User Manual

S9922M Cellular Wi-Fi Router

RICON

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Caution

Due to product updates or functional upgrading, we may renew the content of this file, and this file only for reference. All statement, information, suggestion etc. in this file do not compose any form of guarantee and we reserves the right of final explanation.

Introduction

Summary

S9922M Cellular Wi-Fi Router is a data communication terminal on mobile communication network which independently researched and developed by RICON MOBILE INC. The product is based on 3G/4G wireless communication technology. It uses high performance 32-bit embedded operating system and has a full industrial design. It can provide high performance 3G/4G communication speed by accessing the global 3G/4G network via the embedded 4G module. It is widely used for various industries such as telecommunication, finance, information media, electric power, transportation, on-board devices and environmental protection and so on.

The main function of this document is to help readers know the functional characteristics and typical application modes of the product, understand the installation, deployment and configuration operation methods for the product and master the methods for dealing with common faults during usage.

Product Version

The product version corresponding to the document is as shown below.

Product name	Product version
S9922M 3G/4G Router	V30

Readers

The document applies to the following persons:

- R & D engineers
- Technical support engineers
- Customers

You are recommended to start from Chapter One if you know and use any Router product for the first time so as to get a better understanding of the product and the correct usage by reading all the contents of the document.

You are recommended to select any chapter or section you want to know via the contents below if you have known or used any Router product of RICON MOBILE INC. or a similar product of any other company.

Brief Introduction of Contents

The usage of S9922M Cellular Wi-Fi Router is described in the document.

Section	Contents
1 Product Introduction	S9922M Cellular Wi-Fi Router and its functional characteristics, product orientation are introduced in the chapter.
2 Product Structure	S9922M Cellular Wi-Fi Router software, hardware structures are introduced in the chapter.
3 Installation of S9922M 3G/4G Router	How to install S9922M Cellular Wi-Fi Router is introduced in the chapter.
4 Preparation before Configuration	Preparation before S9922M Cellular Wi-Fi Router configuration is introduced in the chapter.
5 Router Configuration	S9922M Cellular Wi-Fi Router functional configuration is introduced in the chapter.
6 Typical Application	Several typical application modes of S9922M Cellular Wi-Fi Router is introduced in the chapter.
7 FAQ	The causes and handling methods for common faults of S9922M Cellular Wi-Fi Router during usage are introduced in the chapter.

Conventions

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
	Indicates a tip that may help you address a problem or save your time.
	Provides additional information to emphasize or supplement important points of the main text.

Command Conventions

Convention	Description
Boldface	The keywords of a command line are in boldface.
Italic	Command arguments are in italics.

Convention	Description
[ ]	Items (keywords or arguments) in brackets [ ] are optional.
{ x | y | ... }	Optional items are grouped in braces and separated by vertical bars. One item is selected.
[x | y | ...]	Optional items are grouped in brackets and separated by vertical bars. One item is selected or no item is selected.
{ x | y | ... } *	Optional items are grouped in braces and separated by vertical bars. A minimum of one item or a maximum of all items can be selected.
[x | y | ...] *	Optional items are grouped in brackets and separated by vertical ars. Several items or no item can be selected.
&<1-n>	The parameter before the “&” sign can be repeated 1 to n times.
#	A line starting with the “#” sign is comments.

GUI Conventions

Convention	Description
Boldface	Buttons, menus, parameters, tabs, window, and dialog titles are in boldface. For example, click OK.
>	Multi-level menus are in boldface and separated by the ">" signs. For example, choose File > Create > Folder.

Keyboard Operations

Format	Description
Key	Press the key. For example, press Enter and press Tab.
Key 1+Key 2	Press the keys concurrently. For example, pressing Ctrl+Alt+A means the three keys should be pressed concurrently.
Key 1, Key 2	Press the keys in turn. For example, pressing Alt, A means the two keys should be pressed in turn.

Mouse Operation

Action	Description
Click	Select and release the primary mouse button without moving the pointer.
Double-click	Press the primary mouse button twice continuously and quickly without moving the pointer.

Action	Description
Drag	Press and hold the primary mouse button and move the pointer to a certain position.

Modifying Records

Modifying records accumulate the introduction of every document update. The document of the newest version includes all updating contents of previous document versions.

Document Version	Time of Modifying	Modifying Introduction
V1.0	2014-07-11	The manual was firstly released aiming at the release of S9922M Router.
V1.1	2017-10-10	Manual update to doc V1.1; S9922M hardware version update to V30 from V21.

Contents

Table Contents

Figure Contents

1 Product Introduction

About This Chapter

Section	Brief Introduction of Contents
1.1 Summary	The summary of S9922M Cellular Wi-Fi Router is briefly introduced in the section.
1.2 Product Orientation	The product orientation of S9922M Cellular Wi-Fi Router is briefly introduced in the section.
1.3 Functions and Features	The functions and features of S9922M Cellular Wi-Fi Router are briefly introduced in the section.
1.4 Technical Indicators and Specifications	The technical indicators and relevant specifications for S9922M Cellular Wi-Fi Router are briefly introduced in the section.

1.1 Summary

S9922M Cellular Wi-Fi Router is a wireless router gateway researched and developed based on 3G/4G technology. Besides the functions such as VPN, firewall, NAT, PPPoE, DHCP of conventional routers, it can also support 3G/4G wireless dialing to provide wireless high speed bandwidth as high as 100Mbps and support 802.11n to provide local wireless local area network (WLAN) as high as 150Mbps. The most dominant feature of S9922M Cellular Wi-Fi Router is that it can support simultaneous online and backup switchover among various networks such as WAN, WLAN and 3G/4G. The backup in various networks can guarantee and maintain communication links to the greatest extent so as to avoid business loss caused by communication outage. The simultaneous online of various networks can facilitate strategy diversion based on business so as to realize the bandwidth rationality and adequate utilization of various network channels.

S9922M Cellular Wi-Fi Router supports the M2M wireless remote comprehensive network management platform independently researched and developed by RICON MOBILE INC.

The M2M platform is able to realize the statistics of 3G/4G wireless network information and status in the place where S9922M Cellular Wi-Fi Router is used as well as the remote upgrade and configuration management for S9922M 3G/4G Router.

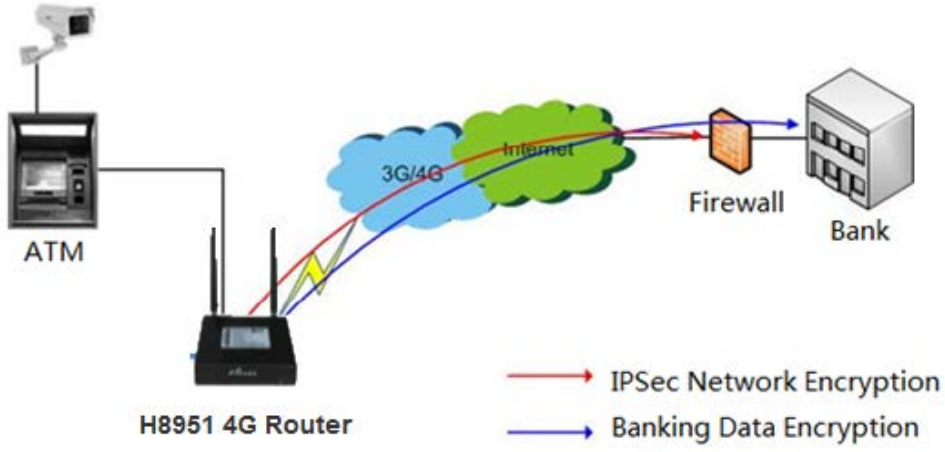
1.2 Product Orientation

S9922M Cellular Wi-Fi Router is widely used for various industries such as telecommunication, finance, information media, electric power, transportation, on-board devices and environmental protection and so on.

VPN application for financial industry

S9922M Cellular Wi-Fi Router can provide guarantees for highly secure transmission of financial data via ways such as IPSec VPN. The typical network is as shown in Figure 1-1.

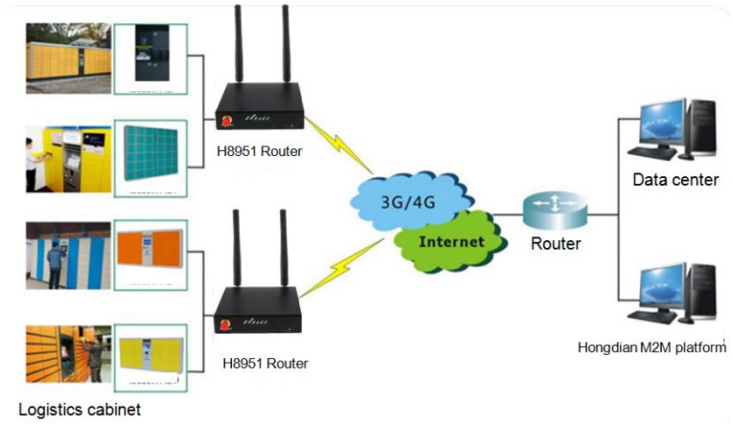
Figure 1-1 Schematic Diagram of Application for Financial Industry



Logistics cabinet industry application

The router transfers the information of the logistics cabinet to the data center for each park via 3G/4G network, and M2M cloud management platform supports vehicular video transmission. The typical network is as shown below.

Figure 1-2 Schematic Diagram of Application for Logistics Cabinet Industry



1.3 Functions and Features

Function

- Modem/WAN/Wi-Fi multiple network mode backup
- VPN support, GRE over IPSec, IPsec over PPTP/L2TP
- WAN port support PPPoE, static IP, DHCP client
- LCP/ICMP/flow/heartbeat check, ensure network usability
- SNMP network management, NTP support
- Local & remote firmware update
- Local & remote log check
- Supports DNS proxy and Dynamic DNS (DDNS)
- Supports timing operation
- Supports LED status indication

Available cellular network

- LTE FDD: B1/2/4/5/7/8/12
  LTE TDD: B38
- LTE FDD: B1/3/7/8/20
  LTE TDD: B40
- LTE FDD: B1/3/7/8/20
- LTE FDD: B2/4/5/13/17/25
- LTE TDD: B38/39/40
  LTE FDD: B7
- LTE FDD: B1/3/5/7/8/18/19/28
  LTE TDD: B38/39/40/41
- LTE FDD: B1/3/8/18/19/26
- HSPA+/HSUPA/HSDPA/WCDMA/UMTS 2100/1900/900/850/800MHz
- EDGE/GPRS/GSM 1900/1800/900/850MHz
- CDMA 2000/EVDO Rev.A 800/1900MHz

1.4 Specification

Interface

- 1×10/100Mb LAN interface
- 1×10/100Mb WAN/LAN interface(optional to customize RS232 console port and RJ45)
- 2× SMA-K antenna interface
- 1× Standard SIM/R-UIM interface
- 1× Standard DC power interface

Power supply

- Voltage: +12VDC
- Idle state: 200mA@12V DC
- Communication state: 300mA@12V DC

Others

- Dimension: 100mm x 98mm x 23mm (not including antenna)
- Weight: 300g
- Operation temperature: -30~+70℃
- Store temperature: -40~+85℃
- Related humidity: <95% (non-condensing)
- Guarantee: one year
- length of 3G/4G antenna cable：＞20cm

2 Product Structure

About this chapter

Chapter	Content
2.1 Hardware	S9922M Cellular Wi-Fi Router .
2.2 Structure	Structure of S9922M Cellular Wi-Fi Router .

2.1 Hardware

2.1.1 Appearance & Size

Appearance

Figure 2-1 S9922M Cellular Wi-Fi Router Appearance

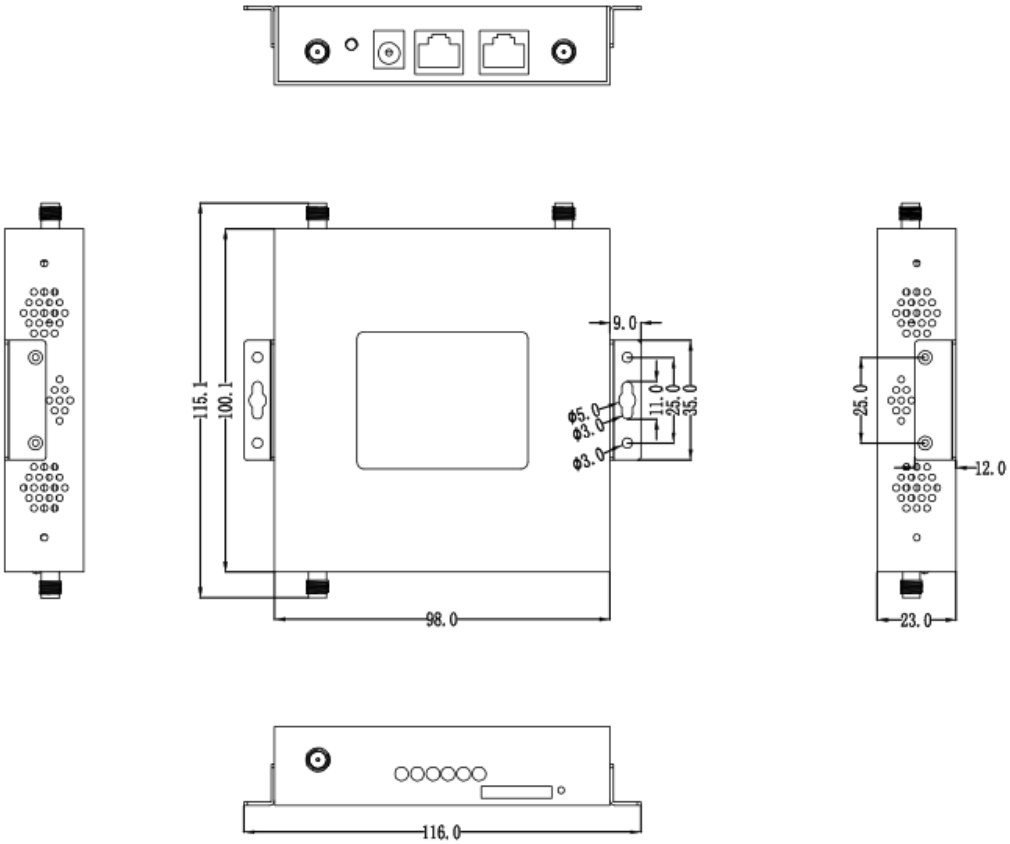
Size

Table 2-1 S9922M Cellular Wi-Fi Router size

Model	Dimension (mm)	Interface
S9922M Cellular Wi-Fi Router	100×98×23	1×10/100Mb LAN interface 1×10/100Mb WAN/LAN interface 1× RS-232 console port(RJ45) 2× SMA-K antenna interface 1× Standard SIM/R-UIM interface • 1× Standard DC power interface

S9922M Cellular Wi-Fi Router appearance as the figure shown below.

Figure 2-2 S9922M Cellular Wi-Fi Router Figure



2.1.2 Accessories

Table 2-2 S9922M Cellular Wi-Fi Router accessories

Accessories name	Number	Note
S9922M Cellular Wi-Fi Router	1 pcs	
CD-ROM	1 pcs	Optional
3G antenna	1 or 2 pcs	According to module number inside
RJ45 cable	1 pcs	
Mounting	1 pair	Optional
Certificate and warranty card	1 pcs	
+12V power adapter	1 pcs	

2.2 Structure

The S9922M interface panels are as shown below.

Figure 2-3 Front panel

Figure 2-4 Back panel

3 Router Installation

About This Chapter

Section	Brief Introduction of Contents
3.1 Unpacking	The unpacking operation and the list of equipment to be checked for installation of S9922M Cellular Wi-Fi Router are briefly introduced in the section.
3.2 Installation and Wiring	The installation of SIM/UIM cards, Ethernet connection, serial port line connection for S9922M Cellular Wi-Fi Router are briefly introduced in the section.
3.3 Power Supply	The Power supply requirements and methods for S9922M Cellular Wi-Fi Router are briefly introduced in the section.
3.4 Installation Inspection	The inspection after the installation of S9922M Cellular Wi-Fi Router is briefly introduced in the section.

3.1 Unpacking

Upon arrival of the equipment, it is necessary to unpack the box and inspect whether the parts are complete. Generally speaking, the complete set of equipment shall include the parts shown in Table 2-2. The packing materials shall be properly kept for future use.

3.2 Installation and Wiring

3.2.1 Install SIM/UIM card

S9922M Cellular Wi-Fi Router support single SIM/UIM card, so you may need insert single SIM before config it.

CAUTION

Please guarantee that the router is off when installing a SIM card.

Step 1 Use a small stick push the yellow button on router, the SIM slot will pop out as Figure 3-1 shows.

Figure 3-1 Pop out SIM slot

---End

3.2.2 Ethernet cable connection

Use Ethernet port directly connect S9922M Cellular Wi-Fi Router and computer, or transferred by a switch.

3.3 Power Supply

In order to get high reliability, S9922M Cellular Wi-Fi Router adapt wide voltage input: +12VDC, support hot plug and complex application environment.

3.4 Installation Inspection

Before installation and power-on, the SIM card shall be pressed to inspect whether it is properly inserted. After power-on, the working status indicator of the router shall be inspected. The LAN interface will be bright as soon as power-on, and the RUN lamp will be bright a while later, which means that the system has been started and working normally.

CAUTION

An antenna must be connected before power-on to avoid the impedance mismatching of RF that causes unsuccessful dial-up and Internet access due to poor signals

Operating steps

Step 1 Inspect whether the antenna is correctly connected.

Step 2 Inspect whether the SIM card is correctly and properly installed and confirm whether the SIM card is valid.

Step 3 Provide power supply for S9922M 3G/4G Router. The following content is about the router dialing of the SIM card.

- After providing power supply, it means that the power supply for the router is normal in case the LAN interface lamp of S9922M Cellular Wi-Fi Router connected with a lower computer is bright.
- After a certain period, it means the router system is started in case the RUN indicator lamp of the router is bright.
- After the RUN indicator lamp is bright for a while, it means that the router has found the module and started dialing in case the NET indicator lamp is bright and flashing quickly.
- During the dialing process, the SIG lamp will be bright, which means that the router has acquired the signal strength of the SIM card, and the network signal strength can be judged as per the flashing condition of the SIG lamp. See “Terminal Panel Indicator Lamp Status” for details.
- Upon the completion of router dialing, in case the 3G/4G lamp is normally on, it means that the connected network is 3G/4G. In case it is flashing slowly, it means that the connected network is 2G/2.5G/2.75G.

For different modules, the durations for the router to find all modules are various; in addition, the durations for dialing are various due to different networks. Therefore, for different modules, the durations of router dialing and acquiring IP addresses may vary. However, the router dialing process is exactly as specified above.

---End

4 Before config

About This Chapter

Chapter	Content
4.1 LED Status	The meaning of LED status.
4.2 Local config	How to local config S9922M Cellular Wi-Fi Router .
4.3 Basic config	Basic config & function.

4.1 LED Status

There are LED on front panel of S9922M Cellular Wi-Fi Router , they show how S9922M Cellular Wi-Fi Router works.

Table 4-1 LED instruction

LED name	Status
WIFI	• Solid light: system normal • Dark: system abnormal or during booting
LAN/WAN	• Solid light: connect ok • Blinking: data sending/receiving. • Dark: no connection.
LAN	• Same as LAN/WAN status.
RF	• Solid light: good signal, 21～31 • Blinking quickly (0.5s): normal signal, 11～20 • Blinking slowly(2s): bad signal, 1～10 • Dark: no signal
NET	• Solid light: connect 3G ok • Blinking slowly(0.5s): connect 2.5G network ok • Blinking quickly(2s): dialing • Dark： No module or no auto-dial
SYS	• Solid light: run ok

4.2 Local Connection Configuration

Precondition

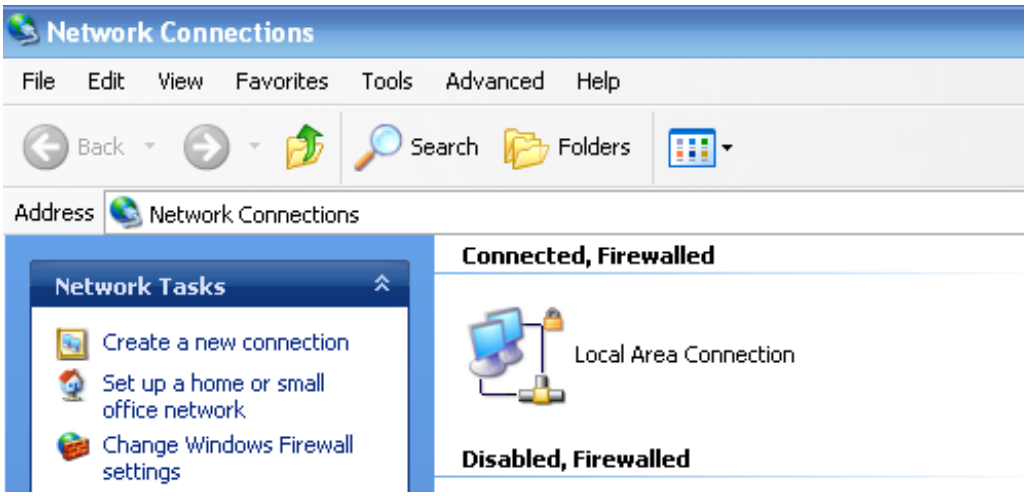
- Already power on S9922M Cellular Wi-Fi Router
- Ethernet cable connect to S9922M Cellular Wi-Fi Router

You could specify a static IP or DHCP get IP for your computer.

Static IP

Step 1 Click “start > control panel”, find “Network Connections” icon and double click it to enter, select “Local Area Connection” corresponding to the network card on this page. Refer to the figure below.

Figure 4-1 Local Area Connection



Step 2 Obtain a IP address automatically, or follow below instruction.

NOTE

S9922M Cellular Wi-Fi Router default enabled DHCP server. If it has been disabled, DHCP cannot be use.

Step 3 Change or add a IP 192.168.8.* on your computer.

Figure 4-2 1 Connection properties

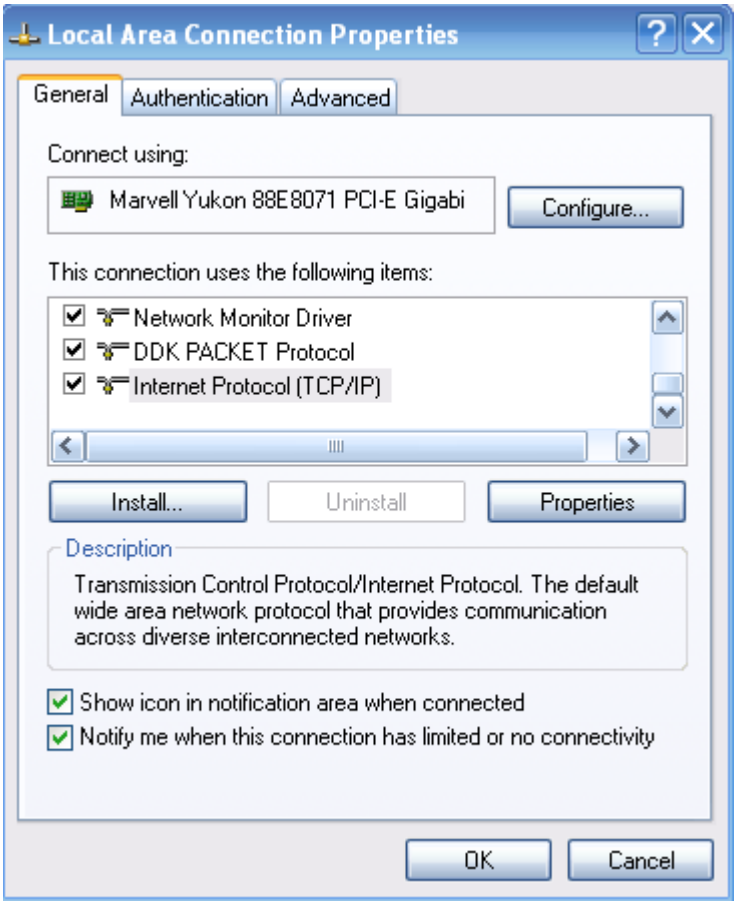
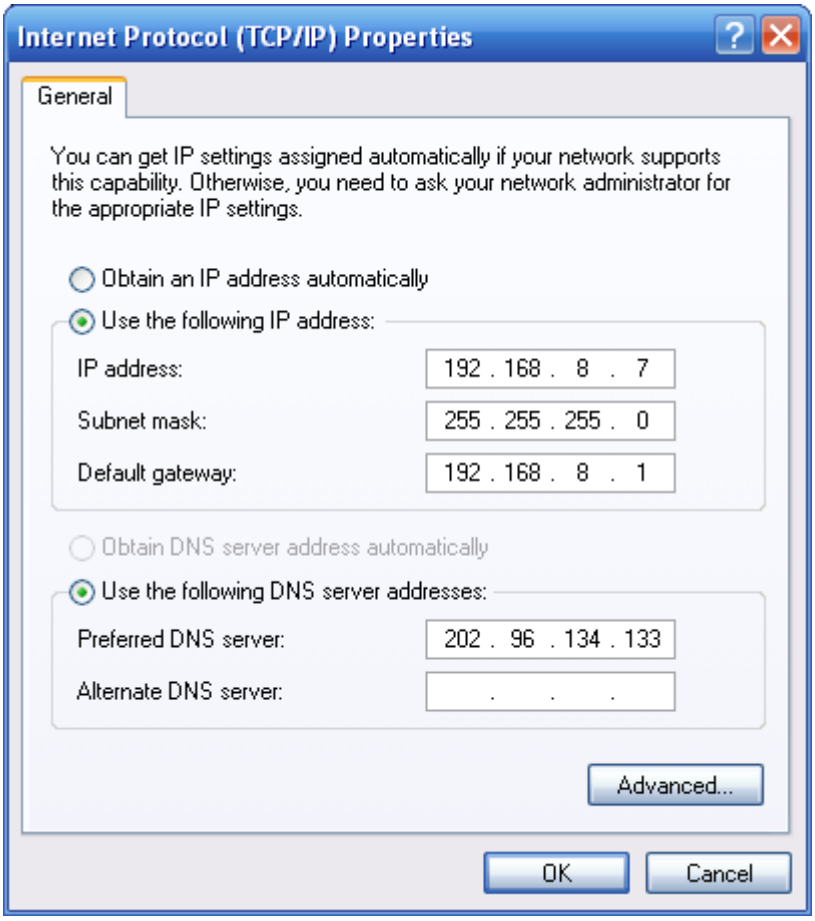


Figure 4-3 Internet protocol (TCP/IP)



You could change your IP address or add a IP address in Advanced setting.

- General configuration

This method will temporarily interrupt the communication between the computer under configuration and LAN, and the specific parameter configuration is shown as below:

IP address: 192.168.8.* (*indicates any integral between 2 to 254)

Subnet mask: 255.255.255.0

Default gateway: 192.168.8.1

Remember:

S9922M Cellular Wi-Fi Router LAN port factory default parameter:

IP address: 192.168.8.1

Subnet mask: 255.255.255.0

S9922M Cellular Wi-Fi Router factory default login parameter:

Management interface login IP address: 192.168.8.1

Login name: admin

Login password: admin

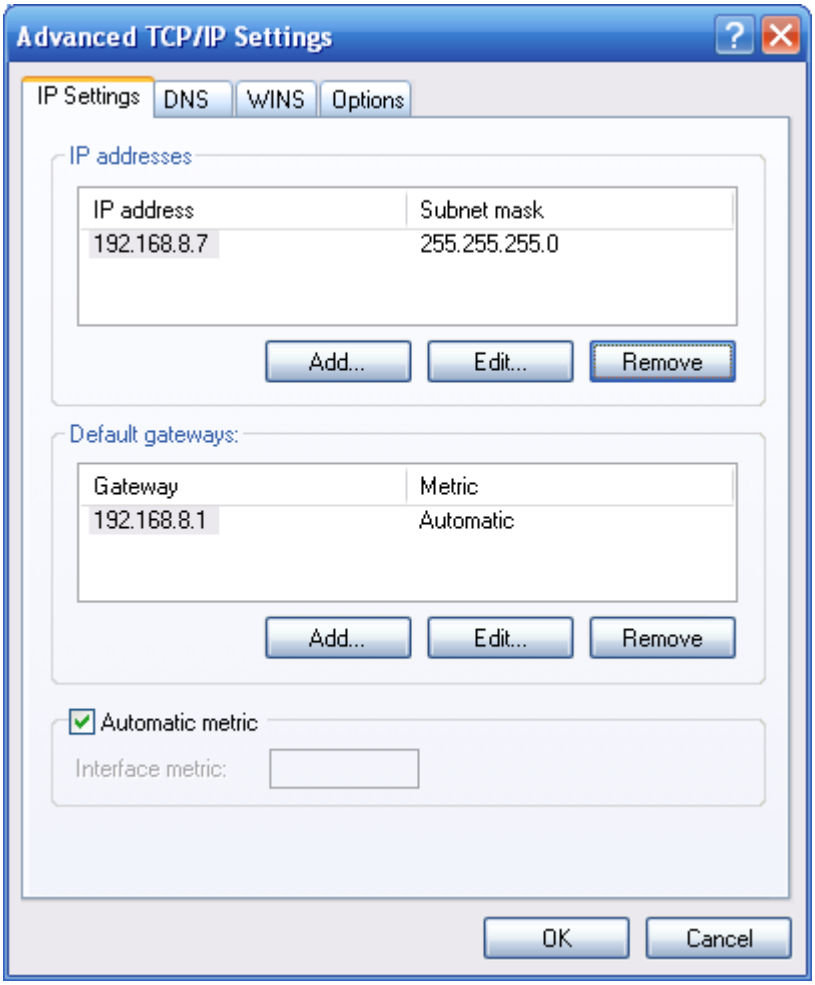
- Advanced configuration

If you don’t want to interrupt local PC LAN communication and configure S9922M Cellular Wi-Fi Router when the former network configuration exists, it is required add route (IP).

The configuration operation is shown as below:

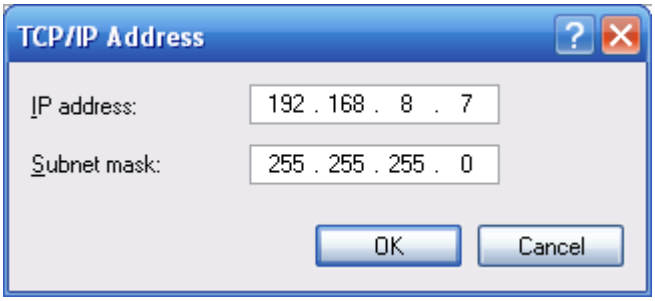
Click the “Advanced…” button to enter the interface as below:

Figure 4-4 Advanced TCP/IP Settings



Click the “Add (A)” button under the “IP address (R)”, and fill in the IP address that you want to add:

Figure 4-5 TCP/IP address



After the configuration is completed, click the “Add”. By now the computer has a route to router S9922M.

Note:

“Default gateway” depends on whether the configuration computer connects with Internet through original local network configuration. If Internet is accessed through original local network, the default gateway setting does not need to be modified; if S9922M Cellular Wi-Fi Router is used, you need to modify the default gateway and configure it as S9922M 3G/4G Router’s default LAN IP address 192.168.8.1.

---END

Network Check

Step 1 IP configuration check

Use the command of ipconfig to check whether the IP address is correctly set or added. You can enter DOS mode and key-in command: ipconfig, for instance:

C:\>ipconfig

Windows IP Configuration

Ethernet adapter local connection:

Connection-specific DNS Suffix.:

Auto configuration IP Address . . .: 192.168.8.7

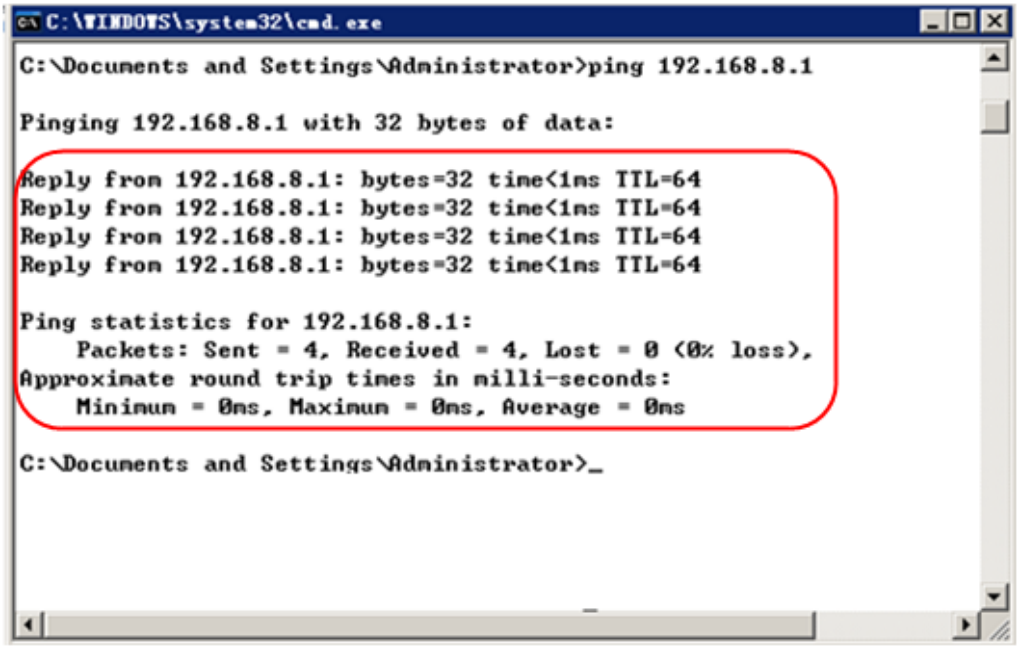
Subnet Mask . . . . . .: 255.255.255.0

Default Gateway . . . . . : 192.168.8.1

Step 2 Connectivity check

After the configuration is completed, you can check the connectivity between it and Galaxy S9922M Cellular Wi-Fi Router by ping command. Key-in ping command in system command line:

Figure 4-6 Connectivity check



By now, it means that the configuration computer has been connected to the router. You can carry out configuration operation on it.

---END

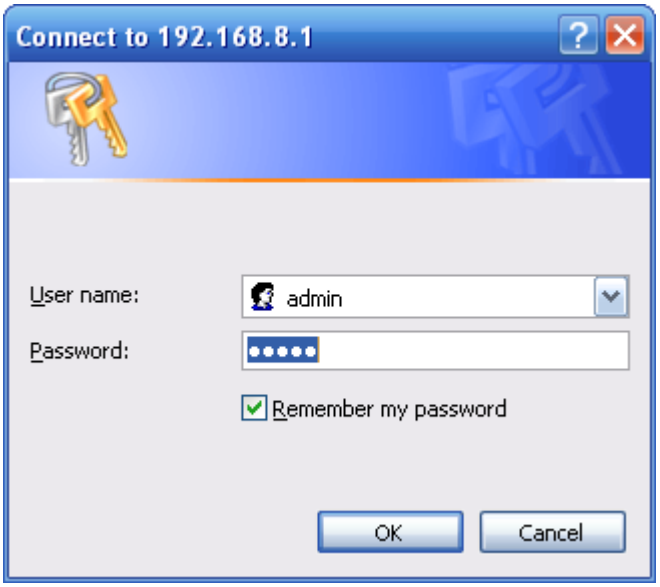
4.3 Basic configuration

Through this chapter, you could achieve basic function: visit internet.

4.3.1 Login WEB GUI

Step 1 Run a Internet Explorer and visit “http://192.168.8.1/”, to enter identity page.

Figure 4-7 User identity page



Step 2 User should use default user name and password when log in for the first time:

Step 3 User name: admin

Step 4 Password: admin

---EN

5 Router Configuration

About this chapter

Chapter	Content
5.1 Overview	Enter S9922M Cellular Wi-Fi Router WEB GUI to configure
5.2 Network configuration	Network configuration & function
5.3 Application	Advanced function of router like timing operation, link backup .etc.
5.4 Security	Security setting of S9922M
5.5 Forward	NAT & DMZ setting
5.6 VPN	PPTP, L2TP, IPSec & GRE setting
5.7 System	Updating & maintain
5.8 Status	Router working status

5.1 Overview

S9922M Cellular Wi-Fi Router adopts WEB GUI to configure, all parameter can be modified by this GUI, and it is easy to understand.

