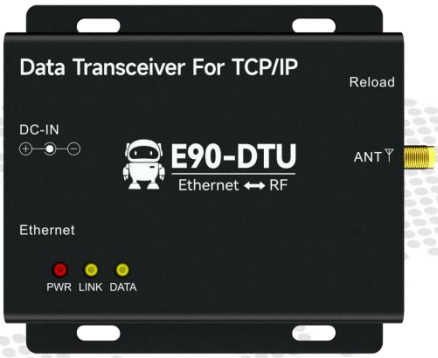
Chengdu Ebyte Electronic Technology Co.,Ltd

Wireless Modem

User Manual



E90-DTU(433L30)E
The Ethernet Gateway User Manual

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1 Product Overview

1.1 Product profile



E90-DTU (433L30) E is a wireless gateway (10M / Ethernet interface) based on LoRa communication technology and Ethernet protocol. It supports 2-way Socket, provides six working modes of TCPS erver, TCPC lient, UDPS er ver, UDPC lient, HTTPC lient, and MQTT Client, and supports six-way client connection in TCP server mode.

The wireless communication adopts LoRa direct sequence frequency expansion technology, which will bring further communication distance, and has the advantages of concentrated power density and strong anti-interference ability. With the software FEC forward error correction algorithm, it has high coding efficiency and strong error correction ability. In the case of sudden interference, it can actively correct the disturbed data packets, greatly improve the reliability and transmission distance, and help users to efficiently complete the transparent transmission of long-distance data.

Support users can use WEB web page, UDP host computer for related configuration.

1.2 Features

- Using industrial-grade LoRa modulation technology, with data encryption, subcontracting length can be set;
- Support for wireless sending of command data packets;
- Industrial grade design can work in-40℃ ~ + 85℃ environment
- D C 8~28V wide voltage input;
- RJ 45 Adaptive 10 / 100M Ethernet interface;
- Support multiple working modes (TCPS, TCPC, UDPS, UDPC, HTTPC, MQTTC);
- Support configuration tools, web page, AT instruction three configuration ways;
- Support 2-road Socket;
- Server mode supports up to 6 Socket connections;
- Support the DHCP function;
- Support DNS (domain name resolution), and custom domain name resolution server;
- Support a variety of Modbus gateways (simple protocol conversion, multi-host mode, storage gateway, configurable gateway, etc.);
- Support fast access to Ali Cloud, Baidu Cloud, OneNET, Huawei Cloud, 3.1 version of the standard MQTT server;
- Support the HTTP protocol (GET / POST request);
- Support the timeout and restart function;
- Support the short connection function;
- Support the heartbeat package, registration package function;
- Support access to external network, LAN, support virtual serial port tools;
- Support the hardware to restore the factory Settings and online upgrades

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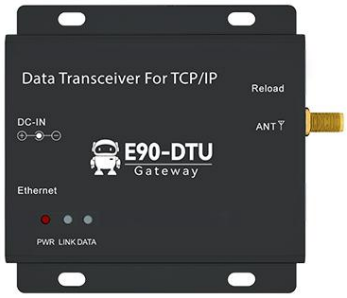
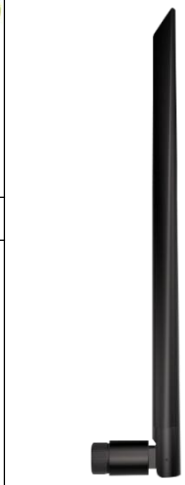
2 Quick Start

2.1 Hardware preparation

E90-DTU (433L30) E and E 90-DTU (433L30) -V8 are transparently transmitted transparently.

To test the E90-DTU (433L30) E, the following hardware is required:

- One PC with a network port;
- E90-DTU (433L30) One E, hereinafter referred to as "Gateway Radio";
- E90-DTU (433L30) -V8 digital radio station, hereinafter referred to as "serial radio station" (for example, purchased separately if needed);
- T X 433-JKD-20P, 2 antennas (inner thread, inner needle);
- 2 DC12V-1A power adapters;
- Network cable 1;
- 1 USB to RS-485 serial port line;

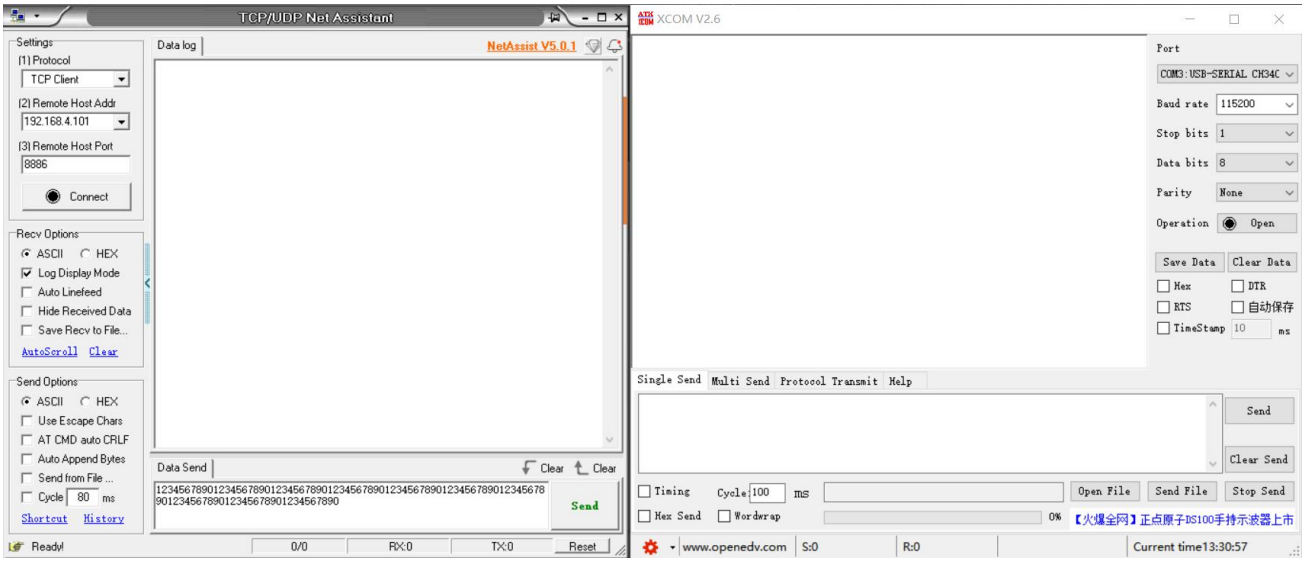
			
PC	E90-DTU(433L30)E	E90-DTU(433L30)-V8	
			
Parvicostellae	DC 12V-1A Power Supply 2	USB turn serial port + several cables	TX433-JKD-20P ×2

2.2 Software preparation

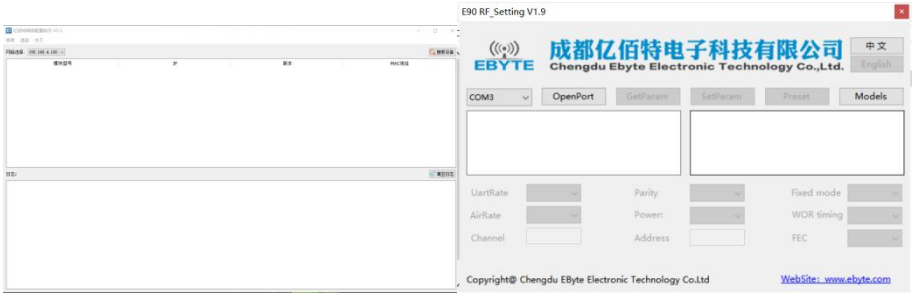
The product details on the official website provide the network debugging assistant "Net Assist" and the serial port assistant "XCOM" for download, as shown in the figure below. Website address: https: / / www.cdebyte.com.

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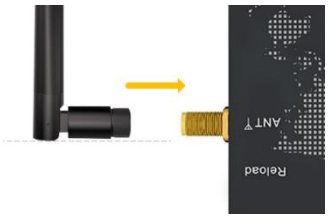
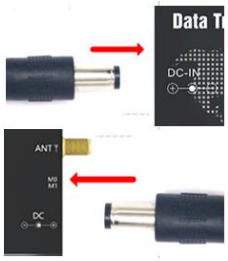
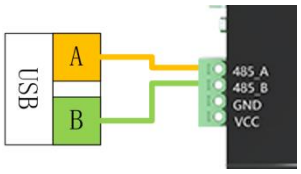


Corresponding product details download configuration tool, "Gateway Radio" uses "Ebai network configuration tool", "Serial radio" uses "RF_S e tting_E90.exe".



2.3 Hardware connection

Connect antenna to power supply for E 90 station (DC: 8~28V), R S485 connection, network cable connection:

			
Connect the antenna	On: the "Gateway radio station" is connected Next: the "Serial radio station" is connected	Connect RS-485 for "serial Radio"	Connect the network cable for the Gateway Radio Station

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2.4 Wireless parameter configuration

2.4.1 Configure Serial Radio

Step 1: Switch on the power supply and connect USB to RS-485 serial line (serial line A to station 485_A, serial line B to station 485_B);

Step 2: Check whether the radio station is working in the configuration mode, if it is not the configuration mode to enter the configuration mode according to the figure below;

	Categories	M1	M0	Description
Mode 0	Normal Mode	ON	ON	Open UART and RF，transparent transmission is on
Mode 1	Wake-up Mode	ON	OFF	Air wake-up mode, the packet comes with a wake-up code,
Mode 2	Power-saving Mode	OFF	ON	The air wake-up receive mode, saving receive power, the mode can not be transmitted
Mode 3	Sleep Mode	OFF	OFF	Parameter setting using the configuration software



Step 3: Open the configuration upper computer "RF_Se tting_E90.exe" and select the corresponding serial port;



Step 4: "Open the serial port" and click "Read the parameters", and click "Restore the factory Settings";

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Step 5: configure the port rate is 9600, check for 8N1, the transmission mode is through transmission, the air speed is 2, as shown in the figure below, click "write parameter";



Step 6: Exit the configuration mode and enter the transparent transmission mode;

2.4.2 Configure the "Gateway Radio Station"

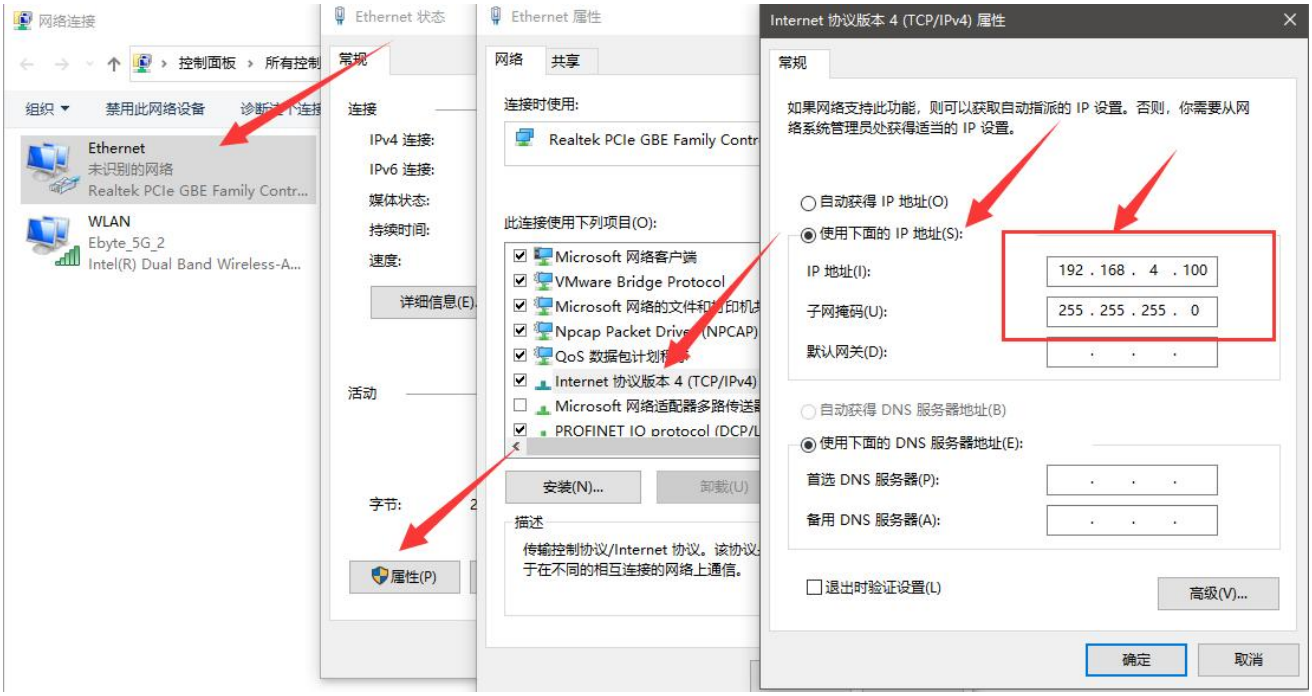
Step 1: connect the power supply, connect the PC and "Gateway radio";

Step 1: factory configuration of "gateway radio", long press R eload button until the indicator light is fully on;

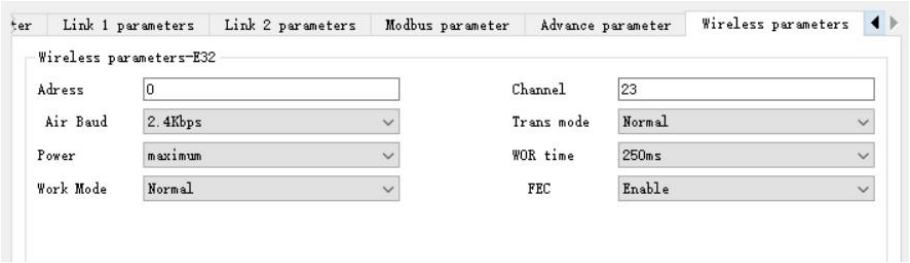
Step 2: Modify the I P v 4 configuration of PC, use static IP, and ensure that Gateway Radio is in the same network segment as PC. The default IP is 192.168.4.101, so the static IP of configured PC is 192.168.4.100 as shown in the figure below:

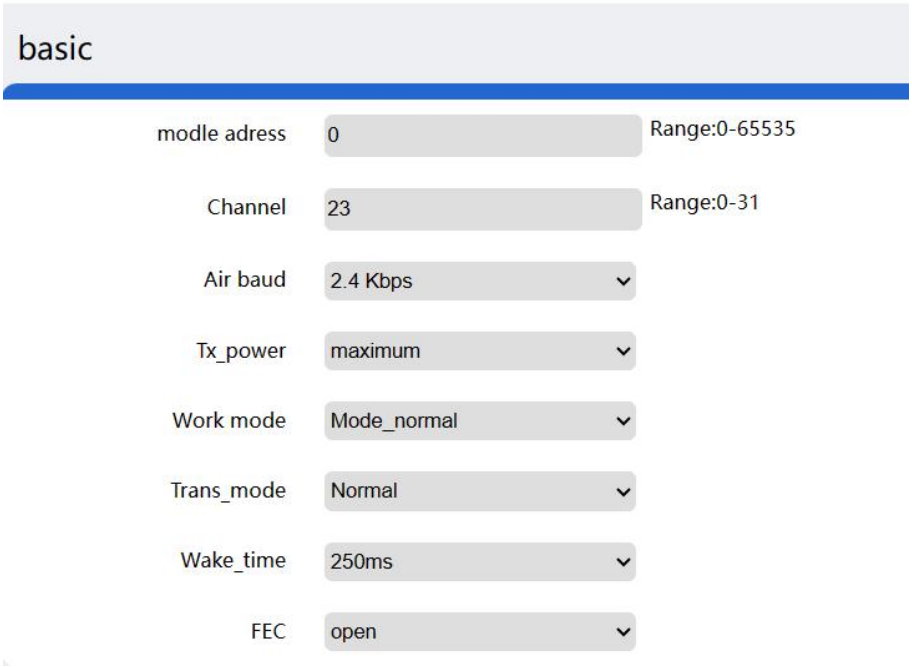
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Step 3: Use the "Ebai Network Configuration Tool" or web page configuration;





