Chengdu Ebyte Electronic Technology Co.,Ltd

Wireless Modem

User Manual

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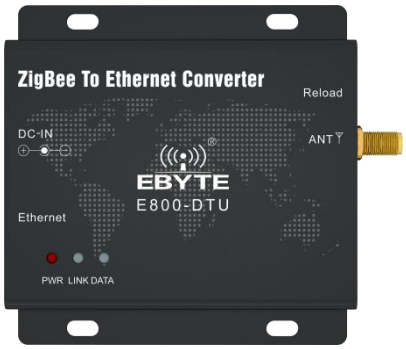
1. Overview

1.1 Brief introduction



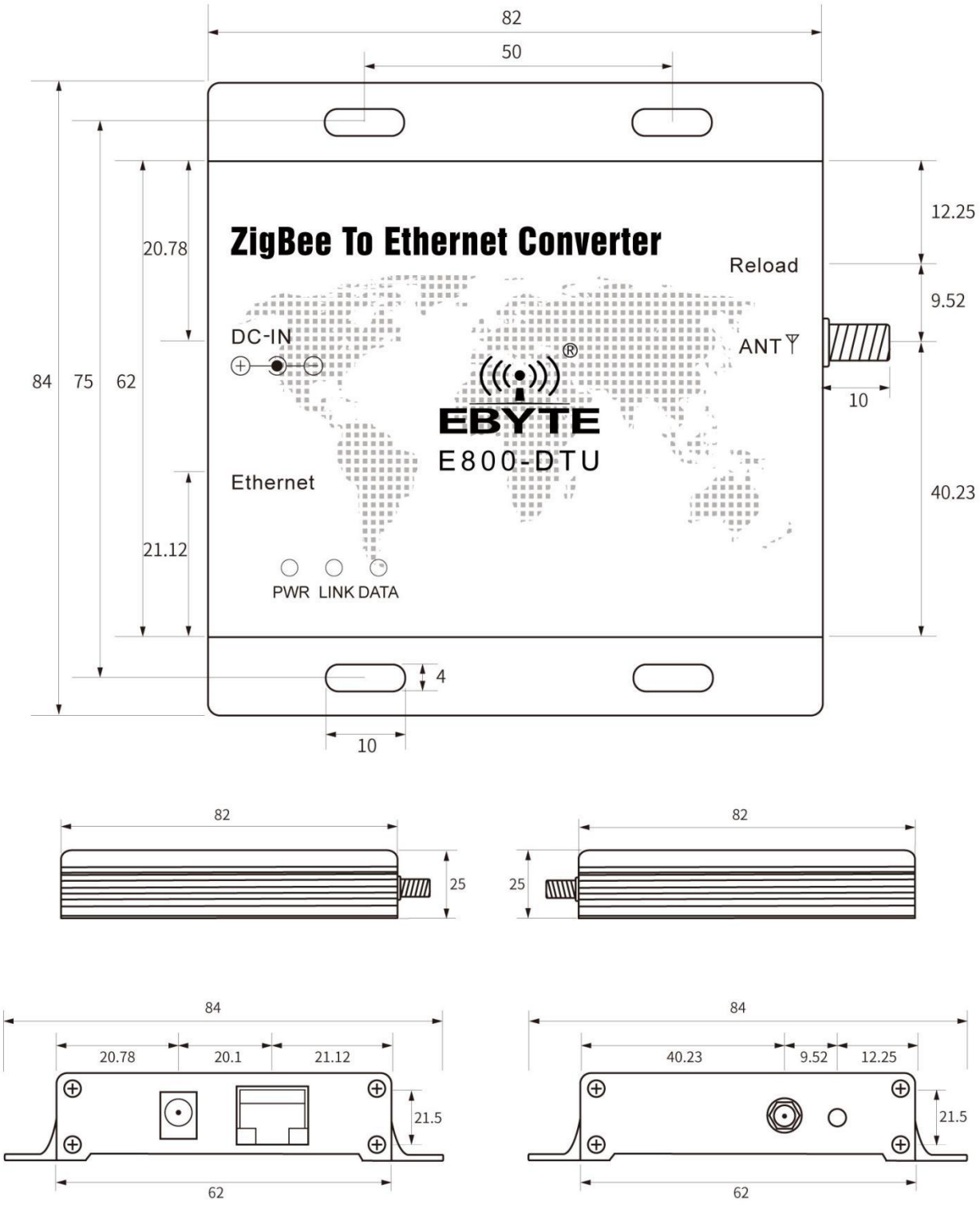
E800-DTU (Z2530-ETH-27) is a high-power ZIGBEE gateway. It has a complete set of supporting ZIGBEE node equipment to solve MESH networking and access Internet applications, and supports adaptive network speeds (up to 100M full duplex), provides TCPServer, TPCClient, UDPServer, UDPClient four working modes, and support two SOCKET working simultaneously. There are three types of logical devices in the ZigBee network: Coordinator (coordinator), Router and End-Device. The ZigBee network consists of a Coordinator, multiple Routers, and multiple End_Devices, and users can configure them via WEB page.

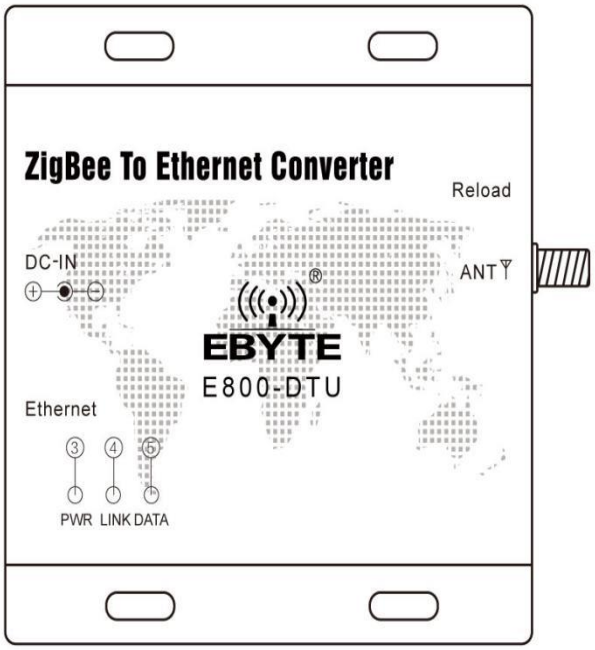
2. Hardware parameter

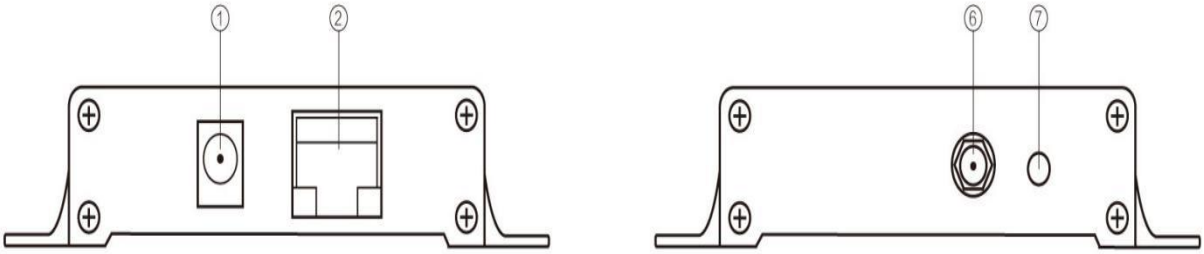
2.1 Main specifications

No.	Parameter	Specification
1	Network port specifications	RJ45，10/100Mbps
2	Network protocol	IP、 TCP/UDP、 ARP、 ICMP、 IPV4
3	Simple transparent transmission	TCP Server、TCP Client、UDP Server、UDP Client、Cloud transparent transmission
4	TCP Server connection	Supports up to 6 TCP connections
5	IP acquisition method	Static IP、 DHCP
6	DNS	Available
7	User configuration	Web page configuration
8	Working current	74mA@12V
9	Supply voltage	8V~28VDC, 28V may burn out, 12V or 24V power supply is recommended
10	Operating temperature	-40 ~ +85℃，industrial grade
11	Operating humidity	10% ~ 90%，relative humidity, non-condensing
12	Size	84mm*82mm*25mm
13	Average weight	126.5g
14	Storage temperature	-40～+125℃，industrial grade

2.2 Size and pin definition







No.	Item	Description
1	DC8~28V	Power interface, default 8-28V (customizable standard 5V version), 12V / 24V recommended
2	ETHERNET	Ethernet interface, standard RJ45 interface, connect with device or PC
3	PWR	Power Indicator
4	LINK	Connection establishment indicator
5	DATA	Serial port transceiver indicator
6	Reload	Restore to factory settings button
7	ANT	SMA antenna interface

3. Function description

3.1 Typical application model

3.2 Basic function

→Ethernet

3.2.1 SOCKET

E800-DTU(Z2530-ETH-27) can establish two-way sockets, Socket A1 and Socket B1. Socket A1 supports all types of TCP Client, TCP Server, UDP Client, and UDP Server. Socket B1 supports only three types: TCP Client, UDP Client, and UDP Server.

