EBYTE Wireless Data Transceiver
E90-DTU(433L30E)

User Manual

1.Introduction

1.1 Brief Introduction

E90-DTU(Ethernet) is a small, powerful wireless digital data-Ethernet transceiver with the function of long range, digital data processing, digital modulation and demodulation, FEC, balanced soft decision, etc. It carries a M0+ series 32 bit processor, quick speed, high efficiency. It has adaptive network rate(supporting for 100M full duplex) and TCP Server, TCP Client, UDP Server, UDP Client four communication mechanisms.

Wireless data transceiver working as a communication medium, as well as the fiber, microwave, the same line, has a certain scope of application: it provides some special conditions in the private network monitoring signal real-time, reliable data transmission, with the features of low cost, convenient installation and maintenance, diffraction ability, flexible network structure,   range of coverage, suitable for the occasion of dot and scatter, complex geographical environment , connecting with PLC, RTU, rain gauge, level gauge and other data terminals.

E90-DTU(Ethernet) is easy to operate, users can directly configure the module through computer and transmit the data easily. It solves the problem that some scenes are inconvenient to deploy network cable or short range of normal WiFi transceiver.

1.2 Features

❖   All the core components are imported originally , compared with the current imports of digital transceiver, we are the most advanced, most cost effective and the smallest one.

❖   Transmission power is optional, all technical indicators have met the European industry standards.

❖   Use temperature compensation circuit, the frequency stability is better than $\pm$ 2PPM.

❖   With operating temperature range: -40 ℃ ～ +85 ℃, adapting to a variety of harsh working environment.

❖   All with aluminum alloy shell, compact, easy installation, good heat dissipation; perfect shielding design, good electromagnetic compatibility and strong anti-interference ability.

❖   Power reverse protection, over-protection, antenna surge protection and other multiple protection functions, greatly increase the reliability of the transceiver.

❖   Powerful software features, all parameters can be programmed to set: such as power, frequency, air data rate, address ID, etc.

❖   Ultra-low power consumption, standby current is 20mA (the power consumption of power saving mode and sleep mode is lower), the transmitting current ≤ 350A (1W).

❖   With watchdog and accurate time layout, in the event of an exception, the module will automatically restart and continue to follow the previous parameters to operate.

2.Dimension

2.1 Pin Description
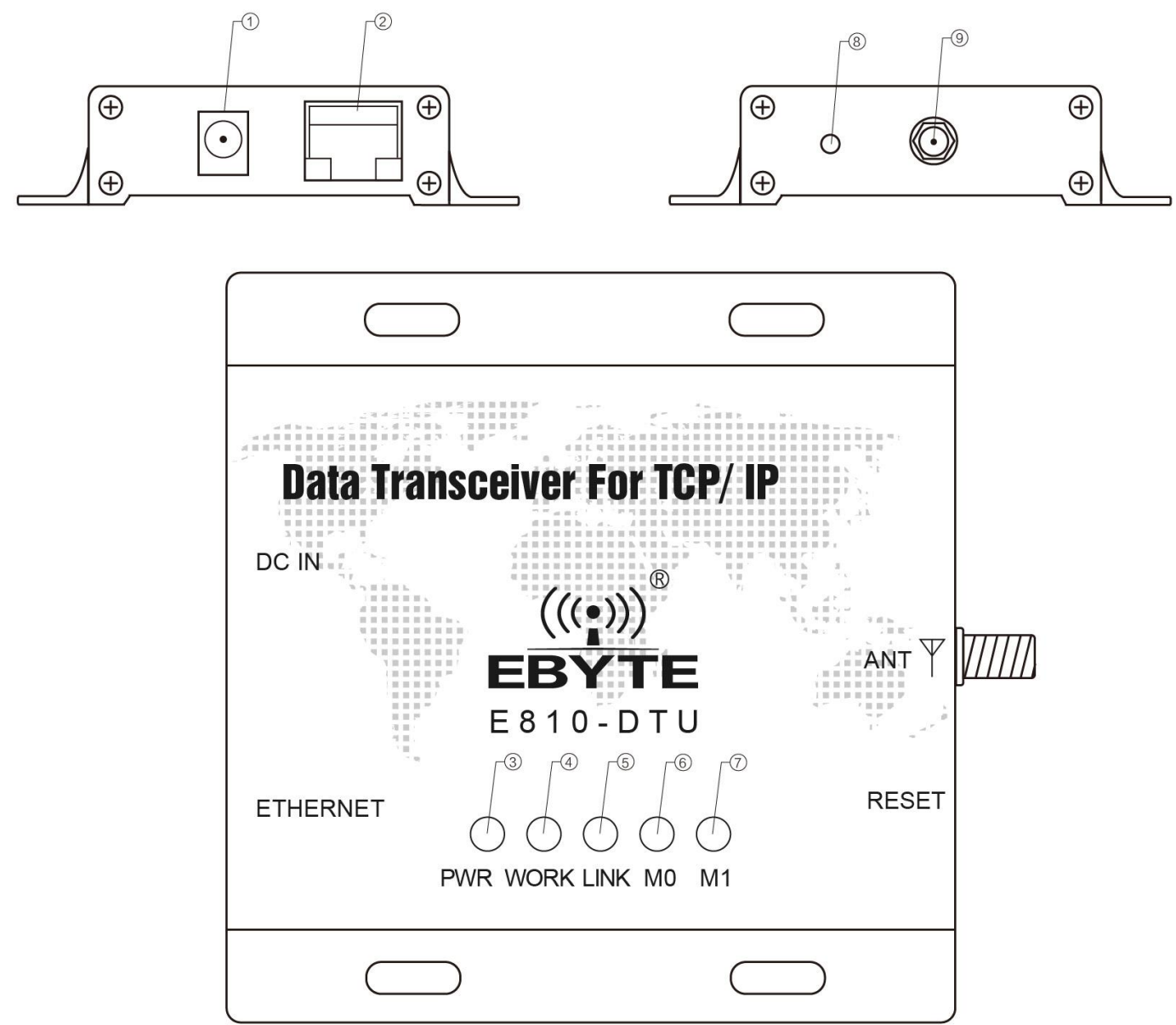
Pin NO.	Name	Function	Description
1	PWR-LED	Power interface	Straight plug-in hole, O.D 5.5mm, I.D 2.5mm
2	RJ45-interface	Ethernet interface	Standard RJ45 interface, connect with the device or PC
3	PWR-LED	Power LED	Red, lit when the power is on
4	WORK-LED	Transmit LED	Yellow, blinks when sending data
5	LINK-LED	Receive LED	Yellow, blinks when connected
6	M0-LED	Mode LED	Yellow, M0、M1 indicates RF status
5	M1-LED	Mode LED	Yellow, M0、M1 indicates RF status
	RESET	RESET switch	Restore factory default setting after long press 5-15 seconds
8	Antenna interface	SMA-K interface	External thread, 10mm, 50Ωcharacteristic impedance

3.Technical indicators

3.1 Model specification

Model	Frequency	Power	Distance	Feature	Application
	Hz	dBm	km		
E90-DTU(433L30E)	433M	30	8	LoRa Spread spectrum anti-interference	To the environment with small data, far distance
E90-DTU(433C30E)	433M	30	3	High-speed continuous transmission	To the environment with large data, supporting Modbus
E90-DTU(433N30E)	433M	30	6	Narrowband technology	To the environment with medium data, dense deployment

★ Note: Test condition: in clear and open air without shelters, 12V /2A power supply, 5dBi gain sucker antenna over 2 meters height from the ground, with the factory default parameters.

3.2 General specification parameters

NO.	Parameter	Specification	Description
1	Size	66 * 66 * 21 mm	E90-DTU（433L30E/433C30E433N30E）
2	Weight	79±1g	E90-DTU（433L30E/433C30E/433N30E）
3	Operating temperature	-40℃～+85℃	Long time use above 70 ℃(not recommended)
4	Antenna impedance	50 Ω	Standard 50 Ω characteristic impedance
5	Supply voltage	+8 ~ +28V DC	It is recommended to use 12V or 24V
6	Communication interface	RS232/RS485	Standard DB9 hole / 3.81 terminal block
7	Baud rate	Default 9600	From 1200 to 115200 bps
8	Address	Default 0	65536 configurable addresses

3.3 Frequency range and channels

Model	Default frequency	Frequency range	Channel spacing	Channels
	MHz	MHz	MHz	
E90-DTU(433L30E)	433	410~441	1	32, Half-duplex
E90-DTU(433C30E)	433	425~450.5	0.1	256, Half-duplex
E90-DTU(433N30E)	433	425~450.5	0.1	256, Half-duplex

★ Note: In the same area when multiple data transceivers are communicating one to one at the same time, it is recommended to set the channel spacing between each group of data transceivers at 2MHz or more.

3.4 Transmit power level

Model	21 dBm	24 dBm	27 dBm	30 dBm（Default）
E90-DTU(433L30E)	√	√	√	√
E90-DTU(433C30E)	√	√	√	√
E90-DTU(433N30E)	√	√	√	√

★ Note: 1. The lower the transmit power, the closer the transmission distance, but the working current won't be declined in exact proportion, it is recommended to use the maximum transmit power.

2. In order to guarantee the transmitting efficiency of, the factory default is the maximum transmitting power.

3.5 Air data rate

Model	Default air data rate	Levels	Air data rate
	kbps		kbps
E90-DTU(433L30E)	2.4	6	0.3、1.2、2.4（default）、4.8、9.6、19.2
E90-DTU(433C30E)	1.2	8	1.2（default）、2.4、4.8、9.6、19.2、38.4、50、70
E90-DTU(433N30E)	1.2	8	1.2（default）、2.4、4.8、9.6、19.2、38.4、50、70

★ Note: The higher the air data rate, the faster the transmission rate, the transmission distance is also closer; when the rate meets the requirements, the lower air data rate, the better quality .

3.6 Current parameters

Model	Transmitting current（mA）		Standby current（mA）	
	12V	24V	12V	24V
E90-DTU(433L30E)	330.0	170.0	20.0	10.0
E90-DTU(433C30E)	310.0	150.0	20.0	10.0
E90-DTU(433N30E)	350.0	180.0	20.0	10.0

★ Note: It is recommended to retain more than 50% of the current margin when selecting the power supply, which will help the data transceiver to work steadily for a long time.

3.7 Transceiver Length and Sub-packing Mode

Model	Buffer	Sub-packet
E90-DTU(433L30E)	512 bytes	Automatically send 197 bytes per packet
E90-DTU(433C30E)	512 bytes	Automatically send 197 bytes per packet
E90-DTU(433N30E)	512 bytes	No limitation of packet length without sub-packet

★ Note: 1. When the receiving data is more than a single packet capacity (100 bytes), the beyond part will be automatically assigned to the second transmission until it is completed;

2. The data transceiver can not receive data which is more than the buffer capacity;

3. If one can not determine the amount of data sent and received, it is recommended to use C series.

4. Network basic function introduction

4.1 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.

E90-DTU's IP address of E90-DTU 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, E90-DTU 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

4.2 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, E90-DTU 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.

5. Socket characteristics

The Socket operating mode of E90-DTU 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:
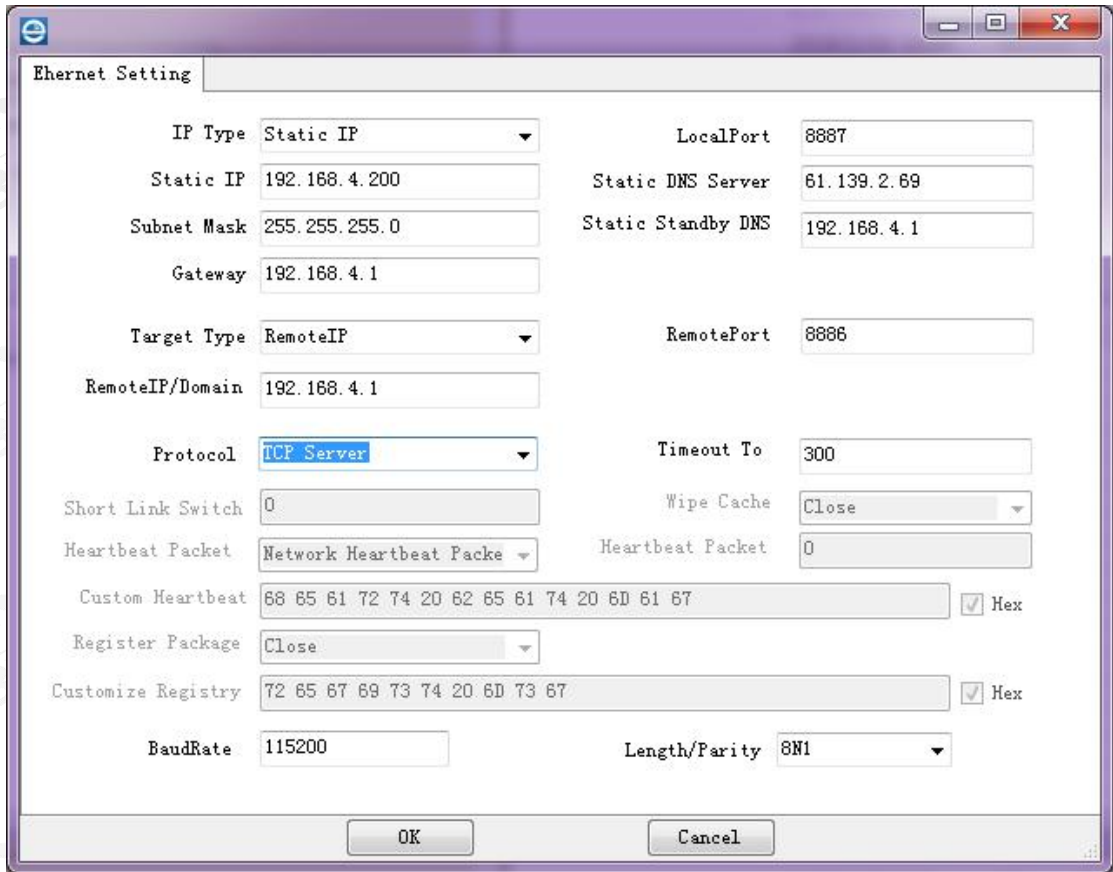
Figure 3 Setting interface

