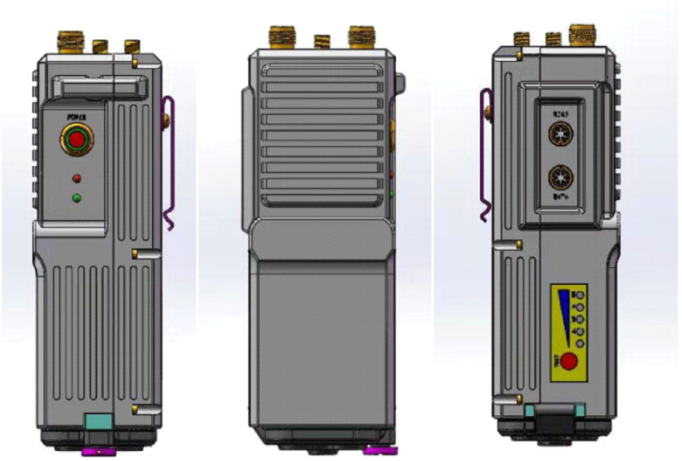

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Wireless ad hoc network handheld individual

Operation Guide

Version number: Vcan1401-Mesh20210220

Manufacturer: Shenzhen Huaqia Technology Co., Ltd.

Table of contents

1、Brief introduction of hand-held illustration leaflet soldier

As a mobile self-organizing network, Vcan1401-Mesh supports any network topology. Unlike traditional wireless networks, it is a wireless broadband system with no center, distributed, multi-hop relay, dynamic routing, strong invulnerability, and good scalability. It uses its own routing protocol internally to complete the wireless communication between nodes through wireless multi-hop forwarding. An ad hoc distributed broadband wireless network transmission system with an efficient MAC layer transmission protocol and a two-layer routing protocol. All nodes are completely equal, without any infrastructure, and can quickly build a dedicated self-organizing network between mobile nodes, provide instant adaptive communication, have excellent broadband performance, and support the real-time transmission of multimedia information such as video coding and audio coding. The system technology has the advantages of strong anti-interference ability, high spectrum efficiency, long transmission distance, anti-fading ability, and strong diffraction ability. It can realize real-time and high-quality wireless two-way data transmission functions in complex and non-line-of-sight environments.

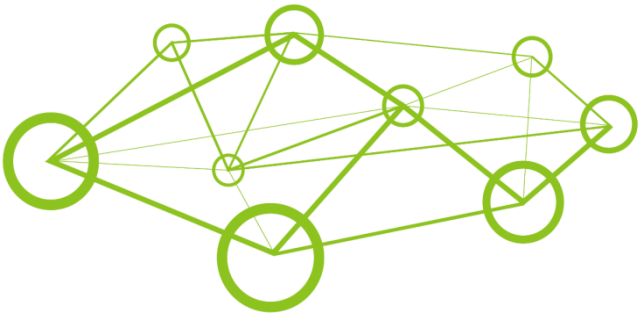
Vcan1401-MeshSeries Technical Features

*There is no need to set up a central station and complex system configuration. After the site is powered on, it will automatically form a network, and the communication can be started in "seconds";

* Arbitrary topology, multi-hop relay, relay forwarding;

* The logical attributes of each node can be flexibly configured;

* At present, the same frequency network can support the interconnection of ≥32 nodes;



* The channel is encrypted with AES;

* The system data bandwidth peak value is 90Mbps;

* Strong anti-interference ability, high spectrum efficiency, long transmission distance, anti-interference

Strong falling ability, and diffraction ability

2. Technical parameters

- Communication frequency: 1415~1455MHz, adjustable in 1MHz steps;
- Transmission power: 2*30dBm (2*1W), 1dBm step adjustable;
- Bandwidth mode: 5 / 10 / 20 MHz;
- Modulation method: multi-carrier TDD-COFDM;

- Carrier modulation: BPSK/QPSK/16QAM/64QAM (adaptive or fixed);
- Receive sensitivity: -98dBm @ 10MHz;
- Communication distance: 30km (ground-air/air-air line-of-sight), 8km (ground-ground line-of-sight);
- Communication rate: peak 90Mbps (adaptive);
- Transmission delay:Single jump about 2ms;
- Multi-hop capability: up to 8 video jumps;
- Start time: ≤25S;
- Network access time: less than 1 second;
- Routing switching: less than 1 second;
- Data interface: network port x 2, RS232 x 2;
- Wifi supports 2.4G or 5.8G
- Battery power supply: 12V/2A, battery capacity 4000mAh;
- Power consumption: 6~12W
- Protection level: IP65;
- Working temperature: -40~+70℃;
- Size: Length: 155mm*W70mm*H45mm
- Weight: 800g

3、 Equipment List

sequence	name	unit	quantity	Remark
1	Wireless ad hoc network individual host	tower	1	Working frequency: 1410~1460MHz, power: 3dBm*2;
2	gooseneck antenna	attached	2	Working frequency: 1410~1460MHz, gain: 2dBi;
3	RS232 aviation plug control line	root	1	9 pin female
4	RJ45 aviation network cable	root	1	cable
5	18650 battery	Festival	4	
6	charger	indivual	1	
7	call headset	indivu	1	

		al		
8	2.4G antenna	Only	2	2dBI
9	5.8G antenna	Only	2	2dBI

4. Interface description

4.1 Capacity description

(figure 1)

4.2 Interface description

(figure 2)

1) After the antenna is installed, turn on the digital switch of the power supply. After the power is turned on, the red light of the switch power supply is on;

2) After the self-organizing network is working, the signal indicator light is on, and the signal is weak for a flashing alarm, and the light is off when the network is disconnected.

4.3 Data interface description

4.4 Battery Installation

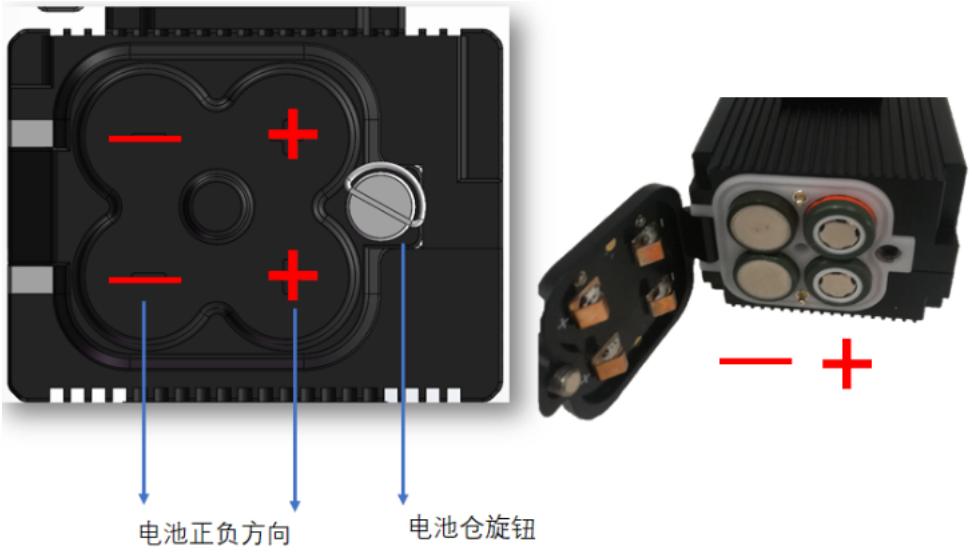


image 3

1) Note: Install the battery or replace the battery when the switch is off;

2) Twist the battery knob, open the battery compartment, and replace the battery, pay attention to the direction and polarity;

3) Replace the battery, press the cover tightly, and then turn the screw;

4) Keep the battery compartment dry and do not allow water to enter.

