Serial ⇌ Ethernet
Serial Server
NE2-D11/NE2-D12

Chengdu Ebyte Electronic Technology Co.,Ltd.

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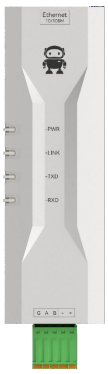
Chapter 1 Product introduction



NE2-D11/NE2-D12 single serial port server is used to realize the two-way transparent transmission of data from serial port to Ethernet port. It has a variety of Modbus gateway modes and MQTTC/HTTPC Internet of Things gateway modes, which can meet the networking functions of various serial port devices/PLC; Adopt industrial design standards to ensure the reliability of equipment.

Serial port server realizes the transparent transmission of serial port data to TCP/IP data packet on the Ethernet port side. Users do not need to care about specific details, and the protocol conversion is completed inside the device.

The product comes with RJ45 interface and power supply. The RS485 (or RS232) port adopts 2.54 mm spring terminal, which is convenient for wiring. The product can be installed by DIN35 guide rail or positioning hole. It adopts a small volume design of 80 × 28 × 27 mm, which is convenient for users to integrate into the system.

If there are problems in the use process, you can refer to our application case in official website.

Functional characteristics

- RJ45 supports 10/100 M Ethernet interface and cross direct connection is adaptive;
- The product supports 2 Sockets, each of which supports TCP Server, TCP Client, UDP Server, UDP Client, HTTPC, MQTTC
- Support configuration tools, web pages and AT instructions;
- Server mode supports 5-way Socket connection;
- Support DHCP function;
- Support DNS (Domain Name Resolution), can customize the domain name resolution server;
- Support a variety of Modbus gateways (simple protocol conversion, multi-host mode, storage gateway, configurable gateway, active upload mode);
- Support fast access to Alibaba Cloud, Baidu Cloud, OneNET, Huawei Cloud and version 3.1. 1 standard MQTT servers;
- Support HTTP protocol (GET/POST request);
- Support virtual serial port;
- Support disconnection reconnection and timeout restart functions;
- Support Keepalive mechanism, which can quickly detect network anomalies and reconnect quickly

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- Support short connection function and customize short connection interval;
- All modes support heartbeat package and registration package functions;
- Support access to external network and local area network;
- Support one-click restoration of factory settings;
- Support online upgrade function.

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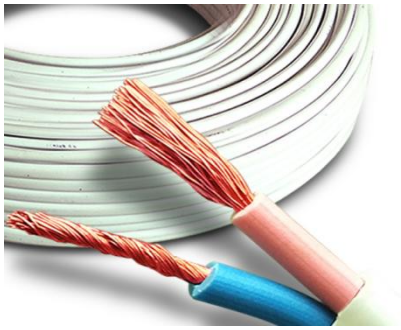
Chapter 2 Quick Start

If there are problems in use, click on the official website link:https://www.ebyte.com/product-class.aspx

Note: NE2-D11 is RS485 version, and NE2-D12 is RS232 version. Except for the inconsistency of wiring diagrams, the rest are exactly the same. NE2-D11 is used as an explanation in this chapter.

2.1 Preparation for use

Serial port server (hereinafter referred to as "equipment") before use, need to prepare network cable, computer, USB to serial port converter and other related auxiliary materials. The details are as follows:

NE2-D11	Network cable	Computer
		
DC 12V Switching Power Supply	USB to RS485	Several Cable

2.2 Equipment wiring

2.2.1 Network cable connection

Adopt standard RJ45 network cable, one end is connected to RJ45 interface of NE2-D11, and

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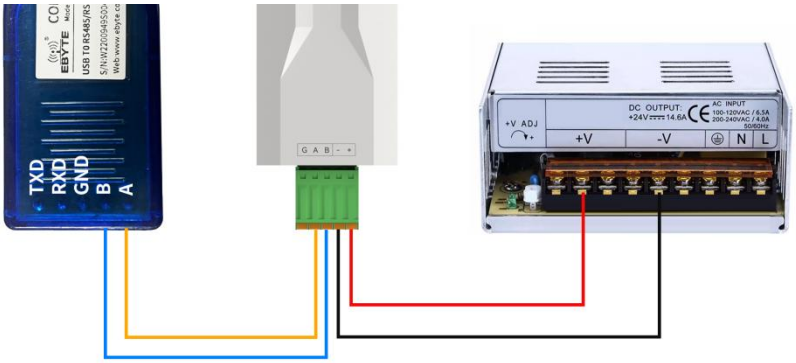
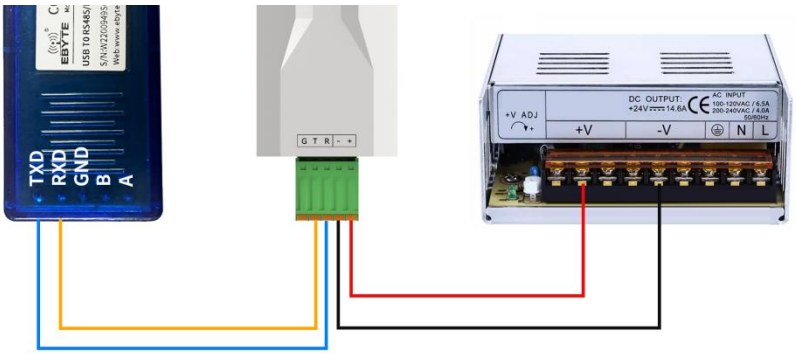
the other end is connected to computer or switch/router interface;

2.2.2 Serial port connection

A of NE2-D11 is connected with USB to RS485-A;
B of NE2-D11 is connected with USB to RS485-B;
(In case of NE2-D12, connect T with USB to RS232-R, R with USB to RS232-T, and G with USB to RS232-GND);



RS485 Connection



RS232 Connection

2.2.3 Power connection

Connect + of NE2-D11 with DC 12V switching power supply V + using wires;
Connect-of NE2-D11 with DC 12V switching power supply V-;

2.3 Software setup

2.3.1 Network test environment

Avoid the server search failure and the inability to open web pages in the process of real

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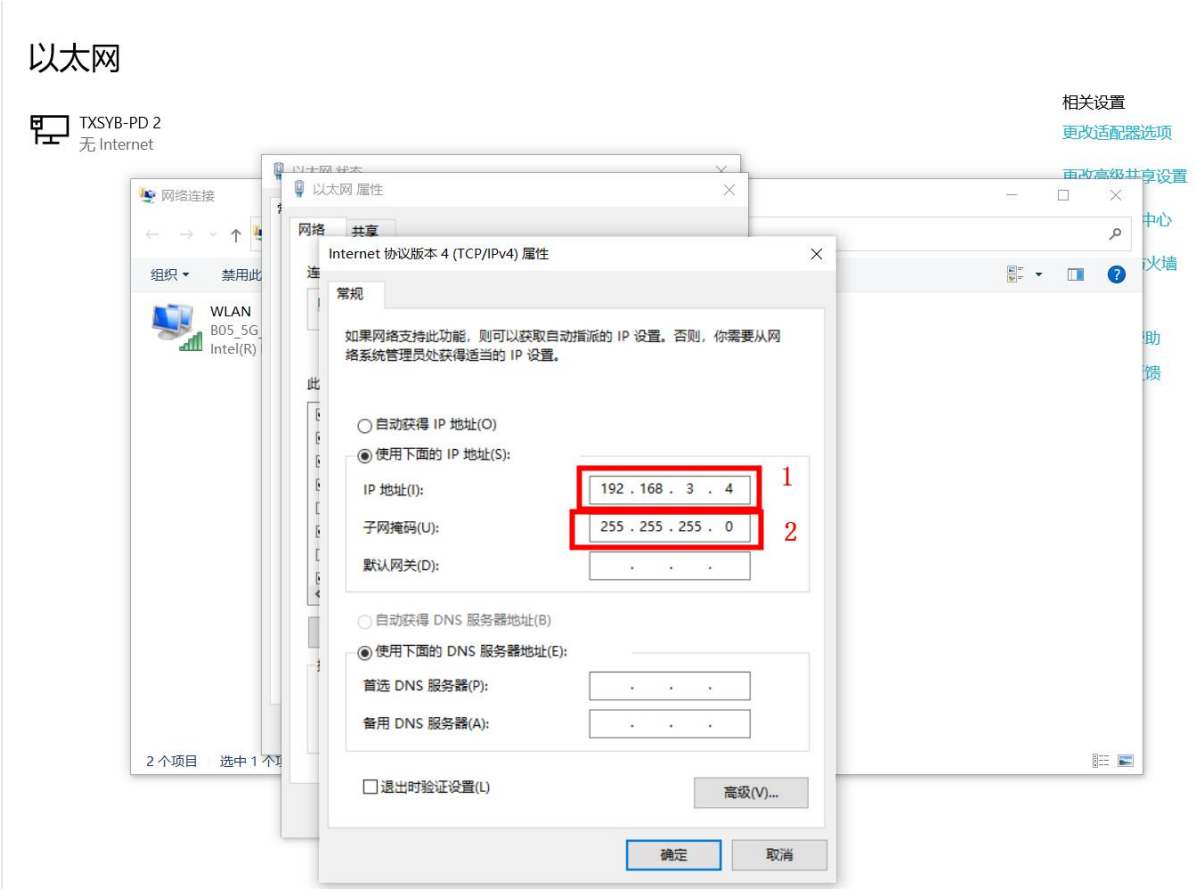
application. first checks the relevant settings on the computer.

（1） Turn off the firewall and antivirus software of the computer;

（2） Configure the network card connected with the equipment;

（3） This case is aimed at testing the device directly connected to the computer. It is necessary to configure the computer as static IP (the computer is directly connected to the serial server, and there is no router to allocate it, and the computer cannot obtain the IP address). When using the switch or router, it is necessary to ensure that the device and the computer are on the same network end (for example, 192.168. 3. xxx);

（4） Here, the static IP of the computer is 192.168. 3.4 (the same network segment as the serial server), the subnet mask is 255.255. 255.0, and the default gateway is 192.168. 3.1.



2.3.2 Default parameter

Project	Default parameter
IP address	192.168.3.7

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Default local port	8886
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

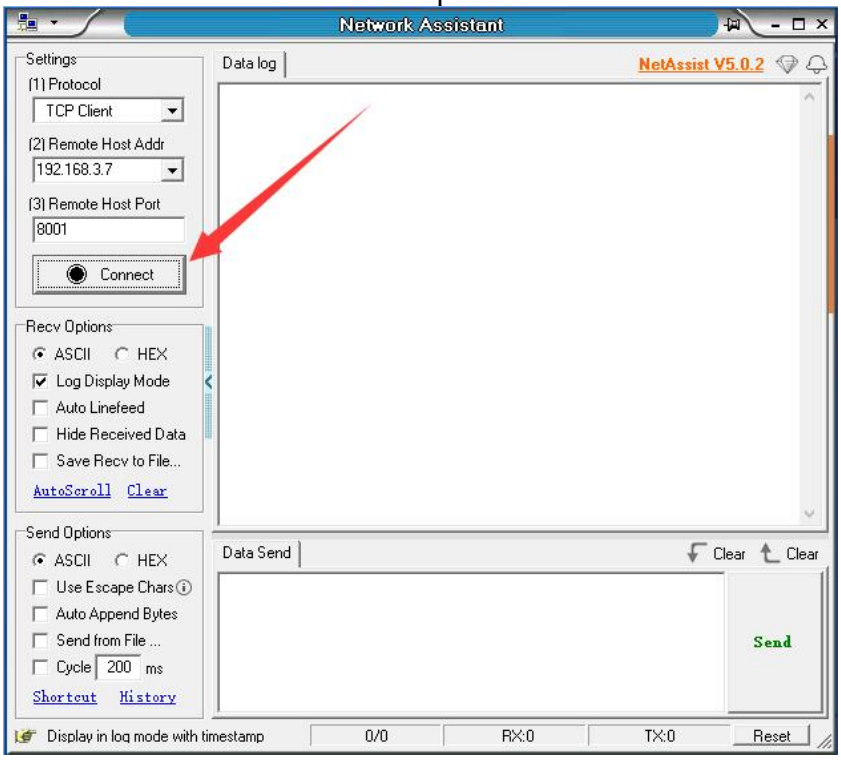
After the above operation steps, the transparent transmission test of data can be realized by following the factory default parameters of the equipment and performing the following operations.

The operation steps are as follows:

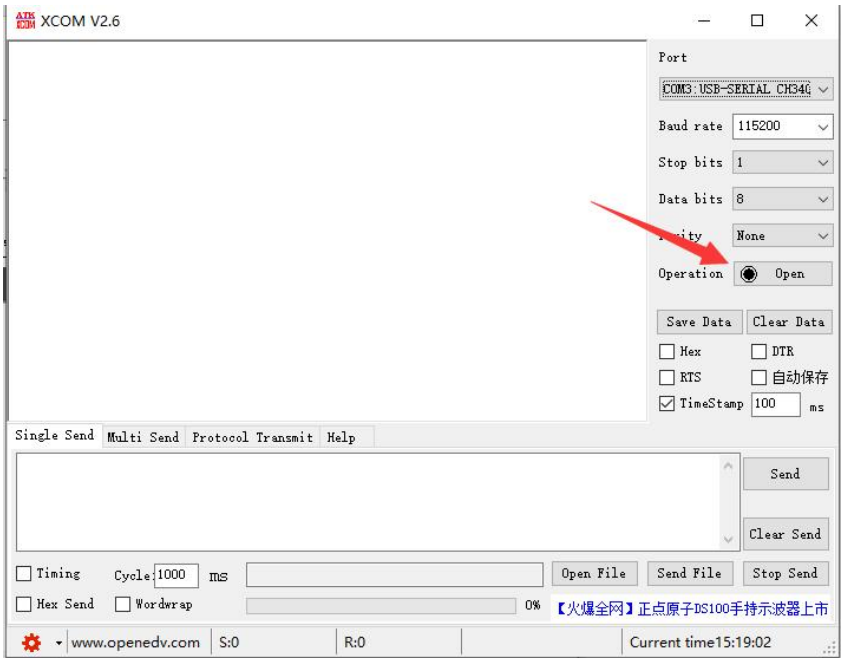
（1） Open the Test TCP/IP Debugging Assistant software.

（2） In the "Network Settings" area, select TCP Client mode, the remote host address corresponds (the default local IP of the device is 192.168. 3.7), and the remote host port corresponds to the factory local port 8886 of the device, and click Connect.

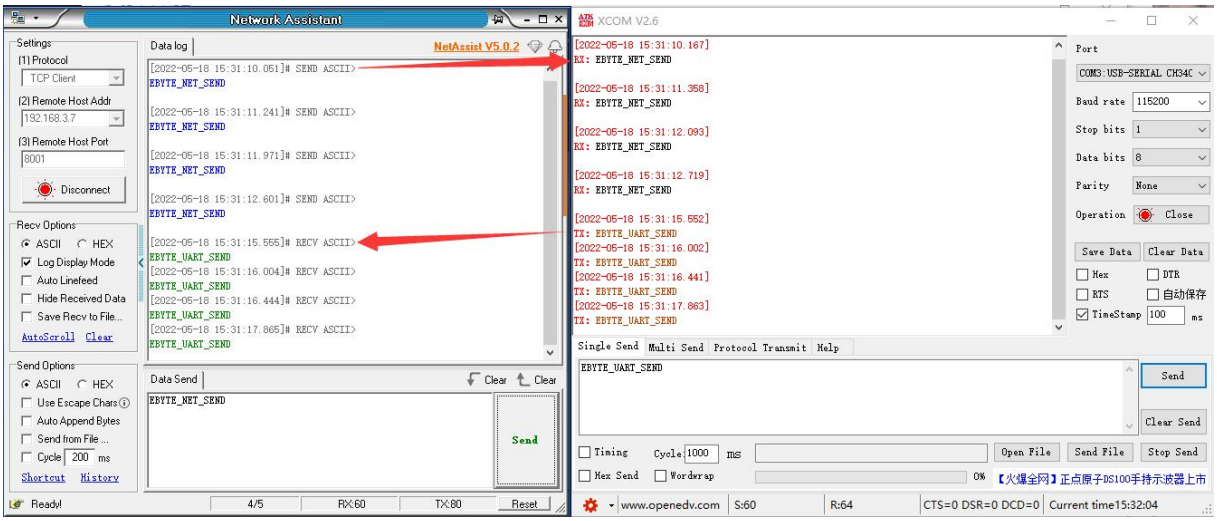
（3） Wait for the computer to connect to the serial server, and the LINK lamp of the serial server will always be on after the connection is completed.