5.2 Network configuration

Network connection configuration, including LAN, WAN, cellular network, Wi-Fi(optional), parameter switch, DHCP setting and so on.

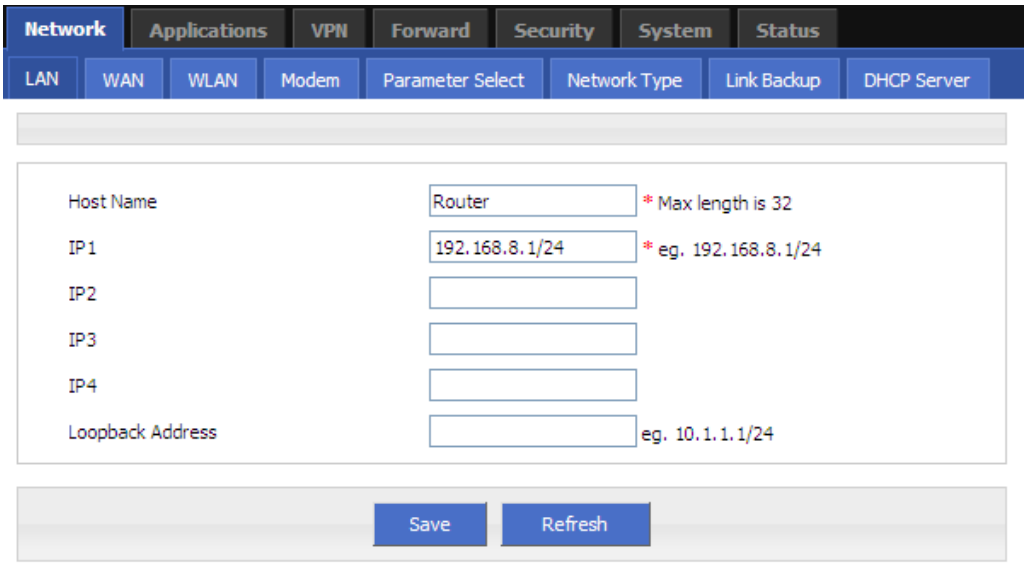
5.2.1 LAN

LAN setting used to manage local area network PC which connect to S9922M, make them could visit internet and the network segment connectivity normal.

Step 1 Login S9922M WEB GUI.

Step 2 Single click “Network > LAN”.

Figure 5-1 LAN window



Step 3 LAN parameter.

Table 5-1 LAN Parameter instruction

Parameter	Details	Operation
Host name	router name	Manual input, Maximum length limited to 32 word type character
IP1～4	Divide sub-network, those sub-net could communicate	Manual input Format：A.B.C.D/Mask IP1 default：192.168.8.1/24
Loopback address	Use for network test, e.g. tunnel test, it won’t shutdown with the LAN interface closed	Ping IP address from peer of tunnel

Step 4 Single click “save” icon, done.

NOTE

After change the LAN IP, if page has no response anymore, please make sure your PC address is in the same network segment, or set a new IP to your PC to insure that.

---END

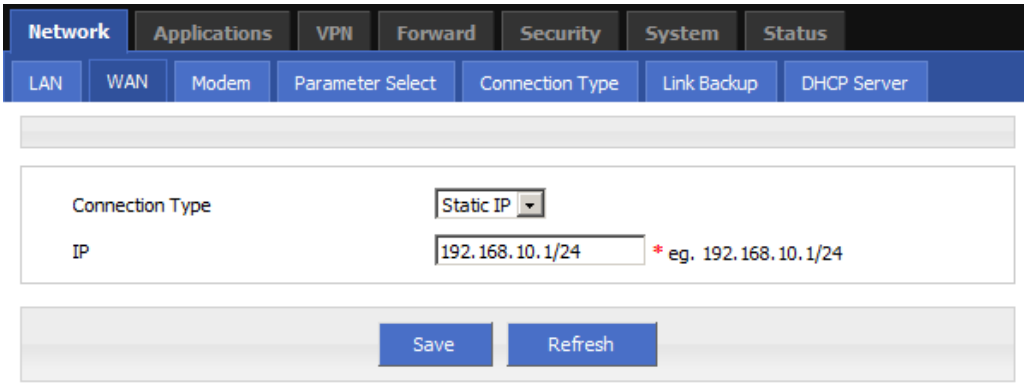
5.2.2 WAN

Wired connect to Internet by static IP, DHCP or PPPoE.

Step 1 Login S9922M WEB GUI.

Step 2 Single click “network > WAN”.

Figure 5-2 WAN window



Step 3 WAN connection type.

Table 5-2 WAN connection type parameter instruction

Parameter	Details	Operation
Connection Type	WAN Connection Type	Dropdown List Selection: • Static IP: Manual set WAN IP, if set static IP, need manual set gateway, DNS etc. • DHCP: DHCP get IP address • PPPoE: PPPoE dial to get IP, usually you need connect to a ADSL modem
”Connection Type” select ”Static IP”		
IP	Configure the static IP	Manual input Format：A.B.C.D/Mask IP1 default：192.168.10.1/24
”Connection Type” select ”DHCP”		
IP	get IP address from	Select DHCP

Parameter	Details	Operation
	DHCP	
”Connection Type” select ”PPPoE”		
Service Name	Configure PPPoE service name, which is usually used for identification and judgment between client and server, and is usually provided by the service side, while ADSL dial-up provided by your ISP	WORD type, up to 64 characters, not blank, please refer to parameters regulation format
Username/Password	PPPoE dial-up user name/password usually provided by the server	WORD type/CODE type, up to 64 characters, not blank, please refer to parameters regulation format
Advanced Settings	Advanced parameters are used in special circumstances, and are generally not recommended for configuration. For the parameters instructions of the "Advanced Settings", please refer to the related parameters in table 5-2	Single click ”Display” icon show advanced settings parameters
Authentication (need match server end, default auto-negotiation)		
CHAP	Challenge-Handshake Authentication Protocol, a way to send real password when build ppp link, improved security	• Disable • Negotiation CHAP is prior to PAP
PAP	Password Authentication Protocol	• Disable • Negotiation
MS-CHAP	MS-CHAP Microsoft Challenge-Handshake Authentication Protocol Based on MPPE	• Disable • Negotiation
MS2-CHAP	MS-CHAP second version	• Disable • Negotiation
EAP	PPP Extensible Authentication Protocol	• Disable • Negotiation

Parameter	Details	Operation
Compress (need match server end, default disable)		
Compression Control Protocol	Negotiate which compress control protocol used on PPP link	• Disable • Negotiation
Address/Control Compression	Whether compress IP address	• Disable • Negotiation
Protocol Field Compression	Whether compress Whether compress IP address	• Disable • Negotiation
VJ TCP/IP Header Compress	Whether allow TCP/IP to communicate by compressing VJ	• Disable • Negotiation
Connection-ID Compression	Whether allow TCP/IP to communicate by compressing ID in the first	• Disable • Negotiation
More		
Debug	Enable PPP dialing log, default value is enable, in order to check more info about dialing, suggest no changing	• Disable • Negotiation
Peer's DNS	Auto get peer DNS when PPP dialing. DNS is necessary if want visit domain name. In order to forbid LAN pc visit domain name, you may disable it	• Disable • Negotiation
LCP interval/Retry	After PPP dialing succeed, LCP is needed to keep PPP link alive. Also it could use to quickly spot network interrupt and reconnect	Value area ： 1～512 Unit: second Default value: 30/5
MTU	the number of bytes of the maximum transfer unit by PPP interface, sometimes financial data has request on this	Value area ： 128～16364 byte
MRU	the number of bytes of the maximum receive unit by PPP interface, sometimes financial data has request on this	Value area ： 128～16364 byte
Local IP	Set the local IP address when PPP dialing, need ISP support	A.B.C.D, Example: 10.10.10.1
Remote IP	Set the remote IP address when PPP dialing, need ISP support	A.B.C.D, Example: 10.10.10.254
Professional	• nomppe • mppe required • mppe stateless	Do not suggest modify, please

Parameter	Details	Operation
	• nodeflate • nobsdcomp • default-asyncmap	contact us for help if necessary

Step 4 Single click “save” icon.

---END

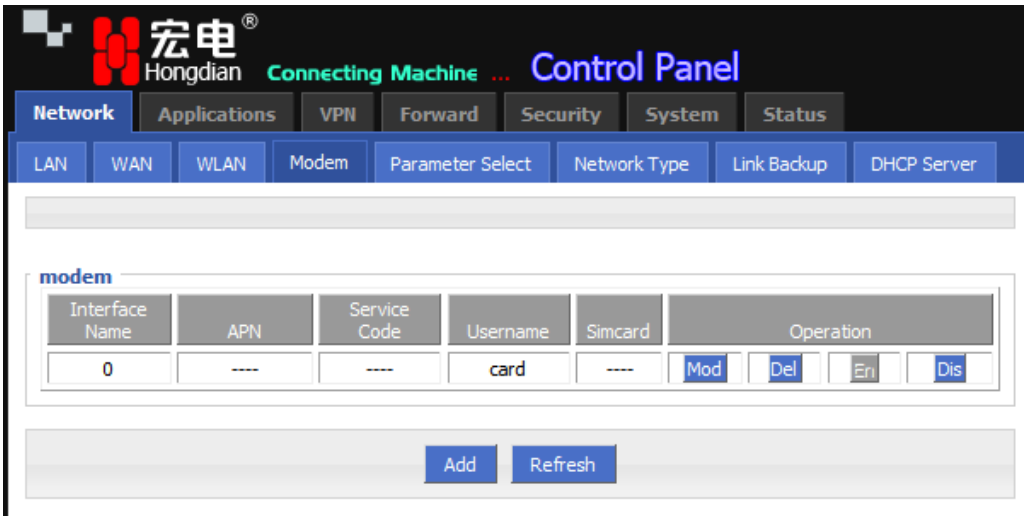
5.2.3 Modem

S9922M Cellular Wi-Fi Router core function, connect Internet by cellular modem, S9922M Cellular Wi-Fi Router support single modem single SIM, those three working type provide internet connection to customers. Usually 3G network bandwidth is 1～5Mbps, 3.5G up to 20Mbps and LTE up to 100Mbps.

Step 1 Login S9922M WEB GUI.

Step 2 Single click “network > Modem”.

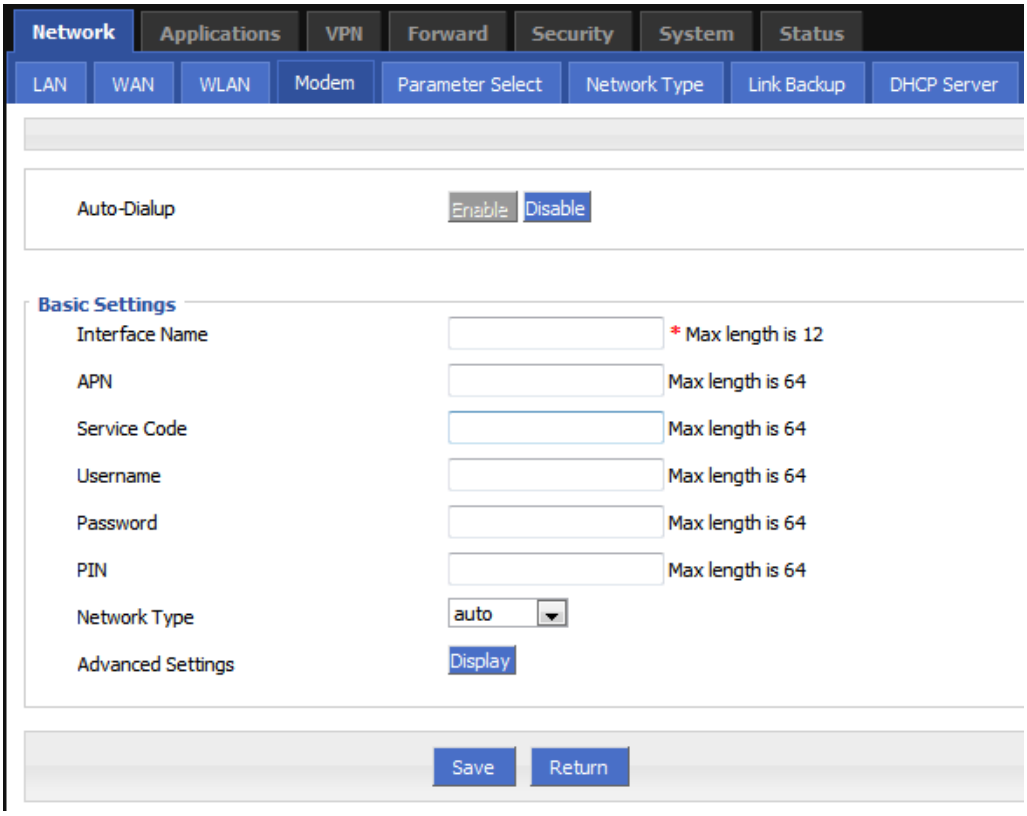
Figure 5-3 Modem window



Step 3 Operation:

- add
  1. Single click “add” and the window shows like below.

Figure 5-4 Modem page



2. Input suitable parameter.

Table 5-3 Modem Parameter instruction

Parameter	Details	Operation
Auto-dialup	• Auto-dialup current modem, if all modem auto-dialup disabled, router will not auto-dialup	• Enable • Disable
Interface Name	Interface name, to identify this interface	WORD type, up to 12 characters
APN	APN, provided by local ISP, usually CDMA/EVDO network do not need this parameter	WORD type, up to 64 bytes
Service code	Usually *99***1#, CDMA/EVDO: #777	CODE type, up to 64 bytes
Username/Password	Provided by ISP	WORD type/CODE type, up to 64 bytes

Parameter	Details	Operation
Network type	• Network type force to 2.5G or 3G/4G	Dropdown List WCDMA: • auto • wcdma • edge EVDO: • auto • evdo • cdma LTE, HSPA+ module force 3G means 3G auto, AUTO means 2.5G/3G/4G auto
Advance Setting	PPP process advanced parameter, do not suggest to modify the setting. If necessary, contact us for support	Single click to show advanced setting
Authentication (need match server end, default auto-negotiation)		
CHAP	Challenge-Handshake Authentication Protocol, a way to send real password when build ppp link, improved security	• Disable • Negotiation CHAP is prior to PAP
PAP	Password Authentication Protocol	• Disable • Negotiation
MS-CHAP	MS-CHAP MicrosoftChallenge-Handshake Authentication Protocol Based on MPPE	• Disable • Negotiation
MS2-CHAP	MS-CHAP second version	• Disable • Negotiation
EAP	PPP Extensible Authentication Protocol	• Disable • Negotiation
Compress (need match server end, default disable)		
Compression Control Protocol	Negotiate which compress control protocol used on PPP link	• Disable • Negotiation
Address/Control Compression	Whether compress IP address	• Disable • Negotiation
Protocol Field Compression	Whether compress Whether compress IP address	• Disable • Negotiation
VJ TCP/IP Header Compress	Whether allow TCP/IP to communicate by compressing VJ	• Disable • Negotiation

Parameter	Details	Operation
Connection-ID Compression	Whether allow TCP/IP to communicate by compressing ID in the first	• Disable • Negotiation
More		
Debug	Enable PPP dialing log, default value is enable, in order to check more info about dialing, suggest no changing	• Disable • Negotiation
Peer's DNS	Auto get peer DNS when PPP dialing. DNS is necessary if want visit domain name. In order to forbid LAN pc visit domain name, you may disable it	• Disable • Negotiation
LCP interval/Retry	After PPP dialing succeed, LCP is needed to keep PPP link alive. Also it could used to quickly spot network interrupt and reconnect	Value area ： 1～512 Unit: second Default value: 30/5
MTU	the number of bytes of the maximum transfer unit by PPP interface, sometimes financial data has request on this	Value area ： 128～16364 byte
MRU	The number of bytes of the maximum receive unit by PPP interface, sometimes financial data has request on this	Value area ： 128～16364 byte
Local IP	Set the local IP address when PPP dialing, need ISP support	A.B.C.D, Example: 10.10.10.1
Remote IP	Set the remote IP address when PPP dialing, need ISP support	A.B.C.D, Example: 10.10.10.254
Professional	• nomppe • mppe required • mppe stateless • nodeflate • nobsdcomp • default-asyncmap	Do not suggest modify, please contact us for help if necessary

Figure 5-5 Modem Dialup

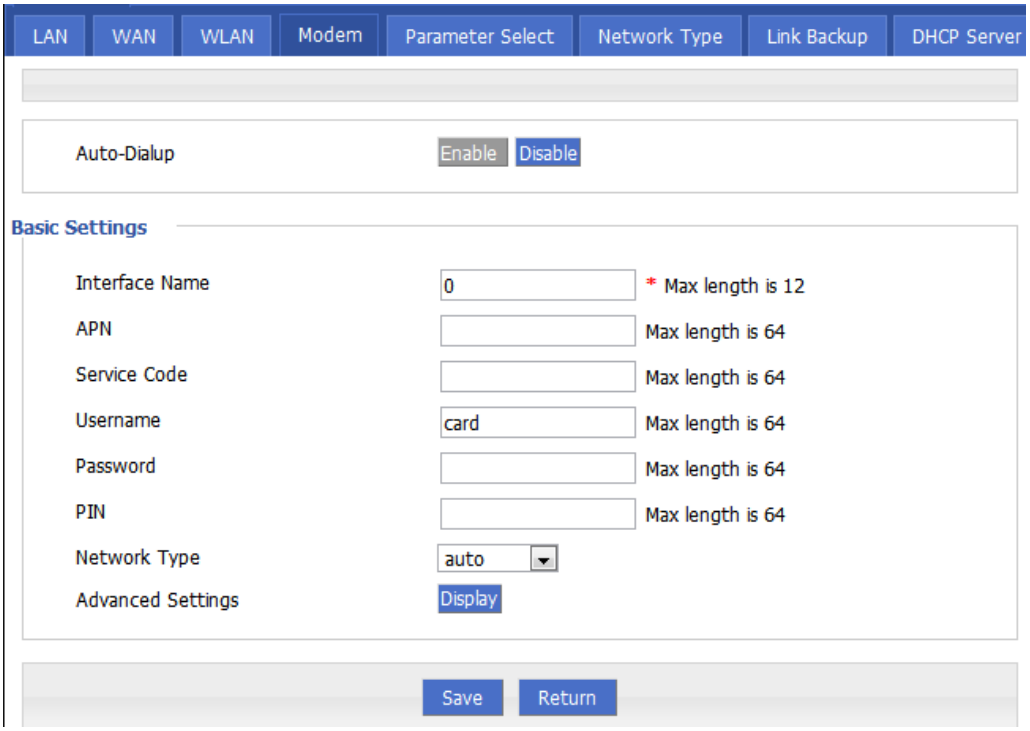
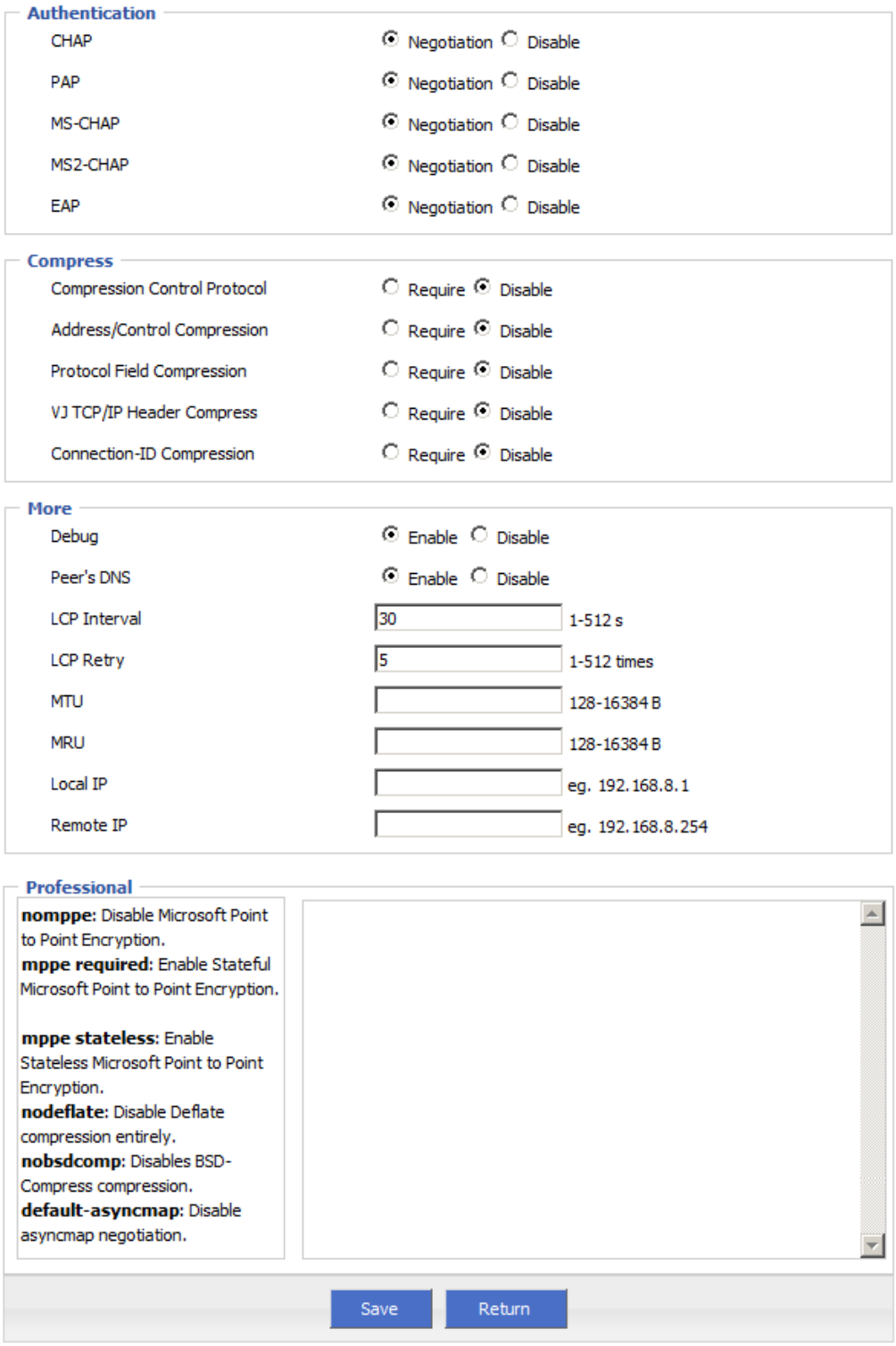


Figure 5-6 Advanced setting



3. Single click “save” icon to finish.

NOTE

Grey icon means enabled.

---END

5.2.4 WLAN

S9922M Cellular Wi-Fi Router provides WLAN AP, Station Client, Repeater three functions, through AP function, S9922M Cellular Wi-Fi Router can provide wireless LAN hotspots; through Station client function, it allows S9922M Cellular Wi-Fi Router access to other AP devices, such S9922M Cellular Wi-Fi Router downlink machine can access the Internet via the AP connection; Repeater functionality can be other AP WLAN signal amplification device, to achieve WLAN signal repeater, so the clients far away from the AP WLAN can access the AP.

Step 1 Login S9922M WEB GUI.

Step 2 Single click “Network > WLAN”.

Step 3 Open “WLAN” tag, when you select a different VLAN mode (AP, Station, Repeater), respectively, display the page shown in Figure 5-19, Figure 5-20, Figure 5-21. When the WLAN mode select Station and Repeater, need to scan the surrounding AP, an AP access to select, shown in Figure 5-22.

Figure 5-7 AP mode configure interface

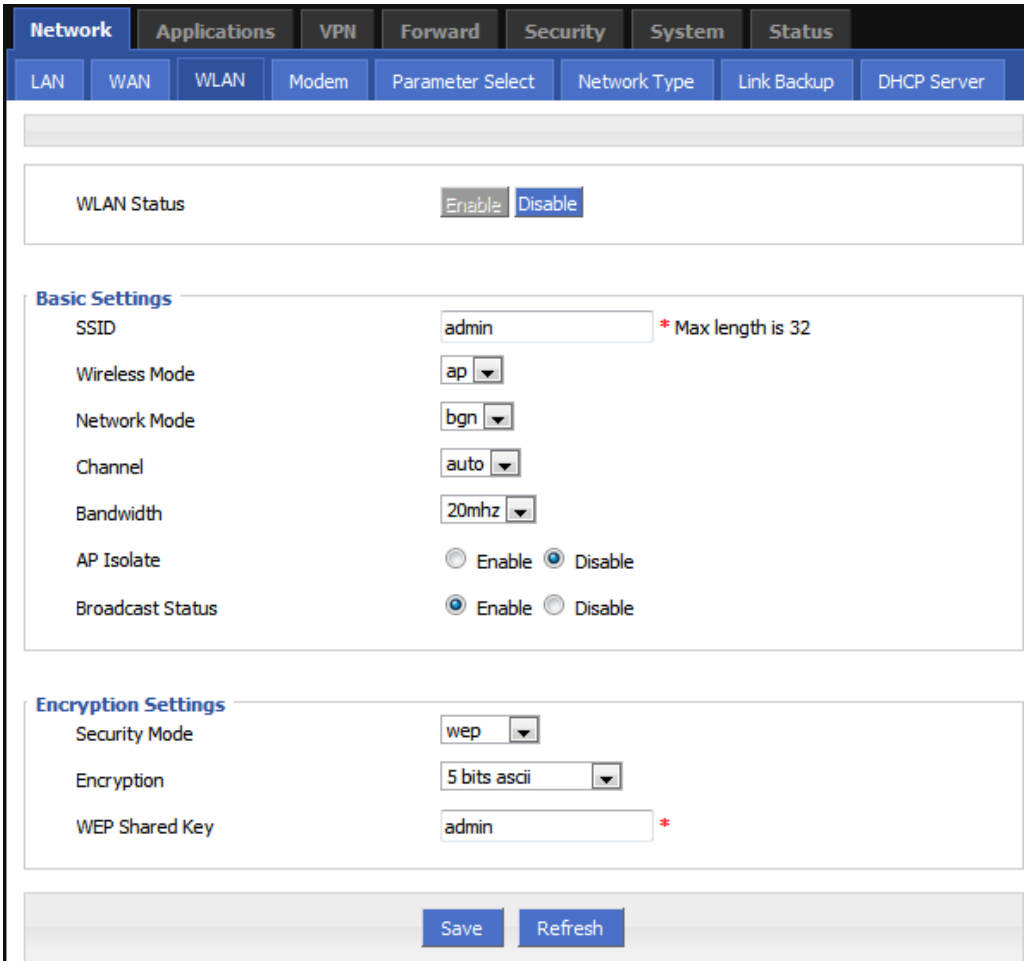


Figure 5-8 Station mode configure interface

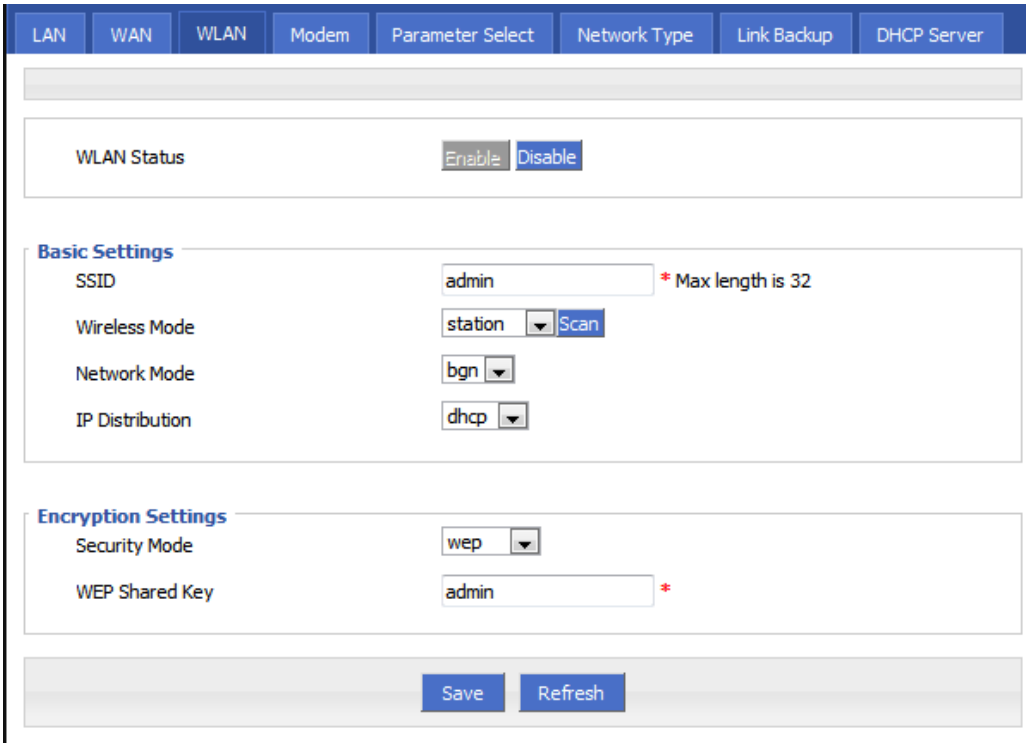
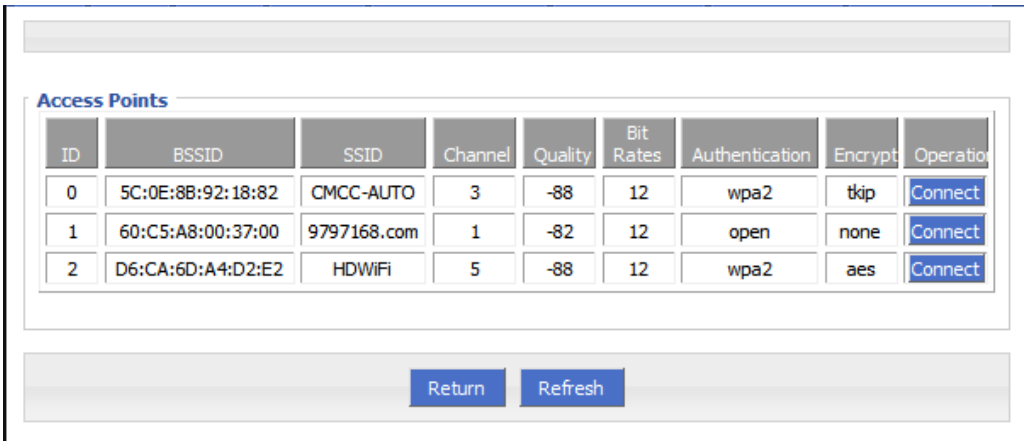


Figure 5-9 Station scan signal interface



Step 4 "WLAN" configure parameter instruction, parameter instruction as Table 5-4.

Table 5-4 WLAN parameter instruction

Parameter	Details	Operation
WLAN Status	Enable or disable WLAN feature	Dropdown List • Enable • Disable
Basic Setting		

Parameter	Details	Operation
SSID	WLAN server identity	WORD type, max to 32Bytes
Wireless Mode	• WLAN work mode, support ap/station	Dropdown List • ap • station
Network Mode	WLAN network mode, different network models are quite different transmission rates, default bgn mixed mode. When operating mode is selected AP, the AP needs to manually set the network mode; When working mode selection station or repeater, AP network mode for the selected network mode, can not be modified manually.	Dropdown List • n represents the network rate is • 150Mbps • bgn represents the network rate is • 11Mbps,54Mbps(Auto-Negotiation) • bgn can support 11Mbps, • 54Mbps,150Mbps mixed mode • (auto adapt according to the client)
Channel	WLAN work channel, configure according to the specific needs of the network environment, the default value is auto.	Dropdown List • auto • 1～13 auto shows when there is no interference, the default channel is 6, when the same channel interference occur, it can automatically jump out interfere to work with the smaller channel
Bandwidth	Bandwidth configure when WLAN work at 802.11n	Dropdown List • 20MHz • 40MHz 40MHz represents high speed mode
AP Isolate	AP isolate the WLAN client, so the WLAN client can not access each other	Dropdown List • Enable • Disable
Broadcast Status	Used to configure the WLAN SSID is broadcasted so that clients can search the SSID, usually do not want other people to search and disable WLAN function, disable it means hidden SSID function in a network environment, users want to connect, you need to manually add the SSID	Dropdown List • Enable • Disable

Parameter	Details	Operation
IP Distribution（when Wireless Mode is station)	The router is used as station, and the router can get the IP address when it is connected to AP	Dropdown List • dhcp：get IP address from DHCP • static： manually set IP address
IP（when Wireless Mode is station)	The router get an IP in correspondence with AP when it is station	Manual input Format：A.B.C.D/Mask
BSSID（when Wireless Mode is repeater)	MAC which the router select AP	WORD type MAC format: XX:XX:XX:XX:XX:XX You can manually set MAC depending on the selected AP
WLAN Encryption		
Security Mode	Configure the WLAN encryption, when encrypted authentication is not required, it can disable. WEP encryption is relatively easy to crack, we recommend using WPA encryption	Dropdown List • wep • disable • wpa • wpa2
WEP Encryption （**Wired Equivalent Privacy)**		
Encryption	WLAN password format • 5 bits ASCII • 13 bits ASCII • 10 bits hex digits • 26 bits hex digits	Dropdown List
WEP shared key	Password connected to WLAN	Configure according to the previous "Encryption" result
wpa/wpa2（**WiFi Protected Access**)		
Algorithms	Encryption algorithms • tkip • aes	Dropdown List
WPA Share Key	WLAN encryption key, used to connect the specified SSID	WORD or Number type, refer to "Parameter Specification Table"
WPA Renewal Interval	WLAN client verification interval; If authentication passes, it continues to be a WLAN connection, if	Value area：120-86400 Units：Seconds

Parameter	Details	Operation
	authentication fails, disconnect the WLAN connection	

NOTE

When the working mode select station or repeater, S9922M Router will automatically match according to the selected AP and the corresponding encryption algorithm (to keep consistent with AP encryption); shared key update interval is required to fill in the connections of AP key and interval.

---END

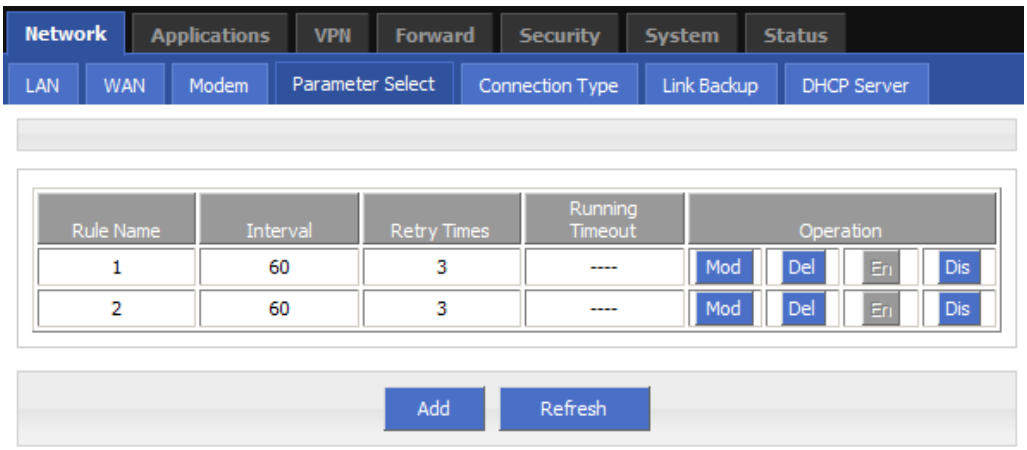
5.2.5 Parameter select

Router parameter select function is used for multi-function switch, like VPN parameter switch, SIM parameter switch, multi-sever switch .etc. You could pre-config several network parameter and switch between them, to achieve multiple Telecom operator backup. This function also could switch VPN setting, for example, when modem online it connect VPN 1, wan online it connect VPN2, they cannot connect at same time because conflict, by this function you could easily switch when network failure.

Step 1 Login S9922M WEB GUI.

Step 2 Single click “Network > parameter select”.