Two sockets run simultaneously can be connected to different networks at the same time for data transmission.

3.2.2 TCP Client

(1) TCP Client provides client connection for TCP network services. Actively initiate a connection request to the server and establish a connection, which is used to implement the interaction between wireless data and server data. According to the relevant provisions of the TCP protocol, TCP Client is distinguished from connected and disconnected, thereby ensuring reliable exchange of data. It is usually used for data interaction between the device and the server, and is the most commonly used network communication method.

(2) When E800-DTU(Z2530-ETH-27) attempts to connect to the server in TCP Client mode and the local port is 0, the connection is initiated through a random port each time.

(3)E800-DTU(Z2530-ETH-27) supports short connection function.

(4) Under the same LAN, if E800-DTU(Z2530-ETH-27) is set to a static IP, please keep the IP of E800-DTU(Z2530-

ETH-27) and the gateway on the same network segment, and set the gateway IP correctly, otherwise normal communication cannot be achieved.

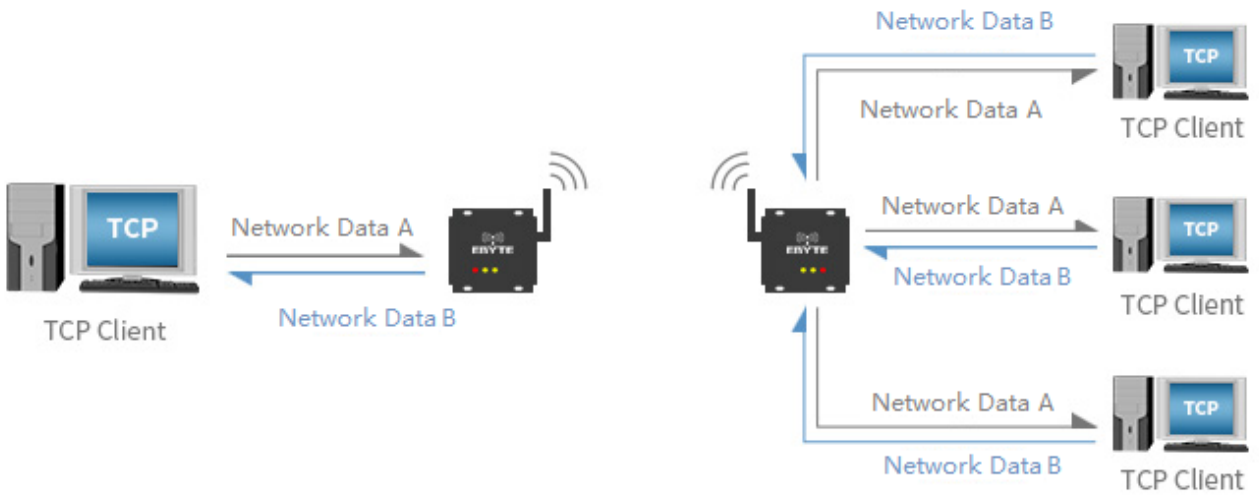
3.2.3 TCP Server

(1) In TCP Server mode, E800-DTU(Z2530-ETH-27) monitors the local port. When a connection request is sent, it accepts and establishes a connection for data communication. When E800-DTU(Z2530-ETH-27) receives the data, it will simultaneously send the data to all client devices that have established a connection with it.

(2) It is usually used for communication with TCP clients in a LAN, which is suitable for the scenario where there is no server in the LAN but multiple computers or mobile phones requesting data from the server. Like TCP Client, there are differences between connection and disconnection to ensure reliable exchange of data.

(3) When E800-DTU(Z2530-ETH-27) is used as TCP Server, it can accept a maximum of 6 Client connections (the number of connections can be customized). The local port number is a fixed value and cannot be set to 0.

(4) TCP Server can set the maximum number of connections. When the maximum number of connections is reached, users can choose to kick off the old connection or prohibit the establishment of new connections according to the configuration through commands.

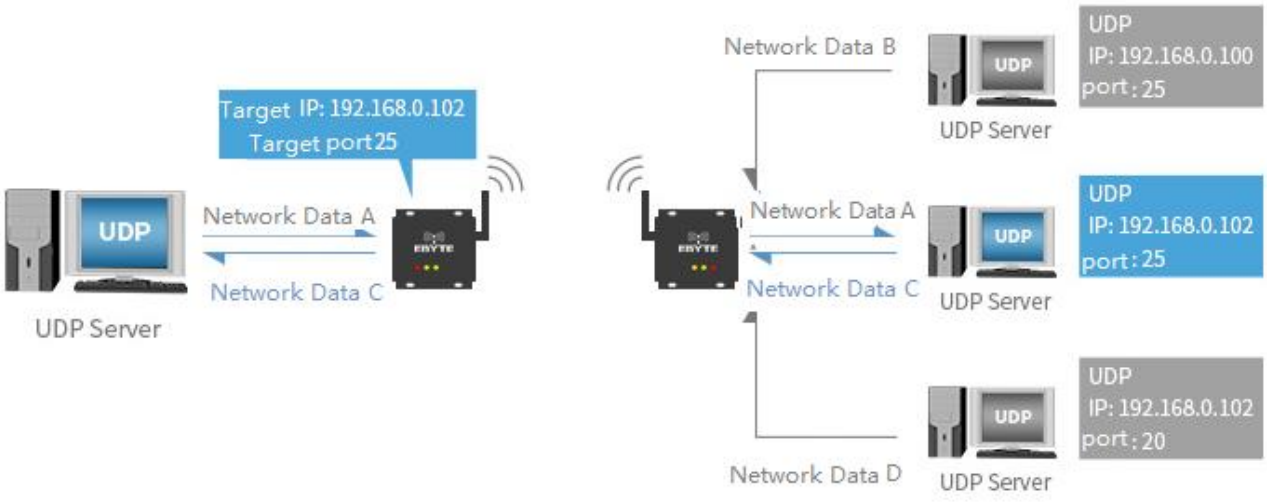


3.2.4 UDP Client

(1) UDP Client is a disconnected transmission protocol that provides transaction-oriented simple and unreliable information transmission services. There is no connection establishment and disconnection, only the IP and port are required to send data to each other. Usually used for data transmission scenarios where there is no requirement for packet loss rate, data packets are small and transmission frequency is fast and data is to be transmitted to the specified IP.

(2) In UDP Client mode, E800-DTU(Z2530-ETH-27) only communicates with the target port of the target IP. If the data is not from this channel, it will not be received by E800-DTU(Z2530-ETH-27).

(3) In UDP Client mode, if the destination address is set to 255.255.255.255, it can achieve the effect of UDP broadcast on the entire network segment, and it can also receive broadcast data. E800-DTU(Z2530-ETH-27) module supports broadcasting within the network segment , such as xxx.xxx.xxx.255 broadcast mode.

