M352-5G

Miniature Industrial IoT 5G NR Router

User Manual

Version 1.00

Table of Contents

1 Introduction

Proscend M352-5G Miniature Industrial IoT 5G NR Router features the most compact industrial 5G NR customer premises equipment enabling 5G NR connectivity everywhere in the smart cities, where high-speed IoT applications are rapidly growing.

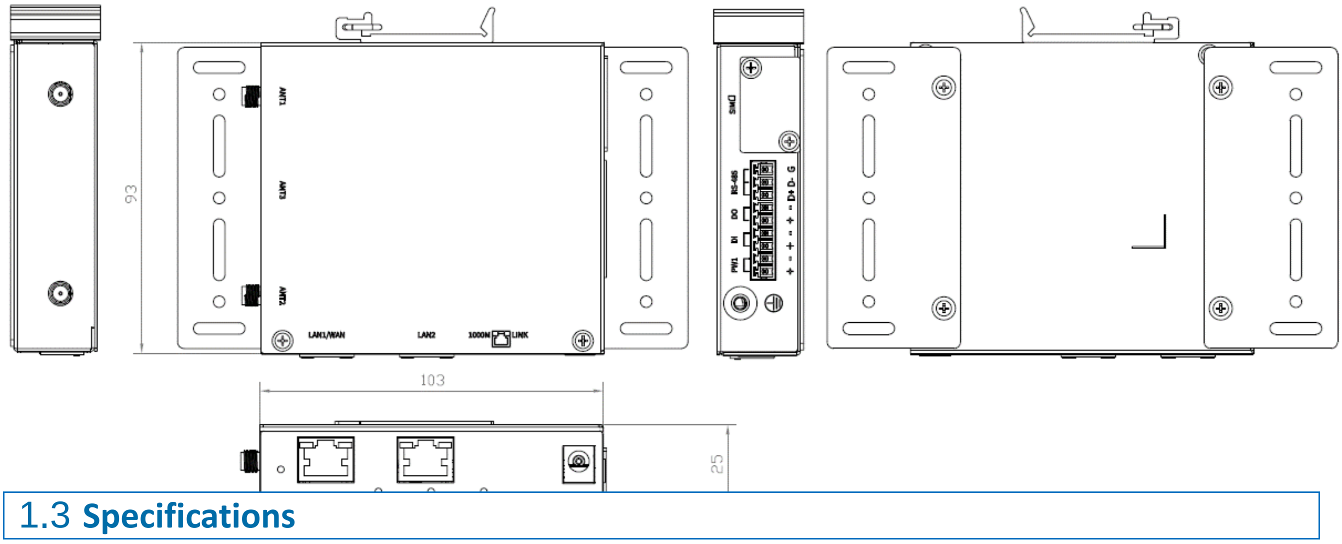
The M352-5G equipped with 5G NR cellular technology of greater wireless transmission speed and low latency, is perfectly suitable for carrying 8k Ultra HD video stream to the Internet. The purpose-built design of miniature size, lower power consumption, extended operating temperature, optimized cost performance, and two Gigabit Ethernet and DI/DO enables the network designers to place M352-5G in a small cabinet for a wide variety of IoT applications.

For massive rollouts in smart cities, M352-5G works with O’smart, the Proscend IoT Management System, for empowering network administrators to remotely monitor, supervise, and upgrade the M352-5G Cellular Routers anywhere, anytime.

1.1 Features

- Miniature dimension 103 x 25 x 93 mm (W x H x D).
- Support multiple band connectivity with 5G NR / FDD LTE / TDD LTE.
- Built-in dual Gigabit Ethernets, Micro SIM slot, DI/DO interfaces.
- Detachable antenna design for using a wide variety of external antennas.
- Industrial rated from -40 to +70°C for use in harsh environments.
- Support massive remote management by O’smart the IoT Management System

1.2 Dimensions



1.3 Specifications

Cellular Interface

- 5G: NR FDD/TDD
- 4G: LTE FDD/TDD
- 3G: WCDMA

Hardware interface

- 1 x LAN/WAN 1000Base-T sharing port compliant with 802.3ab
- 1 x LAN 1000Base-T ports compliant with 802.3ab
- 1 x Micro SIM slot
- 1 x Reset Button
- 1 x RS-485 (D+/D-/GND, Non-Isolated)
- 1 x DI (Non-Isolated), 1 x DO (Non-Isolated)
- 2x SMA connectors for 5G Antenna

Physical Characteristics

- Enclosure： Metal Case
- Dimensions (W x H x D)：103 x 25 x 93 mm
- Weight：335 g
- Installation： Wall mounting, DIN-rail mounting, Desktop.

LED Display

- 1 x Power status
- 1 x SIM card presence
- 1 x Cellular signal strength

Power Supply

- Terminal block power Input: 10~26VDC
- DC Jack Power Input: 12 VDC, 2A
- Power Consumption: 18 watts (Max)

Environment

- Operating Temperature -40 ~ +70°C
- Storage Temperature -40 ~ +85°C
- Ambient Relative Humidity 10 ~ 95% (non-condensing)
- Humidity 0 ~ 95% (non-condensing)

Software

- Network Protocols: IPv4, IPv6, IPv4/IPv6 dual stack, DHCP server and client, Static Routing, Policy Route, Static IP, SNTP, DNS Proxy, Modbus TCP to Modbus RTU, DDNS, QoS, UPnP
- Routing/Firewall: NAT, Virtual Server, DMZ, MAC Filter, URL Filter, IP Filter, IPS
- VPN: IPSec (3DES, AES128, AES192, AES256, MD5, SHA-1, SHA256), GRE, PPTP, L2TP
- Management: Web GUI with HTTPS/HTTP, Dual Image, Syslog, SNMP, SSH v2, SMS Action, O'smart
- Cellular: Dual APN, IP Passthrough
- Alarm: SMS, VPN/WAN Disconnect, SNMP Trap, E-mail

Standards and Certifications

- NCC & BSMI CNS15936 & CNS15598-1

2 Hardware Installation

This chapter introduces how to install and connect the hardware.

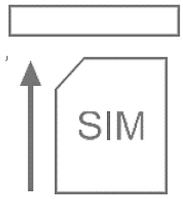
2.1 Install the SIM Card

STEP 1: Before inserting or removing the SIM card, ensure that the power has been turned off, or the power connector has been removed from the M352-5G Cellular Router.

STEP 2: Using a screwdriver to remove the metal protective cover first, insert the SIM card into the card slot. The cut-off edge of the SIM card on the SIM slot is to the left.

STEP 3: Push the SIM card and lightly press it to lock into the slot.

STEP 4: Remove the SIM card, lightly press it and it will pop out of the slot.



NOTE:

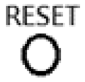
- Please use the industrial SIM cards operating from -40°C to +105°C to ensure proper cellular router operation.
- SIM loose contacts: adding a layer of tape behind the SIM might increase contact pressure for better attachment.

2.2 LED Indicators

The following table explains the LED indicators on the front panel.

LED	Off	On	Slow	Fast	Heartbeat
SYS	Power down	Power up	N/A	N/A	N/A
SIM	Not working	Connected	Connecting	Error	Reading
Signal	No signal	High signal	Medium signal	Low signal	N/A

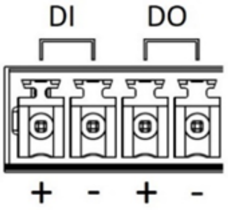
2.3 Reset Button



Function	Operation
Reset	Press the button for 1 second.
Reset to default setting	Press the button for more than 5 seconds.

2.4 Connecting I/O Ports

There are four terminals on the terminal block, two for digital input and two for digital output.



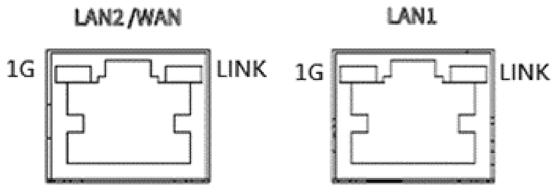
Pin	Description
DI +	Digital Input
DI -	
DO +	Digital Output
DO -	

DI: Low (+0 to +3V) / High (+8 to +40V)

DO: Open Collect (maximum 30V/300mA)

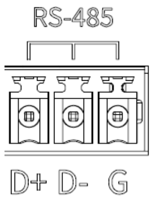
2.5 LED Indicators of Ethernet Port

There are two LED indicators for each of the two LAN ports and one WAN port.

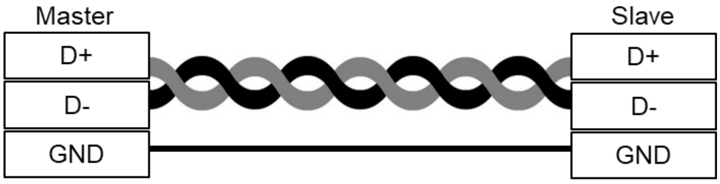


LED	Blinking	On	Off
1000M	N/A	1000Mbps	10/100Mbps
LINK	Data Transmitting	LINK UP	LINK DOWN

2.6 RS-485 pinouts



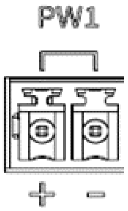
Pin	Description
D +	Serial Port, Data+ (A) wire
D -	Serial Port, Data- (B) wire
G	Signal Ground



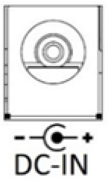
RS-485 2-wire cable (Twisted Pair)

2.7 Connecting the Power Supply

Powering the M352-5G Cellular Router is by either a terminal block or a DC jack.



+, - pins of the terminal block (PW1, PW2) on the right panel. The power input voltage range is 12~26 VDC.



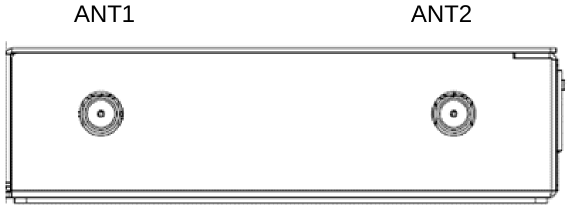
One DC Jack is on the front panel.

The power input voltage is 12 VDC, 2A.

2.8 Antenna Installation

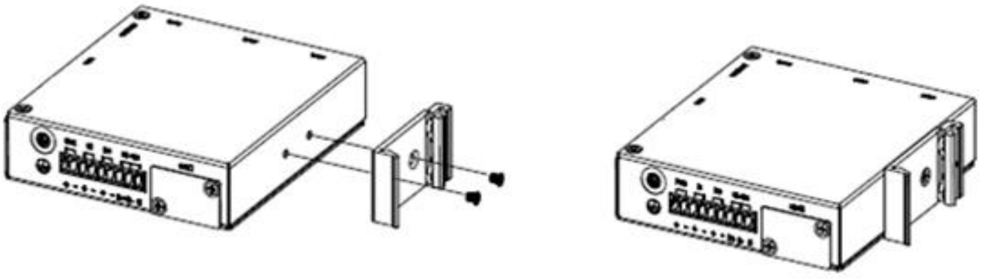
Tow SMA connectors placed on the right panel are for connecting to external 5G antennas.

ANT1 and ANT2: for 5G/4G Transmit and Receive.



2.9 DIN-rail Mounting

STEP 1: Use the screws to install the DIN-rail kit to attach at the rear side of the device.

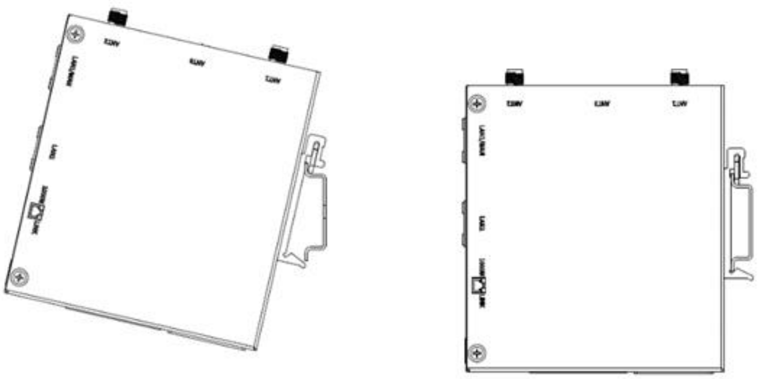


NOTE:

- Three screw types are flat head M3 x 5 mm.

STEP 2: Hook the unit onto the DIN rail.

STEP 3: Push the bottom of the unit towards the DIN rail until it locks in place.



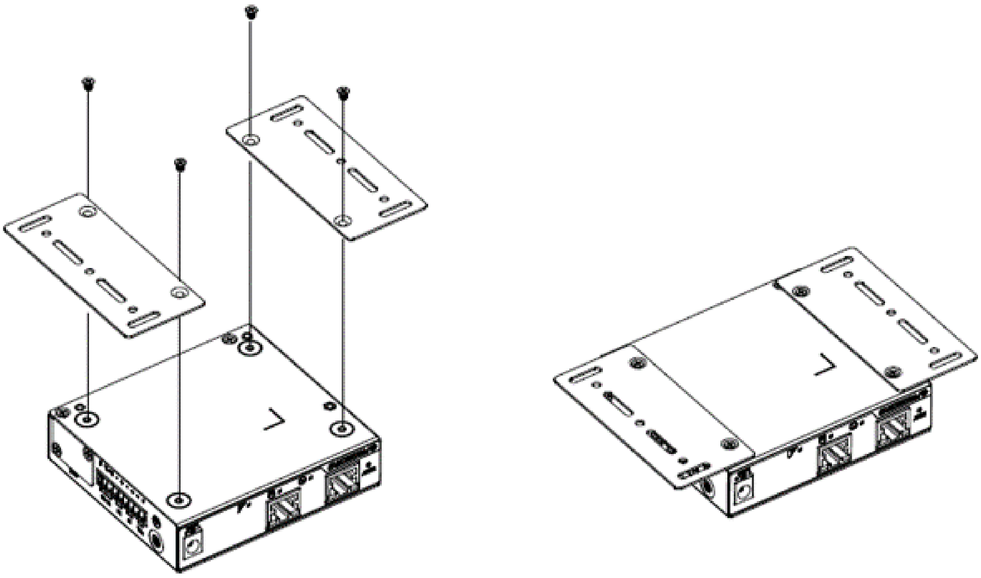
2.10 **Wall Mounting**

STEP 1: Use two screws to install each bracket at the bottom of the device.

NOTE:

- Each screw type is flat head M3 x 4 mm.

STEP 2: Use the screws to attach the bracket of the device for wall mounting.



NOTE:

- These screws are not included in the package. The head of each screw is less than 7 mm in diameter, the shaft is less than 3 mm in diameter, and the length is less than 10 mm in diameter.

3 Configuration via Web Browser

3.1 Access the Web Configurator

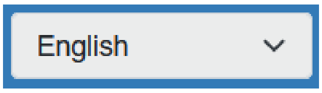
The web configuration is an HTML-based management interface for quick and easy set up of the cellular router. Monitoring of the status, configuration and administration of the router can be done via the Web interface.

After properly connecting, the hardware of cellular router as previously explained. Launch your web browser and enter https://192.168.1.1 as URL.

The default IP address and sub net-mask of the cellular router are 192.168.1.1 and 255.255.255.0. Because the cellular router acts as DHCP server in your network, the cellular router will automatically assign IP address for PC or NB in the network.

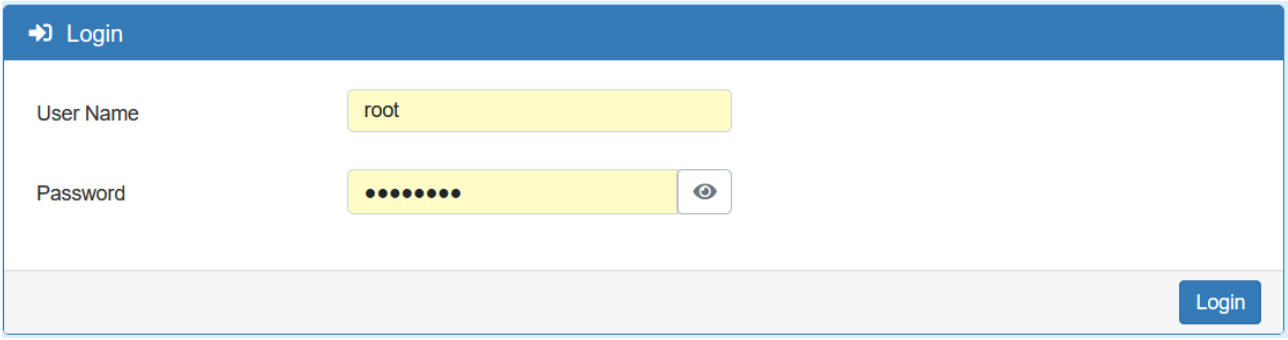
Title Bar Panel > Selecting Language

You can choose the different language display of web GUI.



Logging in the Router

In this section, please fill in the default User Name **root** and the default Password **2wsx#EDC** and then click Login.



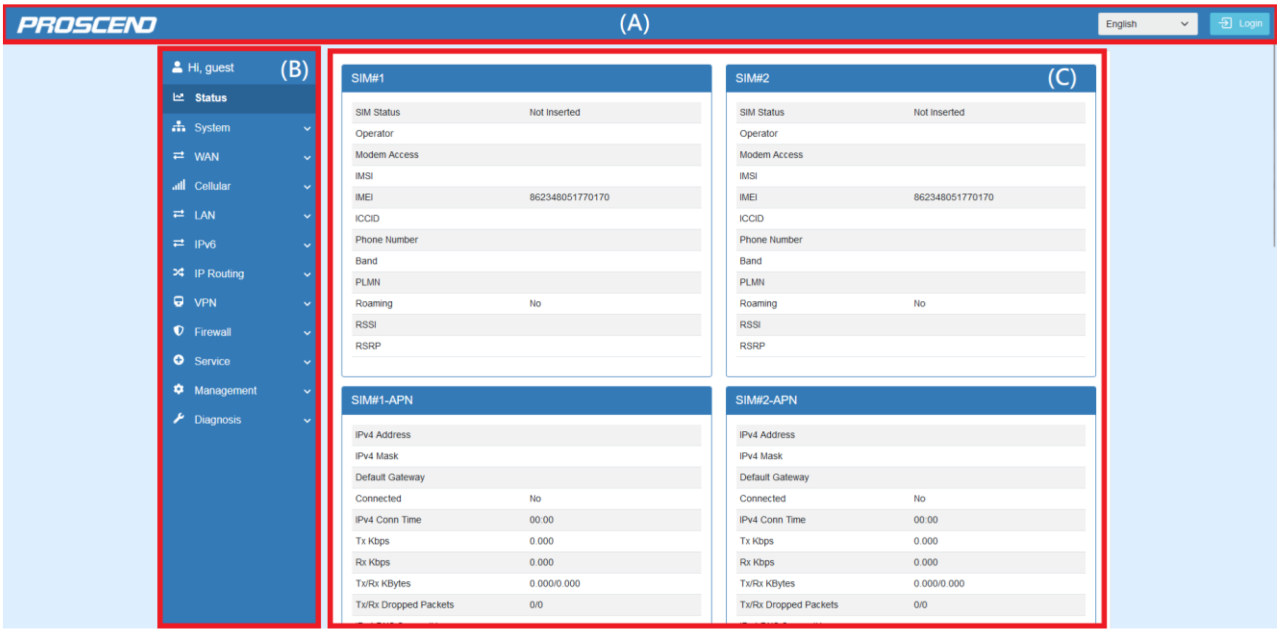
User Name: root

Password: ●●●●●●●●

3.2 Navigate the Web Configurator

The main screen is divided into three parts as below.

A -Title Bar, B -Navigation Panel and C -Main Window.



SIM#1

SIM Status	Not Inserted
Operator	
Modem Access	
IMSI	
IMEI	862348051770170
ICCID	
Phone Number	
Band	
PLMN	
Roaming	No
RSSI	
RSRP	

SIM#2

SIM Status	Not Inserted
Operator	
Modem Access	
IMSI	
IMEI	862348051770170
ICCID	
Phone Number	
Band	
PLMN	
Roaming	No
RSSI	
RSRP	

SIM#1-APN

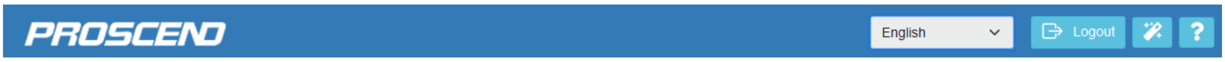
IPv4 Address	
IPv4 Mask	
Default Gateway	
Connected	No
IPv4 Conn Time	00:00
Tx Kbps	0.000
Rx Kbps	0.000
Tx/Rx KBytes	0.000/0.000
Tx/Rx Dropped Packets	0/0

SIM#2-APN

IPv4 Address	
IPv4 Mask	
Default Gateway	
Connected	No
IPv4 Conn Time	00:00
Tx Kbps	0.000
Rx Kbps	0.000
Tx/Rx KBytes	0.000/0.000
Tx/Rx Dropped Packets	0/0

(1) A : Title Bar

The title bar provides some useful instructions that appear the situation of router.



Title Bar	
Item	**Description**
Language	Choose your language from the drop-down list on the upper right corner of the title bar.
Login / Logout	Click to login or logout the web GUI.

(2) B : Navigation Panel-Main Menu and Sub Menu

The menu items are divided into main and sub menu to configure the settings and get the status of connectivity on the navigation panel.

Navigation Panel	
Main Menu	**Sub Menu**
Status	Device overall status
System	Time and Date, Logging, Alarm, Dying Gasp, COM Ports, Ethernet, Modbus, Client List

WAN	Connection Table, Ethernet, IPv6 DNS, Health Check
Cellular	Config, GPS, SIM Config, SIM Usage, SMS, Serving Cell, DNS
LAN	IPv4
IPv6	IPv6 Config
IP Routing	Static Route, Policy Route
VPN	OpenVPN, IPSec, GRE, PPTP Server, L2TP
Firewall	Basic Rules, Port Forwarding, DMZ, Management IP, ACL, IP Filter, MAC Filter, URL Filter, NAT, IPS
Service	SNMP, Dynamic DNS, MQTT, UPnP, SMTP, IP Alias, QoS
Management	Identification, Administration, Contacts / On Duty, SSH, Web, Telnet, Firmware, Configuration, Load Factory, Restart, Schedule Reboot, Fail2Ban, O’smart
Diagnosis	Ping, Traceroute

4 Web Menu Item > Status

This page shows the overall status of the device.

Status > SIM#1 and SIM#2	
Item	**Description**
SIM Status	The status of SIM.
Operator	The name of the operator.
Modem Access	The access type between the LTE module and base station.
IMSI	The IMSI number of the SIM card.
IMEI	The IMEI number of the SIM card.
ICCID	The ICCID number of the SIM card.
Phone Number	The phone number of the SIM card.
Band	The currently connected band.
PLMN	The Public LAN Mobile Network ID.
Roaming	The status of Roaming.
RSSI	RSSI is measured over the entire bandwidth.
RSRP	RSRP is the received power of 1 RE average of power levels received across all Reference Signal symbols within the considered measurement frequency bandwidth

Status > SIM#1-APN1/APN2 and SIM#2-APN1/APN2	
Item	**Description**
IPv4 Address	The IPv4 address that assigned by the operator.
IPv4 Mask	The IPv4 mask that assigned by the operator.
Default Gateway	The default gateway that assigned by the operator.
Connected	The status of connection. “Yes” means Connected; “No” means Disconnected.
IPv4 Conn Time	The connection time of IPv4 network.
Tx Kbps	The uplink speed is in Kbps.
Rx Kbps	The downlink speed is in Kbps.
Tx/Rx KBytes	The accumulated TX/RX in KBytes.
Tx/Rx Dropped Packets	The dropped packets of Tx/Rx.
IPv4 DNS Server #1/#2/#3	The DNS server address that assigned by the operator.

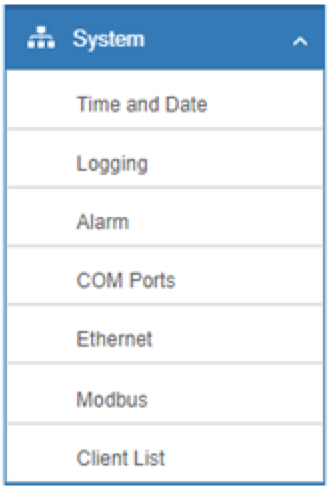
Status > LAN Ethernet	
Item	**Description**
IPv4 Address	The IPv4 address of the M351 device.
IPv4 Mask	The IPv4 mask of the M351 device.
IPv6 Address	The IPv6 address of the M351 device.
IPv6 Prefix	The IPv6 Prefix of the M351 device.
IPv6 DNS Server #1/#2/#3	The IPv6 DNS server address.
IPv6 Conn Time	The connection time of IPv6 network.
Tx Kbps	The speed of uplink in Kbps.
Rx Kbps	The speed of downlink in Kbps.
Tx/Rx KBytes	The accumulated TX/RX in KBytes.
Tx/Rx Dropped Packets	The dropped packets of Tx/Rx .

Status > WAN Ethernet	
Item	**Description**
IPv4 Address	The IPv4 address of the M351 device.
IPv4 Mask	The IPv4 mask of the M351 device.
IPv4 Gateway	The default gateway that assigned by operator.
IPv4 DNS Server #1/#2/#3	The IPv4 DNS server address.
Tx Kbps	The speed of uplink in Kbps.
Rx Kbps	The speed of downlink in Kbps.
Tx/Rx KBytes	The accumulated TX/RX in KBytes.
Tx/Rx Dropped Packets	The dropped packets of Tx/Rx .

Status > Connected VPN Connections	
Item	**Description**
OpenVPN	Total connected number of OpenVPN.
IPSec	Total connected number of IPSec.
GRE	Total connected number of GRE.
PPTP Server	Total connected number of PPTP Server.
L2TP	Total connected number of L2TP.

5 Web Menu Item > System

This system section allows you to configure the following items, including Time and Date, Logging, Alarm, Ethernet Ports, and Client List.

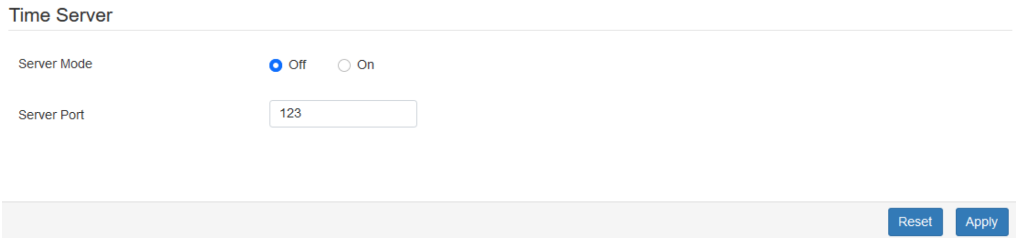


5.1 Time and Date

This section allows you to set up the time and date of router and NTP server. There are two modes at **Time and Date Setup**, including **Get from Local System** and **Get from Time Server**. The default mode is **Get from Time Server**.

For **Time Zone Setup**, the **Daylight Savings Time** allows the device to forward/backward the amount of time from **Ahead of standard time** setting automatically when the time is at the **Daylight Savings** duration that you have set up before.

The Time server feature allows user to set a time server for LAN side client to get the time through NTP/SNTP protocol.



Time Server

Server Mode ● Off ○ On

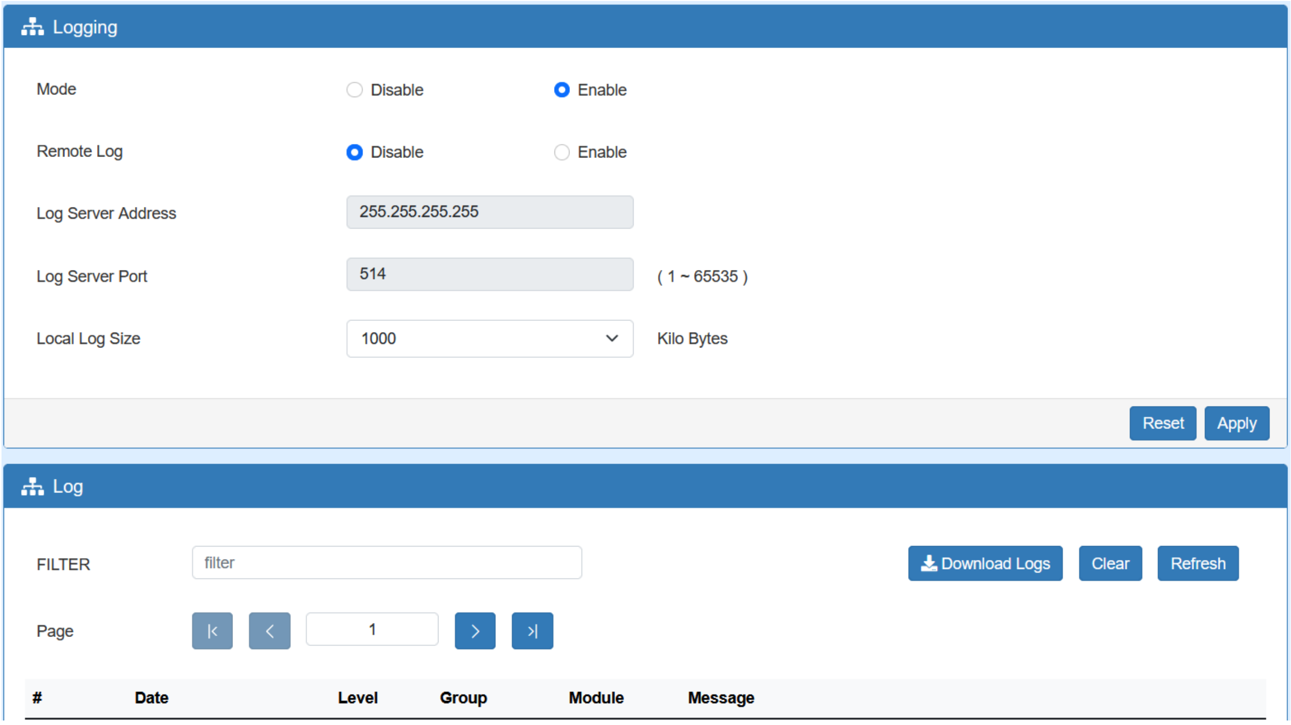
Server Port 123

System > Time and Date > Time Server	
Item	**Description**
Server mode	Turn on/off the time server.
Server port	The UDP port listened by time server.

System > Time and Date > Time Zone Setup	
Item	**Description**
Daylight Saving	Turn on or off the Daylight Savings feature. Select from “Off” or “On”. The default is off.
Ahead of standard time	The forward / backward minutes when enter/leave Daylight Savings duration. Default is 60 mins.
Start Date/Start Time	Time to enter Daylight Savings duration. The Month range is 1~12; 1 - Jan. 2 - Feb. 3 - Mar. 4 - Apr. 5 – May 6 - Jun. 7 - Jul. 8 - Aug. 9 - Sep. 10 - Oct. 11 - Nov. 12 - Dec. The Week range is 1~5; 1 - first week in month. 2 - second week in month 3 - third week in month 4 - fourth week in month 5 - fifth week in month The Day range is 0~6; 0 - Sunday (The start day of a week) 1 - Monday 2 - Tuesday 3 - Wednesday 4 - Thursday 5 - Friday 6 - Saturday The Hour range is 0~23; The Min range is 0~59;
End Date/End Time	Time to leave Daylight Savings duration. Same with Start Date/Start Time.

5.2 Logging

This section allows cellular router to record the data and display the status of data.



Logging

Mode ○ Disable ● Enable

Remote Log ● Disable ○ Enable

Log Server Address: 255.255.255.255

Log Server Port: 514 (1 ~ 65535)

Local Log Size: 1000 Kilo Bytes

Log

FILTER: filter

Page: 1

#	Date	Level	Group	Module	Message

5.2.1 Logging > Logging

(1) Logging section provides you to control all logging records.

(2) Users need to select Apply to confirm your settings.

System > Logging > Logging	
Item	**Description**
Mode	Turn on / off the logging configuration. Select from “Disable” or “Enable”. The default is enable.
Remote Log	The logging messages send to remote log or not. Select from “Disable” or “Enable”. The default is disable.
Log Server Address	When you choose “Enable” on Remote Log, you should input IP address to save and receive all logging data. (***Note:*** This server should have installed Log software.)
Log Server Port	The port number of Log Server.
Local Log Size	Define the maximum file size of log.

5.2.2 Logging > Log

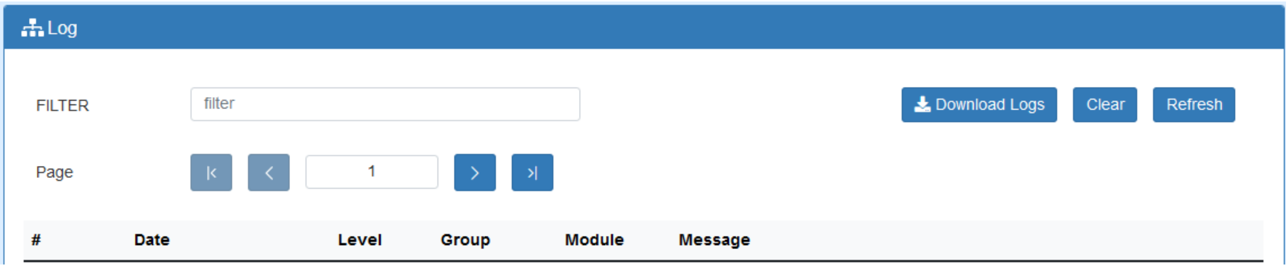
This section displays all status of router.

(1) You can choose Filter function to quickly search for your data.

(2) When you click Clear, all of the data that displays on the page will be cleared totally without any backup.

(3) When you click Refresh, the system will update and display the latest data from your cellular router.

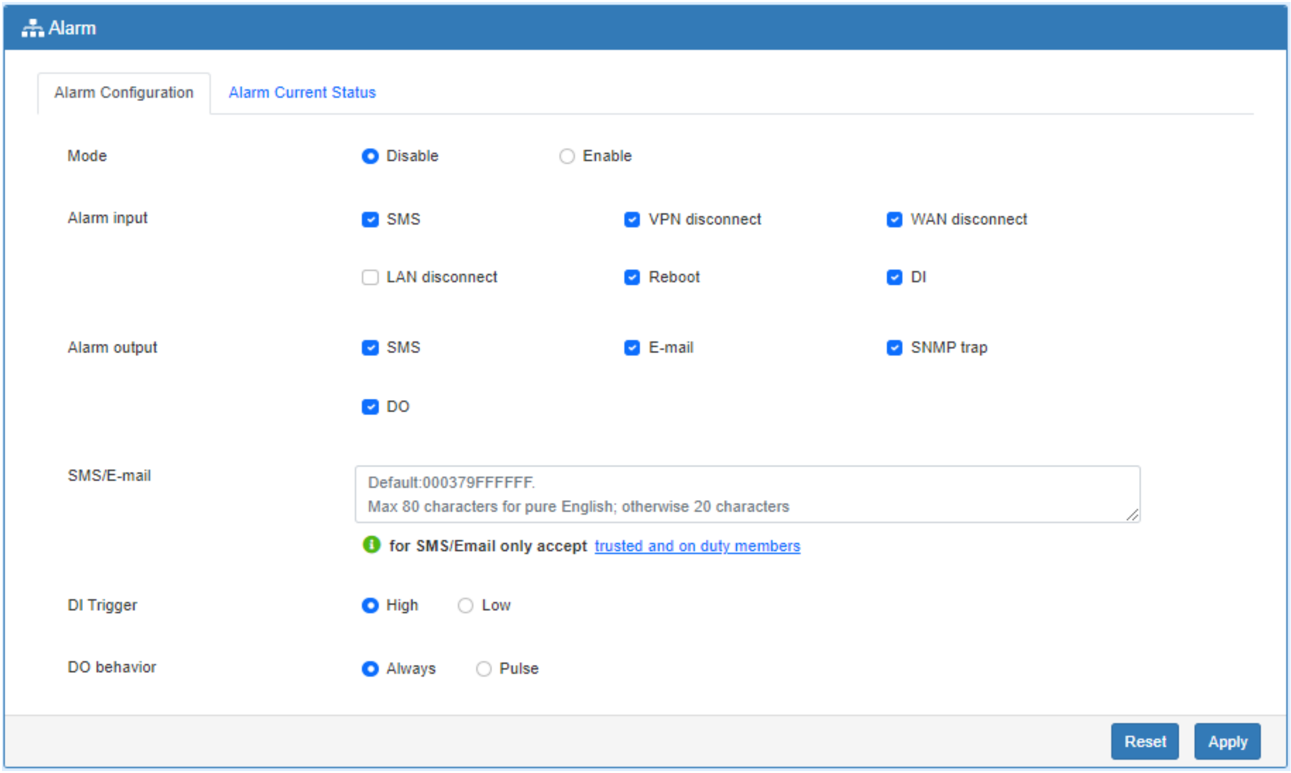
(4) When you click Download Logs, the system will download the latest data from your cellular router.



System > Logging > Log	
Item	**Description**
Filter	Filter the required data quickly.
Date	Show the date of log for each logging data.
Level	Show the date of log for each logging Level.
Group	Show the group of software functions.
Module	Show the module of group of software functions.
Message	Show the messages for each logging data.

5.3 Alarm

This section allows you to configure the alarm.



Mode ● Disable ○ Enable

Alarm input ☑ SMS ☑ VPN disconnect ☑ WAN disconnect ☐ LAN disconnect ☑ Reboot ☑ DI

Alarm output ☑ SMS ☑ E-mail ☑ SNMP trap ☑ DO

SMS/E-mail: Default:000379FFFFFF. Max 80 characters for pure English; otherwise 20 characters

for SMS/Email only accept trusted and on duty members

DI Trigger ● High ○ Low

DO behavior ● Always ○ Pulse

Note:

If you select SMS in Alarm input/output, you need to add the trust phone number into [Contracts/ On Duty].

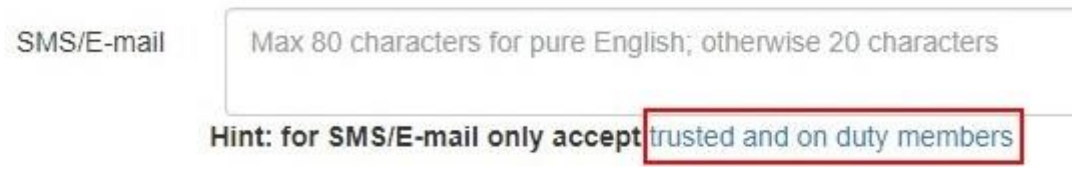
If you select SNMP trap in Alarm output, you need to set up SNMP trap configuration from Service SNMP.

If you select E-Mail in Alarm output, you need to set up SMTP configuration from Service SMTP.

System > Alarm	
Item	**Description**
Mode	Turn on or off the Alarm configuration. Select from “Disable” or “Enable”. The default is disable.
Alarm Input	● **SMS:** It means on duty team members on [Contacts / On Duty] can send SMS to the phone number of using SIM card to trigger alarm. ● **VPN disconnect:** All tunnels get disconnected then trigger alarm. ● **WAN disconnect:** All WAN connections get disconnected then trigger alarm. ● **LAN disconnect:** All LAN connections get disconnected then trigger alarm. ● **Reboot:** Reboot then trigger alarm. ● **DI:** When device gets DI input then trigger alarm.
Alarm Output	Select from SMS, E-mail, SNMP trap and DO as alarm output.
SMS / E-mail	Write your messages and the messages limit 80 pure English characters or 20 characters for other languages to deliver.
DI Trigger	Set High or Low to trigger DI.
DO behavior	Set DO output behavior, always ON or pulse.

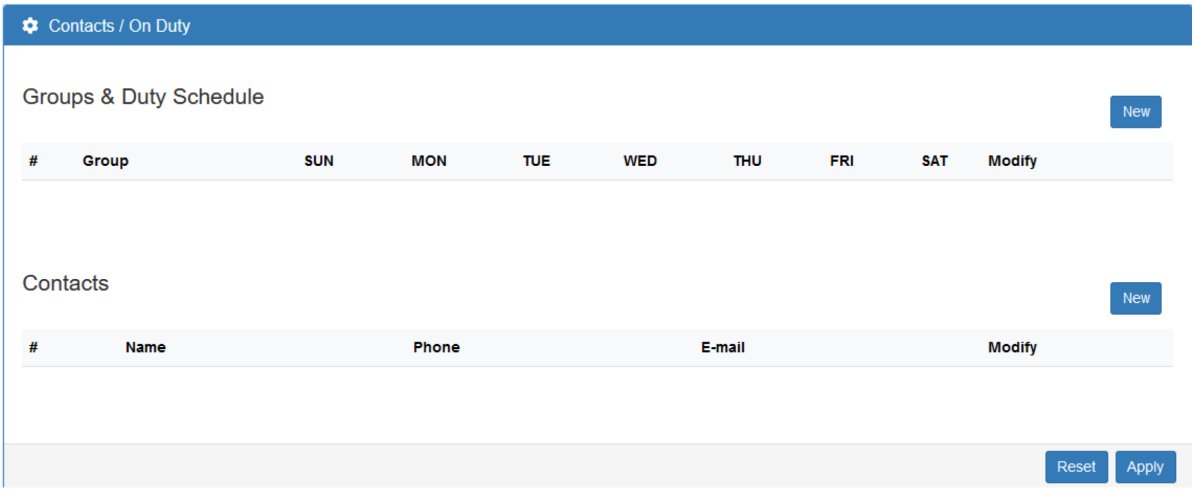
5.3.1 Alarm > Group > Create the Group

- Click **trusted and on duty members** to add trusted user who can send SMS message or receive the mail from device.