5.1 TCP Server characteristics
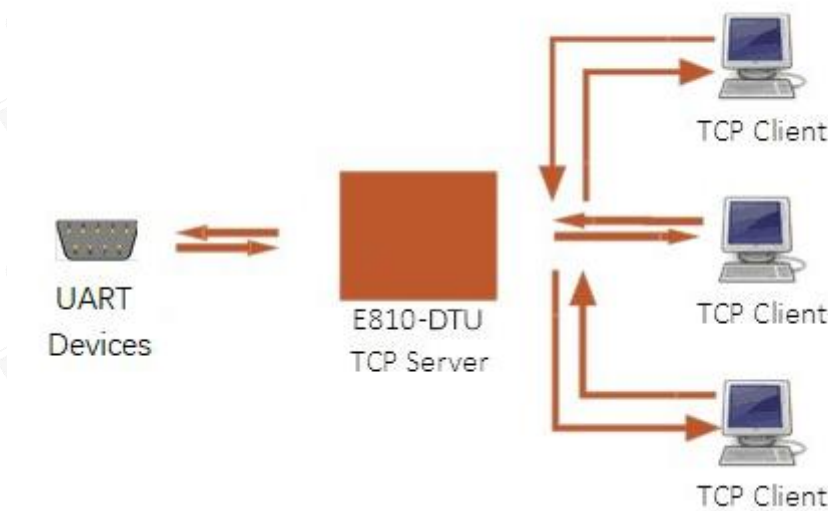
Figure 5 TCP Server

(1) In TCP Server mode, E90-DTU monitors the local port, receiving and establishing a connection for data communication when a connection request is sent. When the E90-DTU serial port receives data, it will transmit data to all client devices which established a connection with the E90-DTU.

(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 E90-DTU 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.

5.2 TCP Client characteristics

Figure 4 TCP Client

(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 E90-DTU 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 E90-DTU is set to static IP, please keep the E90-DTU IP and gateway in the same network segment and set the gateway IP correctly, otherwise it cannot communicate normally.

5.3 UDP Server characteristics
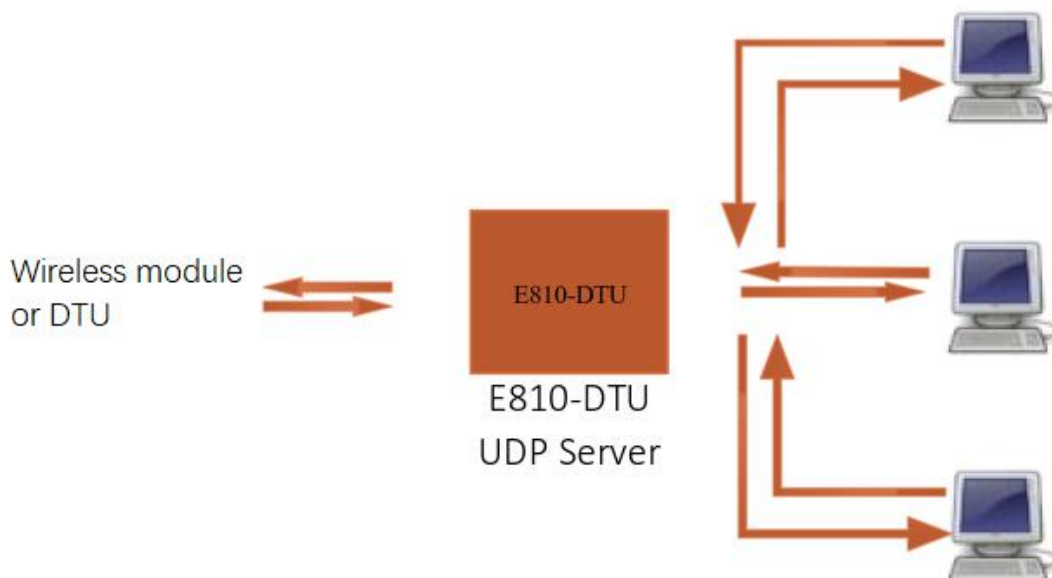
Figure 7 UDP Server

(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.

5.4 UDP Client characteristics

Figure 6 UDP Client

(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 E90-DTU 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 E90-DTU.

(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，E90-DTU supports broadcast within the supporting network segment, such as the mode of xxx.xxx.xxx.255.

6. Special function

6.1 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.

6.2 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.

E90-DTU 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.
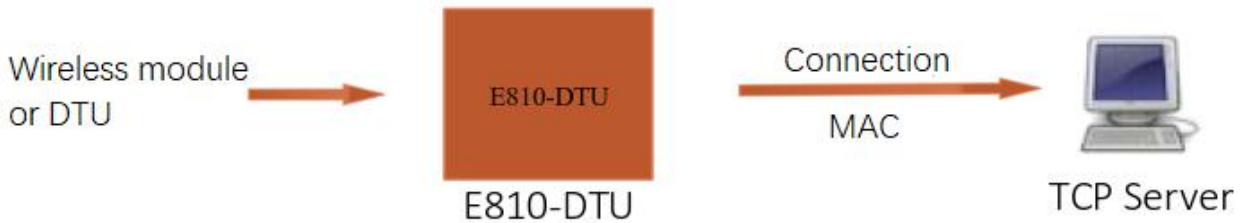
Figure 8 Sending MAC when connecting

Figure 9 Sending user-defined data when connecting

Figure 10 Each packet of data sending MAC

Figure 11 Each packet of data sending user-defined data

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.

6.3 Heartbeat mechanism

In the network transparent transmission mode, users can make the 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), E90-DTU module supports custom heartbeat packet content up to 40 bytes

6.4 Overtime restart

Overtime restart (no data restart) function is mainly used to ensure long-term stability of E90-DTU. When the network port cannot receive data for a long time, or if the network does not receive data for a long time, the E90-DTU 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.

6.5 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 E90-DTU and send and receive data at the same time. When E90-DTU 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.

6.6 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 E90-DTU 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.

6.7 Link and data transfer instructions
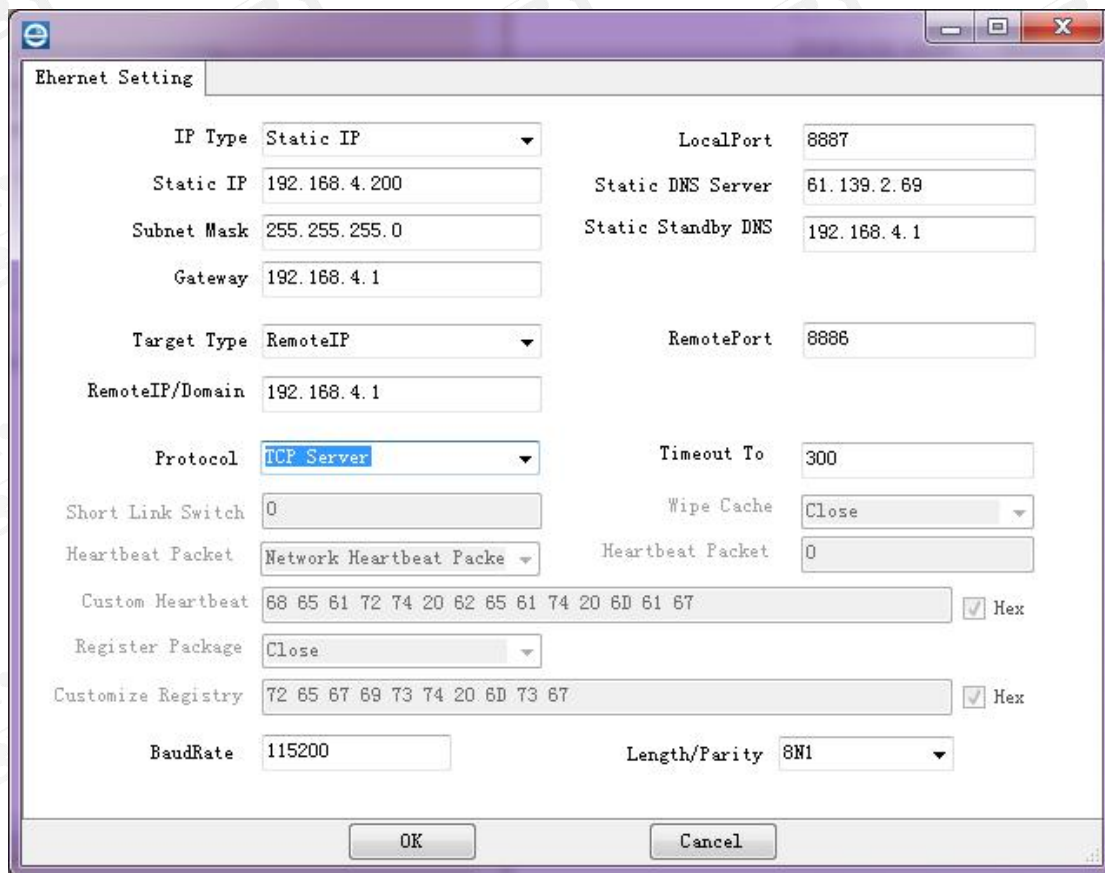
Link indicates the network connection status of the module. In TCP mode, when the network is not connected, the link goes out. When the connection is established, the link is always on. Link indicator is on in UDP mode.

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.
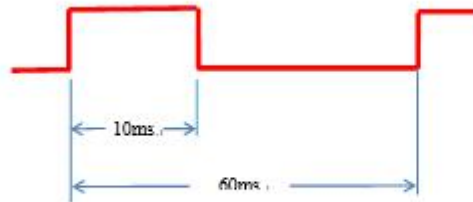
7. Quick instructions