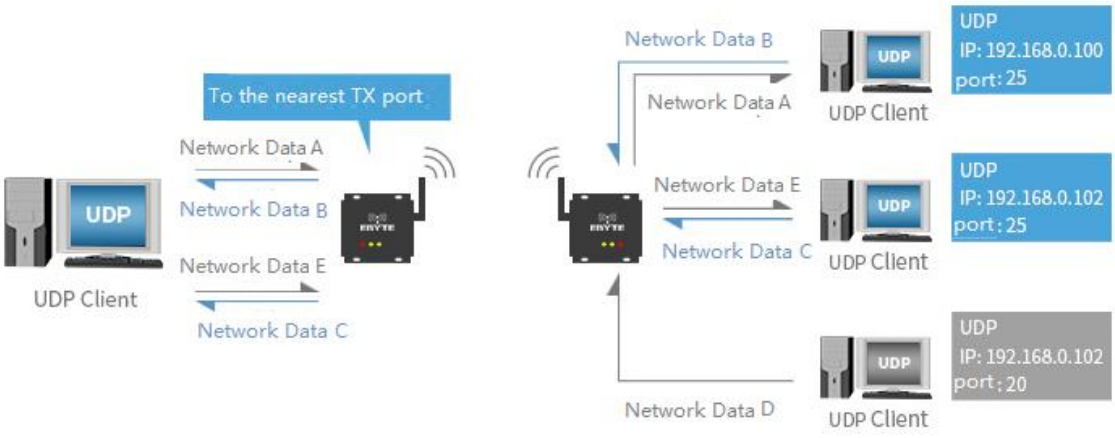


3.2.5 UDP Server

(1) UDP Server means that the source IP address is not verified on the basis of ordinary UDP. After receiving a UDP data packet, the destination IP is changed to the data source IP and port number. When sending data, send to the IP and port number of the most recent communication.

(2) This mode is usually used for data transmission scenarios where multiple network devices need to communicate with the module and do not want to use TCP due to the fast frequency.

Note: UDP Server cannot send data actively. Only after receiving the data can it send data to the IP and port that have recently exchanged data.



→Wireless

ZigBee Features

No.	Feature	Description
1	Role switch	Users can switch the device between the three types of coordinator, router and terminal through the WEB page.
2	Automatic networking	Support automatic networking when power on. The coordinator automatically sets up the network when it is powered on, and the terminal and router automatically search for and join the network.
3	Network self-healing function	Lost network auto-reconnect function. The intermediate nodes of the network are lost, and other networks automatically join or maintain the original network. (Isolated nodes automatically join the original network, and non-isolated nodes maintain the original network.) The coordinator is lost and there are non-isolated nodes in the original network. The coordinator can join the network again or the coordinator of the original network PAN_ID set by the same user can join the original network.
4	Data retention time setting	When the device is in the coordinator and router state, users can set the data saving time by himself and use it with the terminal in the sleep mode to save the data of the terminal device and send the data to the terminal after the terminal wakes up from sleep. Save up to 3 pieces of data, if exceeding, automatically clear the first data! After setting the data saving time, the data heap is automatically emptied.
5	Automatic retransmission function	In unicast mode, the device automatically retransmit when it fails to send to the next node. Each message is retransmitted three times.
6	Automatic routing	Support network routing function. Routers and coordinators carry network data routing function, and users can perform multi-hop networking.
7	Support encryption protocol	Adopt AES 128-bit encryption function, it can change the network encryption and anti-monitoring. Users can change the network key by themselves. Only devices with the same network key can communicate normally.
8	Multi-type data communication	Support network-wide broadcast, multicast, and unicast functions. Support several transmission modes in broadcast and unicast modes.
9	Multiple working mode selection	Support transparent transmission mode, semi-transparent transmission mode, and protocol mode, users can switch according to their needs.
10	Channel change	Support 16 channels (2405 ~ 2480MHZ) on WEB page 11 ~ 26, different channels correspond to different frequency bands.
11	Network PAN_ID change	Any switch of the network PAN_ID, users can customize the PAN_ID to join the corresponding network or automatically select the PAN_ID to join the network.
12	MAC address and short address view	WEB page to visually check MAC address (unique, fixed) and short address

3.2.6 Operating mode

Mode	Node	Description	Data communication display mode

Mode 1（Transparent transmission）	Coordinator	This type of node is in transparent transmission mode, and serial data is transparently transmitted to End-Device in the network through broadcast.	The data carrying format can be configured through commands: 1. Display sender mac address 2. Display sender short address 3 .Display the RSSI value of the shortest path of the message (You can configure the display mode to not carry display and any one or more display modes)
	Router	This type of node is in transparent transmission mode, and serial data is transparently transmitted to the coordinator through unicast. (Note: The terminal cannot receive the transparent transmission data of mode 1 in the sleep mode)	
	terminal		
Mode 2（Semi-transparent transmission）	Coordinator	The module transmits in full protocol according to the fixed format of data transmission. It can perform unicast, broadcast, and multicast communication. (Please refer to "HEX Data Communication Instructions" for details).	
	Router	This type of node is in transparent transmission mode, and serial data is transparently transmitted to the coordinator through unicast.	
	terminal		
Mode 3（Protocol mode ）	Coordinator	The module transmits in full protocol according to the fixed format of data transmission. It can perform unicast, broadcast, and multicast communication. (Please refer to "HEX Data Communication Instructions" for details).	No
	Router		
	terminal		

3.2.7 Introduction to Protocol mode communication

No.	Mode	Description
1	Broadcast	In the case of joining the network, users can perform network-wide broadcast according to instructions (divided into three broadcast modes) 1.Broadcast mode 1—This message is broadcast to all devices in the entire network. 2.Broadcast mode 2—This message is broadcast to devices that receiving (except sleep mode) is turned on. 3. Broadcast Mode 3—This message is broadcast to all fully functional devices (routers and coordinators)
2	Multicast	In the case of joining the network, users can multicast non-dormant devices on the entire network.
3	Unicast	In the case of joining the network, users can individually communicate with devices on the network in a short address according to instructions(divided into three broadcast modes) 1. Transparent transmission mode— (no carrying information) 2. Short address mode— (carrying information is short address) MAC address mode— (carrying information is MAC address

3.2.8 HEX Data communication instructions

Command format description

Command（COM）1Byte	Data length（LEN）1Byte	Data content（DATA）

FC	LEN	DATA

Parameter description

DATA parameter description：

（1）Broadcast data（data is the content to be sent ）

Command：01+type+data

Parameter description：type

01： Broadcast mode 1-The message is broadcast to all devices in the entire network

02：Broadcast mode 2-This message is only broadcast to devices that receiving (except sleep mode) is turned on

03：Broadcast mode 3-The message is broadcast to all full-function devices (routers and coordinators)

Example：FC 05 01 02 AA BB CC

Example description: Send HEX data to network broadcast in broadcast mode 2: 0xAA 0xBB 0xCC

（2）Multicast data（data is the content to be sent）

Command：02+ group+data

Parameter description：group

0~99：Multicast number of multicast messages

Example：FC 05 02 01 AA BB CC

Example description: Send HEX data to network group number 1: 0xAA 0xBB 0xCC

（3）Unicast data（data is the content to be sent）

Command：03+ type +addr+data

Parameter description： type （Coordinator in mode 2. This parameter is invalid and can be set to any value）

01：Transparent transmission mode (without carrying information)

02：Short address mode (carrying information is short address)

03：MAC address mode (carrying information is MAC address)

Parameter description：addr：Network short address Effective unicast address 0x0000—0xFFF8)

