Robustel GoRugged R2000

Dual SIM Industrial Cellular VPN Router

For GSM/GPRS/EDGE/UMTS/TD-SCDMA/CDMA/

WCDMA/HSPA+/E-UTRA/LTE Networks

User Guide

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www.robustel.com

About This Document

This document describes hardware and software of Robustel R2000, Dual SIM Industrial 2G/3G/4G Router.

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Important Notice

Due to the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the router is used in a normal manner with a well-constructed network, the router should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. Robustel accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the router, or for failure of the router to transmit or receive such data.

Safety Precautions

General

- The router generates radio frequency (RF) power. When using the router, care must be taken on safety issues related to RF interference as well as regulations of RF equipment.
- Do not use your router in aircraft, hospitals, petrol stations or in places where using cellular products is prohibited.
- Be sure that the router will not be interfering with nearby equipment. For example: pacemakers or medical equipment. The antenna of the router should be away from computers, office equipment, home appliance, etc.
- An external antenna must be connected to the router for proper operation. Only uses approved antenna with the router. Please contact authorized distributor on finding an approved antenna.
- Always keep the antenna with minimum safety distance of 20 cm or more from human body. Do not put the antenna inside metallic box, containers, etc.
- RF exposure statements
    1. For mobile devices without co-location (the transmitting antenna is installed or located more than 20cm away from the body of user and nearby person)
- FCC RF Radiation Exposure Statement
    1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
    2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Note*: Some airlines may permit the use of cellular phones while the aircraft is on the ground and the door is open.* Router *may be used at this time.*

Using the router in vehicle

- Check for any regulation or law authorizing the use of cellular devices in vehicle in your country before installing the router.
- The driver or operator of any vehicle should not operate the route while driving.
- Install the router by qualified personnel. Consult your vehicle distributor for any possible interference of electronic parts by the router.
- The router should be connected to the vehicle’s supply system by using a fuse-protected terminal in the vehicle’s fuse box.
- Be careful when the router is powered by the vehicle’s main battery. The battery may be drained after extended period.

Protecting your router

To ensure error-free usage, please install and operate your router with care. Do remember the followings:

- Do not expose the router to extreme conditions such as high humidity / rain, high temperature, direct sunlight, caustic / harsh chemicals, dust, or water.
- Do not try to disassemble or modify the router. There is no user serviceable part inside and the warranty would be void.
- Do not drop, hit or shake the router. Do not use the router under extreme vibrating conditions.
- Do not pull the antenna or power supply cable. Attach/detach by holding the connector.
- Connect the router only according to the instruction manual. Failure to do it will void the warranty.
- In case of problem, please contact authorized distributor.

Regulatory and Type Approval Information

Table 1: Directives

2011/65/EC	Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)
2012/19/EU	Directive 2012/19/EU the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)

Table 2: Standards of the Ministry of Information Industry of the People's Republic of China

SJ/T 11363-2006	"Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products" (2006-06)
SJ/T 11364-2006	"Marking for Control of Pollution Caused by Electronic Information Products" (2006-06) According to the "Chinese Administration on the Control of Pollution caused by Electronic Information Products" (ACPEIP) the EPUP, i.e., Environmental Protection Use Period, of this product is 20 years as per the symbol shown here, unless otherwise marked. The EPUP is valid only as long as the product is operated within the operating limits described in the Hardware Interface Description. Please see **Table 3** for an overview of toxic or hazardous substances or elements that might be contained in product parts in concentrations above the limits defined by SJ/T 11363-2006.

Table 3: Toxic or hazardous substances or elements with defined concentration limits

Name of the part	Hazardous substances					
	(Pb)	(Hg)	(Cd)	(Cr (VI))	(PBB)	(PBDE)
Metal Parts	o	o	o	o	o	o
Circuit Modules	x	o	o	o	o	o
Cables and Cable Assemblies	o	o	o	o	o	o
Plastic and Polymeric parts	o	o	o	o	o	o

o:

Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

x:

Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials for this part *might exceed* the limit requirement in SJ/T11363-2006.

Revision History

Updates between document versions are cumulative. Therefore, the latest document version contains all updates made to previous versions.

Release Date	Firmware Version	Doc Version	Change Description
2016-08-24	1.2.2	V2.0.0	Initial Release.
2016-08-31	1.2.2	V2.0.1	Modify the frequency range of FDD LTE and TDD LTE; modify the EMC details; and modify the Tel and Fax No.
2016-10-08	1.2.2	V2.0.2	Updated frequency band info in Chapter 1.5 Other minor changes
2016-11-11	1.2.2	V2.0.3	Updated section about 2.9 Power Supply
2016-11-18	1.2.2	v.2.0.4	Updated information about input voltage
2016-11-29	1.2.2	v.2.0.5	Updated section about 1.5 Selection and Ordering Data
2017-01-19	1.2.2	v.2.0.6	• Changed Tel number to +86-20-29019902 • Changed CD information in Chapter 1.2 • Updated section about 1.5 Selection and Ordering Data

Contents

Chapter 1 Product Concept

1.1 Overview

Robustel GoRugged R2000 is an enterprise-class cellular router offering state-of-the-art mobile connectivity for machine to machine (M2M) applications.

- Dual SIM redundancy for continuous cellular connections; supports 2G/3G/4G
- Various interfaces: 2xLAN/ 1xLAN, 1xWAN, Wi-Fi
- WAN: static, PPPOE and DHCP client
- Multiple links backup and ICMP detection
- VPN tunnel: IPsec/OpenVPN/GRE
- Auto reboot via SMS/Timing
- Flexible management methods: Web/SMS/CLI
- Firmware upgrade via Web/CLI/SMS
- Advanced firewall: filtering, port mapping, DMZ
- Supports DDNS
- Supports VRRP
- Support SNMP report events which include system startup, system reboot, system time update etc.
- WAN interface support PD feature, compatible 802.3at. (optional)
- The metal enclosure can be mounted on a DIN rail, on the wall or be put on desktop
- Built-in Watchdog, Timer

1.2 Packing List

Check your package to make sure it contains the following items:

- Robustel R2000 router x 1

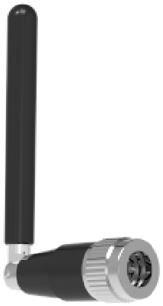
- 3-pin pluggable terminal block for power connector x 1

- *Quick Start Guide* with download link of other documents or tools x 1

If any of the above items is missing or damaged, please contact your Robustel Sales Representative

Optional accessories (can be purchased separately):

- Cellular SMA antenna x 1 (for 3G/4G)



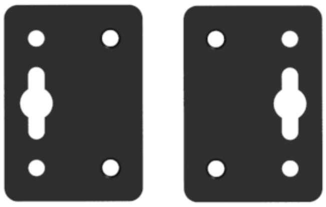
- RP-SMA Wi-Fi antenna x 1 (stubby or magnet optional)

  Stubby antenna

  Magnet antenna

- Ethernet cable x 1

- Wall mounting kit x 2



- 35 mm DIN rail mounting kit x 1

- AC/DC power adapter x 1 (12V DC, 1.5 A; EU, US, UK, AU plug optional)

1.3 Specifications

Cellular Interface

- Standards: GSM/GPRS/EDGE/UMTS/TD-SCDMA/CDMA/WCDMA/HSPA+/E-UTRA/LTE
- GSM: max DL/UL = 9.6/2.7 Kbps
- GPRS: max DL/UL = 86 Kbps
- EDGE: max DL/UL = 236.8 Kbps

- UMTS: max DL/UL = 384 Kbps
- TD-SCDMA: max DL/UL = 2.8 Mbps/384 Kbps
- CDMA: max DL/UL = 3.1 Mbps/1.8 Mbps
- WCDMA: max DL/UL = 14.4 Mbps/384 Kbps
- HSPA+: max DL/UL = 21/5.76 Mbps, fallback to 2G
- FDD LTE: max DL/UL = 100/50 Mbps, fallback to 2G/3G
- TDD LTE: max DL/UL = 100/50 Mbps, fallback to 2G/3G
- SIM: 2 x (3 V & 1.8 V)
- Antenna connector: SMA male (1 x MAIN and 1 x AUX)

Ethernet Interface

- Number of ports: 2 x LAN or 1 x LAN + 1 x WAN (10/100 Mbps)
- WAN supports 802.3at PD feature (optional)
- Magnet isolation protection: 4 KV

WLAN Interface (optional)

- Standards: 802.11 b/g/n, support AP and Client mode
- Data speed: 2*2 MIMO,300 Mbps
- Frequency band: 2.412 - 2.485 GHz
- Security: WEP, WPA, WPA2
- Encryption: 64/128 AES, TKIP
- Antenna connector: RP-SMA female

System

- Reset button
- LED indicators: RUN, PPP, USR, 3 x RSSI

CPU & Memory

- CPU: 535 MHz
- SDRAM: 64 MB
- FLASH: 16 MB

Software

- Network protocols: PPP, TCP, UDP, DHCP, ICMP, NAT, DMZ, DDNS, VRRP, HTTP, HTTPs, DNS, ARP, SNTP, Telnet, SNMP, etc.
- VPN tunnel: IPsec/OpenVPN/GRE
- Firewall: SPI, anti-DoS, Filter, Access Control
- Management methods: Web, SMS

Power Supply and Consumption

- Connector type: 3.5 mm terminal block
- Input voltage:
  9 to 26V DC (A014401, A014402, A014403, A014404, A014405, A014406, A014701, A014702, A014703, A014704, A014705, A014706);
  9 to 36V DC
- Power consumption: Idle: 100 mA @ 12 V
- Data link: 500 mA (peak) @ 12 V
- PD feature (optional): WAN interface supports, input voltage: 48~57V DC

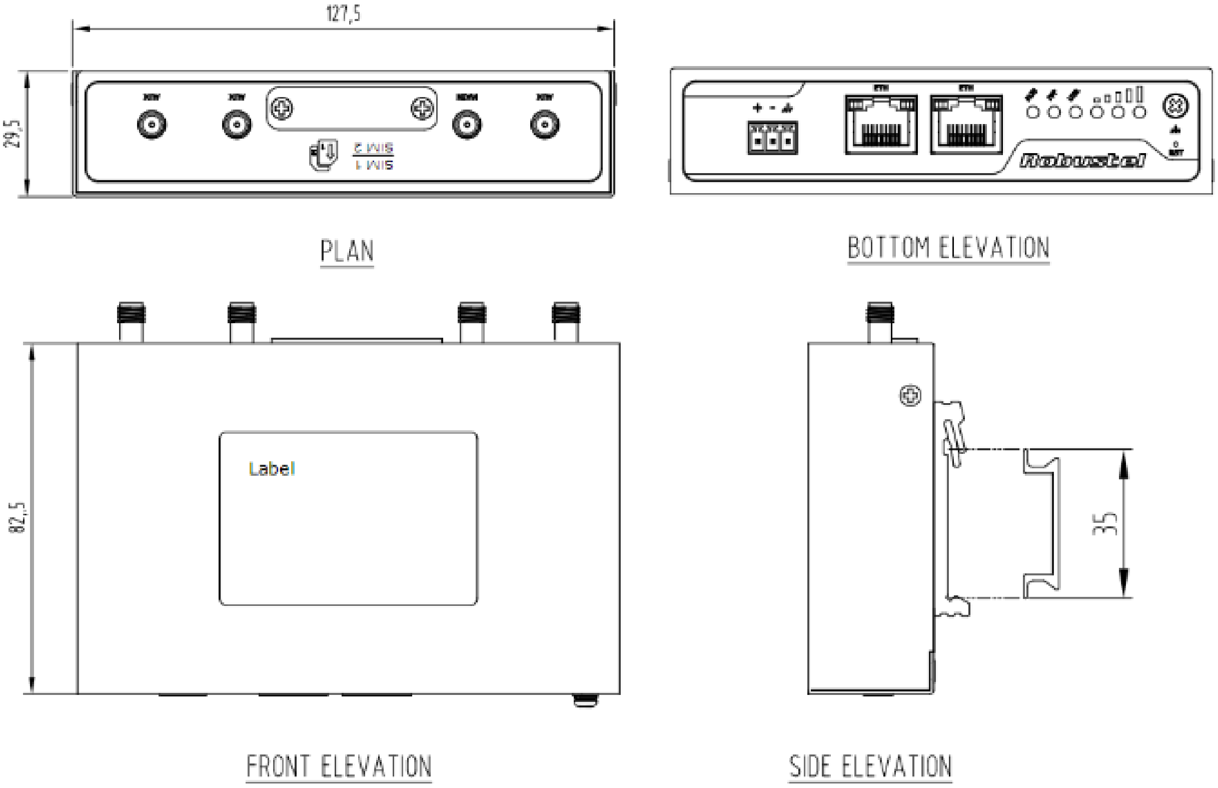
Physical Characteristics

- Housing & Weight: Metal, 300 g
- Dimension: 29.5 x 82.5 x 127.5 mm
- Installation: 35 mm DIN rail or wall mounting or desktop

Regulatory and Type Approvals

- Approvals & Certificates: CE, RCM
- EMC:
  EMI: EN 55022: 2006 / A1: 2007 (CE&RE) Class B
  EMS: IEC 61000-4-2 (ESD) Level 4
  IEC 61000-4-4 (EFT) Level 3
  IEC 61000-4-5 (Surge) Level 3

1.4 Dimension



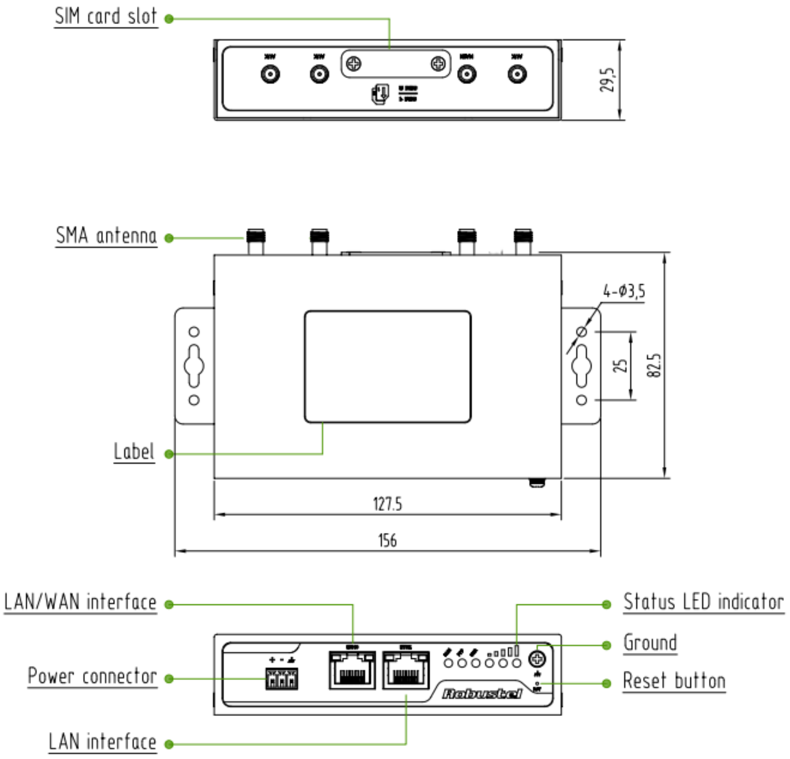
1.5 Selection and Ordering Data

Model No.	Frequency Bands	Operating Environment
R2000-3P	HSDPA/HSUPA/HSPA+: 800/850/900/AWS/1800/1900/2100 MHz WCDMA: 900/2100 MHz CDMA (CDMA1X/EVDO): BC0 TD-SCDMA: 1900/2100 MHz UMTS: 800/850/900/1800/1900/2100 MHz GSM/GPRS/EDGE: 850/900/1800/1900 MHz	-20 to 65°C/5 to 95% RH
R2000-4L	FDD LTE: B1, B2, B3, B4, B5, B7, B8, B18, B19, B20, B21, B28, B31 TDD LTE: B38, B39, B40, B41 3GPP E-UTRA Release 11 HSDPA/HSUPA/HSPA+: 850/900/1900/2100 MHz WCDMA: 850/900/2100 MHz CDMA (CDMA1X/EVDO): BC0 TD-SCDMA: 1900/2100 MHz UMTS: 800/850/900/1800/2100 MHz GSM/GPRS/EDGE: 850/900/1800/1900 MHz	-20 to 65°C/5 to 95% RH

Chapter 2 Hardware Installation

2.1 Overview

As shown in the following figures, R2000 router has two Ethernet ports (2xLAN or 1xLAN+1xWAN) and two cellular SIM card slots.



2.2 LEDs

Name	Color	Status	Function
RUN	Green	On, blinking	Router is ready.
		On, solid	Router is starting.
		Off	Router is power off.
PPP	Green	On, blinking	PPP Indicator: Null
		On, solid	PPP Indicator: PPP connection is up.
		Off	PPP Indicator: PPP connection is down.
USR	Green	On, blinking	SIM: using backup SIM card. NET: register to a low level network.
		Off after blinking	SIM: working well. NET: working well.

		On	OpenVPN: OpenVPN is connected. IPSec: IPSec is connected. GRE: GRE is connected.
		Off after lighting up	OpenVPN: OpenVPN is disconnected. IPSec: IPSec is disconnected. GRE: GRE is disconnected.
▫▫▯▯▯ ○○○	Green	On	Signal level: 21-31 (Perfect signal level).
	Yellow	On	Signal level: 11-20 (Average signal level).
	Red	On	Signal level: 1-10 (Exceptional signal level).
	When the network is disconnected, those three signal LEDs are designed as a binary combination code to indicate a series of error report. (Green Yellow Red) On: 1 Off: 0 001 AT command failed 010 no SIM card detected 011 it need to enter the PIN code 100 it need to enter the PUK code 101 registration failed 110 something wrong happened in the module		

Note: Please go to **Services > Advanced** to set the **User LED Type**.

2.3 Reset Button

Function	Operation
Reboot	Push the button for 2~7 seconds under working status.
Restore to factory default setting	Power on the router, wait 5 seconds, and then keep pressing the "RST" button until six LEDs start to blink one by one circularly. Please release the pressing operation within 5 seconds. In this time the router loads default successfully.

2.4 Ethernet Port

The R2000 Lite has two Ethernet ports. ETH1 is LAN interface and ETH0 can be the LAN or WAN interface, while defaults as LAN. Each Ethernet port has two LED indicators. The yellow one is **Link indicator** and the green one doesn't mean anything. Link indicator has three statuses, for details please refer to the form below.

Indicator	Status	Description
Link Indicator	Off	Connection is down
	On	Connection is up
	Blink	Data is being transmitted

2.5 Install SIM Card

- **Removing slot cover**

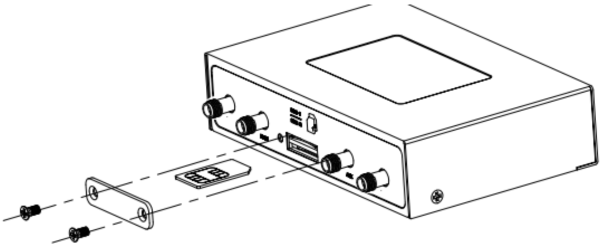
1. Make sure router is powered off.
2. Use a screwdriver to unscrew the screw on the cover, and then remove the cover, you could find the SIM Card slots.

- **Inserting SIM Card**

3. Insert the SIM card, and you need press the card with your fingers until you hear “a cracking sound”. Then use a screwdriver to screw the cover.

- **Removing SIM Card**

4. Make sure router is powered off.
5. Press the card until you hear “a cracking sound”, when the card will pop up to be pulled out.



Note:

1. Recommended torque for inserting is 0.5N.m and the maximum torque is 0.7N.m.
2. Please use the specific M2M SIM card when the device works in extreme temperature (temperature exceeding 0-40℃), because the long-time working of regular SIM card in harsh environment (temperature exceeding 0-40℃)may increase the possibility of SIM card failure.
3. Don’t forget screw the cover for again-theft.
4. Don’t touch the metal surface of the SIM card in case information in the card is lost or destroyed.
5. Don’t bend or scratch your SIM card.
6. Keep the card away from electricity and magnetism.
7. Make sure router is power off before inserting or removing your SIM card.

2.6 Connect the External Antenna

Connect router with an external antenna connector. Make sure the antenna is within correct frequency range and is screwed tightly.

Note: Recommended torque for mounting is 0.35N.m

2.7 Ground the Router

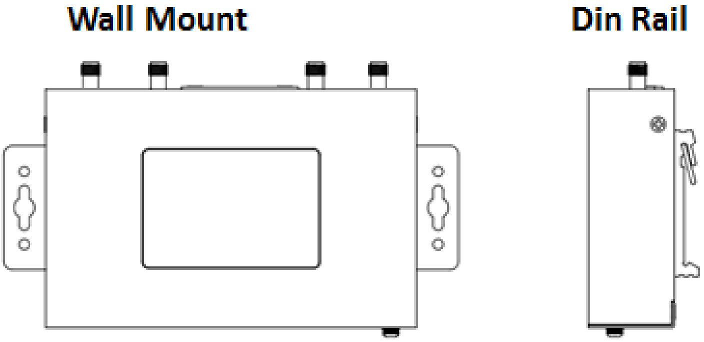
Grounding and wire router helps limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground by screwing to the grounding surface before connecting devices.
Note: This product is intended to be mounted to a well-grounded mounting surface, such as a metal panel.

2.8 Mount the Router

The router may be placed on a horizontal surface such as a desktop, mounted on a DIN-rail, or mounted on the wall.

