

ZLAN9809M/-E

Rail type

4G router

4G/WiFi/RJ45



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1. Overview

ZLAN9809M/-E Industrial-grade 4G router is a high-performance communication product developed by ZLAN for 4G network requirements.(The ZLAN9809M-E is a model that uses the European 4G module) It combines several technologies such as routing, switching, 4G, WLAN and encryption to meet the diverse needs of industry users in data transmission. This device can implement a variety of functions such as WAN to LAN/WiFi, WiFi to LAN/WiFi and 4G to LAN/WiFi, providing users with a flexible network connection. The 9809M also supports WEB configuration, making network management more convenient and efficient.

In terms of hardware, the ZLAN9809M/-E is equipped with a high-performance 32-bit processor that can quickly process various network protocols and large amounts of data. In addition, it is equipped with multiple interfaces, including four 10/100M LAN ports, one WAN port, WiFi interface and 4G interface, making it easy to interconnect with various terminal devices.

The ZLAN9809M/-E also supports 4G/ wired smart backup and can switch to a normal network by itself. Improve network availability.



Figure 1 ZLAN9809M/-E

4G routers are widely used in the industrial field. In modern factories, it enables stable data transmission between equipment and control centers, ensuring continuous operation of production lines. In areas with harsh environments, such as mines and ports, 4G routers can overcome challenges such as complex terrain and harsh environments to provide reliable and real-time communication services. In addition, 4G routers are also widely used in remote monitoring systems in logistics, transportation and other industries to help achieve intelligent management and scheduling. Its flexible networking capability and wide coverage make all aspects of industrial production can be effectively supported and guaranteed.



Figure 2 Application scenario of 9809M

ZLAN9809M/-E can be applied to:

Create an internal subnet when IP address resources are scarce.

The network port PLC is converted into WiFi access to the existing network to achieve seamless connection;

With its WiFi relay/bridge function, the WiFi communication range can be further expanded;

When the WAN port is disconnected, the ZLAN9809M/-E can quickly switch to the 4G network.

1.1 Product Appearance

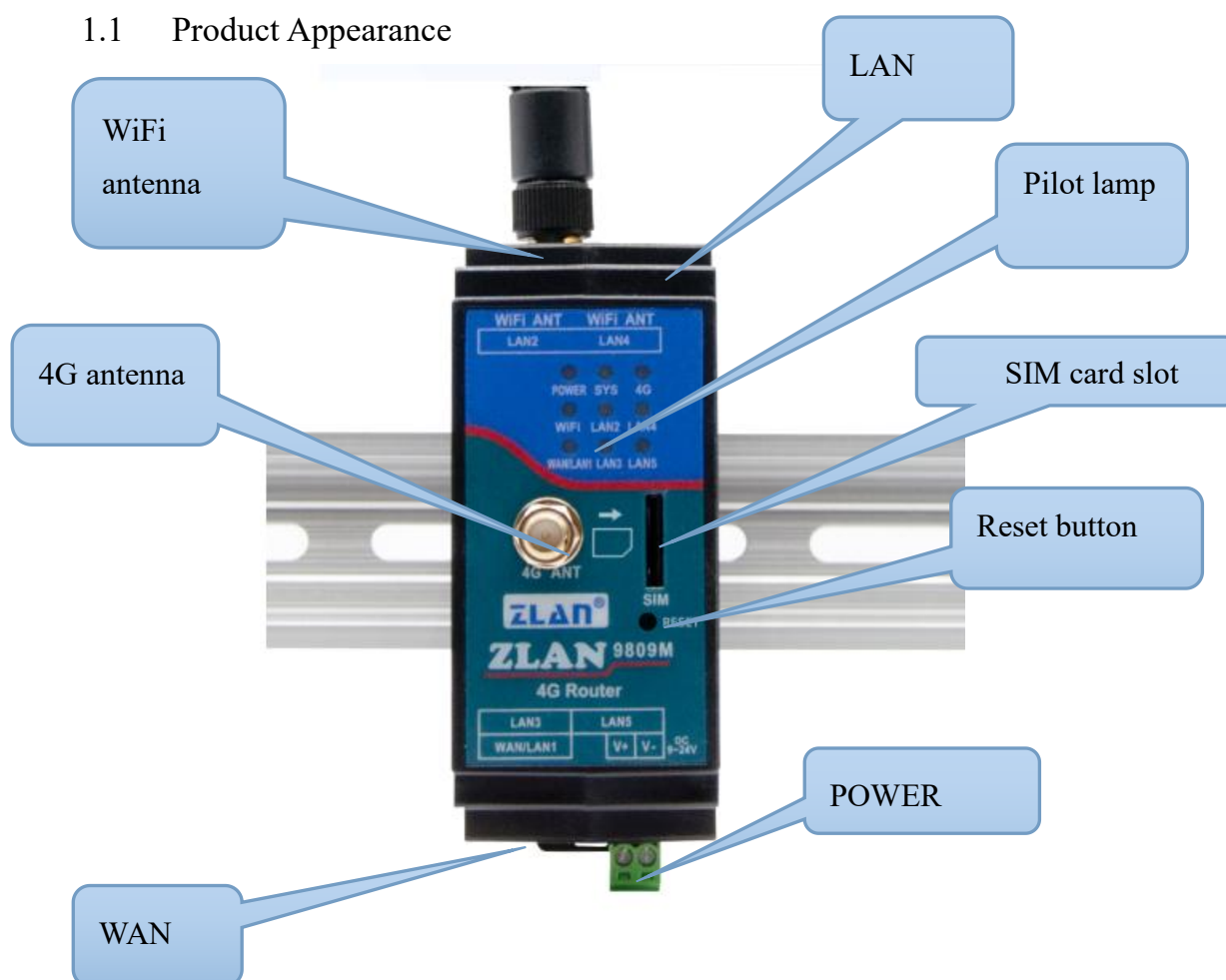


Figure 3 Appearance of ZLAN9809M/-E

1.2 Product Interfaces

1. This device has four LAN ports distributed on the left and right sides, two on each side. There is a WAN port next to the power supply of the device. When using the network cable, you only need to insert the network cable into the corresponding network port as required.
2. The antenna interface of the device adopts the standard 50 Ω /SMA (female head) to ensure compatibility with the antenna of the corresponding working band. Generally speaking, only the antenna on the left side needs to be installed, and you can choose a glue stick antenna or a suction cup antenna. For 4G antennas, it is located on the front panel of the device and usually uses a suction cup antenna.
3. Next to the panel light, there is a hidden SIM card slot. The 9809M uses the 4G network of all Netcom. SIM card of any operator is required. Please ensure that the device is powered off when installing SIM card. Thanks to the embedded SIM card holder design, SIM card installation is very convenient. Simply push the

SIM card chip down into the card slot until it locks. If you need to pull out the SIM card, push it a little harder and it will automatically eject.

1.3 Panel Indicators

The panel light of ZLAN9809M/-E is shown as follows:

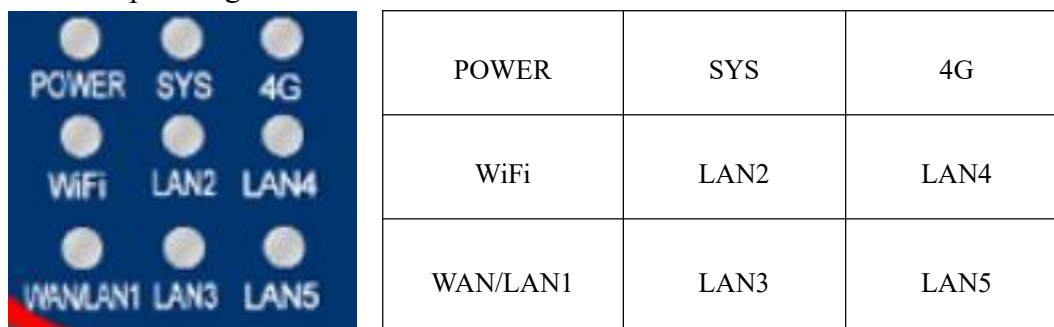


Figure 4 Panel light

The meanings of specific indicators are shown in the following table:

Name	colour	Instructions
WAN/LAN1	green	WAN port indicator. On: The WAN port is connected
WiFi	green	WiFi indicator. On or blinking: The WiFi is working properly
POWER	RED	Power indicator: When the device is powered on
LAN	green	Four LAN port indicators correspond to four LAN ports. If on, the corresponding LAN ports are connected
SYS lamp	green	4G power on indicator. On: The 4G module is powered on
4G lamp	blue	If the indicator is steady on, the dial is being dialed. If the indicator is blinking, the dial is successful
Reset button	Button	After the device is started: press 1 second to release, the device will restart after 5 seconds; Press for 5 seconds to release, the device restarts after 5 seconds, and the device is reset to factory Settings

Table 1 Indicator parameters

2. Technical parameters

Main product parameters		
Parameter name	Parameter	remark

Support mode 9809M	4G CAT1 supports 3 modes:B1/B3/B5/B8@FDD LTE B34/B38/B39/B40/B41@TDD-LTE B3/B8@GSM It includes Unicom 4G, 2G, mobile 4G, 2G and telecom 4G networks.	Most of Asia and Africa
Support mode 9809M-E (European frequency band)	4G CAT1 supports EGSM900 DCS1800 LTE-FDD B1 LTE-FDD B3 LTE-FDD B5 LTE-FDD B7 LTE-FDD B8 LTE-FDD B20	European version
Transmission rate	LTE: Max 10Mbps (down) /Max 5 Mbps (up) GPRS: 85.6Kbps (down) /Max85.6Kbps (up)	
SIM card	Voltage: 3V, 1.8V; Size: Medium card	
Antenna interface	50 Ω /SMA glue stick antenna or suction cup antenna is optional	
Power interface	Power terminal input.	
Input voltage	DC9V~24V	
port	LAN port *4, WAN port *1, SIM*1, 4G antenna *1,WiFi antenna *1	
Basic function	Network port to network port /WiFi, WiFi to network port /WiFi, 4G to network port /WiFi	
Advanced function	Firewall, Static routing, Log services, channel analysis, DHCP/DNS, Network diagnostics, host name Mapping	
Product size	37.6(L)x 83.6(W)x 89.2(H)mm	
Configuration mode	WEB Page configuration (default: 192.168.8.1)	
Operating temperature	-40 degrees to 85 degrees	
Storage temperature	-40 degrees to 120 degrees	
Humidity range	0 to 95% non-condensing	

Table 2 Technical parameters

3. Use instructions

(This note takes the win10 system as an example to demonstrate the

interconnection of devices and computers)

3.1. Connect the 9809M/-E router

If you don't have an Internet cable and want to connect your device via WiFi, you need to do the following:

Open WLAN in the lower right corner of your computer:

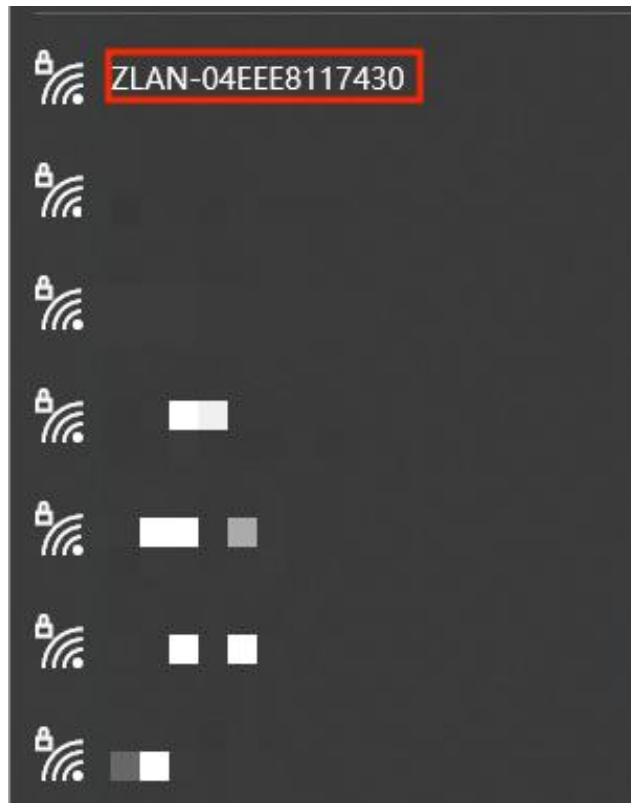


Figure 5 ap name

Connect ZLAN-XXXXXXXX WiFi. The default password is 66666666.