（4） Open the serial port assistant, set the baud rate of the serial port to 115200, and set the serial port parameters to 1/8/None. Click to open the serial port.



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



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Chapter 3 Product Overview

3.1 Series products

Product model	Product type	Socket Number of connections	Working mode	Operating voltage (V)	Product size (mm)
NE2-S1	SMD module	2 x 5 roads	TCP Server TCP Client UDP Server UDP Client MQTT Client HTTP Client	DC 3.1 ~ 6 or 3.0~3.6	17×19×4
NE2-T1	Direct plug module	2 x 5 roads		DC 3.1 ~ 6	35×22×25
NE2-T1B					
NE2-D11	DTU	2 x 5 roads		DC 8 ~ 28	80×28×27
NE2-D12				DC 8 ~ 28	

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3.2 Technical parameters

Project	Description
Operating voltage	DC 8 ~ 28V
Interface	Serial port (RS485/RS232, 3 × 2. 54mm spring terminal)
	Power supply (2 × 2. 54mm spring terminal)
	Network port (RJ45)
Working mode	TCP Server (default), TCP Client, UDP Server, UDP Client, HTTP Client, MQTT Client
Socket Connection	The TCP server supports 5 client connections
Network protocol	TCP/UDP, MQTT, HTTP, IPv4, DHCP, DNS
IP Acquisition Mode	Static IP (default), DHCP
DNS domain name resolution	Support
Domain name resolution server	114.114. 114.114 (customizable)
Configuration mode	Web page, parameter configuration tool, AT instruction
IP address	192.168. 3.7 (customizable)
User name	admin (customizable)
Password	admin (customizable)
Local port	8886 (customizable)
Subnet mask	255.255. 255.0 (customizable)
Gateway	192.168. 3.1 (customizable)
Serial cache	10kByte or 1024 packs
Packaging mechanism	Maximum 1024Byte, 1 ~ 80 bytes idle time
Serial port baud rate	600 ~ 460800 bps (default 115200)
Data bit	5, 6, 7, 8 (default)
Stop bit	1 (default), 1.5, 2
Parity bit	None (default), Odd, Even
Product size	80 × 28 × 27mm (L × W × H)
Product weight	40g ± 5g
Working temperature and humidity	-40 ~ + 85 ℃, 5% ~ 95% RH (no condensation)
Storage temperature and	-40 ~ + 105 ℃, 5% ~ 95% RH (no condensation)

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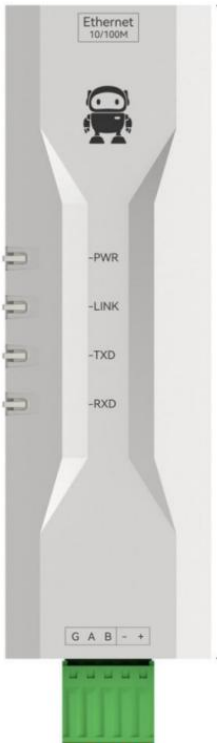
humidity	

3.3 Indicator light description



Serial number	Name	Function	Description
1	POWER	Power indicator	Always on: power on; Always off: power is disconnected;
2	LINK	Connection indicator light	Off: The network cable is not connected; Flashing: The network cable is connected normally but the link is not connected; Steady on: The network link is connected successfully;
3	TXD	Serial port sending indicator light	Flashing: NE2-D11 serial port outputs data to the customer device
4	RXD	Serial port receiving indicator light	Flashing: The customer device outputs data to the NE2-D11 serial port

[Note] When the network cable is not connected, POWER lights up, other indicator lights go out, and the equipment is in standby state; When factory settings are restored, all indicator lights are on.
[Note] The green light of the network port indicator light is 100M indicator light, and the yellow

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light is 10M indicator light, which lights up under normal circumstances (generally 100M lights up) and flashes when data is sent and received.

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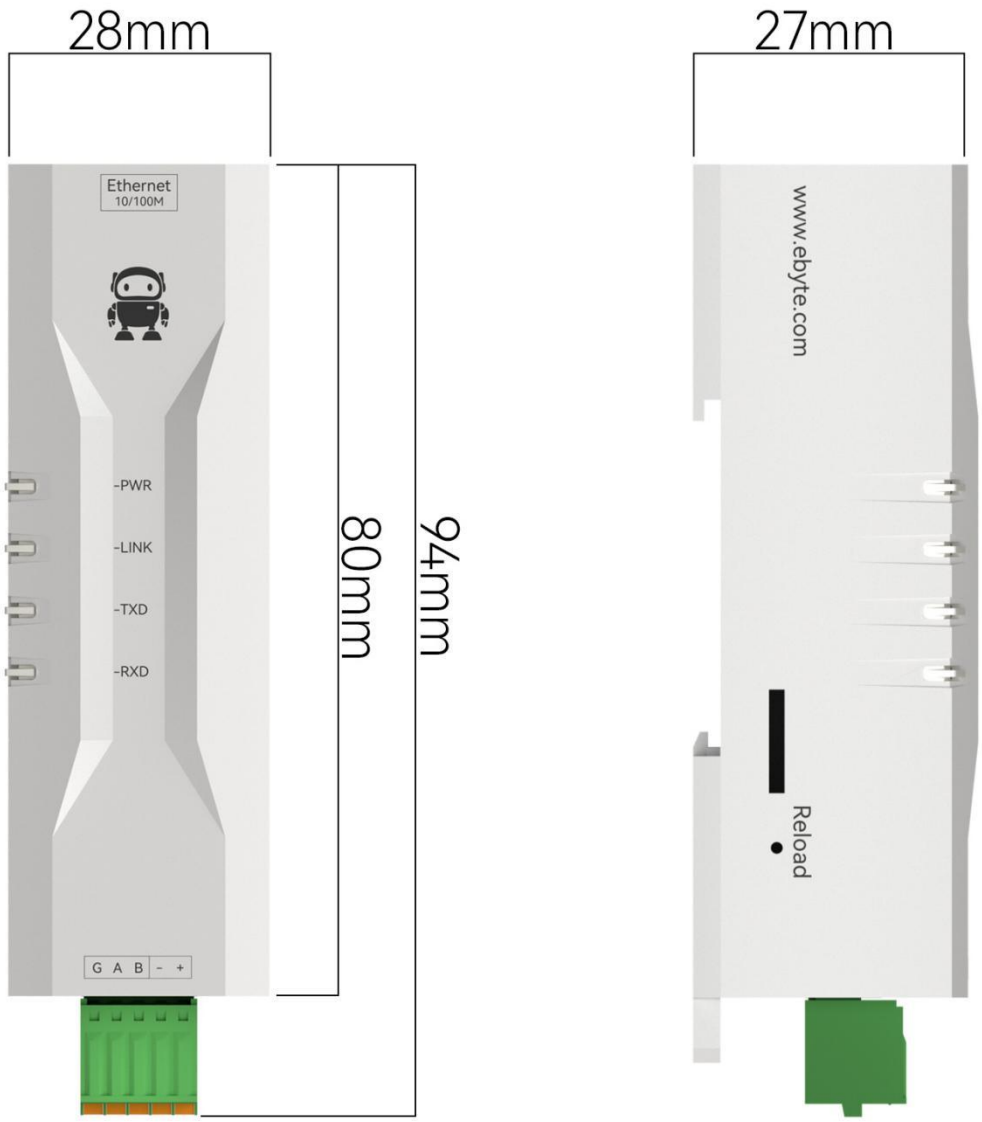
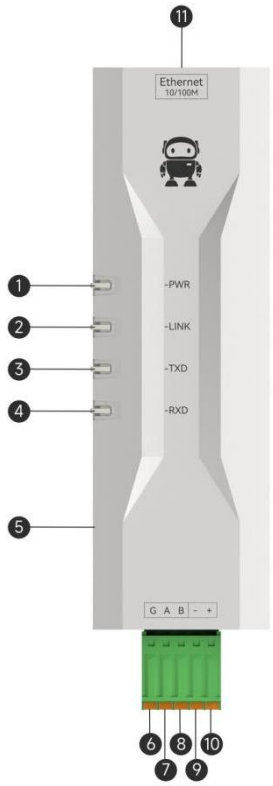
3.4 Mechanical dimensions



3.5 Pin definition



Serial number	Name	Function	Description
1	POWER	Power Indicator	Always on: power on; Always off: power is disconnected;
2	LINK	Connection indicator light	Off: The network cable is not connected; Flashing: The network cable is connected normally but the link is not connected; Steady on: Any network link is successfully connected or in UDP mode;
3	TXD	Serial port sending indicator light	Flashing: The serial port outputs data to the customer device
4	RXD	Serial port receiving indicator light	Flashing: The customer device outputs data to the NE2-D11 serial port
5	Reload	Factory reset button	Press and hold for 5-10S until all indicators on the device light up, indicating that the device has been restored to factory settings.
6	G	GND	Connect RS485 cable shield or RS232-G
7	A/T	485-A or 232-T	Connect to RS485-A interface or RS232-R interface

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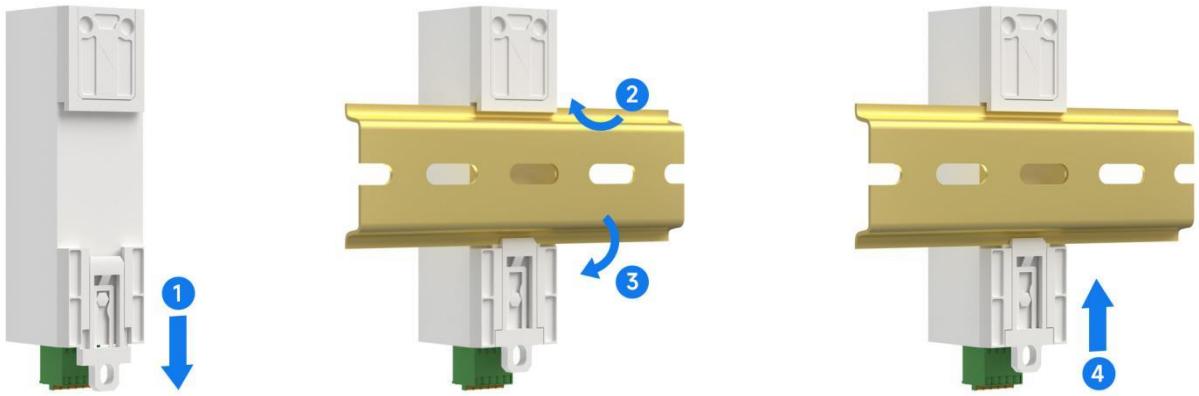
8	B/R	485-B or 232-R	Connect to RS485-B interface or RS232-T interface
9	-	Power supply-	Connect 8~28v power supply V-
10	+	Power +	Connect 8~28v power supply V+
11	Ethernet	Net port	Standard RJ45 interface, 10/100M cross-connect direct connection adaptive

3.6 Installation mode

The equipment is installed by guide rail or positioning hole.



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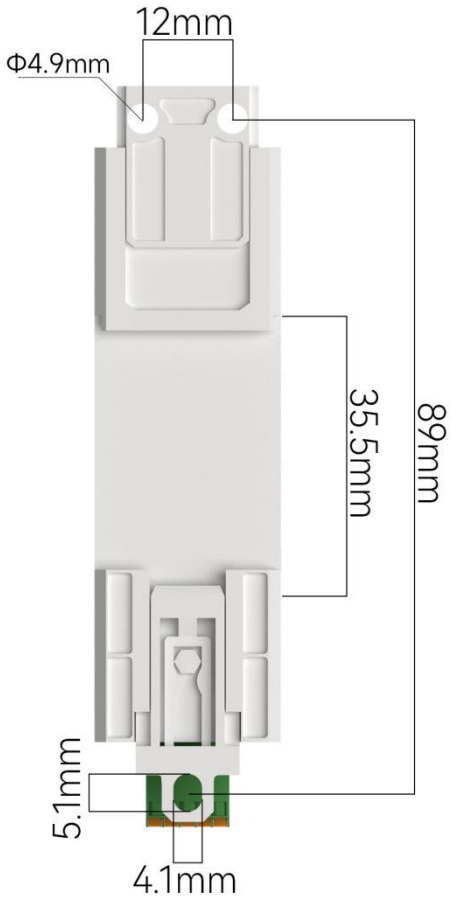

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Chapter 4 Product function

4.1 Basic parameters of this machine

4.1.1 Basic parameters

SN code is the traceability code written when the equipment leaves the factory, highlighting the batch number of the equipment leaving the factory, which can only be read, not written.

The equipment model is the full name of the current equipment model, and the information can be obtained from official website through this model.

The firmware version is the factory firmware model of the current device, and the latest firmware update can be downloaded from official website.

The MAC address is the physical address of the chip and is the unique identification code.

4.1.2 IP Address Type

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

（1） Static IP: Static IP needs to be set manually by users. In the process of setting, pay attention to writing IP, Subnet mask and gateway at the same time. Static IP is suitable for scenarios where IP and devices need statistics and one-to-one correspondence.

The invention has the advantages that all devices accessing which cannot allocate IP addresses can search for through the broadcast mode of the whole network segment, which is convenient for unified management of;

Disadvantages: Different LAN segments are different, resulting in 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 gateway host, thus avoiding the tedious steps of setting IP address. It is suitable for scenarios where there is no requirement for IP and 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: Access to a network without DHCP Serve, such as direct connection to a

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computer, the module will not work properly.

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

Subnet mask must be set. Our commonly used Class C subnet mask is 255.255. 255.0, the network number is the first 24 bits, the host number is the last 8 bits, the number of subnets is 255, and the module IP is within the range of 255, so the module IP is considered to be in this subnet.

Gateway refers to the network number of the network where the current IP address of the module is located. If a device such as a router is accessed when connecting to an external network, the gateway is a route.

4.1.3 Domain Name Resolution (DNS)

Domain name resolution translates a domain name into a network-recognized IP address through a Domain Name Resolution (DNS) server. In this way, when the IP address of the server is a non-fixed IP address, you can try to use the domain name resolution function, so that no matter how the IP address of the server changes, as long as the corresponding domain name remains unchanged, the setting parameters of NE2-D11 do not need to be changed. The address of the domain name resolution (DNS) server of the serial port server supports user-defined, which can realize domain name resolution through the custom domain name resolution server under the abnormal situation of the router domain name server. When the device resolves the domain name, it will report the resolution request to the custom domain name resolution (DNS) server, and return the device connection parameters (generally IP address) after the resolution is completed.

When the destination IP is a domain name, the maximum configurable domain name length is 256 bytes. When the target server cannot be connected, the module will resolve the domain name continuously and periodically.

In DHCP mode, the domain name resolution (DNS) server address is automatically acquired (synchronous router domain name resolution address) and cannot be modified.

In static IP mode, the default address of the domain name resolution (DNS) server is114.114. 114.114, or you can customize the domain name resolution server.