7.1 Parameter setting instructions

Figure 12 Parameter setting instructions

7.2 Socket instructions

7.2.1 TCP Server instructions

(1) Connect two E90-DTU cable to the PC. Open the network configuration software and search for the device. The searched device will be displayed in the device list. Double-click the device to be configured in the list, enter the setting interface, and set the module to TCP Server mode, Set the module IP address to 192.168.4.101, 192.168.4.102, set the module's local port to 8886, set the RF parameters. After the setting is complete, click the OK button, then restart the device and search again to see if the parameter modification was successful.
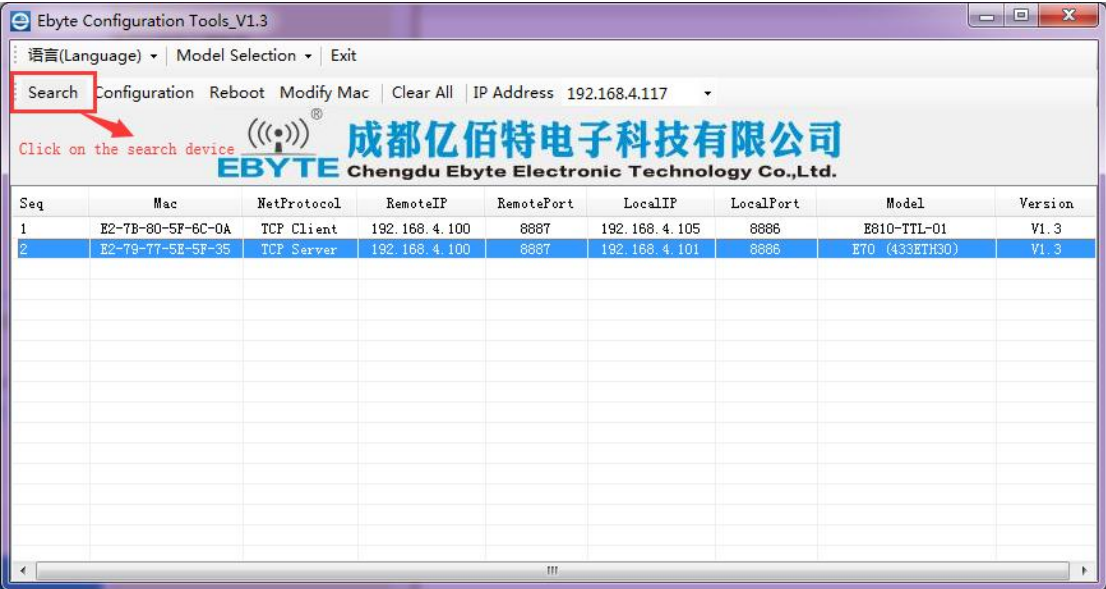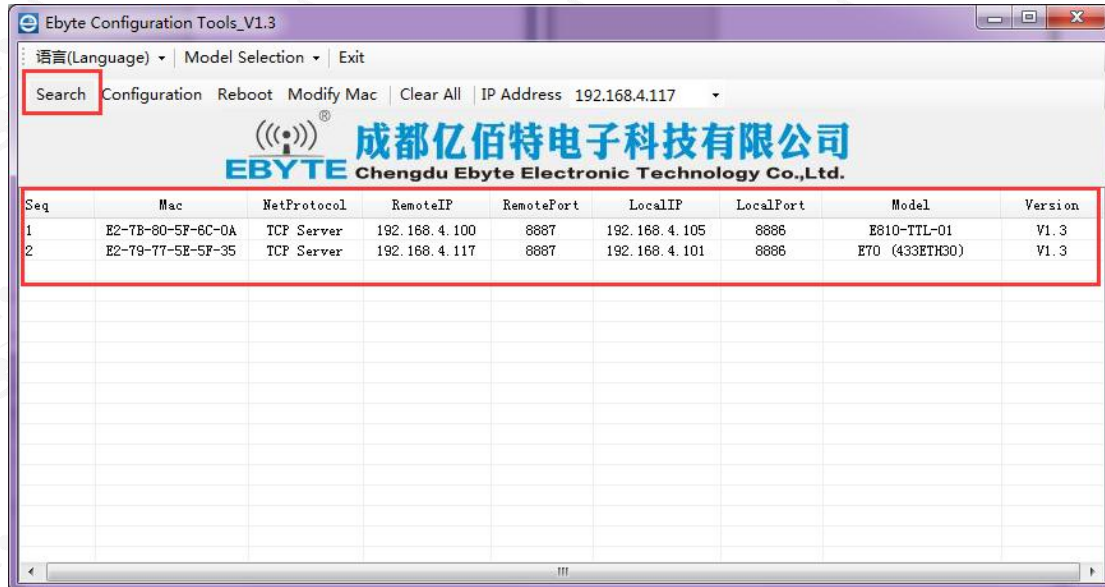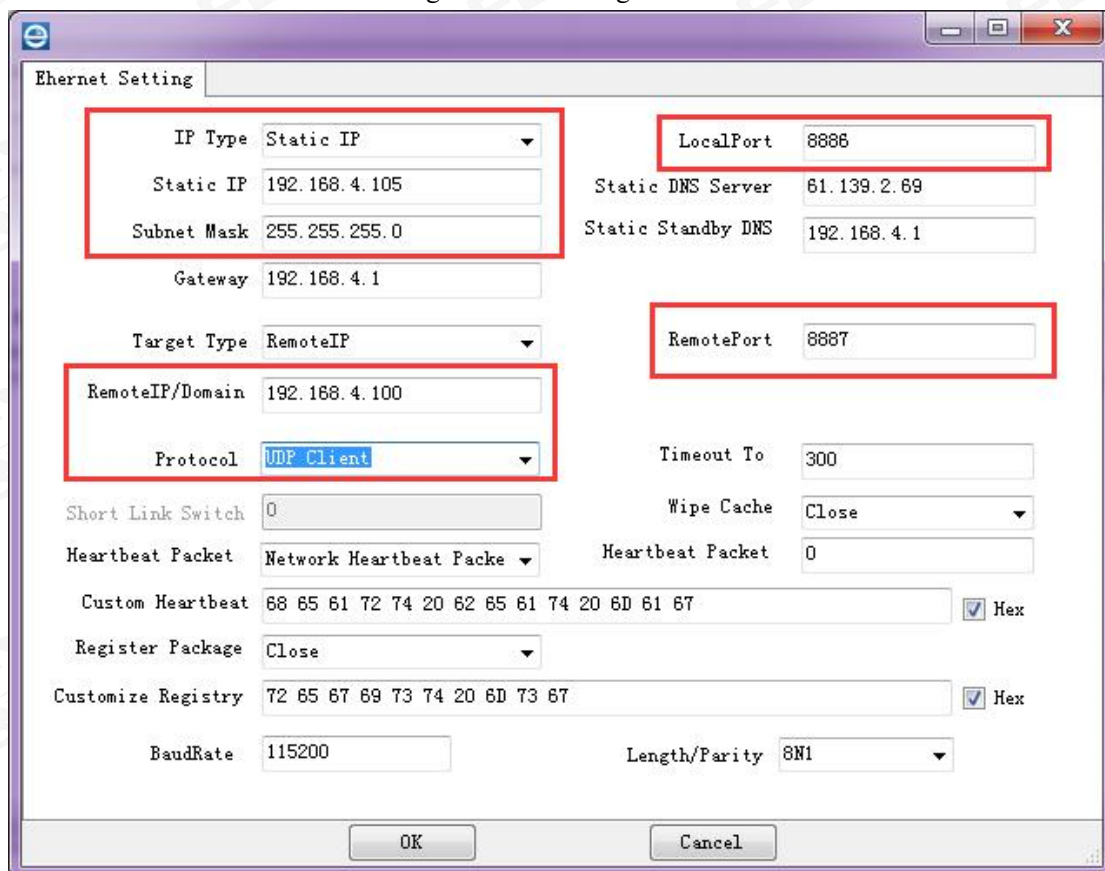
Figure 13 Searching devices
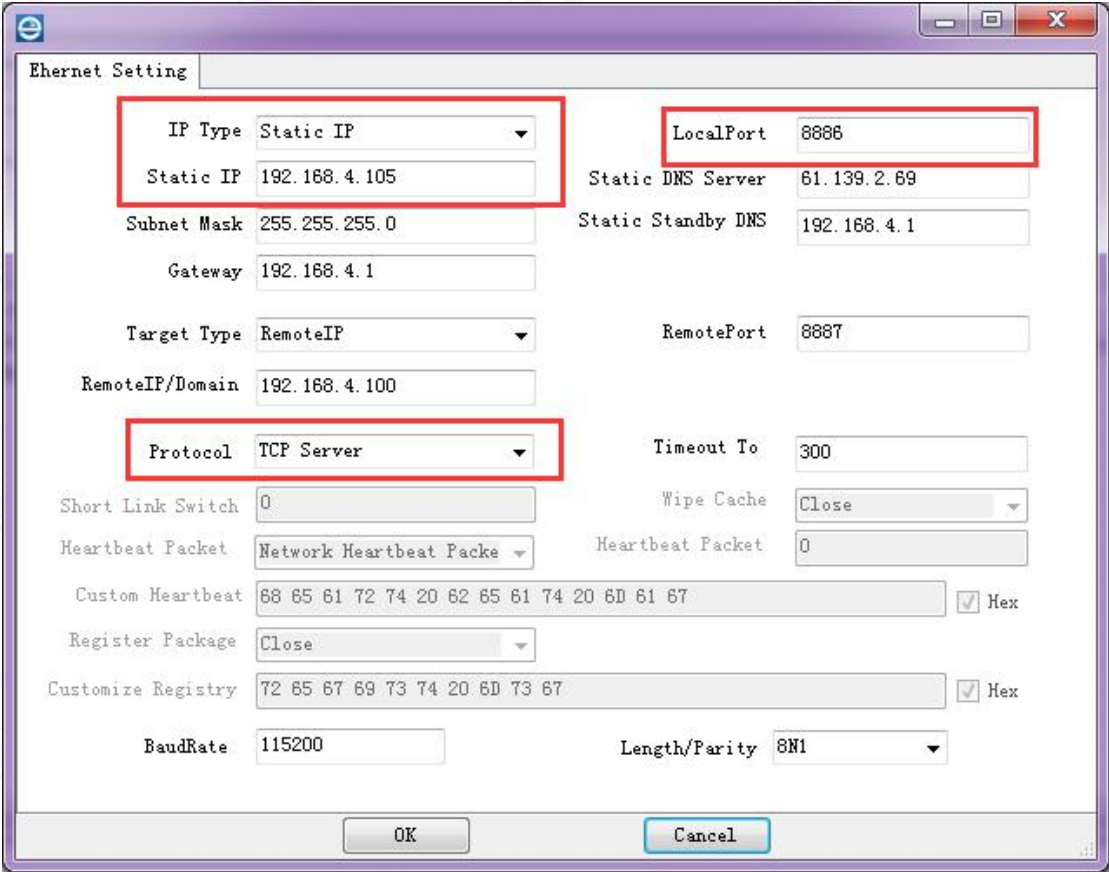
Figure 14 Network port parameter settings

Click Read Parameters on the RF Parameter Settings interface to obtain the module's current RF parameter settings, then you can configure the RF settings.
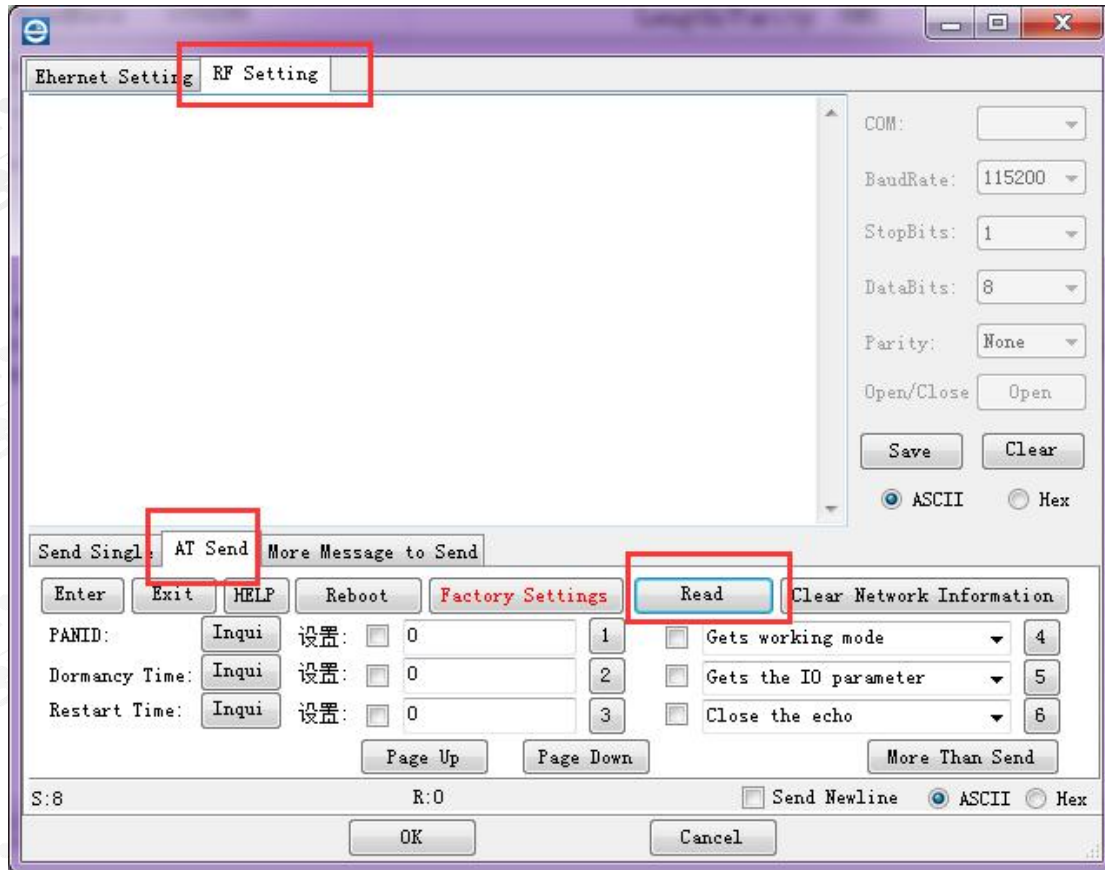
Figure 15 RF Parameter configuration settings

(2) Open two network debugging assistants, set the network debugging assistant protocol type to TCP Client, the network debugging assistant's server IP address is set to the module's IP address, the network debugging assistant's server port is set to the module's local port, 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 16 Data transparent transmission

7.2.2 TCP Client instructions

(1) Connect two E90-DTU serial ports and network cables 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 TCP Client mode, set the target IP address to 192.168.3.100, set the target port of module A to 8887, the target port of module B to 8886, 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 17 Searching devices

Figure 18 Parameter settings

Click Read Parameters on the RF Parameter Settings interface to obtain the module's current RF parameter settings. Then you can configure the RF settings.
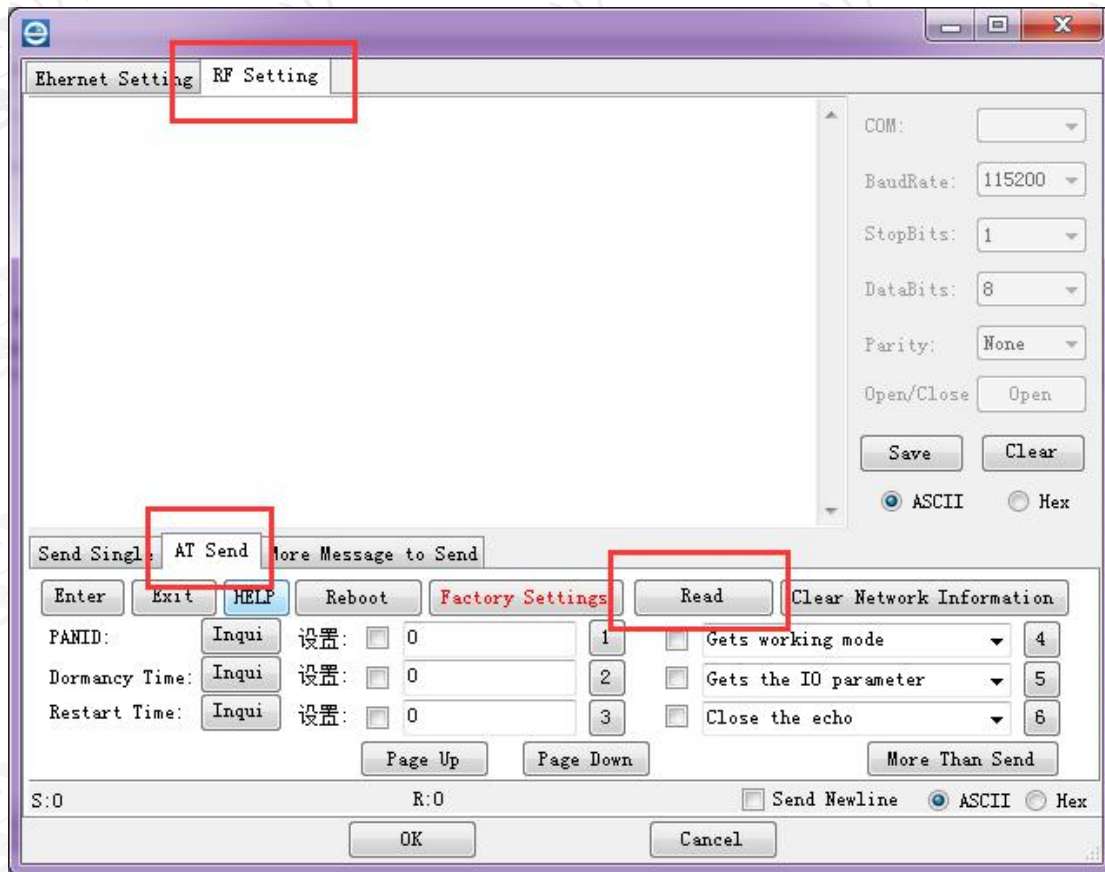