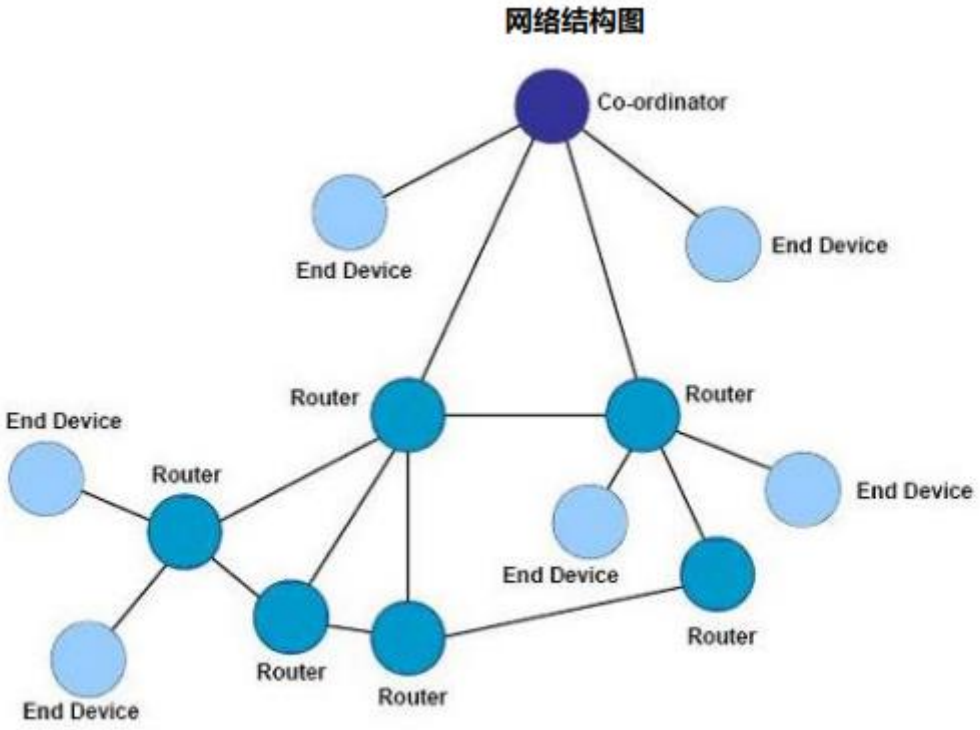
Example：FC 07 03 01 AB CD AA BB CC

Parameter description：Unicast HEX data to the device with network address 0xABCD by carrying short address: 0xAA 0xBB 0xCC

3.2.9 Network structure

E800-DTU (Z2530-ETH-27) network structure is mesh network structure (MESH)

MESH network topology has powerful functions. The network can communicate in a "multi-level hopping" manner; the topology can also form extremely complex networks; the network also has self-organizing and self-healing functions.



3.2.10 ZigBee network role and notes

No.	Description
1	E800-DTU (Z2530-ETH-27) adopts ZigBee network networking. The network consists of a coordinator plus any other devices (routers and terminals)
2	With self-organizing, self-routing, and network multi-hopping functions. (Support network depth: 5, child nodes: 20, child routing nodes: 6 by default)
3	The parent node device (coordinator and router) can save data for the Sleep- End-Device, and the save time can be set by the user (default 30 seconds, range 0 ~ 120 seconds).
4	Only the End device has sleep function, which is within 250 during sleep and can be set by the user. The default is 0 (sleep

	mode is off). Note: It is recommended that the sleep time must be shorter than the data retention time of the parent node, otherwise it will affect data reception
5	Short address communication is used for network communication. Note: The short address is randomly assigned when the device joins the network. The long address of the device MacAddress is the only fixed one. Check the short address of the network on the WEB page and then perform point-to-point communication.
6	The coordinator is unique in the network and the short address is fixed at 0000.
7	If the unicast address is FFFF, FFFD, FFFC, they correspond to three broadcast modes respectively.
8	It is automatically assigned when the network parameter PANID is FFFF. If the device PANID is different, it cannot be networked.
9	The network key cannot join the network at the same time. E800-DTU (Z2530-ETH-27) network key is all on, and users cannot capture the correct air data through software capture.
10	All devices in the network have the broadcast function enabled. Multiple devices broadcasting at the same time or a single device with a higher frequency of broadcasting may cause serious network congestion. Please try to avoid this situation.
11	E800-DTU (Z2530-ETH-27) does not need to join this group when multicast. It can directly multicast to any group according to the communication usage method. After multicast, the local group number does not change due to different multicast numbers。
12	In the sleep state, the first frame of data is invalid for wake-up.
13	For communication in the ZigBee network, the single packet data sending cycle cannot be too fast (generally recommended above 1 second). Too fast may cause data loss. (Note: there are too many nodes in the network, and the broadcast cycle is too fast may cause network instability.)
14	Device communication single packet maximum allowed byte: 70Byte. If it exceeds 70Bytes, data communication may fail.

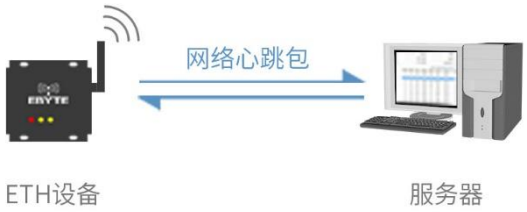
3.3 Special functions

3.3.1 web page configuration

DTU can be accessed through browser to configure web page. When web page is accessed, the access end and the module need to be on the same LAN. After entering 192.168.4.101, user name and password, enter the web configuration page.

3.3.2 Heartbeat packet

In the network transparent transmission mode, users can choose to let the E800-DTU(Z2530-ETH-27) send heartbeat packets. Heartbeat packets can be sent to the web server. The main purpose of sending to the network is to maintain a connection with the server. It only takes effect in TCP Client and UDP Client modes. E800-DTU(Z2530-ETH-27) module supports up to 40 bytes of custom heartbeat packet content.



3.3.3 Registration packet

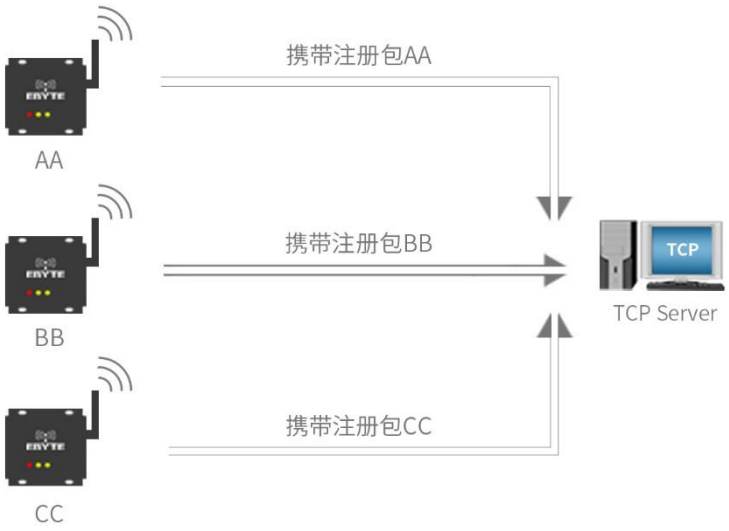
In the network transparent transmission mode, users can choose to let the DTU send a registration packet to the server. The registration package is to enable the server to identify the data source device or as a password to obtain server function authorization. It can be sent when the DTU establishes a connection with the server, or the registration packet data can be spelled into the front end of each data packet as a data packet. The data of the registration packet can be MAC address or custom registration data, of which the content of the custom registration packet setting is up to 40 bytes.

Establishing connection and sending registration packet are mainly used to connect to a server that needs to be

registered.

Data carry registration packet: Sending data to access the registration packet at the forefront of the data, which is mainly used for protocol transmission.

Registration packet mechanism is only applicable to TCP Client and UDP Client. It is invalid under TCP Server and UDP Server.



3.3.4 Transparent transmission cloud

Transparent transmission cloud function mainly solves the open platform of data interaction between device and device, device and host computer, device and server platform. Users can enable the transparent transmission cloud function according to the command, and register the device and perform data interaction according to the relevant usage of Ebyte cloud platform. Please refer to“Ebyte Cloud Platform Transparent Transmission Guide”for more details.

