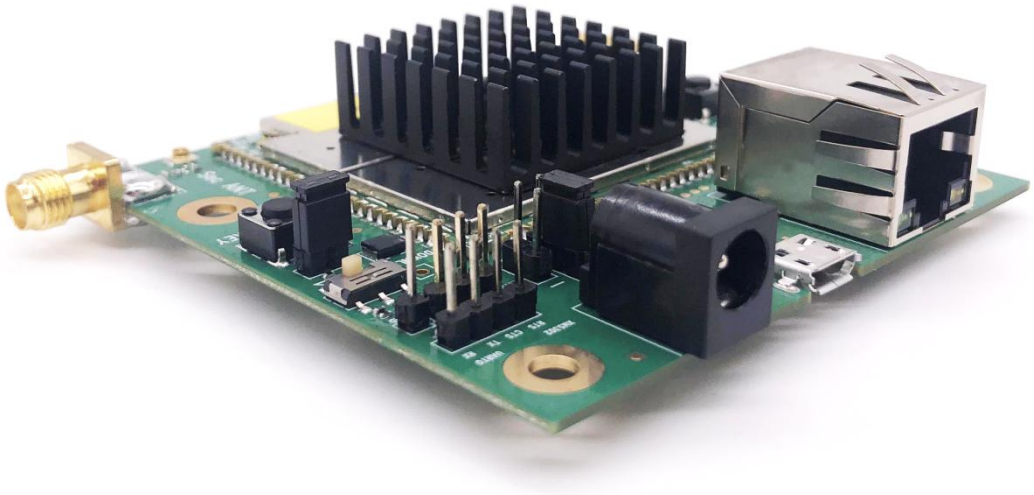
User Manual of FD-6100

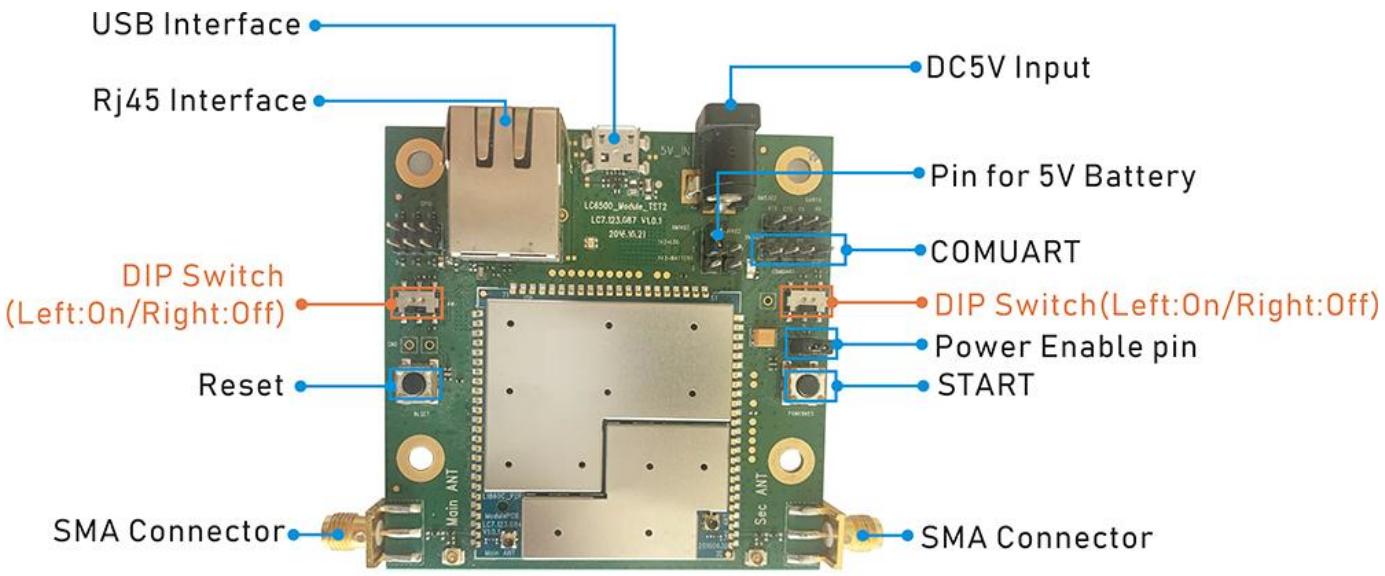
Wireless MESH Ethernet & Full Duplex TTL Serial Data Module



Catalogue

1.Hardware

1.1. Interface



Note:

- Using a 5V/2A adapter for power supply.
- Before powering on, set the two DIP switches to the left side.
- Please install the antennas firstly before powering on. Or the device will be burn out.
- For short-distance test, distance between two units should be more than 10meters before powering on. Otherwise, the equipment may be damaged.
- We suggest to use IE browser (version 11 or above) for Web UI login.

1.2.COMUART

COMUART is 2.85V voltage domain and compatible with 3V/3.3V level.
Control Data Transmission: TTL mode.
Baud rate: 115200bps, full-duplex communication
Transmission Mode: Pass-through mode

The data is transmitted on the network by means of broadcast mode. After successful networking, each FD-6100 node can receive a serial port instruction.

Note: If you want to distinguish between sending, receiving and control, you need to define the format yourself.

Baud Rate: The max baud rate is 115200bps(The total rate of unidirectional receiving or unidirectional sending)

Baud rate 115200 = 115200 (bits/second)

If there is no check bit, divided by 10, resulting in a number of bytes per second:
Baud rate 115200 = 115200 (bits/second) = 11520 (bytes/second)

Divided by 1024, which is the number of KB per second:
Baud rate 115200 = 115200 (bits/sec) = 11.25 (KB/sec)

= =

If there is one parity bit, the number of bytes per second should be obtained by dividing by 11.

Finally:
Baud rate 115200 = 115200 (bits / sec) = 10.27 (KB / sec)

2. Software Setup

2.1. Brief Introduction

The network management software is applicable to Windows 10 / Windows 11 / Windows 7. The parameters inputs, node configurations, and configuration states are displayed on the UI interface based on the cooperation of the WEB server and the browser.

2.2. Software Opening and Login

Open the software needs to opens the server firstly and then accesses the webpage from the browser for device configuration.

Open the server
Open the server software directory, execute mesh _ windows _ amd64.exe with administrator rights, and the following interfaces appear after normal opening:

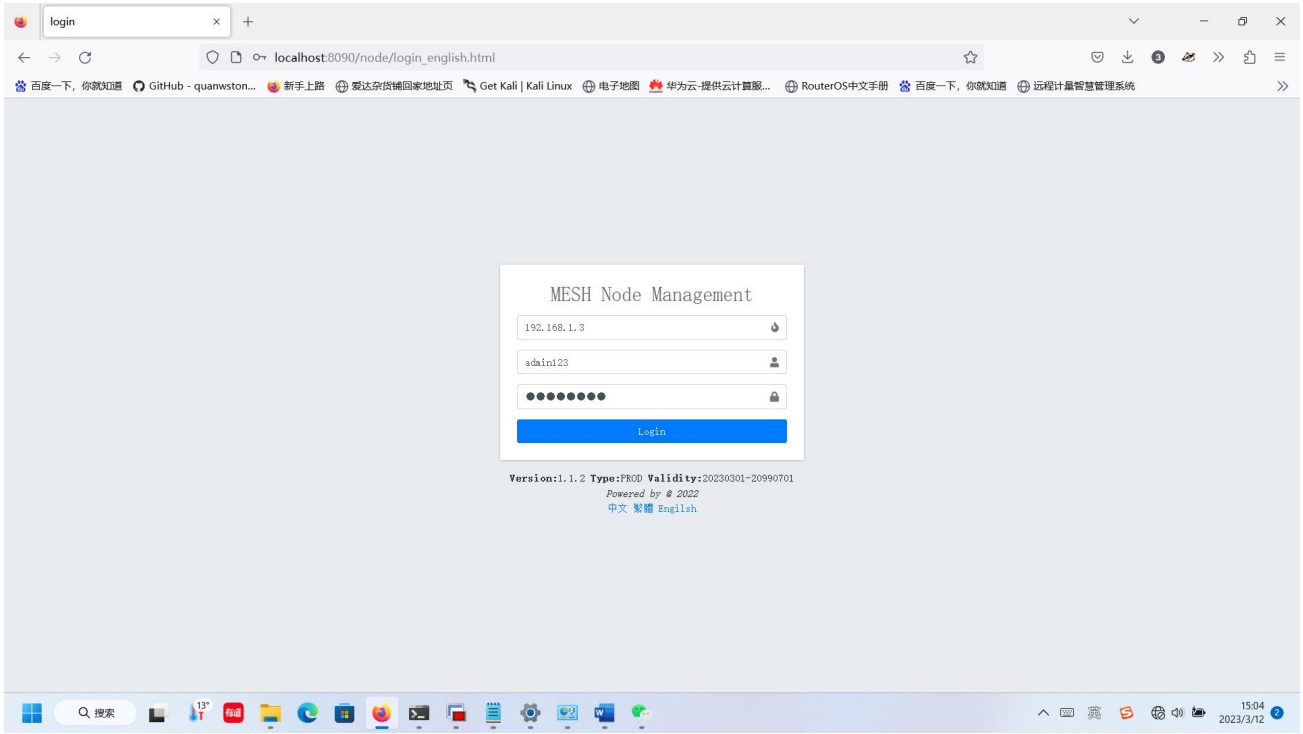
Browser Access:

Opens the browser and the initial login link: *http://localhost:8090/node/login_english.html*

IP Address: 192.168. 1.3 (Device IP)

Initial username: admin123

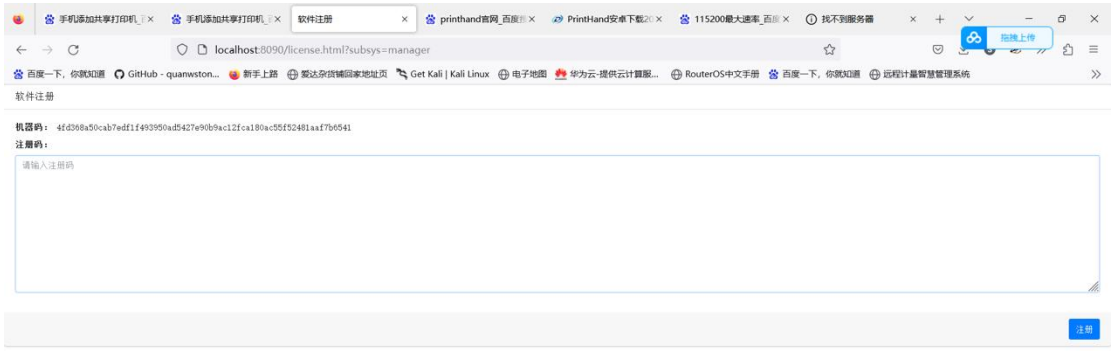
password: admin123



Input the IP address of each node, user name(admin123) and password(admin123), you can access the configuration.

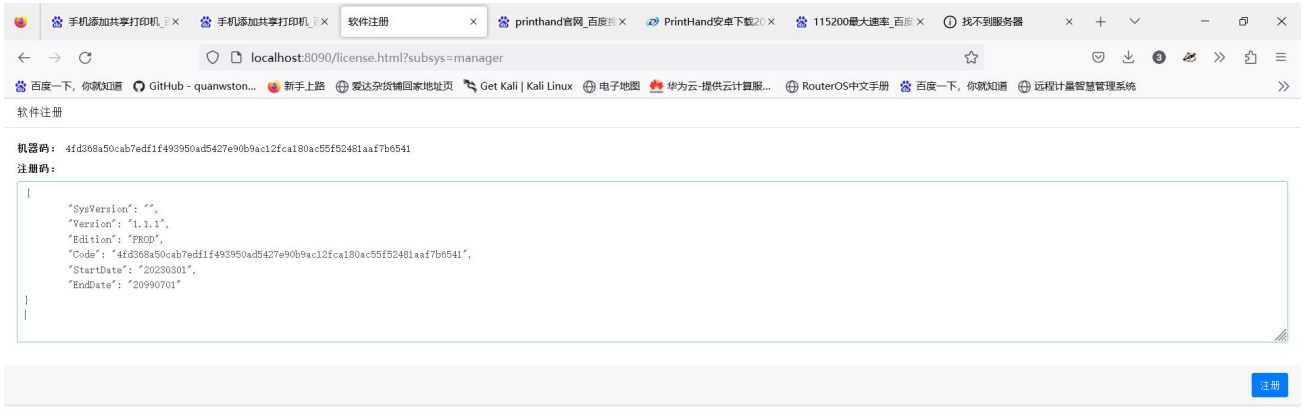
2.3. Software Registration

The software needs to be authorized to register for use, and if you open it without authorization, the following interfaces will popup:



Please send the code *4fd368a50cab7edf1f493950ad5427e90b9ac12fca180ac55f52481aaf7b6541* to us and we will activate the code to the following format:

When you get the activation code, input them into the blank, click the “Register”. Now the software can be used normally.



2.4.Software Configuration

2.4.1.The Main Interface of Software

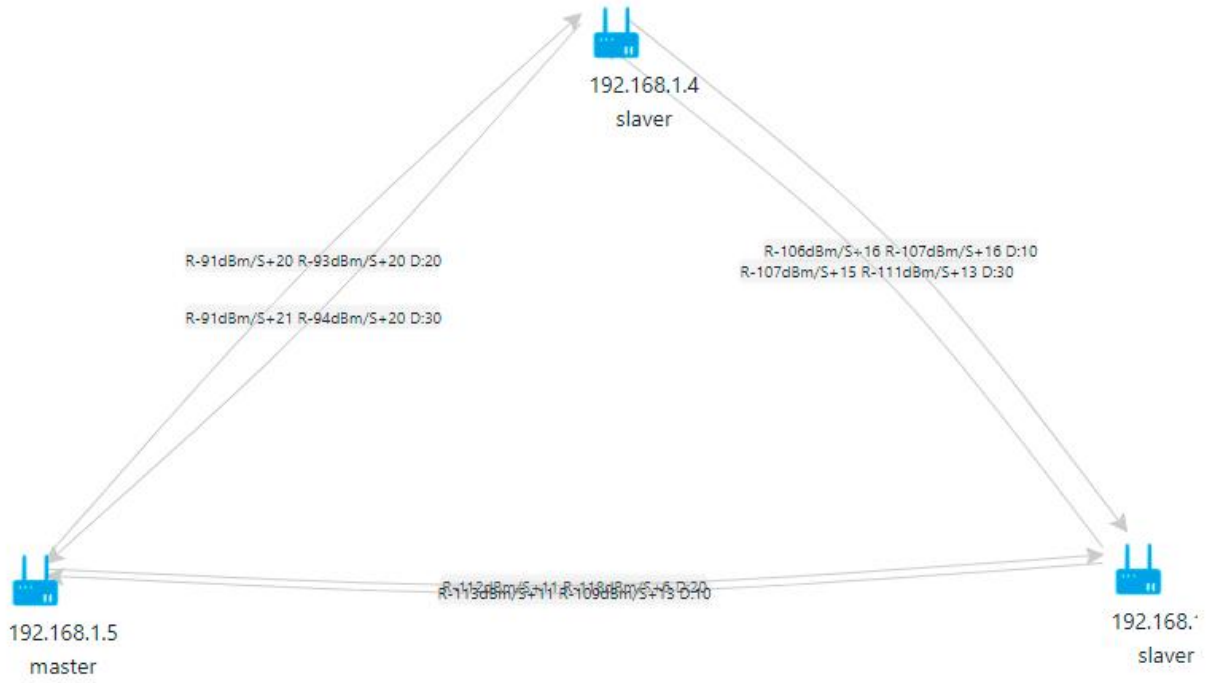
After login, you will see the following page.
A: Software Configuration
B: The number of current active nodes
C: Active Node Topology