Figure 19 RF Parameter configuration settings

(2) Open two network debugging assistants, set the network debugging assistant protocol type to TCP Client, the network debugging assistant's server IP address is set to the module's IP address, the network debugging assistant's server port is set to the module's local port, 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.
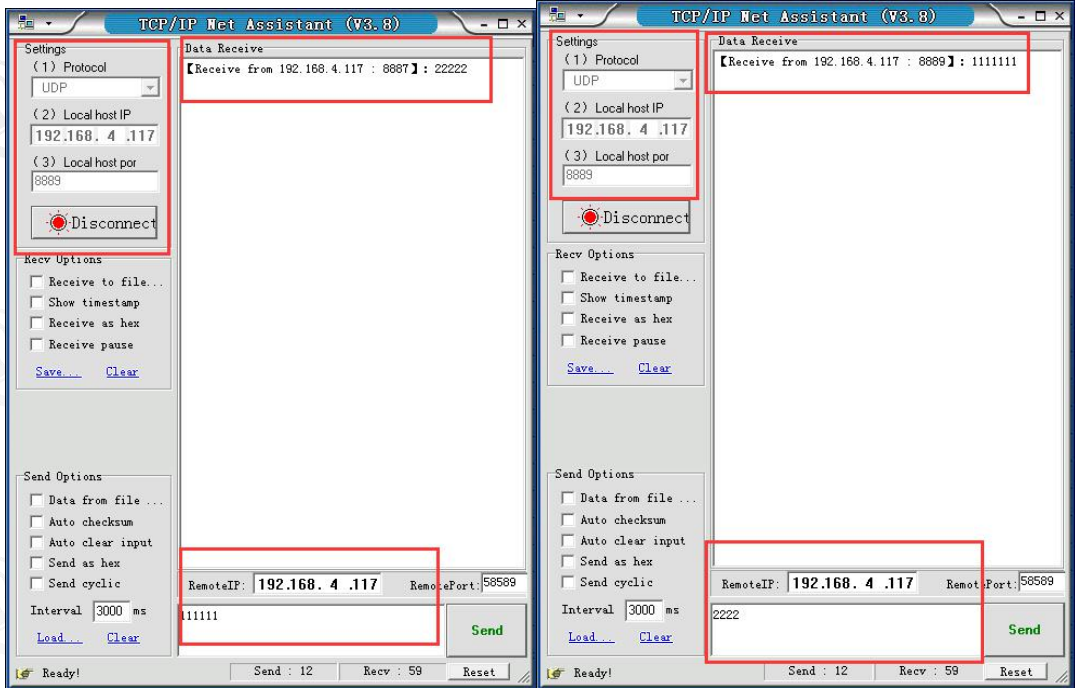
Figure 20 Data transparent transmission

7.2.3 UDP Server instructions

(1) Connect two E90-DTU serial ports and network cables 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 192.168.3.100, set the target port of module A to 8887, the target port of module B to 8886, 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.

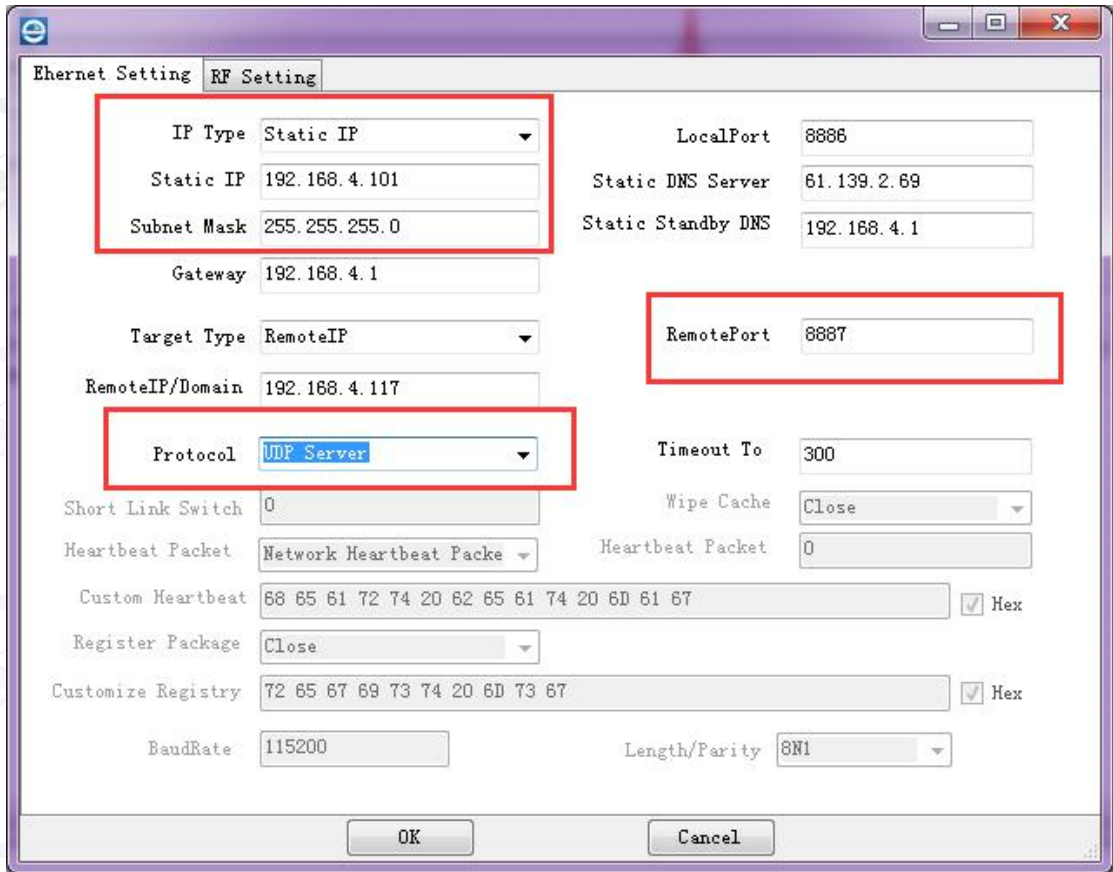| Seq	Mac	NetProtocol	RemoteIP	RemotePort	LocalIP	LocalPort	Model	Version
1	3C-97-0E-44-10-77	TCP Client	192.168.3.10	8887	192.168.3.22	8886	E810-DTU (433N30)	V1.3
2	3C-97-0E-44-10-09	TCP Client	192.168.3.10	8887	192.168.3.11	8886	E810-DTU (433N30)	V1.3

Figure 21 Searching devices

Figure 22 Parameter settings

Click Read Parameters on the RF Parameter Settings interface to obtain the module's current RF parameter settings. Then you can configure the RF settings.
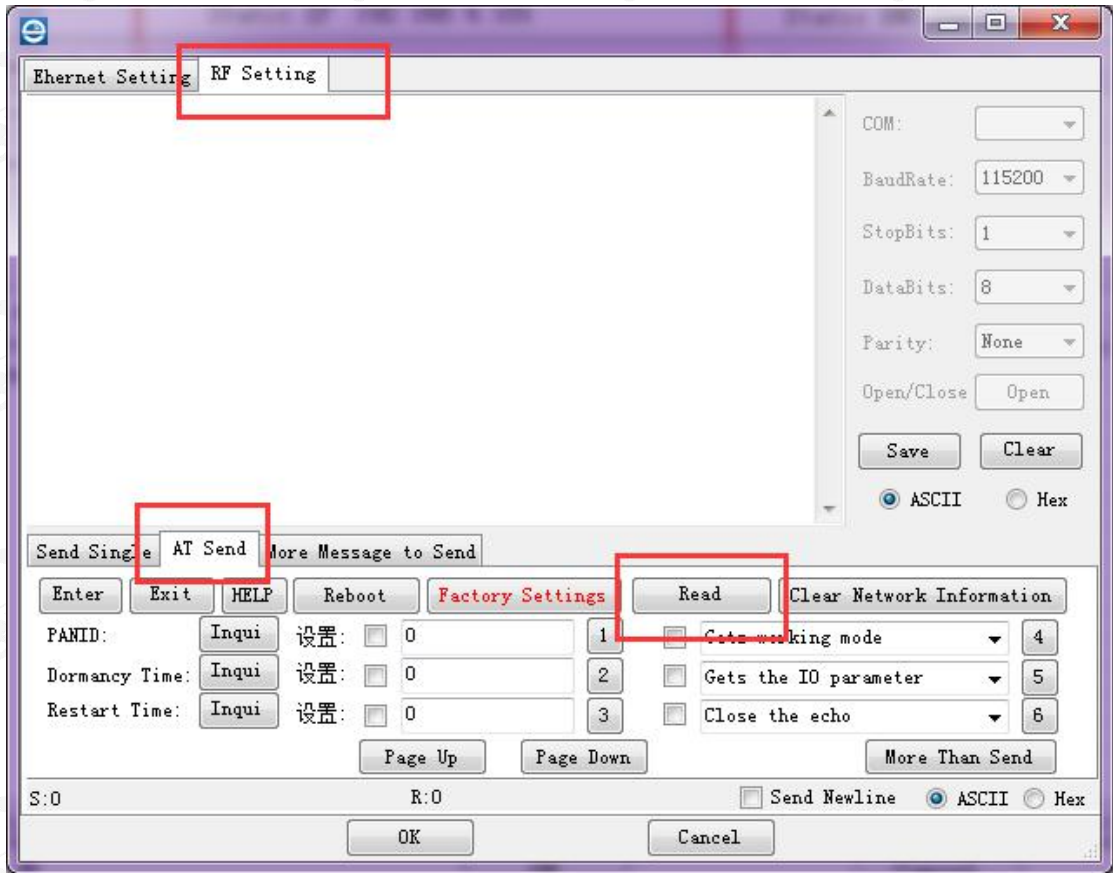

Figure 23 RF Parameter configuration settings

(2) Open two network debugging assistants, 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, the network debugging assistant's server port is set to the module's local port, 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.
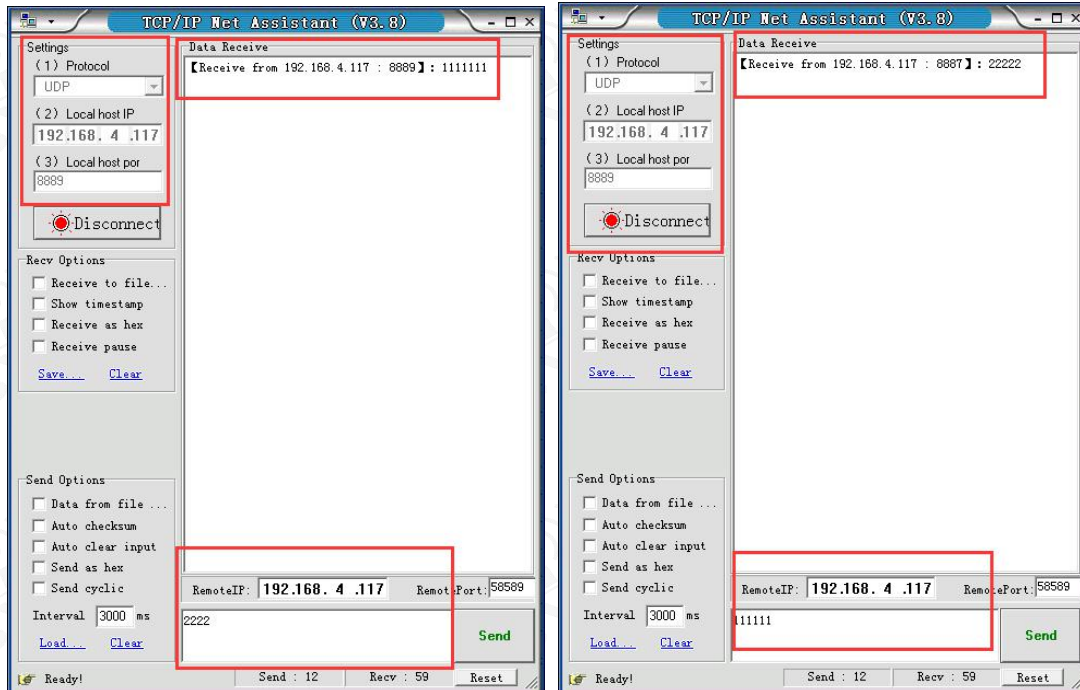