4.5 Equipment Installation

5、 Software Operating Instructions

5.1 Basic functions:

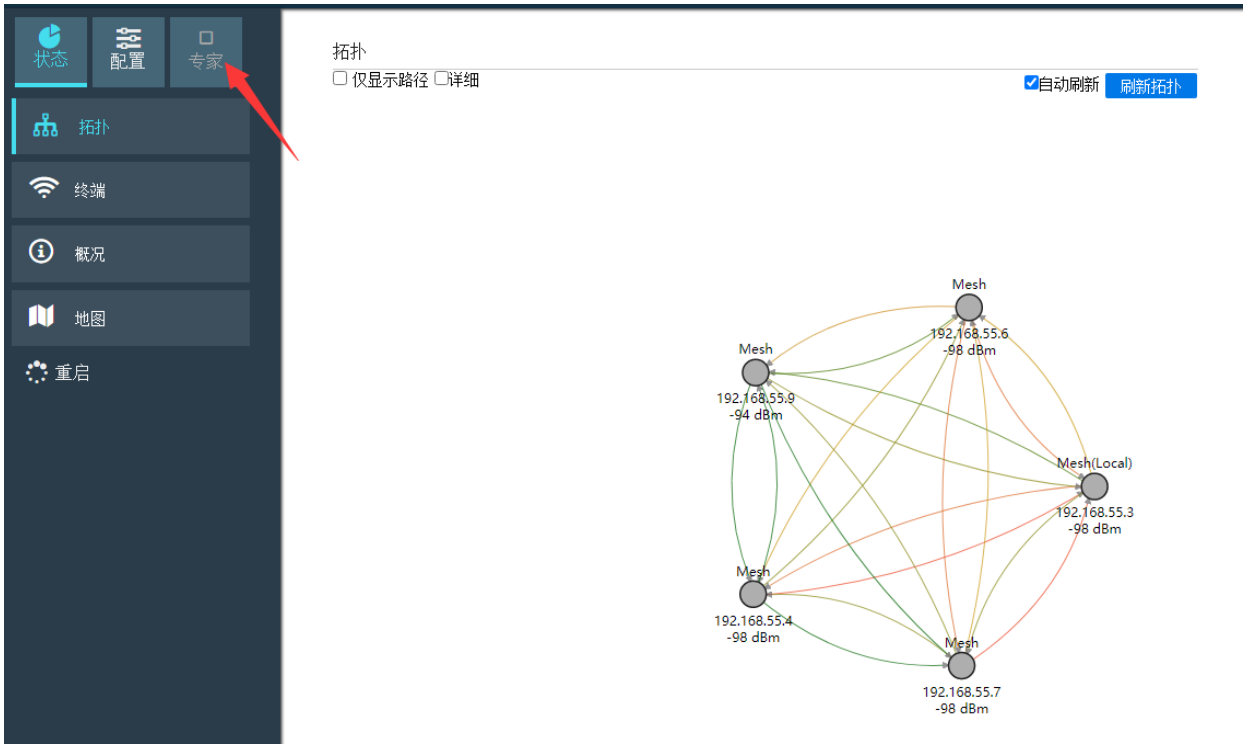
Support 5M, 10M, 20M bandwidth, real-time graphical interface display, real-time map indication, etc.

The software disables DHCP by default, and the default IP address: 192.168.17.1 If you forget the address, please connect the 9th pin of the 26PIN cable to the ground to reset the parameters.

Enter the IP address of the module in the browser, the default username and password are admin, and the software will restart every 12 minutes without authorization. It takes about 20s for the module to connect to the network from power-on. The recommended browser is Chrome.

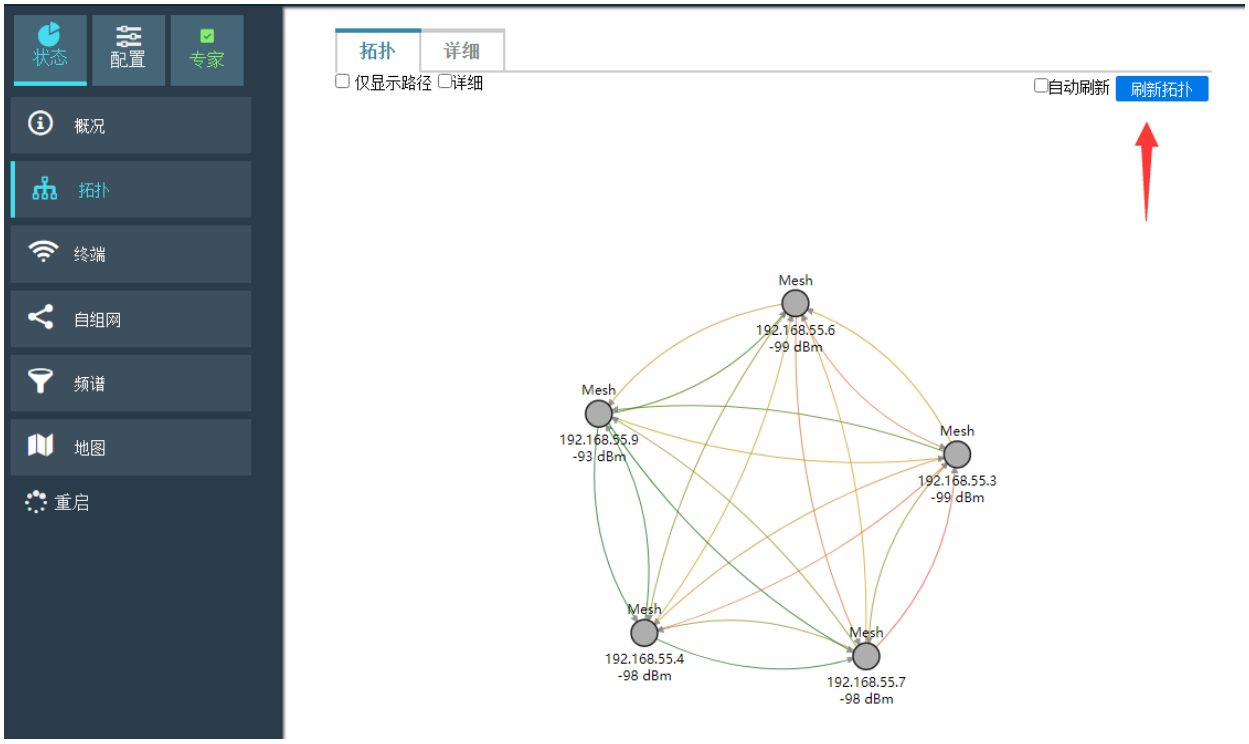
After entering, it defaults to simple mode, click expert mode to unlock more settings, suitable for professional debugging.