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4.2 Network working mode

4.2.1 TCP Server Mode

TCP Server is a TCP Server. In TCP Server mode, the device monitors the local port, accepts the connection request from the client and establishes a connection for data communication, which is usually used for communication with TCP clients in LAN. As a server mode, the device supports 5 client connections, and if two Sockets start the server mode at the same time, it can support 10 client connections.

When the Modbus gateway function is turned off, the device sends the data received by the serial port to all the client devices connected with the device, and supports the connection of 5 clients at most. After the Modbus gateway function is enabled, the non-Modbus data will be cleared and not forwarded.

4.2.2 TCP Client Mode

The TCP Client is a TCP Client. When the device works, it will initiate a connection request to the server and establish a connection, which is used to realize the interaction between serial port data and server data.

Using the client needs to configure the IP address/domain name of the target accurately, and the target port.

Note: The local port for client mode is recommended to be 0 (dynamic port).

4.2.3 UDP Server Mode

UDP Server means that the device does not verify the source IP address of data when communicating with 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 the data packet to the source IP address and port where the device received the data last time.

This mode is usually used in scenarios where multiple network devices communicate with this

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device at a high frequency and 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 1024 bytes per packet, and will be lost if the data exceeds it.

4.2.4 UDP Client Mode

UDP Client is a connection less transport protocol, which provides simple transaction-oriented unreliable information transfer service. There is no connection establishment and disconnection, and only the destination IP and destination port need to be configured to send data to each other. It is usually used in data transmission scenarios where there is no requirement for packet loss rate, data packets are small and sent quickly, and data is transmitted to a specified IP.

In UDP Client mode, the device only communicates with the configured remote UDP device (Destination IP and Destination Port).

In this mode, the destination address is set to 255.255. 255.255, and the transmitted data will be broadcast in the whole network segment, but the transceiver equipment needs to ensure that the ports are consistent, and the equipment can also receive the broadcast data.

Note: In UDP mode, the packet length of a single packet cannot exceed 1024 bytes.

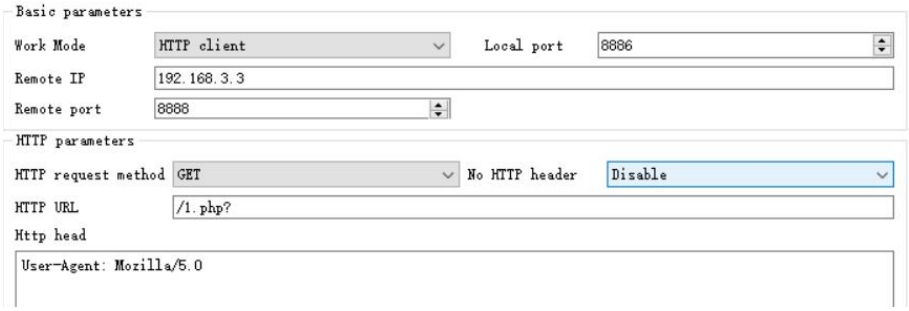
4.2.5 HTTP Client Mode

This mode can realize the function of HTTP packet grouping, and provides two modes: GET and POST. Customers can configure URL, Header and other parameters by themselves, and the device (serial server) can send packets, so as to realize the rapid communication between serial device and HTTP server. Using HTTP client mode, it is suggested to use random port and open short connection to save HTTP server resources.

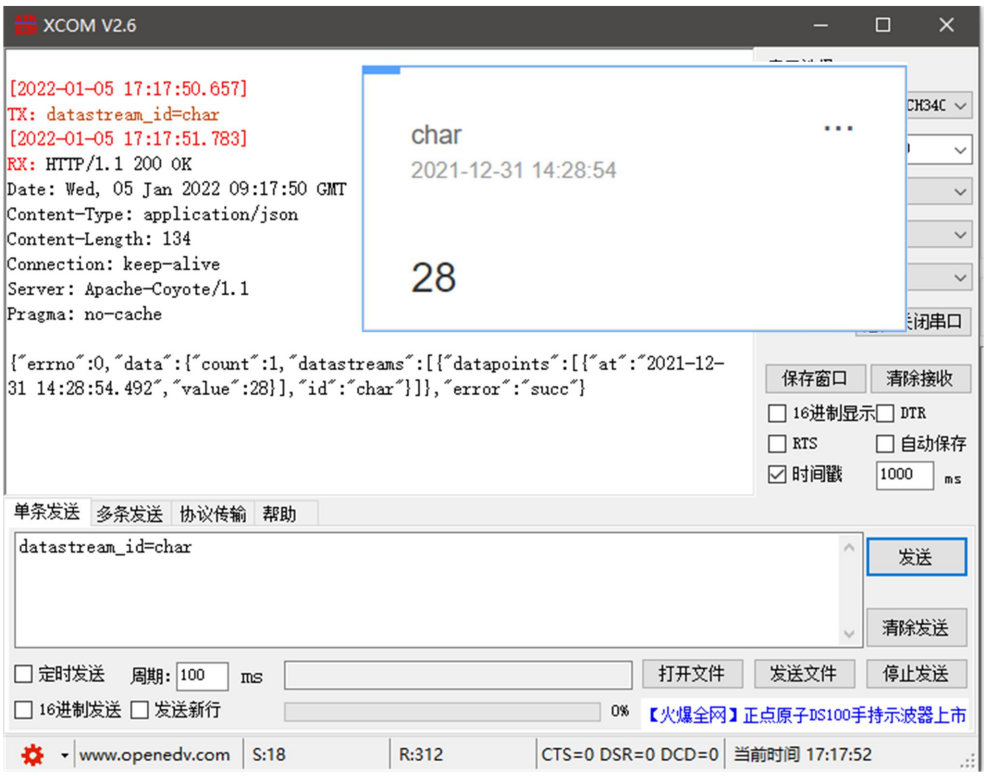
1. GET

Test the device HTTP-GET request using the HTTP mode of OneNET multi-protocol access, as shown in the following figure.

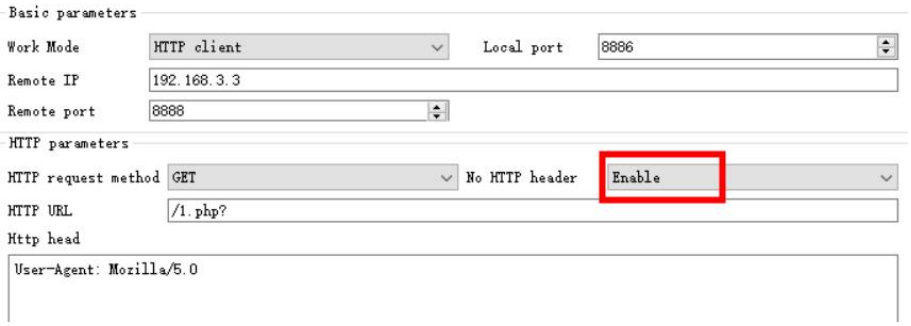
(1) Return data configuration with packet header:



Data return test:



(2) Return data configuration without packet header:

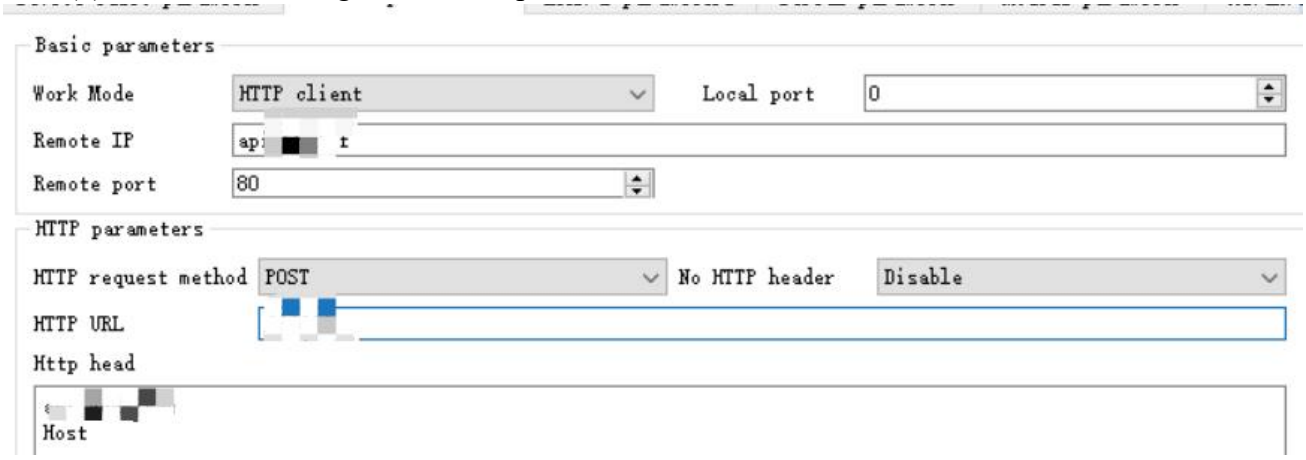


Data return test:

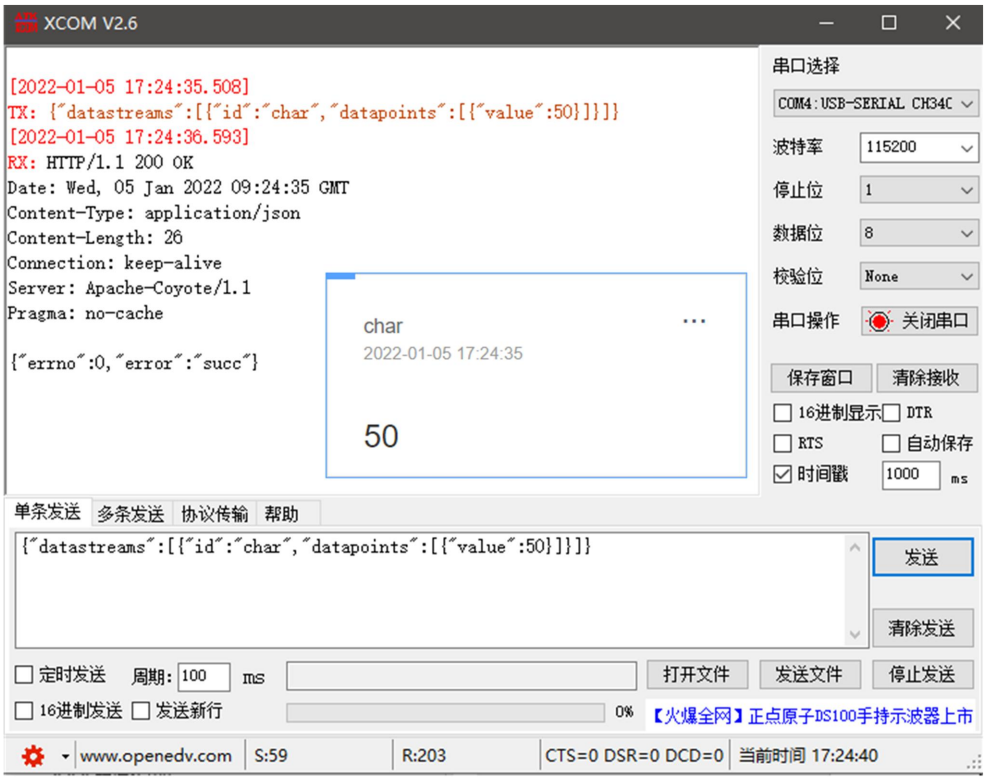
2. POST

Test the device HTTP-POST request using the HTTP mode of OneNET multi-protocol access, as shown in the following figure.

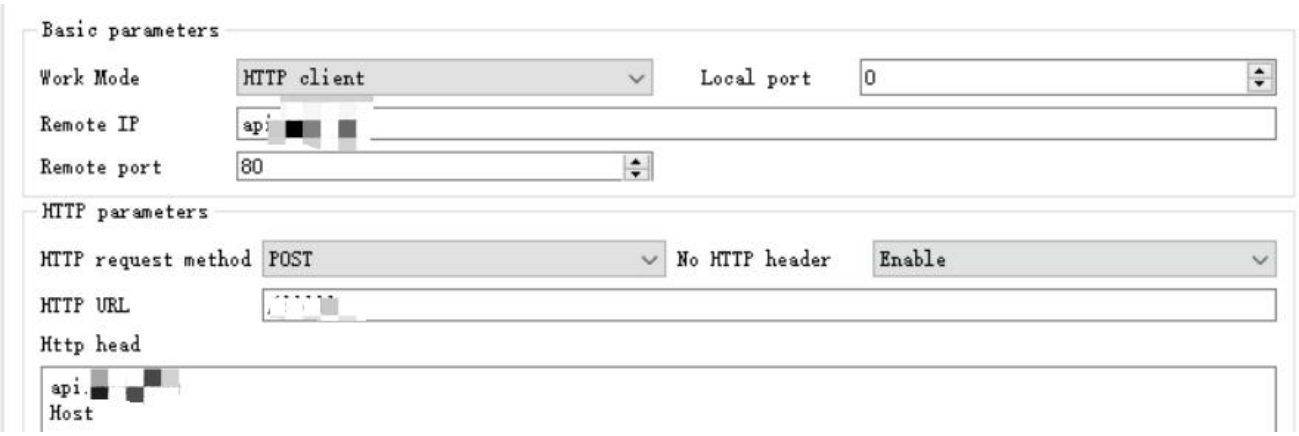
(1) Return data configuration with packet header:



Data return test:



(2) Return data configuration without packet header:



Data return test:

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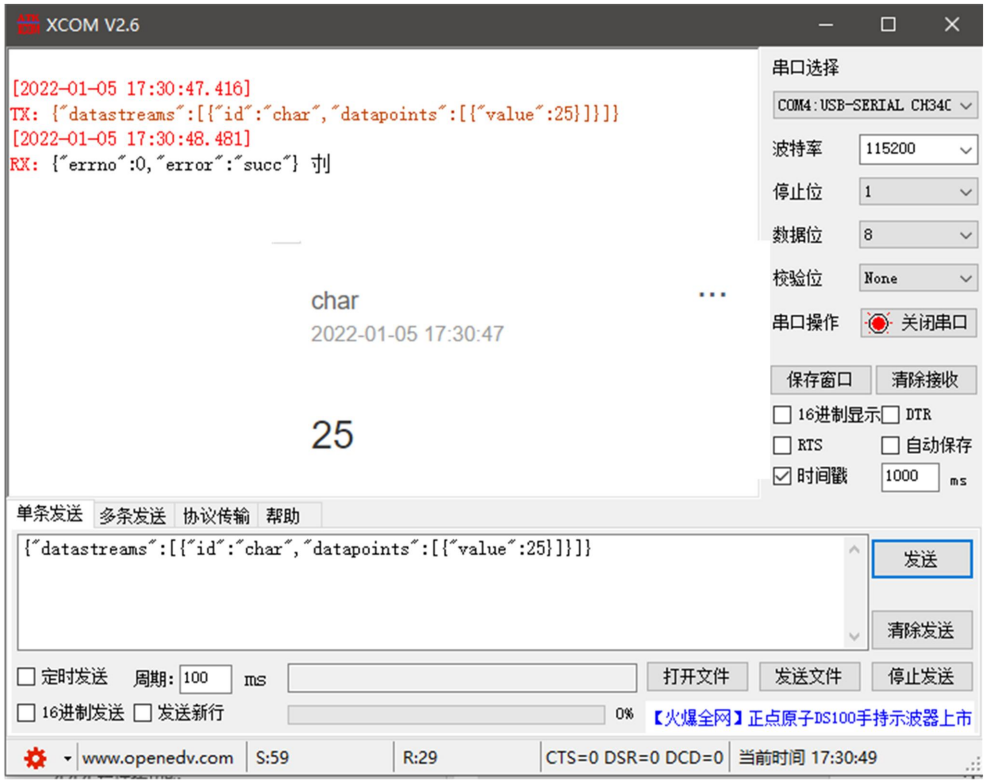