3.3.5 Short connection

The use of TCP short connection is mainly to save server resources and is generally applied in multi-point-to-point scenarios. The use of short connection can ensure that all existing connections are useful and do not require additional control measures to filter.

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

3.3.6 KeepAlive

Keep-Alive is a mechanism for detecting dead connections in TCP connections. When there is no data sent by users , TCP link will periodically send "Keep-Alive" information to maintain the idle link, avoiding dead connections consuming unnecessary system resources. This setting is valid under TCP. Users can customize the Keep-Alive switch and other parameters.

Keepalive parameters:

Time: Start probe message after how many seconds the TCP link has no data message transmitted ;

Intv: **I**nterval between the previous probe message and the next probe message;

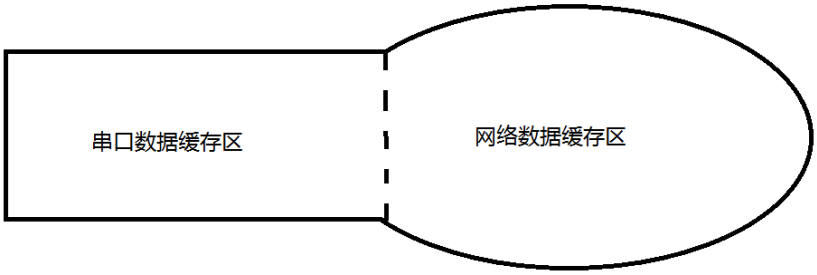
Probes: Maximum number of probe failures. When the number of sniffing failures reaches this number, TCP connection will be disconnected.

3.3.7 Timeout restart

Timeout restart (no data restart) function is mainly used to ensure the long-term stable operation of E800-DTU(Z2530-ETH-27). When the network port cannot receive data for a long time or the network has not received data for a long time, E800-DTU(Z2530-ETH-27) will restart after exceeding the set time so as to avoid abnormal conditions affecting communication. The timeout restart can be set via the web page. The normal working time of this function is set to 60 ~ 65535S, and the default value is 3600S. 0 is off,and it returns to the default value when the setting exceeds the range.

3.3.8 Clear cache

When TCP connection is not established, the data received by DTU will be placed in the cache area. E800-DTU(Z2530-ETH-27) receiving cache is 2Kbyte. After TCP connection is established, the network cache data can be set to be cleared or not according to customer needs.

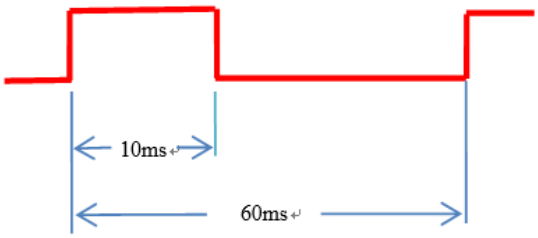


The device has two cache areas, the serial data cache area and the network data cache area. When SOCKET clear cache function is enabled, only the cache data of the relevant SOCKET link will be cleared and the serial port cache data will not be cleared.

3.3.9 Link/Data receiving and sending command

Link indicates network connection state. In TCP mode, Link is off when the network is not connected. When the connection is established, Link is always on. The Link indicator is always on in UDP mode.

The other one is a data transmission indication, which shows the transmission state of DTU. When there is no data transmission on DTU, the data transmission indicator is off. When there is data transmission on DTU, the flashing indicates that its period is 60ms and the indicator is on for 10ms.



3.3.10 Restore factory setting

DTU restore factory setting has two ways: software restore the factory settings and press the button to restore the factory settings.

4. Quick start

4.1 Default parameter

IP acquisition type	STATIC
IP Address	192.168.4.101

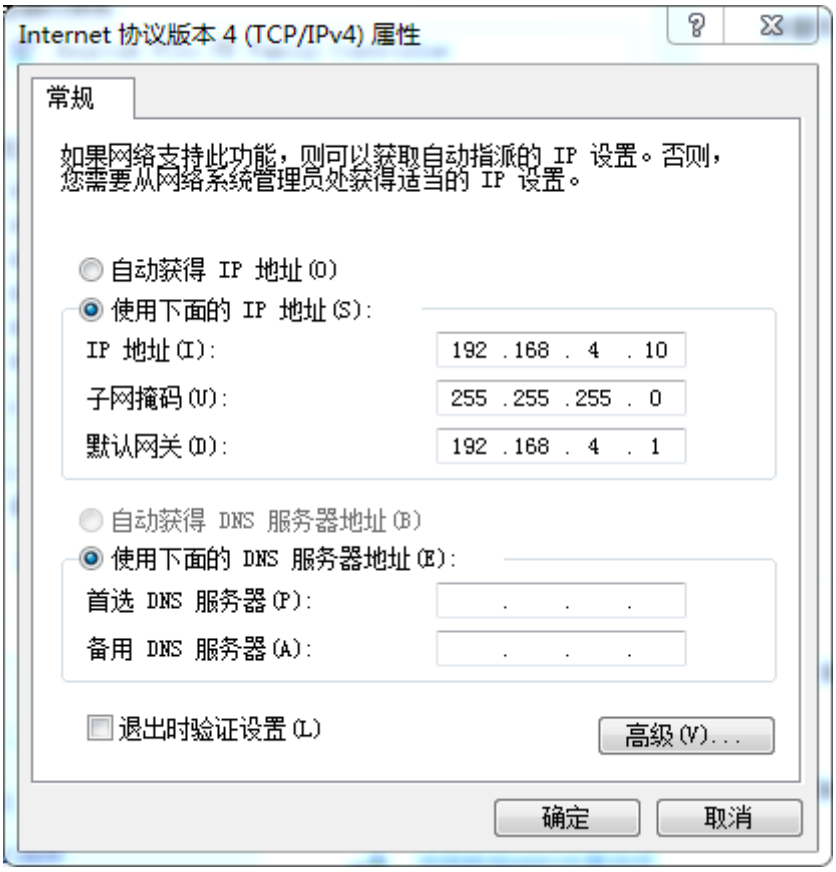
Subnet mask	255.255.255.0
Gateway	192.168.4.1
DNS	61.139.2.69
Spare NDS	192.168.4.1
Socket A1 basic parameters	TCPS,192.168.4.101,8886
Socket A1 heartbeat packet mode	NET
Socket A1 heartbeat packet content	0（Sec），Turn off heartbeat packet function
Socket A1 registration packet mode	heartbeat msg
Socket A1 registration packet time	OFF
Socket A1 registration packet content	regist msg
Socket A1 short connection time	0（Sec），Turn off the short connection function
Socket A1 keepalive parameter	time/inteval/probes = 10（Sec）/5（Sec）/30（Times）
Socket A1 clear cache function	OFF
Socket B1 basic parameter	TCPC,192.168.4.100,8887
Socket B1 heartbeat packet mode	NET
Socket B1 heartbeat packet time	0（Sec），Turn off the heartbeat packet function
Socket B1 heartbeat packet content	heartbeat msg
Socket B1 registration packet mode	OFF
Socket B1 registration packet content	regist msg
Socket B1 short connection time	0（Sec），Turn off the short connection function
Socket B1 keepalive parameter	time/inteval/probes = 10（秒）/5（秒）/30（次）
Socket B1 clear cache function	OFF
Cloud transparent transmission switch	OFF
Tcp server server maximum allowed connections	6
Intranet discovery port	1901
Intranet discovery password	www.cdebyte.comwww.cdebyte.com
web page port	80
web login username / password	admin/admin
Timeout restart time	3600（Sec）

