Star Network Modem

E70-DTU(433NW30-ETH)

User Manual

Version	Date	Description	Issued by
1.00	2018/03/29	Initial version	huaa

Brief Introduction

E70-DTU (433NW30-ETH) is a star network modem, operating at 433MHz, with coordinator and terminal as a whole.

The modem features with long range and high-speed transmission modes. Maximum 200 nodes can send data to one coordinator. Use PC to configure which greatly simplifies user operations. With stable batch production, the modem is suitable for various wireless communication network applications.

The module is equipped with M0+ 32 bit processor, with fast operating speed and high efficiency. It has four communication mechanisms: network rate-adaptive (maximum support 100M full duplex), TCP Server, TCP Client, UDP Server, and UDP Client.

1. Features

- Use PC to configure parameters.

- Support TCP and UDP

- In coordinator mode, support broadcast transmission, short address transmission and long address transmission;

- Support multi-salve&single master transmission,maximum support 200 nodes and send data at the same time;

- The modem features with long range and high-speed transmission modes;

- Use AES128 data encryption to ensure data packet security and reliability;

- Support 8~28V power supply;

Contents

1. Specifications and characteristics

NO.	Parameter	Description
1	Size	82 * 62 *25mm
2	Average weight -	120g±2g
3	Operating frequency	433MHz
4	Transmitting power	30dBm
5	Supply voltage	8~28V DC,(Note: the voltage higher than 28V is forbidden)
6	Serial port standard	1200~115200bps,115200bps (default)
7	Antenna connector	SMA
8	Network specifications	RJ45,10/100Mbps
9	Network protocol	IP、 TCP/UDP、 ARP、 ICMP、 IPV4
10	IP acquisition method	Static IP、 DHCP
11	Domain name resolution	Available
12	User configuration	PC software configuration, AT command configuration
13	Transparent transmission	TCP Server 、TCP Client 、 UDP Server 、 UDP Client
14	Software	Parameter configuration software
15	Packaging mechanism	200 bytes packet length
16	TCP Server connection	Supports up to 6 TCP connections
16	Operating current	Send: 427mA@12V, Receive: 78mA@12V
17	Operating temperature	-40～+85℃， Industrial grade
18	Operating humidity	10%～90%， Relative humidity, no condensation
19	Storage temperature	-40～+125℃， Industrial grade

2. Technical indicators
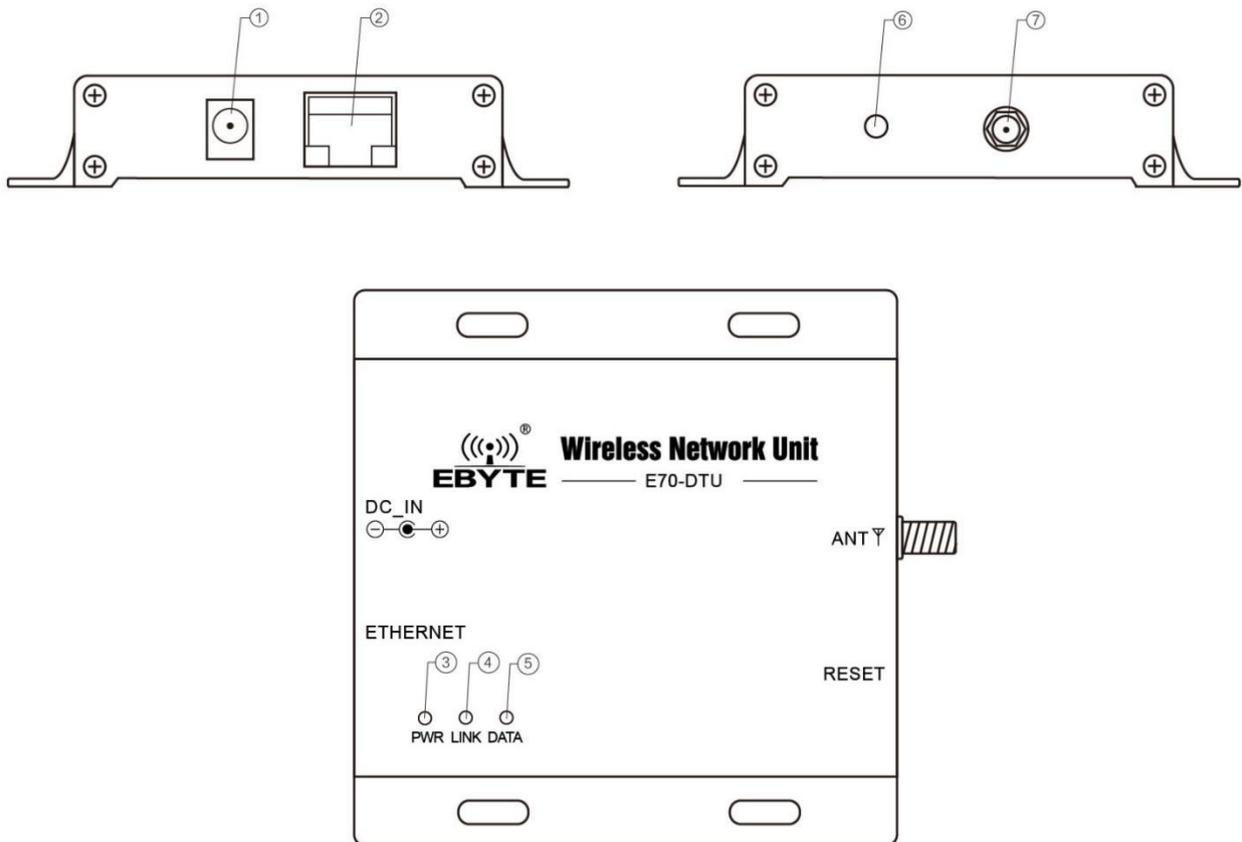
2.1 Pin Description

Pin NO	Name	Function
1	DC	Default power supply 8~28V（standard 5V version is customizable）
2	INTERNET	RJ45 interface with network transformer
3	PWR	Power LED
4	LINK	Receive LED
5	WORK	Transmit LED
6	RESET	Configuration parameters are restored to factory settings
7	ANT	SMA Connector

2.2 Dimension
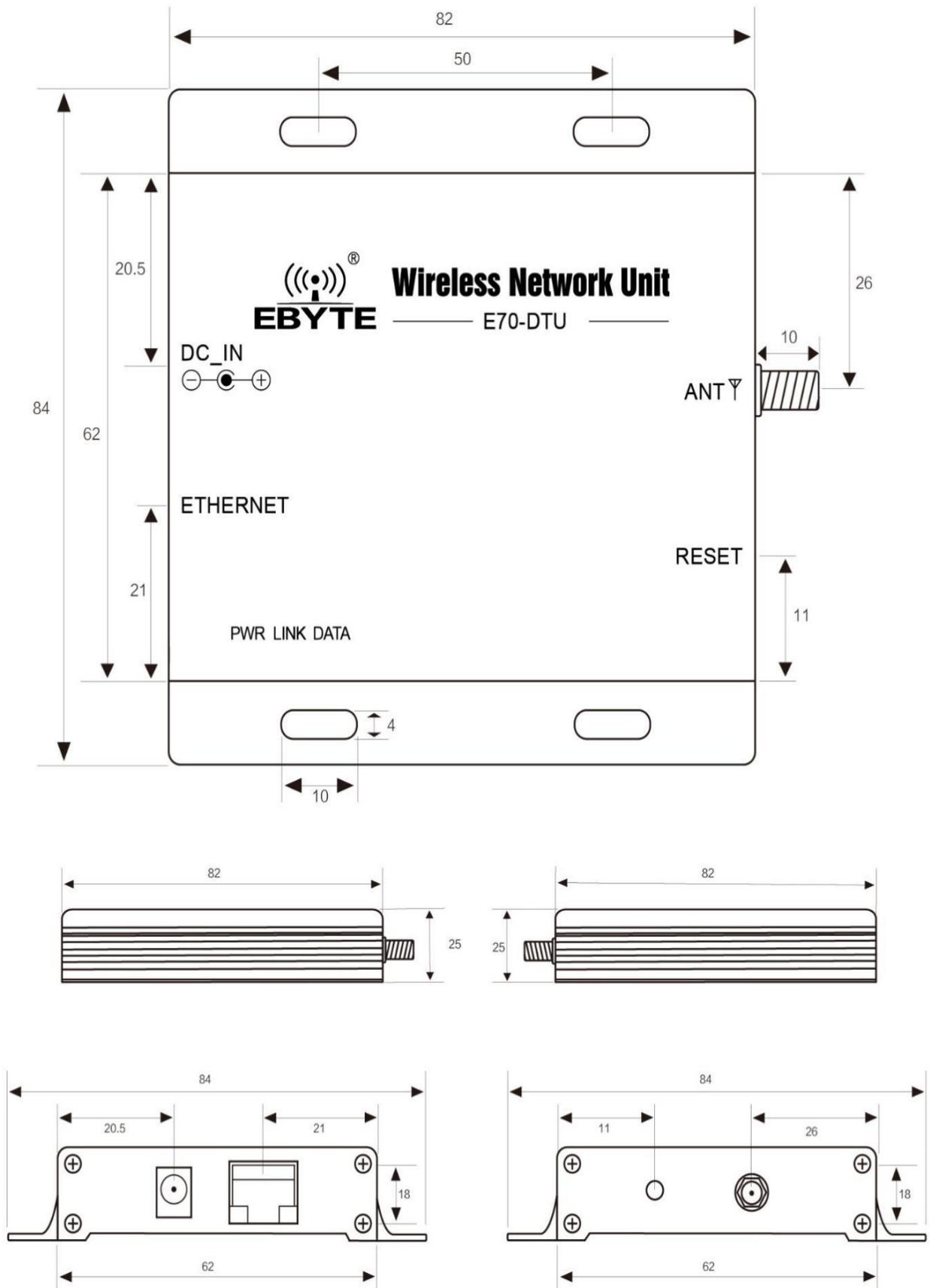
2.3 Connection method
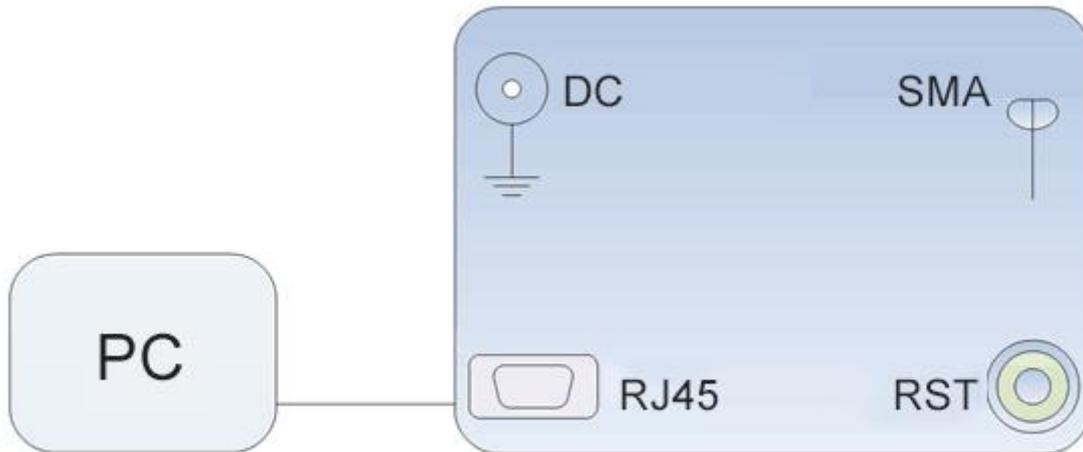
3. Network basic function introduction

3.1 IP address/Subnet mask/Gateway

1. The IP address is the identity of the module in the LAN. It is unique in the LAN and cannot be duplicated with other devices on the LAN.

E70-DTU(433NW30-ETH)'s IP address of E70-DTU(433NW30-ETH) is static IP and DHCP.

 (1) Static IP

Static IP requires the user to set manually，please note that the IP, subnet mask, and gateway should be written at the same time. Static IP is suitable for scenarios that require IP and device statistics and have a one-to-one correspondence.

Advantage: Devices which cannot automatically assign IP addresses can be searched through the entire LAN.

Disadvantages: Different IP segments in different LANs cannot carry out normal TCP/UDP communication.

 (2) DHCP

The main role of DHCP is to dynamically obtain IP address, Gateway address, DNS server address and other information from the gateway host, eliminating the cumbersome steps of setting the IP address. It is suitable for scenarios where there is no requirement for IP and no need for correspondence one by one of IP and modules.

Advantages: When connected routers and other devices with DHCP Server can communicate directly, and reduce the hassles of setting up IP address gateways and subnet masks.

Disadvantages: When connected LANs without DHCP Server, such as computers, E70-DTU(433NW30-ETH) cannot work.

2. The subnet mask is mainly used to determine the LAN number and host number of the IP address, and indicate the number of subnets, and judge whether the module is within the subnet。The subnet mask have to be set, what we normally use is C type subnet mask: 255.255.255.0, LAN number is the first 24 numbers, host number is the last 8 numbers, and there are 255 subnets, If the module IP is within the 255 subnets, it is considered to be in this subnet.

