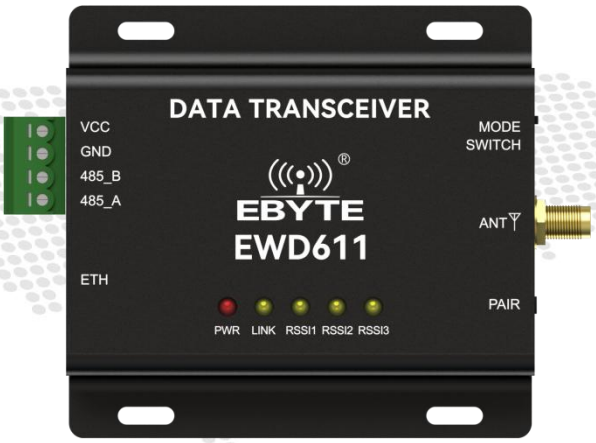
EBYTE

成都亿佰特电子科技有限公司

Chengdu Ebyte Electronic Technology Co.,Ltd.

Wireless Modem

用户使用手册



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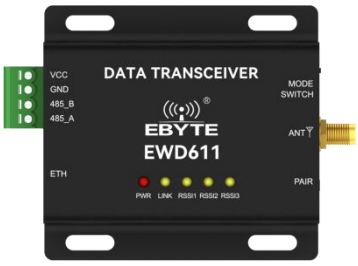
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Chapter 1: Overview

1.1 Introduction



The EWD611-868/915NW33(485) is a high-power, long-range video and data transmission radio developed by Chengdu EBYTE Electronics Technology Co., Ltd. With a transmission rate of 16 Mbps, it supports the transmission of four 1080p video streams, can form a network with up to 31 sub-nodes, and enables simultaneous pass-through transmission via both Ethernet and serial ports. It operates in the 863 MHz to 928 MHz frequency band with a maximum RF transmission power of 33 dBm.

The EWD611-868/915NW33(485) radio uses standard AT commands, making it simple and quick to operate. It is widely applicable in fields such as smart wearable, home automation, home security, personal health care, smart home appliances, accessories and remote controls, automotive, lighting, the Industrial Internet, smart data acquisition, and smart control.

1.2 Features and Functions

- Maximum transmit power: 33 dBm (2 W);
- Supports star-shaped networking with up to 31 sub-nodes；
- Maximum data rate of 16 Mbps, capable of transmitting four 1080p video streams;
- The module supports simultaneous pass-through for both Ethernet and serial ports;
- Supports integrated video and data transmission;
- Switching between master and slave modes is simple, with one-click pairing for easy use;
- Ideally, the maximum transmission distance can reach 2 km;
- Supports relay networking functionality;
- Equipped with AT commands for easy configuration of radio settings；

1.3 Use Cases

- Smart home devices and industrial sensors, etc
- Smart wearable
- Home Security
- Smart Home Appliances
- Accessories and remote controls
- Wireless Sensing
- Smart Control

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Chapter 2: Specifications

2.1 Basic Specifications

Key Specifications		Performance Description			Notes
		MIN	Typical	MAX	
Operating Voltage（V）		5	5/12	24	Supply voltage ≥ 12 V ensures maximum wireless power output
Communication Level（V）		-	3.3	-	Using a 5V voltage level carries the risk of burning out the device
Operating Temperature（℃）		-40	-	85	Industrial-grade design
Operating Band（MHz）		863	-	928	E611-868NW33S：863~873MHz E611-915NW33S：902~928MHz
Transmit Power（dBm）		32.5	33	33.5	-
Power consumption	Emission Current（mA）	550	1100	2000	Peak transient current 550 mA at 24 V, 1100 mA at 12 V, 2000 mA at 5 V
	Received current（mA）	50	85	180	50 mA at 24 V, 85 mA at 12 V, 180 mA at 5 V
Receive Sensitivity（dBm）		-	-107	-	@1M MCS10
Communication Range（m）		-	1500	2000	In clear, open conditions, with an antenna gain of 5.0 dBi, an antenna height of 1 meter, at 33 dBm, the data rate is 16 Mbps.

2.2 Hardware Specifications

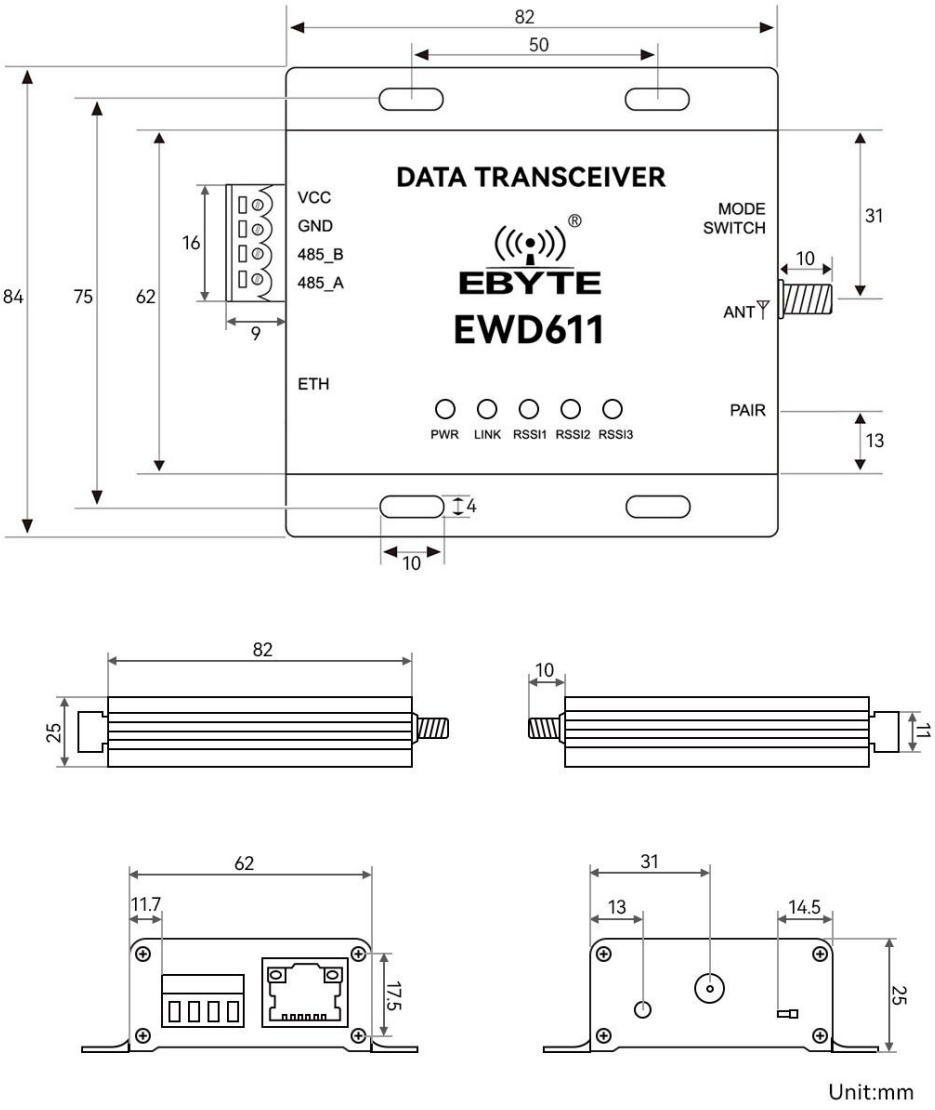
Key Specifications	Description	Notes
Communication Interface	RS485/Ethernet	Serial port parameters (cannot be modified): Baud rate 115200, frame format 8N1
FLASH	8MB	-
SRAM	704KB	-
Dimensions	84*82*25mm	Tolerance range: ±0.2 mm
Antenna connector	SMA-K Interface	External thread, internal bore, 10 mm long, characteristic impedance 50 Ω
Net Weight	126g	Tolerance range: ±1 g

