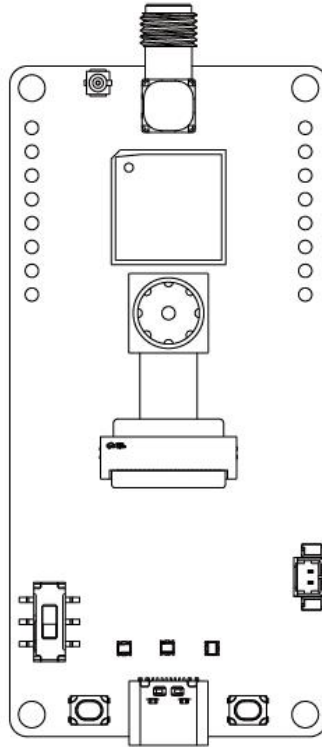
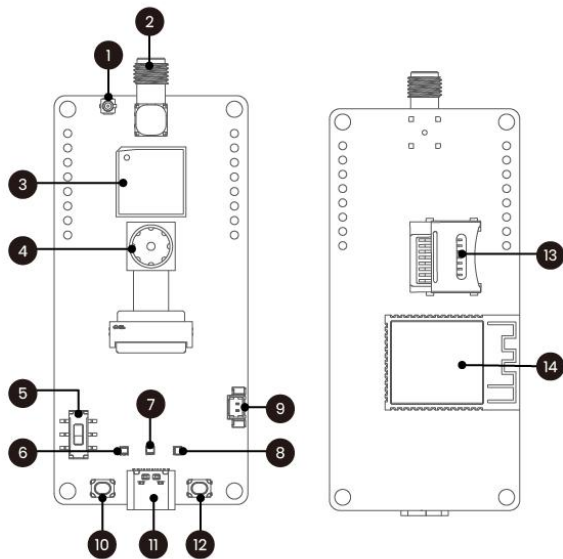


ESP32 WiFi Halow Module



User Manual

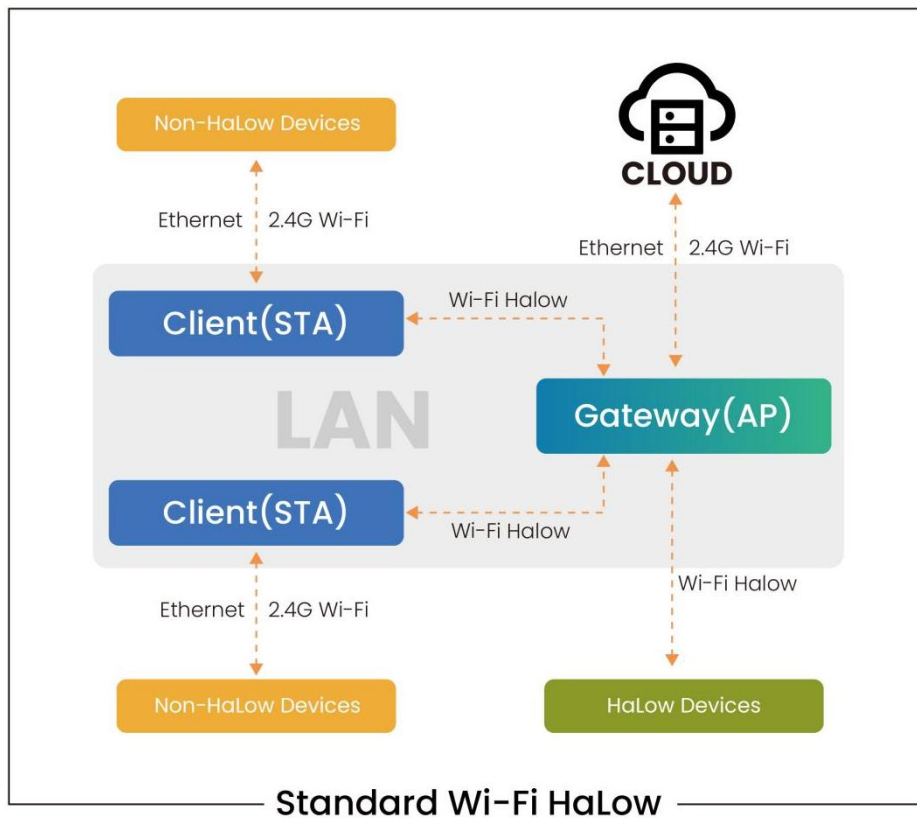
Diagram



- | | | |
|-----------------|----------------|-----------------|
| 1 Antenna 1 | 2 Antenna 2 | 3 FGHI00M |
| 4 Camera | 5 Switch | 6 Power Light |
| 7 Data Light | 8 Charge Light | 9 Bat Header |
| 10 Boot Button | 11 USB-C Port | 12 Reset Button |
| 13 TF Card Slot | 14 ESP32-S3 | |

