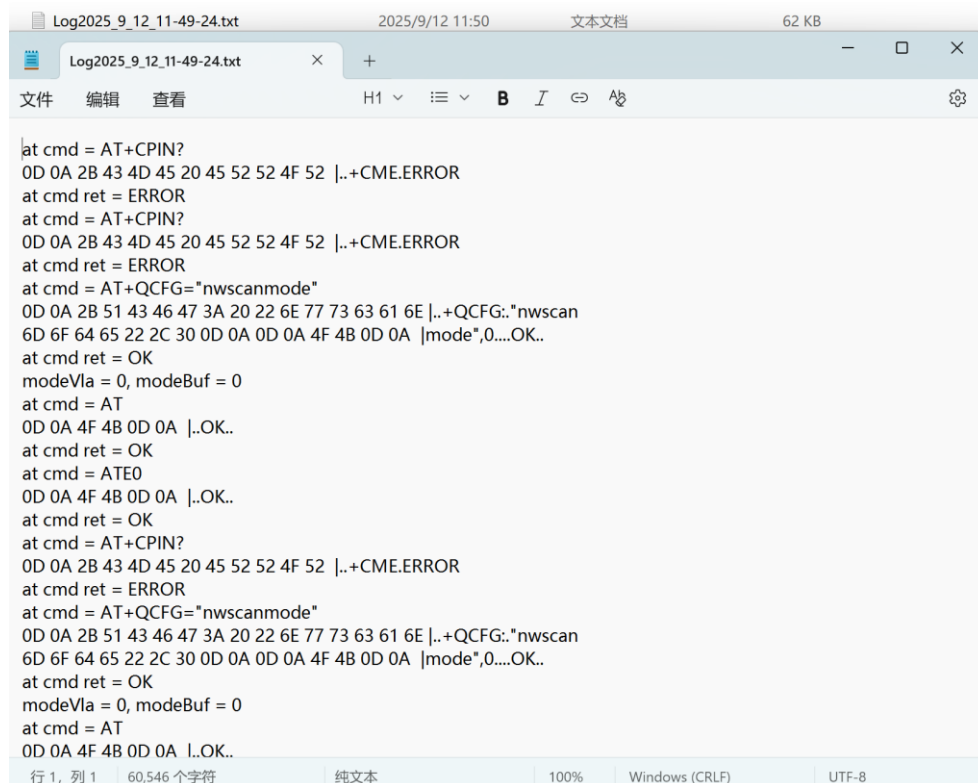
The system log is mainly used for troubleshooting, recording operational status, communication link events(such as network registration, heartbeats, and data transmission/reception), and abnormal errors(e.g., signal loss, connection interruptions or packet verification failures). It provides engineers with critical diagnostic evidence, enabling rapid fault localization, network performance optimization, and ensuring the reliability of IoT data transmission.