- **Two ways of mounting the router**

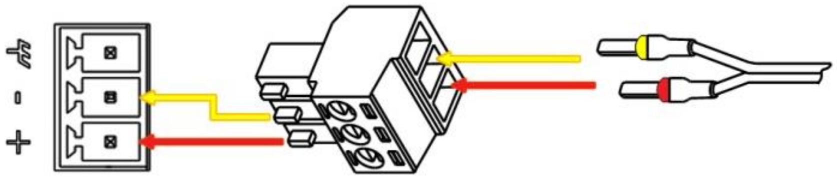
1. Use 4 pcs of M2.5 screw to fix the router on the two metal plates.
   And then use 2 pcs of M2.5 countersunk head cross recess screws with point-end to mount the router with two metal plates on the wall.
   Note: Recommended torque for mounting is 0.5N.m and the maximum torque is 0.7N.m.
2. Mount the router on a DIN rail with 3 pcs of M3 countersunk head cross recess screws, and then hang the DIN-Rail on the holder.
   You need to choose a standard holder. When mounting the unit on a DIN-rail, make sure that it is oriented with the metal springs on top.
   Note: Recommended torque for mounting is 1.0N.m and the maximum torque is 1.2N.m.



2.9 Power Supply

CONNECTING THE POWER CABLE

COLOR	POLARITY
RED	+
YELLOW	-

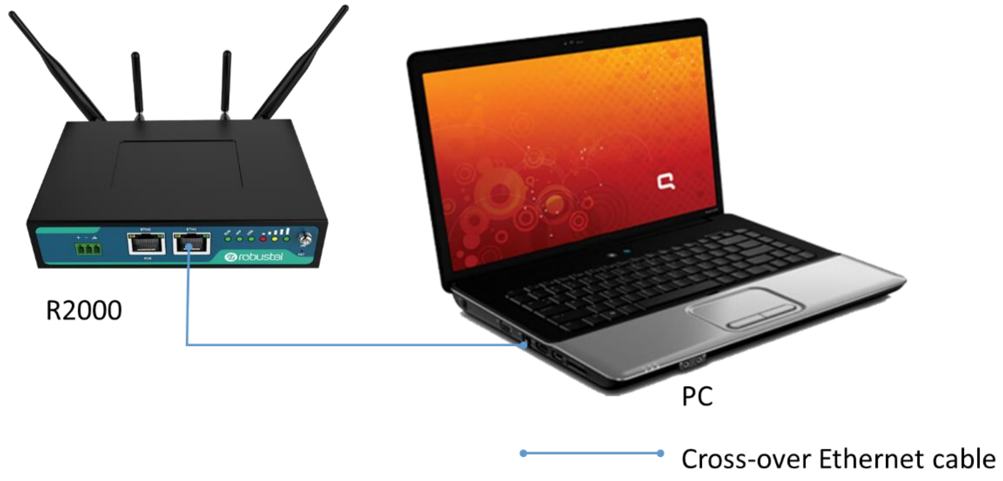


R2000 router supports reverse polarity protection, but always refers to the figure above to connect the power adapter correctly. There are two cables associated with the power adapter. Following to the color of the head, connect the cable marked red to the positive pole through a terminal block, and connect the yellow one to the negative in the same way.

Note: The range of power voltage is 9 to 26V DC (A014401, A014402, A014403, A014404, A014405, A014406, A014701, A014702, A014703, A014704, A014705, A014706) or 9 to 36V DC.

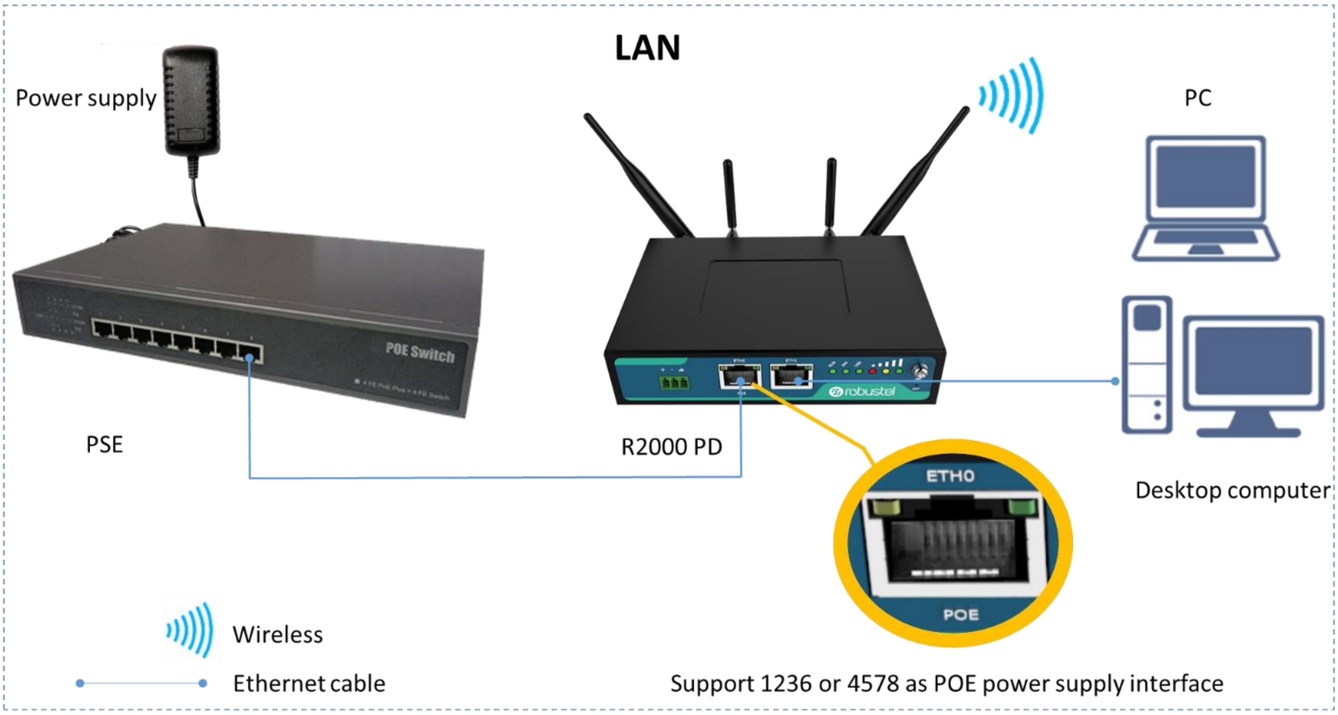
2.10 Connect R2000 to PC with Ethernet cable

Use a standard cross-over Ethernet cable to connect R2000 to PC with Eth0 or Eth1 port.



2.11 PD Connection (Optional)

If you want to power on R2000 by Ethernet, please refer to the following topology and connect R2000 to PSE (Power Sourcing Equipment).
POE power input voltage range is 48~57 VDC.



Chapter 3   Configure Settings over Web Browser

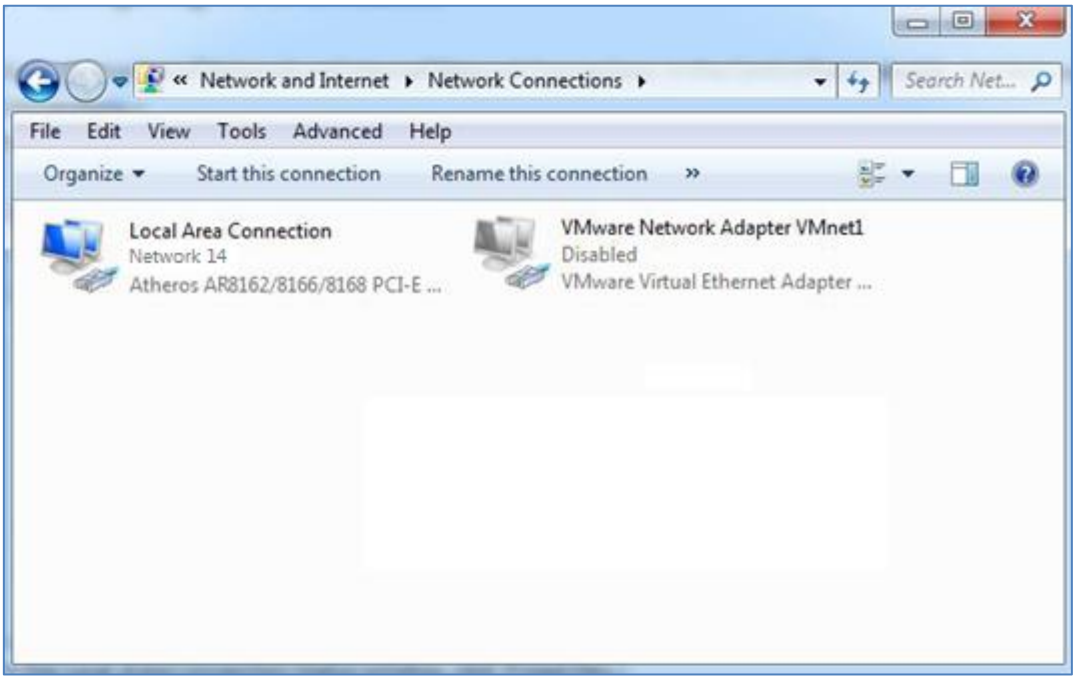
The router can be configured through your web browser that include IE 8.0 or above, Chrome and Firefox. A web browser is included as a standard application in the following operating systems: Linux, Mac OS, Windows 98/NT/2000/XP/Me/Vista/7/8, etc. It provides an easy and user-friendly interface for configuration.
There are various ways to connect the router, either through an external repeater/hub or connect directly to your PC. However, make sure that your PC has an Ethernet interface properly installed prior to connecting the router.
You must configure your PC to obtain an IP address through a DHCP server or a fixed IP address that must be in the same subnet as the router. If you encounter any problems accessing the router web interface it is advisable to uninstall your firewall program on your PC, as this tends to cause problems accessing the IP address of the router.

3.1   Configuring PC in Windows 7

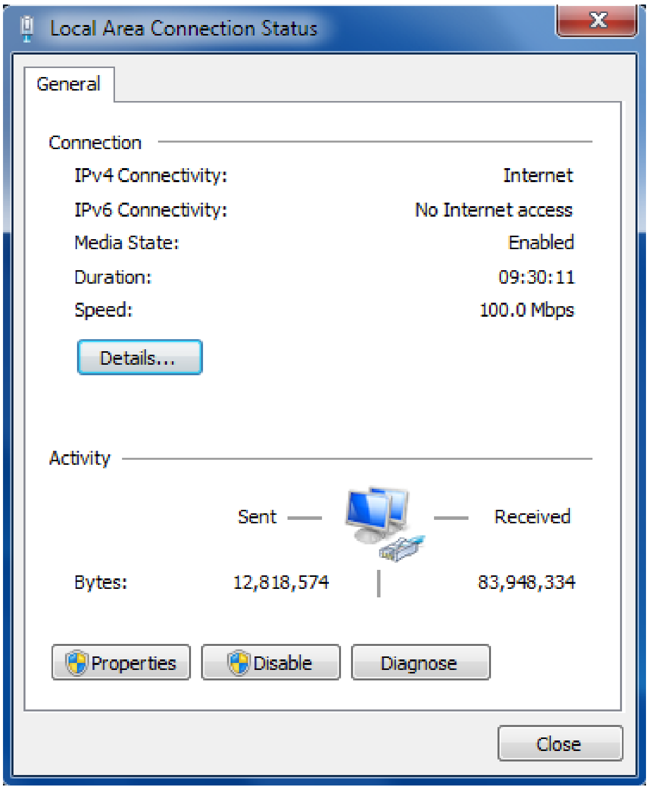
There are two methods to obtain IP address for the PC, one is automatically obtain IP address from DHCP server, and another is manually configured static IP address within the same subnet of R2000 router.

The configuration for windows system is similar.

1. Go to **Start > Control Panel > Network and Sharing Center**, and double-click **Local Area Connection**.


« Network and Internet ▸ Network Connections ▸
Search Net...
File
Edit
View
Tools
Advanced
Help
Organize ▾
Start this connection
Rename this connection
»
Local Area Connection
Network 14
Atheros AR8162/8166/8168 PCI-E ...
VMware Network Adapter VMnet1
Disabled
VMware Virtual Ethernet Adapter ...

2. Click **Properties** in the window of **Local Area Connection Status**.



Local Area Connection Status

General

Connection

IPv4 Connectivity: Internet

IPv6 Connectivity: No Internet access

Media State: Enabled

Duration: 09:30:11

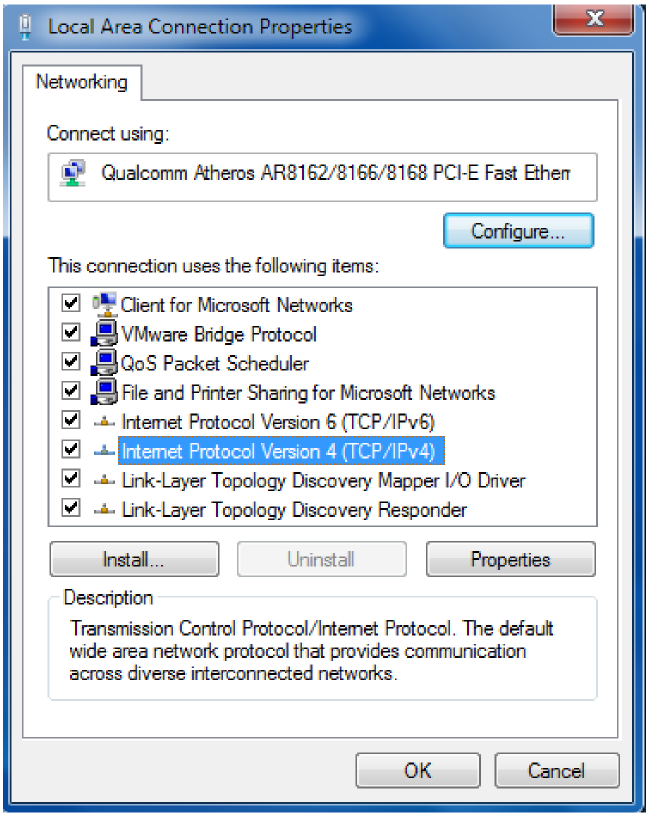
Speed: 100.0 Mbps

Activity

Sent — Received

Bytes: 12,818,574 | 83,948,334

3. Select **Internet Protocol Version (TCP/IPv4)** and click **Properties**.



Local Area Connection Properties

Networking

Connect using:

Qualcomm Atheros AR8162/8166/8168 PCI-E Fast Ethern

This connection uses the following items:

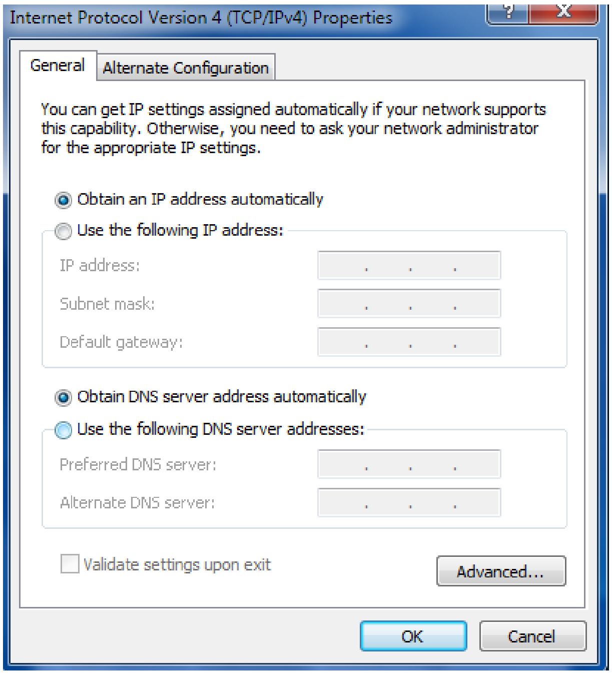
- ☑ Client for Microsoft Networks
- ☑ VMware Bridge Protocol
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

4. Two ways for configuring the IP address of PC:

Obtain an IP address automatically:



Internet Protocol Version 4 (TCP/IPv4) Properties

General | Alternate Configuration

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically

○ Use the following IP address:

IP address: . . .

Subnet mask: . . .

Default gateway: . . .

● Obtain DNS server address automatically

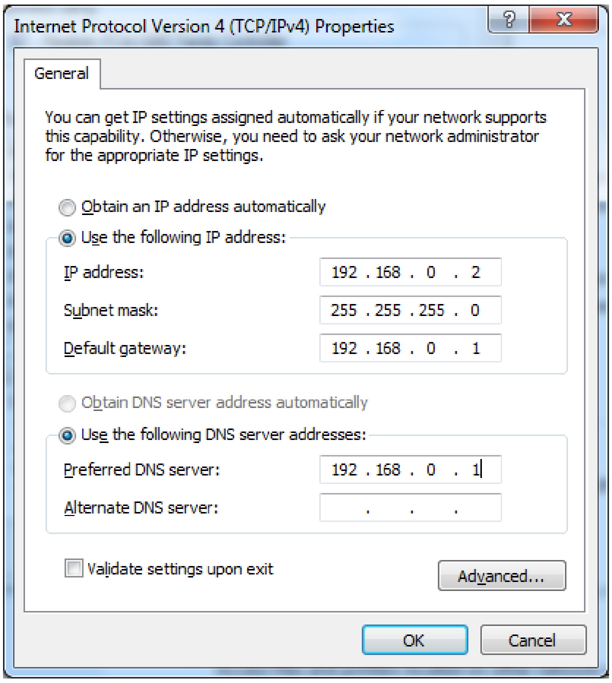
○ Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

□ Validate settings upon exit

Use the following IP address (configured a static IP address manually within the same subnet of R2000 router):



Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 192 . 168 . 0 . 2

Subnet mask: 255 . 255 . 255 . 0

Default gateway: 192 . 168 . 0 . 1

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server: 192 . 168 . 0 . 1

Alternate DNS server: . . .

□ Validate settings upon exit

5. Click **OK** to finish the configuration.

3.2 Factory Default Settings

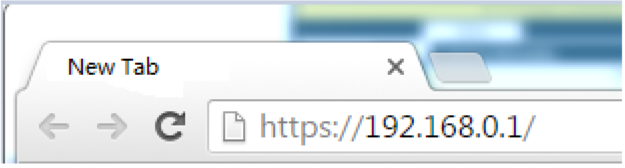
Before configuring your router, you need to know the following default settings.

Item	Description
Username	admin
Password	admin
eth0	192.168.0.1/255.255.255.0, LAN
eth1	192.168.0.1/255.255.255.0, LAN
DHCP Server	Enabled

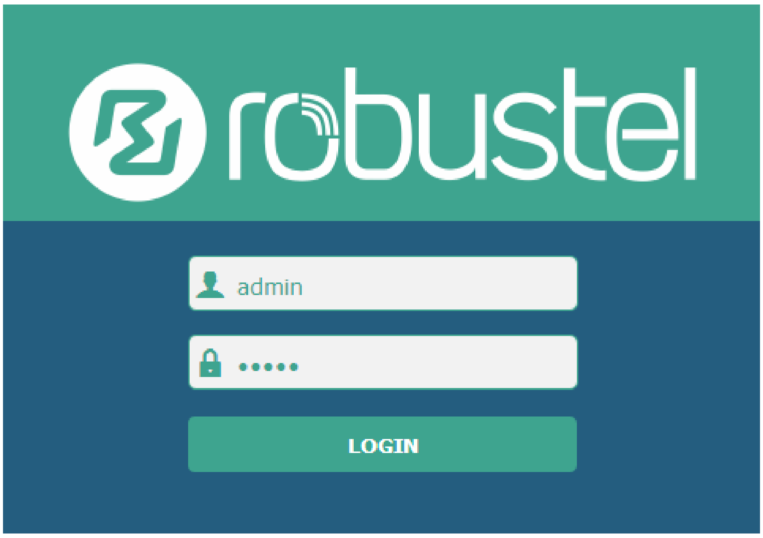
3.3 Login Router

1. On the PC, open a web browser such as Internet Explorer.

2. In the browser's address bar, enter the IP address of the Router. The default IP address is 192.168.0.1, though the actual address may vary.



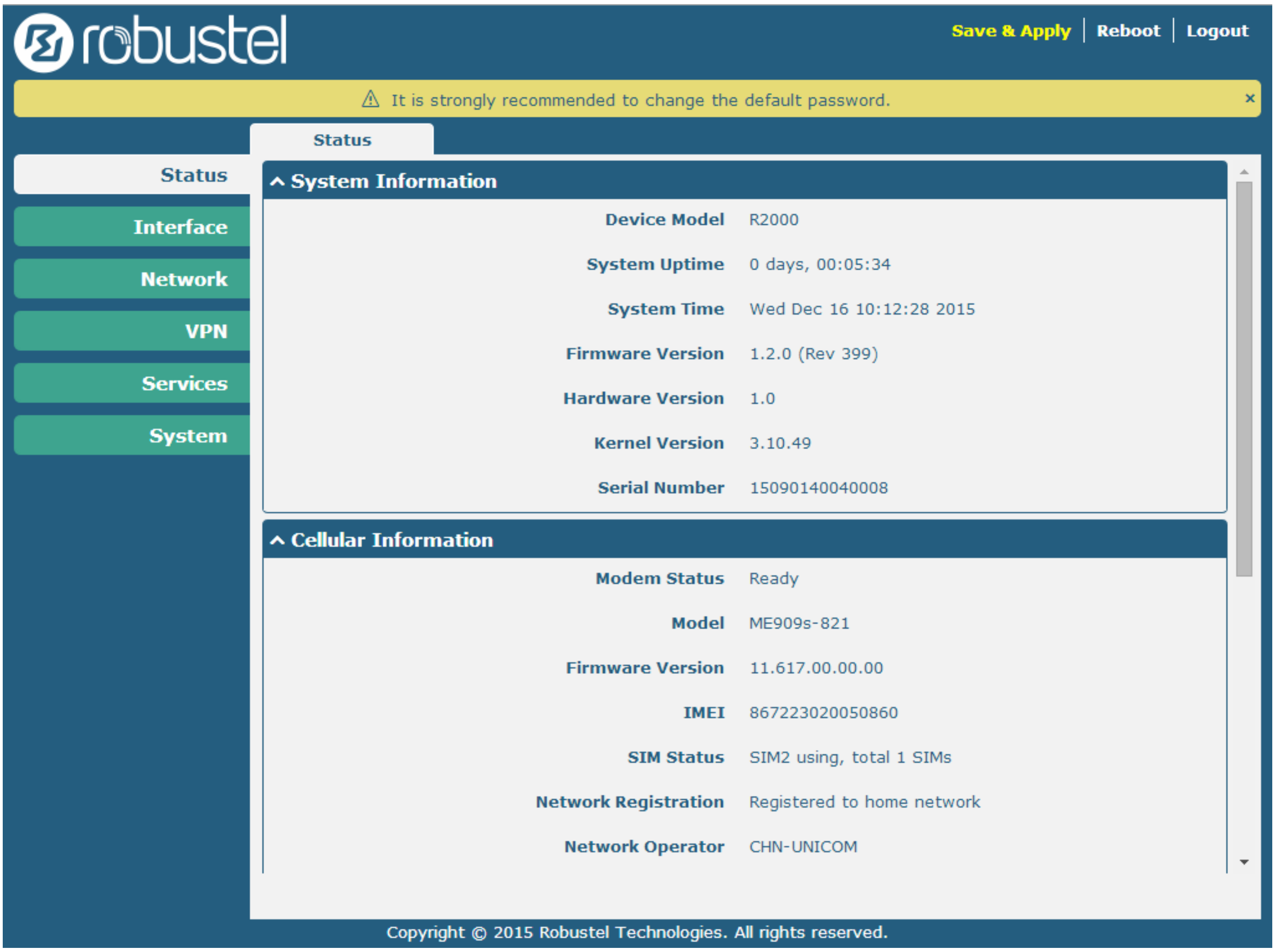
3. Input the username and password and login the R2000. If enter the wrong username or password six times, the login web will be locked for 5 minutes.