D: Software control region
E: Topology Refresh Control Region
F: Software version and license validity period

3.4.2.Software Topology Profile

Ad hoc network topology brief introduction(FD-6100):
As shown in the below figure, the AD hoc network topology mainly shows the connections between nodes, including star network, mesh network, and chain network.
R means RSRP
S means SNR
D means a distance between the two nodes.

Slaver and Master represent the logical status between nodes. All the nodes dynamically and automatically adjusts their logical status based on network and wireless conditions.



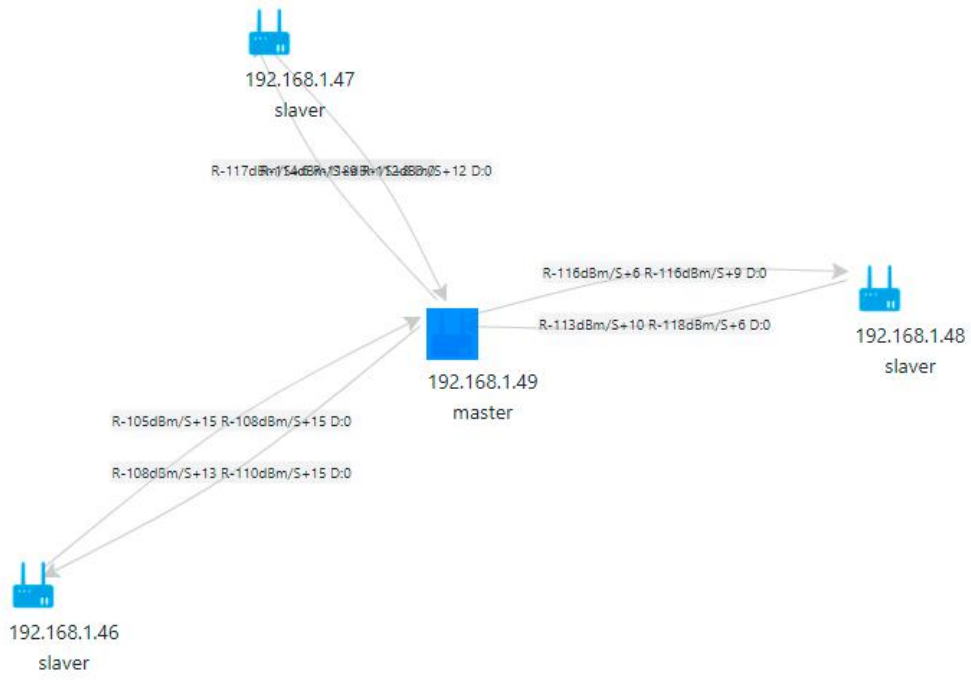
Star network Topology(FDM-6600):

The following topology is a typical star network.

R means RSRP

S means SNR

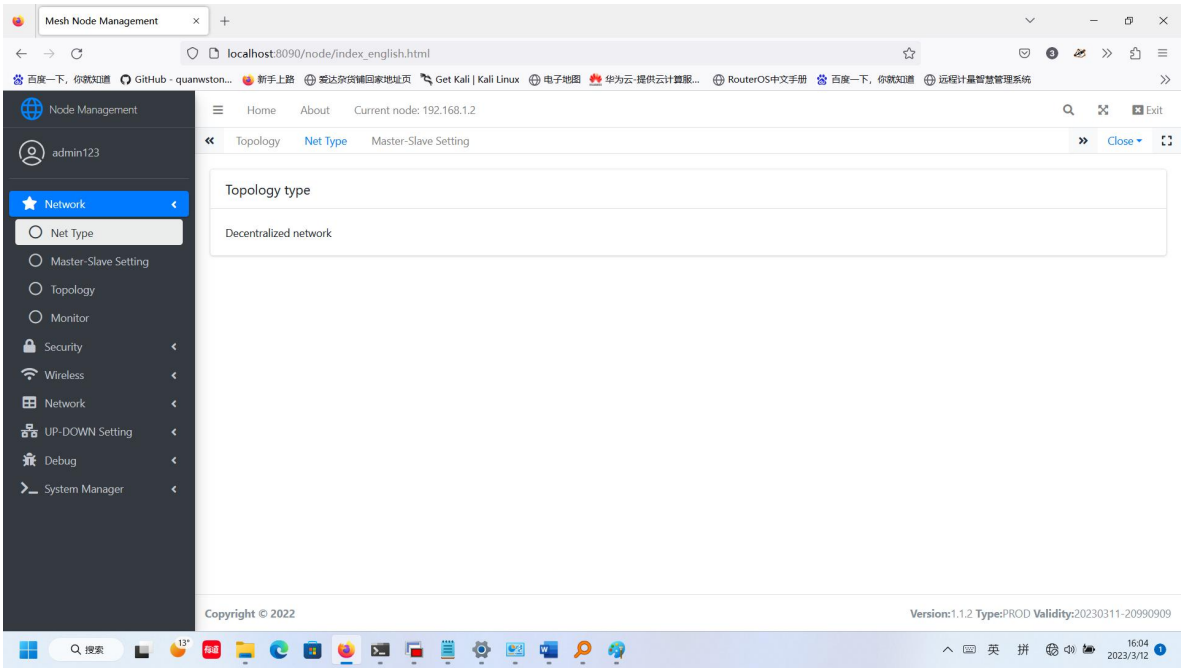
D means a distance between the two nodes. The Slaver and Master are represented the logical status between nodes. The logical state between nodes must be configured based on requirements and cannot be automatically and dynamically adjusted as needed.