Status section:

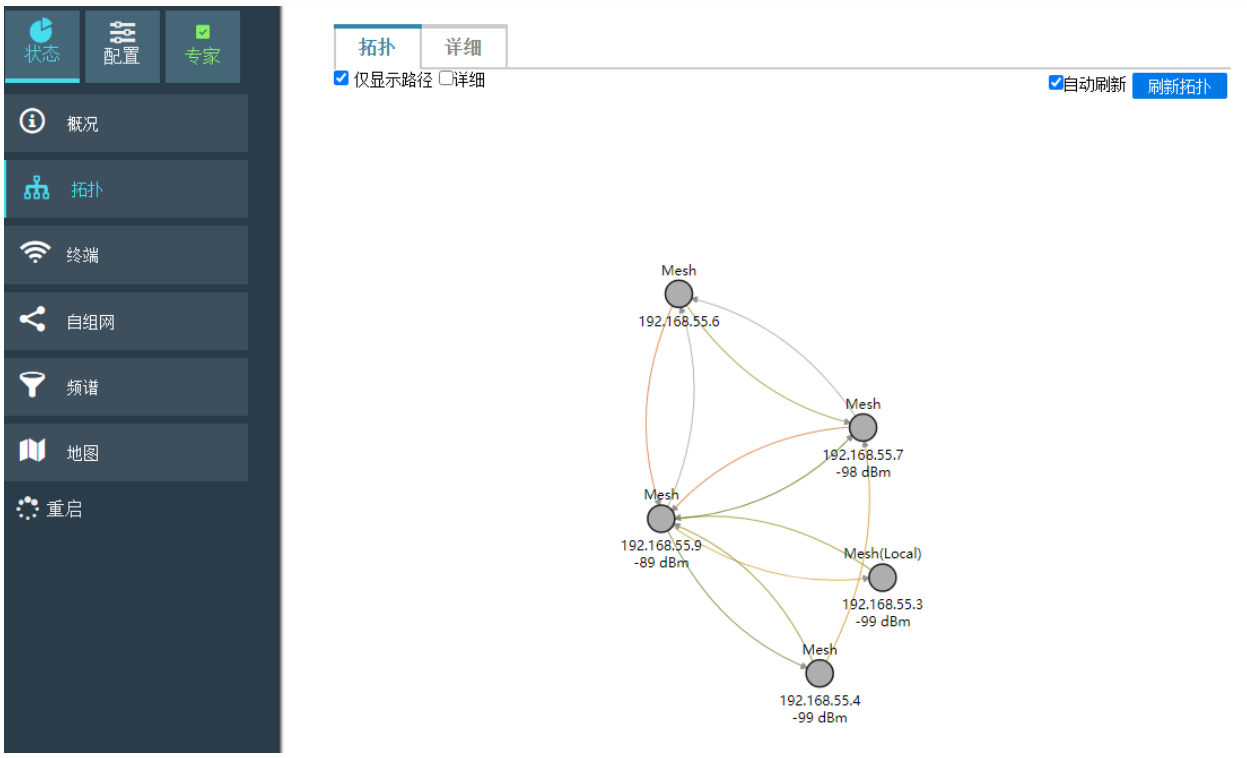


Overview:

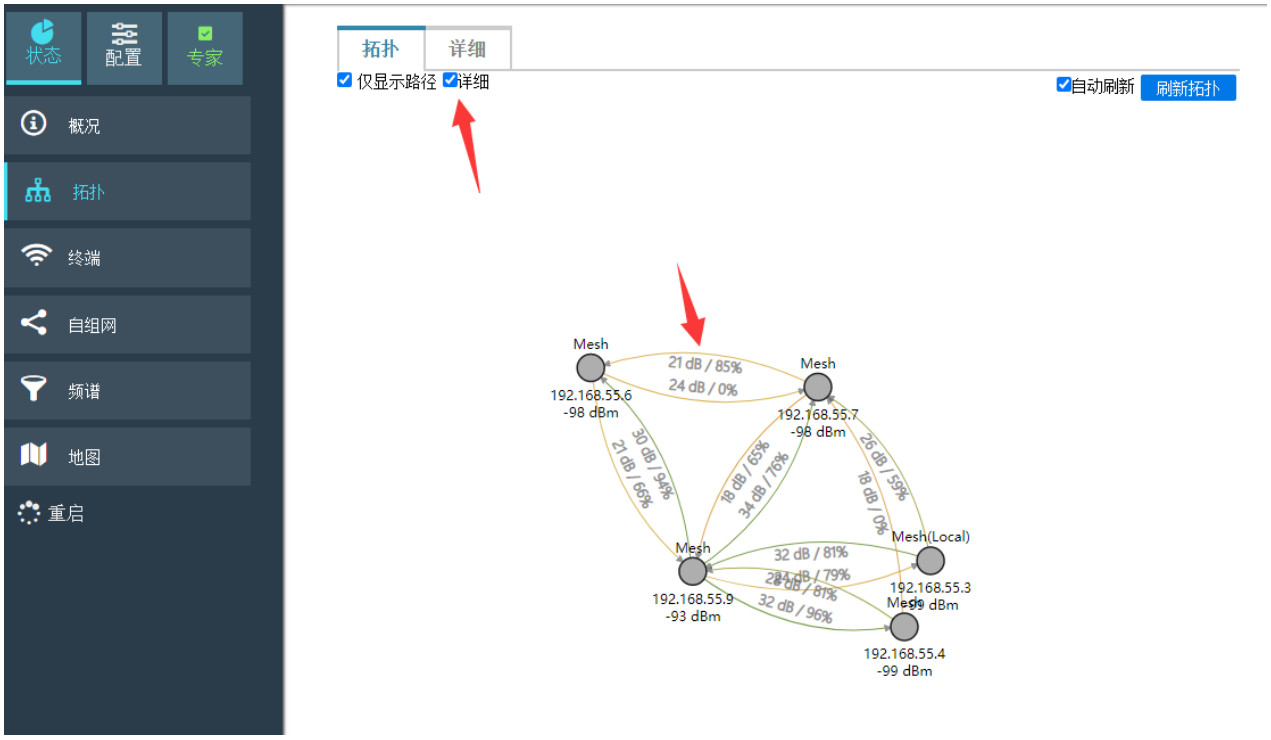
Topology map: (automatic refresh is turned off by default to save bandwidth, you can check automatic refresh)