4.2.6 MQTT Client Mode

4.2.6.1 Standard MQTT 3.1. 1 Connection

Here, the standard MQTT3.1. 1 connection takes Tencent's standard MQTT3.1. 1 server as an example, and the "three elements" described by the standard can be obtained from Tencent server as shown in the following figure:

The parameter configuration description is shown in the following figure:

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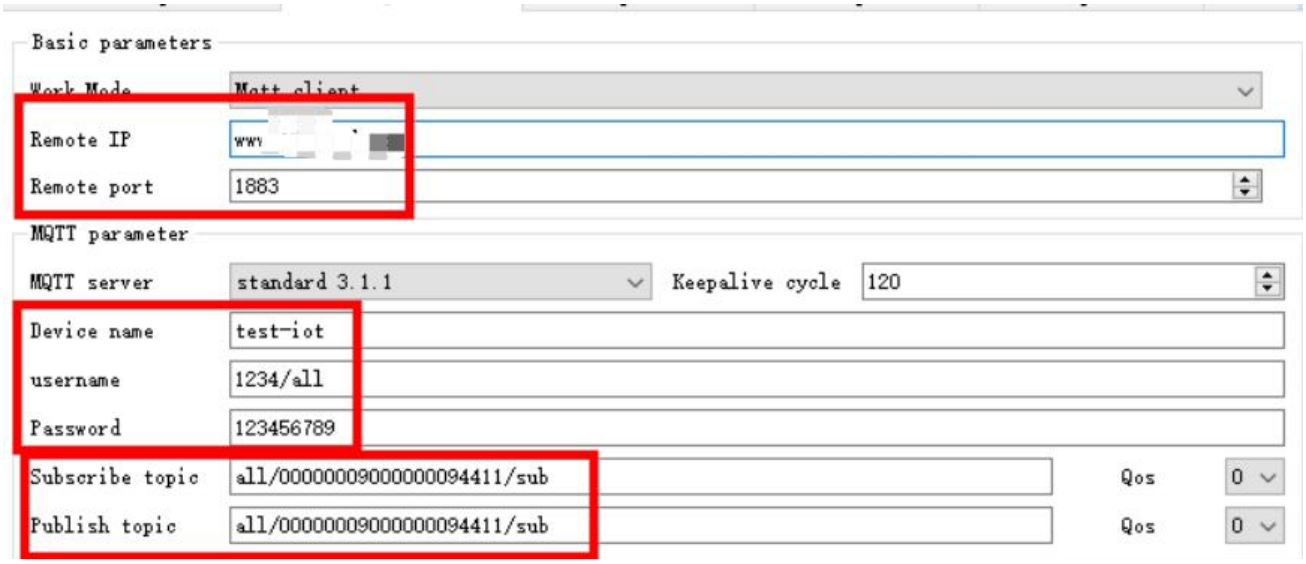

Configure the corresponding subscription and publishing address, and use the platform to debug and send data online for communication test:

4.3 Serial port parameters

Serial port parameters include baud rate, data bit, check bit and stop bit.

Baud rate: Serial communication rate, which can be configured at 600, 1200, 240, 480, 960, 144, 192, 384, 576, 115, 200, 230, 400, 460800 bps.

Data bit: The length of data bits, ranging from 5, 6, 7 to 8.

Check bit: Check bit of data communication, support None, Odd, Even three kinds of check mode.

Stop bit: can be set to range 1, 1.5 and 2.

By setting the serial port parameters, keeping the serial port parameters consistent with the serial port connection equipment can ensure the normal operation of communication.

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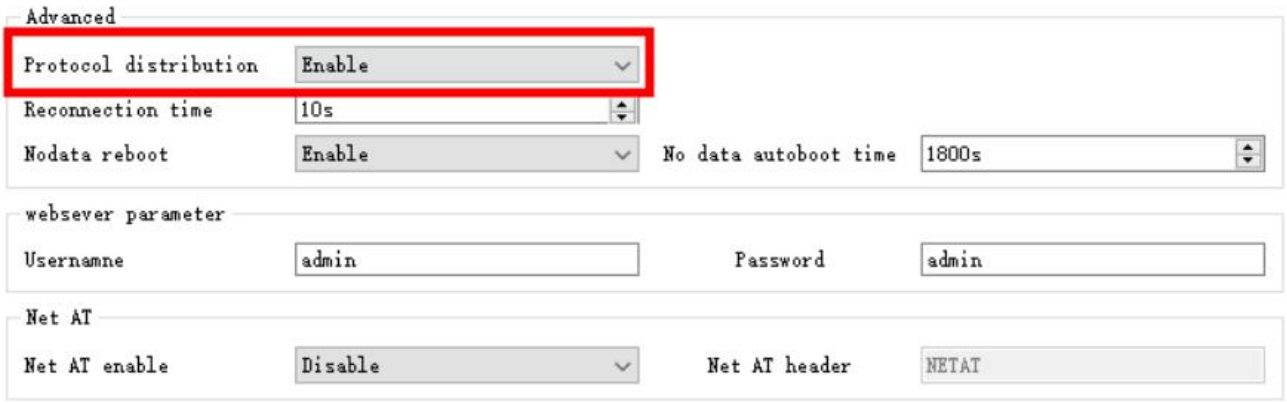
4.4 Advanced parameter

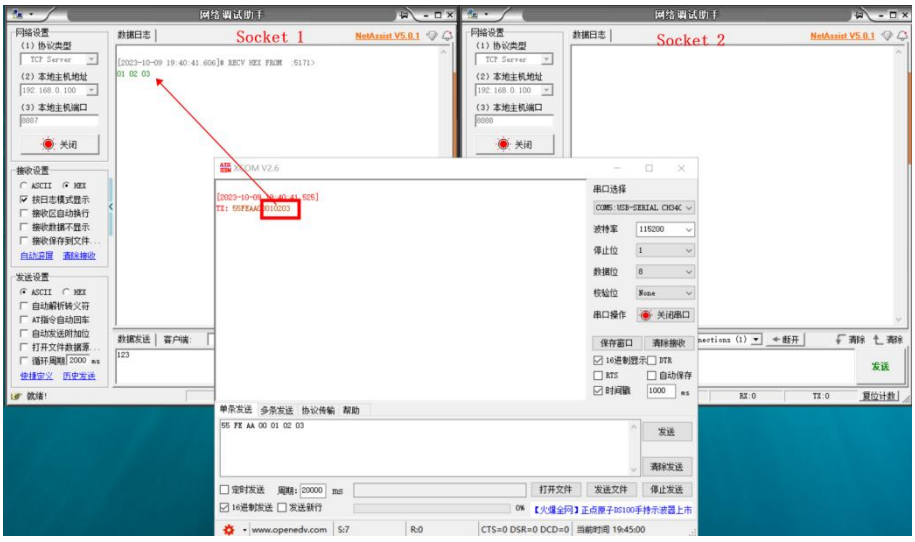
4.4.1 Link protocol distribution

supports socket distribution protocol, which can send data to different links through specific protocols, and can also distinguish the data received by different links by adding headers and trails. Upper computer software configuration steps:



After turns on the multi-link protocol distribution mode, there are the following possibilities. Here, for example,link 1connects to server port 8887, and link 2connects to server port 8888:

1. The data sent by serial port meets the data header of 55 FE AA 00, that is, meets the requirements, that is, 55 FE AA 00 + data, then the data will only be transmitted to Socket 1, and the received content only contains data, not data header;



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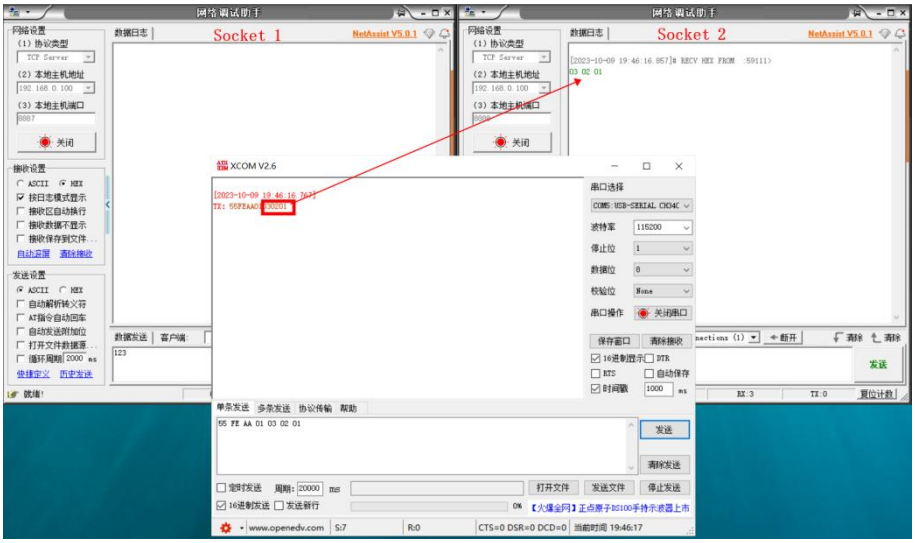
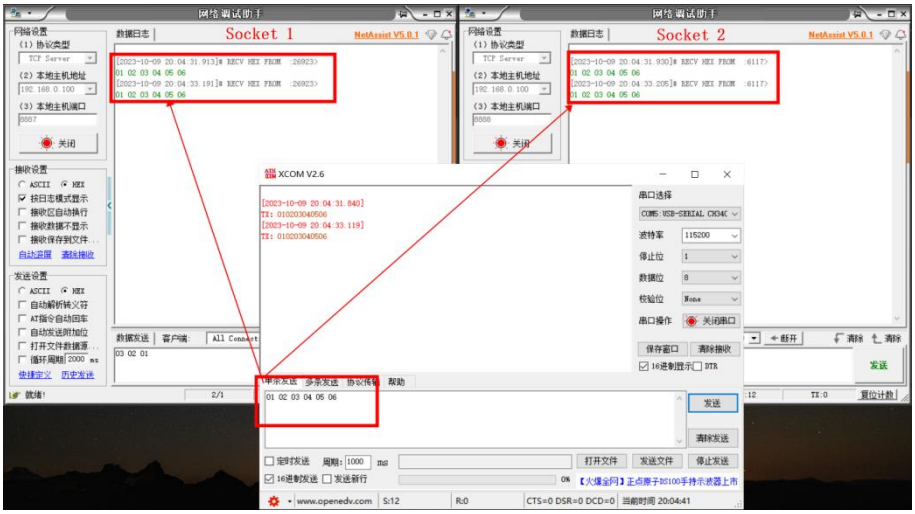
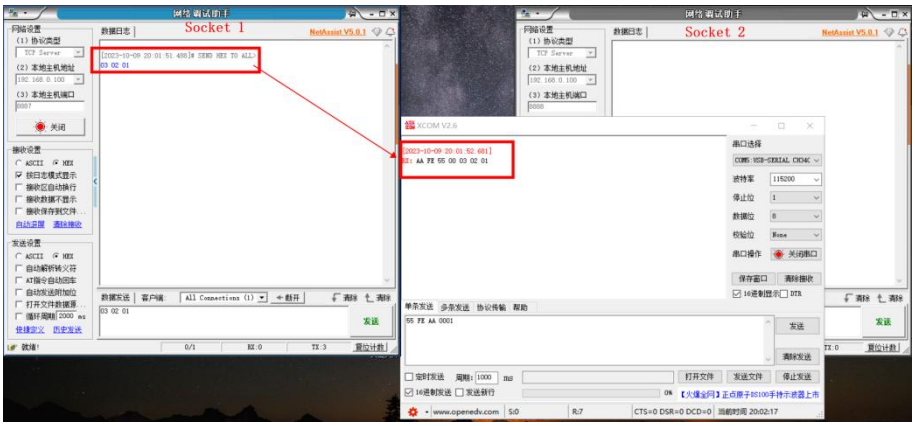
2. The data sent by serial port meets the data header of 55 FE AA 01, that is, it meets the requirements, that is, 55 FE AA 01 + data, then the data will only be transmitted to Socket 2, and the received content only contains data, not data header;



3. If the data sent by serial port is arbitrary, the data will be transmitted to two Sockets



4. Socket 1 sends arbitrary data, and after receiving it by serial port, the data header AA FE 55 00 will be added before the data



5. Socket 2 sends arbitrary data, and after receiving it by serial port, the data header AA FE 55

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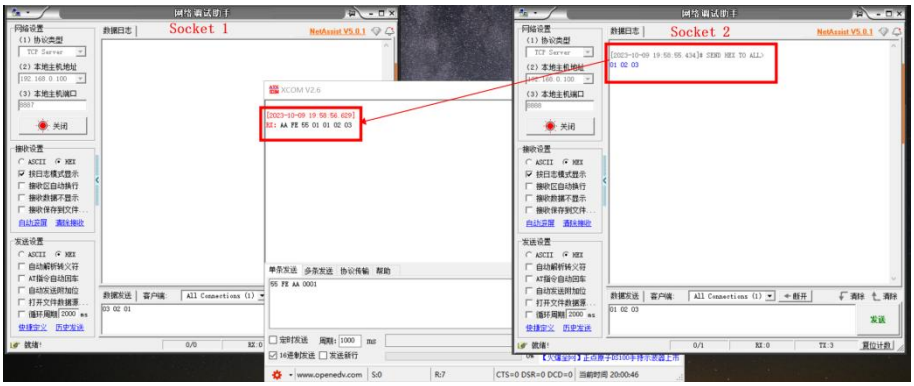
01 will be added before the data



4.4.2 Disconnection and reconnection function

In client mode, the device attempts to actively connect to the server at a specified time after the network is disconnected.

Disconnection reconnection time: The time interval between each attempt to reestablish the network by the device, 0 is a fast reconnection, and 0 ~ 65535 can be configured.

4.4.3 Timeout restart function

Support timeout restart function (default: 1800 seconds), which is mainly used to ensure the long-term stable operation of the equipment. If the data sent by the network is not received within the set timeout restart time, the equipment will restart, thus avoiding the influence of abnormal conditions on communication.

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

4.4.4 Short connection function

In TCP client and HTTP client mode, short network connection is supported (this function is turned off by default). TCP short connection is mainly used to save server resource overhead, and is generally applied to multi-point (multi-client) to one-point (server) scenario.

After the short connection function is turned on, it only requests to connect with the server when sending information. After the connection is successful, the device will automatically disconnect if the serial port does not receive the pilot data or the network port does not send and receive data within the set time.

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When the short connection function is turned on, the short connection time setting parameter ranges from (1-65535) seconds.

4.4.5 Connect to empty cache function

The device is in the 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 packets or 10k, which will cover the earliest received data after being larger than the buffer space. After the network connection is successful, the serial port buffer can be emptied or sent through the network through configuration.

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

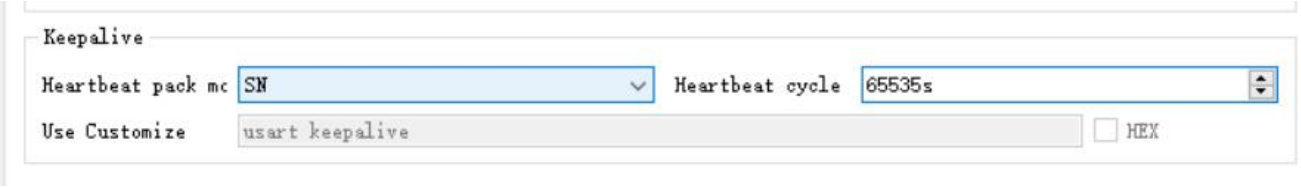
Disabled: After the connection is established, the network will receive the data cached by serial port.