Figure 24 Data transparent transmission

7.2.4 UDP Client instructions

(1) Connect two E90-DTU serial ports and network cables 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 Client mode, set the target IP address to 192.168.3.100, set the target port of module A to 8887, the target port of module B to 8886, 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.
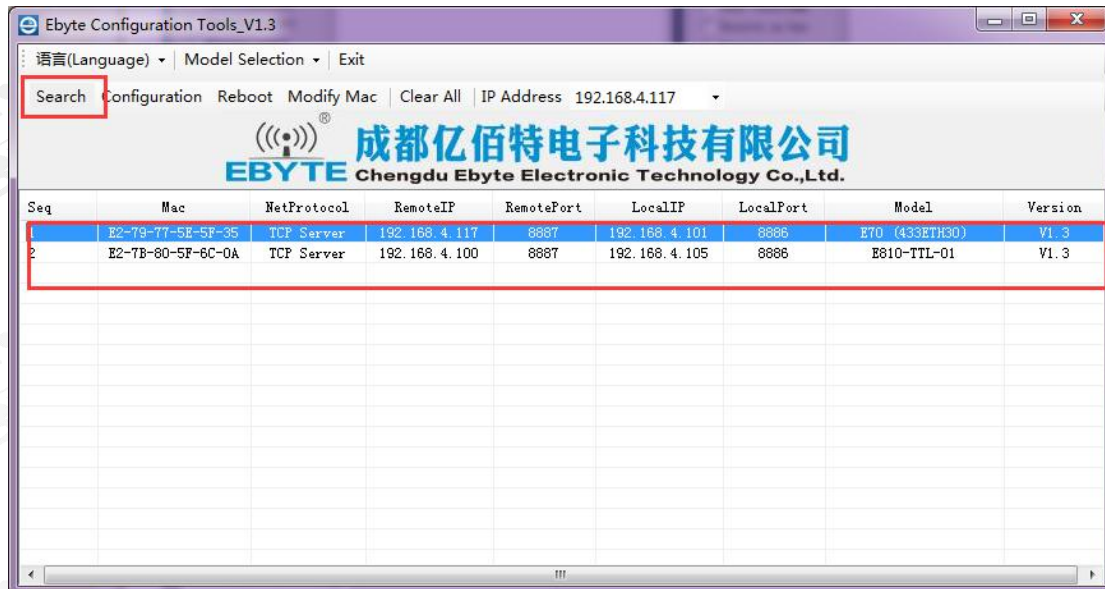
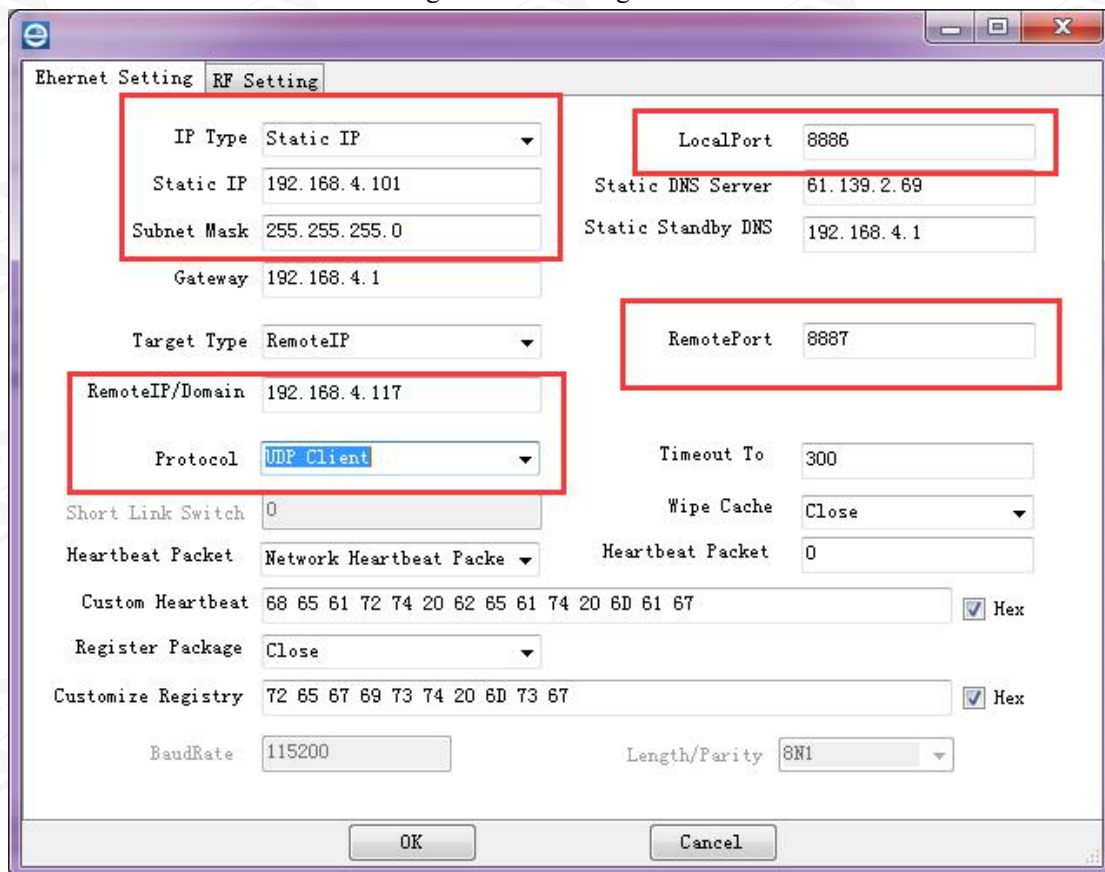Figure 25 Searching devices

Figure 26 Parameter settings

Click Read Parameters on the RF Parameter Settings interface to obtain the module's current RF parameter settings. Then you can configure the RF settings.
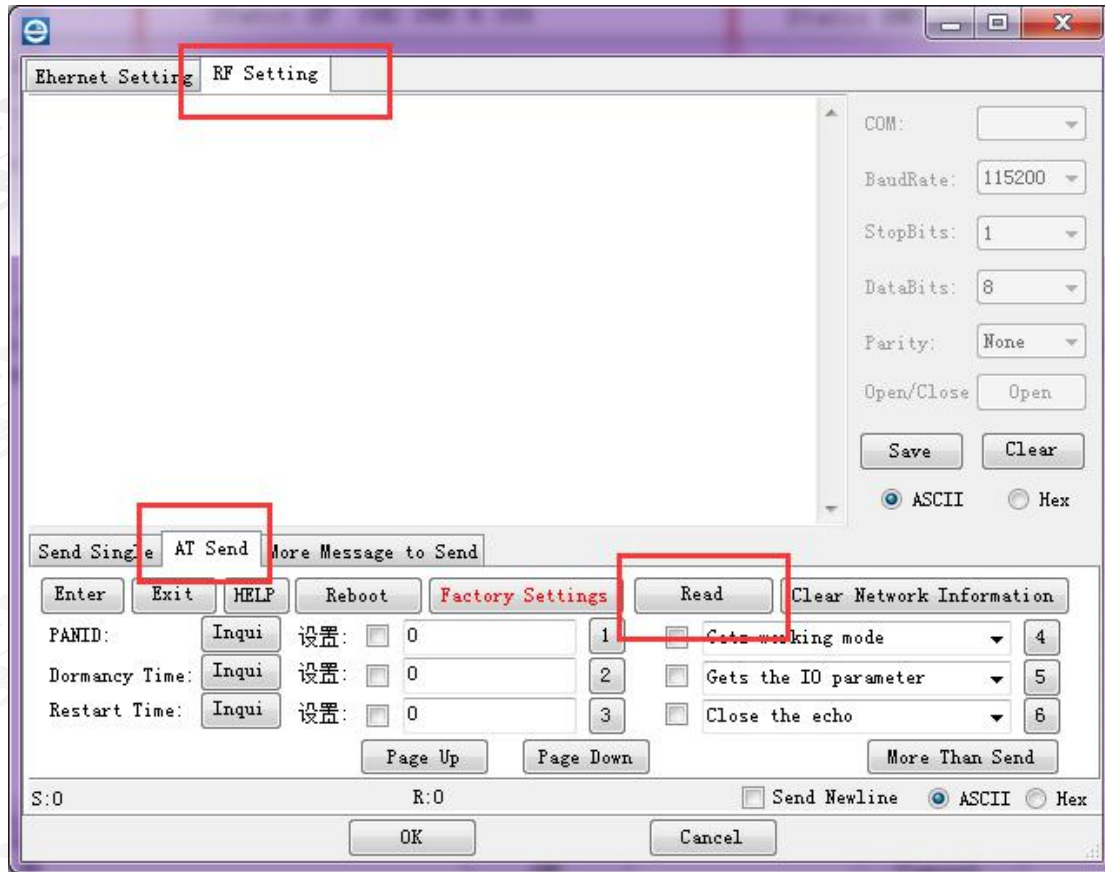
Figure 27 RF Parameter configuration settings

(2) Open two network debugging assistants, set the network debugging assistant protocol type to UDP Client, the network debugging assistant's server IP address is set to the module's IP address, the network debugging assistant's server port is set to the module's local port, 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.
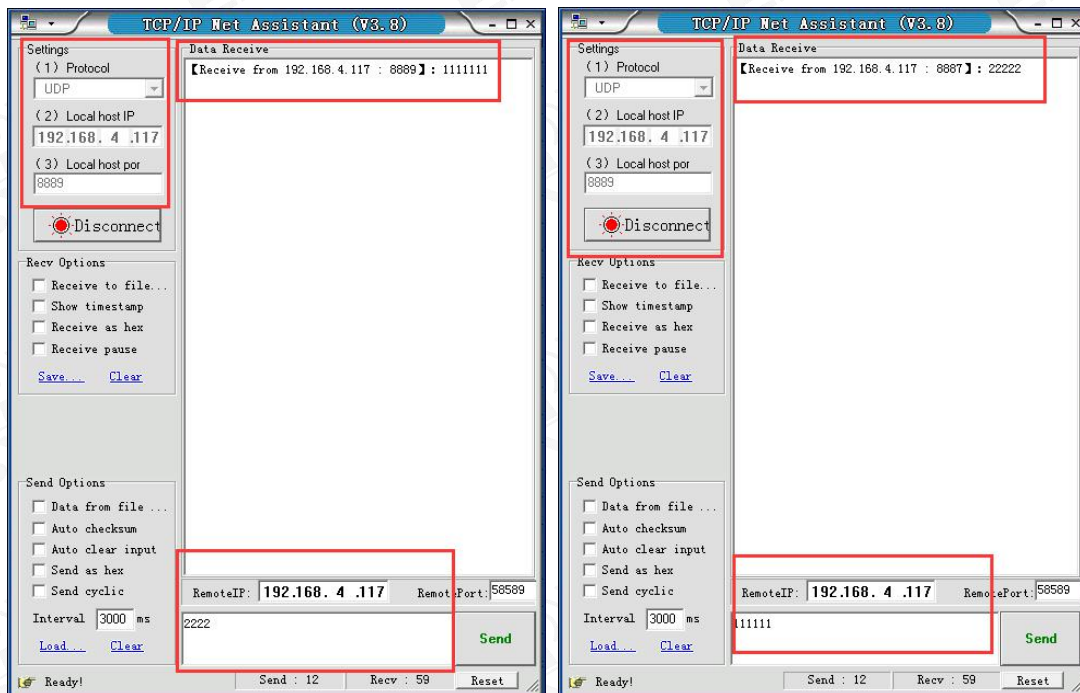

Figure 28 Data transparent transmission

7.3 Special function instructions

7.3.1 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.
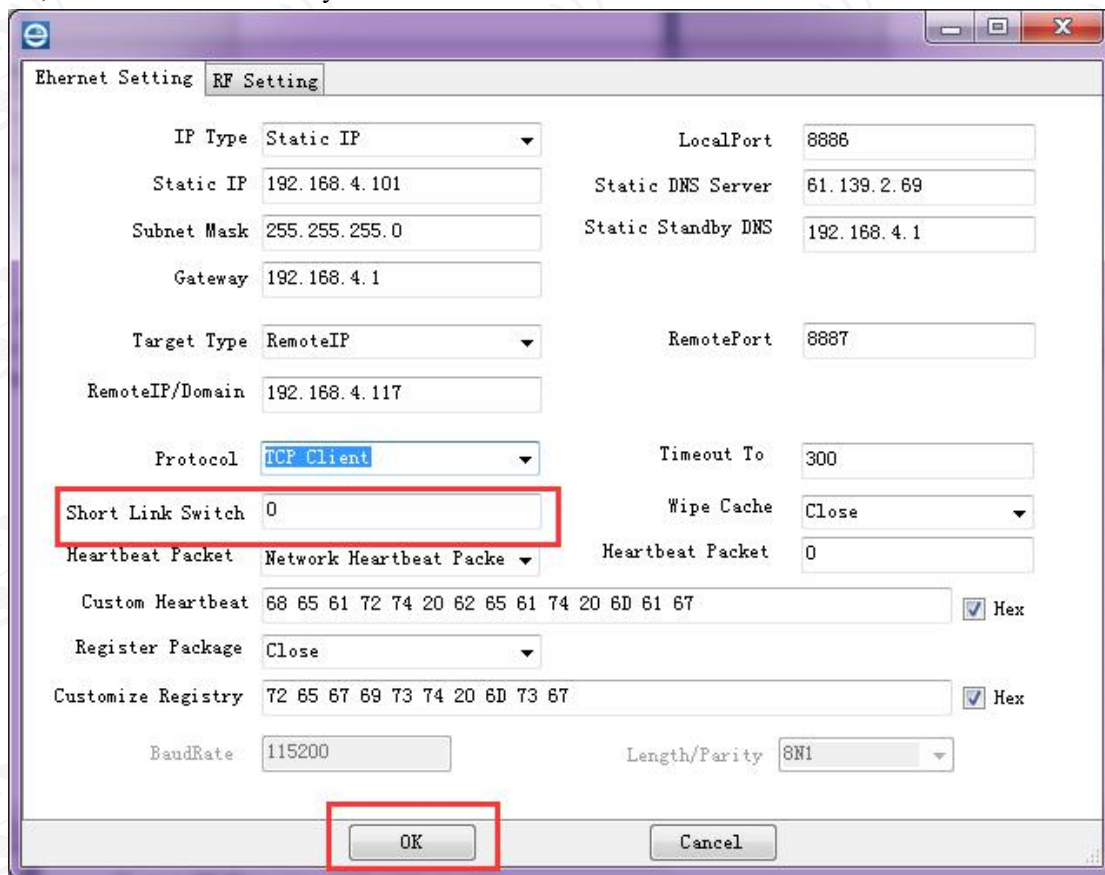