If you have a network cable and plan to connect the device through the cable, directly connect the network cable to any LAN port, open your browser, enter 192.168.8.1 in the address bar, press enter to confirm, and then open the web page of 9809M.

(Using a wired connection requires the computer's Ethernet to be set to automatic (DHCP), or the IP to be set manually to the same network segment as the router)



Figure 6 web login page

There is no password at first, just click to log in. After login, the configuration page will be displayed:

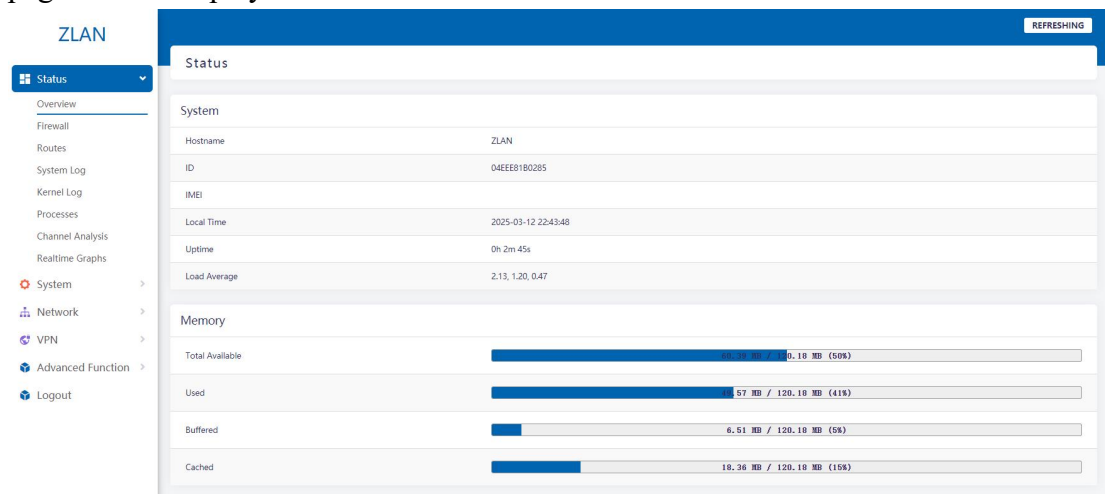


Figure 7 web configuration page

Click Network > Interface, you can see the existing interfaces of the device, mainly LAN port, WAN port, and WAN_4G port. The WAN interface is used to provide users with external network access services, while the LAN interface is used to provide users with local LAN access or output interfaces. Specifically, through WAN ports, routers can receive data packets from the Internet and forward them to

devices in the local LAN; Through the LAN interface, routers can receive data packets from devices in the local LAN and forward them to the Internet or other networks.

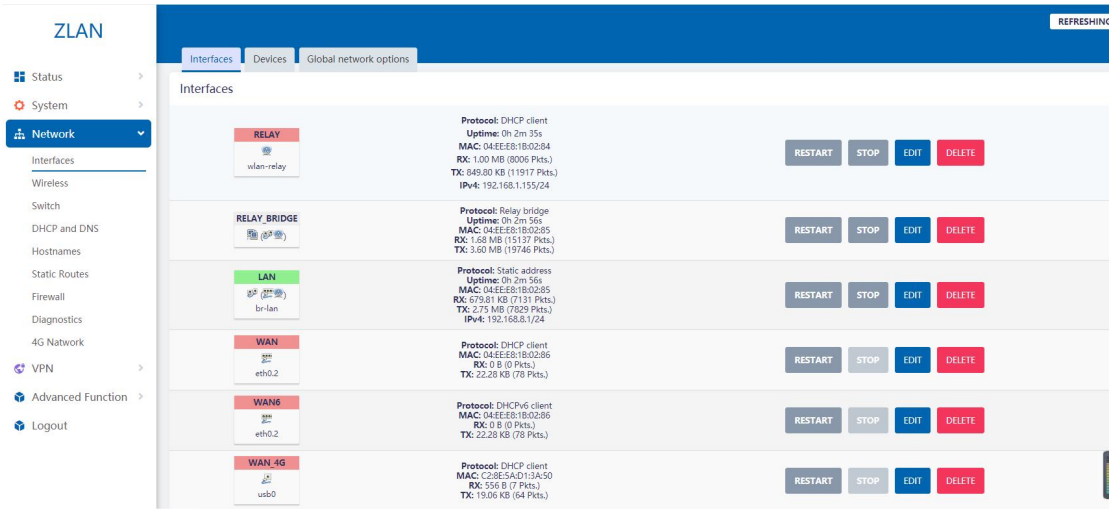


Figure 8 Interface page

3.2. Configure network connections

Initial configuration: Click the menu bar on the left side of the web page: Network --> Interface, you can see the interface page as shown in Figure 8. (ctrl+mouse wheel to enlarge)

WAN Port mode The default mode is Wired priority mode, that is, the WAN port on the router accesses the Internet through a network cable. Related parameters can be viewed by clicking Network -->4G network.

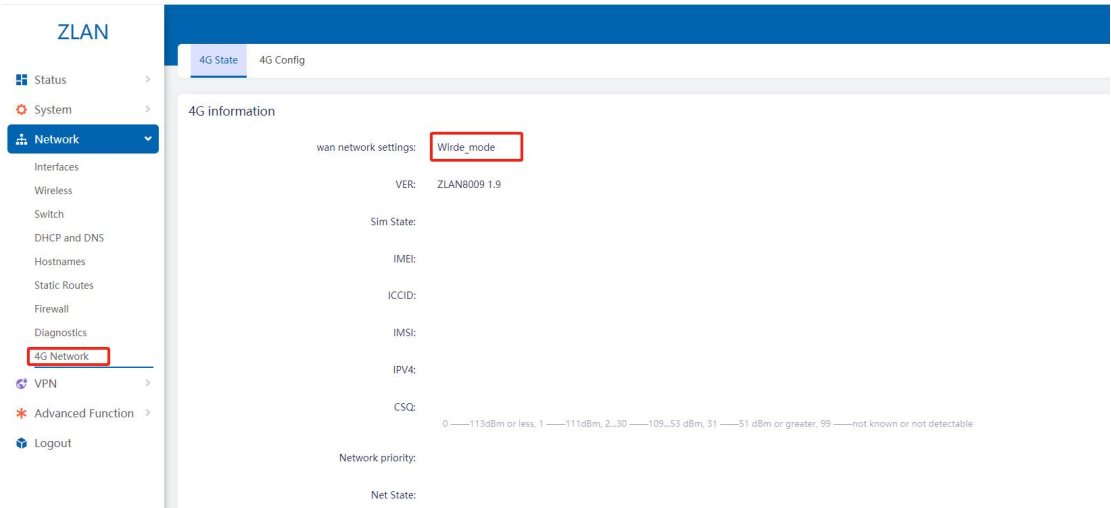


Figure 9 4G network status

3.2.1. WiFi Trunk mode

Click the menu bar on the left side of the web page: Network -- > Wireless, you can see the wireless overview, 9809M-W has 2.4G band wireless card.

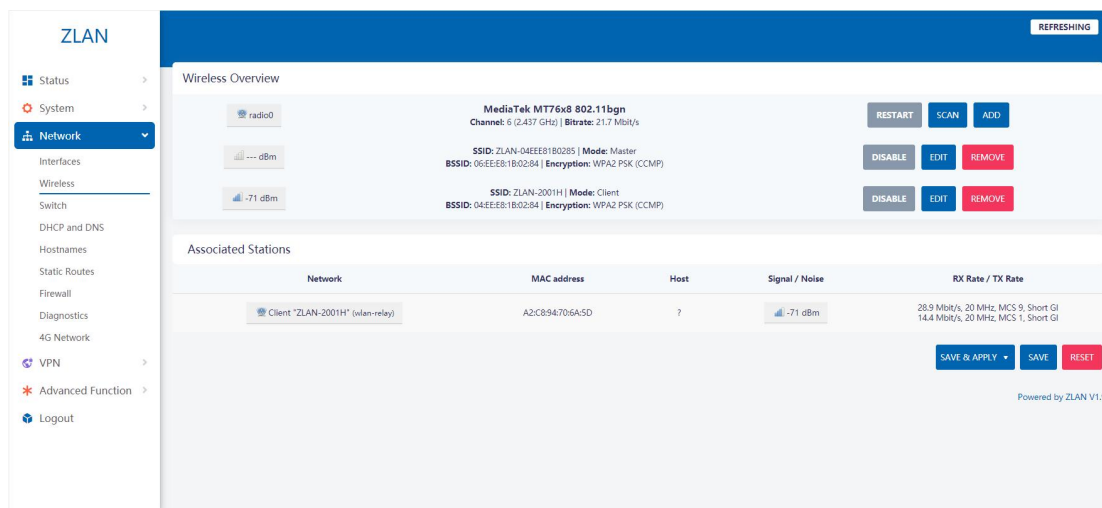


Figure 10 Wireless overview

WiFi relay mode, that is, the 9809M router connects to the upper-level network through the upper-level WiFi, and your device connects to the 9809M router through wired or WiFi. Before setting, please ensure that the upper-level WiFi network can connect to the public network and connect the WiFi antenna.

Step 1: Enter the web page, click the left menu bar: Network -- >WiFi, click the scan button on the right side of the network card:

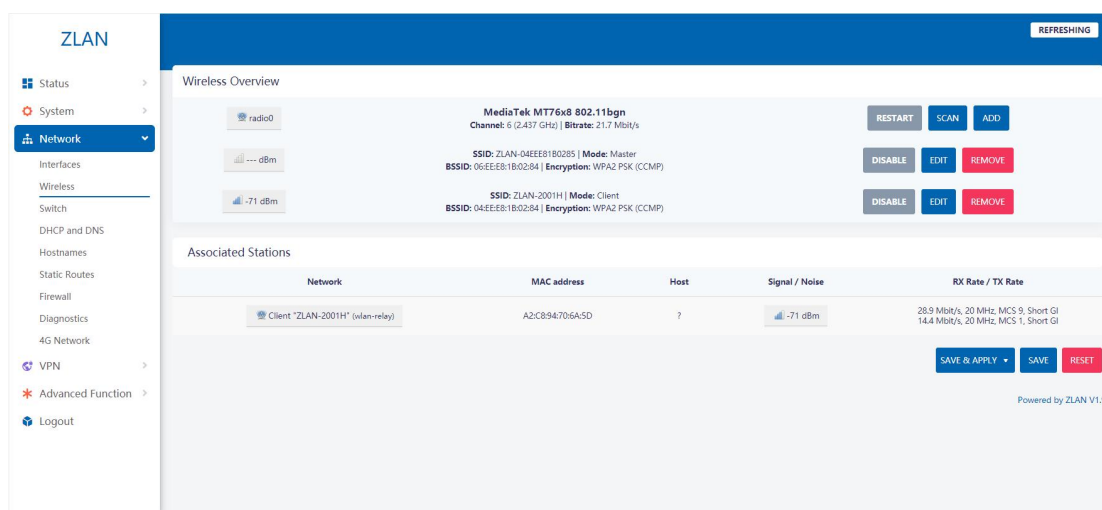


Figure 11 Scan button

Step 2: Select the upper-level network you want to access on the open page and

click Join Network.

Join Network: Wireless Scan						
Signal	SSID	Channel	Mode	BSSID	Encryption	
-67 dBm	ZLAN-2001H	6	Master	A2:C8:94:70:6A:5D	WPA2 PSK (CCMP)	JOIN NETWORK
-70 dBm	ZLAN-2001	11	Master	30FC:68:44:D2:1B	mixed WPA/WPA2 PSK (CCMP)	JOIN NETWORK
-79 dBm	HUAWEI_E5586_88DE	6	Master	A2:1E:10:DE:88:C2	WPA2 PSK (CCMP)	JOIN NETWORK
-86 dBm	zlanycap	11	Master	C6:85:43:23:F8:C5	WPA2 PSK (CCMP)	JOIN NETWORK
-91 dBm	shbilee	6	Master	08:3A:38:AB:8E:90	mixed WPA/WPA2 PSK (CCMP)	JOIN NETWORK
-91 dBm	hidden	6	Master	08:3A:38:AB:8E:92	None	JOIN NETWORK
-92 dBm	TEST123	11	Master	F2:74:15:56:35:64	WPA2 PSK (CCMP)	JOIN NETWORK

Figure 12 Joining the network

Step 3: Enter your superior network password on the open page), the default name of the new network interface is wwan, you can modify it yourself, then click the Submit button in the lower right corner, the second interface will pop up.

