Serial vs Ethernet Conversion Module

NT1-M



Chengdu Ebyte Electronic Technology Co.,Ltd.

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1. Introduction

NT1-M is a module that realizes serial port data to Ethernet data transmission (also known as "super network port"). The product comes with an RJ45 interface. It can meet the networking functions of various TTL level serial port devices and MCUs.

Features

- RJ45 supports 10M Ethernet interface;
- Support multiple working modes (TCP Server, TCP Client, UDP Server, UDP Client, HTTPC, MQTTC);
- Supports three configuration methods: configuration tool, web page, and AT command;
- Server mode supports multiple Socket connections;
- Support multiple baud rates;
- Supports multiple verifications (None, Odd, Even, Mark, Space) and flow control;
- Support DHCP function;
- Supports DNS (domain name resolution) and can customize the domain name resolution server;
- DNS server address customization;
- Supports a variety of Modbus gateways (simple protocol conversion, multi-host mode, storage gateway, configurable gateway);
- Supports quick access to Alibaba Cloud, Baidu Cloud, OneNET, Huawei Cloud, and version 3.1 standard MQTT servers;
- Support HTTP protocol (GET/POST request);
- Support virtual serial port;
- Supports timeout restart function and can customize the restart time;
- Supports short connection function and can customize short connection interval;
- Supports heartbeat package and registration package functions;
- Support cache cleaning function;
- Support access to external network and local area network;
- Support hardware restoration to factory settings;
- Support online upgrade function.

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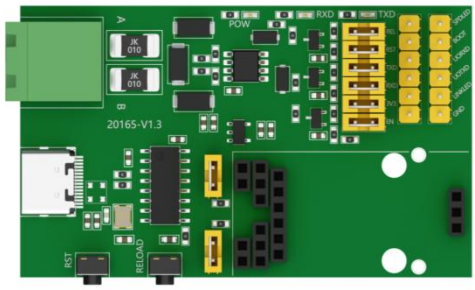
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2. Quick start

If any problem occurs during use, please send a email to Ebyte support：service@cdebyte.com

2.1 Preparation for use

Before using the super network port NT1-M (hereinafter referred to as the "device"), you need to prepare network cables, computers, test baseboards and other related auxiliary materials. details as follows:

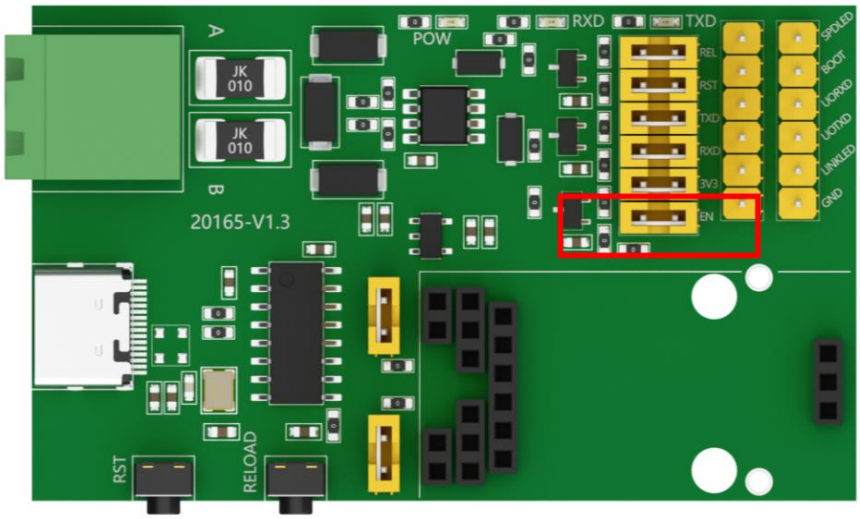
		
NT1 -M	NT1-M-TB test base plate	cable
		
computer	type-C adapter cable	

Note: The test baseboard has a USB interface and an RS485 interface. The USB interface is used for demonstration here.

Note: The RS485 interface is a half-duplex interface. When using it, you need to connect the jumper cap to the corresponding EN position, otherwise it will not be usable.

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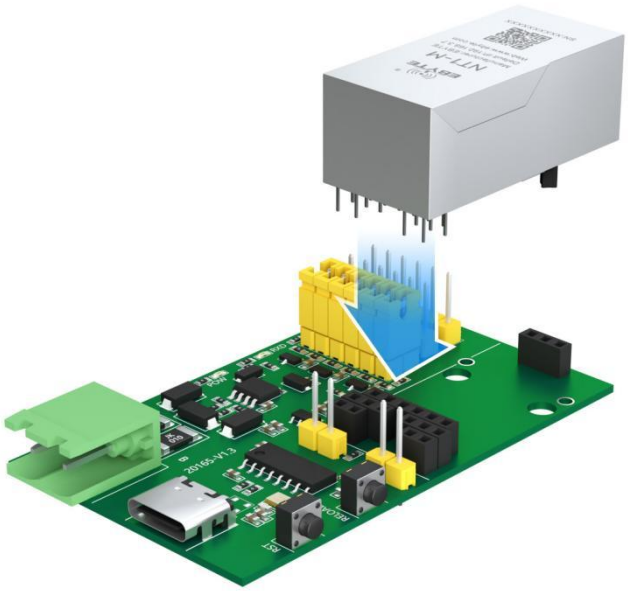
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2.2 Equipment wiring

2.2.1 Connect the test base board to the super network port

Connect the super network port to the test baseboard, taking care not to damage the pins.



2.2.2 Network cable connection

Use a standard RJ45 network cable, connect one end to the RJ45 interface of NE2-T1M, and the other end to the computer or switch/router interface.

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2.2.3 USB cable connection

Connect the USB to type-c cable to the computer USB interface and the test chassis interface respectively.

Note: If you use the RS485 interface for testing, you need to power the super network port.

2.3 Software settings

2.3.1 Network test environment

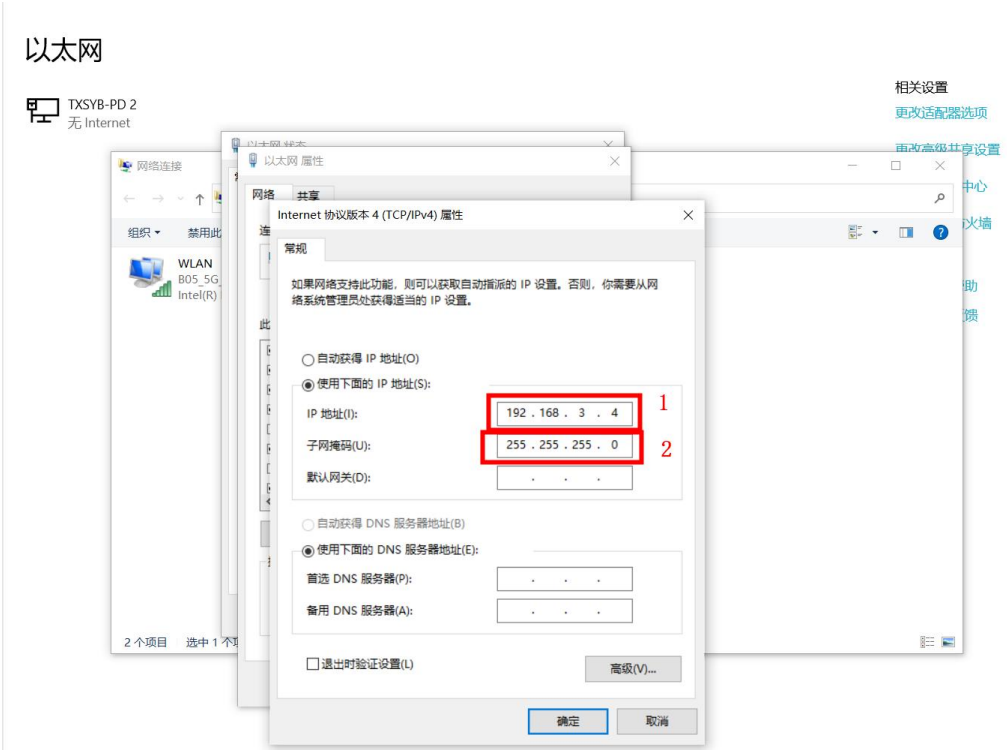
To prevent customers from experiencing server search failures, inability to open web pages and other related problems during actual application , it is recommended to check the relevant settings of the computer first.

（1） Turn off your computer’s firewall and anti-virus software;

（2） Configure the network card connected to the device;

（3） This case is for the direct connection test of the device to the computer. The computer needs to be configured with a static IP (the computer is directly connected to the device, there is no router to allocate, and the computer cannot obtain the IP address). When using a switch or router, you need to ensure that the device and the computer are on the same network (for example: 192.168.3.xxx);

（4） Here, configure the static IP of the computer to 192.168.3.4 (the same network segment as the device), configure the subnet mask to 255.255.255.0, and configure the default gateway to 192.168.3.1 .



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2.3.2 Default parameters

project	Default parameters
IP address	192.168.3.7
Default local port	8887
subnet mask	255.255.255.0
Default gateway	192.168.3.1
Default working mode	TCP Server
Serial port baud rate	115200
Serial port parameters	8/None/1

2.3.3 Data transmission test

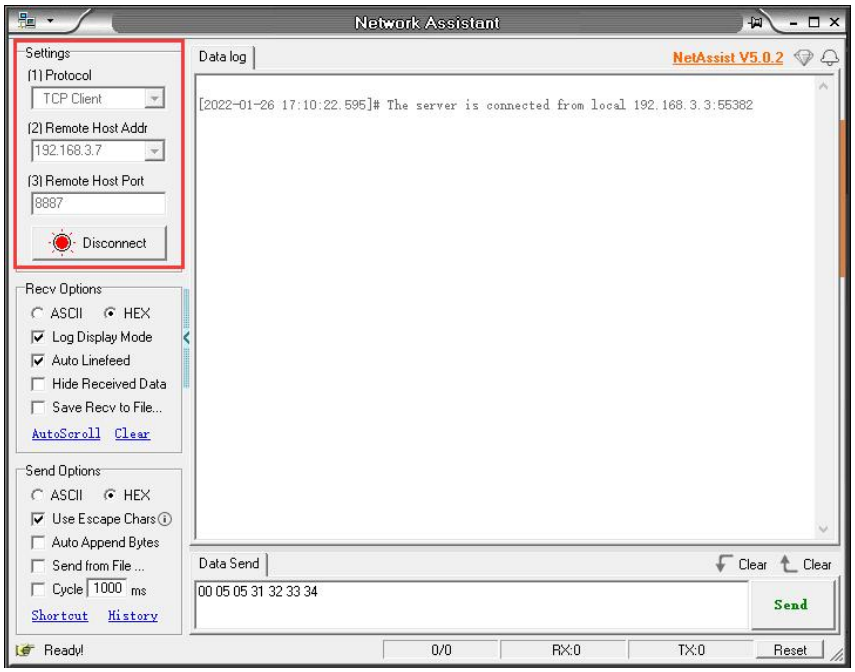
After going through the above steps, use the device's factory default parameters and perform the following operations to achieve a transparent transmission test of data.

The steps are as follows:

（1） Open the TCP/IP debugging assistant software ;

（2） In the "Network Settings" area, select the TCP client mode (TCP Client), the remote host address corresponds (the device's default local IP: 192.168.3.7), the remote host port corresponds to the device's factory local port 8887, and click Connect ;

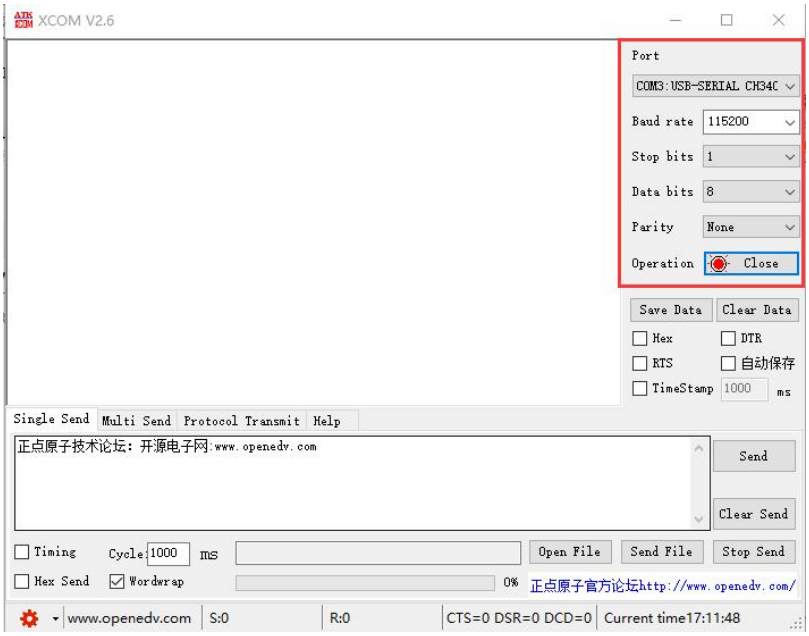
（3） Wait for the computer to connect to the serial port server. After the connection is completed, the LED2 pin of the module outputs low level ;



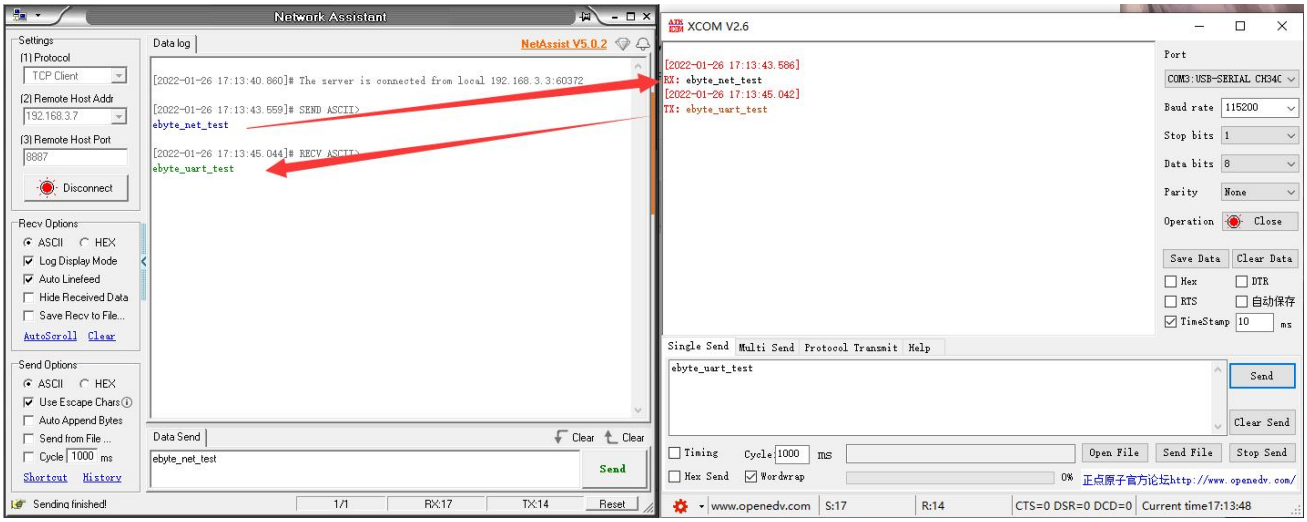
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（4） Open the serial port assistant, set the serial port baud rate to 115200, set the serial port parameters to 1/8/None, click to open the serial port ;



（5） Data transmission test, the serial port assistant (serial port side) sends test data, and the network debugging assistant (network side) receives the test data. The network debugging assistant (network side) sends test data, and the serial port assistant (serial port side) receives the test data. Realize duplex communication (that is, two-way data sending and receiving from local to network).