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Chapter 3: Installation Dimensions

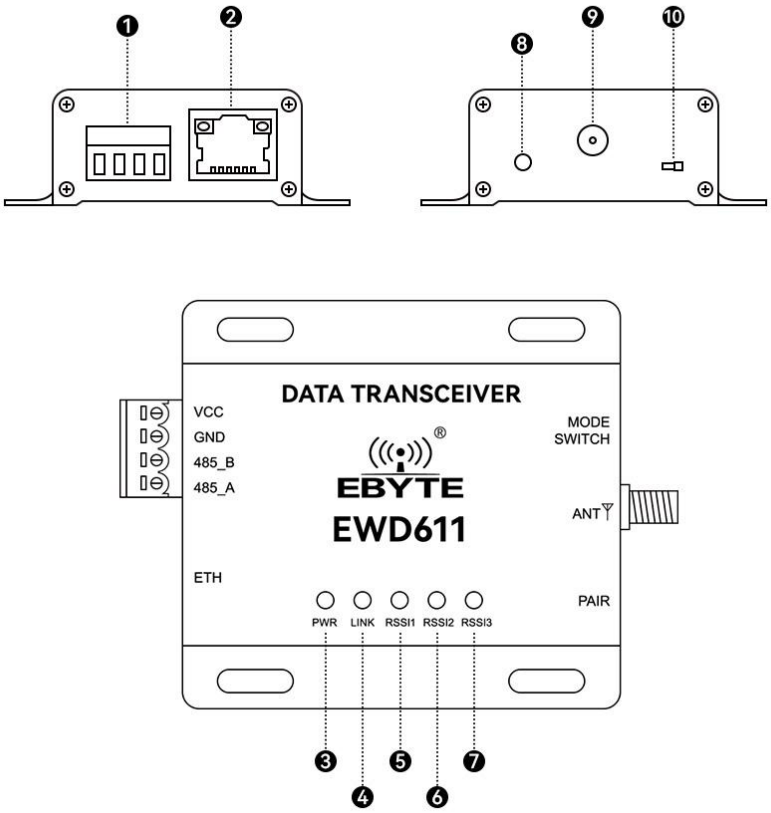
3.1 Product Dimensions



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3.2 Functional Definitions of Each Component



Pin number	Name	Features	Note
1	3.81 mm terminal block	Serial port, power connector	Standard RS-485 interface and screw-terminal power connector
2	ETH	Ethernet interface	Standard RJ45 connector, 100 Mbps
3	PWR-LED	Power indicator	Red, stays on when power is connected
4	LINK-LED	Link indicator	a)Off: Ethernet cable not connected or not connected to the server; b)Flashing: The light flashes when the Ethernet cable is connected; c)Always On: Network connection established;
5	RSSI1-LED	Signal Strength Indicator	-
6	RSSI2-LED	Signal Strength Indicator	-
7	RSSI3-LED	Signal Strength Indicator	-
8	Pairing button	Pairing Control	Master and Slave Pairing Button
9	Antenna connector	SMA-K connector	External thread, internal bore, 10 mm long,

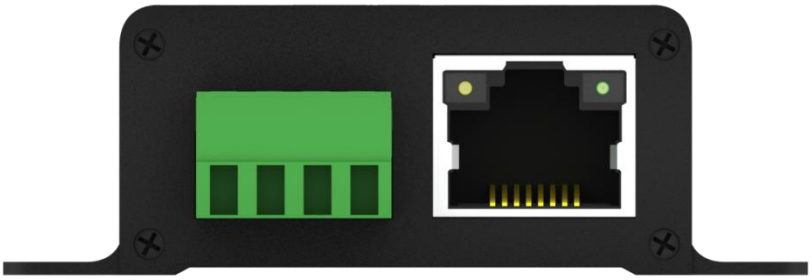
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			characteristic impedance 50 Ω
10	Mode Switch	Tactile switch	Master-Slave Mode Switch

3.3 Interface Definition

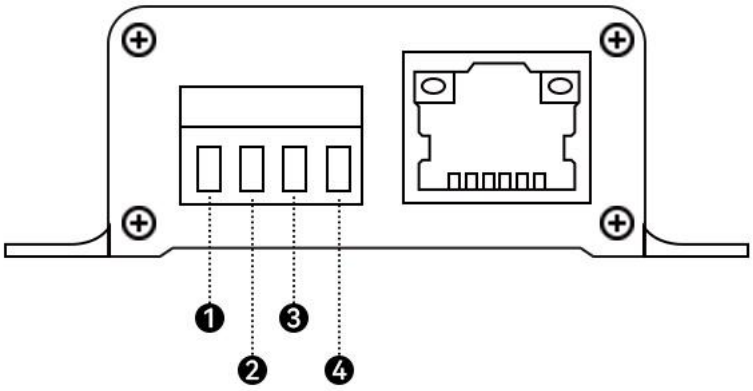
3.3.1 Power Connector Instructions



Users must connect the VCC and GND pins on the radio's green port to provide power. The EWD611 can be powered by a 5–12 V DC power supply; a 12 V or 5 V DC power supply is recommended.