Figure 29 Short connection setting

7.3.2 Registration packet instructions

The E90-DTU 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.
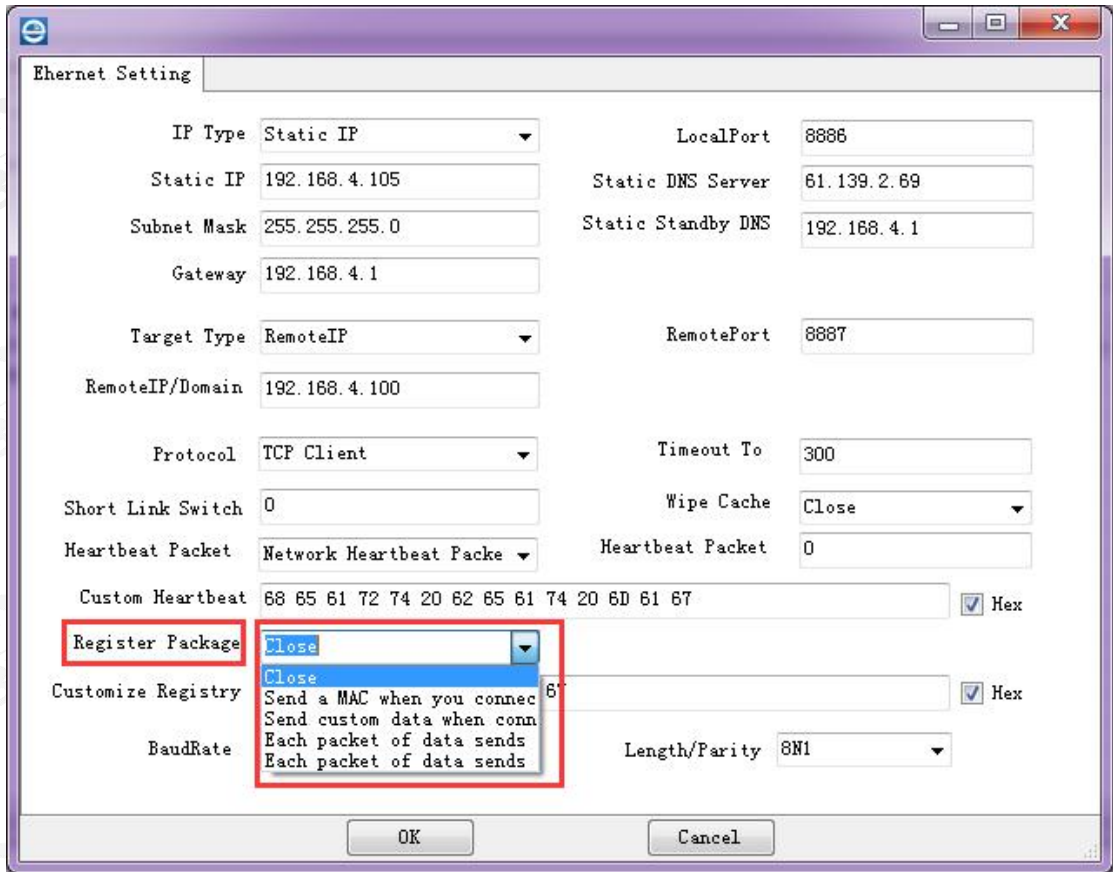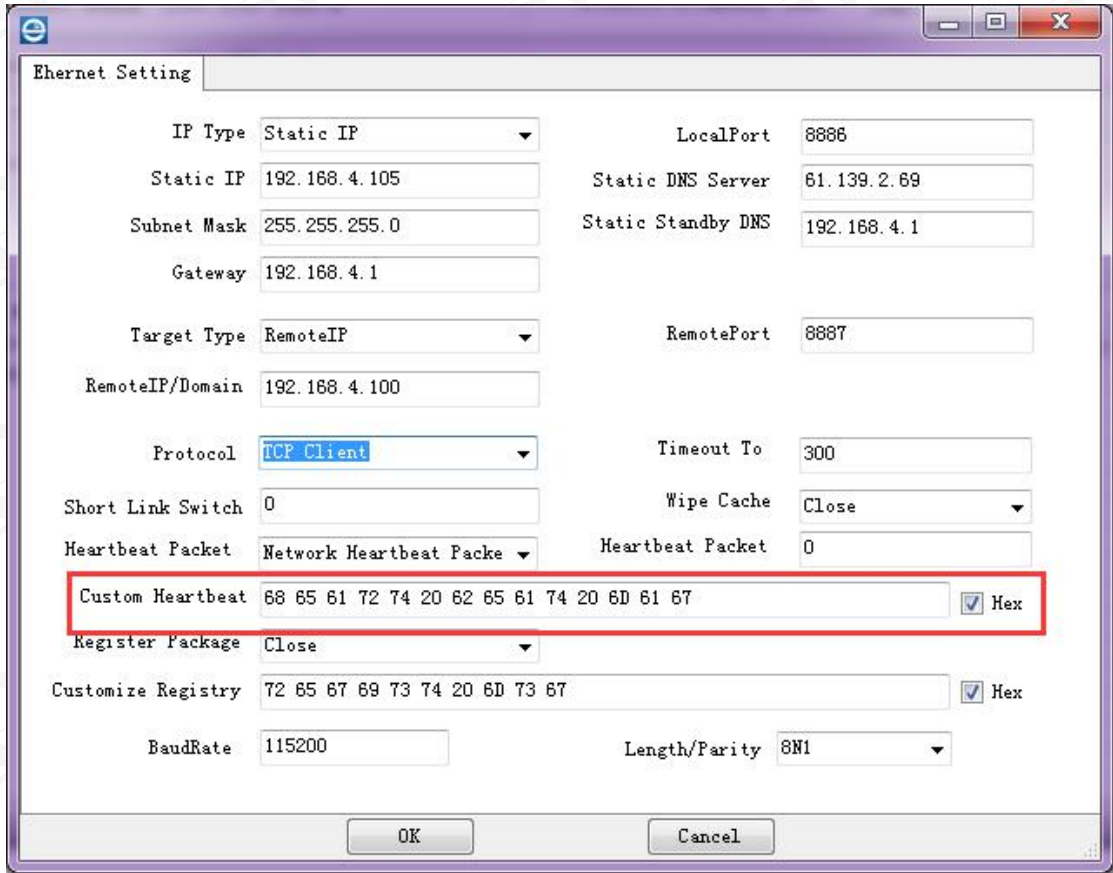
Figure 30 Registration packet setting

Figure 31 User-defined data setting

7.3.3 Heartbeat packet instructions

Heartbeat packets are used to ensure the reliability of the connection. E90-DTU 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.
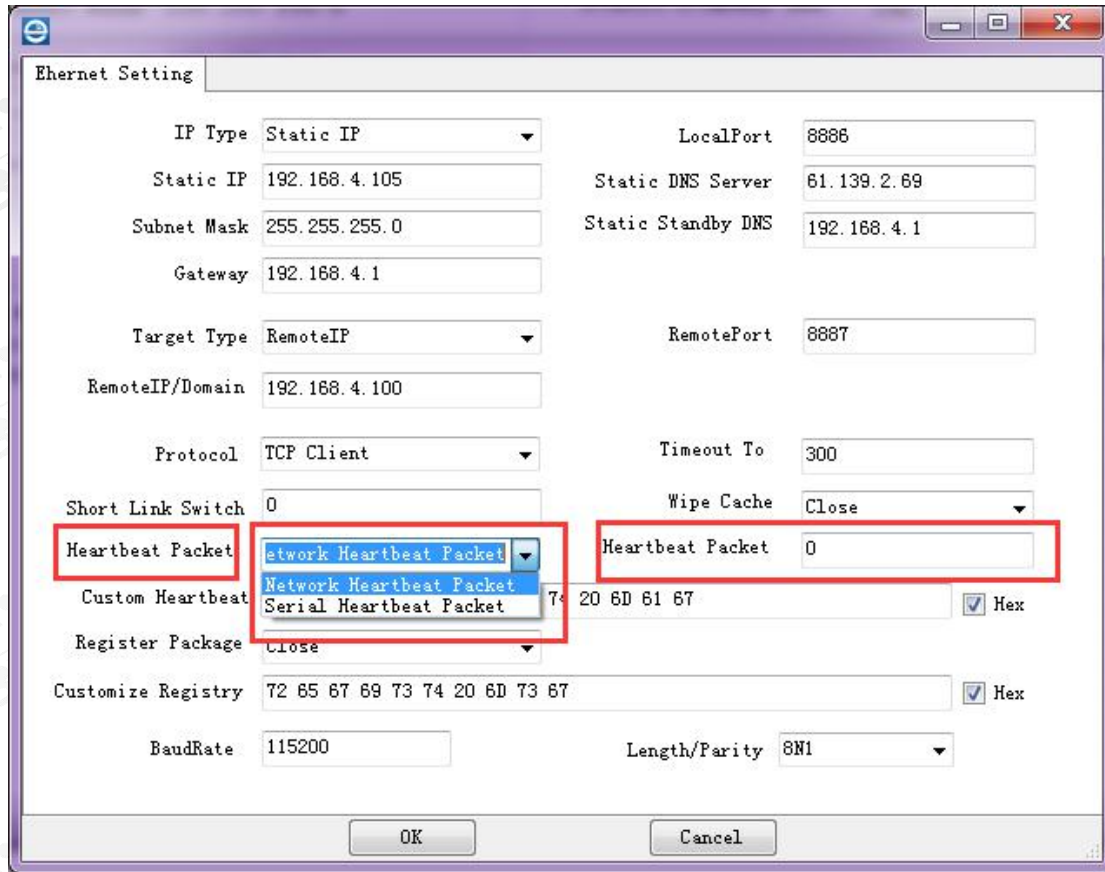
Figure 32 Heartbeat packet setting

7.3.4 Overtime restart instructions

The overtime restart is when the network port has not received data for a long time. After the module exceeds the set time, it restarts automatically to avoid communication abnormalities The restart time can be set to 60~65535S, default 300s.
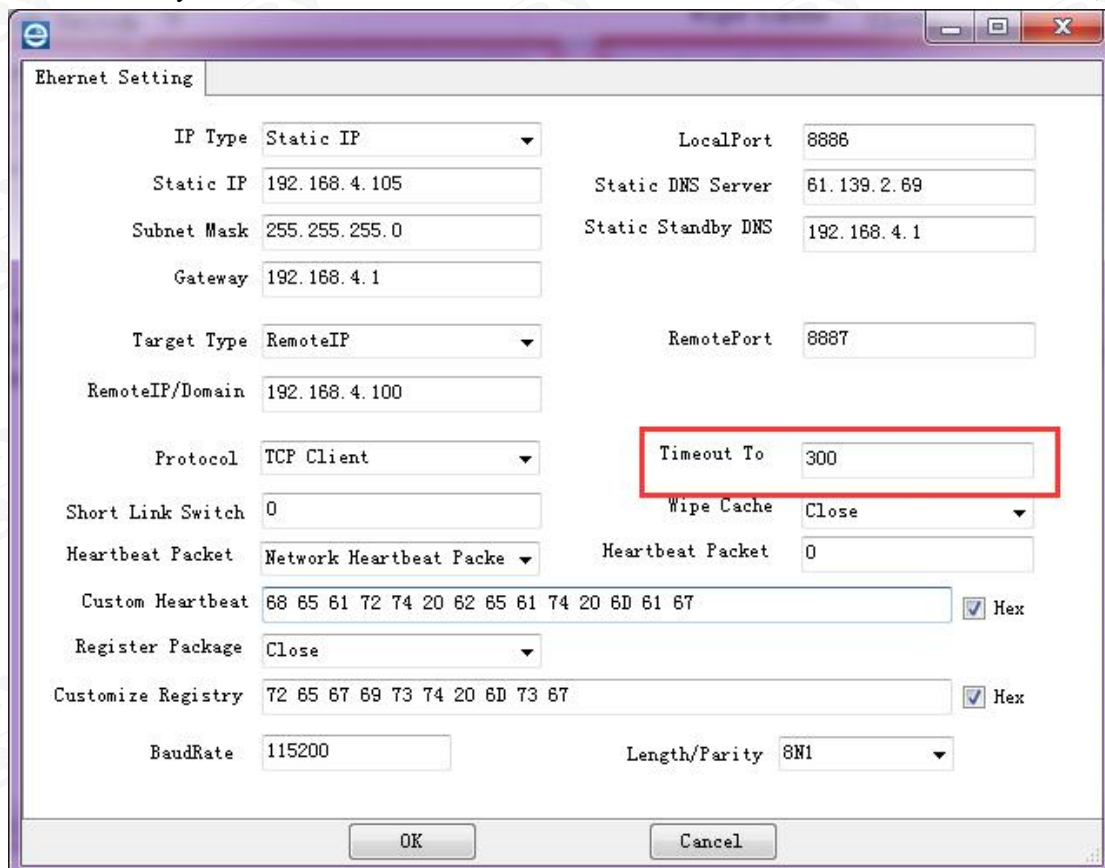
Figure 32 Overtime restart setting

7.3.5 TCP multi-connection instructions

When the module is a TCP Server, up to 6 TCP Clients can be connected. When the 7th Client is connected, the first Client will be disconnected. When the server's radio receives data, it will send data received by the radio to all connected clients over the network.