Joining Network: "ZLAN-2001H"

Replace wireless configuration

☐

Check this option to delete the existing networks from this radio.

Name of the new network

wwan

The allowed characters are: A-Z, a-z, 0-9 and _

WPA passphrase

Specify the secret encryption key here.

Lock to BSSID

☐

Instead of joining any network with a matching SSID, only connect to the BSSID A2:C8:94:70:6A:5D.

Create / Assign firewall-zone

wan wan6 wan4g wan4g_v6 RELAY

Choose the firewall zone you want to assign to this interface. Select unspecified to remove the interface from the associated zone or fill out the custom field to define a new zone and attach the interface to it.

CANCEL

SUBMIT

Figure 13 Modifying the network interface name

The second page has operating frequency, transmission power and other options. If the WiFi version of the device to be connected is older and does not support 802.11N, you can change the operating frequency to Legacy. Under normal circumstances, there is no need to set any parameters, just click Save.

Device Configuration

General Setup Advanced Settings

Status **Mode: Client | SSID: ZLAN-2001H**
--- dBm *Wireless is not associated*

Wireless network is enabled **DISABLE**

Operating frequency Mode: N Channel: auto Width: 20 MHz

Allow legacy 802.11b rates ☐
Legacy or badly behaving devices may require legacy 802.11b rates to interoperate. Airtime efficiency may be significantly reduced where these are used. It is recommended to not allow 802.11b rates where possible.

Maximum transmit power driver default - Current power: *unknown*
Specifies the maximum transmit power the wireless radio may use. Depending on regulatory requirements and wireless usage, the actual transmit power may be reduced by the driver.

Interface Configuration

General Setup Wireless Security Advanced Settings

Mode Client

ESSID ZLAN-2001H

BSSID

Network wlan:

Choose the network(s) you want to attach to this wireless interface or fill out the custom field to define a new network.

DISMISS SAVE

Figure 14 Interface configuration

Click Save and enter the page as shown in the following figure. You can see an additional mode in the wireless overview: Client wireless. The web page indicates that the interface has multiple unapplied changes. Click Save and apply them to take effect.

Wireless Overview

radio0

MediaTek MT76x8 802.11bgn
Channel: 6 (2.437 GHz) | Bitrate: 28.9 Mbit/s

SSID: ZLAN-04EE81B0285 | Mode: Master
BSSID: 02EE881B0284 | Encryption: WPA2 PSK (CCMP)

SSID: ZLAN-2001H | Mode: Client
BSSID: 04EE881B0284 | Encryption: WPA2 PSK (CCMP)

SSID: ZLAN-2001H | Mode: Client
BSSID: 06EE881B0284 | Encryption: -

SSID: ZLAN-2001H | Mode: Client
Interface has 7 pending changes

RESTART SCAN ADD

DISABLE EDIT REMOVE

DISABLE EDIT REMOVE

DISABLE EDIT REMOVE

DISABLE EDIT REMOVE

Associated Stations

Network	MAC address	Host	Signal / Noise	RX Rate / TX Rate
Client "ZLAN-2001H" (wlan-relay)	A2:C8:94:70:6A:5D	?	-75 dBm	43.3 Mbit/s, 20 MHz, MCS 10, Short GI 19.5 Mbit/s, 20 MHz, MCS 2

SAVE & APPLY SAVE RESET

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Figure 15 Save button

Step 4: Click on the left menu bar: Network -- > Interface, then we can see the newly added interface.



Figure 16 Interface page

Step 5: Click the left menu bar: Network --> 4G Network --> 4g Settings: Set the WAN port mode to wired_mode: (9809M-W no need to perform this step).

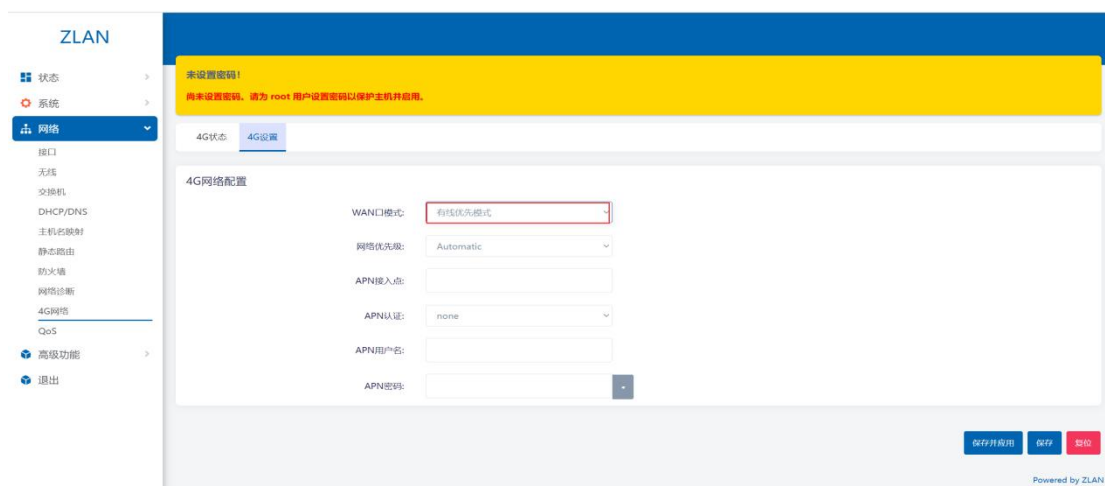


Figure 17 Wired mode

Step 6: Click the right menu bar: System --> Restart, click the restart button to restart the router:

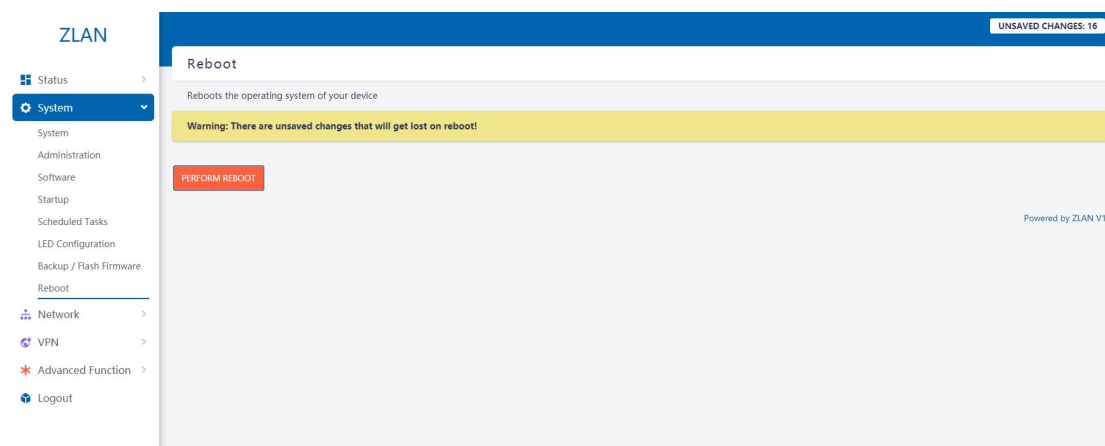


Figure 18 Restarting the device

After the restart is complete, the WiFi trunk is set, and the router connects to the external network through the upper-layer WiFi. Connect your device to your router via wired or AP (this AP is the AP issued by the 9809M, named zlan+id, default password 8 6).

3.2.2. WiFi bridge mode

When the LAN port of the 9809M and the upper-layer network are in the same network segment, the WiFi needs to be set to bridge mode.

First of all, it should be noted that if other computers in the same LAN need to PING through the devices under the 9809M, it is necessary to enable the forwarding of the firewall of the 9809M, so that the network can be bidirectional. Choose Network -> Firewall, click the general Settings, change the Settings as shown in the following picture, and click Save and apply.

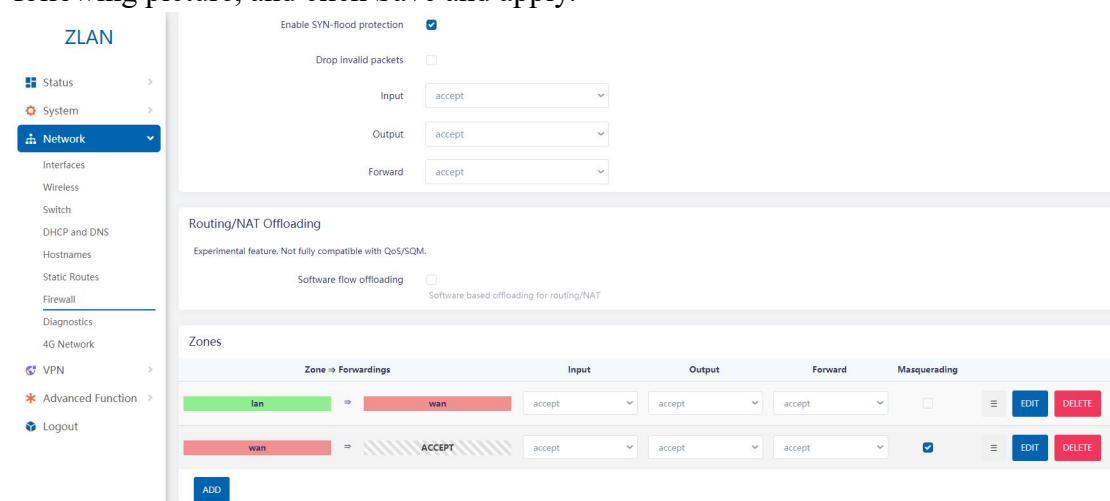


Figure 19 Firewall

Then click Advanced -> Trunk, select Trunk bridge in trunk mode, select the name of the AP that you want to bridge, enter the password of the upper-level WiFi, and select the corresponding encryption mode. The IP address of the device should be set to an IP address in a different network segment from that of the upper-level route.

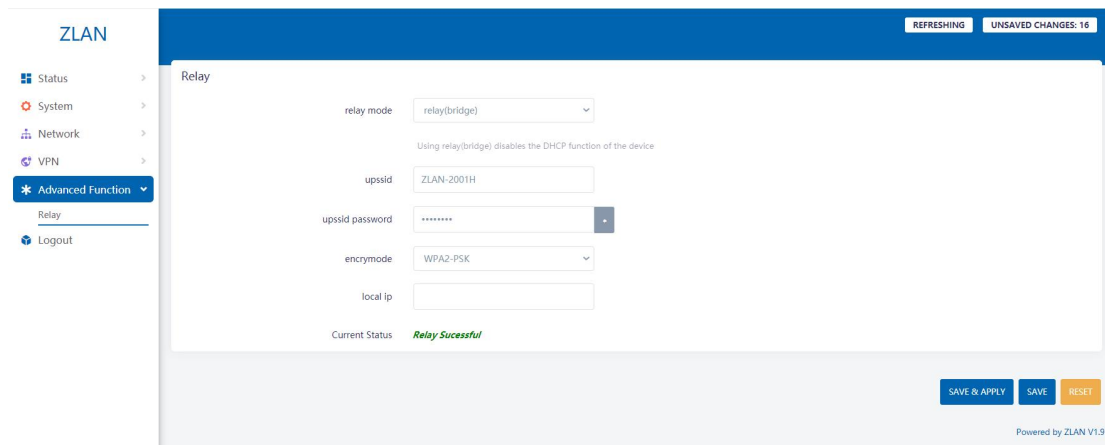


Figure 20 Advanced features

Step 2: Fill it out as required, click "Save and apply" in the lower right corner, and wait for the application to complete.