3. The gateway refers to the LAN number of the LAN where the current IP address of the module is located. If a device such as a router is connected to an external network, the gateway is the router IP address，If the setting is incorrect, the external network cannot be accessed properly，If you do not connect a device such as a router, you do not need to set it, by default.
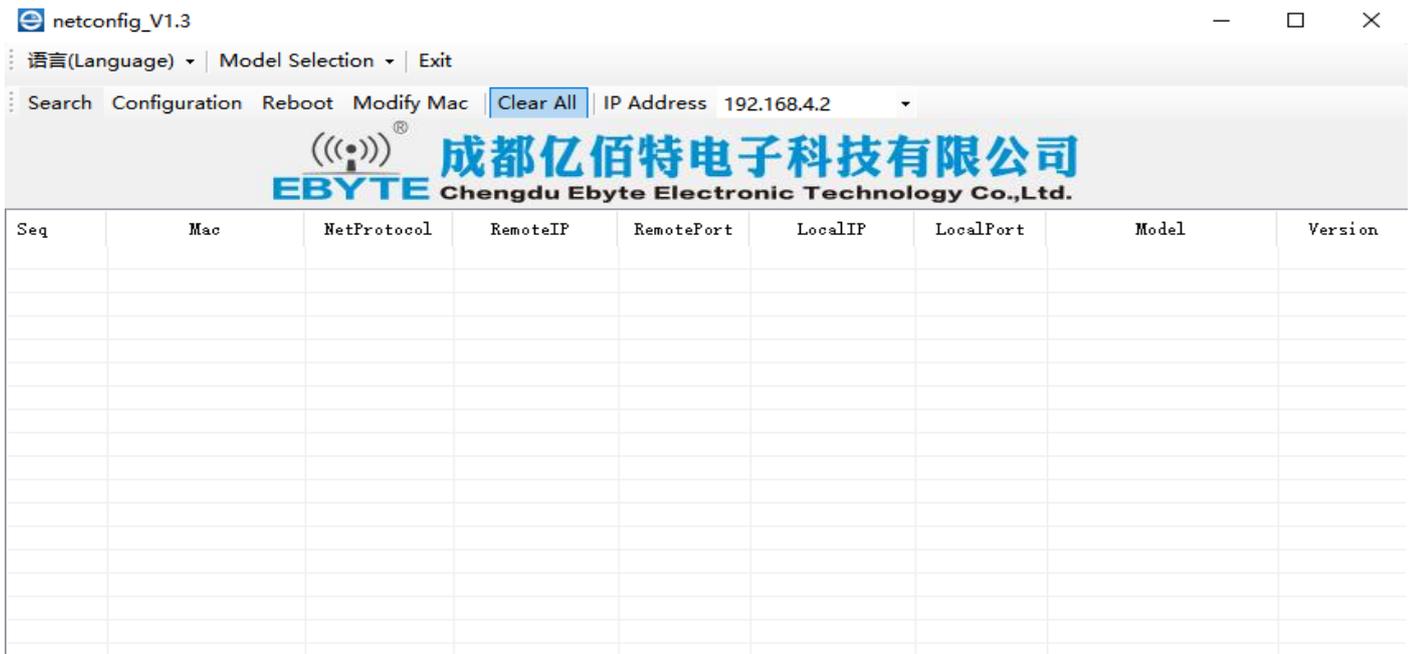
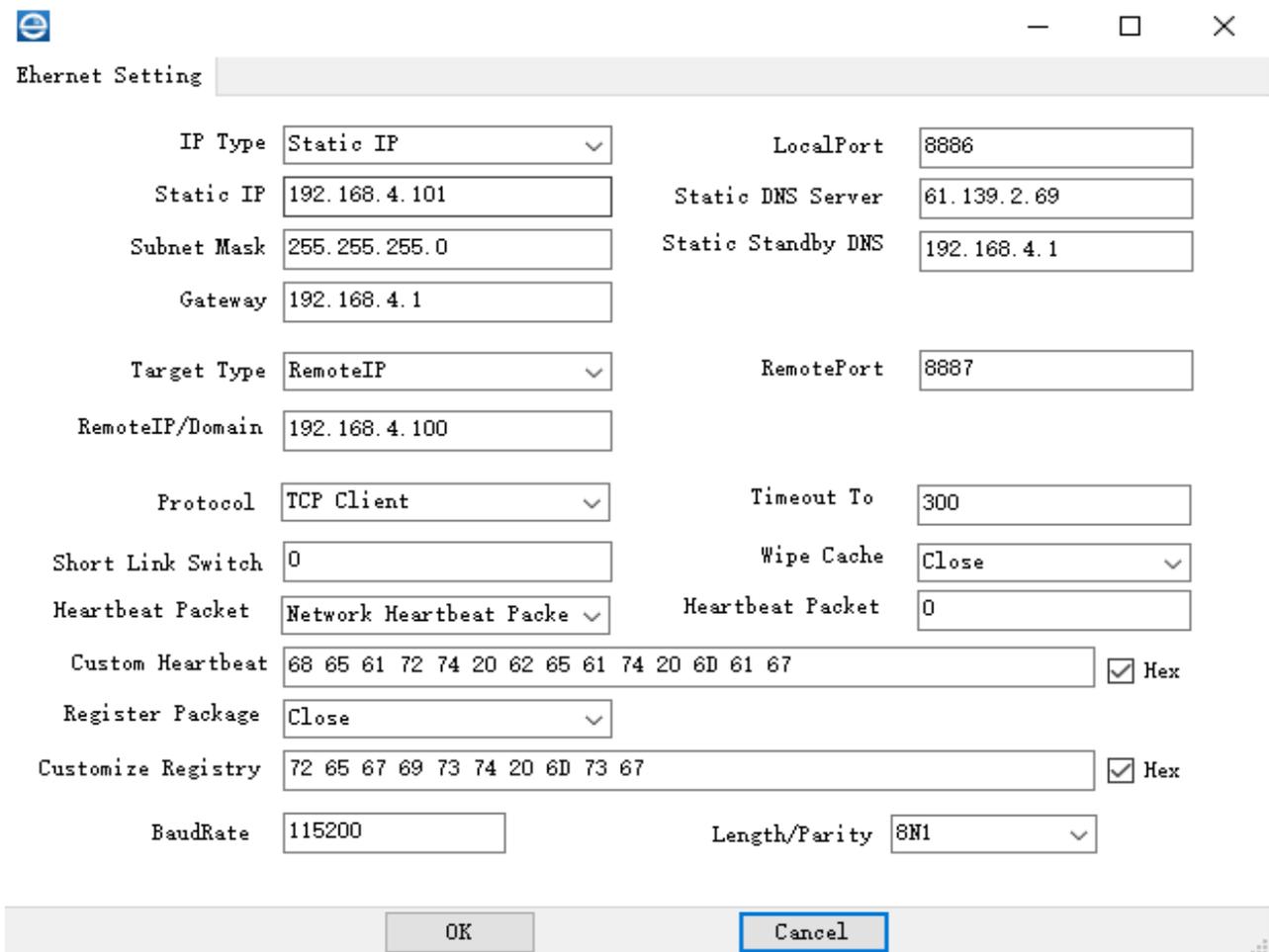4. Software setting

Figure 1 Parameter setting software

Figure 2 Parameter setting interface

3.2 DNS server address

The DNS server is mainly used to convert the domain name into a network-recognizable IP address. DNS server address

can be set, it can implement domain name resolution when the local domain name server is not complete. Users can also set specific DNS server addresses as required, E70-DTU(433NW30-ETH) will submit a resolution request to the configured DNS server when domain name resolution is required, more flexible and reliable.

In static IP mode, the default address of the DNS master server is 61.139.2.69, and the backup DNS server address is 192.168.4.1. In DHCP mode, the DNS server address is automatically obtained. Domain name server address supported by the module can be set.

4. Socket characteristics

The Socket operating mode of E70-DTU(433NW30-ETH) is divided into TCP Client, TCP Server, UDP Client, and UDP Server., it can be set with the host computer software, the setting interface is as follows:

Figure 3 Setting interface

4.1 TCP Server characteristics

1) In TCP Server mode, E70-DTU(433NW30-ETH) monitors the local port, receiving and establishing a connection for data communication when a connection request is sent. When the E70-DTU(433NW30-ETH) serial port receives data, it will transmit data to all client devices which established a connection with the E70-DTU(433NW30-ETH).

(2) It is usually used for communication with TCP clients in the LAN. Suitable for scenarios where there is no server in the LAN and there are many computers or cellphones requesting data from the server. There is difference between connection and disconnection like TCP Client to ensure the reliable exchange of data.

(3) When the E70-DTU(433NW30-ETH) is a TCP Server, it can connect at most six clients, the local port number is a fixed value and cannot be set to 0.

4.2 TCP Client characteristics

(1) TCP Client provides Client connectivity for TCP network services. Proactively initiates connection requests to the server and establishes connections for the interaction of serial data and server data. According to the relevant TCP protocol, there is difference between connection and disconnection to ensure the reliable exchange of data. It is normally used for data exchange between devices and servers and it is the most commonly used networking communication method.

(2) In TCP Client mode, when the E70-DTU(433NW30-ETH) attempts to connect to the server and the local port is 0, it initiates a connection with a random port each time.

(3) This mode supports short connection function。

(4) In the same LAN, if the E70-DTU(433NW30-ETH) is set to static IP, please keep the E70-DTU(433NW30-ETH) IP and gateway in the same network segment and set the gateway IP correctly, otherwise it cannot communicate normally.

4.3 UDP Server characteristics

(1) UDP Server means that the source IP address is not verified on the basis of normal UDP. After each UDP packet is received, the target IP is changed to the data source IP and port number, when the data is transmitted, it will be sent to the IP and port number which was the nearest communication one.

(2) This mode is normally used for multiple network devices which need to communicate with the module, and do not want to use TCP's data transmission due to fast speed and frequency.

4.4 UDP Client characteristics

(1) UDP Client is a connectionless transmission protocol that provides a simple, unreliable information transfer service, without connection establishment and disconnection, only IP and port are needed to send data. Generally used for data transmission scenarios where packet loss rate is not required, data packets are small and the frequency is fast, and data is transmitted to a specified IP.

(2) In UDP Client mode, the E70-DTU(433NW30-ETH) will only communicate with the target IP's target port, if the data is not from this channel, it will not be received by the E70-DTU(433NW30-ETH).

(3) In UDP Client mode, if the target address is set to 255.255.255.255, it will broadcast within the whole UDP network segment, and it can also receive broadcast data,E70-DTU(433NW30-ETH) supports broadcast within the supporting network segment, such as the mode of xxx.xxx.xxx.255.

5. Special function

5.1 Short connection

The use of short connections is mainly to save server resources, and is generally applied to multipoint-to-point scenarios. Short connections is to ensure that existing connections are useful connections and do not require additional controls for

filtering.

The short connection function is applied in the TCP Client mode. After the short connection function is enabled, when sending data. If no data is received from the serial port or network port within the setting time, the connection will be automatically disconnected. The short connection function is turned off by default, and the disconnection time can be set after the function is turned on, the range is 2~255S.

5.2 Registration packet mechanism

In the network transparent transmission mode, users can make the module send registration packets to the server. The registration packet is for the server to identify the data source device, or as a password to obtain server authorization.

E70-DTU(433NW30-ETH) has 4 registration packet mechanisms:

Sending MAC when connecting: The module will send the its own MAC address to the device when the connection is established.

Sending user-defined data when connecting: The module sends a user-defined data to the device when the connection is established

Each packet of data sending MAC: The module will add its MAC address in front of each frame of data sent.

Each packet of data sending user-defined data: The module will add its user-defined data in front of each frame of data sent.

Sending a registration packet when establishing a connection are mainly used to connect to a server that requires registration. Data-carrying registration packets refers to accessing registration packets at the head of data in sending data, which is mainly used for protocol transmission. The user-defined data packet defaults to hexadecimal data (ASCII code optional) and the maximum packet length is 40 bytes.

5.3 Heartbeat mechanism

In the network transparent transmission mode, users can make the E70-DTU(433NW30-ETH) module send heartbeat packets to the server. Heartbeat packets can be sent to the web server or sent to the serial device, they cannot run at the same time.

Network heartbeat pocket: The heartbeat packet is sent to the network, in the heartbeat transmission cycle, the module sends heartbeat packet data to the network server to maintain the connection with the network server. It only runs in the TCP Client and UDP Client modes。

Serial data packet: In the set heartbeat sending cycle, the module sends heartbeat packet data to the serial port, users can do corresponding processing after the serial port receives the heartbeat data.

In an application in which a server sends a fixed inquiry command to a device, in order to reduce communication traffic, users can choose to send a heartbeat packet (inquiry command) to the serial device side instead of sending a inquiry command from the server.

User-defined data packet defaults to hexadecimal data (ASCII code optional), E70-DTU(433NW30-ETH) module supports custom heartbeat packet content up to 40 bytes

5.4 Overtime restart

Overtime restart (no data restart) function is mainly used to ensure long-term stability of E70-DTU(433NW30-ETH) When the network port cannot receive data for a long time, or if the network does not receive data for a long time, the E70-DTU(433NW30-ETH)will restart after exceeding the set time, thus avoiding the influence of abnormal conditions on the communication. The normal working time of this function is set to 60~65535S, default 300S. When the setting time is less than 60S, the default setting is zero, that is, the function is turned off.

5.5 TCP multi-connection function

TCP multi-connection function is mainly to solve that in the TCP Sever mode, the user has multiple clients to connect E70-DTU(433NW30-ETH)and send and receive data at the same time. When E70-DTU(433NW30-ETH) is used as a TCP Server, up to 6 connections can be established at the same time, the TCP Server sends data to multiple (up to 6) TCP clients on the connection at the same time. When the number of established connections exceeds six, the connection established at the beginning will be actively disconnected, that is, the old connection will be kicked off.

5.6 Clearing cached data

When the TCP Client connection is not established, the data received by the serial port will be placed in the buffer area, the E70-DTU(433NW30-ETH) serial port receive buffer is 400 bytes. When the connection is established, the serial port buffer data can be set whether to clear according to customer needs.

5.7 Link and data transfer instructions

Link indicates the network connection status of the module. PWR: Power indicator light, it indicates normal if the PWR is always on after power-on, DATA: data indicator light, green indicator means sending data, blue indicator means receiving data, LINK: network indicator, blue is for Ethernet indicator light, green is for wireless network indicator. After the radio is connected to the Ethernet, the LINK blue indicator light is always on. After the wireless is set as the coordinator, the LINK green indicator light is always on; the wireless is set as the node. When the LINK green indicator light is always on, the node is connected to the coordinator.

The other is the data transmission indication, which shows the data transmission status of the serial port of the module. When there is no data transmission on the serial port, the data transmission indicator is extinguished. When there is data transmission on the serial port, the flashing indicates that the period is 60ms and the indicator lit 10ms
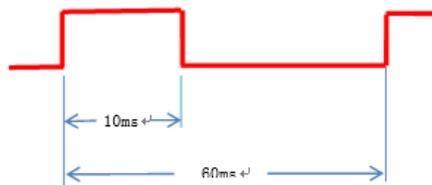
5.8 Restore factory setting

E70-DTU (433NW30-ETH) supports the restoration of the factory settings. The user can restore all parameters factory settings in the following two ways (the MAC address information remains unchanged).

1. The input pin is restored to the factory settings. After the module is powered on,   press RST button for a long time. After pressing for 5 to 15 seconds continuously, the network parameters are restored to the factory settings.