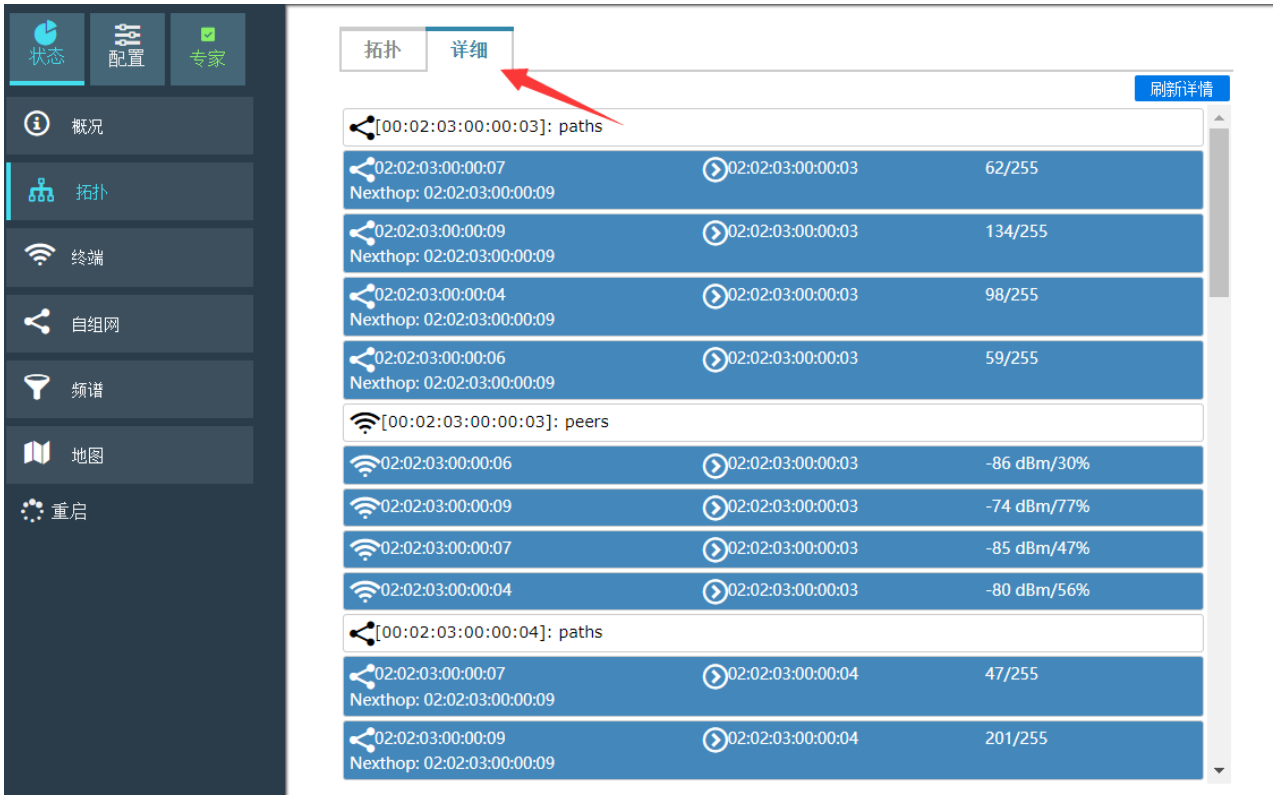
Check only the display path, you can know the direct jump point relationship of each module



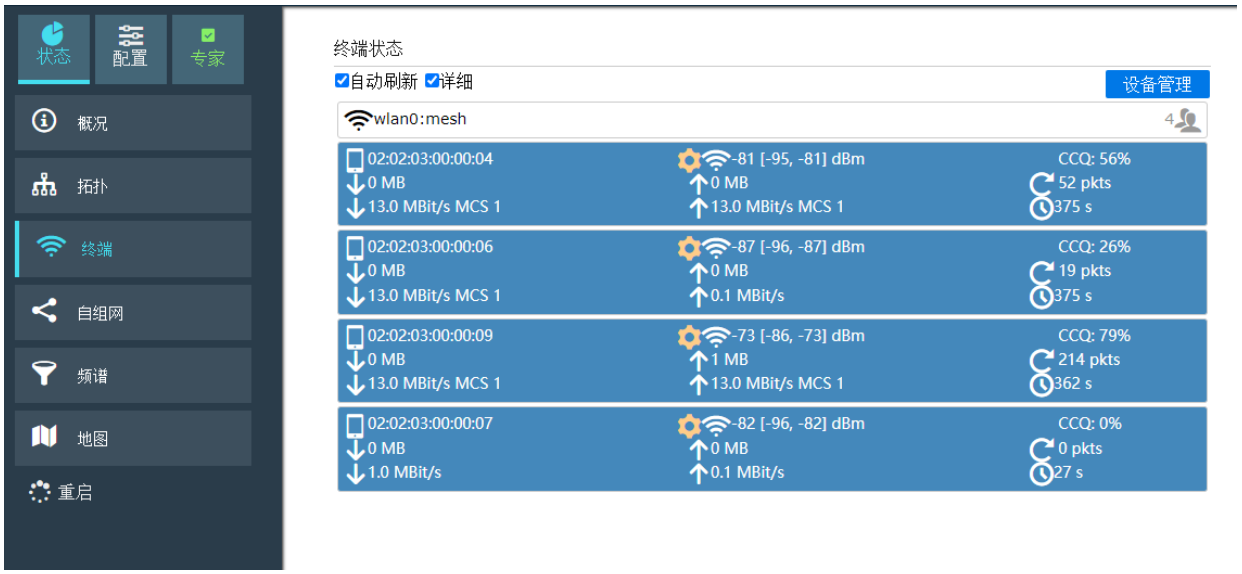
Check the details to judge the data connection status of each module. These are displayed dynamically in real time



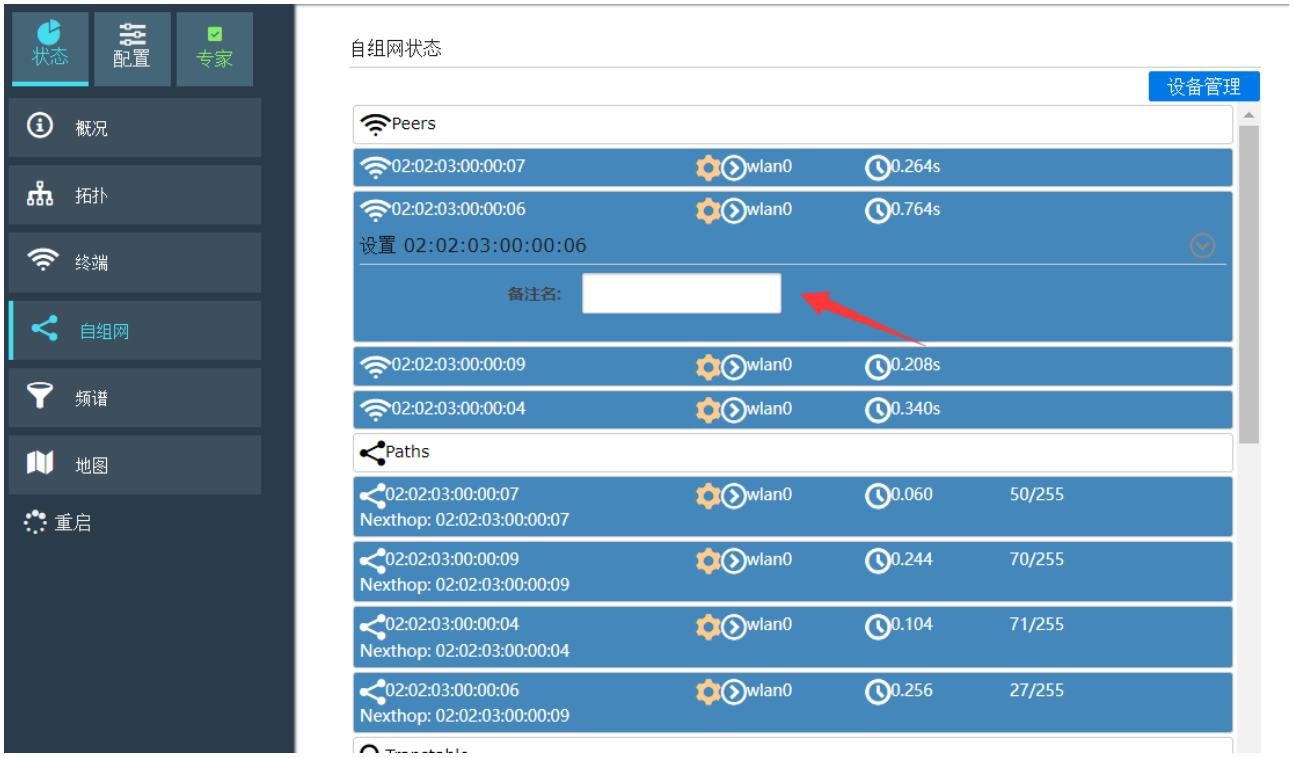
Click Details: You can know the specific situation of each module directly:



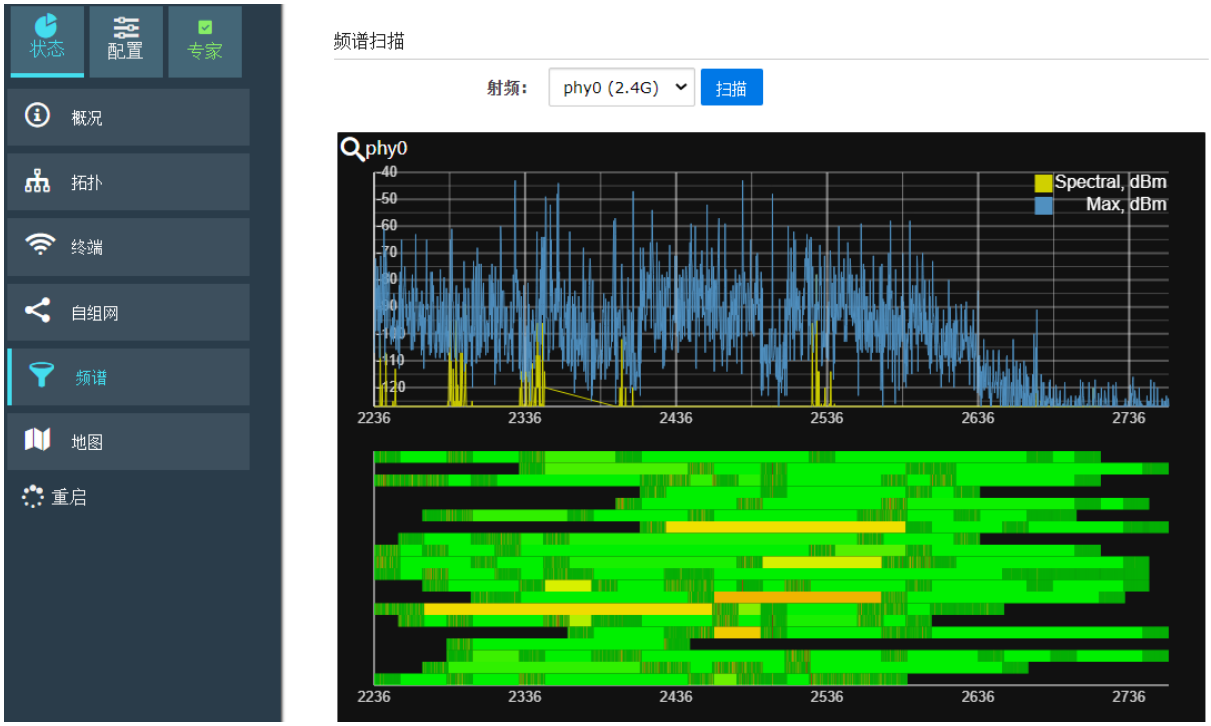
Terminal state:



Ad hoc network: You can remark the name, of course, it can also be operated in the terminal state.



Spectrum scanning: Check the interference of each frequency band. Of course, the frequency bands of different modules are purchased, and the scanning frequency bands are different.



Map: (Of course, to know the location information of each terminal, GNSS modules such as GPS or Beidou need to be installed)
Support tile maps, image maps, network maps, etc.

Configuration section:

Mode: 1. MESH node or bridge configuration

2. Wireless configuration:

2.1 Transmission power configuration, the power of different products purchased is different.
Channel bandwidth: 5M 10M 20M 40M
Channel: Different channels are used to purchase different products
The coverage distance (meters) needs to be filled in according to the actual situation. If it is set to 3000 meters, it is impossible to actually run to 5000 meters.
Number of Antennas 2
Fixed MCS rate: Can be set to off for automatic selection. If you want stable transmission, it is recommended to set manual, range (MCS0 to MCS15)
Bandwidth, Modulation, Rate
Limit MCS rate: It is recommended to enable it. After enabling it, if the fixed rate is MCS4, the software will automatically select the best modulation method from MCS0 to MCS4 during the test.

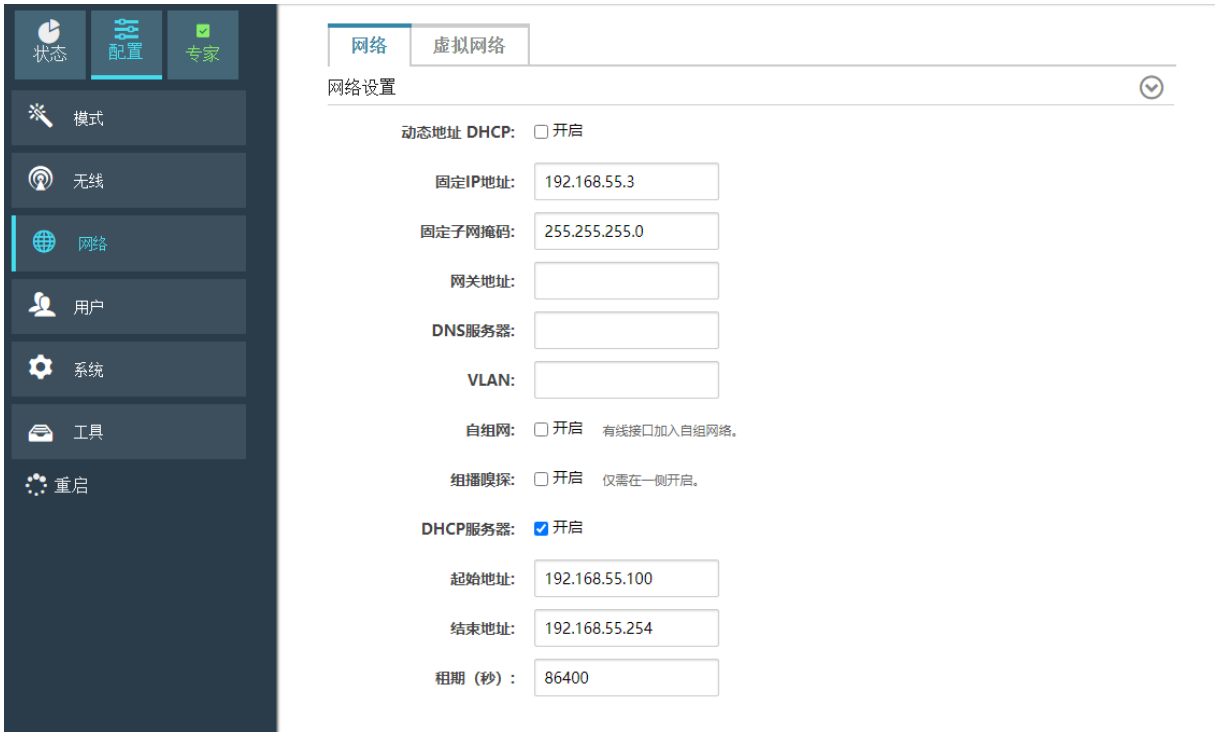
		5M	10M	20M	40M
MCS0	BPSK 1/2	1.7M	3.3m	6.5M	13.5M
MCS1	QPSK 1/2	3.2m	6.5M	13m	27m
MCS2	QPSK 3/4	4.8m	9.8m	19.5M	40.5M
MCS3	16QAM 1/2	6.5M	13m	26M	54M
MCS4	16QAM 3/4	9.7M	19.5M	39M	81M
MCS5	64QAM 2/3	13m	26M	52m	108M
MCS6	64QAM 3/4	14.5M	29M	58.5M	121M
MCS7	64QAM 5/6	16M	32.5M	65m	135M
MCS8	BPSK 1/2	3.2m	6.5M	13m	27m
MCS9	QPSK 1/2	6.5M	13m	26M	54M
MCS10	QPSK 3/4	9.7M	19.5M	39M	81M
MCS11	16QAM 1/2	13m	26M	52m	108M
MCS12	16QAM 3/4	19.5M	39M	78M	162M
MCS13	64QAM 2/3	26M	52m	104M	216M
MCS14	64QAM 3/4	29M	58.5M	117M	243M
MCS15	64QAM 5/6	32.5M	65m	130M	270M