After successful relay, menu bar: Network -> Wireless:

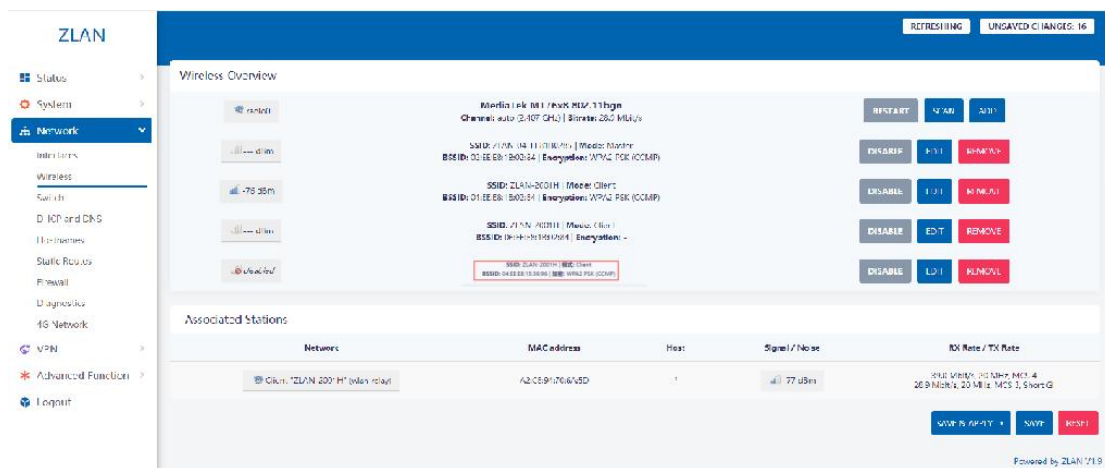


Figure 21 Overview of trunk wireless

The upper-level WiFi is displayed here. If the encryption mode is also displayed, the connection to the upper-level WiFi is successful

Click on the menu bar: Network -> Interface:

Check whether the relay interface has an IP address. If an IP address exists, the relay is successful.

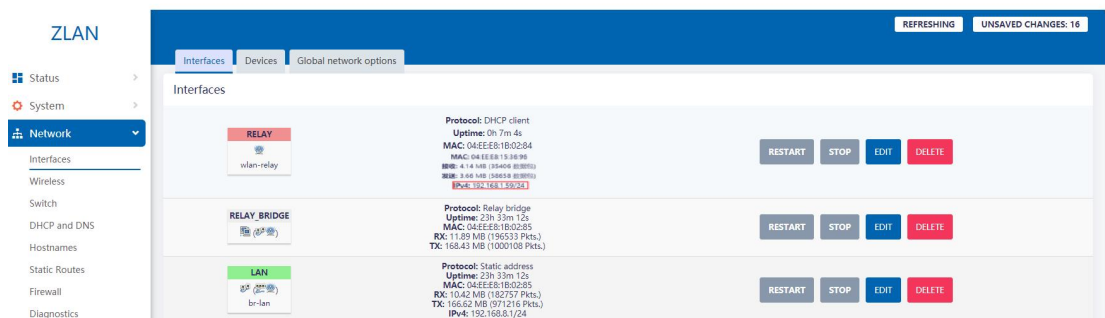


Figure 22 relay interface.

After the configuration is complete, wait 10 seconds. In this case, the router can bridge to the upper-layer AP over WiFi, and the network device can connect to the LAN port through a network cable to obtain the network segment assigned by the upper-layer AP.

IP	(DHCP)	EDITOR
DNS	(DHCP)	EDITOR
Link speed (receive/transfer):	100/100 (Mbps)	COPY
IPv6	fe80::3242:257f:f2ef:5a1%17	
IPv4	192.168.1.156	
IPv4 DNS	116.228.111.118	
	180.168.255.18	
manufacturer:	ASIX	
Description:	ASIX AX88772C USB2.0 to Fast Ethernet Adapter	
driver:	3.18.19.1213	
MAC	00-00-00-01-60-23	

Figure 23 DHCP obtaining parameters

3.2.3. WiFi mesh networking mode

WiFi mesh network is a network topology that consists of multiple WiFi nodes (aps) that are connected to each other to form a multi-hop network. In such a network, each node can communicate with other nodes and can act as a relay station to forward data from one node to another. This network structure can cover a large area, and the network can be expanded as more nodes are added as needed.

If the level-1 route is also 9809M, the more stable mesh networking mode can be used. Firmware requirements: more than 1.4, the firmware can be obtained from Zlan engineers.

Main routing Settings: Go to the configuration page, menu bar: Network -> Wireless, select radio0 in Wireless Profile, and click Add.

ZLAN

REFRESHING UNSAVED CHANGES: 16

Wireless Overview

radio0 MediaTek MT76x8 802.11bgn
Channel: auto (2.407 GHz) | Bitrate: 43.3 Mbit/s

SSID: ZLAN-04EE81B0285 | Mode: Master
BSSID: 02EEEB180284 | Encryption: WPA2 PSK (CCMP)

SSID: ZLAN-2001H | Mode: Client
BSSID: 04EEEB180284 | Encryption: -

SSID: ZLAN-2001H | Mode: Client
BSSID: 06EEEB180284 | Encryption: -

SSID: ZLAN-2001H | Mode: Client
Interface has 7 pending changes

Associated Stations

Network	MAC address	Host	Signal / Noise	RX Rate / TX Rate
Client "ZLAN-2001H" (wlan-relay)	A2C894706A5D	?	-66 dBm	78.0 Mbit/s, 20 MHz, MCS 12 57.8 Mbit/s, 20 MHz, MCS 5, Short GI

SAVE & APPLY SAVE RESET

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Figure 24 The new page is displayed

Enter interface configuration and select General configuration. Mode Select 802.11s protocol, set a 4-bit meshID, meshID of all devices in the same mesh network must be the same, network select LAN, and finally click Save.

Interface Configuration

General Setup | Wireless Security | MAC-Filter | Advanced Settings

Mode: Access Point

ESSID: OpenWrt

Network: unspecified

Choose the network(s) you want to attach to this wireless interface or fill out the custom field to define a new network.

Hide ESSID: ☐

Where the ESSID is hidden, clients may fail to roam and airtime efficiency may be significantly reduced.

WMM Mode: ☒

Where Wi-Fi Multimedia (WMM) Mode QoS is disabled, clients may be limited to 802.11a/802.11g rates.

DISMISS SAVE

Figure 25 mesh networking configuration

Then click Save and Configure, and the mesh related Settings for the main route will take effect.

Network	MAC address	Host	Signal / Noise	RX Rate / TX Rate
Client "ZLAN-2001H" (wlan-relay)	A2:C8:94:70:6A:5D	?	-69 dBm	78.0 Mbit/s, 20 MHz, MCS 12 57.8 Mbit/s, 20 MHz, MCS 5, Short GI

SAVE & APPLY SAVE RESET

Powered by ZLAN V1.9

Figure 26 Save and configure

Secondary route setting: The setting method is basically the same as that of the main router. It should be noted that the channel of the secondary route and the main route WiFi needs to be the same.

Wireless network is enabled DISABLE

Operating frequency: Mode: N Channel: 9 (2452 Mhz) Width: 20 MHz

Allow legacy 802.11b rates: ☐ Legacy or badly behaving devices may require legacy 802.11b rates to interoperate. Airtime efficiency may be significantly reduced where these are used. It is recommended to not allow 802.11b rates where possible.

Maximum transmit power: driver default - Current power: *unknown*
Specifies the maximum transmit power the wireless radio may use. Depending on regulatory requirements and wireless usage, the actual transmit power may be reduced by the driver.

Interface Configuration

General Setup Wireless Security Advanced Settings

Mode: 802.11s

Mesh Id: 1234

Network: lan:

Choose the network(s) you want to attach to this wireless interface or fill out the custom field to define a new network.

DISMISS SAVE

Figure 27 mesh setup from routing

At the same time, you also need to set the interface of the secondary route. Click Network -> Interface on the menu bar, click the edit button of the LAN interface, set the IP address of the secondary route to the same network segment as that of the primary route, and set the gateway to be the same as that of the primary route.

General Settings Advanced Settings Firewall Settings DHCP Server

Status: **Device:** br-lan
Uptime: 1d 0h 5m 7s
MAC: 04:EE:E8:1B:02:85
RX: 13.37 MB (235153 Pkts.)
TX: 179.03 MB (1046980 Pkts.)
IPv4: 192.168.8.1/24

Protocol: Static address

Device: br-lan

Bring up on boot: ☒

IPv4 address: 192.168.8.1 ...

IPv4 netmask: 255.255.255.0

IPv4 gateway: 192.168.1.1 (RELAY)

IPv4 broadcast: 192.168.8.255

IPv6 address: Add IPv6 address... +

IPv6 gateway:

Figure 28 General Settings for the secondary route

In addition, disable the DHCP server for the secondary

route.

General Setup Advanced Settings IPv6 Settings

Ignore interface ☒ Disable DHCP for this interface.

Start Lowest leased address as offset from the network address.

Limit Maximum number of leased addresses.

Lease time Expiry time of leased addresses, minimum is 2 minutes (2m).

Figure 29 Omit DHCP from a route

3.2.4. WiFi roaming mode

Wireless roaming refers to the STA (Station, wireless workstation) when moving to the critical area of two AP coverage areas, the STA is associated with the new AP and disconnected from the original AP, and maintains an uninterrupted network connection in the process. In simple terms, wireless roaming refers to the STA moving between different AP coverage areas and keeping the user's business uninterrupted.

The function of wireless roaming technology is to solve the problem that the user service is not interrupted when the association relationship is switched, and to minimize the packet loss during the switching, so as to ensure the smooth and smooth service experience of the user. It is worth noting that STA (Station, wireless workstation) must also support wireless roaming function to achieve uninterrupted network connection.

Go to the configuration page, menu bar: Network -> Wireless, select the AP hotspot with wireless mode as Master in Wireless profile, and click Edit.

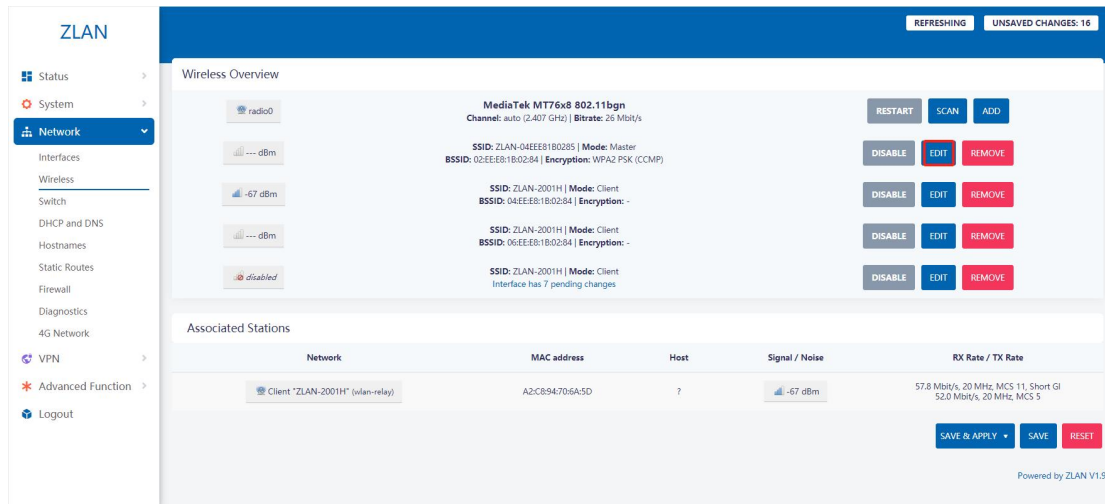


Figure 30 Editing AP hotspots

Click Interface Configuration below to select Wireless Security. The first step is to click the general Settings in the interface configuration. First of all, we need to set the ESSID of the 9809M (that is, the name of the AP) that needs to set the roaming function. For example, the ESSID of the 9808M in the following figure is set to ZLAN-MY, and the password is the default 66666666 (which can be modified in the wireless security bar).