2. Click "Restore default parameters" through PC, as shown in the figure below.
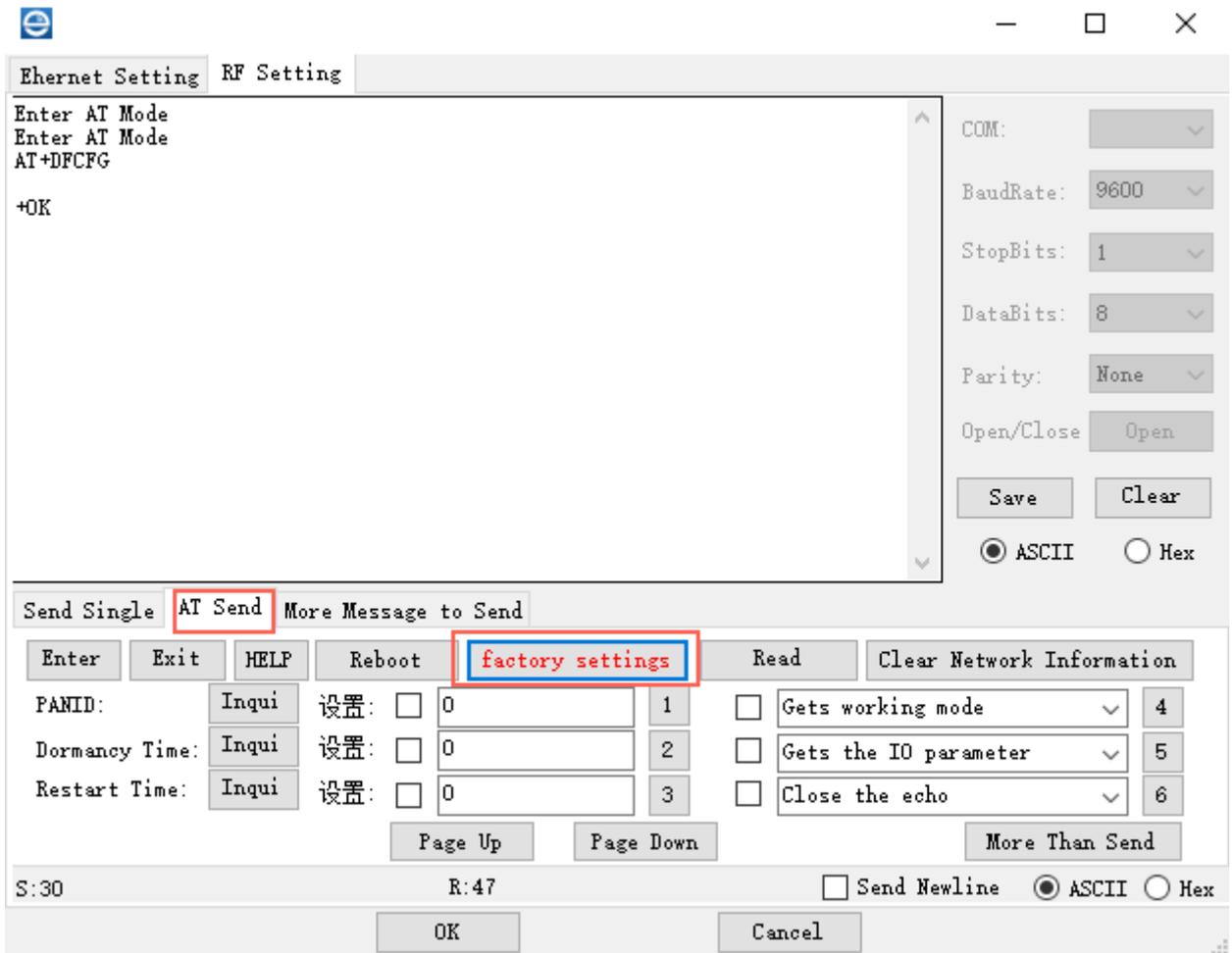
Figure 4 Restore factory setting

6. Quick instructions

6.1 Parameter setting instructions

The following operating examples use switch operations and use wired network cards. Change the IP address of the computer wired network to a fixed value before use. The following operation is 192.168.4.2. After connecting the power supply, network cable, and antenna, use "Ebyte netconfig configuration tool", select E840-DTU (433NW-ETH),select IP Address (display wireless network card and wired network card) to search for devices.
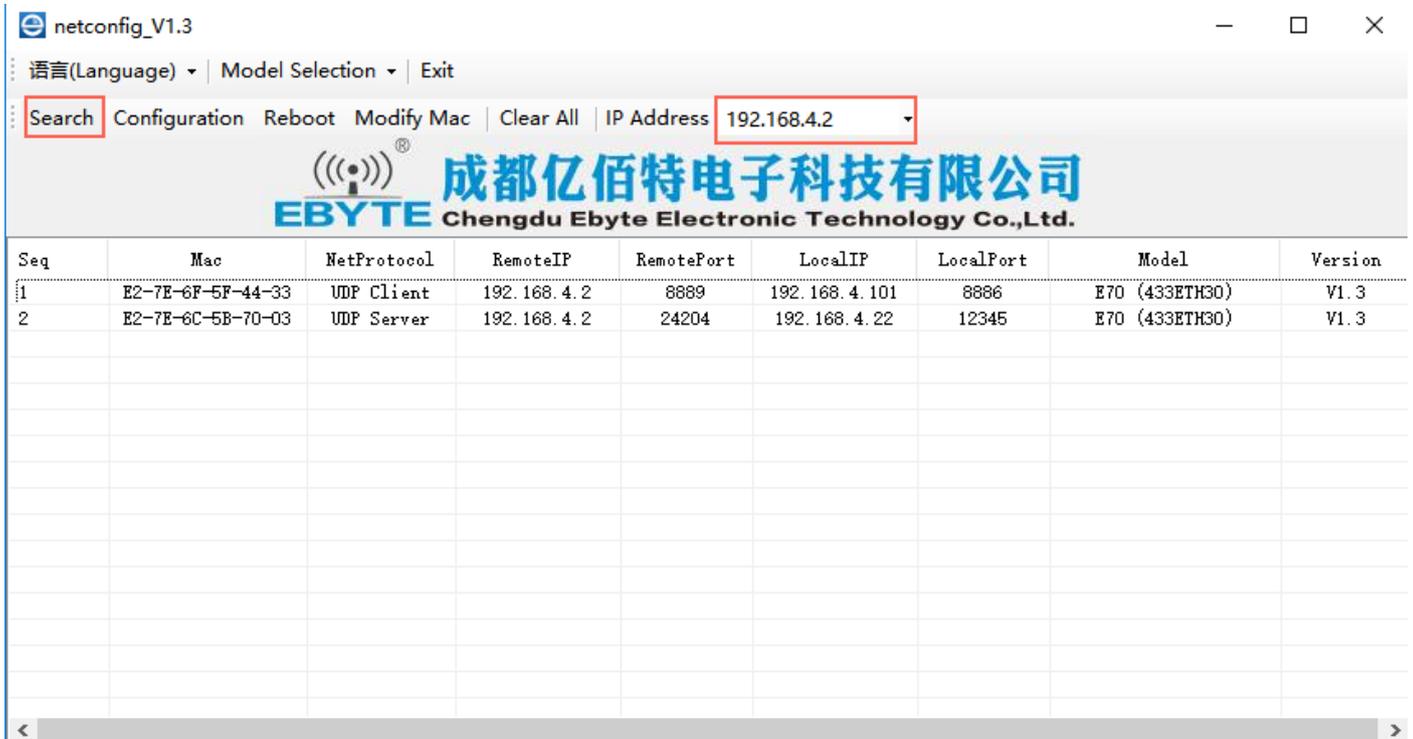
Figure 5   Parameter setting instructions

Double-click the left mouse button to search for the device or click "Configure Device" to enter the configuration mode—>RF Settings—>AT Send, click "Enter AT" to configure the parameters. You need to set one device to the Coordinator mode. The other devices are set to node mode (factory default mode 4, this mode is only applicable to E70-DTU (433NW30)). After setting the parameters, click "Restart device", then the parameter setting is valid.
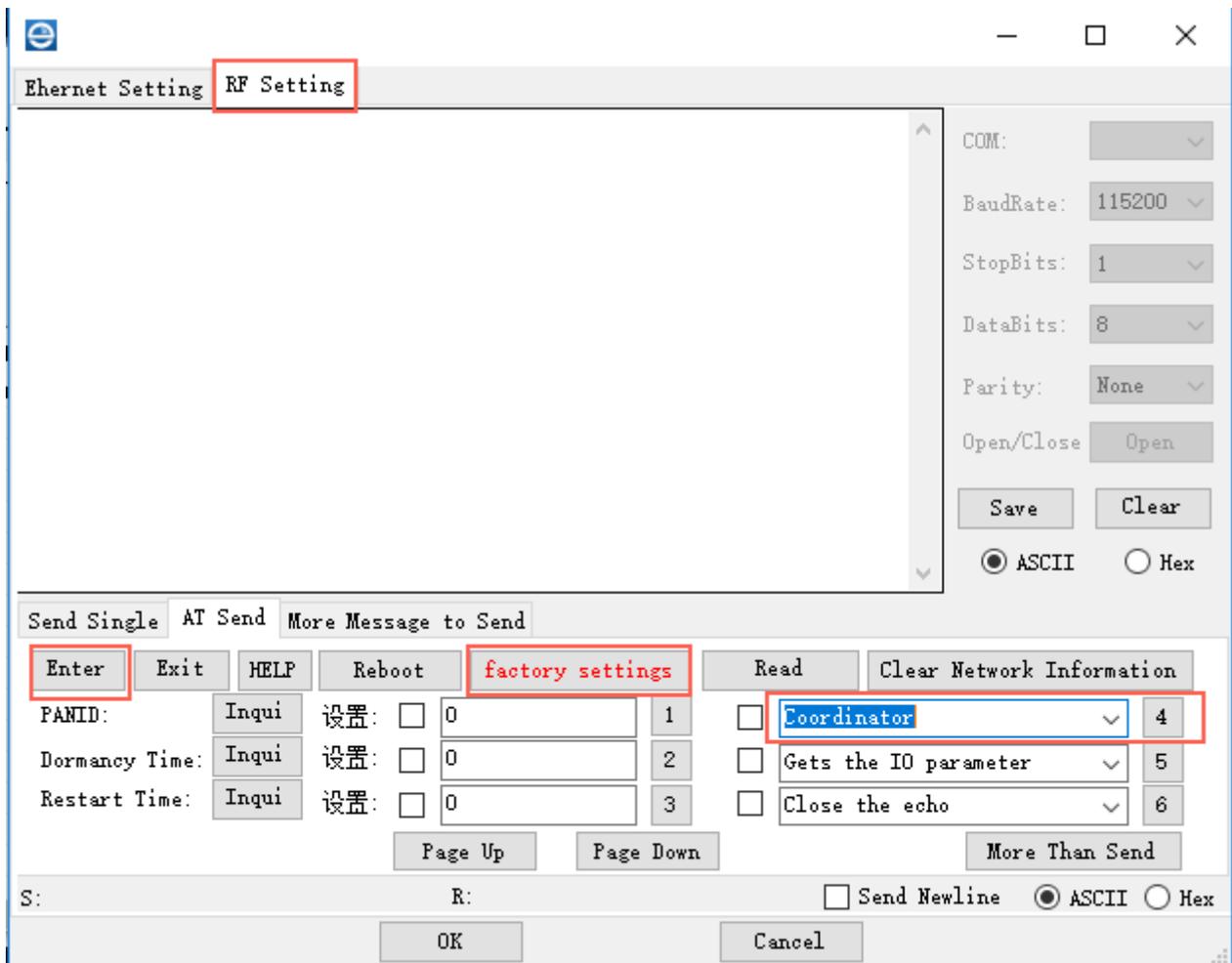

Figure 6   Parameter setting instructions

After the setup is completed,, the LINK green LED of the coordinator device is on. After waiting for the node to access the coordinator, the LINK green LED of the node device is on to indicate that the network access is successful. At this time, the wireless network is set up successfully.

6.2 Socket instructions

6.2.1 TCP Server instructions

(1) As shown in Figure 7, set the device to TCP Server mode, set the static IP address to 192.168.4.22,and set the local port to 8886. After the configuration is complete, search for the device again, check whether the network protocol, local IP, and local port are configured.

Use the network test tool as shown in Figure 8 to create a connection in client mode. The IP address and local port number are the same as the test device.

As shown in Figure 9, a device that communicates with the wireless network of the device can be used as the monitoring device (the monitoring device can be any product of the NW series of the E70). Working Principle is: The network testing tool acts as the client, the TCP Server device acts as the server, and the client and the server exchange data through the Ethernet. The server and the monitoring device communicate data through the wireless network.

Note: Wireless networking must be required between the monitoring device and the server device (M onitoring device: coordinator, server device: node or monitoring device: node. Server device: coordinator)