3.4 Control Panel

After logging in the R2000, the home page of the R2000 router's web interface is displayed, just like the screenshot below.

This section allows users to save configuration, reboot router, logout. When you are first time to login R2000, there will be a pop-up tab "⚠ It is strongly recommended to change the default password.", click × to close the pop-up tab. And if you want to change the password, please refer to **3.27 System > User Management** section.


robustel
Save & Apply | Reboot | Logout
⚠ It is strongly recommended to change the default password. ×
Status
Status
Interface
Network
VPN
Services
System
Copyright © 2015 Robustel Technologies. All rights reserved.

^ System Information

Device Model	R2000
System Uptime	0 days, 00:05:34
System Time	Wed Dec 16 10:12:28 2015
Firmware Version	1.2.0 (Rev 399)
Hardware Version	1.0
Kernel Version	3.10.49
Serial Number	15090140040008

^ Cellular Information

Modem Status	Ready
Model	ME909s-821
Firmware Version	11.617.00.00.00
IMEI	867223020050860
SIM Status	SIM2 using, total 1 SIMs
Network Registration	Registered to home network
Network Operator	CHN-UNICOM

Control Panel		
Item	Description	Button
Save & Apply	Click to save the current configuration into router's flash and apply the modification on every configuration page, to make the modification taking effect.	Save & Apply
Reboot	Click to reboot the router. When the Reboot button is in yellow, it means that some completed configurations will take effect only by reboot.	Reboot

Logout	Click to exit safely, then it will switch to login page. Shut down web page directly without logout, the next one can login web on this browser without a password before timeout.	Logout
Submit	Click to submit the modification on current configuration page.	Submit
Cancel	Click to cancel the modification on current configuration page.	Cancel

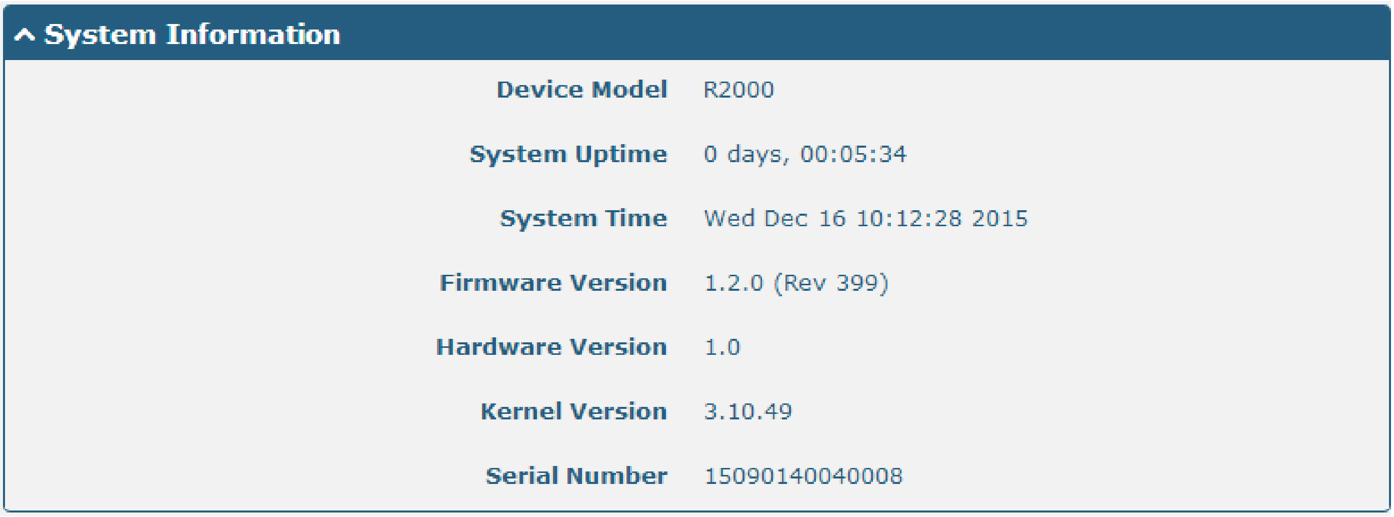
Note: The steps of how to modify configuration are as bellow:

1. Modify in one page;
2. Click Submit under this page;
3. Modify in another page;
4. Click Submit under this page;
5. Complete all modification;
6. Click Save & Apply .

3.5 Status

This section displays the router's status, which shows you a number of helpful information such as System Information, Cellular Information, Internet Status and LAN Status.

System Information



^ System Information

Device Model R2000

System Uptime 0 days, 00:05:34

System Time Wed Dec 16 10:12:28 2015

Firmware Version 1.2.0 (Rev 399)

Hardware Version 1.0

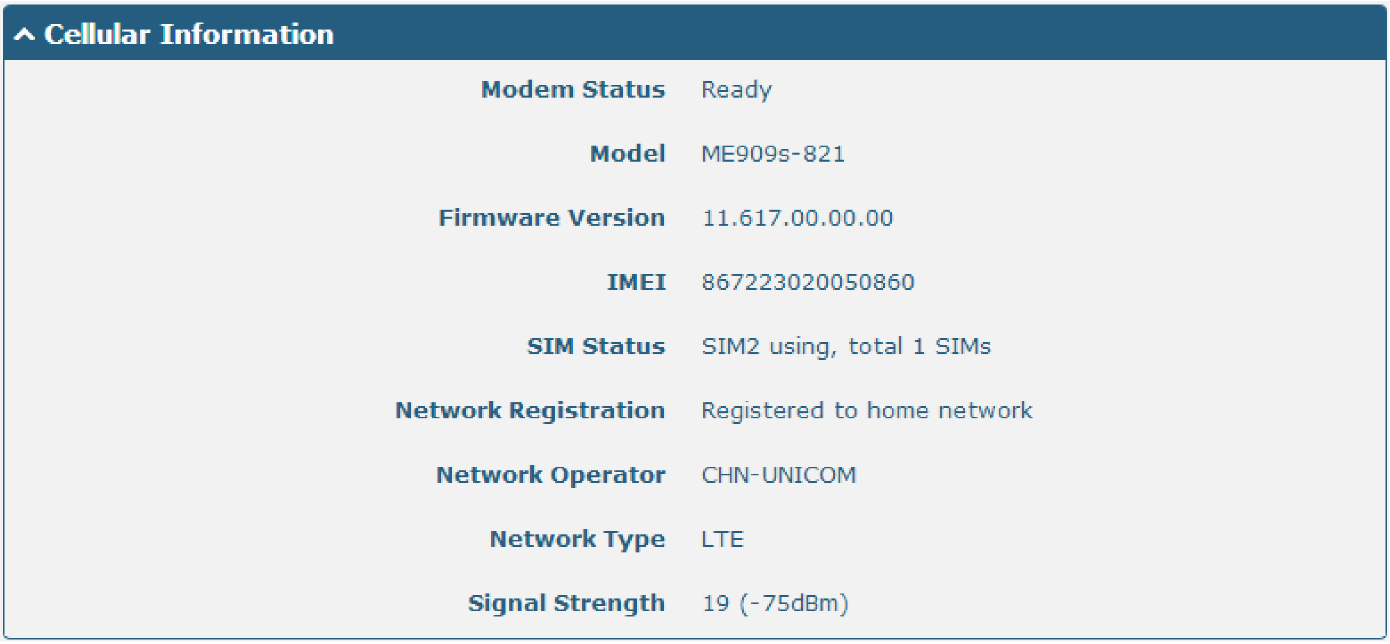
Kernel Version 3.10.49

Serial Number 15090140040008

System Information	
Item	Description
Device Model	Show the model name of this device.

System Uptime	Show how long the router has been working since power on.
System Time	Show the current system time.
Firmware Version	Show the current firmware version.
Hardware Version	Show the current hardware version.
Kernel Version	Show the current kernel version.
Serial Number	Show the serial number of this device.

Cellular Information



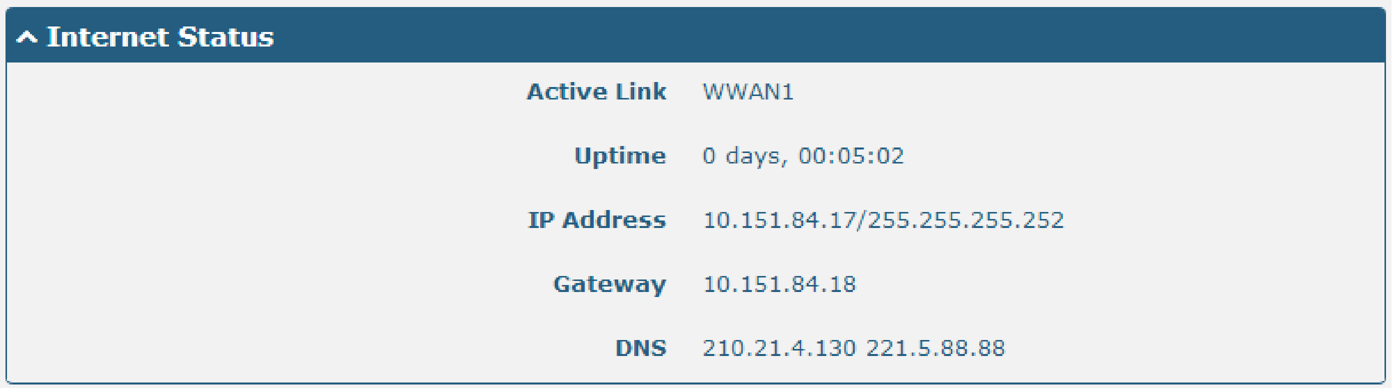
^ Cellular Information

Modem Status	Ready
Model	ME909s-821
Firmware Version	11.617.00.00.00
IMEI	867223020050860
SIM Status	SIM2 using, total 1 SIMs
Network Registration	Registered to home network
Network Operator	CHN-UNICOM
Network Type	LTE
Signal Strength	19 (-75dBm)

Cellular Information	
Item	Description
Modem Status	Show the status of modem. There are 8 different status: 1. Initializing 2. Modem not found 3. No response 4. SIM not detected 5. SIM PIN required 6. SIM PUK required 7. Register failed 8. Ready
Modem Model	Show the current radio module type.
Firmware Version	Show the current radio firmware version.
IMEI	Show the IMEI number of the radio module.
SIM Status	Show the SIM card which the router works with currently: SIM1 or SIM2. And show the total SIM cards in the router.
Network Registration	Show the status of Registration. There are 6 different status: 1. Not registered, search stopped

	2. Registered to home network 3. Not registered, searching 4. Registration denied 5. Unknown 6. Registered, roaming
Network Provider	Show the current network provider.
Network Type	Show the current network service type, e.g. GPRS.
Signal Strength	Show the current signal strength.

Internet Status



Active Link WWAN1

Uptime 0 days, 00:05:02

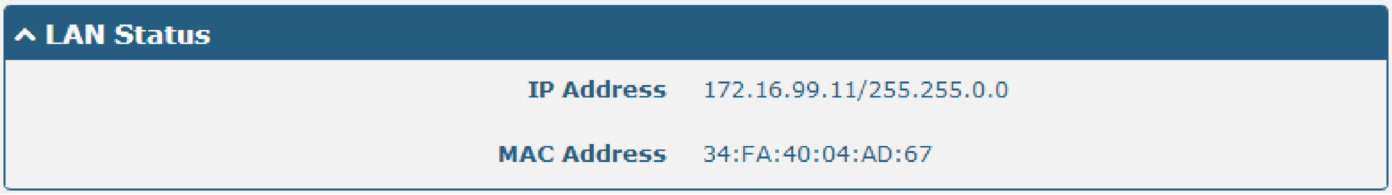
IP Address 10.151.84.17/255.255.255.252

Gateway 10.151.84.18

DNS 210.21.4.130 221.5.88.88

Internet Status	
Item	Description
Active Link	Show the current WAN link: WWAN1, WWAN2 or WAN.
Uptime	Show how long the current WAN have been working.
IP Address	Show the current WAN IP address.
Gateway	Show the current gateway.
DNS	Show the current primary DNS server and Secondary server.

LAN Status



IP Address 172.16.99.11/255.255.0.0

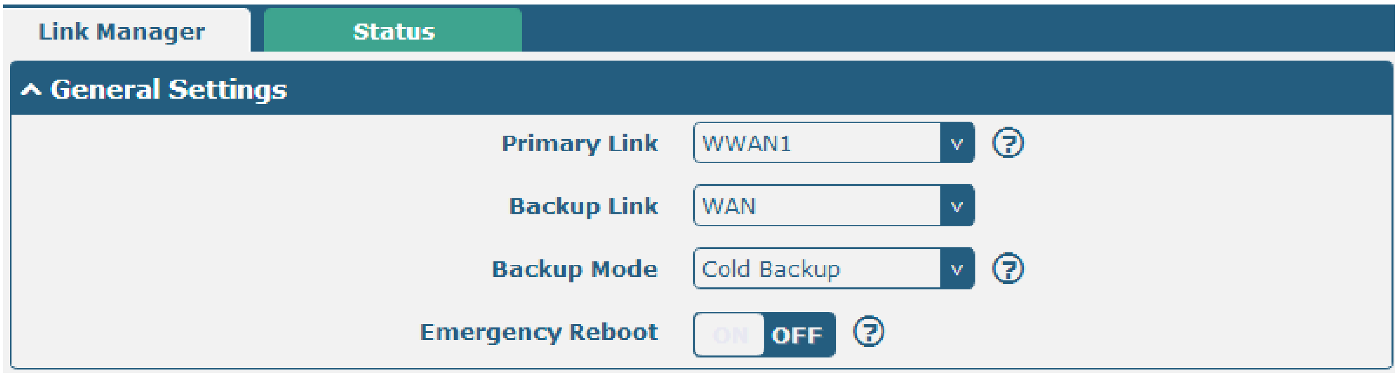
MAC Address 34:FA:40:04:AD:67

Router Information	
Item	Description
IP Address	Show the current IP Address and the Netmask.
MAC Address	Show the current MAC Address.

3.6 Interface > Link Manager

Link Manager

User can manage the link connection in this section.



Primary Link: WWAN1

Backup Link: WAN

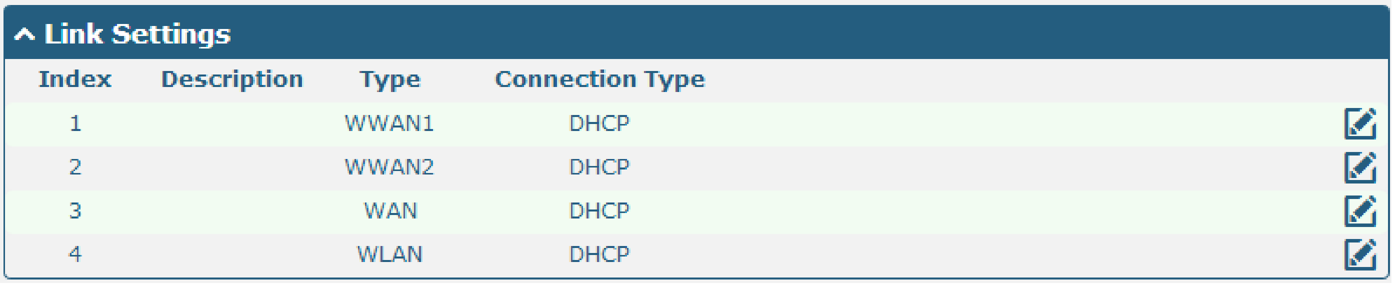
Backup Mode: Cold Backup

Emergency Reboot: ON OFF

Link Manager		
Item	Description	Default
Primary Link	Select from “WWAN1”, “WWAN2”, “WAN”, “WLAN”. 1. WWAN1: Select to make SIM1 as the primary wireless link. ***Note:*** *insert SIM card please refer to the installation quick guide.* 2. WWAN2: Select to make SIM2 as the primary wireless link. 3. WAN: Select to make WAN Ethernet port as the primary link. ***Note:*** WAN link available only if enable ETH0 as WAN interface in **System > Device Configuration > Advance Device Settings** 4. WLAN: Select to make WLAN as the router’s primary link. ***Note:*** WLAN link available only if enable R2000 as Wi-Fi Client in **System > Device Configuration > Advance Device Settings**	WWAN1
Backup Link	Select from “None”, “WWAN1”, “WWAN2”, “WAN”, “WLAN”. 1. None: Do not select backup interface. 2. WWAN1: Select to make SIM1 as backup wireless WAN. 3. WWAN2: Select to make SIM2 as backup wireless WAN. 4. WAN: Select to make WAN Ethernet port as the backup WAN. ***Note:*** WAN link available only if enable ETH0 as WAN interface in **System > Device Configuration > Advance Device Settings** 5. WLAN: Select to make WLAN as the router’s backup link. ***Note:*** WLAN link available only if enable R2000 as Wi-Fi Client in **System > Device Configuration > Advance Device Settings**	None
Backup Mode	Cold backup: The inactive link is offline on standby. Warm backup: The inactive link is online on standby. Warm backup mode is not available for dual SIM backup.	Cold backup
Emergency Reboot	Enable to reboot the whole system if no links available.	OFF

Note: *Click“?” for help.*

Link Setting section allows user to configure the parameter of link connection, include the WWAN1/WWAN, WAN and WLAN.
It is recommended to enable Ping detection to keep router always online.
The Ping detection increases the reliability and also cost data traffic.

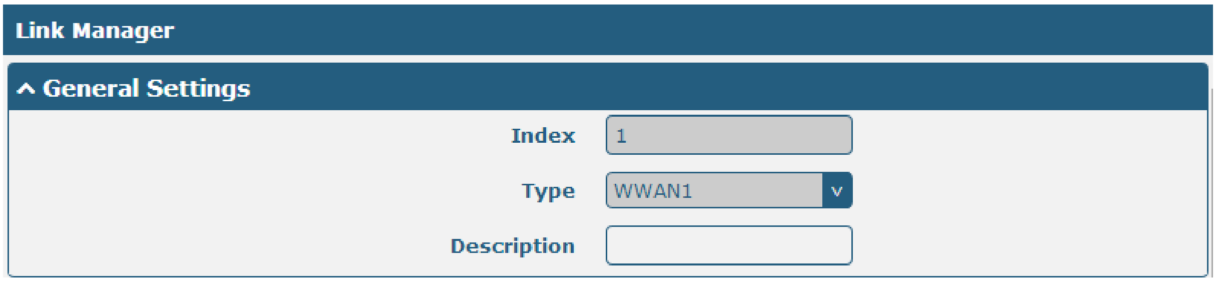


^ Link Settings

Index	Description	Type	Connection Type	
1		WWAN1	DHCP	✎
2		WWAN2	DHCP	✎
3		WAN	DHCP	✎
4		WLAN	DHCP	✎

Click ✎ to enter the link configuration window.