- Power Light: When powered on, the red light stays on continuously. When powered off, the red light turns off;
- Data Light: Blue light blinks during data transmission. If there is no data transmission, the blue light is off;
- Charge Light: While charging, the red light stays on continuously. When fully charged, the green light stays on continuously;
- Power Switch: Slide up to turn the device on; slide down to turn it off;
- Reset Button: Single-click to restart the device;
- BOOT Button: Single-click to restart the device and enter programming mode;

Working principle



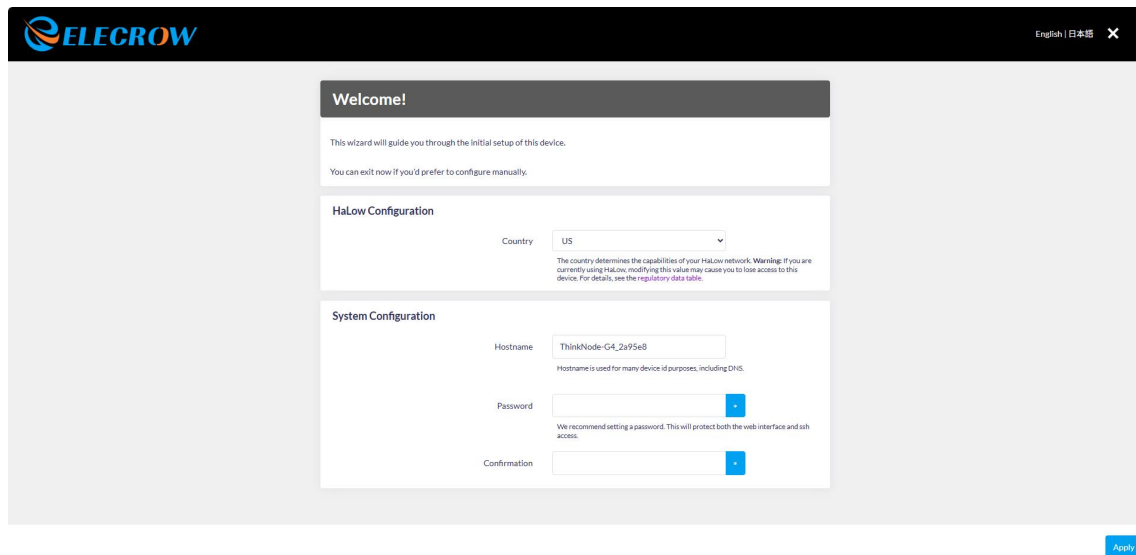
Thinknode G4 Gateway configuration

1. Connect the USB-C power cable, the red light will turn on. Wait 2~3 minutes until the green light is flashing/steady, then you can start.
2. Press and hold the CFG button for 3 seconds to enter configuration mode (NOTE: press and hold the CFG button for 10 seconds to restore factory settings).
3. Open the Wi- Fi list on your phone/computer and connect to **ThinkNode-G4_XXXX**, Default password: **elecrow.com**

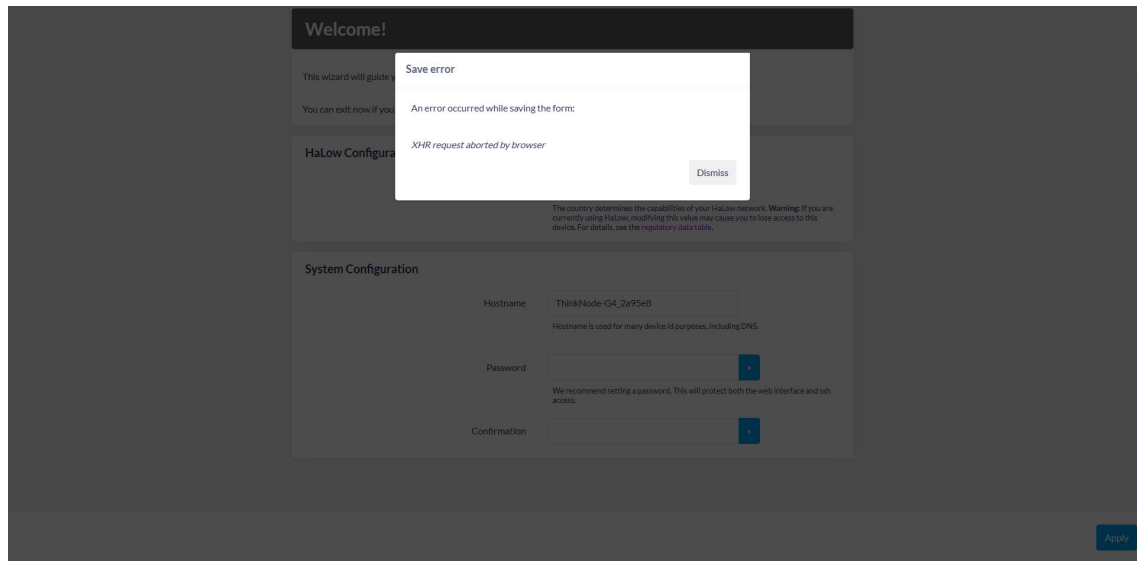
- In your browser, enter: **10.42.0.1** to open the gateway configuration page. Enter the password you want; If you don't want to set a password, you can click **"Log in"** directly.



