

Serial ⇌ Ethernet
SMD module
NE2-S1/NE2-S1-TB

成都亿佰特电子科技有限公司
Chengdu Ebyte Electronic Technology Co.,Ltd.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Table of contents

Chapter 1 Product introduction 1
Chapter 2 Quick start 3
2.1 Preparation for use 3
2.2Equipment wiring 3
2.2.1Serial connection 3
2.2.2Network cable connection 4
2.3Software settings 4
2.3.1Network test environment 4
2.3.2Default parameters 5
2.3.3Data transmission test 5
Chapter 3 Product Overview 8
3.1Series products 8
3.2Technical Parameters 9
3.3Mechanical Dimensions 11
3.4Pin definition 11
3.5Hardware reference design 13
3.5.1Typical application reference connections 13
3.5.2Power circuit reference hardware connection 14
3.5.31.8V serial port circuit reference connection 3.3V 14
1.5.4 5V serial port circuit reference connection 15
3.5.5Network port built-in transformer reference connection 15
3.5.6Network port external transformer reference connection 15
3.5.7Reset circuit reference connections 16
3.5.8Reference package 16
Chapter 4 Product Features 17
4.1Basic parameters 17
4.1.1Basic parameters 17
4.1.2IP address type 17
4.1.3Domain Name Resolution (DNS) 18
4.2Network working mode 18
4.2.1TCP server mode 18
4.2.2TCP client mode 19
4.2.3UDP server mode 19
4.2.4UDP client mode 20
4.2.5HTTP client mode 20
4.2.6MQTT client mode 24
4.2.6.1Standard MQTT3.1.1 connection 24
4.3Serial port parameters 25
4.4Advanced parameters 26
4.4.1Link protocol distribution 26
4.4.2Disconnection and reconnection function 28
4.4.3Timeout restart function 28
4.4.4Short connection function 29

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

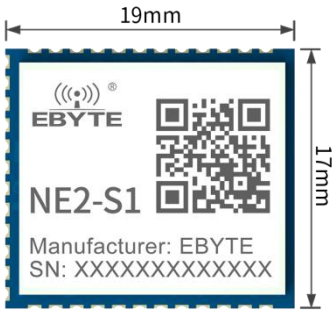
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.4.5Connect to clear cache function 29
4.4.6Heartbeat packet function 29
4.4.6.1Serial heartbeat packet 29
4.4.6.2Network heartbeat packet 30
4.4.7Registration package function 30
4.5Network AT command 31
4.6Modbus gateway 32
4.6.1Simple protocol conversion mode 32
4.6.2Multi-host mode 35
4.6.3Storage gateway 37
4.6.4Configurable gateway 39
4.6.5Automatic upload 39
1.7 Introduction to basic functions 40
4.7.1Web page configuration 40
4.7.2 Restore factory setting 41
4.7.3AT command configuration 42
4.7.4Configuration tool software settings 42
4.7.5Random local port 42
4.7.6Remote upgrade 42
Revision history 47
About Us ..... 错误！未定义书签。

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Chapter 1 Product introduction



NE2-S1 single serial port server module is used to realize bidirectional transparent transmission of data from the serial port to the Ethernet port. Users do not need to care about the specific details, and the protocol conversion is completed inside the device . It has a variety of Modbus gateway modes and MQTTC/HTTPC IoT gateway mode, which can meet the networking functions of various serial devices/PLC; it adopts industrial-grade design standards to ensure equipment reliability .

The product adopts a 1.27mm stamp hole interface and is compact in size, making it easy for users to integrate into the system.

The N E2-S1 -TB test kit comes with a USB to TTL circuit , eliminating the need for users to use an external converter. It also provides reset and restart pins for external buttons for easy operation , and also connects the operation status indicator pins to external LEDs for users to observe the status.

If problems arise during use, you can refer to our company's application cases on the official website.

Features

- Supports 10 /100M Ethernet interface , cross-direct connection adaptive ;
- The product supports 2-way Socket, each channel supports TCP Server, TCP Client, UDP Server, UDP Client, H TTPC , MQTTC
- Supports three configuration methods: configuration tool, web page, and AT command;
- Server mode supports 5- way Socket connection;
- Support DHCP function;
- Supports DNS (domain name resolution) and can customize the domain name resolution server;
- Supports a variety of Modbus gateways (simple protocol conversion, multi-host mode, storage gateway, configurable gateway , active upload mode);
- Supports quick access to Alibaba Cloud, Baidu Cloud, OneNET, Huawei Cloud, and version 3.1.1 standard M QTT servers ;
- Support HTTP protocol (GET/POST request) ;
- Support virtual serial port;
- Supports disconnection reconnection and timeout restart functions;

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

- Supports Keepalive mechanism, which can quickly detect network abnormalities and quickly reconnect
- Supports short connection function and can customize short connection interval;
- All modes support heartbeat package and registration package functions;
- Support access to external network and local area network;
- Supports one-click restore to factory settings;
- Support online upgrade function.

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Chapter 2 Quick start

If there is a problem during use, click the official website link:

https://www.ebyte.com/product-class.aspx

Note: NE2- S1 is a SMD version. When using it for the first time , it is recommended to use the test base plate (NE2-S1-TB). This chapter uses NE2- S1-TB as an explanation.

2.1 Preparation for use

Before using the serial port server (hereinafter referred to as the "device"), you need to prepare network cables, computers, USB to serial port converters and other related auxiliary materials. details as follows:

		
NE2- S1-TB	cable	computer

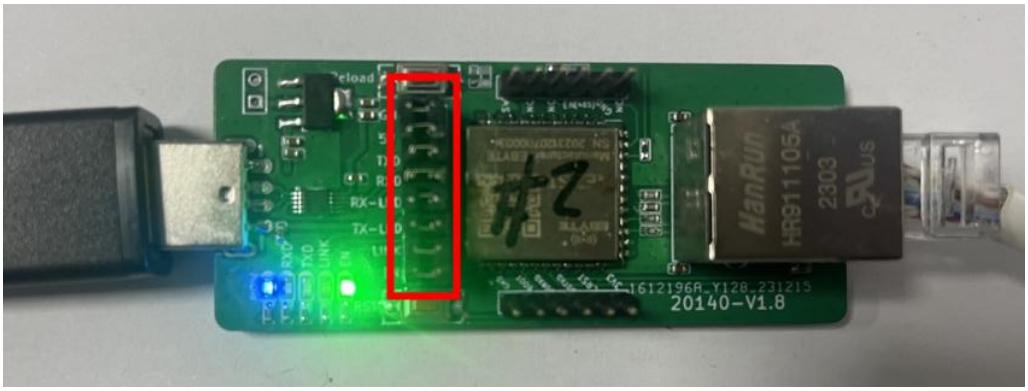
2.2Equipment wiring

2.2.1Serial connection

Connect the USB end of NE2-S1-TB to the computer. Also check whether the jumper cap is connected properly.

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



2.2.2Network cable connection

Use a standard RJ45 network cable, connect one end to the RJ45 interface of NE2-S1-TB, and the other end to the computer or switch/router interface.

2.3Software settings

2.3.1Network test environment

This prevents customers from experiencing server search failures, inability to open web pages and other related problems during actual applications. First check the relevant settings of the computer.

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

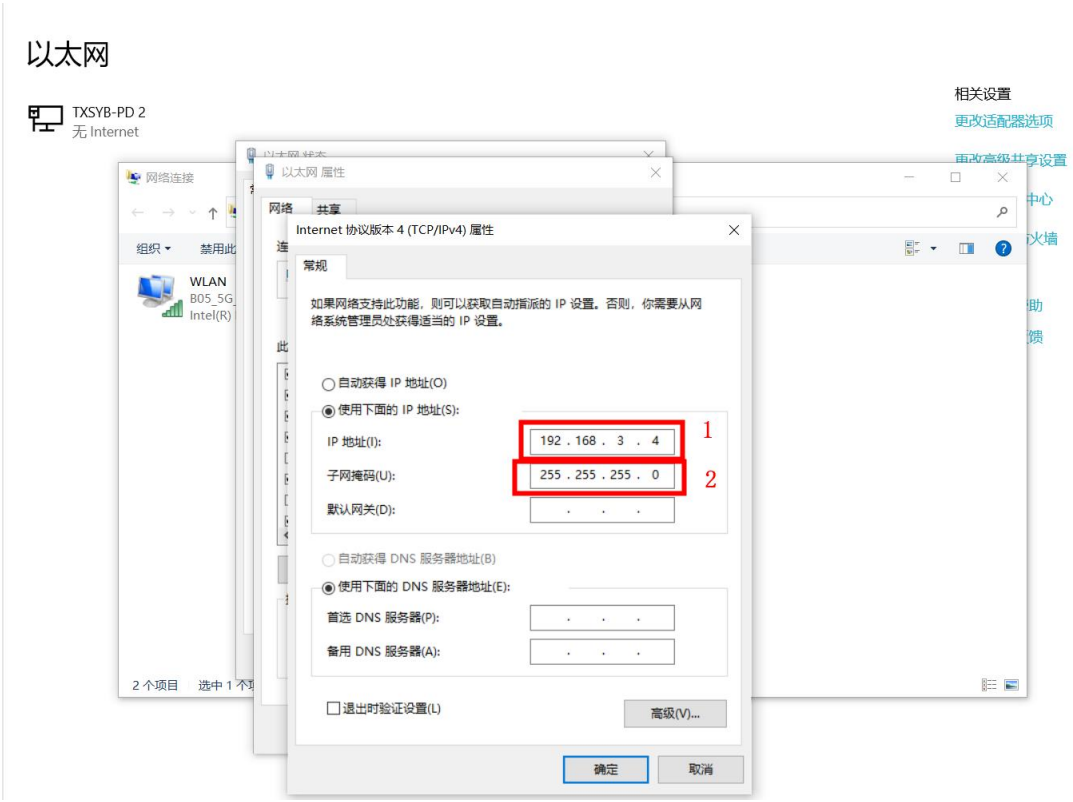
（2） Configure the network card connected to the device;

（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 serial server, 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: 1 92.168.3. xxx);

（4） Here, configure the static IP of the computer to 1 92.168.3. 4 (the same network segment as the serial port server), configure the subnet mask to 2 55.255.255.0 , and configure the default gateway to 1 92.168.3.1 ;

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



2.3.2Default parameters

project	Default parameters
IP address	192.168.3.7
Default local port	888 6
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

2.3.3Data 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:

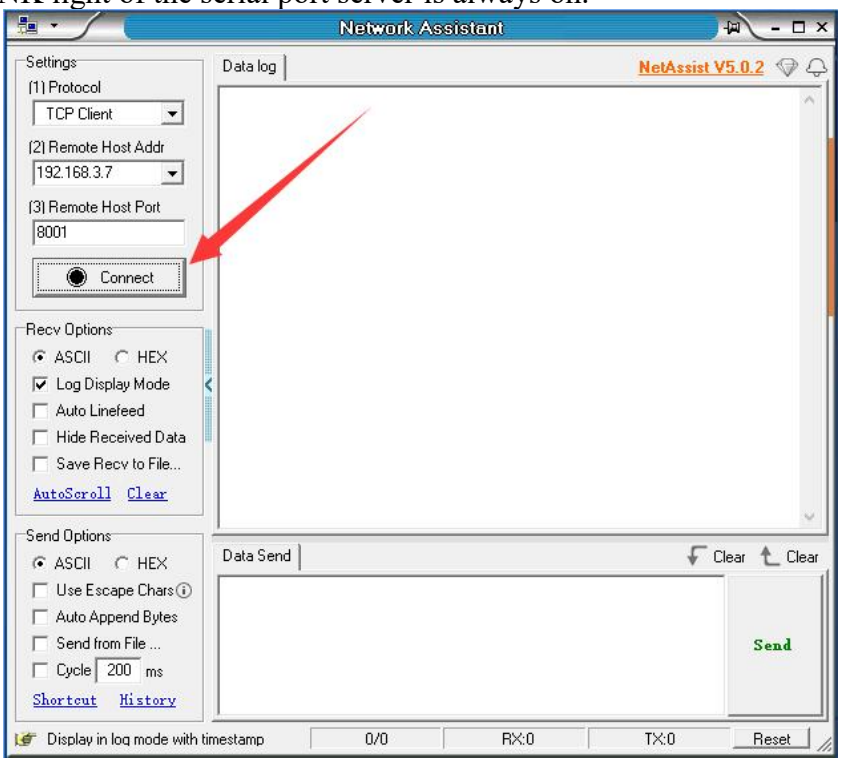
（1） Open the test TCP/IP debugging assistant software.

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

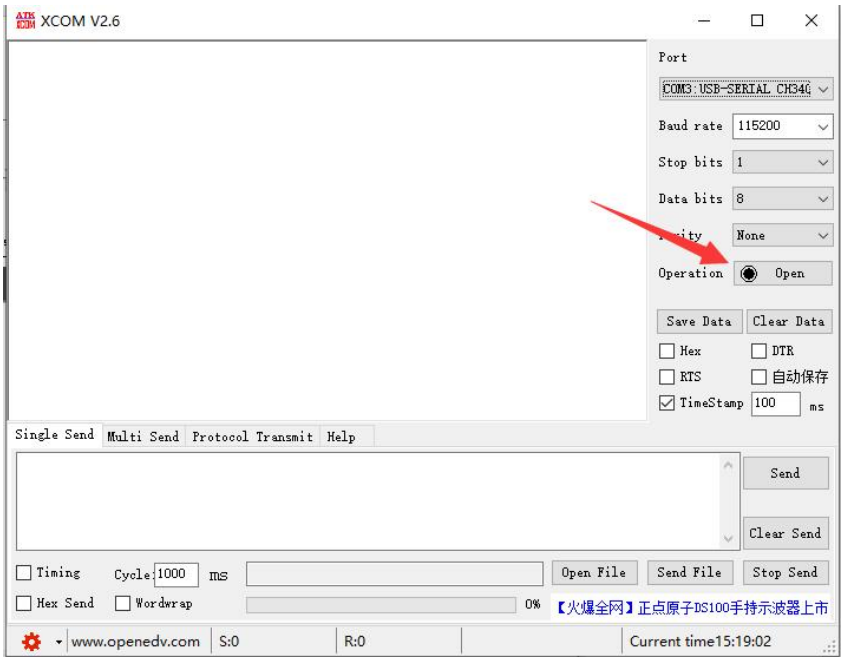
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

（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 888 6 , and click Connect.

（3） Wait for the computer to connect to the serial port server. After the connection is completed, the LINK light of the serial port server is always on.