2. Click "Save Log" button, the current output system log can be saved in your computer as txt format.

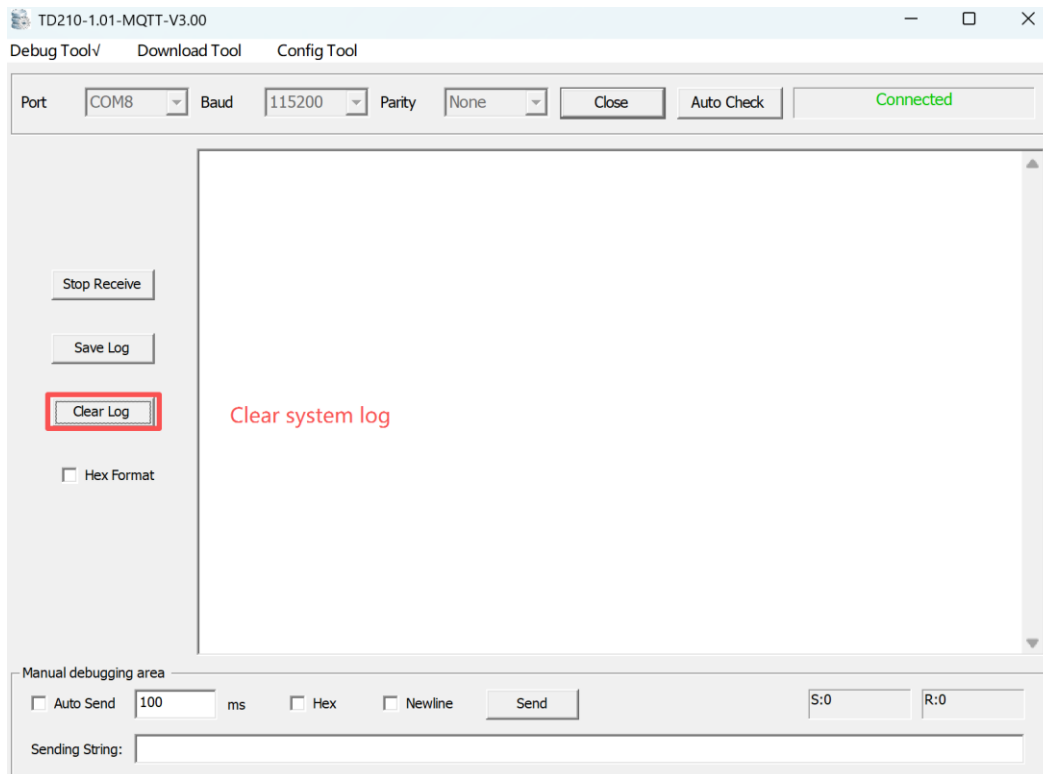


NOTE: When you encounter some uncertain errors, you may need to save the system log and send it to our technicians for analysis and diagnosis.

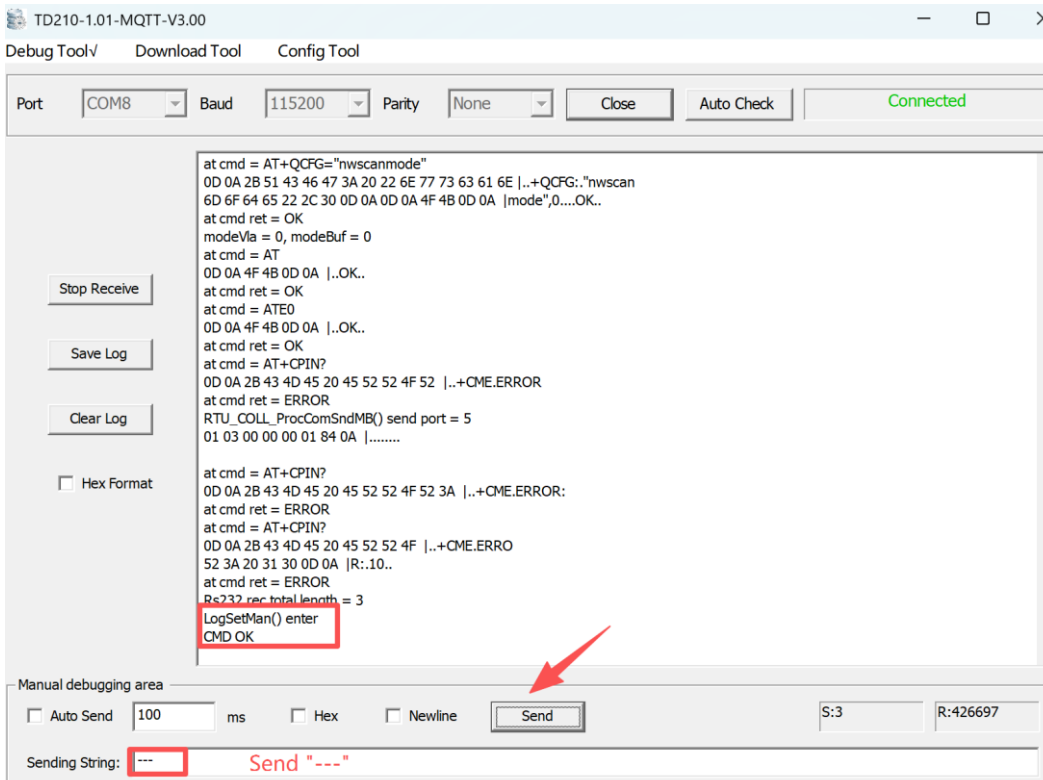
Example log file in txt format:



3. Click "Clear Log" button, all system logs will be deleted.

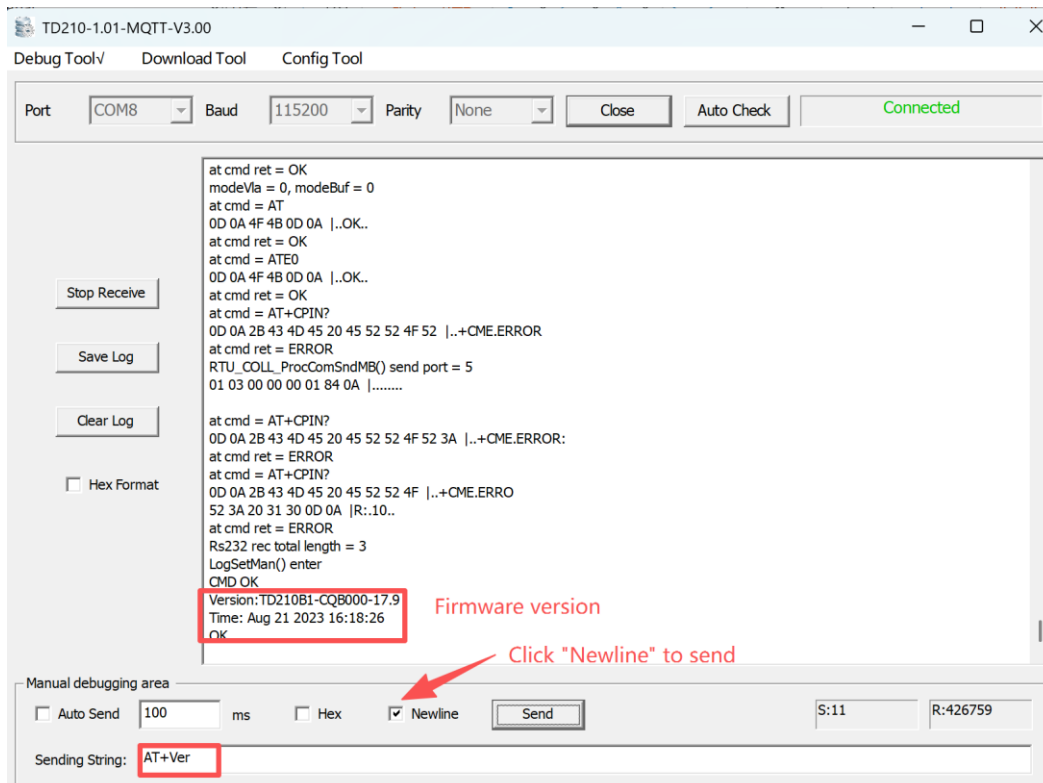


4. You can send AT commands in this command box. Send "---" to enter config mode.

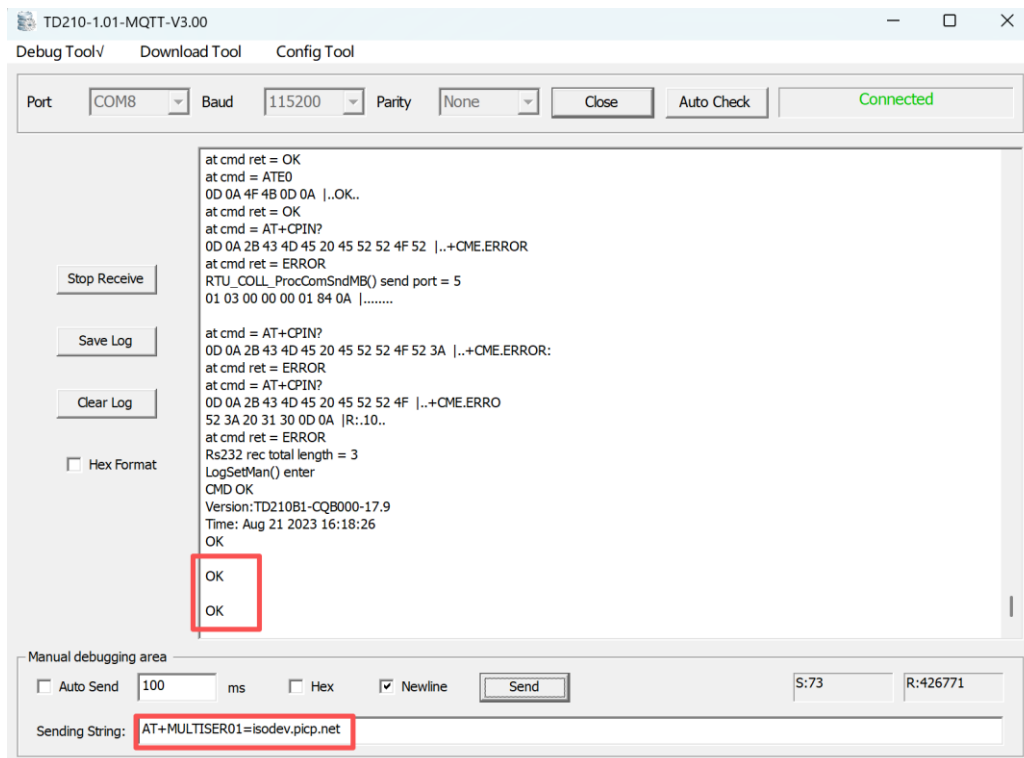


The following are examples of AT commands:

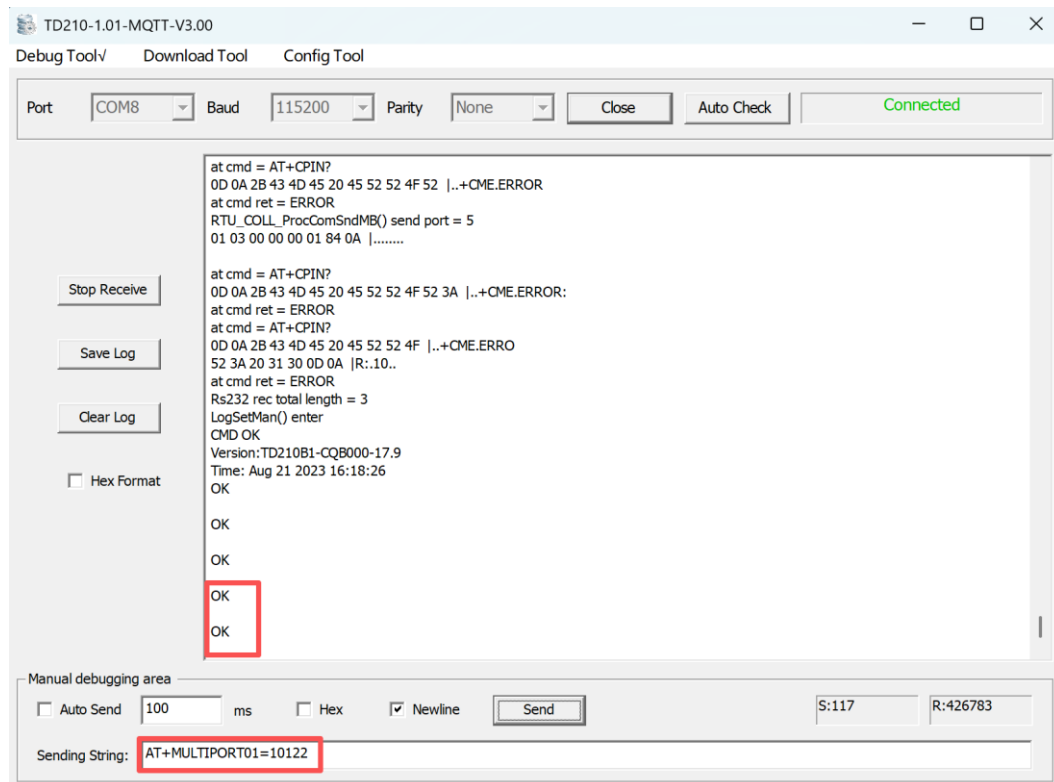
AT+Ver #Firmware version



AT+MULTISER01=isodev.picp.net #Set main Server Address



AT+MULTIPORT01=10122 #Set main Server Port



NOTE: You have to click “Newline” when sending new AT commands.

7. Configure TD210 via SMS

If config command exceeds 140 bytes, please send the command through multi SMS

NOTE: Long SMS is not supported.

SMS Config format:

<password; command 1; command 2>

Password: 123456(default)

Command: Please refer to command after 'AT+' of [Appendix 1, AT Command](#)

Example: <123456;IPAD=121.204.221.34;PORT=9999>

Explanation: password: 1234546, IP address: 121.204.221.34, Port: 9999

8. FAQ

Q1: What to do if the cellular network doesn't dial successfully? Online LED is off.

1. Check the SIM card installation and the cellular antenna connection. The SIM card and antenna must be installed correctly. You can follow the steps [2.2.1 SIM/UIM Card](#).
2. Try to restart the modem and check the network connection again. If the network is connected, the “Online” LED will turn green.
3. Ensure your SIM card service is normal, you can remove the SIM card from TD210 and insert to a cellphone, and check whether it can access the Internet.
4. If you SIM card is private card, you have to confirm with your SIM card operator whether