SMS/E-mail: Max 80 characters for pure English; otherwise 20 characters

Hint: for SMS/E-mail only accept trusted and on duty members



Contacts / On Duty

Groups & Duty Schedule

New

#	Group	SUN	MON	TUE	WED	THU	FRI	SAT	Modify

Contacts

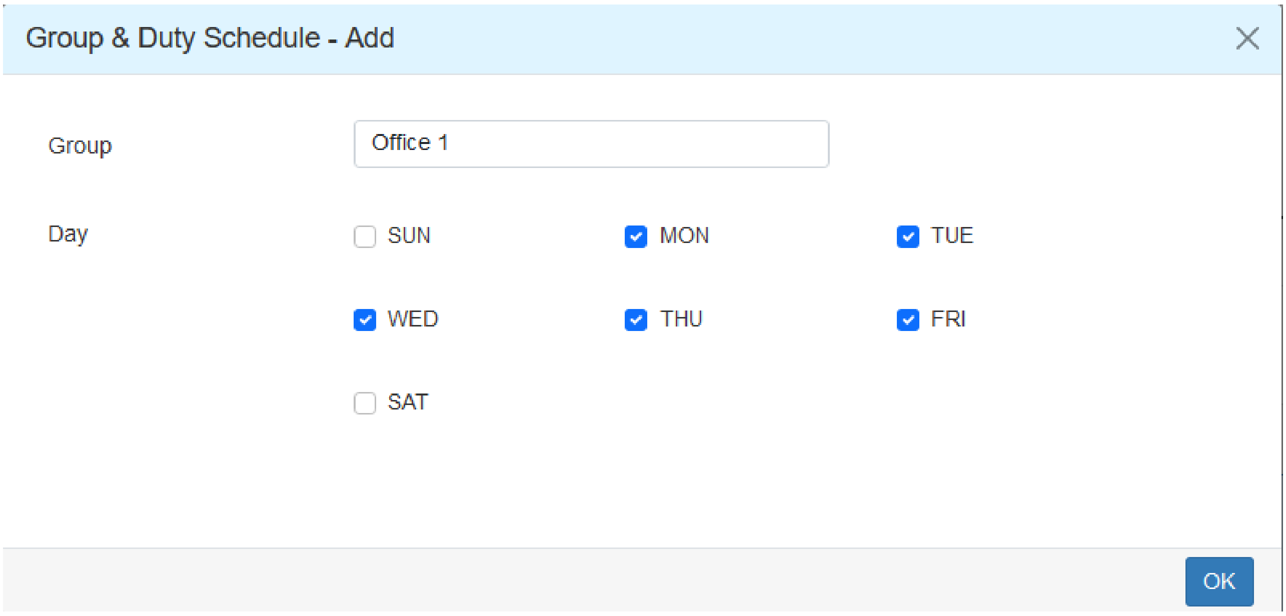
New

#	Name	Phone	E-mail	Modify

Reset Apply

Firstly, we need to create the group and assign the duty day.

The settings below mean the user who only takes effect from Monday to Friday every week in-group “Office 1”.



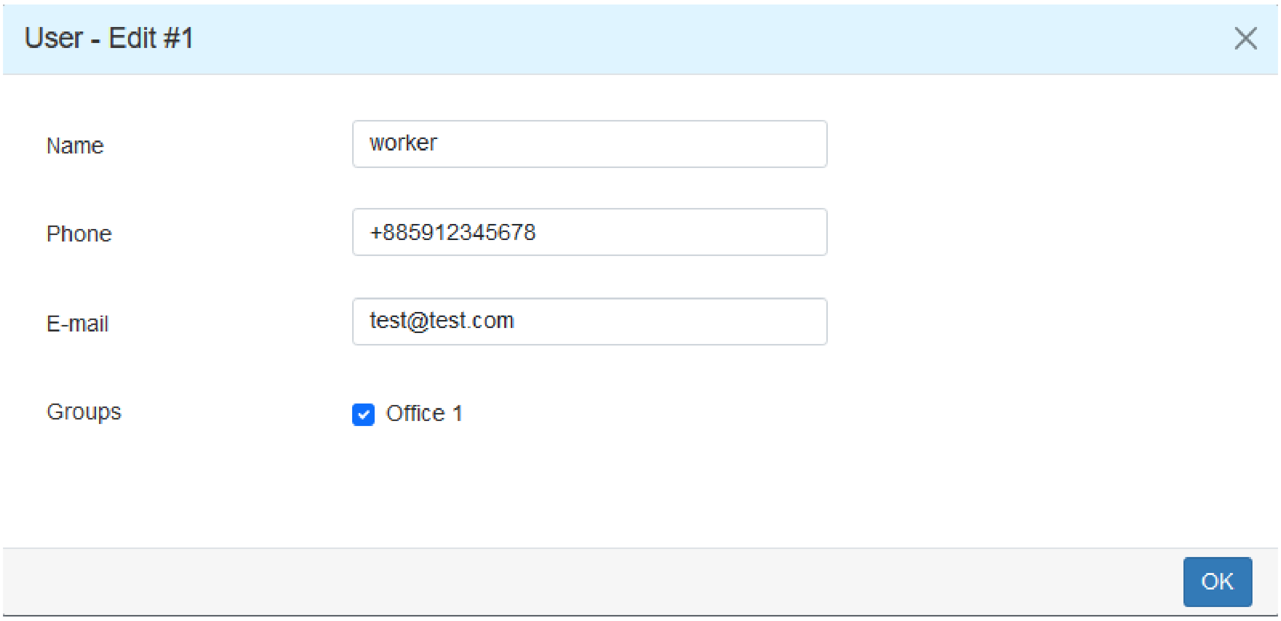
Group & Duty Schedule - Add

Group: Office 1

Day: □ SUN ☑ MON ☑ TUE ☑ WED ☑ THU ☑ FRI □ SAT

5.3.2 Alarm > Contacts > Add User

Once the group created, we need to create the new user and assign to the group we created. Device only accepts the phone number that specify here.



User - Edit #1

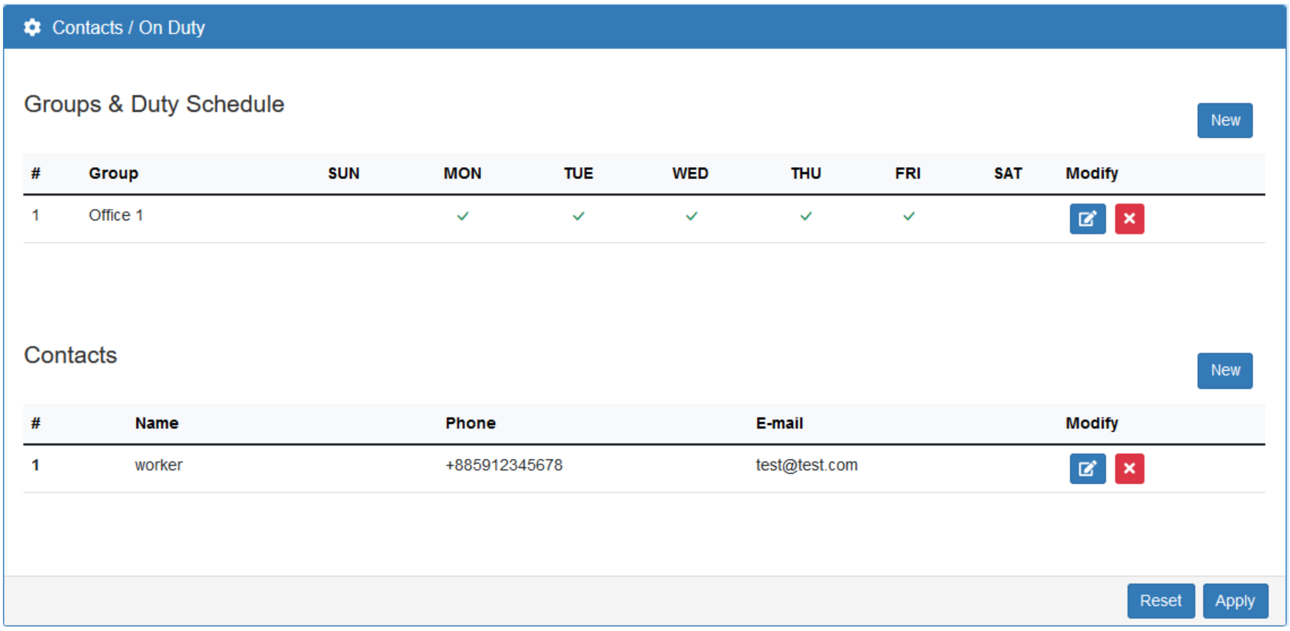
Name: worker

Phone: +885912345678

E-mail: test@test.com

Groups: ☑ Office 1

After submitting your setting, the interface returns to Group window setting. Now you can see your naming group and the user’s information that you have added.



Contacts / On Duty

Groups & Duty Schedule

#	Group	SUN	MON	TUE	WED	THU	FRI	SAT	Modify
1	Office 1		✓	✓	✓	✓	✓		

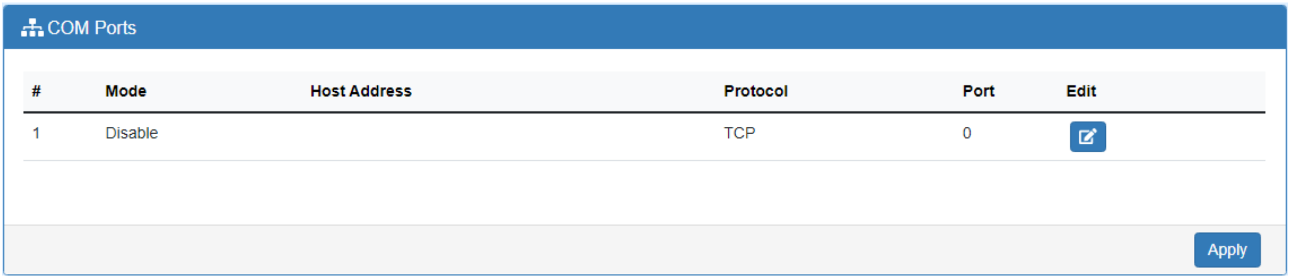
Contacts

#	Name	Phone	E-mail	Modify
1	worker	+885912345678	test@test.com	

5.4 COM Ports

This section allows user to configure the COM port settings and remotely manage the device through the virtual COM setting. For the remote management, the managed device should connect to the cellular router by serial interface.

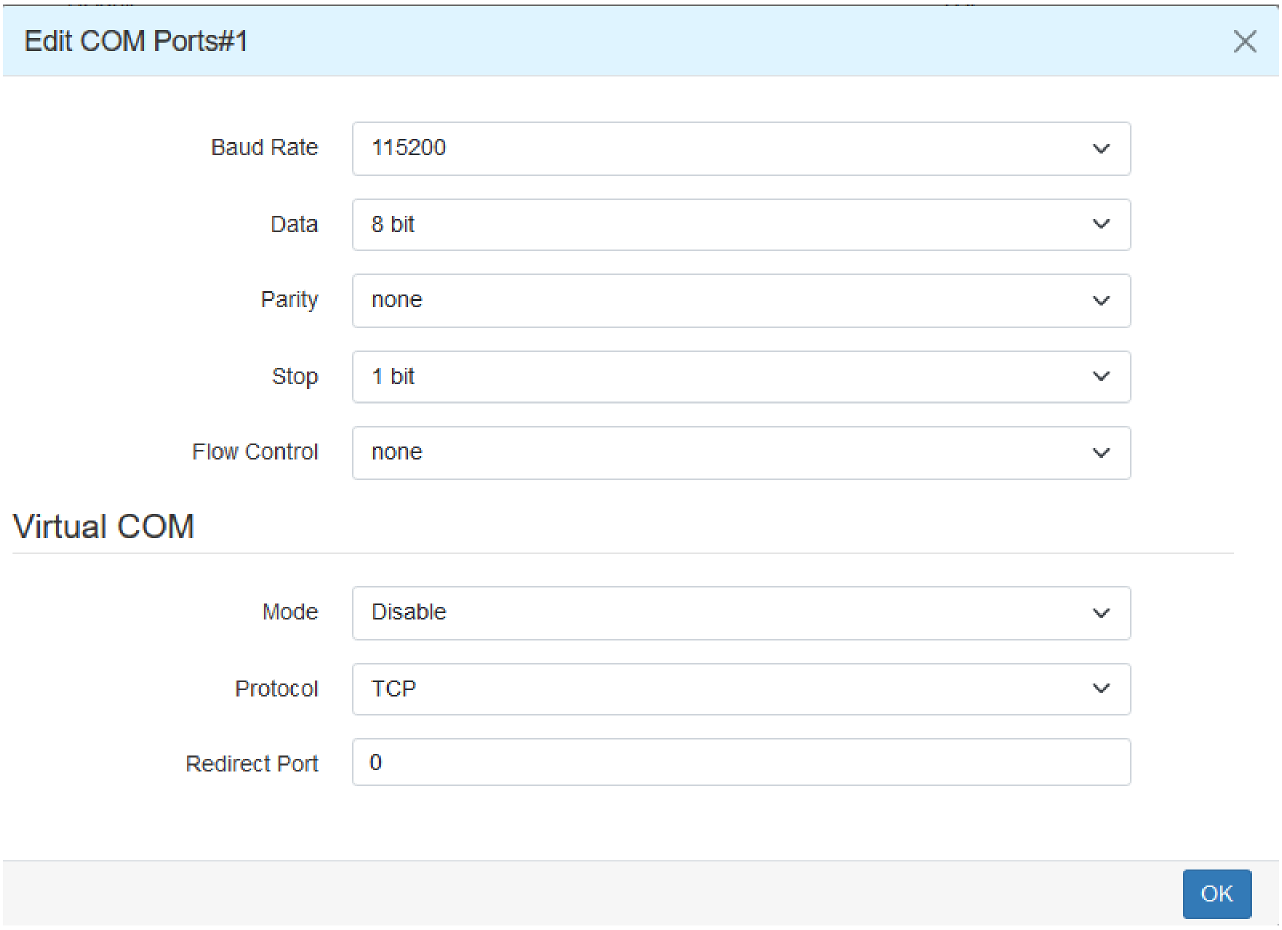
(1) The default is Disable. You can click edit button to configure your settings.



COM Ports

#	Mode	Host Address	Protocol	Port	Edit
1	Disable		TCP	0	

(2) Set up the configuration and Virtual COM. After configuring, click OK to confirm your settings.



Edit COM Ports#1

Baud Rate: 115200

Data: 8 bit

Parity: none

Stop: 1 bit

Flow Control: none

Virtual COM

Mode: Disable

Protocol: TCP

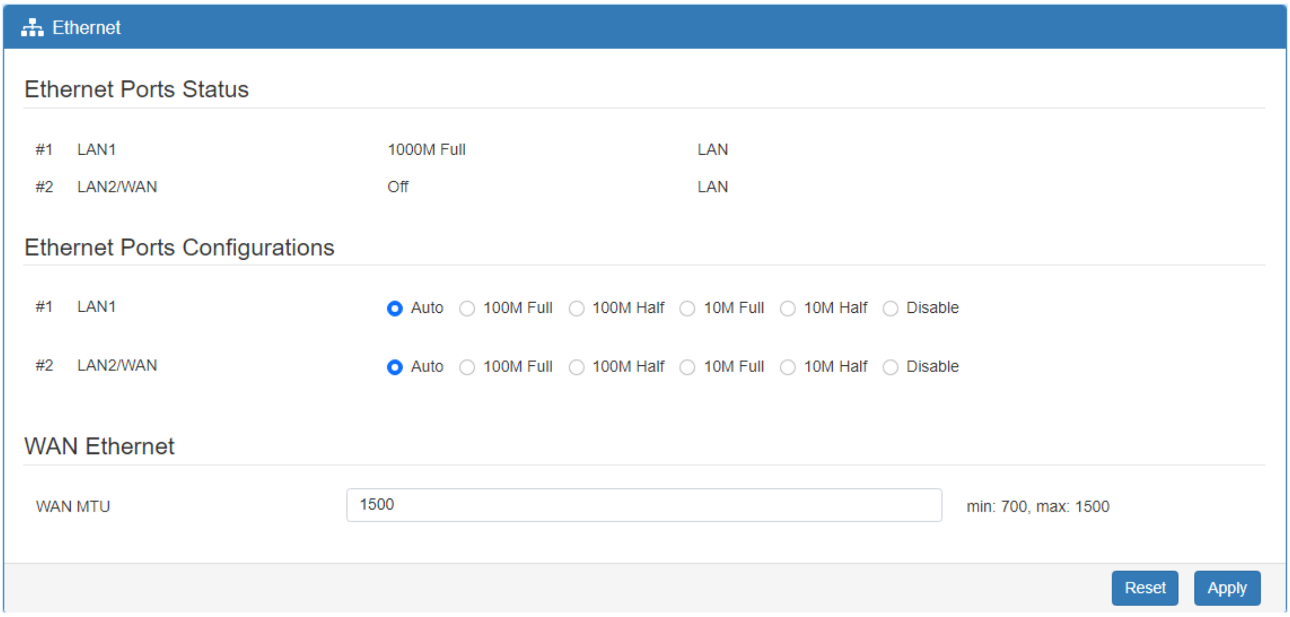
Redirect Port: 0

(3) The interface shows the setting information and click Apply to configure.

System > COM Ports	
Item	**Description**
Edit Configuration	
Baud Rate	Select from the current Baud Rate.
Data	Select from 7 bit or 8 bit.
Parity	Select from the information of Parity.
Stop	Select from 1 bit or 2 bit.
Flow Control	Select from none, Xon/Xoff or hardware.
Virtual COM	
Mode	Select from Disable, Server or Client.
Protocol	Select from TCP or UDP.
Redirect Port	● Server Mode: This network package of cellular router is on this port. ● Client Mode: The network package of remote device is on the remote host.

5.5 Ethernet

This section allows you to configure the Ethernet switch port.



Ethernet Ports Status

#1	LAN1	1000M Full	LAN
#2	LAN2/WAN	Off	LAN

Ethernet Ports Configurations

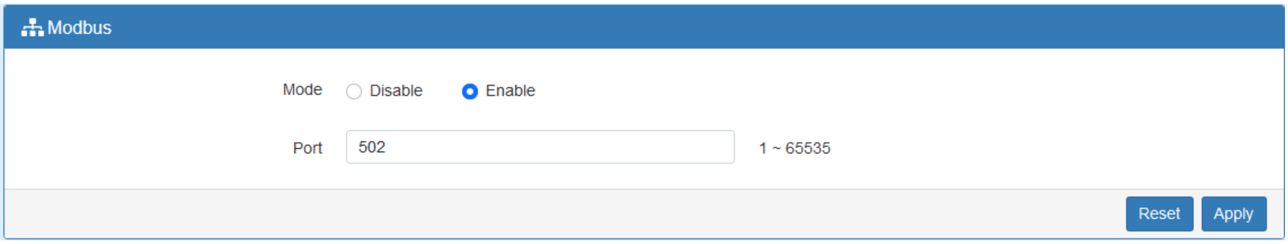
#1 LAN1 ● Auto ○ 100M Full ○ 100M Half ○ 10M Full ○ 10M Half ○ Disable

#2 LAN2/WAN ● Auto ○ 100M Full ○ 100M Half ○ 10M Full ○ 10M Half ○ Disable

WAN Ethernet

WAN MTU 1500 min: 700, max: 1500

System > Ethernet	
Item	**Description**
Ethernet Ports Status	Show the connectivity status of LAN and WAN.
Ethernet Ports Configurations	Select from Auto, 100M Full, 100M Half, 10M Full, 10M Half and Disable.



Mode ○ Disable ● Enable

Port 502 1 ~ 65535

5.6 Modbus

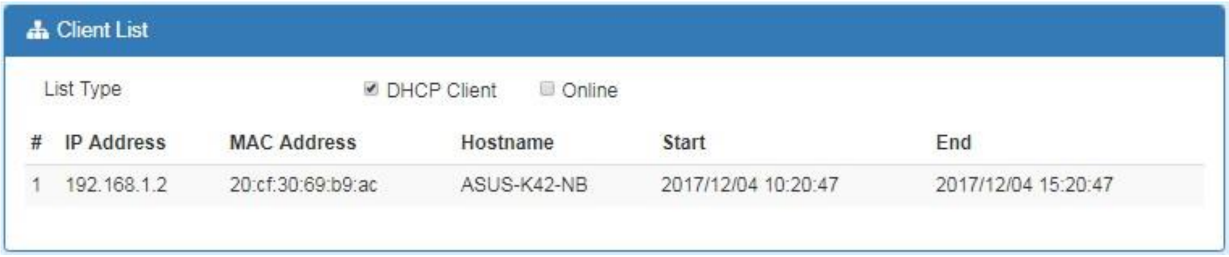
This section allows you to configure the Modbus.

System > Modbus	
Item	**Description**
Mode	Select from Disable or Enable.
Port	The listening port of Modbus TCP.

5.7 Client List

This section allows you to understand how many devices have been connected and their status from the router. There are two types, one is **DHCP Client** and the other is **Online**. The default is both types to show all status when the router is on DHCP Client and Online.

For **DHCP Client** type, the information shows IP address, MAC address, Hostname and the expiry time of IP (Start/End).

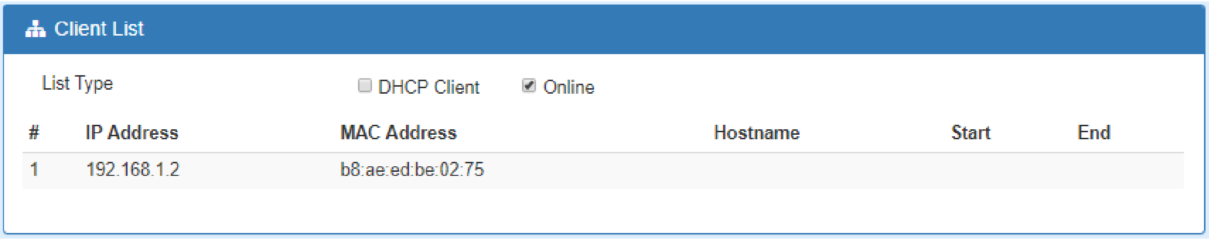


Client List

List Type ☑ DHCP Client □ Online

#	IP Address	MAC Address	Hostname	Start	End
1	192.168.1.2	20:cf:30:69:b9:ac	ASUS-K42-NB	2017/12/04 10:20:47	2017/12/04 15:20:47

For **Online** type, the information shows IP address and MAC address when the client is online.



Client List

List Type □ DHCP Client ☑ Online

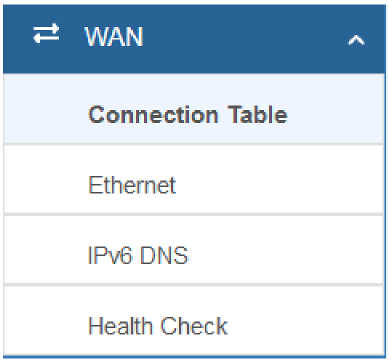
#	IP Address	MAC Address	Hostname	Start	End
1	192.168.1.2	b8:ae:ed:be:02:75			

d

System > Client List	
Item	**Description**
List Type	● **DHCP Client:** List all clients' information when it is via DHCP. ● **Online:** List the information when it is online.

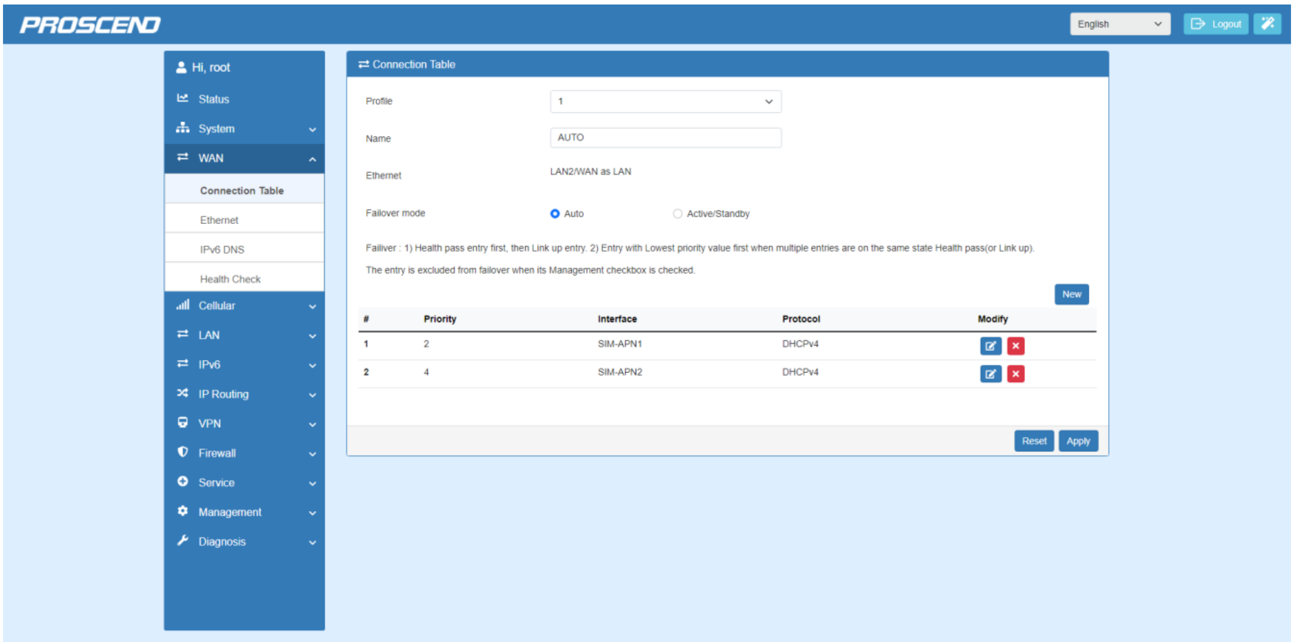
6 Web Menu Item > WAN

This section allows you to configure WAN, including Connection Table, IPv6 DNS, Health Check.



6.1 Connection Table

This section allows to configure the priority for Ethernet WAN and each APN of SIM slot. LAN2/WAN Ethernet port default as LAN port, it will change to WAN if interface WAN selected to configure the priority.



Profile: 1

Name: AUTO

Ethernet: LAN2/WAN as LAN

Failover mode: ● Auto ○ Active/Standby

Failiver : 1) Health pass entry first, then Link up entry. 2) Entry with Lowest priority value first when multiple entries are on the same state Health pass(or Link up).

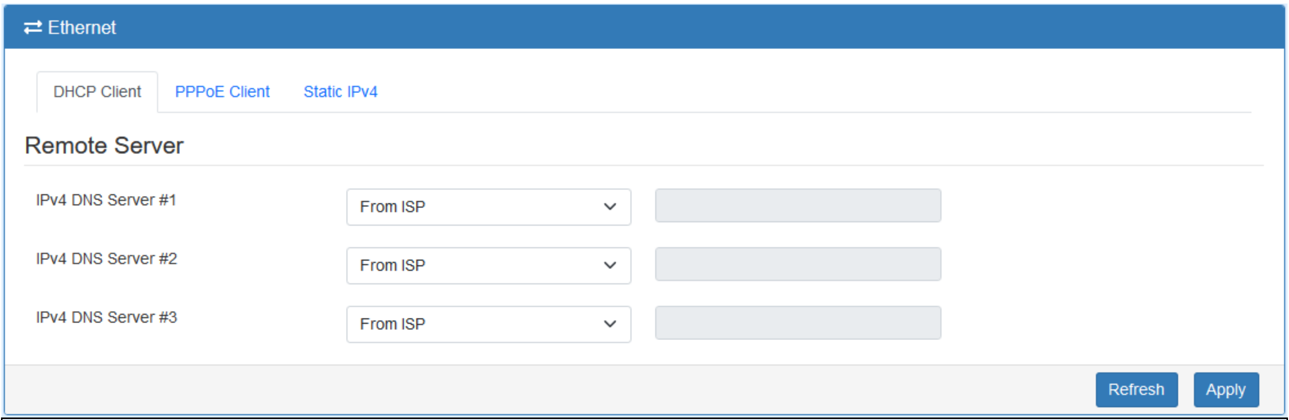
The entry is excluded from failover when its Management checkbox is checked.

#	Priority	Interface	Protocol	Modify
1	2	SIM-APN1	DHCPv4	
2	4	SIM-APN2	DHCPv4	

WAN > Connection Table	
Item	**Description**
Profile	Profile number. There are 3 profiles allow to set in advance.
Name	Name for profile
Failover mode	Interface priority for failover operation. Only the highest priority interface is working. The other one is standby interface.

6.2 Ethernet

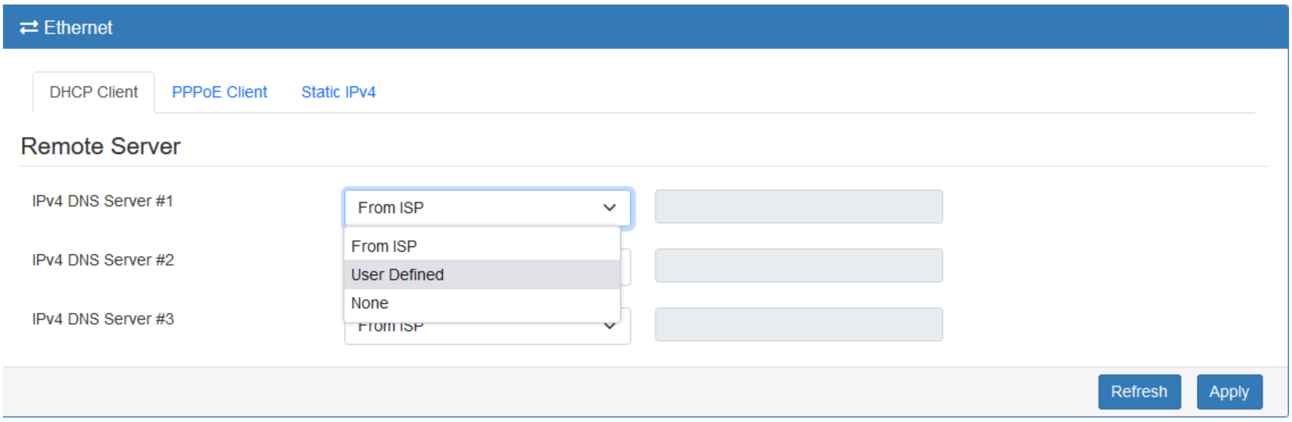
This section provides three options to obtain the IP of Ethernet WAN. The options include DHCP Client, PPPoE Client and Static IPv4. The default is DHCP Client.



WAN > Ethernet	
Item	**Description**
WAN Ethernet	● **DHCP Client:** DHCP server-assigned IP address, netmask, gateway, and DNS. ● **PPPoE Client:** Your ISP will provide you with a username and password. This option is typically used for DSL services. ● **Static IPv4:** User-defined IP address, netmask, and gateway address.

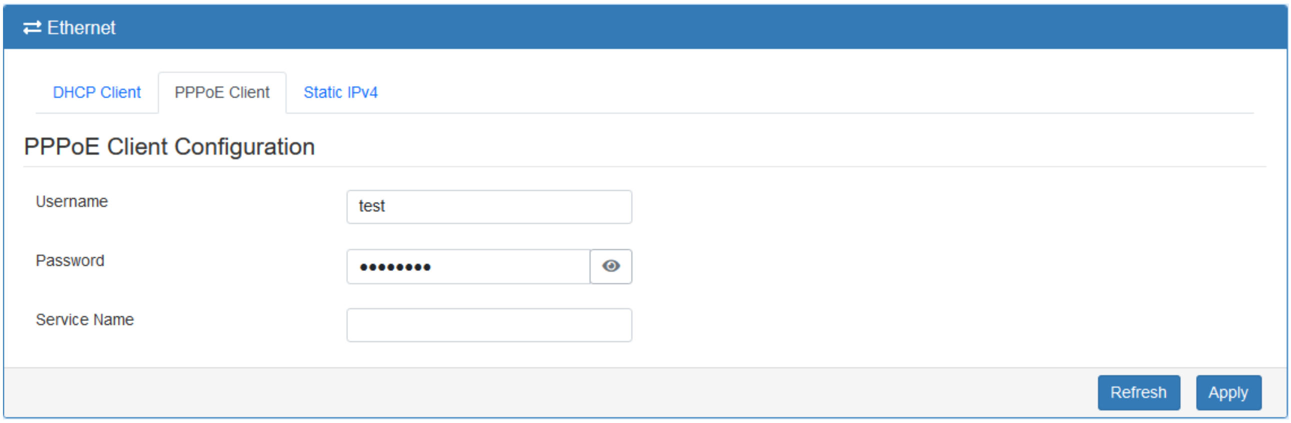
When selecting “DHCP Client”, you can set up DNS Server Configuration.

For IPv4 DNS Server, it provides three options to set up and each option has provided with “From ISP”, “User Defined” and “None” to configure.



WAN > Ethernet > DHCP Client	
Item	**Description**
IPv4 DNS Server #1 **IPv4 DNS Server #2** **IPv4 DNS Server #3**	● Each setting DNS Server has three options, including “From ISP”, “User Defined” and “None”. ● When you select “From ISP”, the IPv4 DNS server IP will be assigned by ISP. ● When you select “User Defined”, user inputs the IPv4 DNS server IP manually.

When you select “PPPoE Client”, the interface shows the item of configuration to fill in your Username and Password. Service name is an option setting.



⇄ Ethernet

DHCP Client | PPPoE Client | Static IPv4

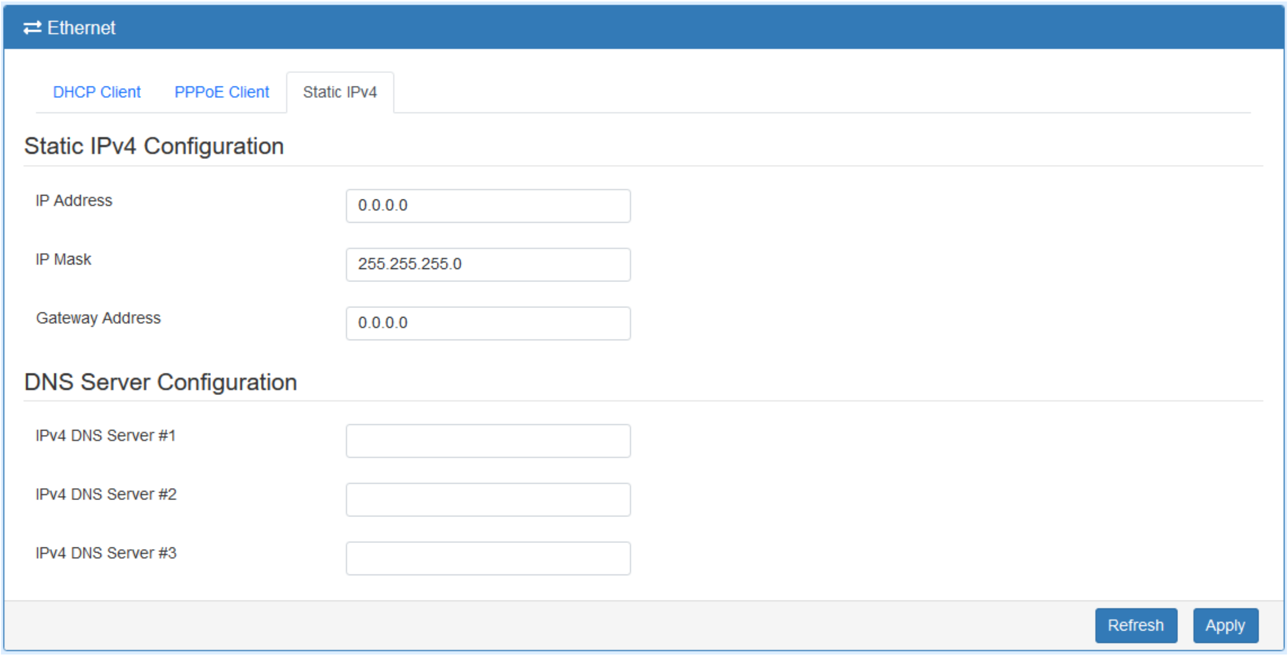
PPPoE Client Configuration

Username: test

Password: ••••••••

Service Name:

When you select Static IPv4, the interface shows the information of configuration, including IP Address, IP Mask and Gateway Address.



⇄ Ethernet

DHCP Client | PPPoE Client | Static IPv4

Static IPv4 Configuration

IP Address: 0.0.0.0

IP Mask: 255.255.255.0

Gateway Address: 0.0.0.0

DNS Server Configuration

IPv4 DNS Server #1:

IPv4 DNS Server #2:

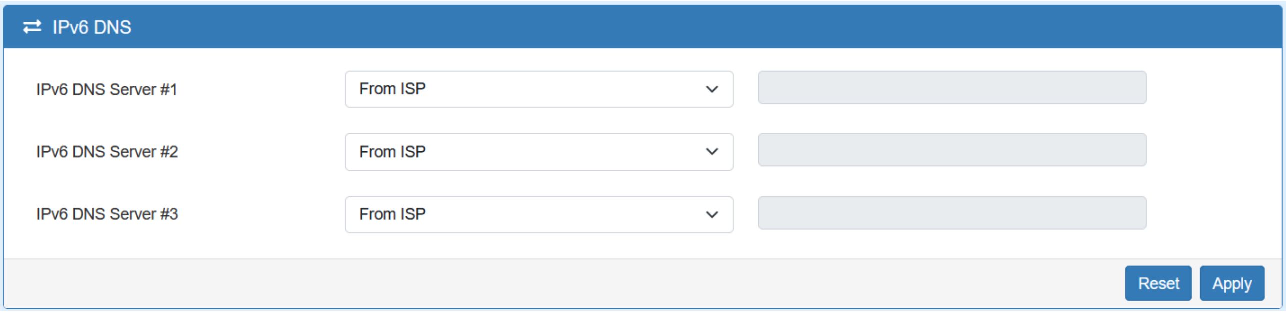
IPv4 DNS Server #3:

WAN > Ethernet > Static IPv4	
Item	**Description**
Static IPv4 Configuration	
IP Address	Fill in the IP Address.
IP Mask	Fill in the IP Mask.
Gateway Address	Fill in Gateway Address.
DNS Server Configuration	
IPv4 DNS Server #1~3	User can enter the IPv4 DNS server IP manually.

6.3 IPv6 DNS

This section allows you to set up IPv6 DNS Server Configuration.

For IPv6 DNS Server, it provides three options to set up and each option has provided with “From ISP”, “User Defined” and “None” to configure.



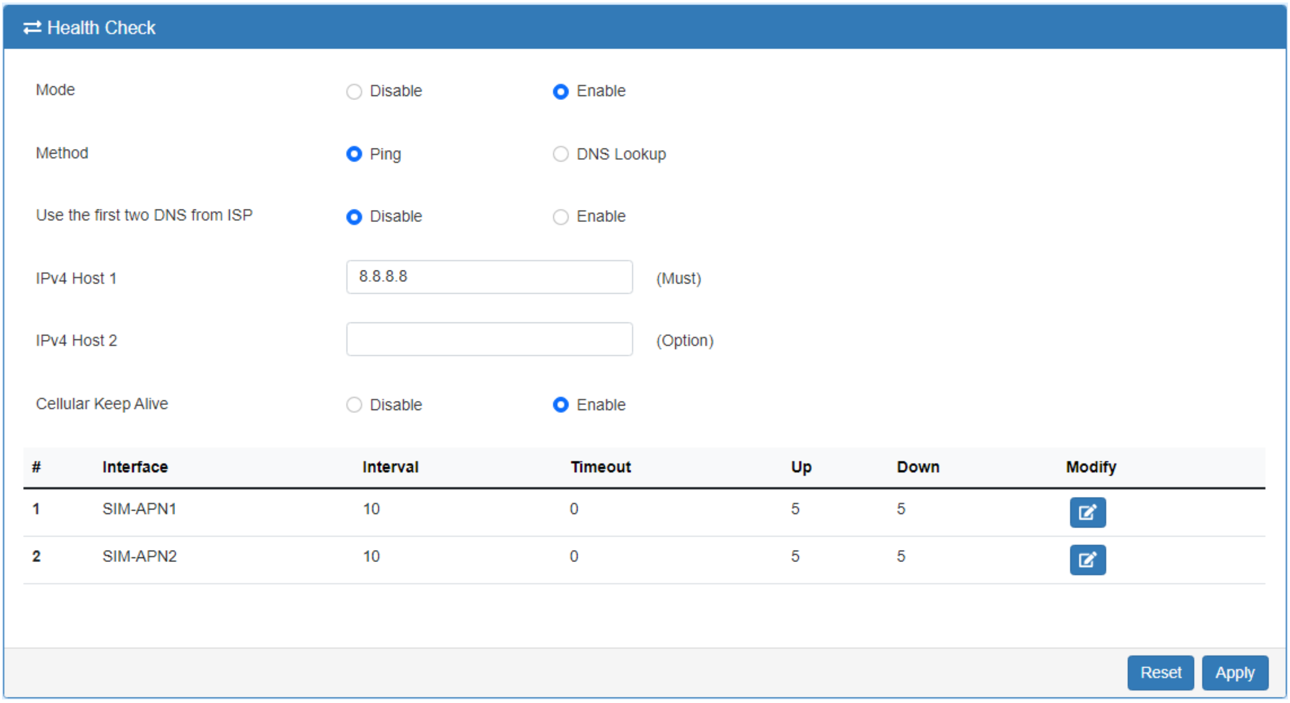
⇄ IPv6 DNS

IPv6 DNS Server #1	From ISP	
IPv6 DNS Server #2	From ISP	
IPv6 DNS Server #3	From ISP	

WAN > IPv6 DNS	
Item	**Description**
IPv6 DNS Server #1 IPv6 DNS Server #2 IPv6 DNS Server #3	Each setting DNS Server has three options, including “From ISP”, “User Defined” and “None”. When you select “From ISP”, the IPv6 DNS server IP will be assigned by ISP. When you select “User Defined”, the IPv6 DNS server IP is entered by user .

6.4 Health Check

This section allows user to configure the WAN healthy check for failover function between different APN of SIM slot and Ethernet WAN.