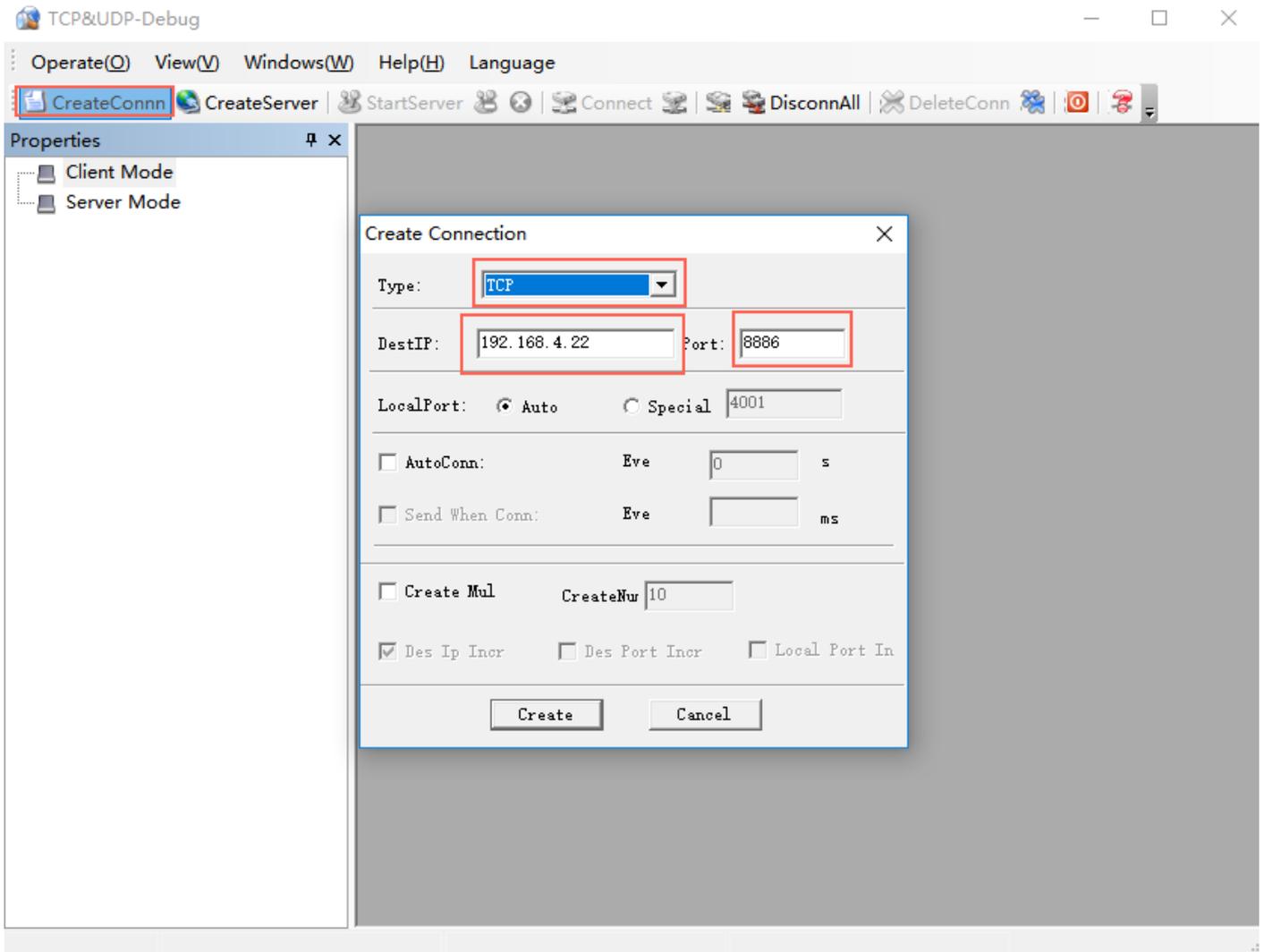Figure 7 Parameter setting instructions

Figure 8 Connection settings

2) If the monitoring device is E70-DTU (433NW30-ETH), the user can operate it in the parameter setting software. If it is E70-DTU (433NW30) or E70 (433NW30S), please use the serial port debugging assistant.
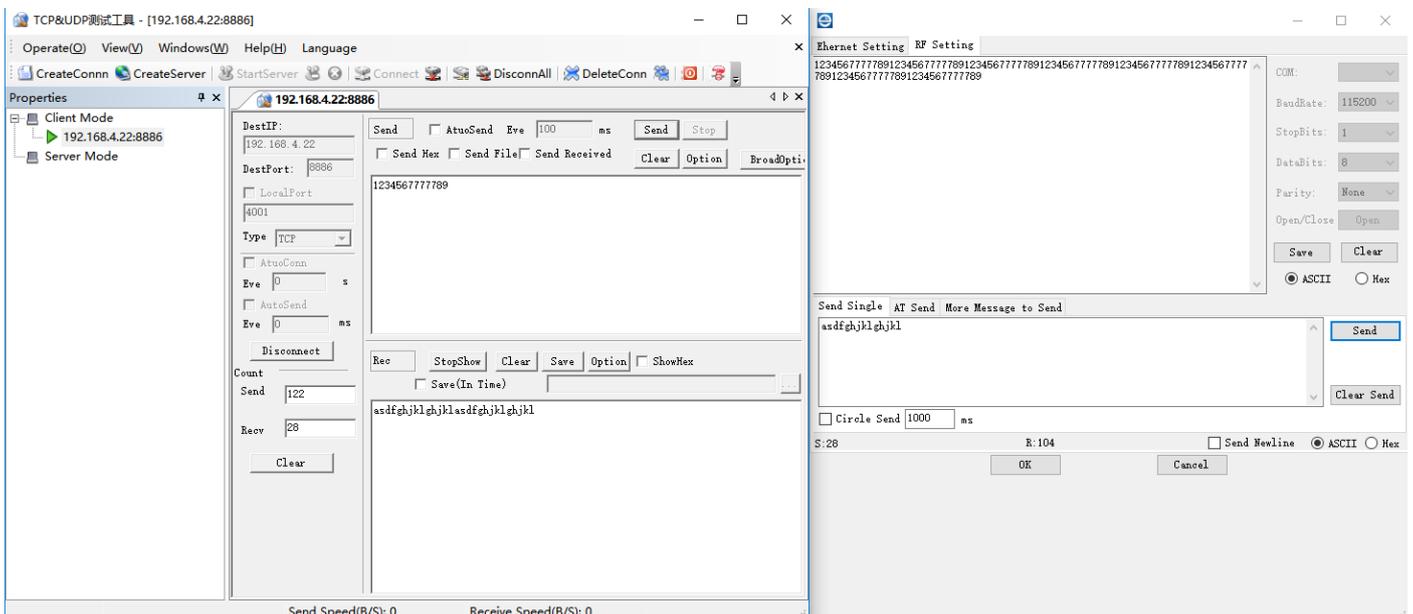

Figure 9 Data transparent transmission

6.2.2 TCP Client instructions

1) Similar to TCP Server operation, as shown in Figure 10, if use the network test tool, the target address must be set to match the computer network card (for example: wired network card is 192.168.4.2, target port is 8889).

As shown in Figure 11, Create Server in the server mode ", set the local port same to the TCP Client target port (Example: 8889) -> Start the server.
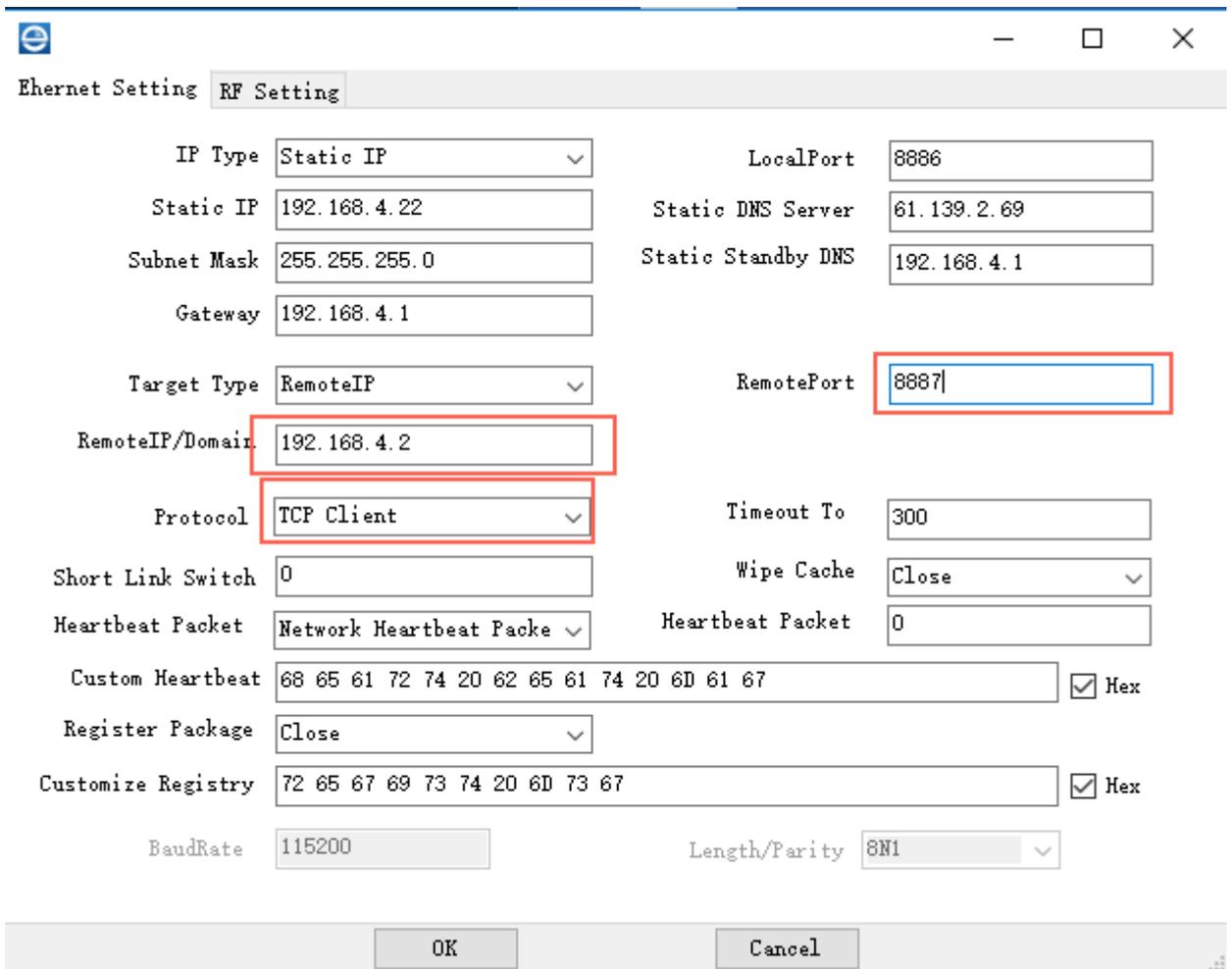

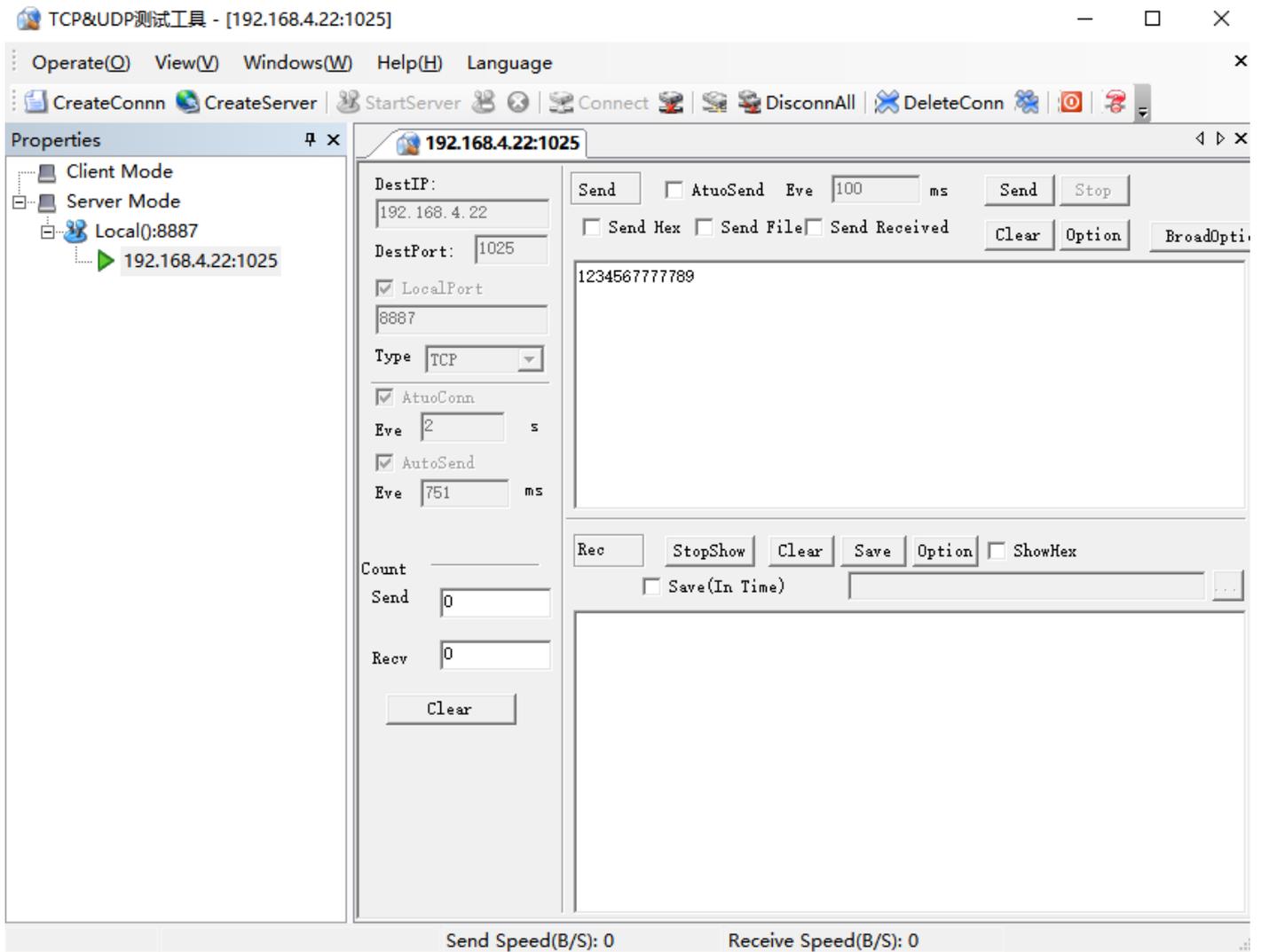Figure 10 Parameter setting instructions

Figure 11 Connection settings

(2)As shown in Figure 12, the working principle is as follows: the network test assistant acts as the server, and the TCP client device acts as the client. The device in the same wireless network as the TCP client device is used as the monitoring device. The server and the client communicate with each other through the Ethernet. The terminal is connected to the monitoring device via wireless.
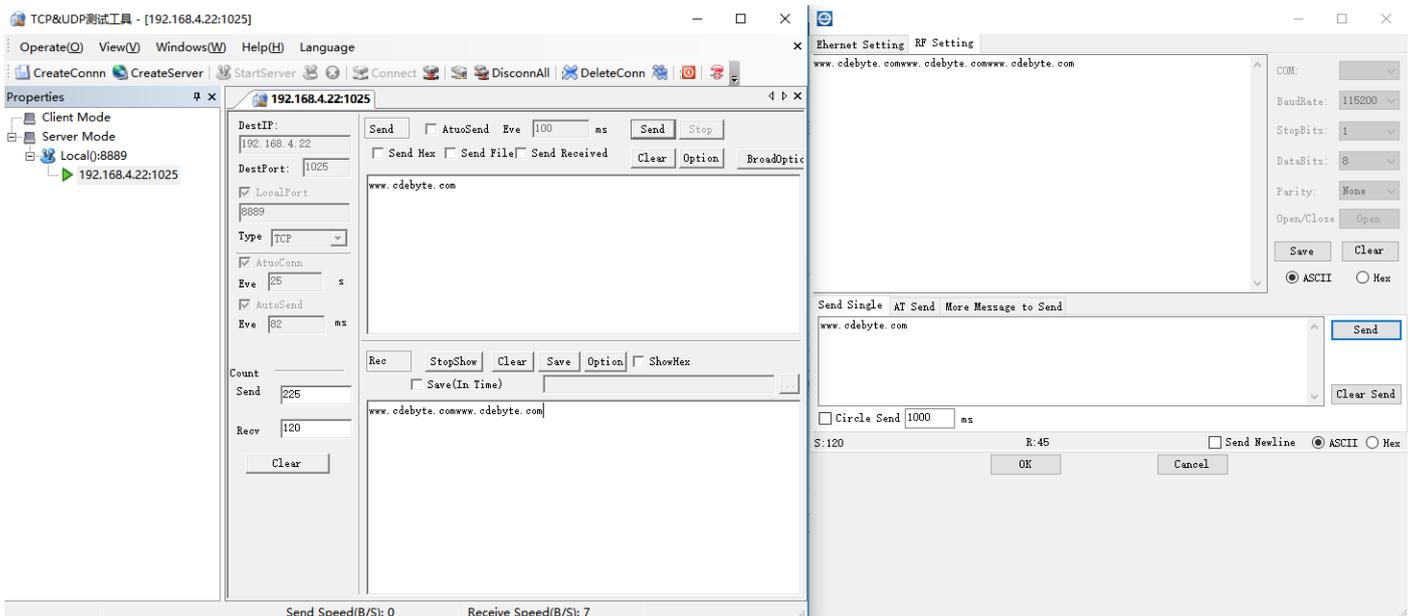