the SIM card requires **APN parameters**. If so, you'll need to configure the correct APN credentials in the config tool(More Setting -> Network Setting).

5. Check the server address/port setting in the [3.4.7 Data Center Setting](#). You must enable a server and configure an available server address and port, and ensure that the server can be accessed via your SIM card network. If the server address is empty, the TD210 will never connect to the network.
6. If you don't have a server address, you can click "**Factory Reset**" to restore the configuration to default parameters. TD210 will connect to the default TCP server "**isodev.picp.net:10122**", which is a public address.

Q2: Why can't enter the config tool even RS232 connected?

1. Check the connection of RS232-0(DEBUG) is correct(**TX0-BLUE, RX0-BROWN, GND-BLACK**).



2. Ensure your serial COM can be recognized by Windows system. Unless you may need to change another COM for connection.
3. Select the correct COM number in your computer, and make sure the COM could be opened in the config tool.
4. Check whether the **baud rate** of TD210 is the same as computer COM. Default baud rate: 115200.

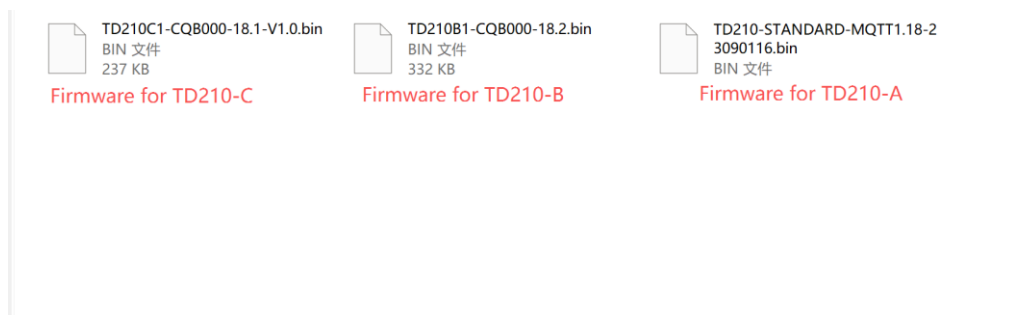
Q3: The device is powered on, but the Power LED is off.