2.4.3. Network Dynamics

2.4.3.1. Node Type

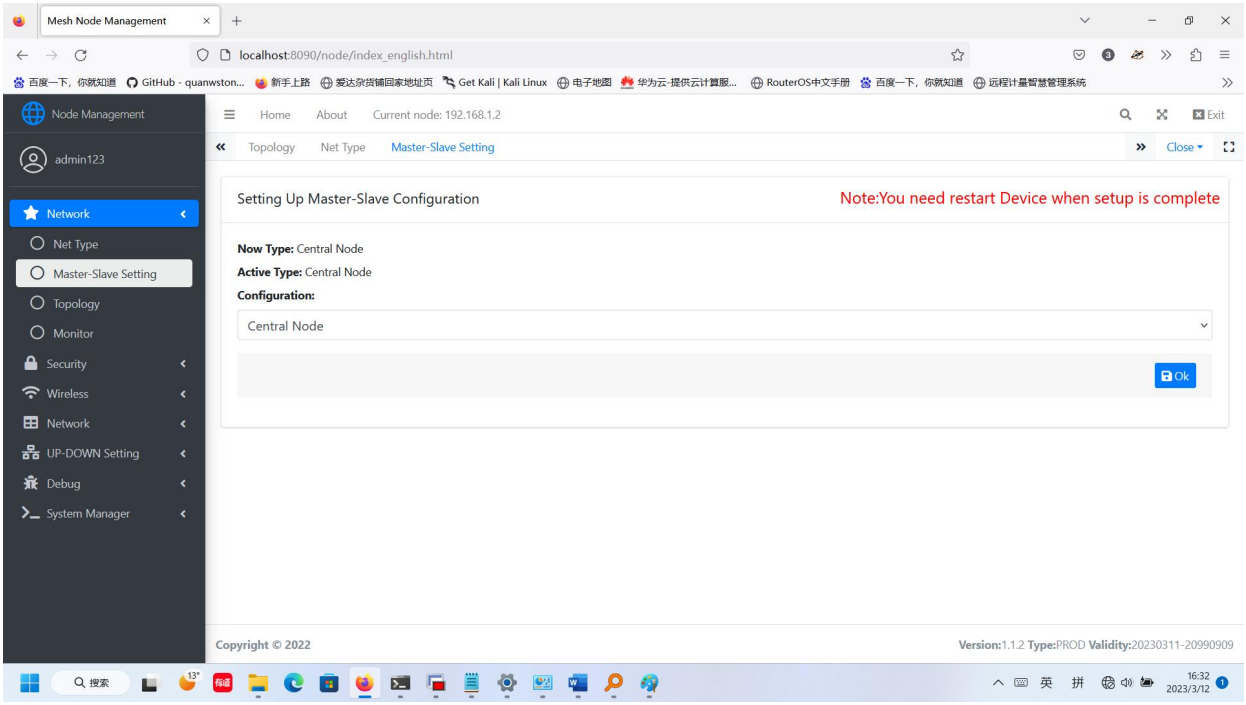
Automatically obtain the node type: AD hoc network(When you use FD-6100) or star network(When you useFDM-6600).



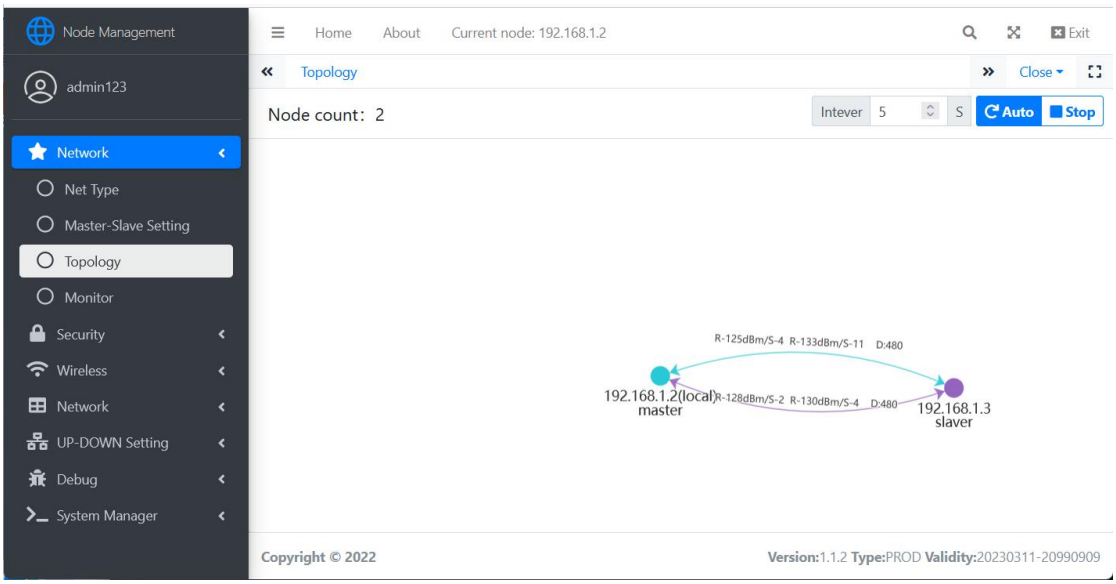
2.4.3.2. Master-Slave Setup

If you use FD-6100,mesh network, just ignore it. No need setup.

If you use FDM-6600, the star network, you need to setup it as needed. And in one wireless network, only one central node can be configured.