WWAN1/WWAN2

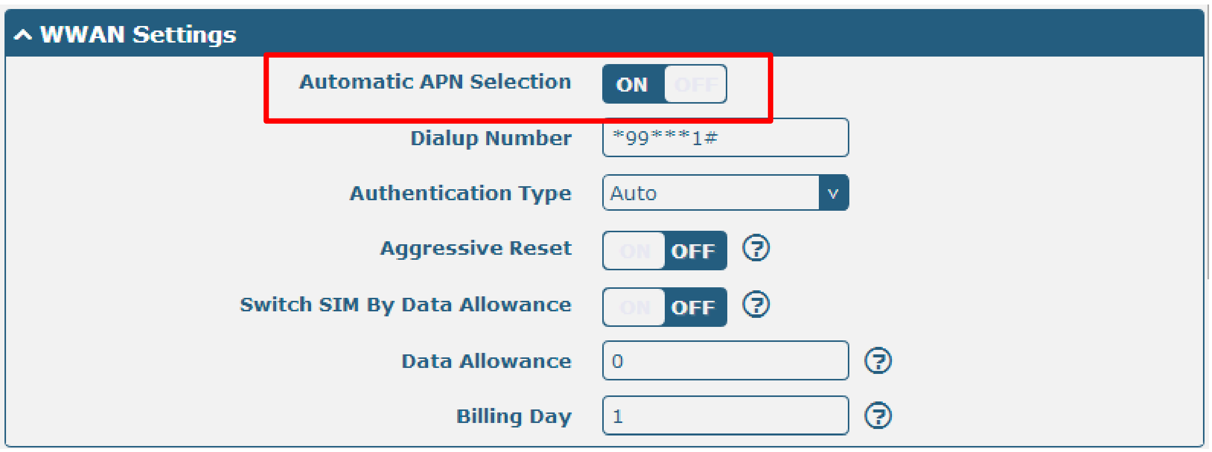


Link Manager

^ General Settings

Index	1
Type	WWAN1
Description	

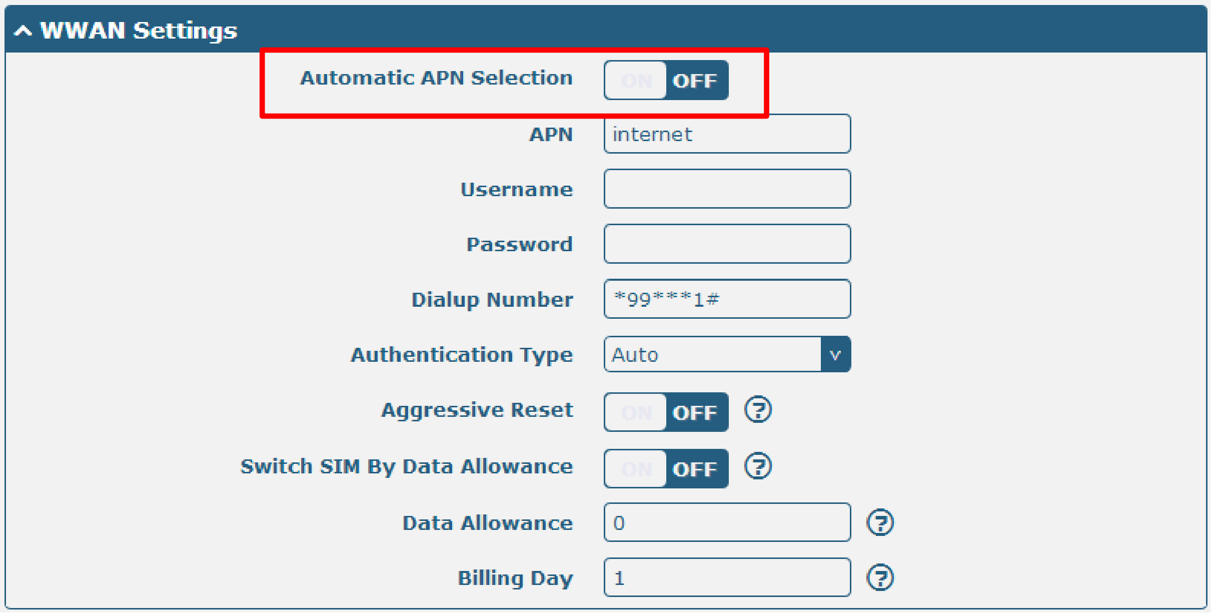
When enable "Automatic APN Selection", the window will display just like the following screenshot.



^ WWAN Settings

Automatic APN Selection	ON
Dialup Number	*99***1#
Authentication Type	Auto
Aggressive Reset	OFF
Switch SIM By Data Allowance	OFF
Data Allowance	0
Billing Day	1

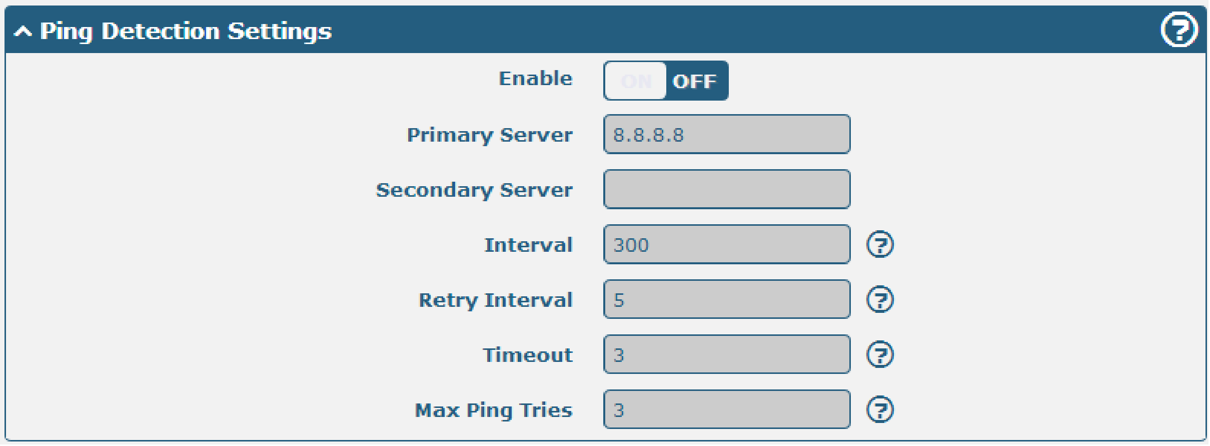
When disable "Automatic APN Selection", the window will display just like the following screenshot.



^ WWAN Settings

Automatic APN Selection	ON OFF
APN	internet
Username	
Password	
Dialup Number	*99***1#
Authentication Type	Auto
Aggressive Reset	ON OFF
Switch SIM By Data Allowance	ON OFF
Data Allowance	0
Billing Day	1

WWAN Setting		
Item	Description	Default
Automatic APN Selection ON	ON: R2000 will recognize the access point name automatically.	ON
Dialup Number	Dialup number for cellular dial-up connection, provided by local ISP.	*99***1#
Authentication Type	Select from "Auto", "PAP" and "CHAP" as the local ISP required.	Auto
Aggressive Reset	The module will be reset when the link become unreachable.	OFF
Switch SIM By Data Allowance	Switch to another SIM when reach data allowance, only use for dual SIM backup.	OFF
Data Allowance	Set the monthly data traffic limitation. The system will record the data traffic statistics when data traffic limitation (MiB) is specified. The traffic record will display in **Link Manager > Status > WWAN Data Usage Statistics** section. 0 means disable data traffic record.	0
Billing Day	This option specifies the day of month for billing, the data traffic statistics will be recalculated from this day.	1
Redial Interval	Seconds to wait for redial.	10
Automatic APN Selection OFF	OFF: Select access point name manually.	/
APN	Access Point Name for cellular dial-up connection, provided by local ISP.	internet
Username	User Name for cellular dial-up connection, provided by local ISP.	Null
Password	Password for cellular dial-up connection, provided by local ISP.	Null



^ Ping Detection Settings

Enable: ON OFF

Primary Server: 8.8.8.8

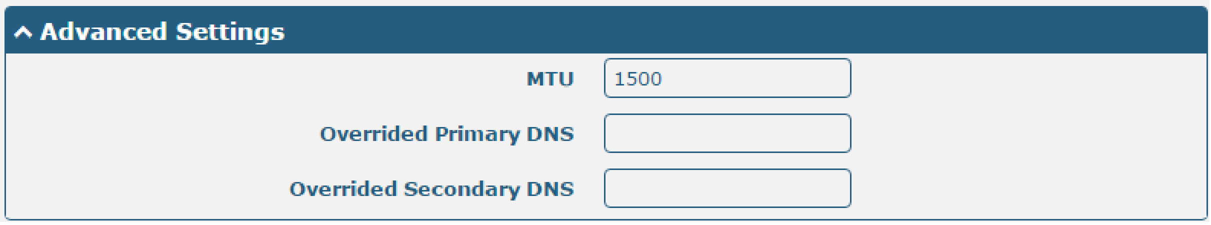
Secondary Server:

Interval: 300

Retry Interval: 5

Timeout: 3

Max Ping Tries: 3



^ Advanced Settings

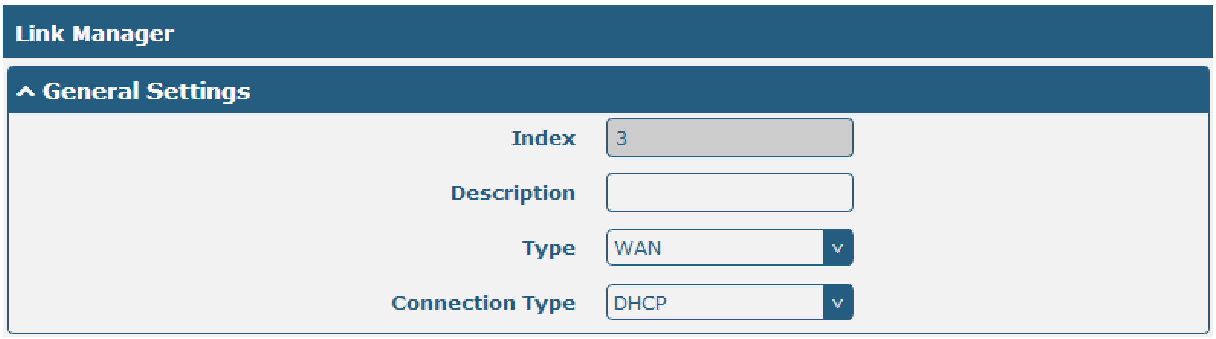
MTU: 1500

Overrided Primary DNS:

Overrided Secondary DNS:

Ping Detection Settings/Advanced Setting		
Item	Description	Default
Enable	To enable “ping detection”. It was a keepalive policy of R2000 router.	OFF
Primary Server	Router will ping this primary address/domain name to check that if the current connectivity is active.	8.8.8.8
Secondary Server	Router will ping this secondary address/domain name to check that if the current connectivity is active.	Null
Interval	Set the ping interval.	300
Retry Interval	Set the ping retry interval.	5
Timeout	Set the ping timeout.	3
Max Ping Tries	Switch to another link or take emergency action if max continuous ping tries reached.	3
MTU	Maximum Transmission Unit. It is the identifier of the maximum size of packet, which is possible to transfer in a given environment.	1500
Overrided Primary DNS	Overrided DNS will override the automatically obtained DNS.	Null
Overrided Secondary DNS	Overrided DNS will override the automatically obtained DNS.	Null

WAN



Link Manager

^ General Settings

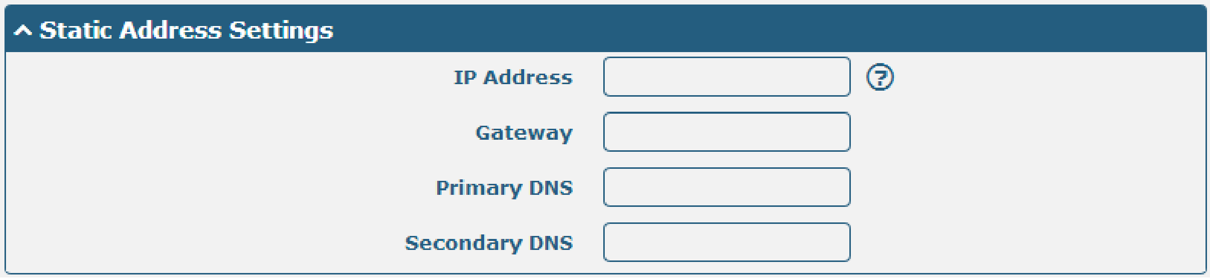
Index: 3

Description:

Type: WAN

Connection Type: DHCP

When choose the WAN Connection Type as DHCP, R2000 will obtain IP automatically from DHCP server.
When choose the WAN Connection Type as Static.



^ Static Address Settings

IP Address:

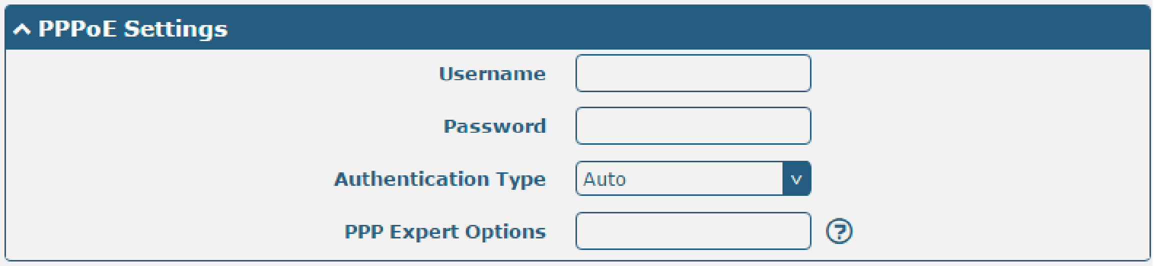
Gateway:

Primary DNS:

Secondary DNS:

Static		
Item	Description	Default
IP Address	Set the IP address with Netmask which can access the internet. IP address with Netmask, e.g. 192.168.1.1/24	Null
Gateway	Set the gateway of the WAN IP.	Null
Primary DNS	Set the Primary DNS.	Null
Secondary DNS	Set the Secondary DNS.	Null

When choose the WAN Connection Type as PPPoE.



^ PPPoE Settings

Username:

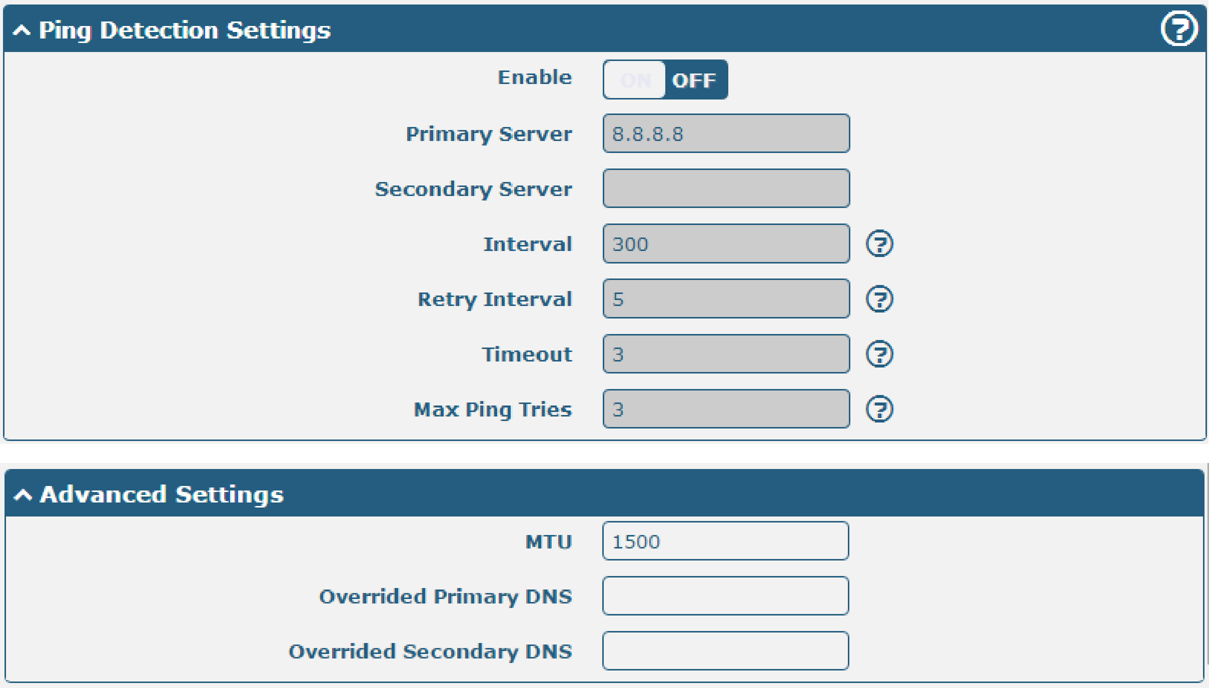
Password:

Authentication Type: Auto

PPP Expert Options:

PPPoE		
Item	Description	Default
Username	Enter the username which was provided by your Internet Service Provider.	Null
Password	Enter the password which was provided by your Internet Service Provider.	Null
Authentication Type	Select from “Auto”, “PAP” and “CHAP” as the local ISP required.	Auto

PPPoE		
Item	Description	Default
PPP Expert Options	PPP Expert options used for PPPoE dialup. You can enter some other PPP initialization strings in this field. Each string can be separated by a semicolon.	Null



^ Ping Detection Settings

Enable: ON OFF

Primary Server: 8.8.8.8

Secondary Server:

Interval: 300

Retry Interval: 5

Timeout: 3

Max Ping Tries: 3

^ Advanced Settings

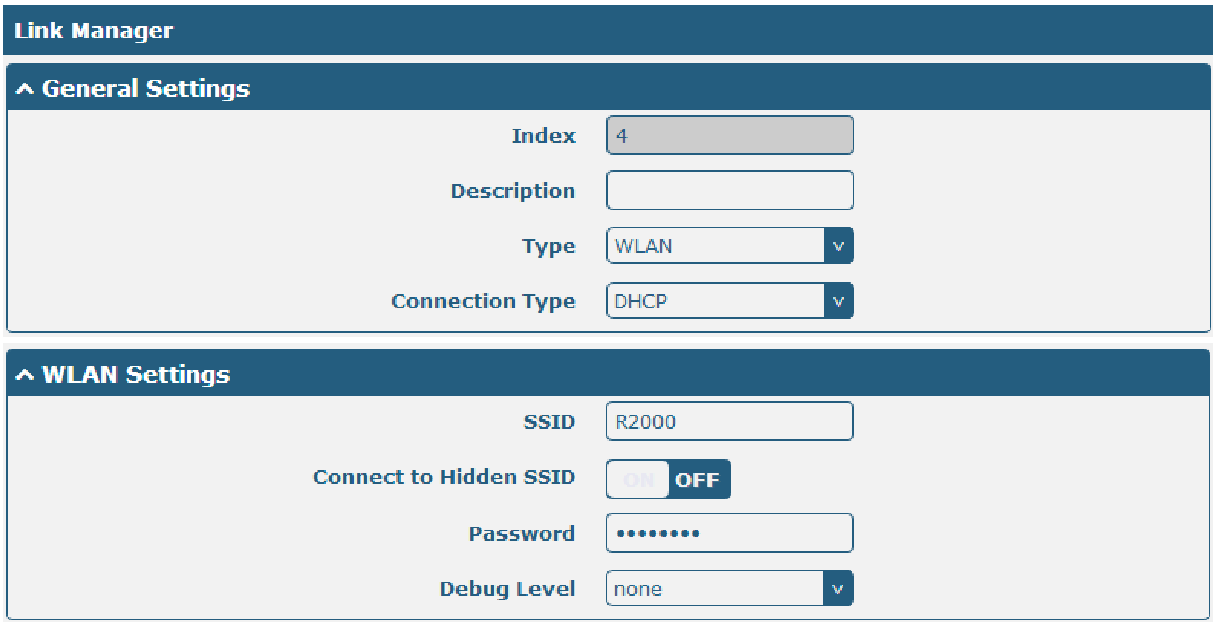
MTU: 1500

Overrided Primary DNS:

Overrided Secondary DNS:

Ping Detection Setting/Advance Setting		
Item	Description	Default
Enable	To enable "ping detection". It was a keepalive policy of R2000 router.	OFF
Primary Server	Router will ping this primary address/domain name to check that if the current connectivity is active.	8.8.8.8
Secondary Server	Router will ping this secondary address/domain name to check that if the current connectivity is active.	Null
Interval	Set the ping interval.	300
Retry Interval	Set the ping retry interval.	5
Timeout	Set the ping timeout.	3
Max Ping Tries	Switch to another link or take emergency action if max continuous ping tries reached.	3
MTU	Maximum Transmission Unit. It is the identifier of the maximum size of packet, which is possible to transfer in a given environment.	1500
Overrided Primary DNS	Overrided DNS will override the automatically obtained DNS.	Null
Overrided Secondary DNS	Overrided DNS will override the automatically obtained DNS.	Null

WLAN



Link Manager

^ General Settings

Index: 4

Description:

Type: WLAN

Connection Type: DHCP

^ WLAN Settings

SSID: R2000

Connect to Hidden SSID: ON OFF

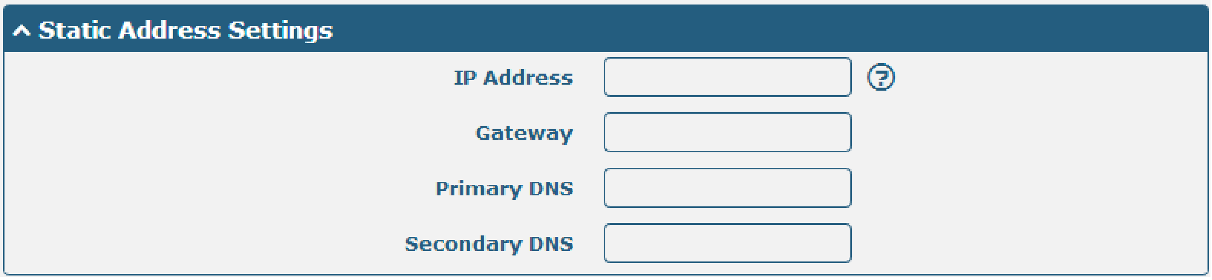
Password: ••••••••

Debug Level: none

WLAN Setting		
Item	Description	Default
SSID	Enter SSID of the access point which R2000 want to connect. Input from 1 to 32 characters.	router
Connect to Hidden SSID	When R2000 works as Client mode and need to connect to any access point which has hidden SSID, you need to enable this feature.	OFF
Password	Enter access point's passphrase which it wants to connect to. Input from 8 to 63 characters.	Null
Debug Level	Select from "verbose", "debug", "info", "notice", "warning", "none".	None

When choose the WLAN Connection Type as DHCP, R2000 will obtain IP automatically from the WLAN AP.

When choose the WLAN Connection Type as Static. Please enter the related parameter in the **Static Address Setting** window.