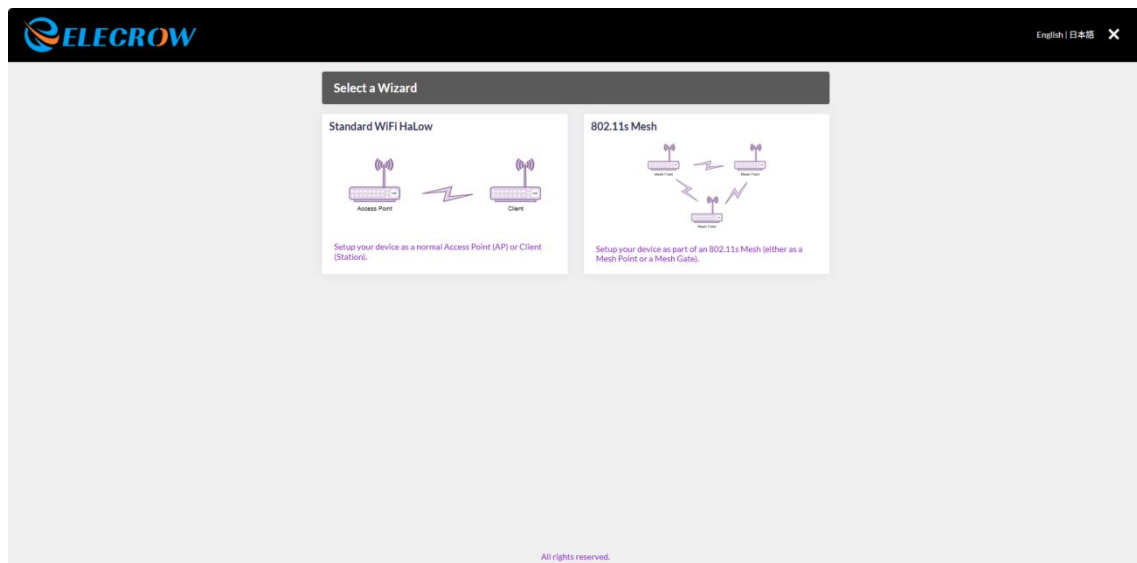
- Set the **"Country"** and **"Hostname"** , then enter the password you want again, if you don't want to set a password, you can click **"Apply"** directly.



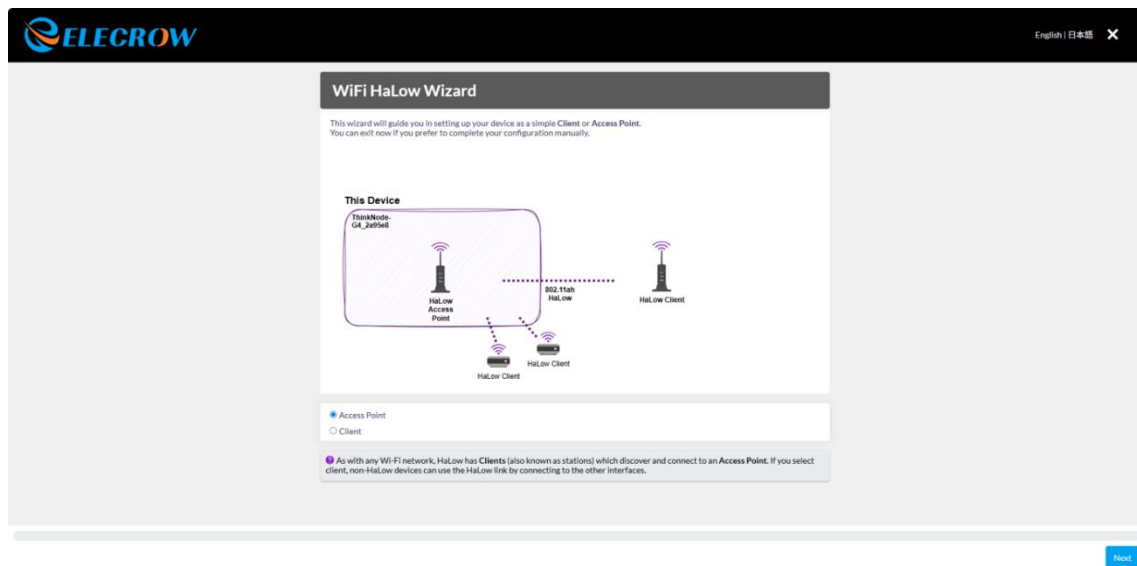
Note: If this happens, it means the connection to ThinkNode-G4_XXXX was lost. You need to reconnect to the Wi-Fi—automatic connection is recommended.