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

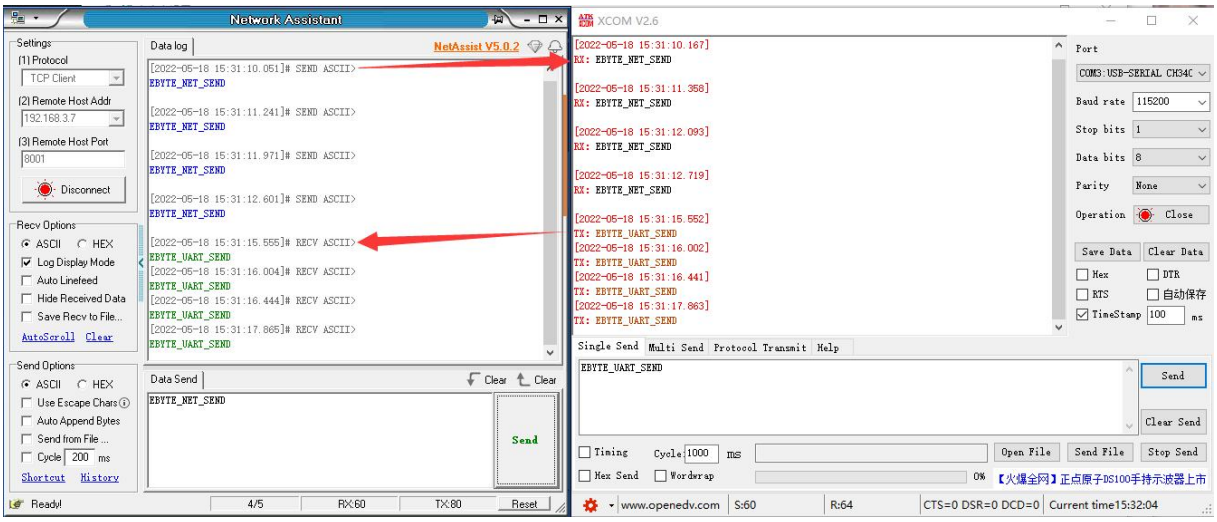


（5） Data transmission test, the serial port assistant (serial port side) sends test data, and the

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

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).



Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Chapter 3 Product Overview

3.1Series products

Product number	product type	Socket Number of connections	Operating mode	Working voltage (V)	Product Size (mm)
NE2-S1	SMD module	2×5 way	TCP Ser ver TCP Client UDP Ser ver UDP Client M QTT Client H TTP Client _	DC 3. 1~6 or 3.0~3.6	17×19×4
NE2-T1	Direct plug module	2×5 way		DC 3. 1~6	35×22× 25
N E2-T1B					
NE2-D11	DTU	2×5 way		DC 8 ~ 28	80×28×27
NE2-D1 2				DC 8 ~ 28	

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3.2Technical Parameters

Item	Description
Operating Voltage	DC 3.1~6 V If powered by 5.0V, it is recommended that the power supply load capacity be above 300mA
Working current	Peak value: 180mA@5V Standby: 50mA@5V
encapsulation	1.27mm stamp hole
Operating mode	TCP Server (default), TCP Client, UDP Server, UDP Client, H TTP Client, M QTT Client
Socket connection	The single link placed by the TCP server supports 5 client connections
Network protocol	TCP/UDP, M QTT , H TTP , IPv4, DHCP, DNS
IP acquisition method	Static IP (default) , DHCP
DNS domain name resolution	support
Domain name resolution server	1 14.114.114.114 (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	888 6 (customizable)
subnet mask	255.255.255.0 (customizable)
gateway	192.168.3.1 (customizable)
Serial buffer	10k Byte or 1024 packets
Packaging mechanism	Maximum 1024 Byte , 1~80 bytes idle time
Serial port baud rate	6 00 ~4608 00 bps (default 115200)
data bits	5, 6, 7, 8 (default)
Stop bit	1 (default), 1.5, 2
Check Digit	None (default), Odd, Even
Product Size	19×17 mm (L × W × H)
product weight	2g ± 1g _
Working temperature and	-40 ~ +85℃, 5% ~ 95%RH (no condensation)

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

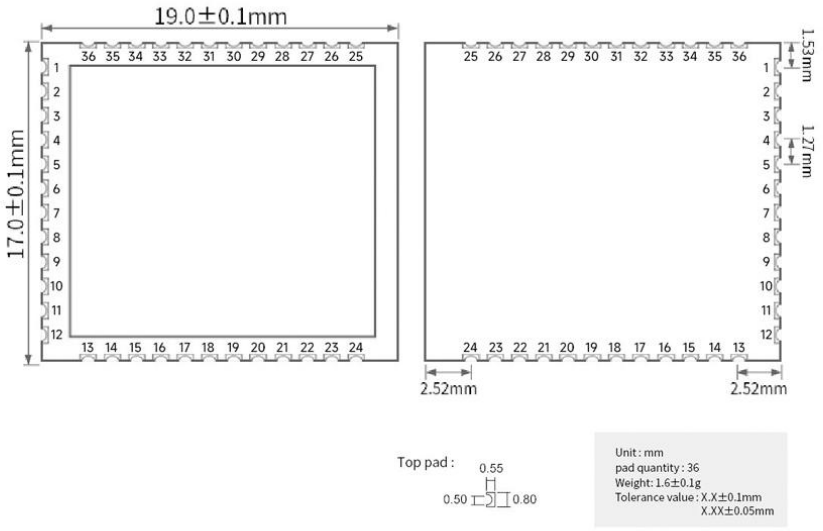
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

humidity	
Storage temperature and humidity	-40 ~ +105℃, 5% ~ 95%RH (no condensation)

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3.3Mechanical Dimensions



3.4Pin definition

Serial number	Pin function	Description
1	RX_P	Ethernet receives RX+ signal ;
2	RX_N	Ethernet receives RX-signal ;
3	TX_P	Ethernet sends TX+ signal ;
4	TX_N	Ethernet sends TX-signal ;
5	NC	Default is left floating ;
6	NC	Default is left floating;
7	TXD	When sending data through the serial port, the T TL level communication voltage only supports 3.3V . If it is connected to 5 V , level conversion is required;
8	NC	Default is left floating;
9	NC	Default is left floating;
10	RXD	The serial port receives data and only supports T TL level communication voltage; 3.3V , if connected to 5 V , level conversion is required;

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

11	485_EN	The serial port works in full-duplex mode by default. If an external 485 chip is connected, the pin is connected to a 1k pull-down resistor. The pin function becomes the RS485 enable control pin. When the serial port sends data, it is set high and the normal state is low ;
12	NC	Default is left floating;
13	NC	Default is left floating;
14	NC	Default is left floating;
15	RST	External reset input, valid for low level for more than 100ns , internal weak pull-up;
16	NC	Default is left floating;
17	LINK	High : The network cable is not connected; 2Hz square wave : The network cable connection is normal but the link is not connected ; Low : The network link is connected successfully;
18	NC	Default is left floating;
19	NC	Default is left floating;
20	I O_RST	Restore factory pin, internal weak pull-up, can be connected to an external reset button, low level lasts for about 5~10s to restore factory settings ; Low level lasts for 200~800ms to restart the device;
21	NC	Default is left floating;
22	TX_LED	The serial port data sending LED indicator light outputs high level by default and outputs a 10Hz square wave when sending data;
23	GND	Common ground terminal, negative terminal input of power supply;
24	VCC	DC 3.1~6 V If powered by 5.0V, it is recommended that the power supply load capacity be above 300mA
25	GND	Common ground terminal, negative terminal input of power supply;
26	RX_LED	The serial port data receiving LED indicator light outputs high level by default and outputs a 10Hz square wave when receiving data;
27	NC	Default is left floating;
28	NC	Default is left floating;
29	NC	Default is left floating;
30	NC	Default is left floating;
31	LINKLED	100M PHY indicator, pulls low after PHY negotiation is successful, and flashes when data is sent and received;
32	SPDLED	10M PHY indicator, pulls low after PHY negotiation is successful, and flashes when there is data being sent and received;

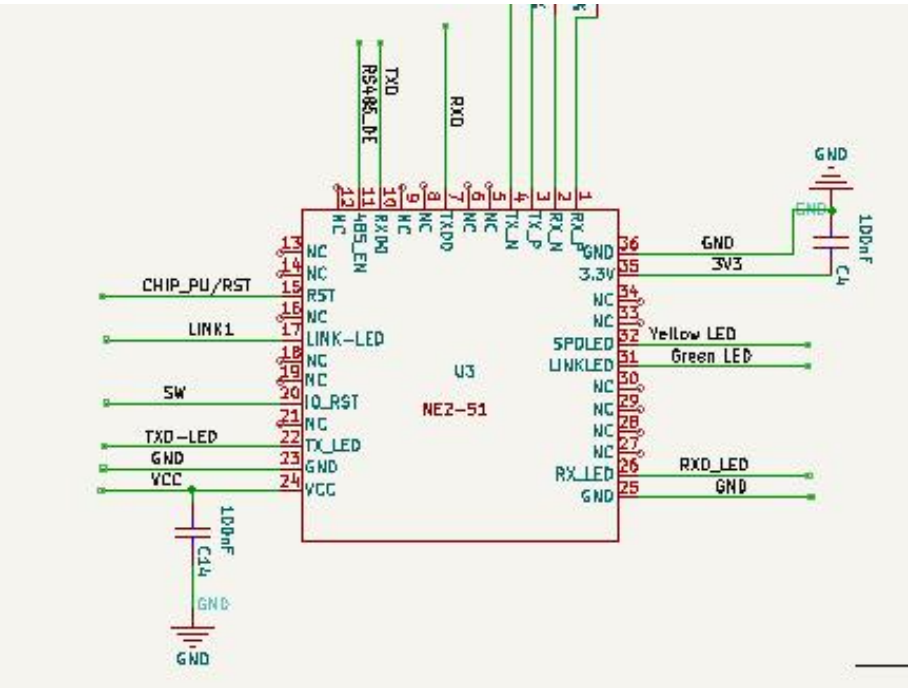
Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

33	NC	Default is left floating;
34	NC	Default is left floating;
35	VOUT	3.3V@50ma，It provides a maximum output capacity of 50ma
36	GND	Common ground terminal, negative terminal input of power supply;

3.5Hardware reference design

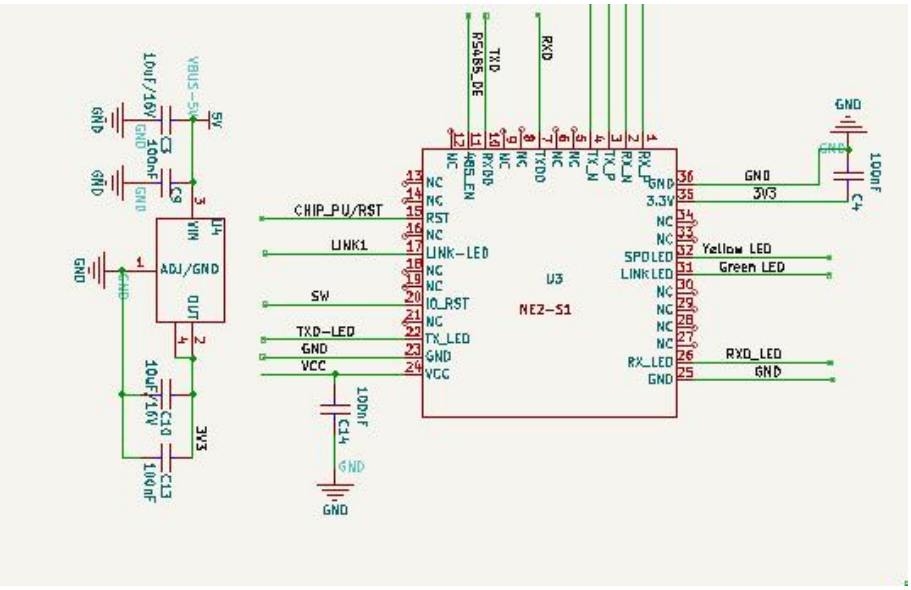
3.5.1Typical application reference connections



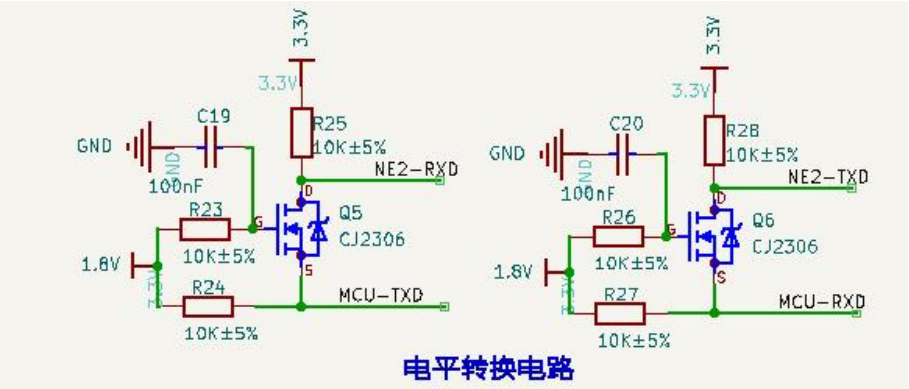
Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3.5.2Power circuit reference hardware connection



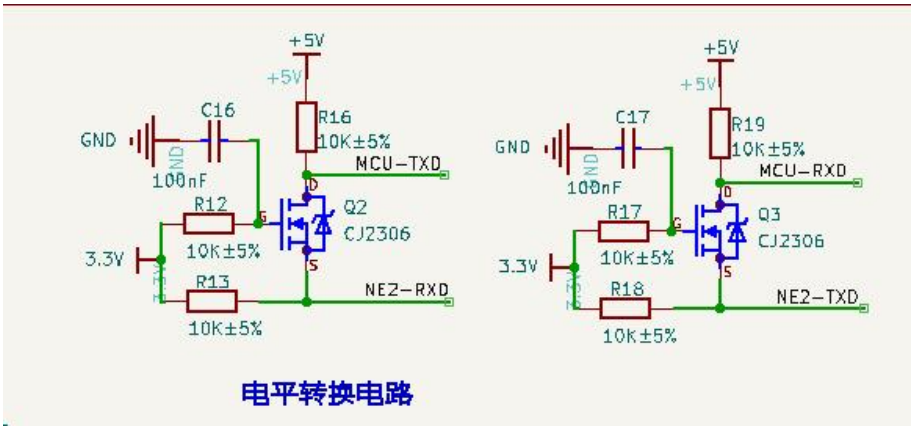
3.5.31.8V serial port circuit reference connection 3.3V



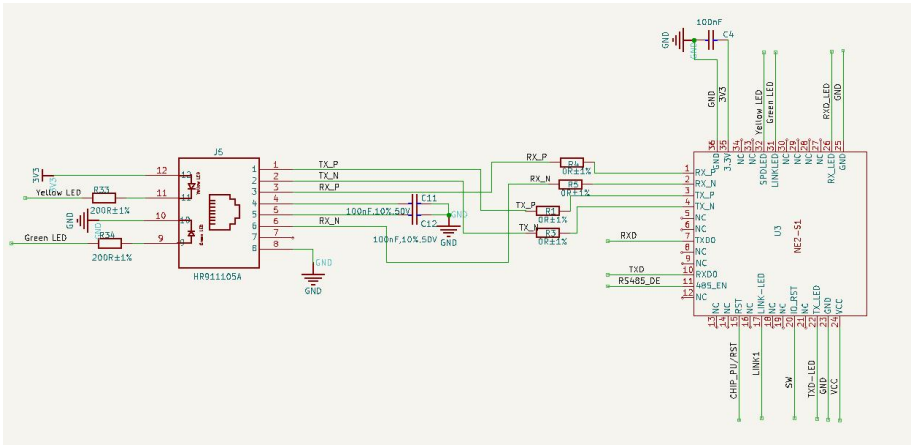
Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