^ Static Address Settings

IP Address:

Gateway:

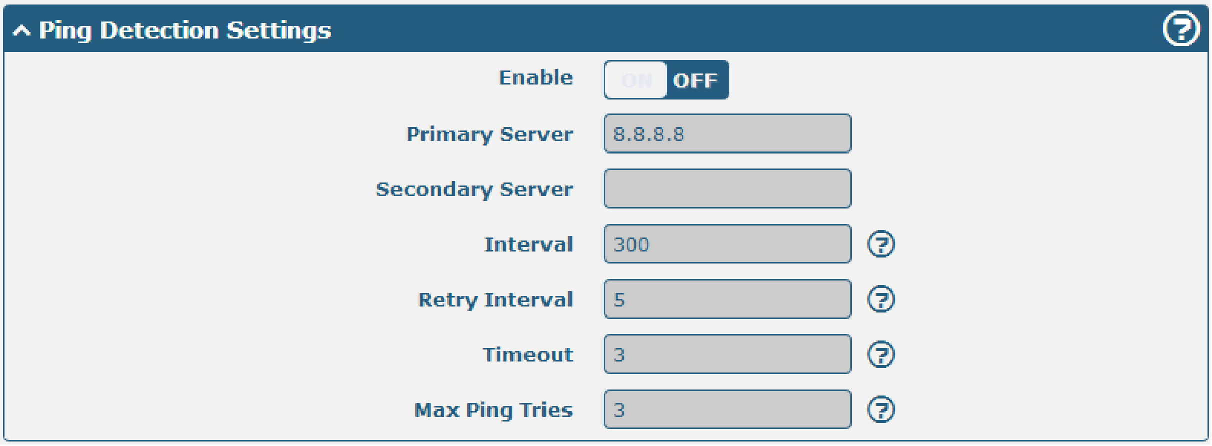
Primary DNS:

Secondary DNS:

Static Address Setting		
Item	Description	Default
IP Address	Enter the IP address which was identified by the Wi-Fi AP. IP address with Netmask, e.g. 192.168.1.1/24	Null
Gateway	Enter the Wi-Fi AP's IP address.	Null

Static Address Setting		
Item	Description	Default
Primary DNS	Enter the primary DNS server IP address.	Null
Secondary DNS	Enter the Secondary DNS server IP address.	Null

R2000 router cannot support PPPoE WLAN Connection Type.



^ Ping Detection Settings

Enable: ON OFF

Primary Server: 8.8.8.8

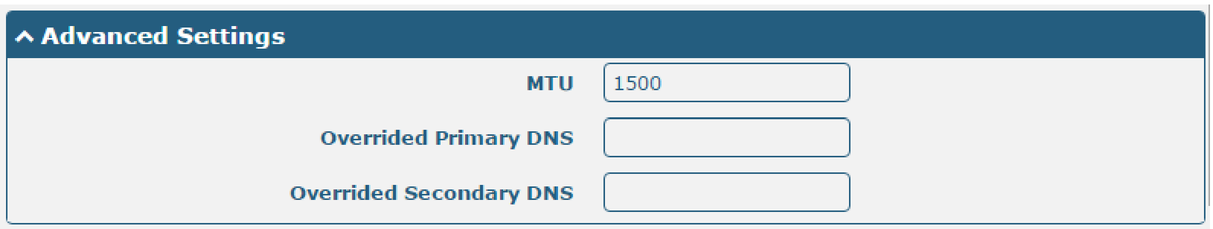
Secondary Server:

Interval: 300

Retry Interval: 5

Timeout: 3

Max Ping Tries: 3



^ Advanced Settings

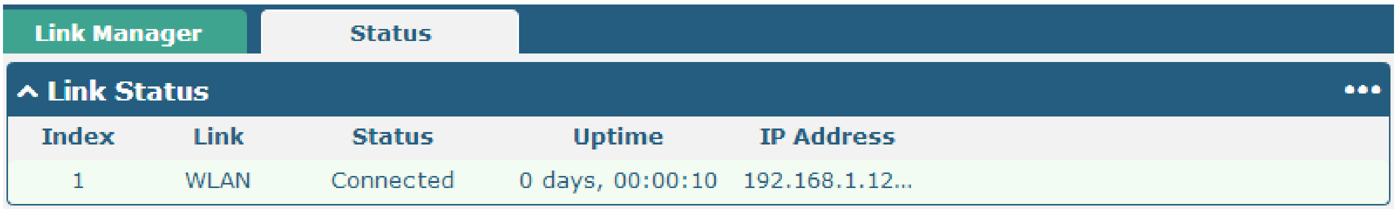
MTU: 1500

Overrided Primary DNS:

Overrided Secondary DNS:

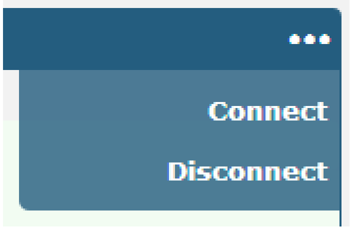
Ping Detection Setting/Advance Setting		
Item	Description	Default
Enable	To enable “ping detection”. It was a keepalive policy of R2000 router.	OFF
Primary Server	Router will ping this primary address/domain name to check that if the current connectivity is active.	8.8.8.8
Secondary Server	Router will ping this secondary address/domain name to check that if the current connectivity is active.	Null
Interval	Set the ping interval.	300
Retry Interval	Set the ping retry interval.	5
Tmeout	Set the ping timeout.	3
Max Ping Tries	Switch to another link or take emergency action if max continuous ping tries reached.	3
MTU	Maximum Transmission Unit. It is the identifier of the maximum size of packet, which is possible to transfer in a given environment.	1500
Overrided Primary DNS	Overrided DNS will override the automatically obtained DNS.	Null
Overrided Secondary DNS	Overrided DNS will override the automatically obtained DNS.	Null

Status

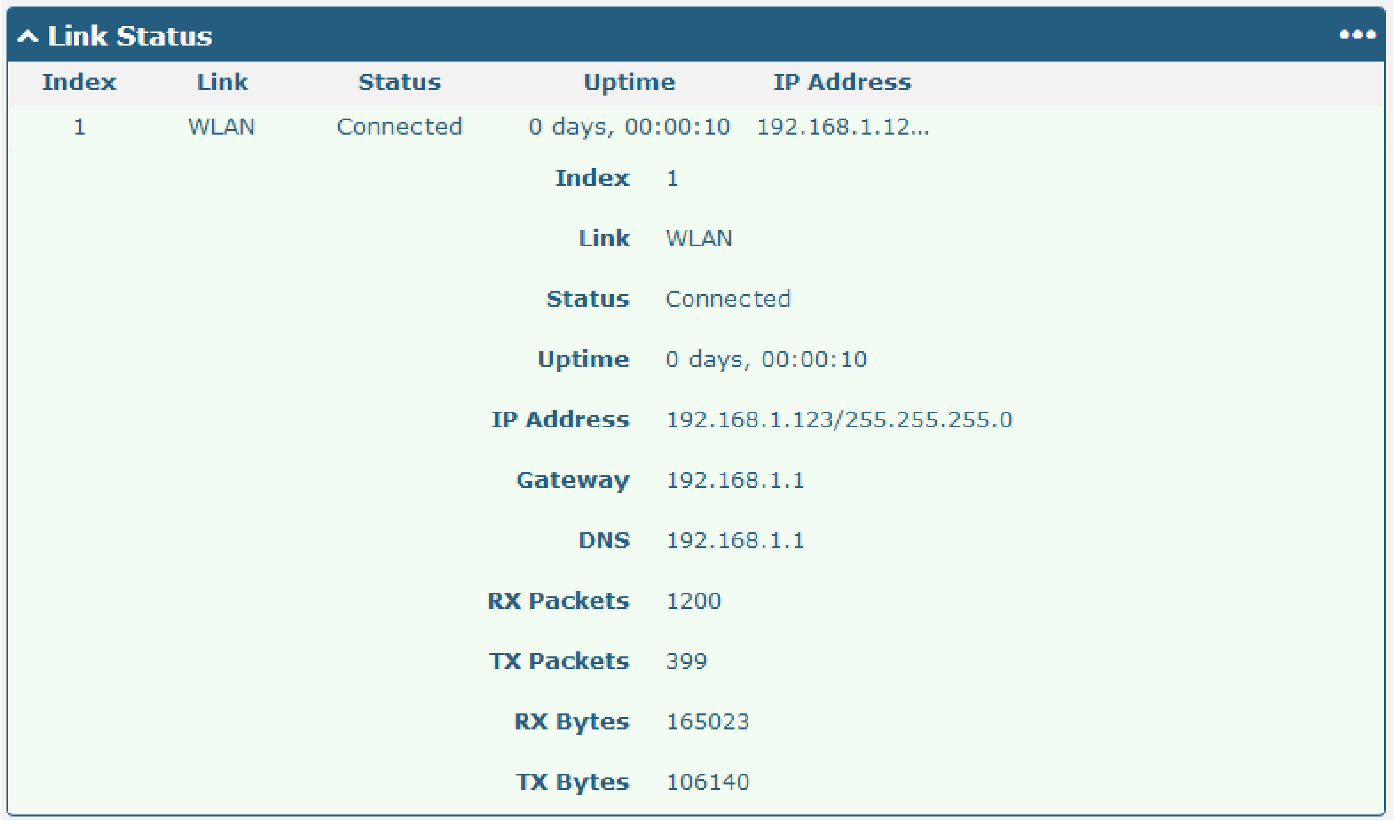


Index	Link	Status	Uptime	IP Address
1	WLAN	Connected	0 days, 00:00:10	192.168.1.12...

Click the button ••• which is in the top right of the Link Status window. Select the connection status of the current link.

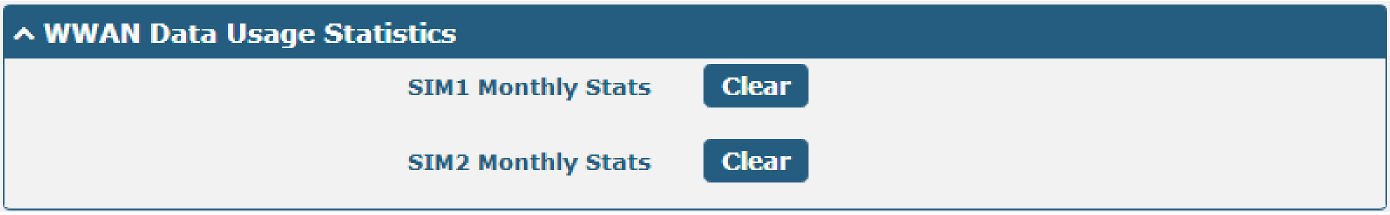


Click the row of the link, and it will show the details information of the current link connection under the row.



Index	Link	Status	Uptime	IP Address
1	WLAN	Connected	0 days, 00:00:10	192.168.1.12...

Index	1
Link	WLAN
Status	Connected
Uptime	0 days, 00:00:10
IP Address	192.168.1.123/255.255.255.0
Gateway	192.168.1.1
DNS	192.168.1.1
RX Packets	1200
TX Packets	399
RX Bytes	165023
TX Bytes	106140

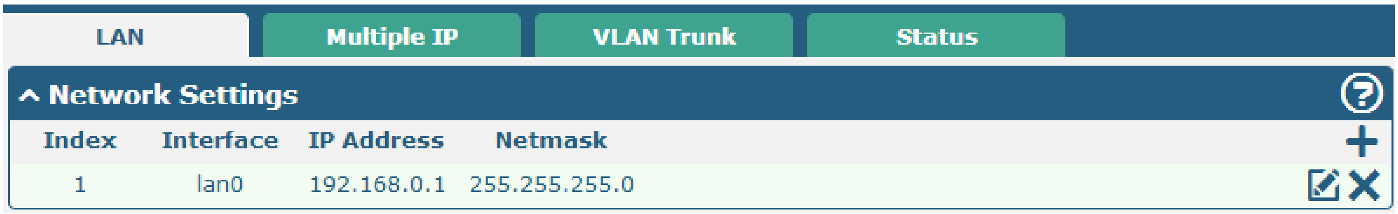


Click Clear button to clear SIM1 or SIM2 monthly data traffic usage statistics. Data statistics will display only if enable the Data Allowance function in **Link Manager > Link Setting > WWAN Setting**.

3.7 Interface > LAN

This section allows user to set the LAN and the related parameters.

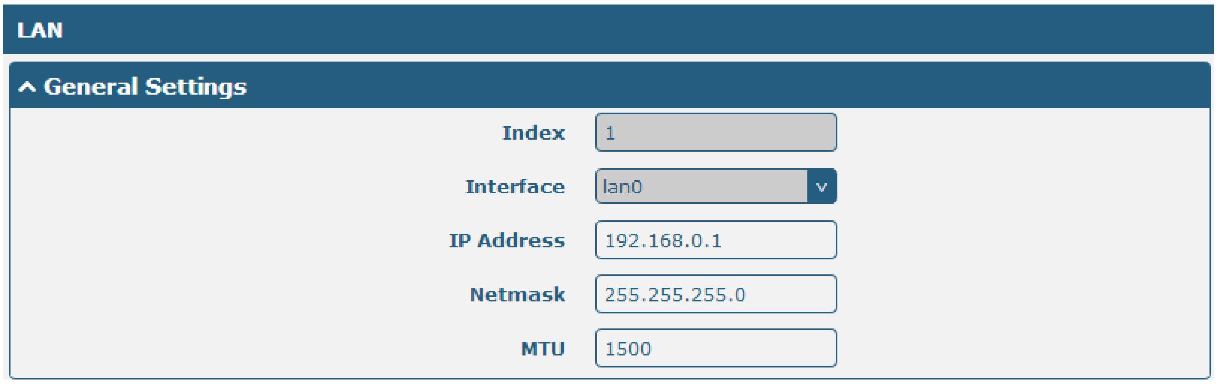
LAN



Index	Interface	IP Address	Netmask
1	lan0	192.168.0.1	255.255.255.0

Click ✎ to edit the configuration of the current LAN interface. Click ✕ to delete the current LAN interface.

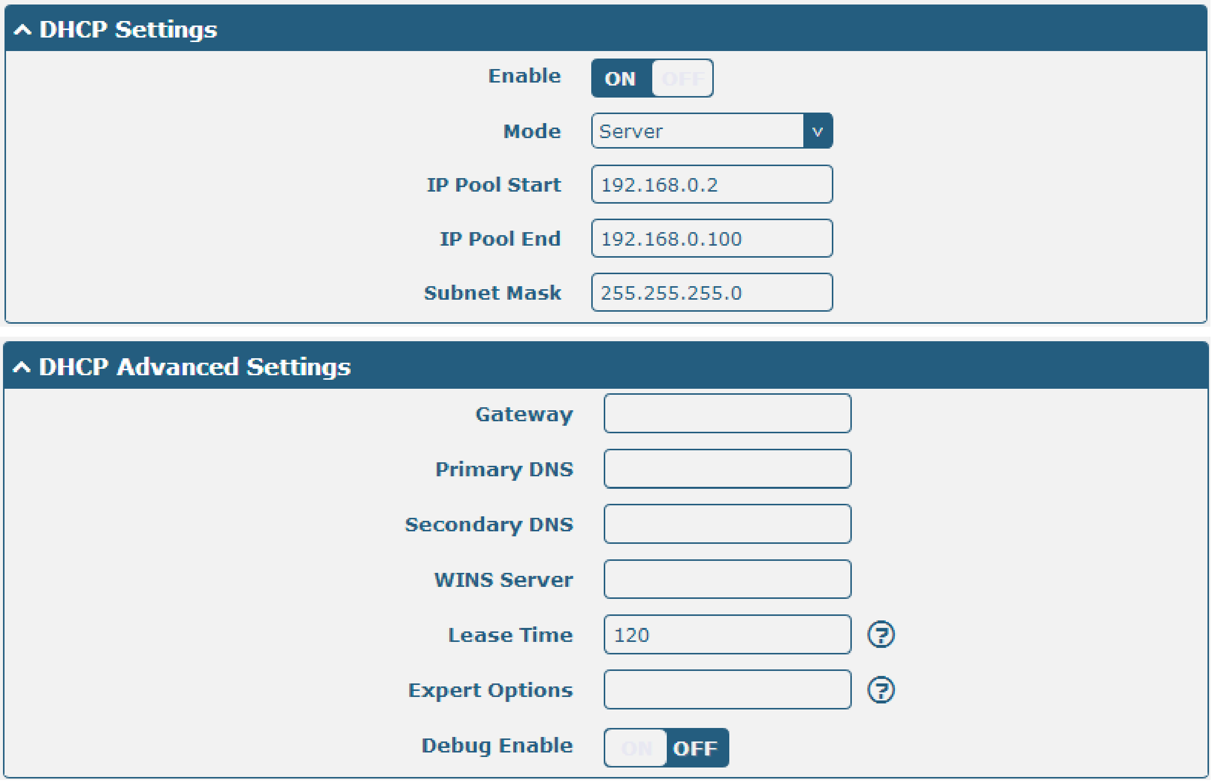
Click + to add a new LAN interface. The maximum number of LAN interface is two.



Index	1
Interface	lan0
IP Address	192.168.0.1
Netmask	255.255.255.0
MTU	1500

General Settings		
Item	Description	Default
Interface	Select lan0 or lan1. When eth0 used As WAN, lan1 is unavailable. And lan1 available only if it was selected by eth0 or eth1 in **Ethernet > Port Setting** section.	lan0
IP Address	Set the IP Address of the LAN interface.	192.168.0.1
Netmask	Set the Netmask of the LAN interface.	255.255.255.0
MTU	Maximum Transmission Unit. It is the identifier of the maximum size of packet, which is possible to transfer in a given environment.	1500

When select DHCP Mode as Server, the window will display as the following screenshot.



DHCP Settings

Enable: ON

Mode: Server

IP Pool Start: 192.168.0.2

IP Pool End: 192.168.0.100

Subnet Mask: 255.255.255.0

DHCP Advanced Settings

Gateway:

Primary DNS:

Secondary DNS:

WINS Server:

Lease Time: 120

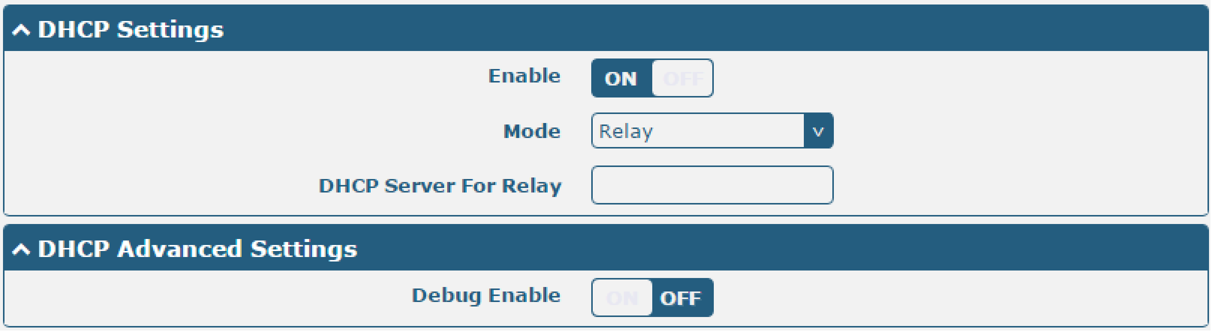
Expert Options:

Debug Enable: OFF

DHCP Server		
Item	Description	Default
Enable	Click the switch to show “ON” and to enable DHCP function.	ON
Mode	Server: Lease IP address to DHCP clients which connect to LAN. Relay: Router can be DHCP Relay, which will provide a relay tunnel to solve problem that DHCP Client and DHCP Server is not in a same subnet.	DHCP Server
IP Pool Start	Define the beginning of the pool of IP addresses which will lease to DHCP clients.	192.168.0.2
IP Pool End	Define the end of the pool of IP addresses which will lease to DHCP clients.	192.168.0.100
Subnet Mask	Define the Subnet Mask which the DHCP clients will obtain from DHCP server.	255.255.255.0
Gateway	Define the Gateway which the DHCP clients will obtain from DHCP server.	Null
Primary DNS	Define the Primary DNS Server which the DHCP clients will obtain from DHCP server.	Null
Secondary DNS	Define the Secondary DNS Server which the DHCP clients will obtain from DHCP server.	Null
WINS Server	Define the Windows Name Server which the DHCP clients will obtain from DHCP server.	Null
Lease Time	Define the time which the client can use the IP address which obtained from DHCP server.	120

DHCP Server		
Item	Description	Default
Expert Options	You can enter some other options of DHCP server in this field. format: config-desc;config-desc, e.g. log-dhcp;quiet-dhcp	Null
Debug Enable	Enable this function; it will output the DHCP information to syslog.	OFF

When select DHCP Mode as Relay, the window will display as the following screenshot.