⇄ Health Check

Mode ○ Disable ● Enable

Method ● Ping ○ DNS Lookup

Use the first two DNS from ISP ● Disable ○ Enable

IPv4 Host 1: 8.8.8.8 (Must)

IPv4 Host 2: (Option)

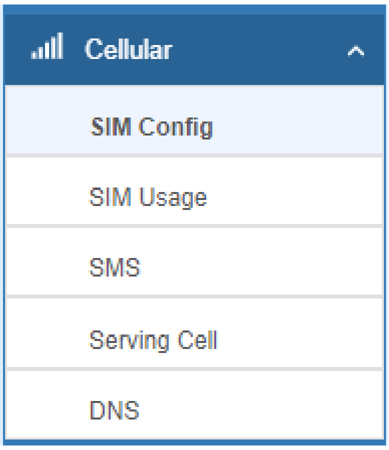
Cellular Keep Alive ○ Disable ● Enable

#	Interface	Interval	Timeout	Up	Down	Modify
1	SIM-APN1	10	0	5	5	✎
2	SIM-APN2	10	0	5	5	✎

WAN > Health Check	
Item	**Description**
Mode	● Select from “Disable” or “Enable”. The default is Enable. ● When “Disable” is chosen, the connection will NOT be treated as down of IP routing error.
Method	This setting specifies the health check method for the WAN connection. This Value can be PING, DNS Lookup. The default is Ping. DNS Lookup: Connections will be considered as up if DNS responses are received from any one of the health check DNS servers, regardless of a positive or negative result.
Use the first two DNS from ISP	● If this setting is checked, the first two DNS from ISP will be DNS lookup targets for checking a connection health. ● If this setting is not checked, Host 1 must be filled, while a value for Host 2 is optional.
IPv4 Host 1	Input the address of IPv4 Host 1.
IPv4 Host 2	Input the address of IPv4 Host 2. This field is optional.
Cellular Keep Alive	keep cellular connections always up with ping check

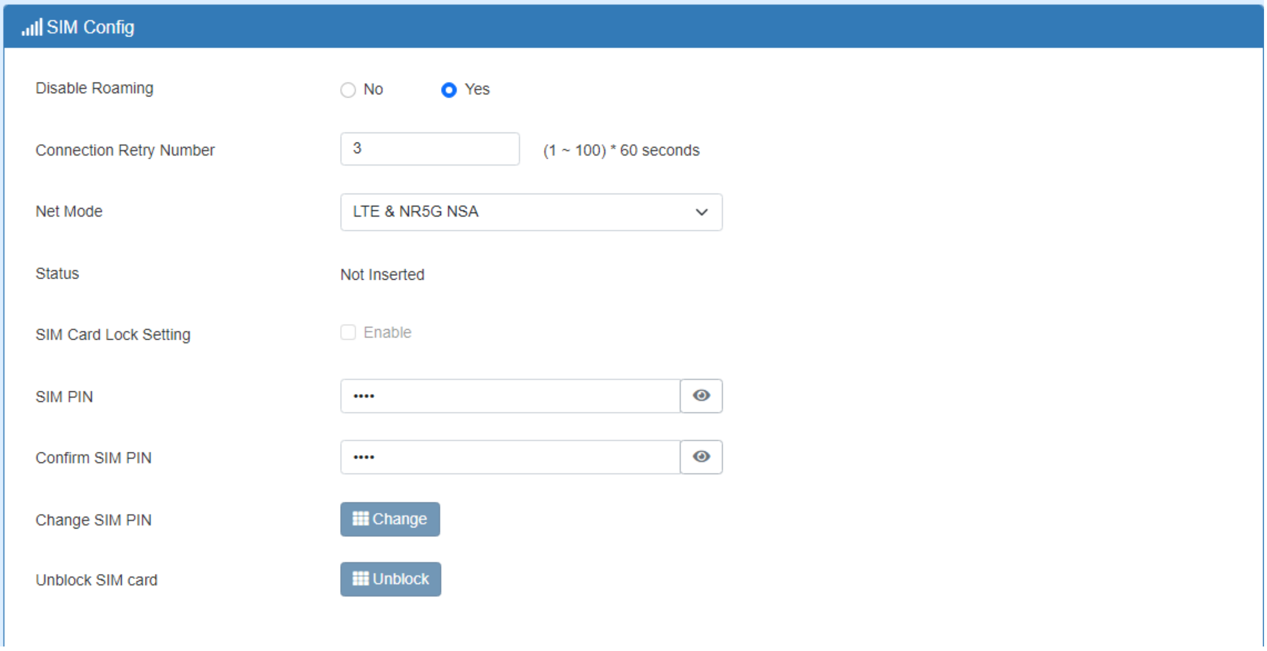
7 Web Menu Item > Cellular

This section allows you to configure the LTE Config, APN, APN1/2 Usage, SMS, Serving Cell, and DNS.



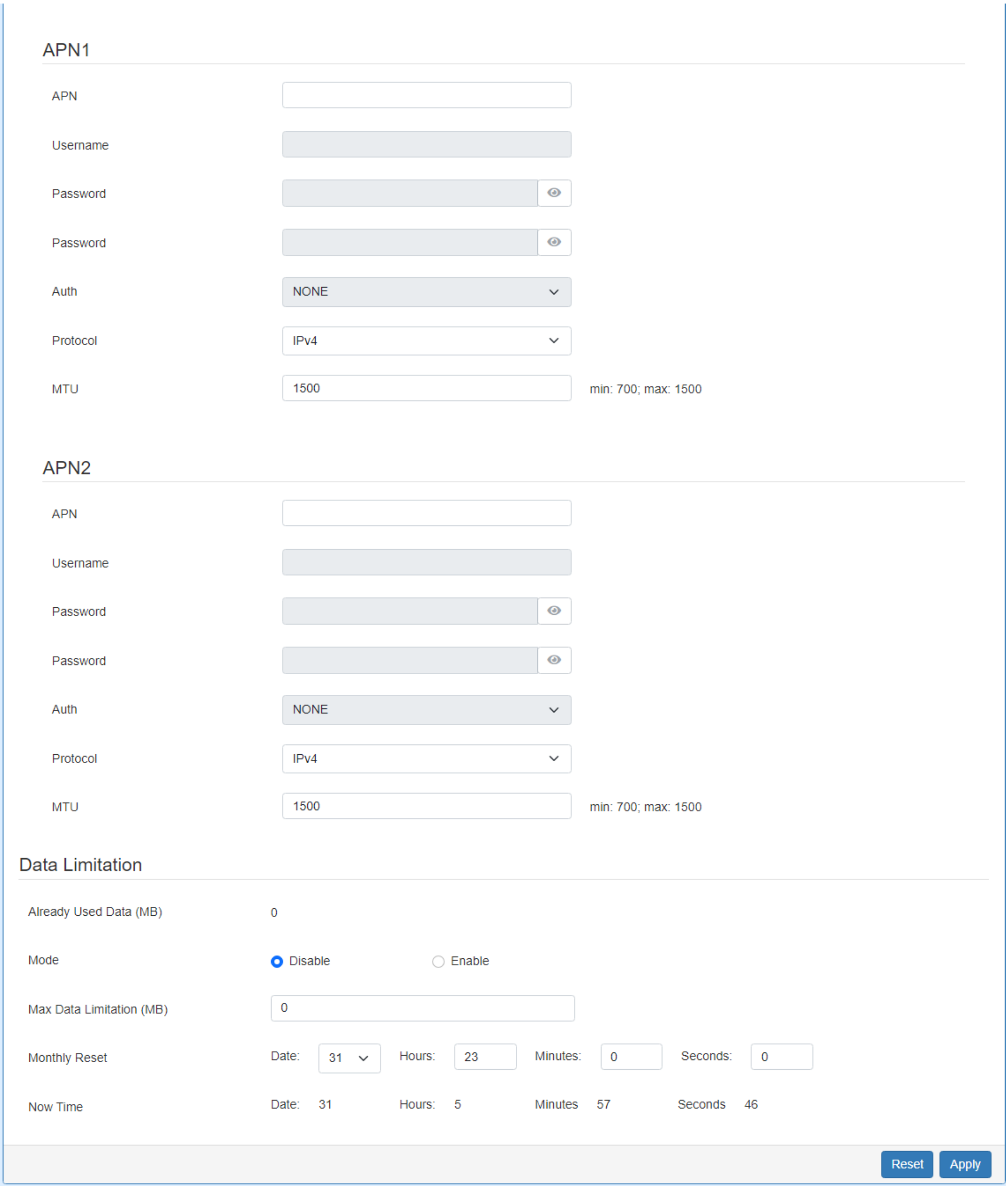
7.1 SIM Config

This section allows user to setup configuration for the SIM card.



SIM Config

Disable Roaming	○ No ● Yes
Connection Retry Number	3 (1 ~ 100) * 60 seconds
Net Mode	LTE & NR5G NSA
Status	Not Inserted
SIM Card Lock Setting	□ Enable
SIM PIN	••••
Confirm SIM PIN	••••
Change SIM PIN	Change
Unblock SIM card	Unblock



APN1

APN

Username

Password

Password

Auth: NONE

Protocol: IPv4

MTU: 1500 min: 700; max: 1500

APN2

APN

Username

Password

Password

Auth: NONE

Protocol: IPv4

MTU: 1500 min: 700; max: 1500

Data Limitation

Already Used Data (MB): 0

Mode: ● Disable ○ Enable

Max Data Limitation (MB): 0

Monthly Reset: Date: 31 Hours: 23 Minutes: 0 Seconds: 0

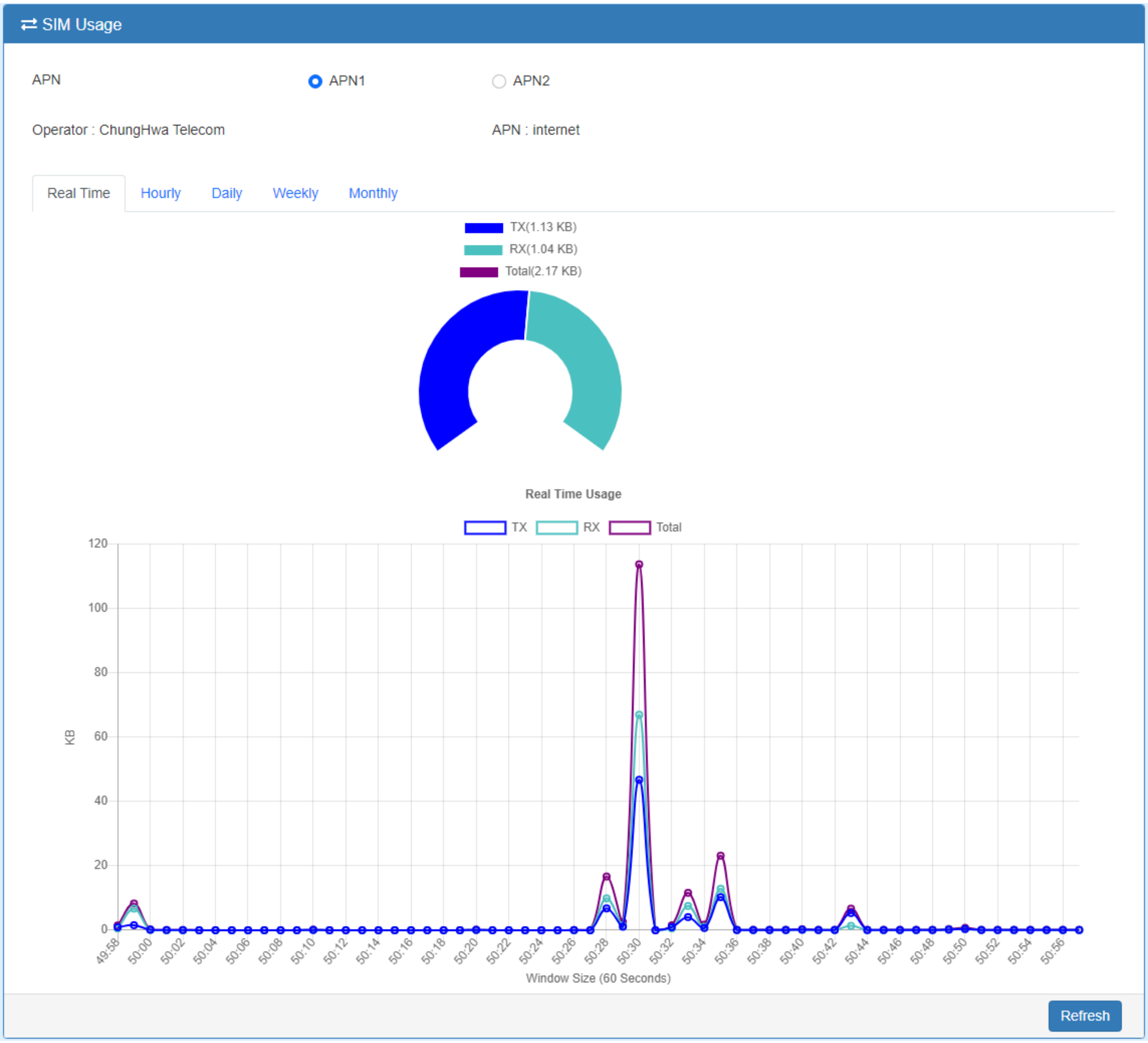
Now Time: Date: 31 Hours: 5 Minutes 57 Seconds 46

Cellular > SIM Config	
Item	**Description**
Disable Roaming	● **No:** Enable the roaming function. ● **Yes:** Disable the roaming function.
Connection Retry Number	The number of attempts to connect to the network. The interval between each attempt is 60 seconds.
SIM Configurations	

Net Mode	● **Auto :** Automatically connect the possible band. ● **3G Only:** Connect to 3G network only. ● **4G Only:** Connect to 4G network only. ● **LTE & NR5G NSA:** Connect to LTE & NR5G NSA ● **NR5G NSA Only:** Connect to NR5G NSA Only
Status	Display the status of SIM Card.
SIM Card Lock Setting	● Enable to display SIM PIN setting. ● Disable to hide SIM PIN setting.
SIM PIN	A password personal identification number (PIN) for ordinary use to protect your SIM card.
Confirm SIM PIN	Double confirm SIM PIN password.
Change SIM PIN	If you want to change SIM PIN code, you can click Change button and type old SIM PIN code and new SIM PIN code. Please aware not to exceed the retry number (PIN remaining number and PUN remaining number).
Unblock SIM card	If user input the wrong SIM PIN more than 3 times, the user needs another password personal unblocking code (PUK) for PIN unlocking. Please check your operator for forgotten PUK number.
APN1 / APN2	
APN	The Access Point Name (APN) is the name of the setting that set up a connection to the gateway between your carrier's cellular network and the public Internet. Leaving it empty will search internally database automatically by SIM card for connection.
Username	Username for authentication. The username can be input by user or the system will search from internal database if the APN setting is empty.
Password	Password for authentication. The password can be input by user or the system will search from internal database if the APN setting is empty.
Confirm Password	Double confirm password.
Auth	Select the authentication method (None/PAP/CHAP).
Protocol	If IPv6 is not selected, then only pure IPv4 connection.
MTU	It allows user to adjust the MTU size to fit into their existing network environment.
Data Limitation	
Already Used Data (MB)	Display current used Data since last reset.
Mode	Turn on/off the Data Limitation to disable or enable.
Max Data Limitation (MB)	Configure maximum Data Limitation.
Monthly Reset	Set up the reset time during the month.
Now Time	Show the current time of system.

7.2 SIM Usage

This section shows the status of **APN**, **operator** and the charts for **Real Time**, **Hourly**, **Daily**, **Weekly**, and **Monthly**.



⇄ SIM Usage

APN ● APN1 ○ APN2

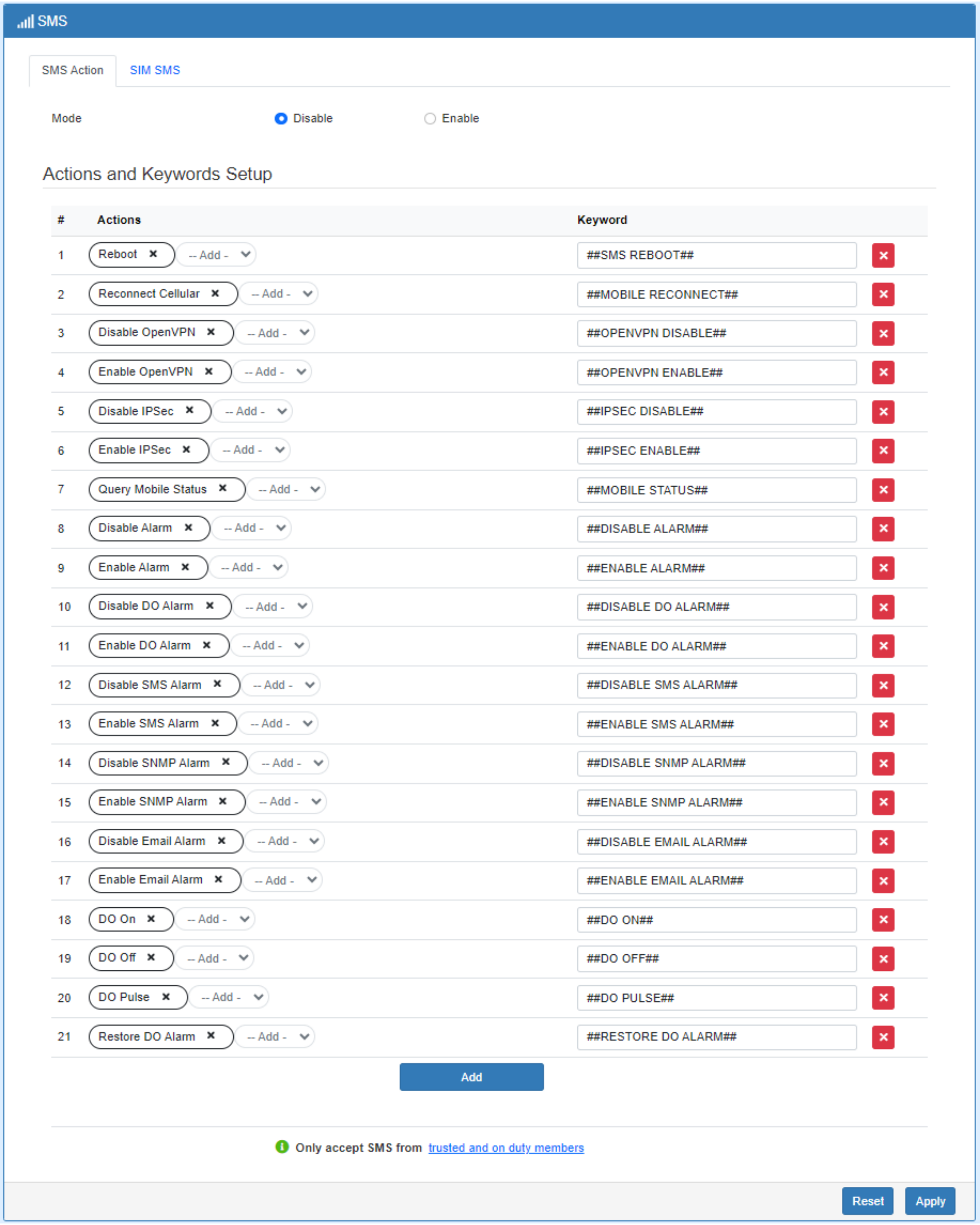
Operator : ChungHwa Telecom

APN : internet

7.3 SMS

This section provides two settings, one is **SMS Action**, and the other is **View SMS**.

(1) When enabling **SMS Action**, it allows trust phone numbers which in [Contacts/On Duty] list by sending key words SMS to trigger device setting/action/query status.



SMS

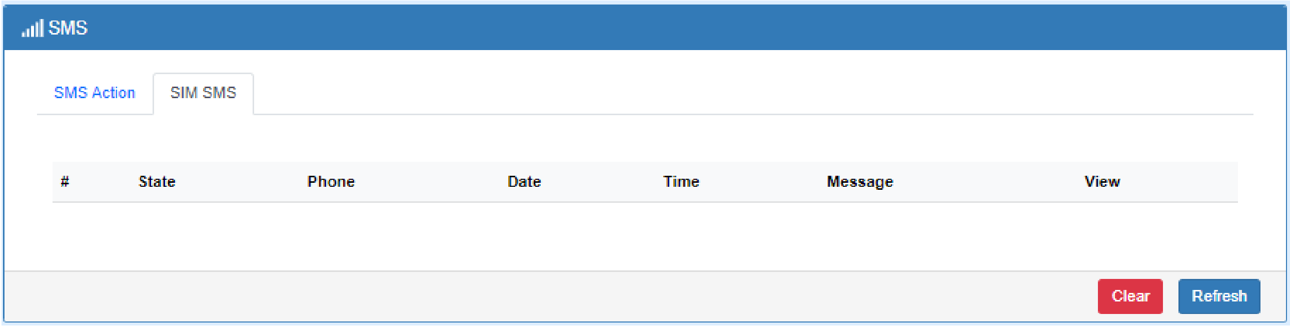
Mode ● Disable ○ Enable

Actions and Keywords Setup

#	Actions	Keyword
1	Reboot	##SMS REBOOT##
2	Reconnect Cellular	##MOBILE RECONNECT##
3	Disable OpenVPN	##OPENVPN DISABLE##
4	Enable OpenVPN	##OPENVPN ENABLE##
5	Disable IPSec	##IPSEC DISABLE##
6	Enable IPSec	##IPSEC ENABLE##
7	Query Mobile Status	##MOBILE STATUS##
8	Disable Alarm	##DISABLE ALARM##
9	Enable Alarm	##ENABLE ALARM##
10	Disable DO Alarm	##DISABLE DO ALARM##
11	Enable DO Alarm	##ENABLE DO ALARM##
12	Disable SMS Alarm	##DISABLE SMS ALARM##
13	Enable SMS Alarm	##ENABLE SMS ALARM##
14	Disable SNMP Alarm	##DISABLE SNMP ALARM##
15	Enable SNMP Alarm	##ENABLE SNMP ALARM##
16	Disable Email Alarm	##DISABLE EMAIL ALARM##
17	Enable Email Alarm	##ENABLE EMAIL ALARM##
18	DO On	##DO ON##
19	DO Off	##DO OFF##
20	DO Pulse	##DO PULSE##
21	Restore DO Alarm	##RESTORE DO ALARM##

Only accept SMS from trusted and on duty members

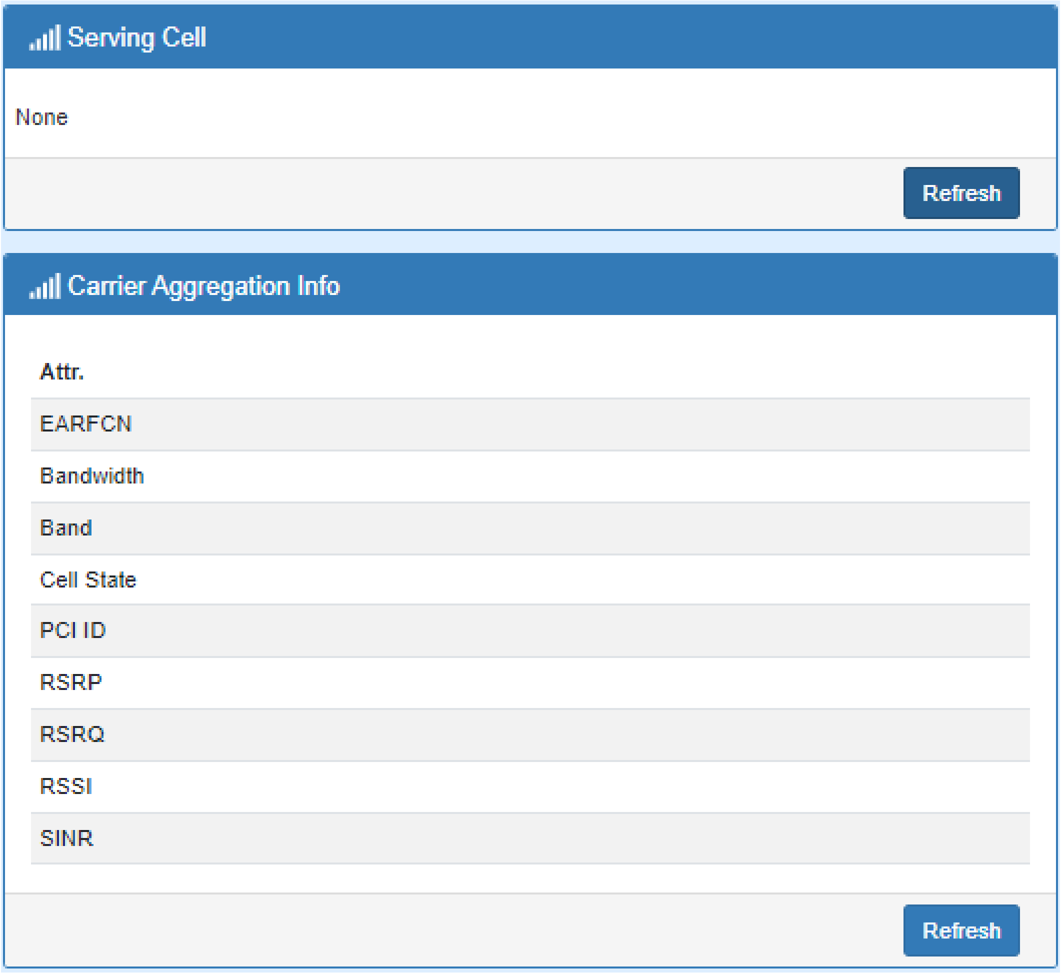
(2) **SIM SMS** allows you to review the information of SMS that you have received, including the state, phone, date and time. You can click 👁 button to view the whole message, click Refresh button to reload the messages, or click Clear button to remove all read messages.



#	State	Phone	Date	Time	Message	View

7.4 Serving Cell

This section displays the information of Serving Cell, including the following items.

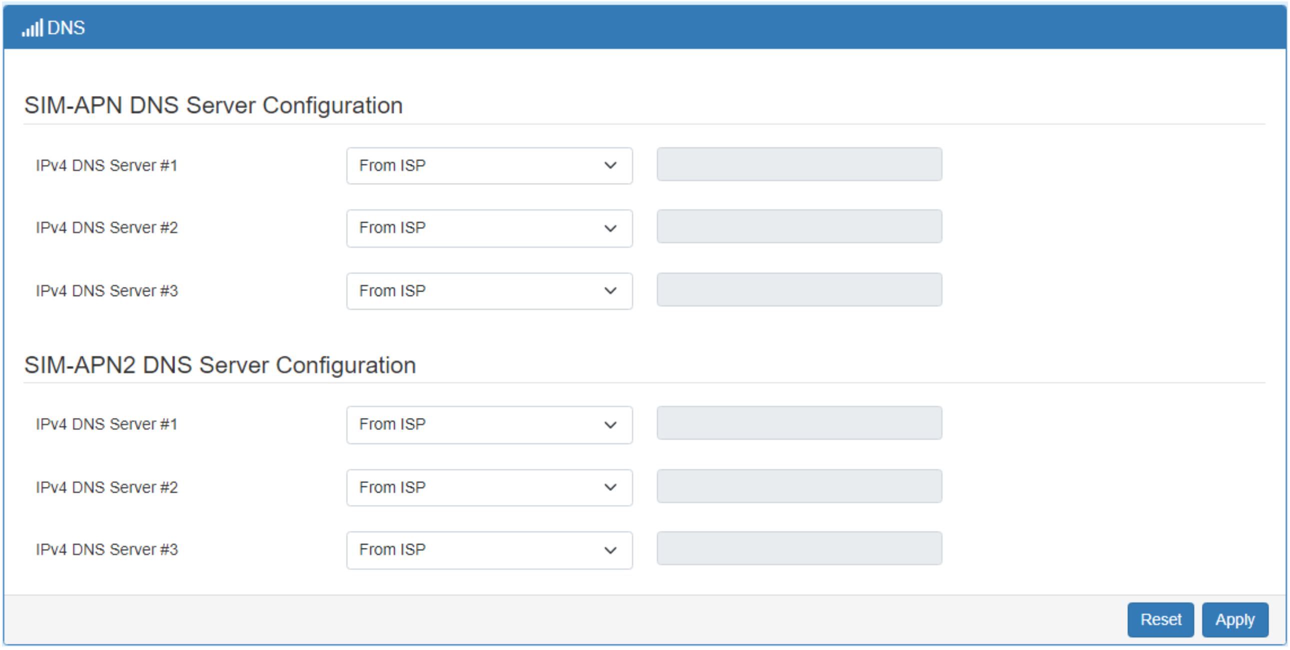


None

Attr.
EARFCN
Bandwidth
Band
Cell State
PCI ID
RSRP
RSRQ
RSSI
SINR

7.5 DNS

This section allows you to set specific DNS server setting.



DNS

SIM-APN DNS Server Configuration

IPv4 DNS Server #1: From ISP

IPv4 DNS Server #2: From ISP

IPv4 DNS Server #3: From ISP

SIM-APN2 DNS Server Configuration

IPv4 DNS Server #1: From ISP

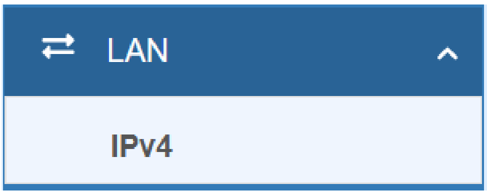
IPv4 DNS Server #2: From ISP

IPv4 DNS Server #3: From ISP

Cellular > DNS	
Item	**Description**
IPv4 DNS Server #1 IPv4 DNS Server #2 IPv4 DNS Server #3	There are three options, including “From ISP”, “User Defined“ and “None”. When you select “From ISP”, the IPv4 DNS server IP will assign from ISP. When you select “User Defined”, the IPv4 DNS server IP is enter by user.

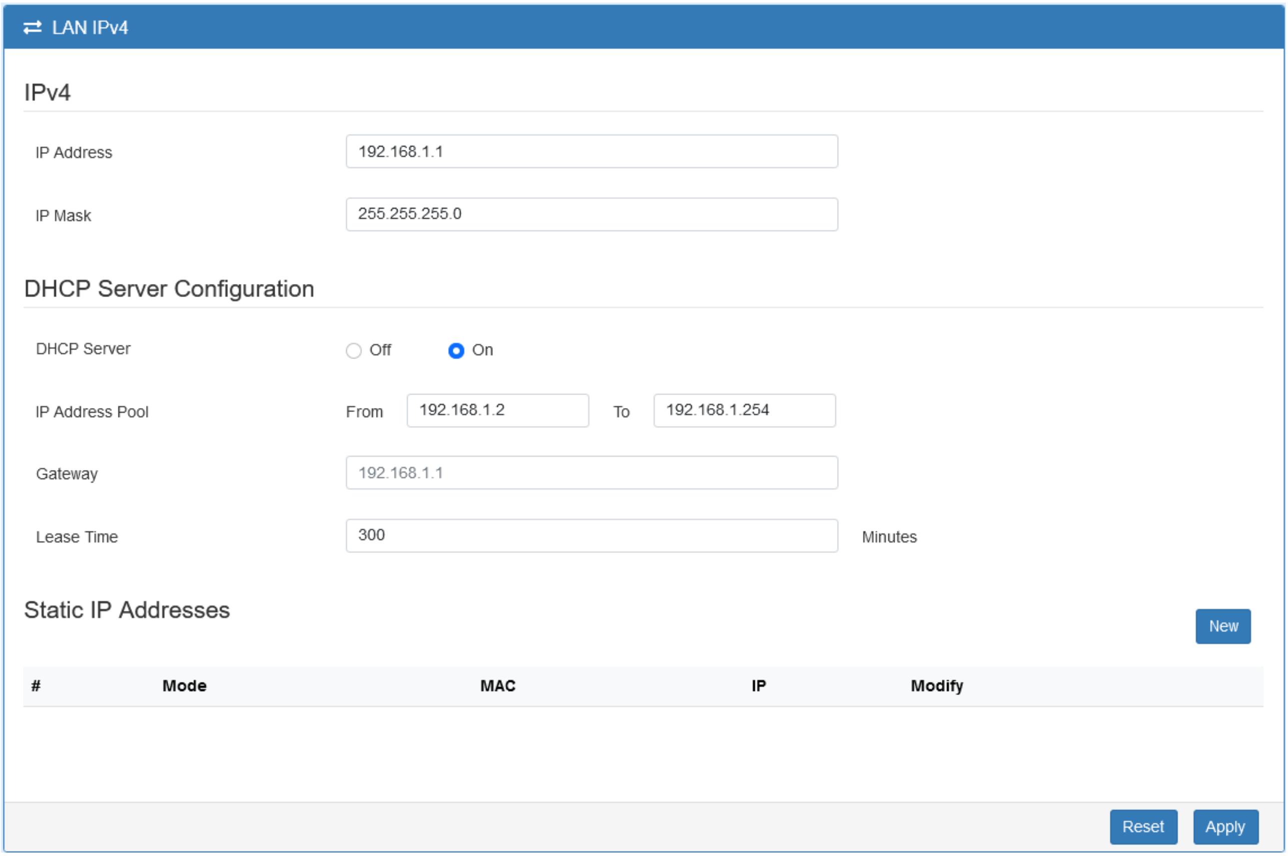
8 Web Menu Item > LAN

This section allows you to configure LAN IPv4, LAN IPv6, VLAN and Subnet.



8.1 IPv4

Set up your IP Address and IP Mask. Also, fill in the information of DHCP Server Configuration.



LAN IPv4

IPv4

IP Address: 192.168.1.1

IP Mask: 255.255.255.0

DHCP Server Configuration

DHCP Server: ○ Off ● On

IP Address Pool: From 192.168.1.2 To 192.168.1.254

Gateway: 192.168.1.1

Lease Time: 300 Minutes

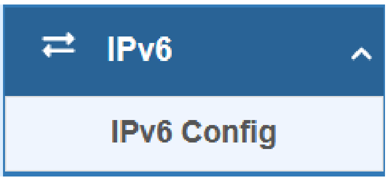
Static IP Addresses

#	Mode	MAC	IP	Modify

LAN > IPv4	
Item	**Description**
LAN IPv4	IP Address:192.168.1.1 IP Mask:255.255.255.0 Both of them are default, you can change them according to your local IP Address and IP Mask.
DHCP Server Configuration	Turn on/off DHCP Server Configuration. Enable to make router can lease IP address to DHCP clients, which connect to LAN.
IP Address Pool	Define the beginning and the end of the pool of IP addresses, which will lease to DHCP clients.
Gateway	Define the gateway IP address that will assign to DHCP clients.
Lease Time	Define the lease time for DHCP clients.
Static IP Addresses	DHCP server support static IP address assignment. The static IP address can add by clicking the **New** button. Each static IP consist of mode (on/off), MAC and IP address. Mode: Turn on/off the static IP address. MAC: The MAC address of target host or PC. IP: The desired IP address for target host or PC.

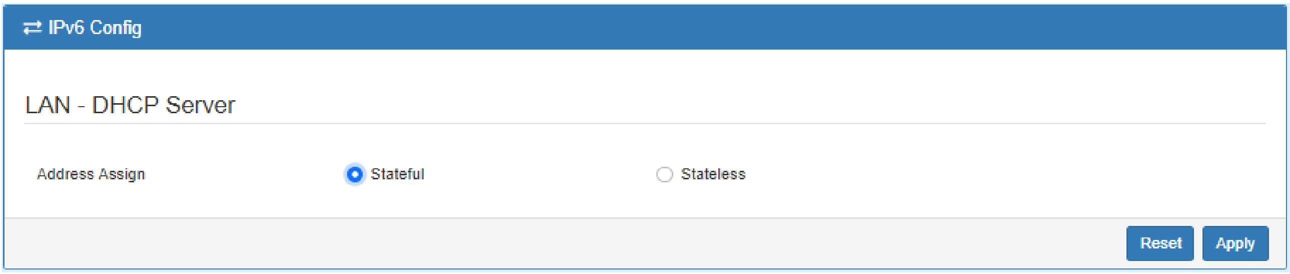
9 Web Menu Item > IPv6

This section allows you to configure the LAN IPv6.



9.1 IPv6 Config

Select your type of IPv6, which shows **Delegate Prefix from WAN** or **Static,** and then set up DHCP Server Configuration.



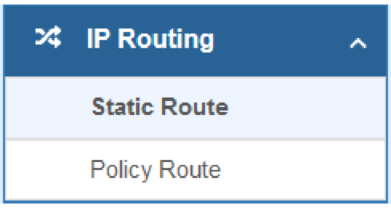
LAN - DHCP Server

Address Assign ● Stateful ○ Stateless

LAN > IPv6	
Item	**Description**
Type (TBD)	● **Delegate Prefix from WAN** Select this option to obtain an IPv6 network prefix automatically from the service provider or an uplink router. ● **Static** Select this option to configure a fixed IPv6 address for the cellular router's LAN IPv6 address.
Static Address (TBD)	You need to input the static address when you select the static type.
DHCP Server Configuration	
Address Assign	Select how you obtain an IPv6 address. ● **Stateful**: The cellular router uses IPv6 stateful auto configuration. The LAN IPv6 clients can obtain IPv6 addresses through DHCPv6. ● **Stateless:** The cellular router uses IPv6 stateless auto configuration. RADVD (Router Advertisement Daemon) is enable to have the cellular router send IPv6 prefix information in router advertisements periodically and in response to router solicitations.

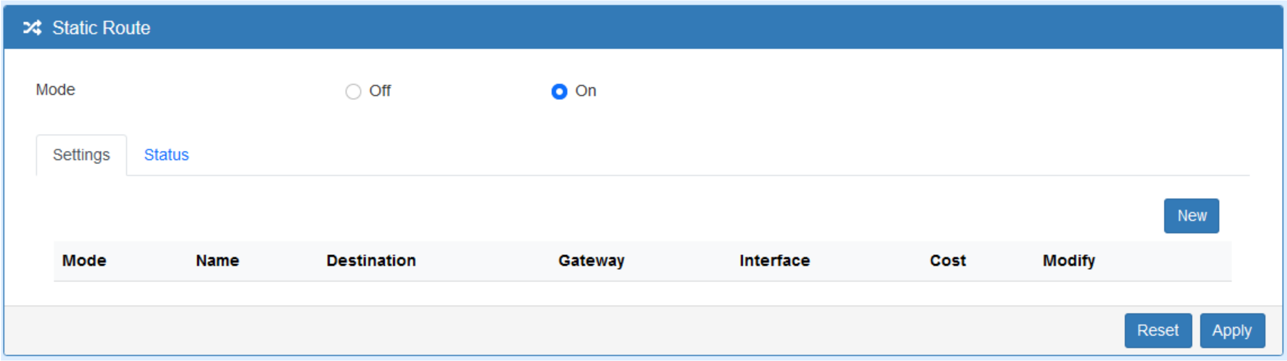
10 Web Menu Item > IP Routing

This section allows you to configure the Static Route and Policy Route.



10.1 Static Route

This section allows you to configure the Static Route. A static route is a pre-determined path that network information must follow to reach a specific host or network.

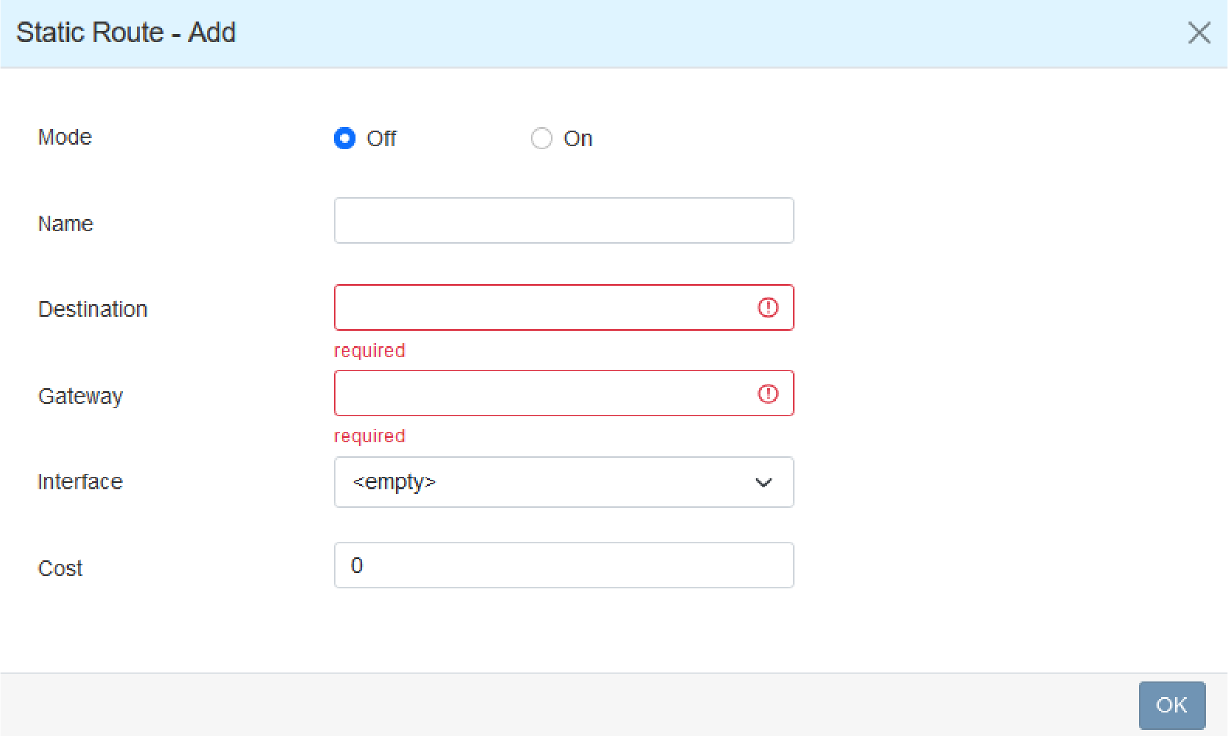


Static Route

Mode ○ Off ● On

Mode	Name	Destination	Gateway	Interface	Cost	Modify

Click the **New** button to add the static route.