4.4.6 Heartbeat pack function

The device supports serial heartbeat packet and network heartbeat packet. Serial heartbeat packet data points to serial port and network heartbeat packet points to network, which can be set separately.

4.4.6.1 Serial heartbeat packet

Serial heartbeat packet data points to serial port, which can be set in serial port parameters. SN, MAC, and custom content can be selected, which can be set in 0 ~ 65535 seconds. Serial heartbeat packet adopts idle heartbeat packet, that is, when the idle time of serial port starts timing, after the time of serial heartbeat packet arrives, the configured content is sent to serial port. See the following figure for configuration:



If the content of the serial heartbeat packet is configured as custom data, the heartbeat packet can be configured with a maximum length of 128 bytes. After checking hexadecimal beneficiation, the sent data is hexadecimal data.

4.4.6.2 Network heartbeat packet

Network Heartbeat packets are suitable for Ethernet links, only effective in client mode, and

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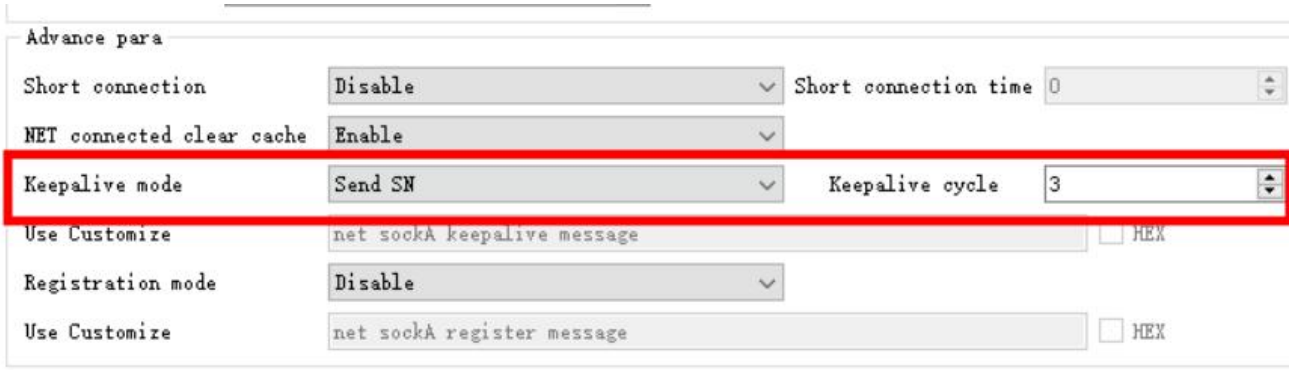
support hexadecimal and ASCII code transmission. The network heartbeat packet is not MQTT heartbeat, which is the data actively sent by the single chip microcomputer according to the configuration situation. Network heartbeat packets run independently in two links without affecting each other. SN, MAC, and custom content can be selected, which can be set in 0 ~ 65535 seconds. The network heartbeat packet adopts forced heartbeat packet, that is, when the link connection is successful, the timing starts, and after the heartbeat packet cycle time arrives, the configured content is sent to the server. See the following figure for configuration:



If the content of the network heartbeat packet is configured as custom data, the heartbeat packet can be configured with a maximum length of 128 bytes. After checking hexadecimal beneficiation, the sent data is hexadecimal data.

4.4.7 Registration package function

In client mode, users can choose to send registration packets to distinguish data or link sources, and registration packets run independently in two links without affecting each other. When using, you need to select the registration package mode, which can be selected as follows:

1. Connect sending SN;
2. Connect and send MAC;
3. Connect to send custom content;
4. Send SN per packet;
5. Send MAC per packet;
6. Send custom content per packet;

Among them, sending per packet refers to adding registration packet content before each data packet. When setting a custom registration package, you can check the hexadecimal option. When customizing the contents of the registry package, the maximum length of the registry package can be configured by 128 bytes.

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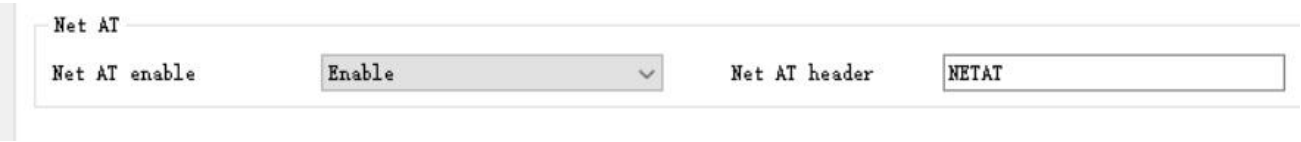
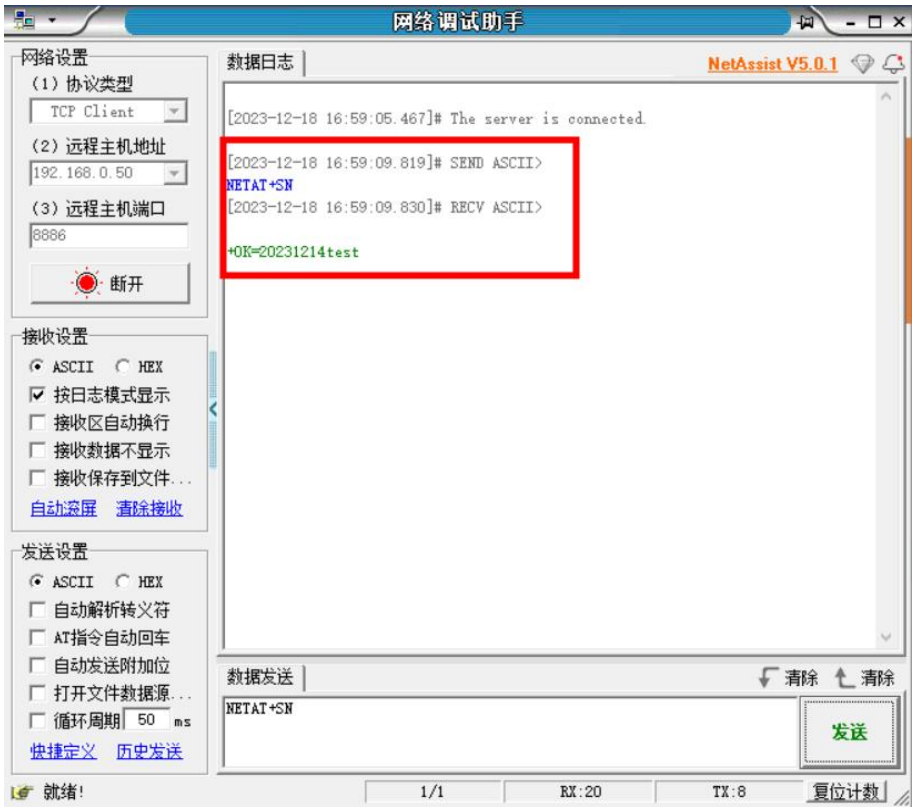
4.5 Network AT command

The device supports the network AT command, which can be enabled by modifying the parameters of the upper computer. When turned on, you can customize the instruction header.





If the current AT command header is NETAT, the link connection is successful, and the parameter query configuration can be carried out by sending instructions through the network. If NETAT + SN is sent, a data reply + OK=20241214test will be received. After the network AT is enabled, the device will analyze whether the data header is correct, such as "NETAT". If the data NETAT123 is sent, the data will be reported as an error by the device, because the device will recognize that the current instruction is sent and it is an illegal instruction, so the data will not be sent, so attention should be paid when using it.

4.6 Modbus Gateway

Note: The device supports two links, and the MOdBus gateway is valid for both links after setting up.

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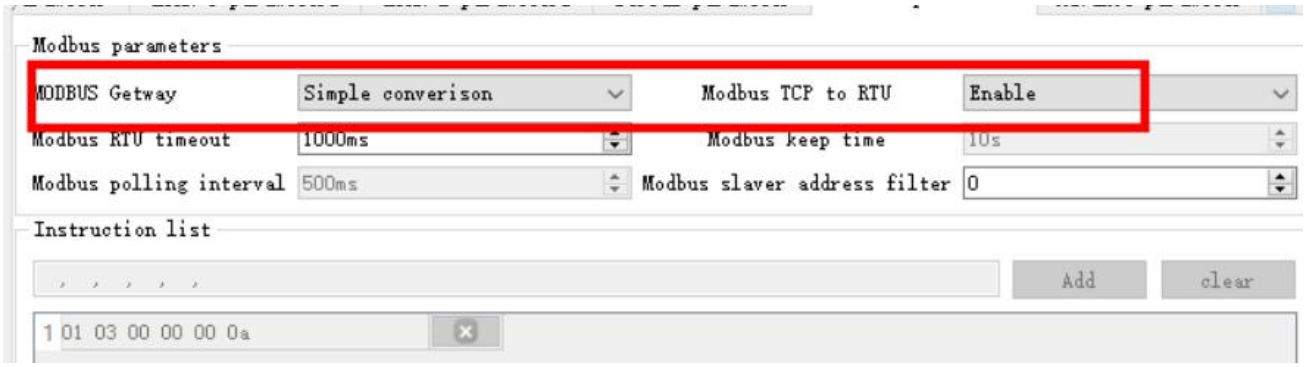
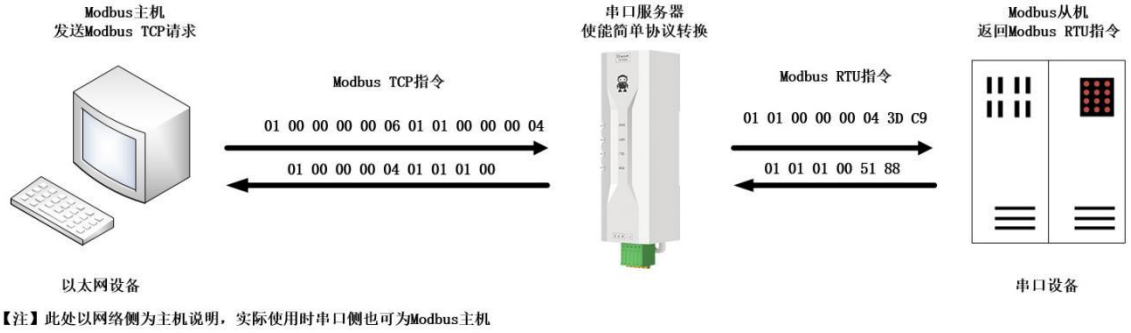
4.6.1 Simple protocol conversion mode



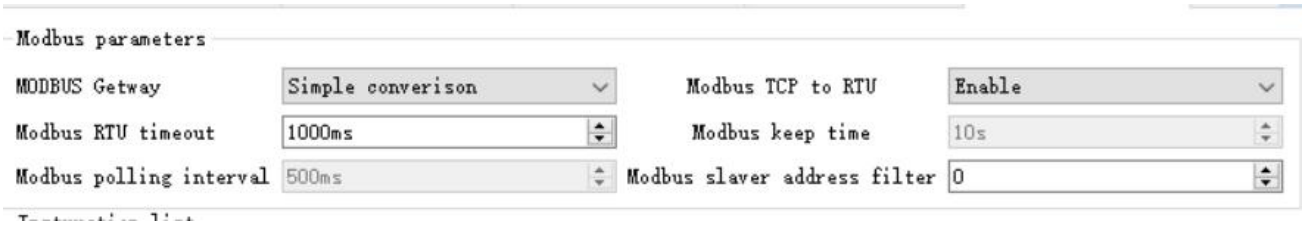
After simple protocol conversion is started, TCP to RTU is started: Modbus RTU protocol and Modbus TCP protocol are transferred to each other, and non-Modbus data (RTU/TCP) is discarded directly.

TCP to RTU shutdown: Modbus data is checked without protocol conversion, and non-Modbus data (RTU/TCP) is discarded.

Simple protocol transformation can work in any mode (TCP client, TCP server, UDP client, UDP server, MQTT client, HTTP client), no matter what mode it works in, only one Modbus master can exist.

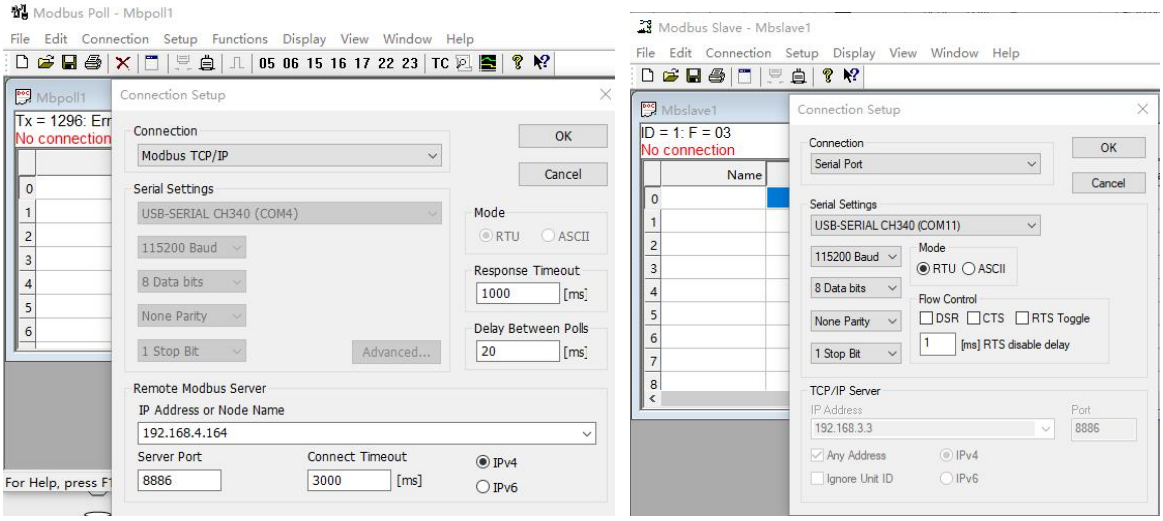


Upper computer configuration:



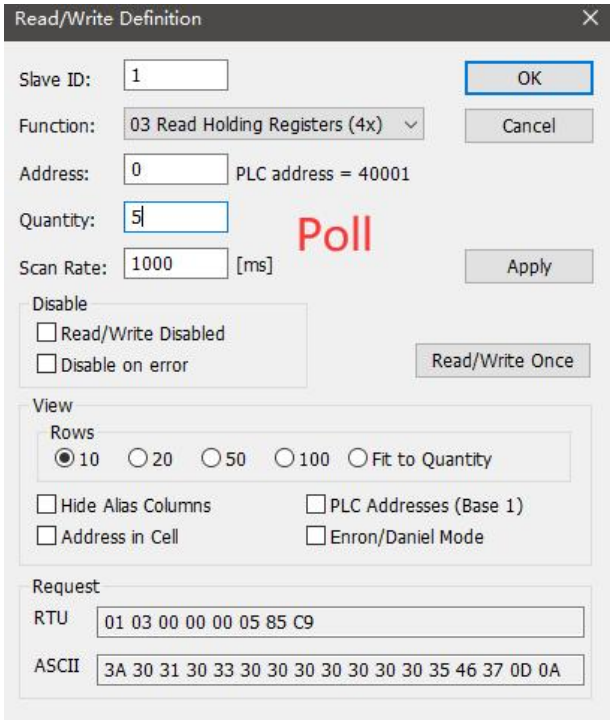
Modbus Poll and Modbus Slave Software Debugging;

Software connection settings:



Software Register Read and Emulation Configuration;