Figure 5-10 parameter select



Step 3 Add, modify, delete, enable and disable the parameter select rule.

- add

Figure 5-11 Add rule

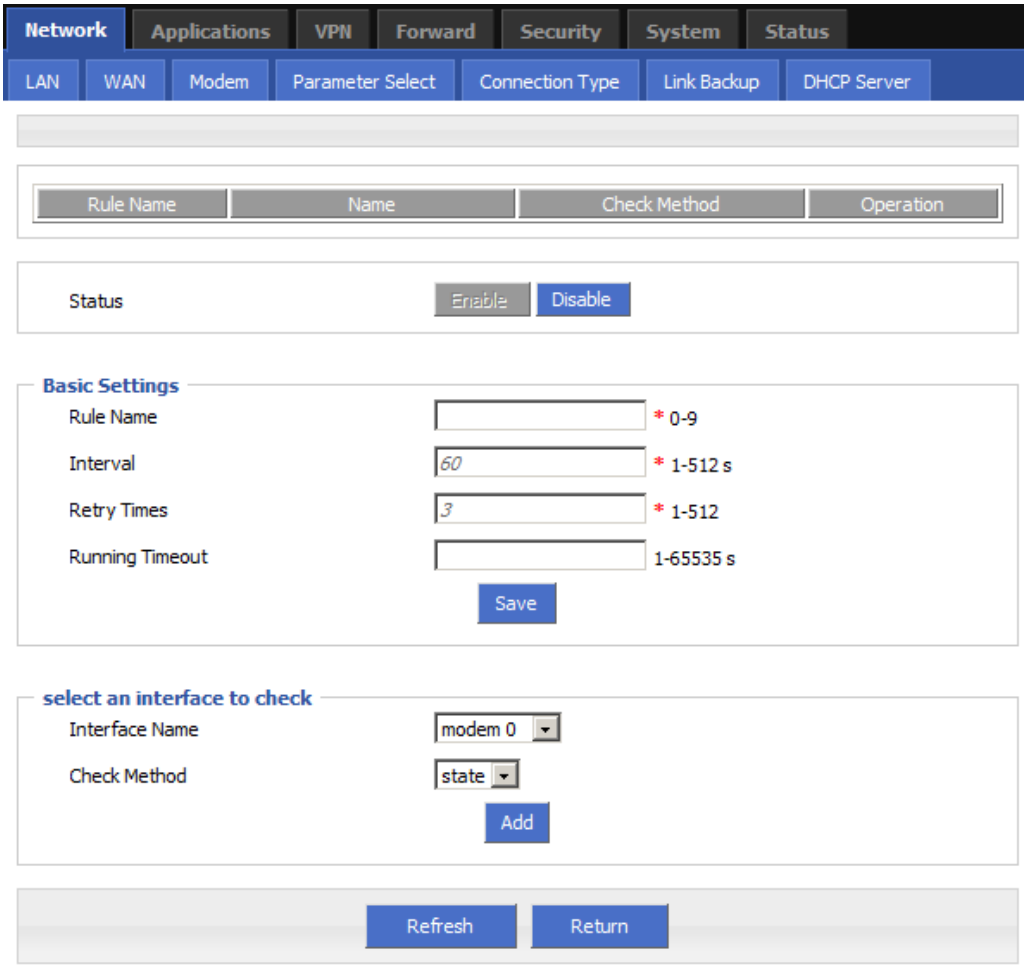


Table 5-5 Parameter instruction

Parameter	Details	Operation
Status	For enabled rule: Only one rule is running at one time, when it checks failed, next rule start running For disabled rule: all related interface also disabled	• Enable • Disable
Basic settings		
Rule name	Name value decided running order	Value area ： [0,9]
Interval/Retry Times	Check interval and retry time, if all check failed, switch to next rule	Value area ： 1～512 Units: seconds/time Default: 60/3
Running timeout	• Not available for rule 0 • This parameter restrict current	Value area ： 1～65535

Parameter	Details	Operation
	rule running time, when timeout, switch to rule0, if do not set, switch to next rule	Units: seconds
Select a interface to check		
Interface name	Set related modem interface	Dropdown List to choose, current available option will show below
Check method	If state, router will check link state If ICMP, router will ping the ICMP IP address to check	Dropdown List • state • icmp

CAUTION

This function is control how the router online & offline, and use which modem to online.
Please notice timing task execute an operation and keep the status, but parameter select only execute an operation. So they do not conflict.
But Link backup function may conflict with parameter select function, if you set both, final running result may not as you presume.

---END

5.2.6 Network type

Step 1 Login S9922M WEB GUI.

Step 2 Single click “Network > Network type”.

Figure 5-12 Connection type window

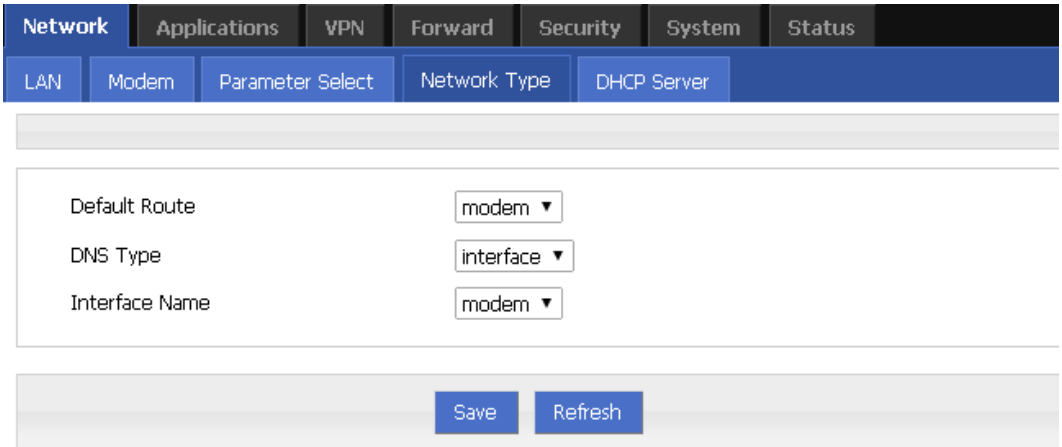


Table 5-6 Network type parameter instruction

Parameter	Details	Operation
Default route	Default route	Dropdown List
Gateway	If default route is wan static IP, need specify gateway and DNS	Example: 192.168.10.254
DNS type	If Interface, will get DNS automatically	Dropdown List • interface • custom
DNS1/DNS 2	Manual set DNS	Example: 8.8.8.8
Interface name	Router will get DNS address from this interface	Dropdown List • modem • eth0

Step 3 Single click “save” icon.

---END

5.2.7 Link Backup

This function used to set how to backup network among modem1 and WAN port, to secure network availability.

There are hot backup and cold backup, hot backup means the backup link will always connect, so switch time is less, but cost extra flow fee.

Please note, when using this feature need to other operation:

The default route in Forward>>Route need to be delete.

The Masq of each link need to be added in Forward>>NAT>>MASQ.

Step 1 Login S9922M WEB GUI.

Step 2 Single click “network > Link Backup”.

Figure 5-13 Link Backup

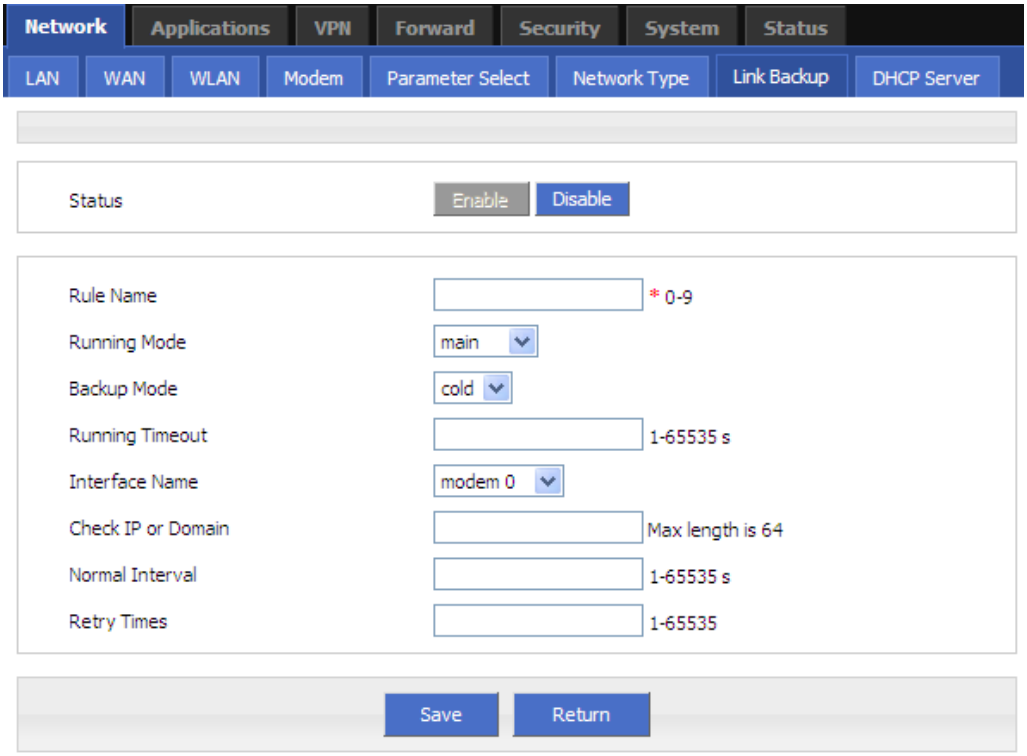


Table 5-7 Link Backup Parameter

Parameter	Details	Operation
Status	Enable or Disable Link Backup feature	• Enable • Disable
Rule Name	Link Backup rule name identification Note: 0 can act as chain link or backup link, 1-9 only can act as backup link 1-9 can take the priority according to the number, the smaller the number the greater the priority	• Value area: 0-9
Running Mode	Link operate mode include: main：Link operate mode is main link backup：Link operate mode is backup link	Dropdown List • main • backup
Backup Mode	Backup mode include: cold and hot Hot refers to the corresponding link treatment enabled, the advantage of hot backup is switching fast, deficiency is when the link online will increase the cost of network overhead and charges. Cold refers to only the interface of	• Dropdown List • cold • hot

Parameter	Details	Operation
	current working link is enabled, and the others, as the interfaces of non-working link, are in offline state.	
Running Timeout	• If the current link is main link, shows the main link stability time • if the current link is backup link, shows the shortest working time • Note: • Running timeout is only suitable for switching between master and slave	Value area:1-65535 Units: seconds
Interface Name	Interface used for link switching	• Dropdown List • modem 0 • eth1 • eth0
Check IP or Domain	Detection by ping packets IP address or domain name, if not the general principles means the failed test	WORD type, up to 64 characters, please refer to parameters regulation format
Normal Interval/Retry Times	• Normal interval means the interval time of the link normal detection. • Retry times means the maximum failure times of the link detection. • When the failure times reach to its maximum, the link will be switched to another.	• Value area:1-65535 • Units: seconds/times

Step 3 Single click “save” icon.

---END

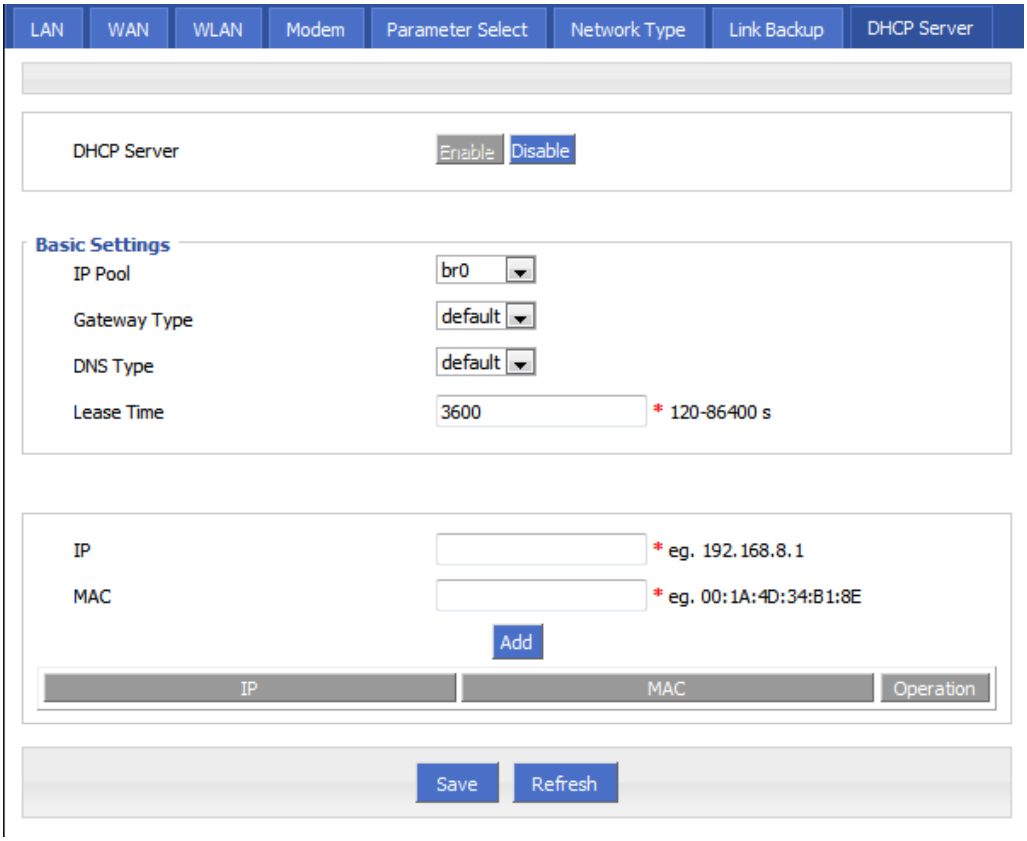
5.2.8 DHCP Service

DHCP(Dynamic Host Configuration Protocol) is a LAN network protocol, enable the DHCP function, a function automatically can obtain the dynamic IP.

Step 1 Login S9922M WEB GUI.

Step 2 Single click “Network > DHCP Server”.

Figure 5-14 DHCP



Step 3 Configure DHCP parameter.

Step 4 DHCP parameter instructions are as Table 5-8.

Table 5-8 DHCP Parameter

Parameter	Details	Operation
DHCP Server	Enable or Disable DHCP feature	• Enable • Disable
Basic Settings（DHCP is not recommended configure in the case of no special network requirement)		
IP Pool	The DHCP client can get the scope of IP address. Selecting interface represents using network segment that the interface belongs to. This option can be configured to specify the IP address range of the lower place machine, for example: only hope at most four machine can automatically obtain the IP	• Dropdown List • br0 • custom
Start IP	When IP pool select custom configuration, configure the DHCP	Manual input

Parameter	Details	Operation
	pool start IP address	Format：A.B.C.D/Mask Example：192.168.8.2
End IP	When IP pool select custom configuration, configure the DHCP pool end IP address	Manual input Format：A.B.C.D/Mask Example：192.168.8.254
Gateway Type	DHCP client access gateway IP source, divided into default, br0, eth0, custom four categories, associated interface, the interface IP assigned to the DHCP client as a gateway	• Dropdown List Default value：default
DNS Type	DHCP client access to the DNS IP source, has a default, modem, eth0, br0, custom and so on, generally do not recommend to modify the configuration.	• Dropdown List • default • modem • eth0 • br0 • custom • Configuring for the default • is based on DNS address • which is allocated by the • router itself
Lease Time	After the DHCP client obtain an IP on IP lease time, the client usually renegotiates obtain an IP address lease time in more than half the time. IP lease time is mainly used to release idle IP to avoid that IP address resources are also occupied after the DHCP client shutdown	Value area：120-86400 Units：seconds Default value：3600
IP, MAC binding is used to assign a fixed MAC within the specified range of IP addresses		
IP	Binding with the specified MAC: when a DHCP client sends a DHCP request, the IP address with the client's MAC binding will be assigned to the DHCP client. The IP address will not be assigned to the other client with different MAC address even if it is not in use.	Manual input Format：A.B.C.D/Mask Example：192.168.8.2
MAC	Configure DHCP to obtain an IP need to specify the DHCP client's MAC address	WORD Type MAC Format Example: 00:1A:4D:34:B1:8E

---END

5.3 Application program configuration

Based on years of customer experience for different applications, besides SNMP, DDNS, S9922M Cellular Wi-Fi Router has developed many functions for wireless network equipment, such as ICMP check, interface flow check function, M2M terminal management function, task management function and waking on demand function.

5.3.1 ICMP check

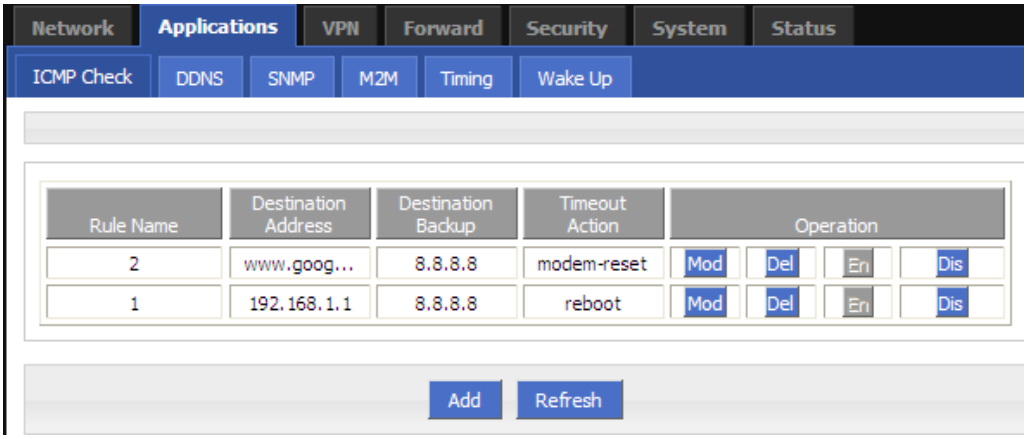
There is fake link (can get IP after dialing, but cannot link to destination address). Usually LCP is used to avoid this. Besides LCP, S9922M Cellular Wi-Fi Router can use another more reliable checking way ICMP which check the link by PING. When abnormal link is checked, the preset action will be executed to recover the link and systems quickly. Initially ICMP is to check wireless link, and now it can be used to check VPN link and supports simultaneous check in different rules. It supports maximum 10 ICMP check rules.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “applications > ICMP Check”.

Open “ICMP Check” tab.

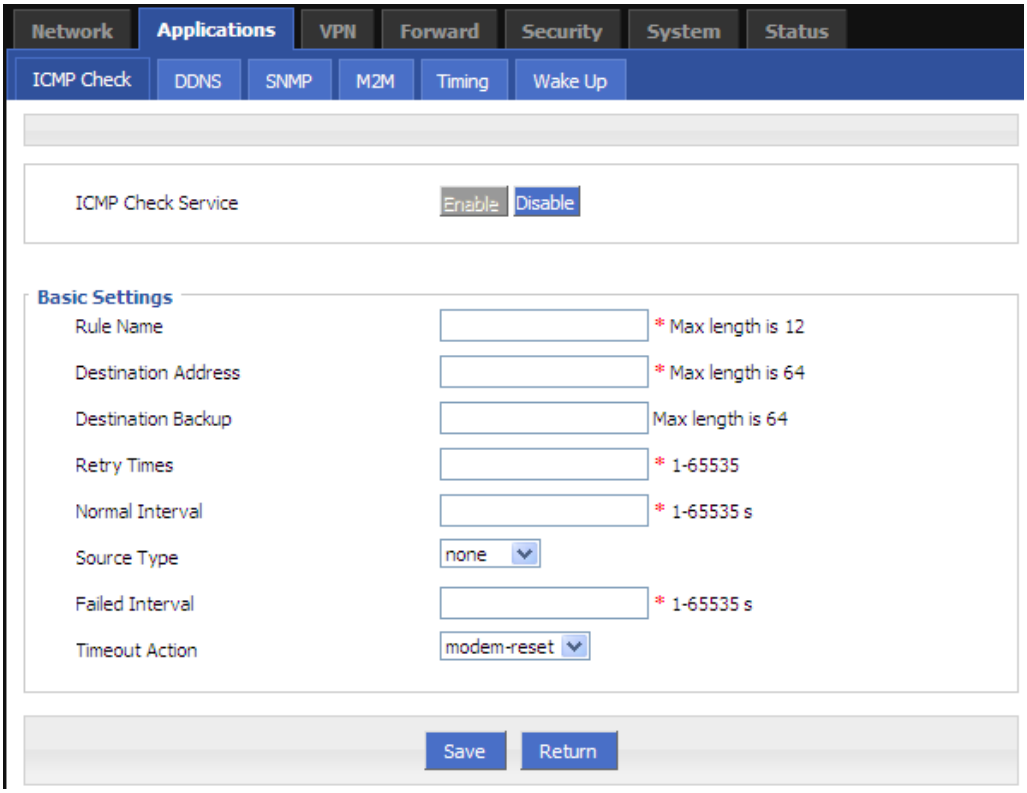
Figure 5-15 ICMP Check tab



Step 3 “Add”, “Modify”, “Delete”, “Enable” “Disable” the function of “ICMP Check”.

- Add

Figure 5-16 ICMP adding page



1. Configure the ICMP check parameter.

Table 5-9 ICMP check rules Parameter instruction

Parameter	Details	Operation
ICMP check service	To enable or disable ICMP check rules, multiple rules can be used simultaneously, and one specific rule can be disabled	Button • Enable • Disable
Basic Config		
Rule Name	ICMP Check rule name, just to distinguish different rules	WORD type, max 12 bytes
Destination address	Destination address of ICMP check, can be domain name and also can be IP address. If domain name, DNS of the router shall be configured correctly	WORD type, max 64 bytes
Destination backup	A backup destination address of ICMP check, if “destination address” cannot be linked by ICMP check, the “destination backup” address will be checked, if still	WORD type, max 64 bytes

Parameter	Details	Operation
	cannot linked, the router will recognize ICMP check fails	
Retry times/normal interval	Check time interval and max check failure times when link is OK, if check failure times reaches the max times, then “timeout action ” will be executed, e.g. “modem reset”	Value area ： 1～65535 Unit: second/time
Source Interface	Router sends an ICMP detected packet's source address	Dropdown List options • br0 • modem
Timeout action	An action when check failure times reach max failure times. Can be modem-reset, reboot, custom	Dropdown List options • modem-reset： modem redials • reboot：router reboots • custom ： customized action
Run commands	If “Timeout action” is “custom”, this shall be configured. Commands are BGO operation. It is not suggested to use, if need, please contact our technical engineers	WORD type, max 64 bytes

2. Single click “save” to finish a ICMP check rule.

NOTE

If ICMP is normal, ICMP packet is sent at “normal interval”. When abnormal, packet will be sent continuously at “failed interval”. If “destination address” cannot be linked and checking times reach “retry times”, “destination backup” will be checked. if “destination address” can be linked in checking “destination backup”, “destination address” will be checked again. If “destination backup” cannot be linked and checking times reach “retry times”, “Timeout action” will be executed.

- Modify
- Delete
- Enable

NOTE

If already enabled, the button “EN” is gray.

- Disable

NOTE

If already disabled, the button “DIS” is gray

- Refresh

  Click “refresh” to refresh the page.

---END

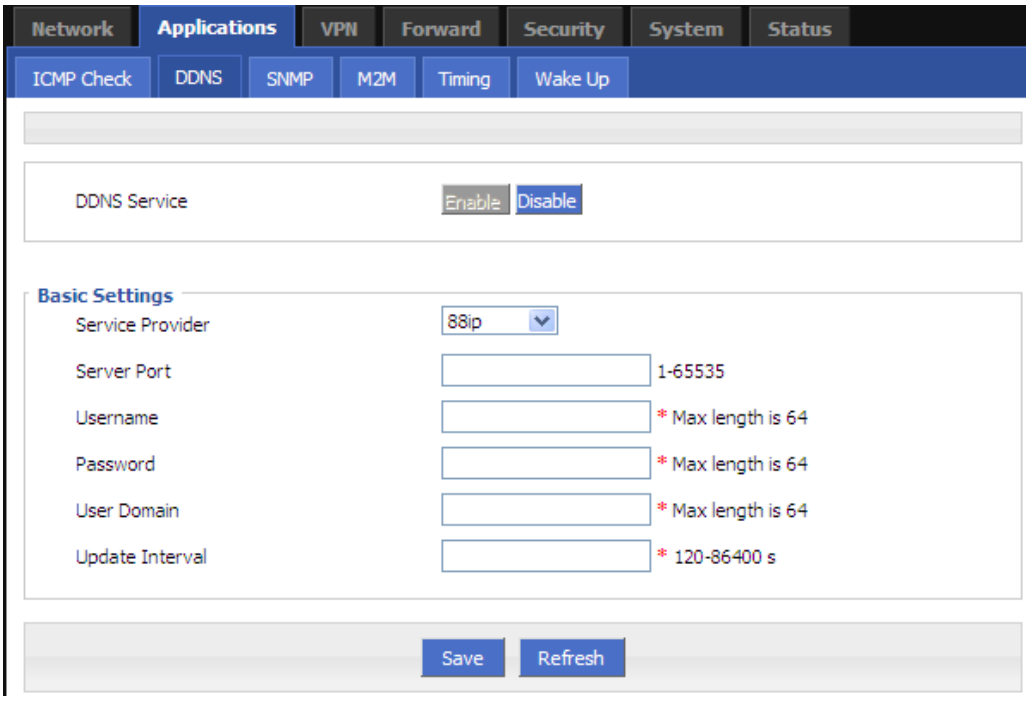
5.3.2 DDNS configuration

Network of SIM/UIM shall be a public address so that router can be visited for a DDNS.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “Applications” > “DDNS”.

Figure 5-17 DDNS configuration



Step 3 Configure DDNS parameter.

Table 5-10 DDNS Parameter instruction

Parameter	Details	Operation
DDNS Service	Set whether enable DDNS service function	Button • Enable • Disable
Basic Config		
Service Provider	Select the DDNS service provider that router currently supports, don’t support other providers	Dropdown List options • 3322 • 88ip • Dnsexit • Dyndns • Zoneedit • changeip • custom
	When “custom” in “service provider” is	WORD type, max 64 bytes

Parameter	Details	Operation
	selected, “Server IP or Domain” will be configured. Default is standard DDNS protocol. for customized protocol, please contact our engineer	
Server Port	Set the port number of the DDNS server provided by the service provider. The default port number is 80	Value area: 1～65535 If empty, it means 80 port
User name/Password	Set user name/password of the DDNS service registered in the service provider	Normal WORD type/CODE type, max 64 bytes
User Domain	Set the domain of the DDNS service provided by the service provider	Normal WORD type, max 64 bytes
Update Interval	Set the interval of the DDNS client obtains new IP, suggest 240s or above	Value area: 120～86400 Unit: seconds

Step 4 Click “Save” to complete DDNS configuration

NOTE

DDNS in China: 88IP (www.88ip.net), 3322 (www.3322.org)
DDNS outside of China: DNSEXIT (www.dnsexit.com), ZONEEDIT(www.zoneedti.com), CHANGEIP(www.changeip.com), DYNDNS(www.members.dyndns.org)
After router reboots, IP address which SIM/UIM gets from ISPs will change. If user uses DDNS in remote login, no matter the IP address changes, he can Log-on the router.

---END

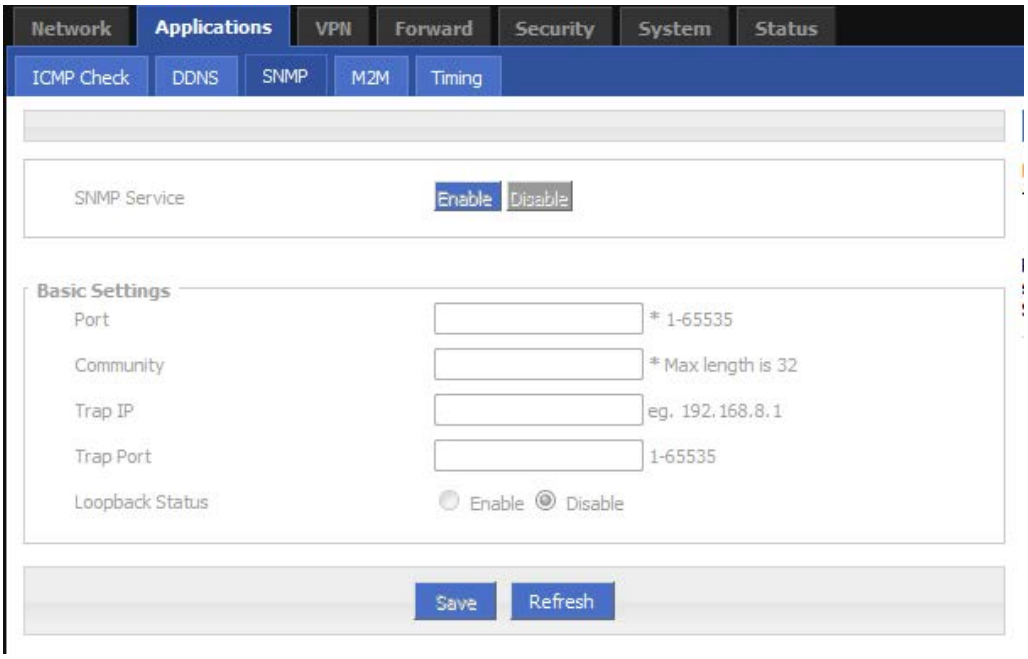
5.3.3 SNMP configuration

SNMP（Simple Network Management Protocol)can monitor routers remotely and get to know the status of routers (Support interface status check, like VPN, modem etc. MIB of our company shall be used).

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “Applications >SNMP” to open the “SNMP” tab.

Figure 5-18 SNMP configuration



Step 3 Configure SNMP parameter.

Table 5-11 SNMP Parameter instruction

Parameter	Details	Operation
SNMP service	To enable or disable SNMP service	Options: • Enable • Disable
Basic Config		
Port	SNMP port, suggest to be default port161	Value area: 1～65535 Default: 161
Community	Community Password of SNMP client to router SNMP, Used for identification	WORD type, max 16 bytes
Trap IP	Link-state router report server address	Manual input Format：A.B.C.D/Mask
Trap Port	Link-state router report server address’s port	Value area：1～65535 Default：162

Parameter	Details	Operation
Loopback Status	Match with "LAN" page loopback address, in the "Loopback Status" to "Enable", means loopback address configuration successfully, the router reported Trap IP packet source address is the loopback address, If the "Loopback Status" to "Disabled" means router IP packet source address for the LAN port address	Options: • Enable • Disable

Step 4 Single click “save” icon to finish SNMP configuration.

MIB for SNMP can be downloaded from our website, if necessary, please contact our technical engineers.

---END

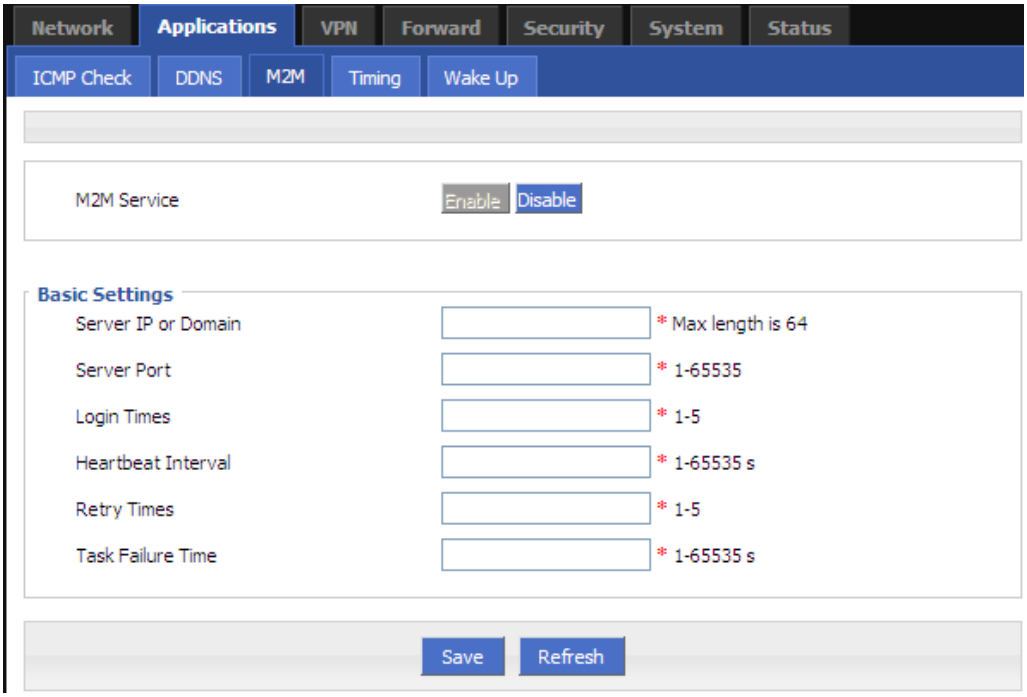
5.3.4 M2M configuration

S9922M Cellular Wi-Fi Router has embedded a WMMP (Wireless Machine-to-Machine Protocol) protocol to realize communication with M2M (Machine-to-Machine) platform which can remotely monitor and manage the routers and its network, e.g. visit the router, patch upgrading, firmware upgrading, parameter configuration, monitor the network strength, time delay, flow. Its configuration is as follows:

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “Applications > M2M” to open M2M configuration tab.

Figure 5-19 M2M configuration



Step 3 Configure M2M parameter.

Parameter instruction is shown.

Table 5-12 M2M Parameter instruction

Parameter	Details	Operation
M2M service	To enable or disable M2M function. This function shall be used with our M2M platform	Button • Enable • Disable
Basic Config		
Server IP or Domain	Set the server IP or domain of M2M platform	Normal WORD type, max 64 bytes
Server Port	WMMP port No, shall be the same with Port No of M2M platform server	Value area: 1～65535
Login Times	Max retry-times of router to login M2M platform. If login times reach max times, the router will reboot, M2M will initialize and login again	Value area: 1～5 Unit: times
Heartbeat Interval	Time interval to send heartbeat which maintains the like with M2M platform server. The heartbeat includes the network status info which will update the network info	Value area: 1～65535 Unit: seconds

Parameter	Details	Operation
	of the M2M platform	
Retry Times	There is a retry mechanism for package exchange between router and M2M platform. When exchange times reach retry times, router will judge the exchange fails and usually no operation will be made	Value area: 1～5 Unit: seconds
Task Failure Time	The time to judge an exchange fails, if an exchange uses time which exceeds the “task failure time”, router will judge the exchange fails and will retry to send the exchange	Value area: 1～65535 Unit: seconds

Step 4 Single click “save” icon to finish the configuration.