Static Route - Add

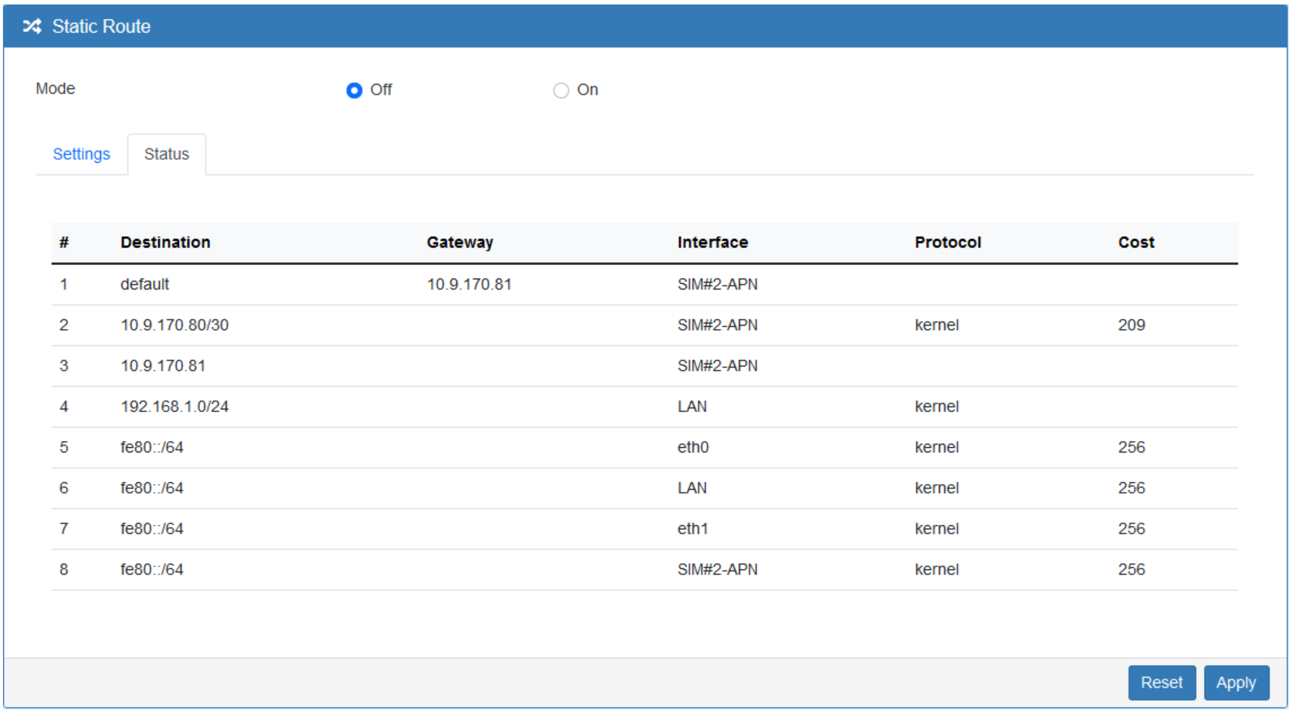
Mode	● Off ○ On
Name	
Destination	required
Gateway	required
Interface	<empty>
Cost	0

IP Routing > Static Route	
Item	**Description**
Mode	The setting is to enable or disable the static route for full network.
Settings	
Mode	The setting is for the specific network. Select “Off “or “On”.
Name	Set up each name for your running host or network.
Destination	Fill in the destination of a specific subnet or IP from network.
Gateway	Fill in the gateway address of your router.
Interface	Select the interface from LAN or Ethernet.
Cost	Cost is a policy for router to commit router, to determine the optimal route. Enter one number greater than or equal to 0.

Note:

- The destination field is required to fill in. The format of destination is IPv4 or IPv6.
- The address of gateway or the type of interface can choose one or both to fill in the field.

The status tab shows the information from the settings of static route.

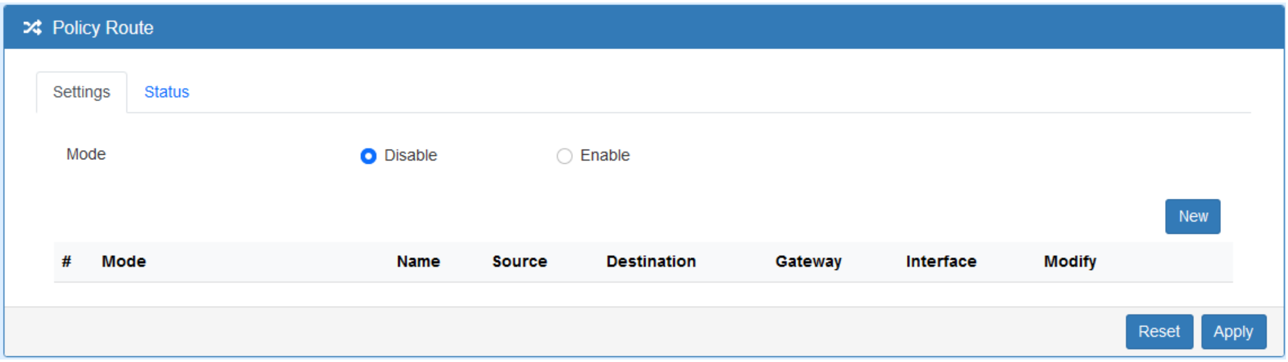


Mode ● Off ○ On

#	Destination	Gateway	Interface	Protocol	Cost
1	default	10.9.170.81	SIM#2-APN		
2	10.9.170.80/30		SIM#2-APN	kernel	209
3	10.9.170.81		SIM#2-APN		
4	192.168.1.0/24		LAN	kernel	
5	fe80::/64		eth0	kernel	256
6	fe80::/64		LAN	kernel	256
7	fe80::/64		eth1	kernel	256
8	fe80::/64		SIM#2-APN	kernel	256

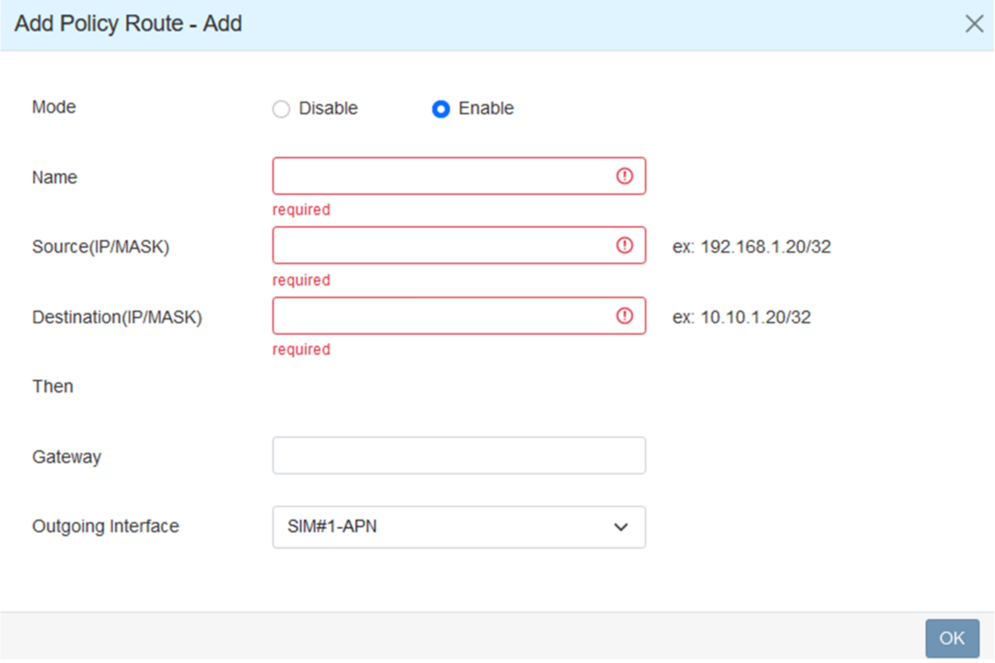
10.2 Policy Route

This section allows user to setup the policy route and check the status of policy route settings. Policy routing works on the activated interfaces only, but disabled on deactivated interfaces automatically.



Mode ● Disable ○ Enable

#	Mode	Name	Source	Destination	Gateway	Interface	Modify



Mode ○ Disable ● Enable

Name: required

Source(IP/MASK): required ex: 192.168.1.20/32

Destination(IP/MASK): required ex: 10.10.1.20/32

Then

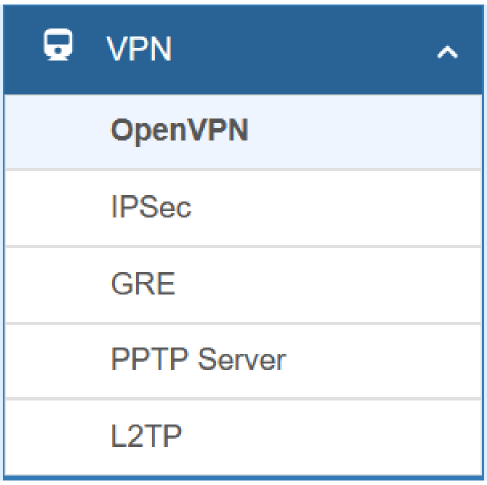
Gateway

Outgoing Interface: SIM#1-APN

IP Routing > Policy Route	
Item	**Description**
Mode	Enable or disable the policy route function.
Settings	
Mode	Enable or disable the selected policy route entry.
Name	Set up each name for your running host or network.
Source (IP/MASK)	Fill in the source of a specific IP/MASK from network.
Destination (IP/MASK)	Fill in the destination of a specific IP/MASK from network.
Gateway	Fill in the gateway address of your router.
Outgoing Interface	Select the outgoing interface.

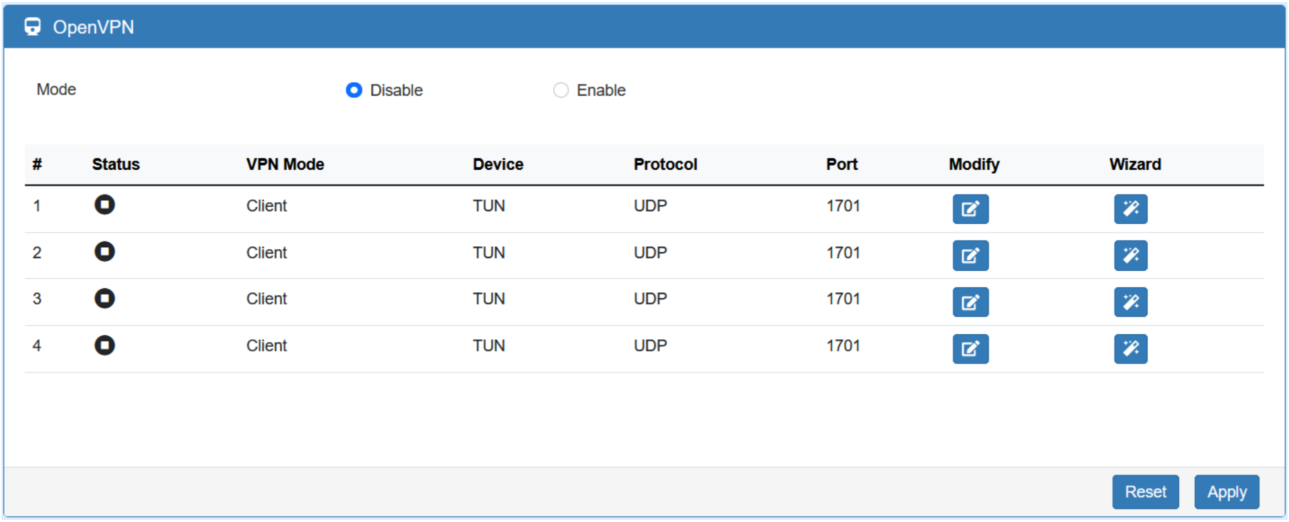
11 Web Menu Item > VPN

This section allows you to configure OpenVPN, IPsec, GRE, PPTP Server, and L2TP.



11.1 OpenVPN

This section allows you to set up the connection of OpenVPN. The default mode is Disable. From **Log** tab, the interface will show the status of connection to make you follow the situation whenever it is successful or fail connection.



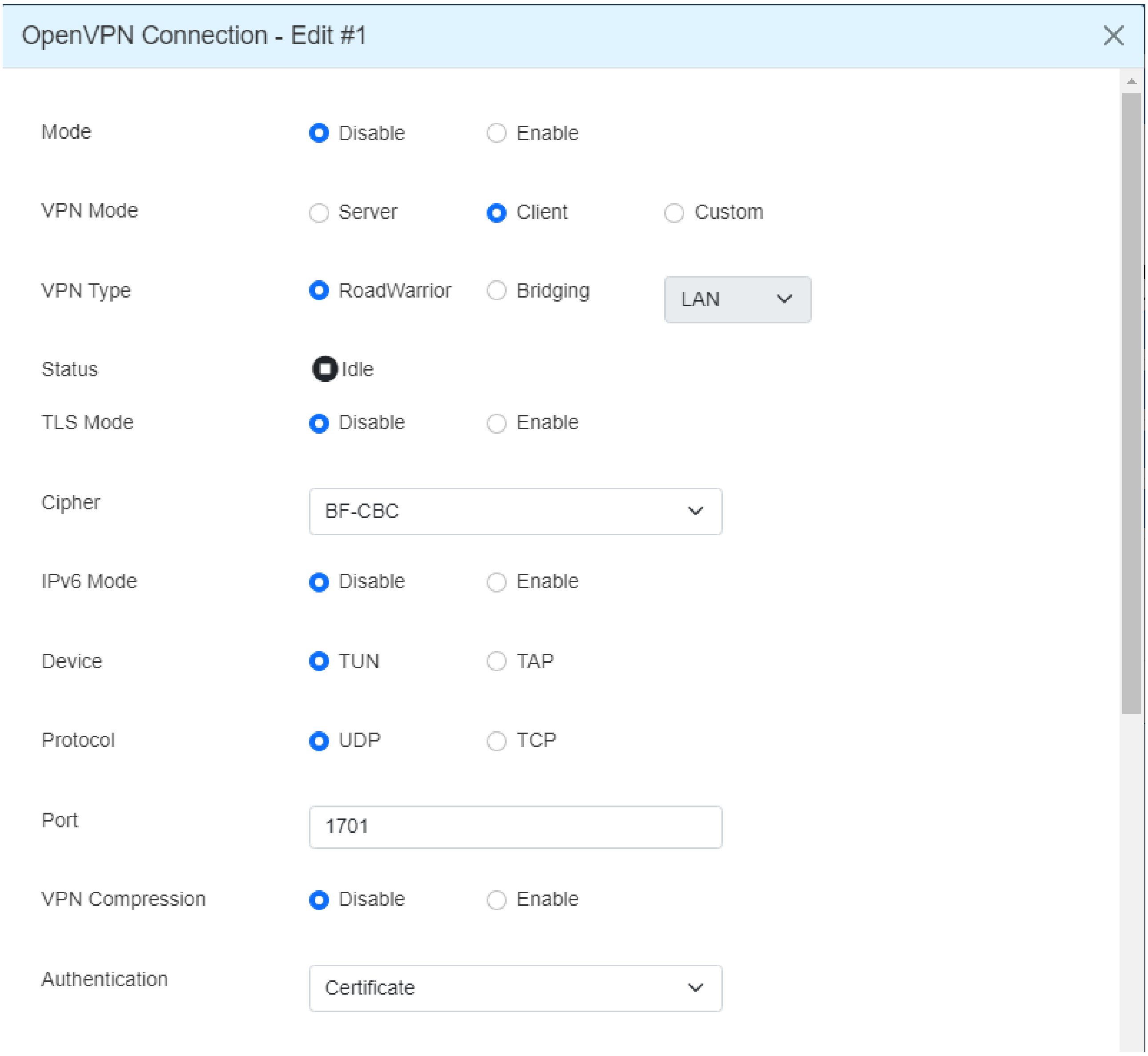
Mode ● Disable ○ Enable

#	Status	VPN Mode	Device	Protocol	Port	Modify	Wizard
1	●	Client	TUN	UDP	1701	✎	✎
2	●	Client	TUN	UDP	1701	✎	✎
3	●	Client	TUN	UDP	1701	✎	✎
4	●	Client	TUN	UDP	1701	✎	✎

11.1.1 OpenVPN Common Setting

(1) Click button to edit OpenVPN Connection.

(2) From **Setting** tab, you can set up the connection of OpenVPN.



OpenVPN Connection - Edit #1

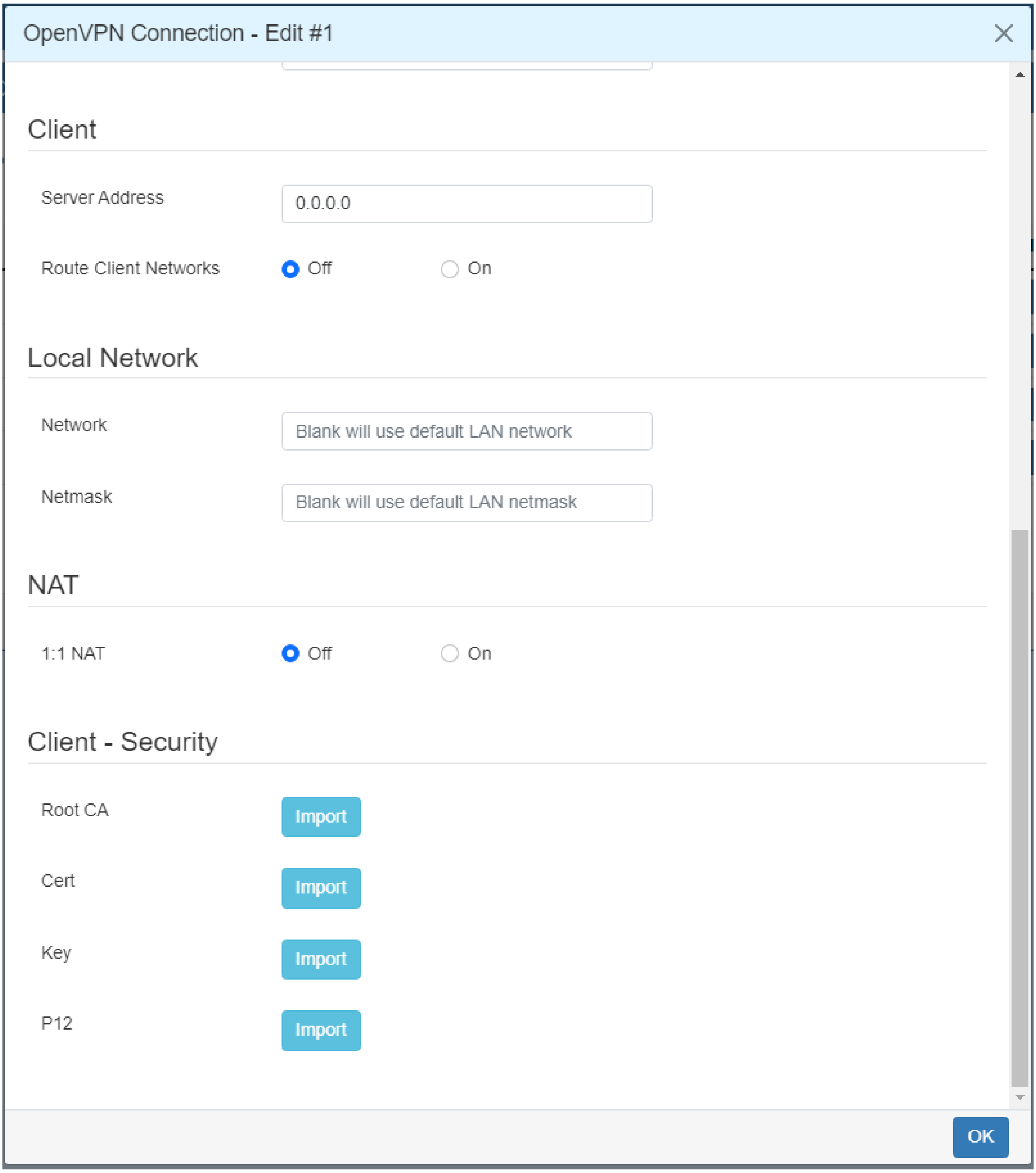
Mode	● Disable	○ Enable	
VPN Mode	○ Server	● Client	○ Custom
VPN Type	● RoadWarrior	○ Bridging	LAN
Status	Idle		
TLS Mode	● Disable	○ Enable	
Cipher	BF-CBC		
IPv6 Mode	● Disable	○ Enable	
Device	● TUN	○ TAP	
Protocol	● UDP	○ TCP	
Port	1701		
VPN Compression	● Disable	○ Enable	
Authentication	Certificate		

VPN > OpenVPN > Setting	
Item	**Description**
Mode	Turn on/off OpenVPN to select Disable or Enable.
VPN Mode	Server: Tick to enable OpenVPN server tunnel. Client: Tick to enable OpenVPN client tunnel. The default is Client. Custom: This option allows user to use the .ovpn configuration file to set up VPN tunnel quickly with third-party server or use the OpenVPN advanced options to be compatible with other servers.
VPN Type	Roadwarrior (default) Bridging: Bridging the VPN tunnel and LAN/VLAN
Status	Display the status of OpenVPN.
TLS Mode	Select from Disable or Enable for data security. The default is Disable.
Cipher	The OpenVPN format of data transmission.
IPv6 Mode	Select from Disable or Enable. The default is Disable.
Device	Select from TUN or TAP. The default is TUN.
Protocol	Select from UDP or TCP Client that depends on the application. The default is UDP.
Port	Enter the listening port of remote side OpenVPN server.
VPN Compression	Select Disable or Enable to compress the data stream. The default is Disable.
Authentication	Select from two different kinds of authentication ways: Certificate or pkcs#12 Certificate. The pkcs#12 option is only available on the VPN client mode.

11.1.2 OpenVPN Client Setting

Select option "**Client**" from VPN Mode, and this section allows you configure the **OpenVPN client** and authentication files.

The files can import by clicking Import button and the file should download from OpenVPN server.



OpenVPN Connection - Edit #1

Client

Server Address: 0.0.0.0

Route Client Networks: ● Off ○ On

Local Network

Network: Blank will use default LAN network

Netmask: Blank will use default LAN netmask

NAT

1:1 NAT: ● Off ○ On

Client - Security

Root CA: Import

Cert: Import

Key: Import

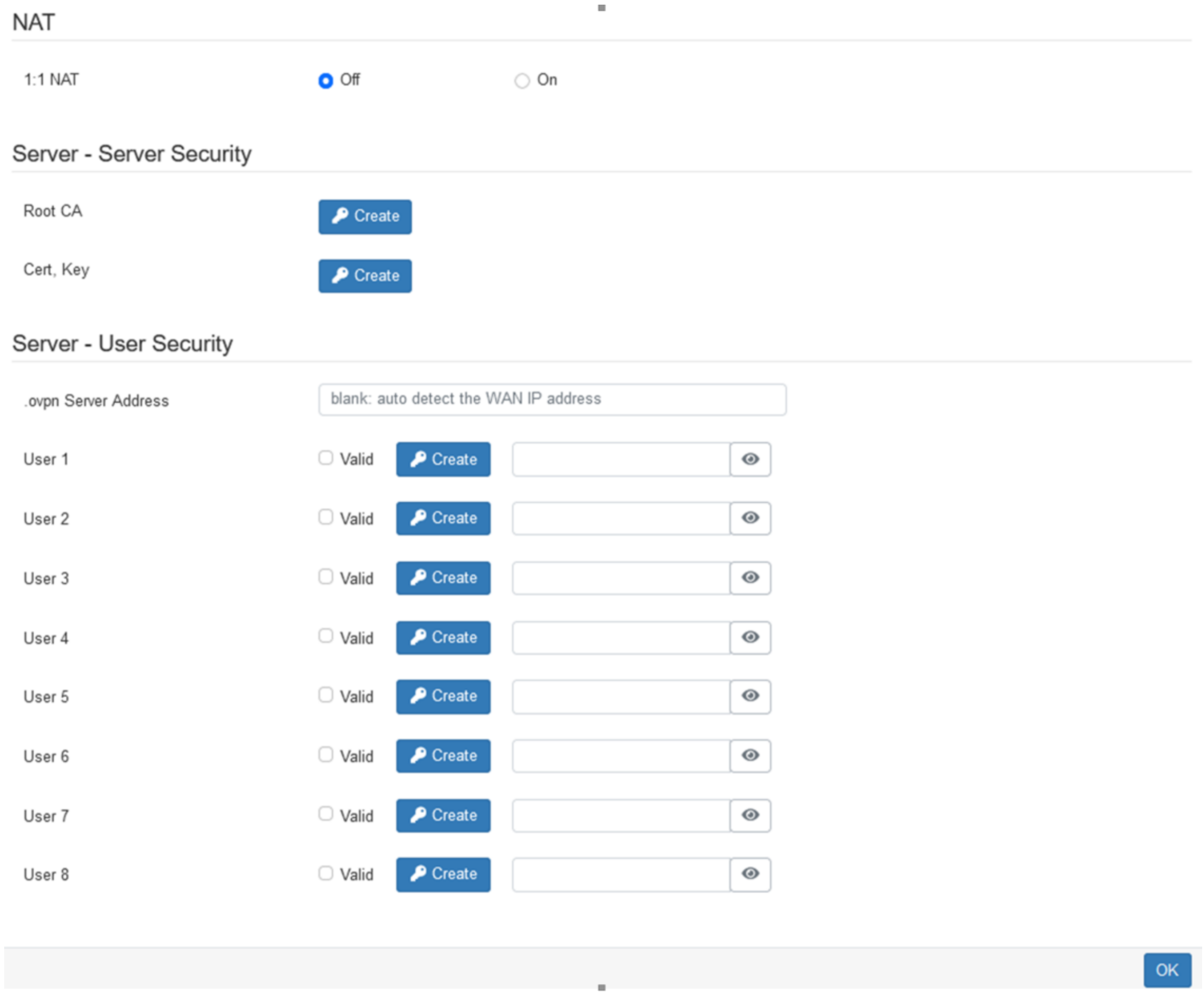
P12: Import

VPN > OpenVPN > Client VPN Mode	
Item	**Description**
Client	
Server Address	Fill in WAN IP of OpenVPN server.
Route Client Networks	This setting needs to match the server side. When enabled, the cellular router will auto apply the properly routing rules.

Local Network	
Network	The local network exported by OpenVPN. When keeping this option blank, the OpenVPN will export the LAN network automatically.
Netmask	The local netmask exported by OpenVPN. When keeping this option blank, the OpenVPN will export the LAN netmask automatically.
NAT	
1:1 NAT	Tick to enable NAT Traversal for OpenVPN. This item must be enabled when the router under NAT environment. When two routers' LAN Subnet are same and create OpenVPN tunnels, this function should turn on.
Client-Security	
Root CA	The Certificate Authority file of OpenVPN server, which can download from OpenVPN server.
Cert	The certification file is for OpenVPN client, which can download from OpenVPN server.
Key	The private key file is for OpenVPN client, which can download from OpenVPN server.
P12	The PKCS#12 file is for OpenVPN client, which can download from OpenVPN server.

11.1.3 OpenVPN Server Setting

Select option “**Server”** from VPN Mode, and this section allows you to configure the **server settings of VPN Mode**.



NAT

1:1 NAT ● Off ○ On

Server - Server Security

Root CA Create

Cert, Key Create

Server - User Security

.ovpn Server Address blank: auto detect the WAN IP address

User 1	□ Valid	Create	
User 2	□ Valid	Create	
User 3	□ Valid	Create	
User 4	□ Valid	Create	
User 5	□ Valid	Create	
User 6	□ Valid	Create	
User 7	□ Valid	Create	
User 8	□ Valid	Create	

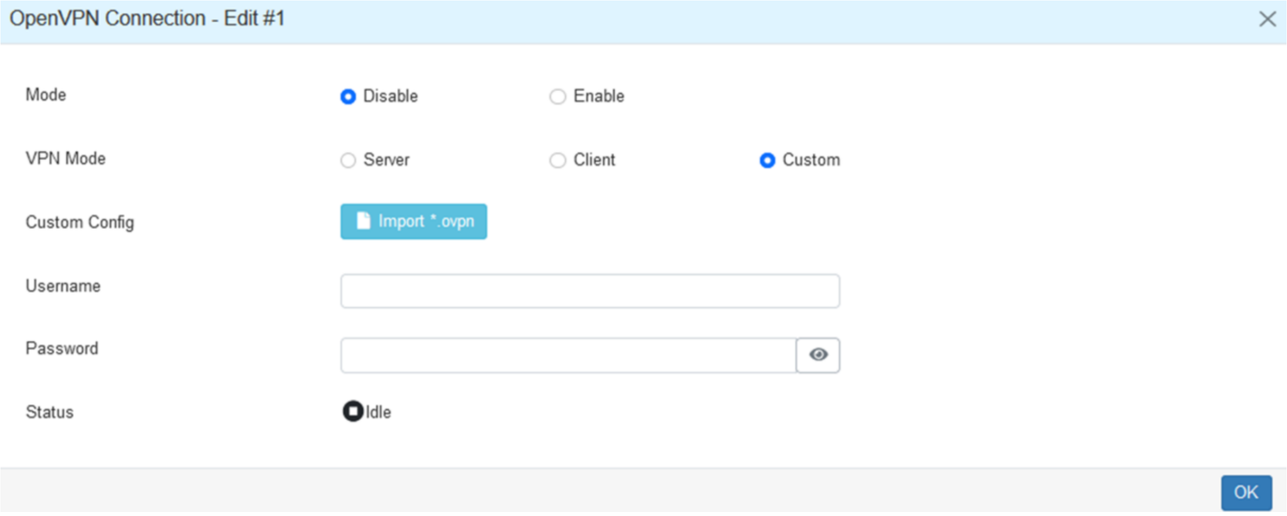
OK

VPN > OpenVPN > Server VPN Mode	
Item	**Description**
Server	
VPN Network	The network ID for OpenVPN virtual network.
VPN Netmask	The netmask for OpenVPN virtual network.
RoadWarrior	
Route Client Networks	The OpenVPN server will route the client traffic or not. User should fill in the client IP and netmask when this option is enable.
Local Network	
Network	The local network exported by OpenVPN. When keeping this option blank, the OpenVPN will export the LAN network automatically.
Netmask	The local netmask exported by OpenVPN. When keeping this option blank, the OpenVPN will export the LAN netmask automatically.

NAT	
1:1 NAT	Tick to enable NAT Traversal for OpenVPN. This item must be enabled when router under NAT environment. The default is Off.
Server - Server Security	
Root CA	Create Root CA key.
Cert, Key and DH	Create Cert, Key and DH key.
Server- User Security	
User 1 - User 8	According to your requirement, you can create different kinds of user security key from User 1 to User 8.

11.1.4 Set up OpenVPN Custom

This section helps you use the .ovpn configuration file to set up OpenVPN tunnel quickly with third-party server or use the OpenVPN advance options to be compatible with other servers.



OpenVPN Connection - Edit #1

Mode ● Disable ○ Enable

VPN Mode ○ Server ○ Client ● Custom

Custom Config Import *.ovpn

Username

Password

Status Idle

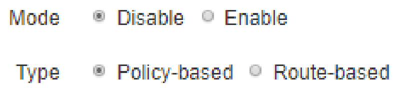
OK

VPN > OpenVPN > Custom VPN Mode	
Item	**Description**
Mode	Enable or disable the selected OpenVPN connection.
VPN Mode	Select the custom mode.
Custom Config	Import OpenVPN configuration with “.ovpn” file.
Username	Fill in the username if the imported file has already set up the username.
Password	Fill in the password if the imported file has already set up the password.
Status	Display the connection status of OpenVPN, such as IP address and the connected time.

11.2 IPSec

This section allows you to set up IPsec Tunnel. The setting has four tags, Connections, Authentication IDs, X.509 Certificates, and CA Certificates.

For the IPsec connection which be authenticated by **pre-shared key**, it only needs to setup the **Connections** and **Authentication IDs.** For the IPsec connection which be authenticated by **RSA or TLS**, the settings must cover the four parts.



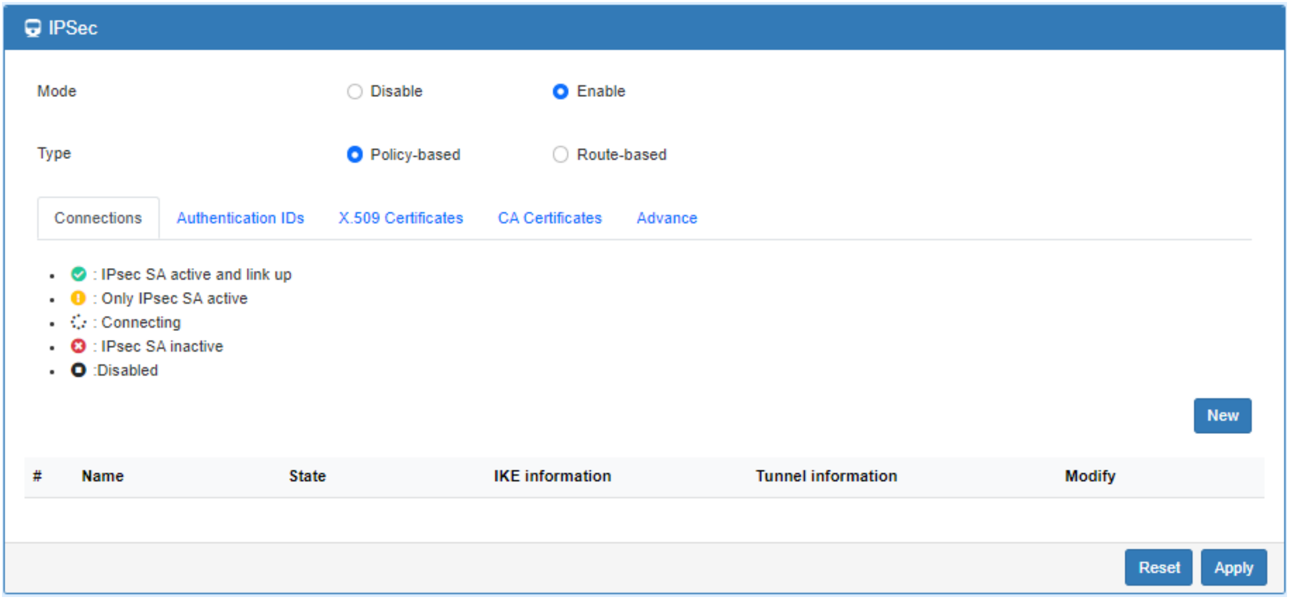
Mode ● Disable ○ Enable

Type ● Policy-based ○ Route-based

VPN > IPsec > General setting	
Item	**Description**
Mode	Select from Disable or Enable. The default is Disable.
Type	Select from Policy-based or Route-based. The default is Policy-based. Policy-based: transmit traffic that meet the IPsec phase 2 local/remote subnet. Route-based: transmit traffic that match routing table.

11.2.1 IPsec > Connections

This section provides the information of the IPsec connections. Each connection will show the **State**, **IKE information** and **Tunnel information**. In the default setting, the list of connections is empty. You can create the new connection by clicking **New** button.



IPSec

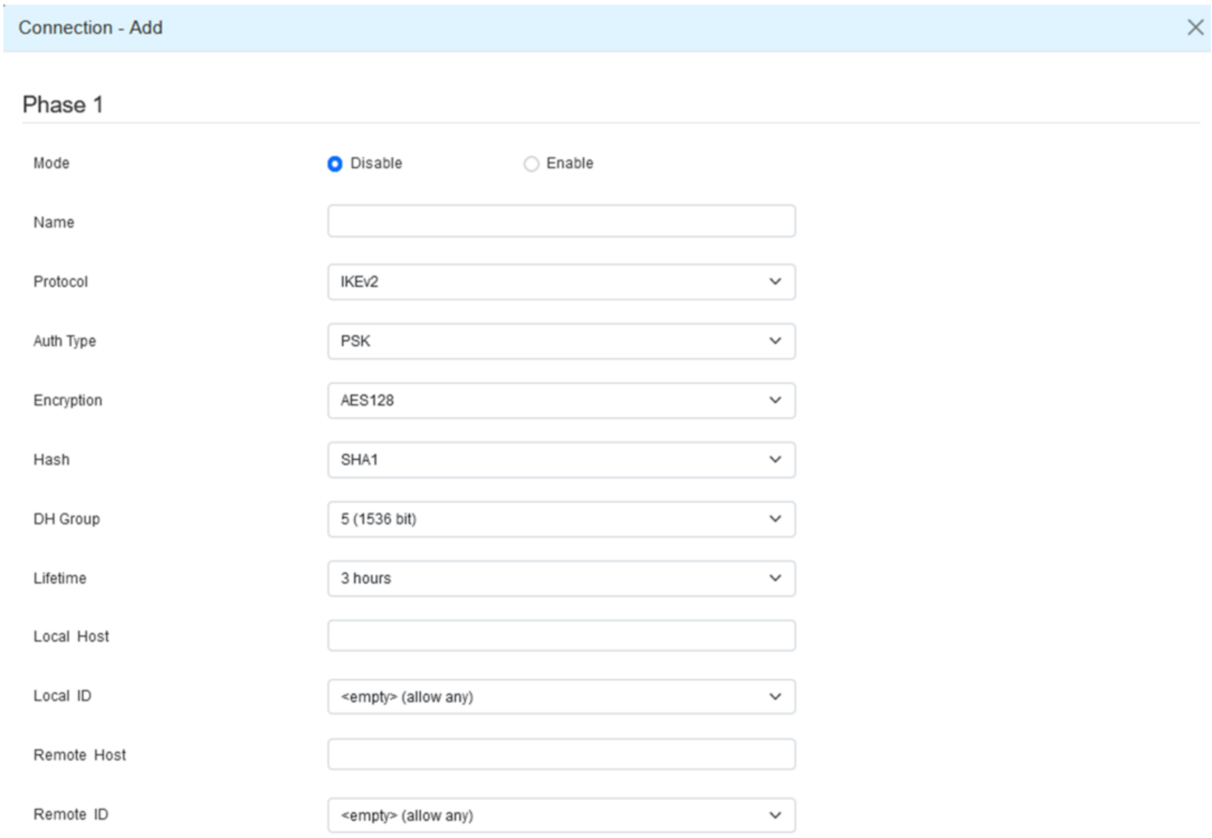
Mode ○ Disable ● Enable

Type ● Policy-based ○ Route-based

- ✓ : IPsec SA active and link up
- ! : Only IPsec SA active
- ⁘ : Connecting
- ✗ : IPsec SA inactive
- ● :Disabled

#	Name	State	IKE information	Tunnel information	Modify

(1) IPsec Phase 1 Setting



Connection - Add

Phase 1

Mode: ● Disable ○ Enable

Name:

Protocol: IKEv2

Auth Type: PSK

Encryption: AES128

Hash: SHA1

DH Group: 5 (1536 bit)

Lifetime: 3 hours

Local Host:

Local ID: <empty> (allow any)

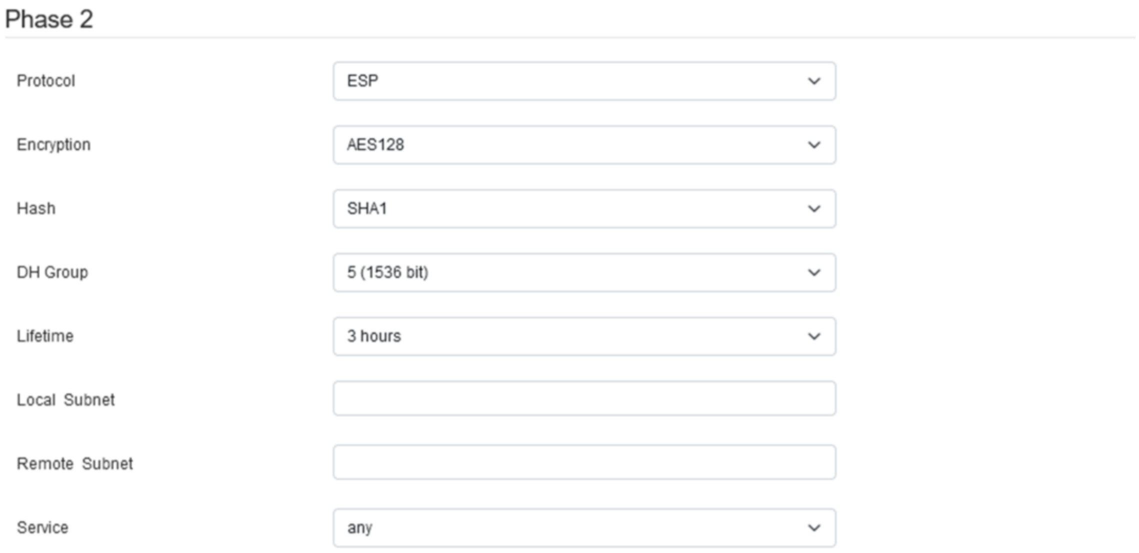
Remote Host:

Remote ID: <empty> (allow any)

VPN > IPsec > Connections > Phrase 1 setting	
Item	**Description**
Mode	Enable or disable the selected IPSec connection.
Name	Short name or description.
Protocol	Select from IKEv1 or IKEv2. The default is IKEv1.
Auth Type	Select from PSK (default), RSA, EAP-TLS. (Note: The EAP-TLS is for IKEv2 only.)
Encryption	The encryption algorithm. Select from AES128 (default), AES192, AES256 or 3DES.
Hash	The integrity algorithm. Select from MD5, SHA1 (default) or SHA256.
DH Group	The Diffie Hellman Group. Select from 1(768 bit), 2(1024 bit), 5(1536 bit) (default), 14(2048 bit), 15(3072 bit), 16(4096 bit), 17(6144 bit) or 18(8192 bit).
Lifetime	The length of the keying channel of a connection. Select from 30 minutes, 1 hour, 2 hours, 3 hours, 6 hours, 12 hours or 24 hours.
Local Host	The IP address of the router's public network interface. If this value is blank, the connection will automatically detect the correct IP

	address.
Local ID	The identification for authentication on local peer. Select from the created authentication IDs or empty.
Remote Host	The IP address of the peer gateway's public network interface. If this value is blank, the connection will act the server role to wait the incoming request.
Remote ID	The identification for authentication on remote peer. Select from the created authentication IDs or empty.