^ DHCP Settings

Enable: ON

Mode: Relay

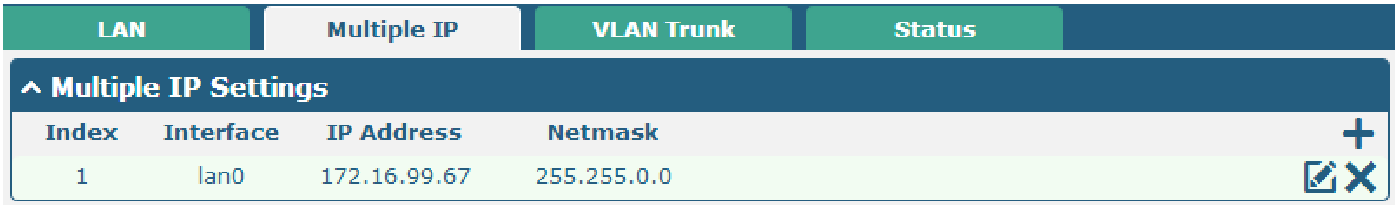
DHCP Server For Relay:

^ DHCP Advanced Settings

Debug Enable: OFF

DHCP Server		
Item	Description	Default
DHCP Server for Relay	Enter the DHCP Relay server IP address.	Null
Debug Enable	Enable this function; it will output the DHCP information to syslog.	OFF

Multiple IP

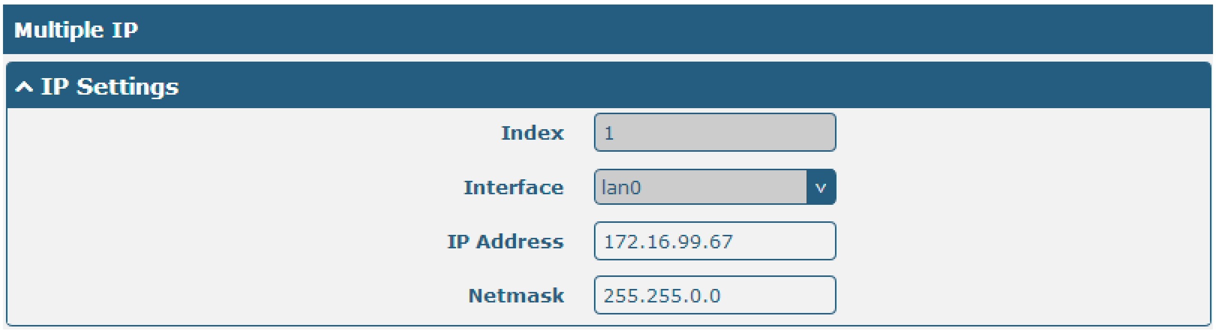


^ Multiple IP Settings

Index	Interface	IP Address	Netmask
1	lan0	172.16.99.67	255.255.0.0

Click ✎ to edit the Multiple IP of the LAN interface. Click ✕ to delete the Multiple IP of the LAN interface.

Click + to add a multiple IP to the LAN interface.



Multiple IP

^ IP Settings

Index: 1

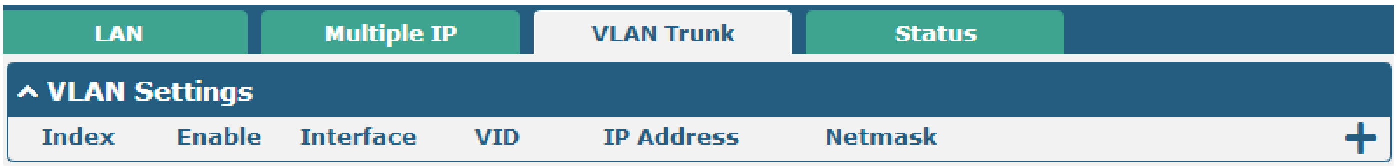
Interface: lan0

IP Address: 172.16.99.67

Netmask: 255.255.0.0

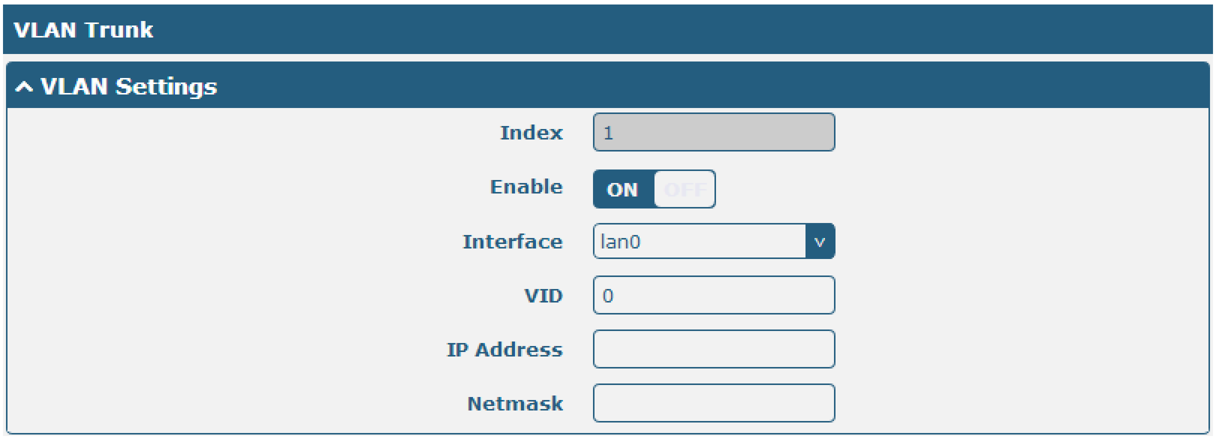
Multiple IP		
Item	Description	Default
Interface	Select lan0 or lan1. When eth0 used As WAN, lan1 is unavailable. And lan1 available only if it was selected by eth0 or eth1 in **Ethernet > Port Setting** section.	lan0
IP Address	Set the multiple IP Address of the LAN interface.	Null
Netmask	Set the multiple Netmask of the LAN interface.	Null

VLAN Trunk



Index	Enable	Interface	VID	IP Address	Netmask

Click + to add a VLAN. The maximum number of the VLAN is eight.

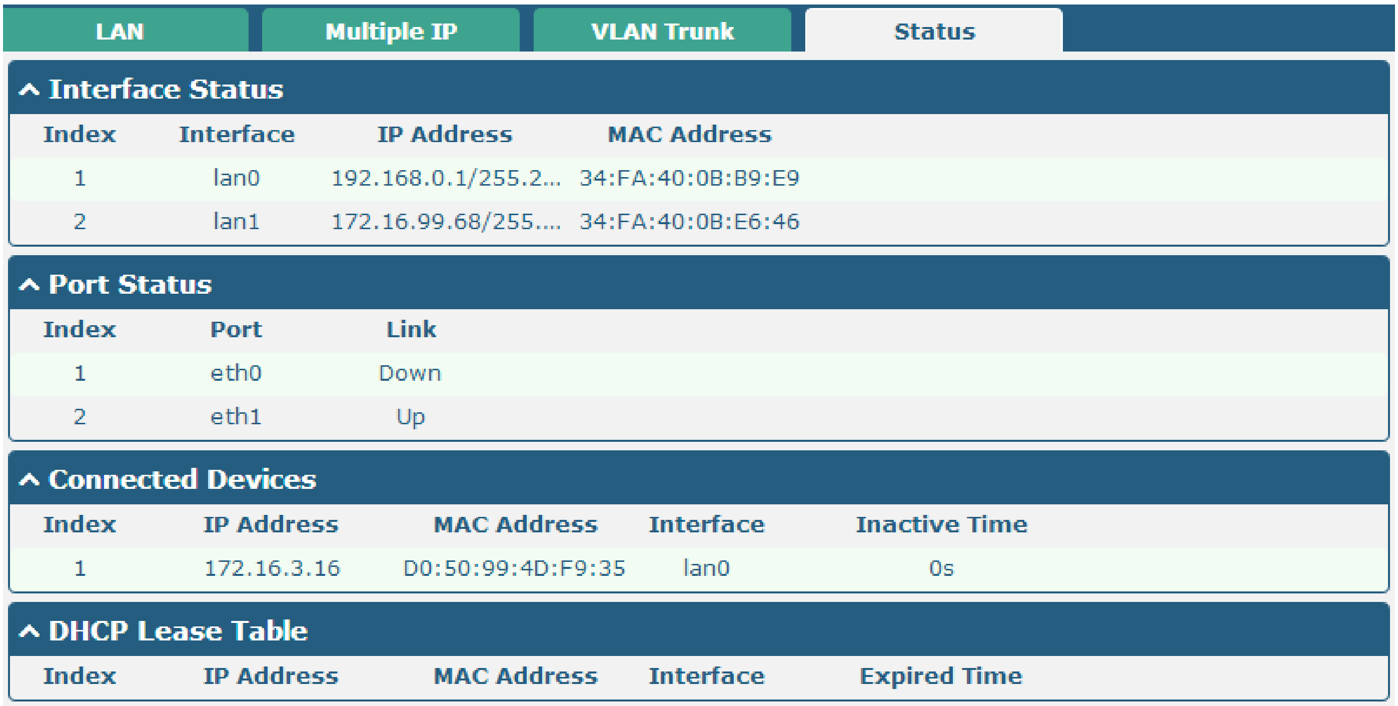


Index	1
Enable	ON OFF
Interface	lan0
VID	0
IP Address	
Netmask	

VLAN Trunk		
Item	Description	Default
Enable	Enable to make router can encapsulate and de-encapsulate the VLAN tag.	ON
Interface	Select lan0 or lan1. When eth0 used As WAN, lan1 is unavailable. And lan1 available only if it was selected by eth0 or eth1 in **Ethernet > Port Setting** section.	lan0
VID	Set the Tag ID of VLAN, values range from 1 to 4094.	100
IP Address, Netmask	Set the IP address, Netmask of VLAN interface	Null

Status

This section shows the Ethernet port status and connected devices.



^ Interface Status

Index	Interface	IP Address	MAC Address
1	lan0	192.168.0.1/255.2...	34:FA:40:0B:B9:E9
2	lan1	172.16.99.68/255....	34:FA:40:0B:E6:46

^ Port Status

Index	Port	Link
1	eth0	Down
2	eth1	Up

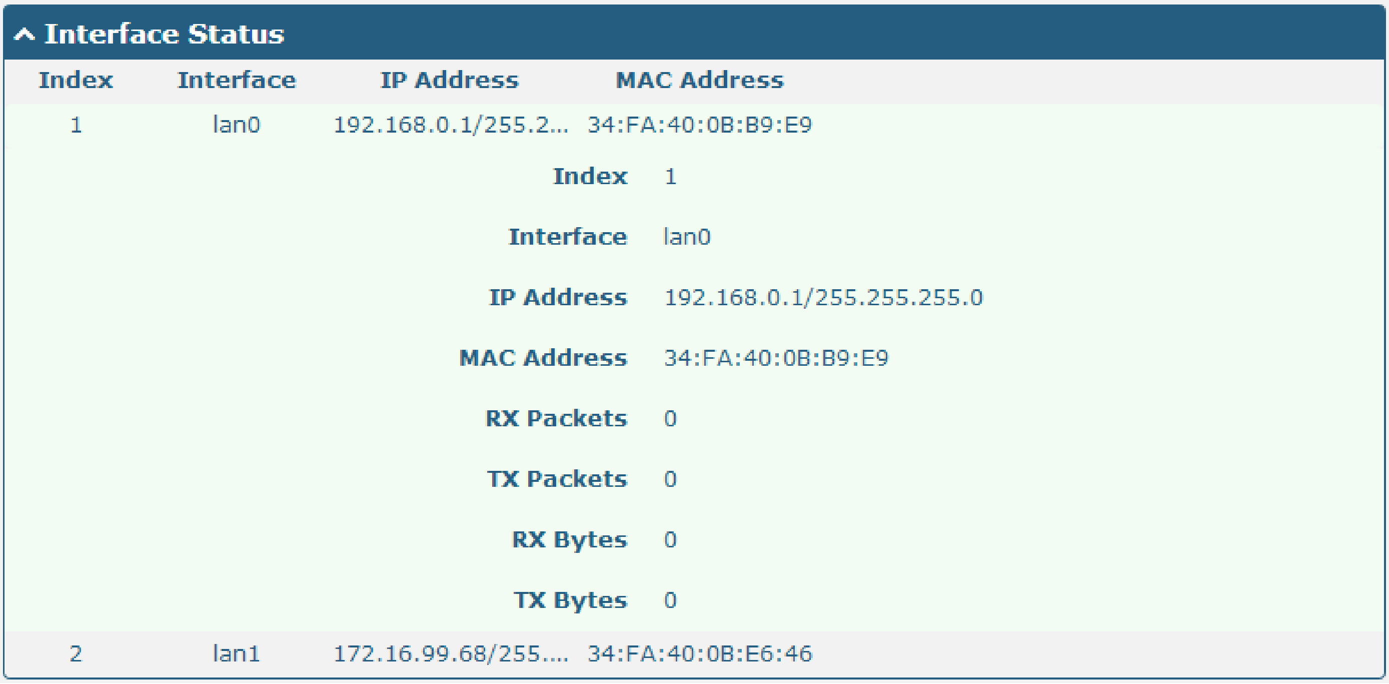
^ Connected Devices

Index	IP Address	MAC Address	Interface	Inactive Time
1	172.16.3.16	D0:50:99:4D:F9:35	lan0	0s

^ DHCP Lease Table

Index	IP Address	MAC Address	Interface	Expired Time

Click every row, the details status information will be display under the row. Please refer to the screenshot below.



^ Interface Status

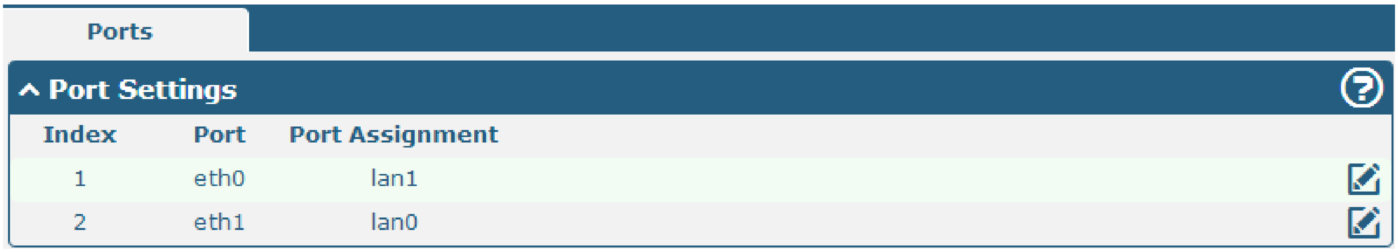
Index	Interface	IP Address	MAC Address
1	lan0	192.168.0.1/255.2...	34:FA:40:0B:B9:E9

Index	1
Interface	lan0
IP Address	192.168.0.1/255.255.255.0
MAC Address	34:FA:40:0B:B9:E9
RX Packets	0
TX Packets	0
RX Bytes	0
TX Bytes	0

2	lan1	172.16.99.68/255....	34:FA:40:0B:E6:46

3.8 Interface > Ethernet

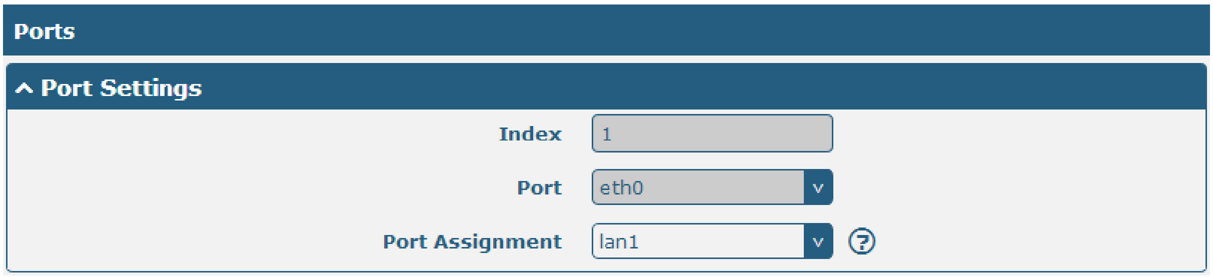
This section allow user to set the parameter of the Ethernet port. One port should be assigned to lan0 a least.



Port Settings

Index	Port	Port Assignment	
1	eth0	lan1	✎
2	eth1	lan0	✎

Click ✎ button, configure the port setting.



Port Settings

Index: 1

Port: eth0

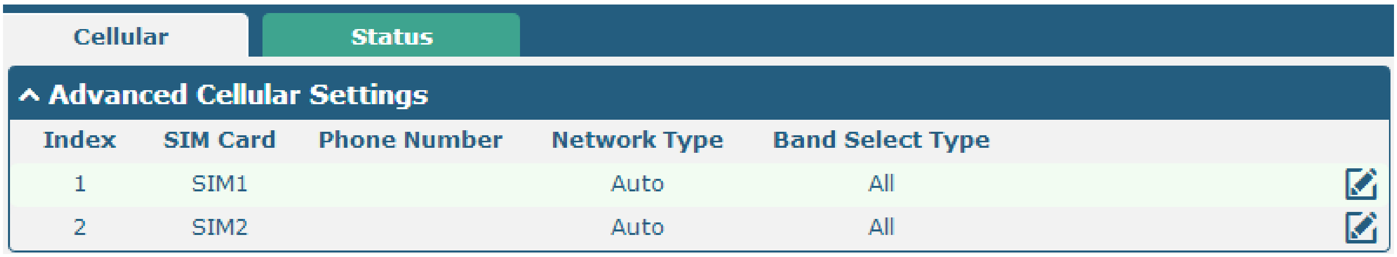
Port Assignment: lan1

Ethernet		
Item	Description	Default
Index	The index of Ethernet port, cannot edit.	1 or 2
Port	eth0 or eth1 One port should be assigned to lan0 a least.	/
Port Assignment	Select lan0 or lan1. **Note:** When eth0 used As WAN, lan1 is unavailable. Please go to **System > Device Configuration** to enable eth0 used as WAN. And lan1 available only if it was selected by eth0 or eth1 in this field.	lan0

3.9 Interface > Cellular

This section allows users to set the Cellular WAN and the related parameters.
When it is the first time to insert single SIM card, SIM card 1 and SIM card 2 slots are available.

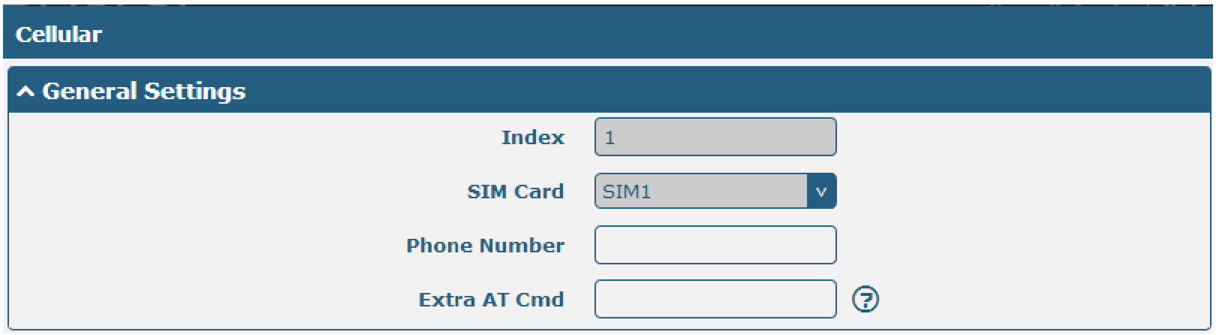
SIM



Advanced Cellular Settings

Index	SIM Card	Phone Number	Network Type	Band Select Type	
1	SIM1		Auto	All	✎
2	SIM2		Auto	All	✎

Click" ✎ " to edit the parameters.



Cellular

^ General Settings

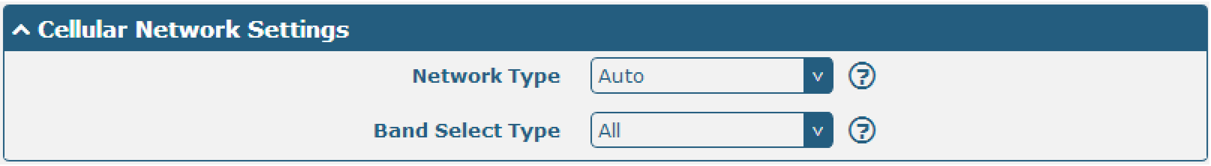
Index: 1

SIM Card: SIM1

Phone Number:

Extra AT Cmd:

When choose "Network Type" is "Auto";

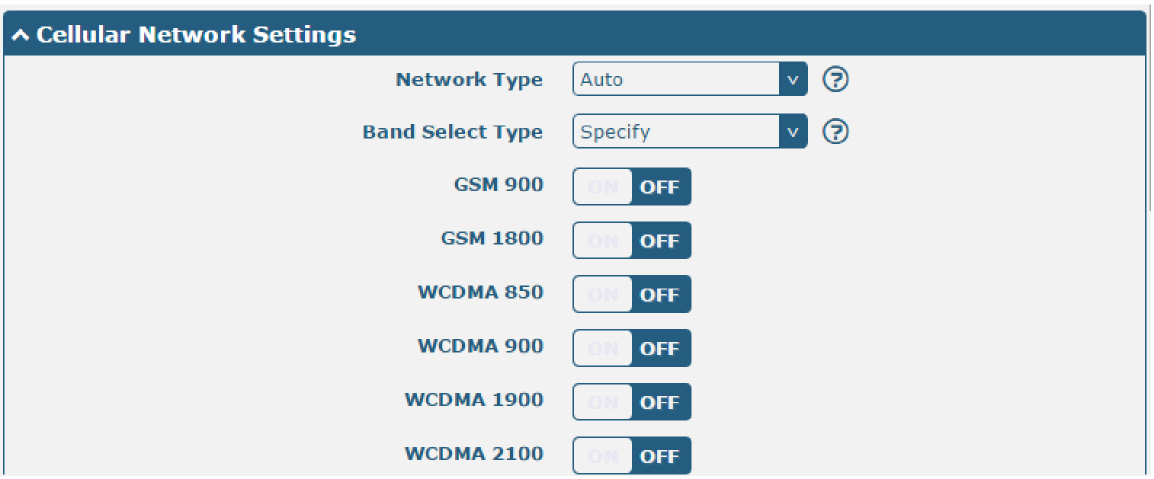


^ Cellular Network Settings

Network Type: Auto

Band Select Type: All

When choose "band select type" is "Specify".