---END

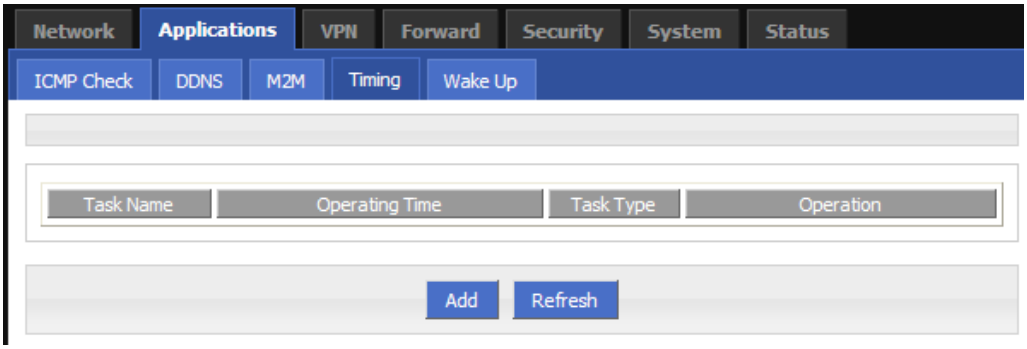
5.3.5 Timing configuration

This application is to control the online time of the router to better manage network and save 3G/4G flow. S9922M can add several online periods as per the user’s requirement (e.g. hours of some day). in addition, this application can support to begin some tasks at a time point (e.g. redial or reboot at 00:00). 10 tasks max.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

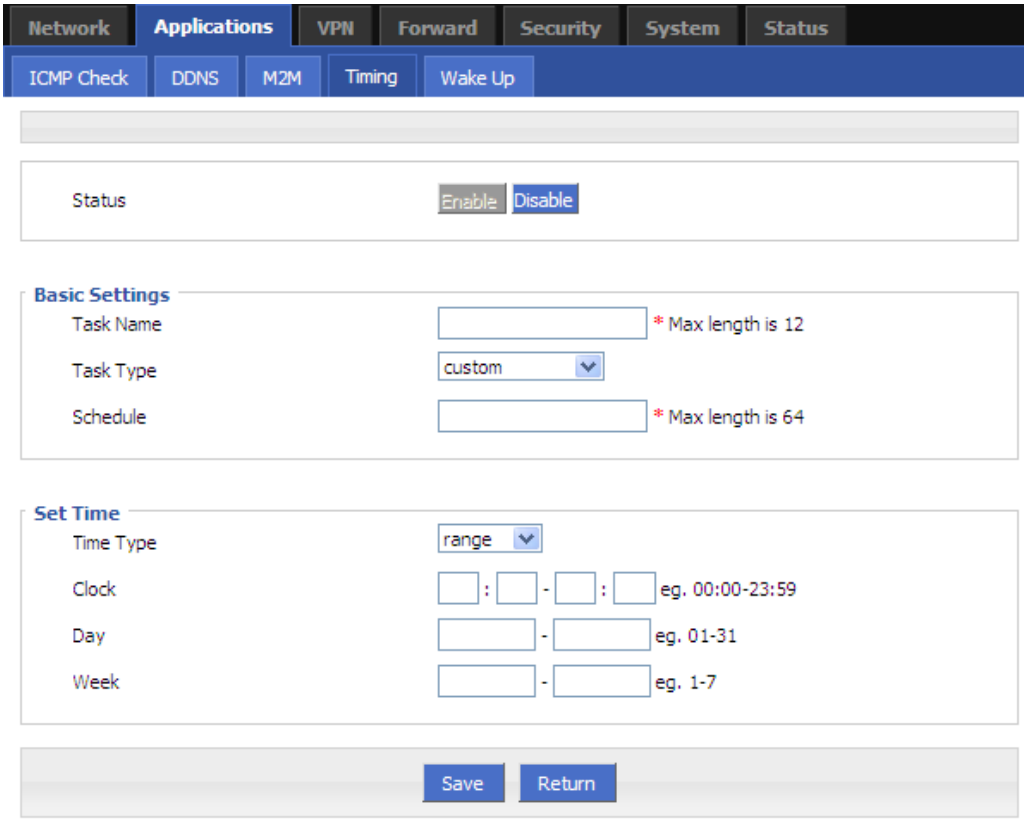
Step 2 Click “Applications > M2M” to open M2M configuration tab.

Figure 5-20 Timing configuration



Step 3 To add a timing task, please click “Add”.

Figure 5-21 To add timing task



Step 4 Configure timing task parameter.

Table 5-13 Timing task parameter instruction

Parameter	Details	Operation
Status	To enable or disable a timing task. Some task shall be enabled together with NTP	options • Enable • Disable
Basic Config		
Task name	Name of a timing task	Max 12 digits
Task type	Task type has action task and status task. Action task is for time point or time interval, while status task is for time period (for "modem-online", which means that the modem will be online (if down, modem will automatically redial)	Dropdown List options: • modem-online • reboot • custom if select "custom", "schedule" will be shown to input command (can be dialup or other command). Max 64 bytes

Parameter	Details	Operation
	during the configured time period. Modem will be offline (no dialing) for other time	
Schedule	This is Linux shell command. Usually suggested not to use it. In case of need, please contact our technical engineers	WORD type. Max 64 digits
Set time		
Time type	Range or interval for status task or action task	Dropdown List options: • range • interval
When “time type” select “range”		
Clock	To input hour and minute. When beginning and end hour and minute are the same, it means a time point for action task	Value area: [00:00,23:59] Format: HH:mm-HH:mm
Day	Days in a month for task	Value area: [01,31] Format: XX-XX
Week	Days in a week for task. When “day” and “week” are both input, it means only if both conditions meet, the task will begin	Value area: [1,7] Format: X-X 1 for Monday
When “time type” select “Interval”		
Interval	Time interval for action task	Value area: 1～65535 Unit: minutes

Step 5 Single click “save” icon to finish “Timing” configuration

The “range” selection requires system clock enable (that is to say the NTP server), while the “interval” selection does not require. For the system clock configuration, see the section “5.6.4 Clock”.

---END

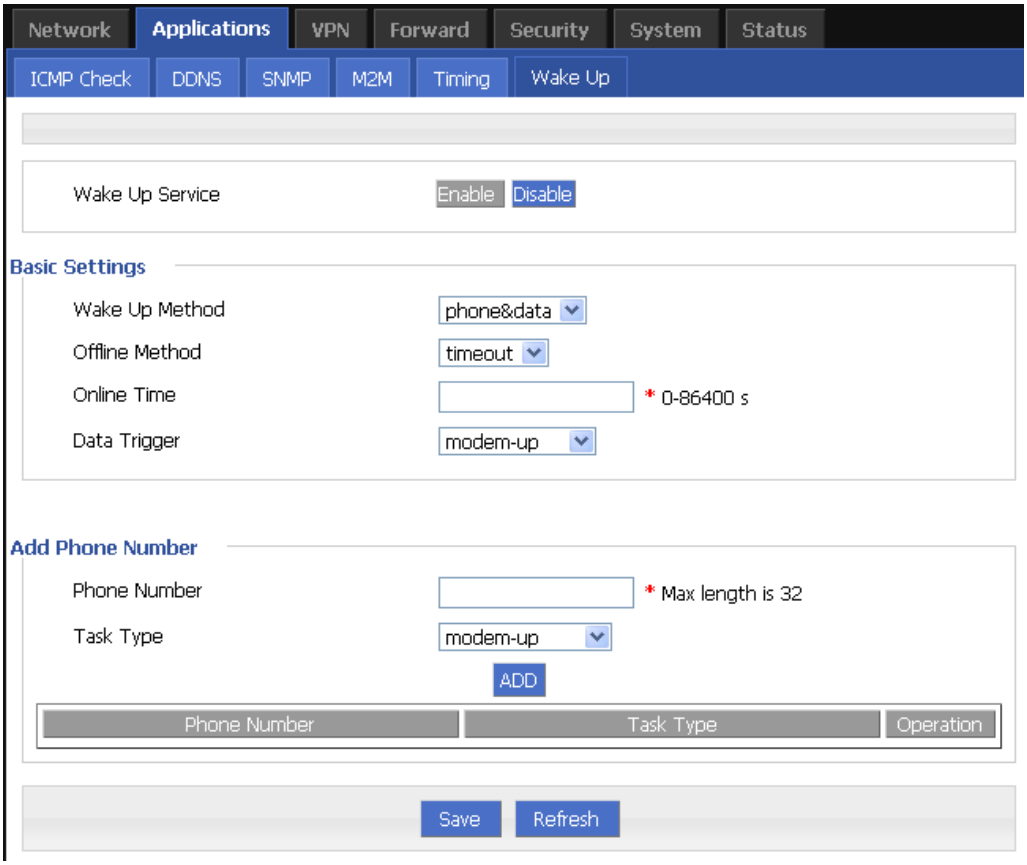
5.3.6 Wake up configuration

3G/4G fee is mostly based on flow. S9922M Cellular Wi-Fi Router can get on/off line on demand. It supports on/offline or reboot triggered by voice, SMS or data. It supports max 10 cell phone Nos.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “Applications > Wake up” to open “Wake up” tab.

Figure 5-22 Wake up configuration



Step 3 Configure “wake up” parameter.

CAUTION

Click “Save” to write in the flash memory, after finishing “basic setting” parameter.

Table 5-14 Wake up Parameter instruction

Parameter	Details	Operation
Wake up service	To enable or disable the service.	Options: • Enable

Parameter	Details	Operation
		• Disable
Add phone Number		
Phone Number	Phone No to trigger the router action. One phone No for one action of one modem.	WORD type. Max 32 digits.
Task type	• Triggered action includes modem-up, modem-down, reboot.	Dropdown List options • modem-down • modem-up • reboot
Basic setting		
Wake up method	To configure actions triggered, it supports phone and data. If choose phone, please be sure that the SIM card has opened voice or SMS service. Usually recommend voice wakeup with high efficiency and don't need SMS charge.	Dropdown List options • phone/data • phone
Offline method	Support "timeout" and "idle". "timeout" means router will get offline once time reaches the configured time commencing from online time. "idle" means if idle (no data transmission) time is as long as the configured time, the router will get offline.	Dropdown List options • timeout • idle
Online time	Online time of router, for "idle", online time will recalculated if there is data transmission.	Value area ： 0～86400 Unit: second
Data trigger	Configured as wakeup by data. When router receives data from external network, the modem will be triggered to be online, LAN data and broadcast data will not trigger actions. If configured as "phone&data", either phone or data can trigger actions	Dropdown List options • modem-up •

Step 4 Click "ADD" to add a new wake up rule.

After add a new rule, the rule will be shown on the bottom, click "Del" to delete the rule.

NOTE

One phone number be set for actions of different modems, but cannot be set as different actions of one modem.

It's OK for either SIM of the two SIMs of S9922M Cellular Wi-Fi Router to open SMS or voice function, no matter which slot to be installed.

"Data" will trigger only actions: modem-up

If "online time" is set as 0, it means router will be always online. To get the router offline, pls choose actions to trigger offline.

"Online time" in "wake up" will affect other functions like SIM switch, network backup, task management. So when users set wakeup parameter, please note whether there is conflict with other factions.

Voice trigger: router will begin the action after 5 seconds of the sound "du".

5.4 Security

5.4.1 Overview

"Security" will control where the data can pass through by analyzing IP address and port of ICMP, TCP/IP package from the destination end or source end. S9922M Cellular Wi-Fi Router supports IP filter, domain filter and MAC filter.

5.4.2 Configuration

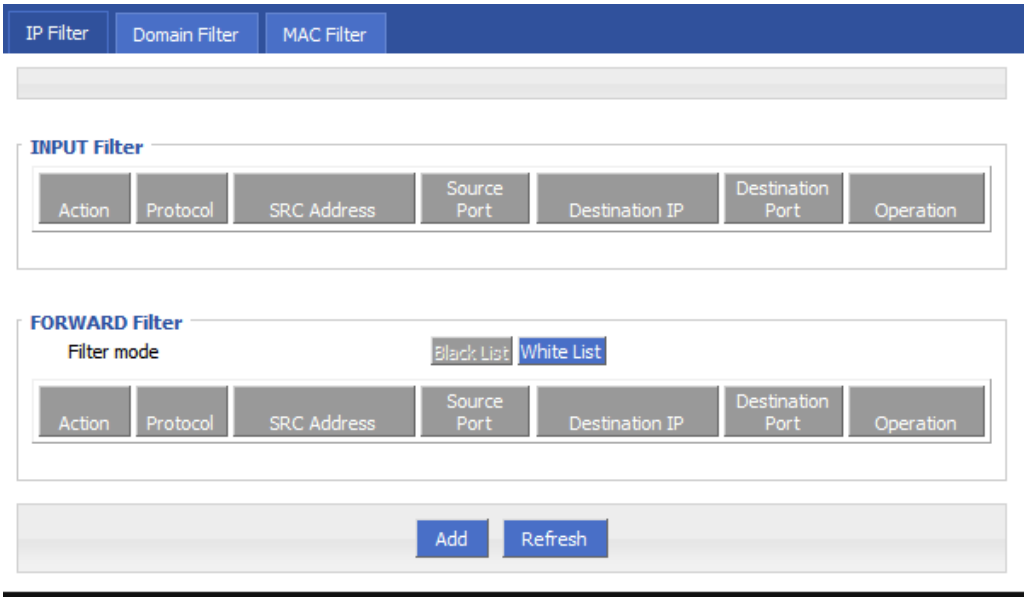
IP Filter

IP filter refers to judgment whether to allow router to forward the data according to filter rules, thus to manage internet surfing of PC in LAN. IP filter is used to allow part of PCs in LAN to visit external WAN network or forbidden some PCs from visiting specific website.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click "Security > IP Filter" to open "IP Filter" tab.

Figure 5-23 IP Filter tab



Step 3 In the forwarding filtering rules.

- Black List： The default allows packet forwarding, in line with the list of "discarded" rules packet cannot be forwarded through the router.
- White List： The default refuses packet forwarding, in line with the list of "accept" rules packet can go through router forwarding.

Step 4 Click “Add” to add a new IP filter rule and configure IP filter parameter. There are two types of IP filter: “Input” and “Forward”, as show in Figure 5-28 and Figure 5-29

Figure 5-24 IP filter “Input” type

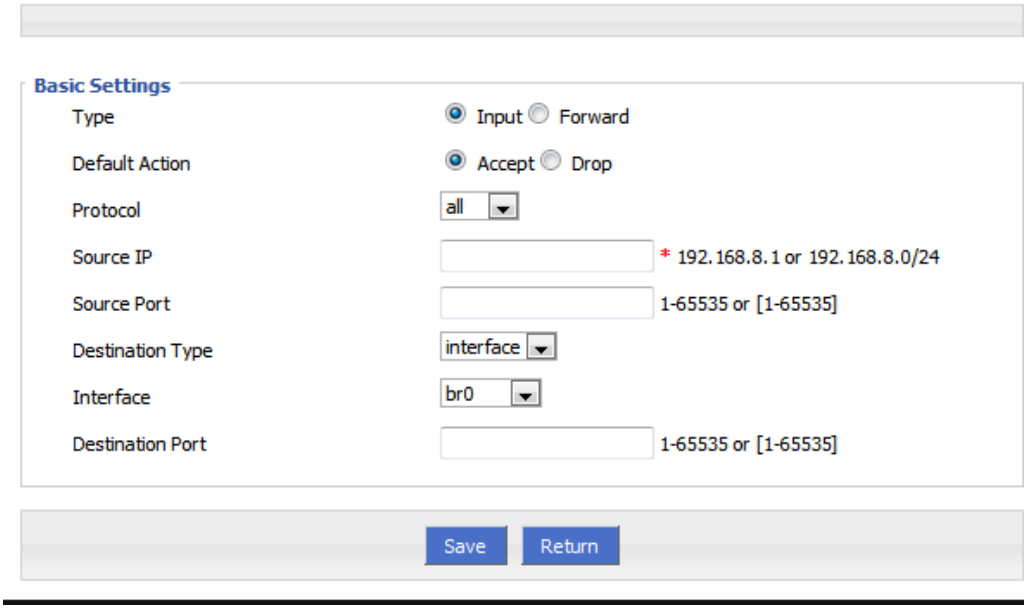


Figure 5-25 IP Filter “Forward” type

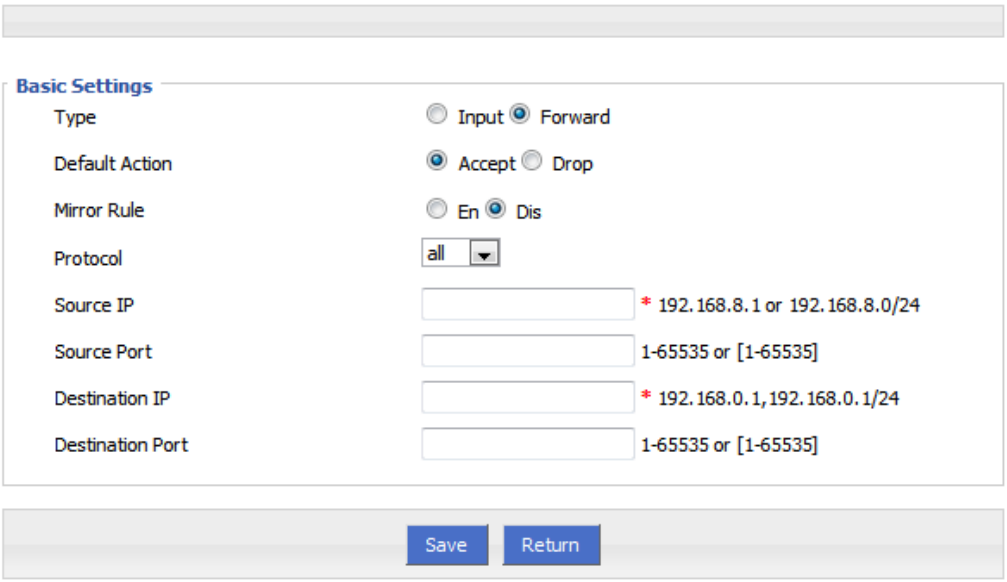


Table 5-15 IP filter parameter instruction

Parameter	Details	Operation
Type	Select a filter type, you can choose according to their needs, "Input" or "Forward" Input: whether to allow access to the router Forward: whether to allow the router forwarding	Dropdown List options
Default Action	The default action rule. You can select "Accept" or " Drop " Accept: firewall to accept the package, which can be passed Drop: firewall discards the packet directly	Dropdown List options
Mirror Rule	When the filter type selects "Forward", it needs to be configured Enable: Base on the configured rules, system auto adds totally opposite rules in addition. Opposite rules mean all the source address/port and destination address/port are reverse in the rules Disabled: no treatment	Dropdown List options

Parameter	Details	Operation
Protocol	Protocol used by IP packets	• Dropdown List options • all • tcp • udp • icmp
Source IP	• The source IP address of the packet	Manual input Format：A.B.C.D/Mask
Source Port	The source Port of the packet, when the protocol choose "icmp", it don't need to configure	Value area: 1-65535 or [1-65535], it can be a range, or a single port
When the IP Filter type select "Input"		
Destination Type	Design an IP packet access router interface	Dropdown List options • interface • any
Interface	Configure when Destination Type select "Interface", means the IP packet access the router interface	Dropdown List options • br0 • modem • eth0 • eth1
Destination Port	IP packet access router ports (when the protocol select "icmp", requires no configuration)	Value area: 1-65535 or [1-65535], it can be a range, or a single port
When the IP Filter type select "Forward"		
Destination IP	IP packet destination IP	Manual input Format：A.B.C.D/Mask
Destination Port	IP packet destination port	Value area: 1-65535 or [1-65535], it can be a range, or a single port

Step 5 Single click "save" to finish.

--END

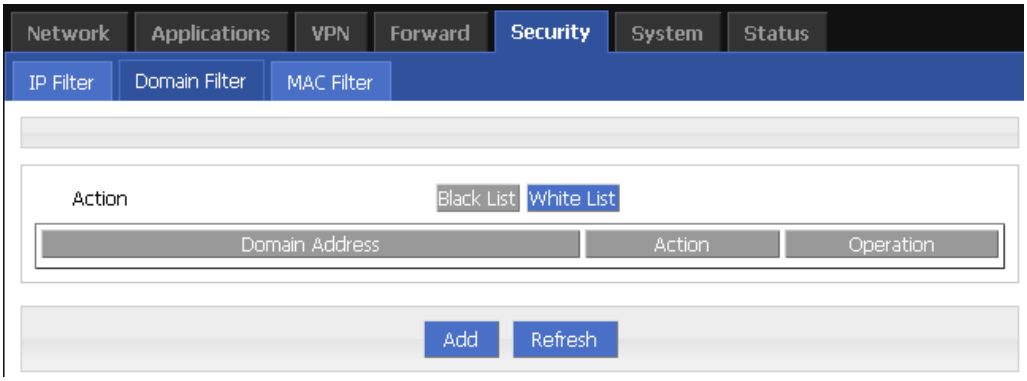
Domain Filter

Domain filter support black list and white list. It is used to forbid PCs in LAN from visit some websites or allows them to visit specific websites.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click "Security> Domain Filter" to open "Domain Filter" tab.

Figure 5-26 Domain filter tab



- Black list: websites in the blacklist cannot be visited. Click “black list” to forbid visiting the websites in the list.
- White list: only the websites in the white list can be visited, while other websites cannot be visited. Click “White list” to activate it.

Step 3 Click “ADD” to add a new domain filter rule and configure domain filtering parameter.

Figure 5-27 Domain filter tab

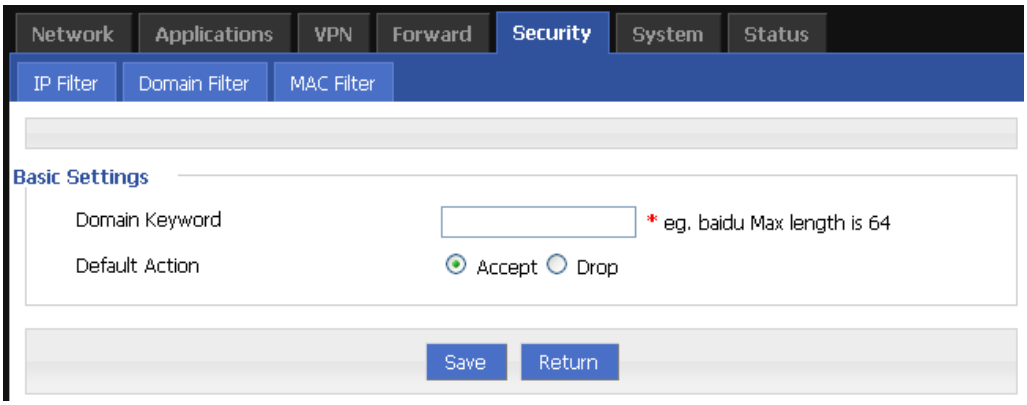


Table 5-16 Domain Filter parameter instruction

Parameter	Details	Operation
Domain keyword	Keyword of domain for filter	WORD type, max 64 digits. E.g. www.google.com, the keyword is “google”.
Default action	Actions to filter the keyword	• Accept. • Drop

Step 4 Single click “Save” to finish configuring a rule.

---END

MAC Filter

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “Security> MAC Filter” to open “MAC Filter” tab.

Figure 5-28 MAC Filter tab

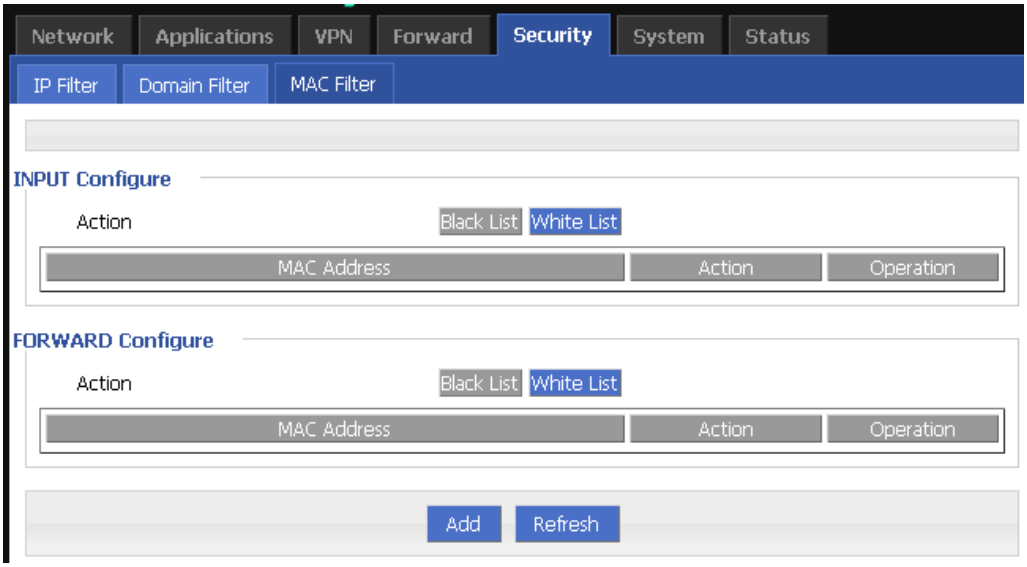


Table 5-17 MAC Filter explanation

Parameter	Details	Operation
Input configuration		
Action	To activate MAC input filtering black list / white list.	• Blacklist: rules in blacklist cannot visit router, other MACs can visit router. • White list: rules in white list can visit router, other MACs cannot visit router.
Forward configuration		
Action	To activate MAC forward filtering black list / white list.	• Blacklist: rules in blacklist cannot visit external network, other MACs can visit external network through router. • White list: rules in white list can visit external network, other MACs cannot visit external network through router.

Step 3 Click “Add” to add a new MAC filter rule and configure MAC filtering parameter.

Figure 5-29 MAC Filter configuration

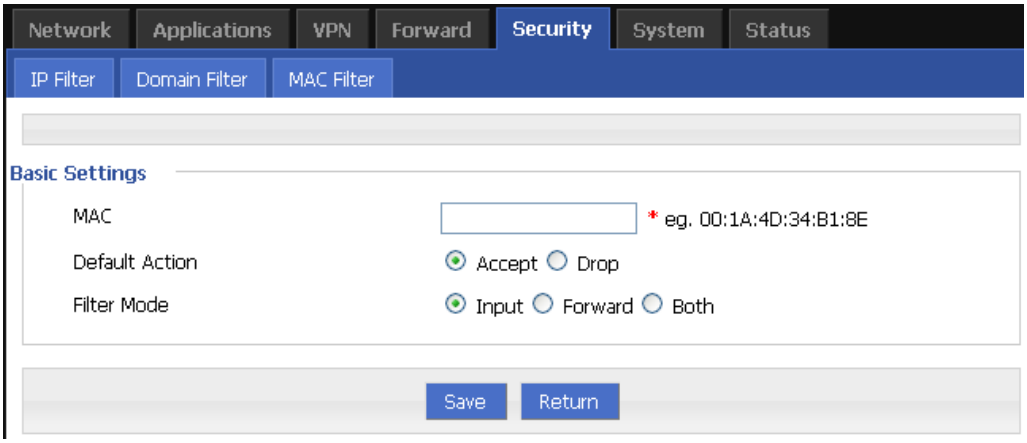


Table 5-18 MAC Filter Parameter instruction

Parameter	Details	Operation
Basic Settings		
MAC	MAC to be filtered	WORD type MAC format: XX:XX:XX:XX:XX:XX
Default Action	Default actions of the rule. Can be “accept” or “Drop”: • Accept: to accept all packages from this MAC. • Drop: to drop all packages from this MAC.	To choose “accept” or “Drop”
Filter mode	To choose “Input”, “Forward” or “Both”. • Input: all packages visiting router. • Forward: all packages forwarded by router. • Both: both Input and forward.	To choose “Input”, “Forward” or “Both”.

Step 4 Single click “save” icon to finish.

---END

5.5 Forward configuration

5.5.1 Overview

Forward function of S9922M Cellular Wi-Fi Router includes NAT, Routing, dynamic routing (RIP, OSPF) (optional) and QoS (optional).

5.5.2 NAT

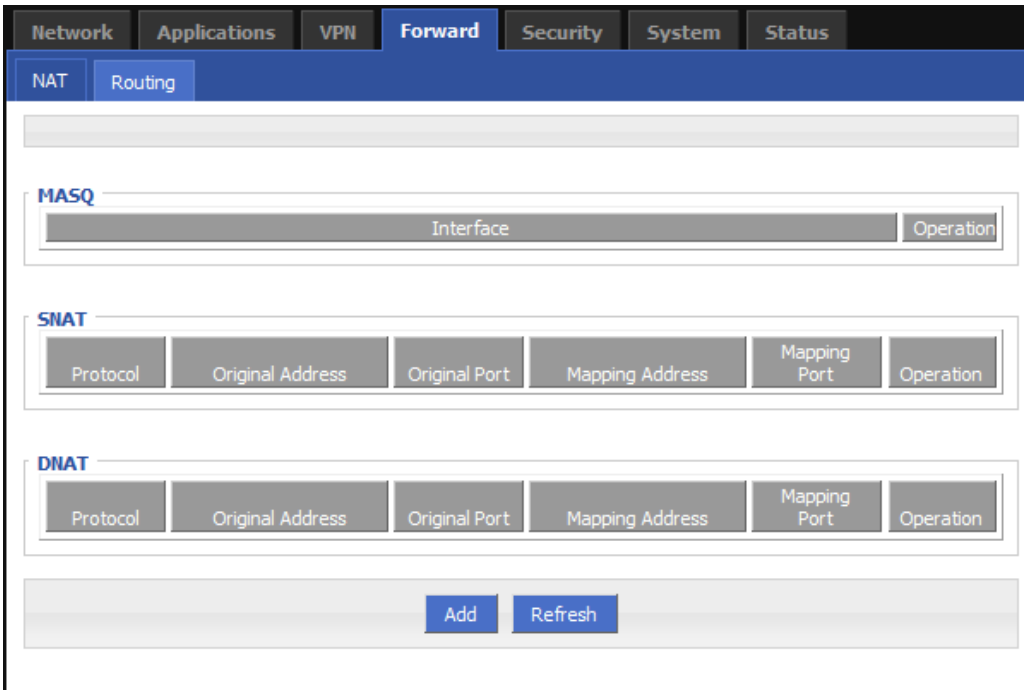
DNAT configuration rule

DNAT is used to replace the destination address of packets accessing external network, router will replace the destination address of packet accessing external network into the user custom settings.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

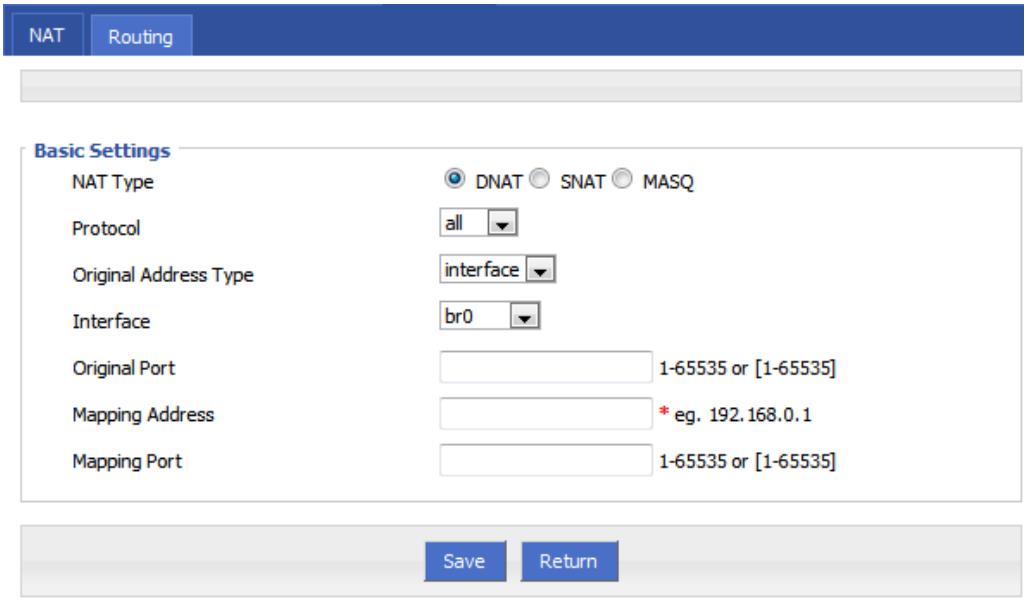
Step 2 Click “Forward > NAT” to open “NAT” tab.

Figure 5-30 NAT tab



Step 3 Click “Add” to add a new NAT rule.

Figure 5-31 DNAT rule configuration



Step 4 Select “DNAT” in NAT Type, to configure DNAT rule parameter.

Table 5-19 DNAT Parameter instruction

Parameter	Details	Operation
Basic Settings		
Protocol	Supports “TCP”, “UDP”, “ICMP” or “ALL”	Select from Dropdown List
Original Address Type	The external address, the address needs to be converted	Dropdown List • interface • static
Interface (when the initial address type select “interface” , needs to be configured)	Indicates the external address of IP packets to an interface of the router	Dropdown List • br0 • modem • eth0 • eth1
Original Address (when the initial address type select “static”, needs to be configured)	The external address, the address needs to be converted	Manual input Format1： A.B.C.D Format2: A.B.C.D/Mask

Parameter	Details	Operation
Original port	The port of external IP, the port need to be replaced	Value area: 1～65535
Mapping address	Internal IP address	e.g. 192.168.8.1
Mapping port	The port of Internal IP address	Value area :1～65535

Step 5 Single click “save” icon to finish.

---END

SNAT configuration rule

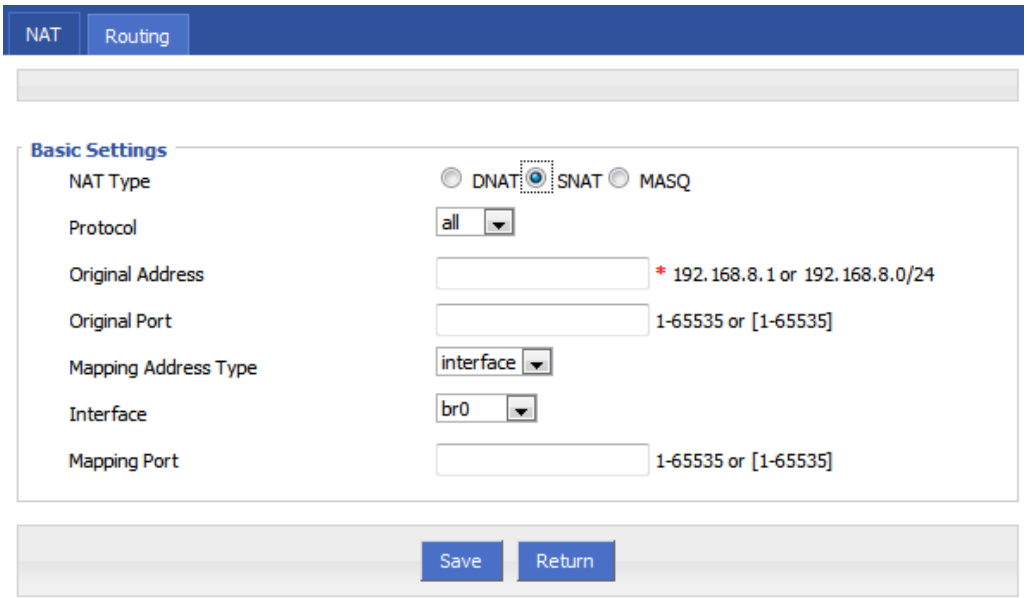
SNAT is the source address translation, and its role is to translate source address of IP packets into another address.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “Forward > NAT” to open “NAT” tab.

Step 3 NAT Type select “SNAT”, Configuration interface as shown in Figure 5-47.

Figure 5-32 SNAT rule configuration



Step 4 Configure SNAT rule parameter.

Parameter instruction as Table 5-22

Table 5-20 SNAT rule instruction

Parameter	Details	Operation
Protocol	Convert some kind of protocol packets into address	• Dropdown List • all • tcp • udp • icmp
Original Address	The source address need to be replaced	Manual input Format1：A.B.C.D Format2: A.B.C.D/Mask
Original Port	The port of external IP, the port need to be replaced	Value area: 1-65535 or [1-65535], it can be a range, or a single port
Mapping Address Type	Internal IP address	• Dropdown List • interface • static
Interface	Select the interface of the router as source address after replacement	• Dropdown List • br0 • modem • eth0 • eth1
Mapping Port	The new port which replaces the original port of source address.	Value area: 1-65535 or [1-65535], it can be a range, or a single port

Step 5 Single click “save” icon to finish.

NOTE

When a SNAT rule is configured with port specified, selecting “all” in protocol means selecting two protocols contain "tcp", "udp"; when a SNAT rule is configured with no port specified, selecting “all” in protocol means selecting three protocols contains "tcp", "udp","icmp".