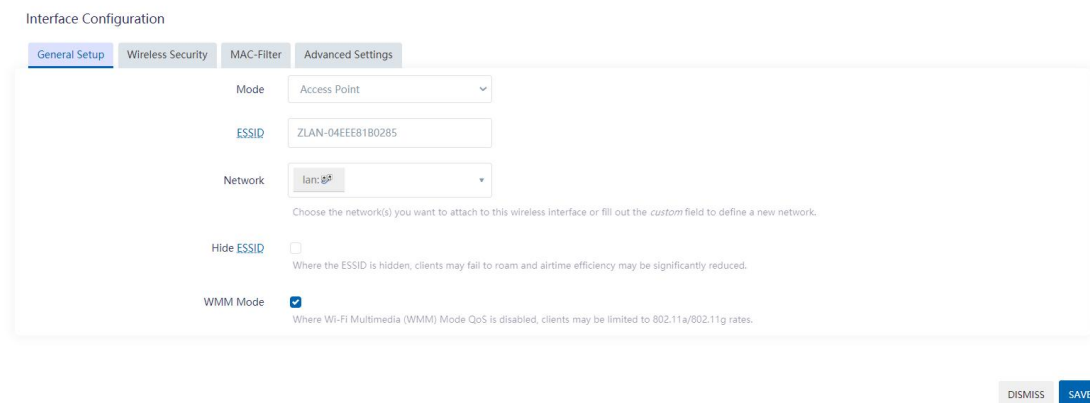


Figure 31 Modifying the consistency of ESSID

The second step needs to enter the wireless security bar, first of all need to set the key to the same parameter (the default key is 66666666). Then select 802.11r Fast switching. The mobile domain numbers of multiple roaming 9809M devices must be the same, for example, 1111. The re-association deadline is changed to 20000ms. THE FT protocol is selected as FT OVER THE AIR, because some STA workstations do not support the newer FT OVER DS. Generate PMK locally Select this option. Leave the rest as default. Finally click Save and Apply.

Interface Configuration

General Setup **Wireless Security** MAC-Filter Advanced Settings

Encryption: WPA2-PSK (strong security)

Cipher: auto

Key: [masked]

802.11r Fast Transition: ☐ Enables fast roaming among access points that belong to the same Mobility Domain

802.11w Management Frame Protection: Disabled
Note: Some wireless drivers do not fully support 802.11w. E.g. mwlwifi may have problems

Enable key reinstallation (KRACK) countermeasures: ☐ Complicates key reinstallation attacks on the client side by disabling retransmission of EAPOL-Key frames that are used to install keys. This workaround might cause interoperability issues and reduced robustness of key negotiation especially in environments with heavy traffic load.

Enable WPS pushbutton, requires WPA(2)-PSK/WPA3-SAE: ☐

DISMISS SAVE

Figure 32 Setting up 802.11r fast switching

3.2.5. Cable Mode

In wired mode, the router connects to the Internet through the WAN port.

Step 1: First, connect the WAN port of the 9809M to the network port of the upper-level router or optical cat through the network cable.

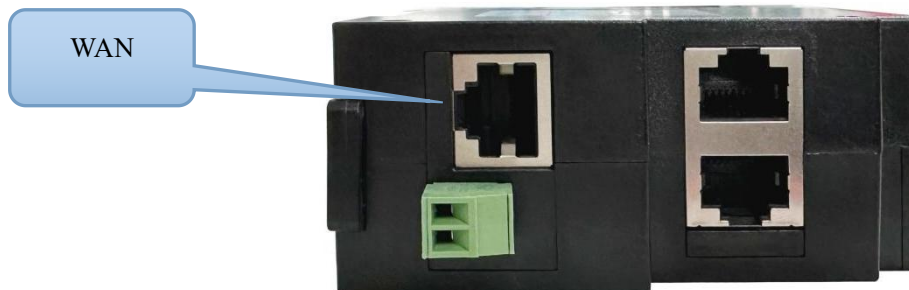


Figure 33 WAN interface diagram

Step 2: Click the left menu bar: Network -- >4G Network -- >4G Settings: Set the WAN port mode to Wired priority mode (if it is already, there is no need to perform this step) and click Save and set in the lower right corner.

4G State 4G Config

4G network configuration

wan network settings:

Network priority:

Apn Access Point:

APN Authentication:

APN Username:

APN Password:

SAVE & APPLY SAVE RESET

Figure 34 Wired priority mode

Wait 10 seconds after the setting is complete, that is, the configuration is complete. At this time, the router can access the external network through the WAN port network cable, and your device can be connected to the Internet after connecting to the router through the cable or WiFi.

As you can see from the Network -> Interface bar, the WAN interface is the DHCP client protocol that is running by default. The 9809M automatically obtains an IP address from the DHCP server of the upper-level network port. In the IPv4 protocol, the 9809M obtains the network segment 192.168.1.92 assigned by the superior. The IP address of the 9809M device itself is in the 192.168.8 network segment (the default is 192.168.8.1 and the IP address of the LAN port in the figure below has been changed to 8.2).

LAN

WAN

WAN6

WAN 4G

Protocol: Static address
Uptime: 1d 0h 35m 14s
MAC: 04:EE:E8:1B:02:85
RX: 15.70 MB (282083 Pkts.)
TX: 186.19 MB (1111081 Pkts.)
IPv4: 192.168.8.1/24

Protocol: DHCP client
MAC: 04:EE:E8:1B:02:86
RX: 0 B (0 Pkts.)
TX: 10.20 MB (30225 Pkts.)
IPv4: 192.168.1.92/24

Protocol: DHCPv6 client
MAC: 04:EE:E8:1B:02:86
RX: 0 B (0 Pkts.)
TX: 10.20 MB (30225 Pkts.)

Protocol: DHCP client
MAC: FA:C6:D4:9F:9F:B7
RX: 25.57 KB (354 Pkts.)
TX: 11.45 MB (30356 Pkts.)

RESTART STOP EDIT DELETE

Figure 35 WAN interface protocol

3.2.6.4G Mode

In 4G mode, the router accesses the external network by inserting a 4G SIM card.

4G mode supports APN (Access point name). Enter the APN name, authentication mode, user name, and password as required by the APN provider.

Step 1: Insert the SIM card and connect the 4G antenna.

Step 2: Click the left menu bar: Network -- >4G Network -- >4G Settings: Set the WAN port mode to 4G priority mode (if it is already, there is no need to perform this step) and click Save and set in the lower right corner.

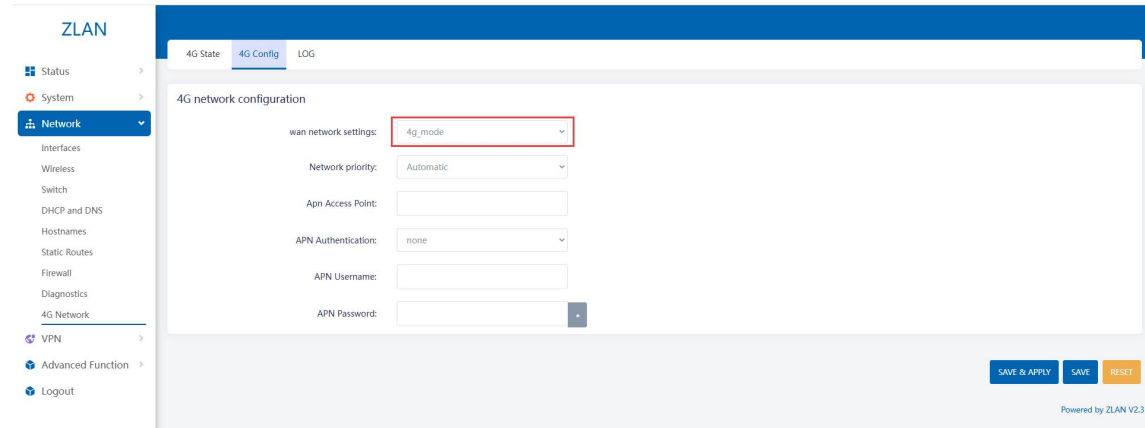


Figure 36 4G priority mode

Wait for the blue light of the router to blink, and then wait for one minute to complete the setting (if you cannot connect to the Internet, wait one minute and see again, or try restarting the router). After completion, the router can access the external network through 4G, and your device can access the Internet through WiFi or wired access to the router.

3.3. Switch VLAN

The network ports on the 9809M can be combined into multiple vlans where computers can communicate directly with each other. Vlans are also used to divide different network segments. By default, one uplink port connects to the carrier, and the other ports are used for the local network.

As shown in the following figure, the four switch ports of the 9809M belong to the same VLAN by default, that is, LAN 1-4 belong to VLAN ID1. The WAN port that connects to the carrier belongs to VLAN ID2.

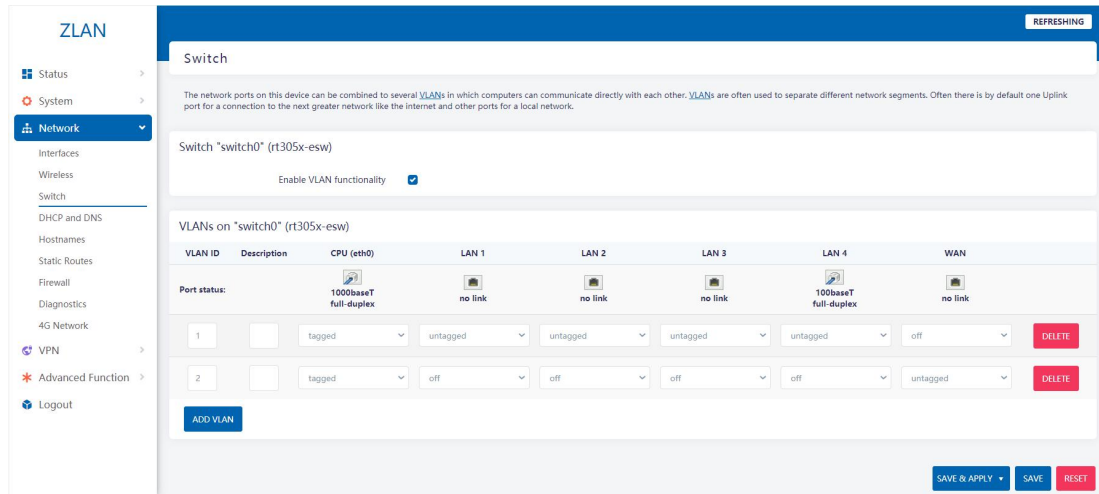


Figure 37 Default VLAN mode

In the following figure, we divide LAN1 and LAN3 into the same VLAN, that is, ID1. Assign LAN2 and 4 to the same VLAN, that is, ID3. First, we need to change the unmarked LAN2 and 4 of ID1 to off. At the same time, the VLAN of ID3 needs to be set to marked CPU(eth0) and unmarked LAN2,4. Finally click Save and apply.

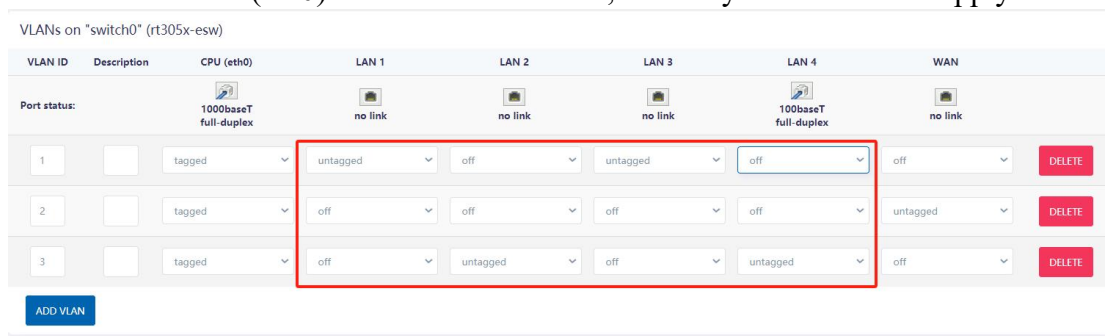


Figure 38 Add VLAN ID3

Next we need to set the interface, click Network --> Interface. Click the New button to create the interface. The name of the interface can be arbitrarily modified, such as VLAN1, the protocol can be static address, and the device can be VLAN "eth0.1", that is, VLAN ID1.