3.3.2 RS485 Interface Specifications

The EWD611 data radio communication connection can be established by selecting the appropriate terminal and crimping the wires into the 3.81mm terminal block. See below for details:



Pin size	Definition of Standards	Features	Note
1	VCC	Wire-contact power connector, positive terminal	5–12 V DC; 12 V or 5 V is recommended
2	GND	Wire-contact power connector, negative terminal	The negative terminal of the power supply is connected to the system ground and the enclosure
3	485_B	Serial port	Terminal B for connecting to other RS-485 devices

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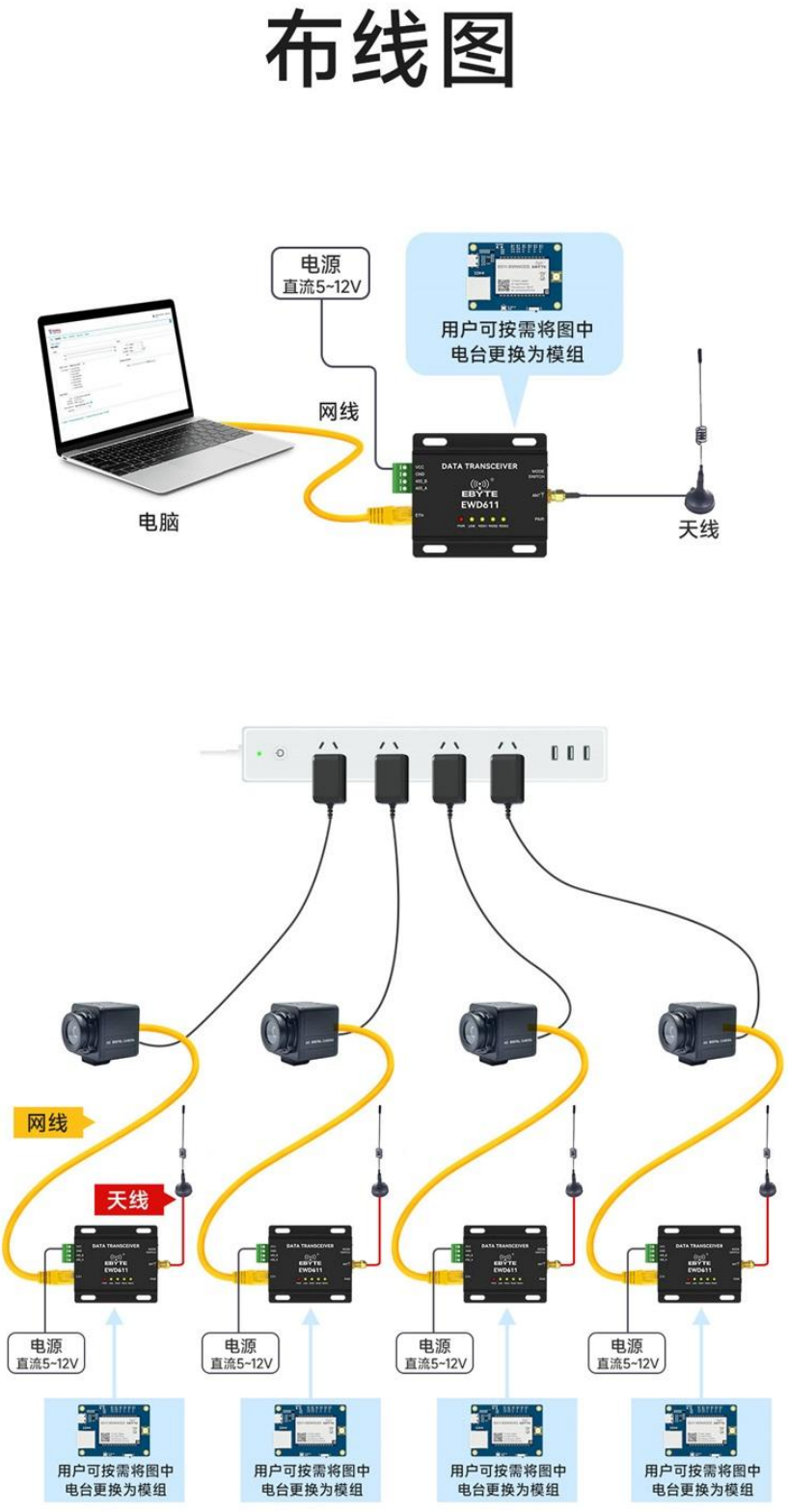
4	485_A	Serial port	Terminal A for connecting to other RS-485 devices

★ Note: If communication issues occur when connecting the radio to multiple devices but not when using a single device, try connecting a 120Ω resistor in parallel between the 485_A and 485_B terminals.

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3.3.3 Detailed Instructions for Connecting the Camera



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Chapter 4: Parameter Description

4.1 Character Description

Supports the following 4 operating modes：

NO	Operating Mode	Mode Details
1	Host Mode ap	The central role in a star network topology
2	Slave Mode sta	Support Role
3	Multicast mode group	Multicast; for details, see the multicast command
4	Relay Mode apsta	A device operating in repeater mode connects to the upstream host as a slave while also acting as a host to provide connectivity services to other slaves.

Chapter 5: Examples of Use

5.1 1-to-1 Serial Port Pass-Through

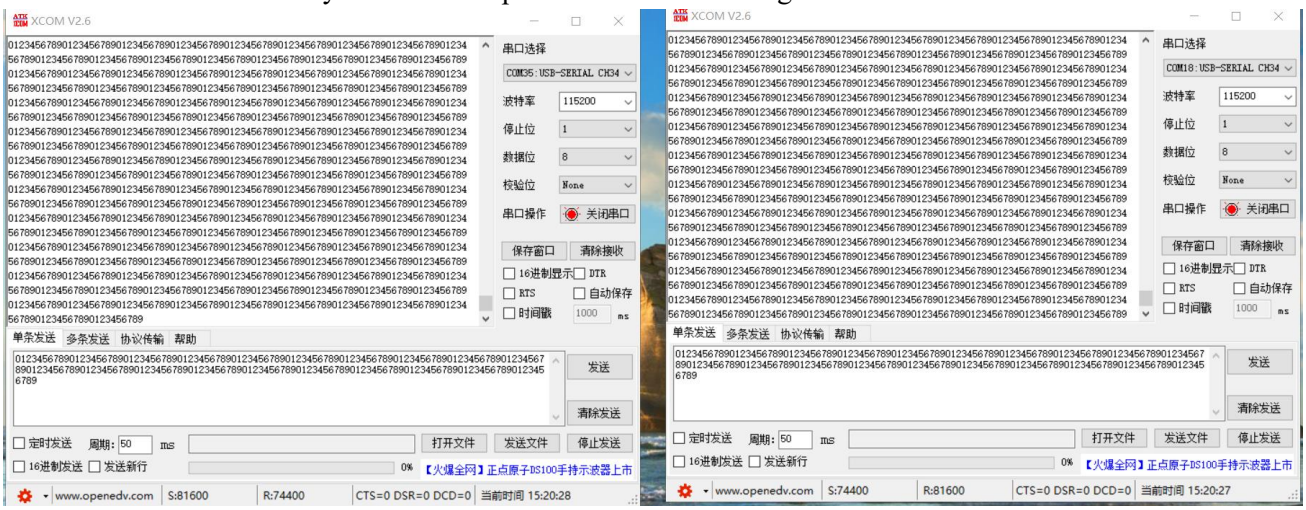
1、Prepare two EWD611-900NW20(485) units and install the antennas