---END

MASQ rule configuration

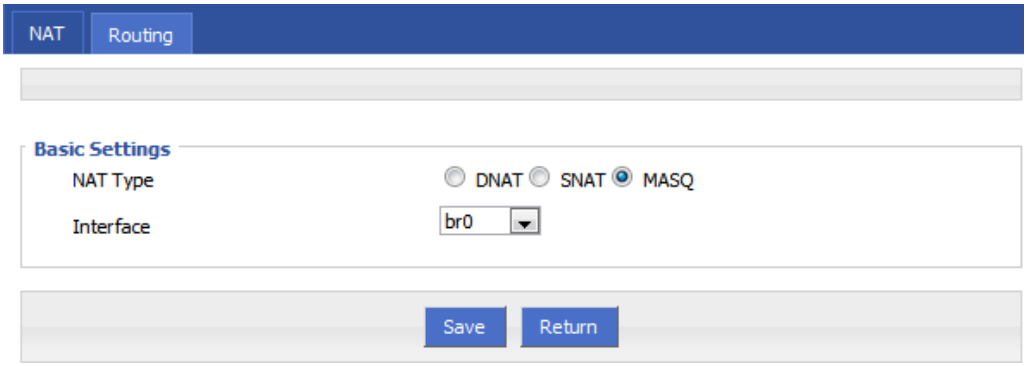
MASQ is MASQUREADE.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “Forward > NAT” to open “NAT” tab.

Step 3 Select “SNAT” in NAT Type. The configuration page is shown in Figure 5-48.

Figure 5-33 MASQ configuration



Step 4 Configure MASQ rule parameter.

Table 5-21 MASQ rule Parameter instruction

Parameter	Details	Operation
NAT Type	To select “MASQ”	Select “MASQ”
Interface	Interface includes: • br0: use br0 interface as commutation address between router & LAN and external network • Modem: use modem interface as commutation address between router & LAN and external network • eth0: use eth0 interface as commutation address between router & LAN and external network	Select from Dropdown List

Step 5 Single click “save” icon to finish.

NOTE

MASQ rule: the source address of all packets in the LAN need to be transferred into the specific ip address of the router, so the PC from the LAN can send packets out; If MASQ rule in the router will be deleted, the router LAN of the PC cannot communicate with external network.

---END

5.5.3 Static Routing

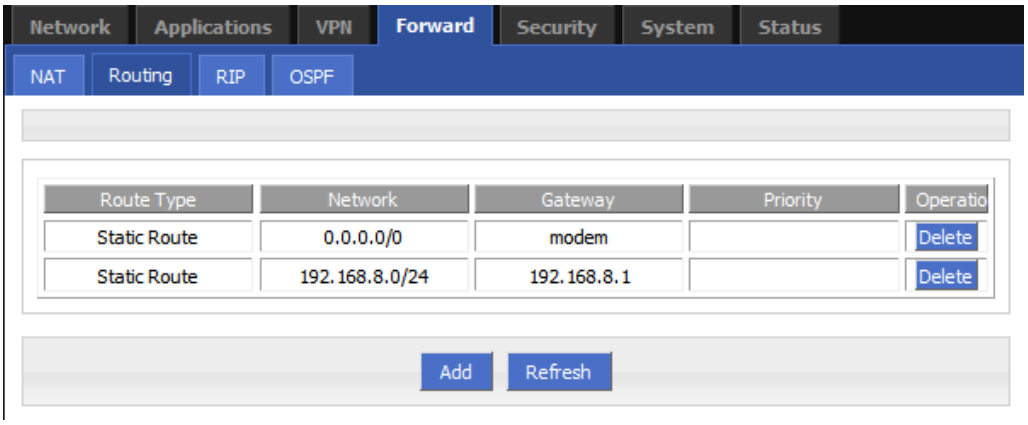
Static routing can forward packets according that the user configured specific forwarding path manually. Static Routing form is divided into static routing and policy routing, static routing is based on the destination address as an alternative route; while policy route is based on the source address that match with the policy to forward the packets (forwarding router detects the received packet's source address, and then forward packages according to the source which matches policy route) and policy routing priority, use numbers 3 to 252 to differentiate, the smaller number with higher priority.

And there are priorities between static routing and policy routing: policy routing higher priority than static routing.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “Forward > Routing” to open “NAT” tab, as Figure 5-49.

Figure 5-34 Static Routing Interface



Step 3 Click “Add” to add a new static route, configure interface as Figure 5-50 and Figure 5-51.

Figure 5-35 Static Routing Interface

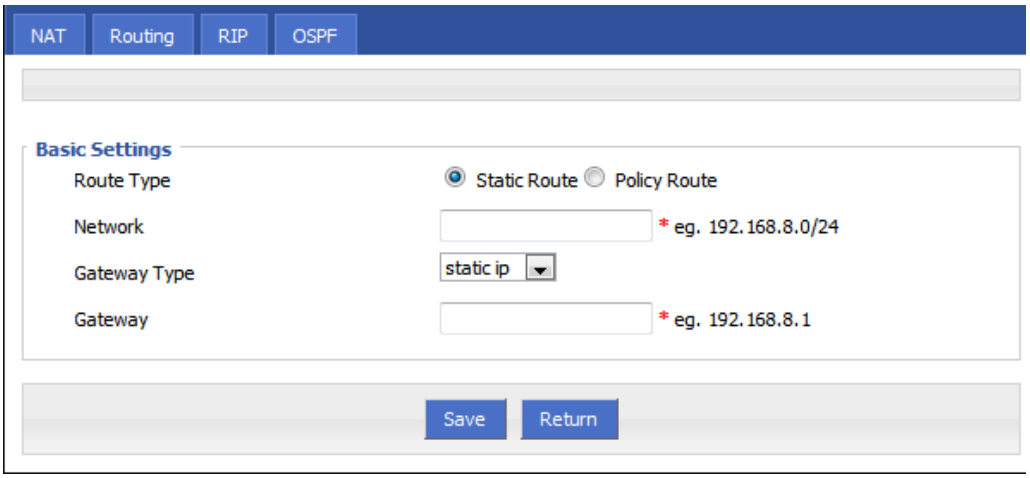
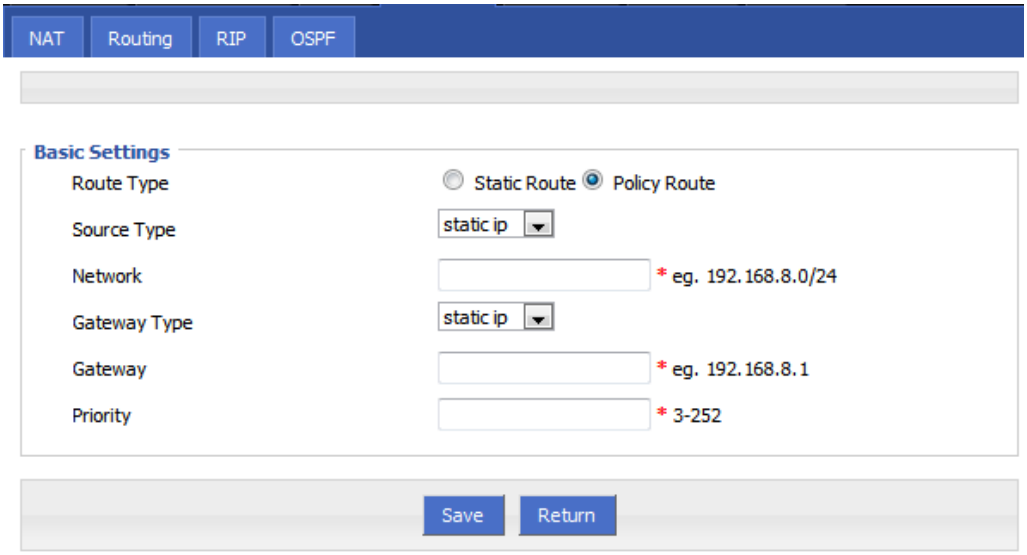


Figure 5-36 Policy Routing Interface



Parameter Instruction as Table 5-24.

Table 5-22 Static Routing Parameter Instruction

Parameter	Details	Operation
Basic Setting		
Routing Type	To select “Static Route” or “Policy Route”	• Dropdown List
When Routing Type is “Static Route”		
Network	Set the destination IP address and subnet mask of static route	Manual input Format1: A.B.C.D/Mask
Gateway Type	Specify gateway type of static routing, includes: • interface • static IP	Dropdown List
Gateway	Set a next hop IP address of static route, IP address of the adjacent router interface	Dropdown List • If the gateway type selects static IP, gateway need to manually input, format: A.B.C.D • If the gateway type select interface, the gateway needs to select from dropdown list
When Routing Type is “Policy Route”		
Source Type	Set source type of policy route • Static IP	Dropdown List

Parameter	Details	Operation
	• Interface	
Network	It can be configured when “static IP” is selected in source type, by adding IP address or subnet manually.	Manual input Format1: A.B.C.D/Mask
Source Interface	When source type is policy route, need to manually set source network address of policy router • modem	Dropdown List
Gateway Type	Set the next hop IP of policy route • static ip • interface	Dropdown List
Gateway	When the gateway type select "Static IP" to fill in the IP address, when gateway type is "interface", it will use the selected interfaces as gateway	Manual input Format1: A.B.C.D/Mask
Priority	Set policy routing priority, the priority lower the number, the higher the priority	Value area：[3,252]

Step 4 Single click “save” icon to finish the static routing setting.

Static routing will forward according to the destination address of the packet, if the router received the packet (e.g. source address is 1.1.1.1 destination address is 2.2.2.2), it will forward the packet to next hop according to the route which meets with the destination address (2.2.2.2).
It will forward the packet to next hop according to the route which meets with the destination address (2.2.2.2).
Policy routing will forward according to the source address of the packet, if the router received the packet (e.g. source address is 1.1.1.1 destination address is 2.2.2.2), it will forward the packet to next hop according to the route which meet with the source address (1.1.1.1).
Policy routing has higher priority than static routing, policy-based routing priority regardless of how much.

---END

5.5.4 QoS (Optional)

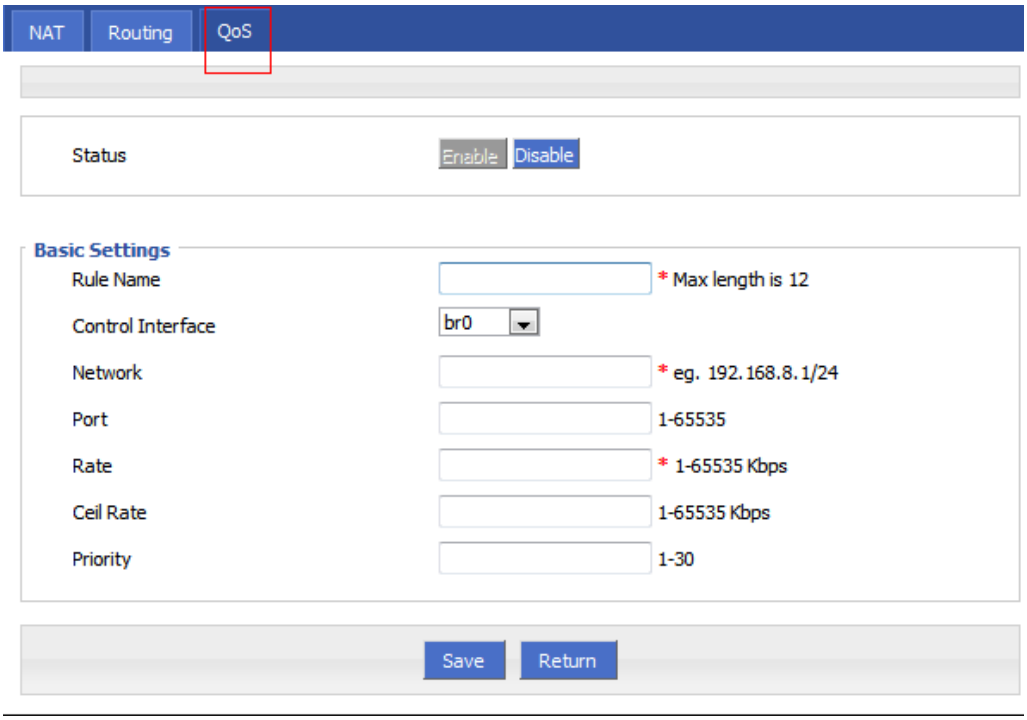
QoS (Quality of Service) quality of service, is a security mechanism for the network, is a technique to solve the network bandwidth allocation and network priority and other issues. When the network is overloaded or congested, QoS to ensure that critical traffic is

not delayed or dropped, while ensuring the efficient operation of the network, our S9922M Cellular Wi-Fi Router supports custom QoS services.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “Forward > QoS” to open “QoS” tab, as Figure 5-52.

Figure 5-37 QoS interface



Step 3 QOS configuration parameter, configuration parameter instruction as Table 5-25.

Table 5-23 QoS parameter instruction

Parameter	Details	Option
Status	Enable or disable QoS feature	Click the button to select
Basic Setting		
Rule Name	QoS rule name	The max to 12 characters Only set when adds a new rule and the follow-up can not be modified The rule name can not be repeated, otherwise the rule will be covered after the rule is added in front of the cover
Control Interface	The interface type of QOS, include: • br0：QOS interface is LAN • modem：QOS interface is modem	Dropdown List

Parameter	Details	Option
Network	The network address that flow in and out via the QOS interface, is the object of speed limit.	Full in destination address and subnet mask Manual input Format1: A.B.C.D/Mask
Port	The network interface of QOS	Value area: 1-65535 You can not configure the port, if not the configuration represents all ports
Rate	Transmission rate of the network address settings	Value area：1～65535 Units：Kbps
Ceil Rate	In ensuring the basic rate and the spare bandwidth, the maximum bandwidth of the network address of the communication can be obtained with higher priority will be given priority redundant bandwidth	Value area：1～65535 Units：Kbps
Priority	Set the precedence of the rules	Value area：[1,30]

Step 4 Single click “save” icon to QOS setting.

NOTE

QoS is mainly used to allocate the average bandwidth for the users which access Internet through the router, or assigned specific users with more bandwidth. If the router is connected with two subnets: 192.168.8.1/24 and 192.168.9.1/24, the router QOS can control the rate of these two subnets; If the router's bandwidth is relatively well-off, the router can adjust the bandwidth based on priority and redundancy of two subnets, that is, the router meets the high priority redundancy bandwidth firstly, then meets the low priority subnet redundancy bandwidth.

---END

5.5.5 Dynamic Routing (Optional)

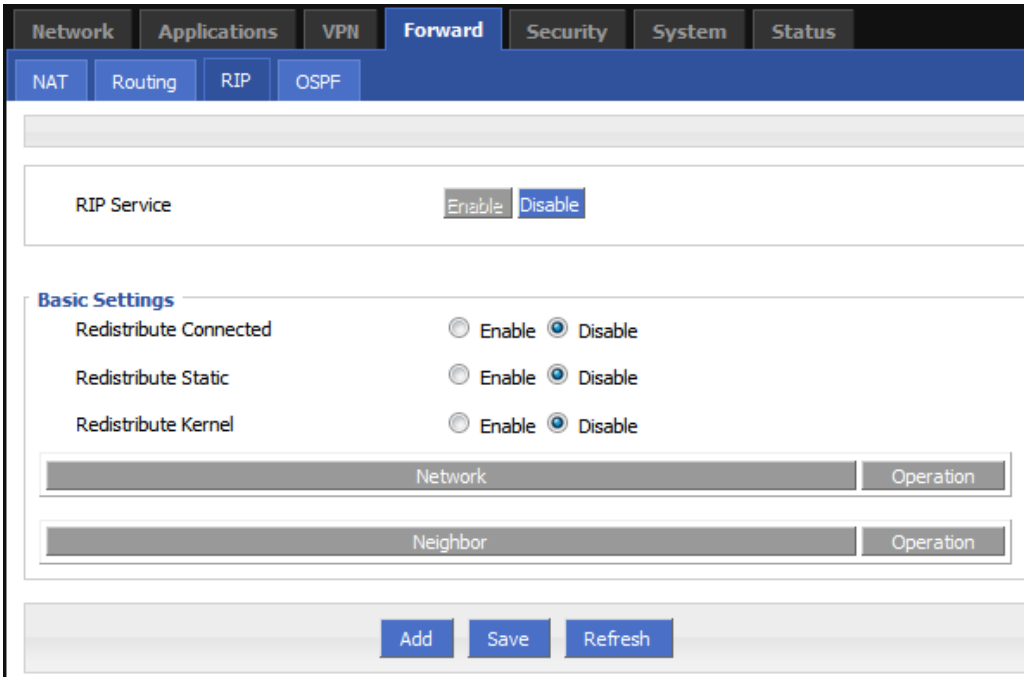
RIP configuration

RIP protocol (Routing Information Protocol) is the most widely IGP (Interior Gateway Protocol), it was designed for the same technology used in small networks, and therefore adapt to most of the campus network and used in a continuous regional networks that the rate change is not big, S9922M Cellular Wi-Fi Router supports RIP v2 protocol. For more complex environments, generally do not use the RIP protocol.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “Forward > RIP” to open “RIP” tab, as Figure 5-53.

Figure 5-38 RIP interface



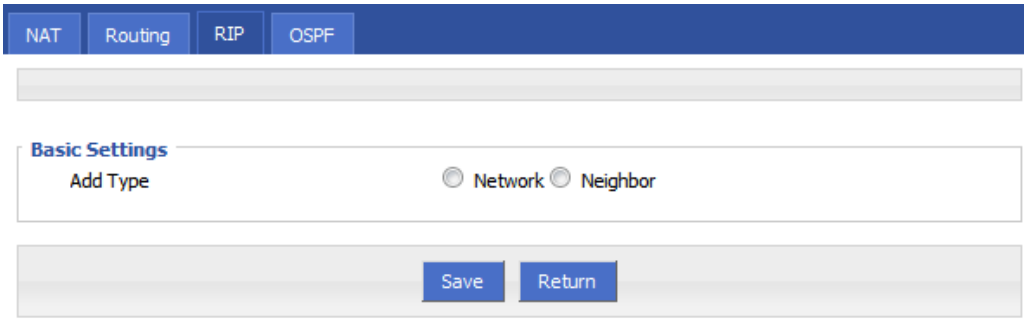
Parameter Instruction as Table 5-26.

Table 5-24 RIP Parameter Instruction

Parameter	Details	Operation
RIP Service	Enable or disable RIP Service	Click the button to select. • Enable • Disable
Redistribute Connected	Enable or disable Redistribute Connected	Click the button to select. • Enable • Disable
Redistribute Static	Enable or disable Redistribute Static	Click the button to select. • Enable • Disable
Redistribute Kernel	Enable or disable Redistribute Kernel	Click the button to select. • Enable • Disable

Step 3 Click “Add” to add a new RIP route, configuration interface as Figure 5-54.

Figure 5-39 RIP route configuration interface



Step 4 Configure RIP route parameter instruction, as Table 5-27.

Table 5-25 RIP parameter instruction

Parameter	Details	Operation
Basic Setting		
Add Type	Add the type of RIP route	Click the button to select Add Type • When it is “Network”, need to configure destination network address. • When it is “Neighbor”, need to configure neighbor’s IP address
Network(directly connect to the router)	Add the destination network of RIP route	Add the destination network of RIP route Format: A.B.C.D/Mask
Neighbor(directly connect to the router)	Add the neighbor’s IP address of RIP route	Add the neighbor’s IP address of RIP route Format: A.B.C.D

Step 5 Single click “save” icon to RIP route setting.

NOTE

RIP is an interior gateway protocol. If the communications between the two routers do not go through another router, the two routers are adjacent. The RIP protocol specifies that no information exchange between non-adjacent routers.
Routers exchanging information is all the information currently known to the router. That is its own routing table. At a fixed time to exchange routing information (such as every 30 seconds), then the router receives the routing information to update the routing table.
RIP protocol "distance" also known as "hops " (hop count), because each through a router hop count is incremented. The RIP judges a better router according to the less routing hops, as the “shorter distance”. RIP allows a path can contain up to 15 routers. Therefore, when the distance reach to 16 hops, it means the destination unreachable. RIP visible only for small Internet.

---END

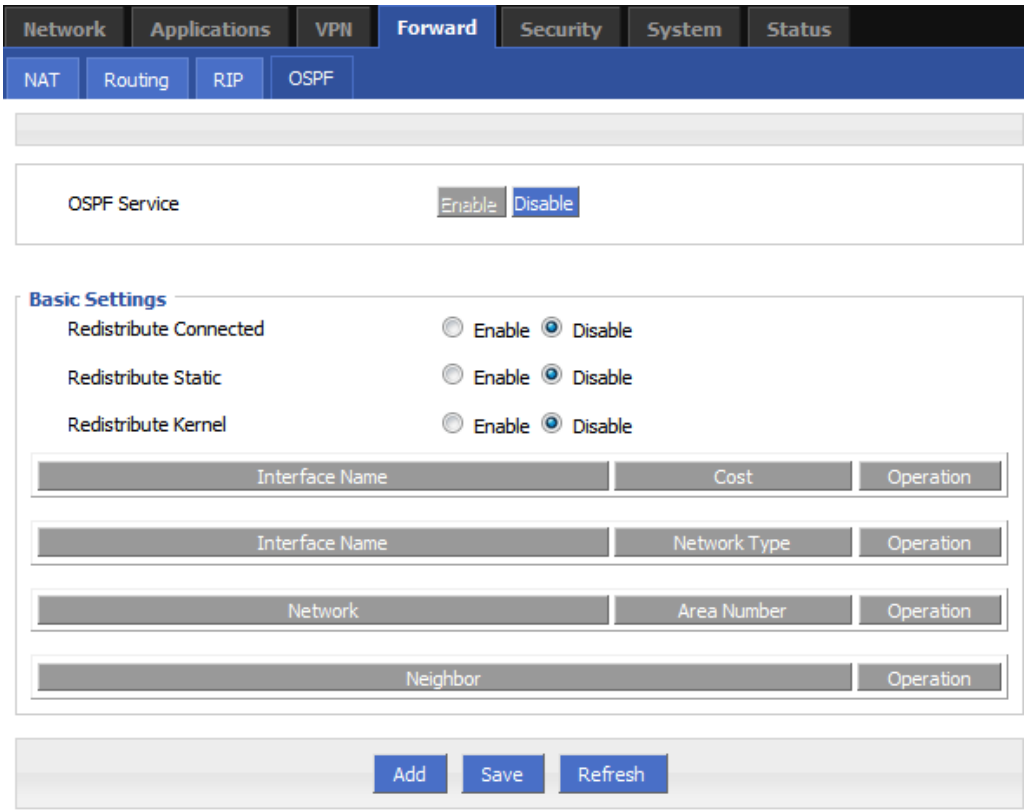
OSPF configuration

OSPF (Open Shortest Path First) protocol is one of the (Interior Gateway Protocol), the most widely used IGP, for a single AS (autonomous system) in the routing decisions for large networks. OSPF business can be based whether the user needs to be configured at the factory S9922M 3G/4G Router.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “Forward > OSPF” to open “OSPF” tab, as Figure 5-55.

Figure 5-40 OSPF Interface



OSPF parameter instruction as Table 5-28

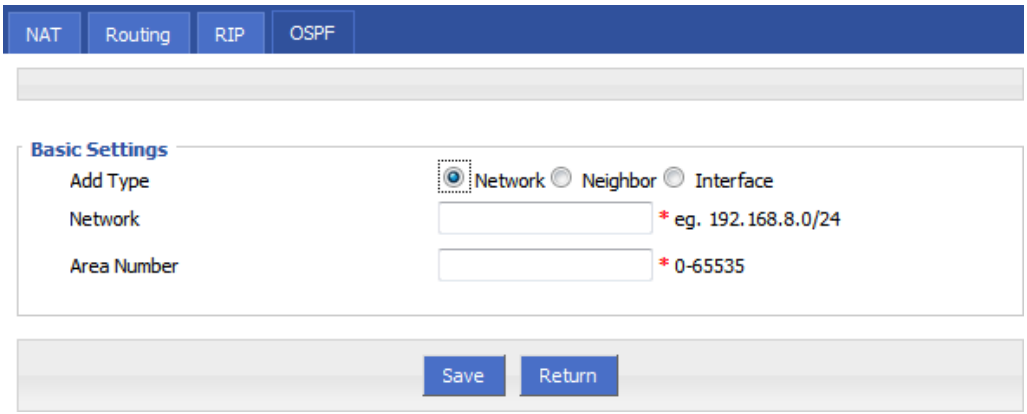
Table 5-26 OSPF parameter instruction

Parameter	Details	Operation
OSPF Service	Enable or disable OSPF Service	Click the button to select • Enable • Disable
Redistribute Connected	Enable or disable Redistribute Connected	Click the button to select • Enable • Disable

Parameter	Details	Operation
Redistribute Static	Enable or disable Redistribute Static	Click the button to select • Enable • Disable
Redistribute Kernel	Enable or disable Redistribute Kernel	Click the button to select • Enable • Disable

Step 3 Click “Add” to add a new OSPF route, configuration interface as Figure 5-56.

Figure 5-41 OSPF route configuration interface



Step 4 Configure RIP route parameter instruction, as Table 5-29.

Table 5-27 OSPF route parameter instruction

Parameter	Details	Option
Add Type	Add the type of OSPF route	Click the button to select Add Type • Network • Neighbor • Interface
• When Add Type is “Network”,		
Network	Set the network address as ospf sending address	Manual input Format1: A.B.C.D/Mask
AS Number	Used to identify the network (only the routers with the same domain address can exchange routing information)	Manual input Value area:[0,65535]
When Add Type is “Neighbor”,		

Neighbor	The router can reach in the next hop	Manual input Format1: A.B.C.D/Mask
When Add Type is “Interface”,		
Interface Name	The interface of the router	• Dropdown List • br0 • modem • eth1 • eth0
Interface Attribute	Configure the router interface attribute, include cost and network	• Click the button to select • cost • network
Cost	Configure the cost of the router interface, used to learn routing table	Manual input Value area:1-65535
Network Type（when the interface attribute is network)	Configure the network type of the router interface	• Dropdown List • broadcast • non-broad • point-to-multipoint • point-to-point

Step 5 Single click “save” icon to OSPF route setting.

Step 6 Single click “save” icon to finish.

NOTE

OSPF is a link-state (Link-state) routing protocol, commonly used for the same routing domain. Here, the routing domain is an autonomous system, which refers to the routers can switch routing information through a unified network switching or routing protocol routing policy in the AS, all OSPF routers maintains an identical description of the database structure AS, which is stored in the database link status information corresponding routing domain, OSPF router is through this database to calculate its OSPF routing table.
As a link-state routing protocol, OSPF link state broadcast data LSA (Link State Advertisement) sent to all routers in an area, which is different from the distance vector routing protocols. Distance vector routing protocol passed some or all routing information of the routing table to the adjacent routers.

---END

5.6 VPN configuration

5.6.1 Overview

S9922M Cellular Wi-Fi Router supports VPN (Virtual Private Network) including L2TP/PPTP/GRE/IPIP/IPSEC. What’s more, it supports VPN OVER VPN, e.g. GRE over IPSec, IPSec over PPTP/L2TP/GRE/IPIP.

5.6.2 VPDN configuration

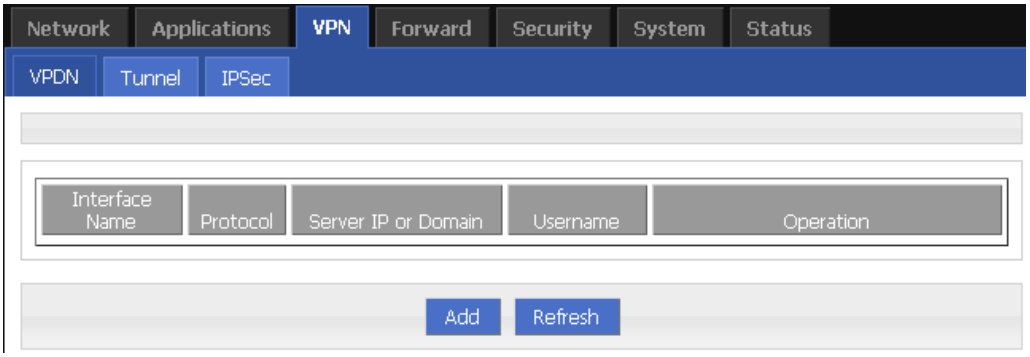
VPDN stands for Virtual Private Dial-up Networks. Now VPDN supports L2TP and PPTP

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 See “4.3.1 Login WEB GUI

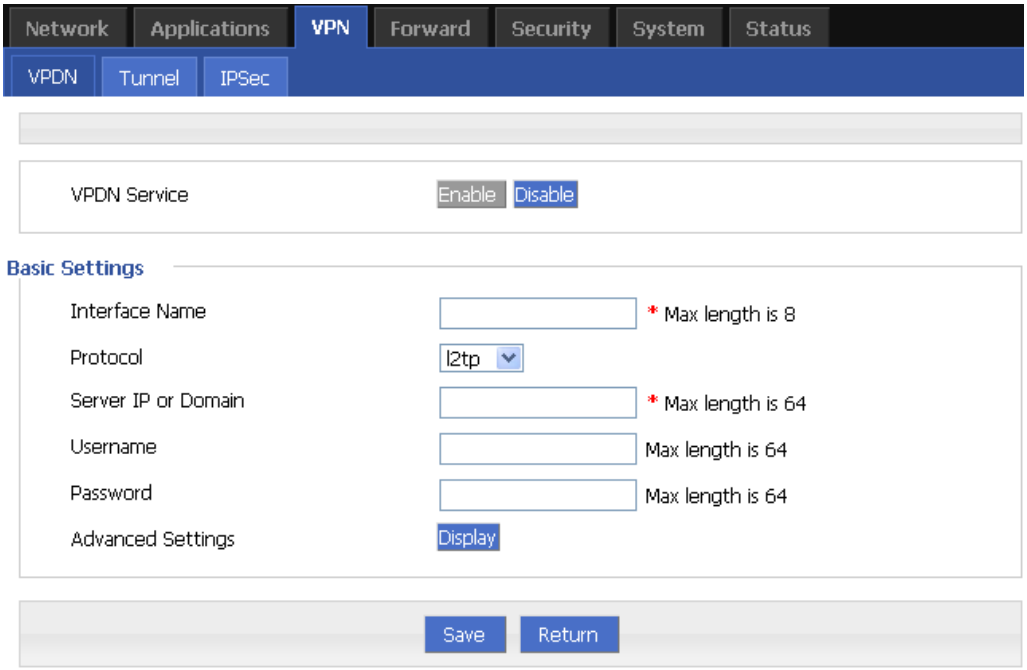
Step 3 Click “VPN > VPDN” to open “VPDN” tab.

Figure 5-42 VPDN configuration



Step 4 Click “Add” to add a new VPDN rule.

Figure 5-43 VPDN rule configuration



Step 5 Configure VPDN rule parameter.

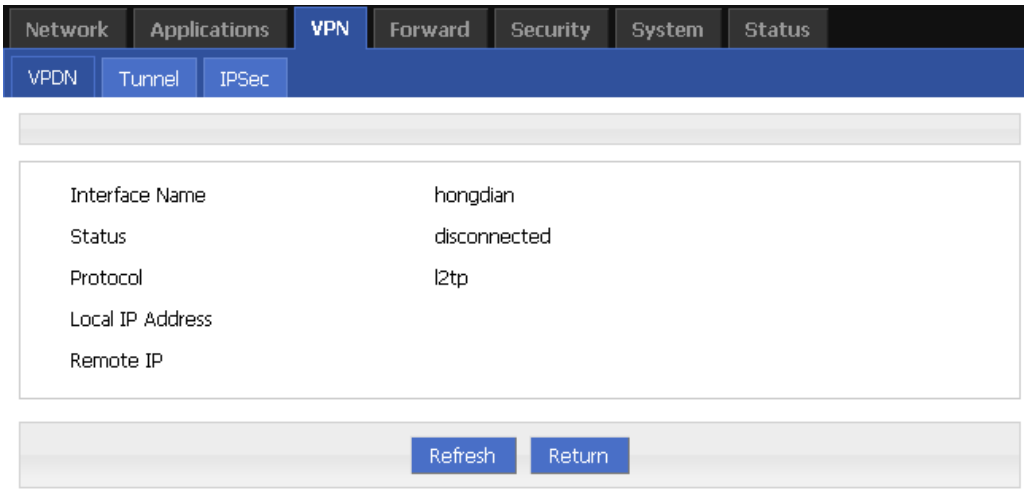
Table 5-28 VPDN rule parameter instruction

Parameter	Details	Operation
VPDN service	To enable or disable the VPDN rule	Click “Enable”
Basic Settings		
Interface name	Name of this VPDN rule	Cannot be modified after save.
protocol	VPDN protocol includes • L2TP • PPTP	Select from Dropdown List, cannot be modified after save.
Service IP or Domain	IP or domain of server to be visited	To input the IP or domain of server to be visited.
Username	Username of server to be visited	To input the username.
Password	Password of server to be visited	To input password.
Advanced settings	Advanced parameter of PPP link	Click “Display”

Step 6 Single click “save” icon to finish.

After a VPDN rule is added, router will build VPN communication with service address automatically. To see the tunnel status, click “View” in “Tunnel” tab.

Figure 5-44 L2TP tunnel status



---END

5.6.3 Tunnel configuration

Tunnel technology transfers data between the networks through the Internet infrastructure. In the whole process of transmission, when the encapsulated data package delivered on a public Internet, the logic path which the packet passes through is called tunnel. GRE and IPIP Tunnel configuration supports two modes.

GRE (Generic Routing Encapsulation, Generic Routing protocol encapsulation) specifies how to use a network protocol to another network protocol encapsulation method. The main purpose of the GRE protocol, there are two: internal protocol encapsulation and private address encapsulation.

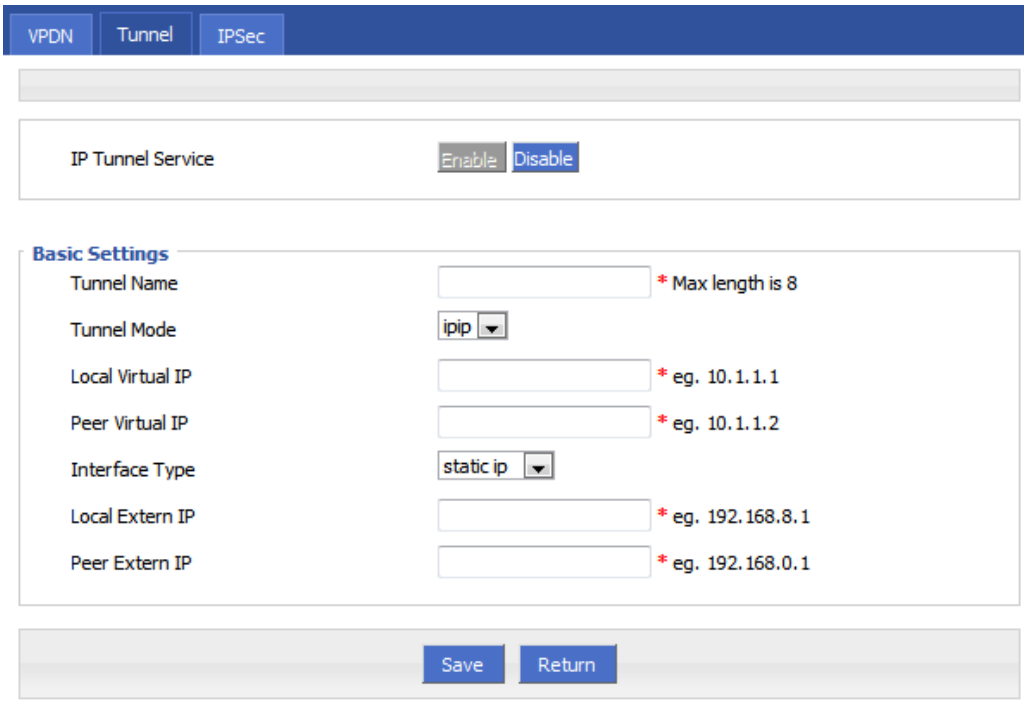
IPIP tunnel is a simple agreement between two routers for IP packet encapsulation, IPIP tunnel interface will be like a physical interface in the interface list, many routers including Cisco, basically support the agreement. This agreement enables multiple network distribution possible.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “VPN > Tunnel” to open “Tunnel” tab.

Step 3 Click “Add” to add a new tunnel.