6. Select "Standard WiFi HaLow";

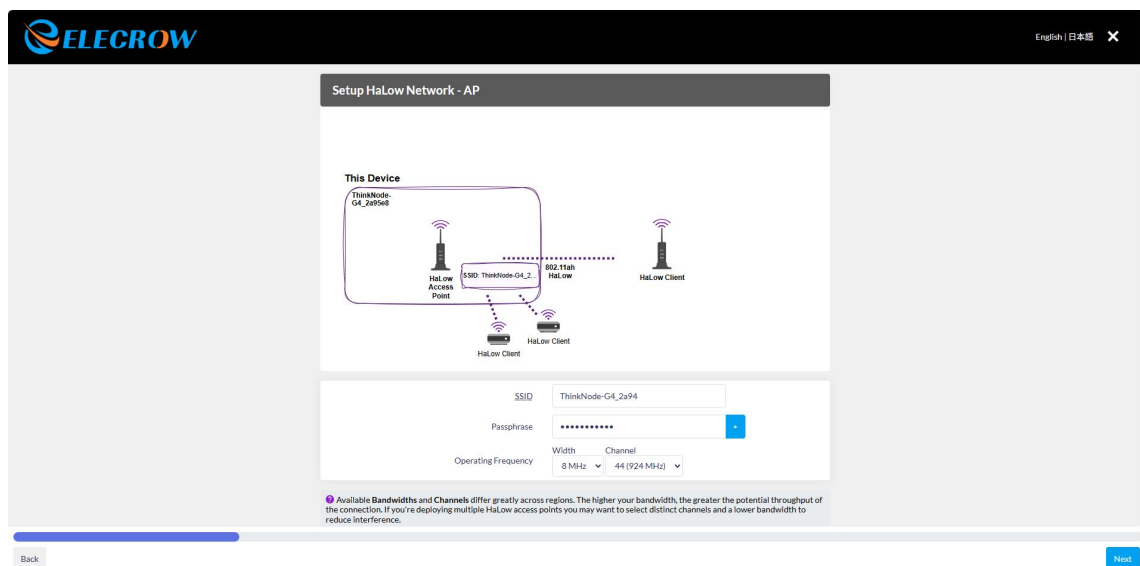


7. Select "Access Point" and click "Next".



8. Setup HaLow Network - AP, parameter descriptions:

- SSID: The Wi- Fi HaLow gateway (AP) hotspot name;
- Password: The Wi- Fi HaLow gateway (AP) hotspot password, Default: elecrow.com;
- Width: Higher bandwidth gives faster data rates but shorter range and higher power consumption;
- Channel: Each bandwidth has specific frequencies used as channels. When other Wi- Fi HaLow devices are nearby, you can set different channels to reduce interference.



9. Choose an “Upstream Network” connection type. This determines how the Access Point (AP) connects to the network. Parameter descriptions:

- None: Your device will have a static IP address and run a DHCP server on all interfaces. The HaLow and non-HaLow networks will be isolated from each other.
- Ethernet-Bridge: Your device and HaLow-connected devices obtain IP addresses from your current upstream network.
- Ethernet-Router: HaLow-connected devices obtain IP addresses from the DHCP server on this device, and this device uses NAT to forward IP traffic.
- Wi-Fi (2.4 GHz): HaLow-connected devices obtain IP addresses from the DHCP server on this device, and this device uses NAT to forward IP traffic.

The screenshot displays the 'Upstream Network' configuration page. At the top, a diagram illustrates the network topology. It shows an 'Existing router' connected to the Internet. 'This Device' (a ThinkNode-G4_2450d) is connected to the router via '2.4GHz WiFi'. The device has an 'Ethernet' port connected to a 'Laptop/Device' with IP '192.168.12.x'. The device also has a 'HaLow Access Point' (192.168.12.1) and a 'HaLow DHCP Server' (192.168.12.1) connected to 'HaLow Clients' (192.168.12.x). A 'HaLow Client' is also shown connected to the 'HaLow Access Point' via '802.11ah HaLow'.