^ Cellular Network Settings

Network Type: Auto

Band Select Type: Specify

GSM 900: ON OFF

GSM 1800: ON OFF

WCDMA 850: ON OFF

WCDMA 900: ON OFF

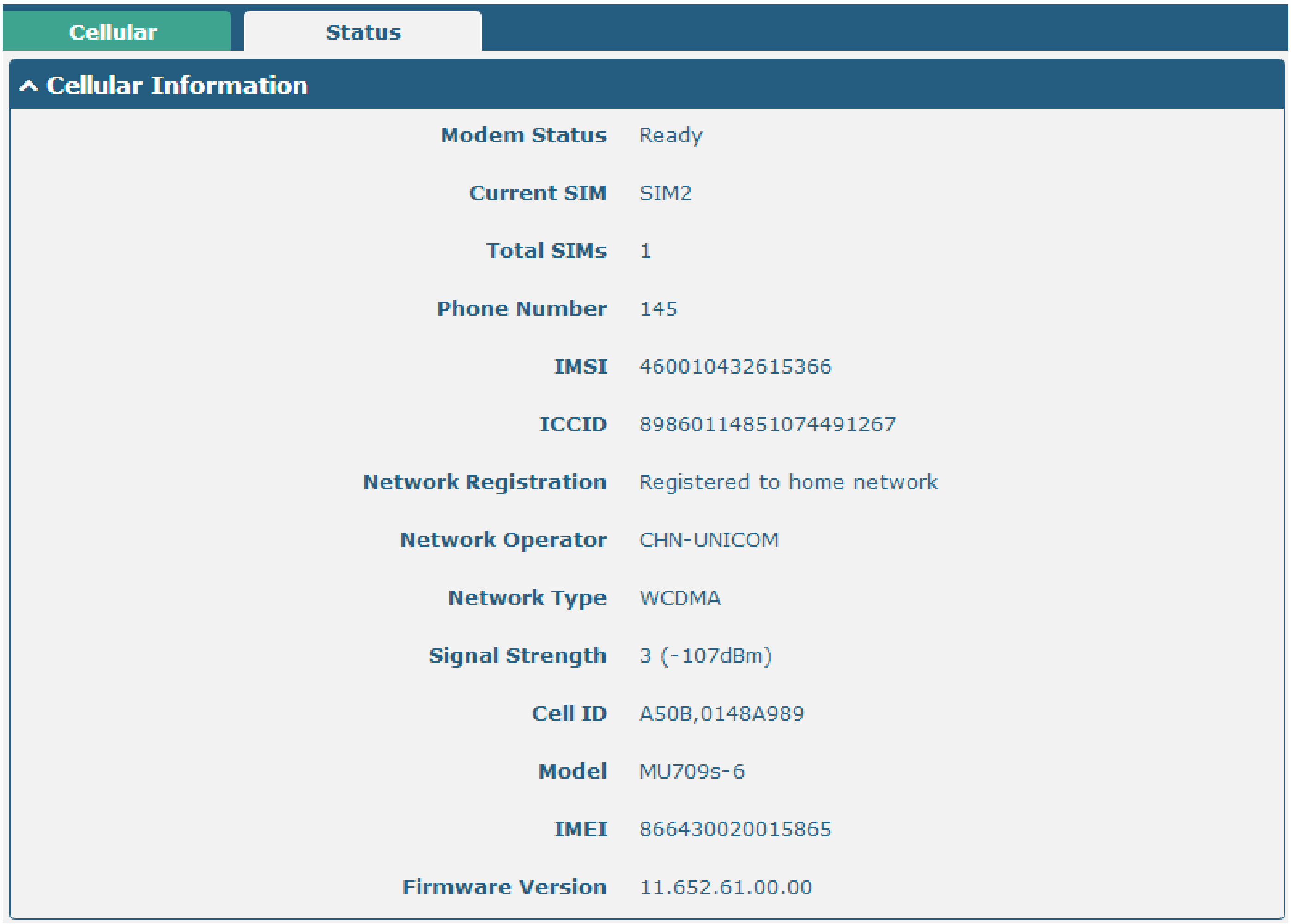
WCDMA 1900: ON OFF

WCDMA 2100: ON OFF

Cellular		
Item	Description	Default
Index	Show the index of the SIM.	1
SIM Card	Set the current SIM card.	SIM1
Link Name	Set the current Link Name.	WWAN1
Phone Number	Define the phone number of the SIM card.	Null
Extra AT Cmd	AT commands used for cellular initialization.	Null
Network Type	Select from "Auto", "2G Only", "2G First", "3G Only", "3G First", "4G Only", "4G First".	Auto
Band Select Type	Select from "All", "Specify". When select "Specify", user can choose certain bands.	All

Status

This section allow user to check the cellular status information.



Modem Status	Ready
Current SIM	SIM2
Total SIMs	1
Phone Number	145
IMSI	460010432615366
ICCID	89860114851074491267
Network Registration	Registered to home network
Network Operator	CHN-UNICOM
Network Type	WCDMA
Signal Strength	3 (-107dBm)
Cell ID	A50B,0148A989
Model	MU709s-6
IMEI	866430020015865
Firmware Version	11.652.61.00.00

Status	
Item	Description
Modem Status	Show the status of the radio module.
Current SIM	Show the SIM card which the router works with currently: SIM1 or SIM2.
Total SIMs	Show the number of SIM cards that is installed in the router.
Phone Number	Show the phone number of the current SIM.
IMSI	Show the IMSI number of the current SIM.
ICCID	Show the ICCID number of the current SIM.
Registration	Show the current network status.
Network Provider	Show the name of Network Provider.
Network Type	Show the current network service type, e.g. GPRS.
Signal Strength	Show the current signal strength.
Cell ID	Show the current cell ID, which can locate the router.
Modem Model	Show the model of the radio module.
IMEI	Show the IMEI number of the radio module.
Firmware Version	Show the current firmware version of the radio module.

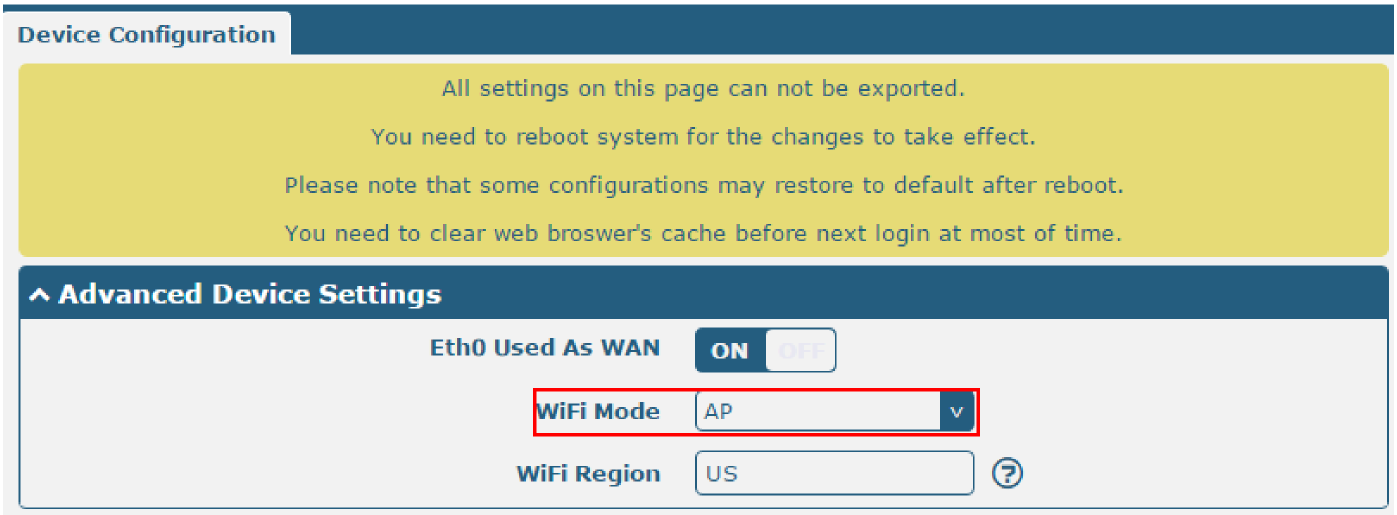
3.10 Interface > Wi-Fi (Optional)

R2000 router support both Wi-Fi AP and Wi-Fi client. The factory default setting of R2000 is as Wi-Fi AP. This section allow user to configure the parameters of Wi-Fi AP.

Wi-Fi AP

Configure R2000 as a Wi-Fi AP

Go to **System > Device Configuration**, select the Wi-Fi mode as AP, click "Submit" and reboot the device to make the setting effect.



Device Configuration

All settings on this page can not be exported.

You need to reboot system for the changes to take effect.

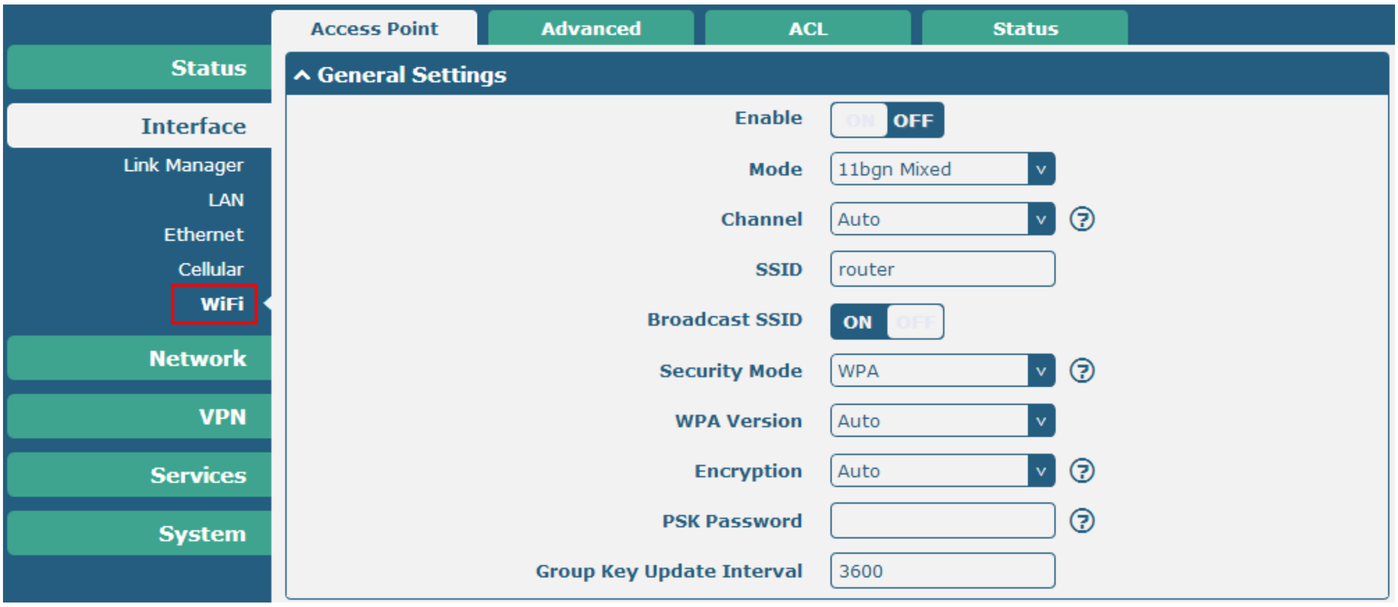
Please note that some configurations may restore to default after reboot.

You need to clear web broswer's cache before next login at most of time.

Advanced Device Settings

Eth0 Used As WAN	ON
WiFi Mode	AP
WiFi Region	US

When R2000 router was set as a Wi-Fi AP, we can find the Wi-Fi item in the Interface menu. Just like the screenshot below.

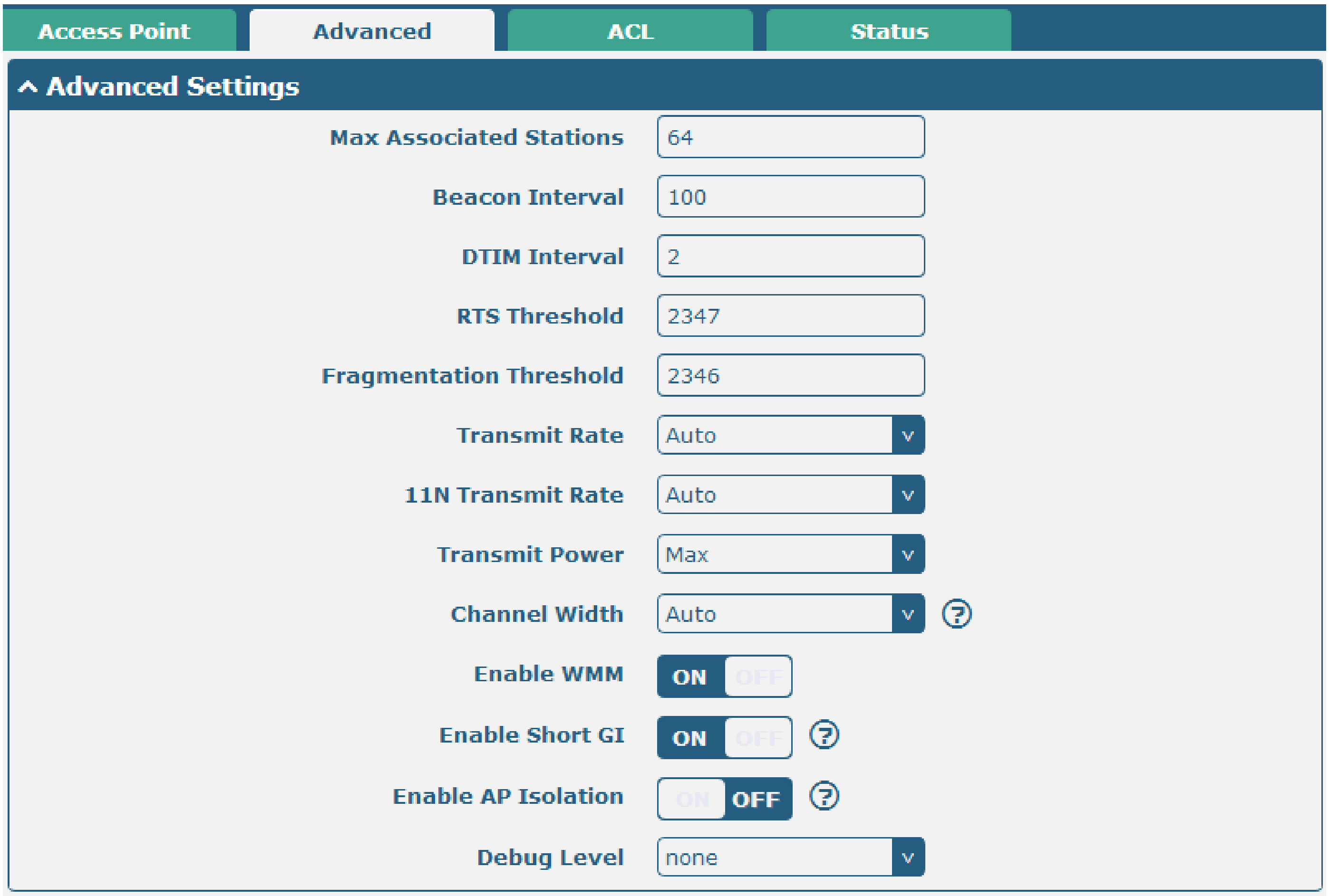


General Settings

Enable	OFF
Mode	11bgn Mixed
Channel	Auto
SSID	router
Broadcast SSID	ON
Security Mode	WPA
WPA Version	Auto
Encryption	Auto
PSK Password	
Group Key Update Interval	3600

Access Point		
Item	Description	Default
Enable	Click to "ON" side, enable the Wi-Fi access point function.	OFF
Mode	Select from "11bgn Mixed", "11b only", "11g only" and "11n only". 11bgn Mixed: Three protocols mixed in order to backward compatibility 11b only: IEEE 802.11b, 11Mbit/s-- 2.4GHz 11g only: IEEE 802.11g, 54Mbit/s--2.4GHz 11n only: IEEE 802.11n, 300Mbps~600Mbps	11bgn Mixed
Channel	Select the frequency channel, which includes "Auto", "1", "2"…… "11". Auto: R2000 will scan all frequencies until it finds the best channel. 1~11: R2000 will be fixed to work with this channel. Following are the frequency of 1~ 11 channel. 1 - 2412 MHz 2 - 2417 MHz 3 - 2422 MHz 4 - 2427 MHz 5 - 2432 MHz 6 - 2437 MHz 7 - 2442 MHz 8 - 2447 MHz 9 - 2452 MHz 10 - 2457 MHz 11 - 2462 MHz 12 - 2467 MHz 13 - 2472 MHz	Auto
SSID	SSID (service set identifier) is the network name of the Wi-Fi. The SSID of a client and the SSID of the AP must be identical for the client and AP to be able to communicate with each other. Input from 1 to 31 characters.	router
Broadcast SSID	Click "ON" to enable the SSID broadcasting. So that the client can scan the SSID. If you disable this feature, none of client could scan the SSID. If you want to connect to the router AP, you must need to enter the SSID of router AP at Wi-Fi client side manually.	ON
Security Mode	Select from "Disable", "WPA" and "WEP". Disable: User can access the Wi-Fi without the password when disable security. WPA: Include WPA and WPA2. Personal versions of WPA (Wi-Fi Protected Access), also known as WPA/WPA-PSK (Pre-Shared Key), provide a simple way of encrypting a wireless connection for high confidentiality. WEP: Wired Equivalent Privacy, provide encryption for wireless device's data transmission. It's not recommended to use WEP.	Disable

Access Point		
Item	Description	Default
WPA Version	Select from “Auto”, “WPA” and “WPA2”. Auto: R2000 will choose the most suitable selection automatically. WPA2 is a stronger security feature than WPA.	Auto
Encryption	Select from “Auto”, “TKIP” and “AES”. Auto: R2000 will choose the most suitable Encryption automatically. TKIP: Temporal Key Integrity Protocol (TKIP) encryption is used over the wireless link. TKIP encryption can be used with WPA-PSK and WPA with 802.1x authentication. It's not recommended to use TKIP encryption in 802.11n mode. AES: AES encryption is used over the wireless link. AES can be used WPA-PSK and WPA with 802.1x authentication. ***Note**: AES is a stronger encryption algorithm than TKIP.*	Auto
PSK Password	PSK password–Pre share key password. When R2000 works as AP mode, enter Master key to generate keys for encryption. A PSK Password is used as a basis for encryption methods (or cipher types) in a WLAN connection. The PSK Password should be complicated and as long as possible. For security reasons, this PSK Password should only be disclosed to users who need it, and it should be changed regularly. Input from 8 to 63 characters.	Null
Group Key Update Interval	Enter the time period of group key renewal.	3600

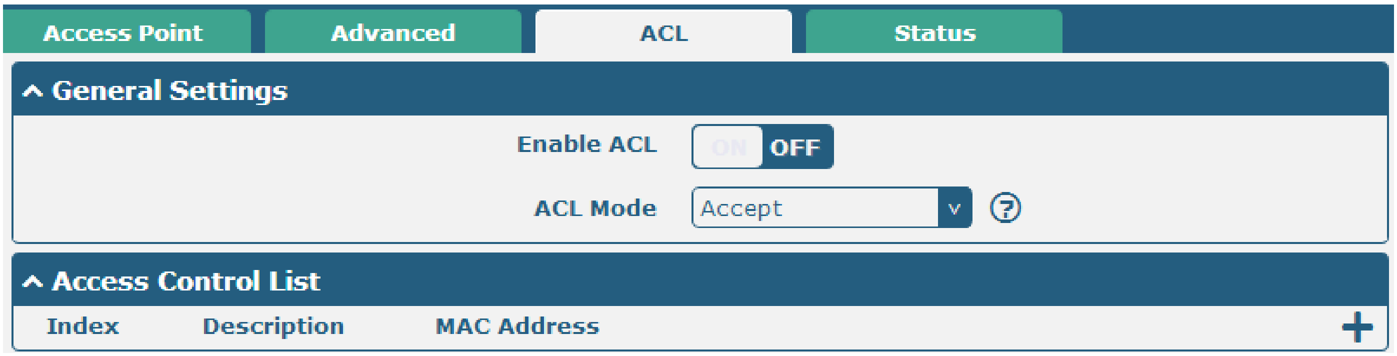


^ Advanced Settings

Max Associated Stations	64
Beacon Interval	100
DTIM Interval	2
RTS Threshold	2347
Fragmentation Threshold	2346
Transmit Rate	Auto
11N Transmit Rate	Auto
Transmit Power	Max
Channel Width	Auto
Enable WMM	ON
Enable Short GI	ON
Enable AP Isolation	OFF
Debug Level	none

Advanced		
Item	Description	Default
Max Associated Stations	Set the max number of association station to access the router AP.	64
Beacon Interval	Set the frequency of the router AP broadcast Beacon, which was used for wireless network synchronization.	100
DTIM Interval	DTIM (Delivery Traffic Indication Message), router AP will send the multicast traffic according to this interval.	2
RTS Threshold	Set RTS (request to send) threshold to 2347, router AP will never sent the signal before sending out data. Set RTS threshold to 0, router AP will send the signal once it sending out data.	2347
Fragmentation Threshold	Set the fragmentation threshold for Wi-Fi AP data packet. Recommend remain at 2346.	2346
Transmit Rate	Set the transmit rate, you can choose Auto or specify a Transmit Rate.	Auto
11N Transmit Rate	Set the data transmit rate under the IEEE 802.11n Wi-Fi mode. Select “Auto” or a specified transmit rate.	Auto
Transmit Power	Select from “Max”, “High”, “Medium” and “Low”.	Max

Advanced		
Item	Description	Default
Channel Width	Select from "20MHz", "40MHz". 40 MHz channel width provides twice the data rate available over a single 20 MHz channel.	Auto
Enable WMM	Click "ON" to enable WMM.	ON
Enable Short GI	Click "ON" to enable Short GI (Short Guard Interval), short GI is a blank time between two symbols, it can provide a long buffer time to delay signal. Using the Short Guard Interval would provide an 11% increase in data rates, but also may result in higher packet error rates.	ON
Enable AP Isolation	Isolate all connected wireless stations so that wireless stations cannot access each other through WLAN.	OFF
Debug Level	Select from "verbose", "debug", "info", "notice", "warning", "none".	none