2、Connect Typec to a PC。

3、On both radios, press and hold the PAIA button simultaneously, wait 2 seconds, then release. You will see the connection light and the RSSI indicator light remain on。

4、Open the XCOM Serial Assistant and open the corresponding serial port (note the serial port settings: 115200, 8N1)

5、Data can be sent directly via the serial port. As shown in the figure below：



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5.2 Set up a bridge connection between two PCs using a point-to-point connection

1、Prepare two EWD611-900NW20(485) units and install the antennas

2、Connect the PC via Ethernet

3、Once the connection is correct, power on the radio. You should see the Ethernet port light stay on, and an “Unknown network” will appear in your computer's network settings

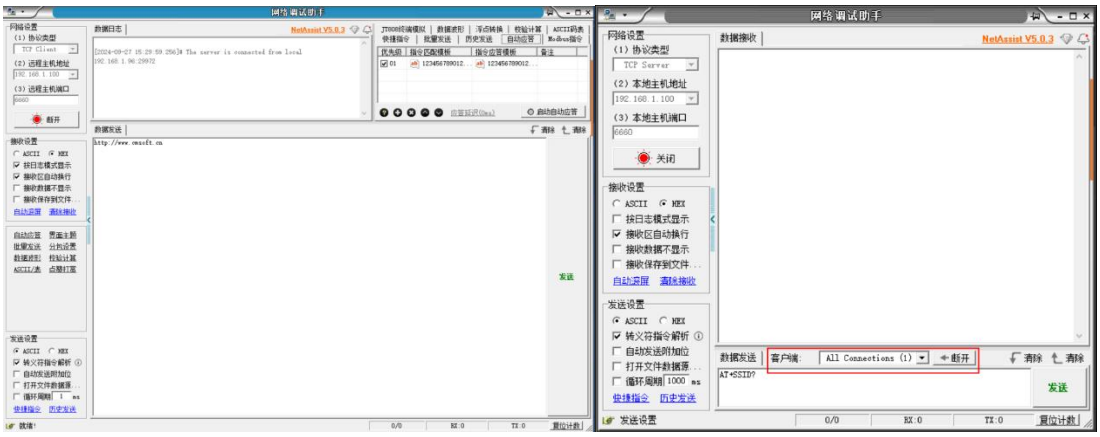


4、Manually configure the corresponding static IP addresses on both PCs. Note that the IP addresses of both devices must be in the same subnet, and you must disable firewalls and other software to prevent communication failures

5、Using the Network Debugging Assistant, start a TCP server on a PC, as shown in the figure below. Note that the IP address should match the modified Ethernet IP address



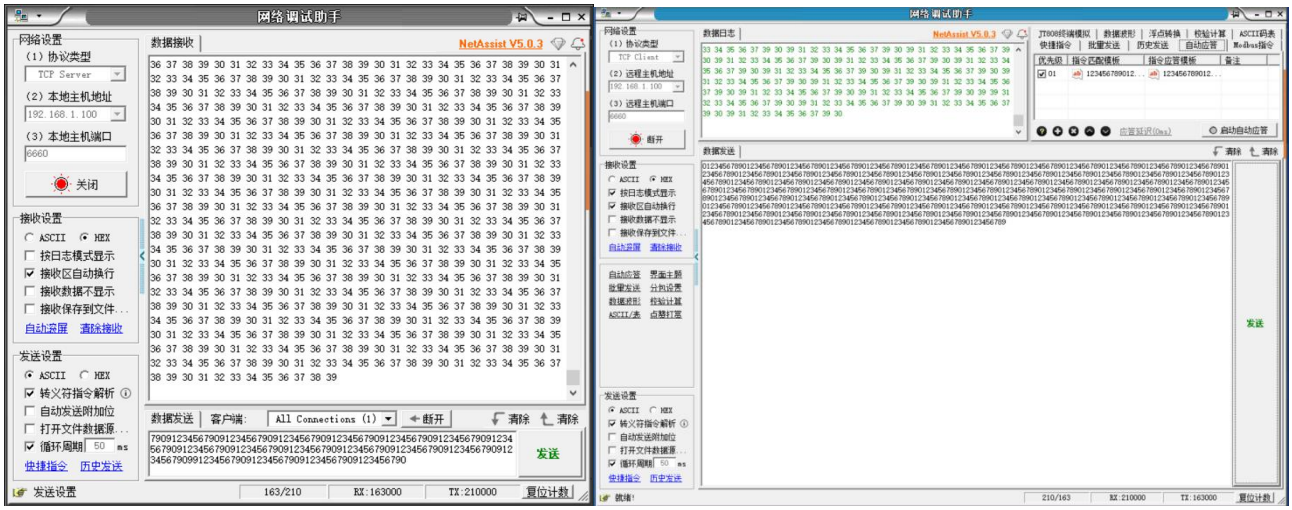
6、Connect another device to the corresponding IP address and port, and you will see that the connection is successful.