Below the diagram, the configuration options are listed:

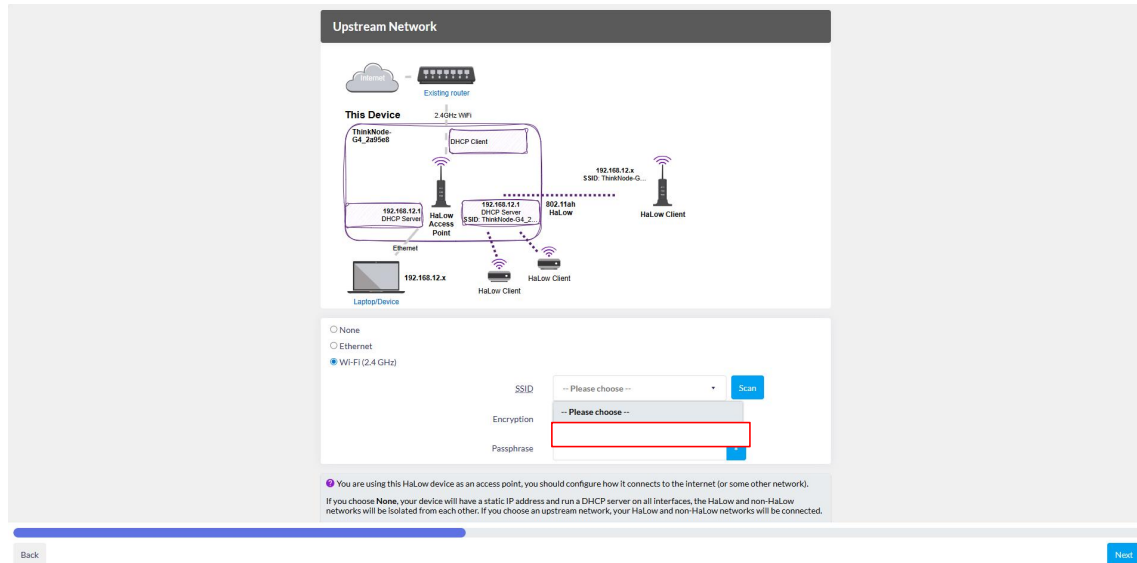
- None
- Ethernet
- Wi-Fi (2.4 GHz)

Fields for configuration:

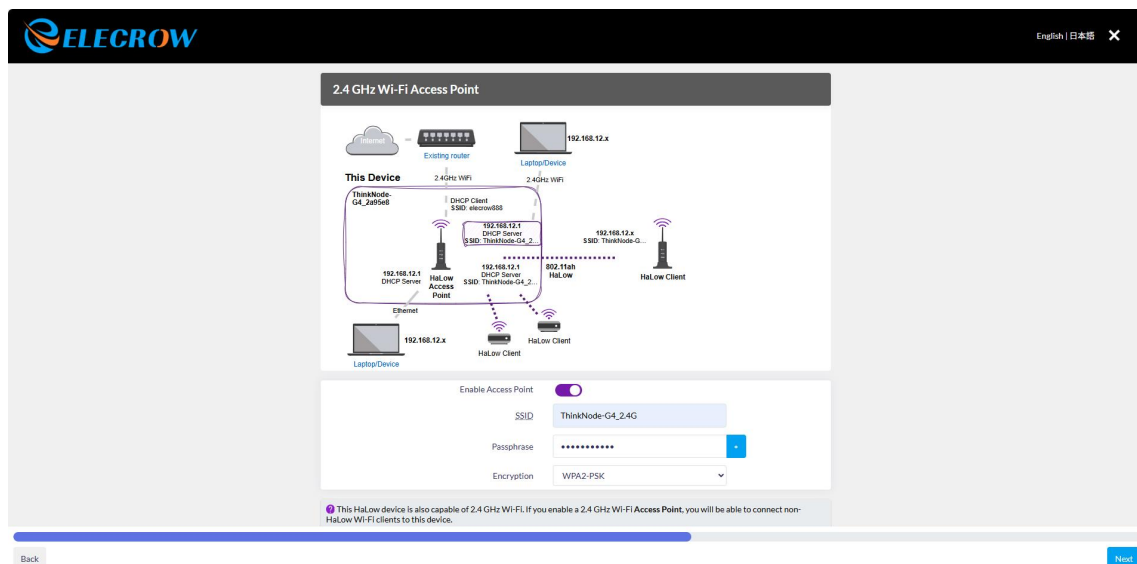
- SSID: -- Please choose -- (with a Scan button)
- Encryption: WPA2-PSK
- Passphrase: (with a plus button)

At the bottom, there is a note: "You are using this HaLow device as an access point, you should configure how it connects to the Internet (or some other network). If you choose None, your device will have a static IP address and run a DHCP server on all interfaces, the HaLow and non-HaLow networks will be isolated from each other. If you choose an upstream network, your HaLow and non-HaLow networks will be connected." Navigation buttons 'Back' and 'Next' are visible at the bottom.

Note: If you choose the "Wi- Fi (2.4GHz)" mode, you can click "Scan" or enter the available Wi- Fi name and password in the fields;



10. Turn on "**Enable Access Point**". This access point provides a HaLow hotspot as well as a standard 2.4 GHz Wi- Fi hotspot. Set your 2.4 GHz Wi- Fi hotspot name and password, and make sure it is not the same as the AP hotspot name from step 8.



11. Remember your AP gateway **"IP address"** , then click **"Apply"** to complete the configuration.

Almost there...