Select Setup→Read/Write Definition from the Poll menu



Slave menu select Setup→Slave Definition

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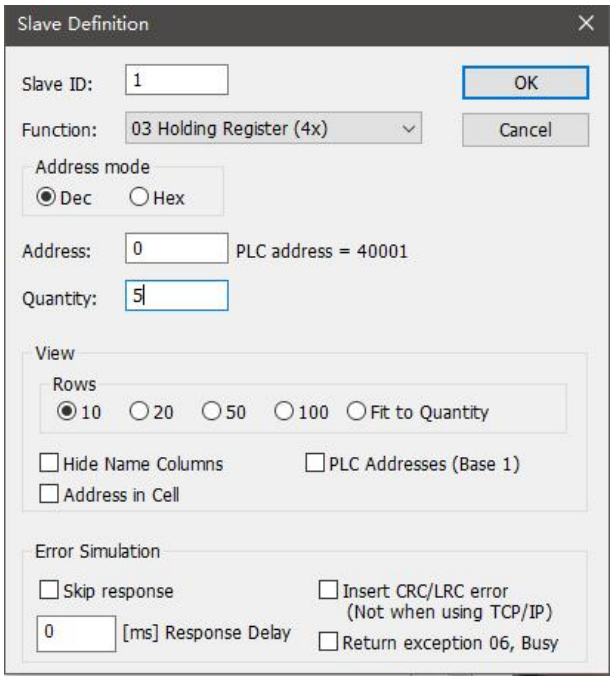
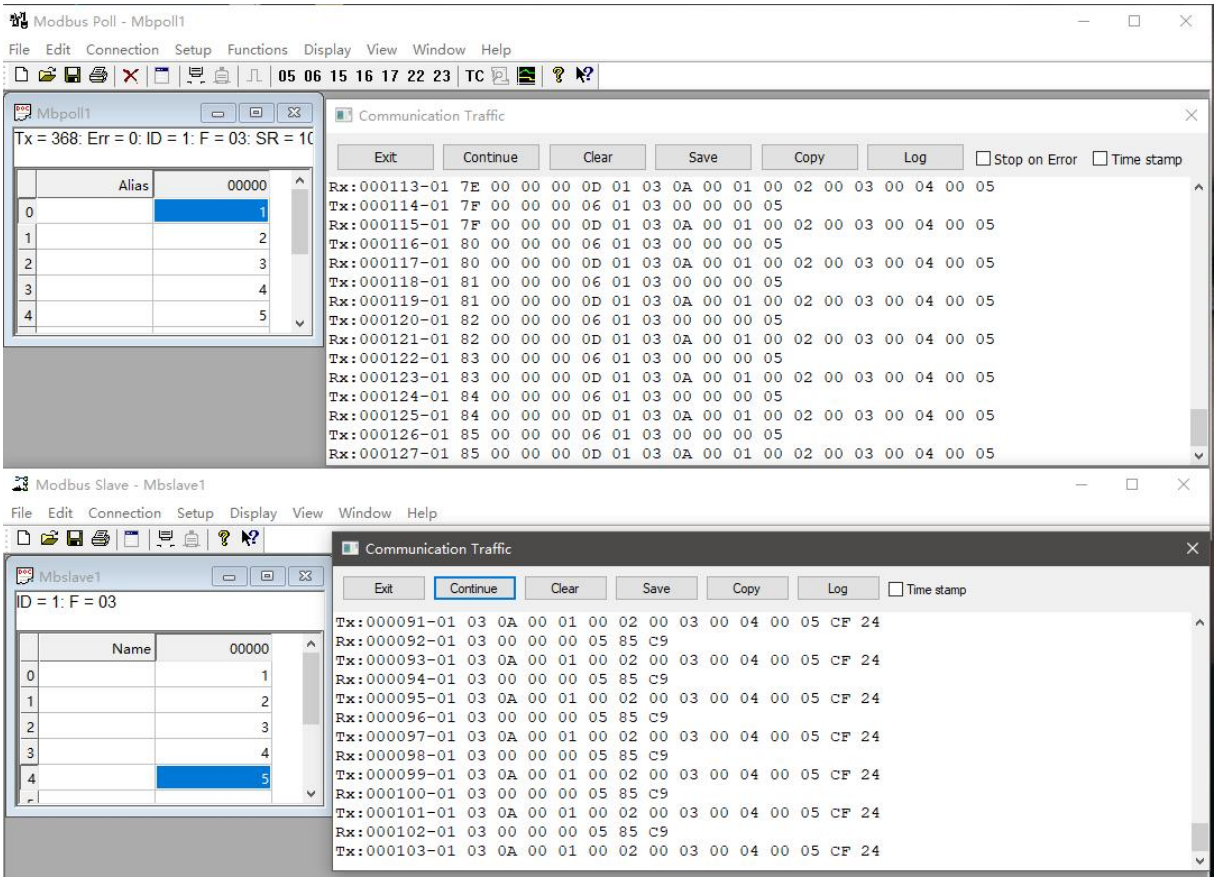


Communication demonstration:

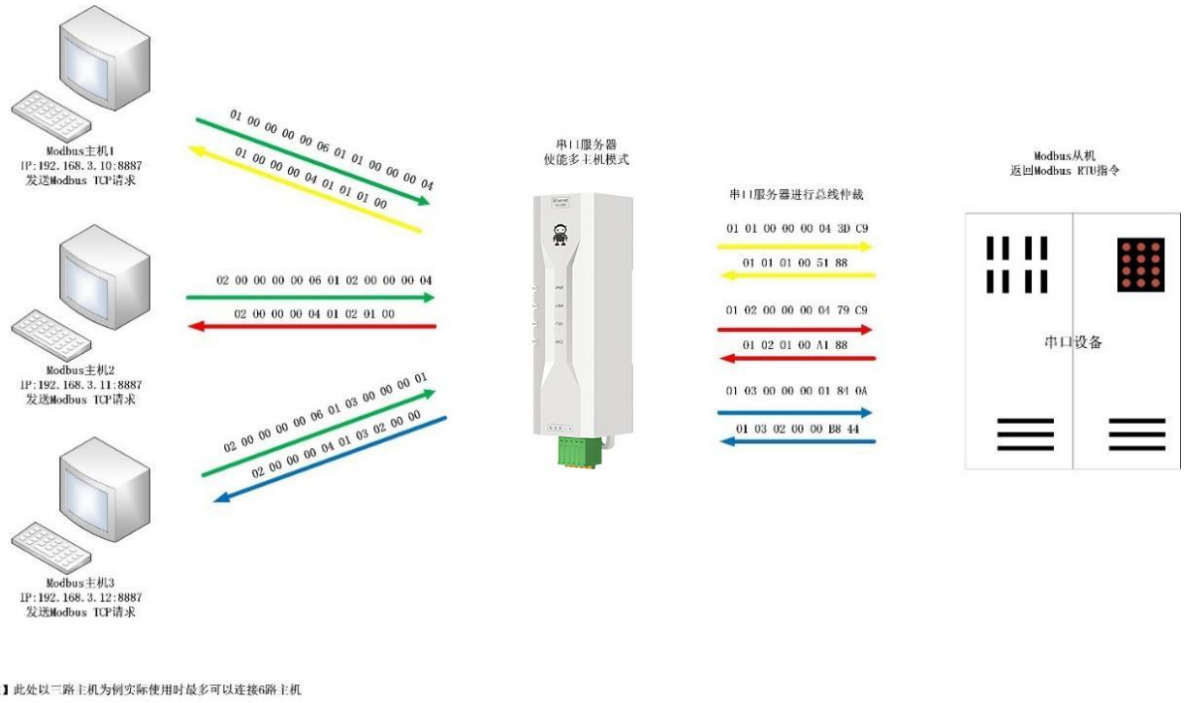


4.6.2 Multi-host mode

Multi-host mode can handle up to 5 Modbus TCP hosts. When multiple Modbus hosts visit at

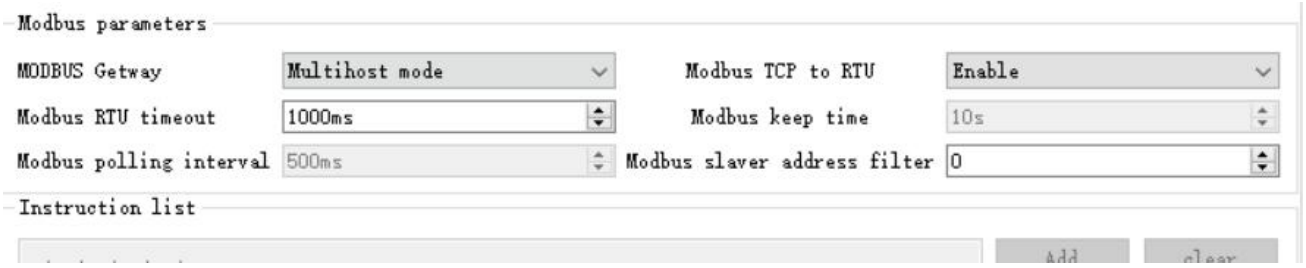
the same time, Modbus gateway will carry out bus occupancy scheduling (RS-485 bus can only handle one request at a time, while multi-host mode will sort according to TCP requests, and other links will wait), thus solving the bus conflict problem (currently only supports 6-host connection), only supports working in TCP server mode, and slaves can only work in serial port, otherwise it cannot work normally.

It is recommended to configure "simple protocol conversion" when no multiplex hosts are used.



【注】此处以三路主机为例实际使用时最多可以连接6路主机

Upper computer configuration:



Modbus Poll and Modbus Slave Software Debugging;

Refer to "Simple Protocol Conversion" for software configuration and register configuration, and turn on multiple Modbus Poll software at the same time (for example, 3 channels can support up to 5 channels).

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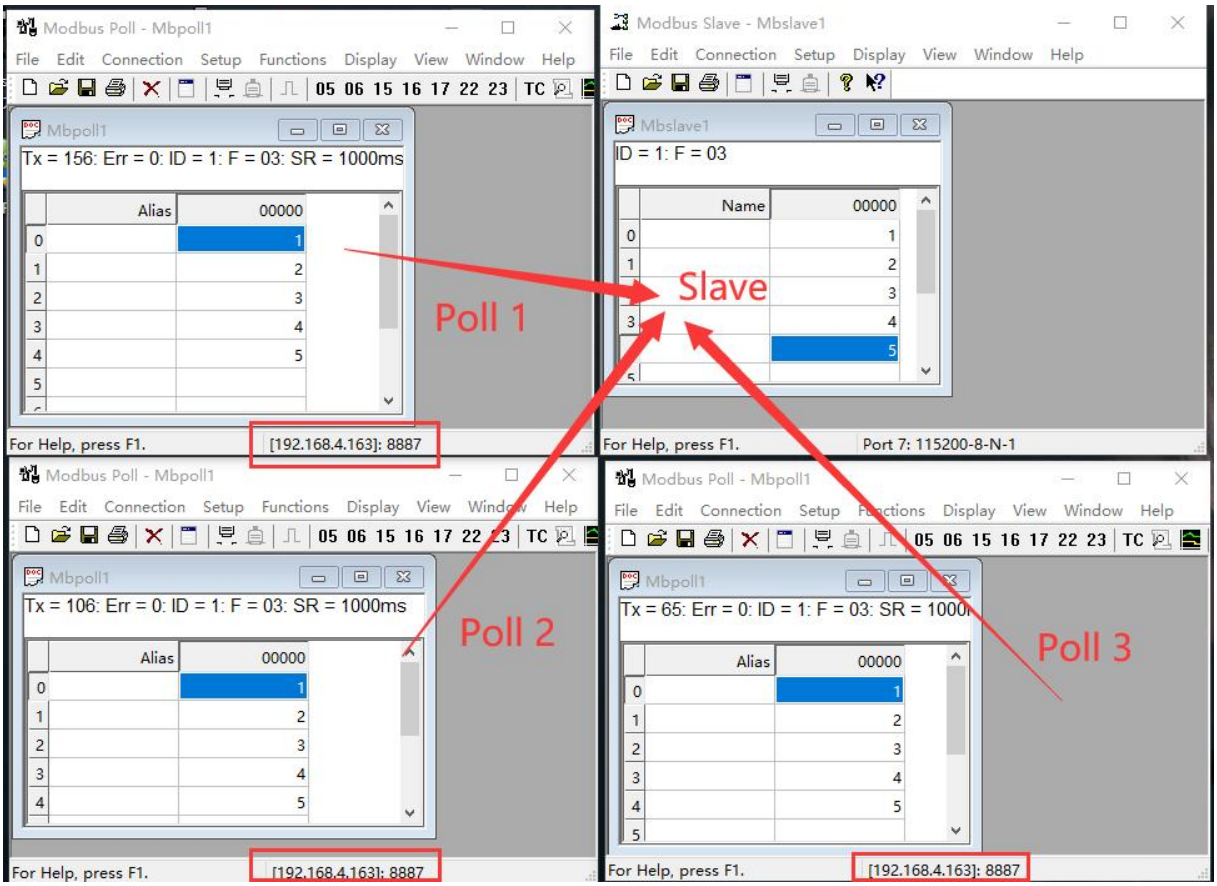

4.6.3 Storage gateway

The storage type gateway not only arbitrates the bus data but also stores the repeated read instructions. When different hosts request the same data, the gateway does not need to ask the RTU equipment register status for many times, but directly returns the cached data in the storage area, which greatly improves the multi-host request processing ability of the gateway and shortens the time consumed by the whole request process. Users can customize the polling interval and storage time of instructions in the storage area according to their needs.

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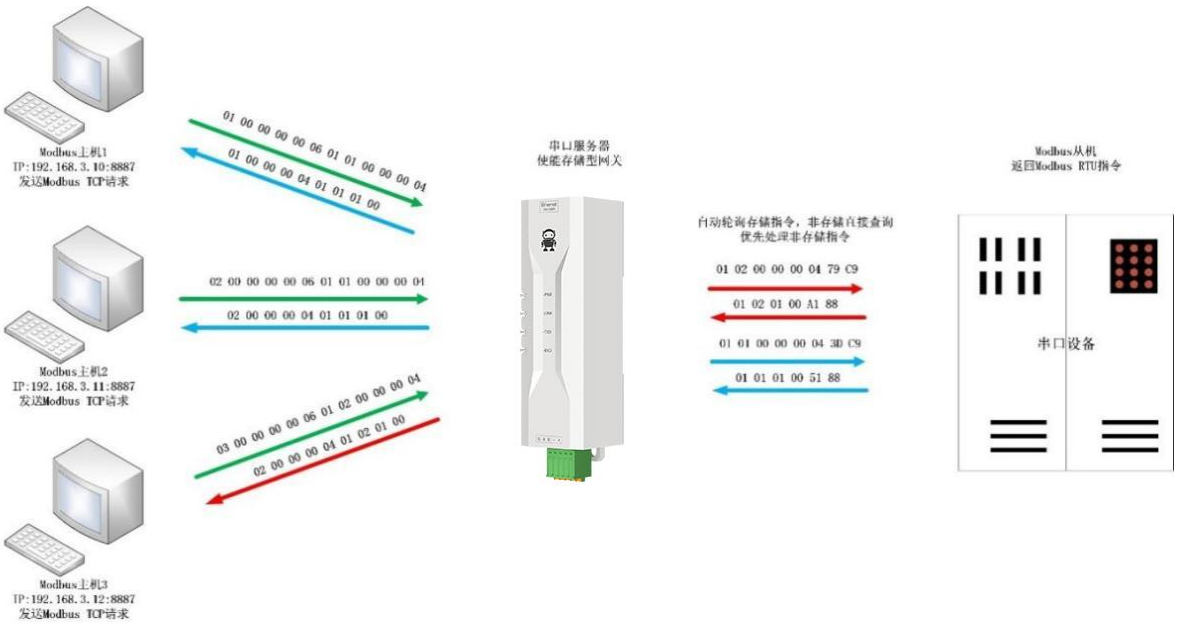