(2) IPsec Phase 2 Setting



Phase 2

Protocol: ESP

Encryption: AES128

Hash: SHA1

DH Group: 5 (1536 bit)

Lifetime: 3 hours

Local Subnet:

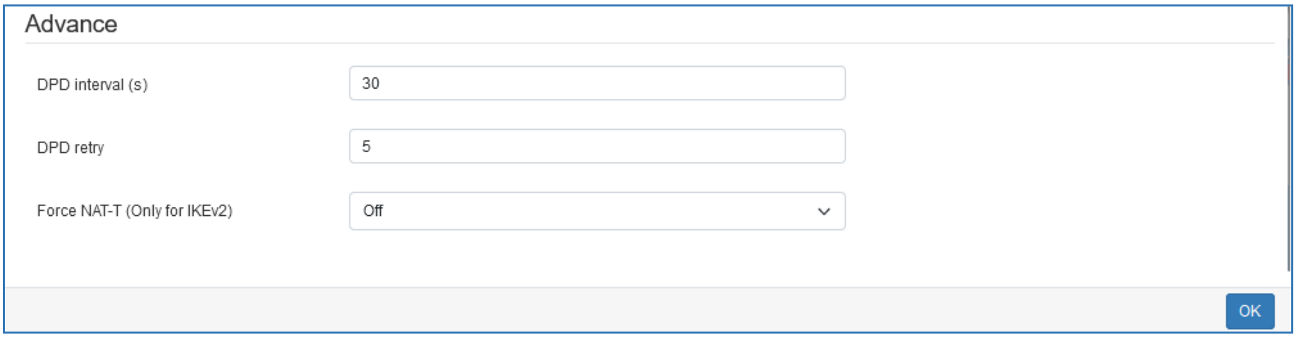
Remote Subnet:

Service: any

VPN > IPsec > Connections > Phrase 2 setting	
Item	**Description**
Protocol	ESP supported only.
Encryption	The encryption algorithm. Select from AES128 (default), AES192, AES256 or 3DES.
Hash	The integrity algorithm. Select from MD5, SHA1 (default) or SHA256.
DH Group	The Diffie Hellman Group. Select from 1(768 bit), 2(1024 bit), 5(1536 bit) (default), 14(2048 bit), 15(3072 bit), 16(4096 bit), 17(6144 bit) or 18(8192 bit).
Lifetime	The length of a particular instance of a connection. Select from 30 minutes, 1 hour, 2 hours, 3 hours, 6 hours, 12 hours or 24 hours.
Local Subnet	The private subnet behind the router. The available formats are A.B.C.D, A.B.C.D/M, A.B::C.D or A.B::C.D/M If this value is blank, the connection will set it as the “Local Host” of Phase 1 setting.

	Note: This option only work on Policy-based IPsec VPN type.
Remote Subnet	The private subnet behind the peer gateway. The available formats are A.B.C.D, A.B.C.D/M, A.B::C.D or A.B::C.D/M If this value is blank, the connection will set it as the "Remote Host" of Phase 1 setting. *Note:* This option only work on Policy-based IPsec VPN type.
Service	Restrict the VPN traffic to the particular protocol only. Select from the Any, TCP, UDP or L2TP.

(3) IPsec Advance Setting



Advance

DPD interval (s): 30

DPD retry: 5

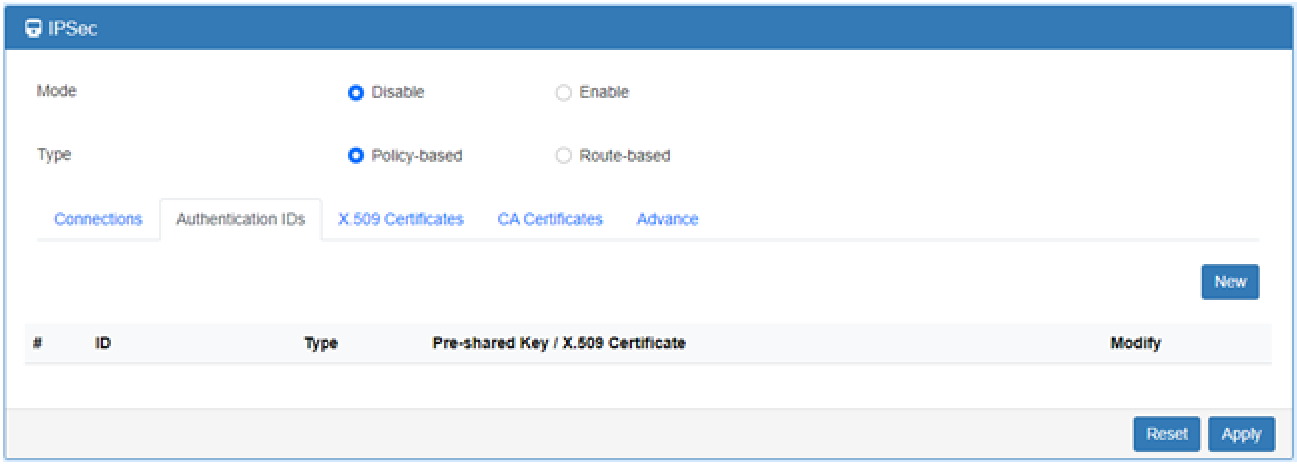
Force NAT-T (Only for IKEv2): Off

VPN > IPsec > Connections > Advance Setting	
Item	**Description**
DPD interval	The period time interval to detect dead peers. The default is 30 seconds.
DPD retry	The max number of retry of dead peer detection. The default is 5 times.
Force NAT-T (Only for IKEv2)	Enable or disable the NAT-T for selected IPSec connection.

11.2.2 IPsec > Authentication IDs

This section provides the authentication ID set to authenticate the IPsec connections.

In the default setting, the list of authentication ID is empty. You can create the new authentication ID by clicking the **New** button.

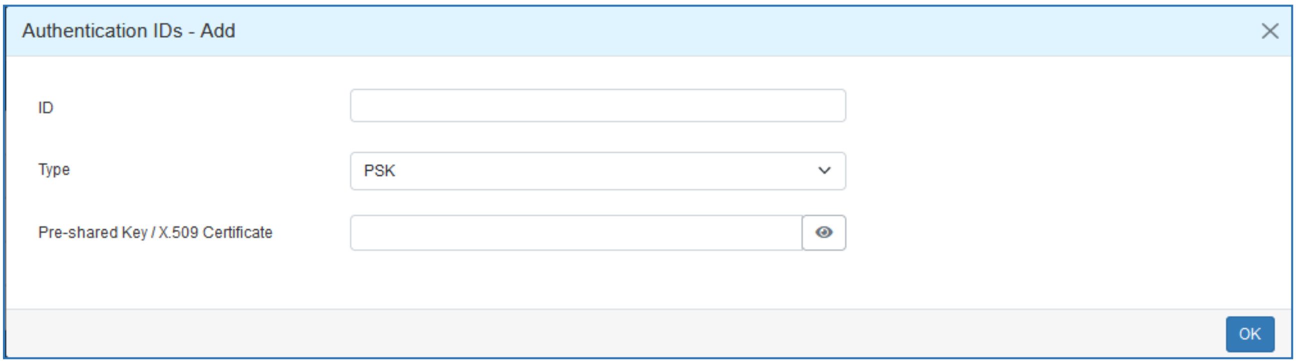


IPSec

Mode ● Disable ○ Enable

Type ● Policy-based ○ Route-based

#	ID	Type	Pre-shared Key / X.509 Certificate	Modify



Authentication IDs - Add

ID

Type: PSK

Pre-shared Key / X.509 Certificate

VPN > IPsec > Authentication IDs	
Item	**Description**
ID	The identification for authentication. It works with PSK type only.
Type	Select from PSK or RSA. The default is PSK. PSK: Use the pre-shared key to authenticate the connection. RSA: Use the certificate to authenticate the connection.
Pre-shared Key / X.509 Certificate	The X.509 certificate for authentication. The certificate generate or import by X.509 Certificates section.

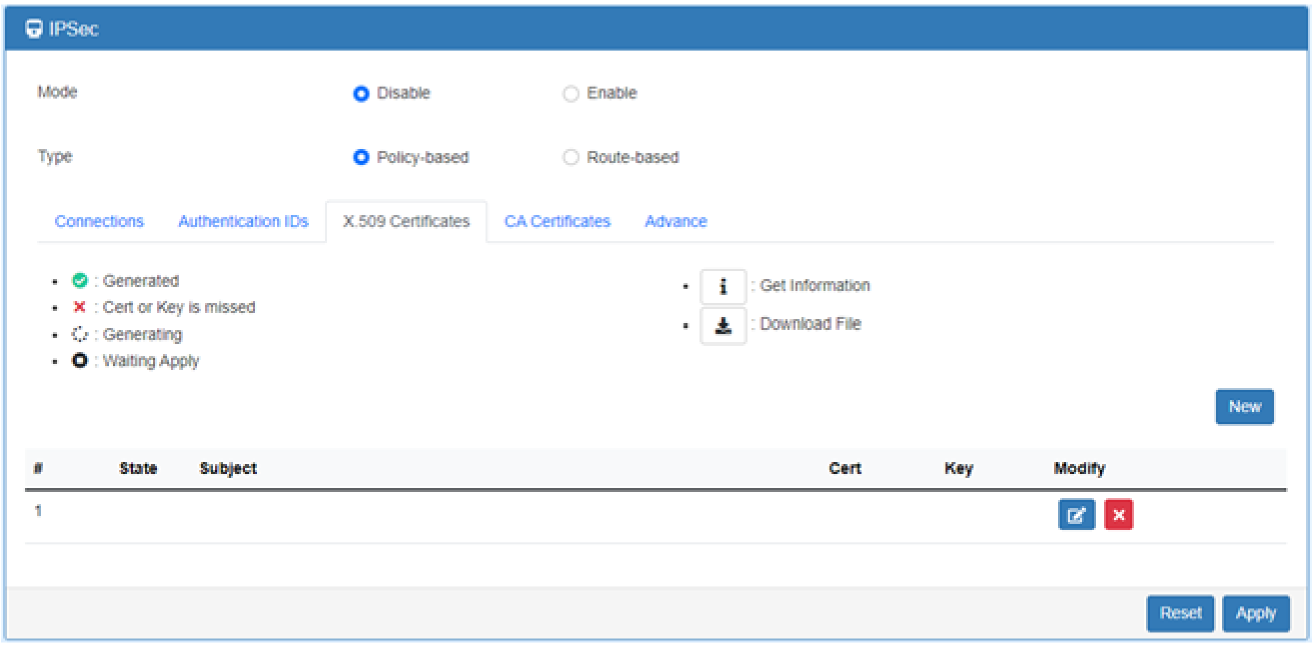
According to the above options, there are some combinations to authenticate the IPsec connection.

VPN > IPsec > Authentication IDs				
#	ID	Type	Pre-shared Key / X.509 Certificate	Comment
1		PSK	password	The default password for the PSK connections.
2	remote.ipsec	PSK	2wsx#EDC	The password only for the PSK connection with remote.IPsec ID. Normally, this case is use to authenticate peer gateway.
3	local.ipsec	PSK		The identification for the connection. Normally, this case is use to announce the ID of the router.
4	test	RSA	created X.509	The ID field will be omitted, and use the common name (CN) of X.509 as the ID field.

11.2.3 IPsec > X.509 Certificates

This section provides the certificates setting which is use by IPsec authentication ID.

Each certificate will show the **State** and **Subject** information.



IPSec

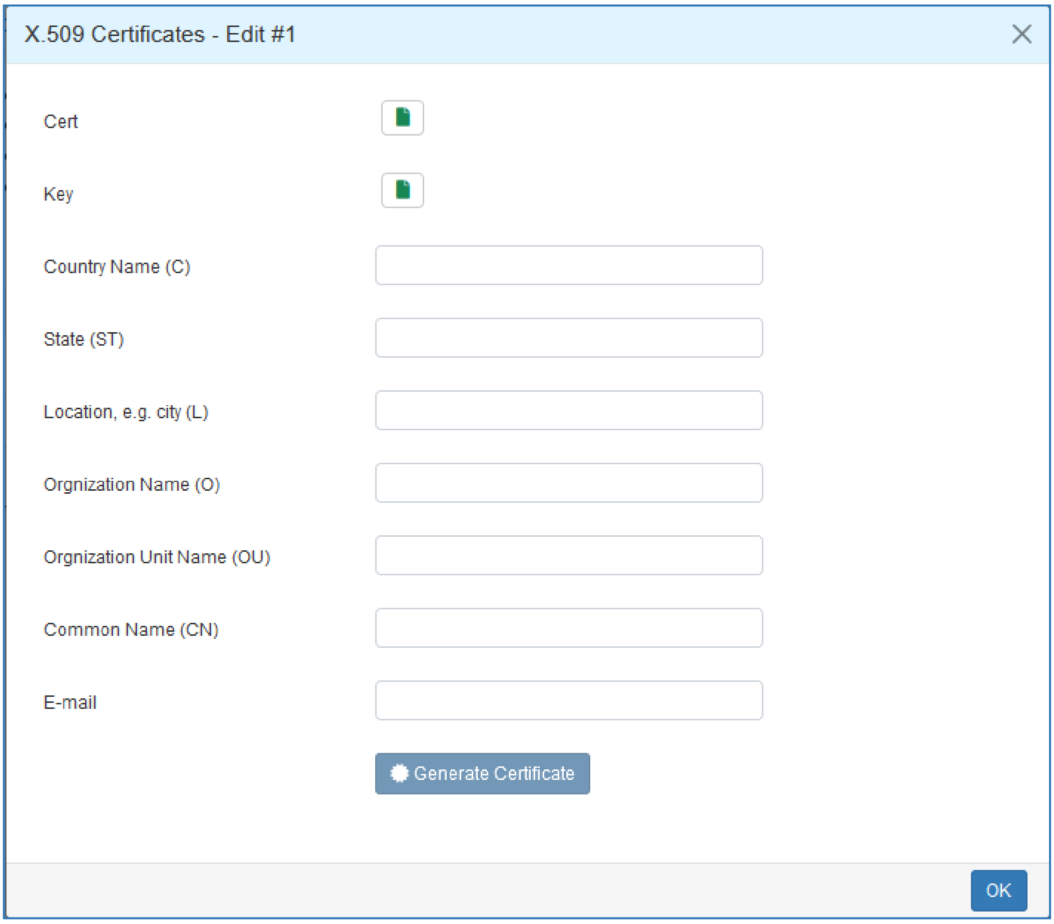
Mode ● Disable ○ Enable

Type ● Policy-based ○ Route-based

- ✓ : Generated
- ✗ : Cert or Key is missed
- : Generating
- ○ : Waiting Apply

- ℹ : Get Information
- ⤓ : Download File

#	State	Subject	Cert	Key	Modify
1					✎ ✗



X.509 Certificates - Edit #1

Cert

Key

Country Name (C)

State (ST)

Location, e.g. city (L)

Orgnization Name (O)

Orgnization Unit Name (OU)

Common Name (CN)

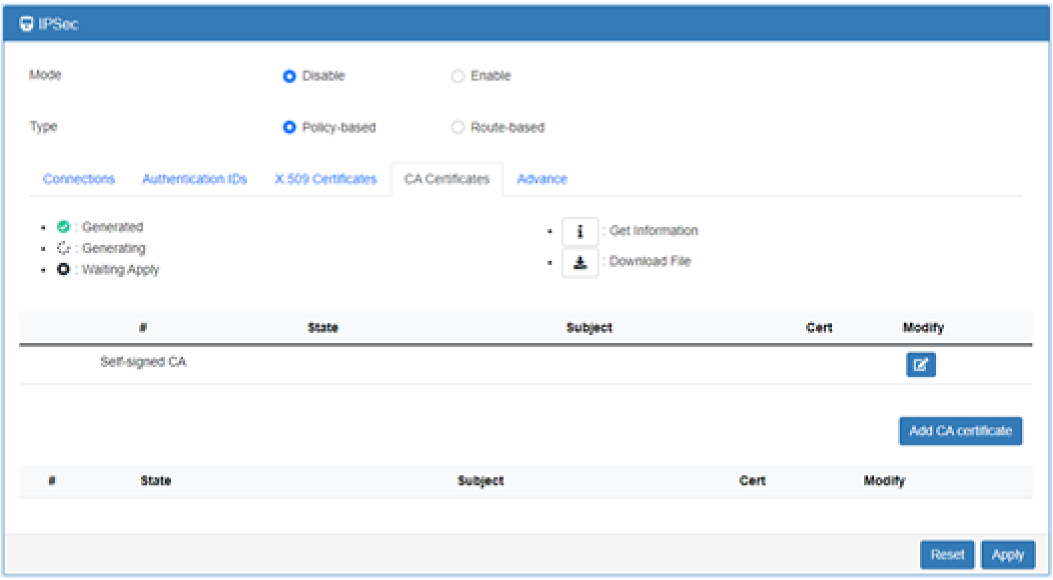
E-mail

11.2.4 IPsec > CA Certificates

This section provides the CA certificates setting which could check whether the X.509 certificate is valid or not.

There is one self-signed CA (generated by the router), and it supports the user import the self-signed CAs to the router. The self-signed CA will help the router to verify the self-signed X.509 certificate, which is import in X.509 Certificates section.

Each CA certificate will show the **State** and **Subject** information and provide the controlling buttons to let user could download or edit the certificate / key files.



Mode ● Disable ○ Enable

Type ● Policy-based ○ Route-based

- ✓ : Generated
- ◌ : Generating
- ○ : Waiting Apply

- ℹ : Get Information
- ⤓ : Download File

#	State	Subject	Cert	Modify
Self-signed CA				✎

#	State	Subject	Cert	Modify

Certificate Generation

There are two kinds of certificate generated by router, one is self-signed CA, the other is X.509.

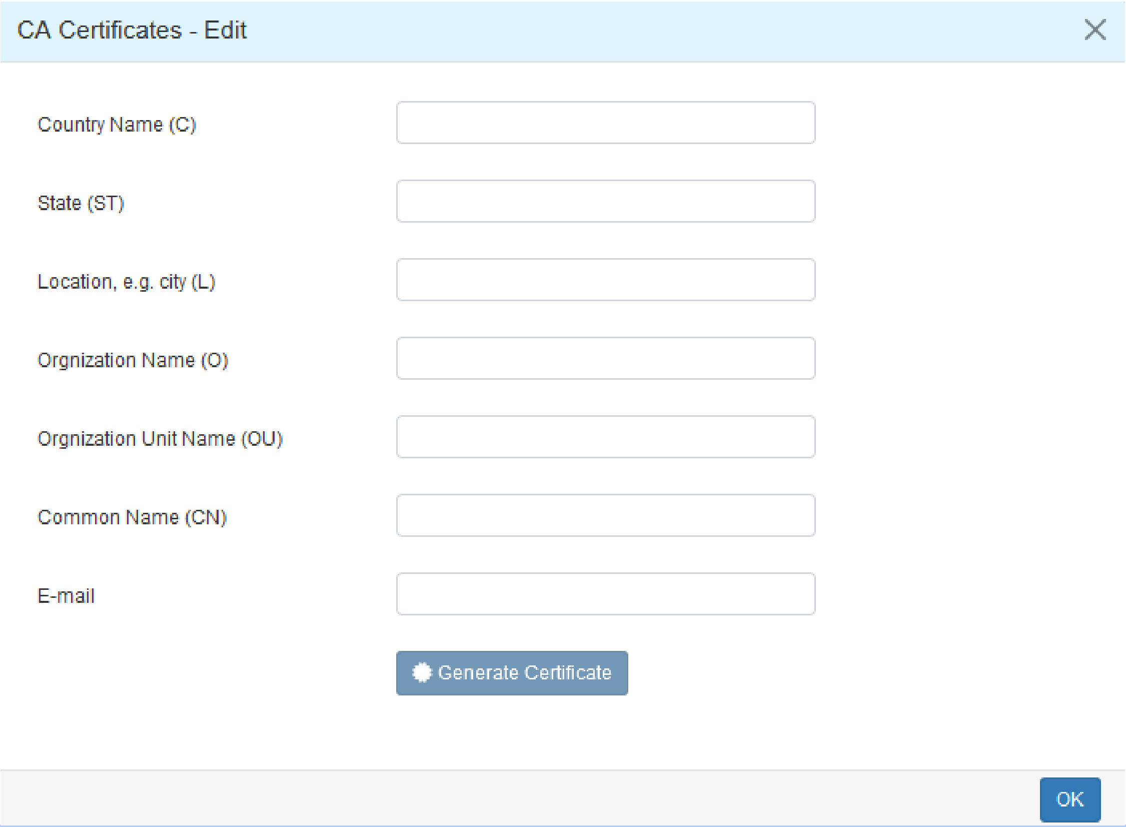
To generate the self-signed CA certificate:

1. Navigate to CA Certificates tab.
2. Click the ✎ edit button to navigate the **Certificate Setting** page.
3. Fill up the information of the CA certificate.
4. Click the Generate Certificate button and OK
5. Click the Apply button to apply the changes.

To generate the X.509 certificate:

1. Make sure the self-signed CA certificate generated.
2. Navigate to X.509 Certificates tab.
3. Add the new X.509 certificate by New button. (If it's not existed.)
4. Click the Edit button to navigate the **Certificate Setting** page.
5. Fill up the information of the X.509 certificate.
6. Click the Generate Certificate button and OK.
7. Click the Apply button to apply the changes.

Certificate Setting



VPN > IPsec > CA Certificates	
Item	**Description**
Country Name	The 2-letter country code. e.g. US This option is required for certificate generation.
State	The state name. e.g. Some-State
Location	The location name. e.g. city-name
Organization Name	The organization name. e.g. company-name This option is required for certificate generation.
Organization Unit Name	The organization unit name.
Common Name	The host name associated with the certificate. e.g. example.com This option is required for certificate generation.
E-mail	The maintainer's E-mail.

Certificate Importing

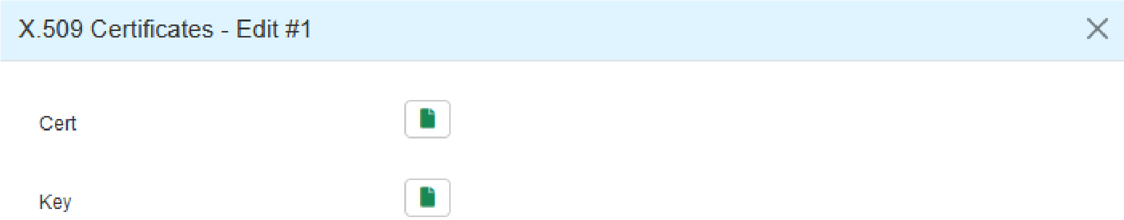
Same as the **Certificate Generation**, the router supports the CA and X.509 certificate importing.

To import the CA certificate:

1. Navigate to CA Certificates tab.
2. Click the Add CA certificate button.
3. Select the CA certificate file from browser window.
4. When the file be selected and everything all right, the newly CA certificate will show the CA certificate list with **Imported** state.

To import the X.509 certificate:

1. Navigate to X.509 Certificates tab.
2. Click the New button. The list will pop up the blank X.509 entry.
3. Click ✎ to edit X.509 Certificates.
4. Click 📄 at Cert to import certificate.
5. Select the X.509 certificate file from browser window.
6. When the file be selected and everything all right, the state should be **Cert or Key is missed**.
7. Click 📄 at Key to import key.
8. Select the X.509 key file from browser window.
9. When the state shown **Imported**, the importing procedure is completed.



X.509 Certificates - Edit #1

Cert

Key

11.3 GRE

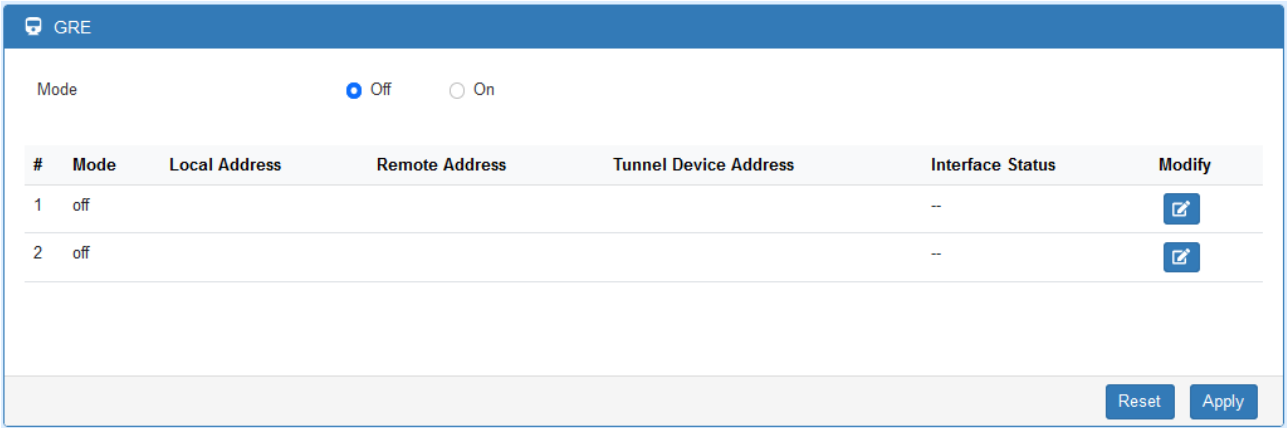
This section allows you to set **GRE configuration**. The default mode is off.

Generic Routing Encapsulation (GRE) is one of the available tunneling mechanisms which uses IP as the transport protocol and can be used for carrying many different passenger protocols. The tunnels behave as virtual point-to-point links that have two endpoints identified by the tunnel source and tunnel destination addresses at each endpoint.

- GRE Tunnel interface comes up as soon as it is configured.
- Local endpoint does not bring the interface down if the remote endpoint is unreachable.
- No way to determine problems in the intervening network.
- Keepalives are used to solve this issue.

The GRE Tunnel Keepalive feature provides the capability of configuring keepalive packets to be sent over IP-encapsulated GRE tunnels. You can specify the rate at which keepalives will be sent and the number of times that a device will continue to send keepalive packets without a response before the interface becomes inactive. GRE keepalive packets may be sent from both sides of a tunnel or from just one side.

There are two entries for user to configure, please press Edit ✎ button.

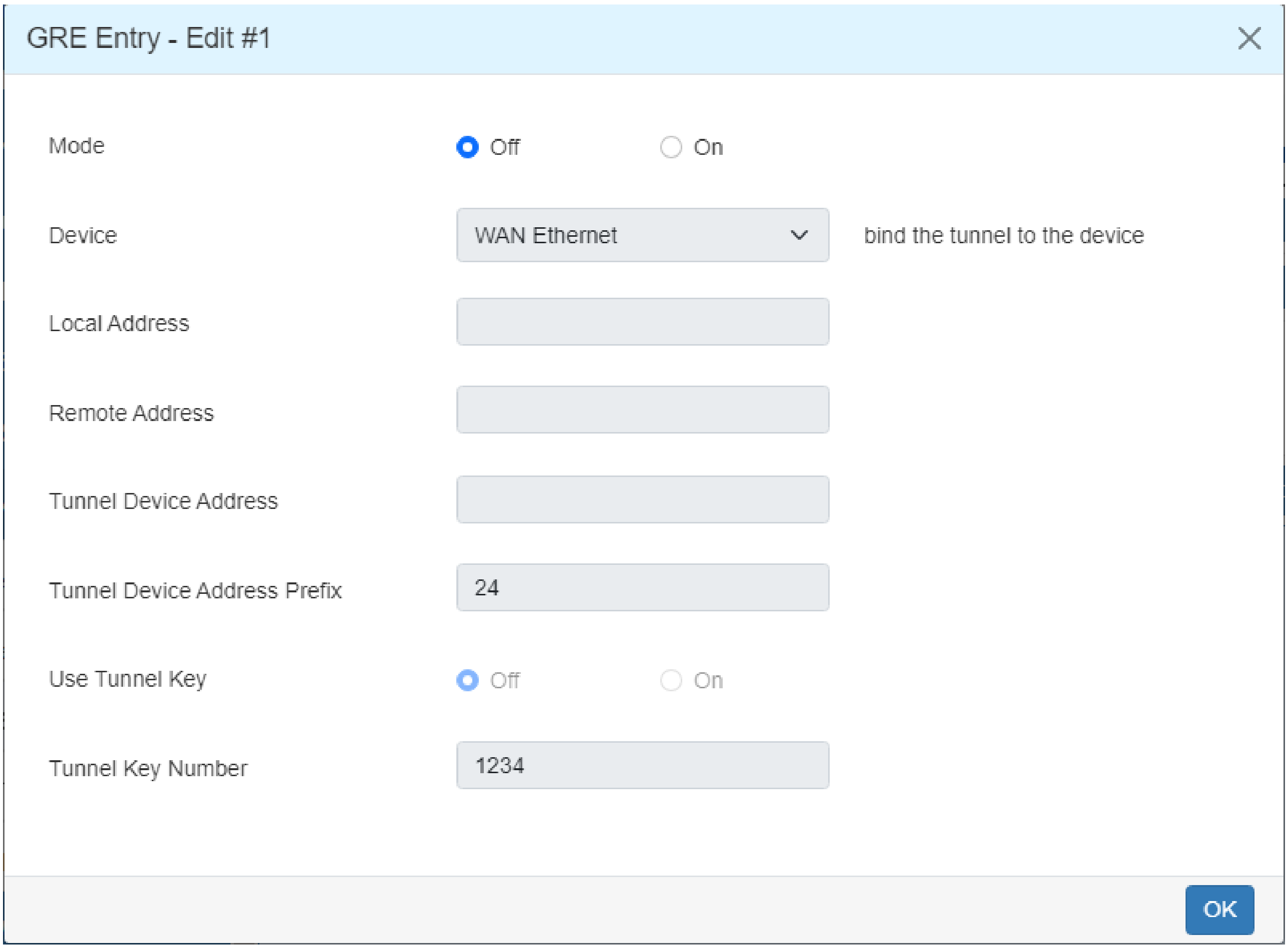


GRE

Mode ● Off ○ On

#	Mode	Local Address	Remote Address	Tunnel Device Address	Interface Status	Modify
1	off				--	✎
2	off				--	✎

Setup the GRE connection by clicking Edit button.



GRE Entry - Edit #1

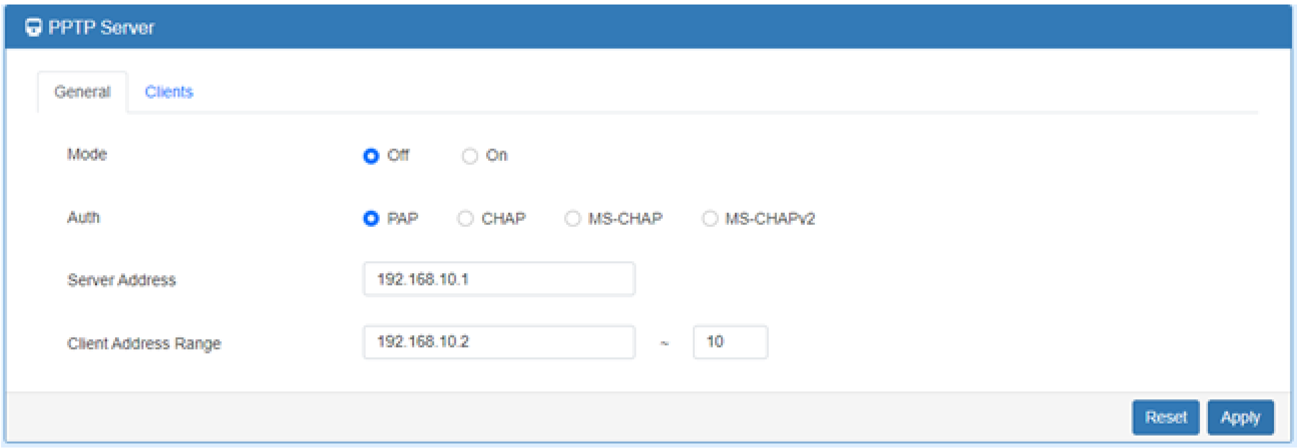
Mode	● Off ○ On	
Device	WAN Ethernet	bind the tunnel to the device
Local Address		
Remote Address		
Tunnel Device Address		
Tunnel Device Address Prefix	24	
Use Tunnel Key	● Off ○ On	
Tunnel Key Number	1234	

VPN > GRE	
Item	**Description**
Mode	Enable or disable the selected GRE connection.
Device	Select the interface that GRE should be applied
Local Address	Set local address of the GRE tunnel.
Remote Address	Set remote address of the GRE tunnel.
Tunnel Device Address	Set IP address of this GRE tunnel device.
Tunnel Device Address Prefix	Set Prefix of the Tunnel Device Address.
Use Tunnel Key	Whether to use the key for identifying an individual traffic flow within a tunnel.
Tunnel Key Number	The number of the tunnel key; default is '1234'.

11.4 PPTP Server

This section provides 2 sub configurations, including General Configuration and Clients Configuration.

(1) General Configuration



Mode ● Off ○ On

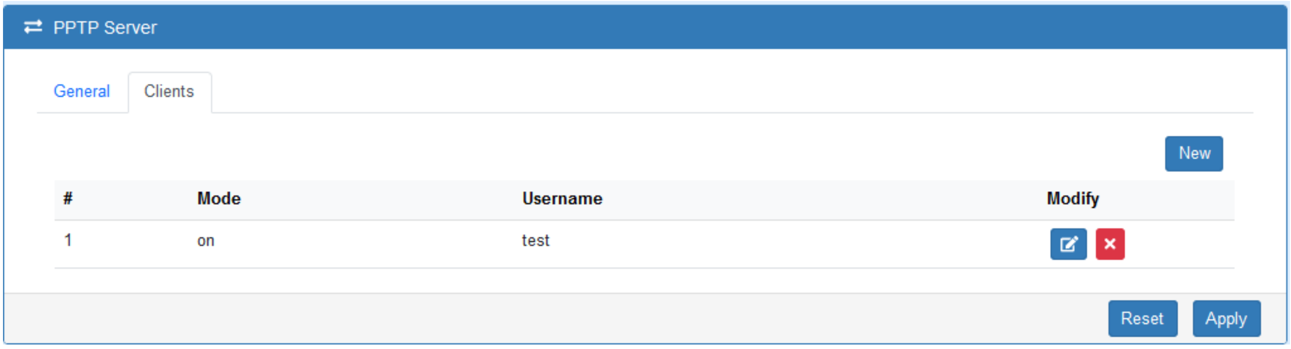
Auth ● PAP ○ CHAP ○ MS-CHAP ○ MS-CHAPv2

Server Address 192.168.10.1

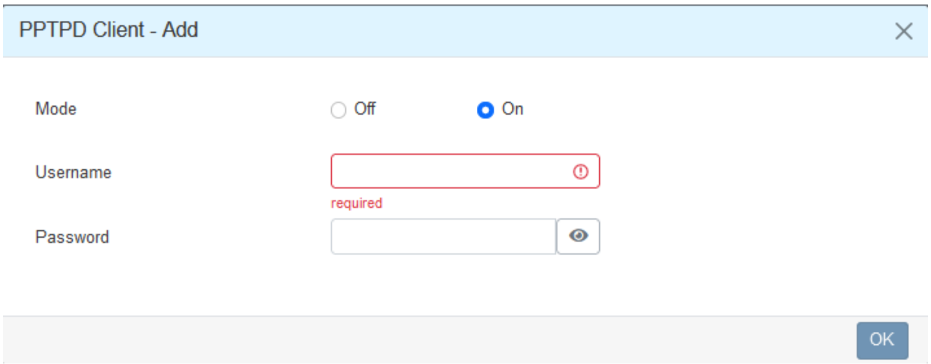
Client Address Range 192.168.10.2 ~ 10

VPN > PPTP Server > General	
Item	**Description**
Mode	Enable or disable the PPTP Server function.
Auth	Select the authentication type.
Server Address	This IP address is use as tunnel IP at server site.
Client Address Range	A list of IP addresses to assign to remote PPTP clients.

(2) Clients Configuration



#	Mode	Username	Modify
1	on	test	



PPTPD Client - Add

Mode ○ Off ● On

Username

required

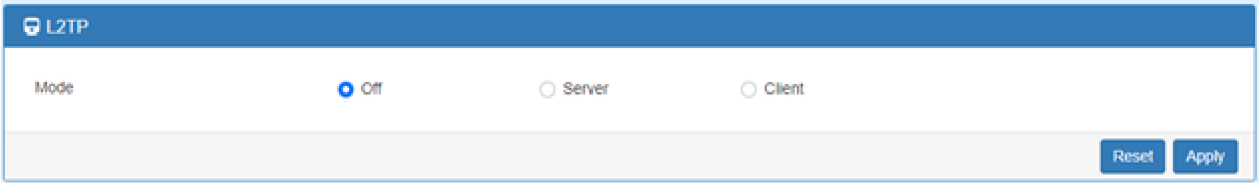
Password

VPN > PPTP Server > Clients	
Item	**Description**
Mode	Enable or disable the selected account.
Username	The username of this client.
Password	The password of this client.

11.5 L2TP

This section allows you to set up L2TP and provides three modes for configuration, including Off, Server, and Client Mode.

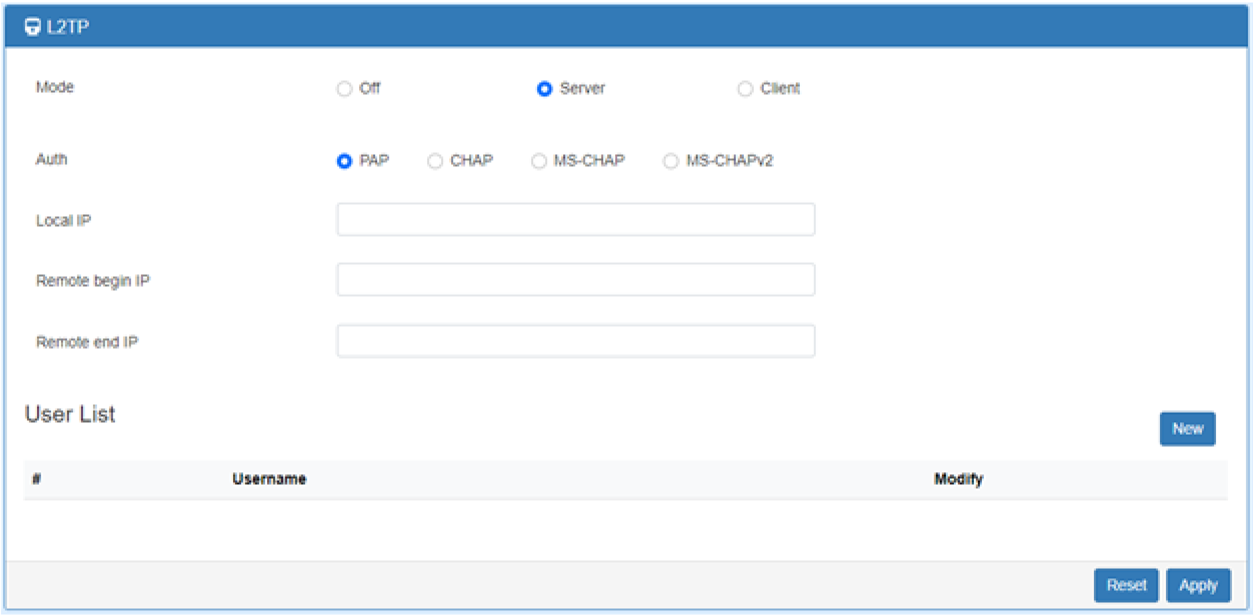
(1) General Mode: The default mode is Off as shown as below.



L2TP

Mode ● Off ○ Server ○ Client

(2) Server Mode:



L2TP

Mode ○ Off ● Server ○ Client

Auth ● PAP ○ CHAP ○ MS-CHAP ○ MS-CHAPv2

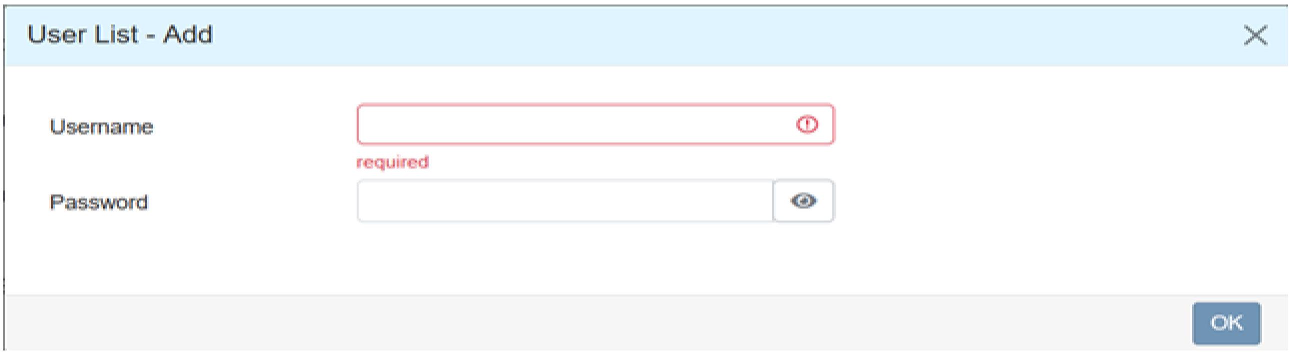
Local IP

Remote begin IP

Remote end IP

User List

#	Username	Modify



User List - Add

Username

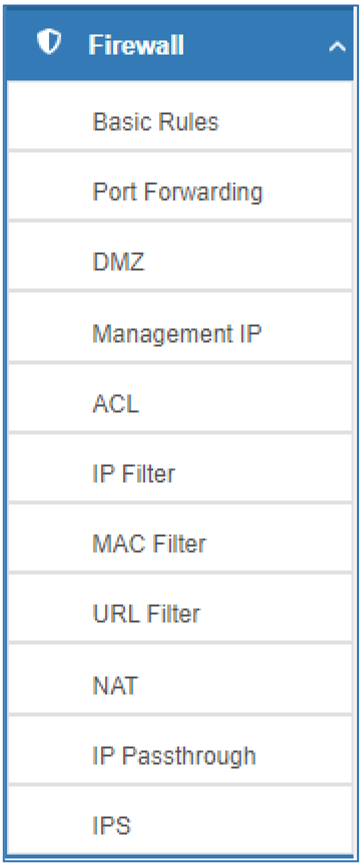
required

Password

VPN> L2TP > Server Mode	
Item	**Description**
Mode	Select from Off or On to set the client setting.
Auth	The authentication method for L2TP connection. Available options: PAP, CHAP, MS-CHAP, MS-CHAPv2
Local IP	The virtual IP for L2TP server.
Remote begin IP	The begin address of L2TP client's IP pool.
Remote end IP	The end address of L2TP client's IP pool.
New	Create a new user account for connecting with server.
Username	The username for L2TP client.
Password	The password for L2TP client.