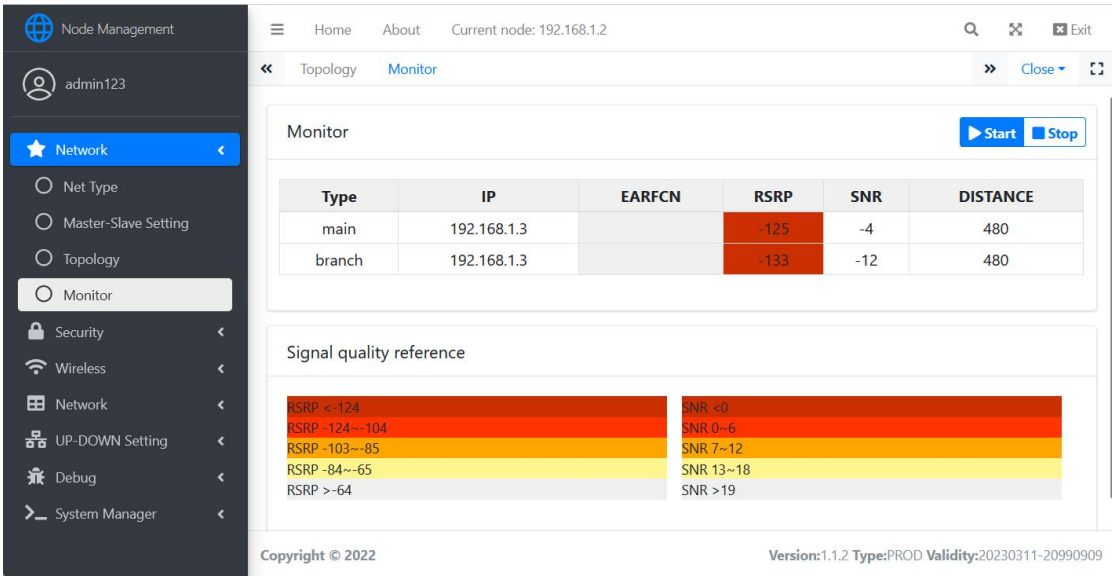


2.4.3.3. Dynamic Topology



2.4.3.4. Dynamic Monitoring

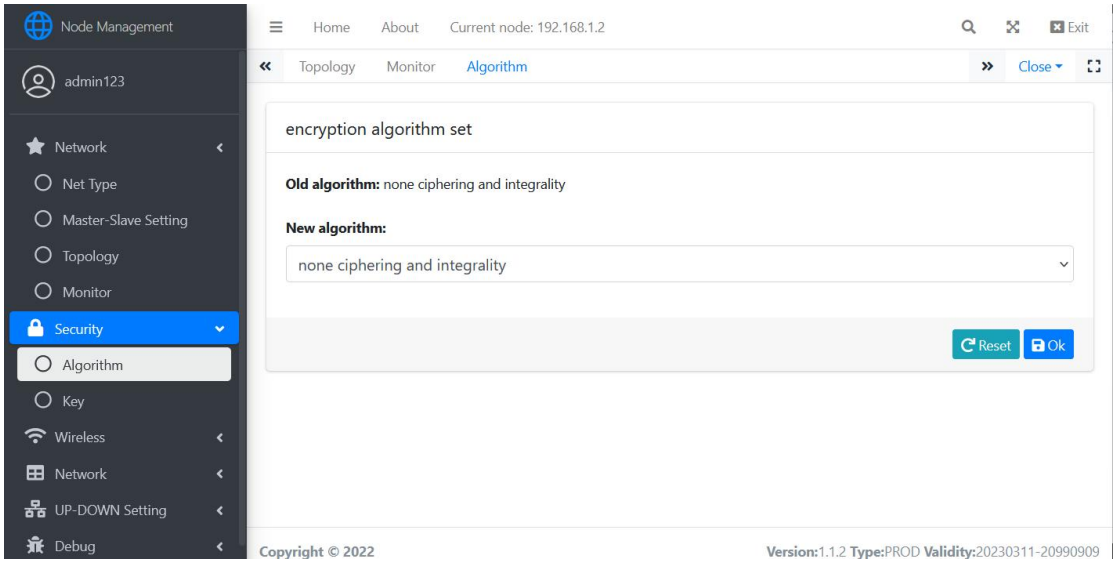
Dynamic monitoring shows the wireless information received by the node from other nodes, such as RSRP, SNR, and distance,etc.



2.4.4.Security Settings

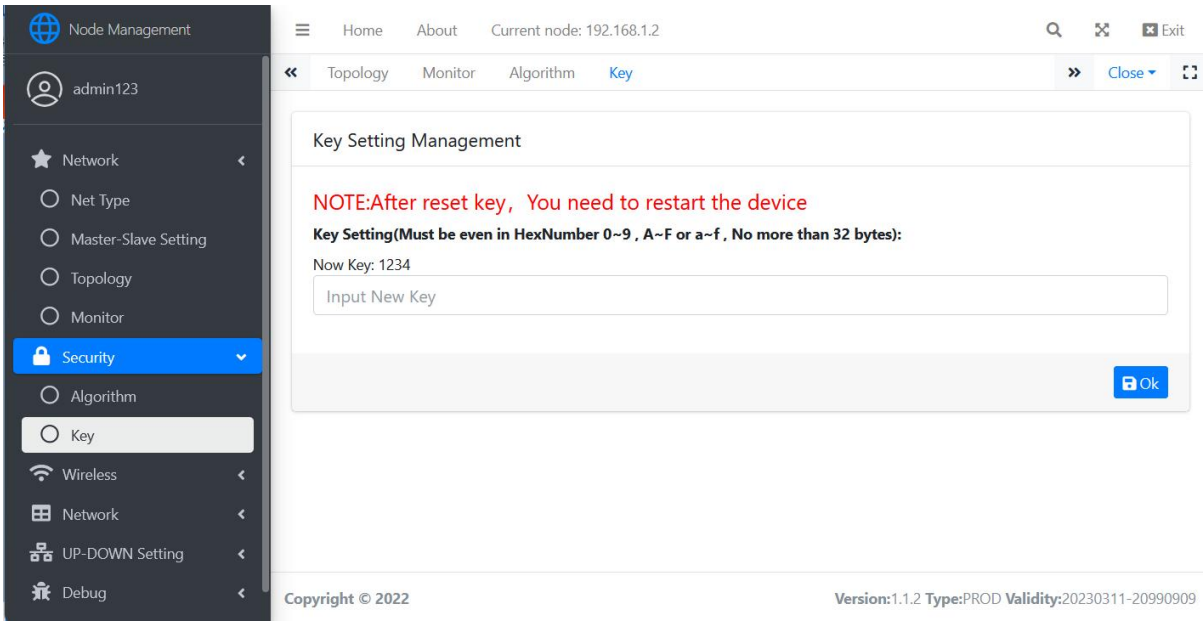
2.4.4.1. Algorithm Settings

The algorithm setting is mainly to select an algorithm used by the network. The wireless network supports SNOW3G, AES18, and ZUC3 algorithms.



2.4.4.2. Key Settings

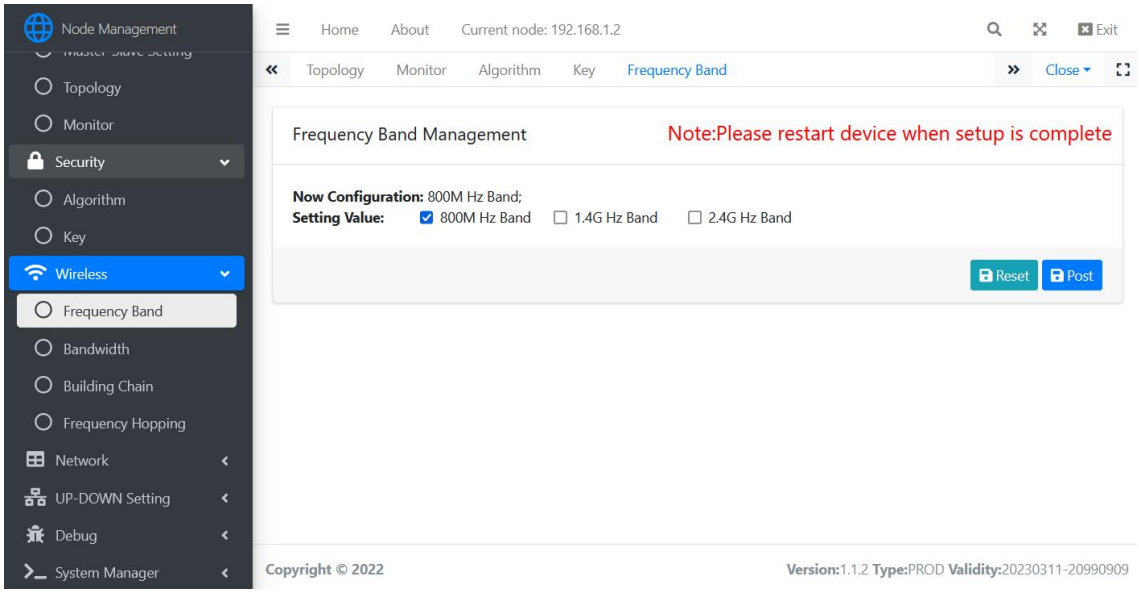
The same key must be used for the same network.
The key must be A hexadecimal number, that is, 0 to 9, A to F or a to f. The value contains a maximum of 64 characters, that is, 32 bytes. It has to be even. After the key is updated, you need to restart before performing other configurations.