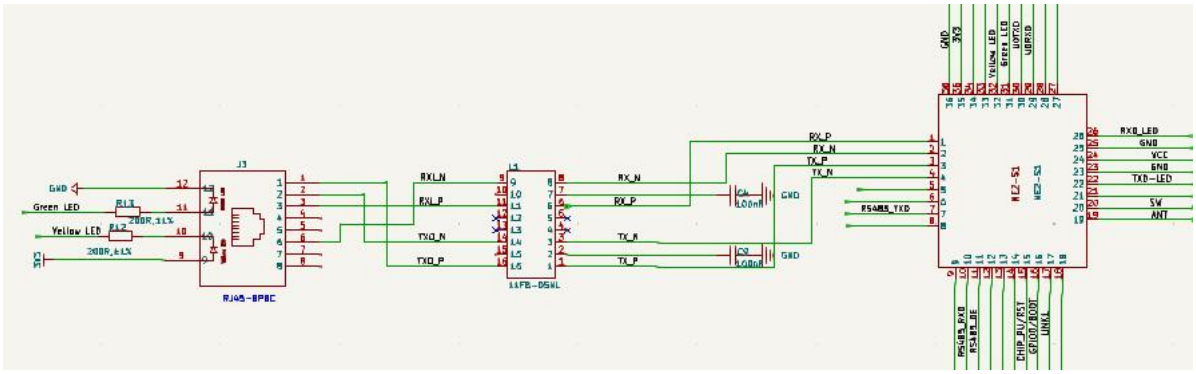
1.5.4 5V serial port circuit reference connection



3.5.5Network port built-in transformer reference connection



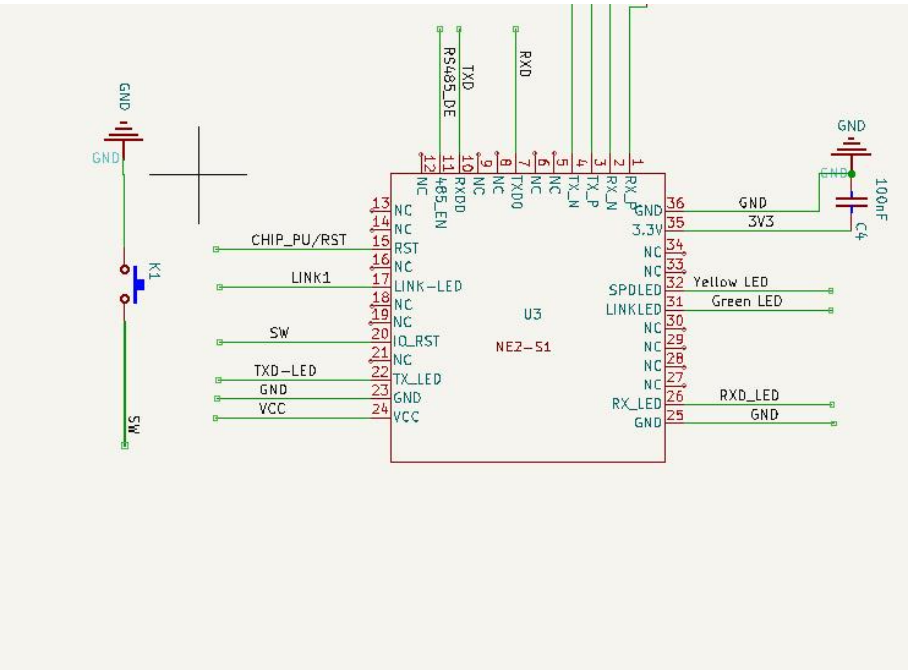
3.5.6Network port external transformer reference connection



Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3.5.7Reset circuit reference connections



3.5.8Reference package

In order to facilitate customers' hardware layout, Ebyte has made corresponding PCB packaging libraries. Please download specific documents from the official website

https://www.ebyte.com

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Chapter 4 Product Features

4.1Basic parameters

4.1.1Basic parameters

The SN code is a traceability code written when the device leaves the factory, highlighting the batch number of the device. It can only be read, not written.

The device model is the full name of the current device model. You can use this model to obtain information from the official website.

The firmware version is the factory firmware model of the current device. You can download the latest firmware update from the official website.

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

4.1.2IP 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, thereby eliminating the cumbersome 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.

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

The subnet mask is mainly used to determine the network number and host number of the IP address, to indicate the number of subnets, and to 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 module's current IP address is located. If you connect to a device such as a router when connecting to the external network, the gateway is the route .

4.1.3Domain Name Resolution (DNS)

Domain name resolution uses a domain name resolution (DNS) server to convert domain names into network-identifiable IP addresses. 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. In this way, no matter how the server IP address changes, as long as the corresponding domain name remains unchanged, the setting parameters of NE2-S1 do not need to be changed. 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 router's domain name server is abnormal. The device will report to the custom domain name resolution (DNS) server during domain name resolution. Parse the request and return the device connection parameters (usually IP address) after the parsing is completed.

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

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 , or the domain name resolution server can be customized .

4.2Network working mode

4.2.1TCP server mode

TCP Server is the TCP server. In TCP Server mode, the device listens to the local port, accepts

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

client connection requests and establishes connections for data communication. It is usually used for communication with TCP clients in the LAN. When in server mode, the device supports 5 client connections, such as two If all Sockets start server mode at the same time, it can support 10 client connections.

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 5 client connections. After the Modbus gateway function is enabled, non -Modbus data will be cleared and will not be forwarded. .

4.2.2TCP 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 .

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

4.2.3UDP server mode

UDP Server means that the device does not verify the data source IP address when communicating using the UDP protocol. After each UDP packet is received, the source IP address and source port of the packet are saved, and set 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 with 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 U DP mode, the data sent by the network to the device should be less than 1024 bytes per packet, and the excess data will be lost .

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.2.4UDP 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 .

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

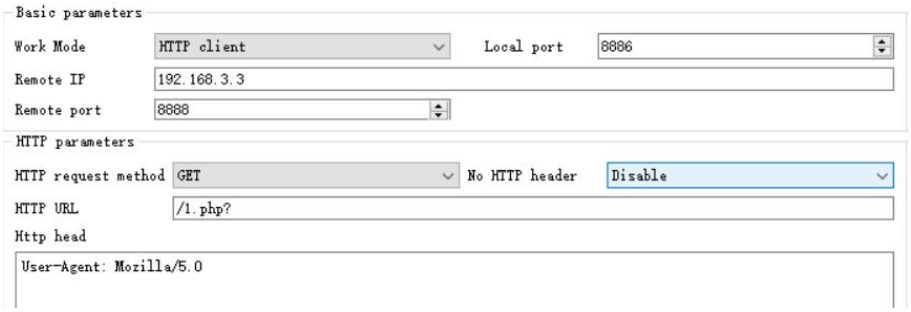
4.2.5HTTP client mode

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 random ports and enable short connections to save HTTP server resources.

1. G ET

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

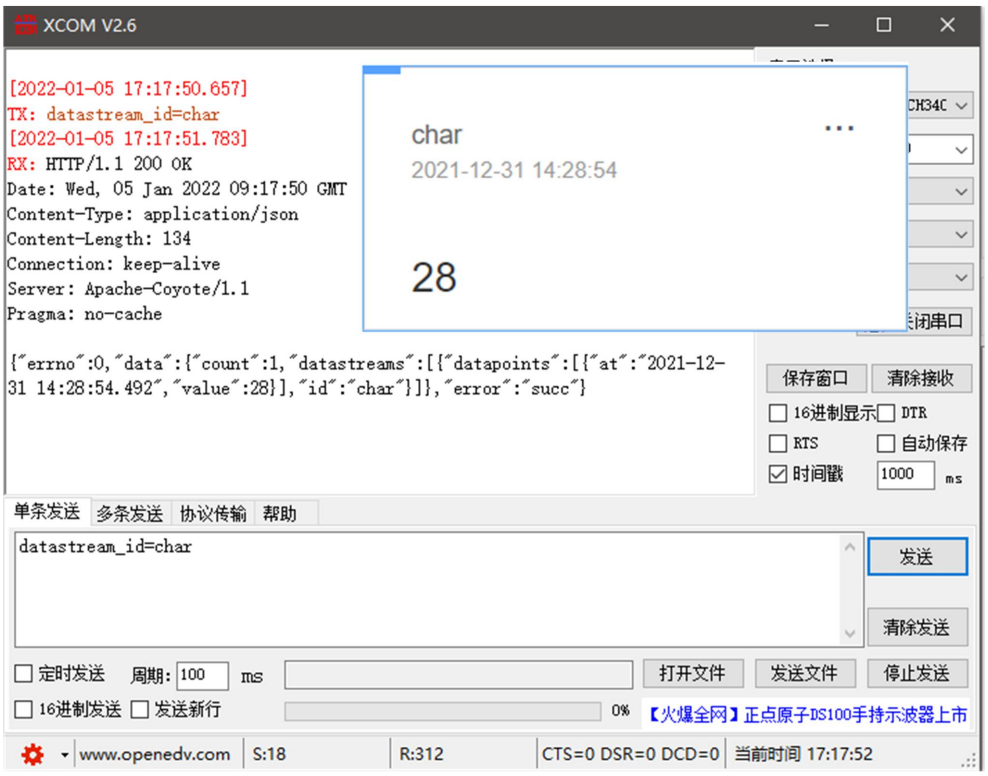
(1) Return data configuration with header:



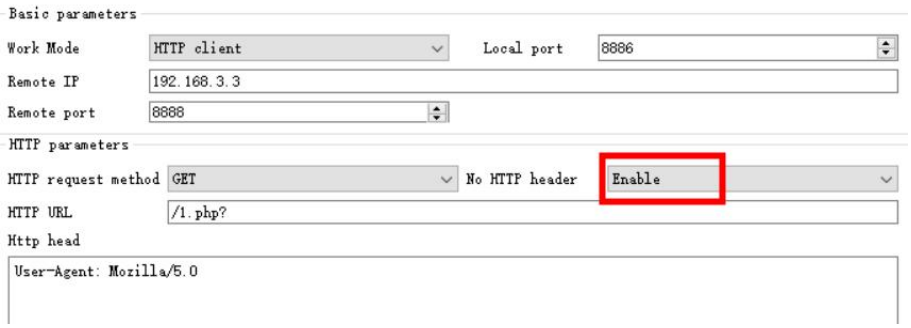
Data return test:

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



(2) Return data configuration without header:



Data return test:

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

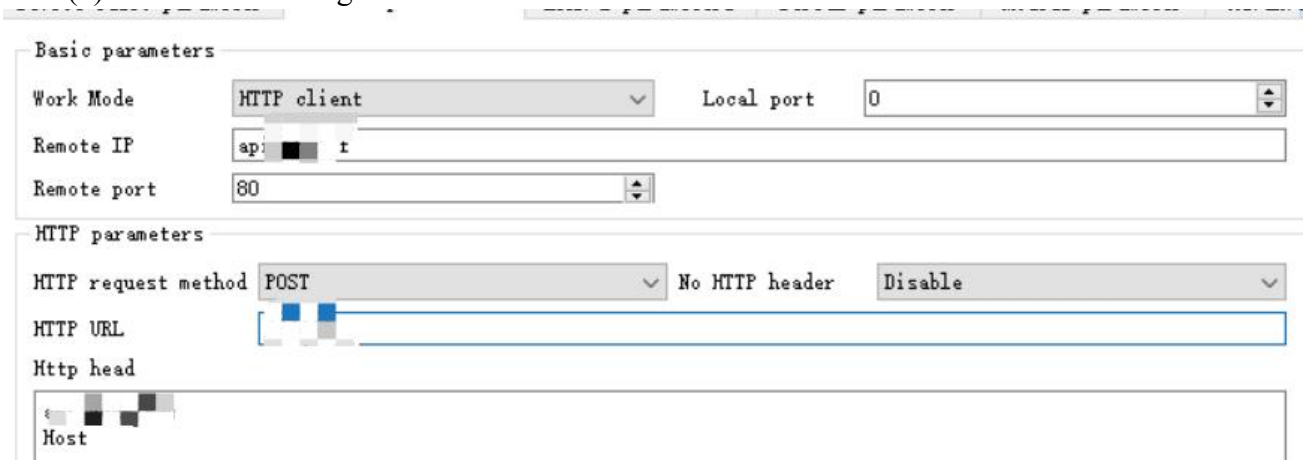
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



2. POST

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

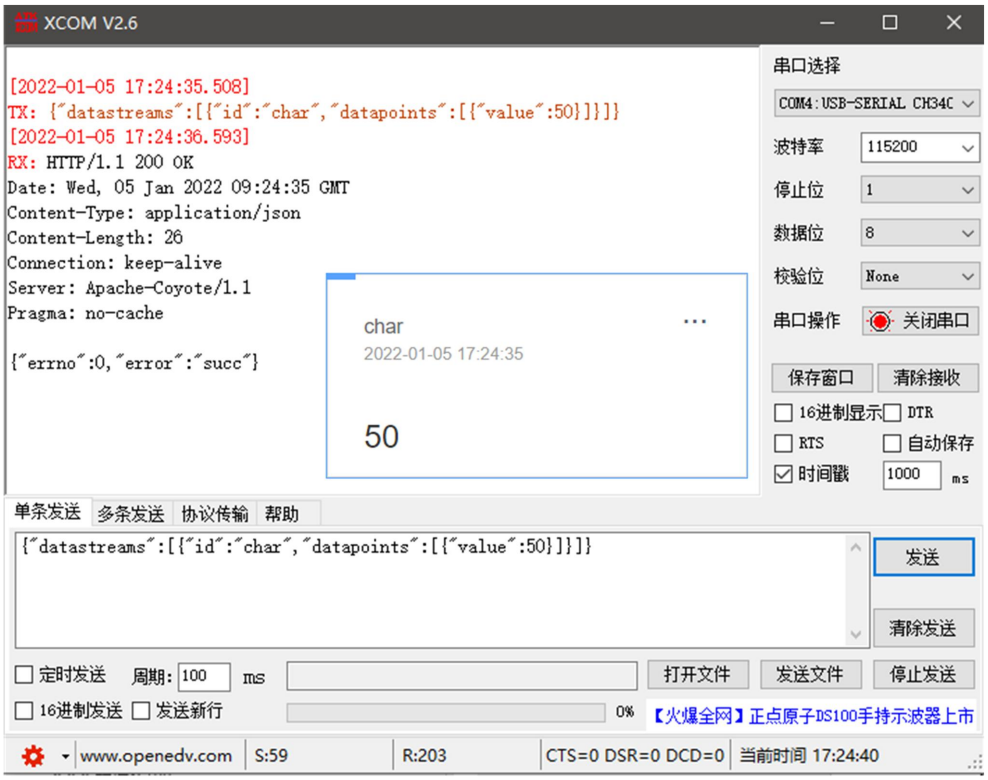
(1) Return data configuration with header:



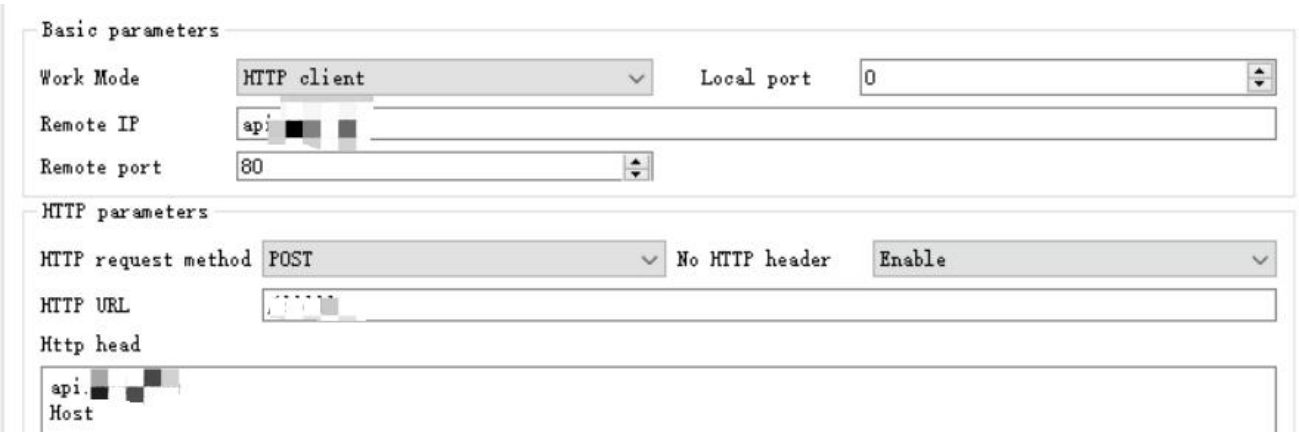
Data return test:

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



(2) Return data configuration without header:



Data return test:

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



4.2.6MQTT client mode

4.2.6.1Standard MQTT3.1.1 connection

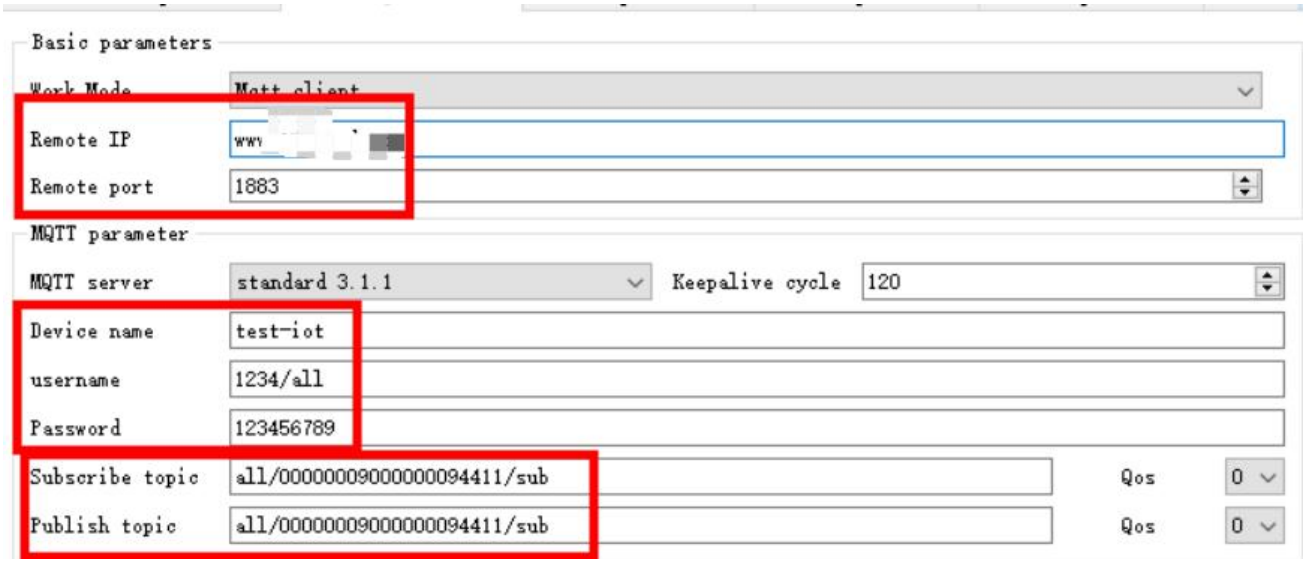
The standard M QTT3.1.1 connection here takes Tencent's standard M QTT 3.1.1 server as an example. The "three elements" of the standard description can be obtained from the Tencent server as shown in the figure below:



Parameter configuration description is shown in the figure below:

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



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



4.3Serial port parameters

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

Baud rate: serial port communication rate, configurable 600, 1 200 , 2 400 , 4 800 , 9 600 , 1 4400 , 1 9200 , 3 8400 , 5 7600 , 1 15200 , 2 30400 , 460800 bps .

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

Check digit: Check digit for data communication, supporting three check modes: None, Odd, and Even .

Stop bit: settable range 1, 1.5, 2.

By setting the serial port parameters and keeping them consistent with the serial port parameters of the serial port connection device, you can ensure normal communication.

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

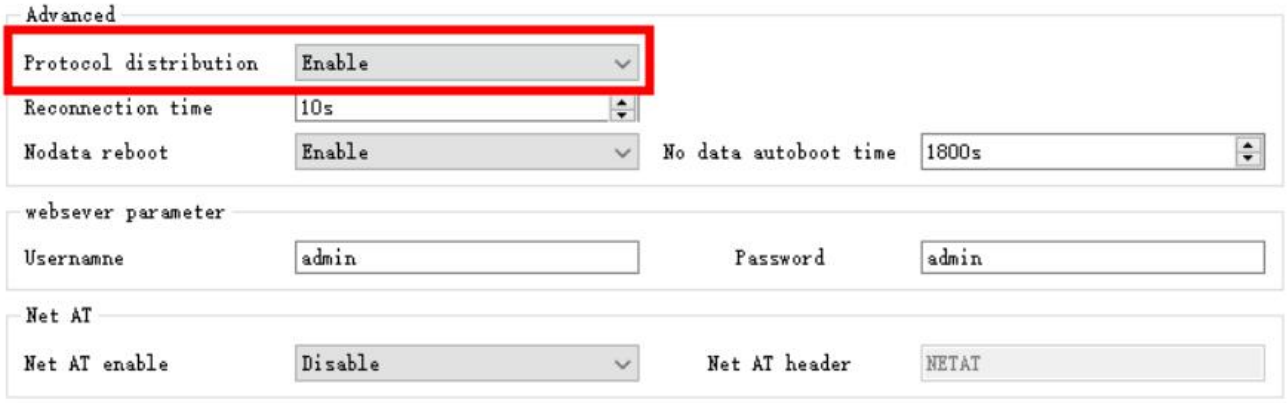
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



4.4Advanced parameters

4.4.1Link protocol distribution

Supports socket distribution protocol. Data can be sent to different links through specific protocols, and data received by different links can also be distinguished by adding headers and tails. PC software configuration steps:

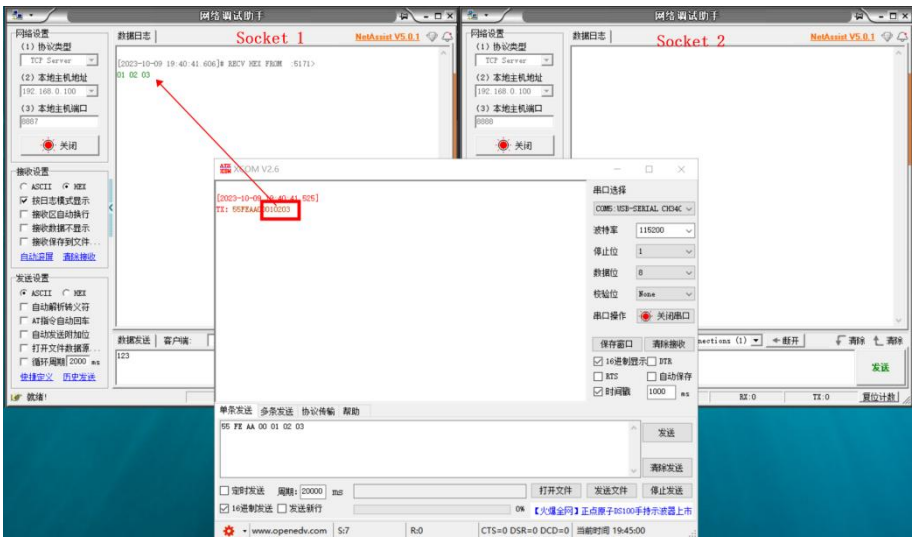


After turning on the multi-link protocol distribution mode, the following possibilities will occur. Here, link 1 is connected to the server port 8887, and link 2 is connected to the server port 888 8 as an example:

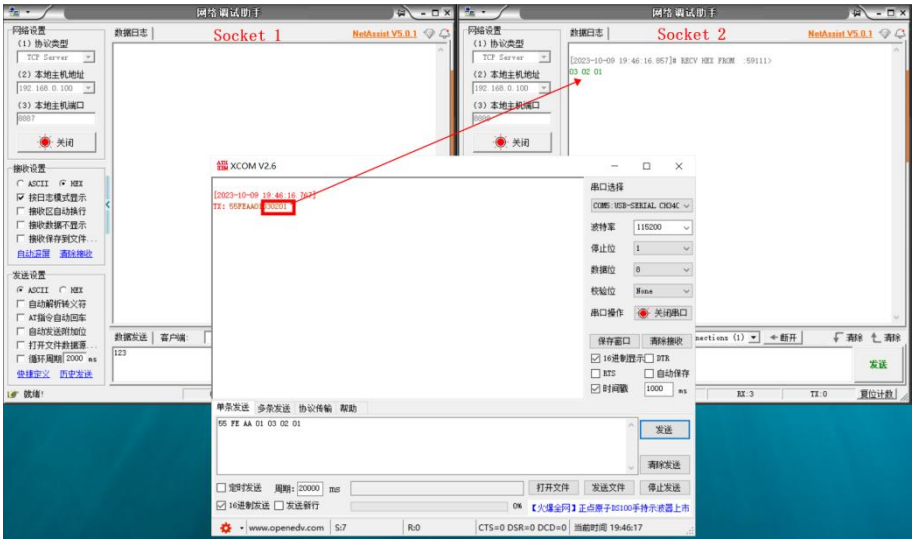
1. The serial port sends data if the data header is 55 FE AA 00, which means it meets the requirements, that is, 55 FE AA 00+data, then the data will only be transmitted to Socket 1 , and the received content only contains data, without the data header;

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

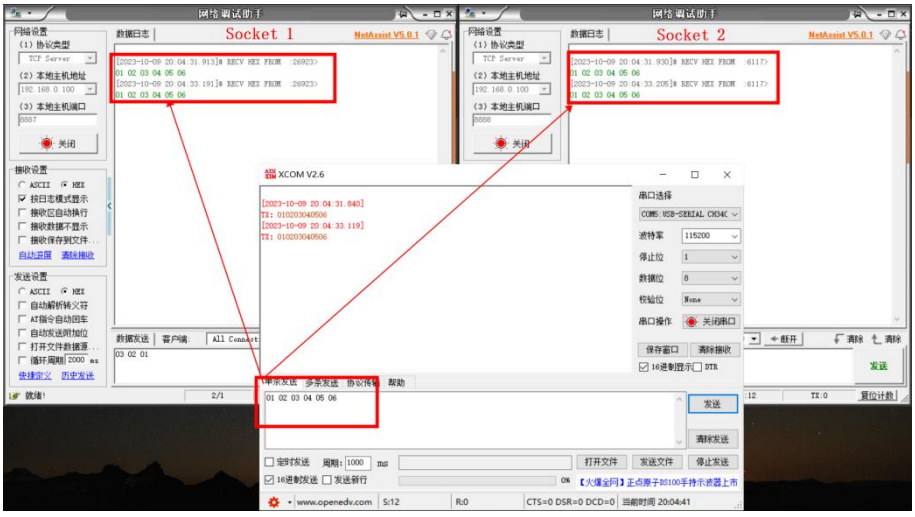
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



2. The serial port sends data if the data header is 55 FE AA 01, which means 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, without the data header;



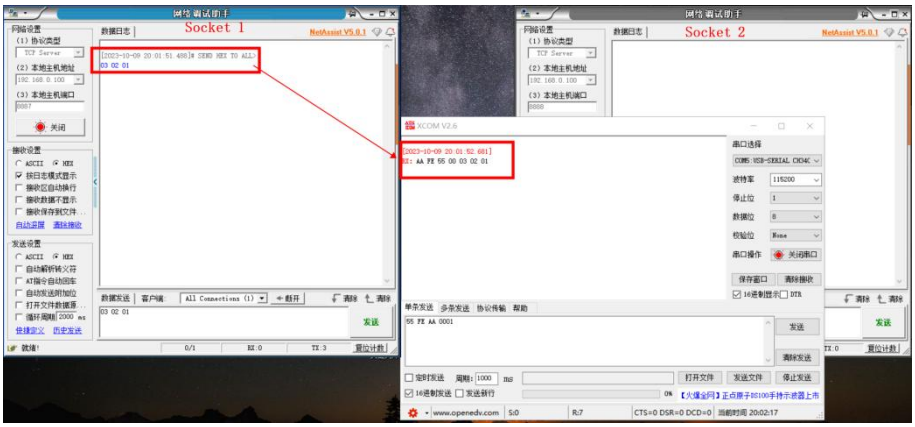
3. The data sent by the serial port is arbitrary data, and the data will be transmitted to two Sockets.



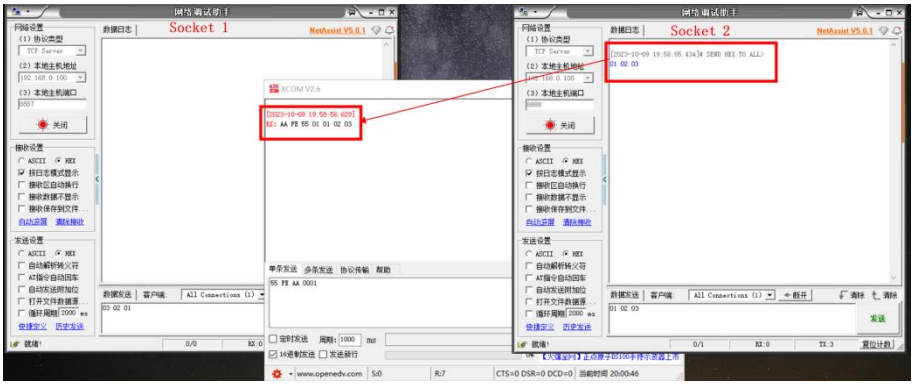
Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4. Socket 1 sends any data. After the serial port receives it, it will add the data header AA FE 55 00 before the data.