From MCS0 to MCS7, two wireless ports send the same data in order to improve the stability during the

movement.
From MCS8 to MCS15, the two wireless ports send different data, which can make the rate X2
If it is in a mobile state, it is recommended to use BPSK or QPSK to transmit data. 16QAM and 64QAM are suitable for use with fixed transmission.
If MCS8 to MCS15 are used, it is recommended that the antennas of the two ports be 90 degrees to each other, for example, one is vertical and the other is horizontal.
If drones are used, MCS0 to MCS2 are recommended.
The greater the bandwidth, the lower the sensitivity. Same goes for modulation.

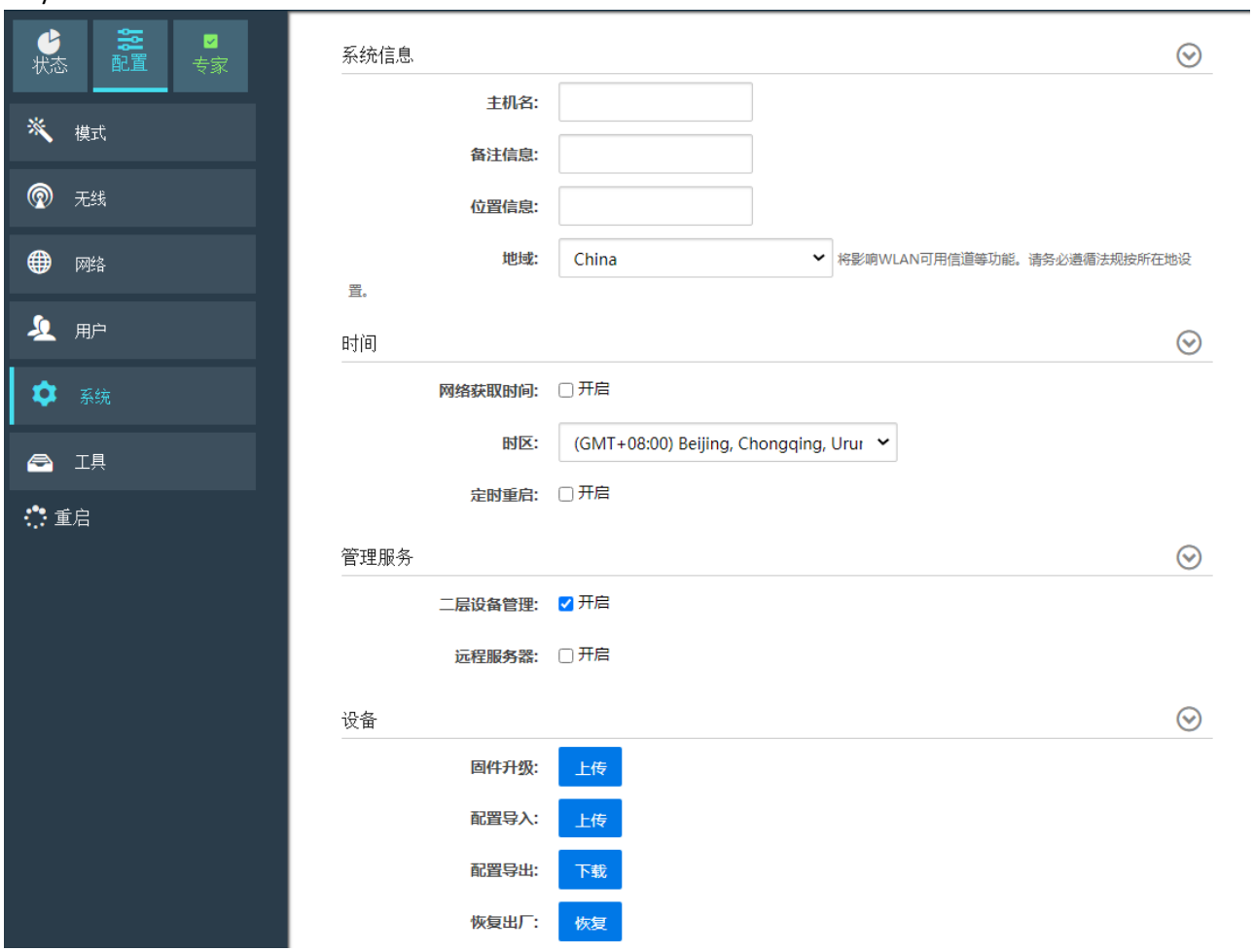
above rate unitbps

3. Network:



4. User management:

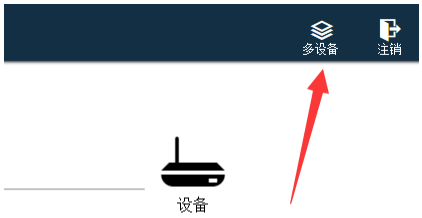
5. System

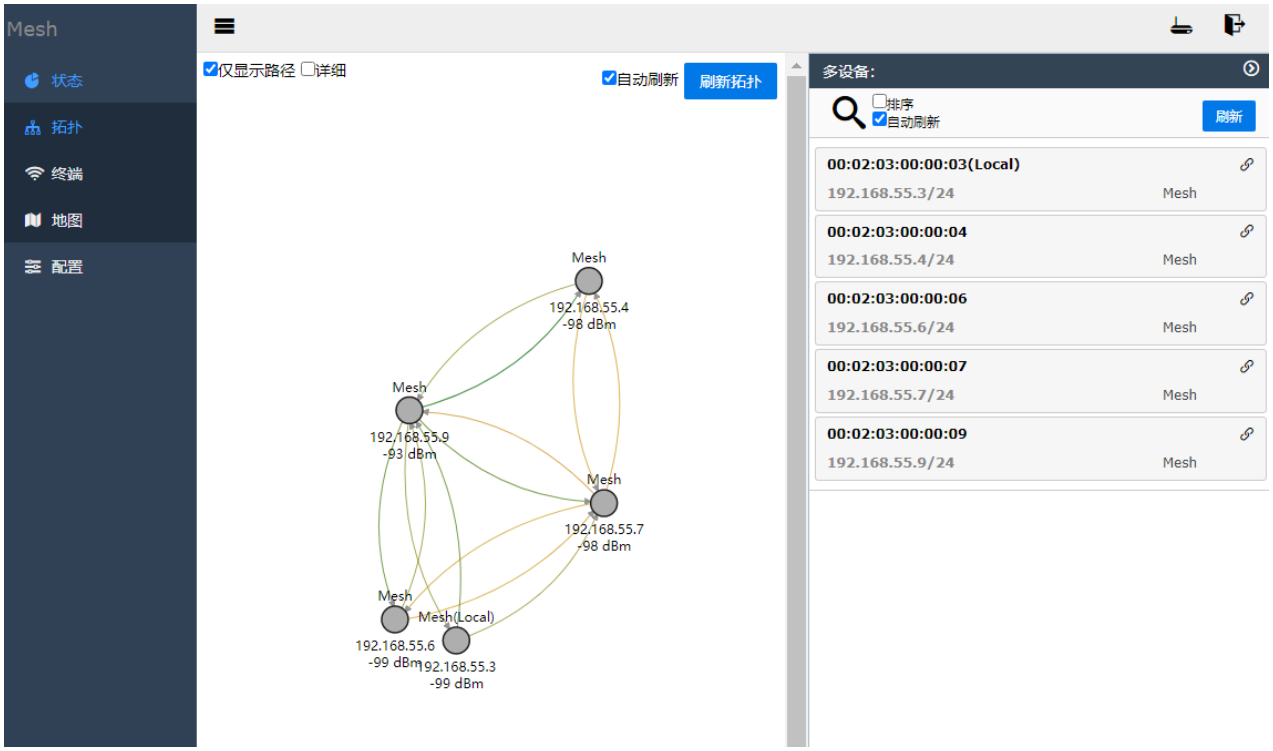