Step 4: Configure the wireless parameters as shown in the figure above. The upper computer click "Save

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Configuration" to click "Restart device", and the webpage configuration click save parameters in the device management to restart the device;

[pour]

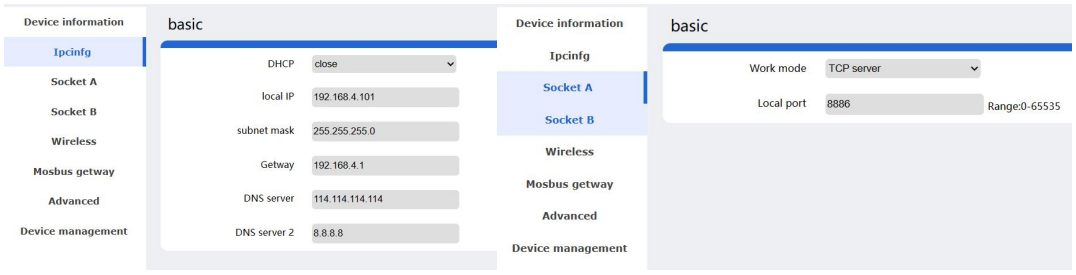
- Browsers that do not support IE kernel can use Firefox, G OOGLE, the latest Edge;
- The computer search device fails, first check whether the network cable is connected normally, check whether the LAN opens the computer many times, if still can not use normally can turn off the firewall and restart the computer;

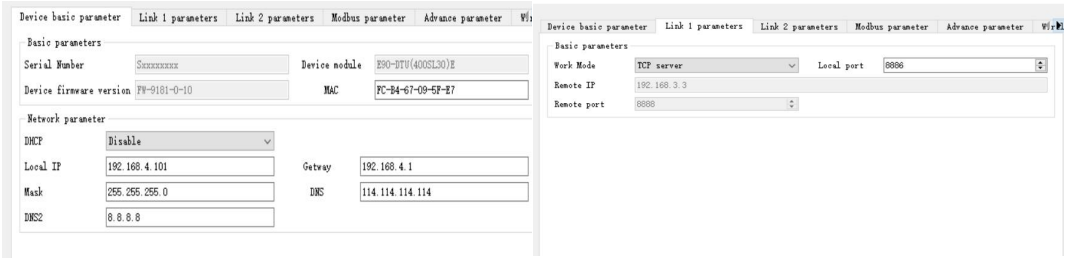
2.5 Network parameter configuration

Note: Because the device has 2 Socket, the two links have completely independent functions and the same use mode, this tutorial takes Socket A as an example, we need to use Socket B, the parameters are not completely consistent with Socket A, such as local port.

2.5.1 The TCP server is intended to use

Ethernet parameters of Gateway Station, host computer and web page are configured as follows:



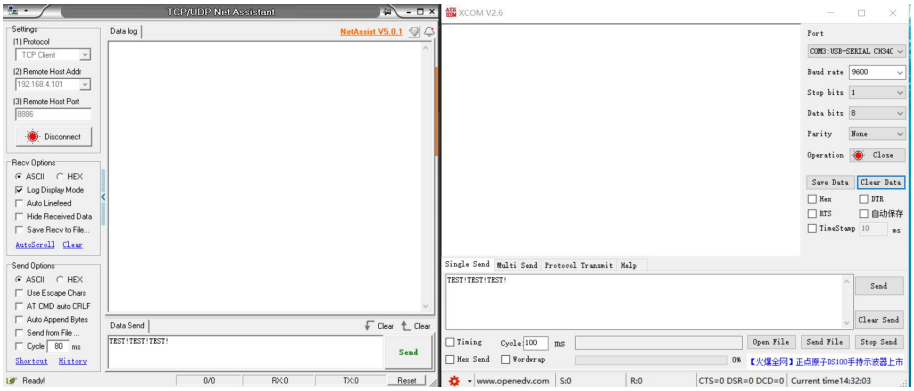


Then resave the configuration and restart the device as described above.

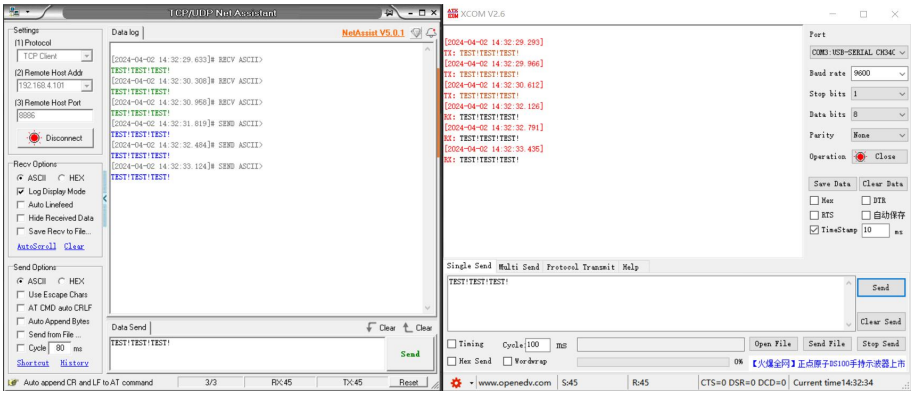
Network Assistant (Net Assist) connects to "Gateway Radio" as shown in the following figure (the device L INK indicator light is always on after successful connection; if the device is connected but the indicator light is not on, the device is in configuration mode and removed by restart the device), XCOM connects to "Serial port gateway":

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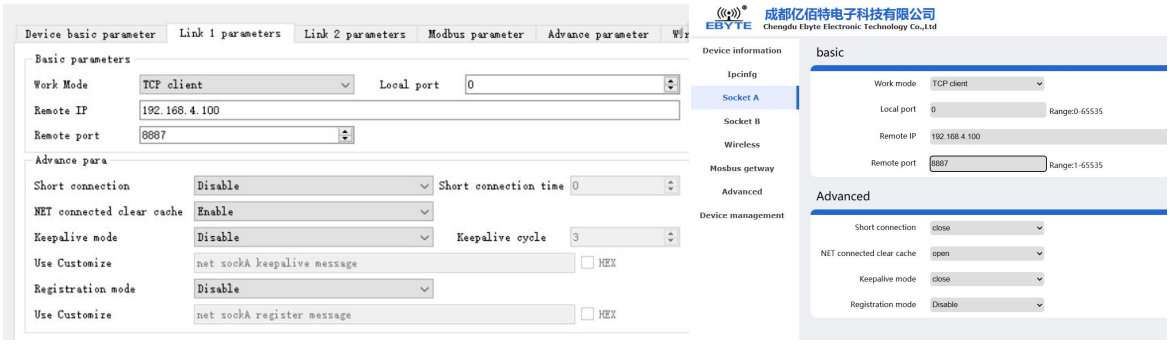


Data receiving and receiving test:



2.5.2 The TCP client is intended to use

Ethernet parameters of Gateway Station, host computer and web page are configured as follows:



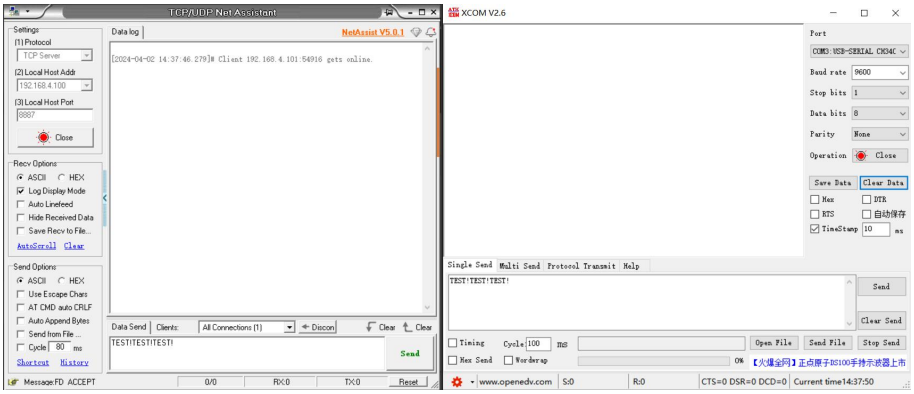


Network Assistant (Net Assist) connects to "Gateway Radio" as shown in the following figure (the device L INK

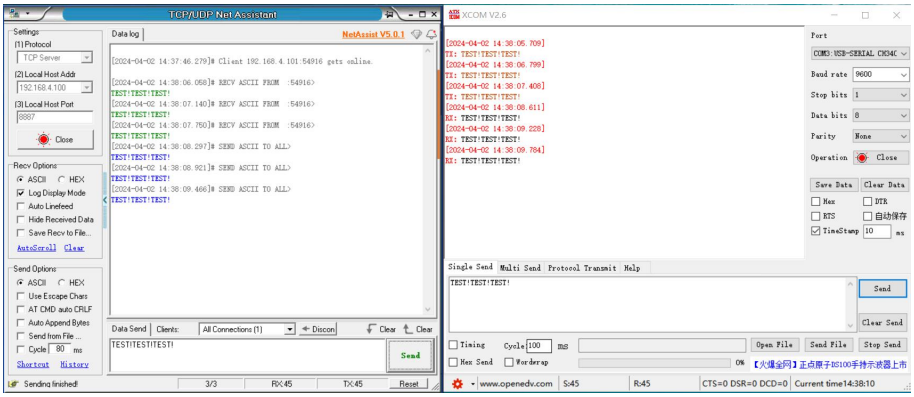
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indicator light is always on after successful connection), and XCOM connects to "Serial port gateway":

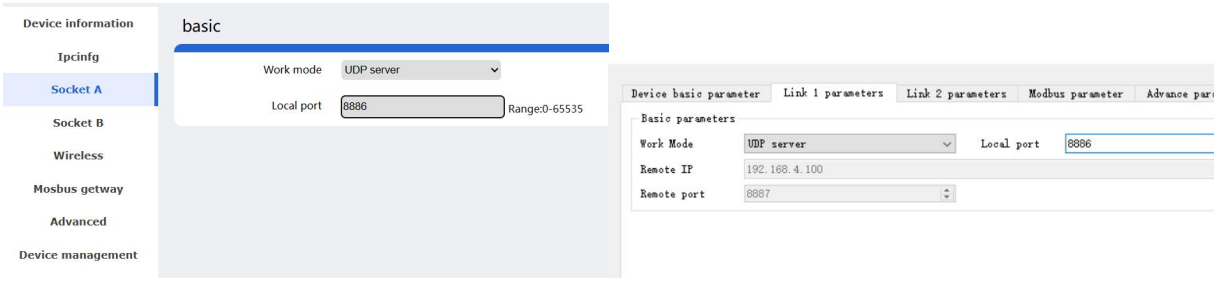


Data receiving and receiving test:



2.5.3 The UDP server is intended to use the

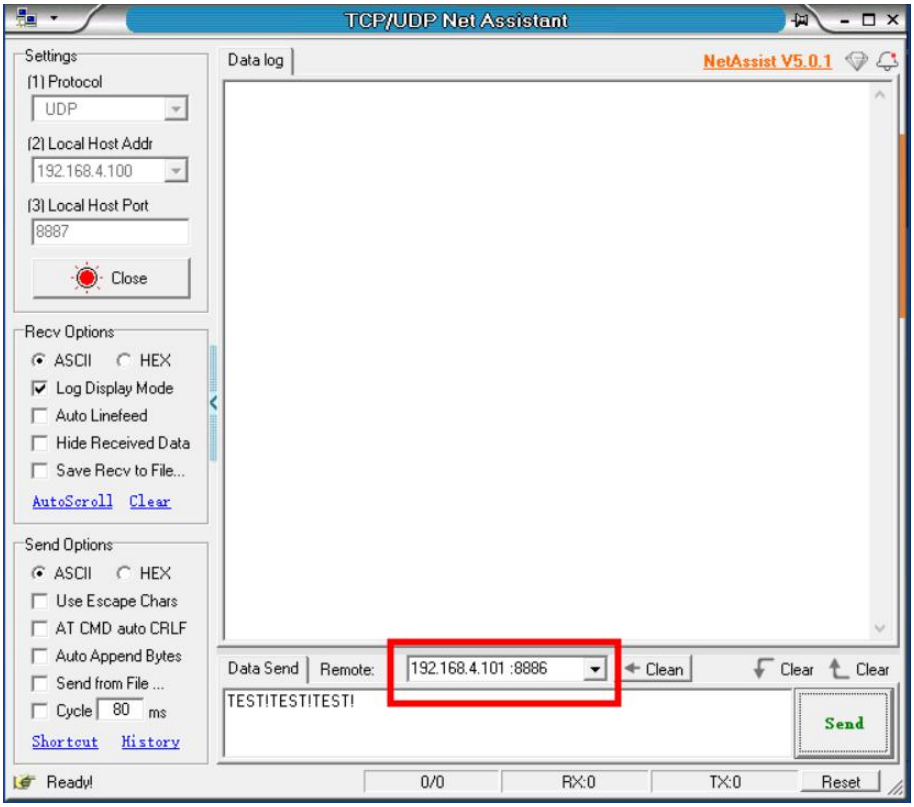
Ethernet parameters of Gateway Station, host computer and web page are configured as follows:



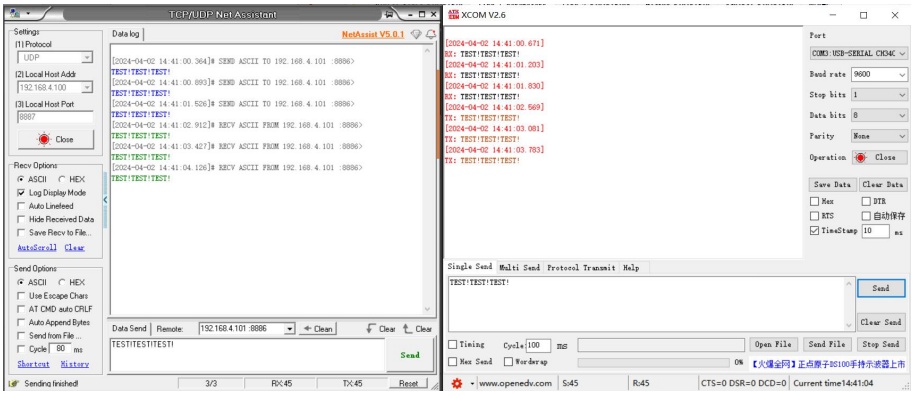
After the configuration, the device L INK indicator is always on, and the network Assistant (Net Assist) connects to "Gateway Radio" as shown in the figure below:

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Data sending and receiving test (UDP server mode must be sent by PC before UDP can dynamically adjust the destination address, and serial port sending data can only be received by UDP of the last communication):