2.4.5.Wireless Setup

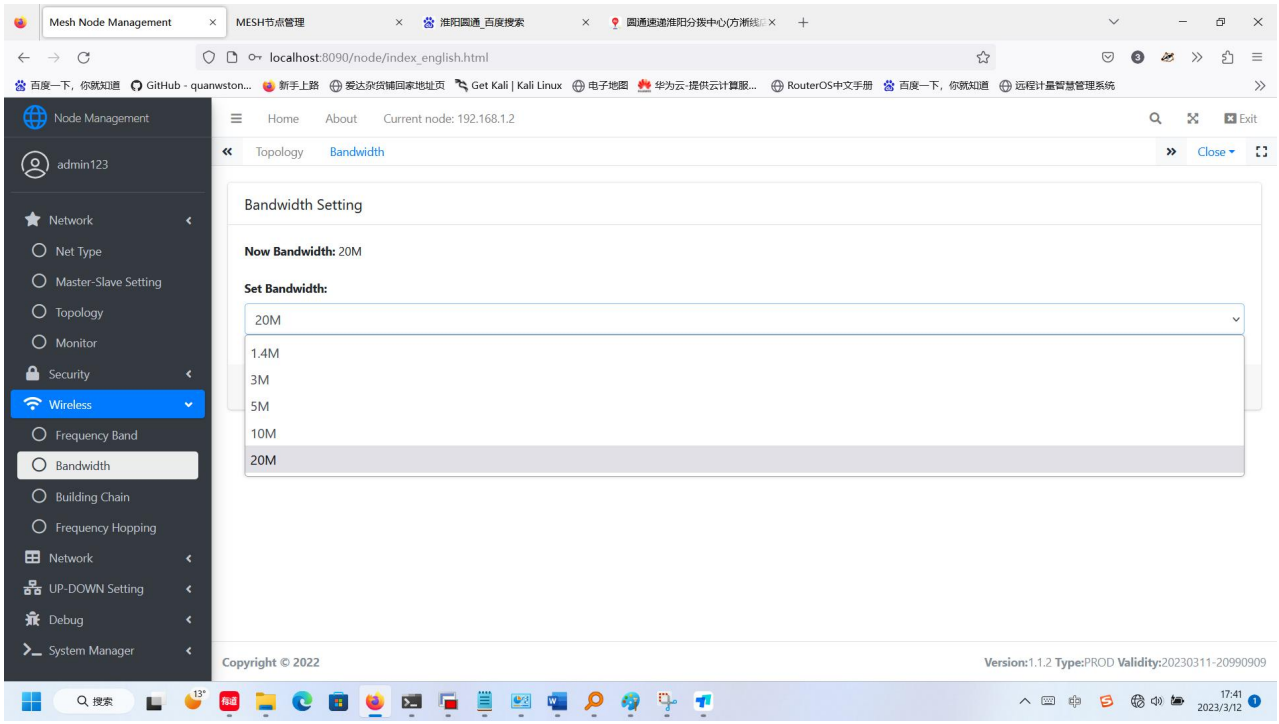
2.4.5.1. Frequency Setup

Configure the working frequency 800Mhz, 1.4Ghz and 2.4Ghz according to your needs.



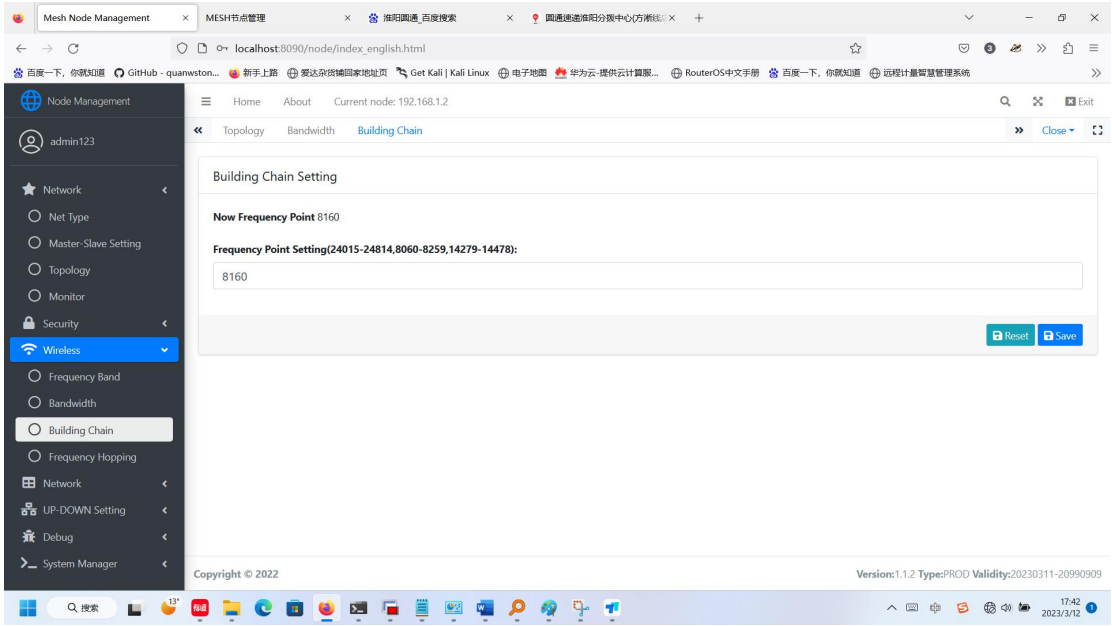
2.4.5.2. Bandwidth Setup

Configure the bandwidth 20Mhz/10Mhz/5Mhz/3Mhz/1.4Mhz according to your needs.



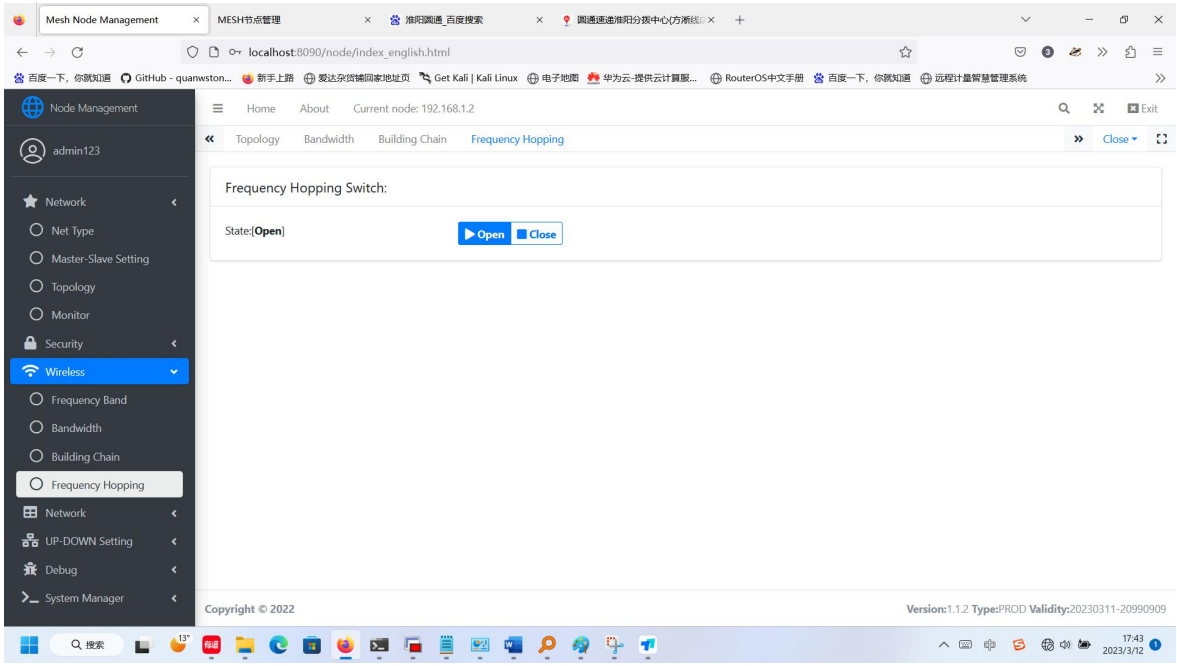
2.4.5.3. Working Frequency Point Configuration

Configure the working frequency point according to your needs.