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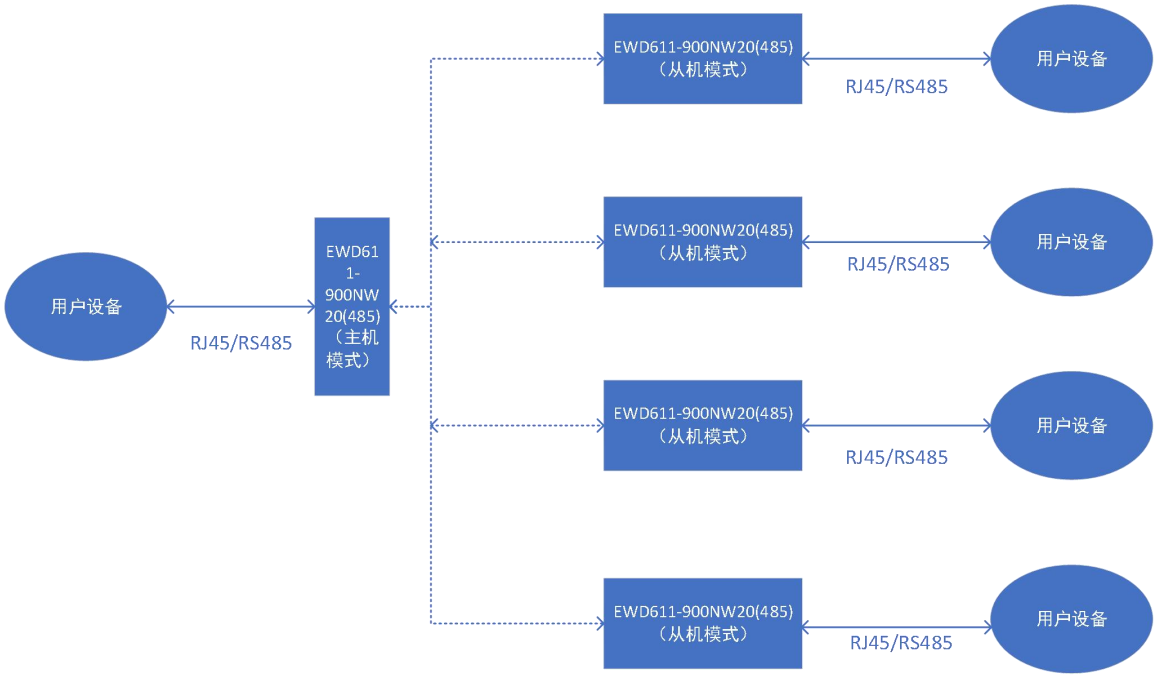
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7、Data test: 50 ms packet interval, 1,000 bytes per packet. The following figure shows the data from both the server and client



5.3 One-to-many star network topology

The network topology diagram is shown below：



This product uses a star-shaped network topology, consisting of one host device and multiple slave nodes. A single host node can support up to eight slave devices. For a demonstration of the network configuration, please

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refer to the video on our official website.

5.4 Examples of Using AT Commands

5.4.1 Basic commands for establishing a connection with the radio

Use the “at” command to configure the EWD611 radio, including frequency settings, bandwidth settings, and SSID and password settings.
Host Radio Configuration：
1） AT+CHAN_LIST=9080,9160,9240 Set 3 frequency points
2） AT+BSS_BW=8 Set 8 Mbps bandwidth
3） AT+SSID=hgic_ah_test Set SSID
4） AT+KEYMGMT=WPA-PSK Enable encryption
5） AT+PSK=baa58569a9edd7c3a55e446bc658ef76a7173d023d256786832474d737756a82 Set an encryption password
6） AT+MODE=ap Set the radio to host mode
From the Electromechanical Station Configuration：
Except for AT+MODE=sta, all other settings are the same as those of the host.

5.4.2 Configure the relay network commands

Host Station：
1） Configure the SSID for each AP; each AP should have a different SSID. You might consider using sequential names such as ssid1, ssid2, and so on. For example:
at+ssid=ssid1
Configuration without encryption (for simplicity, this example uses a configuration without encryption)
at+keymgmt=none

Relay Station：
1） at+mode=apsta
2） Configure as unencrypted
at+keymgmt=none
3） The `r_ssid` configured on the repeater—which is used to connect the repeater to the host—should match the SSID of the host you want to connect to. For example：
at+r_ssid=ssid1
4） Configure the SSID for the repeater, which is used to connect the repeater to the client. For easier management, consider using the same SSID as the main device followed by a suffix, such as ssid1_r1, ssid1_r2, ssid2_r1, etc. For example: at+ssid=ssid1_r1

From the Electromechanical Station：
Configure the SSID of the STA so that the client can connect to the access point; it should match the SSID of the connected access point, for example：at+ssid=ssid1_r1
2） Configure as unencrypted at+keymgmt=none

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Chapter 6: AT Commands

Note: Before sending operational commands, make sure the radio is in wake-up mode; otherwise, it will not be able to receive configuration commands!

6.1 Instructions

Instruction Type	Command Format	Description
Query command	AT+[X]?	This command is used to query the parameters of a configuration command
Configuration Instructions	AT+[X]=<…>	This command is used to set user-defined parameters.。
Execute Command	AT+[X]	Used for commands without parameters, such as resetting the radio

6.2 Configure the radio via the Ethernet port

6.2.1 Connecting a PC via a wireless network cable



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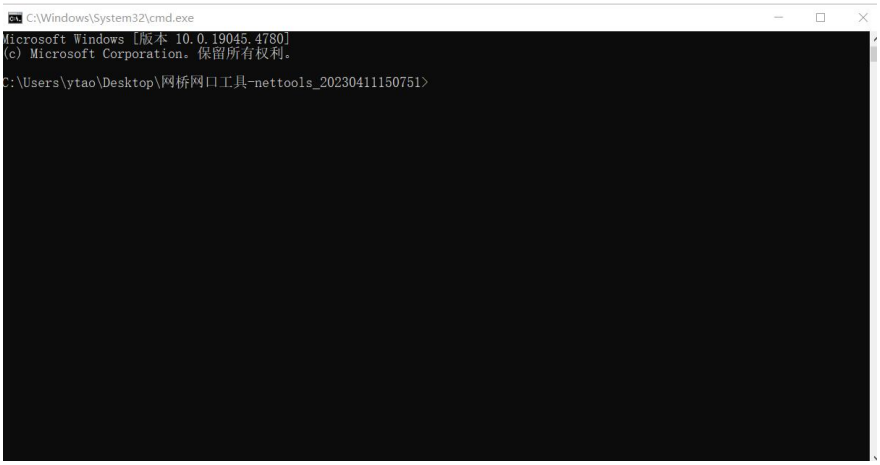
6.2.2 Manually change the IP address for the corresponding network to a static IP