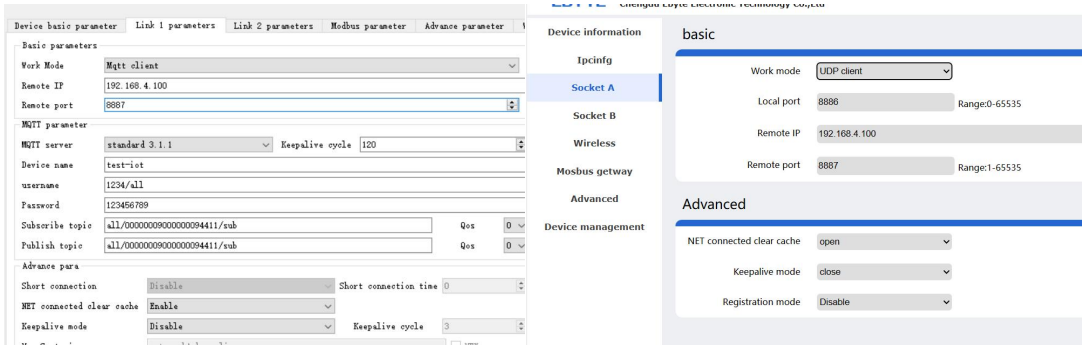


2.5.4 The UDP client is intended to use

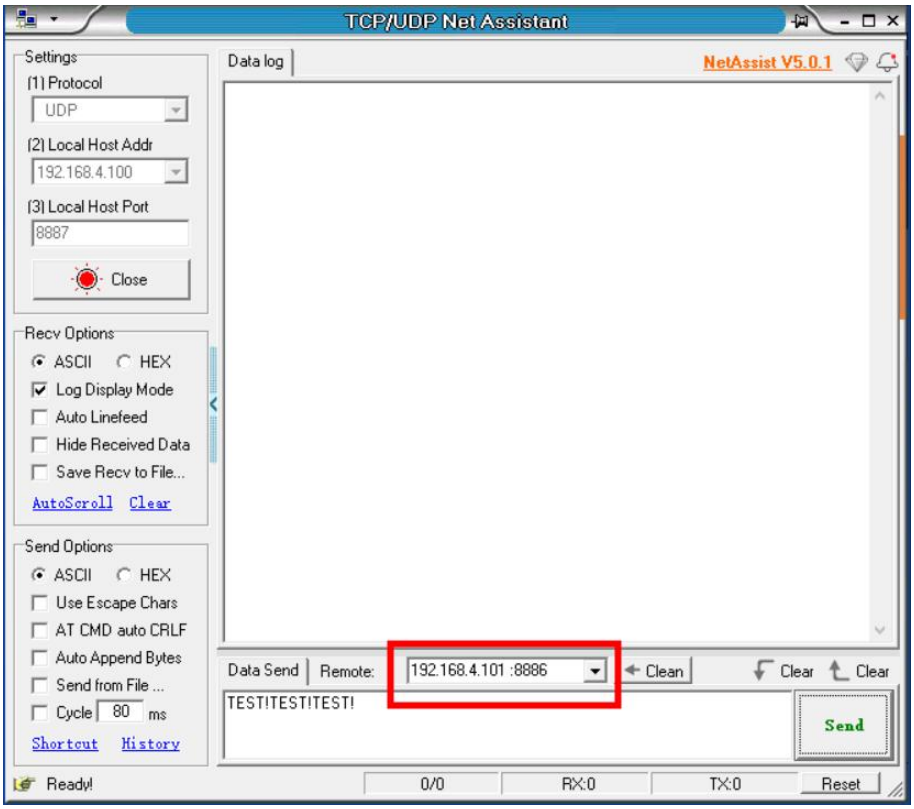
Ethernet parameters of Gateway Station, host computer and web page are configured as follows:

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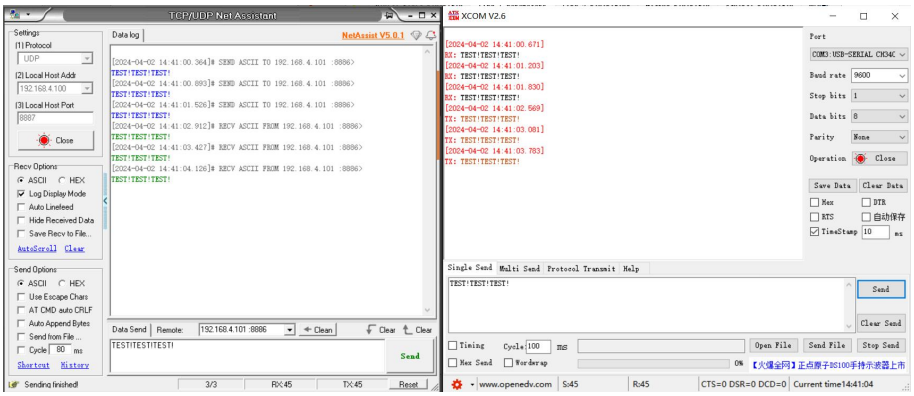
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After the configuration, the device L INK indicator is always on, and the network Assistant (Net Assist) connects to "Gateway Radio" as shown in the figure below:



Data transceiver test serial send data will only be received by UDP (192.168.4.100:8887):



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3 Technical Parameter

3.1 General specification parameters

No.	Name	Specifications
1	Supply voltage	DC8~28V, recommended 12V or 24V power supply
2	Network outlet specifications	Standard RJ 45, with 10 / 100Mbps in support
3	Networking protocol	IP、TCP/UDP、ARP、ICMP、IP v 4、M QTT 、HTTP
4	So ket Number of roads	2 Road full function
5	Socket pattern	TCP Server 、TCP Client 、 UDP Server 、UDP Client 、 HTTP C li ent 、MQTT Client
6	TCP Server linkage	Up to 5-way TCP connections are supported
7	The IP acquisition method	Static IP, and DHCP
8	Domain name resolution	Support
9	Domain name server	Customizable, default 114.114.114.114
10	User configuration	Web page configuration, host computer, and AT instructions
11	Antenna interface	SMA (outer thread and inner hole)
12	Size dimension	84mm ×82mm ×25mm
13	Average weight	130 ± 5g
14	Working temperature	-40 ~ + 85℃, industrial grade
15	Storage temperature	-40~ + 125℃, industrial grade
16	Working humidity	From 10% to 90%, relative humidity, and no condensation

3.2 Wireless specification parameters

Main parameter		Specifications	**Remarks**
Working frequency band (MHz)		410-441	Channel interval: 1M Default 23
Power	Emission current (mA)	400m A @ 12V 250m A @ 24V	Instantaneous power consumption
	Receive current (mA)	20mA @ 12V 12mA @ 24V	

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Maximum emission power (dBm)	30	High (30 dBm), medium (27 dBm), low (24 dBm), very low (21 dBm) The transmitting power except "high" is the reference value, and the actual value may be different, and reducing the transmitting power will not reduce the power consumption of the equipment, so the maximum power is recommended
Aerial rate (bps)	2.4~19.2k	The default air rate is 2.4 kbps, User can configure itself (2.4, 4.8, 9.6, 19.2kbps)
Reference distance	8000m	Clear and open environment, antenna gain 5 dBi, antenna height 2.5 m and air rate 2.4 kbps
Subcontracted length	58 Btye	Maximum subcontract length

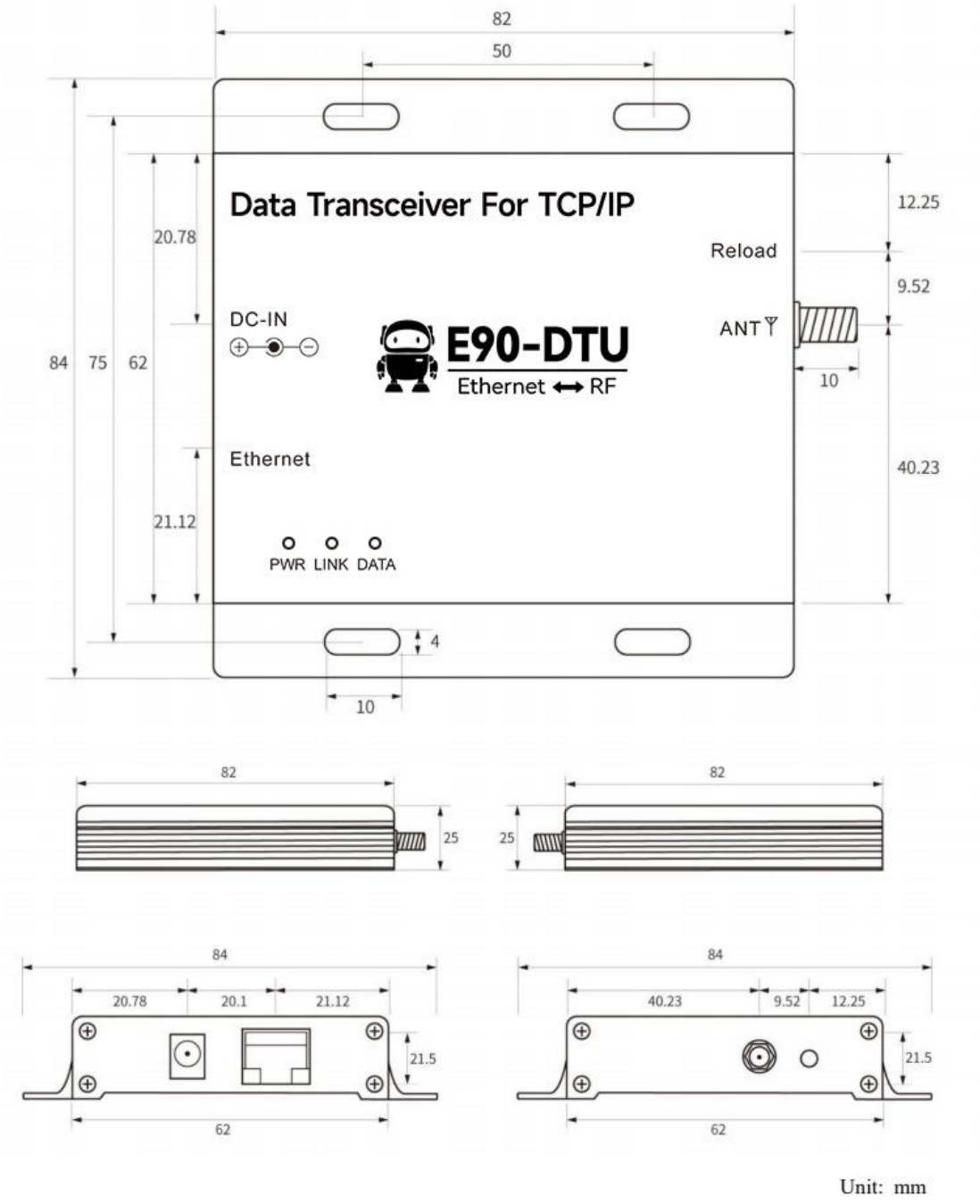
[pour]

- In the same area, use multiple groups of digital stations for one-to-one communication, it is suggested that each group of digital stations set a channel interval of more than 2 MHz;
- The lower the transmission power, the closer the transmission distance, but the working current will not be reduced in the same proportion, it is recommended to use the maximum transmission power;
- The power adjustment function cannot accurately feedback the "medium", "low" and "very low" actual transmitted power, and the value in the table is only for reference, and other powers can be customized;

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3.3 Size

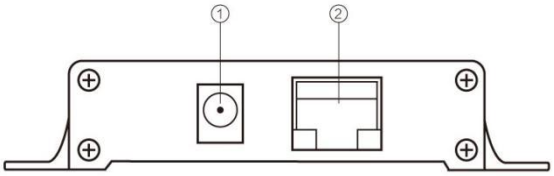


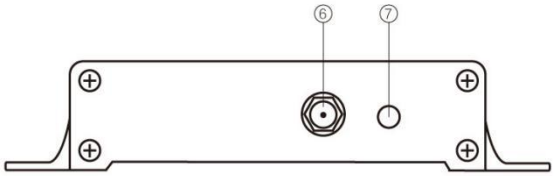
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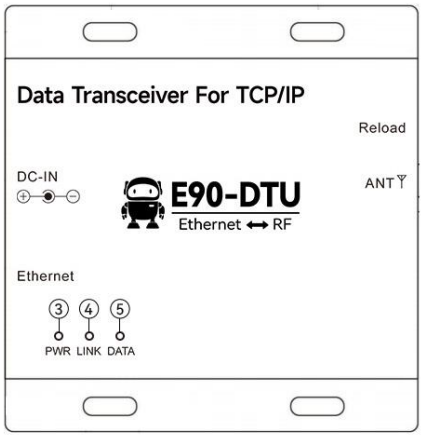
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3.4 Pin definition







Pin No.	Item	Description
1	DC_IN	Power interface, 8~28V DC master hub (inner needle diameter 2.0mm, pore diameter 6.4mm)
2	Ethernet	The Ethernet interface, the standard RJ 45 interface
3	PWR	Power indicator, red, power on
4	LINK	Link indicator light, as shown in green A) Out: the network cable is not connected or not connected to the server; Bb) flicker: the network cable connection is normal but the link is not connected (tentative 2Hz square wave); C) Chang Liang: successful network link connection;
5	DATA	Serial receiving indicator light, yellow, flashes when receiving server delivery data or RF module data
6	ANT	SMA antenna interface (outer screw, inner hole)
7	Reload	Return to the factory settings button

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4 Basic functions

4.1 Default parameter

Type	Name	E90-DTU(433L30)E
LORA parameter	Module address	0
	channel	23
	Air rate	2.4K bps
	transmission mode	Transparent transmission
	work pattern	General mode
	transmitting power	tall
Network parameter	The IP acquisition method	static state
	local port	8886
	local IP	192.168.4.101
	subnet mask	255.255.255.0
	gateway	192.168.4.1
	DNS server	114.114.114.114
	Web Access Port	80
	Network working mode	TCP server

4.2 LORA parameter

4.2.1 Basic wireless parameters

Channel: the equipment requiring communication shall work in the same channel, and the current working frequency band can be calculated according to the channel value;

Operating frequency = lowest frequency band + channel value * channel interval

Module address: transparent transmission shall ensure that the equipment address requiring communication is the same, distinguish different devices of the same channel in the fixed point mode, and the configuration range is 0~65535;

Air speed: ensure the same air speed of communication equipment;

4.2.2 Work pattern

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General mode:

The station receives user data from wireless, can also send data through wireless, the sending data automatically subcontracted to 58 bytes.

Wake up mode:

The station will automatically add wake up code before each packet, the length of wake up code depends on the wake up time set in the user parameters;

The purpose of the wake up code is to wake up the digital radio station working in the "power saving mode", and the data sent by the "wake up mode" will also be received in the "general mode" and "wake up mode";

[Note] This product does not support "power saving mode";

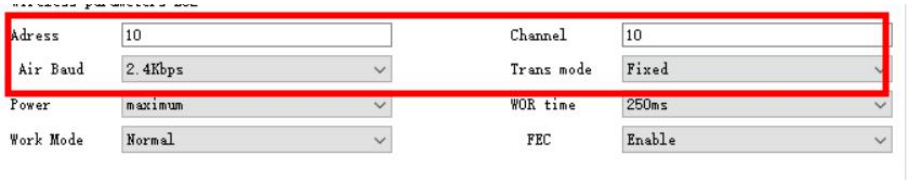
4.2.3 Radio listening

The DTU wireless address is set to 0xFFFF: the data transmission on the same channel; the sent data can be received by a module with any address on the same channel for broadcasting and listening.