5. Socket 2 sends arbitrary data. After the serial port receives it, it will add the data header AA FE 55 01 before the data.



4.4.2Disconnection 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 and reconnection time: The time interval between each time the device attempts to reconnect to the network . 0 means fast reconnection, and 0~65535 is configurable .

4.4.3Timeout restart function

Supports the timeout restart function (default: 18 00 seconds). This function is mainly used to ensure the long-term stable operation of the device . If no data sent by the network is received within the set timeout restart time , the device will restart to avoid abnormal situations affecting communication. cause impact .

When the timeout restart function is turned on, the timeout restart time setting parameter range

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

is (60-65535) seconds.

4.4.4Short connection function

In TCP client and HTTP client modes, 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 multi-point (multi-client) to one-point (server) scenarios. .

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

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

4.4.5Connect 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 packets or 10k . If it is larger than the buffer space , 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.

4.4.6Heartbeat packet function

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

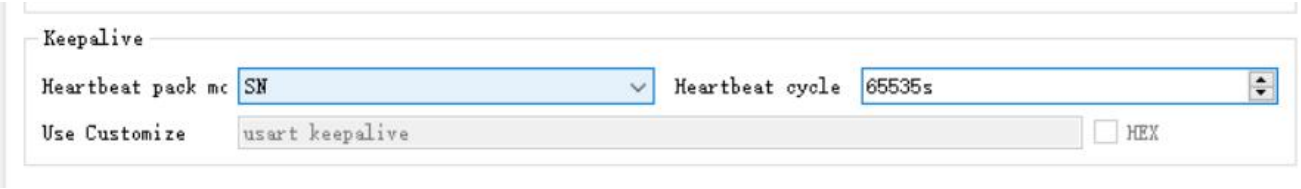
4.4.6.1Serial heartbeat packet

The serial port heartbeat packet data points to the serial port and can be set in the serial port parameters. SN, MAC, and customized content can be selected, and can be set from 0 to 65535 seconds. The serial port heartbeat packet adopts the idle heartbeat packet, that is, it starts timing when the serial port is idle, and when the serial port heartbeat packet time arrives, the configured

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

content is sent to the serial port. The configuration method is shown in the figure below:



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

4.4.6.2Network heartbeat packet

Network heartbeat packets are applicable to Ethernet links, are only effective in client mode, and support hexadecimal and ASCII code transmission . The network heartbeat packet is not M QTT heartbeat, it is data actively sent by the microcontroller according to the configuration. Network heartbeat packets run independently on the two links and do not affect each other. SN, MAC, and customized content can be selected, and can be set from 0 to 65535 seconds. The network heartbeat packet adopts the mandatory heartbeat packet, that is, the timing starts when the link connection is successful, and when the heartbeat packet cycle time is reached, the configured content is sent to the server. The configuration method is shown in the figure below:



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 hexadecimal selection is checked, the data sent will be hexadecimal data.

4.4.7Registration package function

In client mode, users can choose to send registration packets to distinguish data or link sources . Registration packets run independently in the two links and do not affect each other. When using it, you need to select the registration package mode. You can choose the following modes:

1. Connect to send SN ;
2. Connect to send MAC ;

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

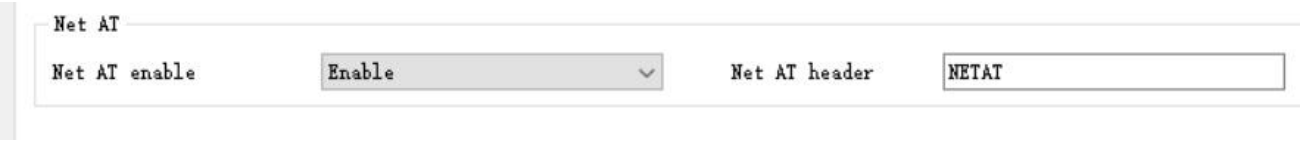
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

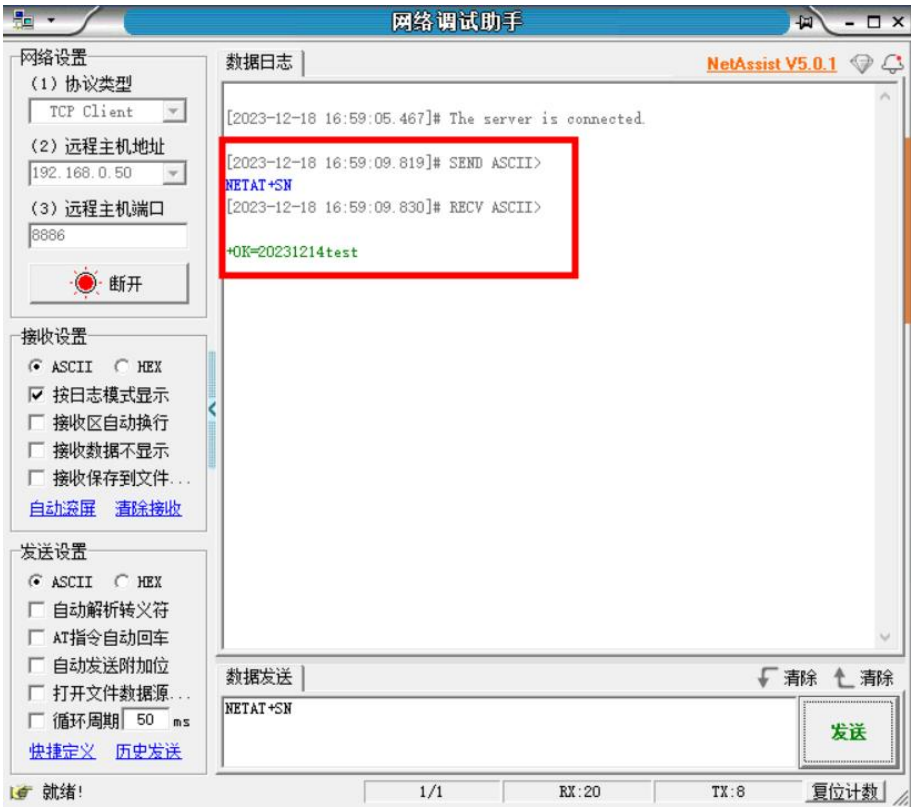
3. Connect to send custom data;
4. Connect to send custom content;
5. Send SN for each packet ;
6. Send MAC per packet ;
7. Send custom content per package;

Sending each packet means adding the registration packet content before each data packet. When setting up a custom registration package, you can check the hexadecimal option. When customizing the registration package content, the registration package can be configured with a maximum length of 128 bytes.

4.5Network AT command

The device supports network AT commands and can be enabled by modifying parameters on the configuration tool. After turning it on, the command header can be customized.





If the current AT command header is NETAT, you can send commands through the network to query and configure parameters after the link is successfully connected. If you send NETAT+SN, you will receive a data reply of +OK=20241214test. After the network AT is

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

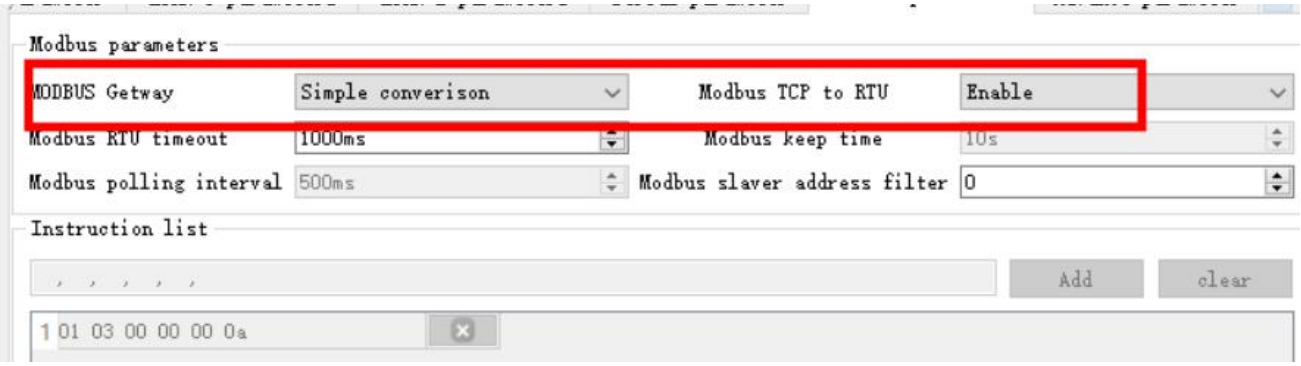
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

enabled, the device will parse whether the data header is correct, such as "NETAT". If the data NETAT123 is sent, an error will be reported by the device. The reason is that the device will recognize that the command currently sent is an illegal command, so The data will not be sent, so please pay attention when using it.

4.6Modbus gateway

Note: The device supports two links. After the MOdBus gateway is set, it is effective for both links.

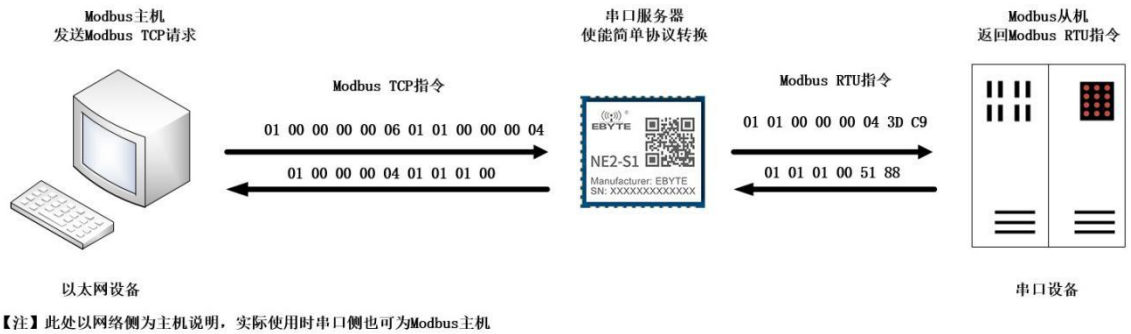
4.6.1Simple protocol conversion mode



After turning on simple protocol conversion, TCP to RTU conversion is enabled: Modbus RTU protocol and Modbus TCP protocol are converted to each other, and non-Modbus data (R TU/TCP) is directly discarded.

TCP to RTU closed: protocol conversion is not performed but Modbus data is verified, and non-Modbus data (R TU/TCP) is discarded.

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



Configuration tool configuration :

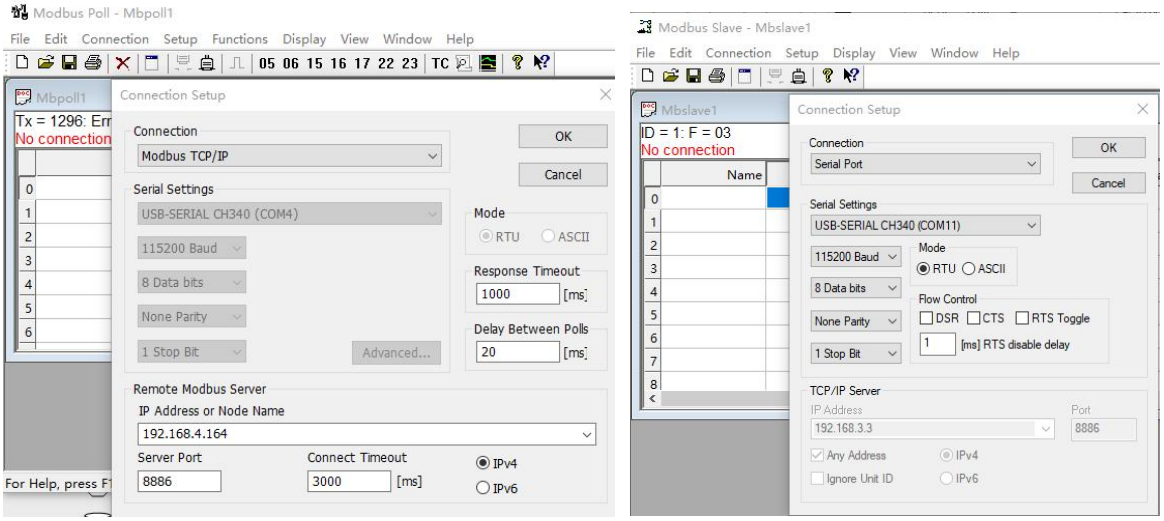
Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



Modbus Poll and Modbus Slave software debugging :

Software connection settings:

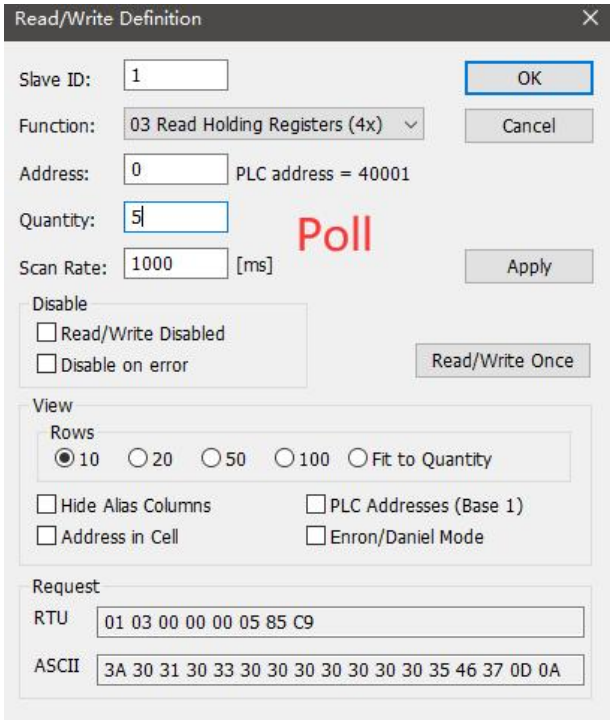


Software register reading and simulation configuration:

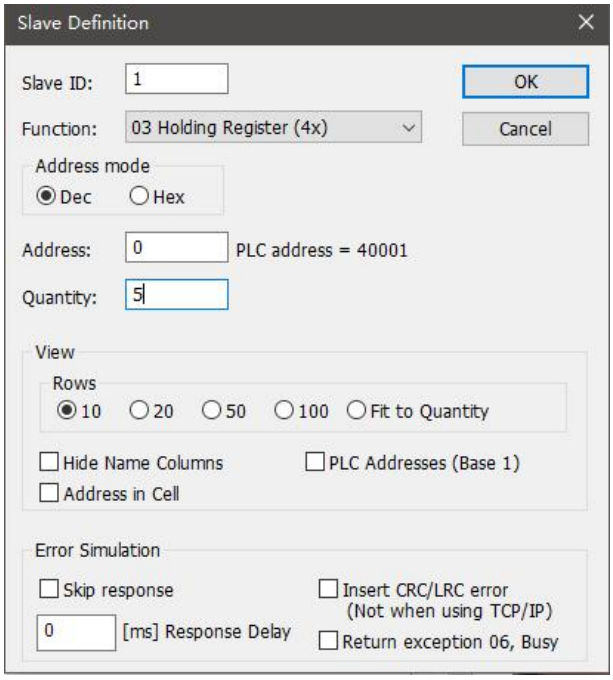
P oll menu select Set up →Read/Write Definition

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



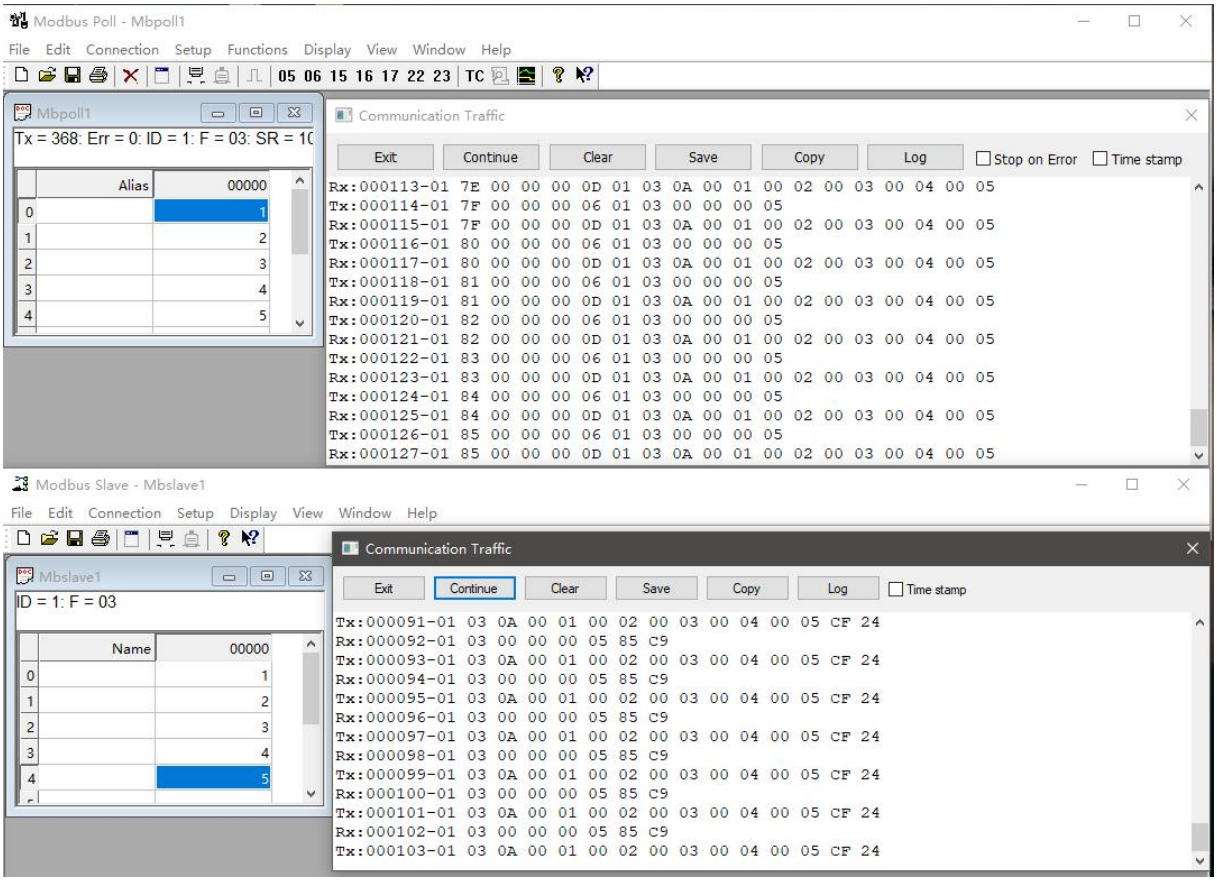
S lave menu select Se tup →Slave Definition



Communication demo:

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



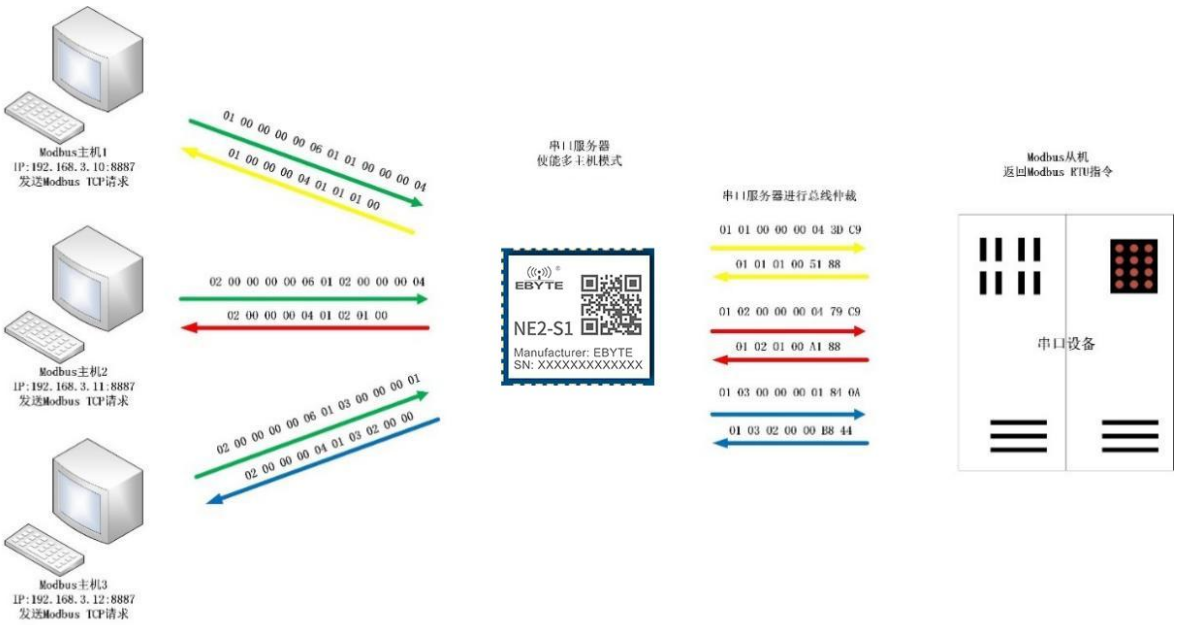
4.6.2Multi-host mode

Multi-host mode can handle up to 5 Modbus TCP hosts. When multiple Modbus hosts access at the same time, the Modbus gateway will schedule the bus occupancy to solve the bus conflict problem (currently only supports 6 host connections). It only supports working in T In CP server mode, the slave can only be connected to the serial port, otherwise it will not work properly.

It is recommended to configure "simple protocol conversion" when there are no multiple hosts.

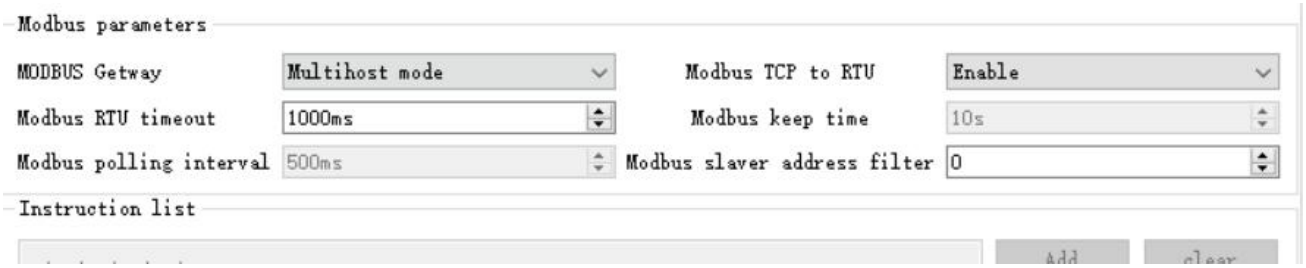
Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



【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

Configuration tool setting:

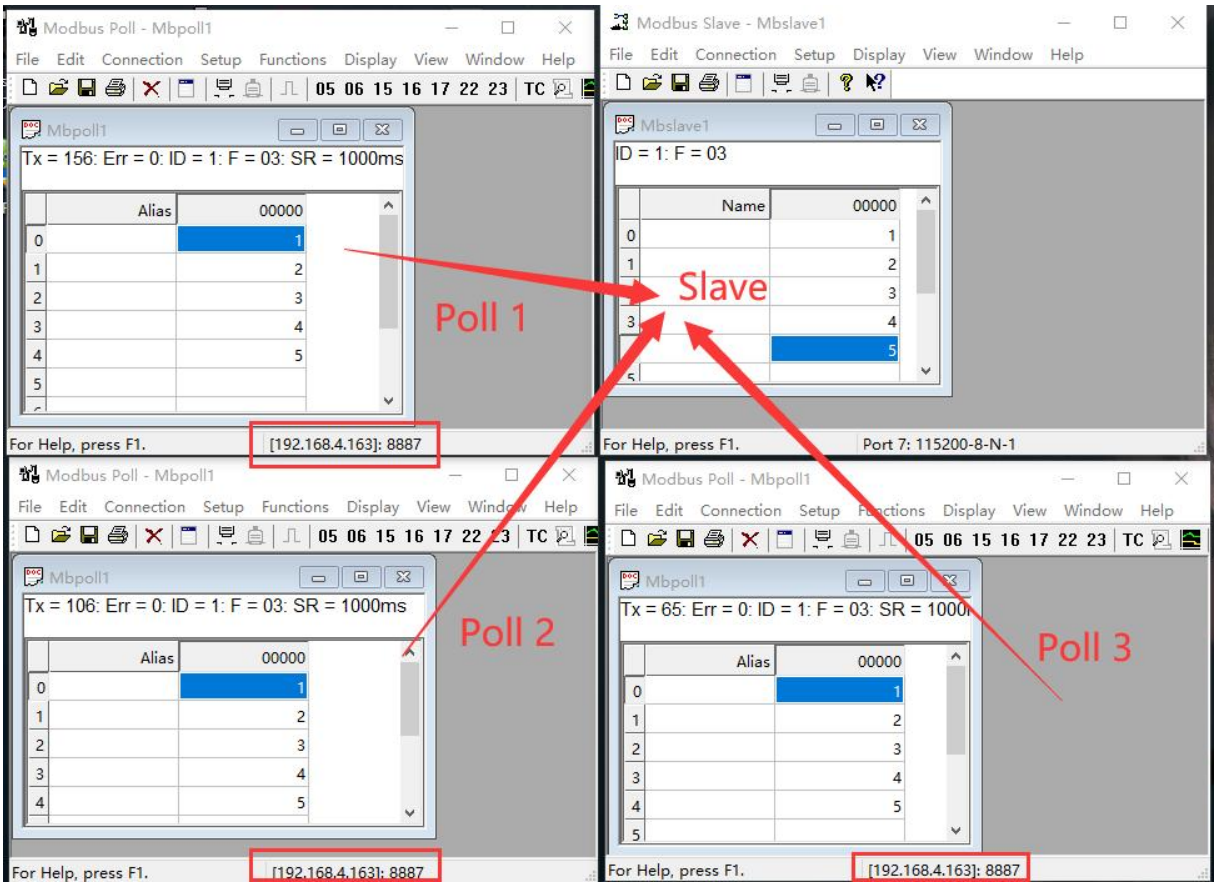


Modbus Poll and Modbus Slave software debugging :

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 5 channels can be supported).

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

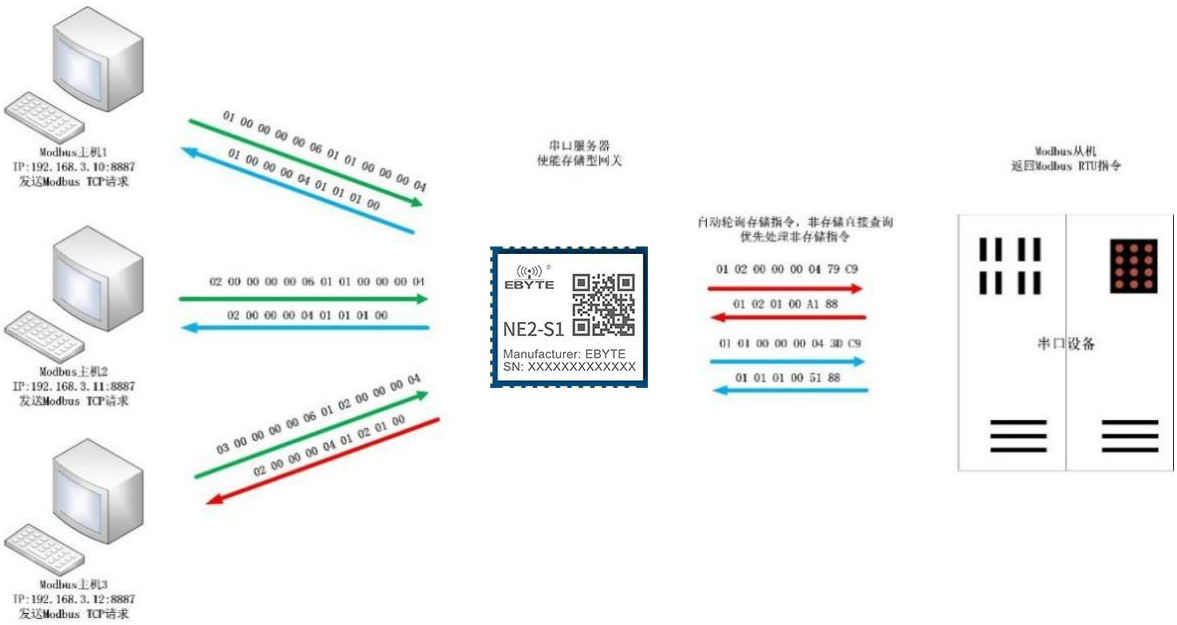


4.6.3Storage gateway

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 very convenient. It 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.

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



【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 a storage gateway that optimizes multi-host request performance, it can only work in TCP server mode, improving the response speed on the network side.