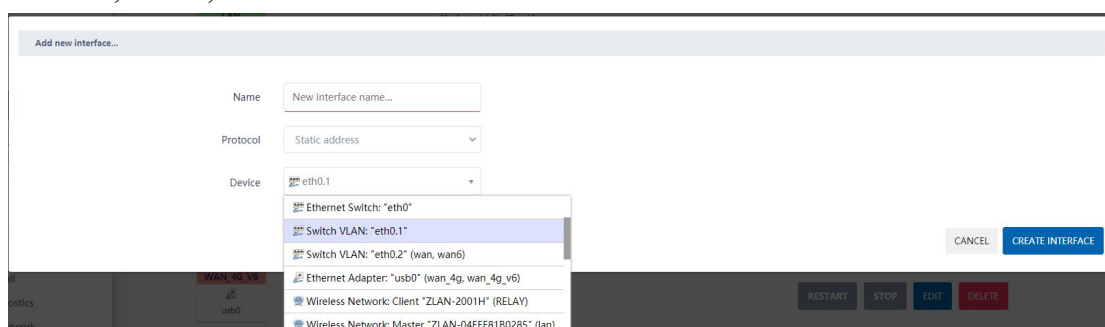


Figure 39 Add interface

Set the IP address to the IP address of the network segment that you want to assign to the device under the network port of VLAN1. For example, you want to assign the IP address to the network device in the network segment 192.168.9.xxx.

192.168.9.1.

The screenshot shows the 'General Settings' tab for an interface configuration. The 'Status' section displays device information: Device: eth0.1, MAC: 04:EE:E8:1B:02:85, RX: 25.13 MB (480885 Pkts.), and TX: 212.18 MB (1405041 Pkts.). The 'Protocol' is set to 'Static address'. The 'Device' is 'eth0.1'. The 'Bring up on boot' checkbox is checked. The 'IPv4 address' is '192.168.9.1', 'IPv4 netmask' is '255.255.255.0', 'IPv4 gateway' is '192.168.1.1 (RELAY)', and 'IPv4 broadcast' is '192.168.9.255'. The 'IPv6 address' and 'IPv6 gateway' fields are empty, with an 'Add IPv6 address...' button next to the IPv6 address field.

Figure 40 General interface configuration

The interface also needs to be configured with a firewall. When creating or assigning firewall Settings, select Custom and specify one firewall zone VLAN1, and press Enter to confirm.

The screenshot shows the 'Firewall Settings' tab. The 'Create / Assign firewall-zone' dropdown menu is open, showing options: 'unspecified', 'lan', 'wan', 'wan6', 'wan_4g', 'wan_4g_v6', 'RELAY', and 'wwan'. The 'lan' option is highlighted in green. The 'wan' option is highlighted in red. The 'wan_4g' option is highlighted in blue. The 'wan_4g_v6' option is highlighted in blue. The 'RELAY' option is highlighted in blue. The 'wwan' option is highlighted in blue. The 'wan' option is highlighted in red. The 'wan_4g' option is highlighted in blue. The 'wan_4g_v6' option is highlighted in blue. The 'RELAY' option is highlighted in blue. The 'wwan' option is highlighted in blue.

Figure 41 Firewall configuration

If the DHCP server function is required, you also need to configure the DHCP server, click Save, return to the previous page, click Save and apply.

The screenshot shows the 'DHCP Server' configuration page. It displays the message 'No DHCP Server configured for this interface' and a red button labeled 'SETUP DHCP SERVER'. At the bottom right, there are 'DISMISS' and 'SAVE' buttons.

Figure 42 DHCP server configuration

The setting mode of VLAN2 is the same as that of VLAN1, and VLAN2 is also created. Select VLAN:eth0.3 for the switch. Set the Ip address to 192.168.10.1. The firewall zone refers to VLAN1 and is also a user-defined zone. Enable a DHCP server at the same time.

The screenshot shows the 'VLAN2 Parameter Settings' window. The 'General Settings' tab is selected. The 'Status' section shows the device as 'eth0.3' with MAC address '04:EE:E8:1B:02:85' and statistics for RX (25.50 MB, 487000 Pkts.) and TX (213.99 MB, 1413847 Pkts.). The 'Protocol' is set to 'Static address'. The 'Device' is 'eth0.3'. The 'Bring up on boot' checkbox is checked. The 'IPv4 address' is '192.168.10.1', 'IPv4 netmask' is 'unspecified', 'IPv4 gateway' is '192.168.1.1 (RELAY)', and 'IPv4 broadcast' is empty.

Figure 43 VLAN2 Parameter Settings

At the same time, the previous default interface LAN interface can be deleted (do not delete the WiFi function). Leave only VLAN1,VLAN2,WAN interface, etc. The final interface overview is shown in the following figure.

VLAN1	eth0.1	协议: 静态地址 运行时间: 1h 33m 31s MAC: 04:EE:E8:1C:7E:0C 接收: 7.06 MB (39542 数据包) 发送: 30.51 MB (40991 数据包) IPv4: 192.168.9.1/24
VLAN2	eth0.3	协议: 静态地址 运行时间: 1h 26m 55s MAC: 04:EE:E8:1C:7E:0C 接收: 0 B (0 数据包) 发送: 1.09 KB (9 数据包) IPv4: 192.168.10.1/24
WAN	eth0.2	协议: DHCP 客户端 运行时间: 2h 18m 50s MAC: 04:EE:E8:1C:7E:0D 接收: 39.64 MB (150062 数据包) 发送: 6.07 MB (38608 数据包) IPv4: 192.168.1.186/24
WAN6	eth0.2	协议: DHCPv6 客户端 MAC: 04:EE:E8:1C:7E:0D 接收: 39.64 MB (150062 数据包) 发送: 6.07 MB (38608 数据包)
WAN_4G	usb0	协议: DHCP 客户端 接收: 0 B (0 数据包) 发送: 0 B (0 数据包) 错误: 网络设备不存在
WAN_4G_VS	usb0	协议: DHCPv6 客户端 接收: 0 B (0 数据包) 发送: 0 B (0 数据包) 错误: 网络设备不存在

Figure 44 VLAN interface probability

When you connect the network port of a computer to port LAN1 and port 3 of VLAN1, the computer automatically obtains the IP address segment 192.168.9. When the interface is connected to port LAN2,4 of VLAN2, the IP address automatically obtained is 192.168.10. The following figure shows the reference Settings of firewall parameters.

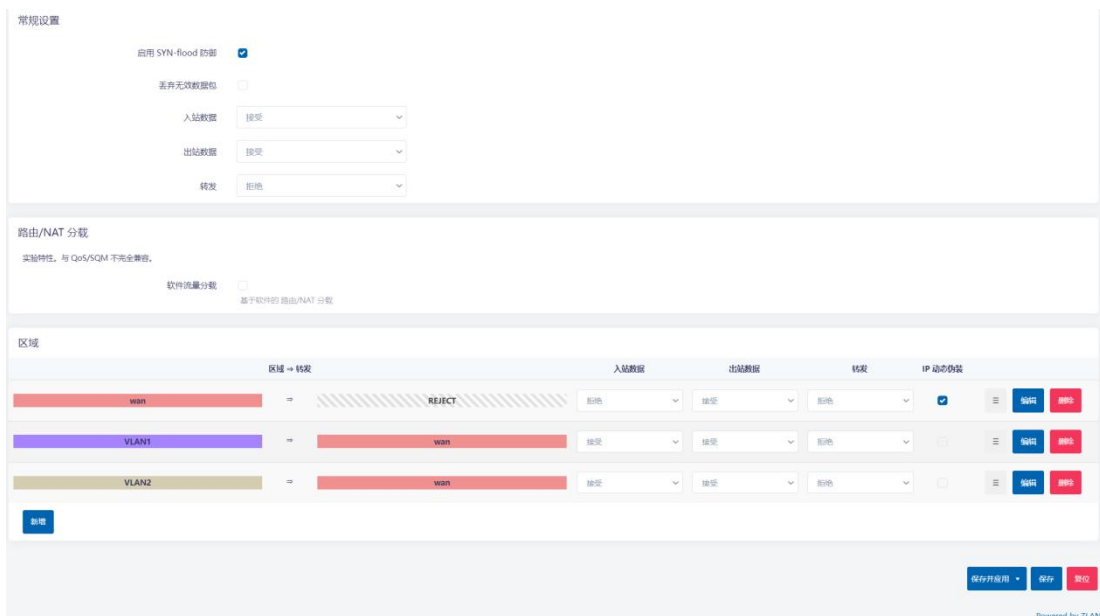


Figure 45 VLAN firewall

3.4. Host name mapping

The 9809M/-E can map Intranet host names based on IP addresses. For multiple hosts on the LAN, the mapped host names facilitate management and access.

After entering the WEB, click Network > Host Name Mapping. Select Add.

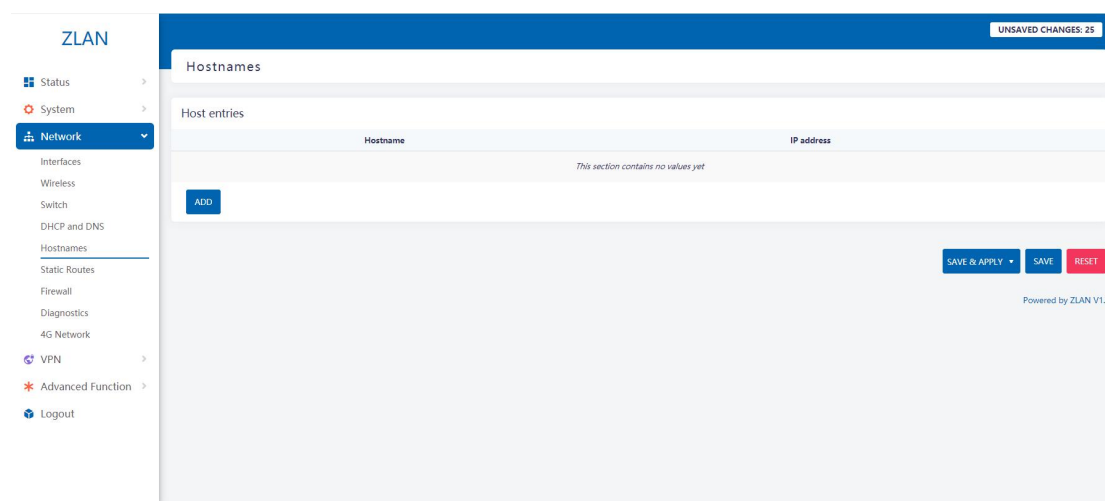


Figure 46 Adding a host name mapping

For example, in the following figure, set the host name to www.zl123.com and the IP address to the IP address of the device on the LAN. After the configuration is complete, click Save, return to the previous page, and click Save and apply.

Hostnames

Hostname:

IP address:

Figure 47 Edit the host name

Finally, open the Zlan network port debugging assistant, a tcp server mode, ip 192.168.9.181. Listen to port 1111. The other is set to tcp client mode, and the destination ip address and port number are set to www.zl123.com:1111. This will point to 192.168.9.181:1111.

Zorlan TCP&UDP Testing tool - http://www.zlmcu.com

Communication settings: Work mode: TCP Client, Local port: 0, Dest IP: www.zl123.com, Dest port: 1111, Group IP: 230.90.76.1

Receive settings: Receive as Hex, Receive to file, Clear window

Send settings: Send as Hex (format 01 02), Send every 100 ms, Send receive mode: Message, Modify send-file

Local IP: 192.168.8.10

Zorlan TCP&UDP Testing tool - http://www.zlmcu.com

Communication settings: Work mode: TCP Server, Local port: 1111, Dest IP: 192.168.1.201, Dest port: 4196, Group IP: 230.90.76.1

Receive settings: Receive as Hex, Receive to file, Clear window

Send settings: Send as Hex (format 01 02), Send every 100 ms, Send receive mode: Message, Modify send-file

Local IP: 192.168.8.10

Figure 48 tcp test

3.5. Static routes

A route specifies the interface and gateway through which a host or network can be reached.

The ZLAN9809M/-E supports the manual configuration of routing information, so that when network devices access the target address, they can send data through the specified gateway. Static routes are only suitable for small and stable networks.

Go to Network > Static Route and select a static IPv4 route. Click Add.