4.2.4 Fixed point to send

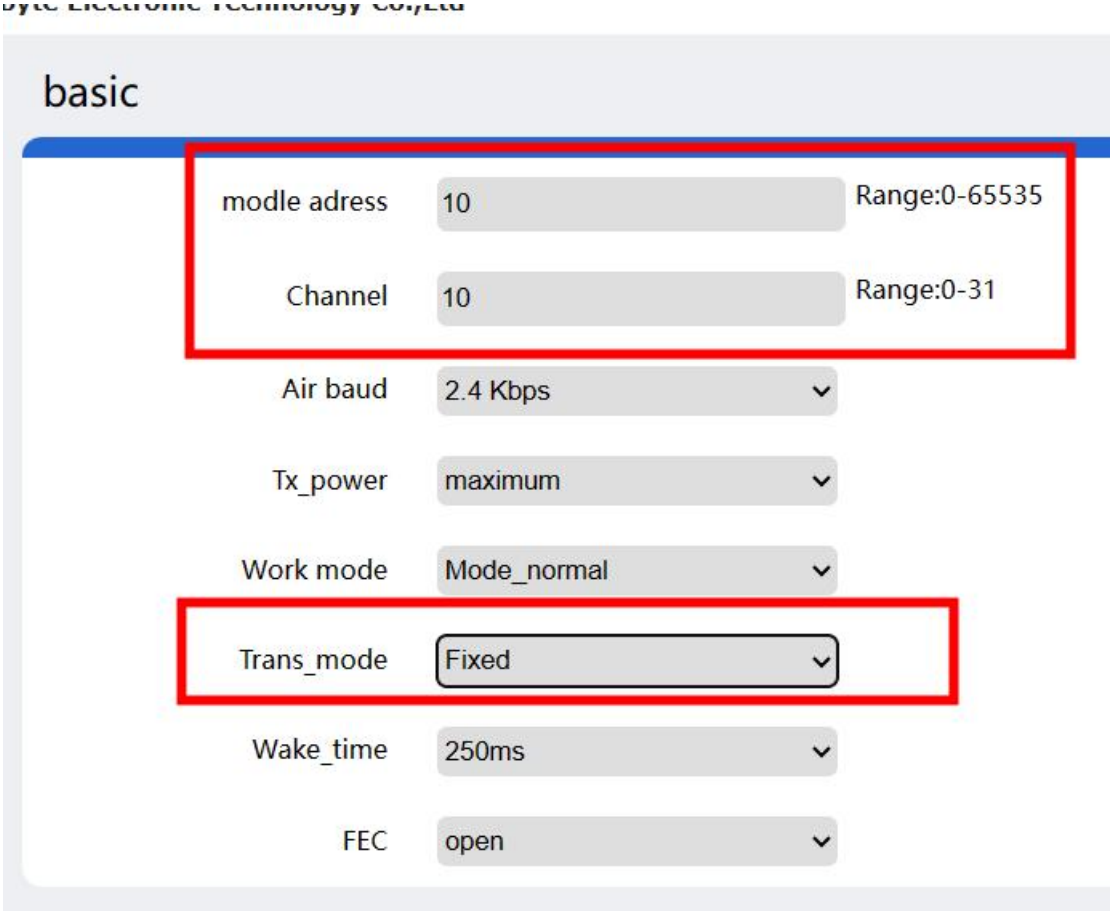
Support the address function, The host machine can transmit data to a module of any address, any channel, To the networking application: e: Module A (address 0x00 0A, Channel 0x 0A) is required to Module B (address 0x00 05, Channel 0x 05) emission data AA BB CC (HEX: 41 41 20 42 42 20 43 43), Its communication format is: 00 05 05 41 41 20 42 42 20 43 43, Where 00 05 is the module B address, 05 is for the module B channel, Then Module B can receive AA BB CC (other stations do not receive data).

For example, configure the device (DEV 01) as the parameters in the figure, PC connection "Gateway Radio" refer to "Quick Start", (DEV 02) for the same series of "serial radio" (to be purchased separately), also configured as the corresponding parameters in the figure.



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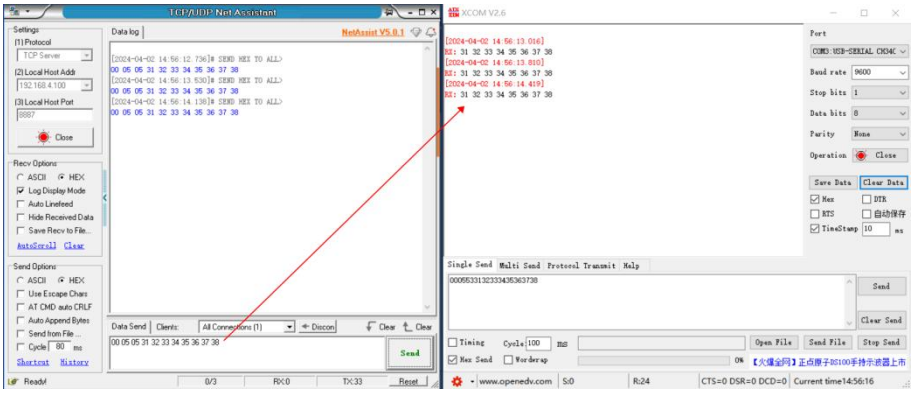
Point-point send presentation:

DEV 01 sent to DEV 02 shall add 00 05 05 (HEX) before the data;

DEV 02 sent to DEV 01 requires 00 0A 0A (HEX) before data;

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4.3 Ethernet section

4.3.1 IP gain

Dynamic Acquisition (D HCP):

The dynamic acquisition device will automatically obtain the IP address and subnet mask from the router and synchronize the gateway and the DNS server of the router, so the working mode and target parameters of the device can only be configured in the dynamic acquisition mode.

Static configuration (S TATIC):

.1IP (factory default: 192.168.4.101), subnet mask (factory default: 255.255.255.0), gateway (factory default: 192.168.4), DNS server (factory default: 114.114.1.114.114) and other parameters of the configuration of the equipment is to ensure that the communication equipment is located in the same network section and avoid IP conflicts, otherwise the equipment cannot pass normally and configure the web page.

4.3.2 Device port

Random port:

TCP client, UDP client, HTTP client and MQTT client can configure the native port as 0 (using random native port), and server mode, otherwise the client cannot connect correctly (the device is not correct for port monitoring).

Use a random port connection to quickly reestablish a connection when a device accidentally breaks the server, preventing the server from rejecting the connection for four incomplete waves. Use a random port in client mode.

TCP port when configured TCP client, HTTP client and MQTT client mode, which can be customized and cancelled.

Static port:

Device fixed port (factory default: 8886), TCP server mode device listening configuration port, accept client connection request and establish connection for data communication, and TCP client mode device fixed port initiates connection request.

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4.3.3 Subnet mask and the gateway configuration

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

The subnet mask must be set. We commonly used class C subnet mask: 255.255.255.0, network number is the first 24, host number is the bottom 8, the number of subnets is 255, module IP is within 255, so module IP is considered in this subnet.

Gateway is the network number of the network where the current IP address is located. If a device like the router is connected when connected to an external network, the gateway is the route.

4.3.4 Domain name Resolution (DNS)

Domain name resolution transforms a domain name into a network-recognized IP address via the Domain name Resolution (DNS) server. This product domain name resolution (DNS) server address support user customization, in the domain name server exception by custom domain name resolution server implementation domain name resolution, equipment in the report of the domain name resolution to the custom domain name resolution (DNS) server resolution request, resolution is returned to the device connection parameters (generally IP address).

In DHCP mode, the domain name resolution (DNS) server address automatically obtains (synchronize the router domain name resolution address) and cannot be customized.

In the static IP mode, the default factory address of the domain name resolution (DNS) server is 114.114.114.114, which users can customize.

4.3.5 Target IP / domain name

The target IP parameter can automatically identify the configuration parameter as the IP address or the domain name input, and the domain name input supports the maximum 128-character configuration.

4.4 SOCKET Function

4.4.1 TCP server

TCP Server The TCP server. In TCP Server mode, the device listens to the native port, accepts connection requests from the client and establishes a connection for data communication. When the Modbus gateway function is turned off, the device will send the data received by the serial port to all client devices connected to the device, supporting up to 6 clients. After the Modbus gateway function is enabled, non-Modbus data will be cleared without forwarding.

Usually used for the communication with the TCP clients within the LAN.

Connection requests are no longer accepted after 6 clients, and web configuration is not available when 6 clients remain connected.

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4.4.2 TCP, client

TCP Client 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 needs to accurately configure the IP address / domain name, target port of the target.

Note: As a client, you set the local port to 0, the dynamic port.

4.4.3 UDP server

UDP Server Means that the device does not verify the data source IP address when communicating with the UDP protocol. After receiving a UDP packet, the source IP address and the source port of the packet are saved and set as the target IP and port, so the data sent by the device only sends the packet to the source IP address and port of the last data received by the device.

This mode is usually used for scenarios where multiple network devices communicate with the device and the frequency is high and TCP S erver cannot meet the conditions.

Using U DP S erver requires the remote UDP device to send the data first, otherwise the data cannot be sent normally.

[Note] In UDP mode, the network should send data to the device less than 512 Bit per package, otherwise it will cause data loss.

4.4.4 UDP client

UDP Client A non-connected transmission protocol that provides a simple and unreliable information transmission service oriented to transactions. Without connection establishment and disconnection, it only needs to configure the destination IP and destination port to send the data to the other party. It is usually used for data transmission scenarios with no requirement for packet loss rate, small packets and fast transmission frequency, and data 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 in the whole network segment, but the transceiver device should ensure the same port, and the device can also receive the broadcast data.

4.4.5 HTTP, the client-side

This mode can realize HTTP automatic package function, provides GET and POST two modes, customers can configure URL, Header and other parameters, sent by the equipment, realize the rapid communication between digital radio and HTTP server, using HTTP client mode suggests random port and open short connection, save HTTP server

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resources, request single package size is affected by L ORA subcontract, when the LORA is configured for 240 byte subcontract, single package data can not be greater than 240.

（1）、 GET by using a demonstration

Test the device HTTP-GET request in HTTP mode using OneNET multi-protocol access.

Query through OneNET-HTTP access instructions (without OneNET usage support, users need to query the usage method, only provide parameter filling instructions):

{

U RL:/devices/863876867/datapoints?

Header: Api-key: xxxxxxxx (presentation only, users need to register their own account to use) Host: api.heclouds.com

HTTP S erver : api.heclouds.com

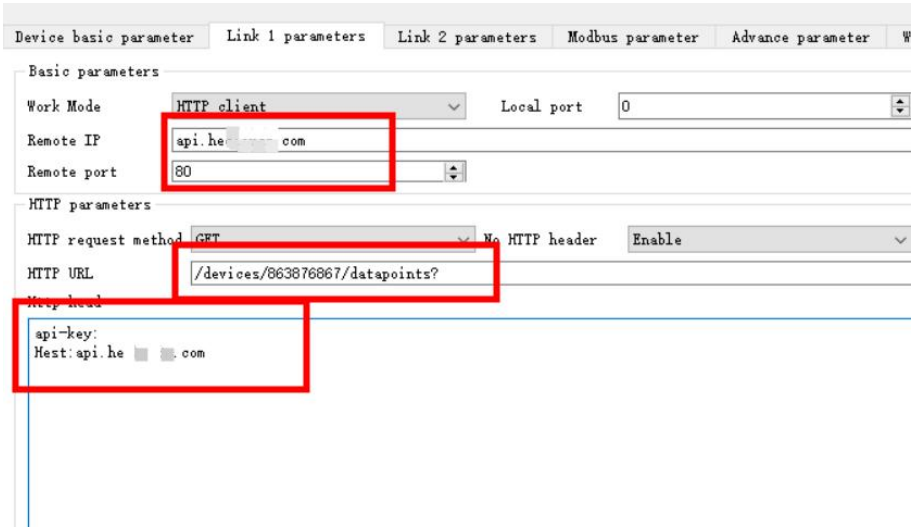
HTTP Port:80

Get send: datastream_id=char

}

The device needs to have access to the Internet, and it is recommended to use dynamic IP acquisition to prevent the device from having normal access to the network due to unreasonable parameter configuration. It is recommended to enable short links to save server resources and open random ports (local port: 0). The above bit computer configuration is used as an example.

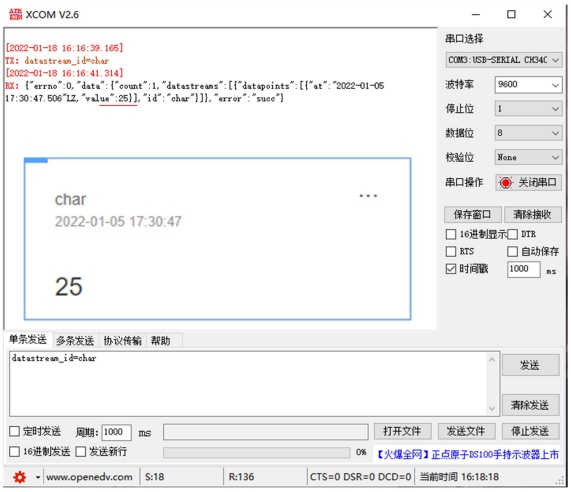
Return data configuration without Baotou (HTTP Baotou input box can enter line character):



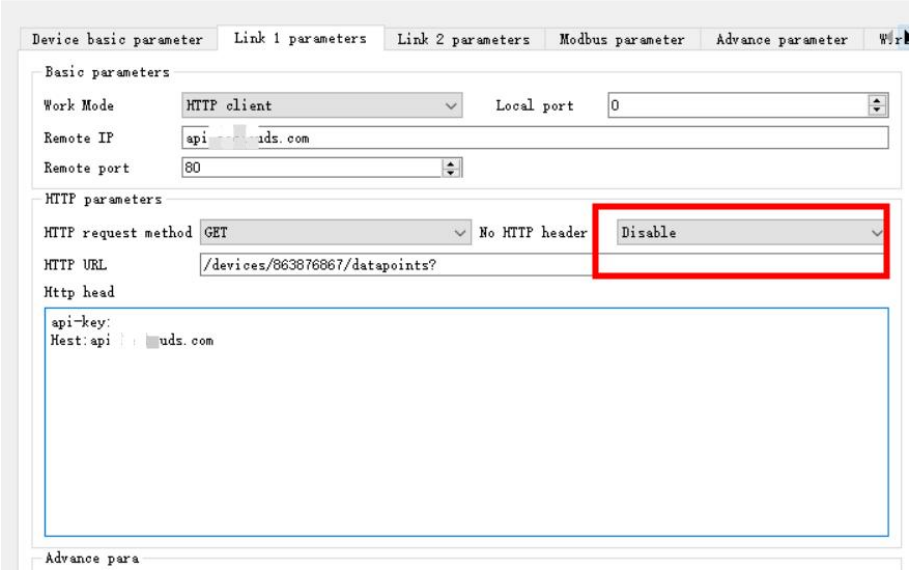
"Serial radio" (additional purchase), wireless connection reference "Quick Start", not explained here, request data demonstration:

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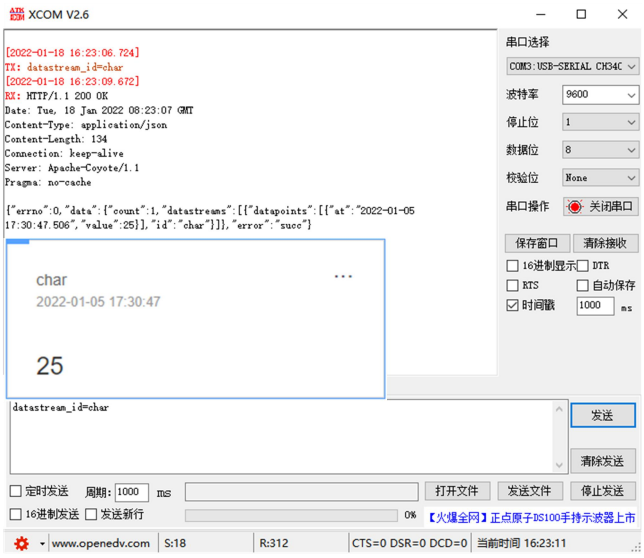
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Return data configuration with header header:



Request Data Presentation:



（2）、 POST

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Test the device HTTP-POST request in the HTTP mode using the OneNET multi-protocol access.