Figure 5-45 Tunnel configuration



Configure Tunnel rule parameter

Table 5-29 Tunnel rule parameter instruction

Parameter	Details	Operation
IP Tunnel Service	To enable or disable IP tunnel service	Click “Enable”
Basic Settings		

Parameter	Details	Operation
Tunnel name	Name of the tunnel, cannot be modified after save	Input the name of tunnel
Tunnel Mode	Tunnel mode: • gre • ipip	Select from Dropdown List
Local virtual IP	Virtual IP address of local tunnel	Format: interface type A.B.C.D/M.
Peer virtual IP	Virtual IP address of peer tunnel	Format: interface type A.B.C.D/M.
Interface type	To choose “interface” or “static IP”	Select from Dropdown List.
Local Extern interface	This parameter will need to be set if “interface” is selected in “interface type”. Choose any connected interface as external interface	Select from Dropdown List.
Local extern IP	This parameter need to be set if “static IP” is selected for “interface type”. It is to set IP address to external network	Format: interface type A.B.C.D/M.
Peer extern IP	External interface IP of counterpart network tunnel. Usually a public IP address, also can be a LAN IP	Format: interface type A.B.C.D/M.

Step 4 Single click “save” icon to finish.

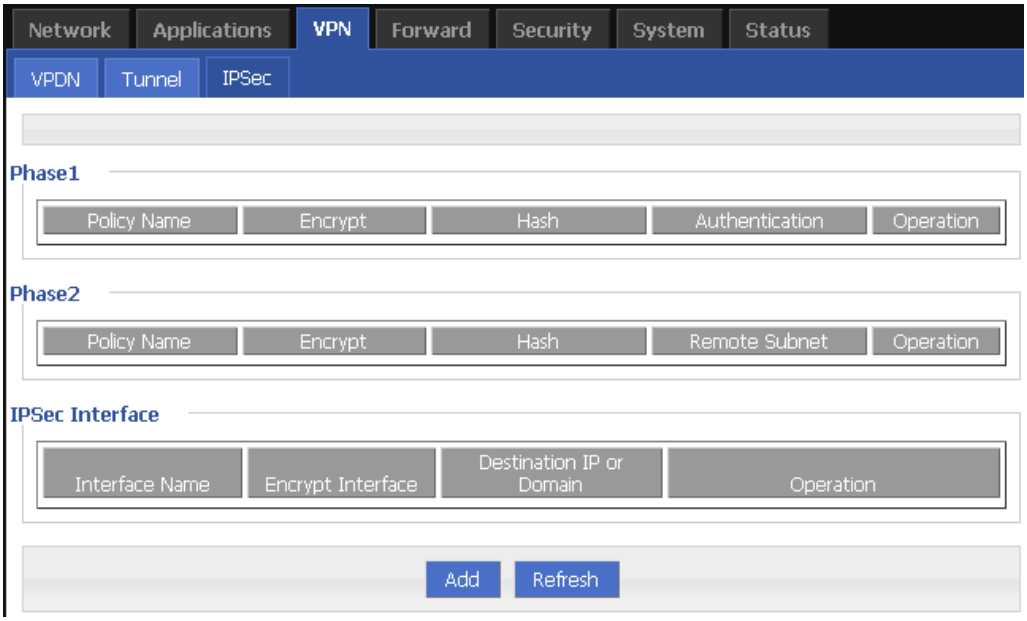
---END

5.6.4 IPSec configuration

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “VPN > IPSec” to open “IPSec” tab.

Figure 5-46 IPSec tab



Step 3 Click “Add” to add a new IPSec rule.

There are 3 phases for IPSec configuration:

3. Phase 1 parameter

Figure 5-47 IPSec phase 1 configuration

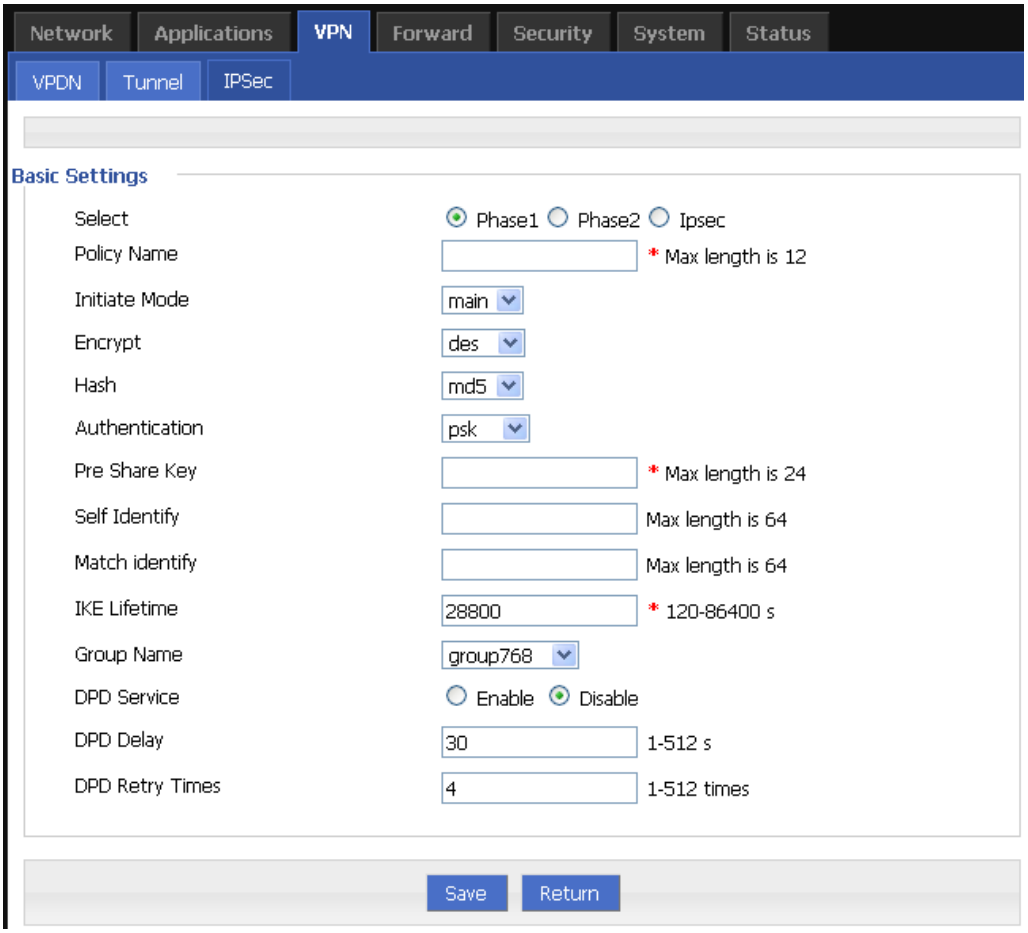


Table 5-30 IPSec Phase 1 Parameter instruction

Parameter	Details	Operation
Basic Settings		
Select	To select which phase of IPSec, phase 1, phase 1 or phase IPSec	Select “Phase 1”
Policy Name	Name of phase 1, mainly to match phase “IPSec”	To input the name of phase 1. Cannot be changed after save.
Initial Mode	To choose “main” or “aggr”	Select from Dropdown List, “aggr” is recommended
Encrypt	Supports 3des and aes	Select from Dropdown List
Hash	Supports md5 and sha1	Select from Dropdown List

Parameter	Details	Operation
Authentication	To select authentication	Select from Dropdown List, presently only “PSK” supported
Pre Share Key	To set pre share key	Max 24 letters
Self Identify	To set the self ID of IPSec	To input the ID, need to match the ID of other side
Match Identify	To input the match ID of IPSec	To input match ID, need to match ID of other side
IKE Lifetime	Life time of IKE key	Value area: 120～86400 Unit: second
Group Name	Select group	Select from Dropdown List
DPD Service	To enable DPD service	To click “Enable”
DPD Delay	To set DPD check interval time	Manual input Value area : 1～512 Unit: second
DPD Retry Times	Max times to continuous DPD check failure.	Manual input Value area: 1～512

Single click “save” icon to finish phase 1 configuration.

4. Phase 2 parameter.

CAUTION

In above parameters, “Initial Mode”, “Encrypt”, “Hash”, “Authentication” “Pre Share Key”, “IKE Lifetime”, “Group Name” need to match parameter of IPSec server. “Self Identify” and “Match Identify” needs to match “match Identify” and “Self Identify” of IPSec sever respectively.

Figure 5-48 IPSec phase 2 configuration

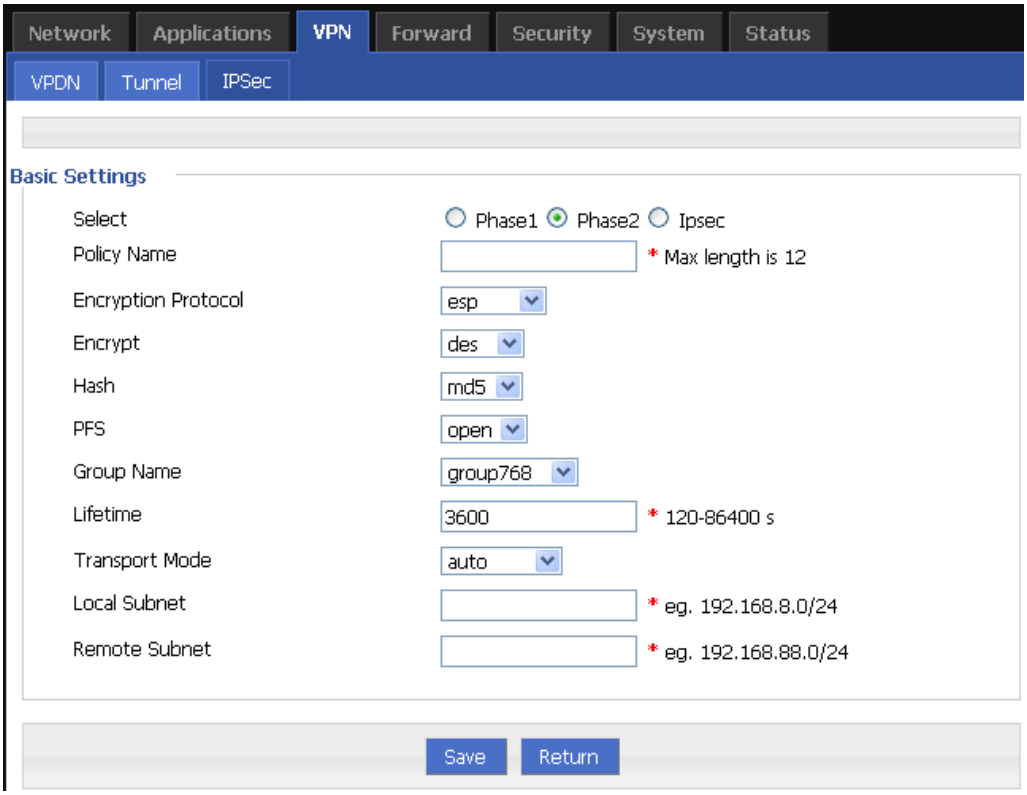


Table 5-31 IPSec Parameter instruction

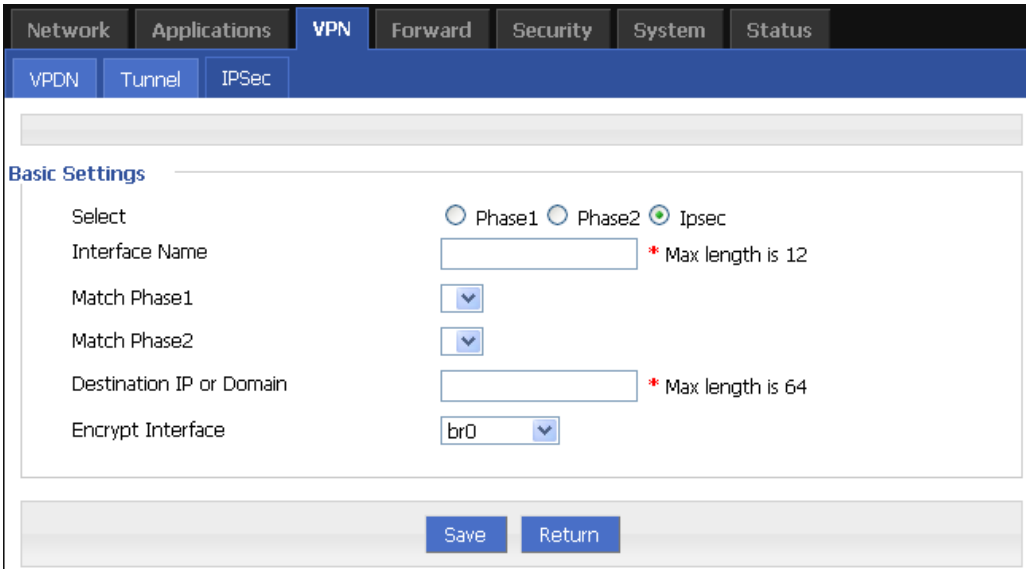
Parameter	Details	Operation
Basic Settings		
Select	To select which phase of IPSec, phase 1, phase 1 or phase IPSec	Select “Phase 2”
Policy Name	Name of phase 2, mainly to match phase “IPSec”	To input the name of phase 2. Cannot be changed after save
Encryption Protocol	Supports esp, ah, ah+esp	Select from Dropdown List
Encrypt	Supports des, 3des, aes	Select from Dropdown List
Hash	Supports md5 and sha1	Select from Dropdown List
Group Name	Need to configured when PFS is “open”, to set the key length of SA initial of phase 2	Select from Dropdown List

Parameter	Details	Operation
PFS	To open or close PFS	Select from Dropdown List
Lifetime	IPSec SA key life time	Value area: 120～86400 Unit: second
Transport Mode	Supports tunnel, transport and auto.	Select from Dropdown List
Local Subnet	Set local subnet	No need to set for “transport” mode, only for “auto” and “tunnel”. Format: A.B.C.D/M
Remote Subnet	To set local subnet	No need to set for “transport” mode, only for “auto” and “tunnel”. Format: A.B.C.D/M

Single click “save” icon to finish phase 2 setting.

5. “IPSec” parameter configuration

Figure 5-49 IPSec configuration tab



To configure “IPSec” parameters, then click “Save”.

Table 5-32 IPSec Parameter instruction

Parameter	Details	Operation
Basic Settings		

Parameter	Details	Operation
Select	To select which phase of IPSec, phase 1, phase 1 or phase IPSec	Select “IPSec”
Interface Name	Name of this phase	Input name
Match Phase1	To select a matching name of “phase1”	Select from Dropdown List.
Match Phase2	To select a matching name of “phase2”	Select from Dropdown List
Destination IP or Domain	counterpart IPSec server IP or domain	Input counterpart IPSec server IP or domain
Encryption Interface	To select binding interface of IPSec. to bind VPDN/modem/br0 as local interface of IPSec initial can support IPSec OVER VPDN. In addition, after binding, IPSec rule will change as per the charge of binding interface. Thus can resume link of IPSec dialing interface and keep IPSec linked as soon as possible	Select from Dropdown List

---END

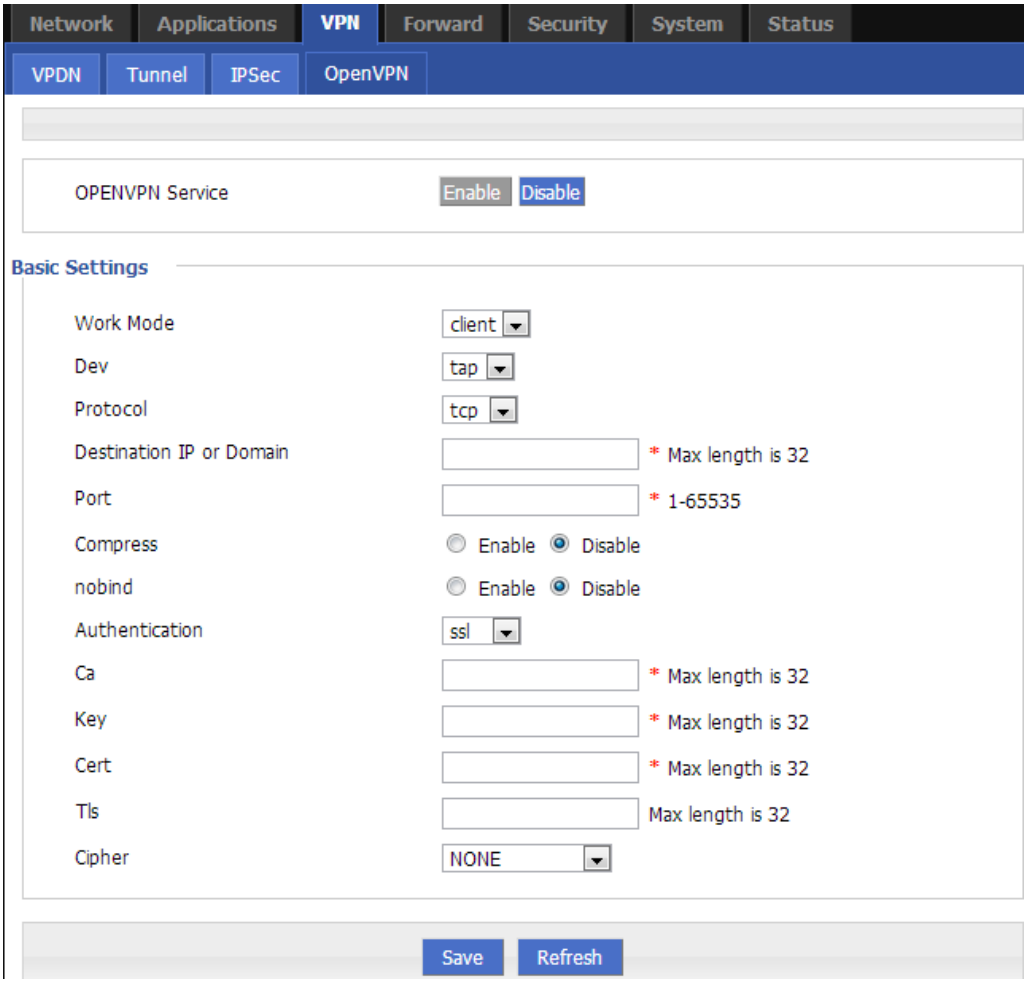
5.6.5 OpenVPN Configuration

OpenVPN is the VPN achievement based on the OpenSSL library's application layer. Compared with the traditional VPN, it is simple and easy to use. OpenVPN all the communications are based on a signal IP port, and it use the UDP protocol transports default and recommended. It can also support the TCP protocol. OpenVPN connection can through most of the proxy servers and work well in the NAT environment. Its server side has the function of pushing some network configuration information (including IP address, route configuration and so on) to the client side. OpenVPN offers two types of interfaces for networking via the universal TUN/TAP driver. It can create either a layer-3 based IP tunnel (TUN), or a layer-2 based Ethernet TAP that can carry any type of Ethernet traffic. Port 1194 is the official IANA (Internet Assigned Numbers Authority) assigned port number for OpenVPN.

Step 1 Login WEB GUI.

Step 2 Click "VPN > OpenVPN".Enter "OpenVPN" page, as shown in Figure 2-4.

Figure 5-50 OpenVPN configuration page



Step 3 Configure OpenVPN parameter.

The parameter instruction is shown in Table 2-1.

Table 5-33 OpenVPN parameter instruction

Parameter	Detail	Operation
OPENVPN Service	Enable OPENVPN Service.	Click button options: • Enable • Disable
Basic Setting		
Working Modem	Supports two working modes: Client mode: client type mode Multi mode: peer to peer working mode (peer is non-server)	Dropdown list options: Select the required working mode from dropdown list.

Parameter	Detail	Operation
Dev	Dev represents the network interface type, and supports two types: Tun(OSI Layer 3):Simulates network layer device to operate the third layer data packets, such as IP packets Tap(OSI Layer 2):Equates to an Ethernet device to operate the second layer data packets, such as Ethernet data frame.	Dropdown list options: Select the required working mode from dropdown list. Demand consistent with peer.
Protocol	Data transfer protocol type settings: • TCP protocol: A kind of connection oriented reliable transmission protocol, which is suitable for the occasions where the reliability requirement is high and the communication efficiency is not high. • UDP protocol: A kind of non - connection unreliable transmission protocol, which is suitable for the scene with relatively high efficiency and relatively low reliability.	Dropdown list options: Select the required working mode from dropdown list. Demand consistent with peer.
Destination address or domain	Specifies connected server address	WORD type， max 32 bytes. Demand consistent with peer.
Port	Specifies connected server port	Value range：1～65535 • Default：1194 Demand consistent with peer. •
Compress	Compression protocol: configure whether VPN connection compression is opened. If the server is open, the client must open.	Click button options: • Enable • Disable
Nobind	Configure whether to bind to the specific local port.	Click button options: • Enable • Disable

Parameter	Detail	Operation
Authentication	Configuring the VPN data transfer mode: SSL: encrypt the network connection in transport layer, high safety factor. Text: transport with text form during transmission, low safety factor	Dropdown list options: Select the required data transfer type from dropdown list.
Ca	Specifies the file path for the client CA certificate	WORD type， max 32 bytes.
Key	Specifies the private key path for the current client	WORD type， max 32 bytes.
Cert	Specifies the certificate file path for the current client	WORD type， max 32 bytes.”。
Tls	Open TLS, if the server is open, the client must also open. TLS: secure transport layer protocol (TLS) to provide confidentiality and data integrity between two communication applications. The protocol consists of two layers: the TLS record protocol (TLS Record) and the TLS handshake protocol (TLS Handshake)	WORD type， max 32 bytes.
Cipher	SSL's encryption algorithm system.	Drop box options: • NONE • BF-CBC • DES-CBC • DES-EDE-CBC • DES-EDE3-CBC • DESX-CBC • RC2-40-CBC • CAST5-CBC • RC2-64-CBC • AES-128-CBC • AES-192-CBC • AES-256-CBC • SEED-CBC

Step 4 Click “Save” to finish OpenVPN configuration.

---END

5.7 System configuration

5.7.1 Overview

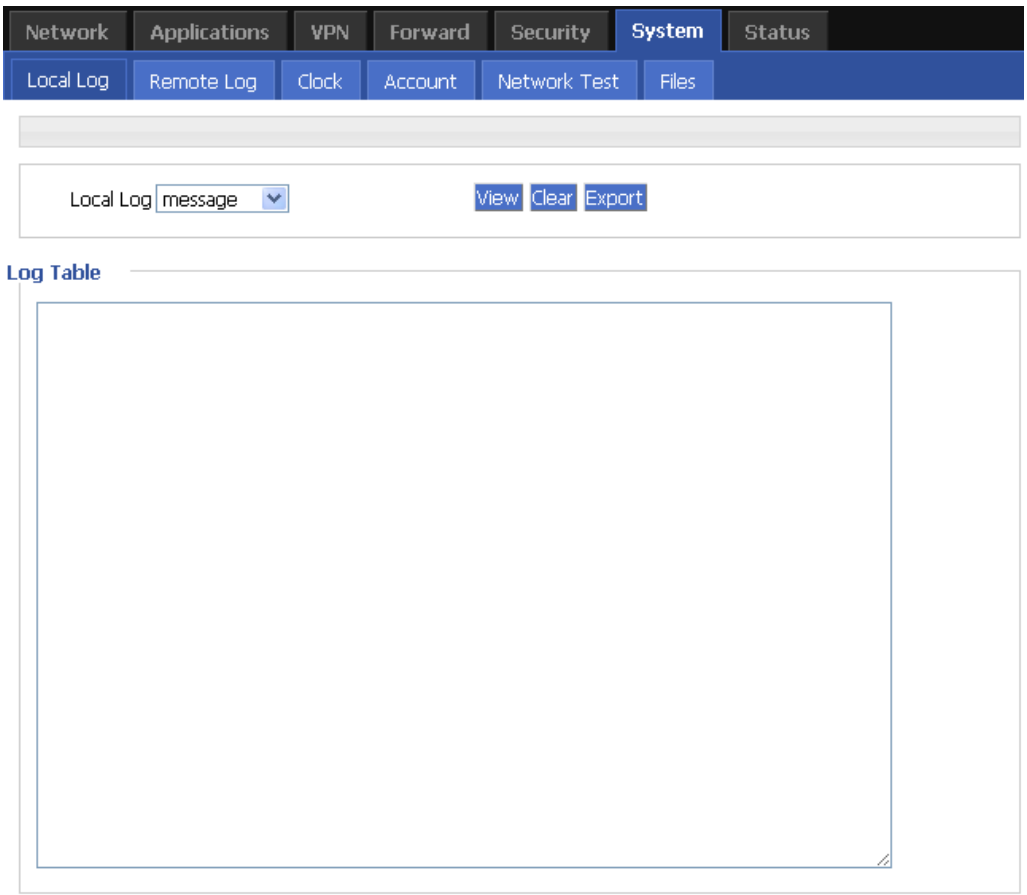
"System" can let you know the status of router, firmware upgrading and other maintenance.

5.7.2 Local Log

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click "System > Local Log" to open "Local Log" tab.

Figure 5-51 Local Log tab



Step 3 Select type of "Local Log" and then click "View" to see log.

Click "Clear" to clear the log info in the "Log Table", and click "Export" to export log in your local PC.

There are 3 types log:

- Message: system log, to record the running log of router, usually for most of users.
- Application: application program log, to record the Open or close of some application programs.
- Kernel: kernel log of router, usually for R&D engineers.

NOTE

To see “local log”, “remote log” must be enabled.

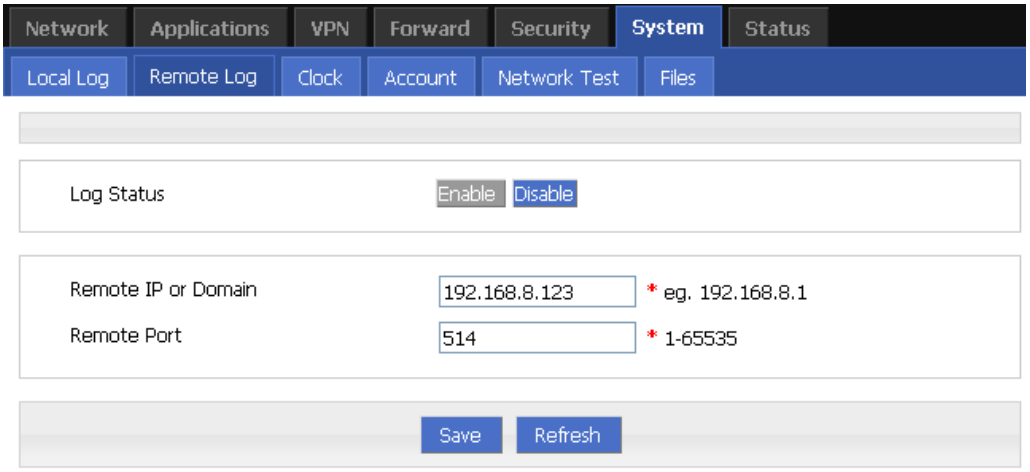
---END

5.7.3 Remote Log

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “System > Remote Log” to open “Local Log” tab.

Figure 5-52 Remote Log tab



Step 3 Configure “Remote Log” parameter.

Table 5-34 Remote log parameter instruction

Parameter	Details	Operation
Log Status	To enable or disable remote log	Click “Enable”
Remote IP or Domain	IP address or Domain of remote log server	To input the IP address or domain to receive log
Remote Port	Port of remote log serve	Default port: 514

Step 4 Single click “save” icon to finish “Remote Log” parameter configuration.

NOTE

The software tool Syslog is use to receive remote log in server. Syslog can be downloaded from the Internet by searching “MT_Syslog.exe”.

---END

5.7.4 Clock

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “System > Clock” to open “Clock” tab.

Figure 5-53 “NTP” Time Synch.

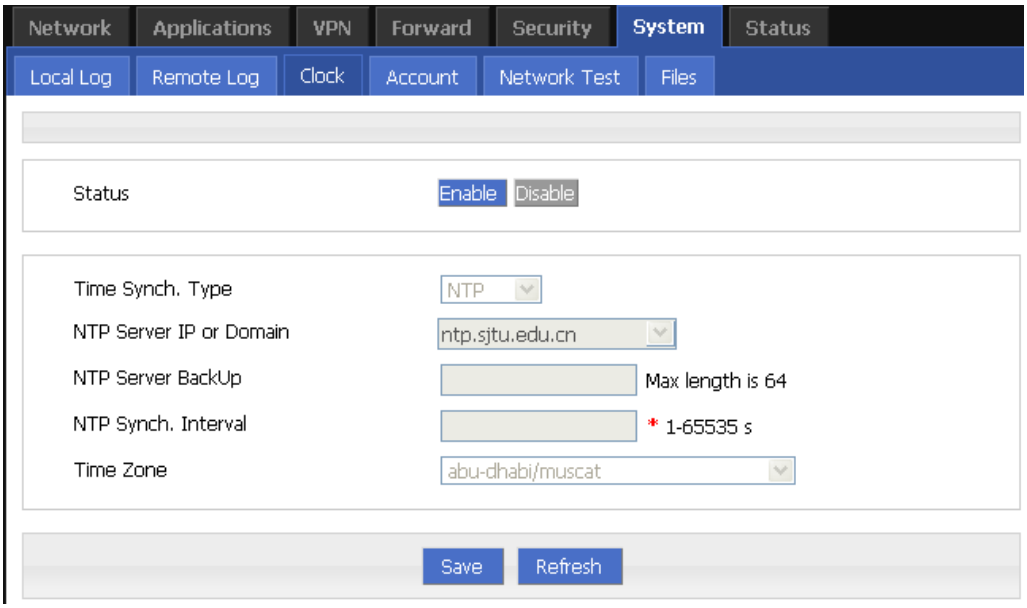
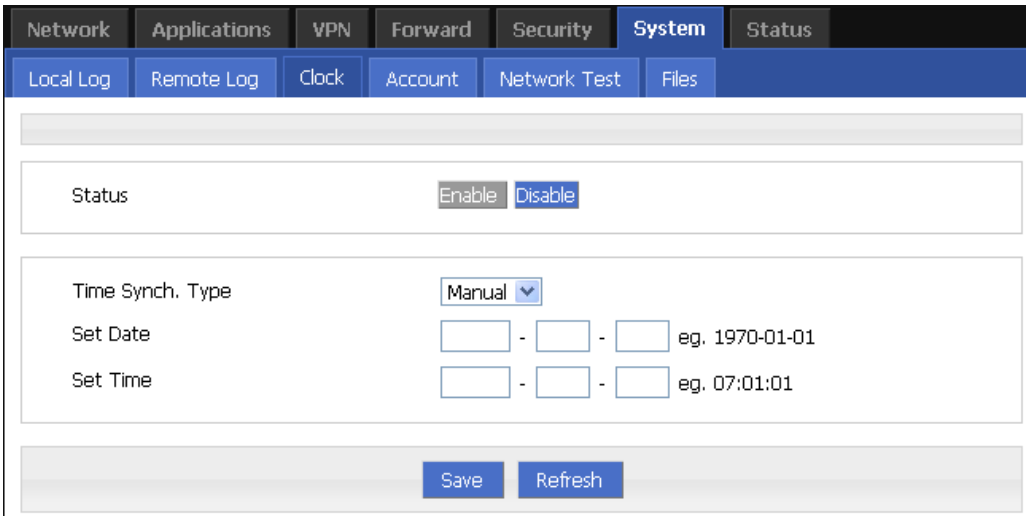


Figure 5-54 Manual Time Synch. Type



Step 3 Set “clock” parameters.

Table 5-35 Clock Parameter instruction

Parameter	Details	Operation
Status	To enable to disable Time Synchronization service	• To click “Enable” or “Disable”
Time Synch. Type	Type to synchronize system time	• Select “NTP” or “Manual”
When select “NTP” in “Time Synch. Type”		
NTP Server IP or Domain	IP or domain of NTP server	Select from Dropdown List
NTP Server Backup	Backup NTP server	Manual input server domain or IP address
NTP Synch. Interval	Interval for NTP client to check time with NTP Server. E.g. every 10 minutes	Value area: 1～65535 Unit: second Default: 600 s
Time Zone	Time Zone	Select from Dropdown List
Time Zone Number	For “Custom” option in “Time Zone”. E.g. +8 or -4	WORD type
When select “Manual” in “Time Synch. Type”		
Set Date	To set date	YYYY-MM-DD e.g. 1970-01-01
Set Time	To set time	HH:MM:mm E.g. 07:01:01

Step 4 Single click “save” icon to finish.

---END

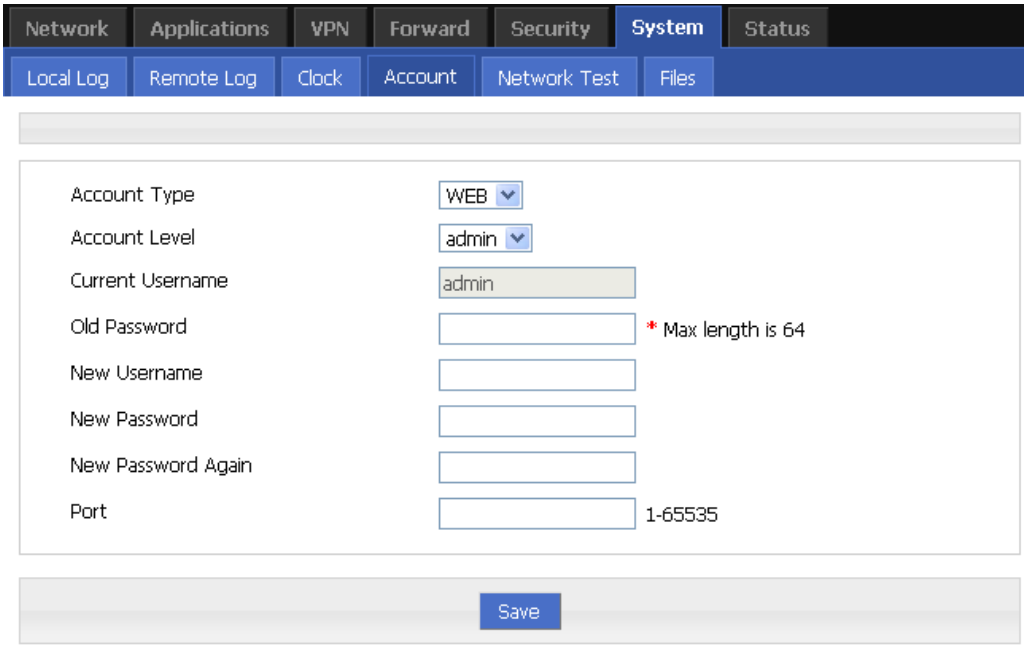
5.7.5 Account

“Account” is to change username/password, change web port and forbid other users to visiting the router.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “System > Account” to open “Account” tab.

Figure 5-55 Account tab



Step 3 Set account parameters.

Table 5-36 Account parameter instruction

Parameter	Details	Operation
Account Type	Visit the router on web	• Select from Dropdown List
Account Level	Level of account to login router	Select from Dropdown List • Admin: can view and change the parameter. • Guest: can view parameter and export log and use “Network Test”.
Current Username	Current username	Showing user name
Old password	Current password	To input current PW
New Username	New username	Manual input, max 64 word type.
New Password	New password	Manual input, max 64 word type.
New password again	To confirm the new password	Manual input, max 64 word type.
Port	Web port to login router	Manual input Value area 1～65535

Parameter	Details	Operation
		Default: 80

Step 4 Click “Save” to finish configuration. After saving, user needs to login again.