4.2 SOCKET Instruction

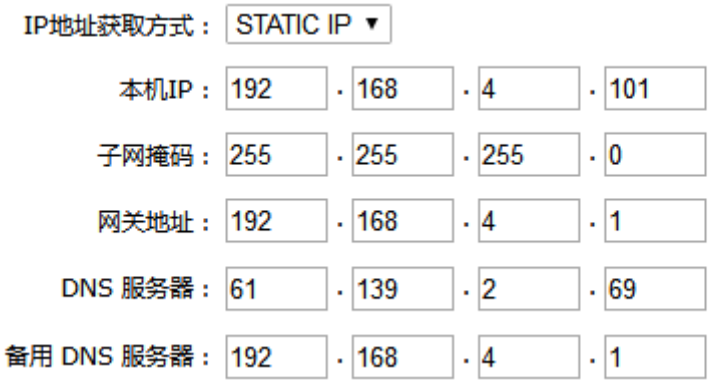
Preparation before use:

1. Set the IP address of the PC computer to the same network segment as E800-DTU (Z2530-ETH-27), with the same subnet mask. For example, the PC IP is 192.168.4.10 and the module IP is 192.168.4.101;

PC configuration:



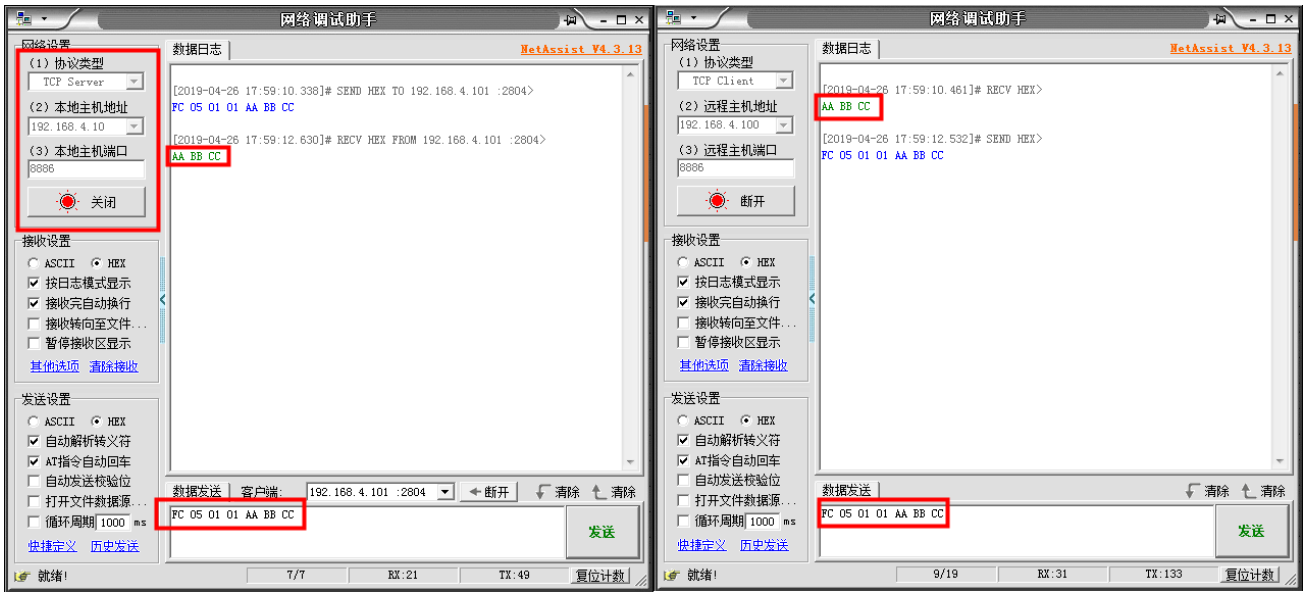
DTU configuration：



4.3 TCP Client Instruction

1. Set the SOCKET A1 network type of device A to TCP Client, the destination IP is 192.168.4.10, local port 0 (random port), and destination port 8886. Click Save to restart the module.

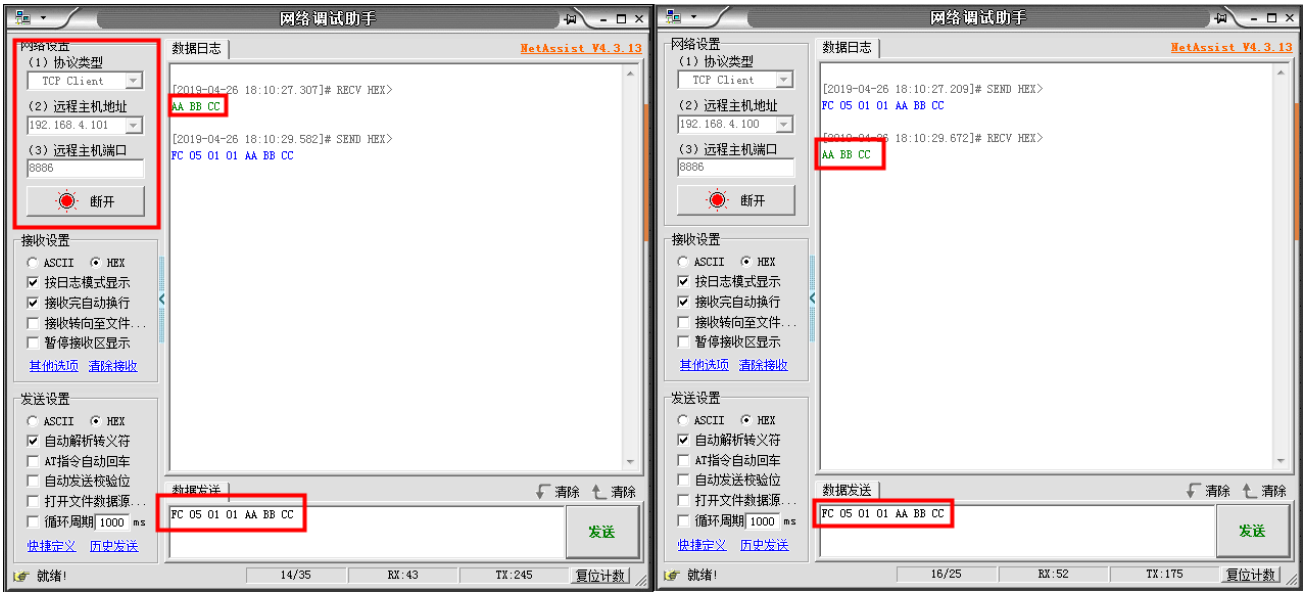
2. As shown in the figure below, communicate with another DTU, and the network debugging assistant connects to the DTU device for testing.



4.4 TCP Server Instruction

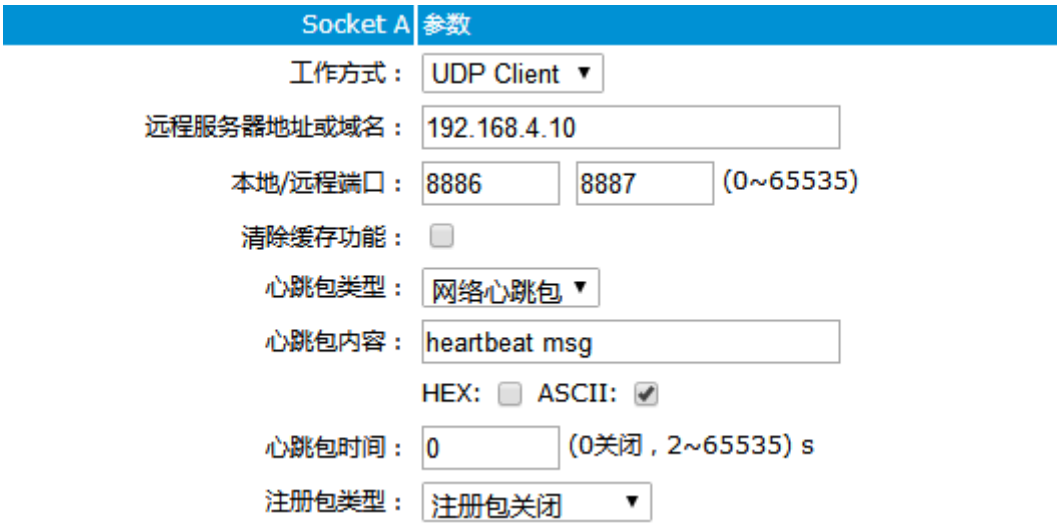
1. Set the SOCKET A1 network type of device A to TCP Server and local port 8886. Click Save to restart the module

2. As shown in the figure below, communicate with another DTU, and the network debugging assistant connects to the DTU device for testing.