Query through OneNET-HTTP access instructions (without OneNET usage support, users should query the usage method by themselves, and only provide parameter filling instructions):

{

URL:/devices/863876867/datapoints

Header: Api-key: xxxxxxxx (presentation only, users need to register their own account to use) Host: api.heclouds.com

HTTP Server: api.heclouds.com

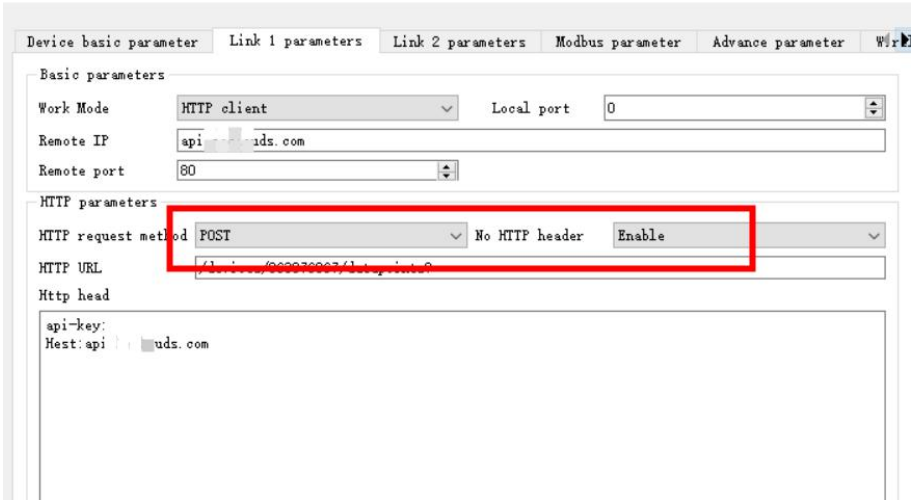
HTTP Port:80

POST send: {"datastreams":[{"id":"char","datapoints":[{"value":28}]}]}

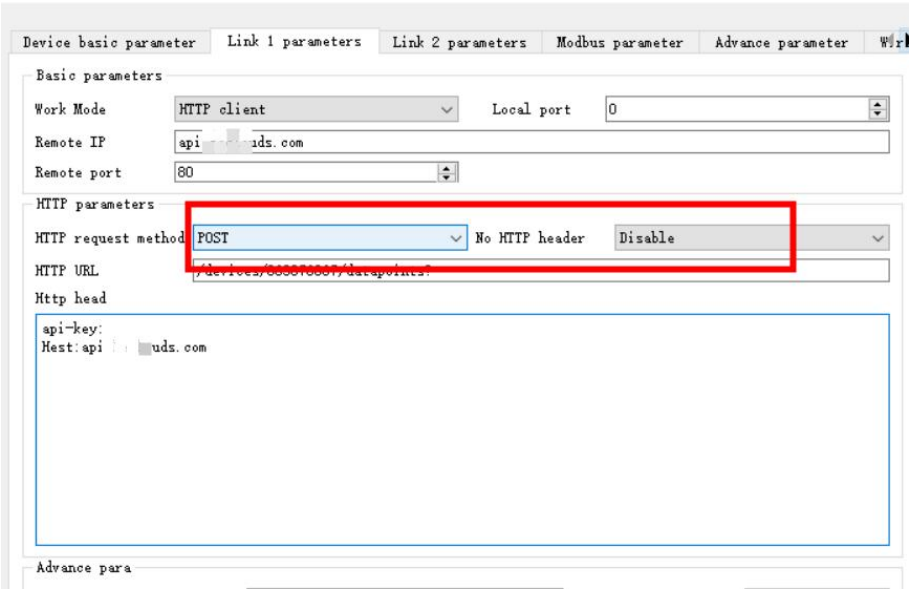
}

The device needs to access the Internet, so it is recommended to use dynamic IP acquisition to prevent the device from normally accessing the network due to unreasonable parameter configuration. It is recommended to enable short links to save server resources and open random ports (local port: 0), and refer to GET configuration.

Return data configuration without Baotou (HTTP Baotou input box can enter line character):



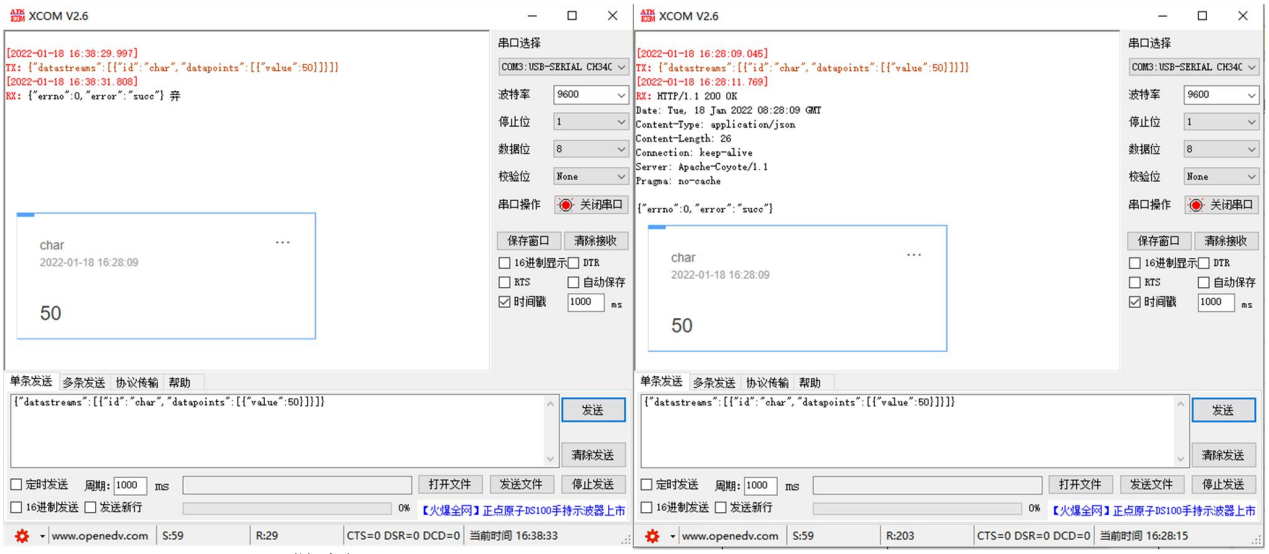
Return data configuration with header (HTTP header input box can enter a line character):



"Serial radio" (additional purchase), wireless connection reference "Quick Start", not explained here, request data

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demonstration:

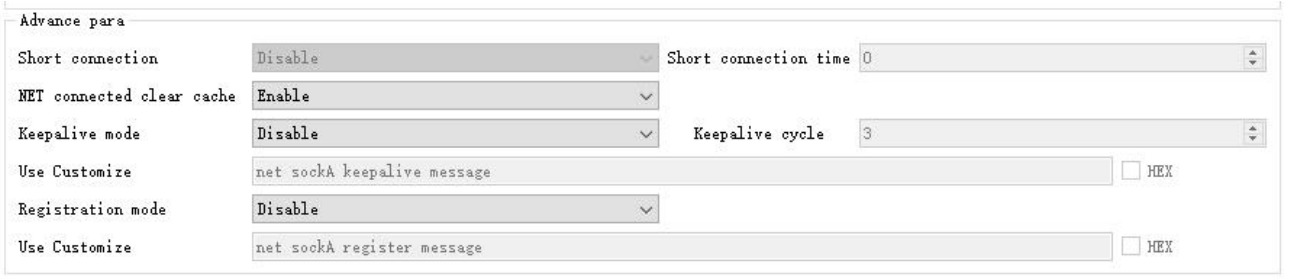


不返回包头 返回包头

4.4.6 MQTT client

Supports quick access to standard MQTT3.1.1 protocol servers (OneNET, Baidu Cloud, Huawei Cloud, user-built and other server types) and Alibaba Cloud servers, supports service quality level configuration (Qos 0, Qos 1), and supports ultra-long text Configuration to facilitate better access to network service operators (server address, three elements, subscription and publishing addresses support configuration of up to 128 characters).

When using the M QTT function, short links and other advanced settings should be turned off, as shown in the figure below (the picture above shows the host computer configuration , and the web page configuration automatically turns off short links):

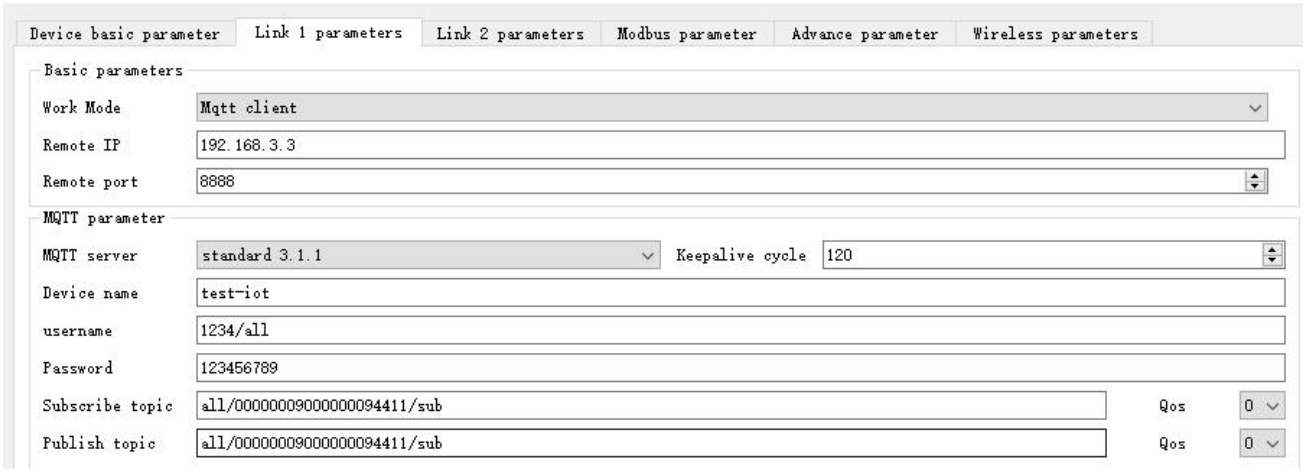


Standard MQTT3.1.1

Standard M QTT3.1.1 cloud parameter configuration:

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QTT3.1.1 to achieve communication through Tencent standard M QTT3.1.1 platform :



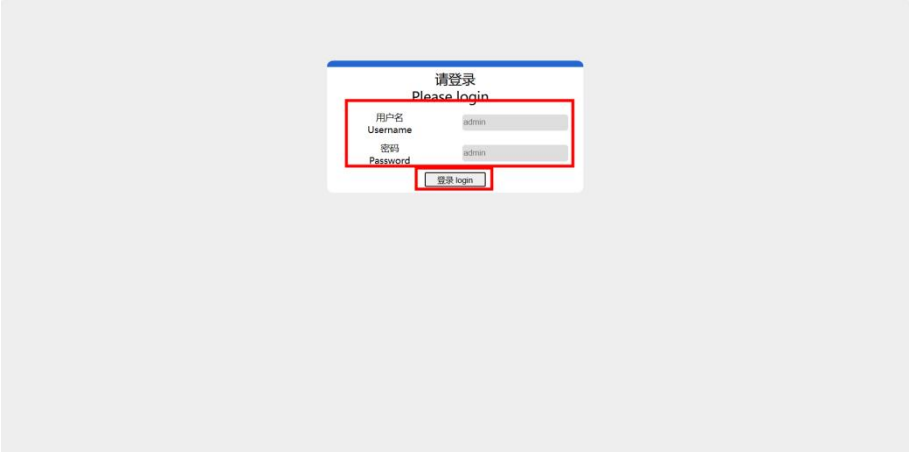
4.5 Web configuration

The built-in web server is convenient for users to set and query parameters through the web page.

The ports of the Web server can be customized (2-65535), the default: 80

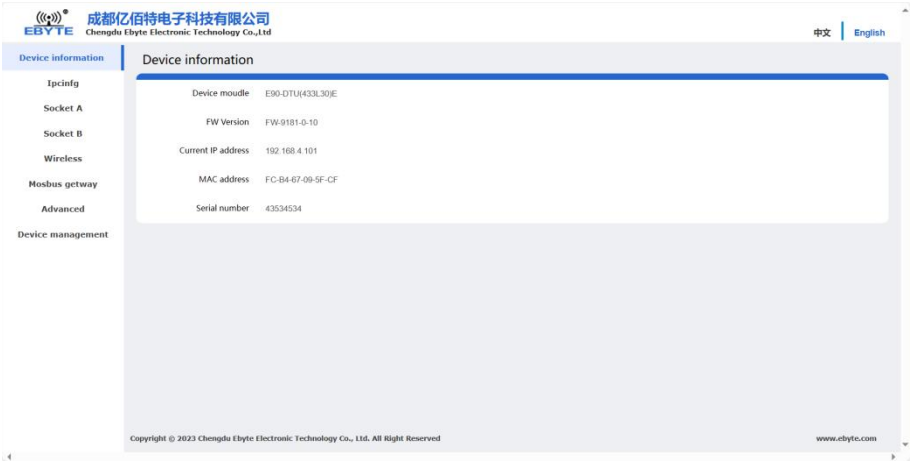
Operation mode (Microsoft Edge version 94.0.992.50, for example, does not support IE kernel browser):

（1）、 Open the browser, enter the IP address of the device in the address bar, example 192.168.4.101 (the IP address and the computer need to keep the same network segment, if you cannot use the closed firewall to try again), forget the local IP can be query through AT instructions and configuration software;



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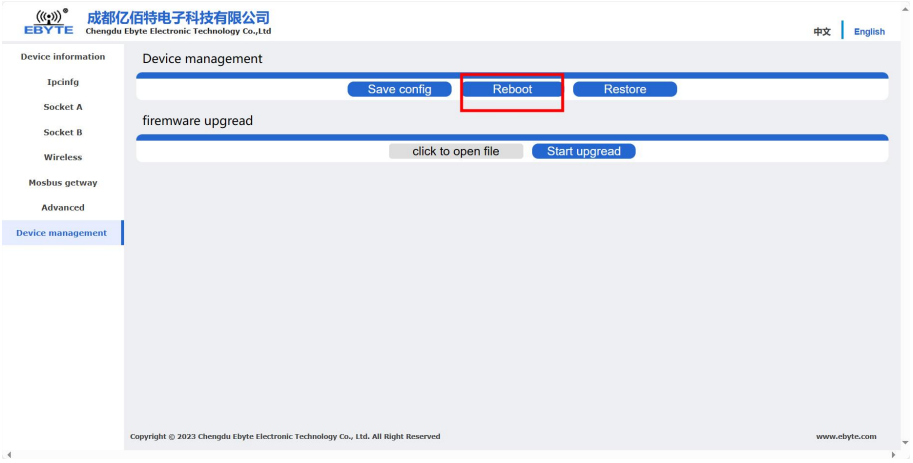
（2）、 Web page pop-up login interface, click log in to enter the main interface;



（3）、 After modifying the parameters, click to save the parameters in the bottom equipment management;



（4）、 After the display operation is successful, click the restart device button on the right side, and the parameters will take effect;



4.6 Hardware is restored to factory

To restore the key needs to effectively connect the network cable and power supply, continue to press the Reload pin of the device until the LED indicator light is fully on to release the button.