1. Check if the power supply range is 5~35V. You'd better use the original power adapter, and make sure the power polarity is correct(Red-PWR, Black-GND).

Q4: What are the differences between TD210-A, TD210-B and TD210-C?

1. TD210—A, TD210-B and TD210-C represents 3 different **hardware versions**.
 - TD210-A is the earliest hardware version and has now reached its **EOL**. Bivocom will no longer sell or maintain it, but existing customers can still continue to use it.
 - The 210-B is currently Bivocom's main DTU model sold to users worldwide. Its I/O interfaces are the same as TD210-A. Besides, it can customize function according to customer needs.
 - TD210-C is the latest hardware version, which has more I/O interfaces(including 3-DI, 2-ADC and optional 2-PI/DO) than TD210-B. It can meet more industrial application scenarios and connect to different types of sensors. Besides, it can customize function according to customer needs.

2. Different hardware has its own independent firmware version, and cannot be compatible with each other. Firmware-B can only be upgraded in Hardware-B, cannot be upgraded in Hardware-A or -C. Please select the correct firmware version before upgrading your device.
3. You can distinguish different version by firmware name directly. There is also a special mark “**B1**” for firmware B, and “**C1**” for firmware C.



4. Different hardware has its own independent config tool, you can go to [Bivocom website](http://www.bivocom.com) to download the correct config tool for your device. Or you can contact Bivocom support team, and let us know your hardware version, we will share the specific config tool with you.

Appendix 1: AT Commands

NOTE: XX means parameter you'd like to set only, not command.

Description	AT Command	Parameter
Debug Level	AT+DEBUG=XX	XX: 0 (No logs) 1 (Simple logs) 2 (Detailed logs)
Baud Rate	AT+IPR=XX	XX: from 300 to 115200
Data bit, stop bit and Parity	AT+SERMODE=XX	XX: 8N1,8E1,8O1,7N1,7E1, 7O1
Frame Interval (ms)	AT+BYTEINT=XX	XX: unit(millisecond)
Trigger Type	AT+ACTI=XX	XX: AUTO (Always Online) SMSD (SMS Trigger) CTRL (Call Trigger) DATA (Data Trigger) MIXD (Mixed Trigger)
Call Trigger Phone No.	AT+CTRLNO=XX	XX: Preset call trigger phone No.
SMS Trigger Password	AT+SMSDPSWD=XX	XX: Preset SMS trigger password
Data Trigger On Password	AT+DONPSWD=XX	XX: Trigger on data
Data Trigger Off Password	AT+DOFFPSWD=XX	XX: Trigger off data
Network Word Mode	AT+MODE=XX	XX: FTCP,HTCP,CTCP, NUDP,CUDP,HUDP
Data Center Number	AT+SVRCNT=XX	XX: number of data center
Main Server Address	AT+IPAD=XX	XX: Main center IP address or DNS
Main Server Port	AT+PORT=XX	XX: Main Server Port
Backup Server Address.	AT+IPSEC=XX	XX: Backup center IP address or DNS
Backup Server Port	AT+PTSEC=XX	XX: Backup Server Port
2 nd Server Address.	AT+IPAD1=XX	XX: 2 nd center IP address or DNS
2 nd Server Port	AT+PORT1=XX	XX: 2 nd Server Port
3 rd Server Address.	AT+IPAD2=XX	XX: 3 rd center IP address or DNS
3 rd Server Port	AT+PORT2=XX	XX: 3 rd Server Port
4 th Server Address.	AT+IPAD3=XX	XX: 4 th center IP address or DNS
4 th Server Port	AT+PORT3=XX	XX: 4 th Server Port
5 th Server Address.	AT+IPAD4=XX	XX: 5 th center IP address or DNS