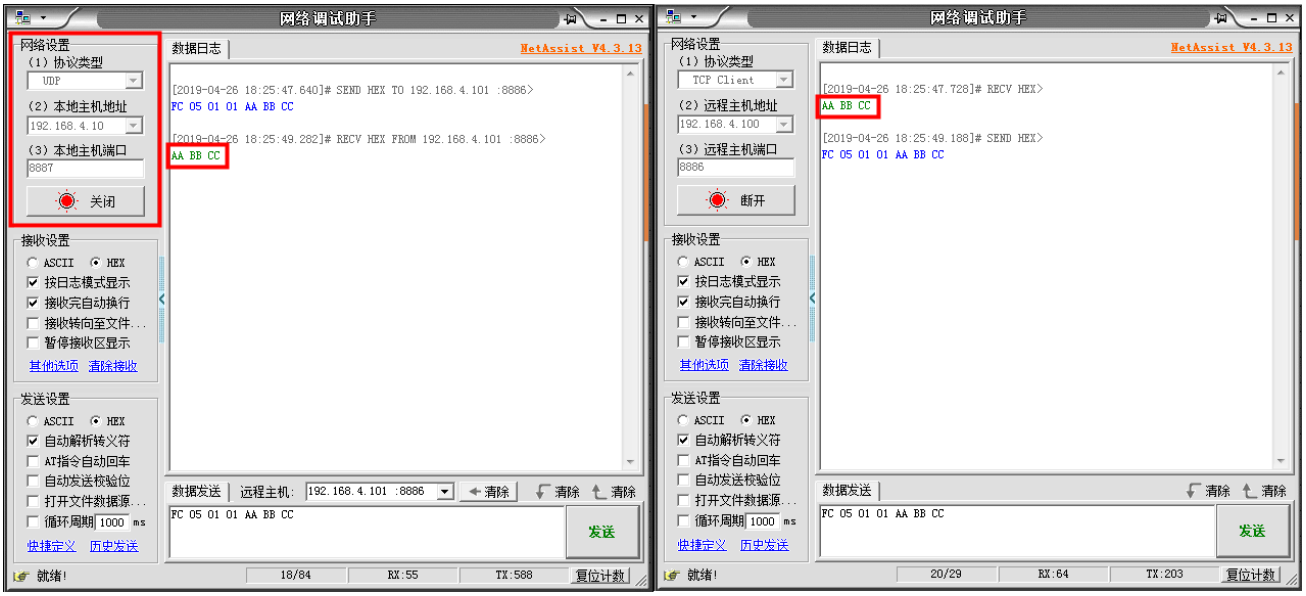


4.5 UDP Client Instruction

1. Set the network type of SOCKET A1 of device A to UDPC (UDP Client), the destination IP is 192.168.4.10 and the destination port is 8887. Click Save to restart the module. Set the "Network Debugging Assistant" to UDP (this host does not distinguish between UDP Client and UDP Server), the local host IP is set to 192.168.4.10, the local host port number is set to 8887, and the remote host is set to 192.168.4.101:8886.



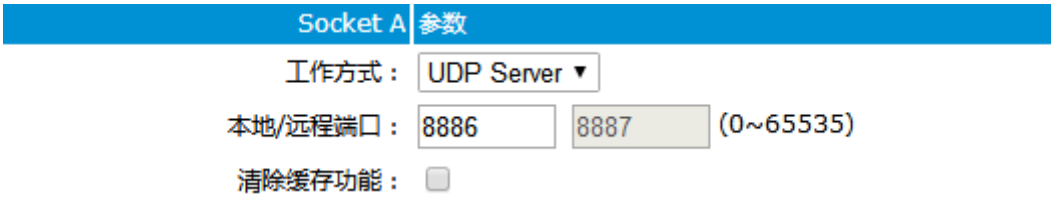
2. As shown in the figure below, communicate with another DTU, and the network debugging assistant connects to the DTU device for testing.



4.6 UDP Server Instruction

1. Set the SOCKET A1 network type of device A and device B to UDPS (UDP Server) and the local port 8887. Click Save to restart the module.

2. Set the "Network Debug Assistant" to UDP (the host does not distinguish between UDP Client and UDP Server), the local host IP is set to 192.168.4.101, the local host port number is set to 8886, and the remote host is set to 192.168.4.101:8887



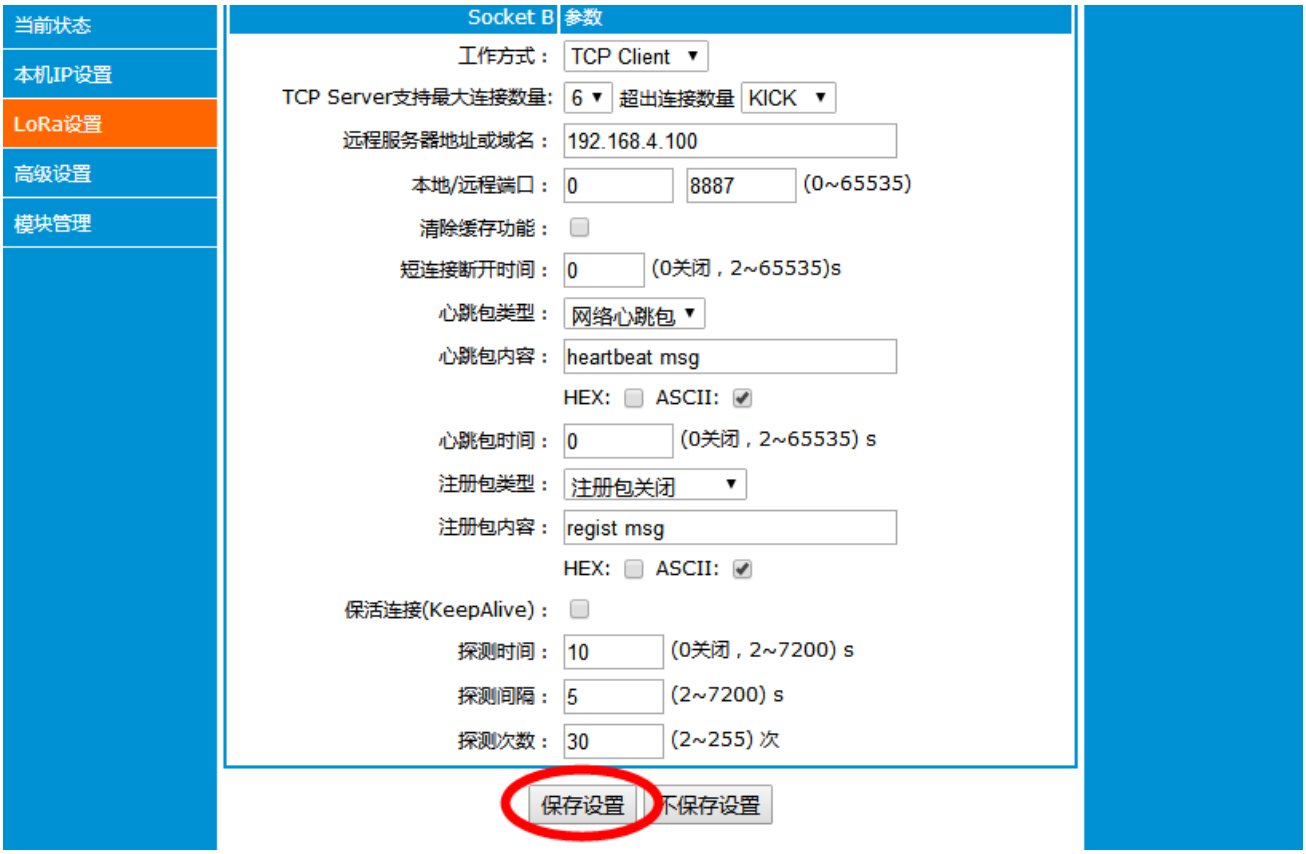
3. As shown in the figure below, communicate with another DTU, and the network debugging assistant connects to the DTU device for testing.