Existing router

Laptop Device 192.168.12.x

This Device

2.4GHz WiFi

2.4GHz WiFi

192.168.12.1 DHCP Server SSID: ThinkNode-G4_2

192.168.12.1 HaLow Access Point

192.168.12.1 DHCP Server SSID: ThinkNode-G4_2

192.168.12.x HaLow Client

192.168.12.x Laptop Device

192.168.12.x HaLow Client

- Connect other HaLow-enabled devices to use your new HaLow network.
- Connect 2.4 GHz devices to your network.
- Connect Ethernet devices to your network.

Click Apply to persist your configuration.

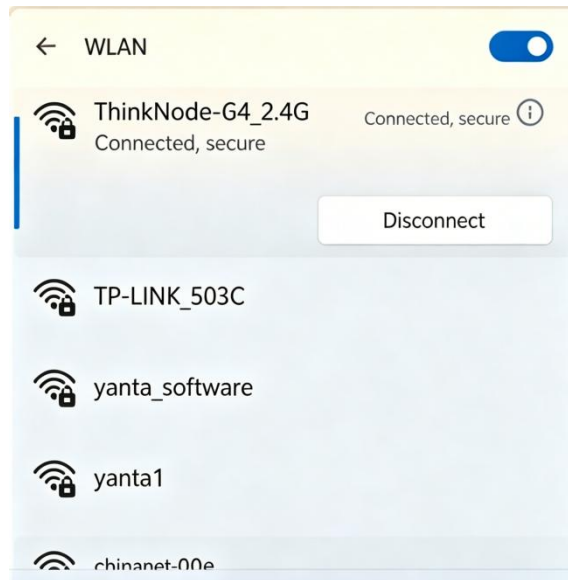
Back Apply

Wizard Complete

Click below to exit the wizard

Leave wizard

12. Open the Wi- Fi list on your computer/phone and connect to the 2.4 GHz Wi- Fi hotspot you set in **step 10 of " Thinknode G4 Gateway configuration" ;**



13. In your browser, enter the AP gateway **"IP address"** from **step 11 of " Thinknode G4 Gateway configuration"** and enter the password from **step 4 of " Thinknode G4 Gateway configuration"** , if there is no password, you can click **"Log in"** directly;



14. You can view various parameter information in the admin interface;

The screenshot displays the Mikrotik WinBox admin interface. On the left is a navigation menu with options like Home, Quick Config, Wizards, Advanced Config, Upgrade, Status, System, Services, Network, Statistics, Help, and Log out. The main content area shows several summary cards: 'Access Point (HaLow)' with 0 connected devices, 'Local Network' with 1 DHCP lease, 'Uplink (2.4 GHz)' which is connected, 'Access Point (2.4 GHz)' with 1 connected device, 'Mode' set to HaLow Access Point, and 'Network Interfaces' showing eth0.1, phy0-ap0, wlan0, and wifi24lan. A 'System' card at the bottom lists model, hostname, and kernel version.

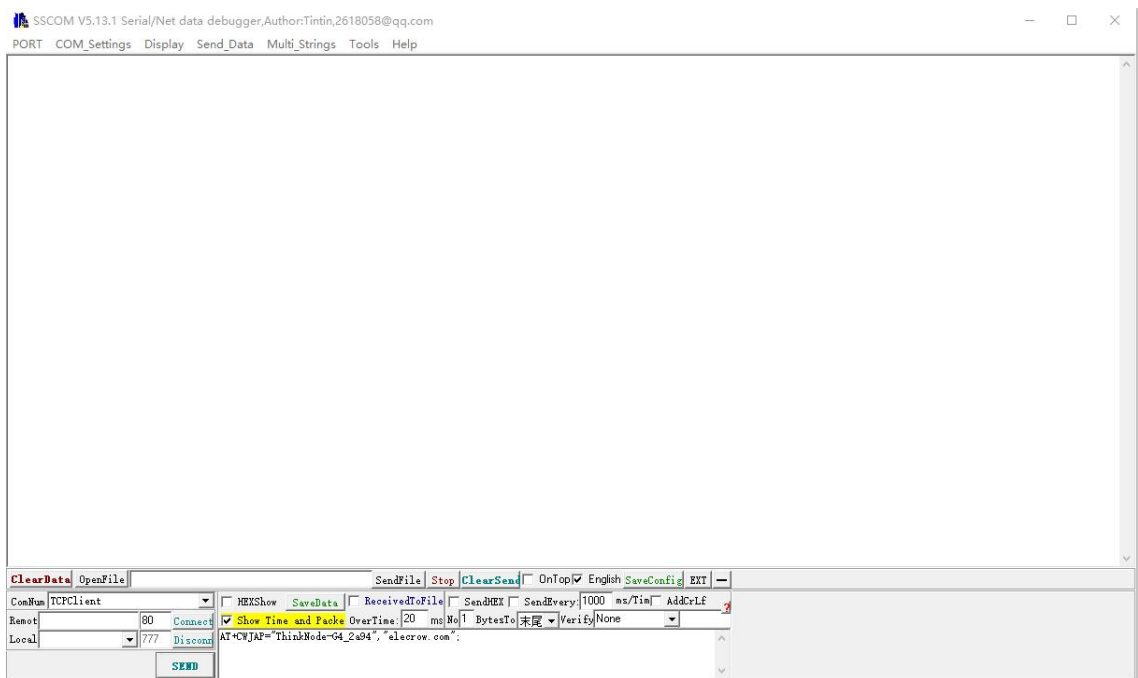
15. Click **“Quick Config”** to quickly modify the configuration you just made;