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3. Serial to Ethernet Model Options

3.1 Models

Product number	product type	Socket Number of connections	Operating mode	Working voltage (V)	Product Size (mm)
NS1	SMD module	Route 6	TCP Server TCP Client UDP Server UDP Client MQTT Client HTTP Client	DC 3.0 ～ 5	17×19×4
NT1	Direct plug module	Route 6		DC 3.0 ～ 5	35×22×30
NT1-B					
NT1-M	Super network port	Route 6		DC 2.1~3.6	32.5×16.5×17.5
NA111	DTU	Route 6		DC 8 ~ 28	110×66×30
NA111-A				A C 85 ~ 265	
NB114	DTU	Route 6		DC 8 ~ 28	102 × 84 × 25

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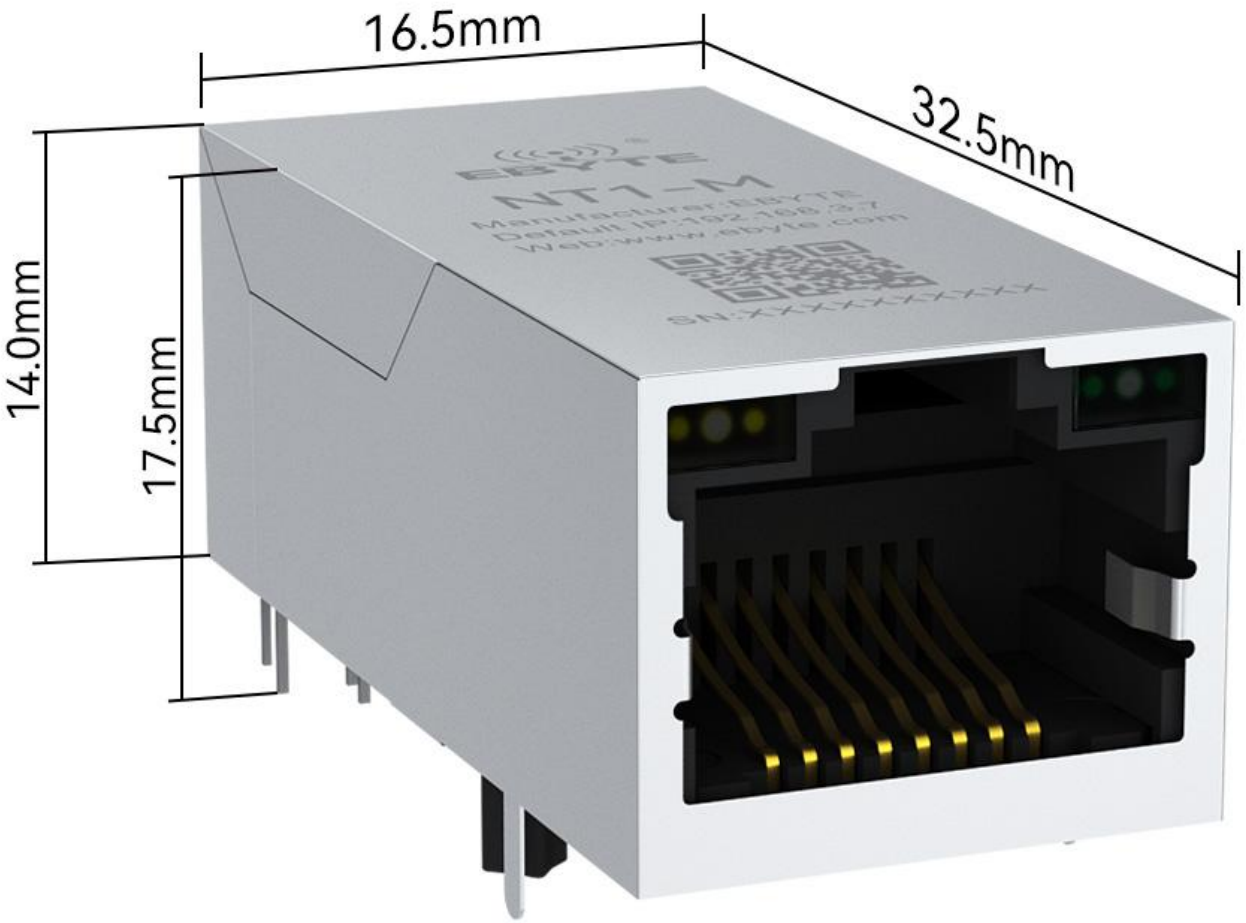
3.2 Technical Parameters

Name	Details
Operating Voltage	DC 2.1~3.6 V It is recommended to use 3.3V power supply, and the power supply load capacity is recommended to be above 300mA.
Working current	Standby: 50mA @ 3.3V Peak: 150mA@3.3V
interface	Serial port (TTL), network port (RJ45)
Serial port level	3.3V TTL level , if 5V is required, an external conversion circuit is required
Operating mode	TCP Server (default), TCP Client, UDP Server, UDP Client, HTTP Client, MQTT Client
Socket connection	TCP server supports 6 client connections
Network protocol	TCP/UDP, MQTT, HTTP, IPv4, DHCP, DNS
IP acquisition method	Static IP (default), DHCP
DNS domain name resolution	support
Domain name resolution server	114.114.114.114 (customizable)
Configuration method	Web page, parameter configuration tool, AT command
IP address	192.168.3.7 (customizable)
username	admin (customizable)
password	admin (customizable)
local port	8887 (customizable)
subnet mask	255.255.255.0 (customizable)
gateway	192.168.3.1 (customizable)
Serial buffer	1024 Bytes
Packaging mechanism	512 Bytes
Serial port baud rate	1200 ~ 230400 bps (default 115200)
data bits	5, 6, 7, 8 (default)
Stop bit	1 (default), 2
Check Digit	None (default), Odd, Even, Mark, Space
Flow Control	NONE (default), RTS/CTS, DSR/DTR, XON/XOFF
Product Size	32.5×16.5×17.5mm
product weight	9±1g
Working temperature and humidity	-40～+85℃, 5%～95%RH (no condensation)
Storage temperature and humidity	-40 ~ +105℃, 5% ~ 95%RH (no condensation)

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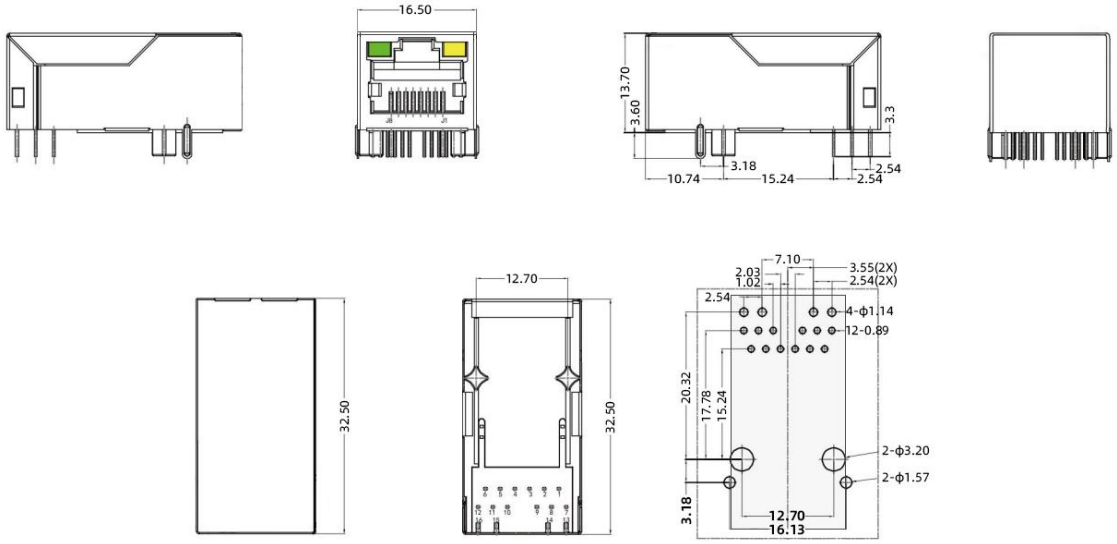
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3.3 Mechanical Dimensions

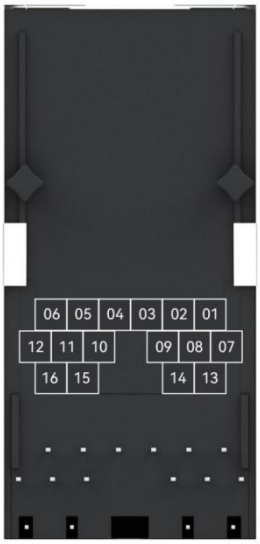


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3.4 Pin definition



NT1-M		
Number	Pin	Functions
1	RXD0	NC, programming interface, no need to leave it floating
2	TXD0	NC, programming interface, no need to leave it floating
3	BOOT	NC, programming interface, external pull-up recommended
4	RST	Connect the chip reset pin and pull it down for more than 100uS to take effect . It is recommended to pull it up externally.
5	485_EN	485 enable pin
6	RELOAD	Restore factory settings, pull down to take effect

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7	STATE0	PHY connection indicator , pulled low after negotiation is completed
8	RXD	User serial port, 3.3V TTL level
9	TxD	User serial port, 3.3V TTL level
10	GND	Power supply + signal ground
11	VCC	Positive pole of power supply , recommended power supply capacity is 300mA@3.3V or above
12	STATE1	Physical data indicator light , the level jumps when there is data
13	LED0-	The negative pole of the LED0 indicator light can be connected to pin 7 to indicate the STATE0 signal
14	LED0+	Positive pole of LED0 indicator light, connect to 3.3 power supply+
15	LED1+	The positive pole of LED1 indicator light can be externally connected to the 12-pin signal for indicating STATE1
16	LED1-	The negative terminal of LED1 indicator light is connected to GND

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4. Product Features

4.1 Network parameters

4.1.1 IP address type

The IP address is the identification of the module in the LAN and is unique in the LAN. Therefore, it cannot be duplicated with other devices on the same LAN. There are two ways to obtain the module's IP address: static IP and DHCP.

（1） Static IP: Static IP requires manual setting by the user. During the setting process, pay attention to writing the IP, subnet mask and gateway at the same time. Static IP is suitable for scenarios where IP and device statistics need to be collected and corresponded one-to-one.

Advantages: Access devices that cannot be assigned an IP address can be searched through the whole network segment broadcast mode, which facilitates unified management;

Disadvantages: Different network segments in different LANs result in the inability to carry out normal TCP/UDP communication.

（2） Dynamic DHCP: The main function of DHCP is to dynamically obtain IP address, gateway address, DNS server address and other information from the gateway host, thus eliminating the tedious steps of setting the IP address. It is suitable for scenarios where there are no requirements for IP and there is no one-to-one correspondence between IP and modules.

Advantages: Access routers and other devices with DHCP Server can communicate directly, reducing the trouble of setting IP address gateway and subnet mask.

Disadvantages: When connected to a network without DHCP Server , such as directly connected to a computer, the module will not work properly.

The subnet mask is mainly used to determine the network number and host number of the IP address, indicate the number of subnets, and determine whether the module is in the subnet.

The subnet mask must be set. Our commonly used Class C subnet mask is: 255.255.255.0. The network number is the first 24 digits, the host number is the last 8 digits, the number of subnets is 255, and the module IP is in the 255 range. within, the module IP is considered to be in this subnet.

The gateway refers to the network number of the network where the current IP address of the module is located. If you connect to a device such as a router when connecting to the external

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network, the gateway is the route.

4.1.2 Domain name resolution (DNS)

Domain name resolution converts domain names into network-identifiable IP addresses through a domain name resolution (DNS) server. The domain name resolution (DNS) server address of the serial port server supports user customization. Domain name resolution can be implemented through a custom domain name resolution server when the domain name server is abnormal. The device will report the resolution to the custom domain name resolution (DNS) server during domain name resolution. request, and after the parsing is completed, the device connection parameters (usually IP address) are returned.

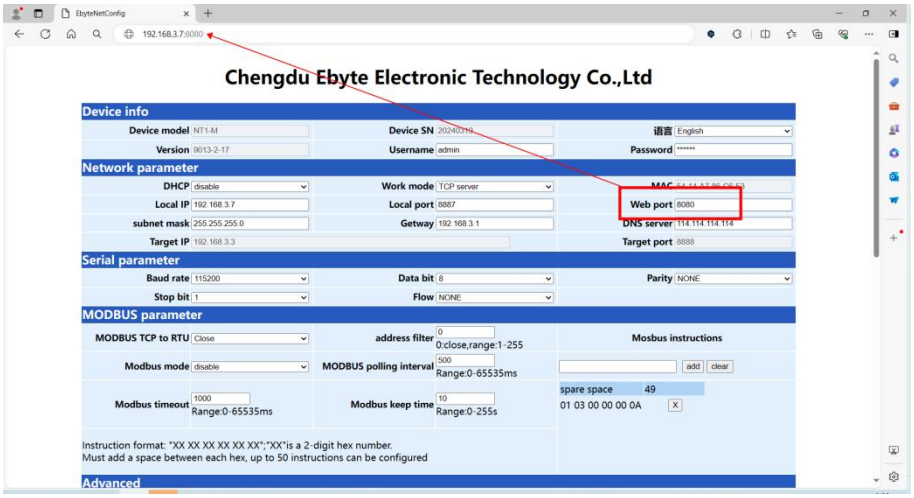
In DHCP mode, the domain name resolution (DNS) server address is automatically obtained (synchronizing the router's domain name resolution address) and cannot be modified.

In static IP mode, the default address of the domain name resolution (DNS) server is: 114.114.114.114.

4.1.3 Web Page Configuration Access

The default web-setting access port is 80.

[Note] If the port number is modified, the port number must be added to the address input field. For example, if you modify the web access port to 8080, you need to enter 192.168.3.7:8080 in the address bar to connect to the web page.



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4.2 Network working mode

4.2.1 TCP server mode

TCP Server is the TCP server. In TCP Server mode, the device listens to the local port, accepts the client's connection request and establishes a connection for data communication. It is usually used for communication with TCP clients within the LAN.

When the Modbus gateway function is turned off, the device will send the data received by the serial port to all client devices that are connected to the device. It supports up to 6 client connections. After the Modbus gateway function is enabled, non-Modbus data will be cleared and not forwarded.

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4.2.2 TCP client mode

TCP Client is the TCP client. When the device is working, it will actively initiate a connection request to the server and establish a connection to realize the interaction between serial port data and server data.

Using the client requires configuring the target IP address/domain name and target port accurately .

4.2.3 UDP server mode

UDP Server means that the device does not verify the data source IP address when communicating using the UDP protocol. After receiving a UDP data packet, it saves the source IP address and source port of the data packet and sets it as the target IP and port, so The data sent by the device only sends data packets to the source IP address and port where the device last received data.

This mode is usually used in scenarios where multiple network devices communicate with the device at a high frequency and the TCP Server cannot meet the conditions.

Using UDP Server requires the remote UDP device to send data first, otherwise the data cannot be sent normally.

[Note] In UDP mode, the data sent by the network to the device should be less than 512Bit per packet, otherwise data loss will occur .

4.2.4 UDP client mode

UDP Client is a connectionless transmission protocol that provides simple and unreliable transaction-oriented information transmission services. There is no connection establishment and disconnection. You only need to configure the destination IP and destination port to send data to the other party. It is usually used in data transmission scenarios where there is no requirement for the packet loss rate, the data packets are small and the sending frequency is fast, and the data needs to be transmitted to the specified IP.

In UDP Client mode, the device will only communicate with the configured (destination IP and destination port) remote UDP device.

In this mode, the target address is set to 255.255.255.255, and the sent data will be broadcast on the entire network segment, but the sending and receiving devices need to ensure that the ports are consistent, and the device can also receive broadcast data .

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4.2.5 HTTP client mode

This mode can realize HTTP packet grouping function and provides two modes: GET and POST. Customers can configure parameters such as URL and Header by themselves, and the device (serial port server) will group and send the package to realize fast communication between the serial port device and the HTTP server. Use In HTTP client mode, it is recommended to use a random port and enable short connections to save HTTP server resources.

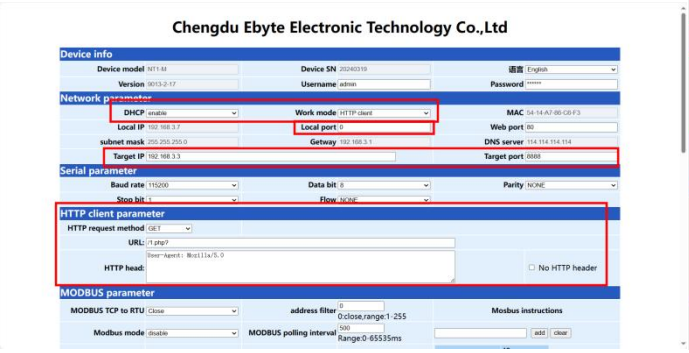
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1. GET

Use the HTTP mode of OneNET multi-protocol access to test the device HTTP-GET request, as shown in the figure below.

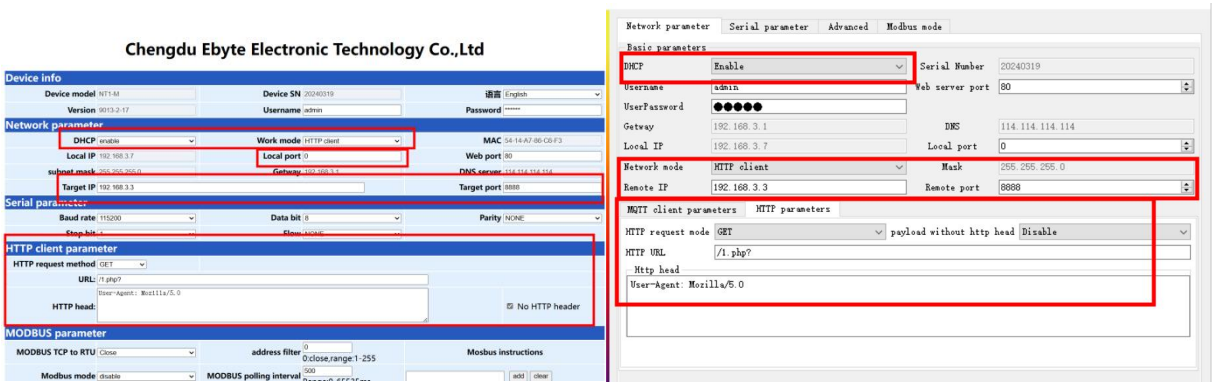
(1) Return data configuration with header:





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(2) Return data configuration without header:



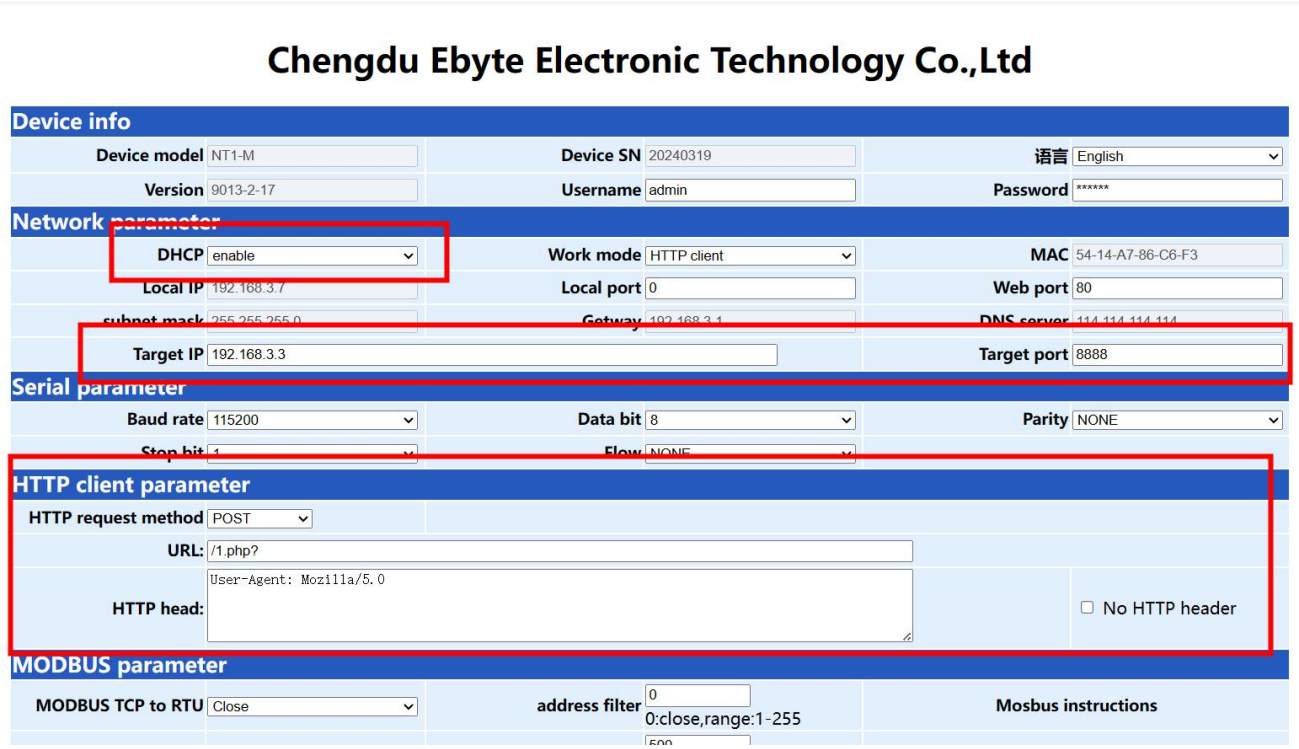
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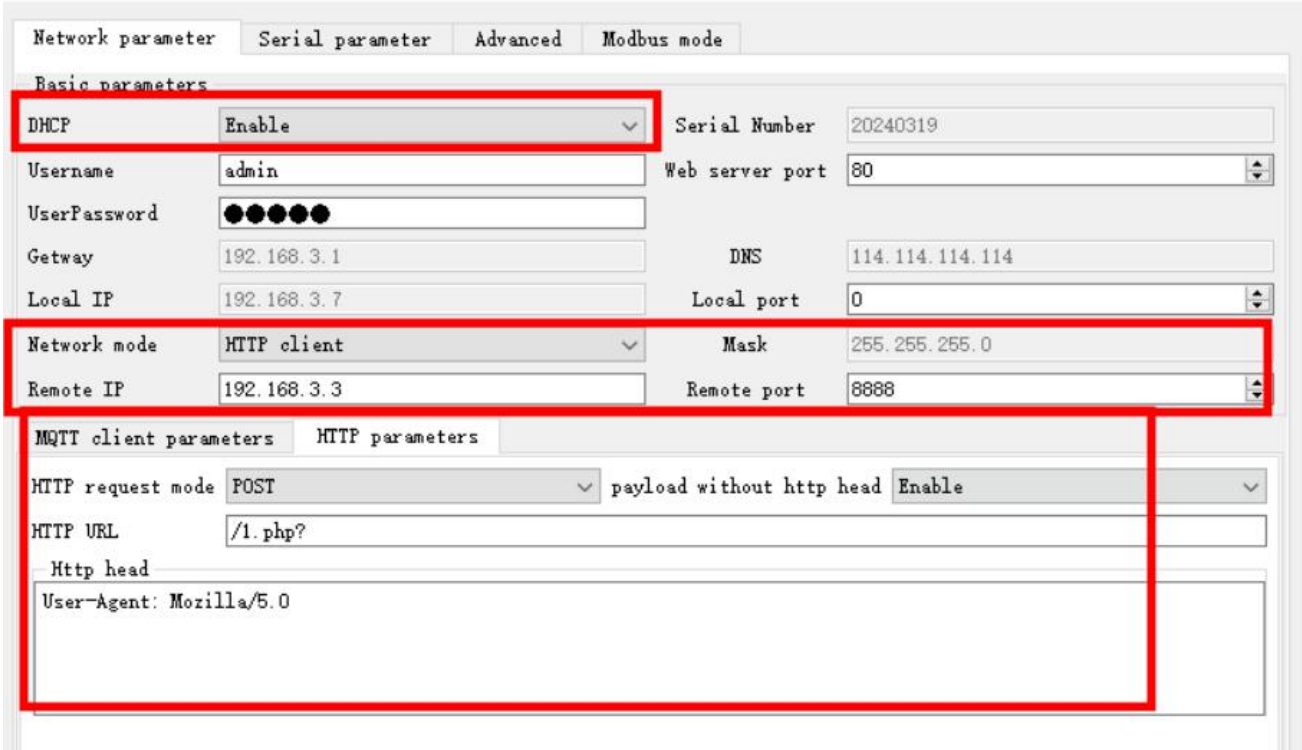
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2. POST

Use the HTTP mode of OneNET multi-protocol access to test the device HTTP-POST request, as shown in the figure below.

(1) Return data configuration with header:

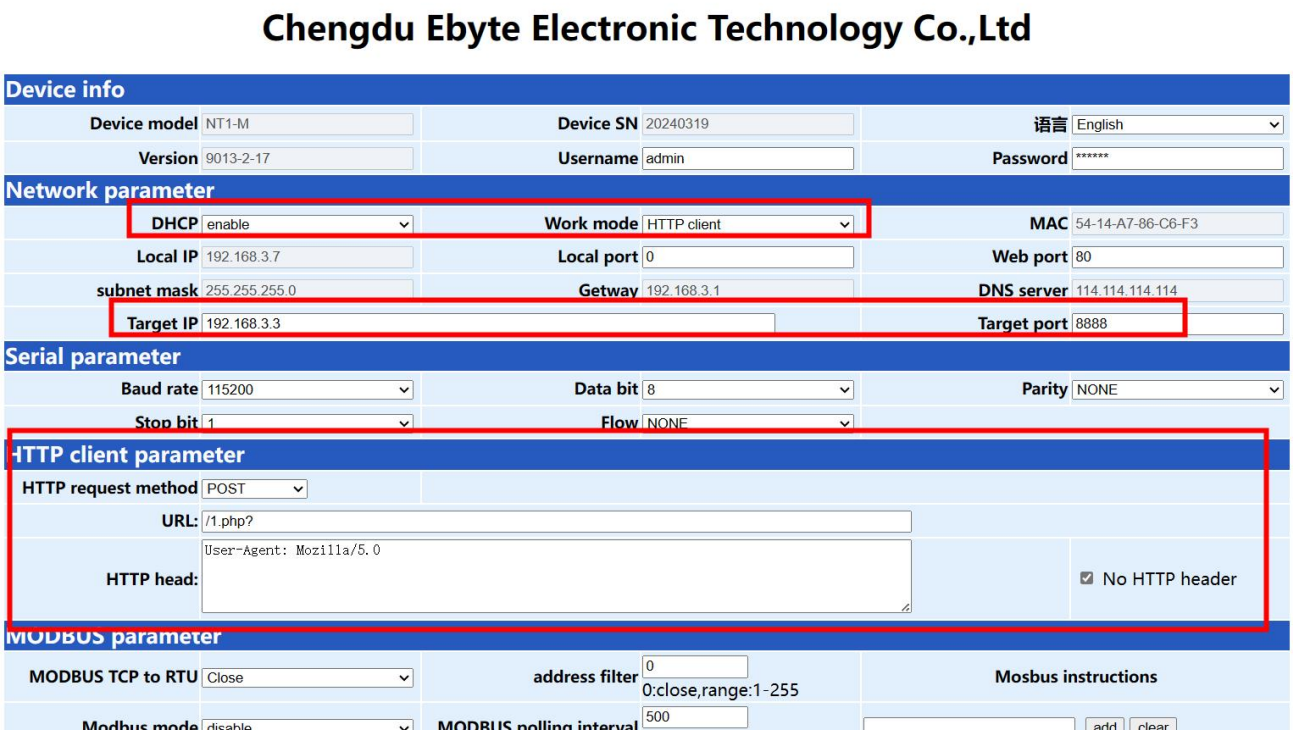


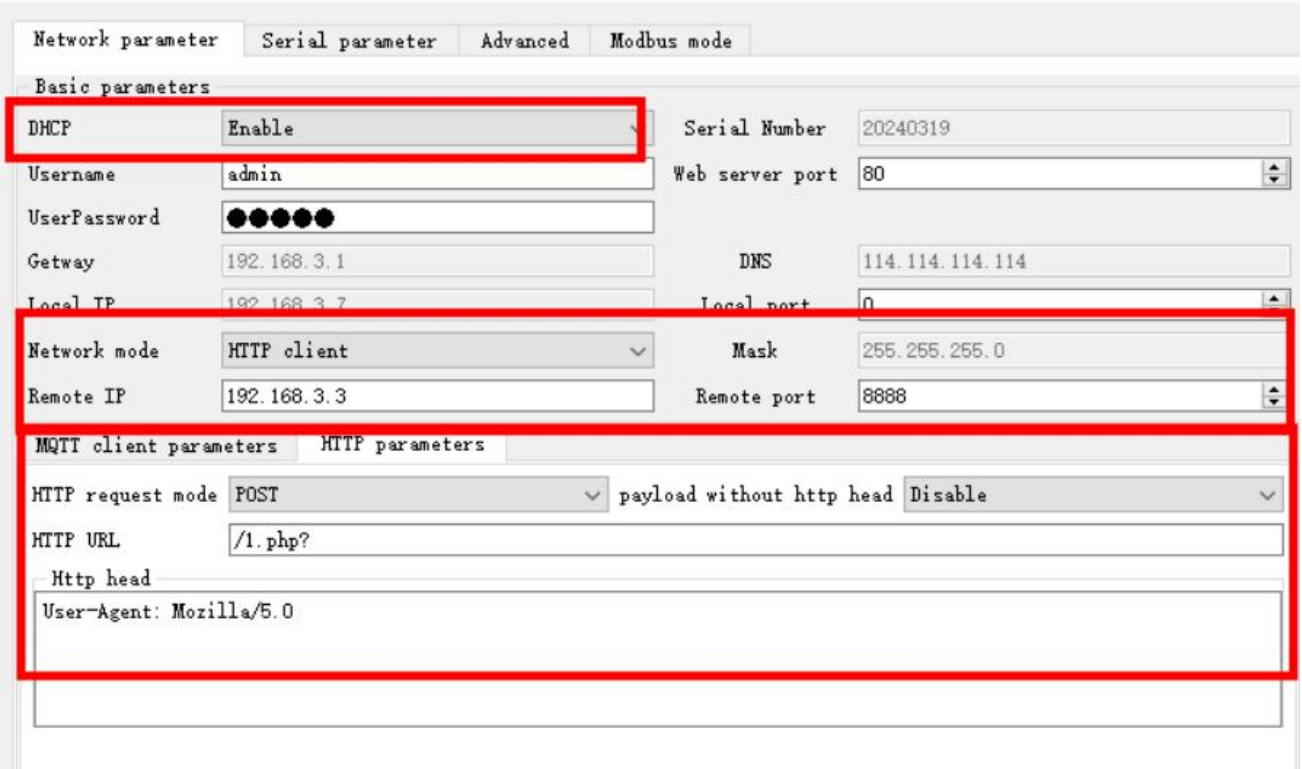


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(2) Return data configuration without header:





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4.2.6 MQTT client mode

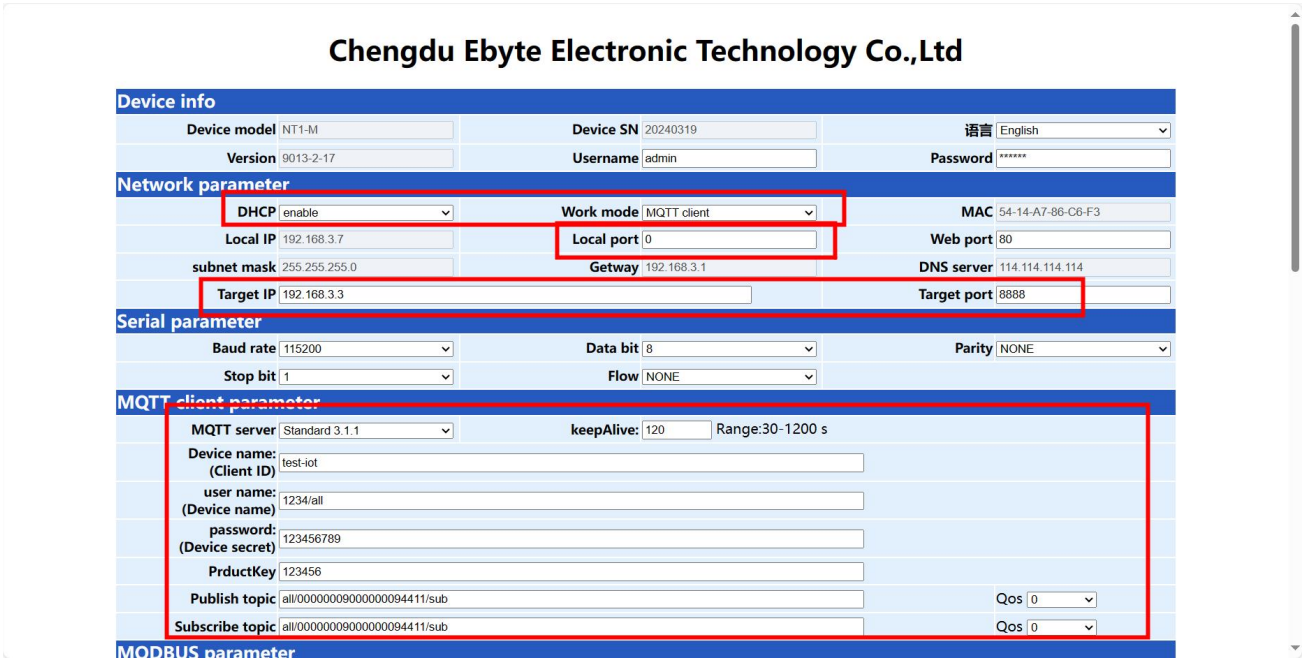
The serial port server supports quick access to standard MQTT3.1 protocol servers (OneNET, Baidu Cloud, Huawei Cloud, user-built and other server types) and Alibaba Cloud servers, supports service quality level configuration (Qos 0, Qos 1), and supports ultra-long text Configuration to facilitate better access to network service operators (server address, three elements, subscription and publishing addresses support configuration of up to 128 characters).

1. Standard MQTT3.1.1

The standard MQTT3.1.1 connection here takes Tencent's standard MQTT3.1.1 server as an example. The "three elements" of the standard description can be obtained from the Tencent server as shown in the figure below:

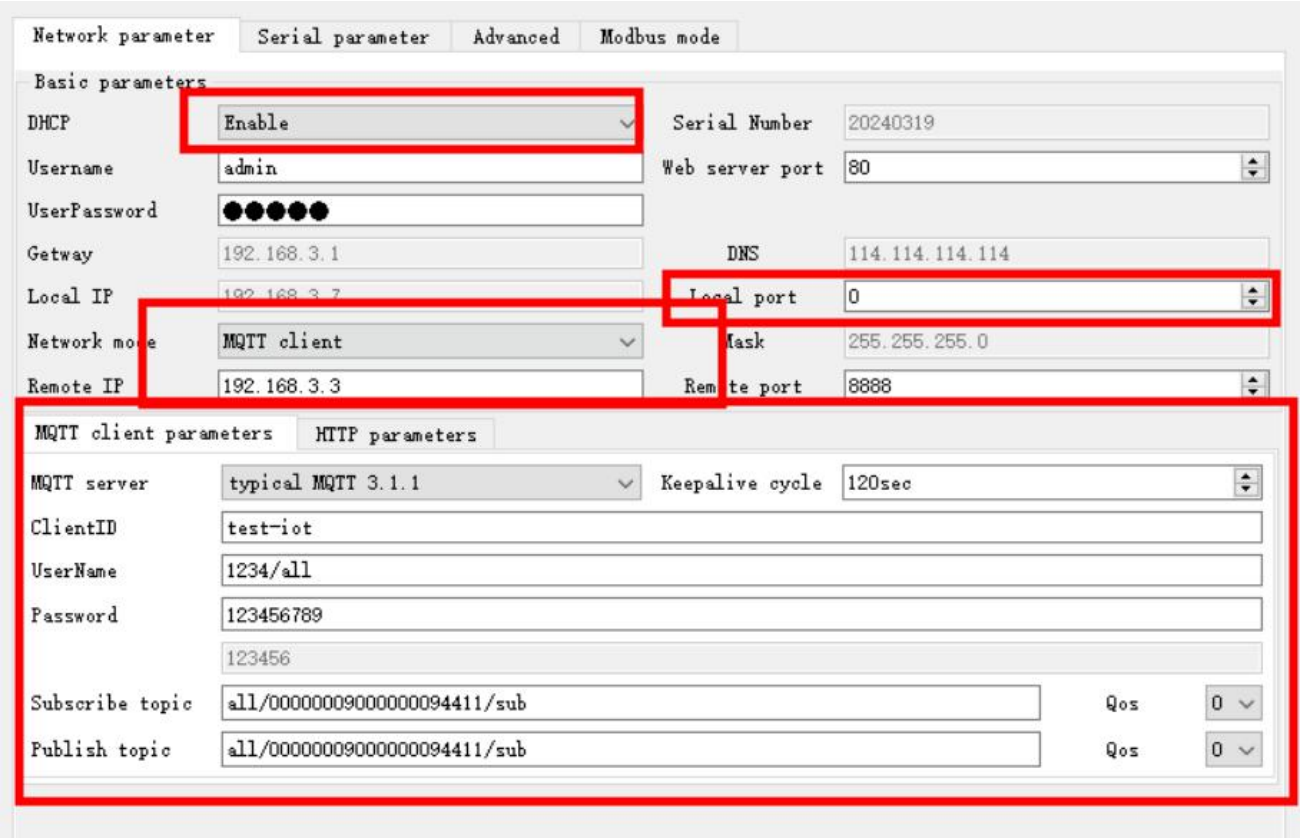


Parameter configuration (configuration software and web page) description is shown in the figure below:



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Configure the corresponding subscription publishing address, and use the platform online debugging to send data for communication testing.