Features:

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

（2） RTU response times out or the last reply time exceeds the instruction storage time, the device automatically clears the cache to ensure the real-time and authenticity of the data;

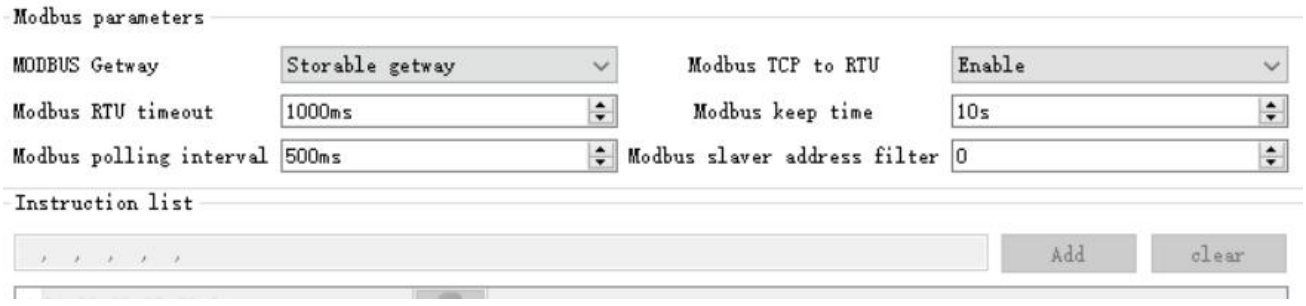
（3） The polling interval can be customized, 0 -65535 ms;

（4） 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 instruction and control instruction (05 , 06 , 0F , 10 function code) will directly access the RTU device ;

（6） Only supports 0 1 , 0 2 , 0 3 , 0 4M od bus function code query result storage;

Storage gateway configuration tool configuration:

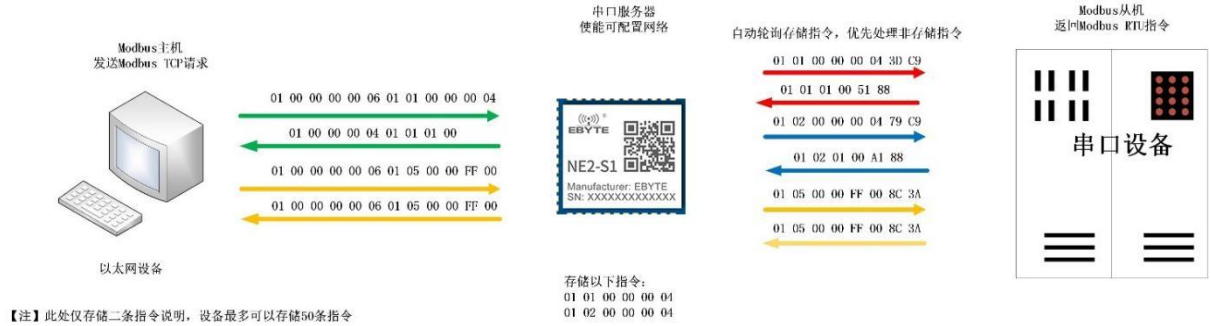


Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

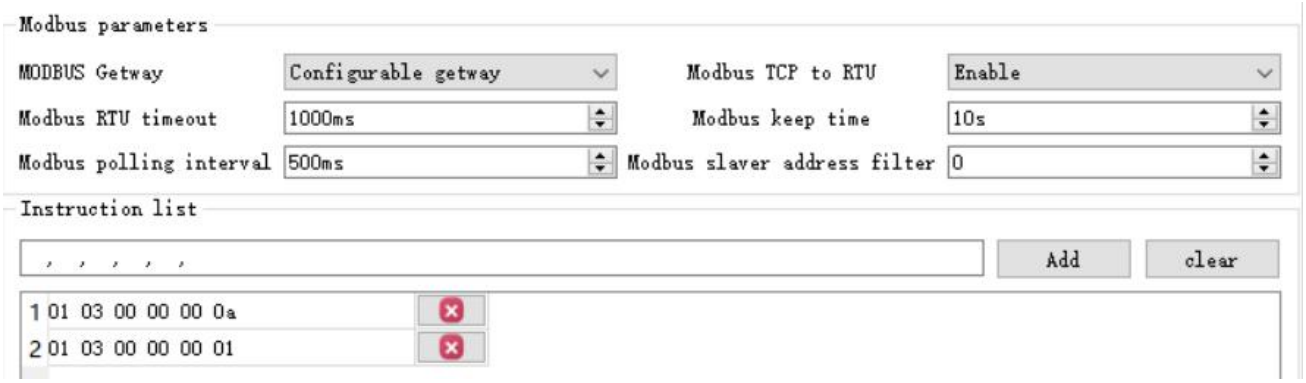
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.6.4Configurable gateway

automatically polls the R TU device register according to the preconfigured M ODBUS command (only supports the configuration of the M ODBUS read command). Non-storage table commands will directly operate the R TU 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.



Configuration tool setting:



Instruction storage instructions (added, instruction errors and format errors cannot be added) . To delete an instruction, just click the cross on the right side of the instruction.

4.6.5Automatic upload

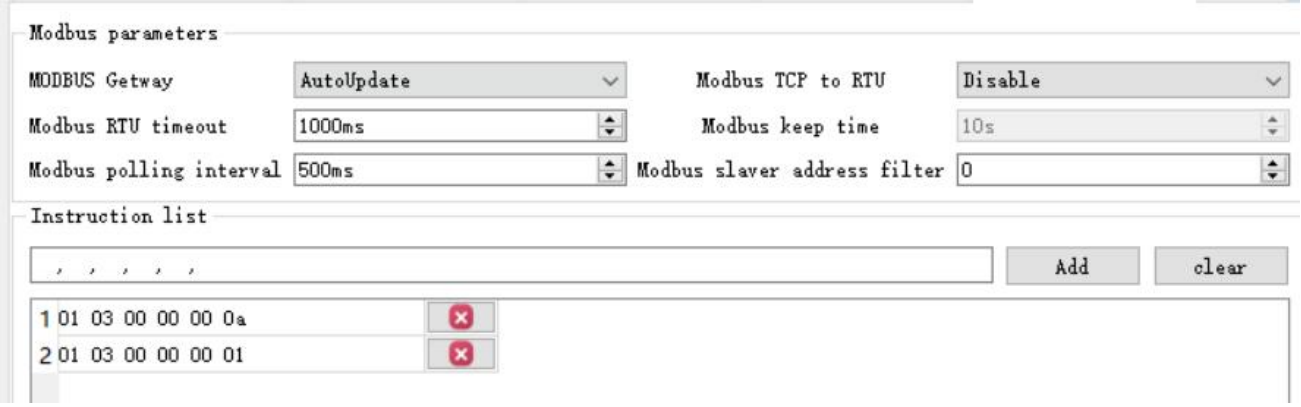
In client mode (TCP client, U DP client, M QTT client, HTTP client) the gateway will automatically poll the instructions in the stored instruction table and upload them to the server. You can choose the feedback format (Modbus RTU format or Modbus TCP format) and command polling interval (0 -65535 ms).

For command pre-storage, refer to "Configurable Gateway - Command Storage Instructions"

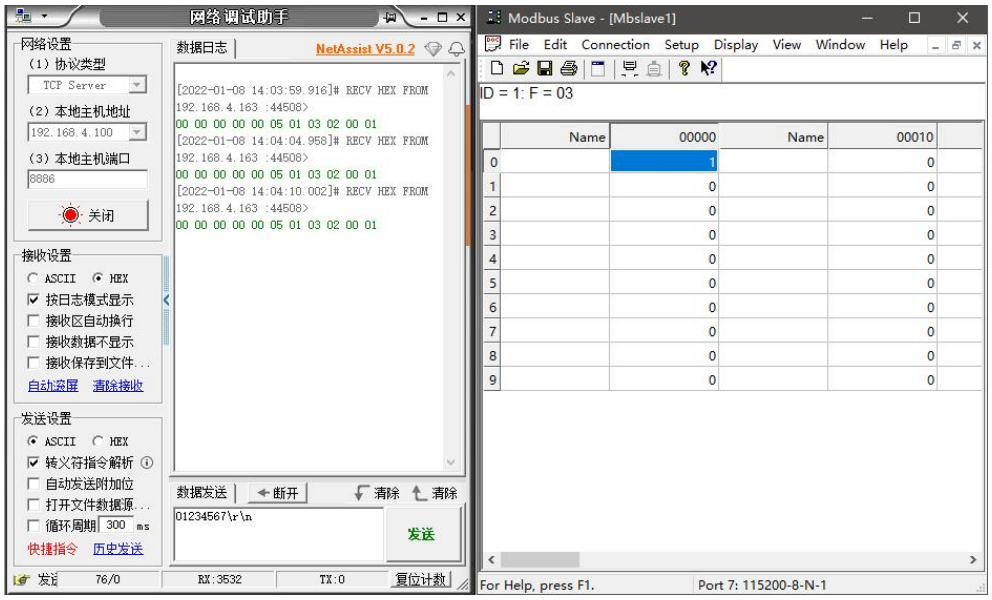
Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

and automatically upload the configuration tool configuration:



TCP client demo (Modbus TCP format) :



1.7 Introduction to basic functions

4.7.1Web page configuration

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

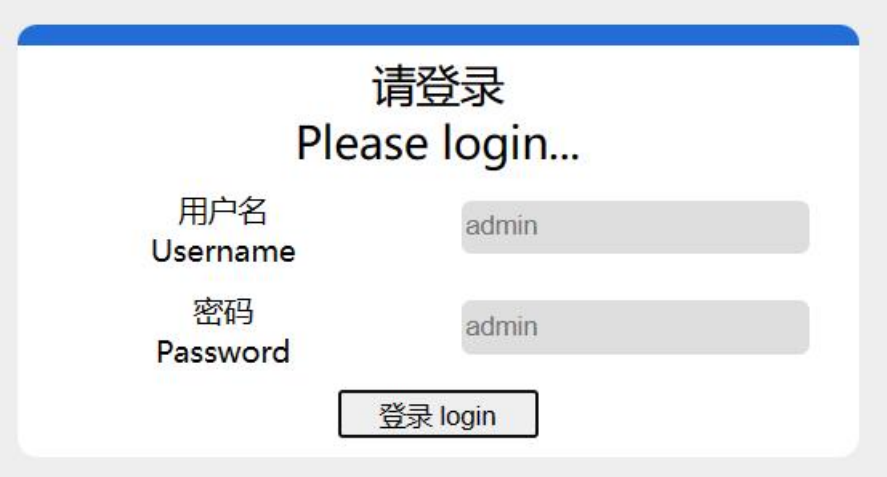
Operation method (Microsoft Edge version 94.0.992.50 is taken as an example. It is recommended to use the Google kernel browser, which only supports IE 10 or above kernel browsers):

- 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

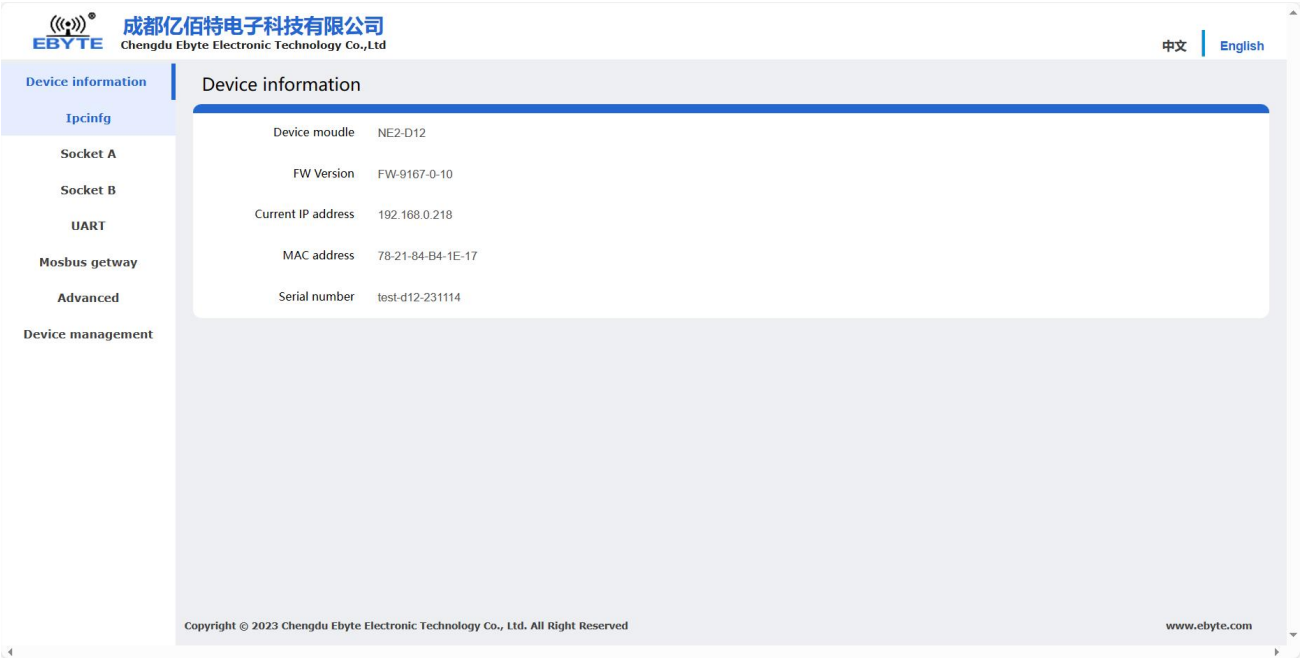
Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

forget the IP of the machine, 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)



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

4.7.2 Restore factory setting

R e load button of the module for 5-10 seconds until all LED indicators light up and then release the button.

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.7.3AT command configuration

Query and modify the relevant parameters of the device can be completed through AT command configuration. For specific AT commands, please refer to "AT Command Set".

4.7.4Configuration 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 according to your needs, then save the configuration, restart the device, and complete the parameter modification.

【Note】:

Do not use multiple configuration tools 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 tool will experience abnormalities (the same device is displayed multiple times, the device cannot be found, etc.)

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

4.7.5Random local port

T CP client, U DP client, HTTP client, M QTT client can configure the local port to 0 (use a random local port). Random ports cannot be used in server mode, otherwise the client cannot 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 HTTP client and M QTT client modes.

4.7.6Remote upgrade

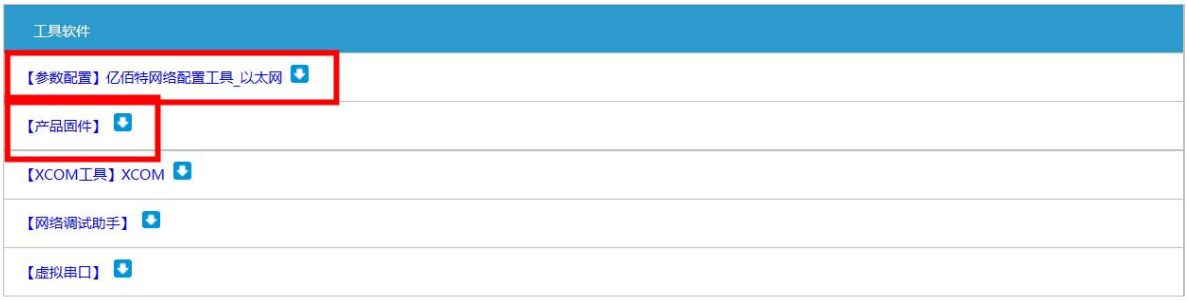
In order to facilitate later maintenance and upgrade functions and replace different firmware, the serial port server supports online upgrade. Through the upgraded firmware provided by our company, users can upgrade or replace the current firmware through the configuration tool.