6.2.3 Open the Network Tools folder and type “cmd” in the search bar



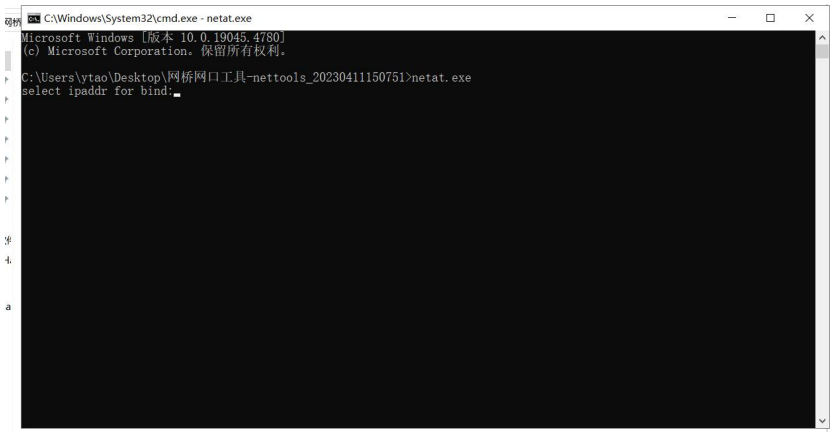
6.2.4 Press Enter to enter the command line interface



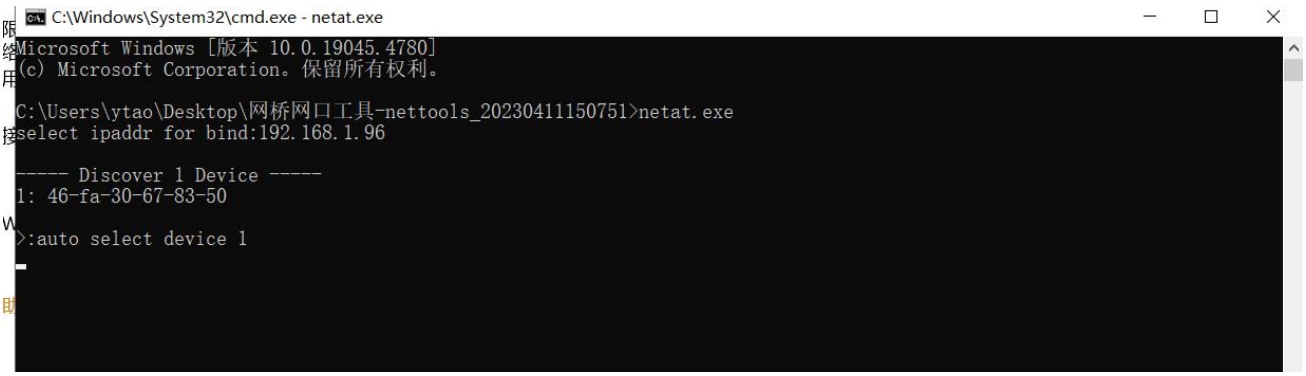
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6.2.5 Type netat.exe and press Enter



6.2.6 Enter the IP address you just modified, and you will then be able to send the corresponding configuration commands as usual



6.3 Instruction Set

6.3.1 Operating Mode

Instructions	**AT+MODE?**	**Response**	**+MODE:<mode> OK**
Description	Read radio operating mode		
Parameters	<mode>:ap/sta/group/apsta 4 Modes		
Instructions	**AT+MODE=<mode>**	Response	**Success：OK Failure：ERROR**
Description	Configurate radio operating mode		
Parameters	<MODE>:ap/sta/group/apsta 4 Modes		
Example	AT+MODE=APConfigure the radio to operate in AP mode		
Explain	AT+MODE=<mode>The command only saves power-off settings for AT+MODE=APSTA.		

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6.3.2 Set the SSID

Instructions	**AT+SSID?**	**Response**	**+SSID:<ssid> OK**
Description	Read the SSID in access point mode		
Parameters	<ssid>:The SSID name on the host		
Instructions	**AT+SSID=<ssid>**	Response	**Success：OK Failure：ERROR**
Description	Set the SSID name in router mode		
Parameters	<ssid>： The character string is less than 32 characters long		
Example	AT+SSID=ebyte_test		

6.3.3 Set encryption method

Instructions	**AT+KEYMGMT?**	**Response**	**+KEYMGMT:<enc> OK**
Description	Read radio encryption method		
Parameters	<enc>:WPA-PSK: Encryption enabled / NONE: Encryption disabled		
Instructions	**AT+KEYMGMT=<enc>**	Response	**Success：OK Failure：ERROR**
Description	Set the radio encryption method		
Parameters	<MODE>: WPA-PSK: Encryption enabled / NONE: Encryption disabled		
Example	AT+KEYMGMT=WPA-PSK		

6.3.4 Set an encryption password

Instructions	**AT+PSK?**	**Response**	**+PSK:<psk> OK**
Description	Retrieve the radio station's encryption key		
Parameters	<psk>:64 hex characters		
Instructions	**AT+PSK=<psk>**	Response	**Success：OK Failure：ERROR**
Description	Set the radio encryption password		
Parameters	<MODE>: 64 hex characters		
Example	AT+PSK=baa58569a9edd7c3a55e446bc6 58ef76a7173d023d256786832474d7377 56a82		

6.3.5 Pairing Control

Instructions	AT+PAIR=<pair>	**Response**	OK
Description	This command enables quick pairing and network setup when the SSID has not been		

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	configured. When pairing is initiated： 1. The AP has been configured with an SSID and password, but the STA has not: During the pairing process, the STA will obtain the AP's SSID and password. 2. Neither the AP nor the STA has an SSID or password configured: During the pairing process, the AP generates a random password for each STA. A “PAIR SUCCESS” message will be generated after pairing is successful, but the pairing session will not automatically end; you must execute AT+PAIR=0 to stop pairing. The connection will be established automatically once pairing is complete. If both the AP and STA have been configured with parameters such as the SSID, there is no need to initiate the PAIR process; they will automatically connect using the SSID and other parameters.
Parameters	<psk>:0/1
Example	AT+PAIR=1 //Start pairing AT+PAIR=0 //Stop pairing

6.3.6 Set BSS bandwidth

Instructions	**AT+BSS_BW?**	**Response**	**+BSS_BW:<bw> OK**
Description	Read the BSS bandwidth of the radio station		
Parameters	<bw>: 1:1MHz 2:2MHz 4:4MHz 8:8MHz		
Instructions	**AT+BSS_BW=<bw>**	Response	**Success：OK Failure：ERROR**
Description	Set the BSS bandwidth		
Parameters	<bw>: 1:1MHz 2:2MHz 4:4MHz 8:8MHz		
Example	AT+BSS_BW=4 Set the bandwidth to 4 MHz		

6.3.7 Set the operating frequency range

Instructions	**AT+FREQ_RANGE?**	**Response**	**+ FREQ_RANGE:<start>-<end> OK**
Description	Read the operating frequency range		
Parameters	<start>:Starting frequency <end>:As of the date of this report		

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Instructions	**AT+FREQ_RANGE=<start>,<end>**	Response	**Success：OK** **Failure：ERROR**
Description	Set the operating frequency range		
Parameters	1. This command is used to set a range of frequency points for continuous use by specifying the starting and ending center frequencies; the AH module will automatically calculate the frequency list. 2. The values of start and end are the center frequency multiplied by 10.		
Example	AT+FREQ_RANGE=9080,9240 Settings start freq=908MHz end freq=924MHz The generated channel list is 908 M， 916M,924M Note: If AT+CHAN_LIST is also set， Parameters take precedence over the configured CHAN_LIST.		