Figure 12 Data transparent transmission

(3)As shown in Figure 13,one modem is set to TCP Server, local IP (for example: 192.168.4.22) and local port (for example: 12345), Set another modem to TCP Client, using network test tool to set the target IP address to 192.168.4.2,the IP and the target port is same with the computer IP (8889).
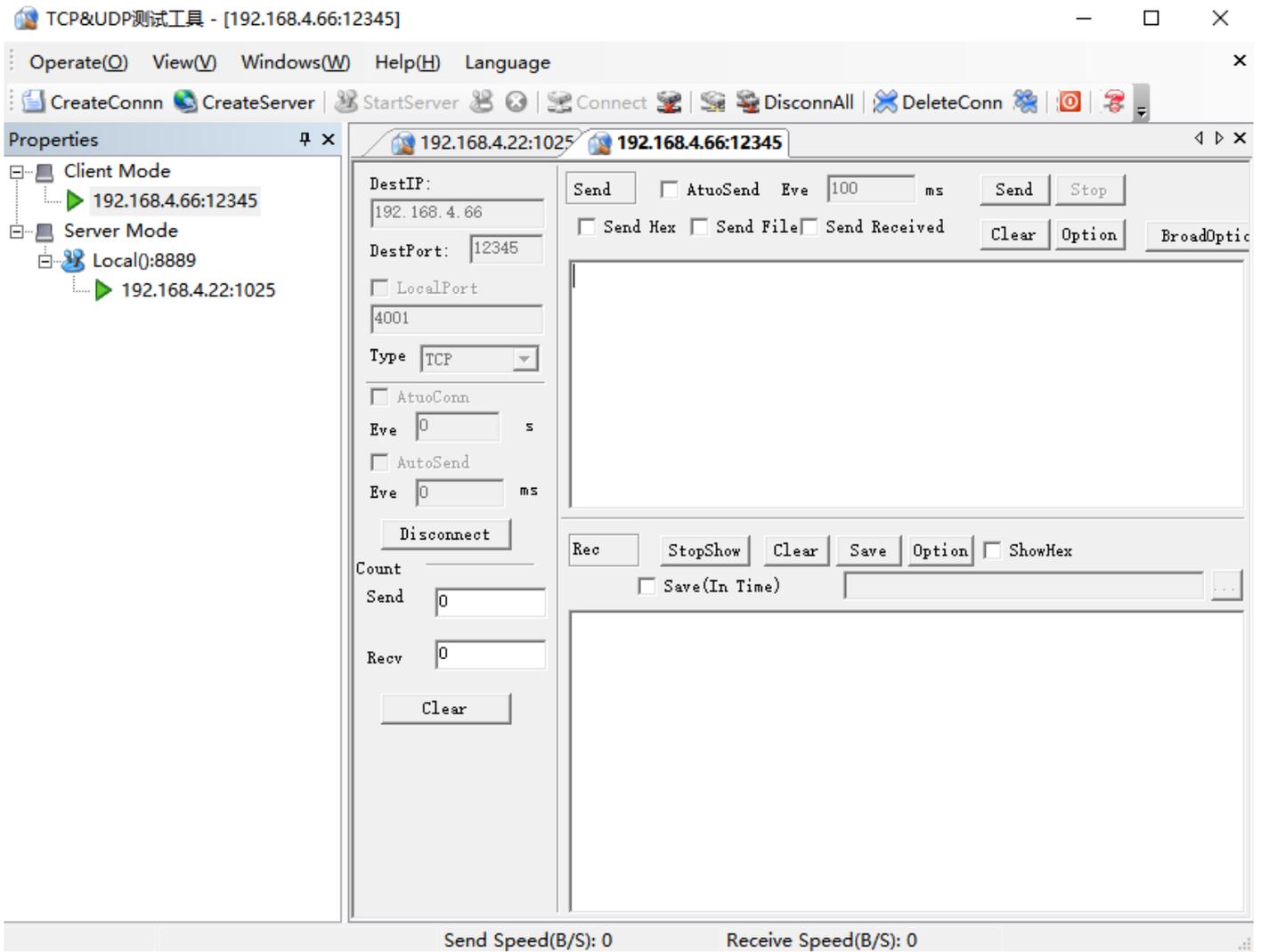

Figure 13 Connection settings

The two modem of E70-DTU (433NW30-ETH) communicate with each other as shown in Figure 14, Working principle: The client simulated by the network test tool sends data to the device TCP Server via Ethernet, and the TCP Server sends the data to the TCP Client through the wireless network. The UDP Client sends the data to the server simulated by the network test tool through Ethernet,and the reverse is also possible. No matter which one is the coordinator and node between the TCP Server and the TCP Client.
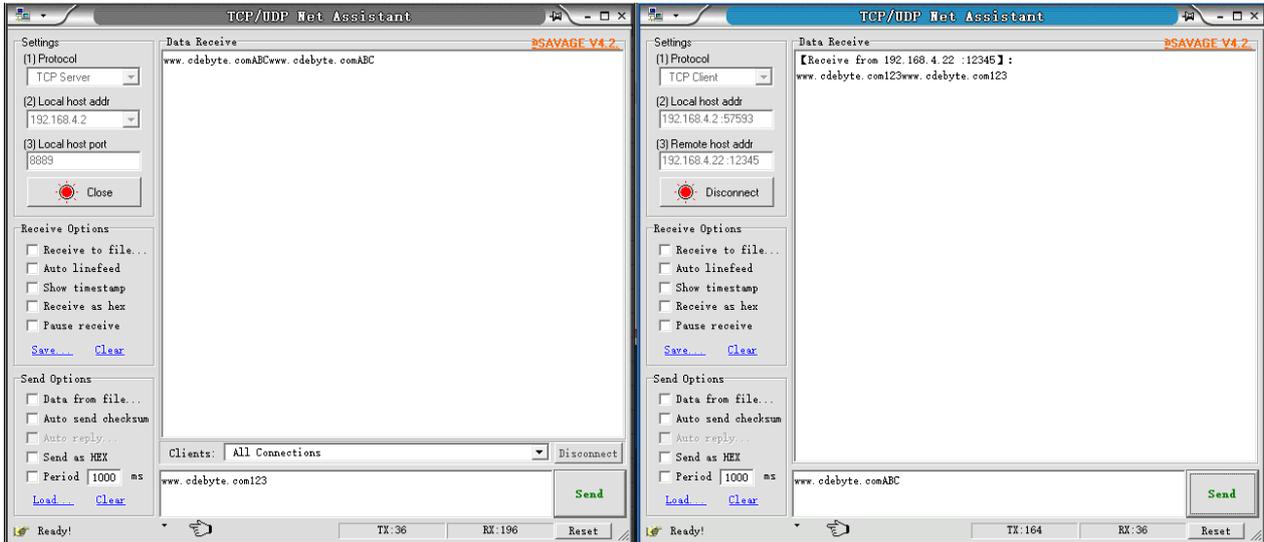
Figure 14 Data transparent transmission

6.2.3 UDP Server instructions

（1）   UDP operation and TCP operation are basically the same, as shown in Figure 15, set the protocol type to UDP Server, static IP address (example: 192.168.4.22) and local port (12345).
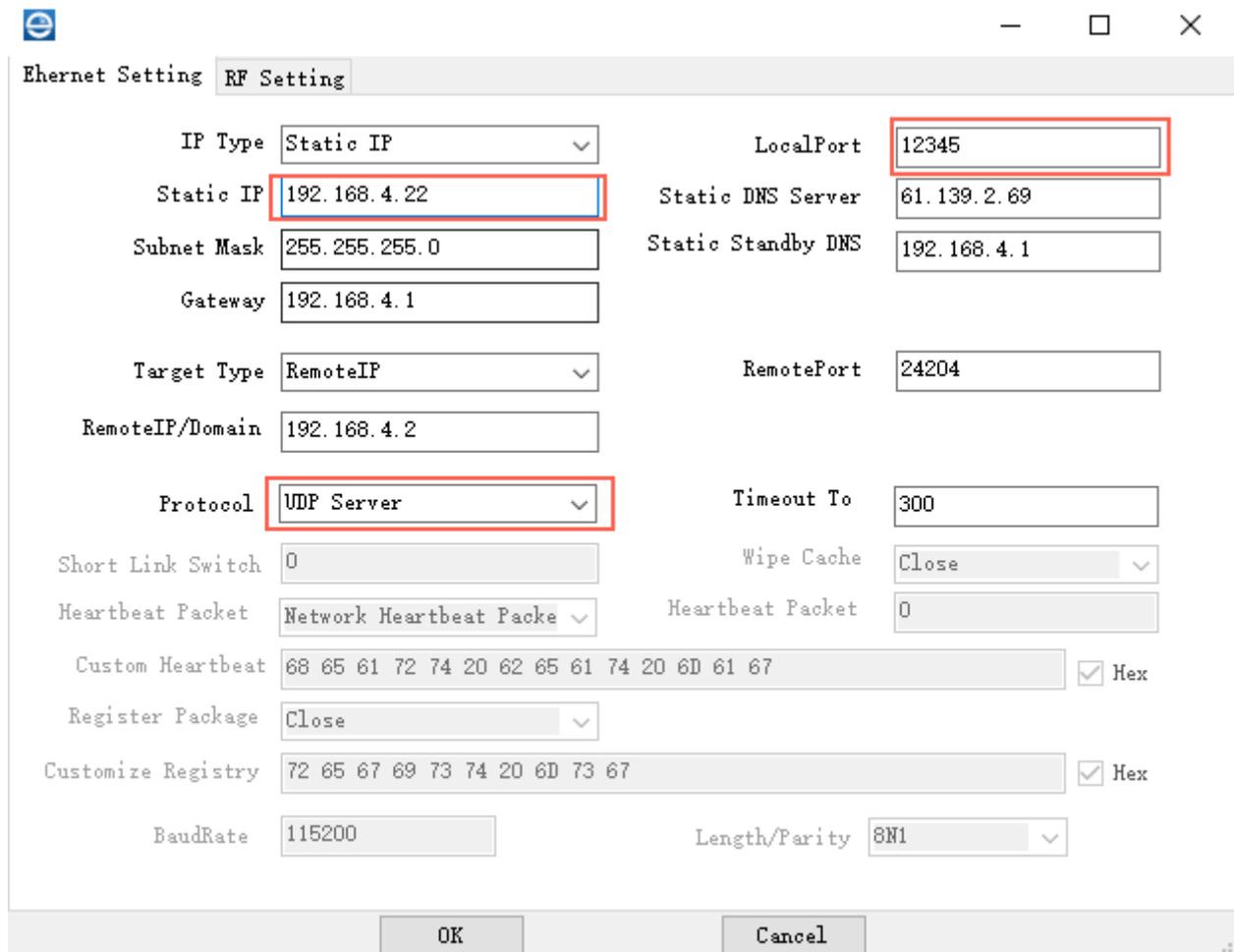

Figure 15 Parameter setting instructions

(2) Open the network test tool as shown in Figure 16, Create connection -> select UDP, write the target IP (static IP address of the UDP server), write the port (local port of the UDP server) -> connecting , using the "Ebyte network configuration tool" "to monitor the transmitted data.
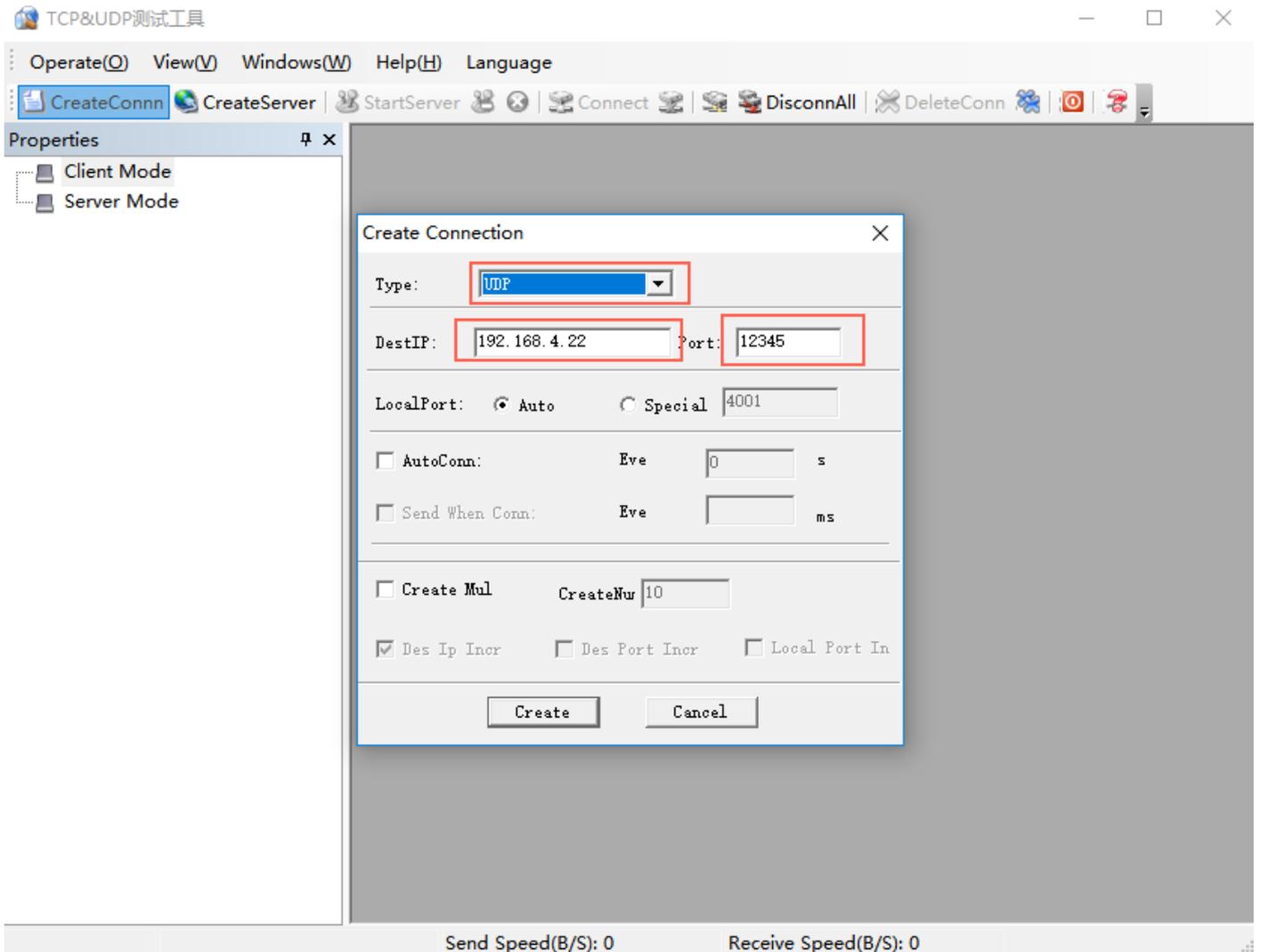
Figure 16 Connection settings
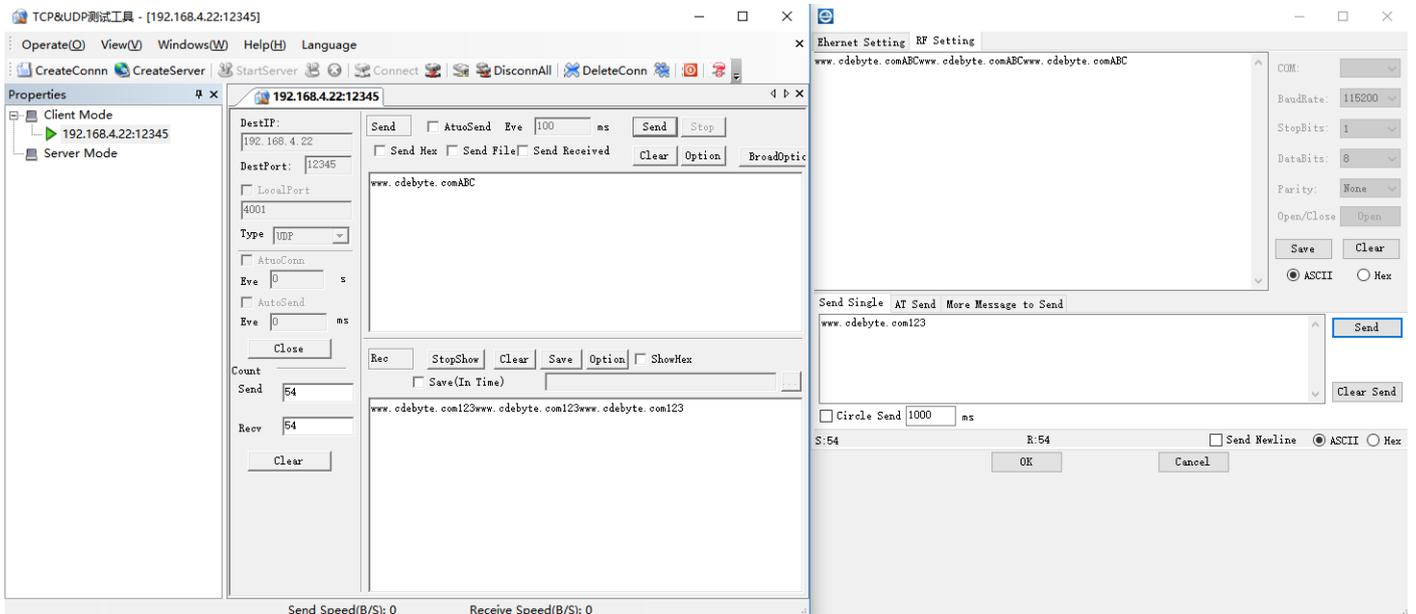
Figure 17   Data transparent transmission

（1）Connect E70-DTU(433NW30-ETH) network cables to PC, connect E70-DTU(433NW30) RS485 or RS232 to PC, open the network configuration software and search for the device. The searched device will display the device list. Double-click the device to be configured in the list and enter the setting interface. Set the module to UDP Server mode, set the target IP address to 192.168.4.22, set the target port of module to 8882, set the RF parameters, click the OK button after the setting is

complete, and then restart the device to search Check once to see if the parameter modification was successful.