The screenshot shows the 'Quick Configuration' page in WinBox. It features a network diagram at the top illustrating the device's role as a DHCP server and access point. Below the diagram is a 'Network Interfaces' table with the following configuration:

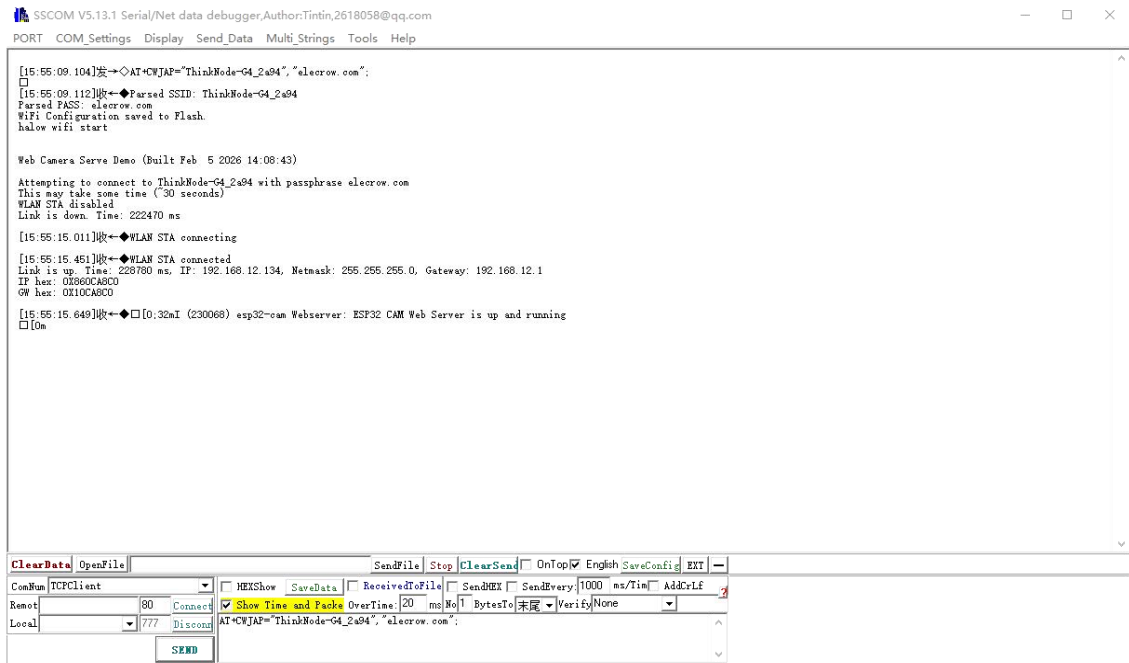
Name	Forward	Wireless	Ethernet	DHCP Server	Protocol	IPv4 address
lan	None		None	<input type="checkbox"/>	Static IP	10.42.0.1
ahwlan	wifi24lan	ThinkNode-G4_2.4G ThinkNode-G4_2a94	eth0.1	<input checked="" type="checkbox"/>	Static IP	192.168.12.1
wifi24lan	None	elecrow888	None	<input type="checkbox"/>	DHCP Client	