6.3.8 Set Up a List of Operating Frequencies

Instructions	**AT+CHAN_LIST?**	**Response**	**+AT+CHAN_LIST:<freq1>,<freq2>,…<freq16>** **OK**
Description	Read operating frequency		
Parameters	1. The specified frequency value is the center frequency multiplied by 10. 2. Supports up to 16 frequencies, separated by commas		
Instructions	**AT+CHAN_LIST=<freq1>,<freq2>,…,<freq16>**	Response	**Success：OK** **Failure：ERROR**
Description	Set the operating frequency		
Parameters	1. This command is used to set a list of non-contiguous frequencies. 2. The specified frequency value is the center frequency multiplied by 10. 3. Supports up to 16 frequencies, separated by commas.		
Example	AT+CHAN_LIST=9080,9240 Set two frequencies: 908 MHz and 924 MHz		

6.3.9 Check device signal quality

Instructions	**AT+RSSI?**	**Response**	**+RSSI:<rssi>** **OK**
Description	Query the RSSI value of the device		
Parameters	AT+RSSI=index/mac_addr index：Specify the device index for the query, starting from 1. mac_addr:Specify the MAC address of the device to query.		
Example	AT+RSSI //If no parameter is specified, query the RSSI of the first device AT+RSSI=1 //Retrieve the RSSI of the first device AT+RSSI=f4:de:09:68:6c:20 //Query RSSI based on MAC address		

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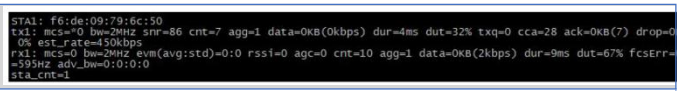
6.3.10 Check connection status

Instructions	AT+CONN_STATE	Response	+CONNECTED //Connected +DISCONNECT //Not connected
Description	Check connection status		
Parameters			
Example	AT+CONN_STATE		

6.3.11 View device specifications

Instructions	AT+WNBCFG	Response	
Description	View Device Specifications		
Parameters			
Example	AT+WNBCFG		

6.3.12 View STA information

Instructions	AT+STA_INFO=<id>	Response	
Description	View the STA information for the corresponding ID		
Parameters			
Example	View the LMAC statistics for the STA with the specified ID, including RSSI, EVM, and other information; AP can use this command, but STA cannot; The ID is the STA's serial number, starting from 1; When using this command, you can first disable the default LMAC output: AT+SYSDBG=LMAC		

6.3.13 Scan nearby Wi-Fi networks

Instructions	AT+SCAN_AP=2	Response	OK
Description	Scan for nearby access points		
Parameters			
Example	Execute this command in STA mode to scan for nearby AP information. After scanning, use the BSSLIST command below to view the results.		

6.3.14 Get the list of scanned access points

Instructions	AT+BSSLIST=2	Response	
Description	Retrieve information about nearby access points		
Parameters			

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Example	After executing the `scan_ap` command, you can use this command to retrieve the list of scanned access points (AP must have an SSID configured to be detected)

6.3.15 Set the maximum transmit power

Instructions	**AT+TXPOWER?**	Response	**+TXPOWER:<pwr>dbm OK**
Description	Check the maximum transmit power		
Parameters	<pwr>:Maximum transmit power		
Instructions	**AT+TXPOWER=<pwr>**	Response	**Success：OK Failure：ERROR**
Description	Set the maximum transmit power		
Parameters	<pwr>:Maximum transmit power, range 6–20		
Example	AT+TXPOWER=20		

6.3.16 Set the ACK TIMEOUT

Instructions	**AT+ACKTMO?**	Response	**+ACKTMO:<time> OK**
Description	Find the timeout duration for the ACK timeout in the Wi-Fi protocol		
Parameters	<time>:Timeout		
Instructions	**AT+ACKTMO=<time>**	Response	**Success：OK Failure：ERROR**
Description	Set the ACK timeout duration in the Wi-Fi protocol		
Parameters	<time>:Timeout Set the value of the “acktimeout” parameter in the AH radio WiFi protocol; the unit is microseconds, and the default value is 0. This parameter only needs to be set when communicating over distances greater than 1 km. The calculation formula is 10 * (distance in kilometers - 1); for example, for a distance of 2 km, set acktmo=10. Changes are saved when power is lost；		
Example	AT+ACKTMO=100 Increase the ACK packet timeout by 100 microseconds		

6.3.17 Set TX MCS

Instructions	**AT+TX_MCS?**	**Response**	**+TX_MCS:<mcs> OK**
Description	Check the MCS value of the radio station		
Parameters	<mcs>:MCS index value		
Instructions	**AT+TX_MCS=<mcs>**	Response	**Success：OK Failure：ERROR**
Description	Set the MCS index value for the radio station		

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Parameters	Set the TX MCS. Values between 0 and 7, or 10 in 1M mode, indicate a fixed MCS; other values indicate automatic MCS adjustment. This command is retained after a power cycle.
Example	AT+TX_MCS=2

6.3.18 Set the heartbeat interval

Instructions	**AT+HEART_INT?**	**Response**	**+HEART_INT:<time> OK**
Description	Check the heartbeat interval		
Parameters	<time>:Heartbeat interval, in milliseconds		
Instructions	**AT+HEART_INT=<time>**	Response	**Success：OK Failure：ERROR**
Description	Set the heartbeat interval		
Parameters	Set the heartbeat interval in milliseconds (ms), with a minimum value of 500. The more STAs there are, the longer the recommended heartbeat interval should be; a suitable heartbeat interval is approximately STA_count * 500. In earlier software versions, the AP and STA must be set to the same heartbeat interval; otherwise, connection issues may occur. This setting is retained after a power cycle. Starting with version 1.6.2, only the AP's heartbeat interval needs to be configured; the AP will automatically synchronize with the STA, rendering this command ineffective for the STA.		
Example	AT+HEART_INT=2000 Set the heartbeat interval to 2 seconds		