7.3.6 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.
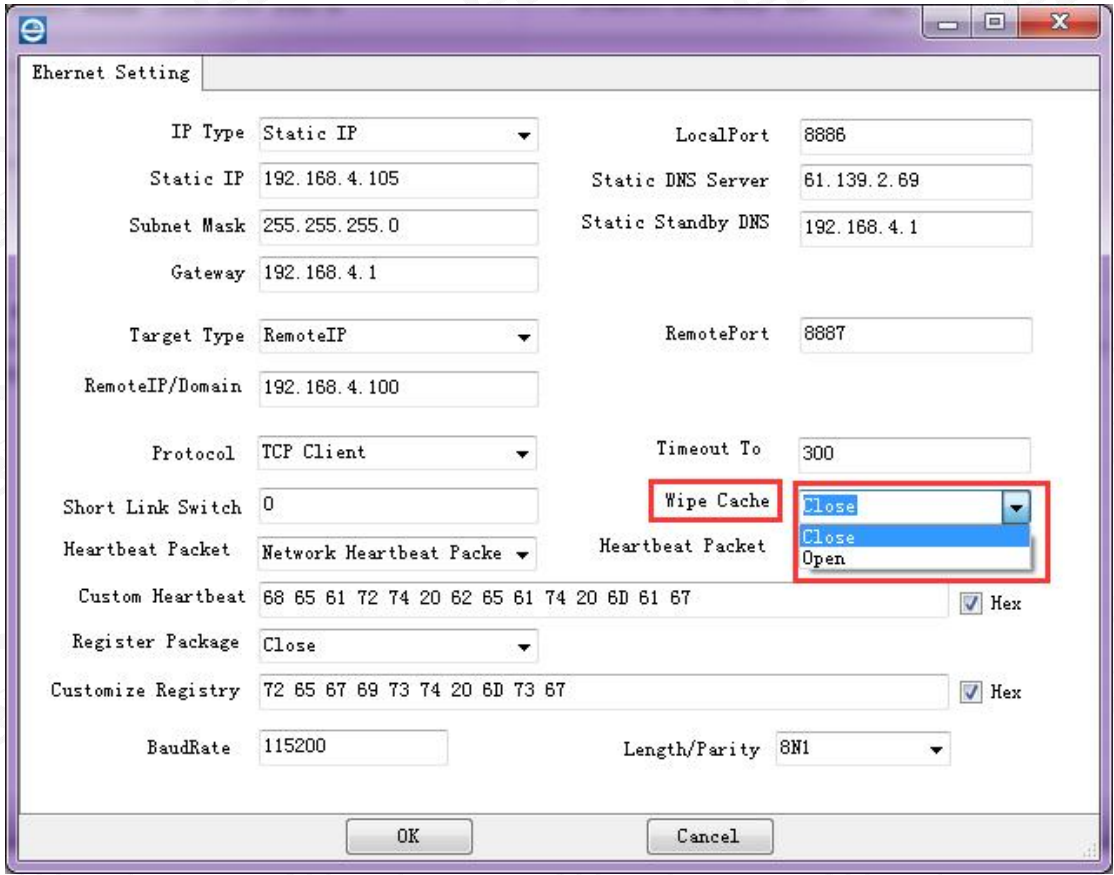

Figure 33 Clearing cache setting

7.4 RF Configuration Instructions

The E90-DTU supports RF configuration, first click the wireless configuration to switch to the RF configuration option, and then click the Read Parameters.
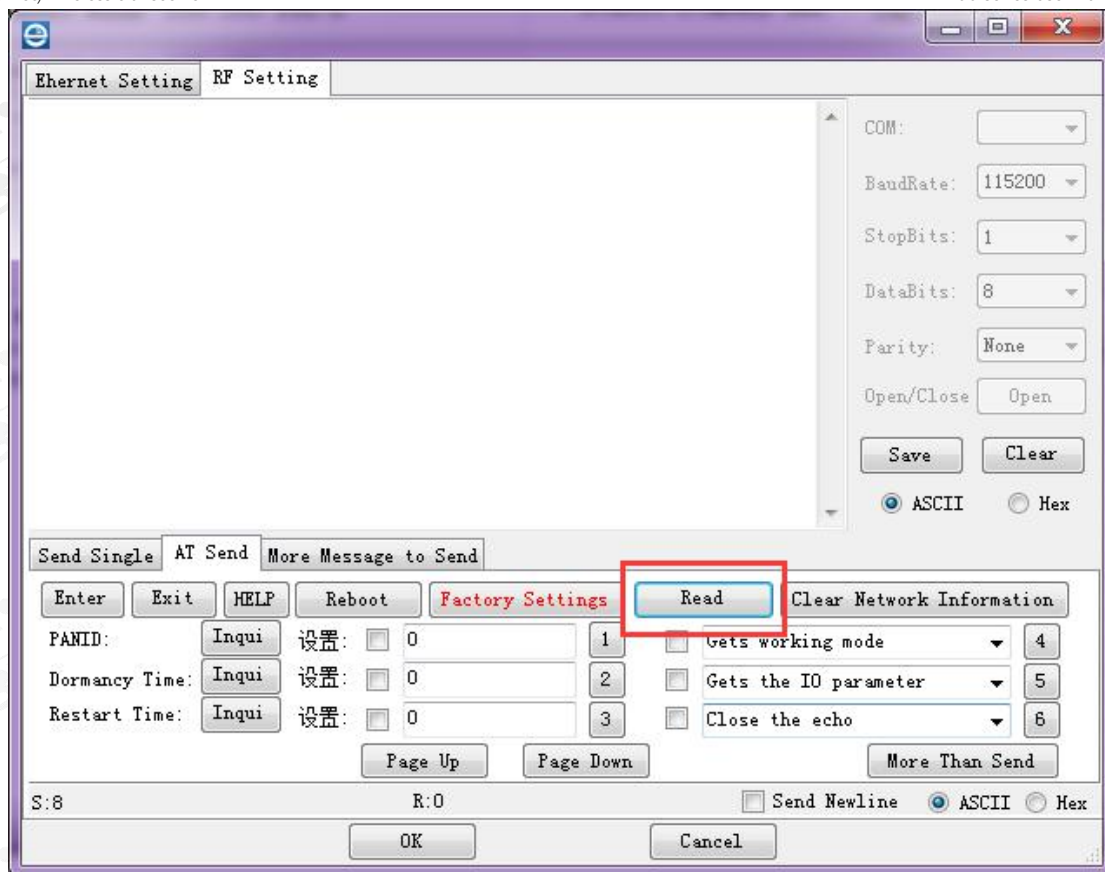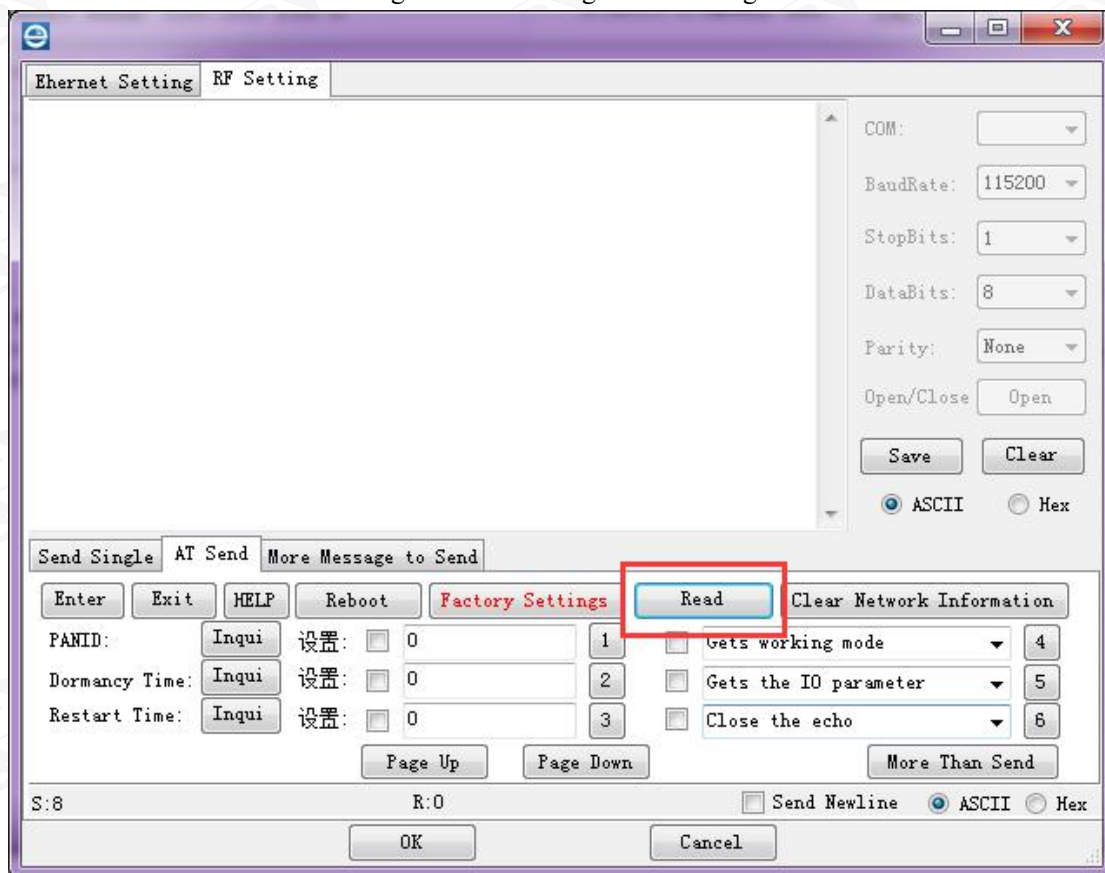
Figure 34 RF configuration setting

Figure 35 RF configuration setting

Please note that the module address is a hexadecimal number. In addition, the operating mode needs to be selected, if not, mode 0 is used by default. Clicking OK will return to the searching interface, and a message indicating "configuration successful" is displayed, if no window pops up, the configuration fails.