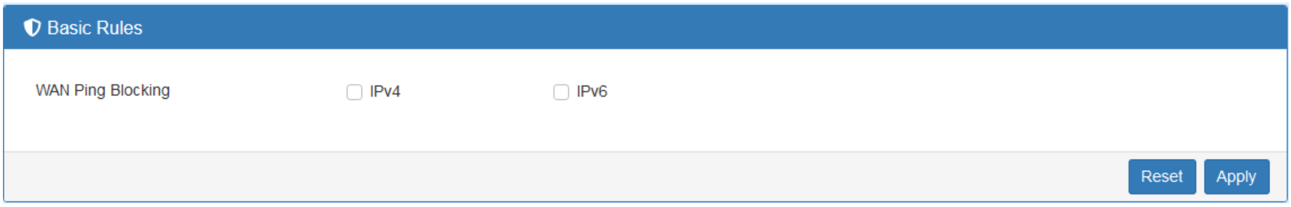
12 Web Menu Item > Firewall

This section allows you to configure Basic Rules, Port Forwarding, DMZ, IP Filter, MAC Filter, URL Filter, NAT and IPS.



12.1 Basic Rules

This section allows you to set the Basic Rules configuration.

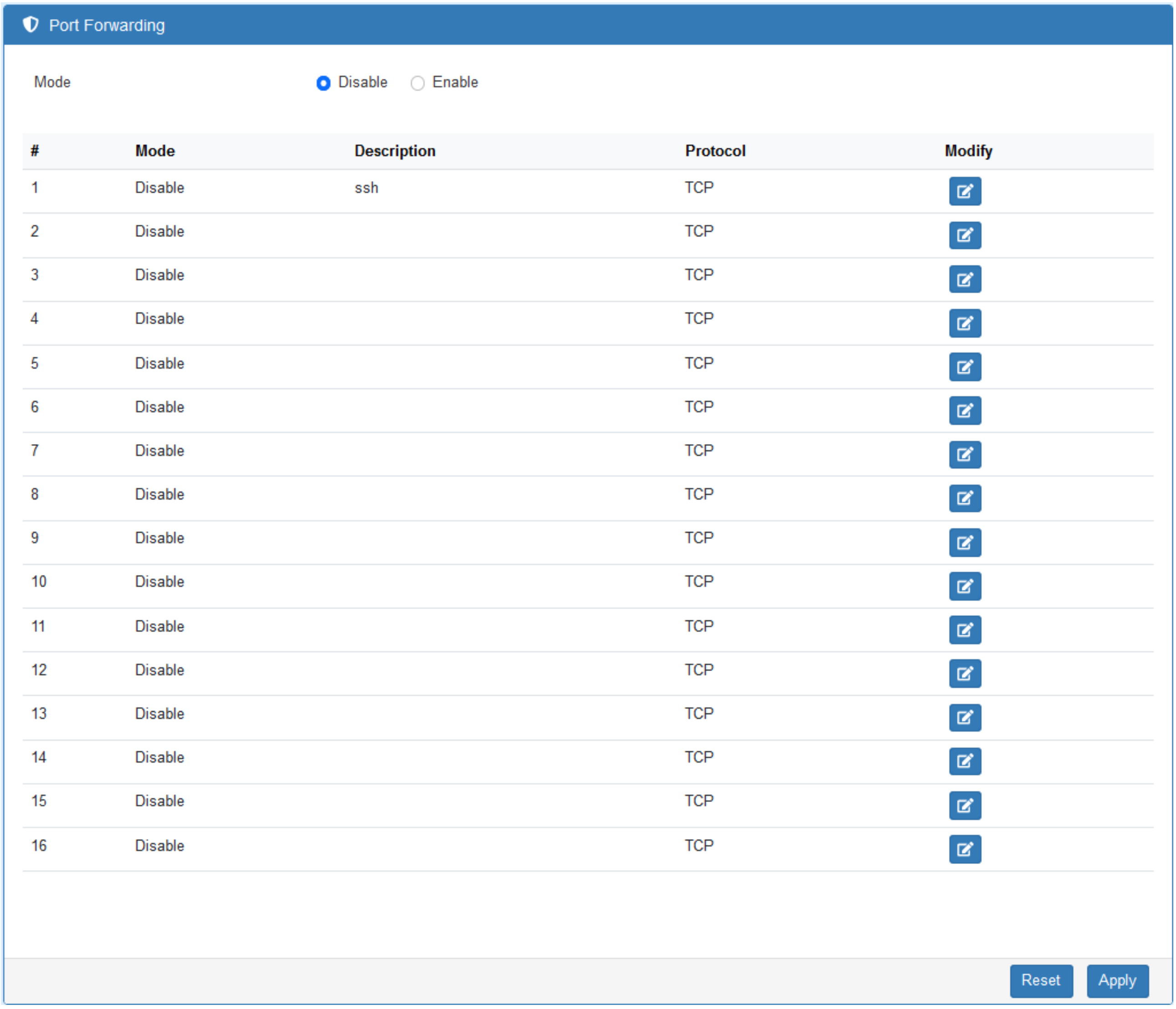


WAN Ping Blocking □ IPv4 □ IPv6

Firewall > Basic Rules	
Item	**Description**
WAN Ping Blocking	Check IPv4 or IPv6 for blocking

12.2 Port Forwarding

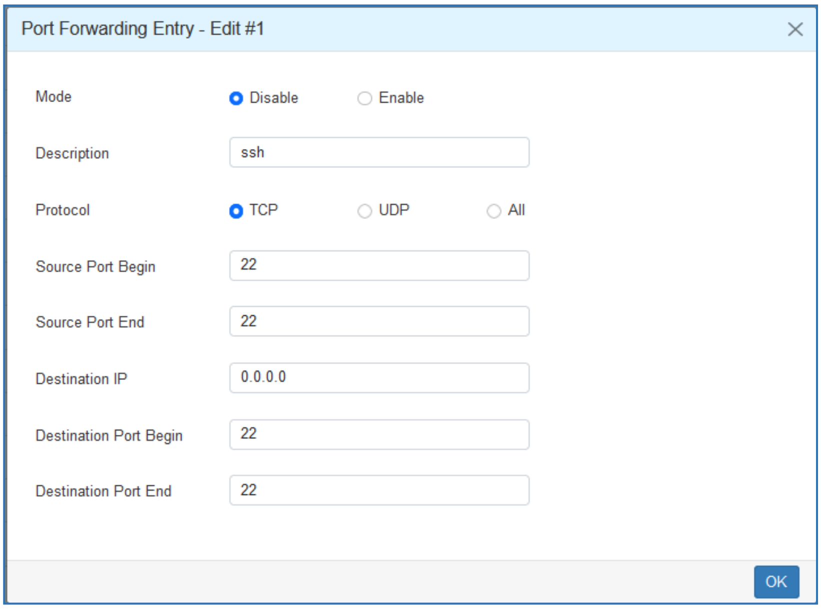
This section allows you to set up **Port Forwarding** and click edit button to configure.



Port Forwarding

Mode ● Disable ○ Enable

#	Mode	Description	Protocol	Modify
1	Disable	ssh	TCP	✎
2	Disable		TCP	✎
3	Disable		TCP	✎
4	Disable		TCP	✎
5	Disable		TCP	✎
6	Disable		TCP	✎
7	Disable		TCP	✎
8	Disable		TCP	✎
9	Disable		TCP	✎
10	Disable		TCP	✎
11	Disable		TCP	✎
12	Disable		TCP	✎
13	Disable		TCP	✎
14	Disable		TCP	✎
15	Disable		TCP	✎
16	Disable		TCP	✎



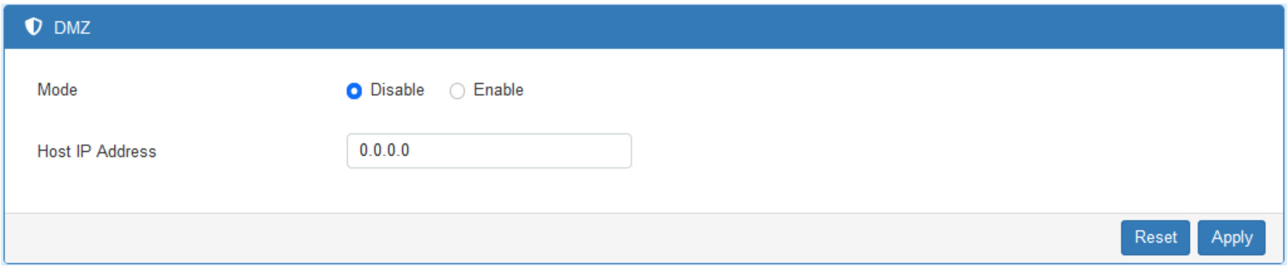
Port Forwarding Entry - Edit #1

Mode	● Disable ○ Enable
Description	ssh
Protocol	● TCP ○ UDP ○ All
Source Port Begin	22
Source Port End	22
Destination IP	0.0.0.0
Destination Port Begin	22
Destination Port End	22

Firewall > Port Forwarding	
Item	**Description**
Mode	Enable or disable the selected port forwarding entry.
Description	Descript the name of Port Forwarding.
Protocol	Select from UDP or TCP Client, which depends on the application.
Source Port Begin	Fill in the beginning of source port.
Source Port End	Fill in the end of source port.
Destination IP	Fill in the current private destination IP.
Destination Port Begin	Fill in the beginning of private destination port.
Destination Port End	Fill in the end of private destination port.

12.3 DMZ

This section allows you to set the DMZ configuration.



DMZ

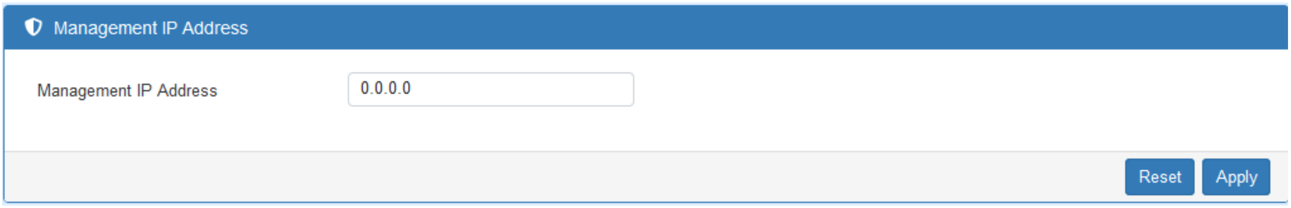
Mode: ● Disable ○ Enable

Host IP Address: 0.0.0.0

Firewall > DMZ	
Item	**Description**
Mode	Enable or disable the DMZ function.
Host IP Address	Fill in your Host IP Address.

12.4 Management IP

This section allows user to setup a management IP that is able to access the device from LAN or WAN side. This IP has higher management permissions than firewall settings.



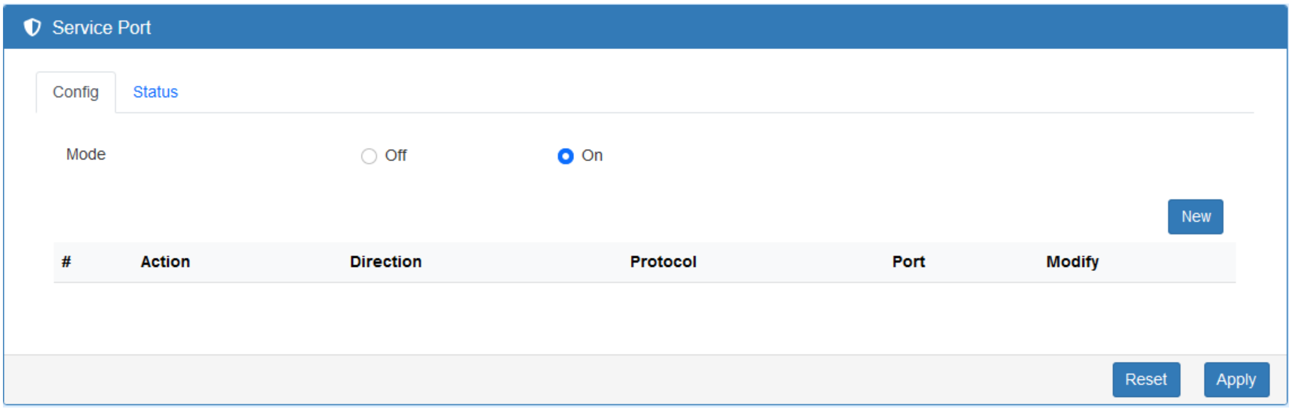
Management IP Address

Management IP Address: 0.0.0.0

Firewall > Management IP	
Item	**Description**
Management IP Address	Fill in your management IP Address.

12.5 ACL

This section allows managing access to the router's own services.



Service Port

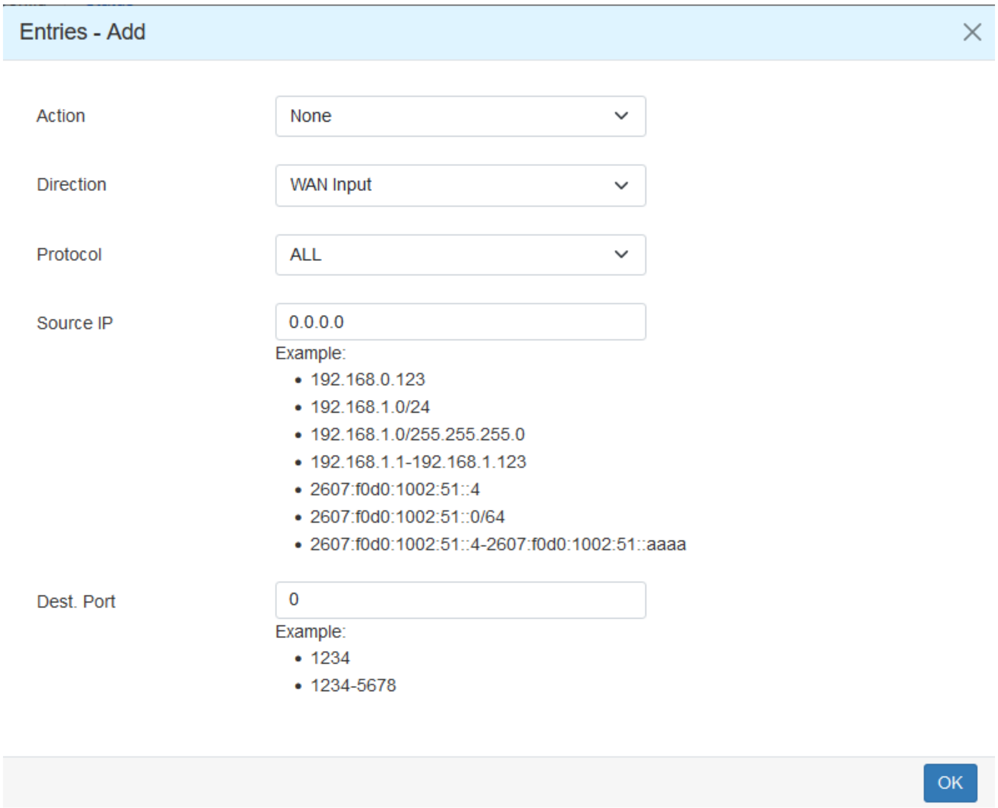
Config | Status

Mode ○ Off ● On

New

#	Action	Direction	Protocol	Port	Modify

Reset | Apply



Entries - Add

Action	None
Direction	WAN Input
Protocol	ALL
Source IP	0.0.0.0

Example:

- 192.168.0.123
- 192.168.1.0/24
- 192.168.1.0/255.255.255.0
- 192.168.1.1-192.168.1.123
- 2607:f0d0:1002:51::4
- 2607:f0d0:1002:51::0/64
- 2607:f0d0:1002:51::4-2607:f0d0:1002:51::aaaa

Dest. Port	0

Example:

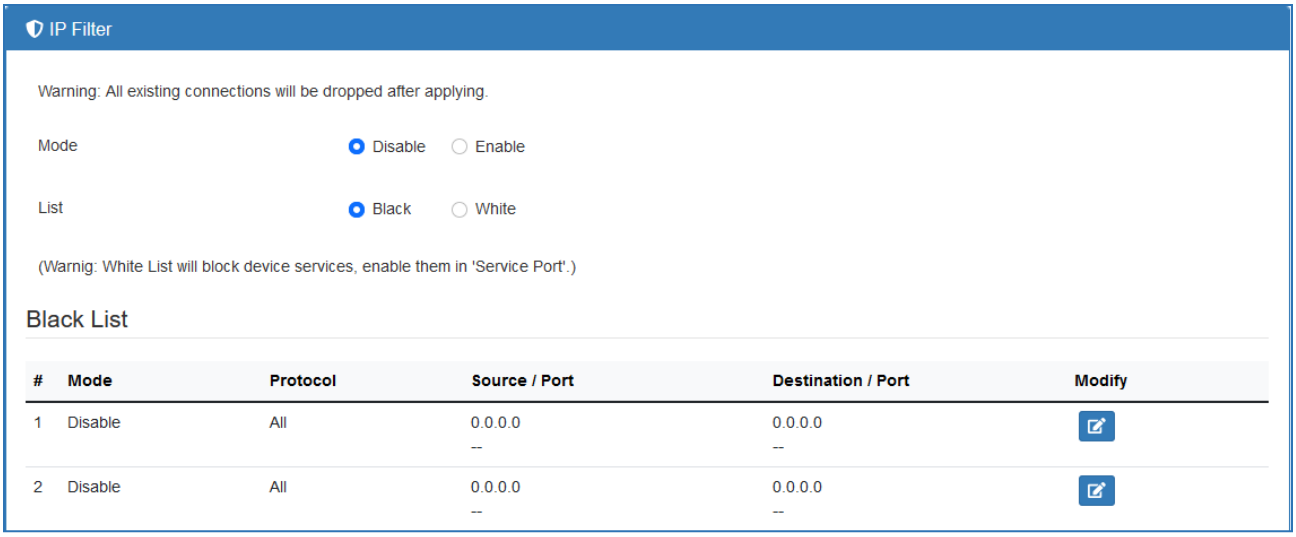
- 1234
- 1234-5678

OK

Firewall > Service Port	
Item	**Description**
Mode	Enable or disable the service port function.
Action	Select the action for selected entry.
Direction	Select the direction of traffic for selected entry.
Protocol	Select the protocol type.
Source IP	Enter the source IP, 0.0.0.0 means any.
Destination Port	Enter the service port number.

12.6 IP Filter

This section allows you to configure IP Filter. After clicking button, you can edit your IP Protocol, Source/Port and Destination/Port. The default is **Disable** mode and **Black** list.



IP Filter

Warning: All existing connections will be dropped after applying.

Mode ● Disable ○ Enable

List ● Black ○ White

(Warnig: White List will block device services, enable them in 'Service Port'.)

Black List

#	Mode	Protocol	Source / Port	Destination / Port	Modify
1	Disable	All	0.0.0.0 --	0.0.0.0 --	
2	Disable	All	0.0.0.0 --	0.0.0.0 --	

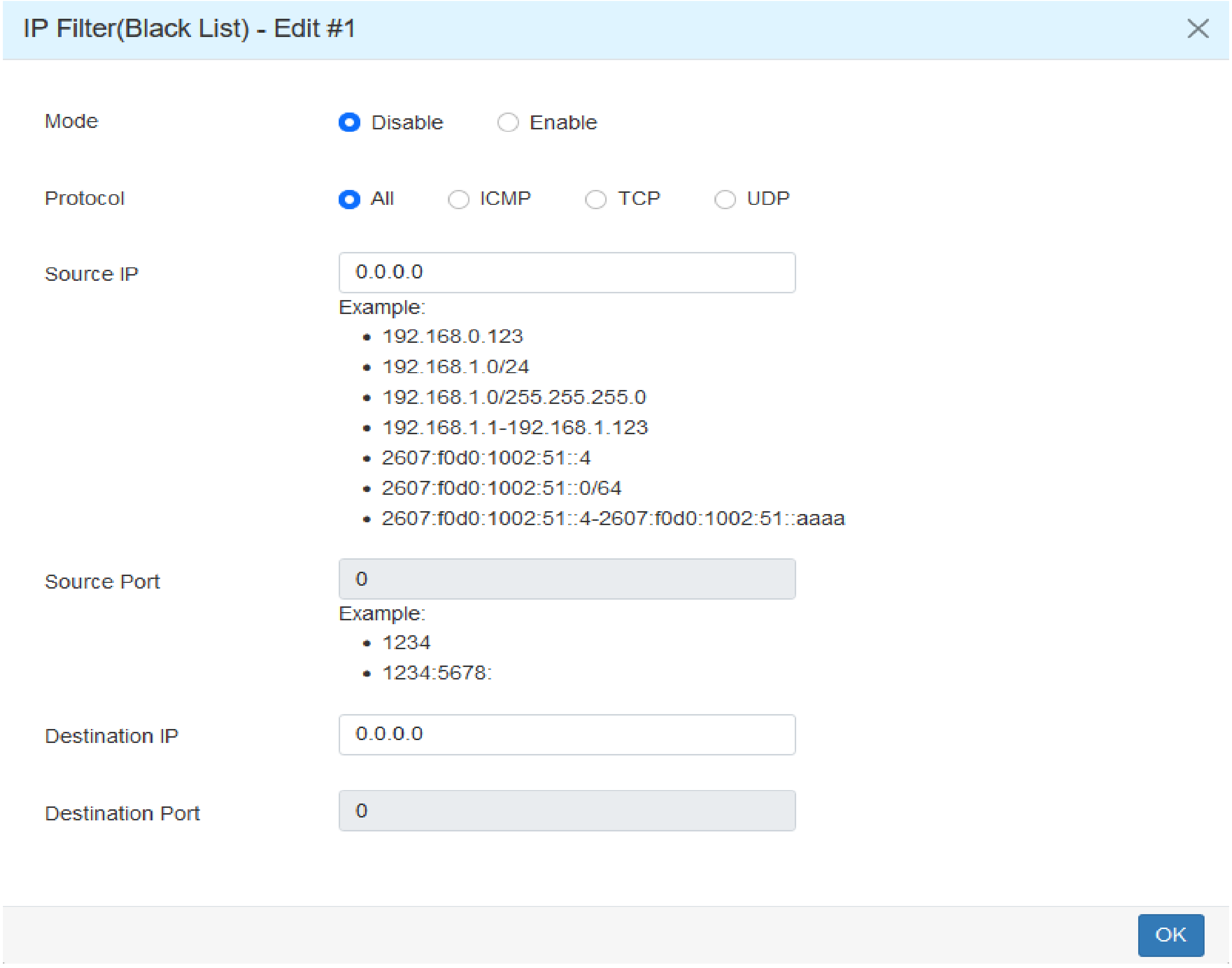
Black List: When Black List selected, all specified IP address/port are blocked.

White List: When White List selected, all specified IP address/port are accepted.

Edit Black/White List

(1) Click button to edit Black/White list.

(2) The default is **Disable** mode as the following interface (Black/White).



IP Filter(Black List) - Edit #1

Mode ● Disable ○ Enable

Protocol ● All ○ ICMP ○ TCP ○ UDP

Source IP: 0.0.0.0

Example:

- 192.168.0.123
- 192.168.1.0/24
- 192.168.1.0/255.255.255.0
- 192.168.1.1-192.168.1.123
- 2607:f0d0:1002:51::4
- 2607:f0d0:1002:51::0/64
- 2607:f0d0:1002:51::4-2607:f0d0:1002:51::aaaa

Source Port: 0

Example:

- 1234
- 1234:5678:

Destination IP: 0.0.0.0

Destination Port: 0

Firewall > IP Filter	
Item	**Description**
Mode	Select from Disable or Enable. The default is Disable.
Protocol	Select from All, ICMP, TCP or UDP.
Source IP	Fill in your source IP address.
Source Port	Fill in your source port.
Destination IP	Fill in your destination IP address.
Destination Port	Fill in your destination port.

(3) When selecting Enable Mode, the protocol is TCP. The source IP has IPv4 and IPv6 setting formats.

(4) For Source IP, there are three types to input your source IP that depends on your requirement, including single IP, IP with Mask or giving a range of IP. The following table provides some examples.

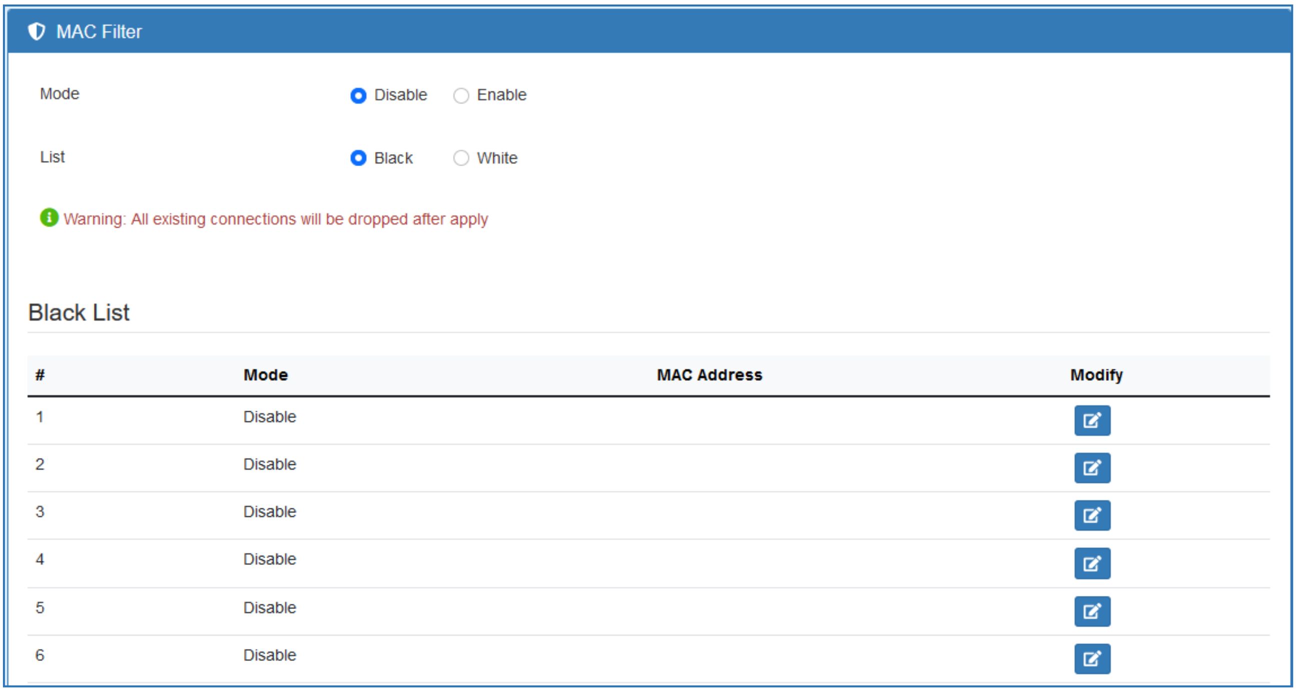
Firewall > Edit IP Filter > Source IP			
IP Format	**Single IP**	**IP with Mask**	**Ranged IP**
IPv4	192.168.0.123	192.168.1.0/24 192.168.1.0/255.255.255.	192.168.1.1-192.168.1.123
IPv6	2607:f0d0:1002:51::4	2607:f0d0:1002:51::0/64	2607:f0d0:1002:51::4- 2607:f0d0:1002:51::aaaa
Note: Setting up a range of IP, please use – hyphen symbol to mark your ranged IP.			

(5) For Source Port, there are two types to input your source port that depends on your requirement, including single port (e.g.1234) or giving a range of ports (e.g.1234:5678).

Note: Setting up a range of source ports, please use: colon symbol to mark your ranged ports.

12.7 MAC Filter

This section allows you to set up MAC Filter. After clicking ✎ button, you can edit your MAC address.



MAC Filter

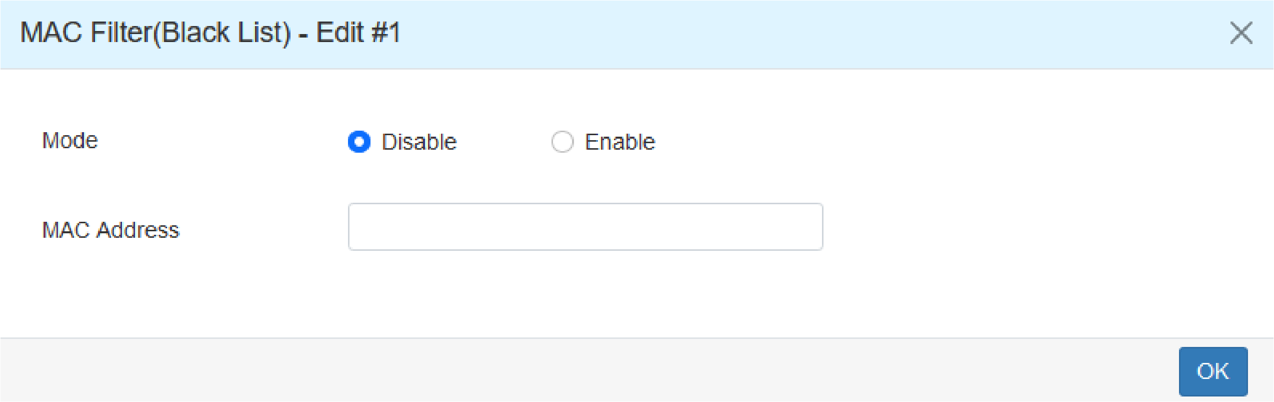
Mode ● Disable ○ Enable

List ● Black ○ White

Warning: All existing connections will be dropped after apply

Black List

#	Mode	MAC Address	Modify
1	Disable		✎
2	Disable		✎
3	Disable		✎
4	Disable		✎
5	Disable		✎
6	Disable		✎



MAC Filter(Black List) - Edit #1

Mode ● Disable ○ Enable

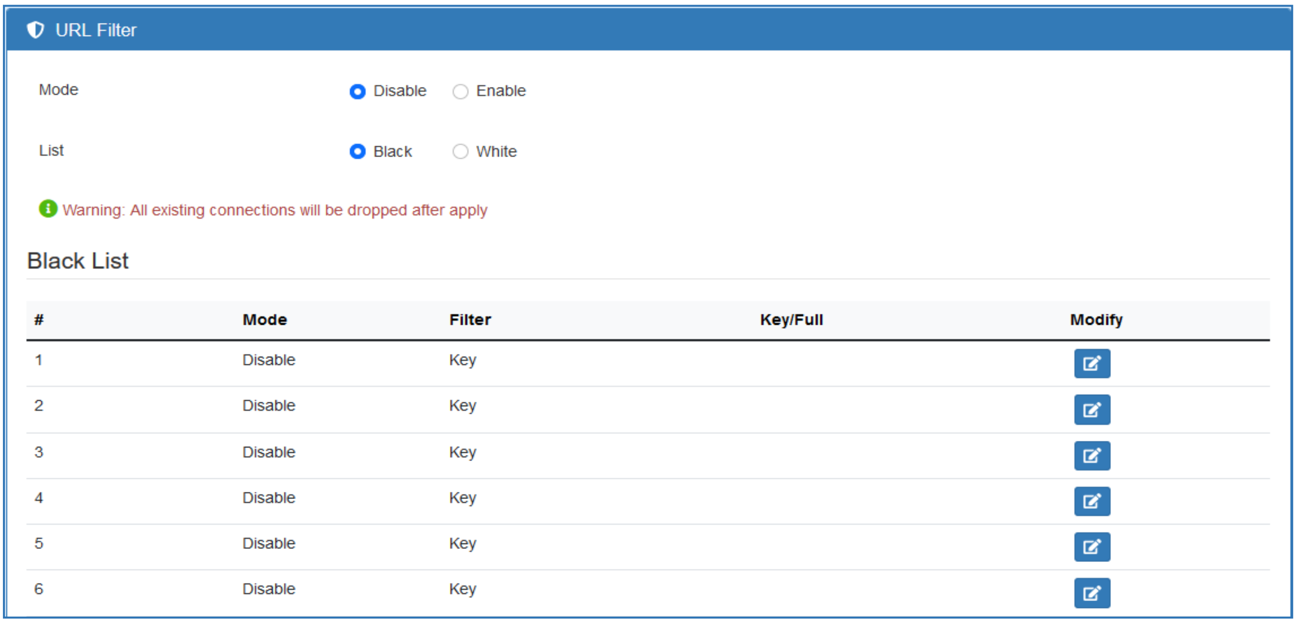
MAC Address

Service > MAC Filter	
Item	**Description**
Mode	Select from Disable or Enable. The default is Disable.
MAC Address	Fill in your MAC address.

Note: Setting up MAC address, please use ”:” colon symbol (e.g. xx : xx : xx : xx) or “-“ hyphen symbol to mark (e.g. xx - xx - xx - xx).

12.8 URL Filter

This section allows you to set up URL Filter. After clicking ✎ button, you can edit the type of filter and information.



URL Filter

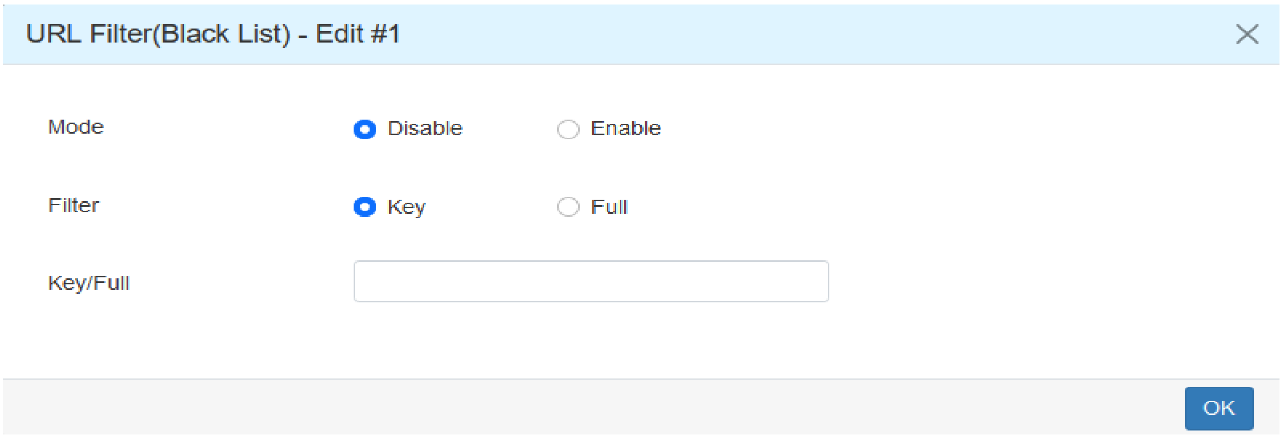
Mode ● Disable ○ Enable

List ● Black ○ White

Warning: All existing connections will be dropped after apply

Black List

#	Mode	Filter	Key/Full	Modify
1	Disable	Key		✎
2	Disable	Key		✎
3	Disable	Key		✎
4	Disable	Key		✎
5	Disable	Key		✎
6	Disable	Key		✎



URL Filter(Black List) - Edit #1

Mode ● Disable ○ Enable

Filter ● Key ○ Full

Key/Full

Note: Please not include “**https://**” or “**http://**” for the URL address in the **Full** Filter.

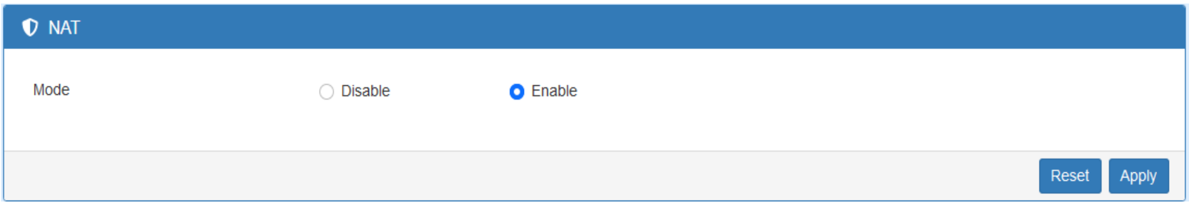
Firewall > URL Filter	
Item	**Description**
Mode	Select from Disable or Enable. The default is Disable.
Filter	Select from Key or Full. The default is Key.
Key / Full	Fill in your Key / Full information.

12.9 NAT

This section allows you to set NAT configuration.

When NAT mode is **Enable**, the router will replace the source private IP address by its Internet public address for outgoing packets, and replace the destination Internet public address by private IP address for incoming packets.

When NAT mode is **Disable**, the router will send the source LAN private IP address for outgoing packets and allow to receive the destination LAN private IP address for incoming packets.



NAT

Mode ○ Disable ● Enable

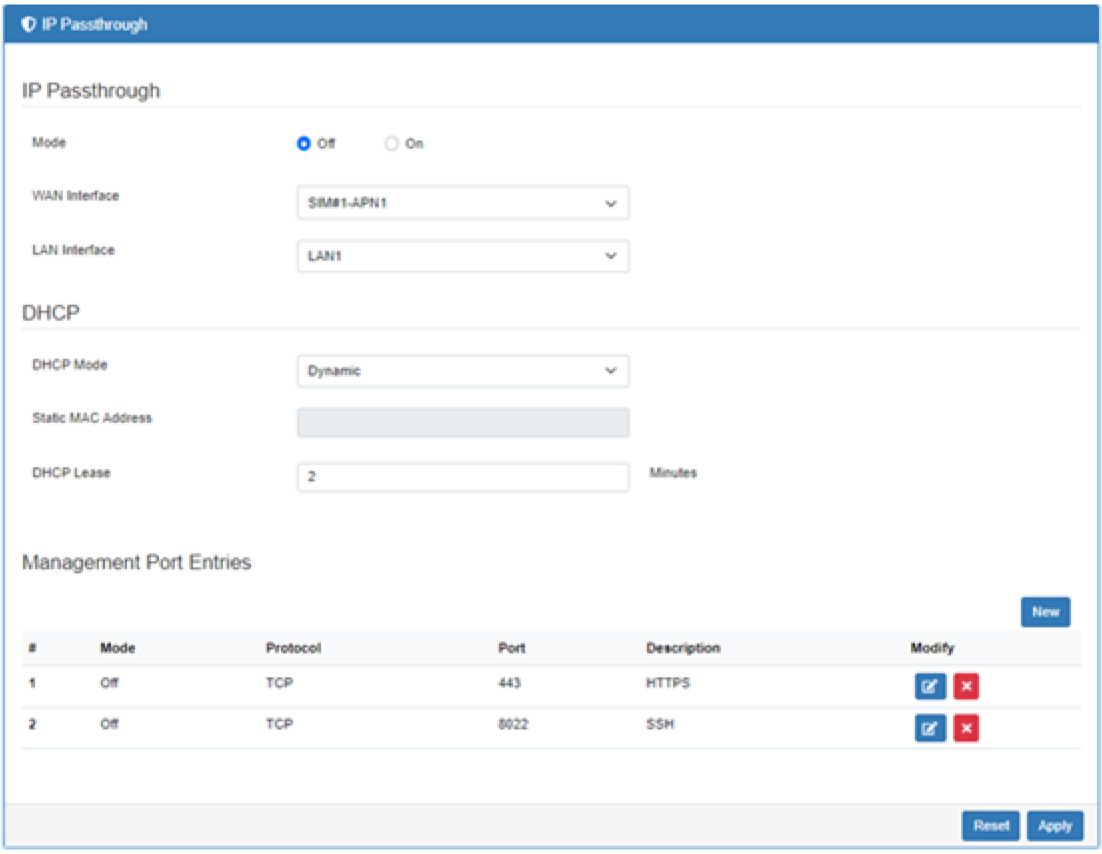
12.10 IP Passthrough

Most common in ISP-provided consumer devices is half bridge mode

In this mode, the device handles authentication (the login/password of your Internet contract) and encapsulation, and it will duplicate the WAN IP address from the ISP to the downstream device.

IP Passthrough, makes the router/modem pass the IP assigned from the ISP to the attached downstream device.

It can be using DHCP to pass the IP address(and DNS server) that has been assigned to a PPP interface by an ISP, to another device running a DHCP client.



IP Passthrough

IP Passthrough

Mode ● Off ○ On

WAN Interface: SIM#1-APN1

LAN Interface: LAN1

DHCP

DHCP Mode: Dynamic

Static MAC Address:

DHCP Lease: 2 Minutes

Management Port Entries

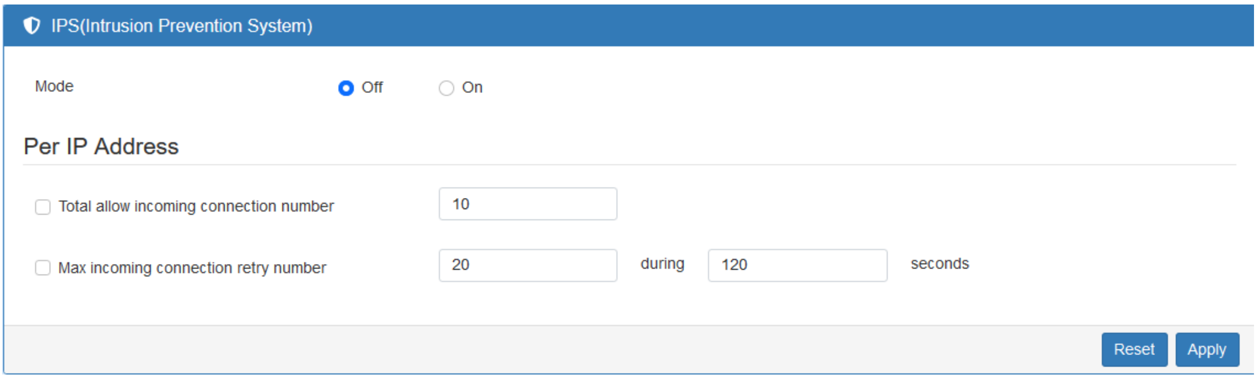
#	Mode	Protocol	Port	Description	Modify
1	Off	TCP	443	HTTPS	
2	Off	TCP	8022	SSH	

Firewall > IP Passthrough	
Item	**Description**
IP Passthrough	
Mode	Select from Disable or Enable. The default is Disable.
WAN Interface	WAN interface ID, each one represents the related interface
LAN Interface	LAN interface ID, each one represents the related interface
DHCP	
DHCP Mode	Select the Service Static or Dynamic DNS.
Static MAC Address	Fill in your Static MAC address.
DHCP Lease	Time in minutes that will be assigned to a lease for DHCP client's address.
Management Port Entries	
Mode	Select from off or on. The default is off.
Protocol	Select from UDP or TCP Client which depends on the application. The default is UDP.
Port	Enter the listening port of remote side.
Description	Fill in the name of HTTPS or SSH
Modify	Modify Management Port Entries

12.11 IPS

This section allows you to set IPS configuration. IPS prevents the system from being attacked by the Internet.