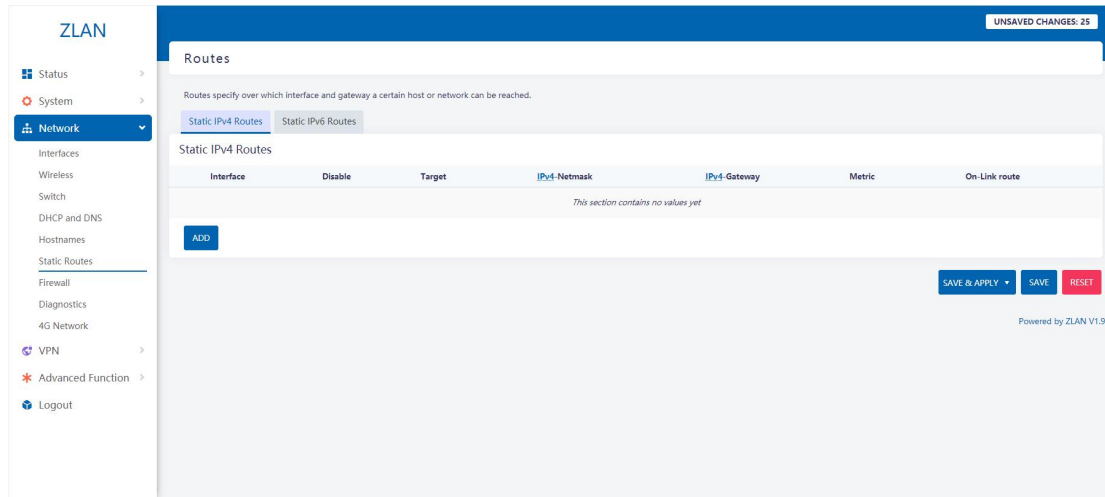


Figure 49 Add a static route

Click Add and configure the routing function as required. After the configuration is complete, click Save and return to the previous page to save and apply.

Interface: indicates the interface through which data can reach the target network.

Destination: IP address of the specified host.

IPv4 subnet mask: specifies the subnet mask.

IPv4 gateway: 9809M Specifies the next-hop address of the destination network.

Figure 50 Static route Settings

3.6. Port forwarding

Port forwarding allows remote computers on the Internet to connect to a specific computer or service on an internal network. When there are insufficient IP addresses in the LAN, the 9809M can map multiple IP addresses into one IP address through the

port forwarding function to save IP resources.

First of all, we need to forward the firewall of 9809M to open, so that the network can be bidirectional. Choose Network -> Firewall, click general Settings, change the Settings as shown in the picture below, click Save and apply.

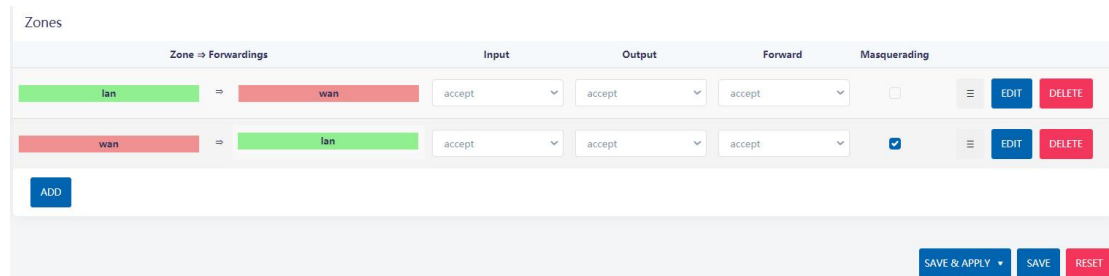


Figure 51 Disabling the firewall

Then click port forwarding and select Add to edit the port forwarding rules.

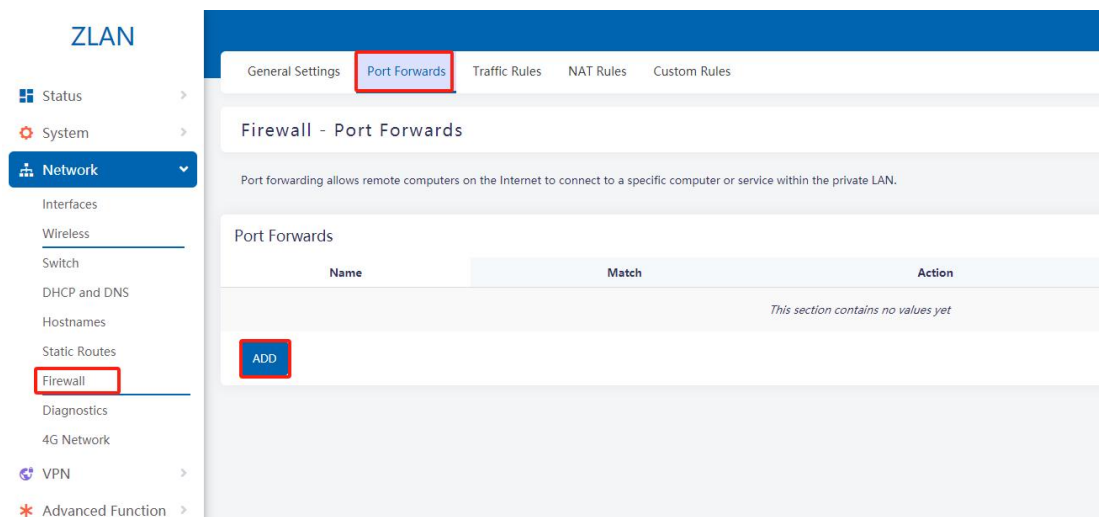


Figure 52 New port forwarding rules

First edit the name, the name is set arbitrarily, such as the IP and port of the internal device that needs to be accessed, the protocol is selected according to its own needs, the source zone selects the area to which the WAN port belongs, the external port selects the external port that needs to be accessed, and the destination zone selects the area where the lan is located. Internal IP Address Select the IP address of the network device to be forwarded, and internal port select the actual port of the device to be forwarded. The external and internal ports can be the same, and when you click Save to return to the previous page, you also need to click Save and apply.

General Settings | **Advanced Settings**

Name: Unnamed forward

Protocol: TCP | UDP

Source zone: wan | wan6 | wan4g | wan4g_v6 | RELAY | wwan

External port:

Match incoming traffic directed at the given destination port or port range on this host

Destination zone: lan | lan6

Internal IP address: any

Redirect matched incoming traffic to the specified internal host

Internal port: any

Redirect matched incoming traffic to the given port on the internal host

Figure 53 Setting the port forwarding rule

Next, set the WAN port. The default protocol of the 9809M WAN port is the DHCP client protocol, so the IP cannot be fixed. Therefore, the protocol of the WAN port needs to be changed to a static protocol. Select Network > Interface, select WAN port, and click the Edit button.

WAN

eth0.2

Protocol: DHCP client
MAC: 04:EE:E8:1B:02:86
RX: 0 B (0 Pkts.)
TX: 11.32 MB (33543 Pkts.)

RESTART STOP **EDIT** DELETE

Figure 54 Edit button

Set the protocol to a static address. Set the IPv4 address to an IP address in the same network segment of the upper-layer network. Ensure that the IP address is not the same as another IP address on the upper-layer network. As shown in the figure below, finally click Save to return to the previous page and click Save and apply to make the configuration take effect.

Interfaces >> WAN

General Settings | Firewall Settings | **DHCP Server**

Status: **Device:** eth0.2
MAC: 04:EE:E8:1B:02:86
RX: 0 B (0 Pkts.)
TX: 11.34 MB (33599 Pkts.)

Protocol: Static address

Really switch protocol? **SWITCH PROTOCOL**

Device: eth0.2

Bring up on boot: ☒

Figure 55 Configuring a static IP address for the WAN port

Finally, turn on the TCP/UDP network port debugging assistant sockettest, and

the debugging assistant on the left is set to the client mode, with the destination IP pointing to the IP of the WAN port on 9809M (that is, 192.168.1.186 set in the figure above) and the destination port 5001 (that is, the external port set before). The IP address of the network port where the debugging assistant resides is 192.168.8.189, that is, the internal IP address set earlier. The working mode is TCP server mode, and the local port 5001 (that is, the internal port set previously) can generate data with each other after TCP links are established, as shown in the following figure.

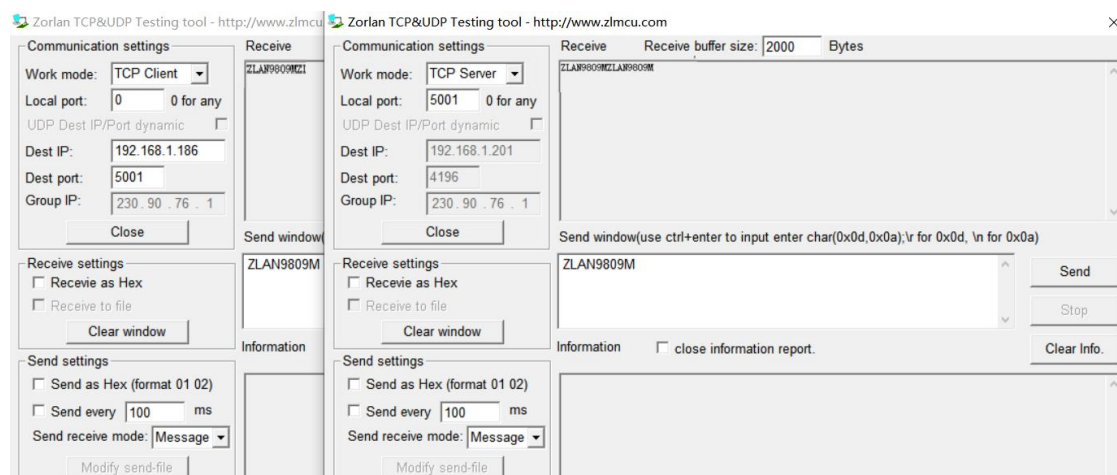


Figure 56 TCP communication

4. Device management

4.1. Set the router login password

Click on the left sidebar: System -- > Management Rights -- > Router Password, enter the password you want to set, then click Save, you can change the router password. The default router does not have a password. You are advised to set your own router password.

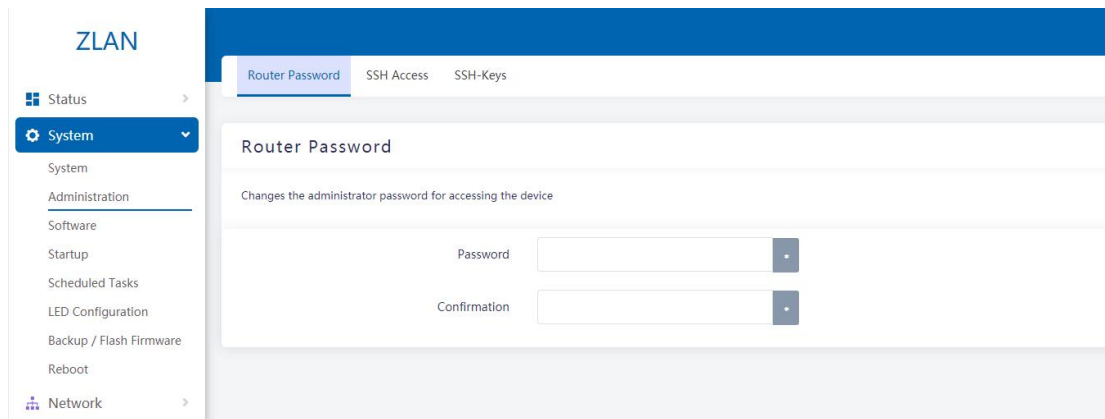


Figure 57 Changing the login password

4.2. Set the router page language

On the left menu bar, click: System --> System, then click Language and interface, you can select the language page

For English, click Save and apply to take effect.