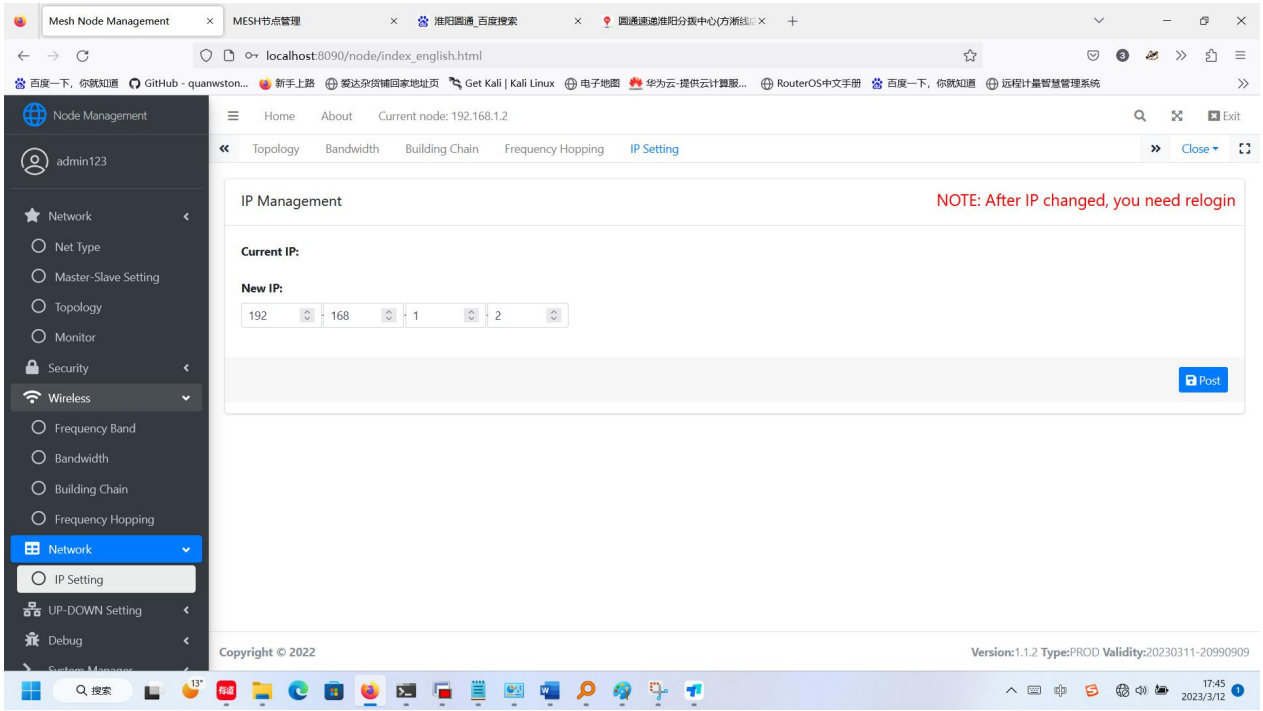
2.4.5.4. Frequency Hopping Setup

Open or Close the frequency hopping function according to your needs.



2.4.6.Network Setup

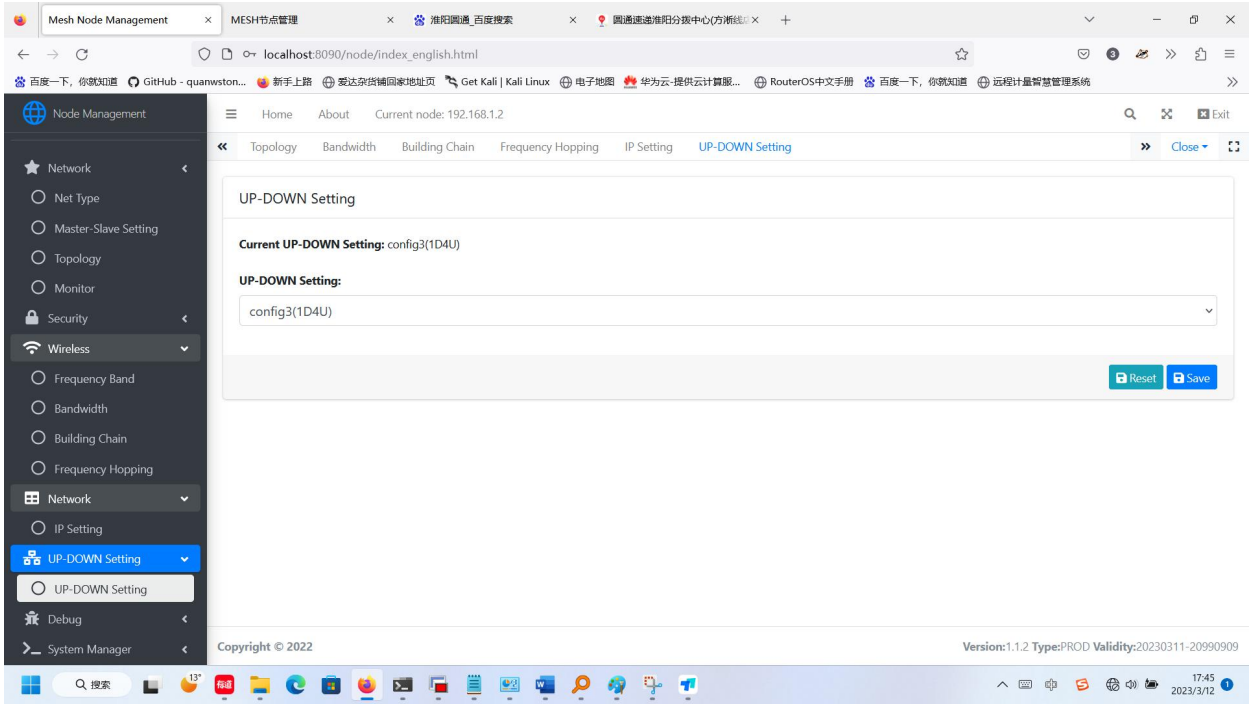
Configuration IP address



2.4.7. Up-Down Sub-frame Setup(FDM-6600)

Four Up-Down Sub-frame modes:
config0 (2D3U)
config1 (3D2U)
config2 (4D1U)
config3 (1D4U)
The long range version only supports config0 (2D3U) and config3 (1D4U)

If you use FD-6100 MESH network, no need this setup. MESH nodes will automatically adjust the sub-frame ratio according to network traffic.
If you use FDM-6600 star network, you need to configure the central note only. And the slave nodes will automatically synchronizes the sub-frame ratio.