---END

5.7.6 Network Test

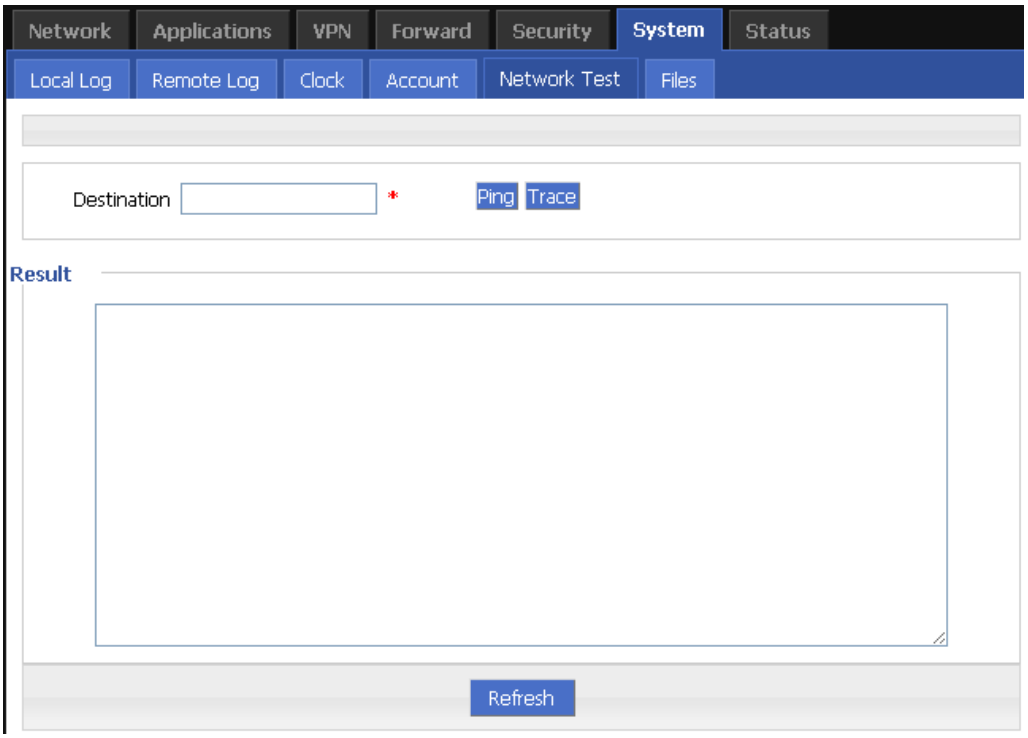
Network Test

This function includes Ping function and Trace router function.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “System > Network Test” to open “Network Test” tab.

Figure 5-56 Network Test Tab



Step 3 Input IP address or domain to be tested in “Destination”, click “Ping, to check whether the router can be linked with destination.

Table 5-37 Network Test Parameter instruction

Parameter	Details	Operation
Destination	To input IP address or domain to be tested	Input IP address or domain to be tested
Ping	To use Ping to test link	Click “Ping”
Trace	To use Trace command to test hops from the router to destination	Click “Trace”
Result	Test result	

---END

5.7.7 Files

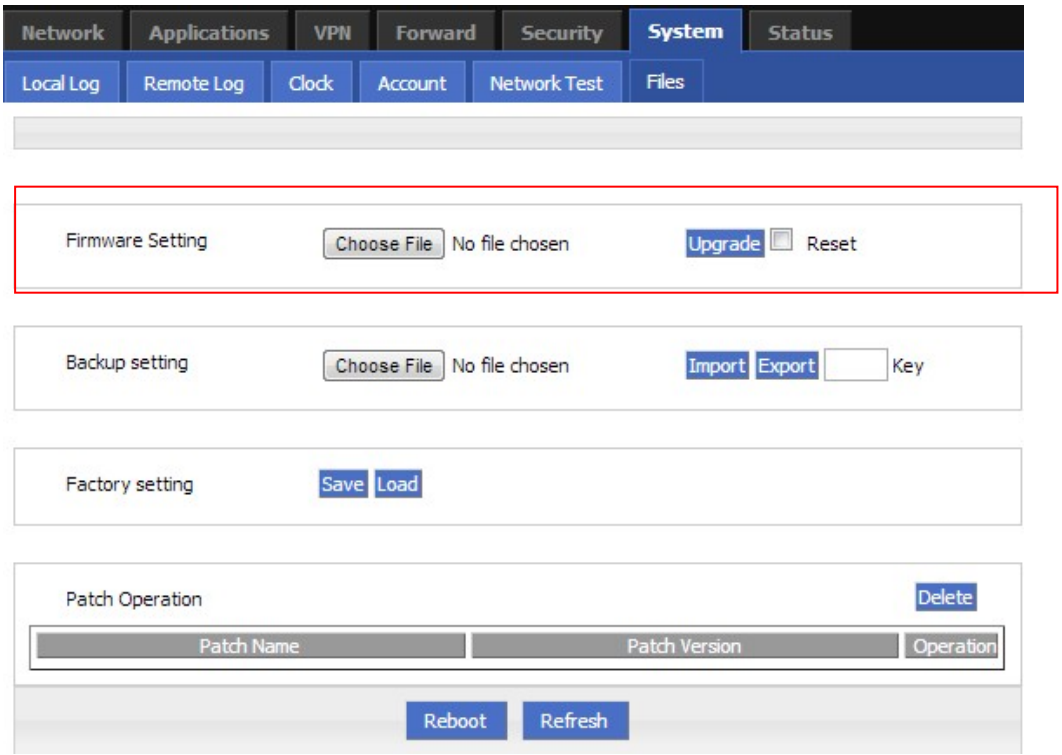
Firmware Setting

S9922M Cellular Wi-Fi Router supports upgrade firmware locally.

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “System > Files” to open “Files” tab.

Figure 5-57 Files tab



NOTE

If “reset” is selected, all parameters will be reset to factory setting.
In upgrading, don’t close the page.
Upgrading files is suggested not to exceed 6MB. If larger than 6MB please use “CFE MINI WEB update”.

Step 3 Click “Browse” to select upgrading file and then click “Upgrade”.

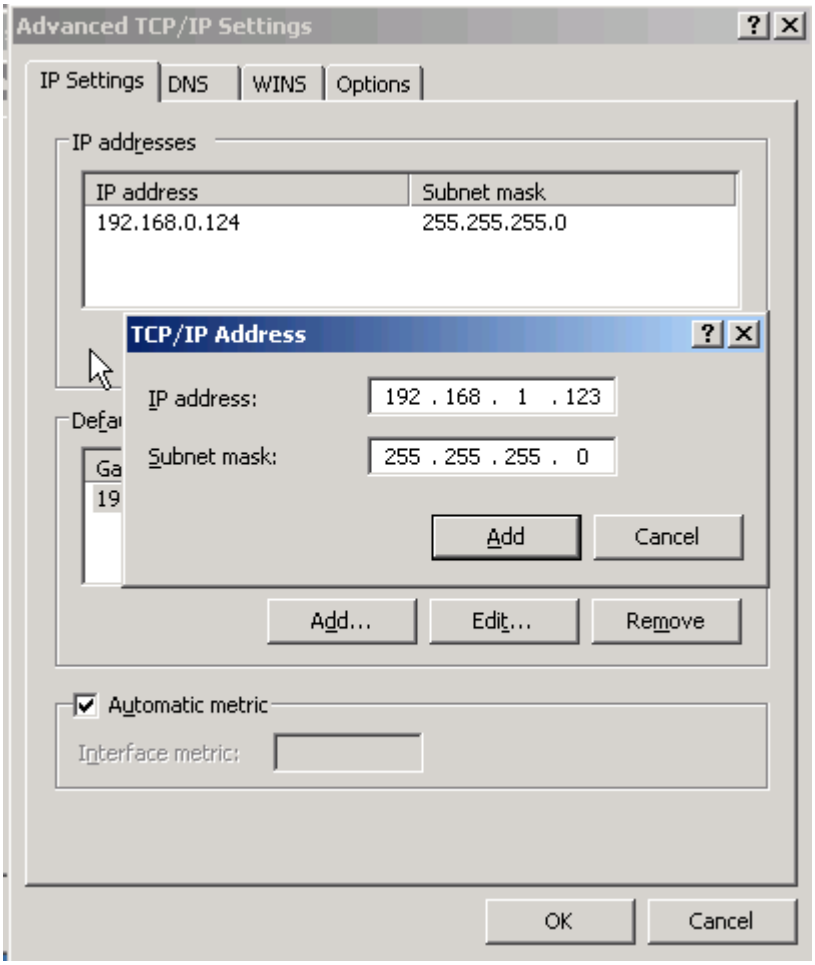
---END

CFE mode upgrading

If upgrading file is larger than 6MB, CFE mode upgrading shall be used to upgrade.

Step 1 Add an IP address 192.168.1.

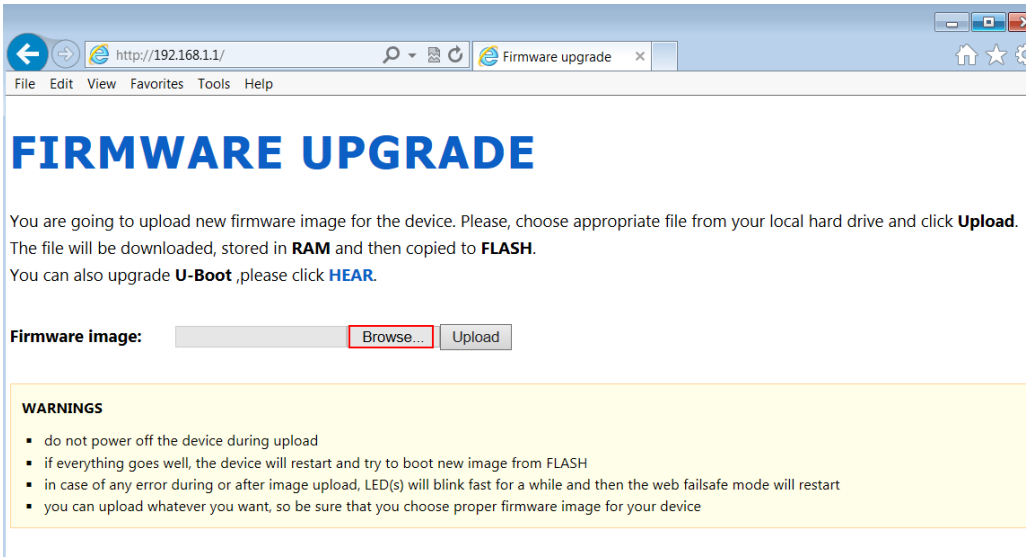
Figure 5-58 Add an IP address



Step 2 Press the RESET/DEF interface. Do not release it. Hold it, meanwhile power on router, till 30 seconds, and connection to PC is built properly. Then release RESET/DEF interface.

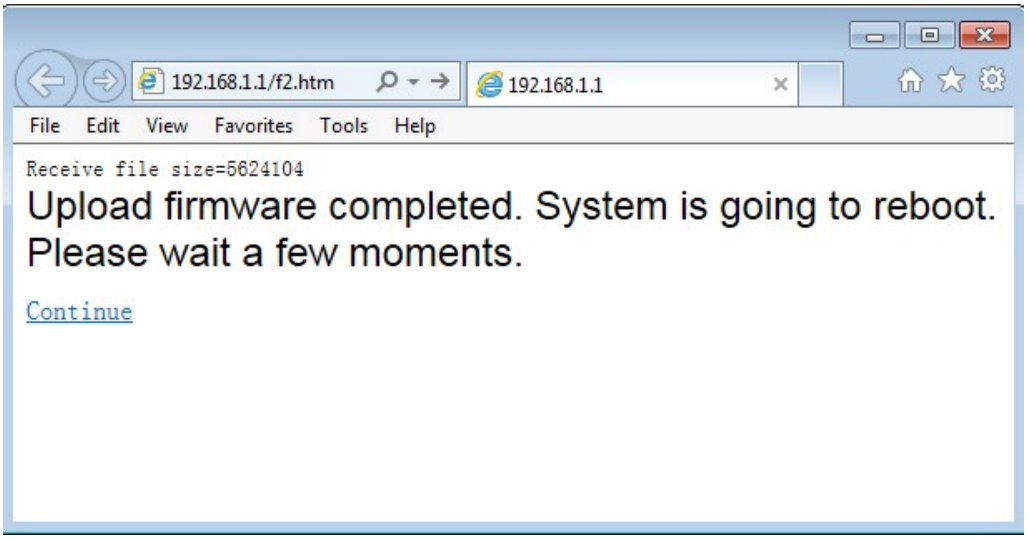
Step 3 Input 192.168.1.1 in your browser, click “enter” you will see following page. If not, start over again from step 1.

Figure 5-59 CFE mode upgrading



Step 4 Click “Browse” to select upgrading file, and then click “Upload” to begin upgrading.

Figure 5-60 CFE upgrading page



Upgrading will need 4-6 minutes, if RUN light is on, upgrading is OK.

TIP

You can also PING br0 address on your PC (**ping** *192.168.8.1 –t*). if Ping ok, upgrading is OK.

---END

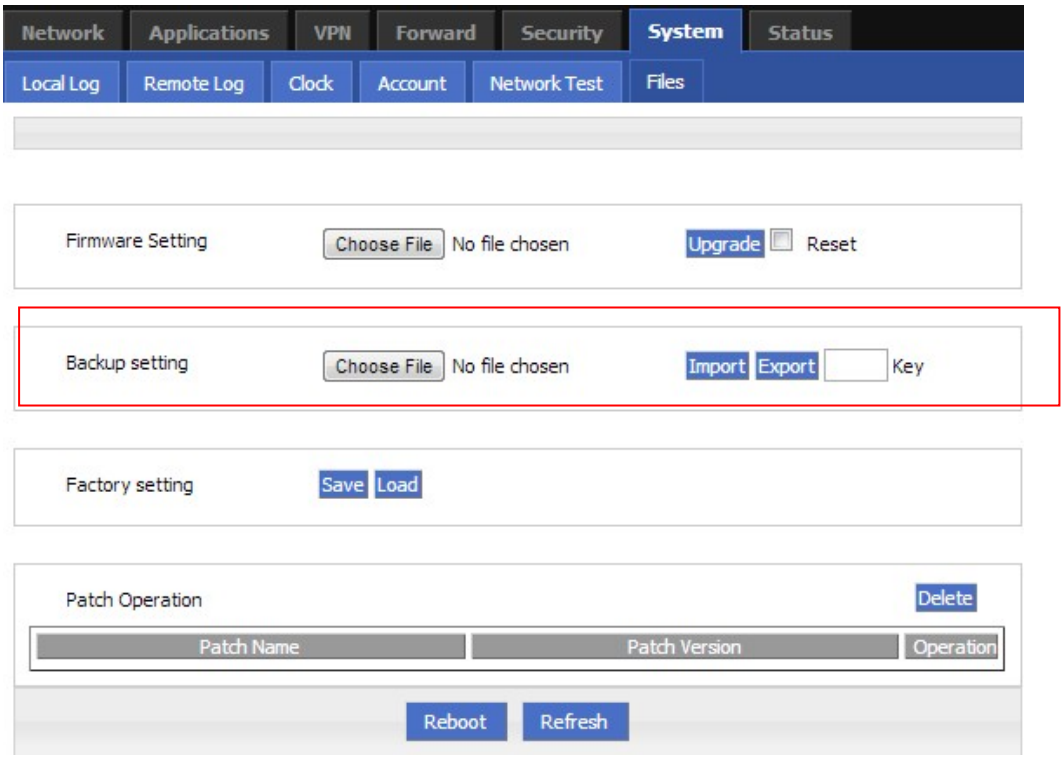
Backup setting

S9922M Cellular Wi-Fi Router supports to backup and to recover configuration file.

- Click “Browse” to select a configuration file to be imported. And then click “Import” to resume the configuration as the configuration file.

- Click “Export” to export configuration file and save it in local PC.

Figure 5-61 Backup setting page



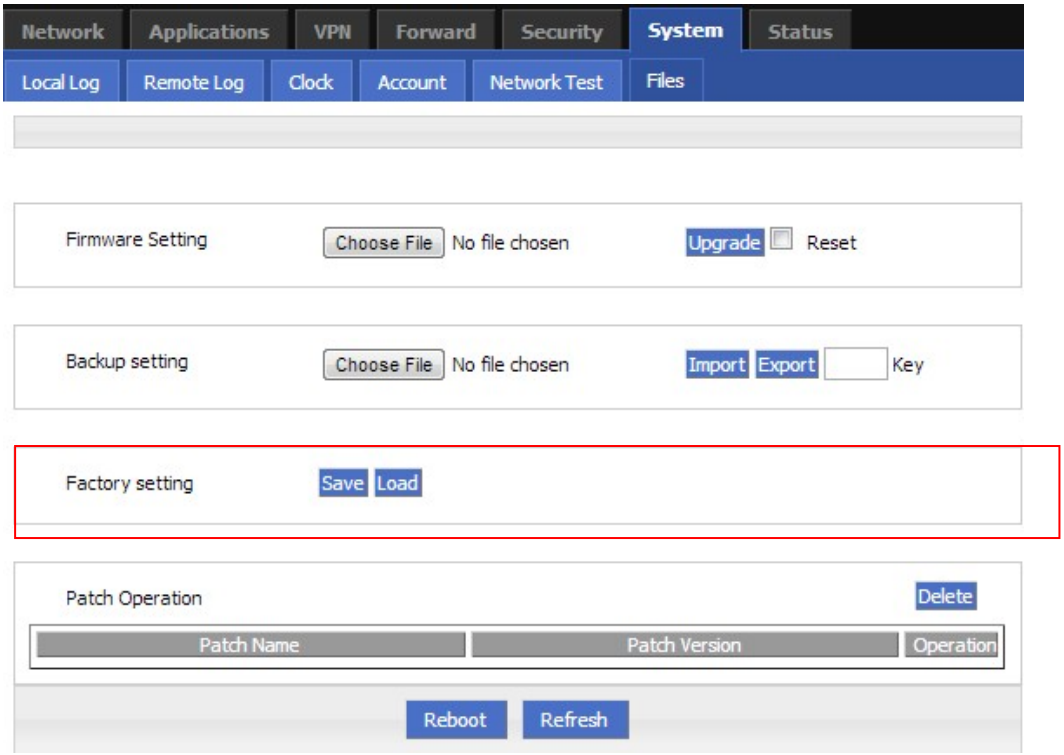
NOTE

After import, router will reboot automatically.
“Key”: if key is input when export configuration file, this key need to be input in import. Not more than 8 digits for key.

Factory setting

S9922M Cellular Wi-Fi Router has function to resume factory configuration. Users can set the configuration to factory mode, and also can set the current configuration into default configuration and generate a default factory configuration file in router. To resume this default factory setting, users can click “Load” in “factory setting”. If the default factory configuration file is deleted, the router will be resumed back to initial factory setting.

Figure 5-62 Factory setting page

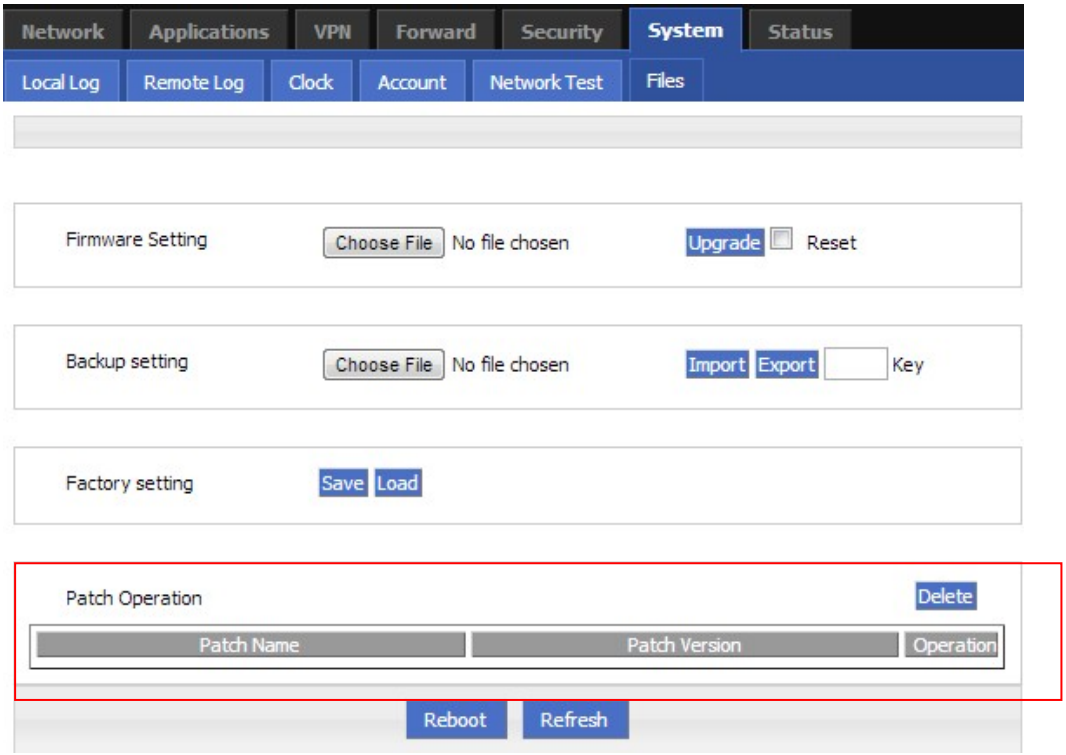


- Save: to save the current setting as default factory configuration setting.
- Load: to resume default factory setting.

Patch operation function

S9922M Cellular Wi-Fi Router supports to delete patch.

Figure 5-63 Patch operation

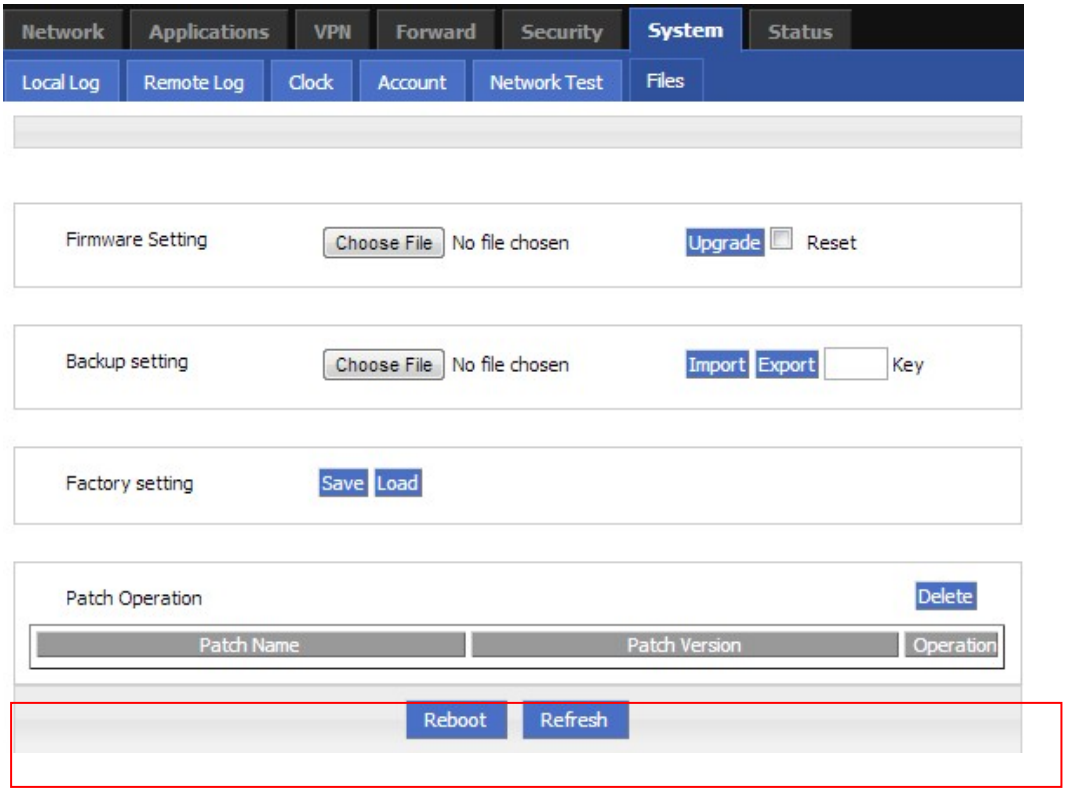


Delete: to delete patch.

Reboot

Click “Reboot” to restart the router.

Figure 5-64 Reboot



--END

5.8 Status

5.8.1 Overview

Status provides the basic info, network status info, router info of S9922M 3G/4G Router.

5.8.2 Base Information

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “Status > Base information” to open “Base Information” tab.

Figure 5-65 Base Information tab

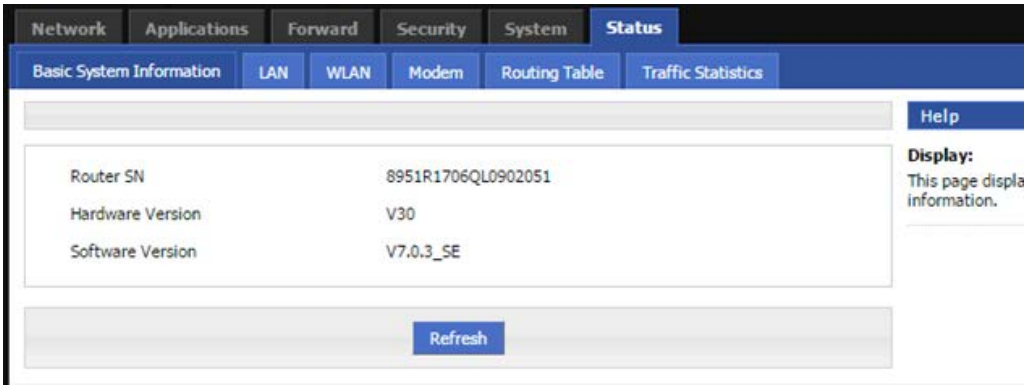


Table 5-38 Base information Parameter instruction

Parameter	Details	Operation
Router Model	Router model info	
Router SN	Router Serial No info	
Hardware version	Router hardware version info	
Software version	OS and application software info.	

5.8.3 LAN

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “Status > LAN” to open “LAN” tab.

Figure 5-66 “LAN” info

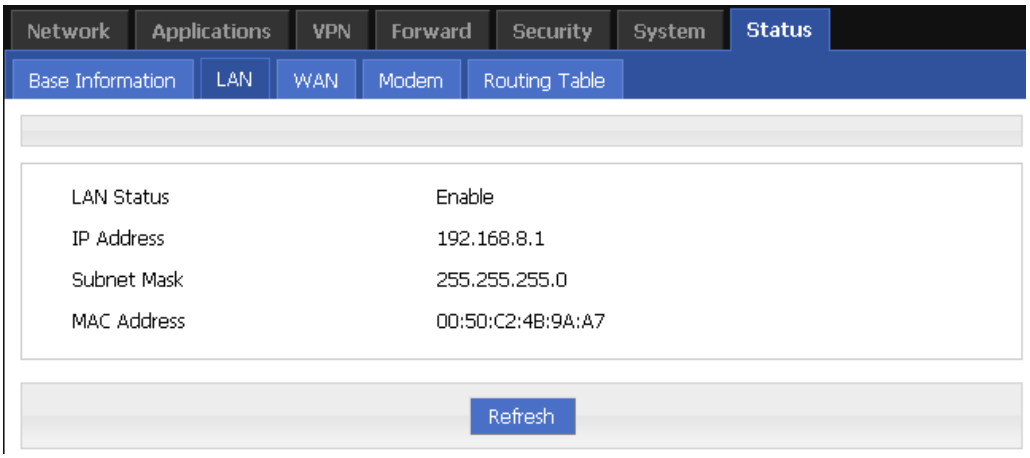


Table 5-39 LAN Parameter instruction

Parameter	Details	Operation
LAN status	To show current LAN interfaces status.	
IP address	To show the LAN IP address.	
Subnet Mask	Subnet mask of LAN interface.	
MAC address	To show the MAC address of the router.	

5.8.4 WAN

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “Status > WAN” to open “WAN” tab. There are three types of WAN status: static IP/DHCP/PPPOE.

Figure 5-67 Static IP WAN status

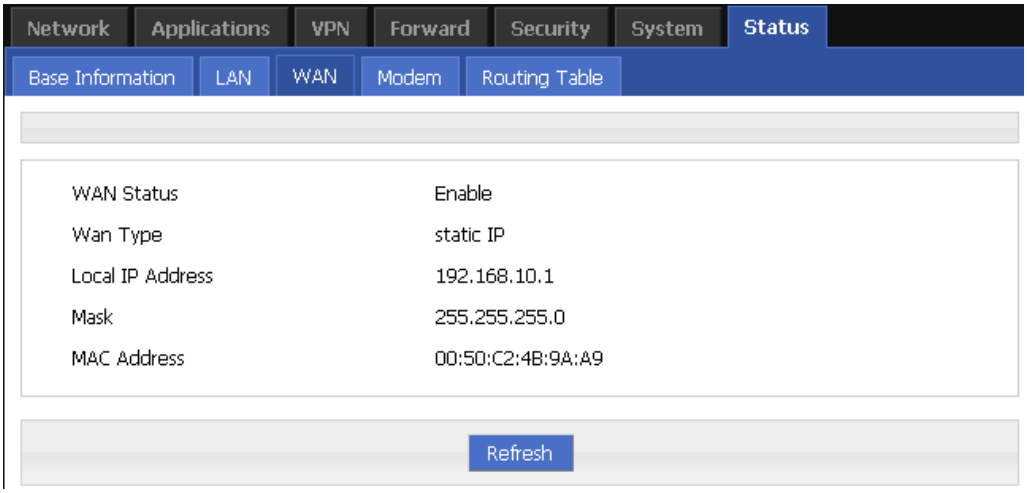


Figure 5-68 DHCP WAN status

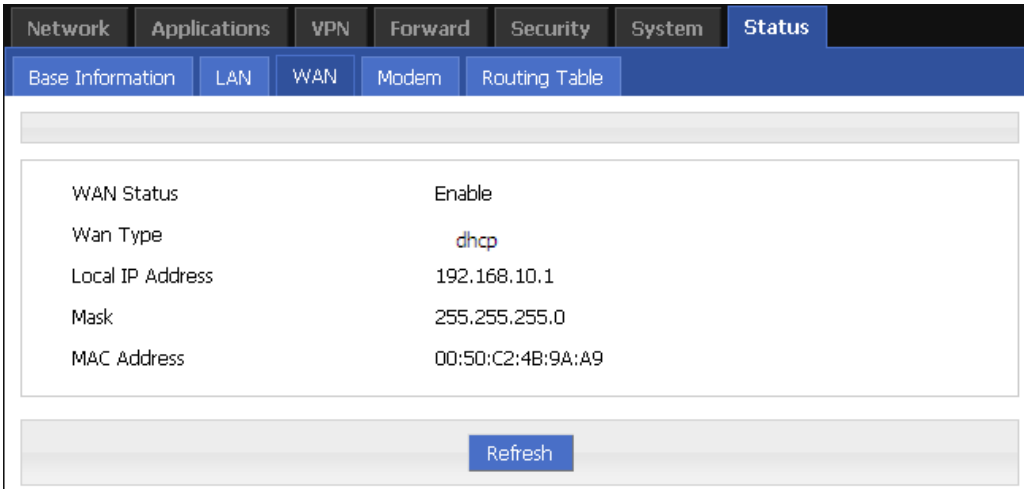


Figure 5-69 PPPoE WAN status

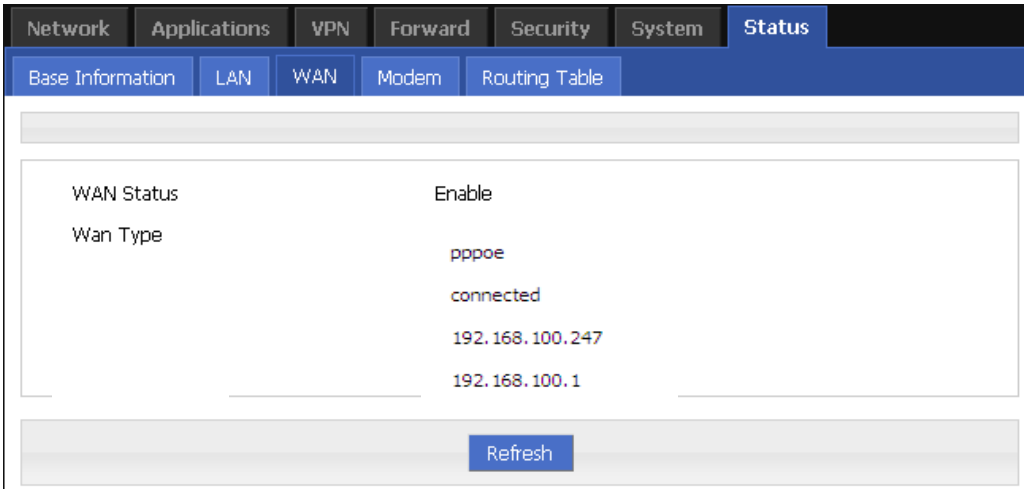


Table 5-40 WAN Parameter instruction

Parameter	Details	Operation
WAN status	To show the current WAN is used or not	
WAN Type	To show the current WAN type	
Local IP	To show the local IP of WAN interface	
Subnet mask	To show the subnet mask	
MAC address	To show the MAC address of the router	
PPPoE for WAN type		

Parameter	Details	Operation
Status	To show the link status of WAN interface PPPoE	
Local IP	To show the router IP distributed by PPPoE	
Remote IP	To show IP of PPPoE server	

5.8.5 Modem

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click “Status > Modem” to open “Modem” tab.

Figure 5-70 Modem Status page

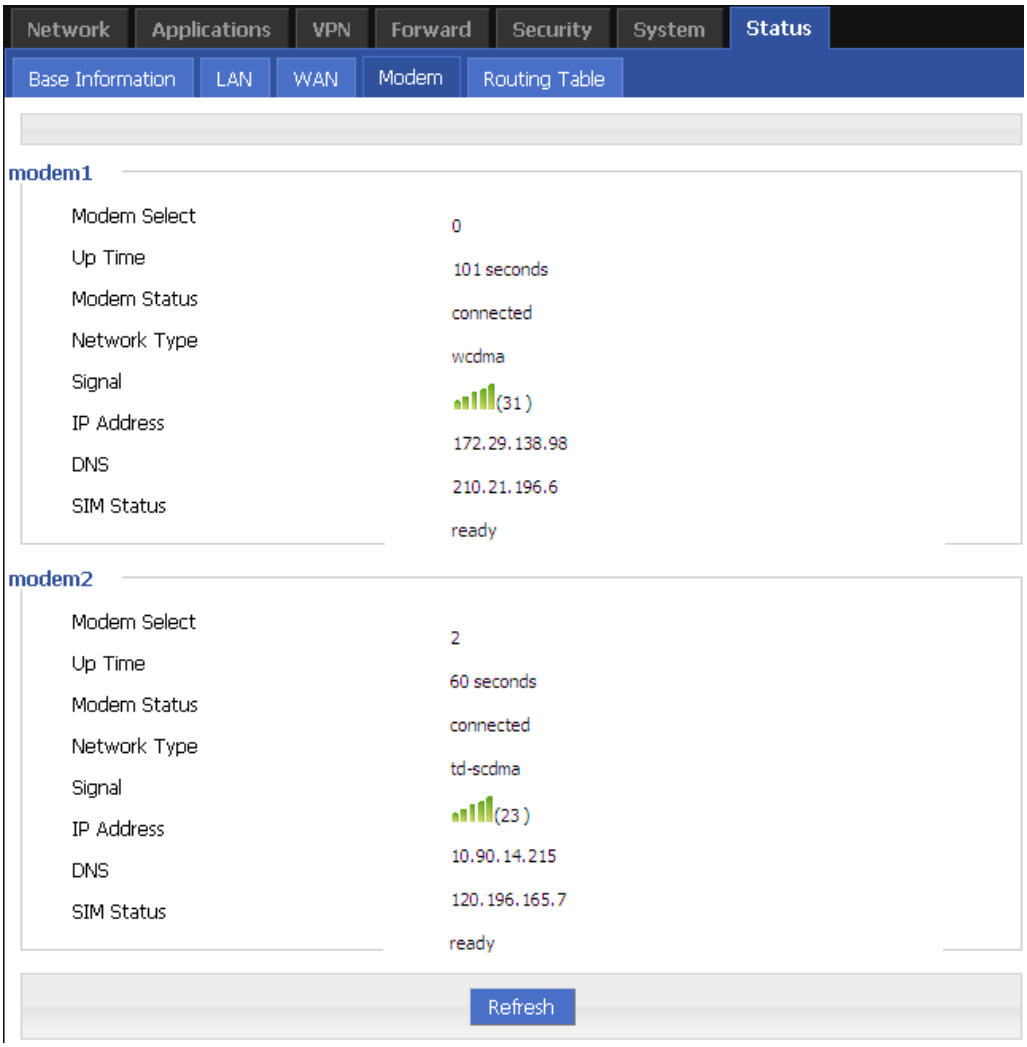


Table 5-41 Modem Parameter instruction

Parameter	Details	Operation
Modem Select	To show the current modem name	
Up tome	To show the current on line time of the modem Unit: second	
Modem Status	To show the Router's status to link to the mobile network	
Network type	Current network type of the SIM in use	
signal	Signal of mobile network Value area: 1-31	
IP Address	To show the external network IP address which the router links	
DNS	To show which DNS router is using	
SIM Status	Status of current SIM	

5.8.6 Routing Table

Step 1 Log-on WEB GUI of S9922M 3G/4G router.