4.3 Serial port parameters

Serial port parameters include: baud rate, data bits, parity bits, and stop bits.

Baud rate: Serial communication rate, configurable 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200, 230400bps.

Data bits: The length of data bits, range 5, 6, 7, 8.

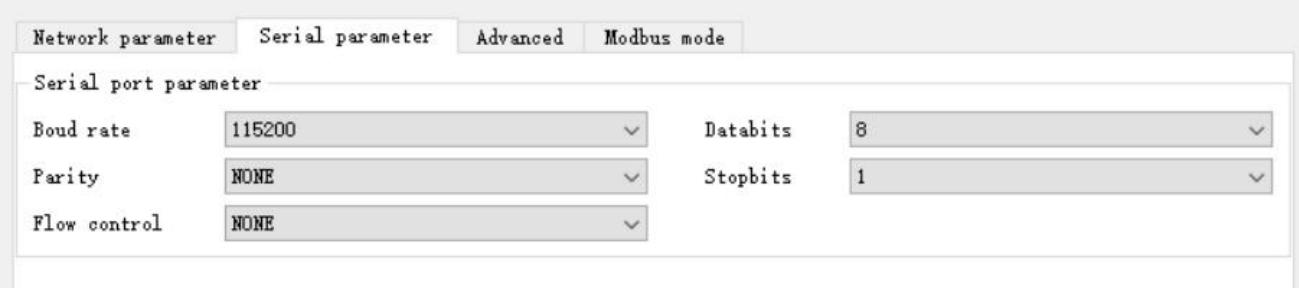
Check digit: Check digit for data communication, supports None, Odd, Even, Mark, and Space. Five check modes are available. By setting the serial port parameters and keeping them consistent with the serial port parameters of the serial port connection device, the normal communication can be ensured.

Stop bit: settable range 1, 2.

Flow control: only NS1 and NT1 can be used.

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4.4 Advanced parameters

4.4.1 Disconnection and reconnection function

In client mode, after the device is disconnected from the network, it attempts to actively connect to the server at the specified time. If the request times out and the set number of reconnections is reached but the reconnection is not successful, the device will perform a restart to prevent the device from being disconnected from the network. Unable to restore connection.

Disconnection and reconnection time: The time interval between each attempt of the device to re-establish the network.

Number of reconnections: The number of times the device attempts to re-establish the network. The cumulative number of requests reaches the preset value. If the connection is not successful, the device will automatically restart.

The actual restart time is the network disconnection and reconnection period multiplied by the number of reconnections. It is recommended to use the factory default parameters without special requirements.

4.4.2 Timeout restart function

Supports timeout restart function (default: 300 seconds). This function is mainly used to ensure long-term stable operation of the device. If no data is sent or received within the set timeout restart time, the device will restart to avoid abnormal situations affecting communication.

When the timeout restart function is turned on, the timeout restart time setting parameter range is (60-65535) seconds.

4.4.3 Short connection function

In client mode, network short connections are supported (this function is turned off by default). TCP short connections are mainly used to save server resource overhead and are generally used in

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multi-point (multi-client) to one-point (server) scenarios.

The TCP short connection function is applied in TCP Client mode. After the short connection function is turned on, it only requests to connect to the server when sending information. After the connection is successful, the serial port does not receive data within the set time or the network port does not send or receive data. The device will automatically disconnect.

When the short connection function is turned on, the short connection time setting parameter range is (2-255) seconds.

4.4.4 Connect to clear cache function

The device is in client mode. When the TCP connection is not established, the data received by the serial port will be placed in the buffer area. The serial port receiving buffer is 1024 bytes. If it is larger than 1024 bytes, the earliest received data will be overwritten. After the network connection is successful, you can Choose to clear the serial port cache or send the cache through the network through configuration.

Enable: The device does not save the data received by the serial port before the connection is established.

Disabled: After the connection is established, the network will receive serial buffered data.

4.4.5 Heartbeat packet function

In client mode, users can choose to send heartbeat packets and customize the heartbeat packet time. The heartbeat packet can choose between network heartbeat packet and serial port heartbeat packet. It supports hexadecimal and ASCII code transmission. This heartbeat packet is not MQTT heartbeat and needs to be turned off in MQTT client mode. MQTT heartbeat only needs to configure the heartbeat in "MQTT mode". It is recommended not to configure the package cycle time to be less than 60s. For example, the Alibaba Cloud manual recommends using 120s.

Heartbeat packet sending mode:

（1） The default is to turn off the heartbeat packet mode.

（2） Serial heartbeat packet->The device sends heartbeat content to the serial port bus according to the set heartbeat time interval.

（3） Network port heartbeat packet->The device sends heartbeat content to the network port bus according to the set heartbeat time interval.

Customize heartbeat packet content (maximum supports 40 bytes (ASCII) data, 20 bytes (HEX) data) .

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Customize the heartbeat packet sending time interval. If the set value is greater than zero, the heartbeat packet function is turned on. When turned on, the range can be set: (1-65536) seconds, and when turned off, it is 0.

4.4.6 Registration package function

In client mode, users can choose to send the registration package, customize the registration package time, and customize the registration package content (maximum support is 40 bytes (ASCII) data, 20 bytes (HEX) data).

The registration package supports the following modes:

（1） The network sends the MAC address when establishing a connection with the device

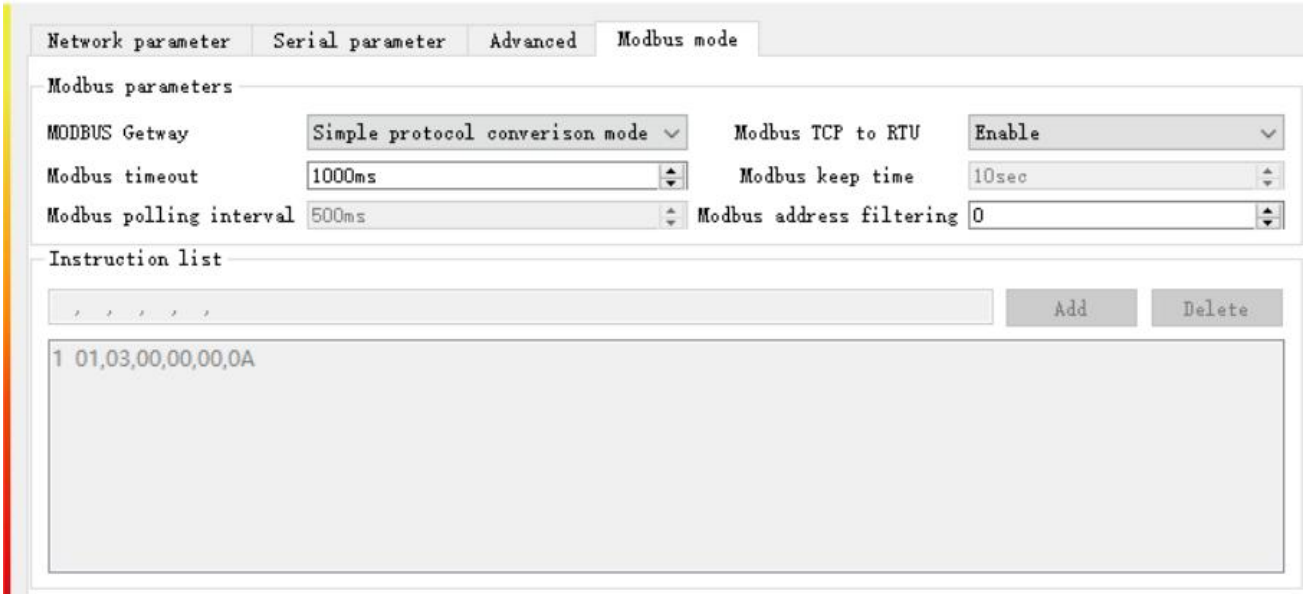
（2） The data of the custom registration package is sent when the network establishes a connection with the device.

（3） After the network establishes a connection with the device, each packet of data sent by the device to the network is preceded by a MAC address.

After the network establishes a connection with the device, each packet of data sent by the device to the network is preceded by custom registration packet data.

4.5 Modbus gateway

4.5.1 Simple protocol conversion mode



Enable: Convert Modbus RTU protocol and Modbus TCP protocol to each other, and discard

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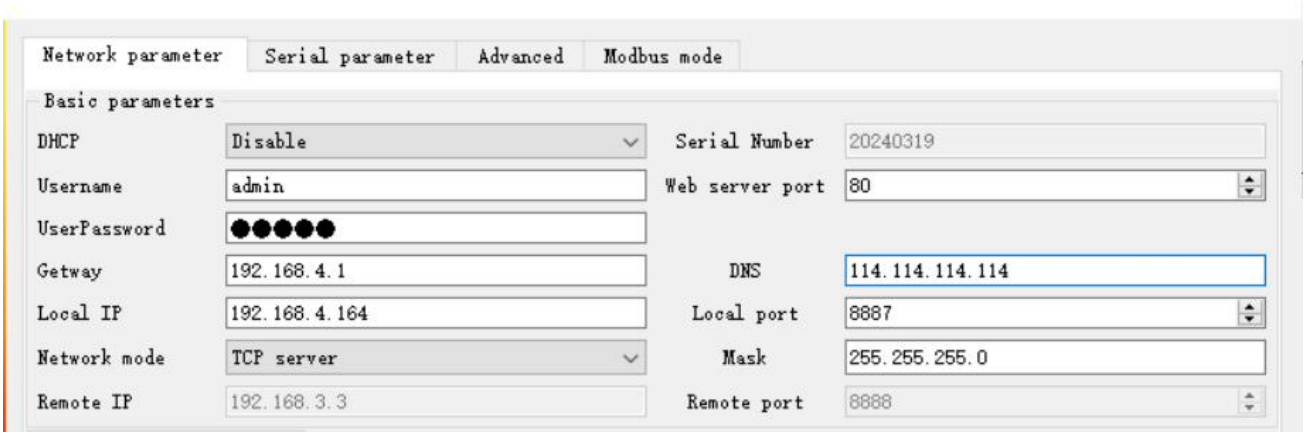
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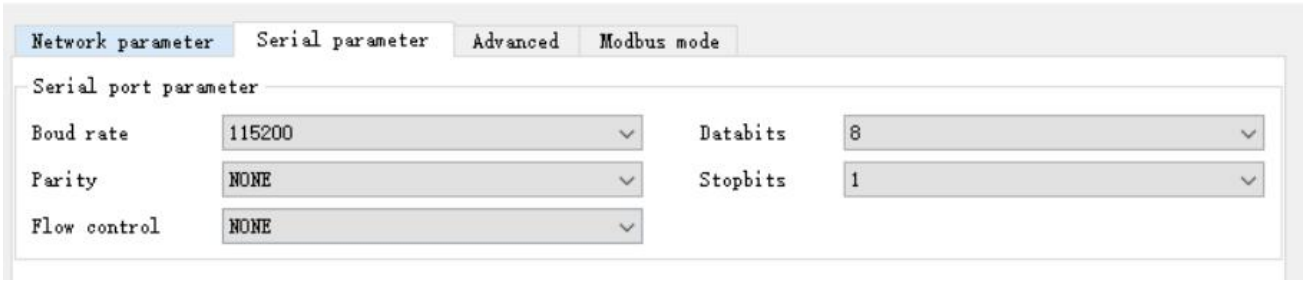
non-Modbus data (RTU/TCP) without conversion.

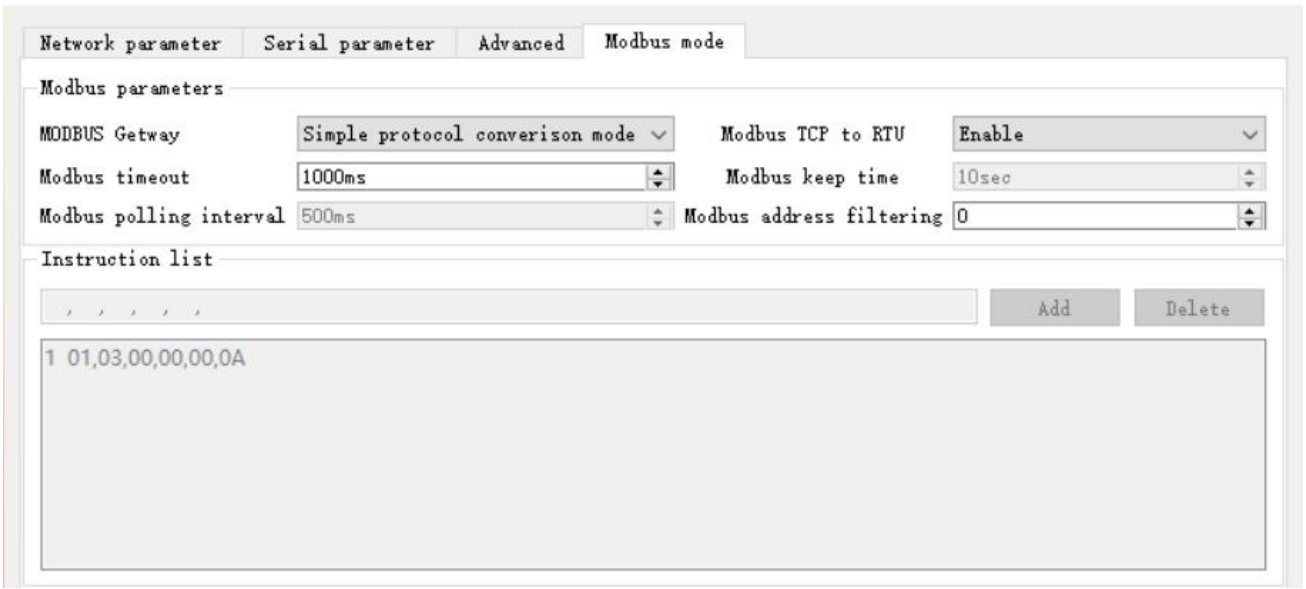
Close: No protocol conversion is performed but Modbus data is verified, and non-Modbus data (RTU/TCP) is discarded.

Simple protocol conversion can work in any mode (TCP client, TCP server, UDP client, UDP server, MQTT client, HTTP client). No matter what mode it works in, there can only be one Modbus master station.

Software/Web page configuration:

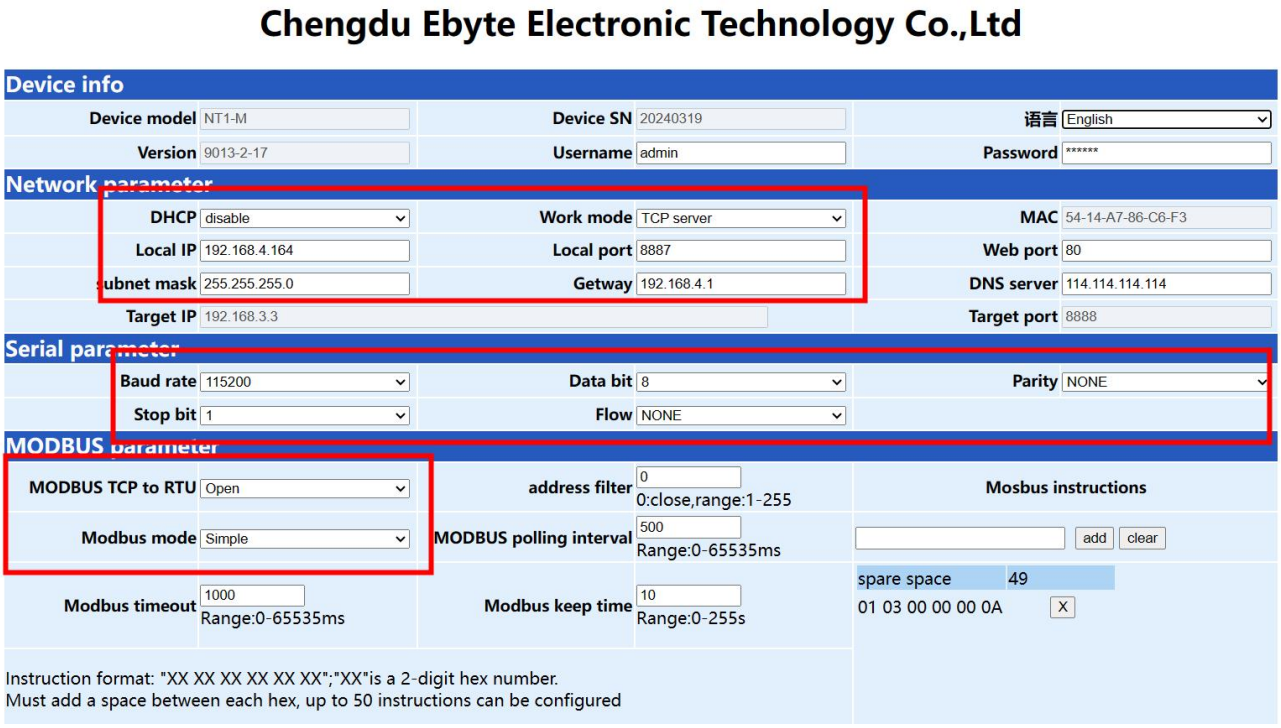






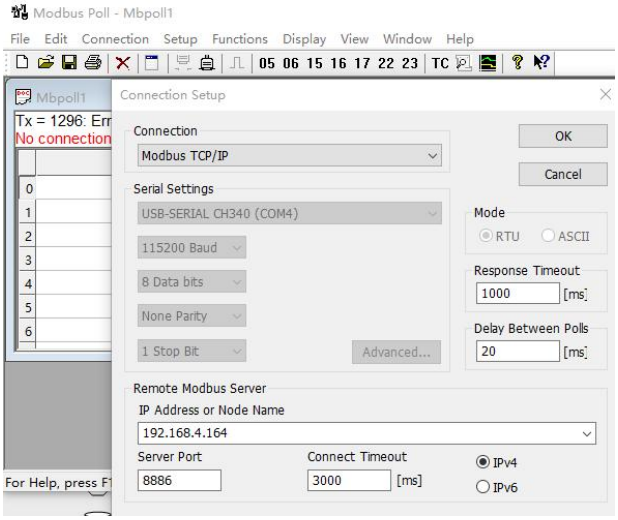
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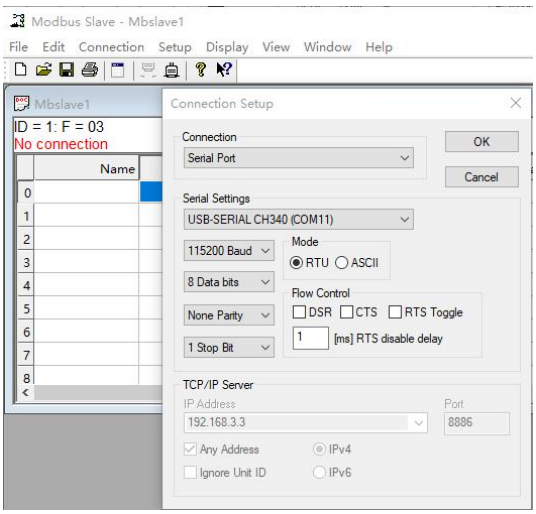
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Modbus Poll and Modbus Slave software debugging:

Software connection settings:



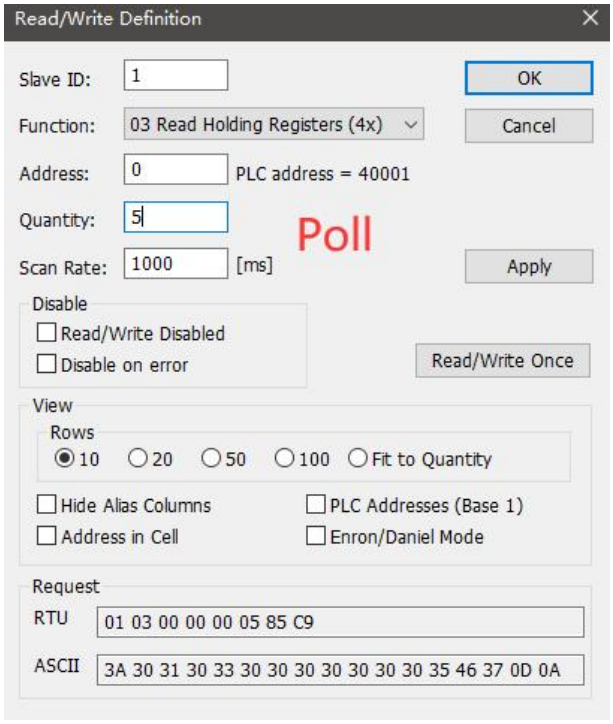


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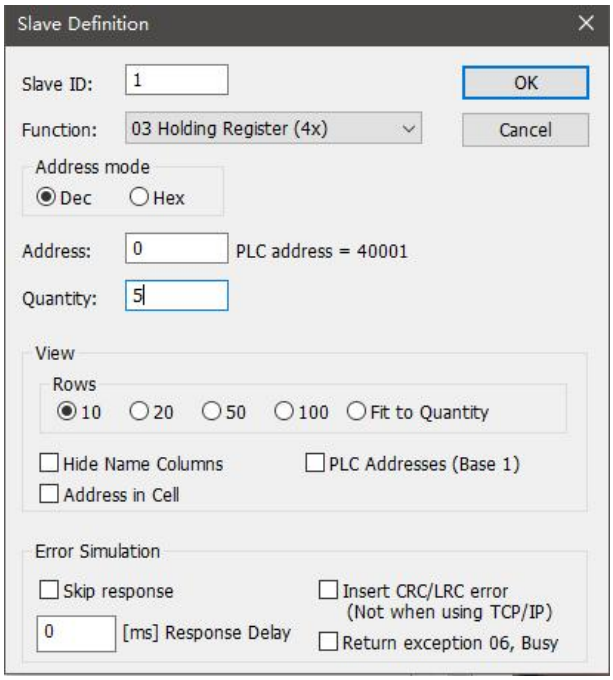
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Software register reading and simulation configuration:

Poll menu select Setup →Read/Write Definition



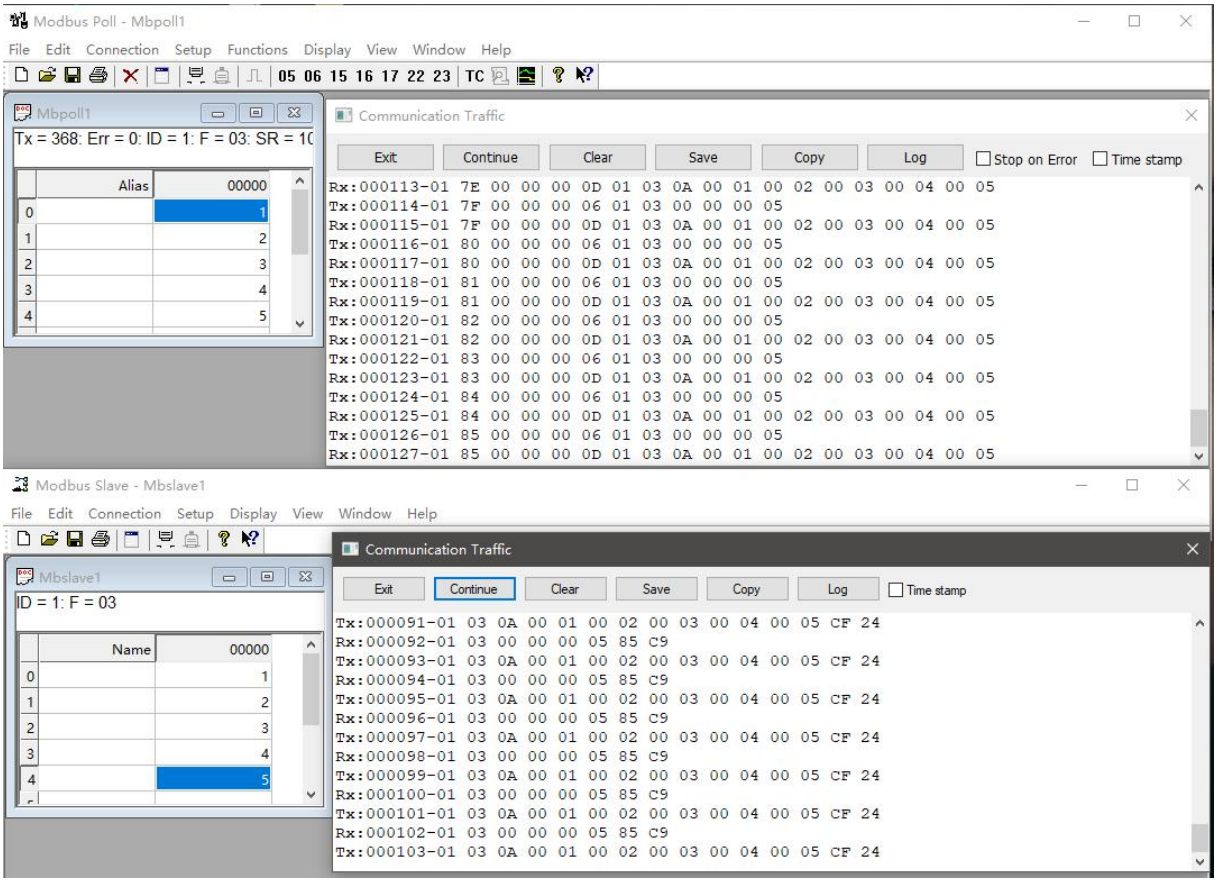
Slave menu select Setup →Slave Definition



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Communication demo:



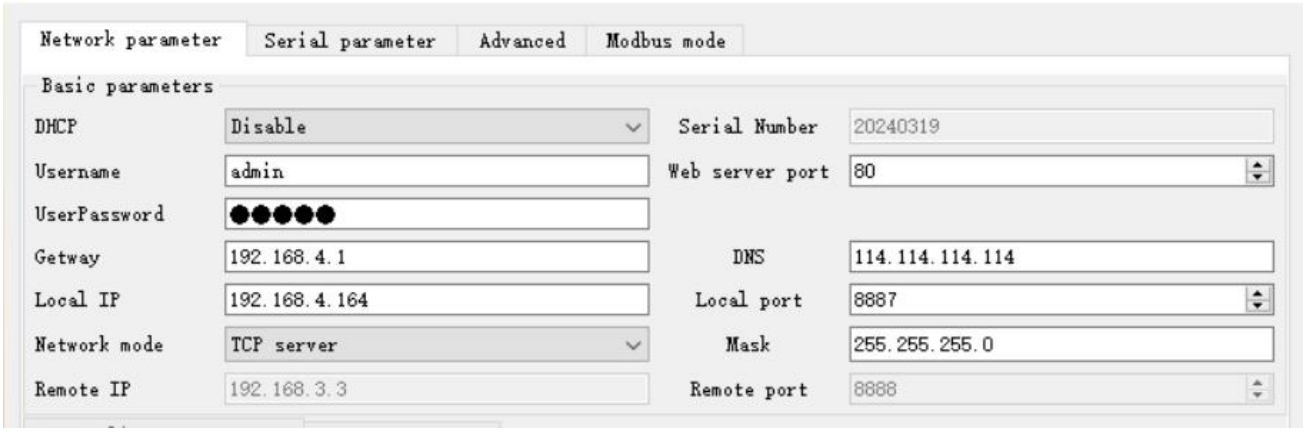
4.5.2 Multi-host mode

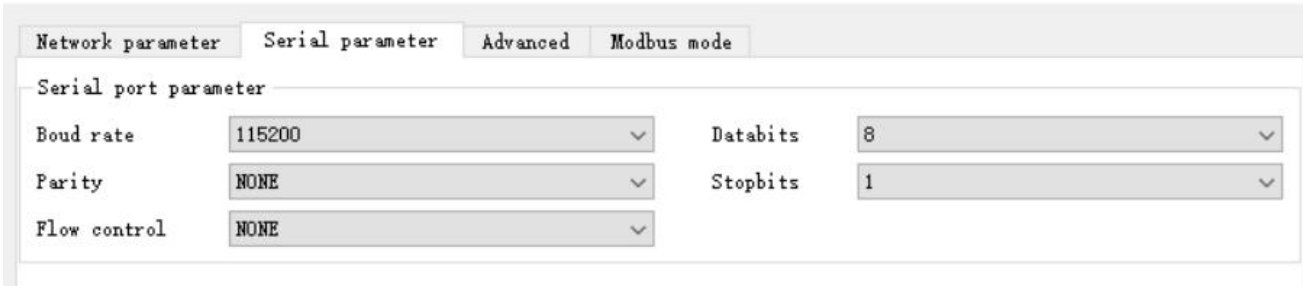
The multi-host mode can handle up to 6 Modbus TCP hosts. When multiple Modbus hosts access at the same time, the Modbus gateway will schedule the bus occupancy (TTL can only process one request at a time, while the multi-host mode will proceed sequentially according to TCP requests. Sorting processing, other links wait), thereby solving the bus conflict problem (currently only supports 6 host connections), only supports working in TCP server mode, and the slave can only be in the serial port, otherwise it will not work properly.

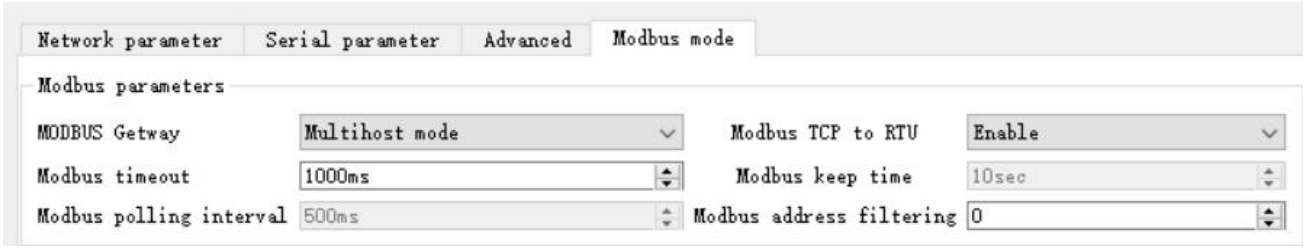
It is recommended to configure "simple protocol conversion" when there are no multiple hosts. configuration software/web page configuration:

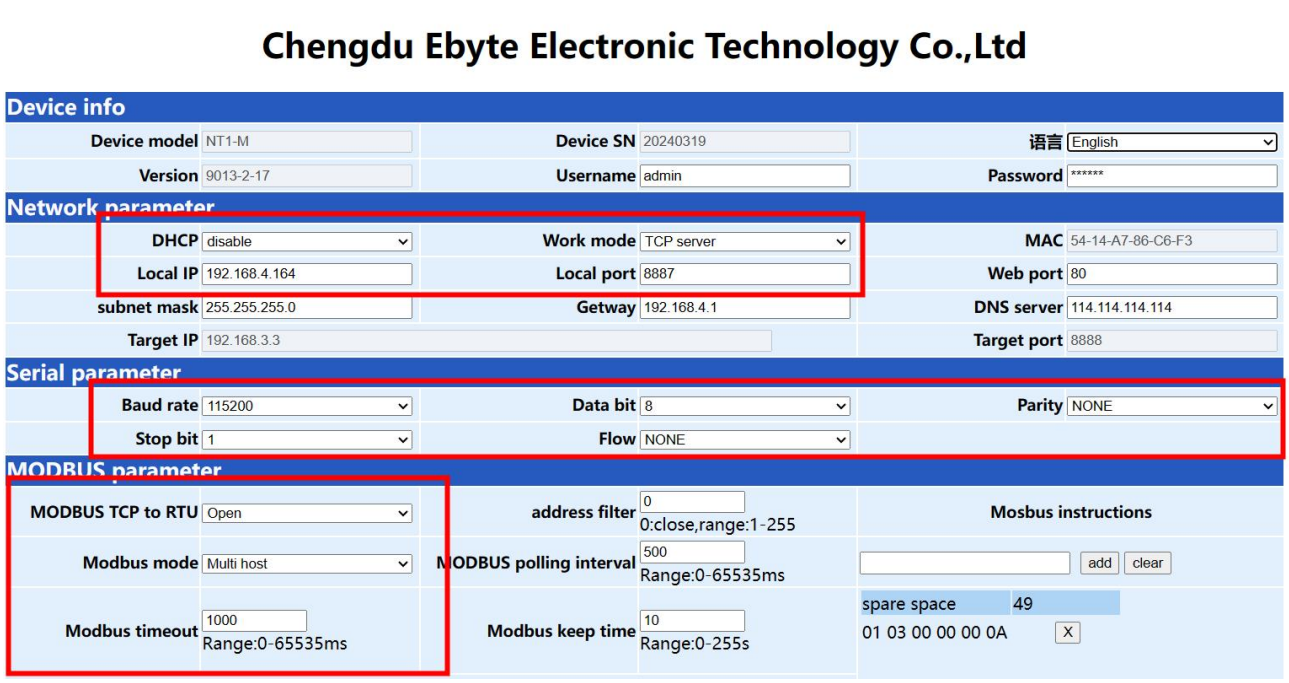
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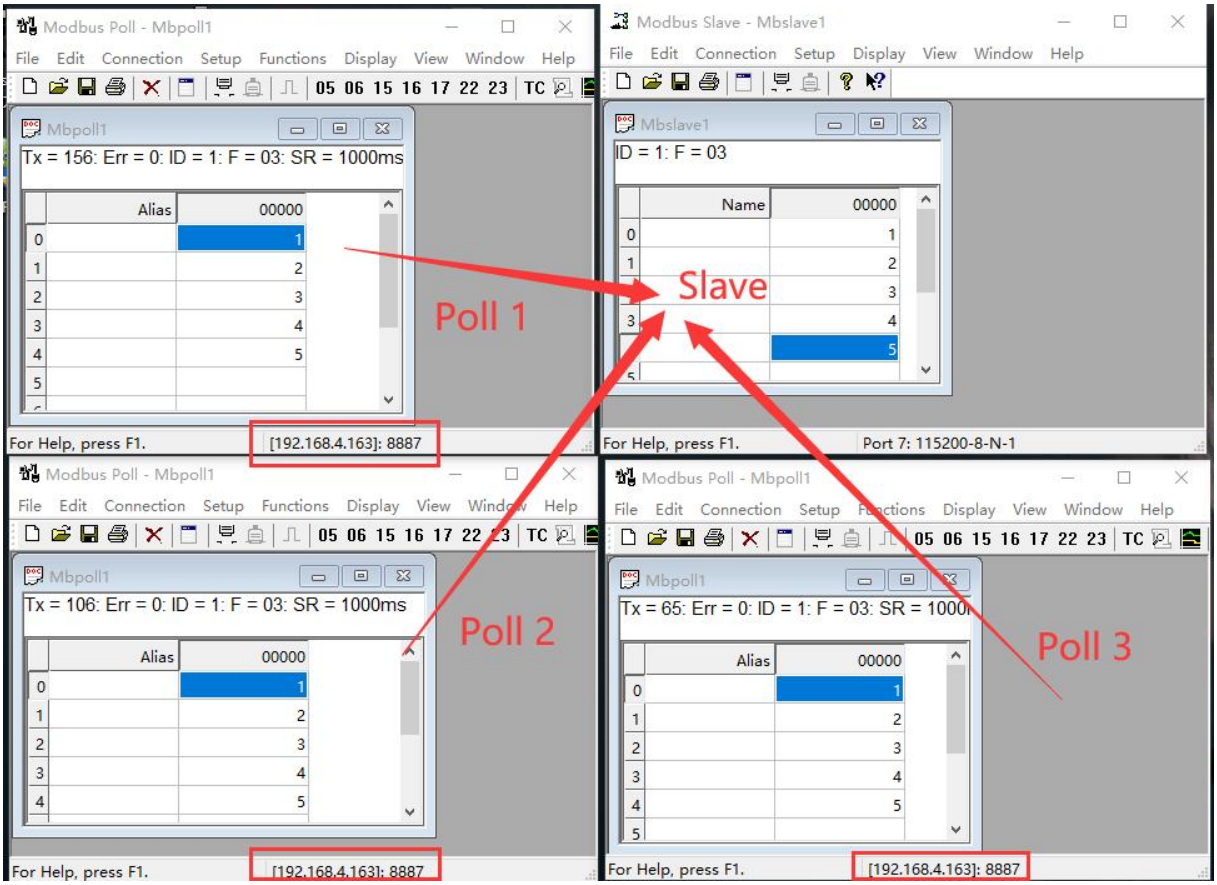


Modbus Poll and Modbus Slave software debugging:

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For software configuration and register configuration, refer to "Simple Protocol Conversion", and open multiple Modbus Poll software at the same time (3 channels are taken as an example, and up to 6 channels can be supported).