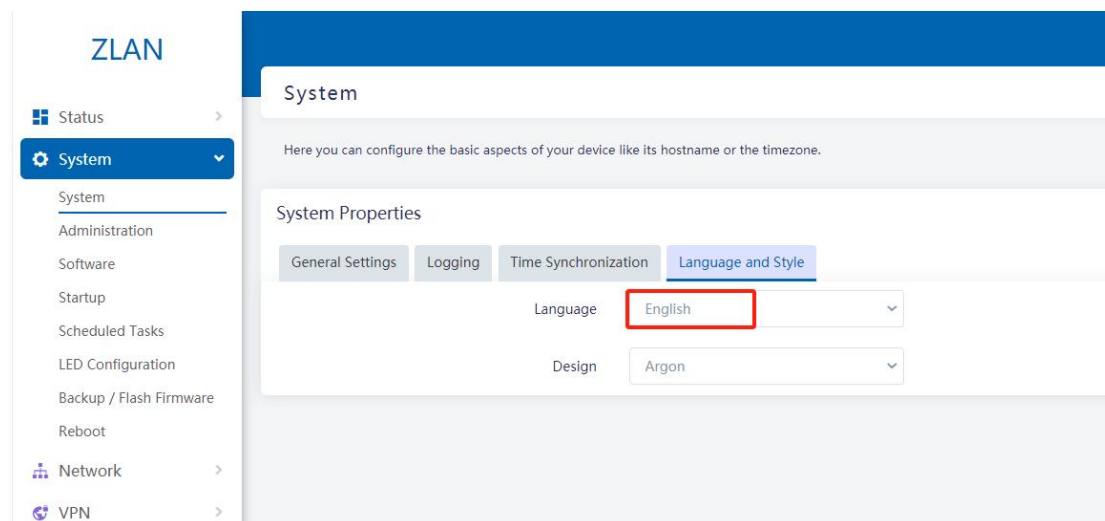


Figure 58 Setting the language

4.3. Set the WiFi parameters of the device

On the left menu bar, click: Network > Wireless, select the WiFi you want to edit, and click the edit button:



Figure 59 WiFi parameters

In the open page, ESSID is the name of WiFi, you can modify the name of WiFi here:

Interface Configuration

General Setup | Wireless Security | MAC-Filter | Advanced Settings

Mode: Access Point

ESSID: ZLAN-04EEE8180285

Network: lan: 0

Choose the network(s) you want to attach to this wireless interface or fill out the custom field to define a new network.

Hide ESSID: ☐

Where the ESSID is hidden, clients may fail to roam and airtime efficiency may be significantly reduced.

WMM Mode: ☒

Where Wi-Fi Multimedia (WMM) Mode QoS is disabled, clients may be limited to 802.11a/802.11g rates.

DISMISS SAVE

Figure 60 Changing the WiFi name

Click the Wireless security button to modify the WiFi password and encryption method here:

Interface Configuration

General Setup | Wireless Security | MAC-Filter | Advanced Settings

Encryption: WPA2-PSK (strong security)

Cipher: auto

Key: *****

802.11r Fast Transition: ☐

Enables fast roaming among access points that belong to the same Mobility Domain

802.11w Management Frame Protection: Disabled

Note: Some wireless drivers do not fully support 802.11w. E.g. mwlwifi may have problems

Enable key reinstallation (KRACK) countermeasures: ☐

Complicates key reinstallation attacks on the client side by disabling retransmission of EAPOL-Key frames that are used to install keys. This workaround might cause interoperability issues and reduced robustness of key negotiation especially in environments with heavy traffic load.

Enable WPS pushbutton, requires WPA(2)-PSK/WPA3-SAE: ☐

DISMISS SAVE

Figure 61 Changing the encryption mode and password

After setting, click the lower right corner to save.

4.4. The router IP address is changed

Open the left menu bar: Network -- > Interface: Click the Edit button under LAN.

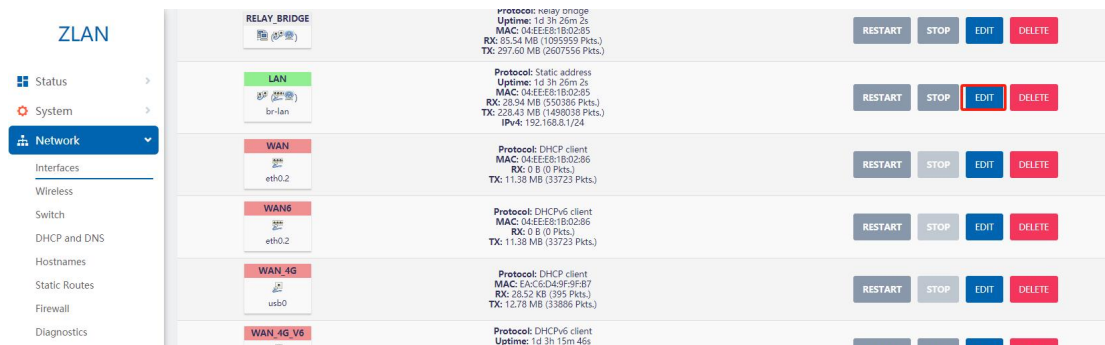


Figure 62 Edit LAN parameters

You can modify the IP and other attributes of the router itself, and click the lower right corner to save.

Figure 63 Saving LAN parameters

Then click the lower right corner to save and apply: (If it fails, you can try to force the application, it is recommended to use the force application).

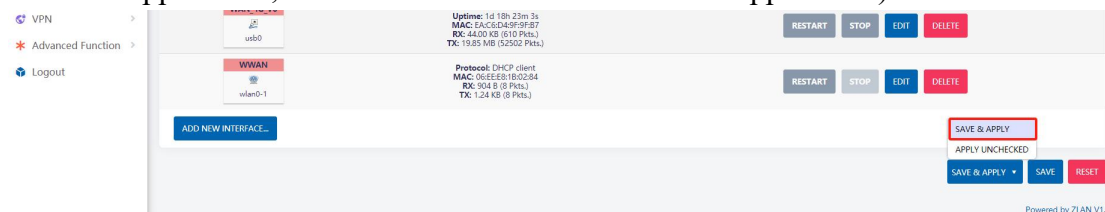


Figure 64 Save application

Wait 30 seconds and enter the IP address to access the router configuration page.

4.5. Router Firmware upgrade/refresh

By brushing the router firmware, you can get the latest features and more stable performance of the 9809M router. Open the left menu bar: System -- > Backup/Upgrade:

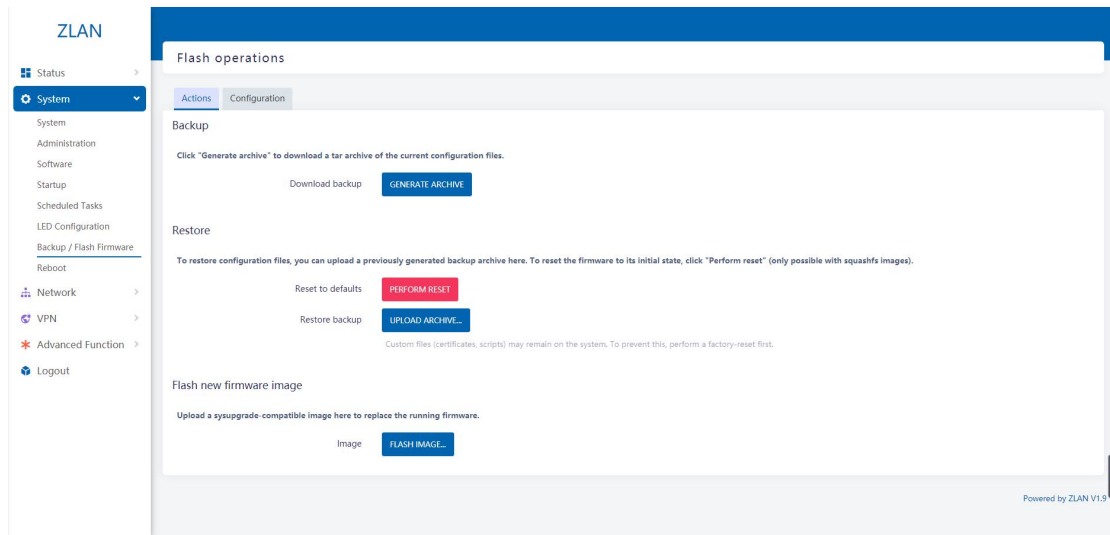


Figure 65 Backup/upgrade

Click the Write Firmware button, click Browse in the page that opens to select the firmware in your computer:

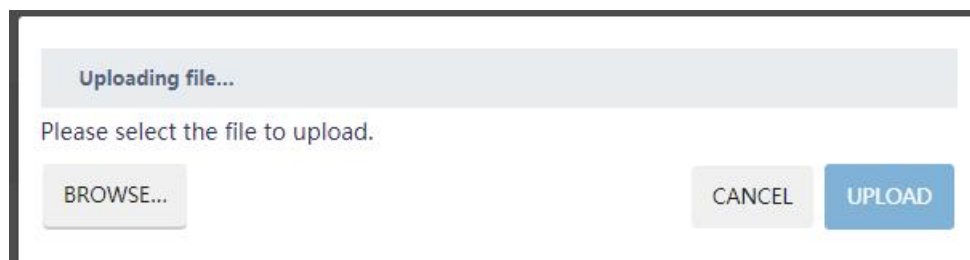


Figure 66 Viewing the firmware

After you click Upload, you will be prompted to wait for firmware writing. After about 5 minutes, you need to refresh the web interface again to complete the firmware writing operation.

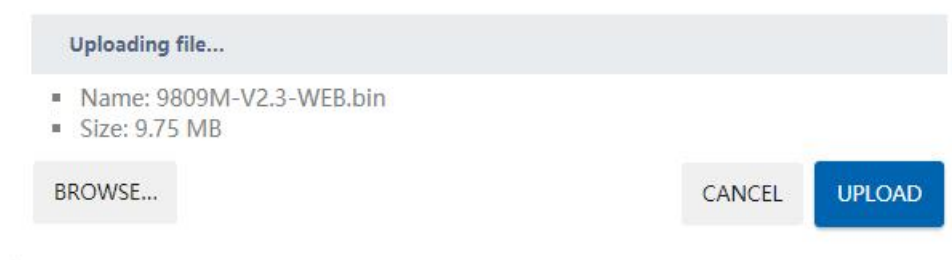


Figure 67 Uploading firmware

If you do not need to save the original Settings after the upgrade, disable the default configuration retention function. As shown in the following picture.

Flash image?

The flash image was uploaded. Below is the checksum and file size listed, compare them with the original file to ensure data integrity. Click 'Continue' below to start the flash procedure.

- Size: 9.75 MB
- MD5: f475d6a4c63b5163843cec635cc92cf2
- SHA256: a965a7ea9d1906f2541487ae46664e0de3a632aa21383b101fa5c58856347bd7

☒ KEEP SETTINGS AND RETAIN THE CURRENT CONFIGURATION

☐ SKIP FROM BACKUP FILES THAT ARE EQUAL TO THOSE IN /ROM

☐ INCLUDE IN BACKUP A LIST OF CURRENT INSTALLED PACKAGES AT /ETC/BACKUP/INSTALLED_PACKAGES.TXT

CANCEL

CONTINUE

Figure 68 Uploading firmware

4.6. Restore factory Settings

Click System on the left menu bar -- > Backup/Upgrade, and click the reset button:

ZLAN

Status

System

System

Administration

Software

Startup

Scheduled Tasks

LED Configuration

Backup / Flash Firmware

Reboot

Network

VPN

Advanced Function

Logout

Upload has been cancelled

Flash operations

Actions

Configuration

Backup

Click "Generate archive" to download a tar archive of the current configuration files.

Download backup

GENERATE ARCHIVE

Restore

To restore configuration files, you can upload a previously generated backup archive here. To reset the firmware to its initial state, click "Perform

Reset to defaults

PERFORM RESET

Restore backup

UPLOAD ARCHIVE...

Custom files (certificates, scripts) may remain on the system. To prevent this, perform a factory

Flash new firmware image

Upload a sysupgrade-compatible image here to replace the running firmware.

Image

FLASH IMAGE...

Figure 69 Factory recovery

After the reset is complete, it is restored to the factory Settings.

Restoring factory Settings will lose the Settings you have made and is generally not recommended.

5. After-sales service and support

Shanghai Zlan Information Technology Co., LTD

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Fax: 021-64325200

Website: <http://www.zlmcu.com>

Email: support@zlmcu.com