The software authorization is here, if there is no authorization, restart every 12 minutes

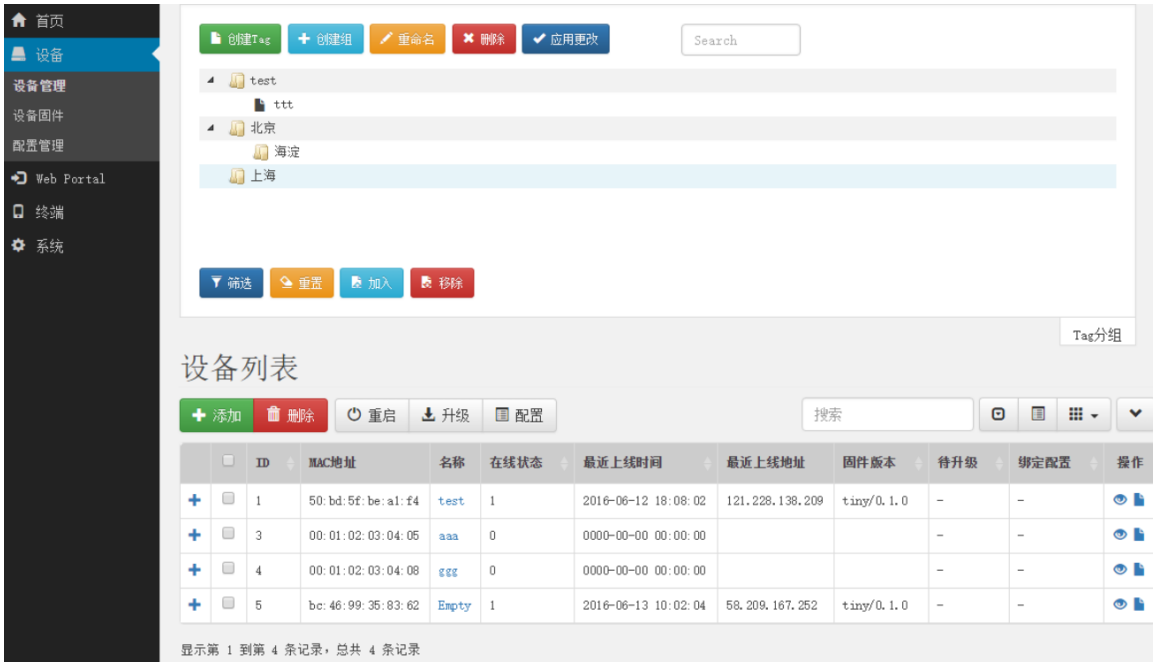
6. Tools Configure serial port, GPS/Beidou/GNSS, 4G/5G access and other parameters

6.1 Multi-device management, in the upper right corner, you can log in and manage users remotely, and it is also a real-time dynamic interface display or map display.





Here is the introduction of ad hoc network configuration and control under WEB.
Of course, you can also provide the code and design the remote control software yourself. For example:



The HTTP protocol is adopted, and the penetration ability is strong, and the device can be located at the back end of the firewall and NAT device.
Use digital signatures to ensure communication security and prevent counterfeit servers from sending instructions.
Optionally encrypt the communication content.