4.5.3 Storage gateway

The storage gateway not only arbitrates bus data but also stores repeated read instructions. When different hosts request the same data, the gateway does not need to query the RTU device register status multiple times, but directly returns the data cached in the storage area, which is greatly This greatly improves the gateway's multi-host request processing capabilities and also shortens the time consumed by the entire request process. Users can customize the storage area instruction polling interval and instruction storage time according to their needs.

As an optimization of multi-host request performance, the storage gateway can only work in TCP server mode, which improves the response speed on the network side.

Features:

（1） The gateway has a 5K cache for storing instructions and returned results (for example, reading 10 holding registers can store 189 instructions and returned results);

（2） The RTU response timeout automatically clears the cache to ensure the real-time and

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authenticity of the data;

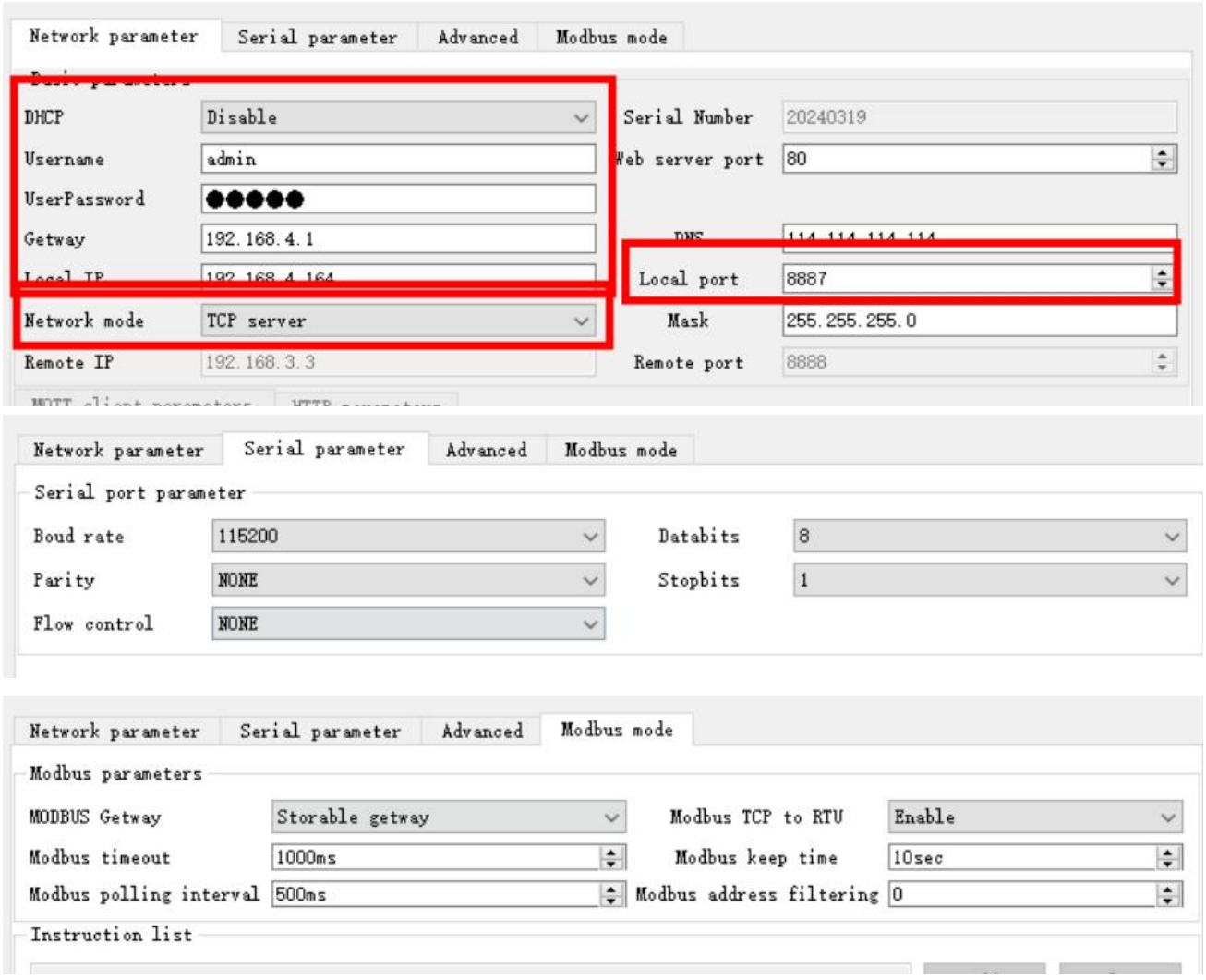
（3） The polling interval can be customized, 0-65535ms;

（4） The gateway will poll the RTU device according to the instruction storage time used for configuration. If the MODBUS host does not query the instruction again during the storage time, the gateway automatically deletes the storage instruction to release the cache;

（5） The first command and control command (05, 06, 0F, 10 function codes) will directly access the RTU device;

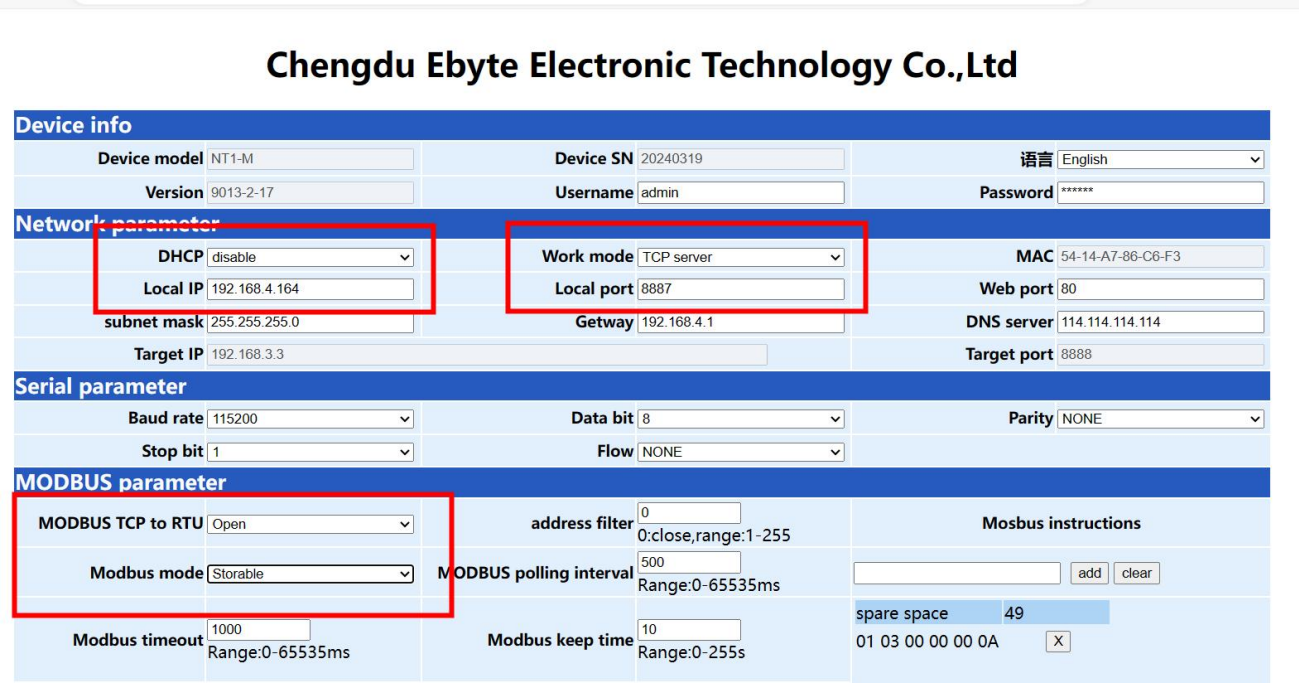
（6） Only supports 01, 02, 03, 04 Modbus function code query result storage;

Storage gateway configuration software and web page configuration:



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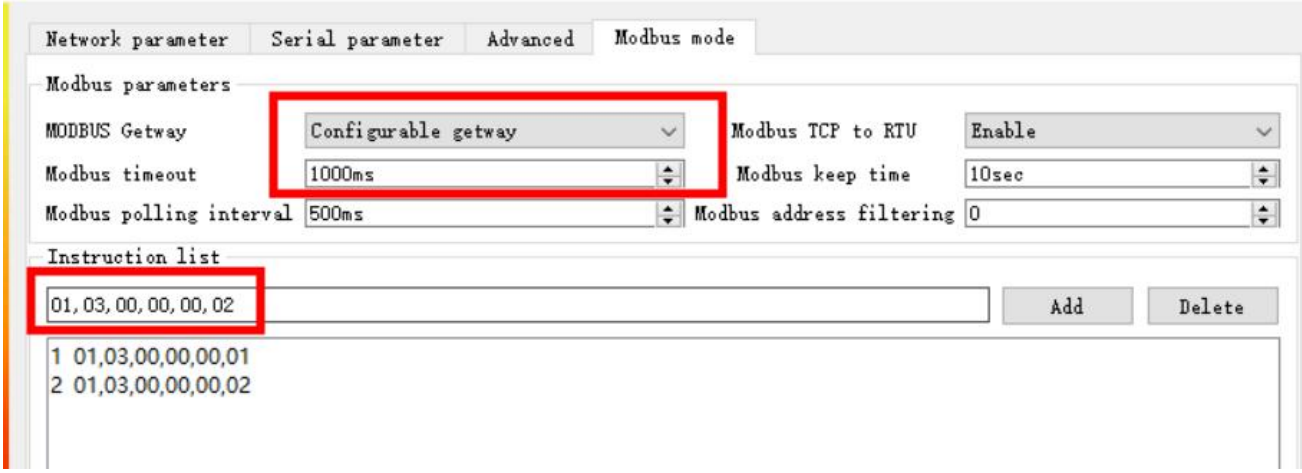
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4.5.4 Configurable gateway

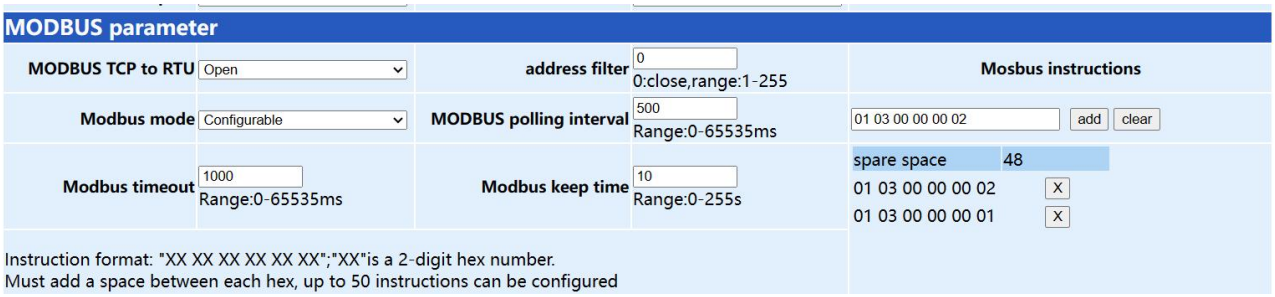
The gateway automatically polls the RTU device register according to the preconfigured MODBUS command (only supports the configuration of the MODBUS read command). Non-storage table commands will directly operate the RTU device. Frequently read instructions can be stored in the gateway in advance, which can shorten the response time (query configured instructions). Due to the above characteristics, the serial port side of the configurable gateway can only be connected to Modbus slave stations.

Save Modbus command(added, instruction error and format error cannot be added):

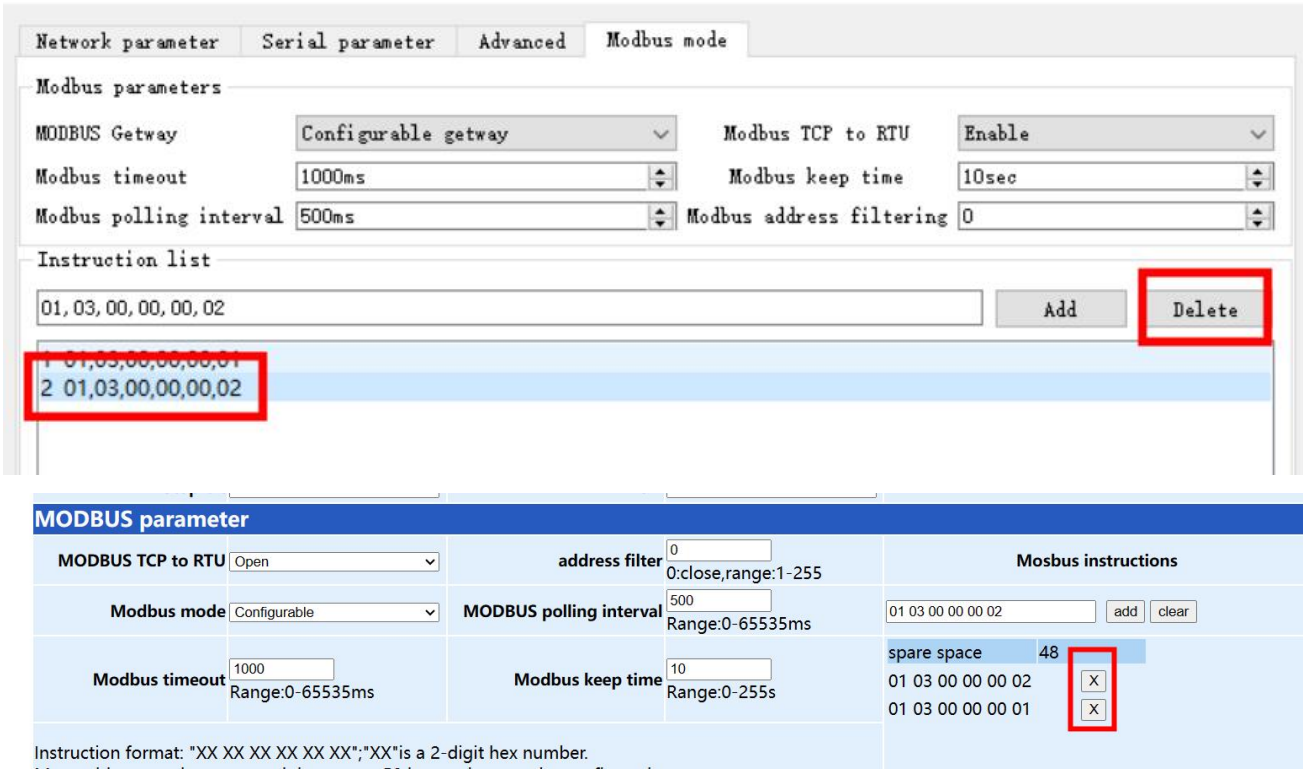


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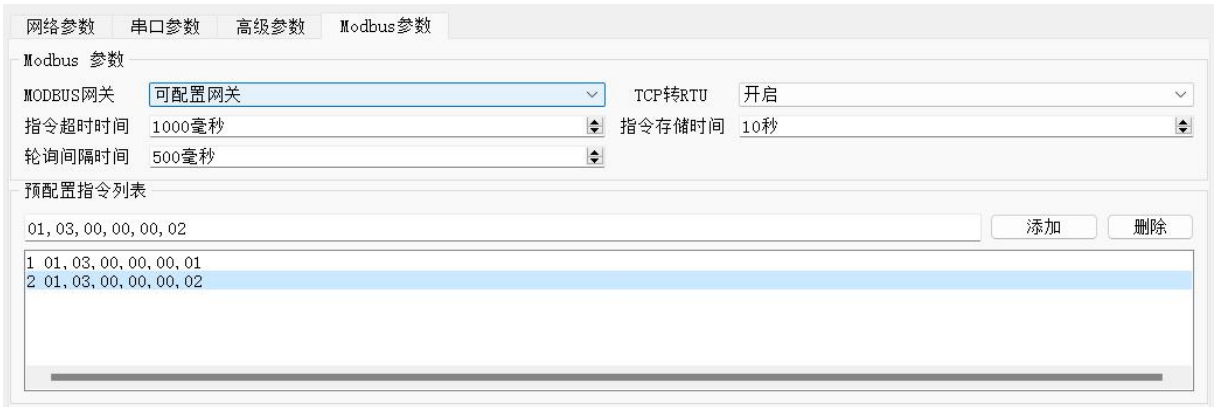
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Delete Modbus Command:

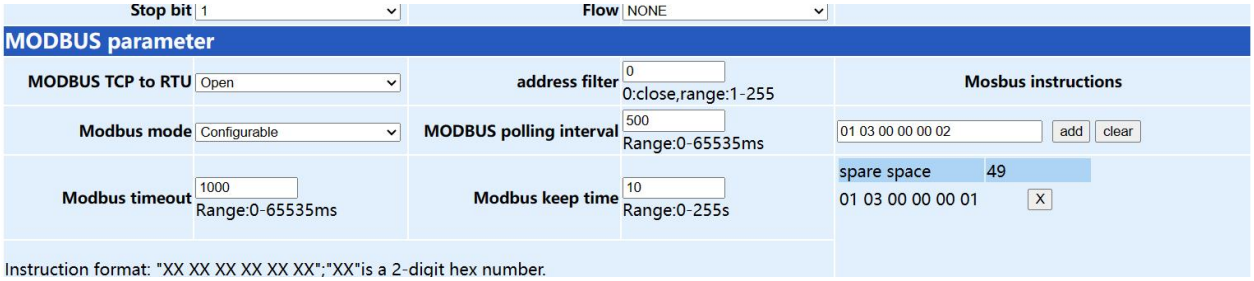


configuration software/web page configuration:



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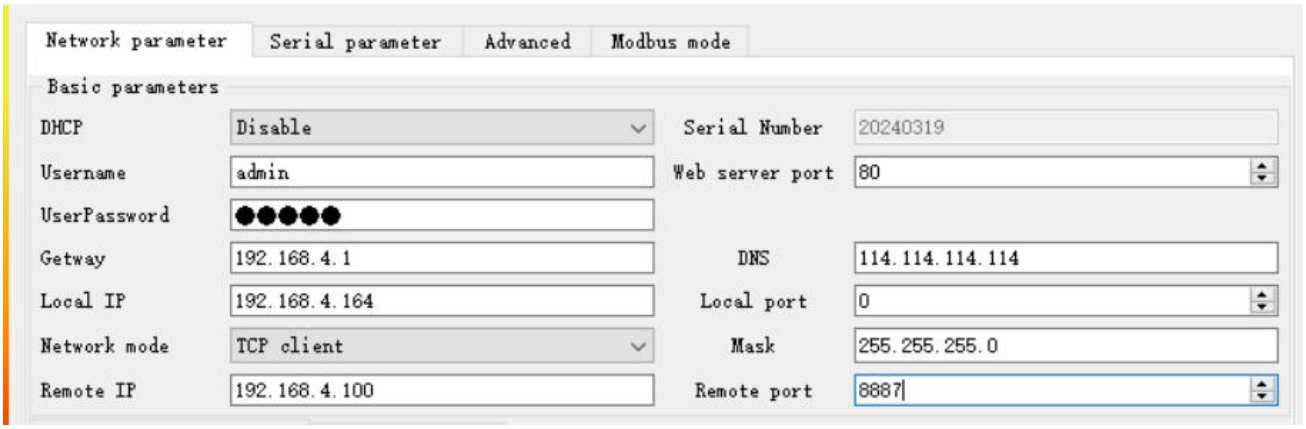
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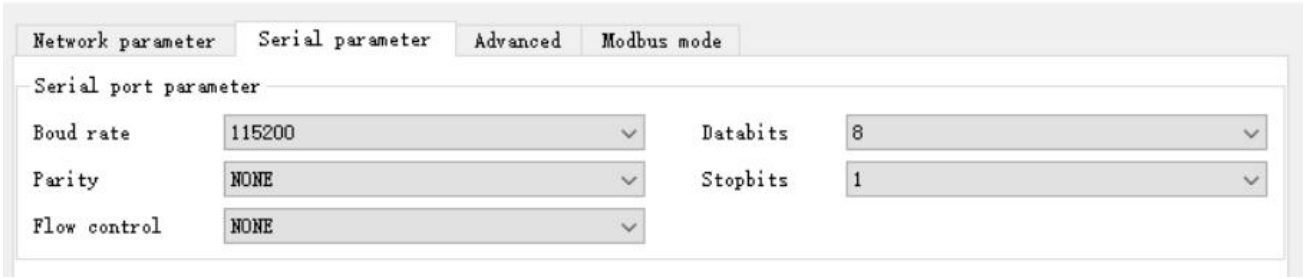


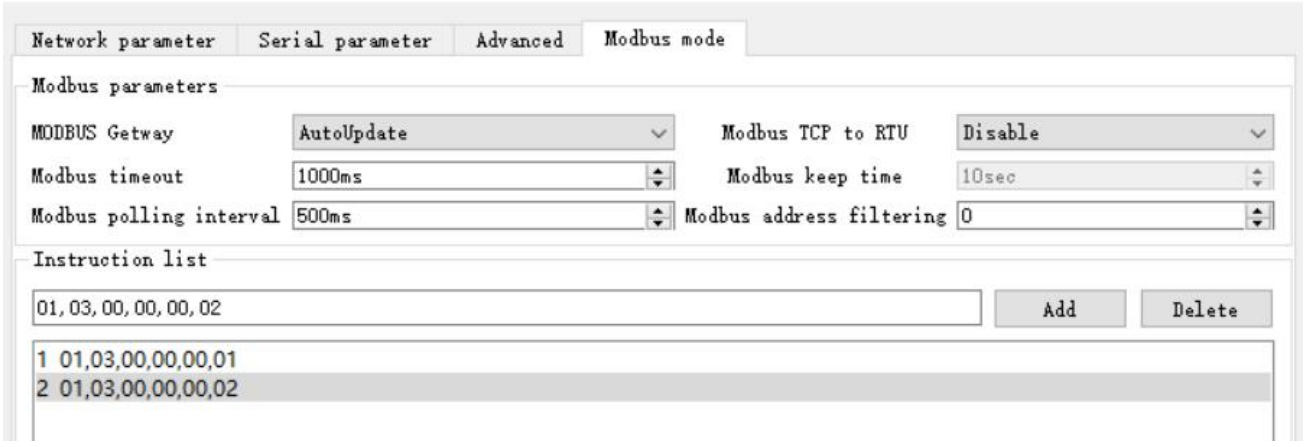
Automatic upload

In client mode (TCP client, UDP client, MQTT client, HTTP client) the gateway will automatically poll the instructions in the stored instruction table and upload them to the server. You can choose the feedback format (Modbus RTU format or Modbus TCP format) according to your needs.) and the command polling interval (0-65535ms).

For command pre-storage, refer to "Configurable Gateway-Command Storage Instructions" and automatically upload the configuration software/webpage configuration:

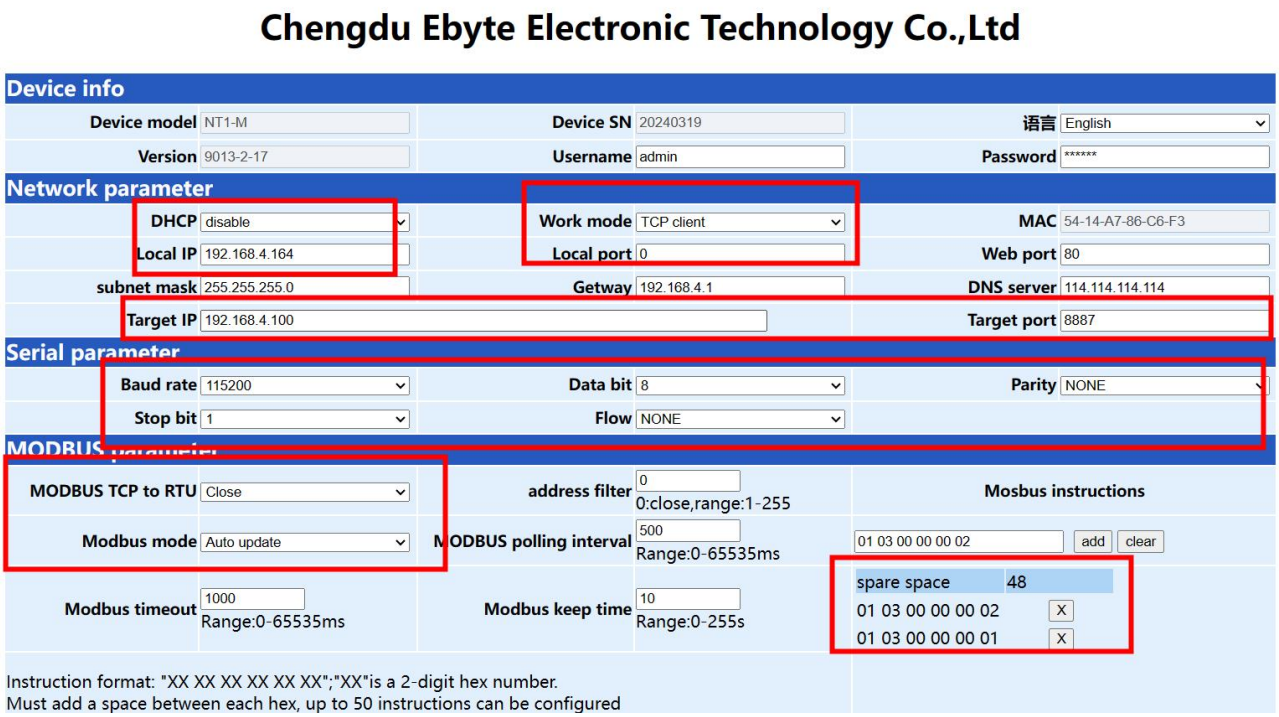




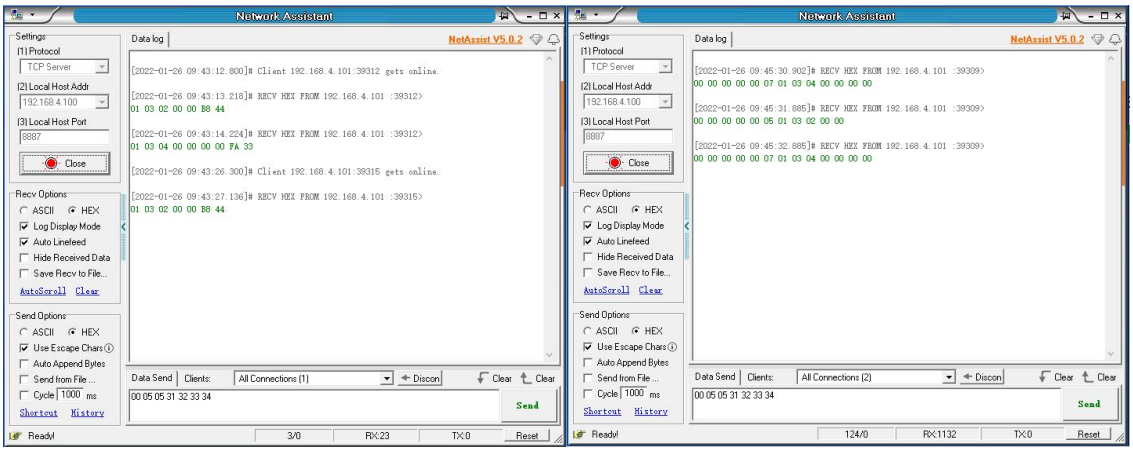


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TCP client demo (Modbus RTU format on the left and Modbus TCP format on the right):



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4.6 Introduction to basic functions

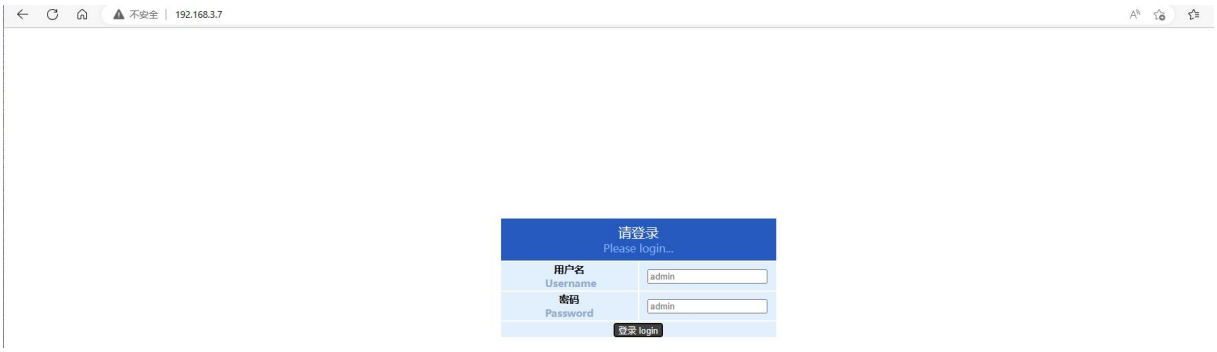
4.6.1 Web page configuration

The device has a built-in web server, which facilitates users to set and query parameters through the web page.

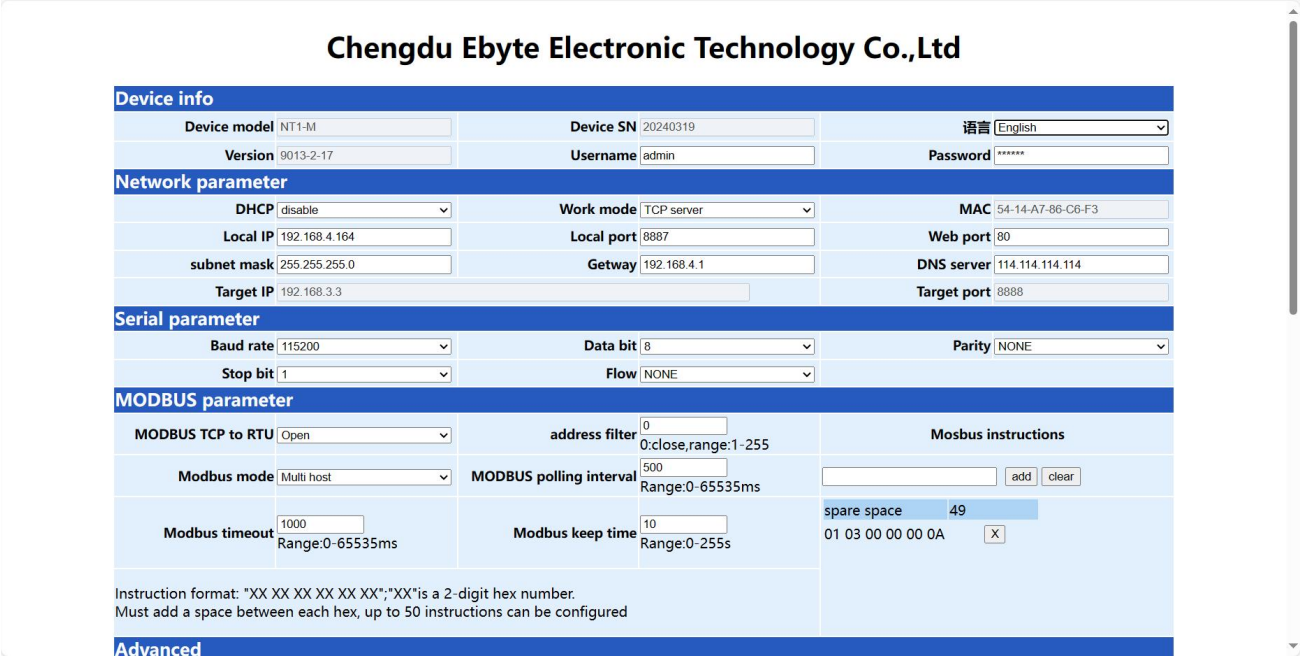
The port of the web server is customizable (2-65535), default: 80 .

Operation method (Microsoft Edge version 94.0.992.50 is taken as an example. It is recommended to use the Google core browser, and the IE core browser is not supported):

- Open the browser and enter the IP address of the device in the address bar. The default is 192.168.3.7 (the IP address and the computer must be in the same network segment). If you forget the local IP, you can query it through AT commands and configuration software;



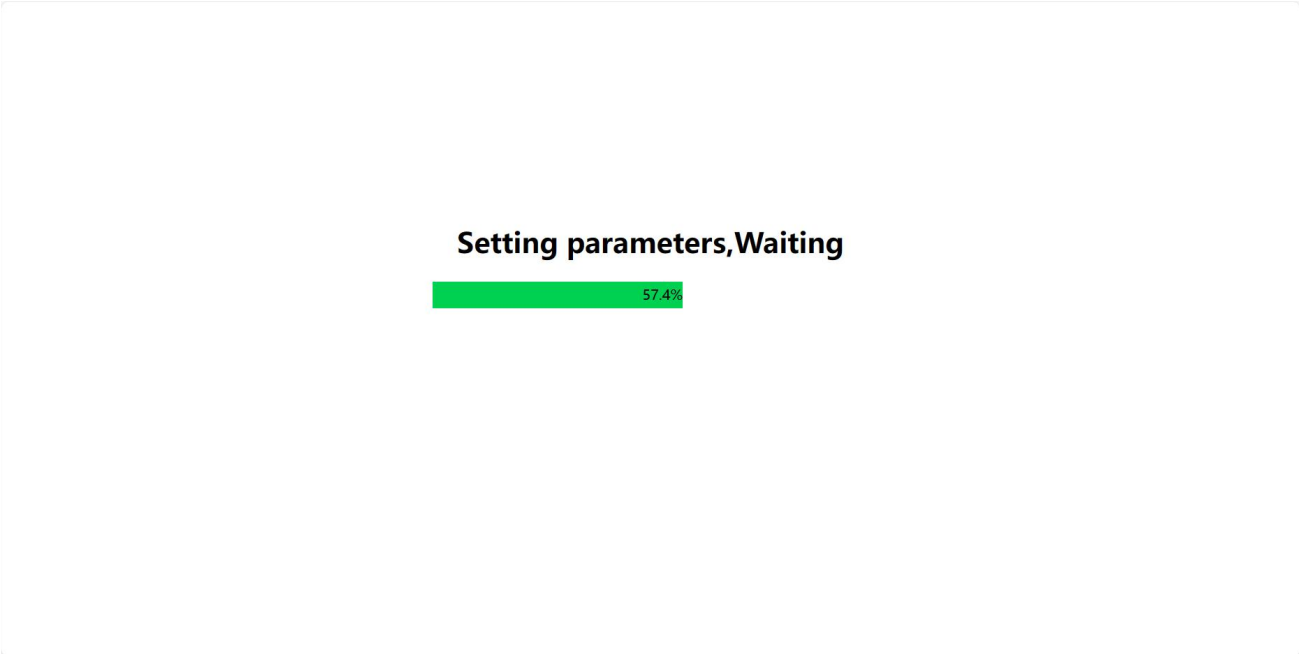
- Click to log in, the default account is admin, the default password is admin (already entered, you can click to log in directly) ;



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- The main interface pops up on the web page, and you can query and set relevant parameters;
- Click Submit to save the configuration parameters;
- The progress bar prompts the configuration progress. Do not refresh the web page again after the configuration is completed (refresh the web page to enter the configuration mode again, and you can enter the communication mode by restarting the device or submitting again) .