Steps to upgrade firmware over the network:

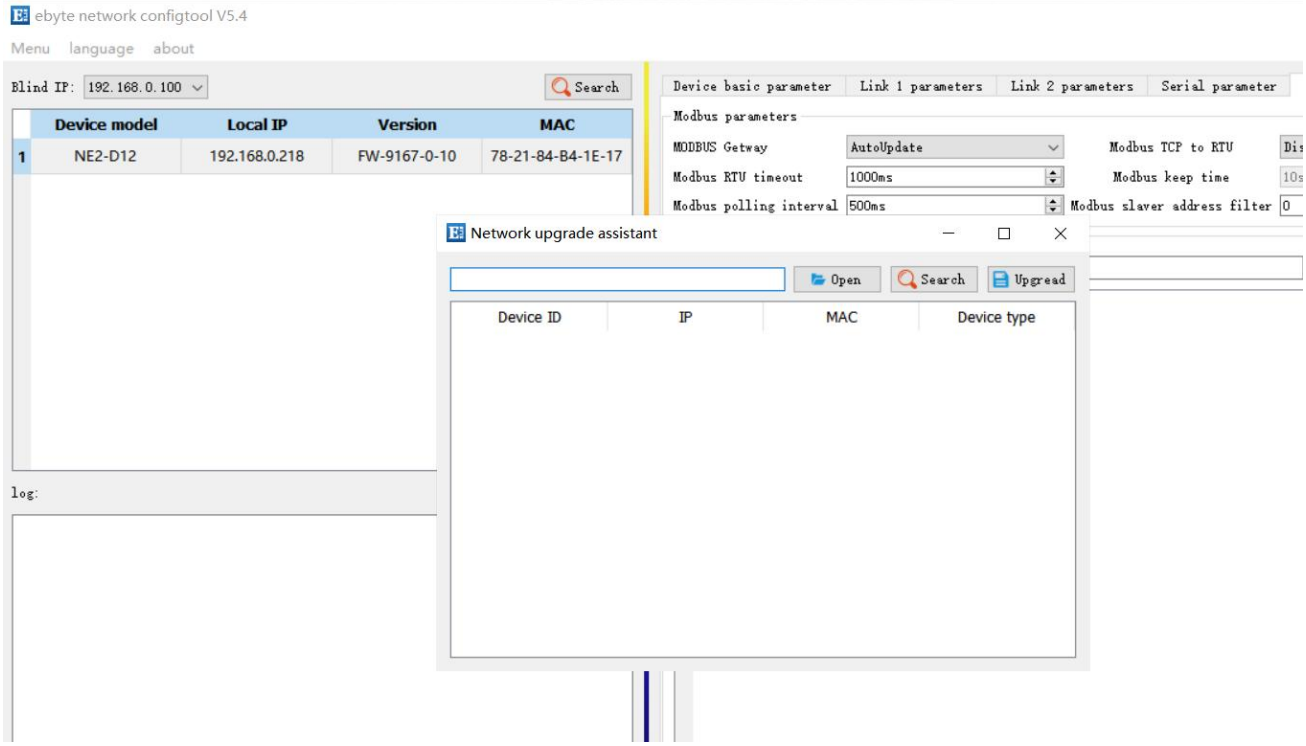
Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

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



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



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;

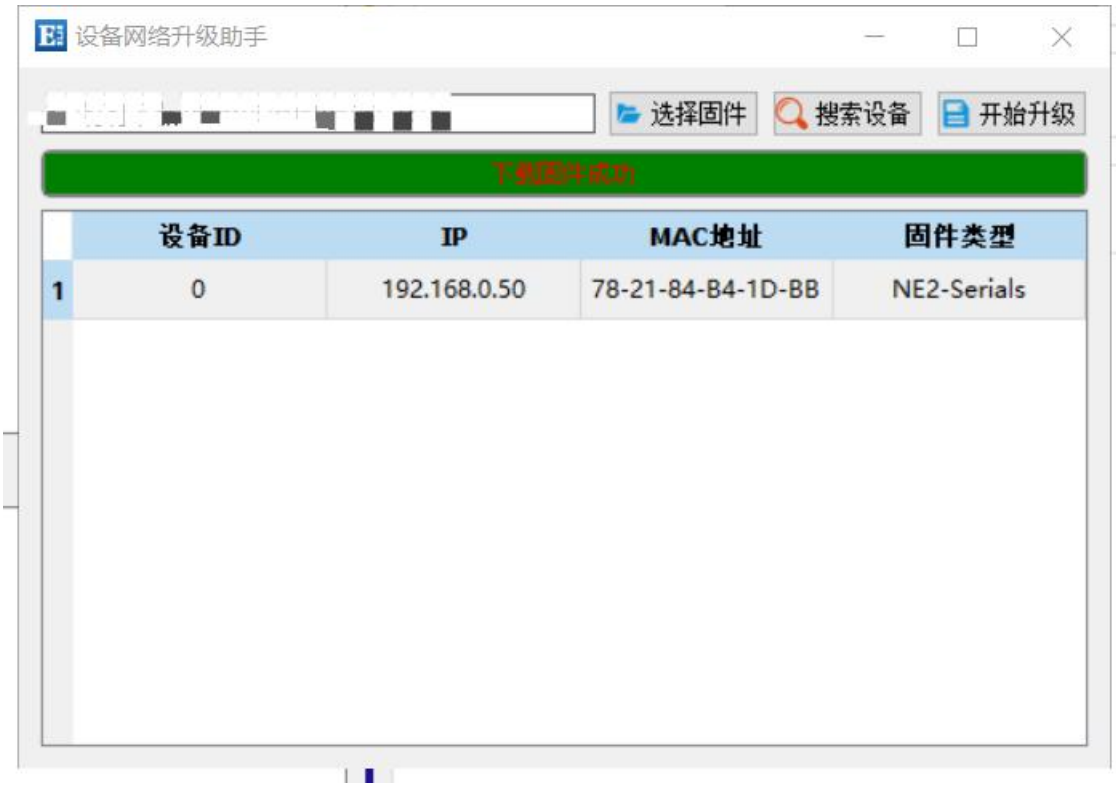
Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



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

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. (The device will not respond for about 7 seconds from clicking "Upgrade" to starting to transfer the firmware. This is normal. Please wait patiently for the upgrade)



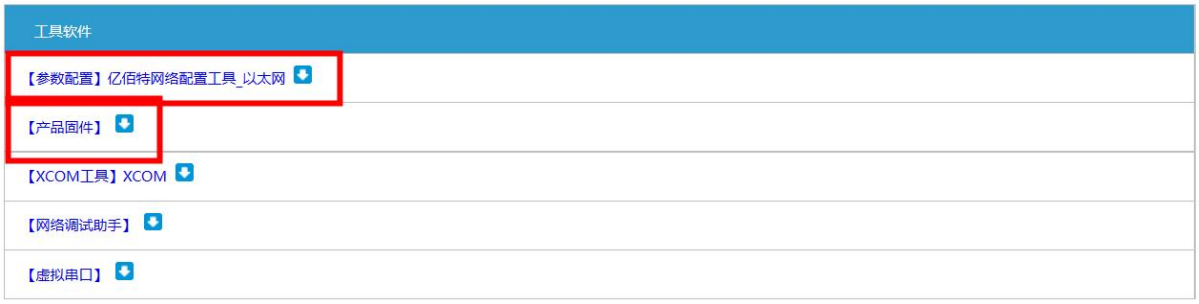
Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



Steps to upgrade firmware via web page :

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



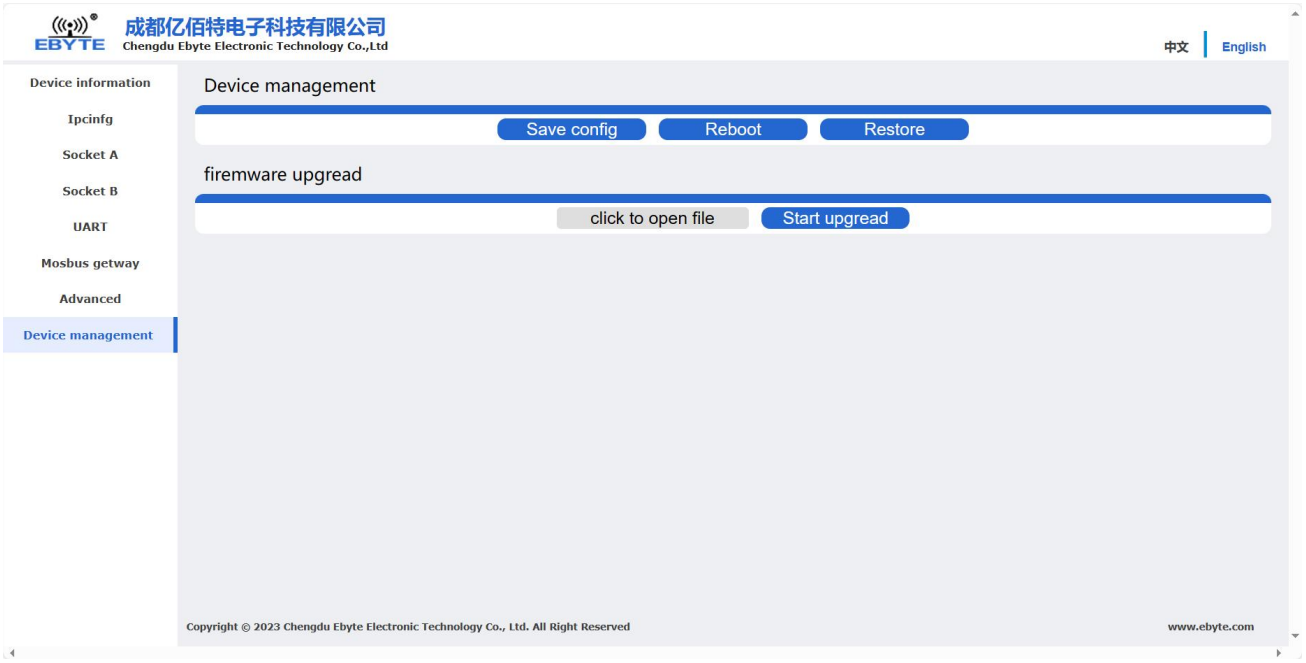
Step 2: Open the configuration tool, search for the current IP of the device, the default is 192.168.3.7, enter the current IP in the web page, and enter the web configuration ;



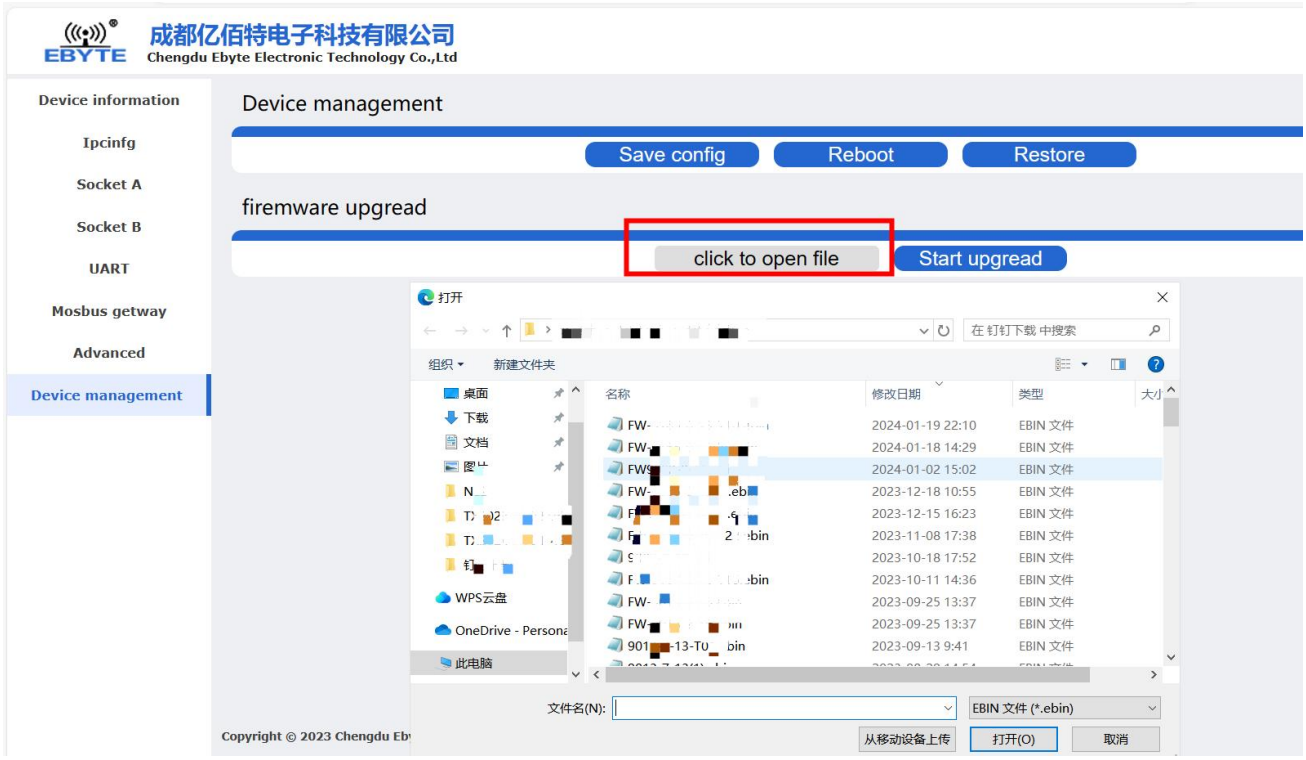
Step 3: Click Device Management ;

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



Step 4: Click " Click to select file ", select the corresponding firmware, then click "Open" , and then click to start the upgrade ;



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

[Note] If the upgrade fails, just upgrade again .

[Note] The device will not respond for about 7 seconds from clicking "Upgrade" to starting to transfer the firmware. This is normal. Please wait patiently for the upgrade.

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

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

Revision history

Version	Revision date	Revision Notes	Maintenance man
1.0	2024-12-18	Initial version	YL _
1.1	2024-4-24	Modify the pin definition	YL _
1.2	2025-11-14	Modify the pin definition	ZYD

About us

Technical support: support@cdebyte.com
Documents and RF Setting download link: www.cdebyte.com
Thank you for using Ebyte products! Please contact us with any questions or suggestions: info@cdebyte.com
---
Phone: 4000-330-990
Web: www.cdebyte.com
Address: B5 Mould Park, 199# Xiqu Ave, High-tech District, Sichuan, China

Chengdu Ebyte Electronic Technology Co.,Ltd.

Copyright © 2012–2025 , Chengdu Ebyte Electronic Technology Co., Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000