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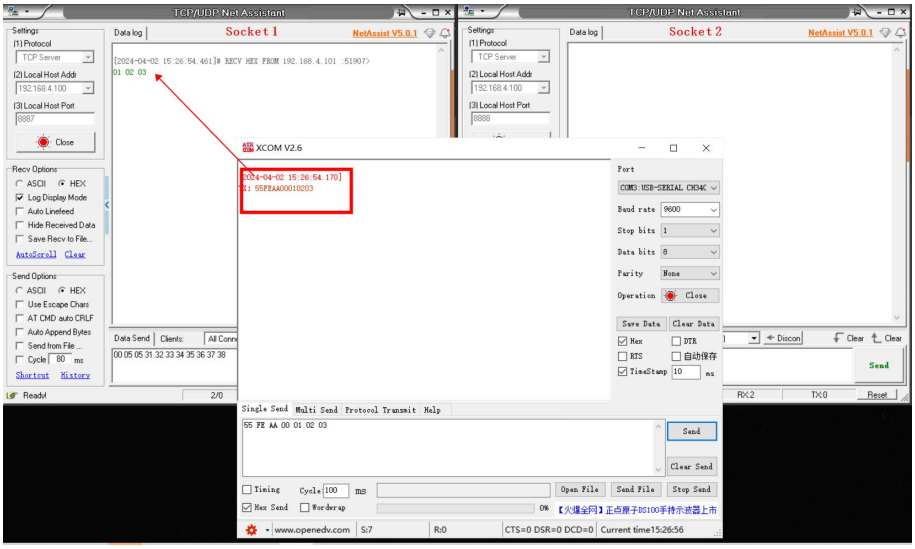
5 Advanced Functions

5.1 Agreement distribution

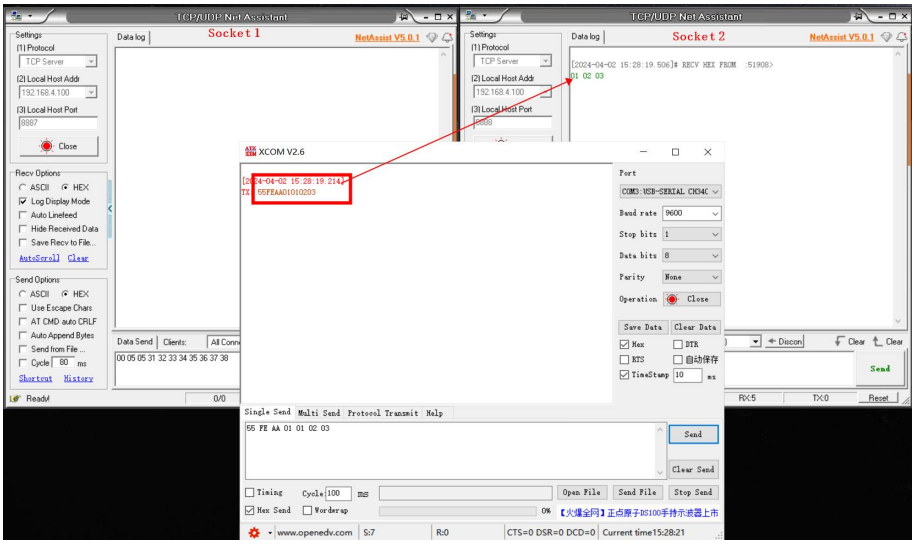
Support socket distribution protocol, the data can be sent to different Socket through a specific protocol, or the data received by different Socket can be added to distinguish.

After opening the protocol distribution mode, it is possible to connect Socke t1 to server port 8887 and Socke t2 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, the data will only be transmitted to Socket 1, and the received content only contains data, not the data header;



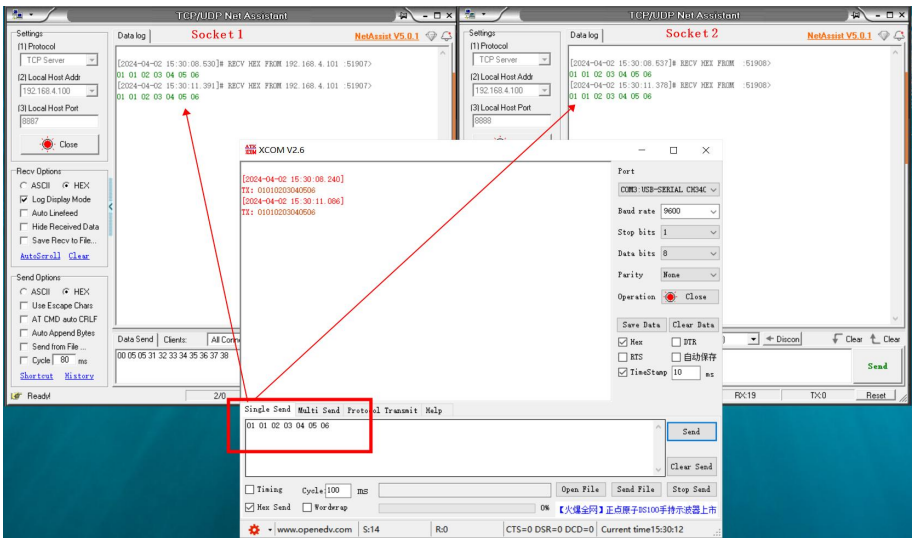
2. The data sent by serial port meets the data header of 55 FE AA 01, that is, meets the requirements, that is, 55 FE AA 01 + data, the data will only be transmitted to Socket 2, and the received content only contains data, not the data header;



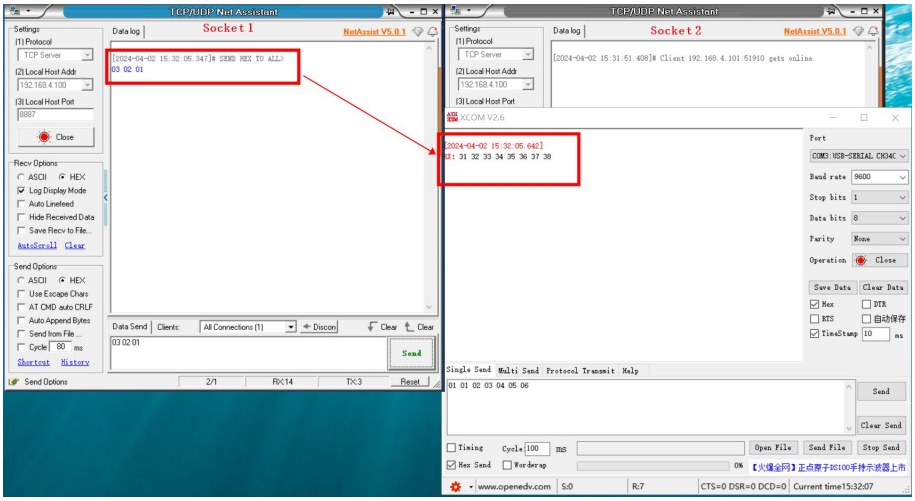
3. The data sent by the serial port is any data, and the data will be transmitted to two Socket

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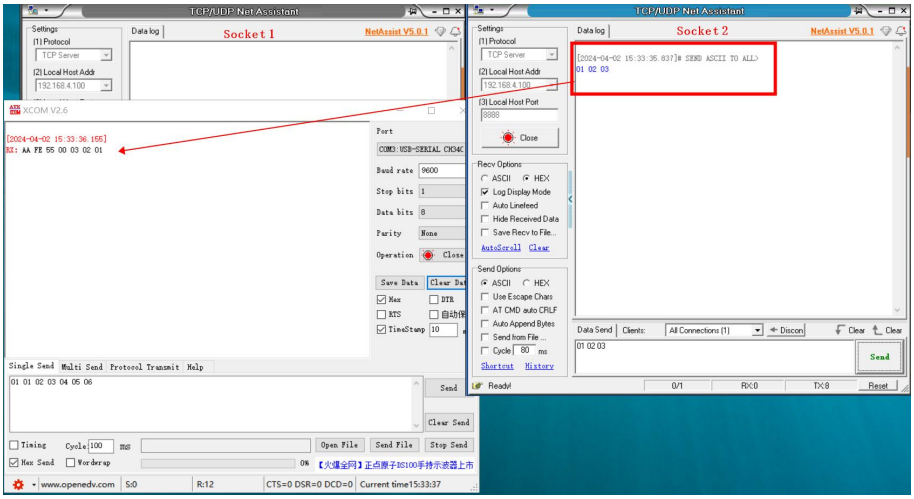
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4. Socket 1 Send any data, and after the serial port receives it, the data header AA FE 55 00 will be added before the data



5. Socket 2 Send any data, and after the serial port receives it, the data header AA FE 55 01 will be added before the data



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5.2 Broken net heavy connection

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

Reconnection interval: After the device is disconnected, the server will be restarted until it is connected, with the range of 0-65535 seconds.

5.3 Timeout restart

If the device runs for a long time and the device will have an abnormal situation, the overtime restart function can be enabled.

Timeout restart time: During this time, the device physical layer (PHY) did not receive any data, it is suspected that the physical layer is abnormal, the device will automatically restart, the range of 60-65535 seconds.

5.4 Page configuration parameters

The web page configuration parameters include two parameters: the web page user name and the device password, which can be displayed on the login page after modification. The default is admin / admin.

5.5 Network AT

The device supports the network AT command, which can modify the device configuration parameters through the instruction issued by the server. After enabling the network AT, the network AT head can be set. Using the network AT hair sending command, the command will be recognized as an AT command by the device, and the device will execute the command and will not transmit the command through.

5.6 Heartbeat bag

In client mode, the user can choose to send a heartbeat packet, customize the heartbeat packet time, and each link can set a separate heartbeat packet. In TCPC mode, you can choose MAC / SN or custom data, time interval of 1 to 65535 S configurable. When custom data, send ASCII or HEX format, and heartbeat packet content supports up to 128 bytes of data.

MQTT heartbeat only needs to configure KeepAlive time in the "MQTT function setting", it is recommended not to configure less than 60s, for example, Ali Cloud manual recommended to use 120s.

5.7 Wireless heartbeat bag

The gateway can be configured with wireless heartbeat packets, namely wireless data to the opposite device, MAC / SN and custom data can be sent, custom data is limited to 128 bytes, ASCII or HEX format, range 1 to 65535 S can be configured.

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5.8 Registration package

In client mode, users can choose to send the registration package and customize the registration time.

The registration package supports the following modes:

（1）、 Send the MAC address when the network is connected to the device

（2）、 Send an SN when the network is connected to the device

（3）、 Data for sending a custom registration package when the network establishes a connection to the device

（4）、 Each package of data sent by the device to the network is preceded with a MAC address

（5）、 Each packet of data sent by the device to the network is SN

（6）、 Each package of data sent by the device to the network is precwith custom registration package data

The custom registration package supports up to 128 bytes of data and can be sent in ASCII and HEX format.

5.9 Short connection

In HTTP and TCP 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) point-to-point (server) scenarios.

The TCP short connection function is applied to TCP Client mode. After the short connection function is enabled, the server only requests the information when the connection is sent. After the connection is successful, the serial port does not receive the guide data or the network port within the set time, and the device will automatically disconnect.

Close the short connection function when the short link holding time is set to 0. Set the range of (1 to 65535) seconds, the short connection function is opened, and the default hold time is 0 seconds (close the short link).

5.10 The network connection blanks the cache

The device is in TCP / MQTT / HTTP client mode, when the connection to the server is not established, the wireless received data will be placed in the cache area, the serial receiving cache is 1024 bytes, greater than 1024 bytes will cover the earliest received data. After the network connection is successful, select the serial cache or send the cache through the network.

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

Disable: The network will receive serial port cached data after the connection is established.

5.11 Remote upgrade

In order to facilitate the later maintenance and upgrade functions and the replacement of different firmware, this product supports the online upgrade of firmware. Our upgrade firmware users can upgrade or replace the current firmware through the host machine or web page.

Web page upgrade firmware operation steps:

Step 1: After entering the web page, go to the device management page, find the firmware upgrade section, and click to select the file.

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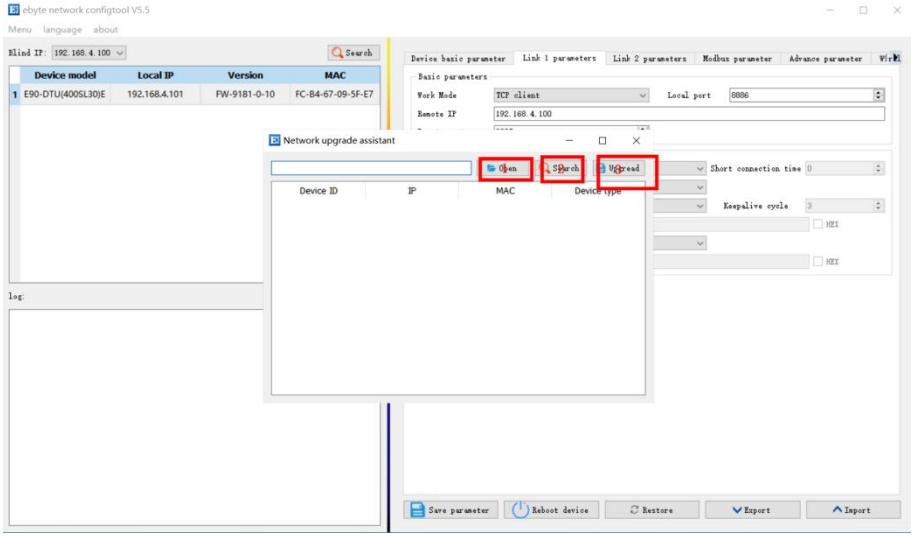
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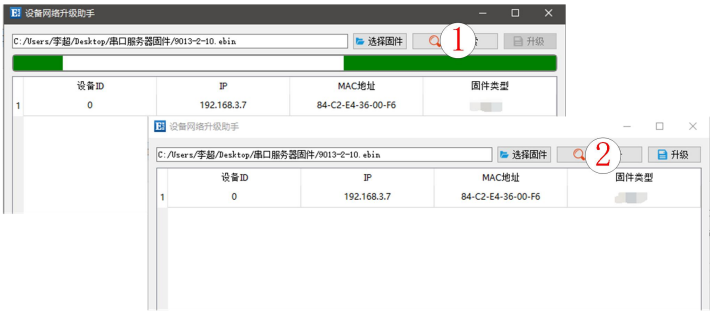
Step 2: After selecting the file, click Start to upgrade. When the progress bar is loaded, the device is automatically restarted, that is, the upgrade is completed.

Web page upgrade firmware operation steps:

Step 1: open the upper computer computer, open the device upgrade assistant in the menu bar, and select the required firmware (the official website provides the download firmware);



Step 2: Click on the search device, find the device and click on to stop the search;



Step 3: Select the equipment that needs to be upgraded;

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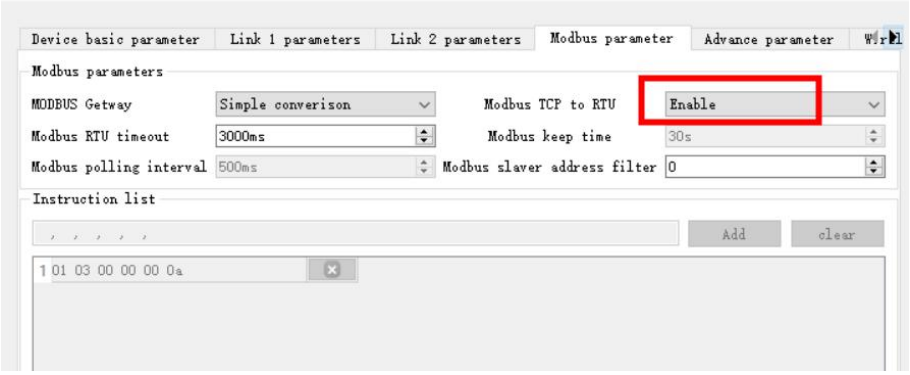
Step 4: Click Start to upgrade, the device indicator flashes, and wait for the upgrade to complete.

[Note] When the device just powers on, clicking the "Search device" device of the upgrade assistant will enter the firmware burning state, and restore the normal mode after the power failure and restart.



5.12 Modbus gateway

5.12.1 protocol conversion



Enable: Check Modbus data non-Modbus data (RTU / TCP) discard no transmission, transfer Modbus RTU protocol with Modbus TCP protocol.

Disabled: no protocol conversion but calibration of Modbus data, non-Modbus data (RTU / TCP) abandoned for transmission.

[Note] Due to the subcontracting mechanism of L ORA wireless modulation, the maximum of single package is 240 bytes, so at most 117 registers (03,04 function codes) or 1872 discrete quantities (01,02 function codes) are read at a time in Modbus.