5 th Server Port	AT+PORT4=XX	XX: 5 th Server Port
Main Center DNS Server	AT+DNSSVR=XX	XX: Main Center DNS Server
Backup Center DNS Server	AT+DNSSV2=XX	XX: Backup Center DNS Server
2 nd Center DNS Server	AT+DNSSVR1=XX	XX: 2 nd Center DNS Server
3 rd Center DNS Server	AT+DNSSVR2=XX	XX: 3 rd Center DNS Server
4 th Center DNS Server	AT+DNSSVR3=XX	XX: 4 th Center DNS Server
5 th Center DNS Server	AT+DNSSVR4=XX	XX: 5 th Center DNS Server
APN	AT+APN=XX	XX: APN
APN Username	AT+USERNAME=XX	XX: APN Username
APN Password	AT+PASSWORD=XX	XX: APN Password
APN Call Center	AT+CEN=XX	XX: APN Call Center
Heartbeat Interval	AT+POLLTIME=XX	XX: Heartbeat Interval
Auto Back to Main Server	AT+RETM=XX	XX: 1, Yes 0, No
Custom Register String	AT+CONNRGST=XX	XX: Custom Register String
Custom Heartbeat String	AT+LINKRGST=XX	XX: Custom Heartbeat String
Transfer Meaning	AT+STRAIGHT=XX	XX: 0, Transfer meaning 1, No transfer meaning
TCP MTU	AT+TCPMTU=XX	XX: TCP Data Maximum Transmission Unit
Multi Center Reconnect Interval	AT+MCONTIME=XX	XX: Second(Unit)
Connect Retry Times	AT+RETR=XX	XX: Connect Retry Times
Reconnect Time Interval	AT+RDLWT=XX	XX: Reconnect Time Interval
TTL Heartbeat	AT+EXFUN=XX	XX: 0, Disable 1, Enable, 1 time per 60 seconds
ECHO Heartbeat Interval	AT+ECHOINT=XX	XX: 0, Disable Other value means seconds you set
1 st SMS Send Phone No.	AT+PHONE1=XX	XX: Use comma for multi phone number
2 nd SMS Send Phone No.	AT+PHONE2=XX	XX: Use comma for multi phone number
3 rd SMS Send Phone No.	AT+PHONE3=XX	XX: Use comma for multi phone number
4 th SMS Send Phone No.	AT+PHONE4=XX	XX: Use comma for multi phone number
SMS Send Type	AT+HEXSMS=XX	XX: 0, Normal SMS 1, HEX SMS

SMS Send Backup	AT+OPENSMSBCKP=XX	XX: 0, NO Backup 1, YES, to Backup
Display SMS Receiving	AT+SMSDIS=XX	XX: 0, No, SMS is not displayed at serial port 1, Yes, SMS display at serial port
MODBUS Work Mode	AT+MBMODE=XX	XX: 0, Disable 1, Network MODBUS 2, Serial Port MODBUS
MODBUS Device Address	AT+MBADDRESS=XX	XX: Address ranging from 1-247
1 st Analog Work Mode	AT+ADCMODE1=XX	XX: 0, Disable 1, Collect Once
2 nd Analog Work Mode	AT+ADCMODE2=XX	XX: 0, Disable 1, Collect Once
1 st Digital Work Mode	AT+DIOWORKMODE1=XX	XX: 0, Disable 1, Input 2, Output
2 nd Digital Work Mode	AT+DIOWORKMODE2=XX	XX: 0, Disable 1, Input 2, Output
3 rd Digital Work Mode	AT+DIOWORKMODE3=XX	XX: 0, Disable 1, Input 2, Output