The system allows user to limit the max incoming connection number from WAN per source IP address to prevent system resource exhausted. Also, the system allows to limit the max incoming connection retry number during a specific time period from WAN per source IP address to prevent too many unexpected connections retry event from causing system busy.



IPS(Intrusion Prevention System)

Mode ● Off ○ On

Per IP Address

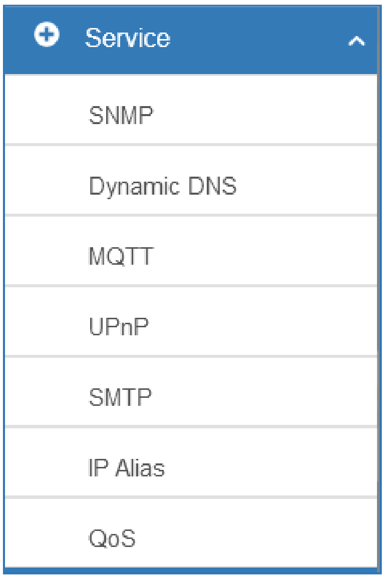
□ Total allow incoming connection number 10

□ Max incoming connection retry number 20 during 120 seconds

Firewall > IPS	
Item	**Description**
Mode	Turn on or off IPS function (default: Off)
Total allow incoming connection number	Select the checkbox to enable or disable the function. The default number is 10.
Max incoming connection retry number	Select the checkbox to enable or disable the function. The default number is 20.
Duration time	The default time is 120 seconds.

13 Web Menu Item > Service

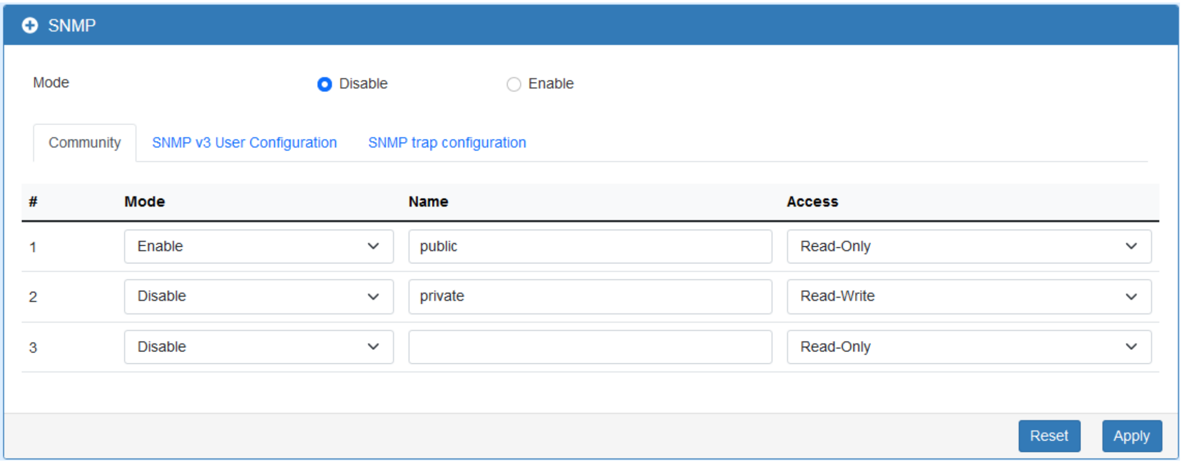
This section allows you to configure SNMP, Dynamic DNS, VRRP, SMTP, IP Alias, and QoS.



13.1 SNMP

This section allows user to configure the SNMP function.

13.1.1 Community

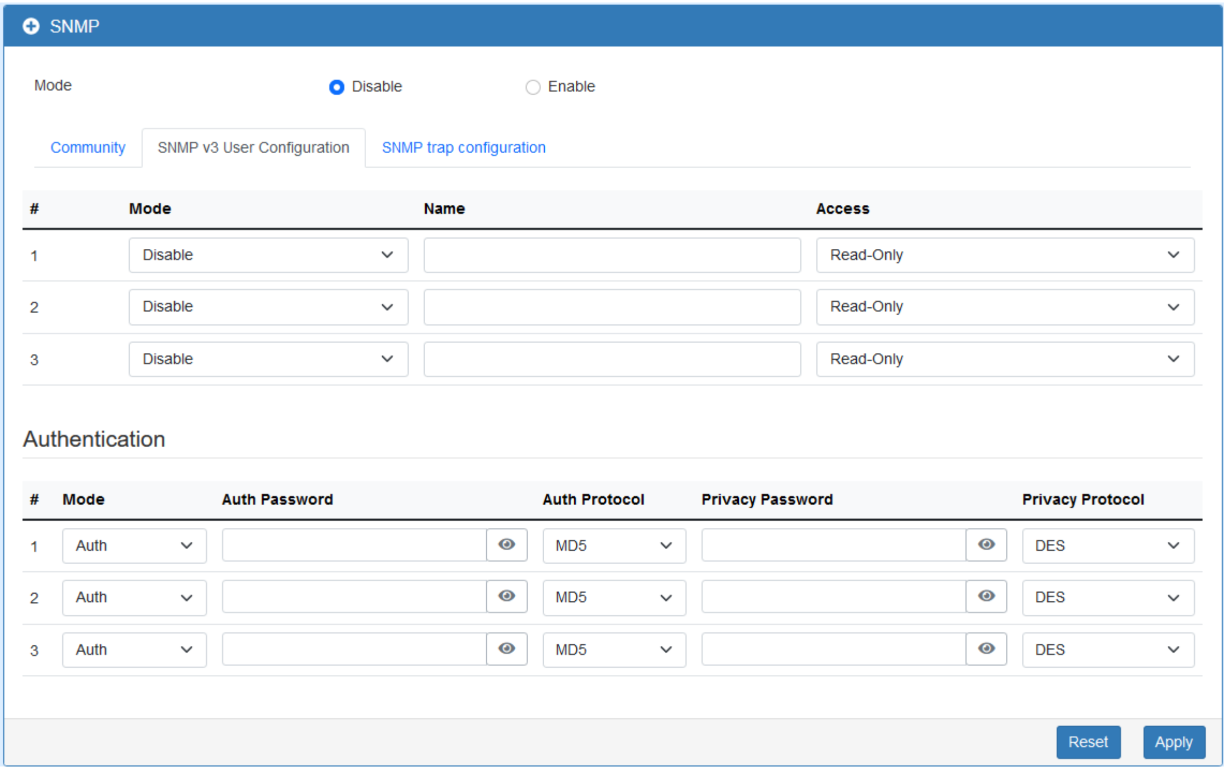


Mode ● Disable ○ Enable

#	Mode	Name	Access
1	Enable	public	Read-Only
2	Disable	private	Read-Write
3	Disable		Read-Only

Service > SNMP > Community	
Item	**Description**
Mode	Select from Disable or Enable to configure SNMP.
Community	Configure community setting with three options, including # 1, # 2 and #3.
Mode	Select from Disable or Enable.
Name	Name each community.
Access	Select from Read-Only or Read-Write.

13.1.2 SNMP v3 User Configuration



SNMP

Mode ● Disable ○ Enable

Community | SNMP v3 User Configuration | SNMP trap configuration

#	Mode	Name	Access
1	Disable		Read-Only
2	Disable		Read-Only
3	Disable		Read-Only

Authentication

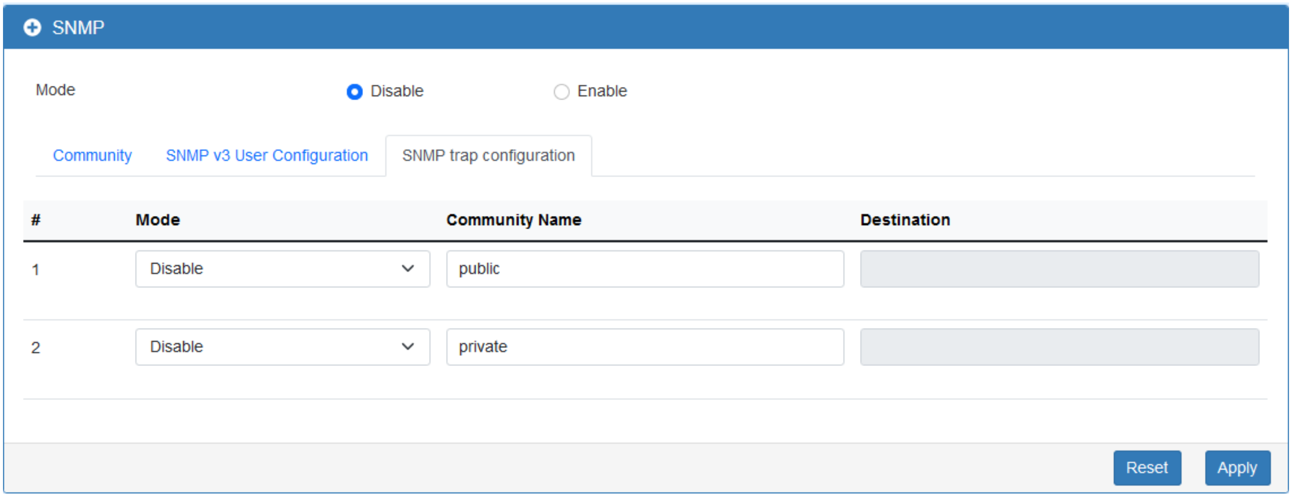
#	Mode	Auth Password	Auth Protocol	Privacy Password	Privacy Protocol
1	Auth		MD5		DES
2	Auth		MD5		DES
3	Auth		MD5		DES

For SNMP v3 User Configuration, you need to register authentication and allow a receiver that confirm the packet was not modified in transit. There are three options to set up SNMP v3 Configuration.

Service > SNMP > SNMP v3 User configuration	
Item	**Description**
Mode	Select from Disable or Enable to configure SNMP. The default is Disable.
Name	Fill in your name.
Auth Mode	Select from Authentication or Privacy.
Authentication Password	Fill in your authentication password.
Authentication Protocol	Select from MD5 or SHA.
Privacy Password	Fill in your privacy password.
Privacy Protocol	Select from DES or AES.
Access	Select from Read-Only or Read-Write.

13.1.3 SNMP trap configuration

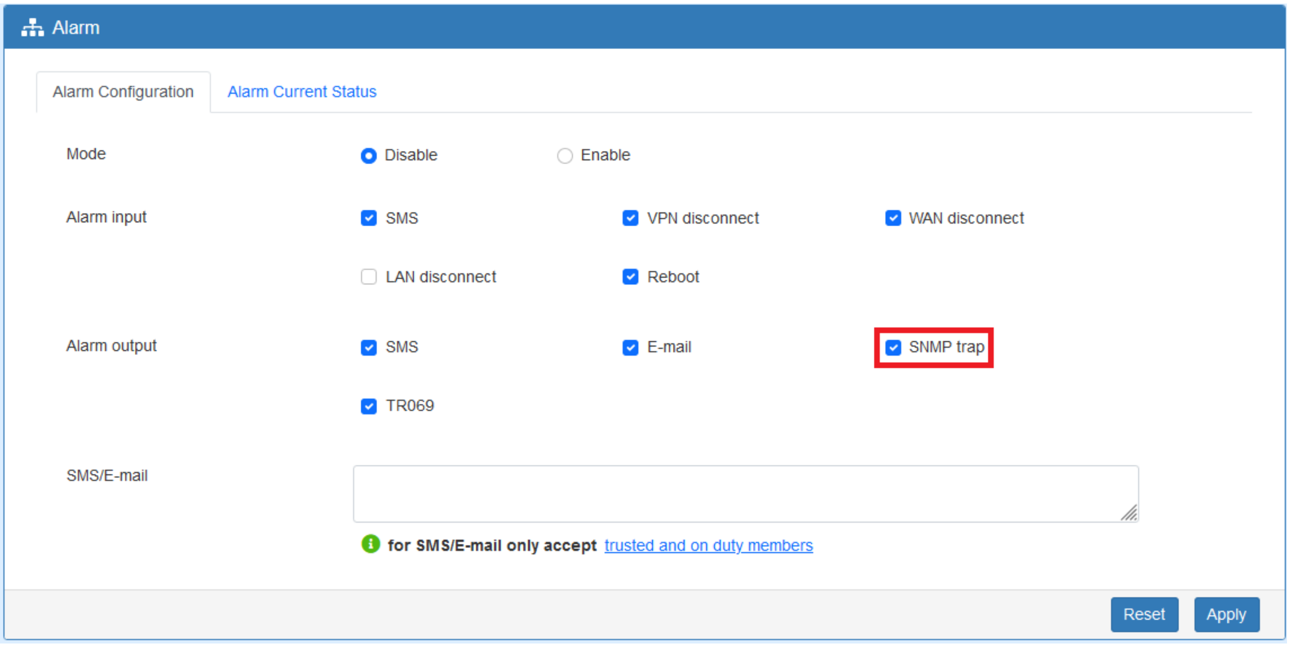
This section allows you to set up the SNMP trap configuration when you select the SNMP trap function from Alarm output of system for your router. With SNMP trap setting, you can know the status of remote device.



SNMP

Mode ● Disable ○ Enable

#	Mode	Community Name	Destination
1	Disable	public	
2	Disable	private	



Alarm

Mode ● Disable ○ Enable

Alarm input ☑ SMS ☑ VPN disconnect ☑ WAN disconnect
□ LAN disconnect ☑ Reboot

Alarm output ☑ SMS ☑ E-mail ☑ SNMP trap
☑ TR069

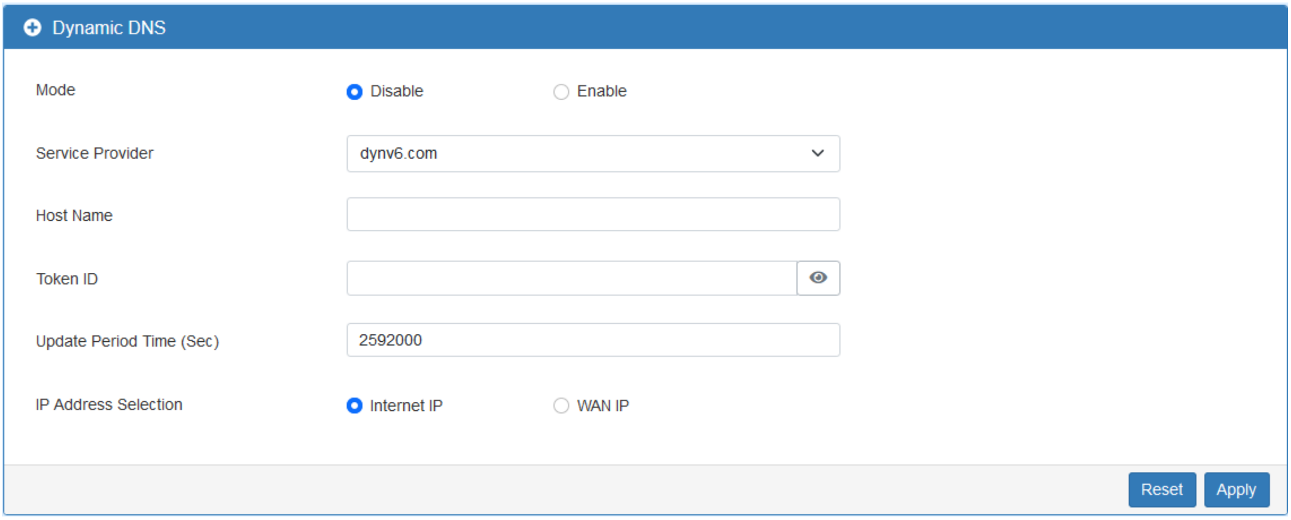
SMS/E-mail

for SMS/E-mail only accept trusted and on duty members

Service > SNMP > SNMP trap configuration	
Item	**Description**
Mode	Select from Disable or Enable. The default is Disable.
Community Name	Fill in your community’s name.
Destination	The destination (domain name/IP) of remote SNMP trap server.

13.2 Dynamic DNS

This section allows you to set up Dynamic DNS.



Dynamic DNS

Mode: ● Disable ○ Enable

Service Provider: dynv6.com

Host Name:

Token ID:

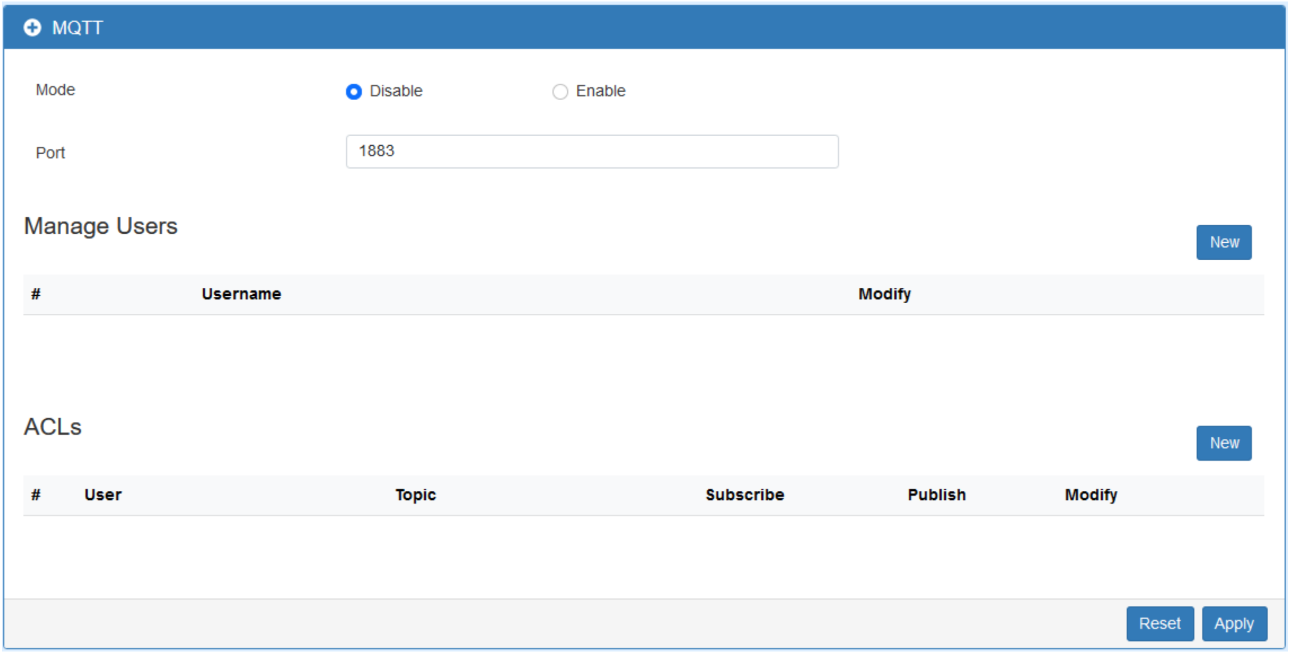
Update Period Time (Sec): 2592000

IP Address Selection: ● Internet IP ○ WAN IP

Service > Dynamic DNS	
Item	**Description**
Mode	Select Disable or Enable to turn on or off this function. The default is Disable.
Service Provider	Select the Service Provider of Dynamic DNS.
Host Name	Fill in your registered Host Name from Service Provider.
Token ID	Fill in your Token ID from Service Provider.
Host Secret ID	Fill in your Secret ID from Service Provider.
Username	Fill in your registered username from Service Provider.
Password	Fill in your registered password from Service Provider.
Update Period Time (Sec)	Fill in “0” to mean 30 days.
IP Address Selection	Select either Internet IP or WAN IP.

13.3 MQTT

This section allows user to configure the MQTT. It allows the MQTT client to send the message within specific topic or channel. By default, the router does not allow anonymous to read/write the MQTT topic or channel. Thus, you need to create the account with username and password for MQTT client on the web UI.



Mode ● Disable ○ Enable

Port 1883

Manage Users

#	Username	Modify

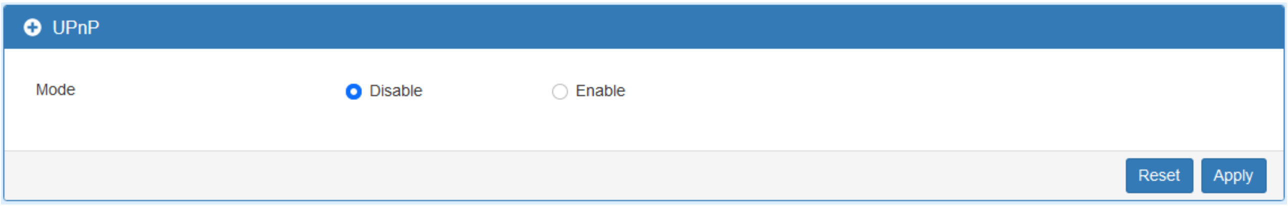
ACLs

#	User	Topic	Subscribe	Publish	Modify

Service > MQTT	
Item	**Description**
Mode	Select from Disable or Enable. The default is Disable.
Port	Fill in the port number of MQTT application.
Manage Users	Create the users and show all users' names. Allow each user to delete their name.
Username	Fill in the username of manage user.
Password	Fill in the password of manage user.
ACLs	Allow to specify what topic should be limited.
User	Select the users and identify their authority to read or write the MQTT topic/channel.
Topic	Name the topic of MQTT message.

13.4 UPnP

This section allows to set up UPnP confirguration to select the mode from Disable or Enable. The default UPnP is disabled for the cellular router.

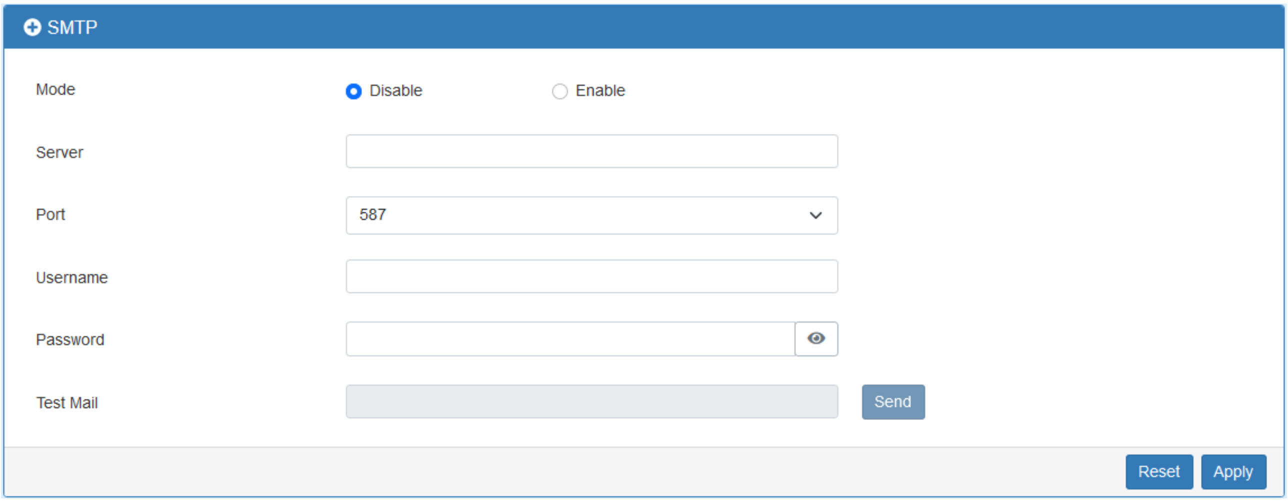


UPnP

Mode ● Disable ○ Enable

13.5 SMTP

This section provides you to send your email for the server. For instance, the email will be sent to notify when the Alarm has a nofitication by the server.



SMTP

Mode ● Disable ○ Enable

Server

Port 587

Username

Password

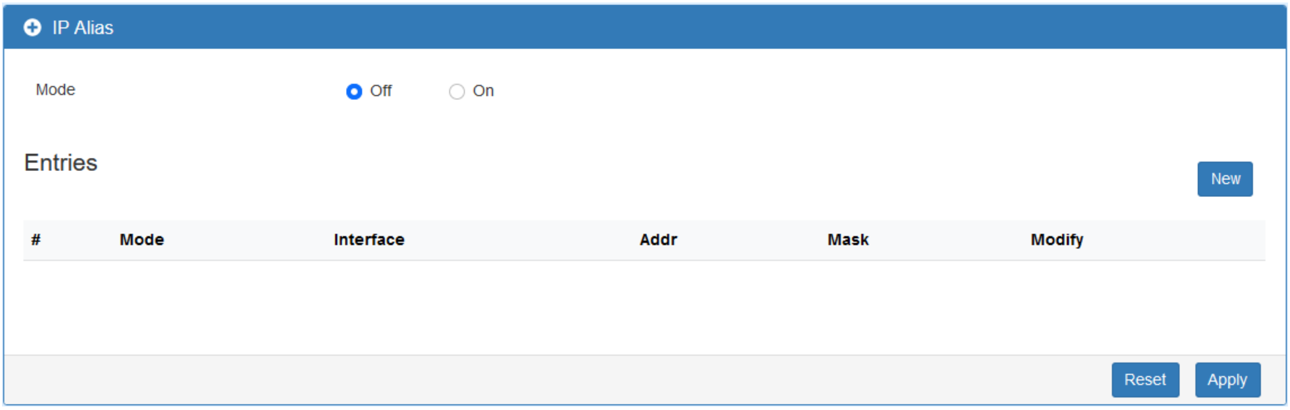
Test Mail

Service > SMTP	
Item	**Description**
Mode	Select from Disable or Enable. The default is Disable.
Server	Enter the domain or IP address of the SMTP server.
Port	There are three ports for SMTP communication between mail servers. Port 25: Use TCP port 25 without encryption. Port 465: SMTP connections secured by SSL. Port 587: SMTP connections secured by TLS.
Username / Password	Fill in your username and password as the same your server.
Test Mail	Enter the mail address for sending test mail.

13.6 IP Alias

This section allows you to set **IP Alias** configuration.

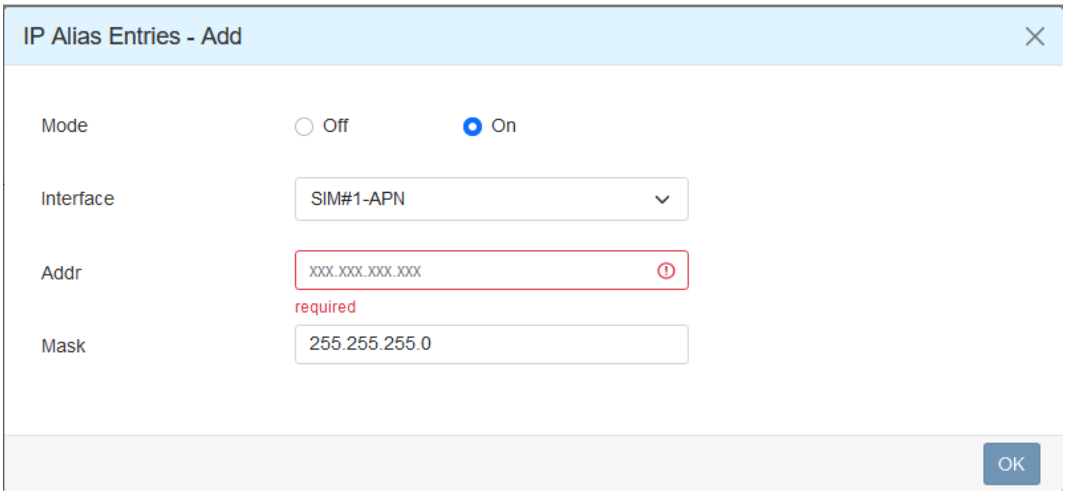
IP Alias is associating more than one IP address to a network interface. With IP Alias, one node on a network can build multiple connections with the network, each serving a different purpose. IP Alias can be used to provide multiple network addresses on a single physical interface.


IP Alias

Mode ● Off ○ On

Entries

#	Mode	Interface	Addr	Mask	Modify


IP Alias Entries - Add

Mode ○ Off ● On

Interface: SIM#1-APN

Addr: xxx.xxx.xxx.xxx

required

Mask: 255.255.255.0

Service > IP Alias	
Item	**Description**
Mode	Select from “Off” or “On” to enable the IP Alias.
Entries	View / Modify / Delete the existing entries.
New / Edit IP Alias Entry	Mode: select from “Off” or “On” to use or not use this entry. Interface: the interface you want to provide the additional address. IP Address: Enter the IP address. IP Mask: Enter the network mask.

13.7 **QoS**

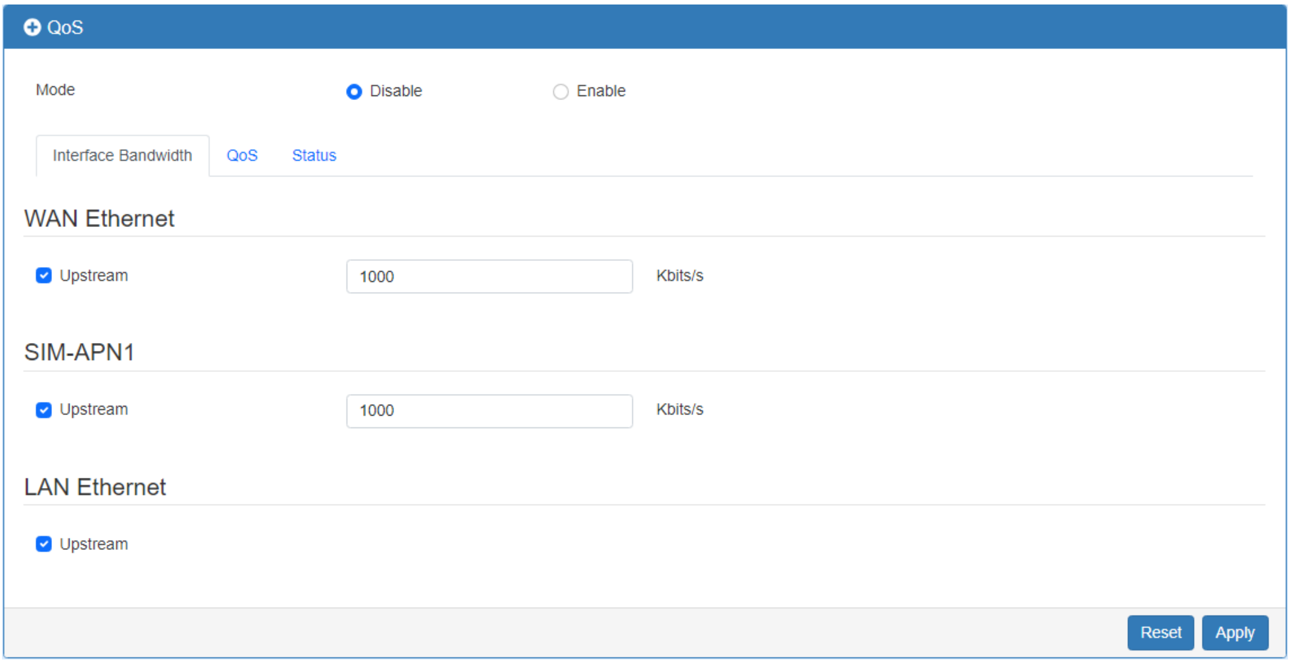
QoS (Quality of Service) refers to a network ability to achieve maximum bandwidth and allow minimum bandwidth. It guarantees the minimum and limit the maximum bandwidth class of traffic. The QoS configuration has three parts, including ISP bandwidth, QoS, and Status.

- ISP bandwidth allows user to configure the max bandwidth for upstream of specific WAN interface. Upstream means from LAN to WAN.
- QoS configuration allows user to classify the traffic. Once classified, the traffic will have the guarantee minimum and limit maximum bandwidth.
- Status allows user to monitor the dynamic bandwidth usage.

13.7.1 QoS > Interface Bandwidth

User can assign the Upstream Bandwidth for each interface. The Bandwidth unit is kilobits per second.

To prevent guaranteed traffic loss, the assigned bandwidth is better not to exceed the real bandwidth because the allowable traffic quantity may exceed the real bandwidth.



QoS

Mode ● Disable ○ Enable

WAN Ethernet

☑ Upstream 1000 Kbits/s

SIM-APN1

☑ Upstream 1000 Kbits/s

LAN Ethernet

☑ Upstream

13.7.2 QoS > QoS

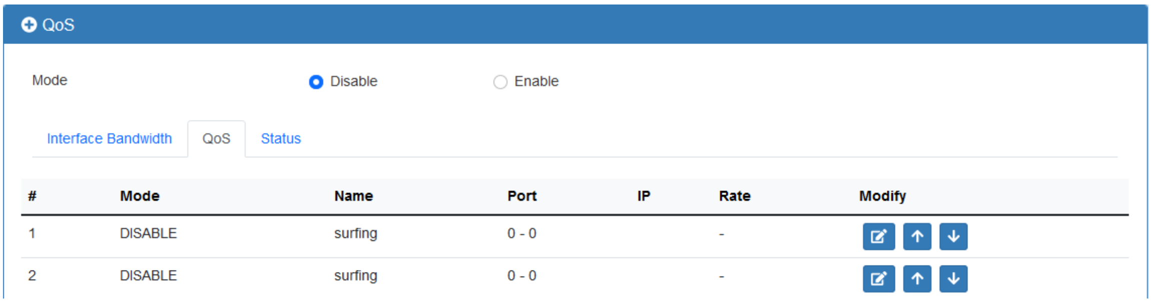
You can select QoS tab to show an overall view for QoS configuration.

At right side of window, there are three buttons.

- Edit button: It allows you to edit QoS Entry and configure QoS settings.

- Up/Down arrow button: It allows you to adjust priority of the QoS entry. The first QoS entry is the highest priority.

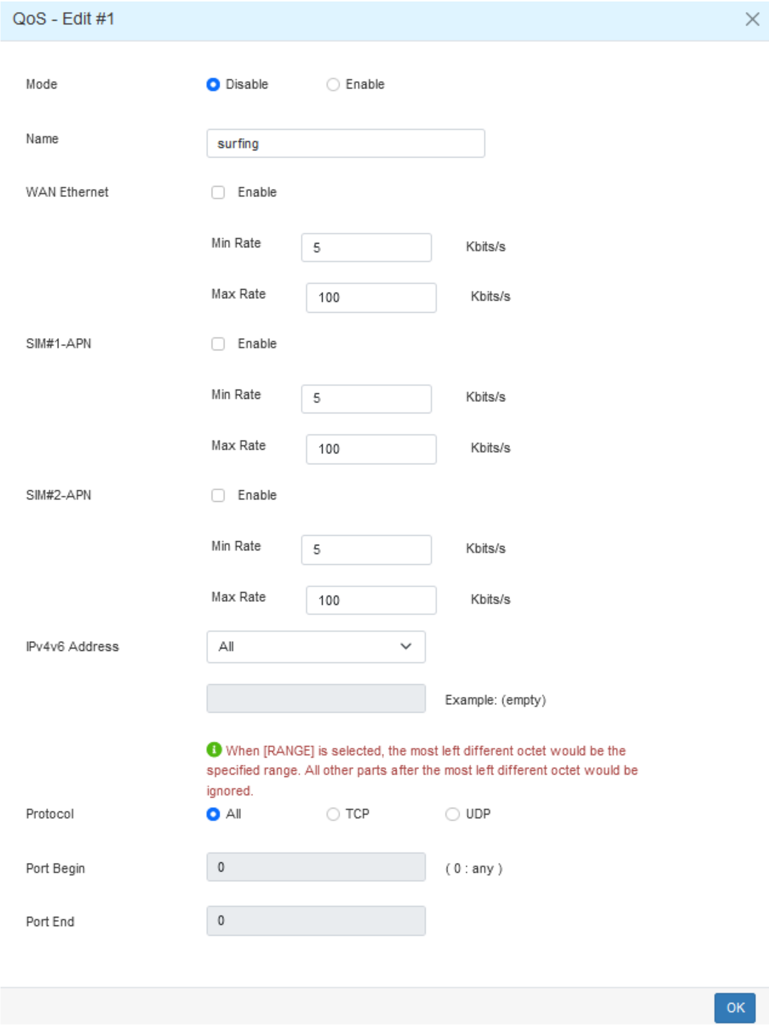
The QoS entry configuration page has two parts for assigning bandwidth, and bandwidth of group IP address.



QoS

Mode ● Disable ○ Enable

#	Mode	Name	Port	IP	Rate	Modify
1	DISABLE	surfing	0 - 0		-	
2	DISABLE	surfing	0 - 0		-	



QoS - Edit #1

Mode ● Disable ○ Enable

Name: surfing

WAN Ethernet □ Enable

Min Rate 5 Kbits/s

Max Rate 100 Kbits/s

SIM#1-APN □ Enable

Min Rate 5 Kbits/s

Max Rate 100 Kbits/s

SIM#2-APN □ Enable

Min Rate 5 Kbits/s

Max Rate 100 Kbits/s

IPv4v6 Address: All

Example: (empty)

When [RANGE] is selected, the most left different octet would be the specified range. All other parts after the most left different octet would be ignored.

Protocol ● All ○ TCP ○ UDP

Port Begin 0 (0 : any)

Port End 0

Service > IP Alias	
Item	**Description**
Mode	Select from “Disable” or “Enable” QoS.
Name	The setting can be edited or deleted the existed entries.
Interface/Min rate	Min Rate: This value guarantees the minimum bandwidth.

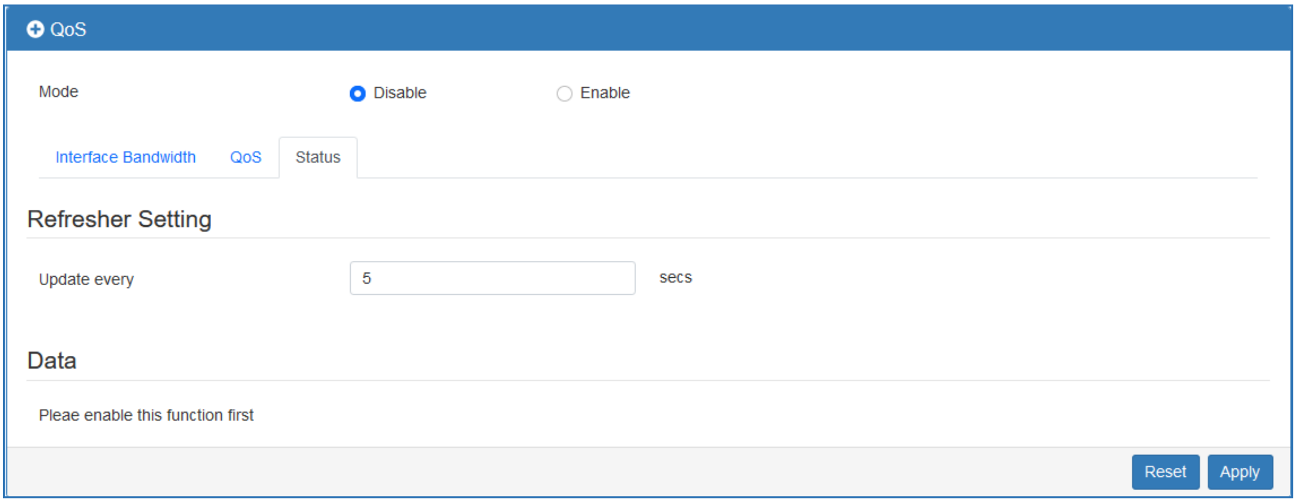
(Result)/Max rate	Max Rate: It is the maximum limited bandwidth.
IPv4v6 Address	Choose four types to set address format, including All, Single, Subnet, and Range.
Protocol	Select the protocol type of traffic.
Port Begin/Port End	Specify the port range of traffic.

13.7.3 QoS > Status

Refresher Setting select the showed content of bandwidth usage by following items:

- Refresh rate: how long the browser will update the showed content once with selected interface.
- Show detail bandwidth for each IP address: show the group IP bandwidth usage.
- Apply Refresh Setting button: press this button to take effect with above new settings.

Data part is the content of bandwidth usage.