【注】此处以二路主机为例实际使用时最多可以连接6路主机

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

Features:

（1） The gateway has 10K cache for storing instructions and returning results (reading 10 hold registers as an example, it can store 300 instructions and returning results);

（2） When the RTU response timeout or the last reply time exceeds the instruction storage time, the equipment automatically empties the cache to ensure the real-time and authenticity of the data;

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

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

（5） The first instruction and control instruction (05, 06, 0F, 10 function code) will directly access RTU equipment;

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

Upper computer configuration of storage gateway;

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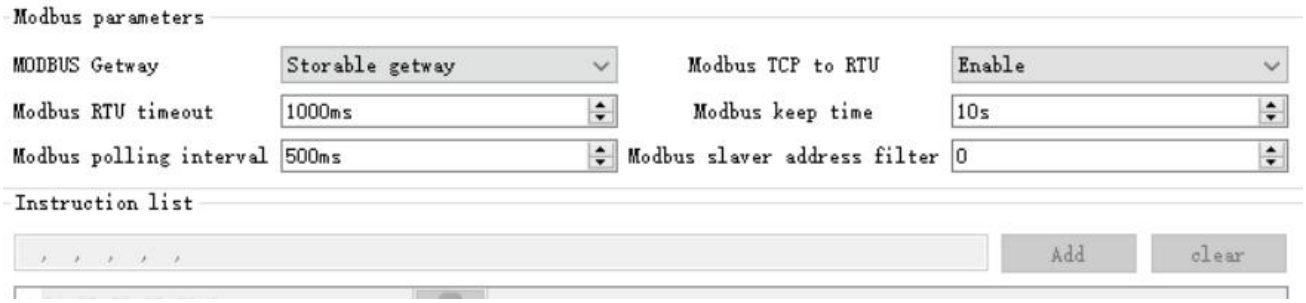
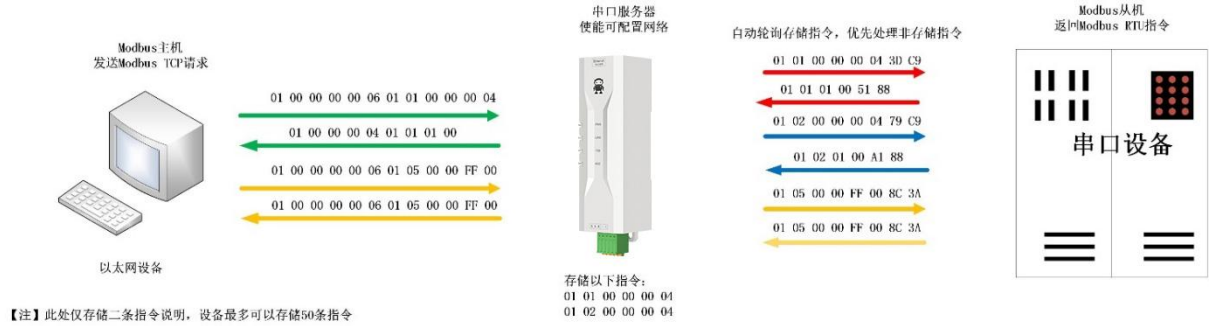
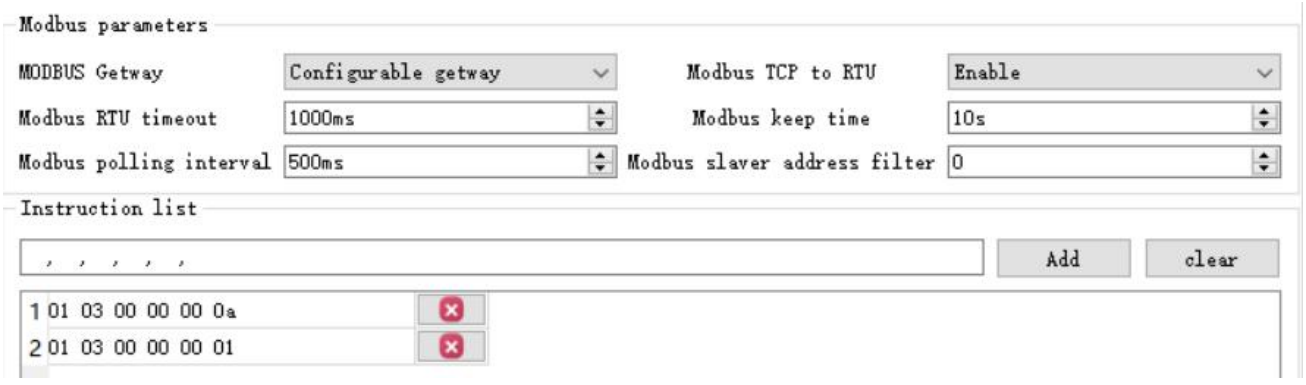


4.6.4 Configurable gateway

According to the pre-configured MODBUS instruction, the gateway automatically polls the RTU device register (only the configuration of MODBUS read instruction is supported), and the instructions in the non-storage table will directly operate the RTU device. Frequently read instructions can be stored in advance in the gateway, which can shorten the response time (query configured instructions). Because of the above characteristics, the serial port side of the configurable gateway can only be connected to the Modbus slave station.



Upper computer configuration:



Instruction storage description (add, instruction error and format error cannot be added), and only click the cross on the right side of the instruction to delete the instruction.

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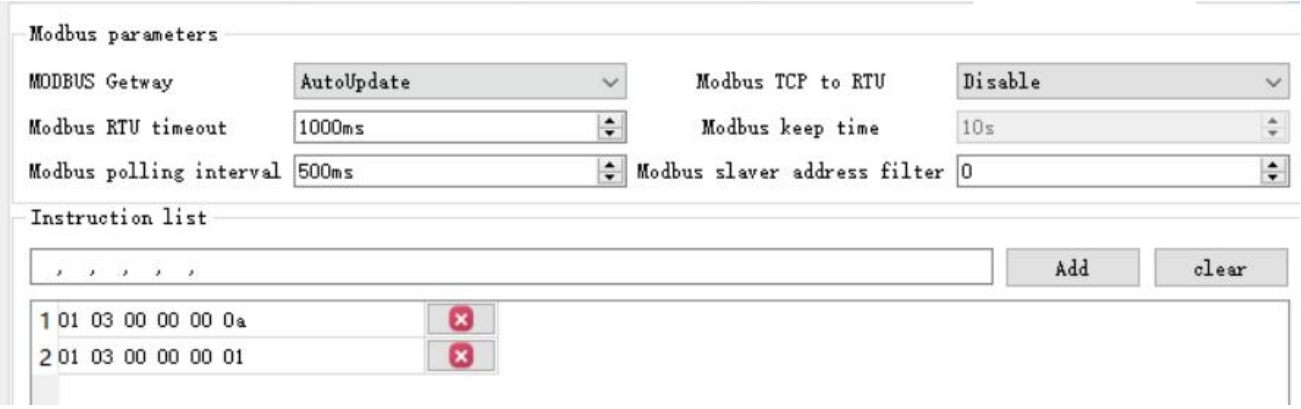
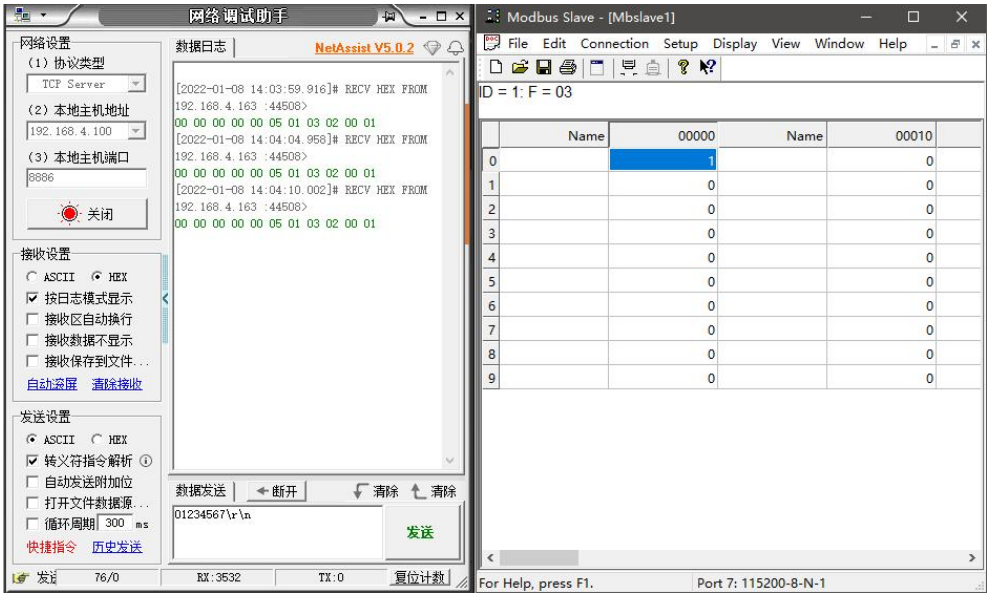
4.6.5 Automatic upload

In the 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. The feedback format (Modbus RTU format or Modbus TCP format) and the instruction polling interval (0-65535ms) can be selected according to the requirements.

Refer to "Configurable Gateway-Instruction Storage Description" for instruction pre-storage, and automatically upload the upper computer configuration:



TCP Client Demo (Modbus TCP Format):



4.7 Introduction of basic functions

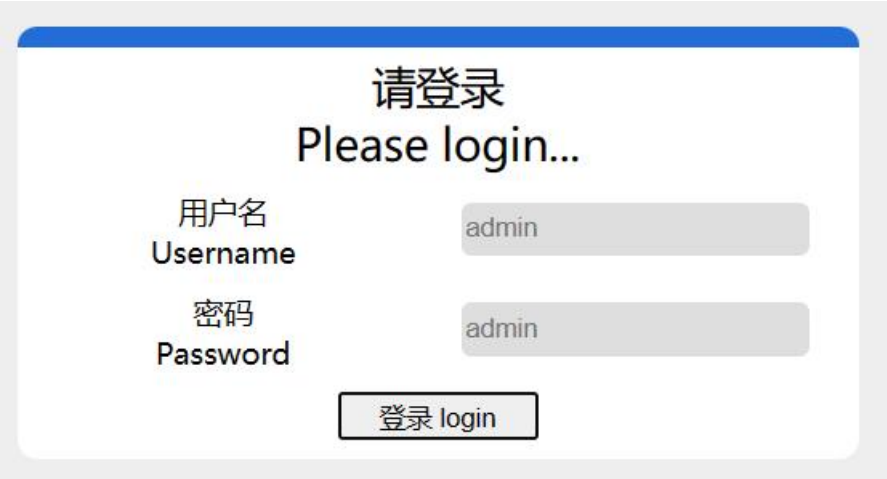
4.7.1 Web page configuration

The device has a built-in web page server, which is convenient for users to set and query

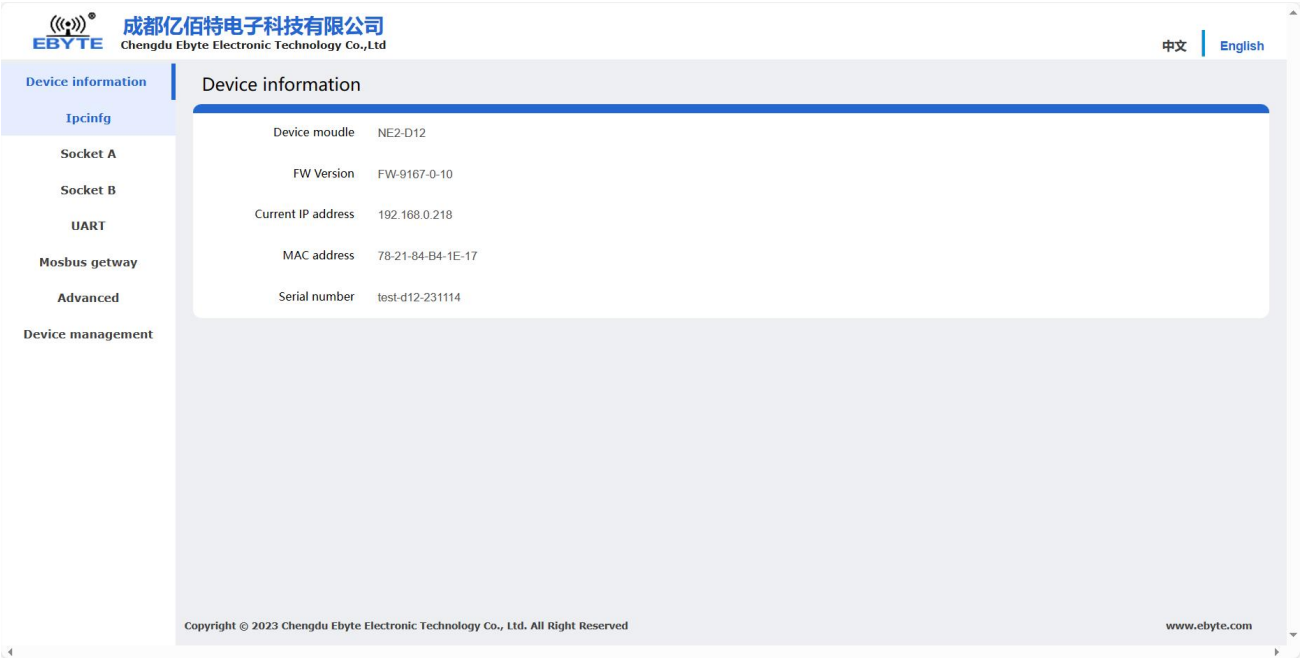
parameters through web pages.

Operation mode (Microsoft Edge version 94.0. 992.50 is an example, Google kernel browser is recommended, and only IE10 kernel browsers are supported):

- Open the browser, enter the IP address of the device in the address bar, and the default is 192.168. 3.7 (the IP address and the computer need to keep the same network segment). Forget that the IP of this machine can be queried through AT instructions and configuration software;



- Click login, default account admin, default password admin (entered, you can click login directly)



- The main interface pops up on the web page, and relevant parameters can be queried and set;
- Click "Save Parameters" in device management to save configuration parameters;

4.7.2 Restore factory settings

Press the Reload button of the device for 5-10 seconds until all LED indicators are on to release the button.

4.7.3 AT instruction configuration

The query and modification of relevant parameters of equipment can be completed through AT instruction configuration. For specific AT instructions, please refer to "AT Instruction Set".

4.7.4 Configure tool software settings

Open the configuration tool software, search for devices, double-click the identified devices, and pop up the parameter query configuration interface. You can customize and modify relevant parameters according to requirements, then save the configuration, restart the equipment and complete the parameter modification.

[Note]:

Do not use multiple host computers in the same LAN environment. The industrial computer with multiple network cards needs to be temporarily disabled without using network cards, otherwise the host computer will appear abnormal (the same equipment is displayed many times, and no equipment can be found)

The upper computer shields the wireless network card, so it must be connected with the network cable to use the upper computer, and the wireless network card can be configured through the web page.

4.7.5 Random native port

TCP client, UDP client, HTTP client and MQTT client can configure the native port to 0 (use random native port), and server mode cannot use random port, otherwise the client cannot establish connection correctly.

Using random port connection can quickly reestablish the connection when the device accidentally disconnects the server, and prevent the server from rejecting the connection because four waves are not completed. It is recommended to use random port in client mode.

The random port is automatically enabled when the device configures HTTP client, MQTT client mode.