7.5 Restore factory setting

E90-DTU side button is the factory restore button. After pressing for 5 to 15 seconds continuously, the network parameters are restored to the factory settings, the RF parameters remain unchanged, and the RF parameters can be reset using the configuration software.
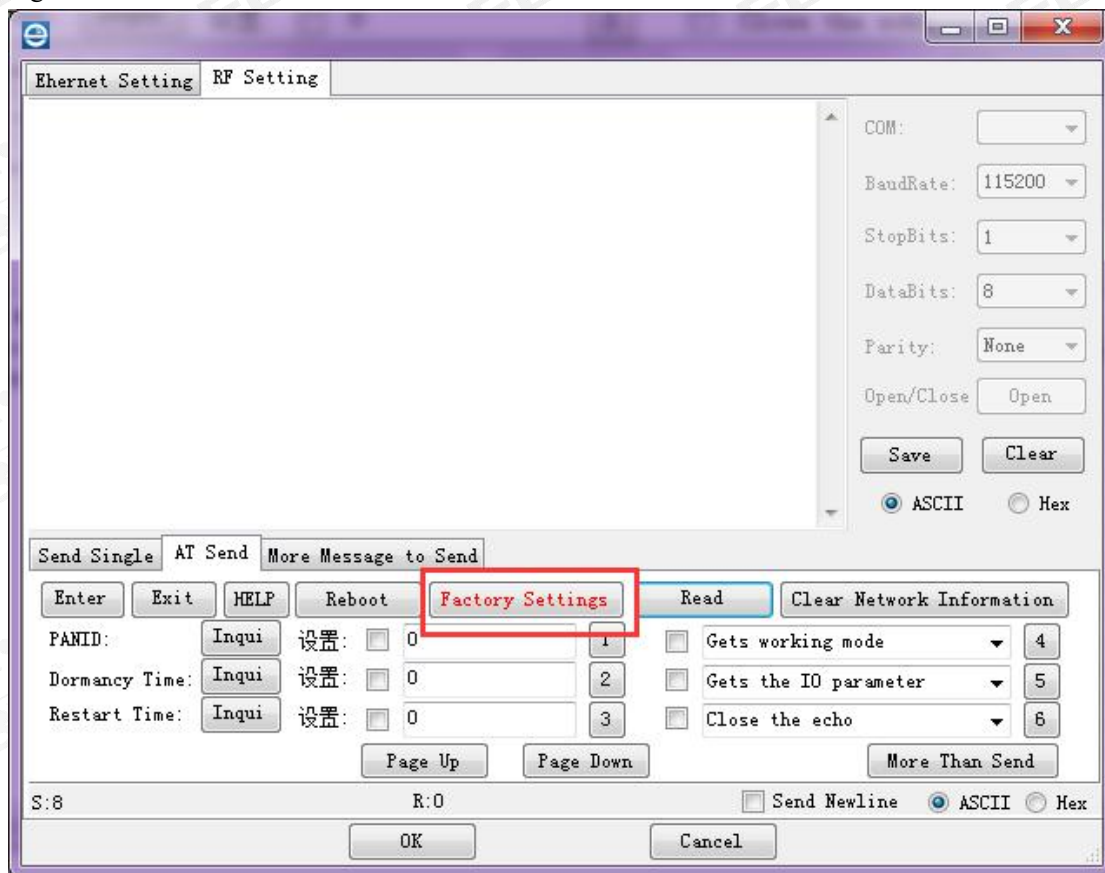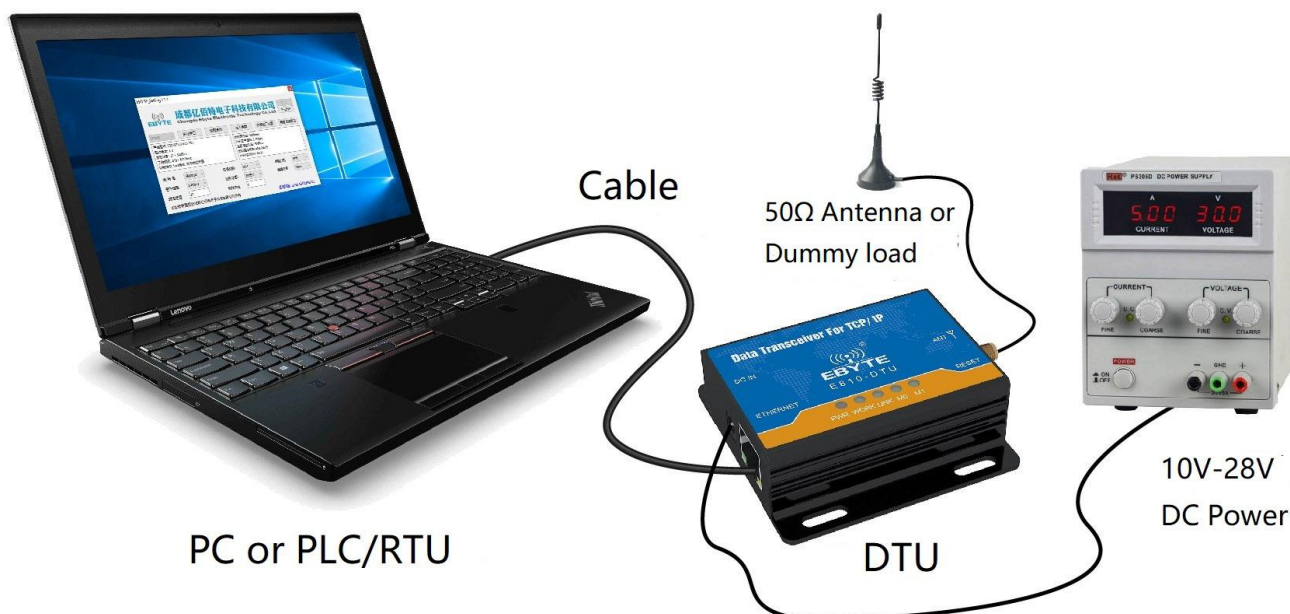

Figure 36 Restore factory setting

8. Connection diagram when programming

| Mode	M0	M1	Description
Sleep Mode	OFF	OFF	The DTU can only be programmed using the configuration software in the current mode
Command mode	OFF	ON	The DTU can only be programmed using the configuration software in the current mode

★   Note: Programming can only be performed in a specific operating mode (see the table above). If the programming fails, please confirm whether the DTU operating mode is correct or not.

9. Connection diagram in test and practical application
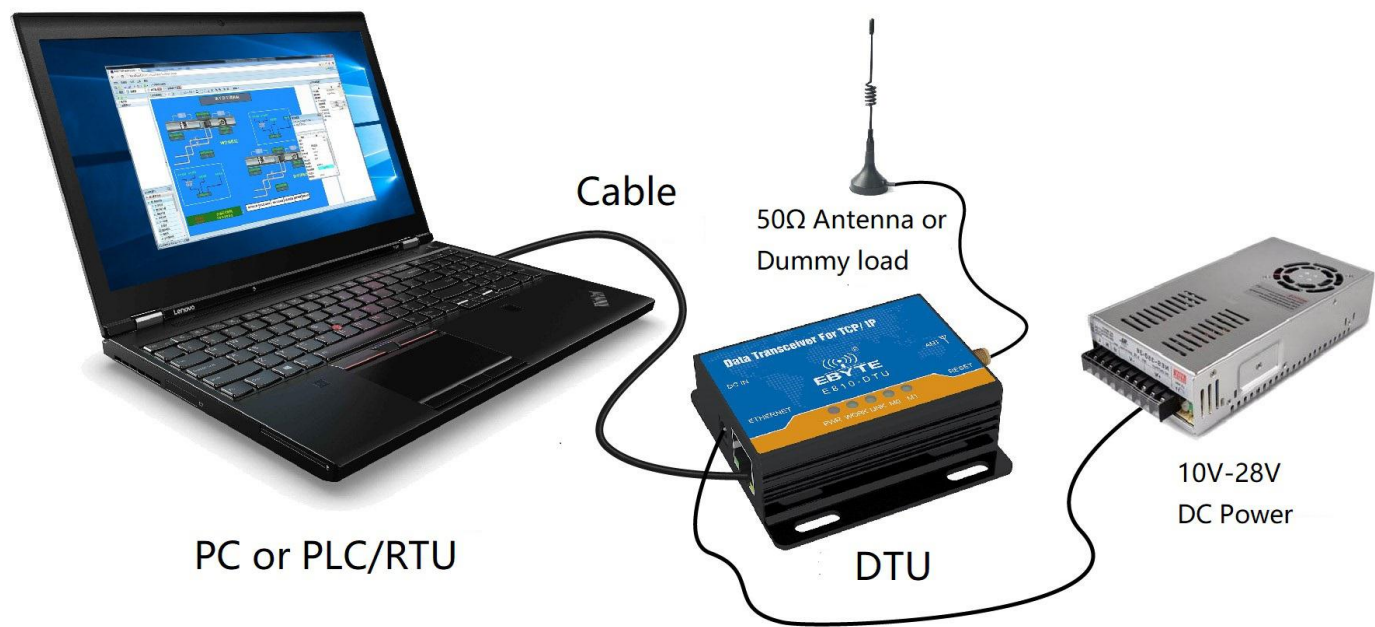
10. Practice application

The data transceiver of CDEBYTE is applied for all kinds of point to point, one point to multiple points wireless data transmission system, such as smart home, Internet of things transformation, power load monitoring, distribution network automation, hydrological and hydrological forecasting, water pipe network monitoring, urban street lamps Monitoring, air defense alarm control, railway signal monitoring, centralized control of railway water supply, oil supply pipe network monitoring, GPS system, remote meter reading, electronic crane, automatic reporting, seismic forecasting, fire prevention, environmental monitoring and other industrial automation system, as shown below:
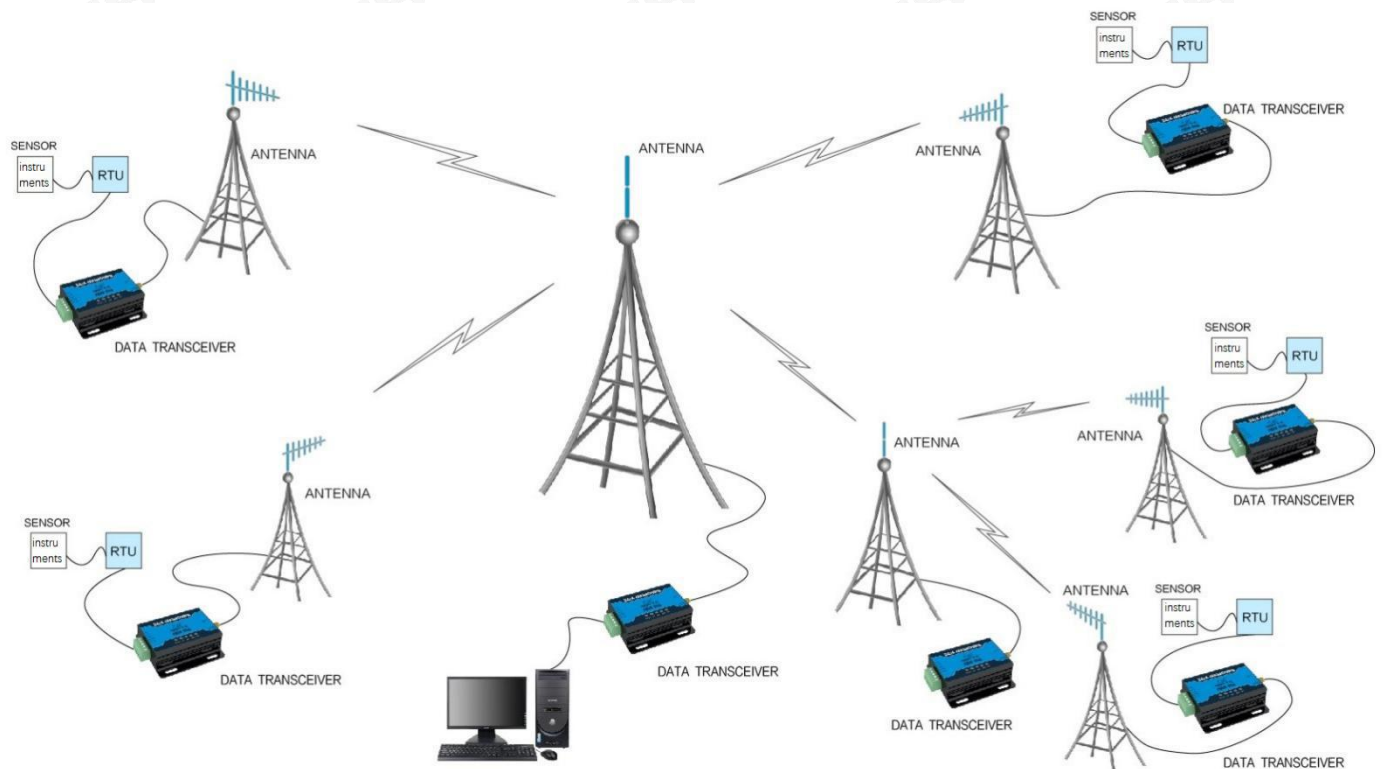
11. Note

1. Please keep the warranty card of the equipment which includes the factory number (and important technical parameters) and is important for user's future maintenance and new equipment.

2. Transceiver during the warranty period, if the quality of the product itself rather than man-made damage or lightning and other natural disasters caused by damage, enjoys free warranty; please do not repair by yourself, the problem and please contact with our company when problem occurring, we offer the first-class after-sales service.

3. Please do not operate the transceiver in some flammable places such as coal mines or near explosive atmospheres (such as detonators).

4. Please use the appropriate DC power supply, high frequency interference ability, small ripple, and enough load capacity are required; it's better to have over current, over voltage protection and lightning protection and other functions to ensure that transceiver working properly.

5. Please do not use it in the working environment beyond the transceiver environmental characteristics, such as high temperature, humidity, low temperature, strong electromagnetic fields or dust larger environment.

6. Please do not continuously keep transceiver to transmit in full capacity, or the transmitter might be damaged.

7. Please connect the ground with the external ground of the power supply (such as PC, PLC, etc.), otherwise it is easy to burn out the communication interface; do not plug the interface with power supplying.

8. When testing, please connect the antenna or 50 Ω load, otherwise transceiver will be damaged easily ;the distance from the antenna is better than 2 meters, so as to avoid harm, please do not touch the antenna when transmitting.

9. Wireless data transceiver has different communication distance in different environments, communication distance is influenced by temperature, humidity, obstacle density, obstacle volume and electromagnetic environment; in order to ensure stable communication, it is recommended to reserve at least 50 % of the communication distance.

10. When communication distance is not perfect, it is recommended to improve the antenna quality and the installation mode of the antenna. You can send mail to support@cdebyte.com for support.

11. When choosing power supply, it is recommended to keep at least 50% current left and the ripple must not exceed 100mV.

12. Important statement

1. CDEBYTE reserves the right of final interpretation and modification of all the contents of this manual.

2. As the hardware and software products continuously improving, this manual may subject to change without notice, please refer to the latest version.

3. Everyone is responsible for protecting the environment: to reduce the use of paper, we only provide electronic documents of the English manual, if necessary, please go to our official website to download; In addition, for special requirements, we agree to offer certain amount of documents according to order quantity, not every data transceiver are supplied with one manual, please understand

Chengdu Ebyte Electronic Technology Co.,Ltd.

Technical support: support@cdebyte.com

Documents and RF Setting download link:：www.ebyte.com

Thank you for using Ebyte products! Please contact us with any questions or suggestions: info@cdebyte.com

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