Figure 18 Parameter setting instructions

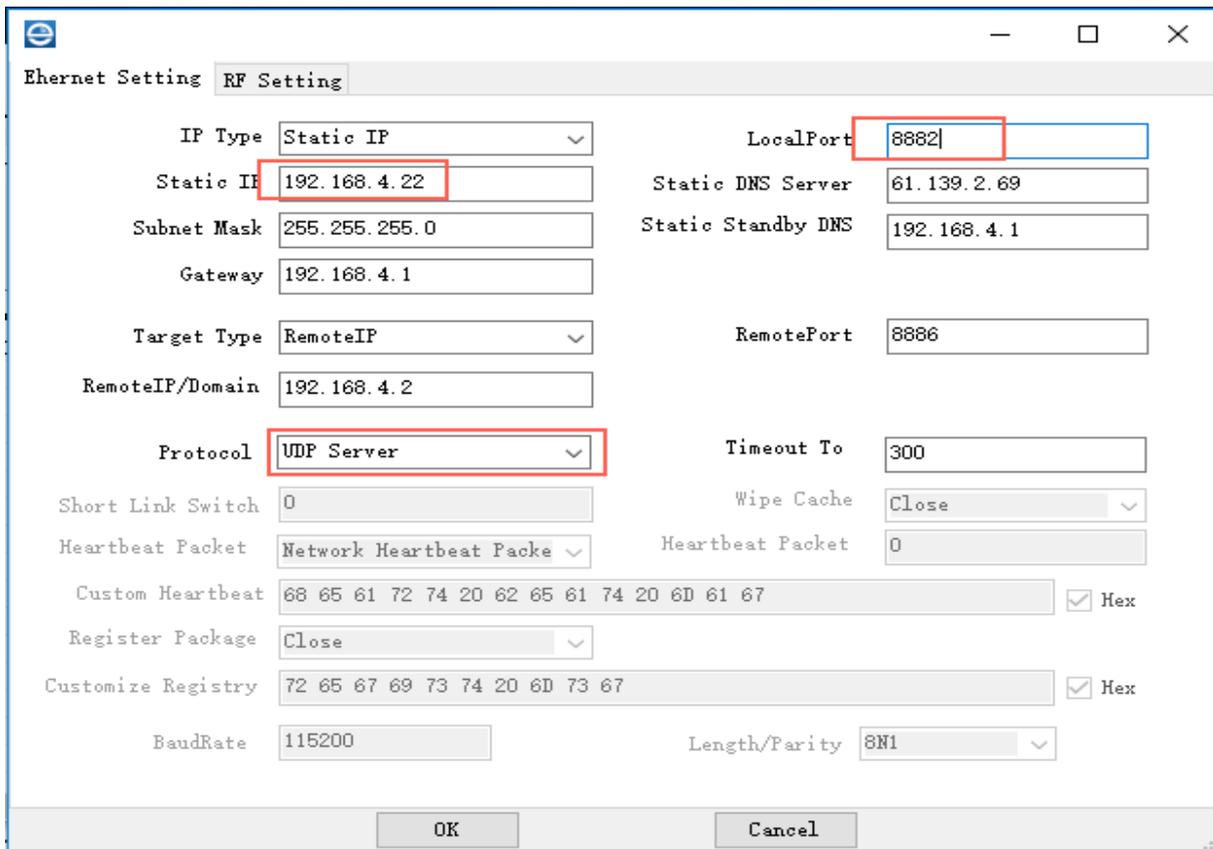(2) Open serial port assistant and network debugging assistants, set the parameter settings of the serial assistant and module at same, open the network configuration software and set the network debugging assistant protocol type to UDP Server, the network debugging assistant's server IP address is set to the module's IP address, set the target port of module to 8886, click Connect.

(3) Enter a string of data in the sending area of network debugging assistant A, click Send, you will see that network assistant B has received the same data in the sending area of the serial port. Input a string of data in the sending area of network debugging assistant A, network assistant B also received the data. It realizes bidirectional transparent transmission
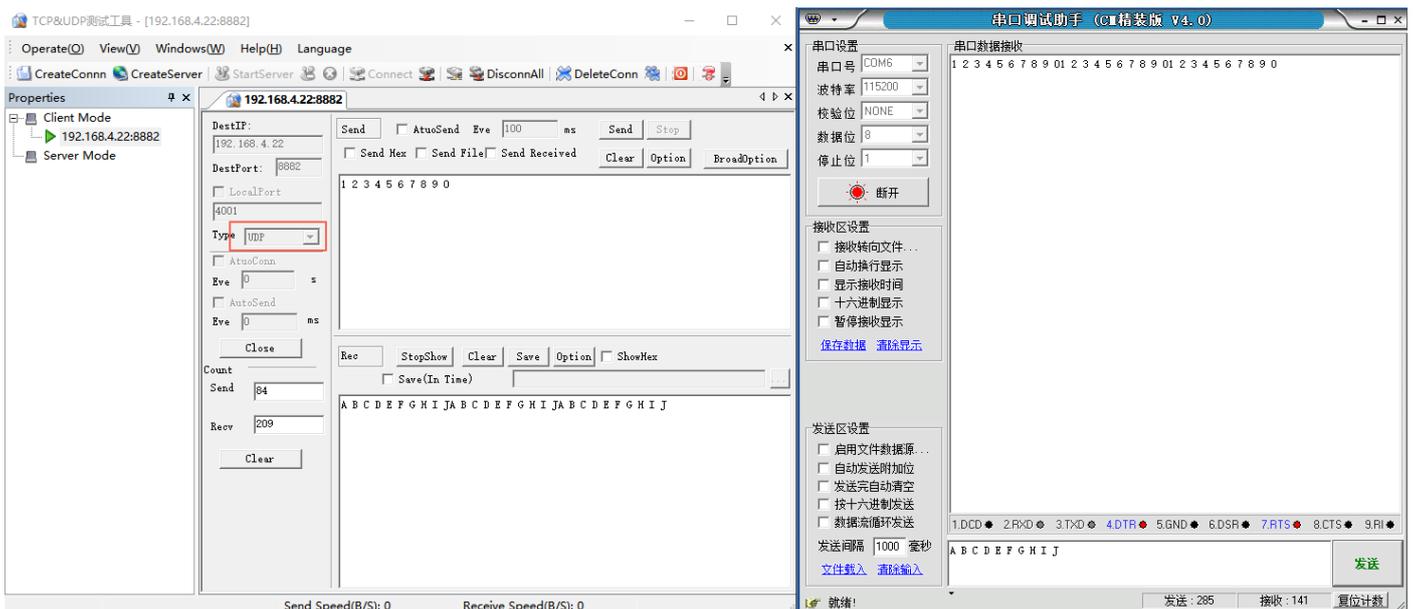
Figure 19 Data transparent transmission

6.2.4 UDP Client instruction

(1) Set the protocol type to UDP Client, destination IP address (example: 192.168.4.2) and target port (8889),the target IP should be consistent with the IP address of the computer.

Figure 20 Parameter setting instructions

(2) Open the network test tool as shown in Figure 21, select UDP, select the IP (the destination IP address of the UDP client), write the port (the target port of the UDP client) -> open, using the "Ebyte network configuration tool" "to monitor the transmitted data.

Figure 21 Data transparent transmission

The two E70-DTU (433NW30-ETH) communicate with each other as follows. Working principle: The client simulated by the network test 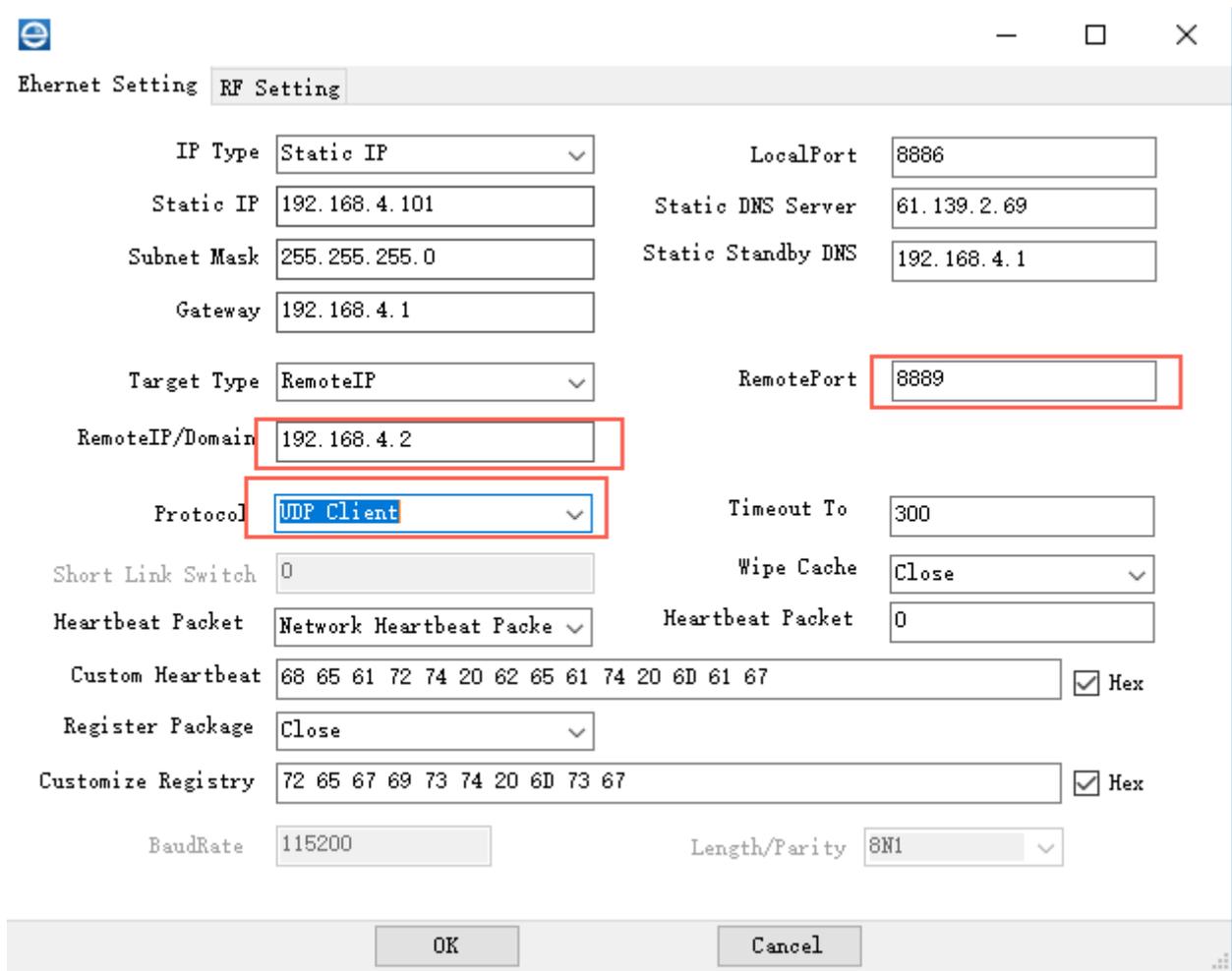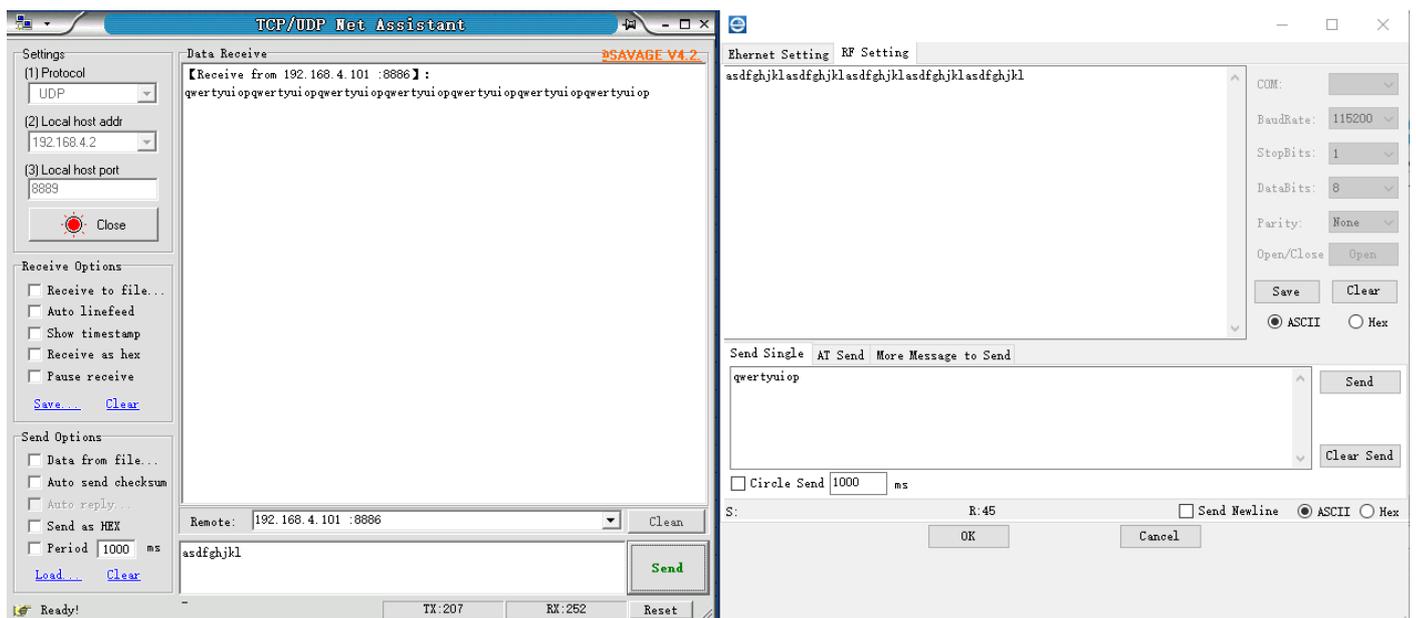tool sends data to the UDP Server via Ethernet. The UDP Server sends the data to the UDP Client through the wireless network. The UDP Client sends the data to the server simulated by the network test tool through Ethernet ,and the reverse is also possible. No matter which one is the coordinator and node between the TCP Server and the TCP Client.