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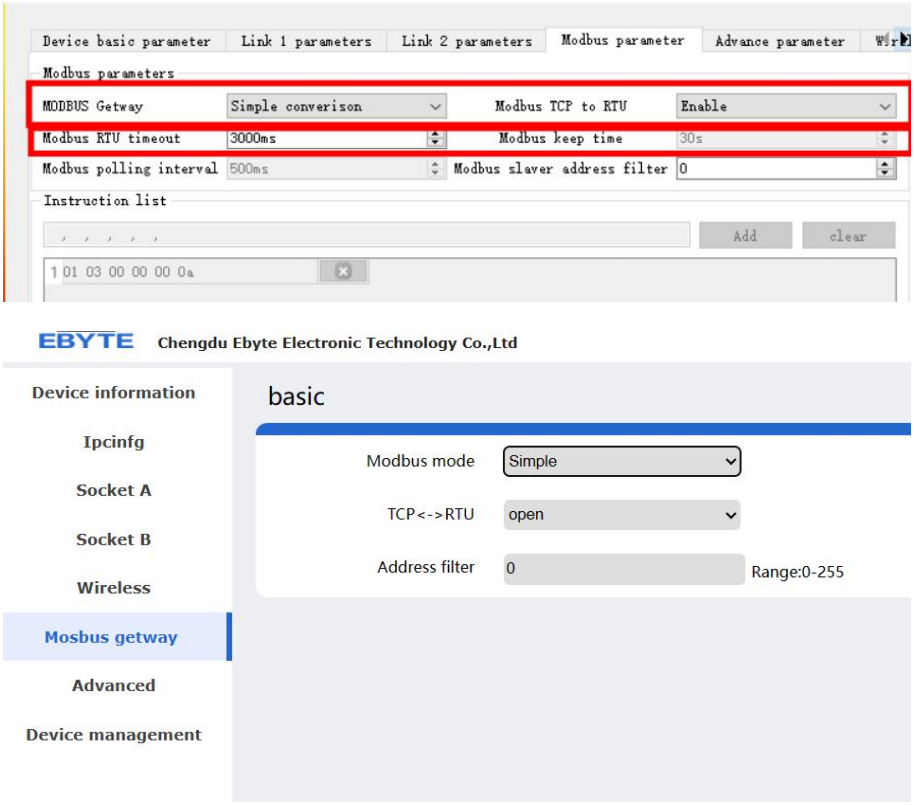
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5.12.2 Simple protocol conversion

Convert Mod bus RTU data into Modbus TCP data, or convert Modbus TCP data into Modbus RTU data to realize the interchange of Ethernet M odbus data and serial M odbus data.

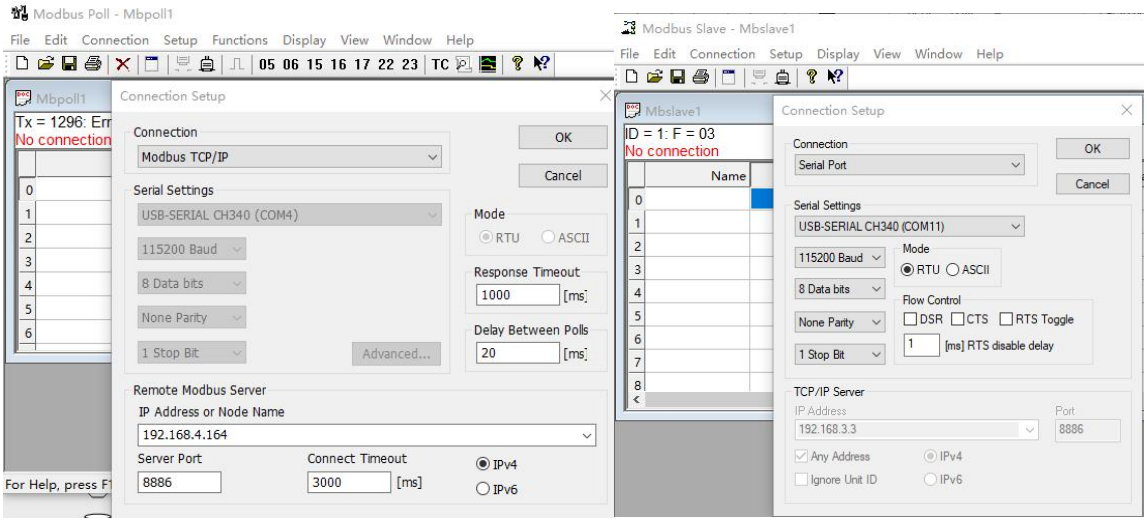
Simple protocol conversion can work in any mode (TCP client, TCP server, UDP client, UDP server, M QTT client), no matter what mode there in only one Modbus master station.

Simple protocol conversion configuration:



M odbus Poll And Modbus Slave software debugging:

The Software Connection Settings:

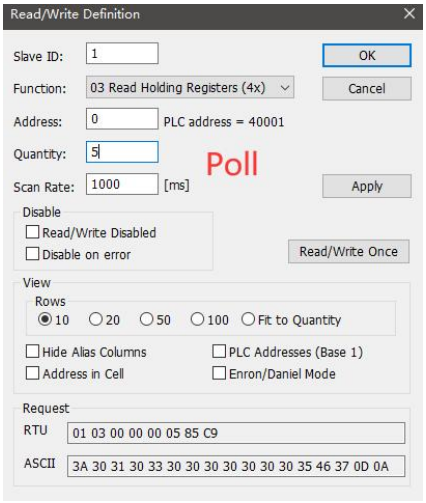


Software register read and simulation configuration:

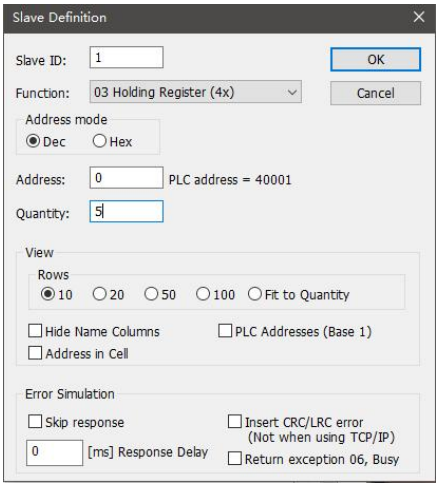
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→The Poll menu selects Set up Read / Write Definition



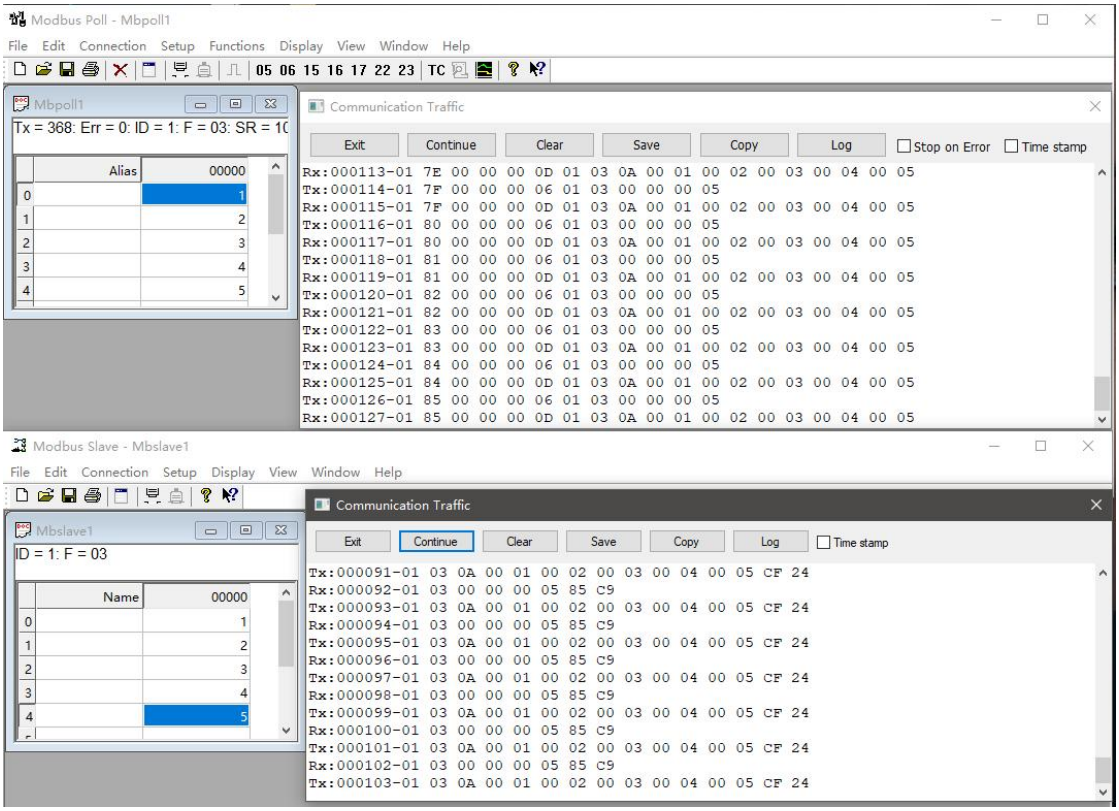
→S lave The menu selects the Se tup Slave Definition



Communication presentation:

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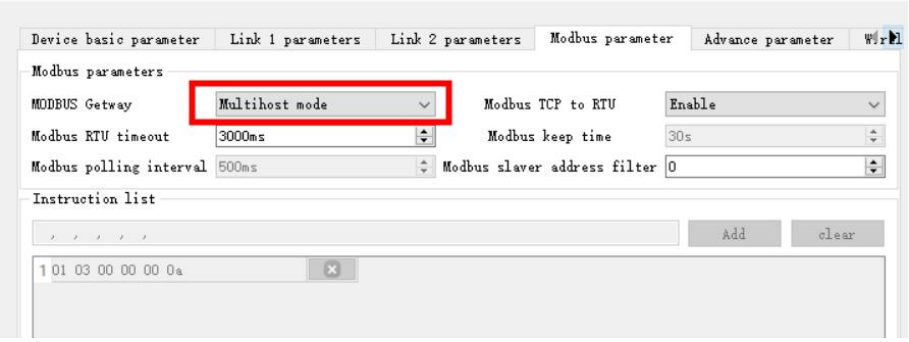
5.12.3 Multi-host mode

The relatively simple protocol conversion can only exist in a single Modbus master station, And the multi-host mode can handle up to five Modbus TCP hosts, When multiple Modbus hosts access at the same time, the Modbus gateway will schedule the bus occupancy (RS-485 bus can only process one request at a time, The multi-host mode will be sorted according to the TCP requests, Other links to wait), To resolve bus conflicts (only 4 host connections are currently supported), Only supported for working in the TCP server mode, The slave machine can only be used in the serial port, Otherwise, it will not work properly.

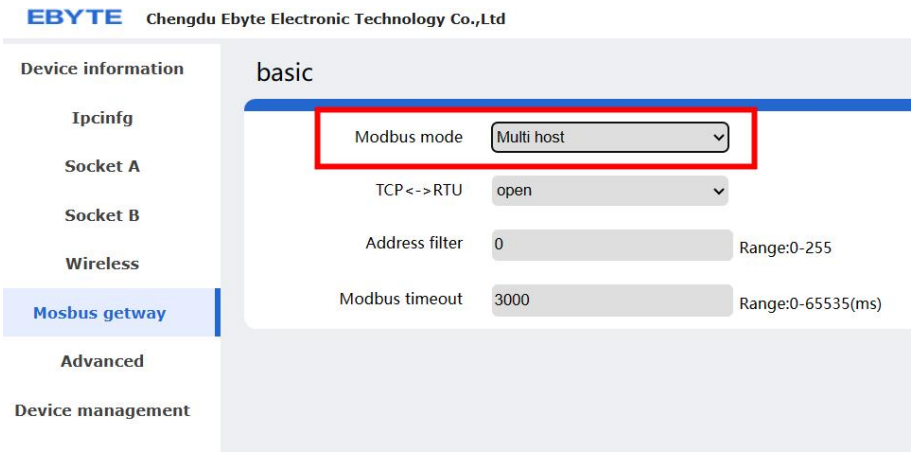
With the increase of the number of hosts, the Modbus timeout time should be increased and the request interval should be increased. Storage gateway is recommended if multiple hosts need continuous high-speed requests.

It is recommended to configure as Simple Protocol Conversion when there is no multiplex host in use.

Multi-host mode configuration:

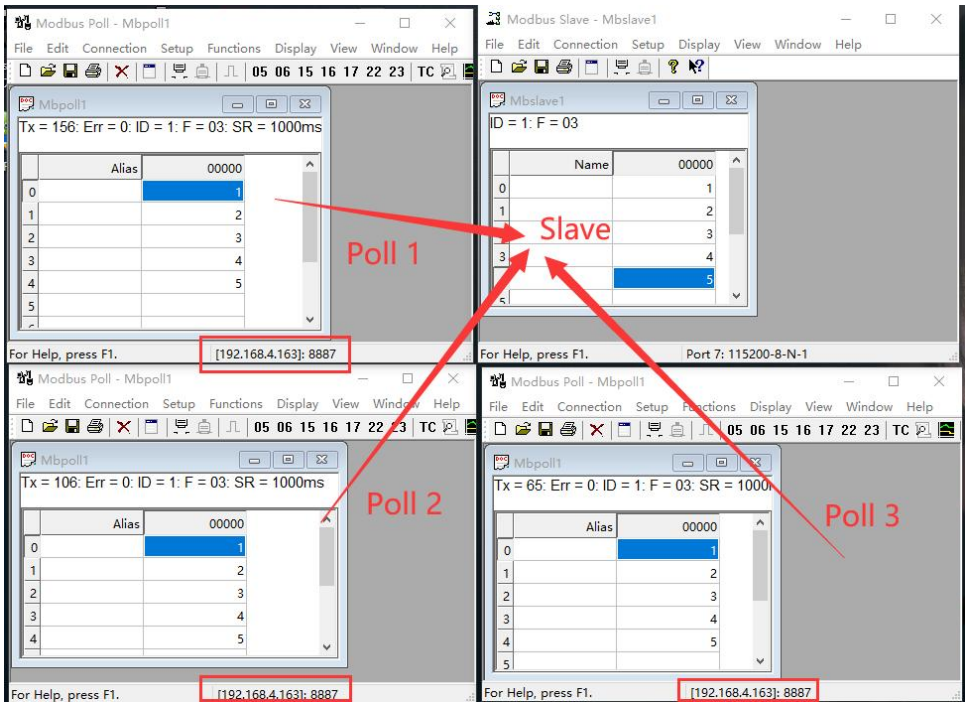


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M odbus Poll And Modbus Slave software debugging:

Software configuration and register configuration refer to "simple protocol conversion", and open multiple Modbus Poll software simultaneously (3 channels, for example, up to 5 channels).



5.12.4 Storage Gateway

Storage gateway not only to the bus data arbitration will also store for repeated read instructions, when different host request the same data without the RTU device register status, and directly return to storage area cache data, greatly improve the gateway more host request processing capacity, but also shorten the time consumed by the whole request process. The user can customize the storage area instruction polling interval and the instruction storage time according to the requirements.