4.6.2 reset

The IO_RST pin of the device can be restored to the factory configuration by continuously pulling it low for 5 seconds and then releasing it.

4.6.3 AT command configuration

Read and modify the relevant parameters of the device can be completed through AT command configuration. For specific AT commands, please refer to "NA11x&NB114&NS1&NT1-AT command set".

4.6.4 Configuration tool software settings

Open the configuration tool software, search for the device, double-click the recognized device, and the parameter query configuration interface will pop up. You can customize relevant parameters

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according to your needs, then save the configuration, restart the device, and complete the parameter modification.

【Note】:

Do not use multiple configuration softwares in the same LAN environment. Industrial computers with multiple network cards need to be temporarily disabled and do not use network cards, otherwise the configuration software will experience abnormalities (the same device is displayed multiple times, the device cannot be found, etc.)

The configuration software blocks the wireless network card, so the network cable must be connected to use the configuration software. The wireless network card can be configured through the web page.

4.6.5 Random local port

TCP clients, UDP clients, HTTP clients, and MQTT clients can configure the local port to 0 (use a random local port). Random ports cannot be used in server mode, otherwise the client will not be able to establish a connection correctly.

Using a random port connection can quickly re-establish the connection when the device accidentally disconnects from the server, preventing the server from rejecting the connection due to four incomplete waves. It is recommended to use a random port in client mode.

The device will automatically enable random ports when configuring TCP client, HTTP client, and MQTT client modes.

4.6.6 Remote upgrade

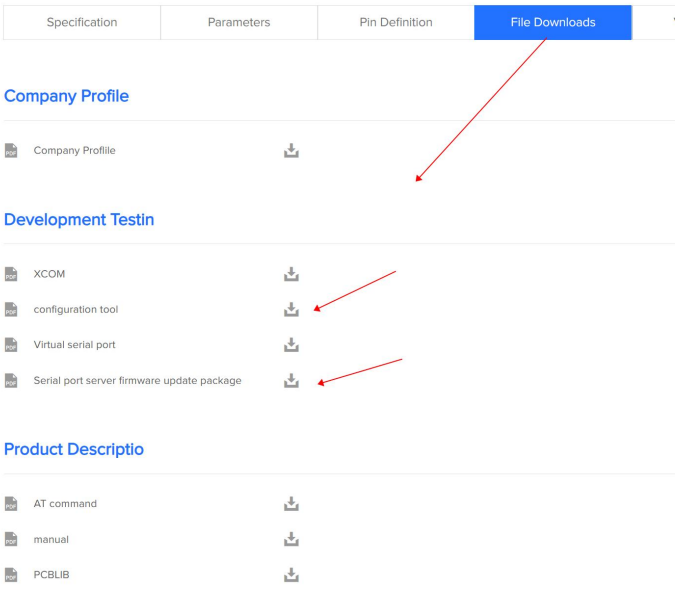
In order to facilitate later maintenance and upgrade functions and replace different firmware, the serial port server (NA11x series, NB114, NS1, NT1, etc.) supports online upgrade. Through the upgraded firmware provided by our company, users can upgrade or replace the current firmware through the configuration software.

Steps to upgrade firmware over the network:

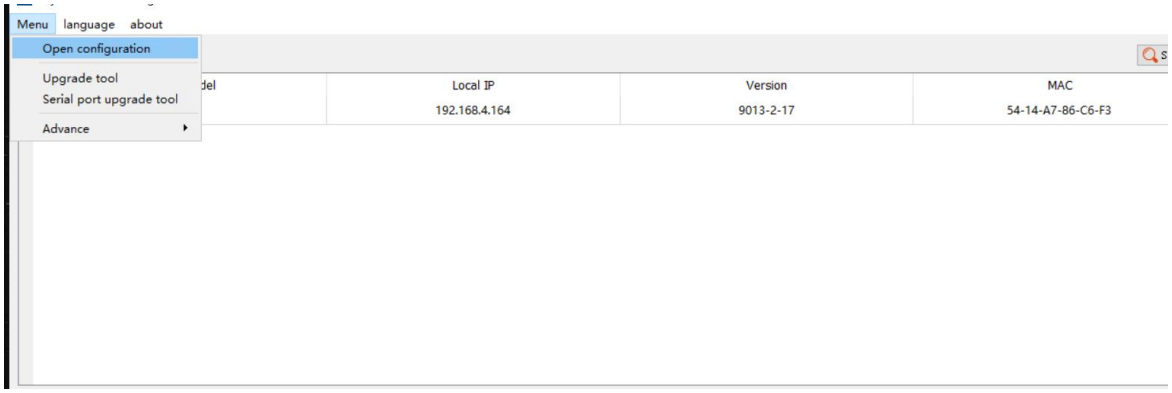
Step 1: Go to the corresponding location on the official website to download the configuration software and "product firmware";

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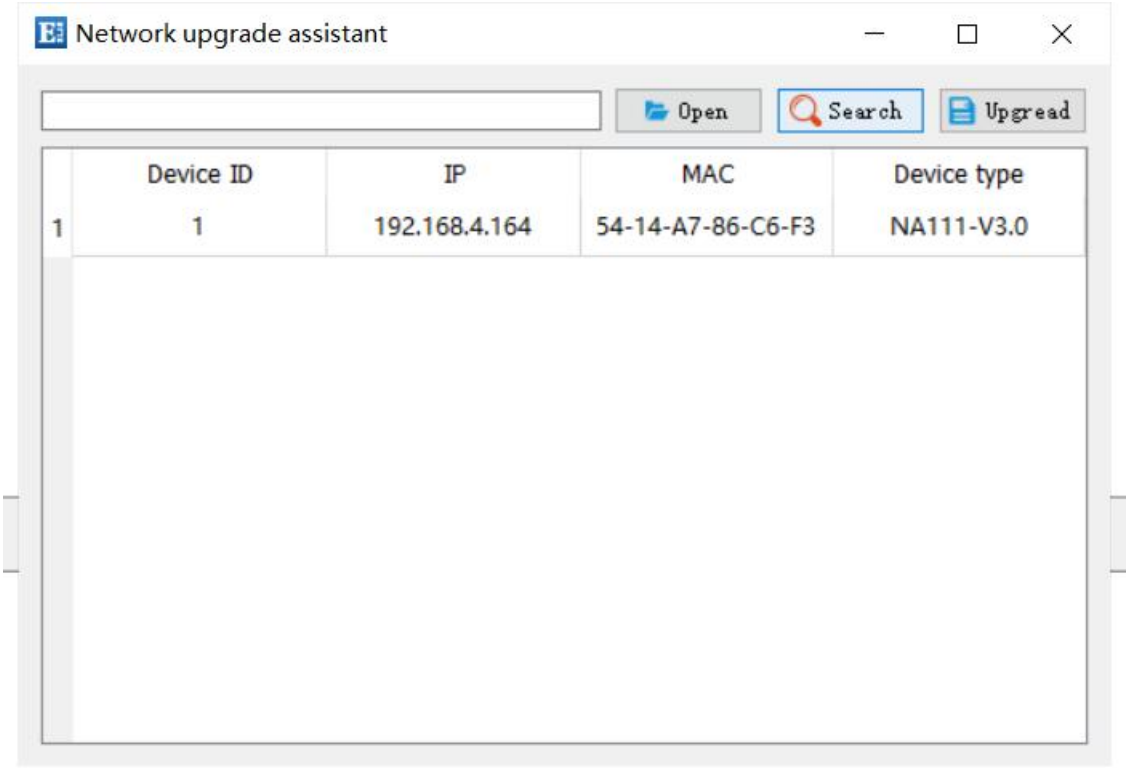
Step 2: Open the configuration software, click "Menu" and select "Device Upgrade Assistant";



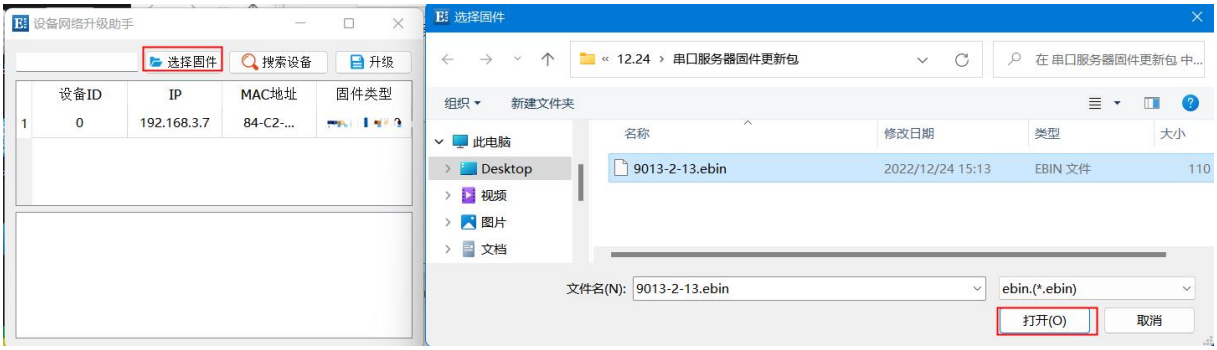
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Step 3: In the pop-up "Device Network Upgrade Assistant" dialog box, click "Search for Device" (the computer and the device should be in the same network segment), and click "Stop Search" after searching for the device;



Step 4: Click "Select Firmware", select the corresponding firmware, and then click "Open";



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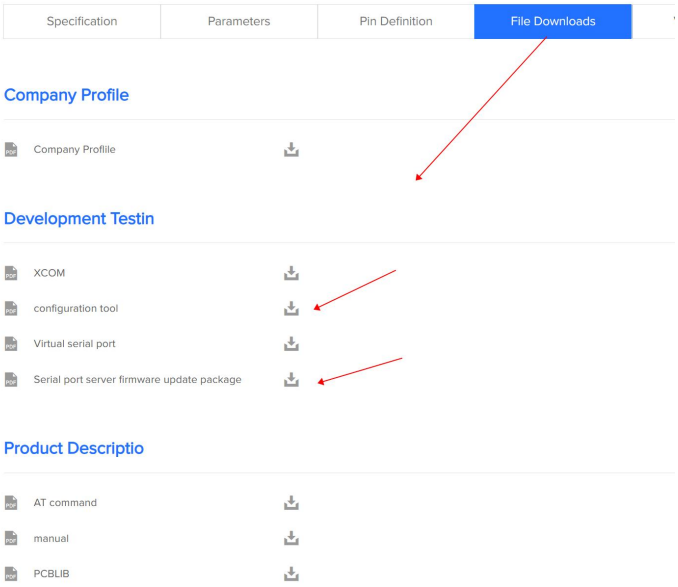
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Step 5: Select the device to be upgraded, click "Upgrade", the progress bar will start to change, and wait for the upgrade to be completed.



Serial port firmware upgrade steps:

Step 1: Go to the corresponding location on the official website to download the configuration software and "product firmware";



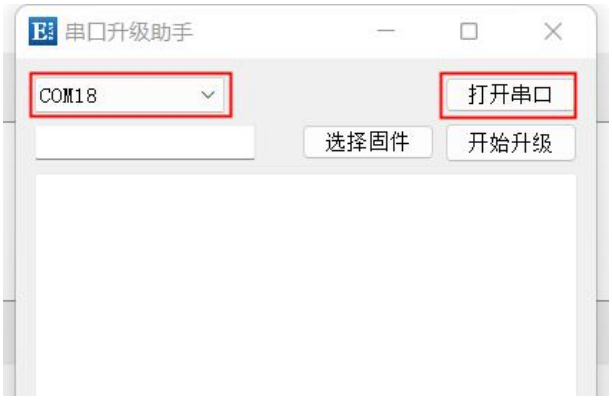
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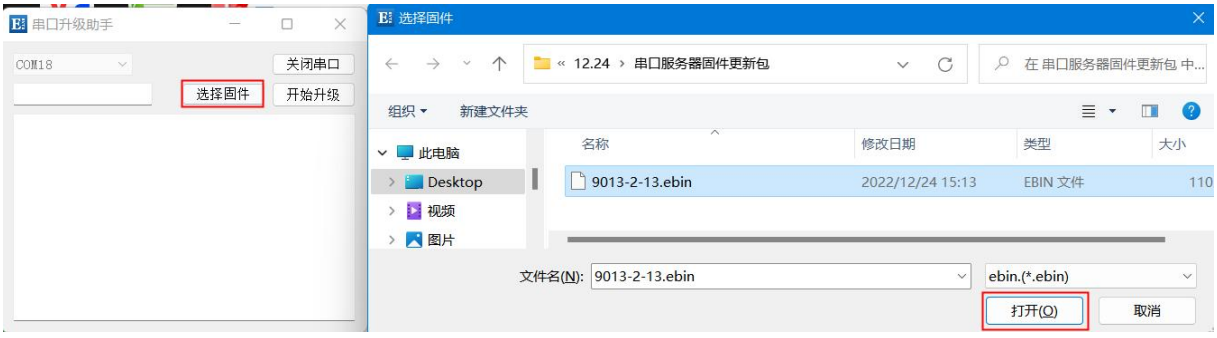
Step 2: Open the configuration software, click "Menu" and select "Serial Port Upgrade Assistant";



Step 3: First connect to the USB port of the computer . In the pop-up "Serial Port Upgrade Assistant" dialog box, select the corresponding port number and click "Open Serial Port";



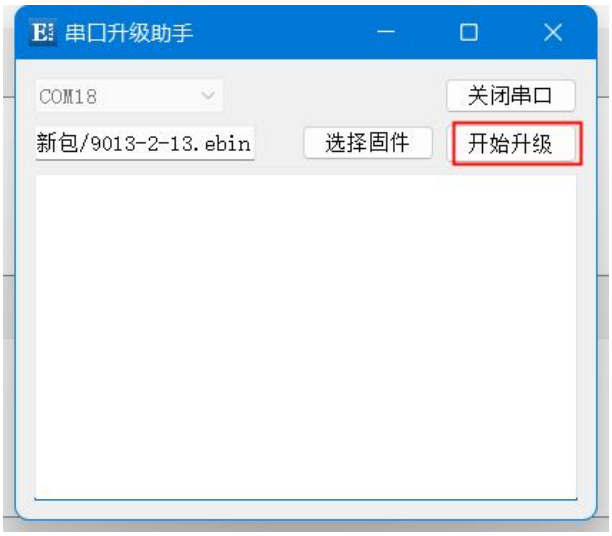
Step 4: Click "Select Firmware", select the corresponding firmware, and then click "Open";

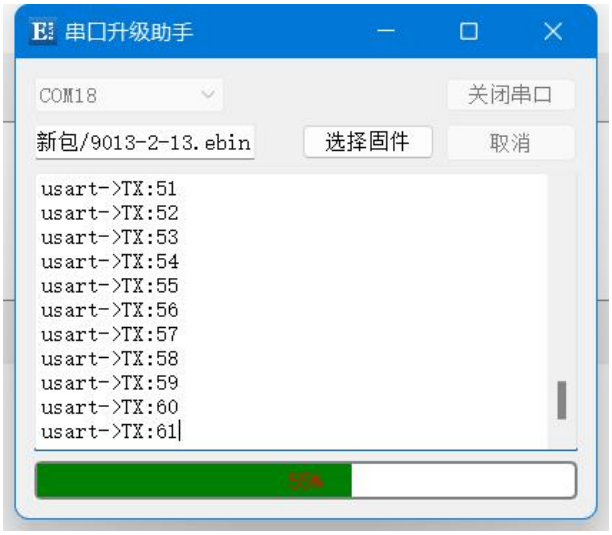


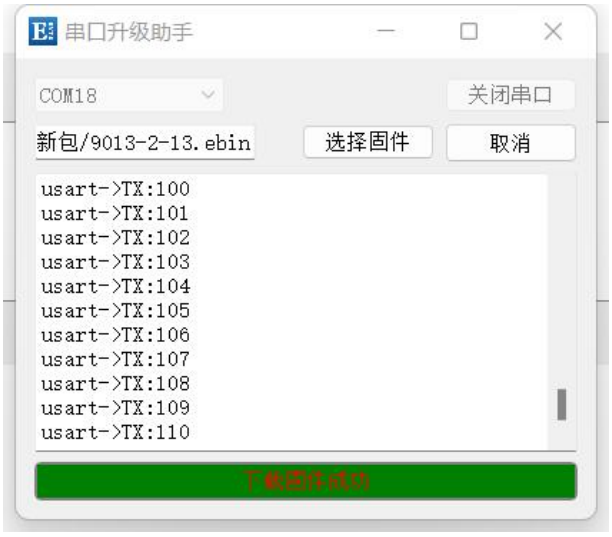
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Step 5: Click "Start Upgrade", the progress bar will start to change, and wait for the upgrade to be completed. **[Note] Repower on to trigger the upgrade.**







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Revise history

Version	Revision date	Revision Notes	Maintenance man
1.0	2024-2-21	initial version	LYL
1.1	2025-11-14	Modify the pin definitions	ZYD
1.2	2025-1-30	Modify the pin definitions	ZYD

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