Figure 22 Parameter setting instructions
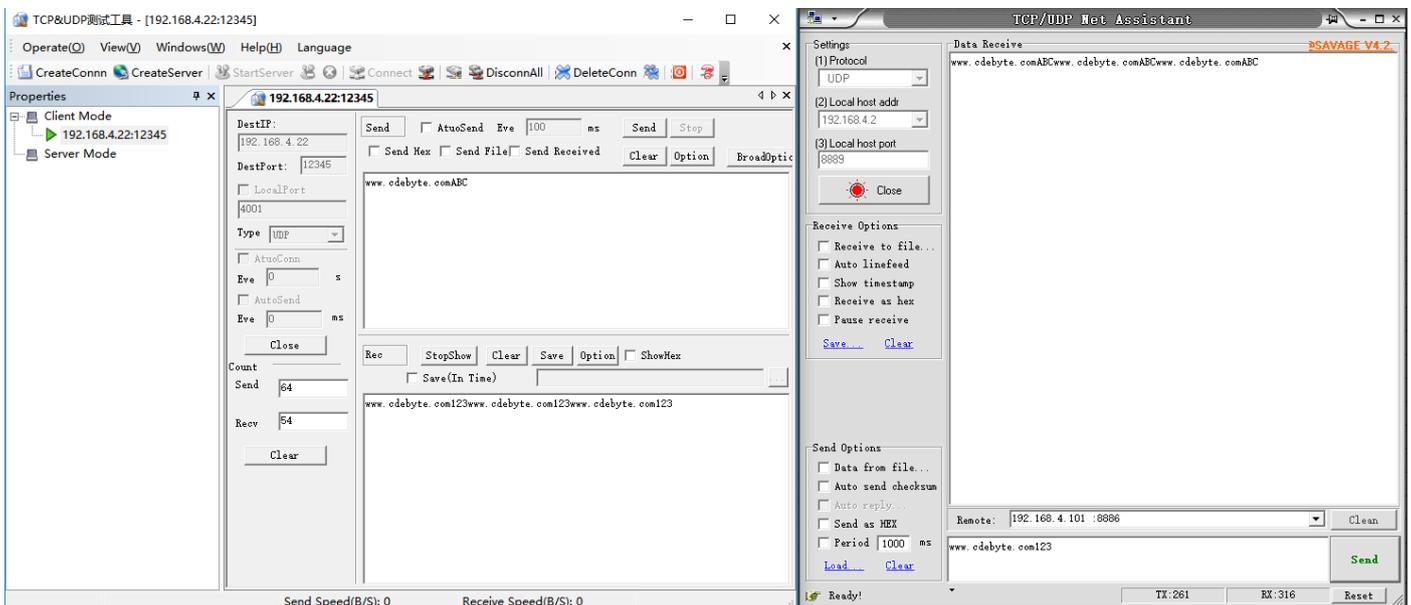
Figure 23 Data transparent transmission

6.3 Special function instructions

6.3.1 Short connection instructions

The TCP short connection function is applied to TCP Client mode. After the short connection function is enabled, if no data is received at the serial port or network port within the set time, the connection will be automatically disconnected. The short connection function is disabled by default, disconnection time can be set after the function is enabled. The setting range is 2~255s, users can enter it directly.

Figure 24 Short connection setting

6.3.2 Registration packet instructions

The E70-DTU(433NW30-ETH) has four registration packet mechanisms, which are sending MAC when connecting, sending user-defined data when connecting, sending MAC for each packet of data, and sending user-defined data for each packet of data, user-defined data defaults to hexadecimal data (ascii optional).

The registration packet is closed by default, when you need to use it, you can open the network configuration software configuration. The user-defined data can be directly input.
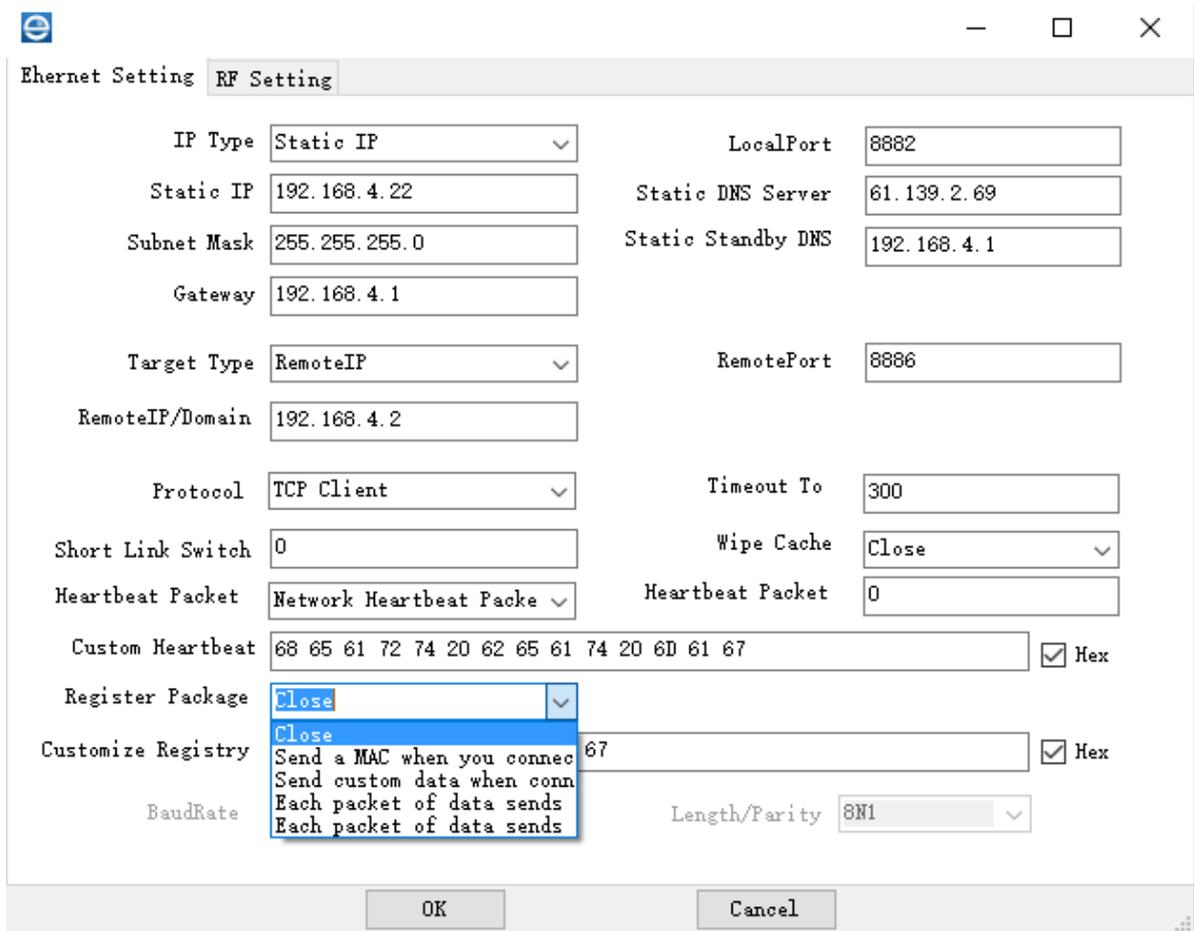
Figure 25 Registration packet setting
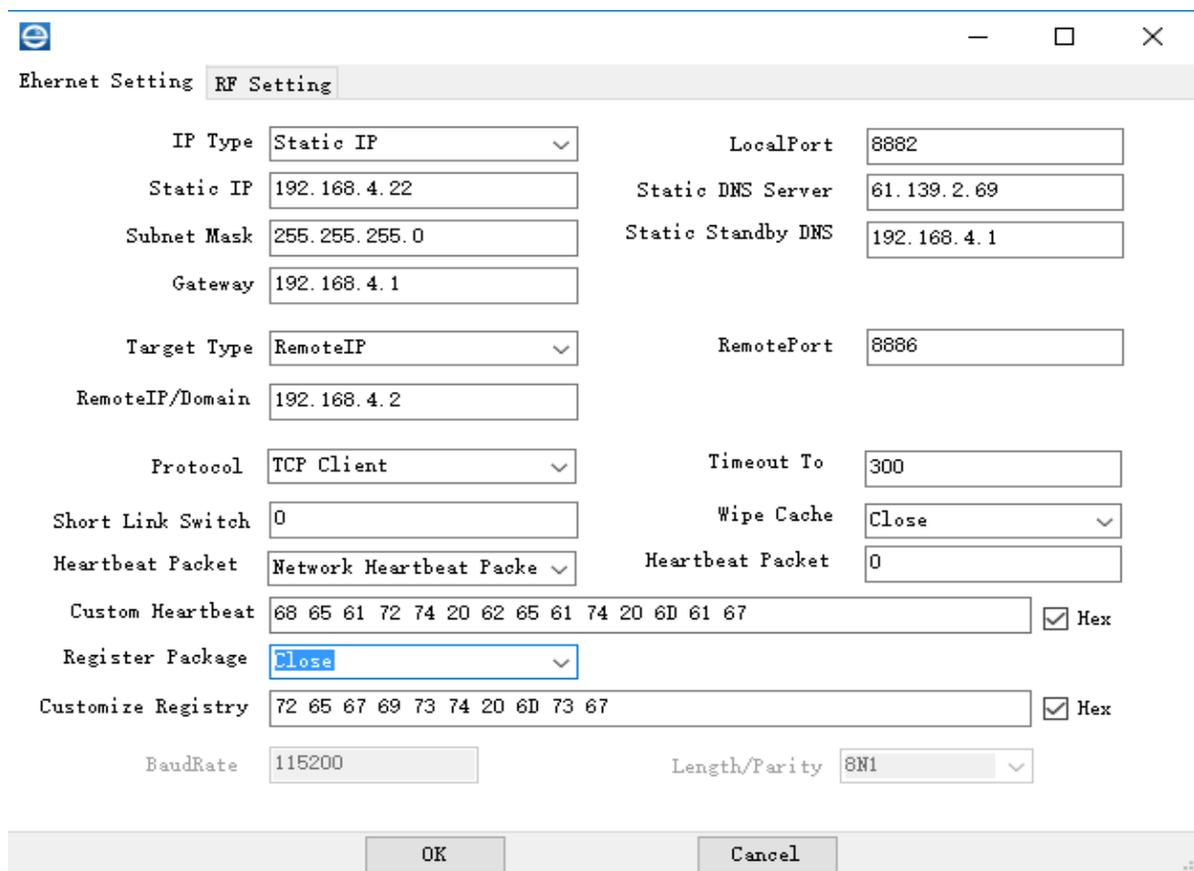
Figure 26 User-defined data setting

6.3.3 Heartbeat packet instructions

Heartbeat packets are used to ensure the reliability of the connection. E70-DTU(433NW30-ETH) supports two heartbeat packets, which are network heartbeat packets and serial heartbeat packets. After setting the heartbeat packet type, you also need to set the heartbeat period and custom heartbeat packet data.
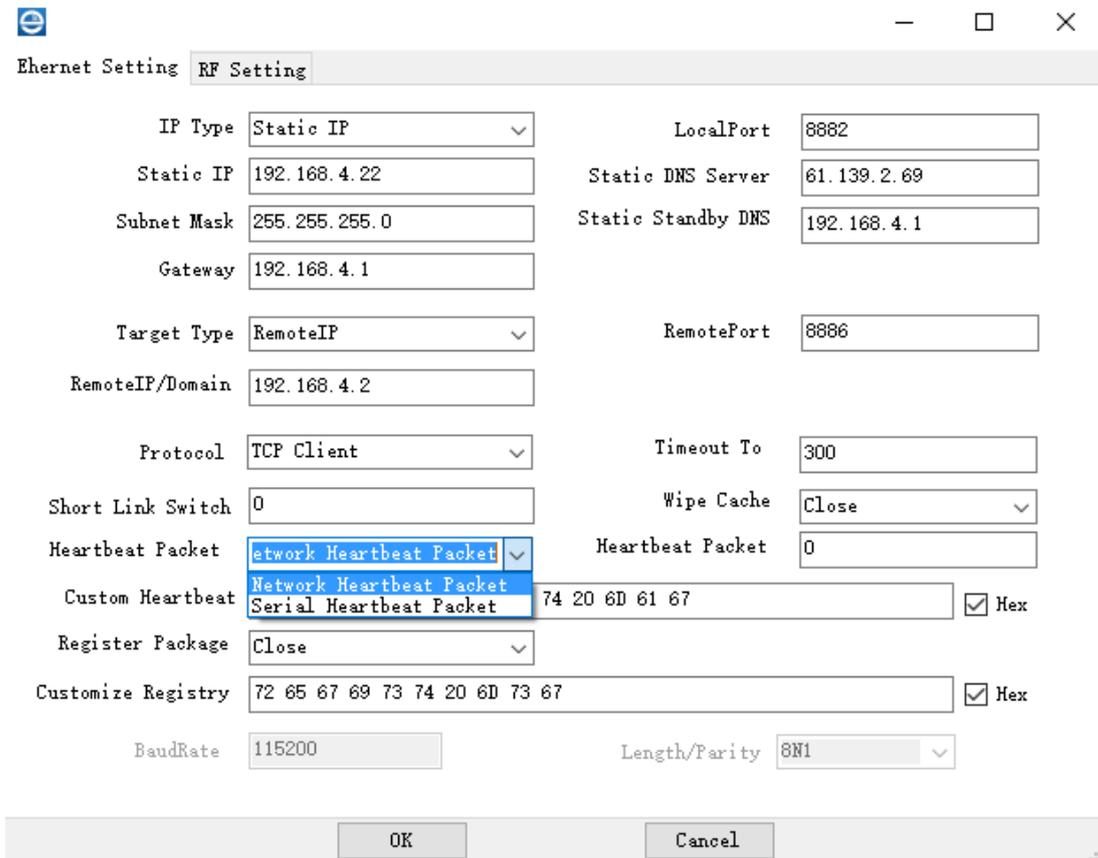
Figure 27 Heartbeat packet setting