6.2 Serial port software settings:

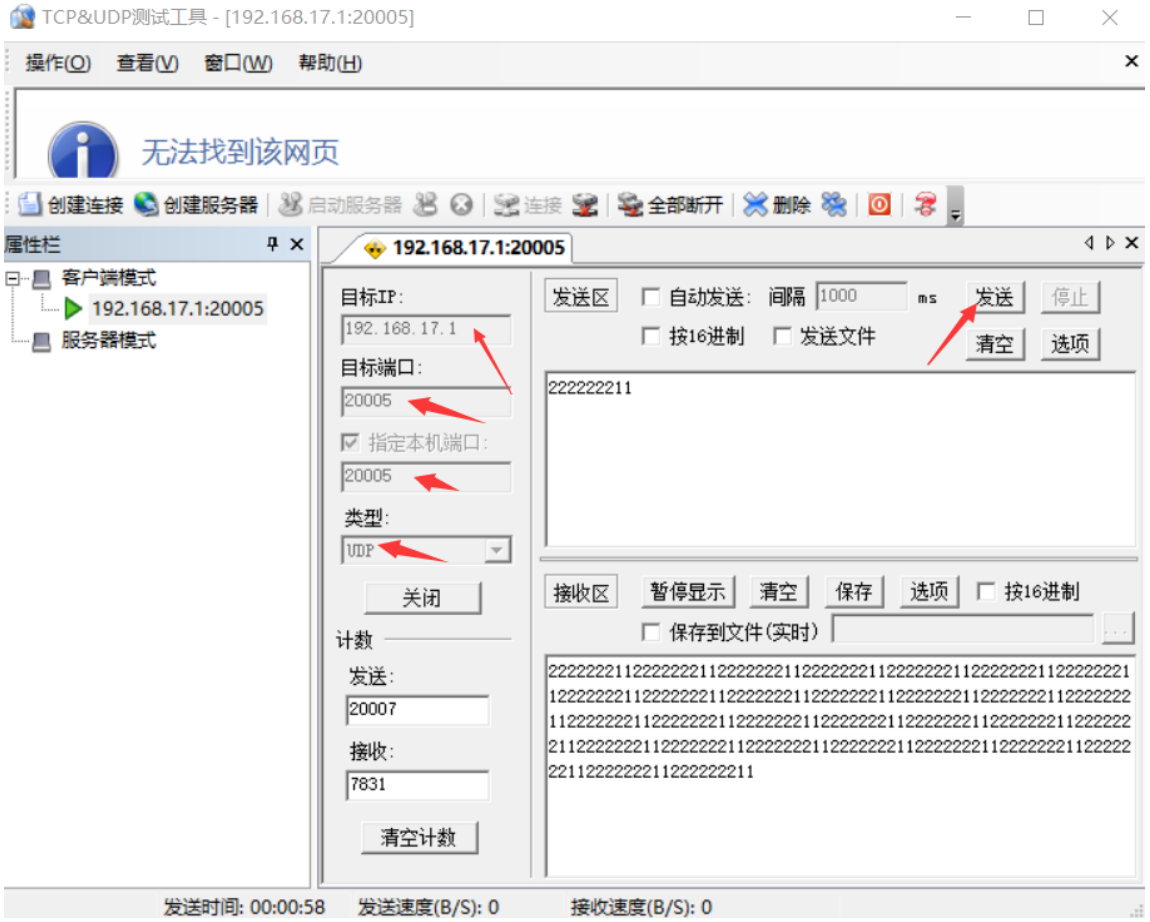
Select Expert Mode, Tools, UART Interface.

choose new

Attention, if you use serial port to transmit serial data, you have to choose ttyS0 (COM1 of hardware) and ttyUSB0 (COM2 of hardware), ttyATH0 is invalid, mode: network
Baud rate 115200, stop bit 1, parity none.
Name 1, protocol UDP, IP address, 192.168.55.100 (the IP address here is the IP address of the other device, for example, input the IP of the computer for the computer, and input the IP of the device for the device).
Port 20005, 20003. Choose a port number

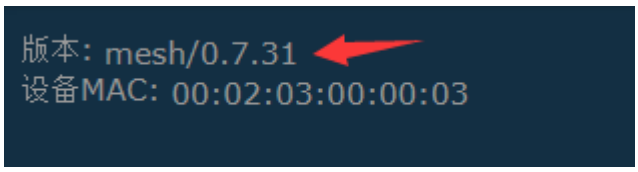
The computer's IP is set to a fixed 192.168.17.100

Short the TX RX pins of COM1 and COM2 of the device.

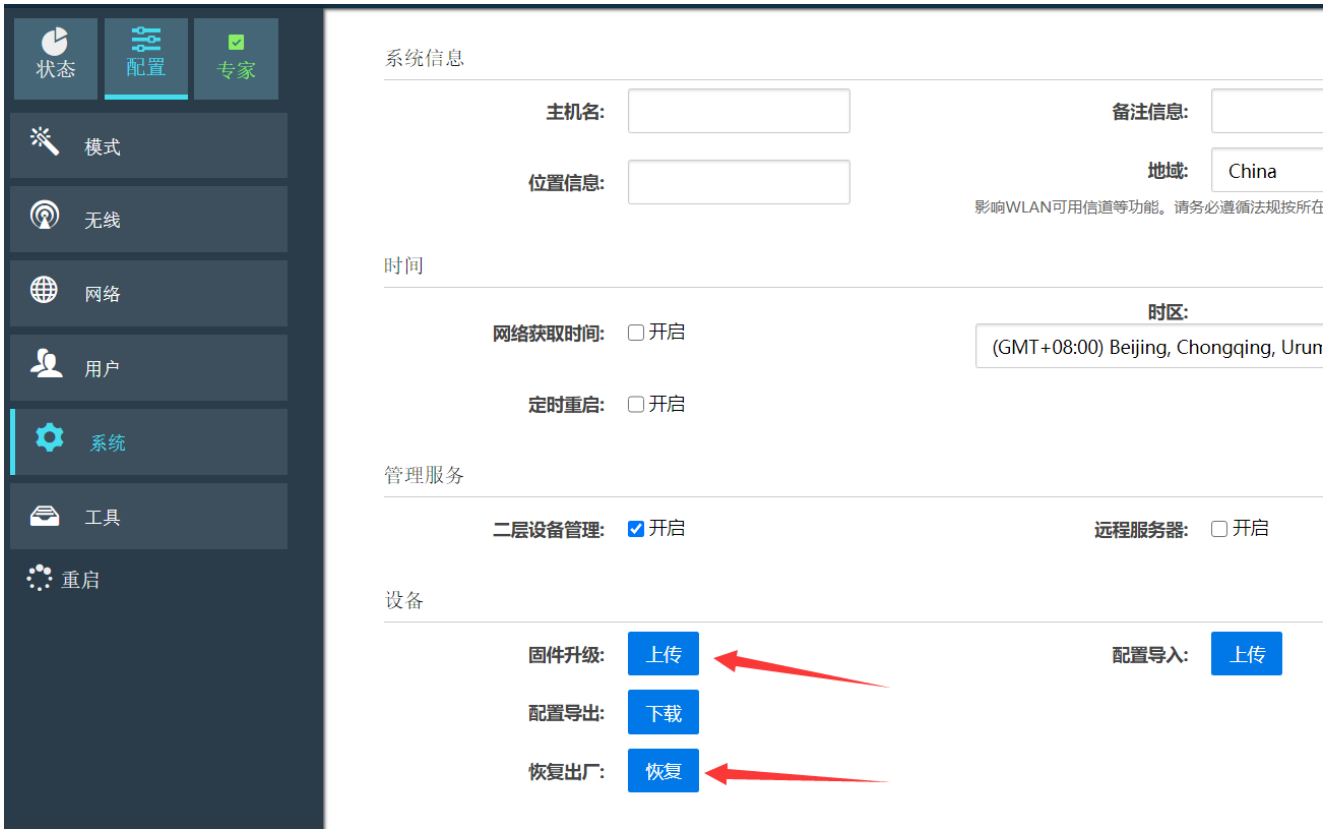


Use the TCP UDP test tool to fill in the IP and port of the device.
Send to loop back data.

if unsuccessful
The system recommends upgrading to the latest version first, the latest version is 1.0.2, see the lower left footer.



After upgrading the system, restore the factory settings and set up again.



Pay attention to restore the factory settings, the IP address will become the default 192.168.17.1. DHCP is off by default

After recovery, you can turn on DHCP, and then set the IP address. After setting, it is recommended to stick a label on the shell for later maintenance.