Mode ● Disable ○ Enable

Refresher Setting

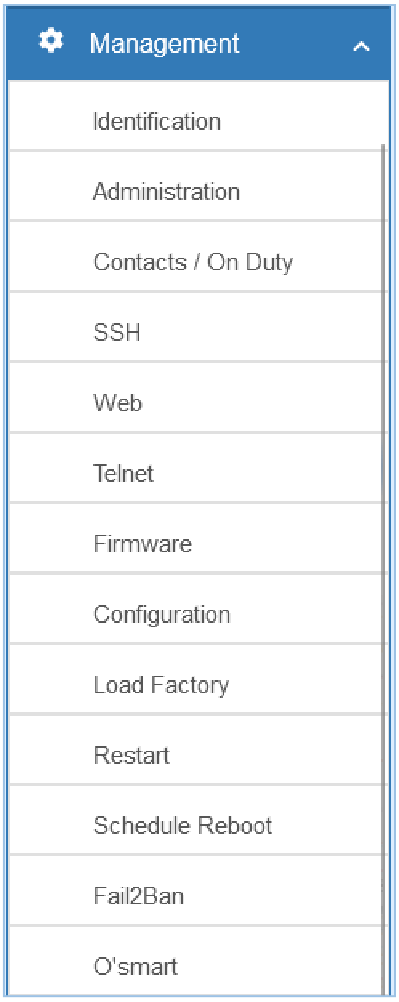
Update every 5 secs

Data

Pleae enable this function first

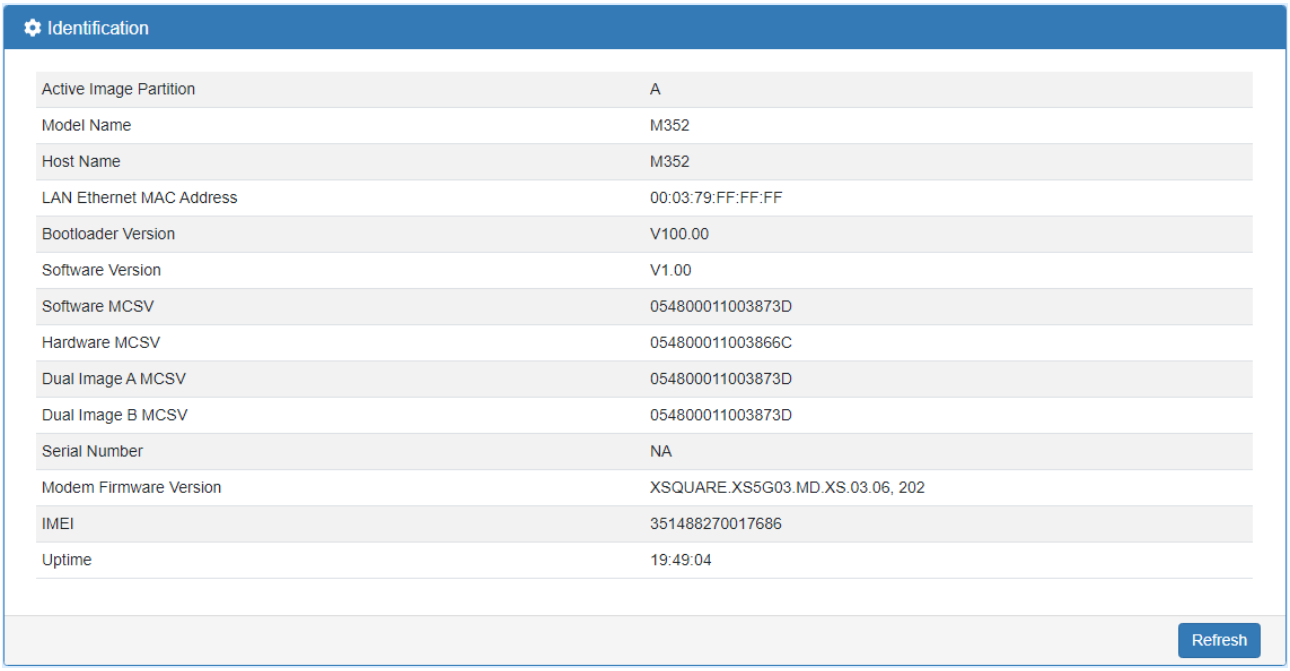
14 Web Menu Item > Management

This section provides you to manage the router, set up your administration and know about the status of current software and firmware. In addition, you can backup and restore the configuration.



14.1 Identification

This section allows you to confirm the profile of router, current software, firmware version and system uptime.

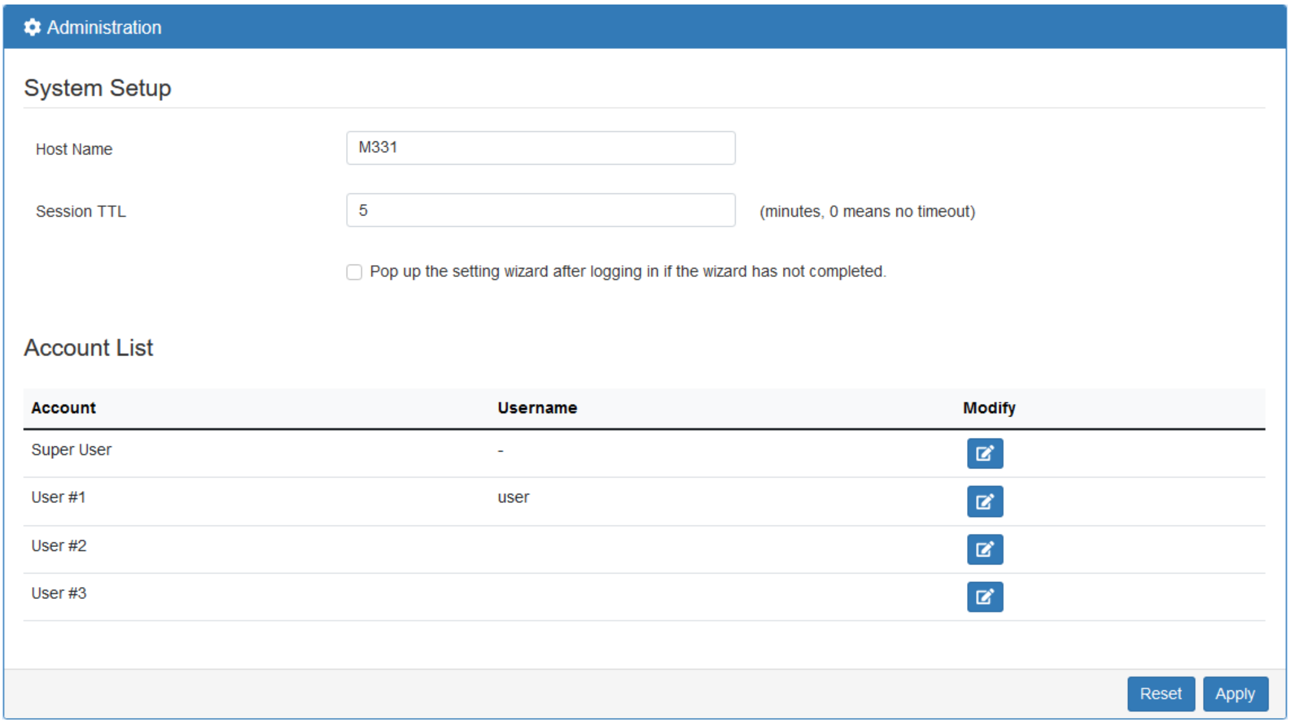


Active Image Partition	A
Model Name	M352
Host Name	M352
LAN Ethernet MAC Address	00:03:79:FF:FF:FF
Bootloader Version	V100.00
Software Version	V1.00
Software MCSV	054800011003873D
Hardware MCSV	054800011003866C
Dual Image A MCSV	054800011003873D
Dual Image B MCSV	054800011003873D
Serial Number	NA
Modem Firmware Version	XSQUARE.XS5G03.MD.XS.03.06, 202
IMEI	351488270017686
Uptime	19:49:04

Management > Identification	
Item	**Description**
Active Image Partition	Show the active image partition: A or B
Model Name	Show the model’s name of the cellular router.
Host Name	Show the host name of the cellular router.
LAN Ethernet MAC Address	Show the MAC address of LAN interface.
Bootloader Version	The bootloader version of the device.
Software Version	Show the software version currently running on the device.
Software MCSV	Show the software MCSV of the running firmware.
Hardware MCSV	Show the hardware MCSV of the device.
Dual Image A MCSV	Show the Dual Image A MCSV.
Dual Image B MCSV	Show the Dual Image B MCSV.
Serial Number	Show the product serial number.
Modem#1 Firmware Version	Show the modem firmware version of the device.
IMEI	Show the International Mobile Equipment Identity number.
Uptime	Show the current system uptime.

14.2 Administration

This section allows you to set up the name of system and change your new password. For the Session TTL, you can set up what duration of time will be logout. If you do not need to have this timeout limitation, you can fill in “0” (Zero).



Administration

System Setup

Host Name: M331

Session TTL: 5 (minutes, 0 means no timeout)

□ Pop up the setting wizard after logging in if the wizard has not completed.

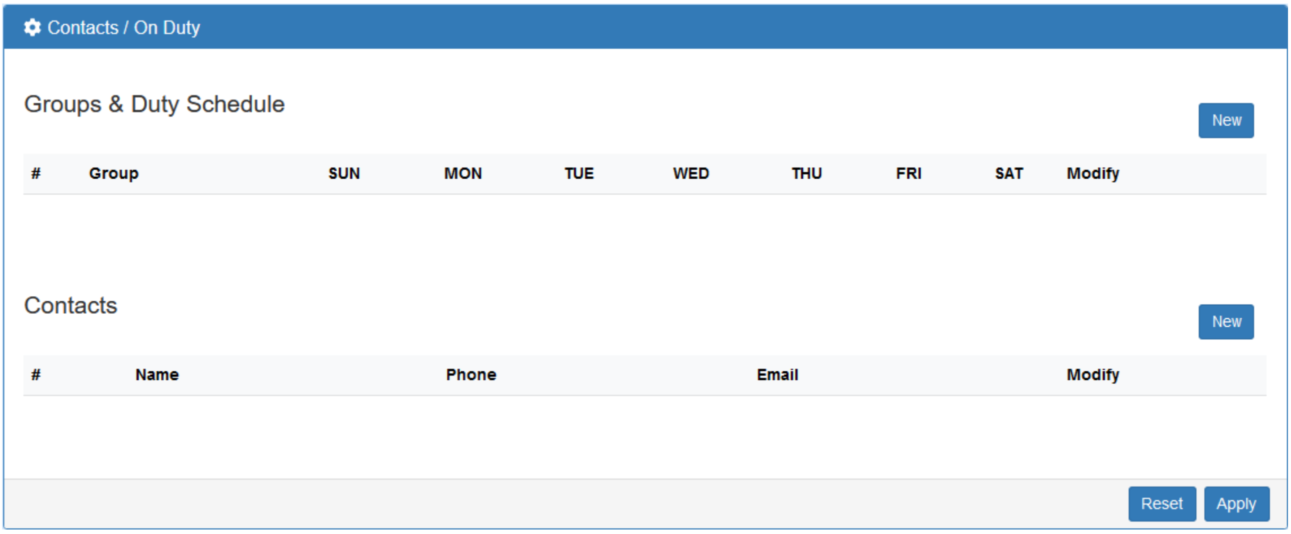
Account List

Account	Username	Modify
Super User	-	✎
User #1	user	✎
User #2		✎
User #3		✎

Management > Administration	
Item	**Description**
System Setup	
Host Name	Enter the device’s host name.
Session TTL	Minutes (0 means no timeout).
Admin Password	
New Password	Type the password you want to change.
Retype to confirm	Retype the password you want to change.

14.3 Contacts / On Duty

This section allows you to create groups, and add users. For more detailed instruction, please navigate to System > Alarm.



Contacts / On Duty

Groups & Duty Schedule

New

#	Group	SUN	MON	TUE	WED	THU	FRI	SAT	Modify

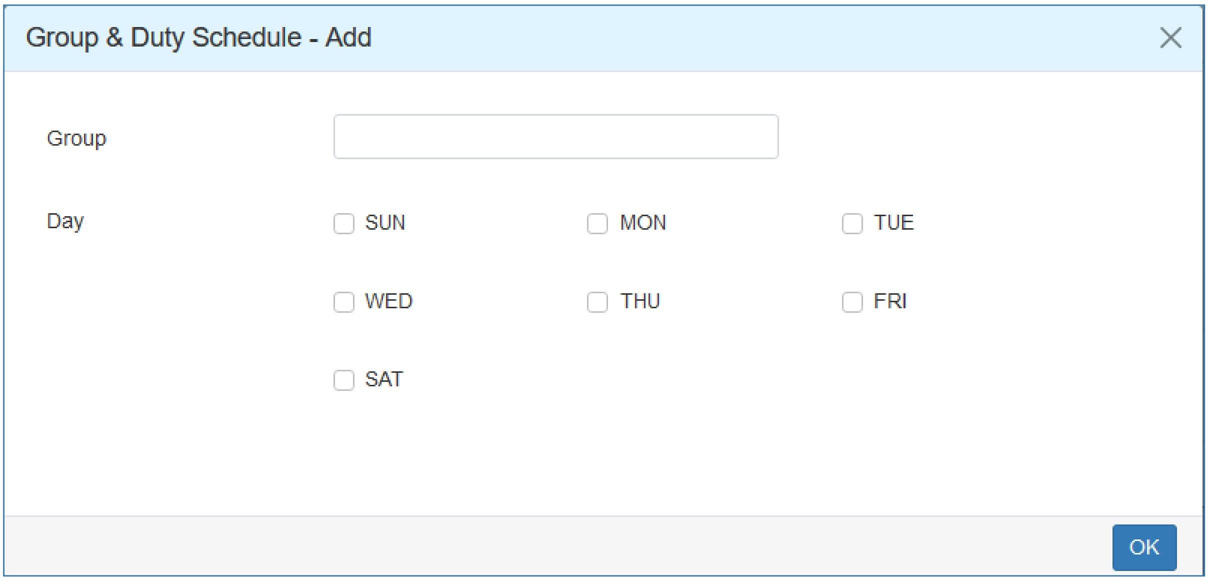
Contacts

New

#	Name	Phone	Email	Modify

14.3.1 Group

Click the **New** button to create a new group. Then enter the name for the group and select the day that should be applied.



Group & Duty Schedule - Add

Group

Day

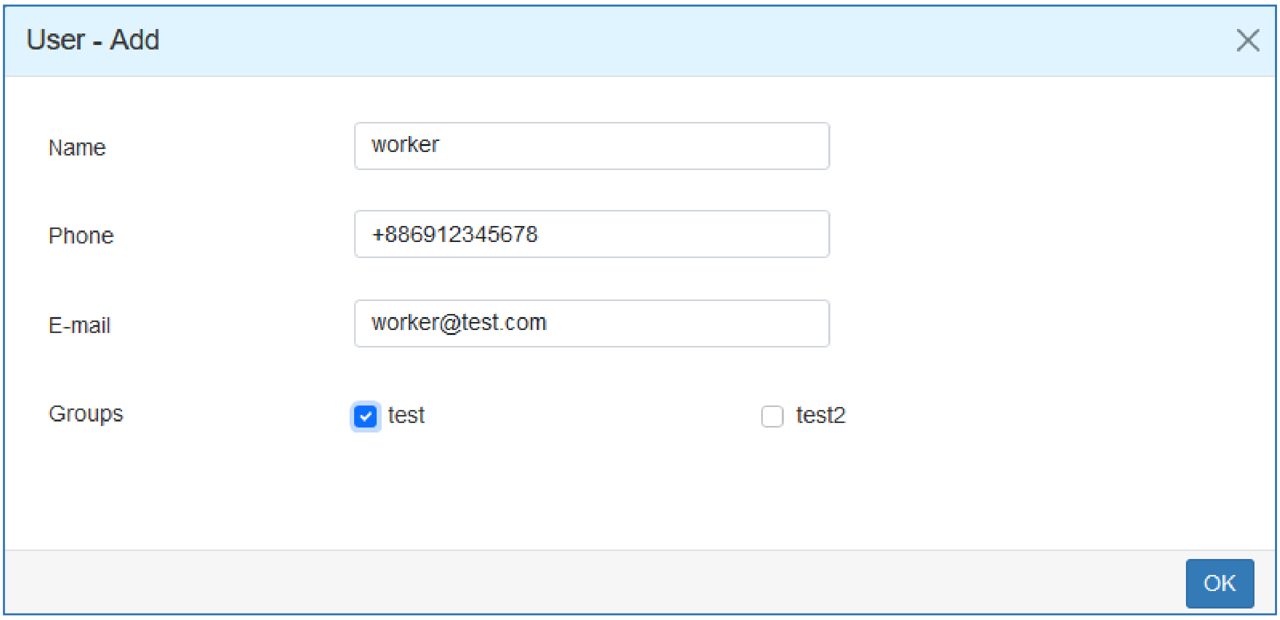
☐ SUN ☐ MON ☐ TUE

☐ WED ☐ THU ☐ FRI

☐ SAT

14.3.2 Contacts

Click the **New** button to create a new user. Enter the user’s information and select the group which created by above step.



User - Add

Name: worker

Phone: +886912345678

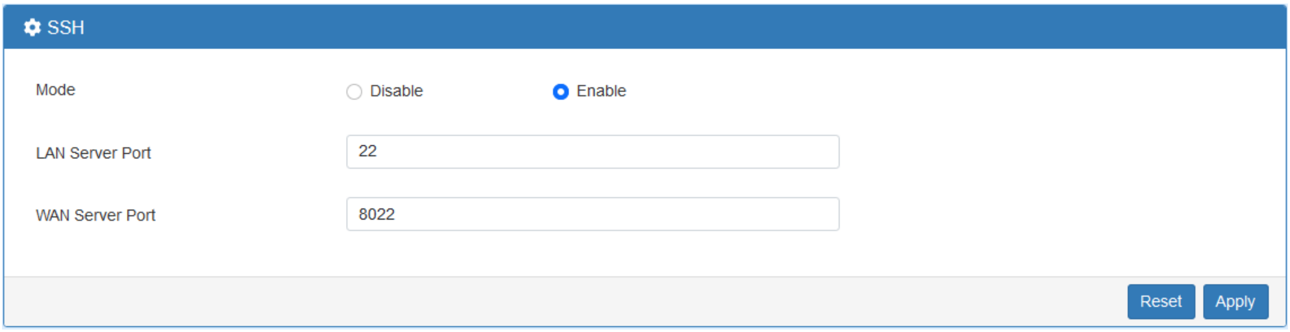
E-mail: worker@test.com

Groups: ☑ test ☐ test2

Please select duty day for every group. The trust and responsible groups can control/receive alarms and SMS.

14.4 SSH

Secure Shell (SSH) allows user to configure system via a secure channel.



SSH

Mode: ○ Disable ● Enable

LAN Server Port: 22

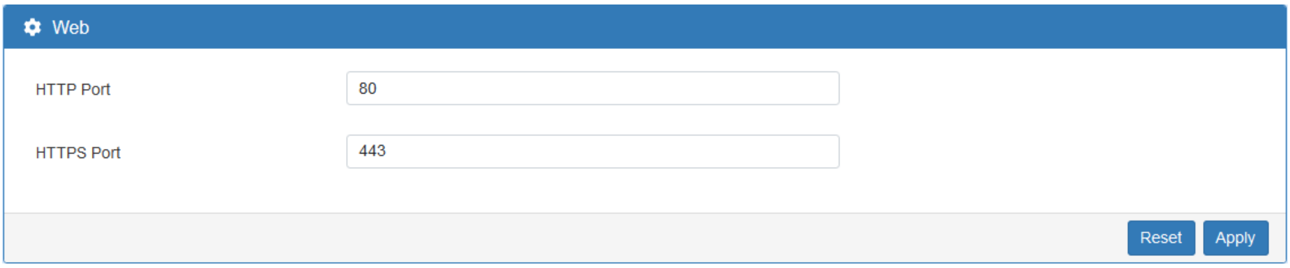
WAN Server Port: 8022

Management > SSH	
Item	**Description**
Mode	Select from Disable or Enable SSH function.
LAN Server Port	The listen port on LAN interface.
WAN Server Port	The listen port on WAN interface.

14.5 Web

This section allows user to change the HTTP port via HTTP. As long as pressing Apply, the web daemon will restart the new configuration, and you will not see the response at the web browser.

After pressing Apply button, the device will apply immediately and give you some hints "Please use new port to access latter". For example, port 3000.



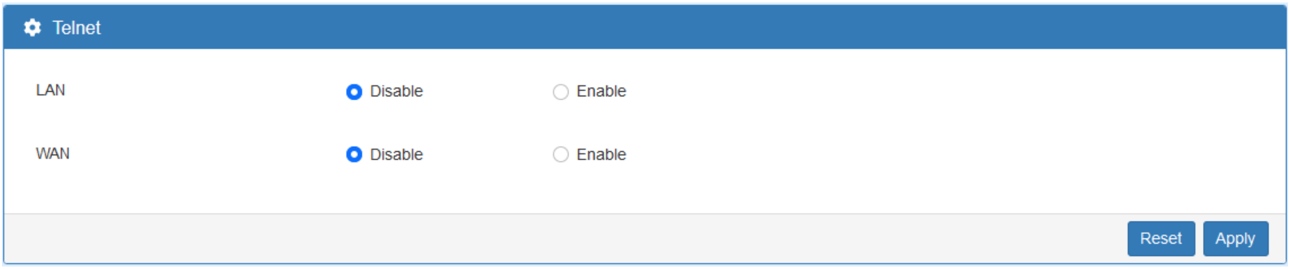
HTTP Port: 80

HTTPS Port: 443

Management > Web	
Item	**Description**
HTTP Port	The TCP port listened by HTTP daemon.
HTTPS Port	The TCP port listened by HTTPS daemon.

14.6 Telnet

This section allows user to choose whether offer the telnet via LAN/WAN. Default is disale.



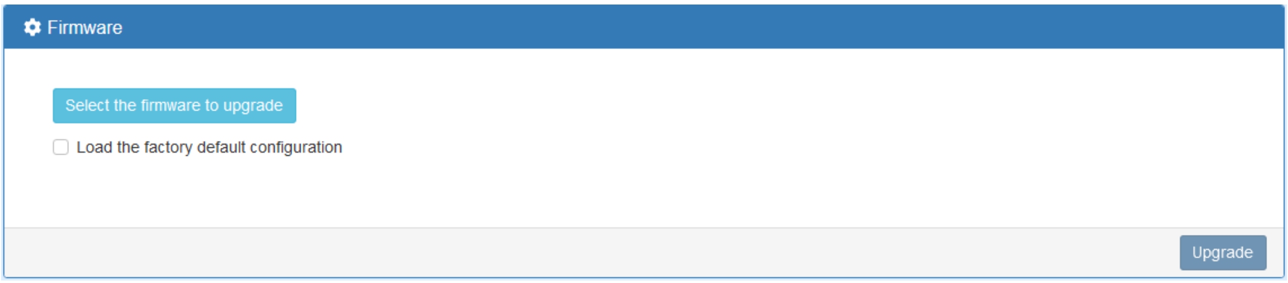
LAN ● Disable ○ Enable

WAN ● Disable ○ Enable

Management > Telnet	
Item	**Description**
LAN	Whether or not offer the telnet service.
WAN	Whether or not offer the telnet service.

14.7 Firmware

This section provides you to upgrade the firmware of the device.


Firmware
Select the firmware to upgrade
□ Load the factory default configuration
Upgrade

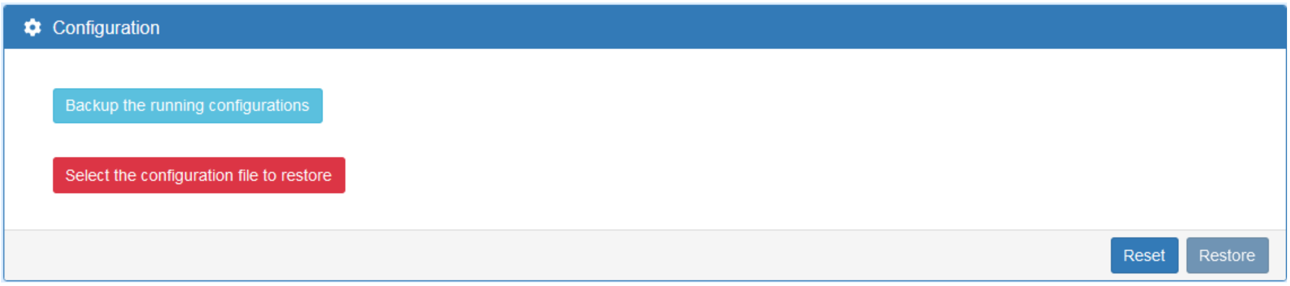
(1) Click Select the firmware to upgrade button to choose your current firmware version in your PC.

(2) Select Upgrade button to update.

(3) After upgrading successfully, the device will reboot automatically. The configuration will reset to factory default after upgrading when "Load the factory default configuration" checked.

14.8 Configuration

This section supports you to export or import the configuration file.

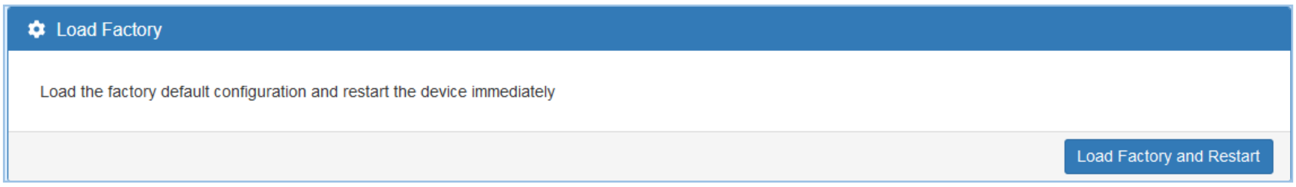

Configuration
Backup the running configurations
Select the configuration file to restore
Reset
Restore

(1) Click Backup the running configurations button to export your current configurations.

(2) Click Select the configuration file to restore button to import the configuration file.

14.9 Load Factory

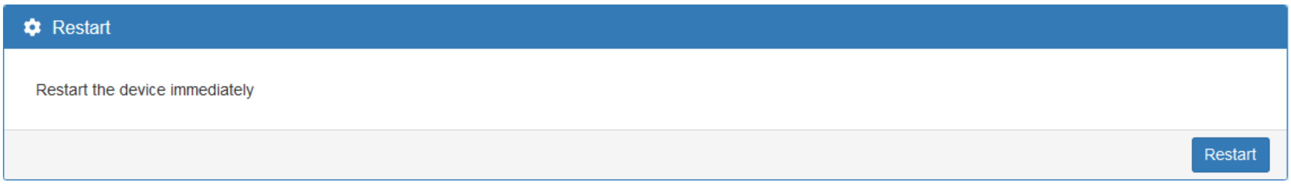
This section supports you to load the factory default configuration and restart the device immediately. You can click the Load Factory and Restart button.


Load Factory

Load the factory default configuration and restart the device immediately

14.10 Restart

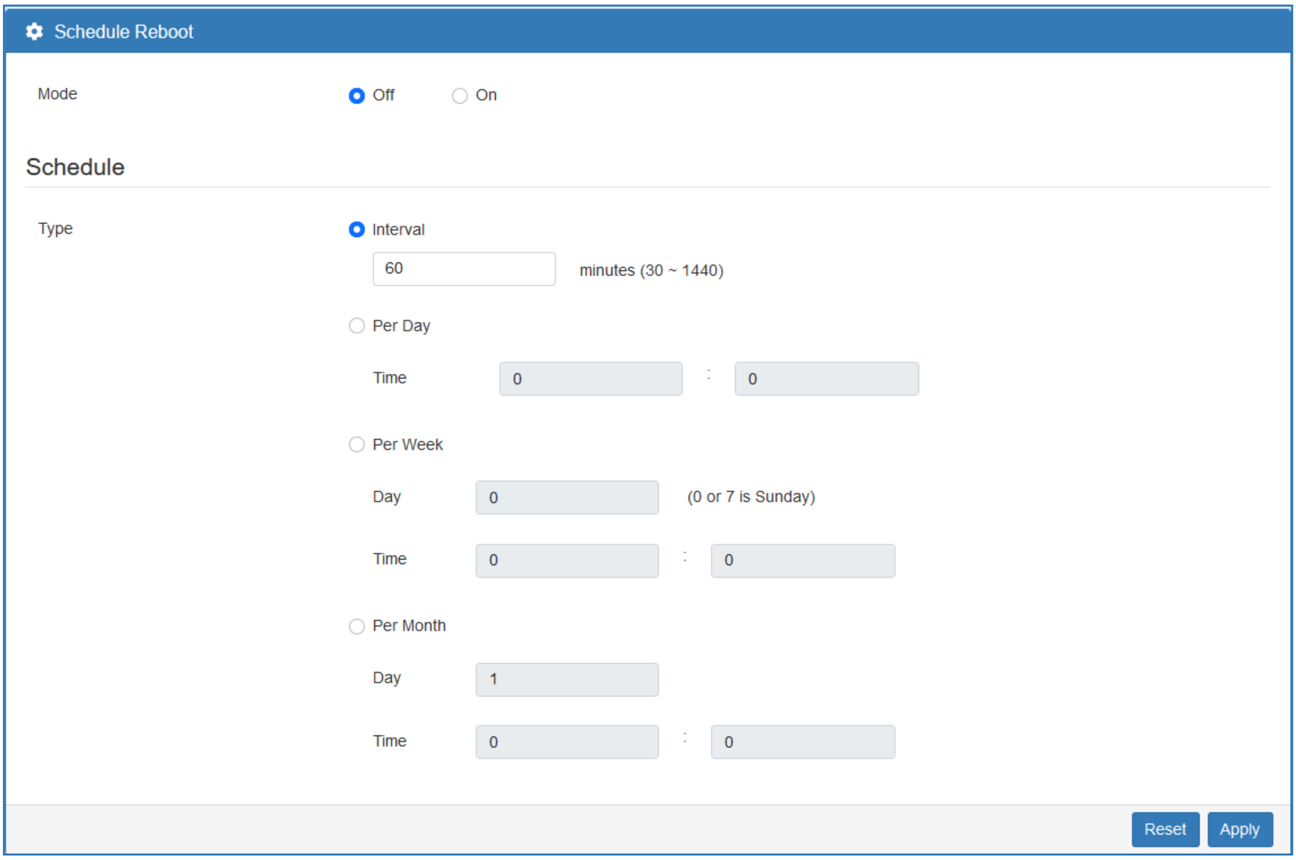
This section allows you to click Restart button to restart immediately.


Restart

Restart the device immediately

14.11 Schedule Reboot

The setting allows you to schedule the reboot time regularly.


Schedule Reboot

Mode: ● Off ○ On

Schedule

Type:

● Interval

60 minutes (30 ~ 1440)

○ Per Day

Time 0 : 0

○ Per Week

Day 0 (0 or 7 is Sunday)

Time 0 : 0

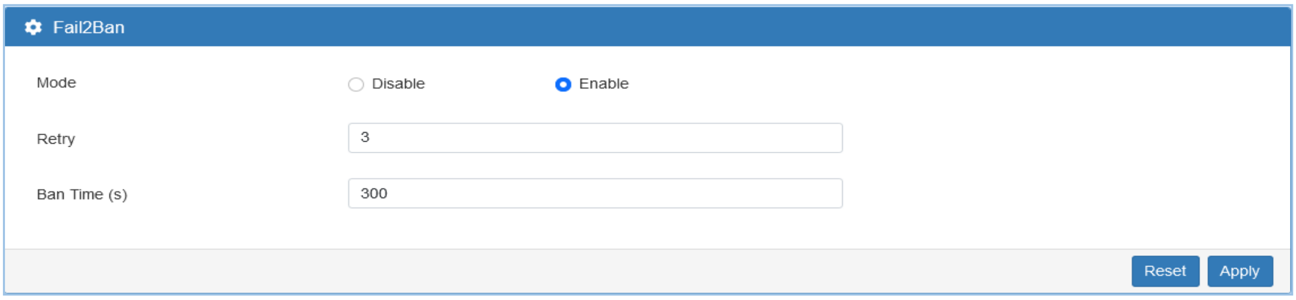
○ Per Month

Day 1

Time 0 : 0

14.12 Fail2Ban

Fail2Ban is an intrusion prevention feature that protects the device from brute-force login attacks.



Mode ○ Disable ● Enable

Retry 3

Ban Time (s) 300

Management > Fail2Ban	
Item	**Description**
Mode	Select from Disable or Enable. The default is Enable.
Retry	The limit for maximum login retries/attempts.
Ban Time(s)	The banned time(s) for user or IP when it exceeded the retry limit.

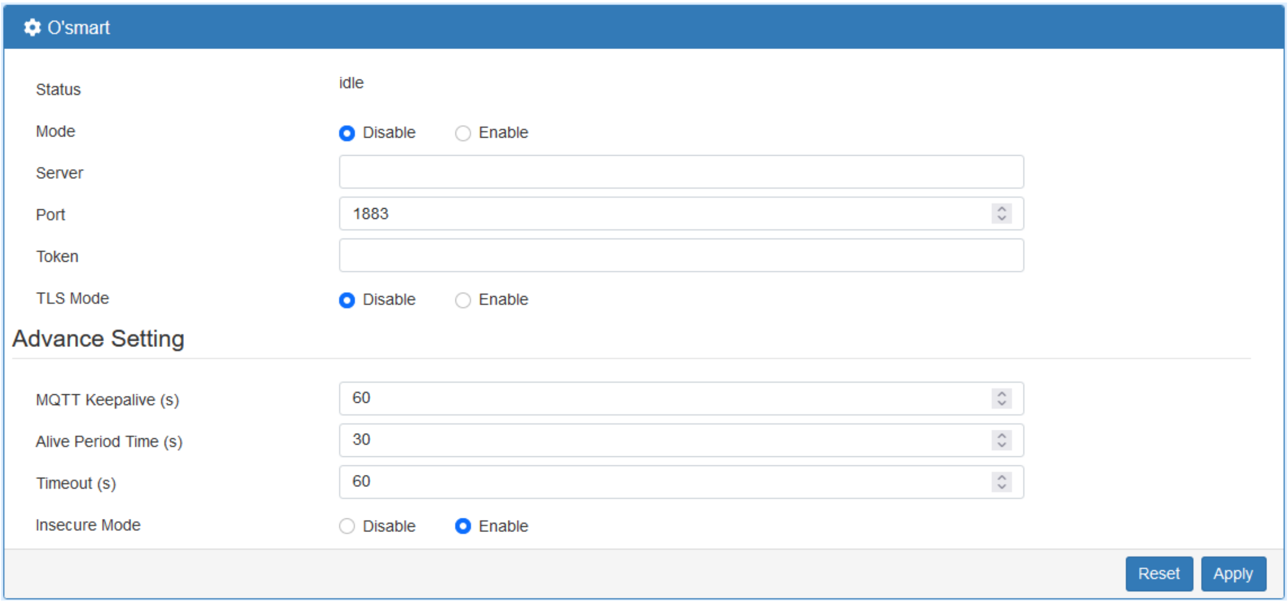
Note: There is an example to explain how to configure. E.g. Assume the retry is 3 and the ban time is 300 seconds. If a specified IP has 3 login failures within 5 minutes then it will be banned 300 seconds. Moreover, if it keeps to attempt a login and still fail then the banned time will be extended automatically.

Time	The count of login failure	The banned time (s)
2019/1/1 12:00:00	0	0
2019/1/1 12:00:01	1	0
2019/1/1 12:00:03	3	300
2019/1/1 12:00:10	4	300
2019/1/1 12:00:30	6	600

14.13 O’smart

This section allows you to set up the connection with O’smart IoT management system.

About the O’smart setting, please contact with reseller.



O'smart

Status idle

Mode ● Disable ○ Enable

Server

Port 1883

Token

TLS Mode ● Disable ○ Enable

Advance Setting

MQTT Keepalive (s) 60

Alive Period Time (s) 30

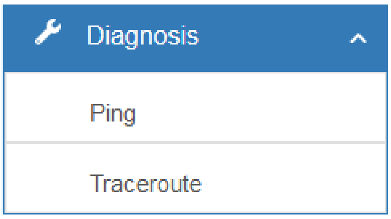
Timeout (s) 60

Insecure Mode ○ Disable ● Enable

Management > O’smart	
Item	**Description**
Status	The status between device and O’smart server.
Mode	Enable or disable the connection with O’smart server.
Server	Enter the O’smart server IP address or domain name.
Port	Enter the listen port of O’smart server.
Token	Enter the token that generated by O’smart server.
TLS Mode	Enable or disable the secure connection with O’smart server.
Advance Setting	
MQTT Keep alive (s)	The period time to keep the MQTT connection.
Alive Period Time (s)	The period time of the server detecting.
Timeout (s)	The time to live between server and device.
Insecure Mode	If Insecure Mode be enabled, then the Certificate checking will be bypassed.

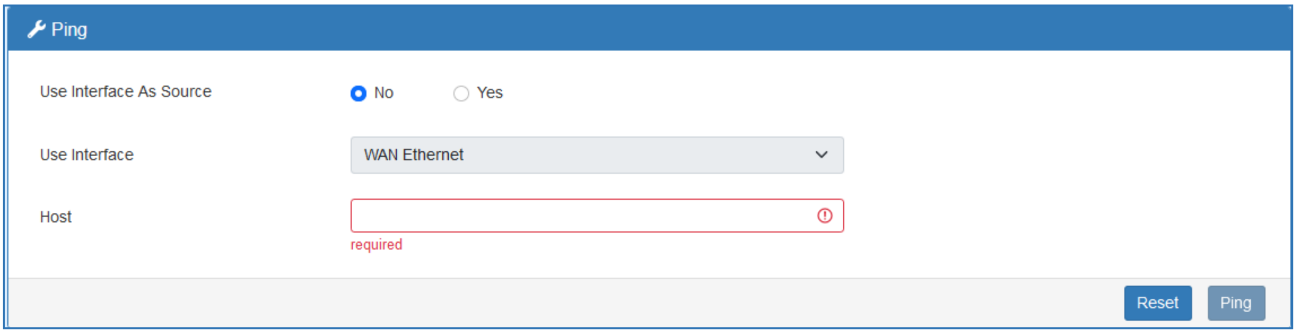
15 Web Menu Item > Diagnosis

This section allows you to diagnose Ping and Traceroute.



15.1 Ping

Please assign the Host that you want to ping.



Use Interface As Source ● No ○ Yes

Use Interface WAN Ethernet

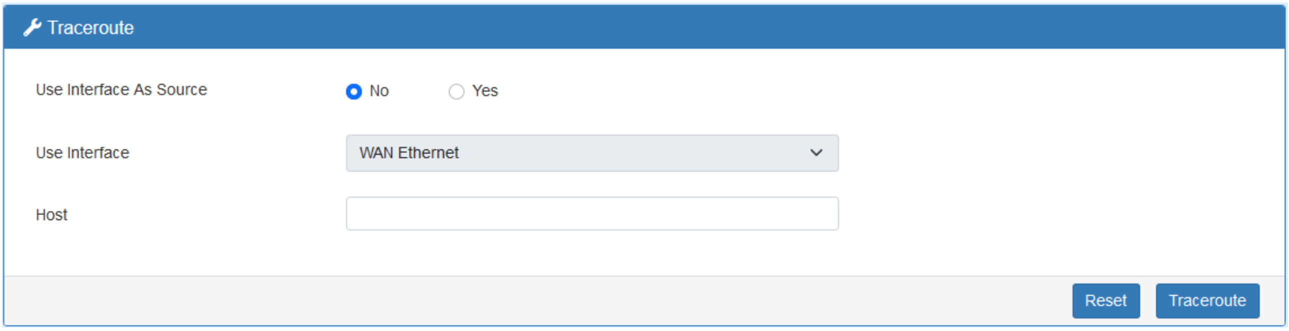
Host

required

Diagnosis > Ping	
Item	**Description**
Use Interface as Source	When set to Yes, it will use the selected interface as source IP.
Use Interface	Specify the IP address of selected interface as source IP.
Host	The host name or the host IP address

15.2 Traceroute

Please assign the Host you want to traceroute.



Use Interface As Source ● No ○ Yes

Use Interface WAN Ethernet

Host

Diagnosis > Traceroute	
Item	**Description**
Use Interface as Source	When set to Yes, it will use the selected interface as source IP.
Use Interface	Specify the IP address of selected interface as source IP.
Host	The host name or the host IP address

16 Troubleshooting Guide

16.1 Troubleshooting Information

If you encounter any issue, please refer to the following troubleshooting guide table first for solutions to common problems:

If you cannot find your issue listed here, please refer to the User Manual document for more information that may help you solve your problem.

Problem Type Table		
No.	Problem Type	Description
1	The Cellular Router No power.	Unit has no power.
2	The Cellular Router Access Issue.	Cannot access the Web management page.
3	No internet (From the Cellular Router).	No Internet from your LTE network.

16.2.1 The Cellular Router “No Power” Problem

#Problem 1: Unit has no power.

For the possible solution, please try the following:

a. Unplug and replug your power adapter from the power source.

b. Disconnect and Connect the Ethernet cable from the Ethernet port of Cellular Router.

If the above didn’t solve your “No power” issue, please contact your support engineer for further advanced troubleshooting. (This could involve a possible software or hardware problem that needs to be identified and solved.)

16.2.2 The Cellular Router “Access Issue” Problem

#Problem 2: Cannot access the Web Management page.

For the possible solotion, please try the following:

a. Check that your PC Ethernet card is enabled and configured to get the IP/DNS address automatically.

b. Disconnect and connect the Ethernet cable from the Ethernet port of Cellular Router.

c. Ping the LAN IP (default IP is 192.168.1.1). The ping should PASS.

d. If ping is OK, please try to access the Web Management page again.

If the above didn’t solve your Access Issue then please contact your MIS or anyone that build your network infrastructure to fix the ping fail problem.

If your network infrastructure is confirmed to be OK (hardware works normally and is configured correctly), please contact your support engineer for further advanced troubleshooting. (This could involve a possible software or hardware problem that needs to be identified and solved.)

16.2.3 No Internet (from the Cellular Router) Problem

#Problem 3: No Internet from LTE network of Cellular Router.

The problem might be on the physical contact of the SIM card.

- For the possible solution 1, please try the following:

a. Remove your SIM card.

b. Please re-insert it again (Cheking that the SIM card is in the correct orentation).

c. Reboot the Cellular Router by turning Off and On the power source or restart from Management.

d. Wait for at least 3 minues and check again if you receive internet correctly.

If the above didn’t solve your “No internet” issue then please continue to solution2 bellow.

- For the possible solution 2, please try the following:

a. Access the Web management page (default url is http://192.168.1.1/).

b. Check that the LTE configuration is OK by going to the “Cellular -> SIM Config” web page.

c. If you change any configuration, please wait for 2 minutes after apply and check again the internet.

If the above didn’t solve your “No internet” issue then please check that your SIM card is active and with traffic enabled (by contacting your SIM card provider or by trying that SIM card in another device).

If you are still experiencing the “No internet issue” then please contact your support engineer for further advanced trublesooting (This could involve a posible Software or Hardware problem that needs to be identified and solved).