6.3.3 Overtime restart instructions
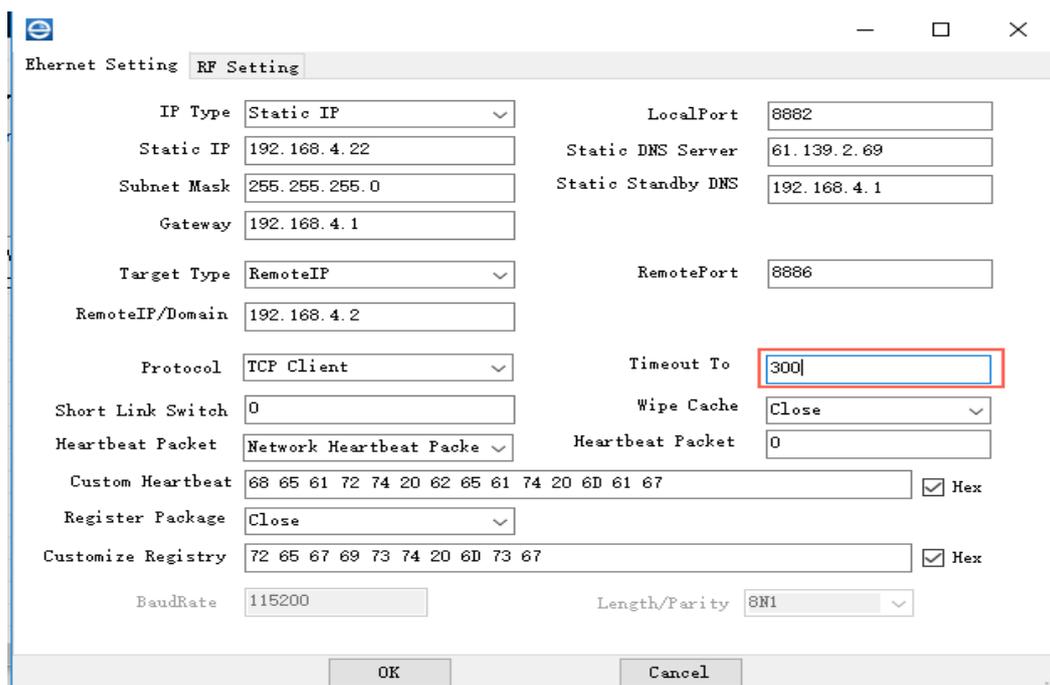
Figure 28 Overtime restart setting

6.3.4 Clearing cache instructions

When TCP is not established, the data received by the serial port is in the buffer, and users can set to clear buffer according to the requirements, default closed.

Figure 29 Clearing cache setting

7. AT Command

7.1 AT command introduction

The AT instruction refers to the instruction set that the user passes the command through the UART and the module in the command mode. After switching on to the configuration mode after power-on, the module can be set via UART.

Sequence from Transparent Transmission Mode to Instruction Mode:
The serial port device sends "+++" to the module continuously. After the module receives "+++", the 3s timer timeout starts. If any AT command is received within the timeout period, it will switch to the configuration mode successfully. (Note: Before the mode was successfully switched, any serial port data was transmitted through the network.

Sequence from AT command mode to network transparent transmission timing:
The serial device sends the instruction "AT+ EXAT" to the module. After receiving the instruction, the module returns "+OK and switches to transparent mode at the same time.

Instructions: <CR>: ASCII code 0x0d;
          <LF>: ASCII code 0x0a;

7.2 AT command error code

Error code	Instructions
-1	Invalid command format
-2	valid command format
-3	Invalid operator
-4	Invalid parameters
-5	Operation not allowed
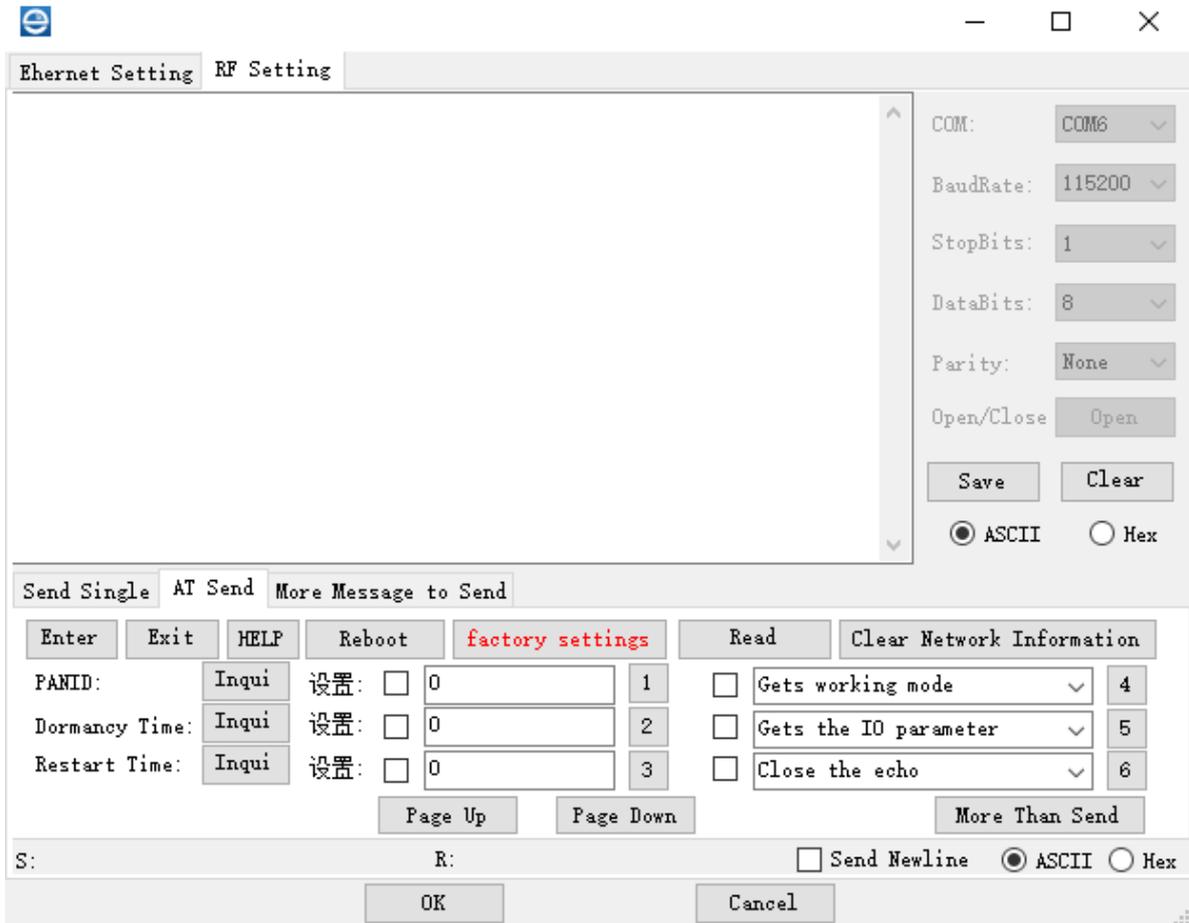
Figure 30 AT instructions

7.3 AT command

When the serial port enters AT mode, it needs to open the serial port assistant, set the serial port (default parameter) baud rate 115200, data bit 8 bit, stop bit 1 bit, open the serial port, input "+++" without carriage return. All parameter settings will reply "\r\n+OK\r\n".

1	Enters" +++" into AT Command	
	+++	Parameter Description: Null Response: Enter AT Mode
	Example: +++	
	Note: 1. The AT command can be used only after entering the AT command mode 2. After entering the AT command mode, the AT command mode can be used again only after exiting the AT command	

	mode, reset or restart the modem 3. When writing this instruction, the serial debugging assistant must be set not to send new lines; writing other AT commands must be set to send new lines.	
2	**AT+EXIT** Exit AT command mode	
	AT+EXIT	Parameter Description: Null Response: Exit AT Mode
	Example：AT+EXIT	
	Note: AT commands are invalid after exiting AT command mode	
3	**AT+HELP** Help command	
	AT+HELP	Parameter Description: Null Response: All instructions and help information
	Example：AT+HELP	
4	**AT+ RPCFG** Reading the operating parameters	
	AT+ RPCFG	Parameter Description: Null Response: Return to the current operating parameters
	Example：AT+ RPCFG	
5	**AT+ WMCFG** Setting /Querying working mode (reboot valid)	
	AT+ WMCFG =?	Description: Gets working mode Response： WMCFG：4
	AT+ WMCFG =Value	Description: Value:0~4 0,Coordinator; 1, Normal node; 2, Dormant Node; 3, Sleep mode; 4, (factory default), dial switch control
	Example：AT+ WMCFG =4	
	Note: 1. After setting a new mode, it needs to be reset or power off and restart	
6	**AT+DINFO** Get facility information	
	AT+DINFO=ALLNODE	Description: Query the short and long address of all node, and return by UART. It works only when the device works in the coordinator mode
	AT+DINFO=SELFS	Description: Get short address and return by UART
	AT+DINFO=SELFE	Description: Get long address and return by UART
	Example：AT+DINFO=SELFE	
7	**AT+ TFOCFG** Setting/Querying output format configuration (reboot valid)	
	AT+ TFOCFG=?	Description: Gets output format configuration Response： TFOCFG:0
	AT+ TFCFG=Value	Description: Value：0~7 0：Output: valid data (transparent transmission)） 1： Output: Valid Data +Long Address 2：Output: Valid Data +Short Address

		3：Output: Valid Data+RSSI
		4：Output：Valid Data+Long Address+Short Address
		5：Output：Valid Data+Long Address+RSSI
		6：Output：Valid Data+Short Address+RSSI
		7：Output：Valid Data+Long Address+Short Address+RSSI
	Example：AT+ TFCFG=0	
8	**AT+ TFICFG** Setting/Querying input transmission format configuration (reboot valid)	
	AT+ TFICFG=?	Description: Gets input transmission format configuration Response： TFICFG:0
	AT+ TFICFG=Value （valid for coordinator only）	Description: Value：0~2 0：Input Broadcast(Only the coordinator works) 1：Input Short Address+Data (0x0000 0xfff) are broadcast address 2：Input Long Address+Data (0x000000000000 0xffffffffffffffff) are broadcast address
	Example：AT+TFICFG=0	
9	**AT+TMCFG** Setting/Querying transport mode configuration (reboot valid)	
	AT+TMCFG=?	Description： Gets transport mode configuration Response： TMCFG:0
	AT+TMCFG=Value	Description： Value：0 or 1 0：Long Range mode，LRM 1：Standard transmission mode,GFSK
	Example：AT+TMCFG=0	
10	**AT+ PIDCFG** Setting/Querying PANID configuration （reboot valid）	
	AT+PIDCFG=?	Description: Gets PANID configuration Response： PIDCFG:65535
	AT+PIDCFG=Value	Description: Value:0~65535
	Example：AT+PIDCFG=65535	
11	**AT+ DMCFG** Setting/Querying dormancy time configuration(reboot valid)	
	AT+DMCFG=?	Description: Gets dormancy time configuration Response: DMCFG:0
	AT+DMCFG=Value	Value: dormant time, per unit second (MS), When the value is less than 2, the system will change to 2 (minimum 2 seconds)
	Example：AT+DMCFG=0	
12	**AT+RSCFG** Setting/Querying the reboot parameter configuration(reboot valid)	
	AT+RSCFG=?	Description: Gets the reboot parameter configuration Response： RSCFG:0
	AT+RSCFG=Value	Description: Value：0 or 60~65535 （S） When the value less than 60s, the system judges 60, equals 0s, does not restart
	Example：AT+RSCFG=0	
	Note: This parameter can be used for node disconnection detection. It is recommended to open it.	

	AT+UBCFG　Setting /Querying the baud rate parameter (reboot valid)	
13	AT+UBCFG=?	Description： Obtains the baud rate parameter Response： UBCFG:7
	AT+UBCFG=Value	Description： Value:0~7 0：1200 1：2400 2：4800 3：9600 4：19200 5：38400 6：57600 7：115200
	Example：AT+UBCFG=7	
14	**AT+UPCFG**　Setting /Querying the device parity parameter(reboot valid)	
	AT+UPCFG=?	Description Gets the device parity parameter Response： UPCFG:0
	AT+UPCFG=Value	Description： Value:0~2 0：None 1：Odd parity 2：Even parity
	Example：AT+UPCFG=0	
15	**AT+PWCFG**　Setting /Querying the power parameter(reboot valid)	
	AT+PWCFG=?	Description： Gets the power parameter Response： PWCFG:3
	AT+PWCFG=Value	Description： Value:0~3 0：Polar Altitude 1：High 2：Medium 3：Low
	Example：AT+ PWCFG=3	
16	**AT+IOCFG**　Setting /Querying the IO parameter	
	AT+IOCFG=?	Description： Gets the IO parameter Response： IOCFG:0
	AT+IOCFG=Value	Description： Value：0 or 1 0：Push-pull 1：open-drain
	Example：AT+IOCFG=0	
17	**AT+DFCFG**　Restore the default parameter	
	AT+DFCFG	Description：Null Restore the default parameter
	Example：AT+DFCFG	
18	**AT+RSTART**　Device Restart	

	AT+RSTART	Description：Null
		Device Restart
	Example：AT+RSTART	
19	**AT+ECHO** Sets up the AT instruction to turn off the back display	
	AT+ECHO=Value	Description:
		Value:0 or 1
		1：Close the echo
		0：Open the echo
	Example：AT+ECHO=1	
	This setting only applies when the power is turned on. After the restart, the default settings are restored and the echo is enabled by default.	
20	**AT+VER** Reading the version number	
	AT+VER	Description:
	Example：AT+VER	
21	**AT+ClcNoNet** Clearing the internal network information	
	AT+ClcNoNet	Description:
	Example：AT+ClcNoNet	
	Note: The network cannot be re-established after the module is cleared (This instruction can clear all the information when the coordinator node number reaches 50)	

8. Note

- In sleep mode, The serial port parameters are 115200, 8N1(fixed). If the user forget the current baud rate, they can use this At command to reconfigure.

- After the node is associated with the coordinator, the node information will be saved, and the information will still exist after the node is disconnected from the network, this mechanism has two advantages:

  1.When the same node joins the network established by the coordinator, the network access speed will be increased.

  2.After a node enters the network, the short address will never change as long as the current network exists.

  If the coordinator has associated more than 200 devices and wants to continue associating new devices, you need to call the AT+CLINFO command to clear the current network information.

- The average power consumption of low power nodes depends on the wake up period of user configuration. The larger the cycle, the lower the power consumption, but the delay of receiving coordinator will be even higher.

- Low-power node cannot receive broadcast data which transmitted by the coordinator

- The system will be reset if the node is powered on for more than 60 seconds and it has not yet entered the network.

- When node PANID is set to 0Xffff (65535), the node can join any network, otherwise it will only be able to join the same network as its PANID.

9. Important Notes

- All rights to interpret and modify this manual belong to Ebyte.
- This manual will be updated based on the upgrade of firmware and hardware, please refer to the latest version.
- Please refer to our website for new product information

10.About Us

Technical support: support@cdebyte.com

Documents and RF Setting download link: www.cdebyte.com/en/

Tel：+86-28-61399028

Fax：028-64146160

Web：www.cdebyte.com/en/

Address：Innovation Center D347, 4# XI-XIN Road,Chengdu, Sichuan, China