Step 2 Click "Status > Routing Table" to open "Routing Table" tab.

Figure 5-71 Routing table page

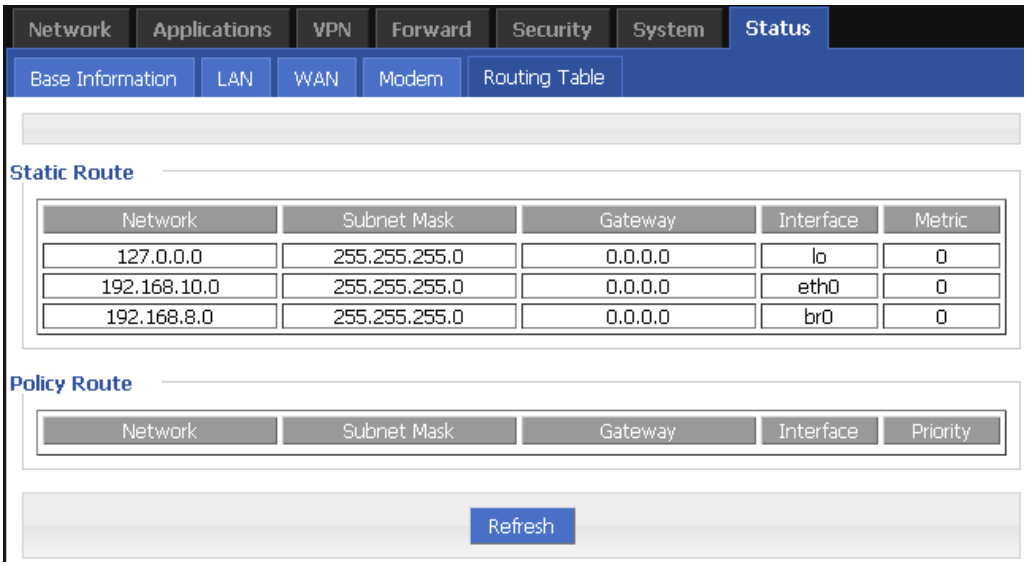


Table 5-42 Routing table Parameter instruction

Parameter	Details	Operation
Static route		
Network	IP address the router can reach	
Subnet Mask	IP network the router can reach. It is used together with “Network”	
Gateway	Next hop IP address which the router will reach	
interface	Interface from router to gateway	
metric	Route No which the router reaches destination IP	
Policy route		
Priority	Priority the router select route	

---END

5.9 RESET button function

“RESET” button is on the rear panel and next to power interface. This button can be used when the router is in use or when the router is turned on. Three are 3 functions to press “RESET” button when the router is in use:

- Press “RESET” for about 2 seconds, router will reboot.
- Press “RESET” 5-10 seconds, the router will reboot, meanwhile, the router will be resumed to default factory setting configuration.
- Press “RESET” over 20 seconds, the router will reboot, and get into CFE upgrading. The router is resumed to default factory setting configuration.
- Press button when the router is turned on:
- Press “RESET” button and turn on the router, and keep pressing “RESET” for 2 seconds. The router will get into CFE upgrading mode.

---END

6 Typical application

About this chapter

Chapter	Content
6.1 Overview	Summary some typical application of S9922M 3G/4G router
6.2 Awake function	How to awake S9922M Cellular Wi-Fi Router if not auto-dial
6.3 Parameter select	Parameter switch to achieve SIM backup function
6.4 VPN	S9922M Cellular Wi-Fi Router VPN setting
6.5 Timing Task	Set Timing task on S9922M 3G/4G Router

6.1 Overview

S9922M Cellular Wi-Fi Router commonly used function includes wake up, parameter switch, VPN, etc.

6.2 Awake function

Typical case

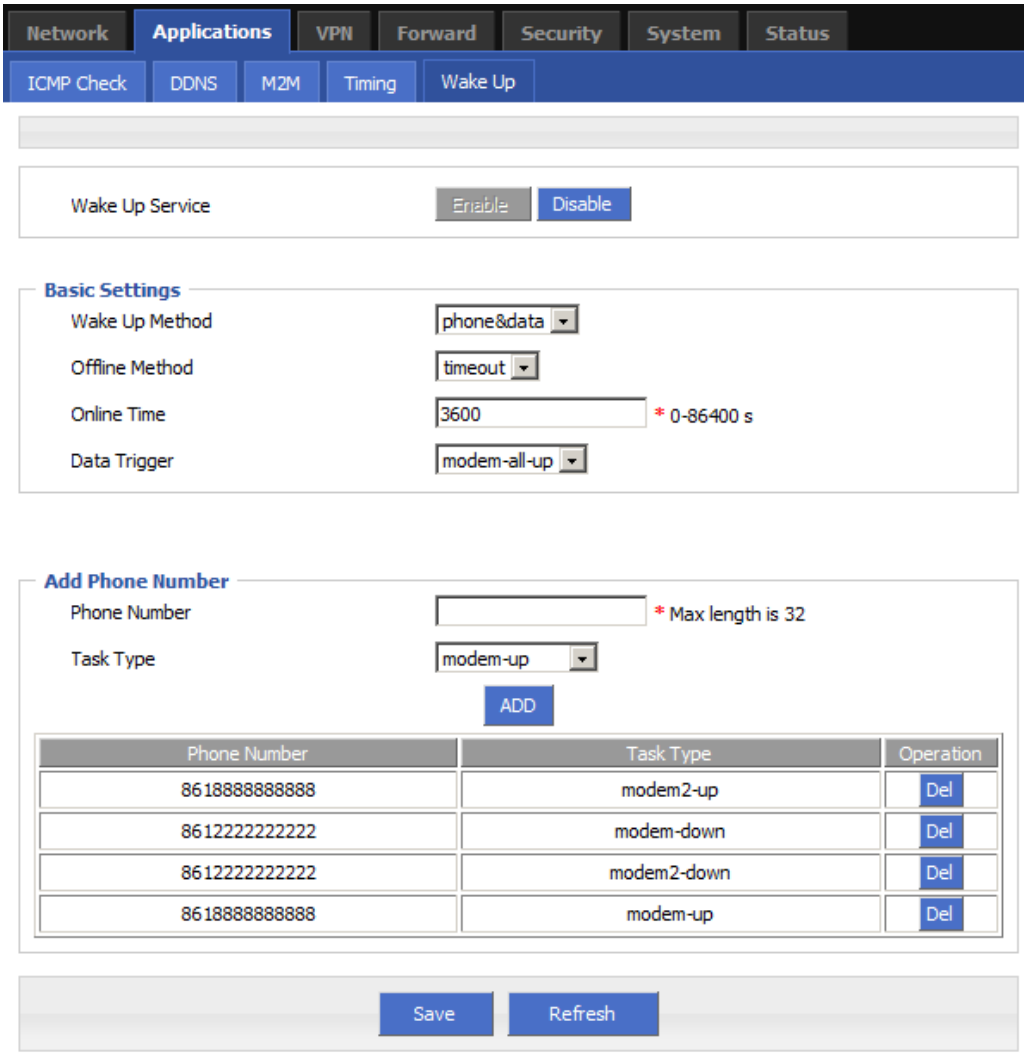
S9922M Cellular Wi-Fi Router support wake up function, means router will not auto-dial after power on, but dial triggered by data or call or SMS. Then router auto in offline by idle or timeout. This function could save your data traffic fee.

For example, after setting phone trigger number, a call to router by that number could trigger the router dial online; one phone number could control the modem.

parameter setting

Let us check an example:

Figure 6-1 Wake up/trigger setting example



Effect

By this setting, after router power on, if there are data trigger or you could call/SMS SIM1 or SIM2 number from 8618888888888 to trigger corresponding SIM online, modem will dial online, After 3600s, router will offline. Or you could use 8612222222222 to call SIM, make the router offline. Please notice, to enable this function, the SIM must support phone and/or SMS function.

6.3 Parameter select

Typical case

S9922M Cellular Wi-Fi Router provides the parameter switching function, or temporarily stop working links can be replaced. For example: When L2TP link is working for some reason does not work, you can switch to an alternate PPTP or IPSec link. S9922M Cellular Wi-Fi Router configured parameters based on switching rules, multi-link switching and good communication ensures the reliability of the network.

Parameter Select

Let us check an example:

CAUTION

Please set the “Parameter select” of vpdn1 and vpdn2 separately

Set rules as below

Figure 6-2 Rules setting

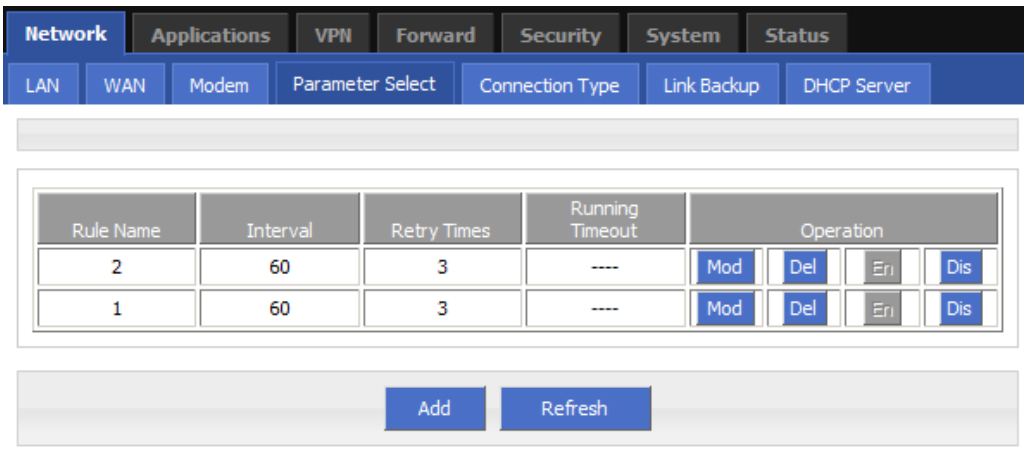


Figure 6-3 parameter select setting 1

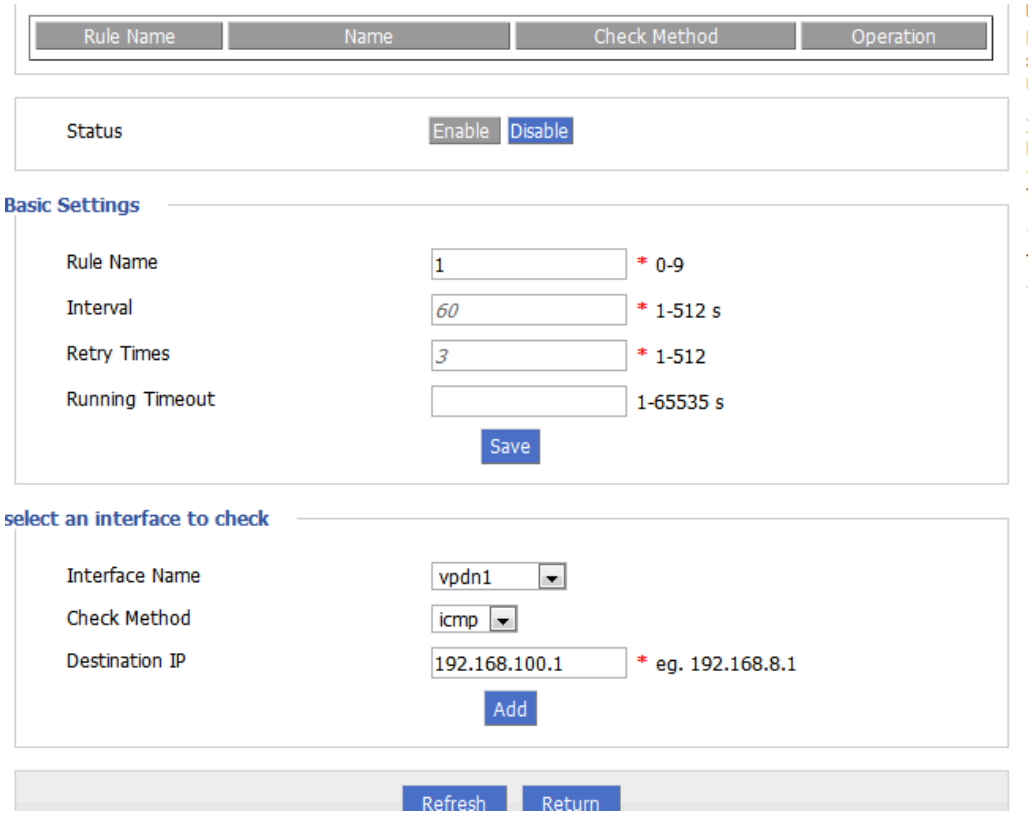
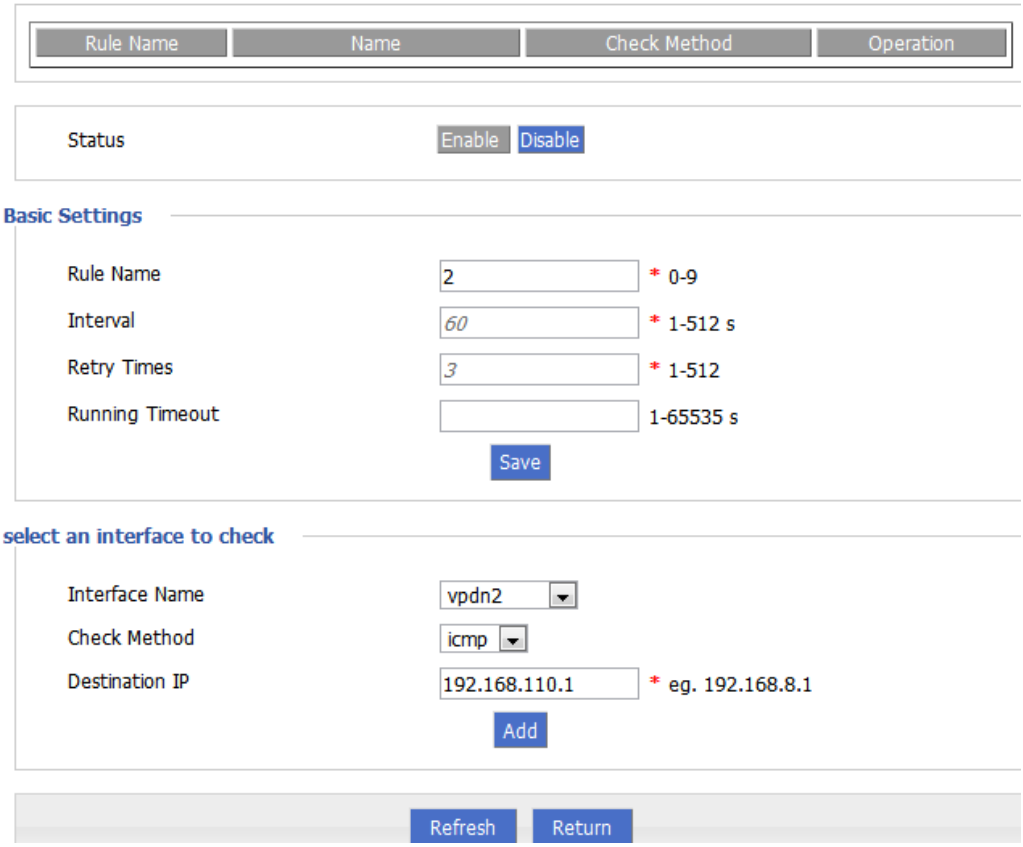


Figure 6-4 parameter select setting 2



When L2TP link is working for some reason disconnected from the server, the router will perform parameter switching in Command "check icmp", through IP ping to detect whether router interrupt with network operators; after 3 IP ping fails, the router will switch to the PPTP link, connecting to maintain the server, continue to work.

Effect

Initially using L2TP link, then set L2TP connection is disconnected manually, the router after 3 ping 192.168.100.1, after the link failed, the link will switch to the L2TP and maintaining connection to the server.

6.4 VPN

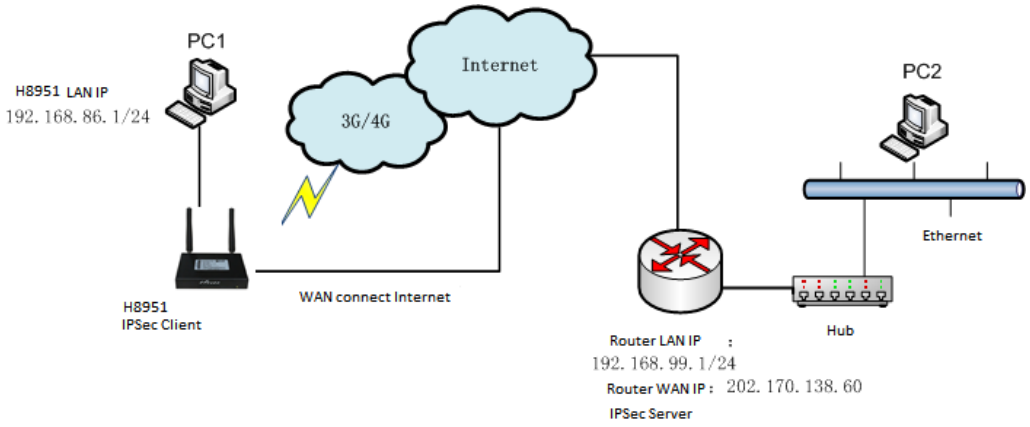
Introduction

VPN, virtual private network, a technology based on Internet, now S9922M Cellular Wi-Fi Router supports L2TP/PPTP/GRE/IPIP/IPSec/OpenVPN of VPN.

L2TP used to build a virtual private network, after S9922M Cellular Wi-Fi Router connect to company NAS server, PC under S9922M could visit company network like visiting the local area network.

Let us check a setting example:

Figure 6-5 Build IPSec



PC1 connect S9922M then build IPSEC link by VPN function of S9922M with company router. I assume using IPSec tunnel mode, H8922S end local network 192.168.86.1/24, company server end 192.168.99.1/24, by IPSEC, two LAN could communicate.

Parameter Setting

Figure 6-6 IPSec Phase 1

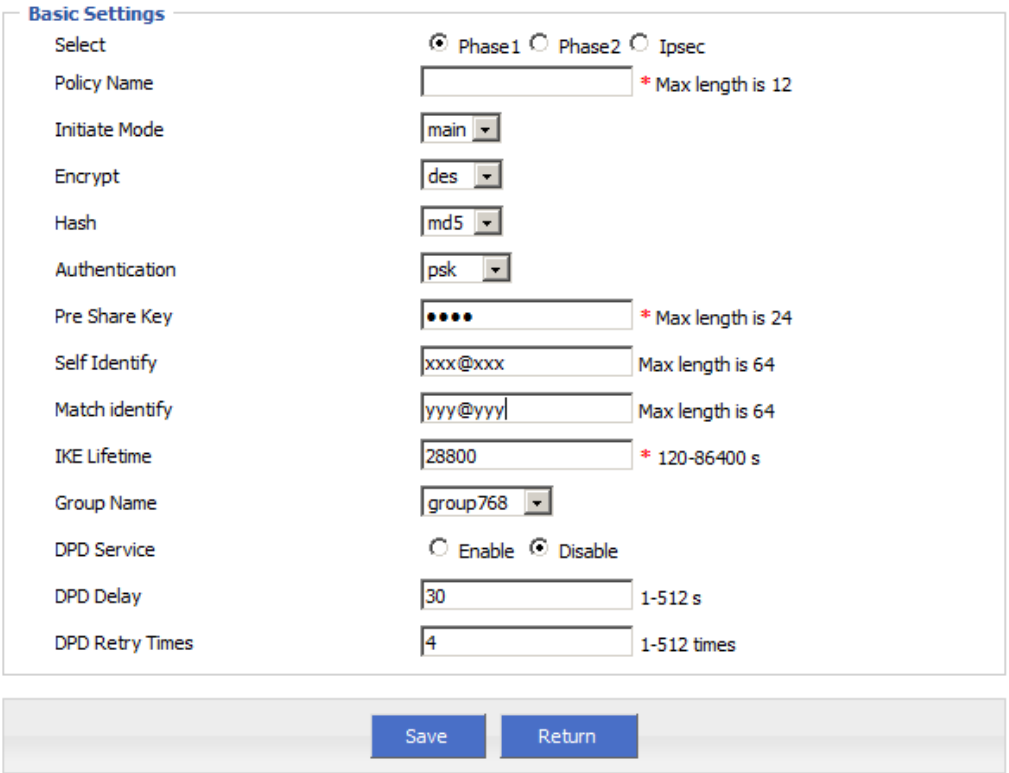


Figure 6-7 IPSec Phase 2

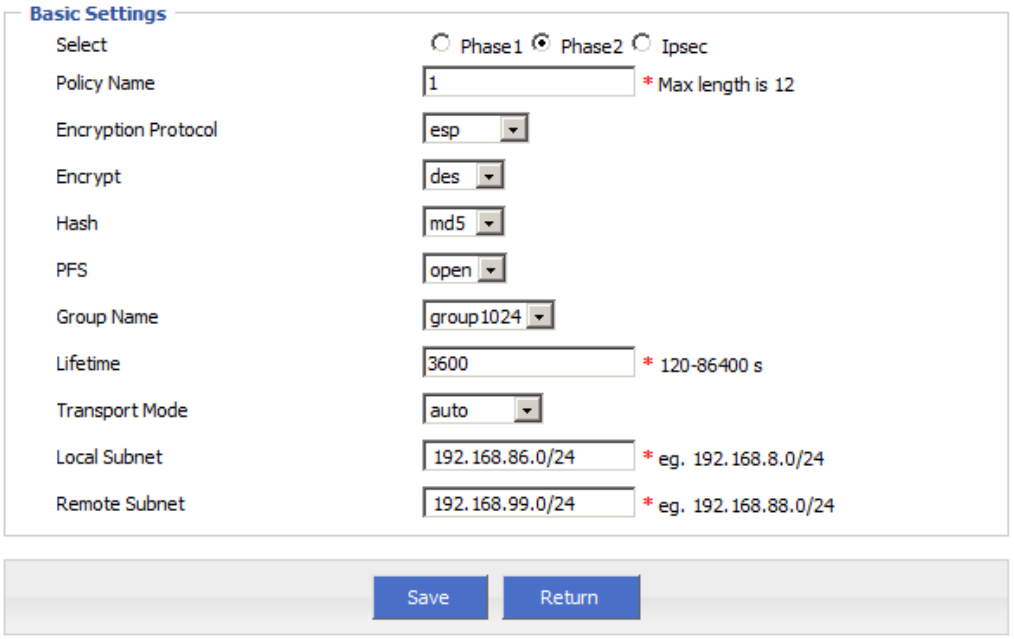
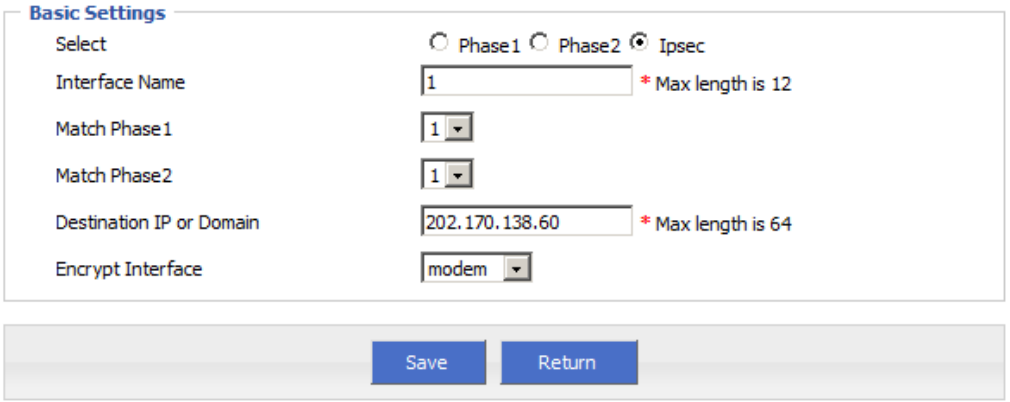


Figure 6-8 IPSec

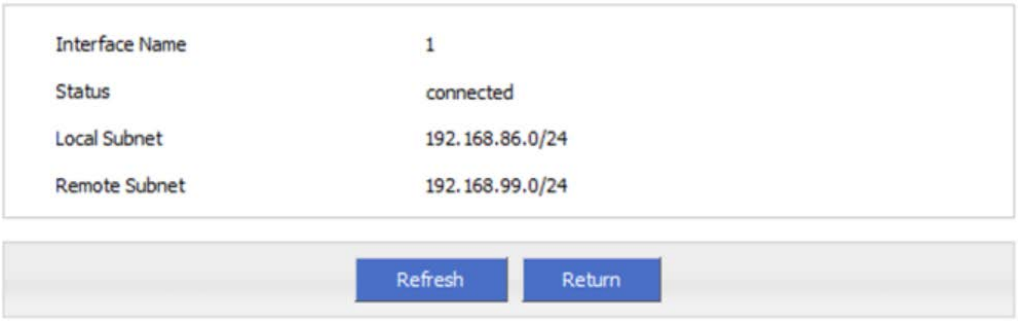


Company router server should have same setting but the identity and subnet setting for the company router server should be the opposite of those for S9922M 3G/4G Router.

Result

After setting S9922M Cellular Wi-Fi Router and company router parameter, they can connect each other by IPSEC, and ping peer subnet, you could check status by click “view” button.

Figure 6-9 IPSec status



~ # ping 192.168.99.1 -I 192.168.86.1
PING 192.168.99.1 (192.168.99.1) from 192.168.86.1: 56 data bytes
64 bytes from 192.168.99.1: seq=0 ttl=255 time=1569.360 ms
64 bytes from 192.168.99.1: seq=1 ttl=255 time=769.937 ms

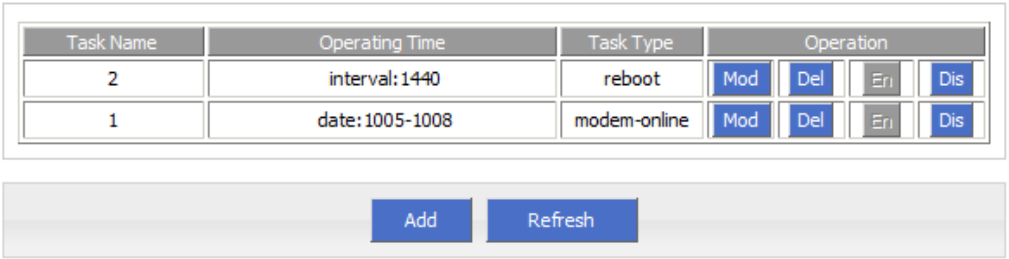
--- 192.168.99.1 ping statistics ---
2 packets transmitted, 2 packets received, 0% packet loss
round-trip min/avg/max = 769.937/1169.648/1569.360 ms

6.5 Timing Task

Typical Application

S9922M Cellular Wi-Fi Router support timing task, by setting timing task, at certain time, router will operate reboot, online command. Etc. Easier the customer operation. I assume set the router online at certain time and keep a moment, then reboot every 24 hours. You could set like below.

Figure 6-10 Timing



Result

Router will be online at 10:05 AM and keep online until 10:08, then offline at 10:09.

And router will reboot every 24 hours count began last reboot.

Figure 6-11 router online

```
10:04:57 time[912]: ntpclient -h clock.via.net -s return 1{time.c->109}
10:04:57 time[912]: open the file(/tmp/ntp_first.mark) success!{time.c->254}
10:04:57 time[912]: NTP failed!{time.c->274}
10:04:59 pppd[345]: sent [LCP EchoReq id=0xf magic=0x5511fa91]
10:05:00 pppd[345]: rcvd [LCP EchoRep id=0xf magic=0xc1caf26e]
10:05:05 modem[969]: got SIG_TERM signal{modem.c->605}
10:05:05 modem[969]: argument error{hp_chat.c->533}
10:05:05 modem[1019]: modem_parameter_init :: boot!{modem.c->702}
10:05:05 modem[1019]: modem name is (0, 0){modem.c->294}
10:05:05 modem[1020]: find the modem(ZTE-AD3812:10){modemcheck.c->185}
10:05:06 modem_mg[229]: search usb device{modem_mg.c->1489}
10:05:06 modem[1020]: open the device(/dev/ttyUSB2) succeed{hp_chat.c->326}
```

Figure 6-12 router off line

```
10:09:02 pppd[1067]: Terminating on signal 15
10:09:02 pppd[1067]: Connect time 3.0 minutes.
10:09:02 pppd[1067]: Sent 445 bytes, received 2660 bytes.
10:09:03 netdown[1336]: ppp interface modem down{netdown.c->37}
10:09:03 netdown[1336]: killall -SIGUSR2 modem{netdown.c->47}
10:09:03 pppd[1067]: Script /usr/sbin/pppdown-run started (pid 1335
10:09:03 pppd[1067]: sent [LCP TermReq id=0x2 "User request"]
10:09:03 pppd[1067]: rcvd [LCP TermAck id=0x2]
10:09:03 pppd[1067]: Connection terminated.
```

Figure 6-13 router reboot

```
10:12:01 timing[1484]: timing: Reboot the system{hp_misc.c->984}
```

7 FAQ

About this chapter

Chapter	Content
7.1 Hardware failure	Possible hardware failure during using S9922M Cellular Wi-Fi Router and how to handle them
7.2 Dial online problem	Possible problem during dialing and how to handle them
7.3 VPN	Possible problem when connecting VPN
7.4 Web configuration	Possible WEB configuration problem and how to handle them

7.1 Hardware Failure

7.1.1 All LED dark

Phenomenon

Router LED all dark

Possible Reason

- Power supply does not match, it should be 9-36VDC
- No power supply

Solution

- Make sure the power supply is 9～36VDC
- Check the power adapter and cable connection

7.1.2 SIM Slot

Phenomenon

Cannot insert SIM card

Possible Reason

- SIM slot damaged
- SIM card wrong direction

Solution

- SIM slot damaged, please contact us to repair
- Chec k the SIM card direction, please make sure the SIM card is inserted correctly

7.1.3 Ethernet Connection

Phenomenon

LAN LED dark, cannot visit router WEB GUI

Possible Reason

- Ethernet cable connection problem
- Ethernet cable damage
- PC end network card abnormal

Solution

- Re-connect Ethernet cable
- Change a Ethernet cable
- Check network card setting on PC end

7.1.4 Antenna Connection

Phenomenon

Cannot connect antenna

Possible Reason

- Antenna type do not match
- Wrong connection

Solution

- Please check antenna interface, should be SMA-J
- Please check antenna type, there are 3G/4G and WIFI, GPS antenna, do not mix them

7.2 Dial Online Problem

7.2.1 Dial discontinue

Phenomenon

S9922M Cellular Wi-Fi Router discontinue during dialing, dial failure

Possible Reason

- SIM card network type do not match
- SIM charges owed
- Power supply do not match
- Modem setting wrong

Solution

- Change to a suitable SIM card
- Recharge SIM card
- Change to suitable power supply
- Change Modem setting, please check related chapter

7.2.2 No Signal

Phenomenon

S9922M Cellular Wi-Fi Router modem status show no signal

Possible Reason

- Antenna connect wrong
- Modem cannot online
- Modem offline

Solution

- Connect suitable antenna
- Modem cannot online, check SIM and modem setting
- Modem offline, check router setting, like wake up setting, ICMP setting, check if there are any setting make router offline

7.2.3 Cannot find SIM/UIM card

Phenomenon

S9922M Cellular Wi-Fi Router cannot find SIM/UIM card

Possible Reason

- SIM card damage
- SIM bad contact

Solution

- Replace SIM card
- Re-install SIM card

7.2.4 Poor Signal

Phenomenon

S9922M Cellular Wi-Fi Router no signal or poor signal

Possible Reason

- Antenna connect wrong
- Area signal weak

Solution

- Check the antenna and re-connect it.
- Contact Telecom Operator to confirm signal problem
- Change to high-gain antenna

7.2.5 Compress Protocol not match

Phenomenon

S9922M Cellular Wi-Fi Router dial failure, log shows compress protocol not match

Possible Reason

Modem compress protocol do not match with server end

Solution

Change compress protocol setting

7.3 VPN Problem

7.3.1 VPDN cannot connect

Phenomenon

VPDN cannot connect

Possible Reason

- VPDN port work abnormal
- VPDN parameter wrong
- VPDN peer server abnormal

Solution

- Make sure Modem is online
- Set the correct port to VPDN
- VPDN parameter wrong
- Check VPDN peer server

7.3.2 VPN cannot communicate

Phenomenon

VPN already connect, but cannot communicate

Possible Reason

- Router table is configured wrong
- VPN peer server is configured wrong

Solution

- Add related Router table
- Check VPN peer server setting

7.3.3 Router can communicate but subnet cannot

Phenomenon

Router can communicate but subnet can not communicate

Possible Reason

- VPN peer server is configured wrong
- Local Router has no MASQ
- Wrong local route table

Solution

- Check VPN peer server setting
- Local Router has no MASQ, please manual add VPN port MASQ
- Wrong local route table, set right route table

7.4 WEB configuration

7.4.1 Updating firmware failure

Phenomenon

Updating firmware failure

Possible Reason

- Auto reboot during updating S9922M 3G/4G Router

- Power supply problem
- Wrong firmware
- Power off during updating router

Solution

- Check setting, disable the function which may cause reboot
- Change to a suitable power supply
- Ask technical support for suitable firmware
- Power off during updating router, please make sure power supply normal

7.4.2 Backup setting problem

Phenomenon

Router import backup setting failure

Possible Reason

- Backup setting file format wrong
- No reboot after backup setting

Solution

- Choose a right file to import
- Must reboot after import setting, then parameters available

7.4.3 Updating patch failure

Phenomenon

Updating fix patch failure, after updating, view fix patch and found no fix patch

Possible Reason

- Patch format wrong
- Patch name too complicated

Solution

- Check patch format, change to a right one
- Change the patch name to a simple one

7.4.4 CFE Updating failure

Phenomenon

CFE updating failure, firmware edition no change

Possible Reason

- Power supply do not match
- Firmware version or format do not match
- Power off during updating process

Solution

- If power supply does not match, please change then update again
- If firmware version, format do not match, please change then update again
- If power off during updating, please update again

7.4.5 Update failure in WEB GUI

Phenomenon

Updating by WEB GUI, failed and cannot visit WEB GUI again

Possible Reason

Firmware oversize cause updating failure

Solution

Using CFE mode to update again, and router will restore to factory mode. If after CFE updating, still cannot visit WEB GUI, please contact us for repairing

7.4.6 Forget Router Password

Phenomenon

Forget router login password

Possible Reason

User has changed the password

Solution

After router power on, push and hold RESET button over 10 seconds then release, then re-power on router, router will back to factory mode (Username/Password both admin), but patch will reserve

When router is power on, press and hold RESET button around 1s, router will reboot and kept all setting.

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

ISED Statement

- English: This device complies with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference, including interference that may cause undesired operation of the device.
The digital apparatus complies with Canadian CAN ICES-3 (B)/NMB-3(B).

- French: Le présentappareilestconforme aux CNR d'Industrie Canada applicables aux appareils

radio exempts de licence. L'exploitationestautorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produir e de brouillage, et (2) l'utilisateur de l'appareildoit accepter tout brouillageradioélectriquesubi, mêmesi le brouillage est susceptible d'encompromettre le fonctionnement.

This radio transmitter (ISED certification number: 23241-S9922M) has been approved by Industry Canada to operate with the antenna types listed with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (ISED certification number: 23241-S9922M) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Radiation Exposure Statement

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Déclaration d'exposition aux radiations

Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 20cm entre le radiateur et votre corps.

Connecting things