Rate description of different sub-frame in a star network:
The slaver-Nodes can automatically obtain the central node's configuration.
The following table describes the actual up-down bandwidths of central node with different bandwidth and sub-frames ratio configuration(The data is based on the laboratory tests) .

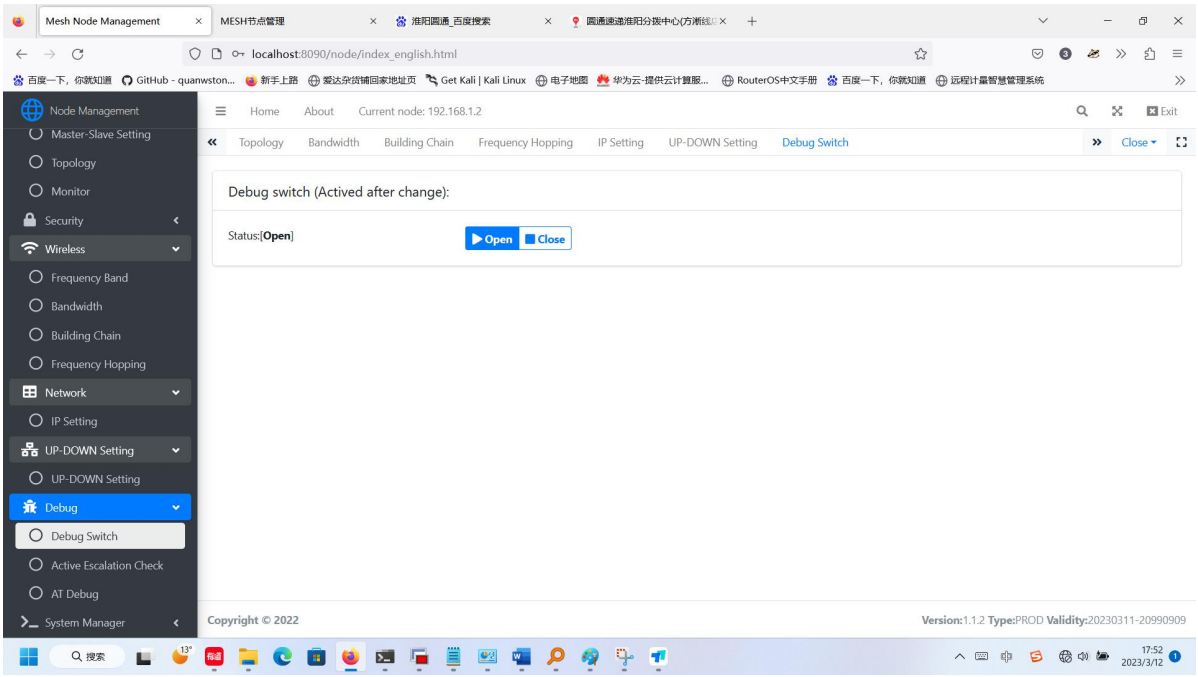
Bandwidth (MHz)	Direction	Rate(Mbps)			
		0	1	2	3
1.4	UL	1.675586	1.092773	0.546386	2.294824
	DL	0.752198	1.385009	2.053467	0.236768
3	UL	4.775196	3.114257	1.557129	6.539941
	DL	2.70205	4.487988	6.385547	1.45332

5	UL	8.571094	5.589844	2.794922	11.73867
	DL	4.85376	7.94751	11.23462	2.608594
10	UL	17.80254	11.61035	5.805176	24.38174
	DL	10.83633	17.02852	23.60772	5.418164
20	UL	27.47871	17.9209	8.96045	37.63389
	DL	16.72617	26.28398	36.43916	8.363086

2.4.8. Debugging Interface

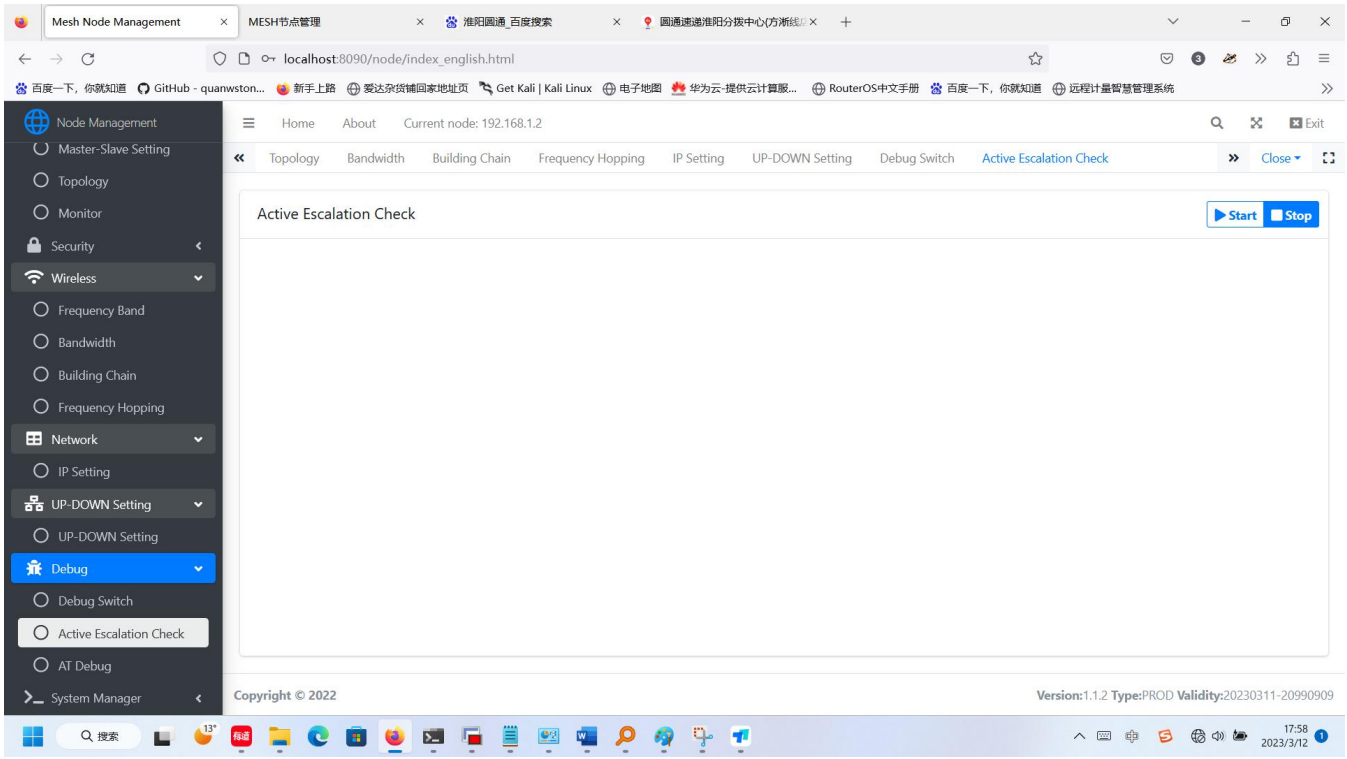
2.4.8.1. Flight Mode

The wireless switch can be opened and closed per your requirement.



2.4.8.2. Information Reporting

Actively report information switch。



2.4.8.3. AT Debugging Interface