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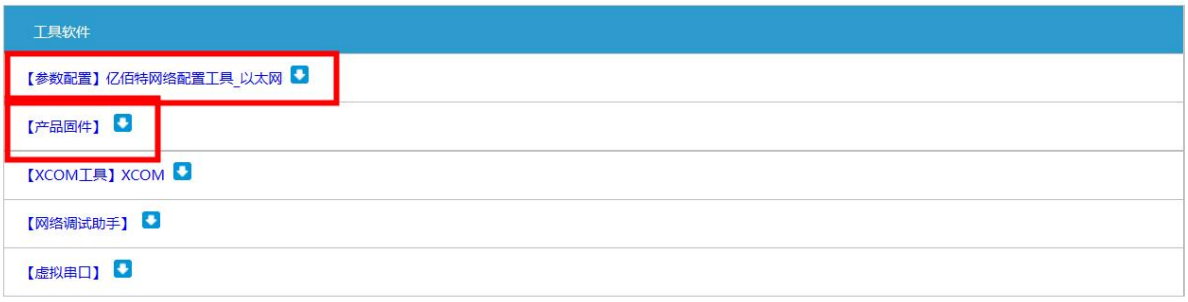
4.7.6 Remote upgrade

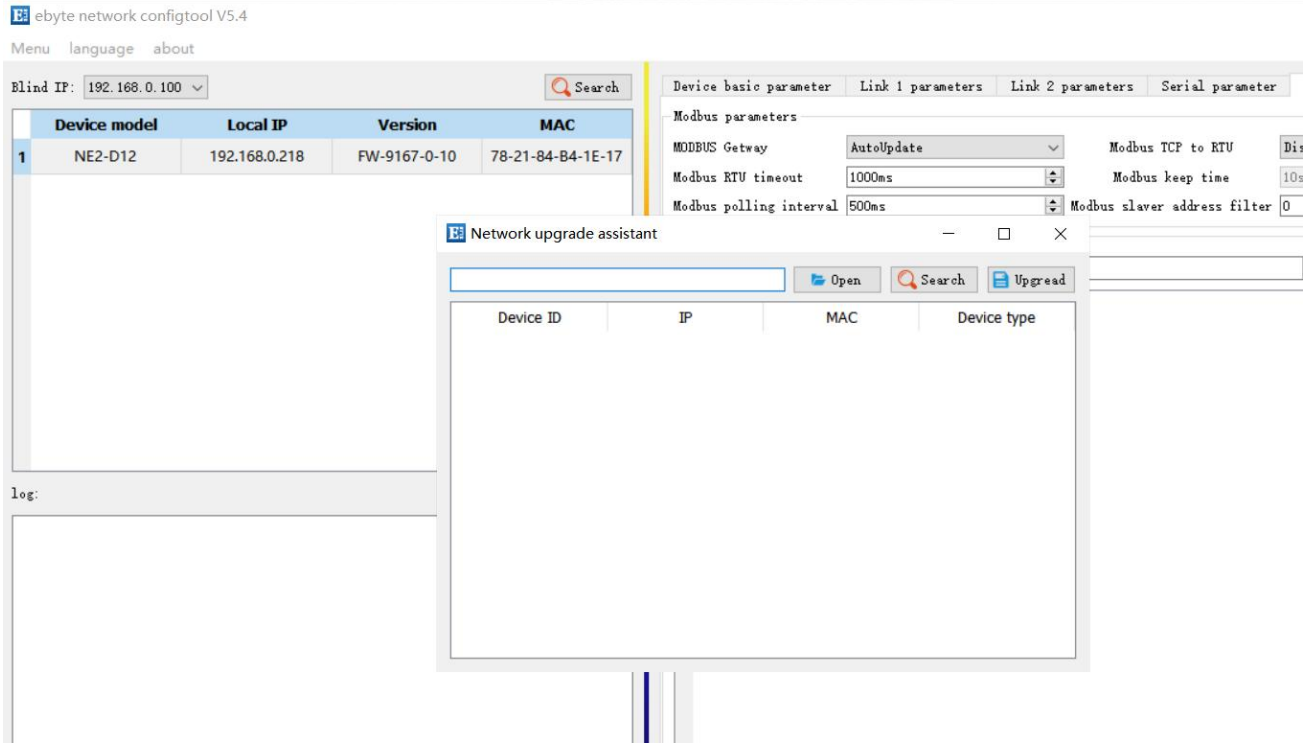
In order to facilitate the later maintenance and upgrade functions and replace different firmware, the serial server supports online upgrade, and users can upgrade or replace the current firmware through the upper computer through the upgraded firmware provided by our company.

Network upgrade firmware operation steps:

Step 1: Download the upper computer and "product firmware" at the corresponding location in official website;



Step 2: Open the upper computer, click "Menu" and select "Equipment Upgrade Assistant";



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

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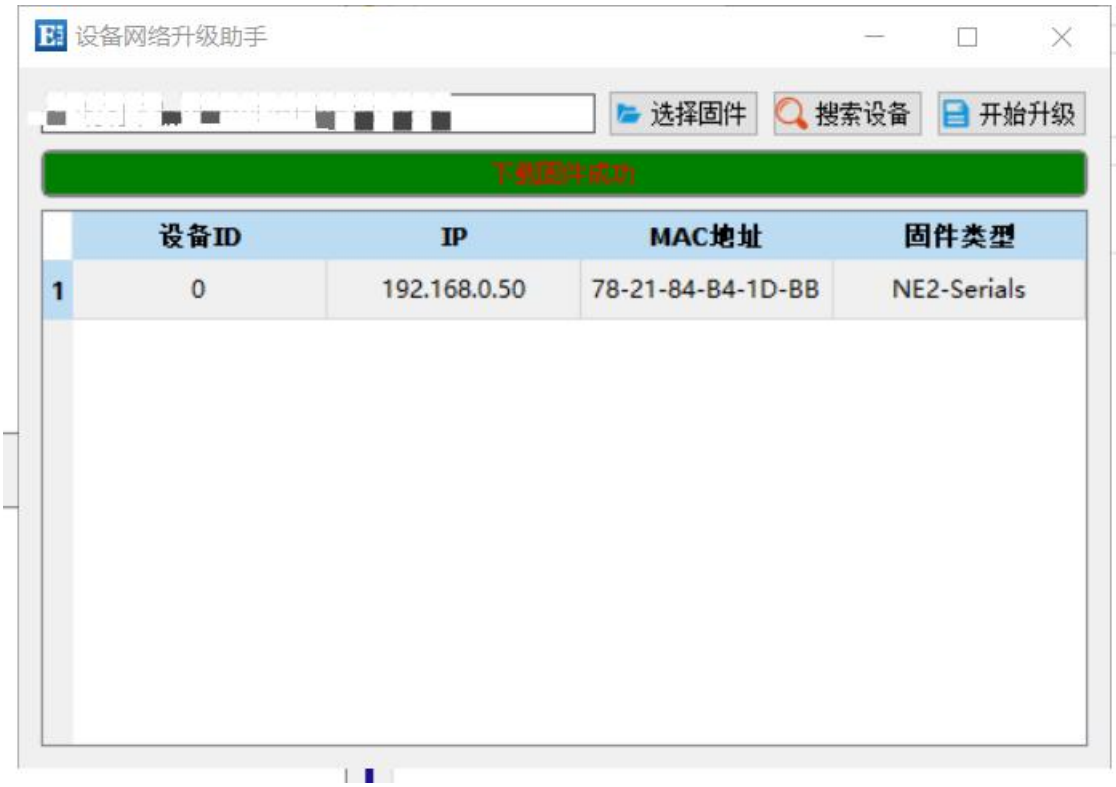
Step 4: Click "Select Firmware", select the corresponding firmware, and then click "Open";

Step 5: Select the device to be upgraded, click "Upgrade", and the progress bar will start to change, waiting for the upgrade to be completed. (From clicking "Upgrade" to starting firmware transfer, the device will not respond for about 7 seconds, which is a normal phenomenon. Please wait patiently for the upgrade)



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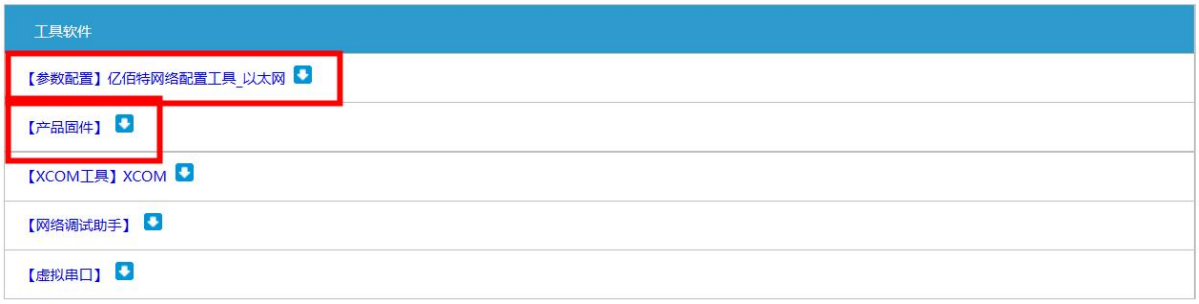
Web page upgrade firmware operation steps:

Step 1: Download the upper computer and "product firmware" at the corresponding location in official website;



Step 2: Open the upper computer, search for the current IP of the device, the default is 192.168.3.7, enter the current IP in the webpage, and enter the webpage configuration;

Step 3: Click Device Management;

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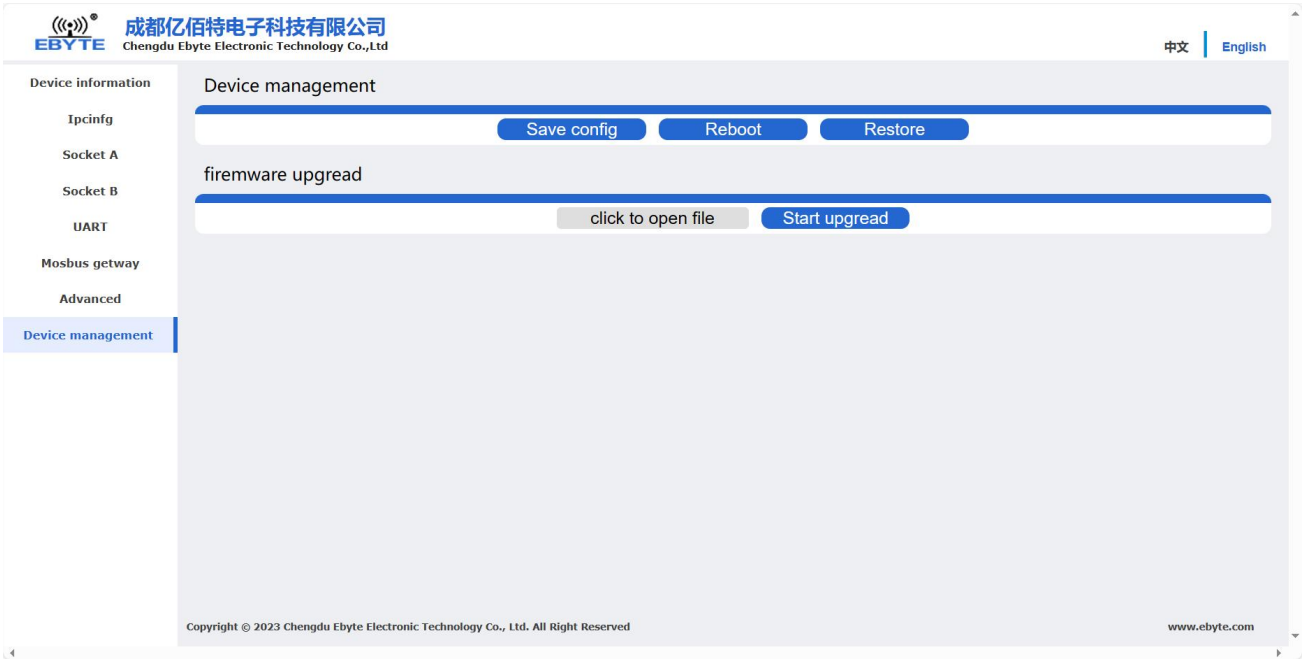
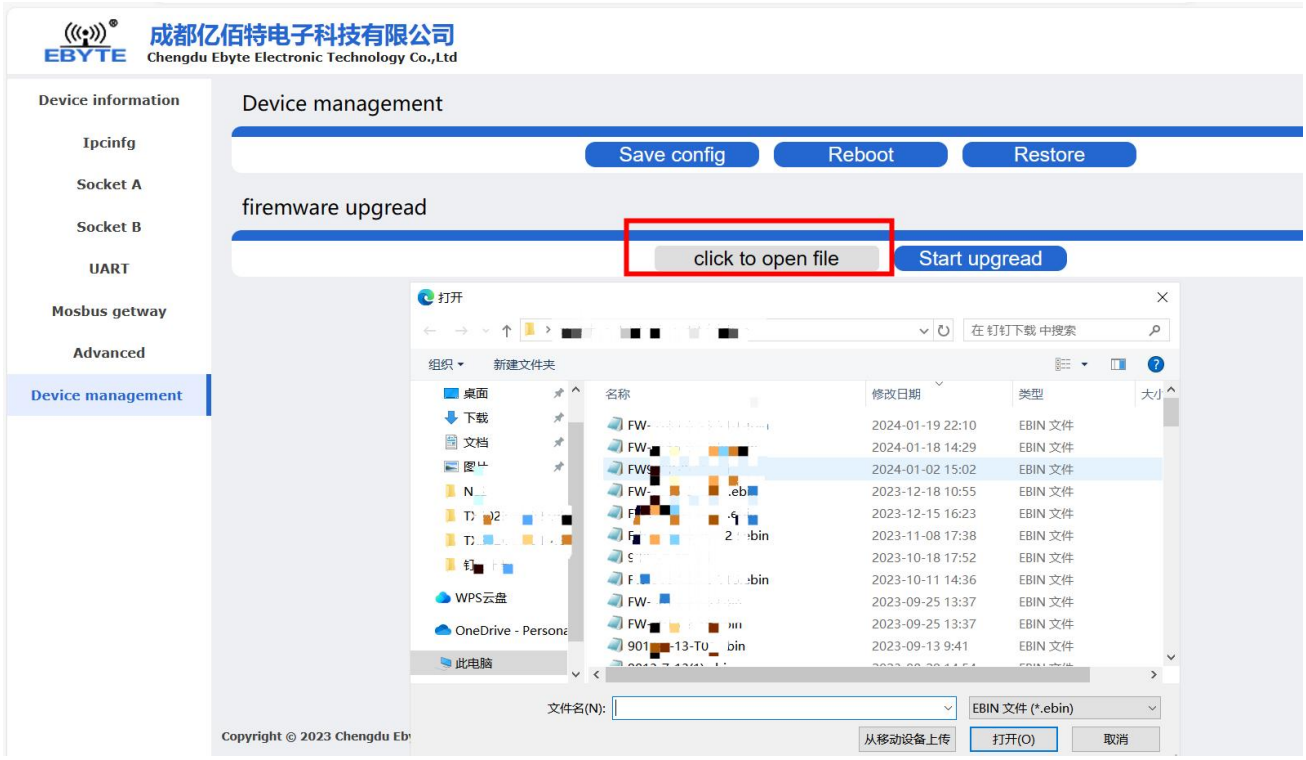


Step 4: Click "Click Select File", select the corresponding firmware, then click "Open", and then click Start Upgrade;



Step 5: Click "Start Upgrade", and the progress bar will change, waiting for the upgrade to be completed.

[Note] If the upgrade fails, you can upgrade again.

[Note] From clicking "Upgrade" to starting firmware transfer, the device will not respond for about 7 seconds, which is a normal phenomenon. Please wait patiently for the upgrade

The final interpretation right belongs to Chengdu Yibaite Electronic Technology Co., Ltd..

Revision history

Version	Revision date	Revision notes	Maintainer
1.0	2024-12-18	Initial version	LYL

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