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

characteristic:

（1） The gateway has a 3K cache for storing instructions and return results (reading 10 holding registers, for example, for storing about 100 instructions and return results);

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（2） RTU response timeout automatically empty the cache to ensure the real-time and authenticity of data;

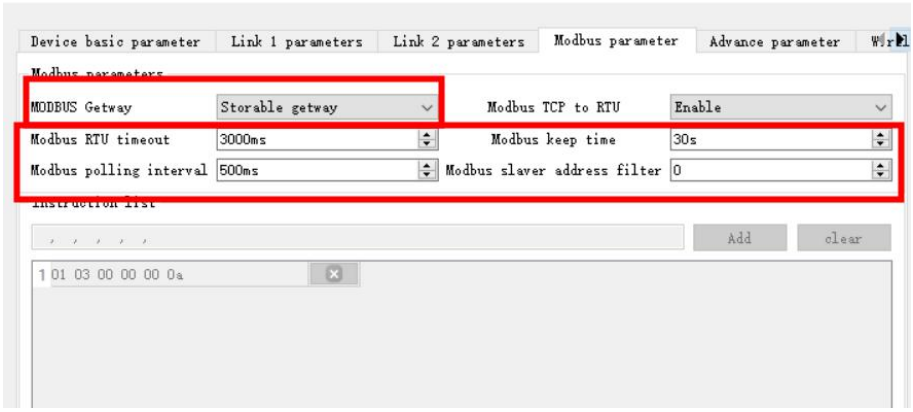
（3） The polling interval can be customized, 0-65535ms (default: 500ms);

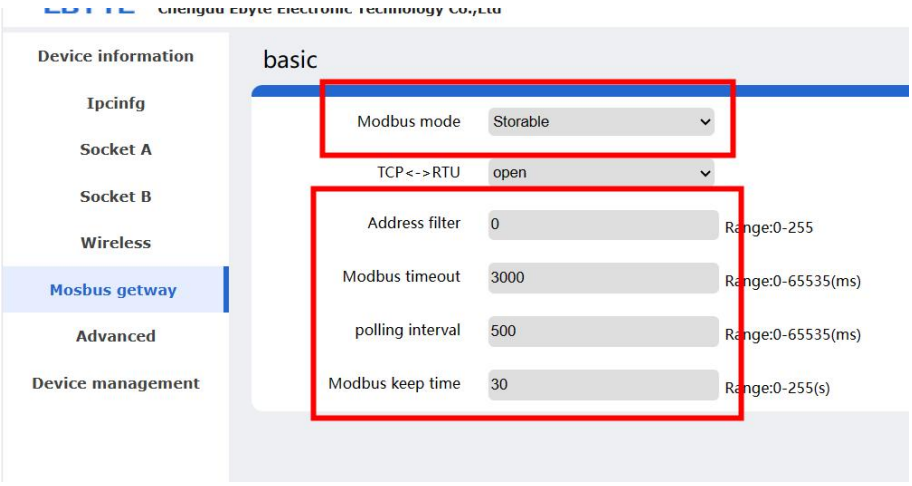
（4） The gateway will poll the RTU device according to the instruction storage time used for the configuration, the MODBUS host does not query the command again during the storage time, and the gateway automatically removes the storage instruction to release the cache;

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

（6） Only support 01,02,03,04M od bus function code query results storage;

Storage-type gateway configuration:





5.12.5 Configurable Gateway

The gateway, based on the pre-configured MODBUS instructions, automatically polls the RTU device register (only supports the configuration of MODBUS reading instructions), and the non-storage instructions will directly operate the RTU device. Often read instructions can be stored in the gateway in advance, shortening the response time (query configured instructions). Due to the above features, the serial port side of the configurable gateway can only connect to the Modbus slave station.

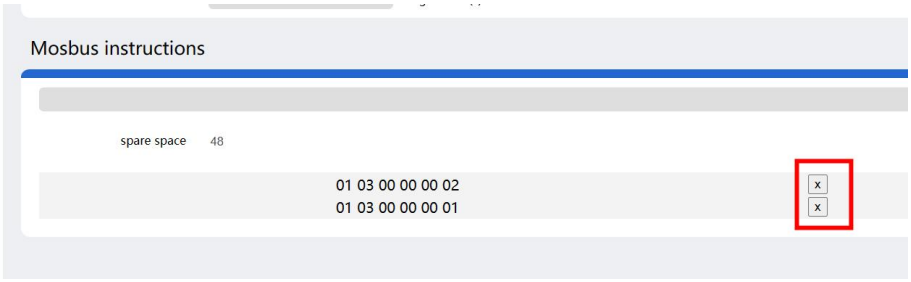
Instructions storage instructions (increase, instruction error and format error cannot be added):

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Instructions struction instruction instructions (delete):



5.12.6 Automatic upload

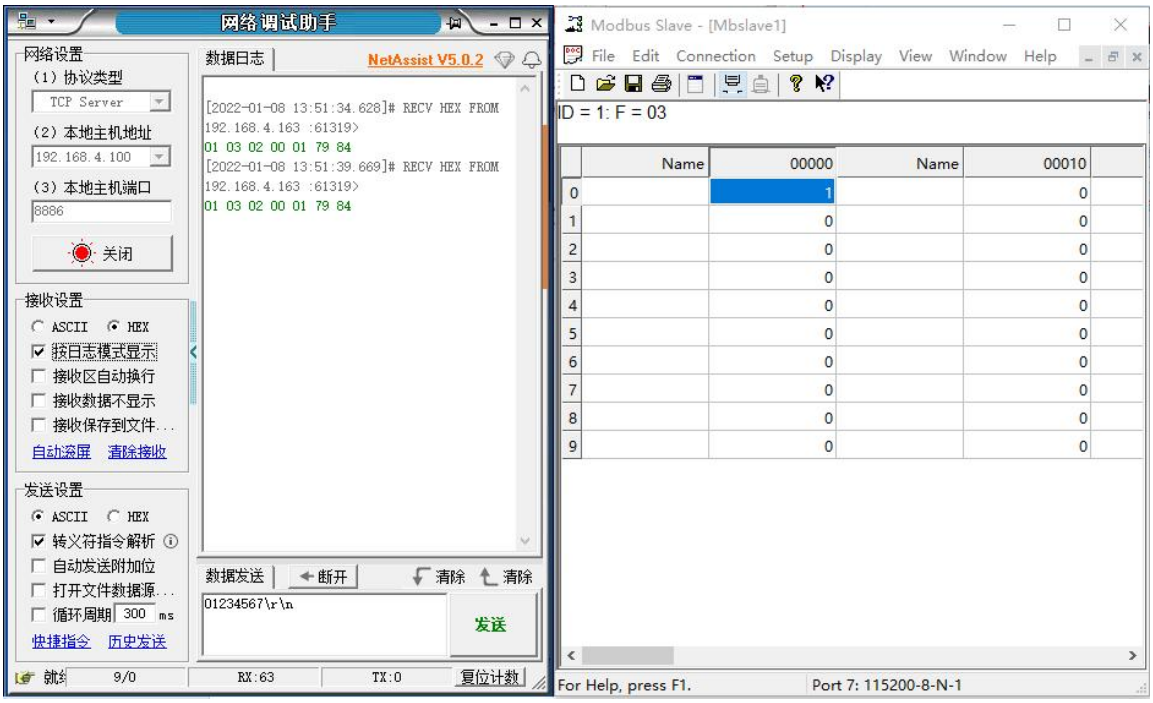
In client mode (TCP client, UDP client, MQTT client, HTTP client), the gateway will automatically poll the instructions in the instruction list and upload them to the server, and can select the feedback format (Modbus RTU format or Modbus TCP format) and the instruction polling interval (0-65535ms) according to the requirements.

Instruction pre-storage refer to "configurable gateway-instruction storage instructions", automatic upload upper computer / web page configuration:

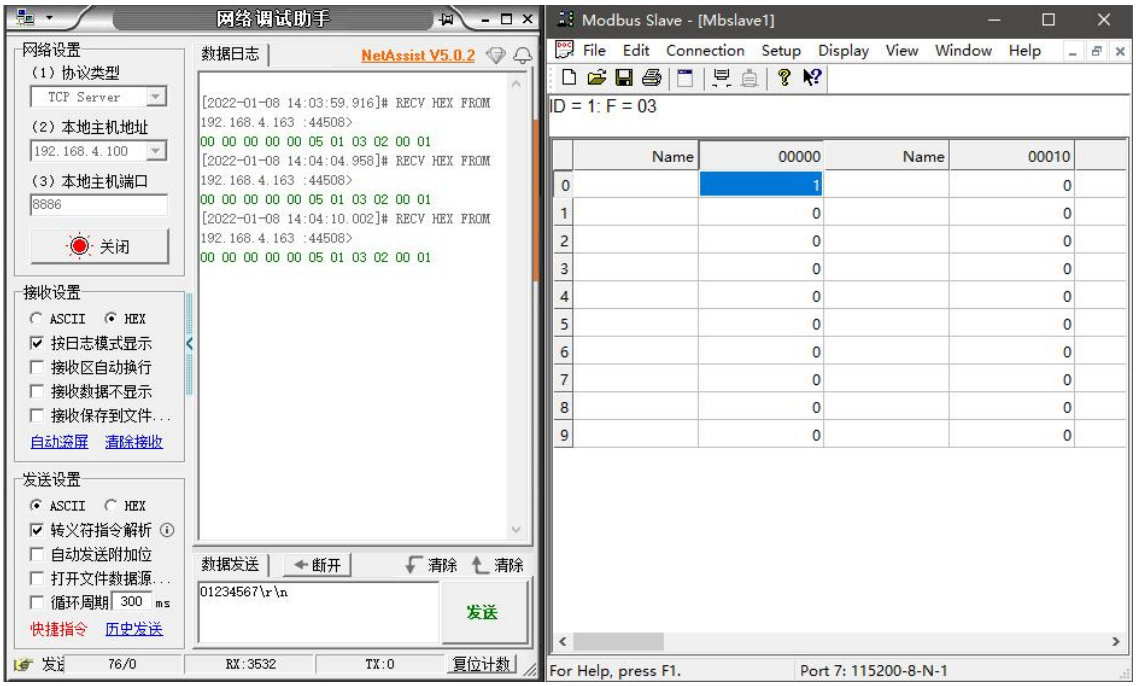
TCP Client Presentation (in Modbus RTU format):

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TCP Client Presentation (in Modbus TCP format):



5.12.7 A protocol conversion-simple demonstration case

Step 1: adjust the Modbus timeout time of the gateway according to the actual application distance test data delay;

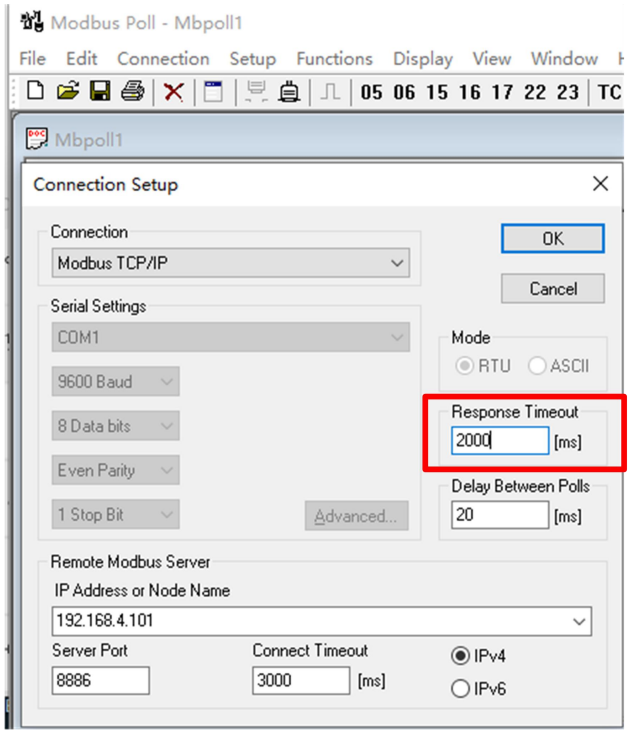
Use transparent transmission mode through X COM and network debugging assistant log, as shown in the figure below:

The Mod bus timeout time of E 90 gateway should be greater than the calculation time (it is recommended to use the maximum value for multiple sending), which can be configured as 2000ms (with a certain margin, do not use 1400ms directly), and the timeout time of the terminal device (such as M odbus Poll software) should be greater than or equal to

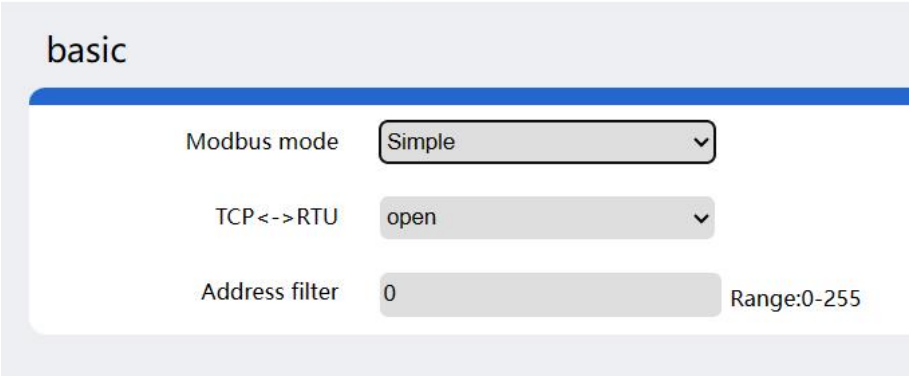
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the timeout time of the gateway.



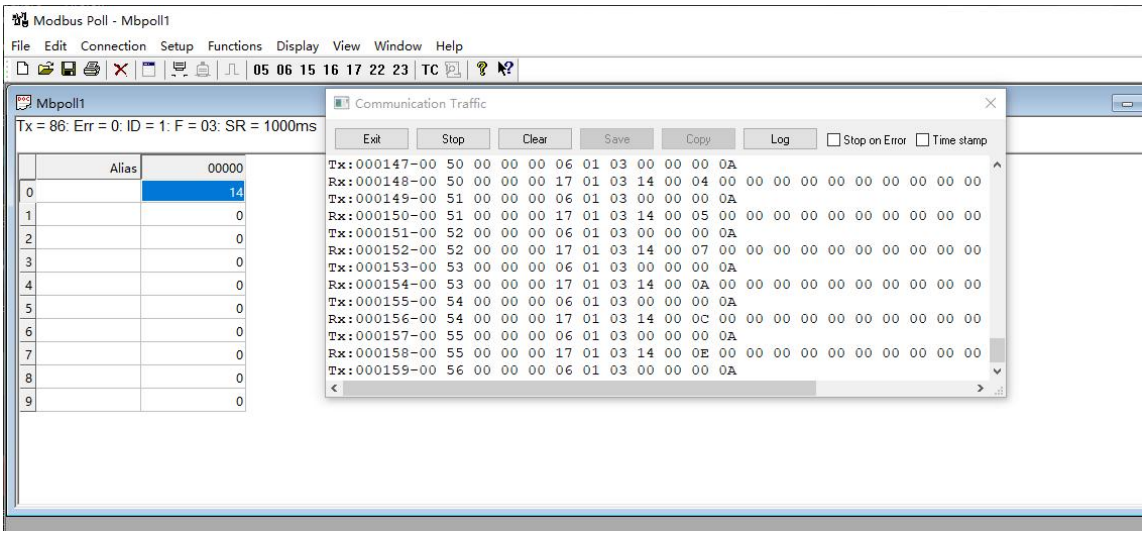
Step 2: enable the Modbus gateway function (simple protocol conversion);



Step 3: Use the Mod bus Poll and Modbus Slav e software to test the configuration with reference to the "Simple Protocol Conversion";

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6 Configuration Method

6.1 Web configuration

You can set the relevant parameters by Web setting. Open the browser, enter the device IP in the address bar (default: 192.168.4.101) in the page, enter the page, you can query and set parameters, and restart configuration parameters take effect.

Web page configuration initialization account: admin

Web page configuration initialization password: admin

Custom configuration, only support 6 upper and lower case letters and numerical configuration.

Web page configuration requires the newer kernel browser to work properly, such as Microsoft Edge (96.0.1054.62), Google chrome (96.0.4664.110), Firefox (95.0.2), etc.

[Note] IE, 360 compatibility mode, QQ browser compatibility mode.

6.2 Upcomputer configuration

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

[pour]:

Do not use multiple upper computer in the same LAN environment, the multi-network card industrial control machine should be temporarily disabled without using the network card, otherwise the upper computer will not be able to search the device normally (the same device displays many times, the device can not be found abnormal)

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

6.3 Network AT instruction configuration

After enabling the network AT, it can be configured through AT instructions. For the specific AT instructions, please refer to the "AT instruction set".

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Revise the history

Version	Revision date	Revision Notes	Maintenance man
1.0	2024-3-14	The initial version	LYL

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