4.7 WEB Introduction

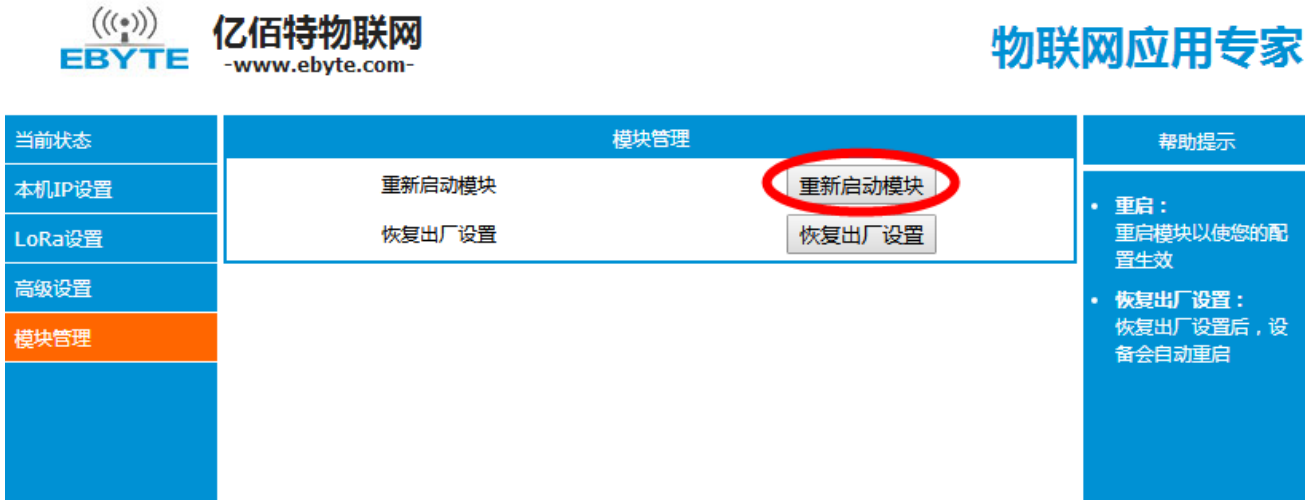
The module supports web page configuration. Users can enter the module IP address and port through any browser (Default port of the browser is 80), and enter the web page after login successfully. As shown in the figure:

Select one or more pages for parameter browsing and configuration according to specific needs (take ZigBee settings as an example).

After filling in the parameters correctly, click Save Setting.



The page will automatically jump to the module management page. After clicking Restart Module, the module restarts and the set parameters take effect.



4.8 Fast data communication

□Protocol mode

1. Necessary conditions for networking(PANID needs to be the same,and network keys need to be the same)
2. Broadcast

Command：01+type+data

Parameter description：type

01: Broadcast mode 1-The message is broadcast to all devices in the entire network

02：Broadcast mode 2-This message is only broadcast devices that have receiving (except sleep mode) turned on

03：Broadcast mode 3-The message is broadcast to all full-function devices (routers and coordinators)

Broadcast mode 1：

Coordinator sends: FC 05 01 01 AA BB CC Router receives: AA BB CC Terminal: AA BB CC (note that the sleep time and parent node save time settings)

Router sends: FC 05 01 01 AA BB Coordinator receives: AA BB CC Terminal: AA BB CC (note that the sleep time and parent node save time settings)

Terminal sends: FC 05 01 01 AA BB CC Coordinator receive: AA BB CC Router: AA BB CC (The terminal enters sleep mode, the first frame of data is used to wake up the device, and the module discards)

Broadcast mode 2：（Devices in sleep cannot receive message）

Coordinator sends: FC 05 01 02 AA BB CC Router receives: AA BB CC Non-sleep terminal: AA BB CC

Router sends: FC 05 01 02 AA BB CC Coordinator receives: AA BB CC Non-sleep terminal: AA BB CC

Terminal sends: FC 05 01 02 AA BB CC Coordinator receives: AA BB CC Router: AA BB CC

Broadcast mode 3：Terminal cannot receive message

Coordinator sends: FC 05 01 03 AA BB CC Router receives: AA BB CC Terminal: None
Router sends: FC 05 01 03 AA BB CC Coordinator receives: AA BB CC Terminal: None
Terminal sends: FC 05 01 03 AA BB CC Coordinator receives: AA BB CC Router: AA BB CC

3. Multicast

Command：02+ group+data

Parameter description：group 1~99：Multicast number of the multicast information

Coordinator sends: FC 05 02 01 AA BB CC Router receives: AA BB CC XX Non-sleep terminal: AA BB CC XX
Router sends: FC 05 02 01 AA BB CC Coordinator receives: AA BB CC XX Non-sleep terminal: AA BB CC XX
Terminal sends: FC 05 02 01 AA BB CC Coordinator receives: AA BB CC XX Router: AA BB CC XX

4. Unicast

Command：03+ type +addr+data

Parameter description：type

01: Transparent transmission mode (without carrying information)

02: short address mode (carrying information is short address)

03: MAC address mode (carrying information is MAC address)

addr: network short address effective unicast address 0x0000—0xFFF8

Terminal network short address: 0x35BD Terminal mac address: 98-2A-28-1C-00-4B-12-00
Coordinator network short address: 0x0000 Coordinator mac address: D5-27-28-1C-00-4B-12-00
Router network short address: 0x8478 Router mac address: 95-2B-28-1C-00-4B-12-00
Note: The network short address is not fixed and is only for reference.

Coordinator sends: FC 07 03 01 35 BD AA BB CC Router receives: None Terminal: AA BB CC
Coordinator sends: FC 07 03 02 35 BD AA BB CC Router receives: None Terminal: AA BB CC 00 00
Coordinator sends: FC 07 03 03 35 BD AA BB CC Router receives: None Terminal: AA BB CC D5 27 28 1C 00 4B 12 00
Router sends: FC 07 03 01 35 BD AA BB CC Coordinator receives: None Terminal: AA BB CC
Router sends: FC 07 03 02 35 BD AA BB CC Coordinator receives: None Terminal: AA BB CC 84 78
Router sends: FC 07 03 02 35 BD AA BB CC Coordinator receives: None Terminal: AA BB CC D5 95 2B 1C 00 4B 12 00
Terminal sends: FC 07 03 01 00 00 AA BB CC Router: None Coordinator receives: AA BB CC
Terminal sends: FC 07 03 02 00 00 AA BB CC Router: None Coordinator receives: AA BB CC 35 BD
Terminal sends: FC 07 03 03 00 00 AA BB CC Router: None Coordinator receives: AA BB CC 98 2A 28 1C 00 4B 12 00

□Transparent transmission mode

Coordinator sends:	AA BB CC	Router receives:	AA BB CC	Non-sleep terminal: AA BB CC
Router sends:	AA BB CC	Coordinator receives:	AA BB CC	Non-sleep terminal: None
Terminal sends:	AA BB CC	Coordinator receives:	AA BB CC	Router: None

Other instructions:
Coordinator device will prompt message when establishing network: FF FF
When the device joins the network, it will prompt message: FF AA
The module device has no network or loses network will prompt message: FF 00
DTU opens a WEB page during data transmission may cause data loss.

5. Important statement

- EBYTE reserves the right of final interpretation and modification of all contents in this manual.
- As the hardware and software of the product continue to improve, this manual may be subject to change without further notice, and the final version of the manual shall prevail.
- Users who use this product need to pay attention to product dynamics on the official website so that users can get the latest information of this product in time.

6. Revision history

Version	Date	Description	Issued by
1.0	2019-3-5	Initial version	All

7. About us

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