6.3.19 Set to unpair the specified STA

Instructions	**AT+UNPAIR?**	**Response**	**No response**
Description			
Parameters			
Instructions	**AT+UNPAIR=<mac_addr>**	Response	**Success：unpair sta:mac_addr Failure：sta:mac_addr is not exist**
Description	Set to unpair the specified STA		
Parameters	<mac_addr>:The other party's MAC address		
Example	at+unpair=f6:de:09:75:a3:61		

6.3.20 Restore factory settings

Instructions	**AT+LOADDEF=1**	**Response**	
Description	Restore Factory Settings		
Parameters			
Example	AT+LOADDEF=1		

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6.3.21 Configure Print Settings

Instructions	**AT+SYSDBG=<type>,<vale>**	**Response**	**Success：OK**
Description	Configure printing of debug information		
Parameters	<type>: LMAC/WNB <vale>: 0 Off / 1 On LMAC statistics are enabled by default and include a lot of data; you can disable them if needed. WNB statistics are disabled by default.		
Example	AT+SYSDBG=LMAC,0 Turn off LMAC printing		

6.3.22 Set the serial port baud rate

Instructions	**AT+BAUDRATE? （ Not currently supported）**	**Response**	**<value>**
Description	Check the baud rate of the serial port		
Parameters	<value> ： Baud rate value		
Instructions	**AT+BAUDRATE=<value> （Not currently supported）**	Response	**Success：OK**
Description	Set the serial port baud rate		
Parameters	<value>:Serial port baud rate: 9600–400 k		
Example	AT+BAUDRATE=115200		
Note	This product does not support baud rate adjustment; the baud rate is fixed at 115200, and the frame format is 8N1		

6.3.23 Join a multicast network

Instructions	**AT+JOINGROUP=<group_addr>,<aid>**	**Response**	**Success：OK** **Failure：ERROR**
Description	Configure the radio to join the multicast group. After setting the WiFi station's operating mode to “group,” you can use this command to configure the WiFi station to join a multicast network. Once joined, the WiFi station will only receive data from that multicast network. All data communication will be conducted via the multicast address. If the operating mode is set to “group” but the station has not joined a multicast network, all data communication will be sent and received via broadcast. Note: The JOINGROUP command can only be used after the operating mode has been set to “group.”		
Parameters	AT+JOINGROUP=group_addr,AIDgroup_addr: The address of the multicast network to join. AID： The AID of this device in the multicast network. Valid AID values: 1–N (where N is the maximum number of STA supported by the firmware). The AID of each device in the network must be unique. Set a valid AID: The Wi-Fi access point will periodically send heartbeats over the multicast network to announce its presence to other Wi-Fi access points.		

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	Invalid AID set: The Wi-Fi access point will not send heartbeats and will not notify other Wi-Fi access points. If all devices are set to AID 0, they are not subject to the firmware's maximum STA limit.
Example	AT+JOINGROUP=11:22:33:44:55:66,3 Join the multicast address:11:22:33:44:55:66 AID Set to 3

6.3.24 Set up an intermediate SSID

Instructions	**AT+R_SSID?**	**Response**	**+R_SSID:<repeater_ssid> OK**
Description	Query the SSID of the parent AP in repeater mode		
Parameters	<value> ： The SSID of the parent AP		
Instructions	**AT+R_SSID=<repeater_ssid>**	Response	**Success：OK Failure：ERROR**
Description	Configure the intermediate access point to use the same SSID as the parent access point		
Parameters	<repeater_ssid>:ssid		
Example	AT+R_SSID=Ebyte_test		

6.3.25 Set the encryption password for the relay

Instructions	**AT+R_PSK?**	**Response**	**+R_PSK:<psk> OK**
Description	Retrieve the encryption password for the AP connected to the parent AP in repeater mode		
Parameters	<psk> ： The encryption password for the parent AP		
Instructions	**AT+R_PSK=<psk>**	Response	**Success：OK Failure：ERROR**
Description	Configure the PSK for the intermediate access point to connect to the parent access point		
Parameters	<psk>:The encryption password must be 64 hex characters long		
Example	AT+R_PSK=baa58569a9edd7c3a55e446bc658ef76a7173d023d256786832474d737756a82		

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Chapter 7: Frequently Asked Questions

7.1 The transmission distance is not ideal

- When there are obstacles in the line of sight, the communication range decreases accordingly;
- Temperature, humidity, and co-channel interference can lead to an increase in packet loss rates;
- The ground absorbs and reflects radio waves, so testing results are less reliable near the ground;
- Seawater strongly absorbs radio waves, which is why testing results are poor near the coast;
- If there are metal objects near the antenna, or if it is placed inside a metal enclosure, signal attenuation will be very severe;
- Incorrect power register settings; airspeed set too high (the higher the airspeed, the shorter the distance);
- At room temperature, if the power supply voltage is lower than the recommended value, the lower the voltage, the lower the power output;
- Poor matching between the antenna and the radio, or issues with the antenna itself.

7.2 The radio is prone to breaking

- Please check the power supply to ensure it falls within the recommended voltage range. Exceeding the maximum voltage may cause permanent damage to the radio;
- Please check the stability of the power supply; the voltage should not fluctuate significantly or frequently;
- Please ensure that anti-static procedures are followed during installation and use, as high-frequency components are sensitive to static electricity;
- Please ensure that humidity levels are not too high during installation and use, as some components are humidity-sensitive;
- Unless there are special requirements, we do not recommend using this product at extremely high or low temperatures.

7.3 The bit error rate is too high

- There is interference from a signal on the same frequency nearby. Move away from the source of interference or change the frequency or channel to avoid the interference;
- An unstable power supply can also cause garbled text, so be sure to ensure a reliable power supply;
- Extension cables or feeder cables that are of poor quality or too long can also result in a high bit error rate.

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Chapter 8: Related Models

Product Model	Frequency Hz	Power dBm	Test Distance km	Air speed bps	Interface	Size mm	Antenna
E70-DTU(433NW30)	433M	30	6.5	2.5k～168k	RS232/RS485	82*62*25	SMA-K

Revision History

Version	Revision Date	Revision Notes	Maintainer
1.0	2026-04-21	Initial Version	Lan
1.1	2026-6-18	Modified the description of the configuration mode instructions	Lan

About Us

Sales Hotline：4000-330-990
Technical Support：support@cdebyte.com
Official Website：www.cdebyte.com
Company Address：Building B5, No. 199 Xiqu Avenue, High-Tech West Zone, Chengdu, Sichuan Province

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