ESP32 WiFi Halow module configuration

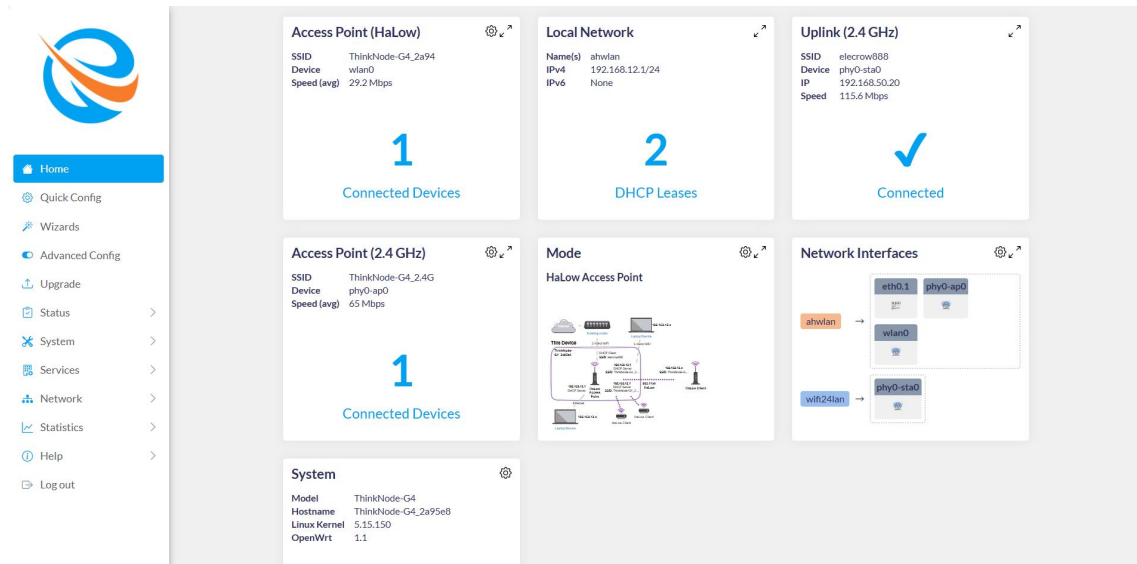
1. Open a serial terminal tool (any serial tool works), select the **corresponding port**, and set the baud rate to **115200**.
2. Send: **AT+CWJAP="AP-SSID","Passphrase";** — where AP-SSID and Passphrase are the Wi- Fi HaLow gateway account and password. Refer to **Step 8 of "Thinknode G4 Gateway configuration"** . For example:
AT+CWJAP="ThinkNode-G4_2a94","elecrow.com";

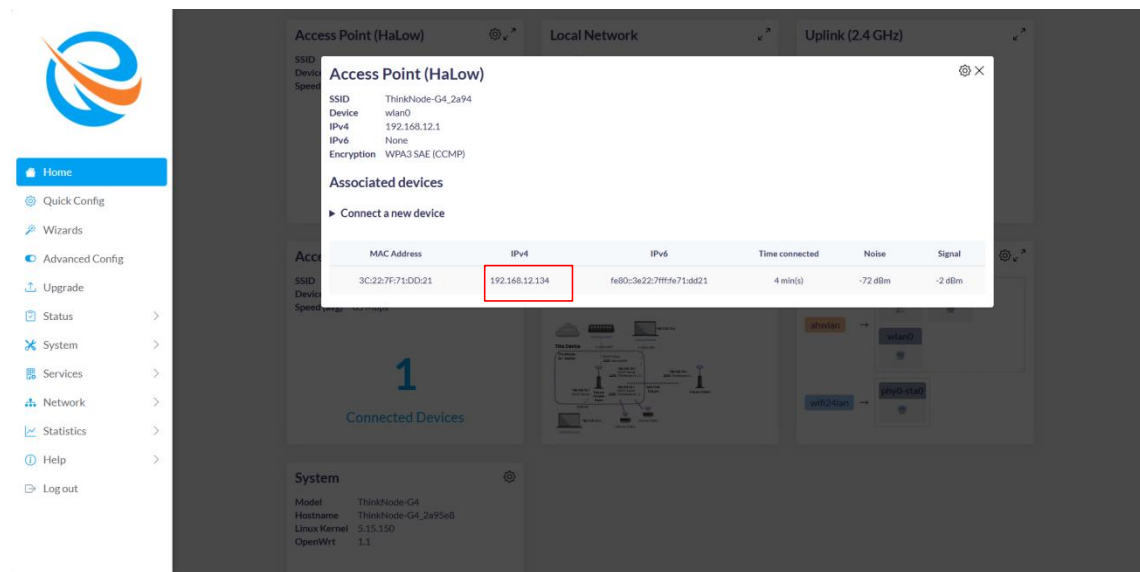


- After sending, you will see the ESP32 Wi-Fi HaLow Module attempt to connect to the Wi-Fi HaLow gateway. When the connection is successful, you will receive the reply: "WLAN STA connected" .



- Open the Wi-Fi HaLow gateway web portal, click "Connected Devices". IPv4 is the "IP address" of the ESP32 Wi-Fi HaLow Module.





5. Open a browser and enter the ESP32 Wi- Fi HaLow Module **“IP address”** to use the ESP32 Wi- Fi HaLow Module.

Main Specifications

Product Name	ESP32 Wifi Halow Module
Main Controller	ESP32-S3
Flash	16 MB
Communication Chip	FGH100M
Camera	2 MP, DVP Port
TF Card slot	Support up to 32 GB
Input	5V/2A
Dimensions	84*36*14 mm
Operating Temperature	-30~65°C

Part List

- ESP32 WiFi Halow Module x1
- Antenna x1
- USB-A to USB-C Cable x1
- User Manual x1