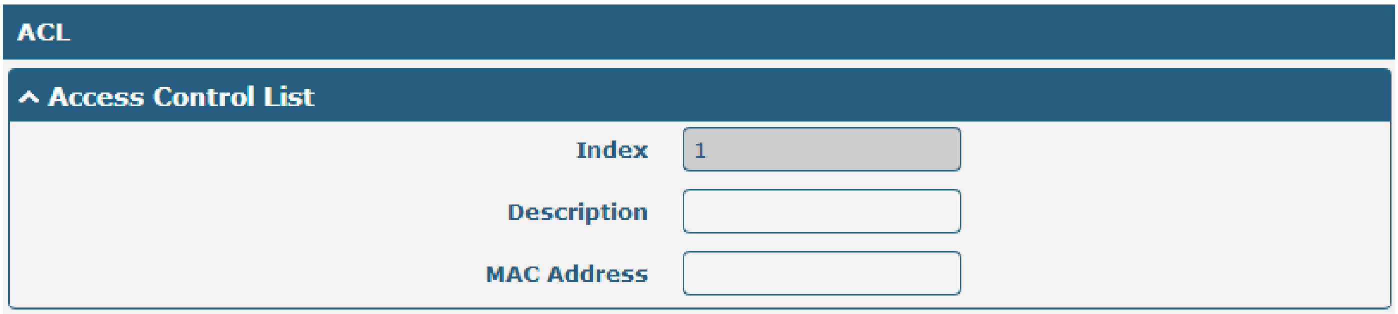
^ General Settings

Enable ACL: ON OFF

ACL Mode: Accept

^ Access Control List

Index	Description	MAC Address	+



ACL

^ Access Control List

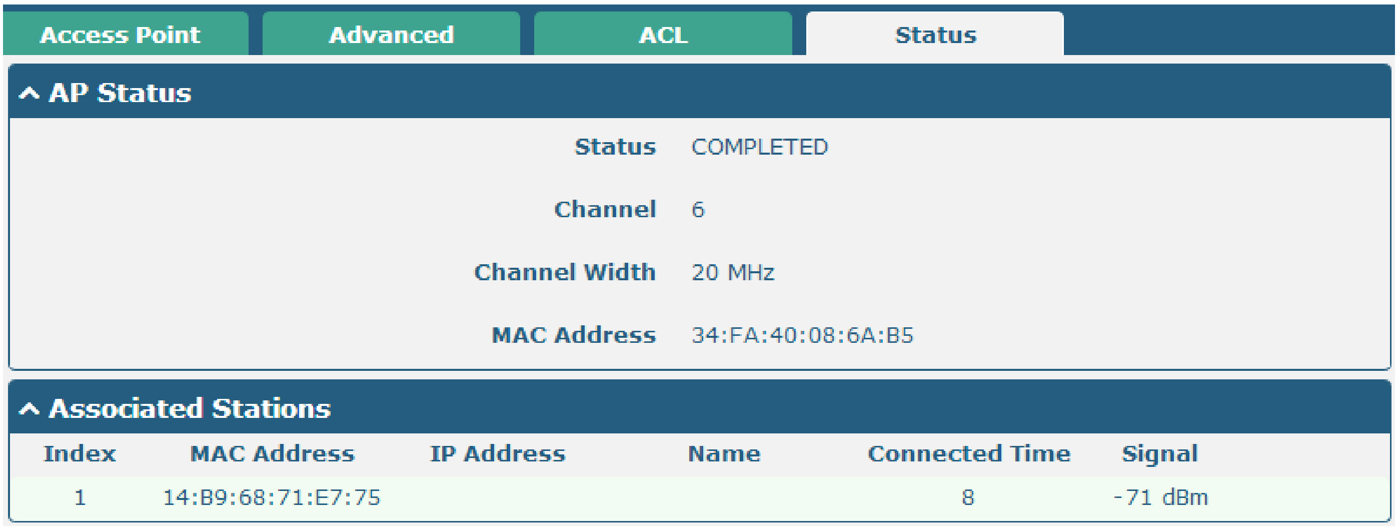
Index: 1

Description:

MAC Address:

ACL		
Item	Description	Default
Enable ACL	Click to enable ACL (Access Control List).	Disable
ACL Mode	Select from "Accept" and "Deny". Accept: Only the packets fitting the entities of the "Access Control List" can be allowed. Deny: All the packets fitting the entities of the "Access Control List" will be denied. ***Note***: *R2000 can only allow or deny devices which are included in "Access Control List" at one time.*	Accept
Access Control List	Click "+" to add MAC address.	Null

This section allow user to check the AP status and those Wi-Fi client had connected to R2000 AP.



AP Status

Status	COMPLETED
Channel	6
Channel Width	20 MHz
MAC Address	34:FA:40:08:6A:B5

Associated Stations

Index	MAC Address	IP Address	Name	Connected Time	Signal
1	14:B9:68:71:E7:75			8	-71 dBm

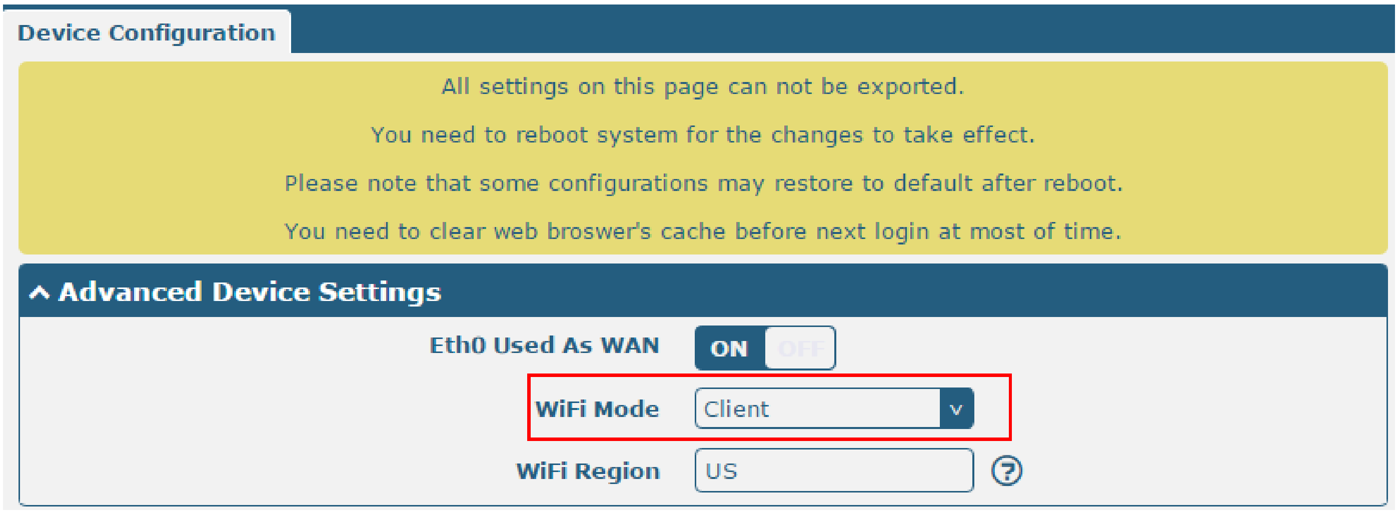
3.11 Interface > WLAN (Optional)

R2000 router support both Wi-Fi AP and Wi-Fi client. The factory default setting of R2000 is as Wi-Fi AP. This section allow user to configure the R2000 router as a Wi-Fi client and set the related parameters.

Wi-Fi Client

Configure R2000 as a Wi-Fi client

Go to **System > Device Configuration**, select the Wi-Fi mode as Client, click “Submit” and reboot the device to make the setting effect.



All settings on this page can not be exported.

You need to reboot system for the changes to take effect.

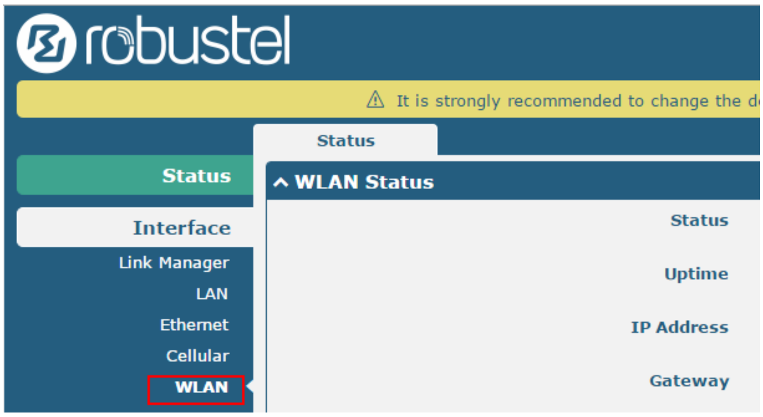
Please note that some configurations may restore to default after reboot.

You need to clear web broswer's cache before next login at most of time.

Advanced Device Settings

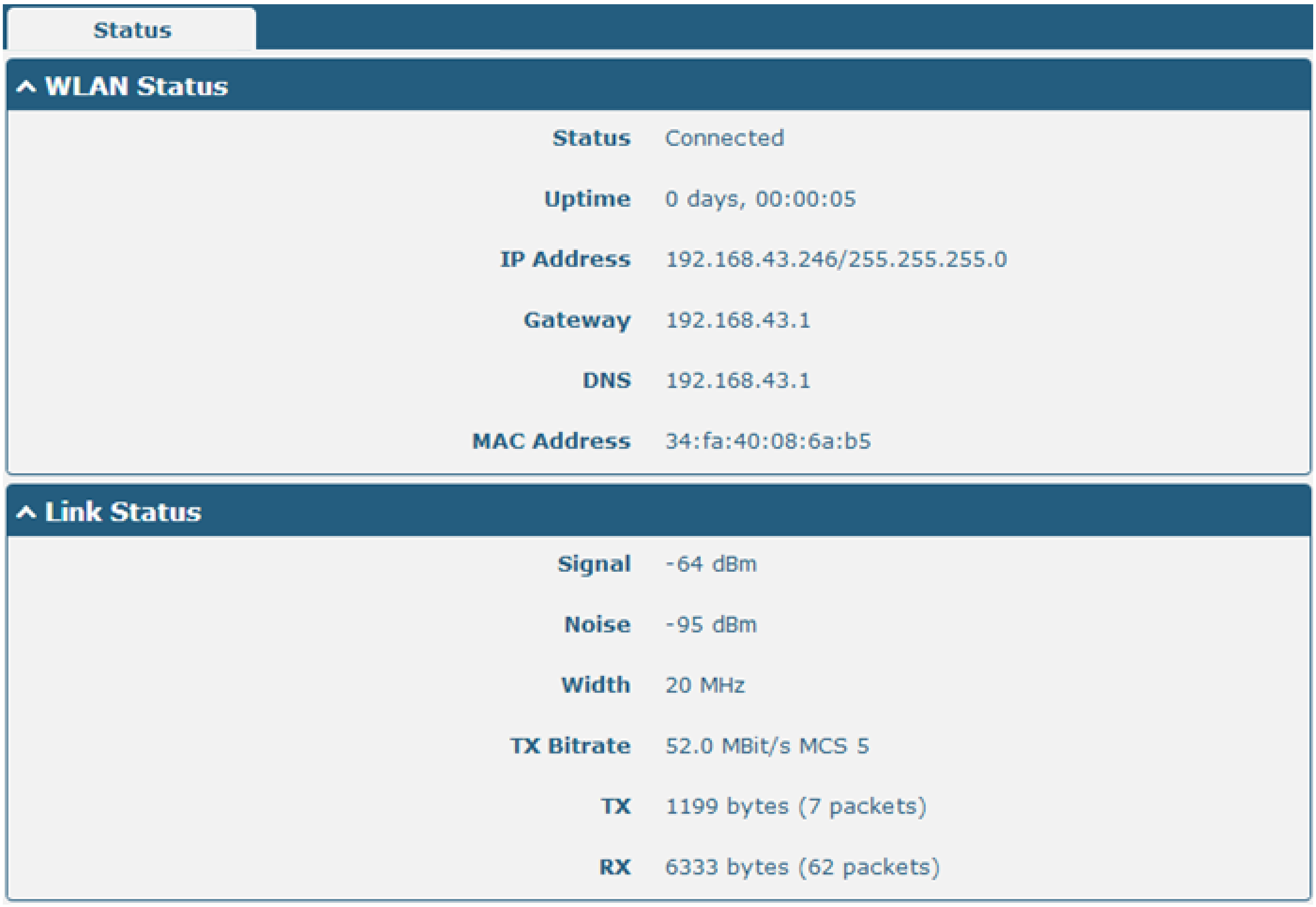
Eth0 Used As WAN	ON
WiFi Mode	Client
WiFi Region	US

After R2000 was configured successfully as a Wi-Fi client, there will appear a WLAN tab in the Interface menu, just as the screenshot below.



Configure the Wi-Fi AP please go to the **Link Manager > WLAN** tab, and the way of configuration refer to the **3.6 Interface > Link Manager** section.

This section allows user to check the WLAN connection status. It includes WLAN status, Link status and WPA status.



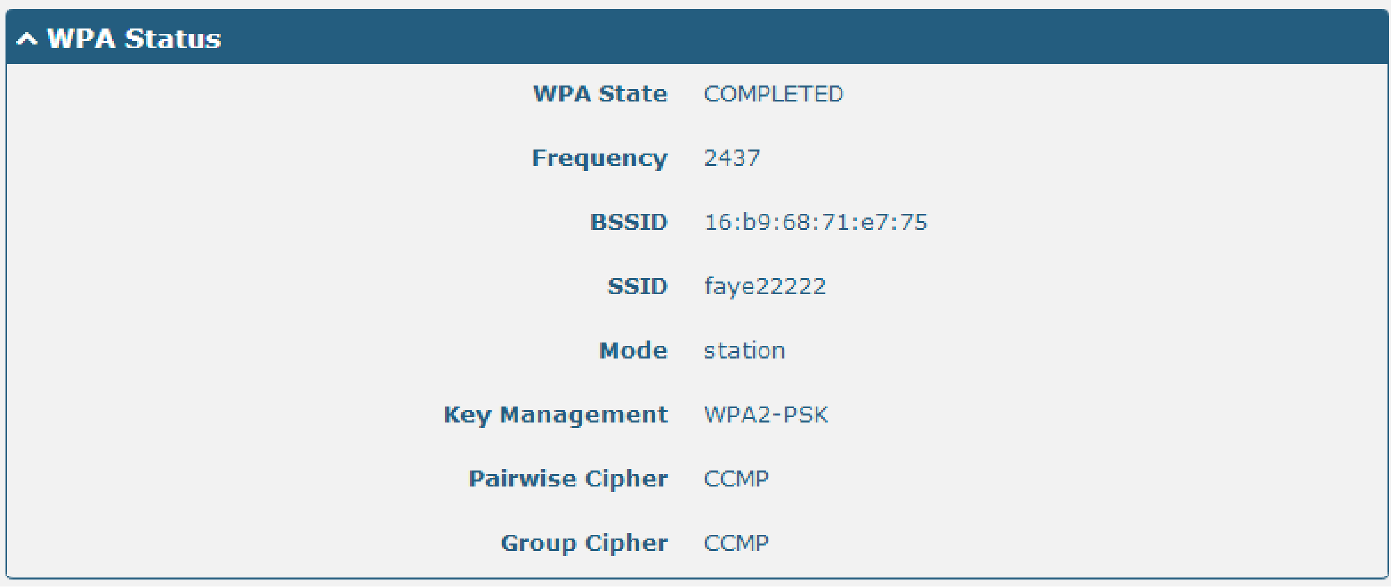
Status

^ WLAN Status

Status	Connected
Uptime	0 days, 00:00:05
IP Address	192.168.43.246/255.255.255.0
Gateway	192.168.43.1
DNS	192.168.43.1
MAC Address	34:fa:40:08:6a:b5

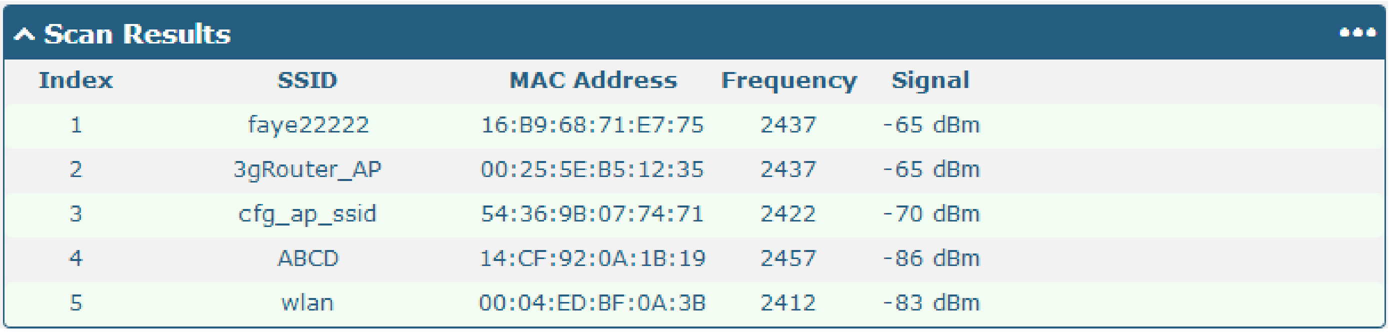
^ Link Status

Signal	-64 dBm
Noise	-95 dBm
Width	20 MHz
TX Bitrate	52.0 MBit/s MCS 5
TX	1199 bytes (7 packets)
RX	6333 bytes (62 packets)



^ WPA Status

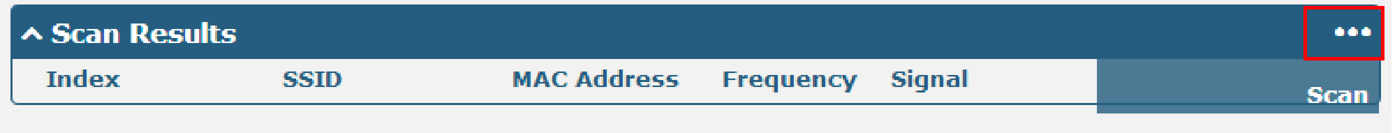
WPA State	COMPLETED
Frequency	2437
BSSID	16:b9:68:71:e7:75
SSID	faye22222
Mode	station
Key Management	WPA2-PSK
Pairwise Cipher	CCMP
Group Cipher	CCMP



^ Scan Results •••

Index	SSID	MAC Address	Frequency	Signal
1	faye22222	16:B9:68:71:E7:75	2437	-65 dBm
2	3gRouter_AP	00:25:5E:B5:12:35	2437	-65 dBm
3	cfg_ap_ssid	54:36:9B:07:74:71	2422	-70 dBm
4	ABCD	14:CF:92:0A:1B:19	2457	-86 dBm
5	wlan	00:04:ED:BF:0A:3B	2412	-83 dBm

User can scan the surrounding SSIDs in this section. Please click •••, and then click "Scan" to scan the surrounding SSIDs.



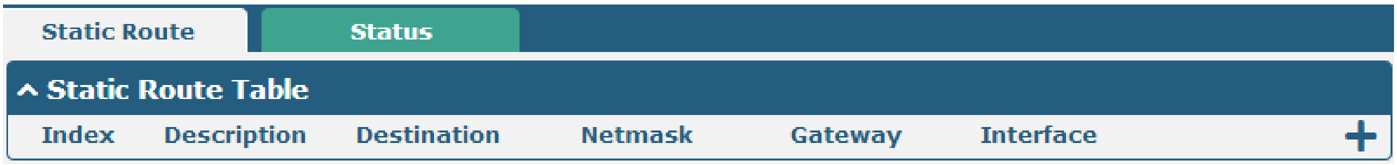
^ Scan Results •••

Index	SSID	MAC Address	Frequency	Signal

3.12 Network > Route

This section allows user to set the static route. (The maximum number of the static route is twenty.)

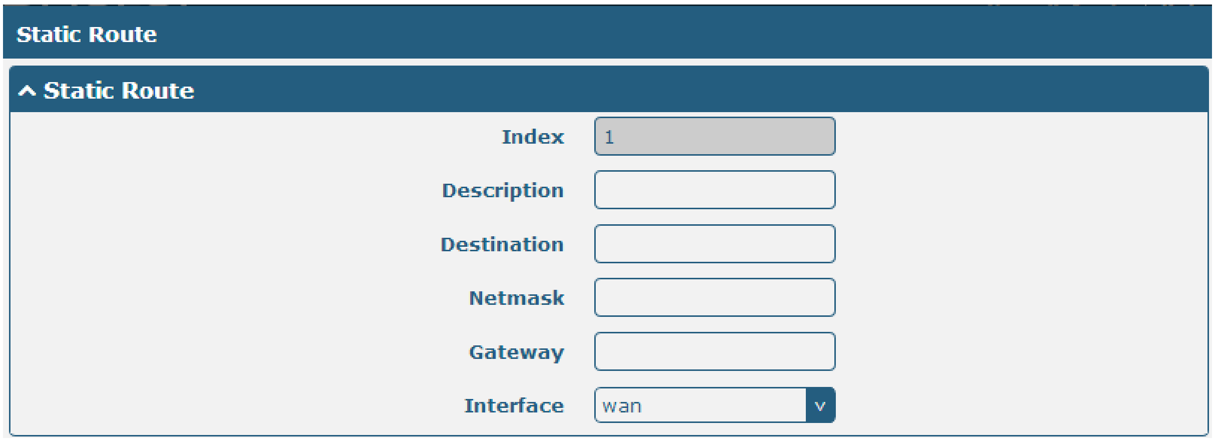
Static Route



^ Static Route Table

Index	Description	Destination	Netmask	Gateway	Interface	+

Click "+" to add static routes, the maximum number of static routes is 20.



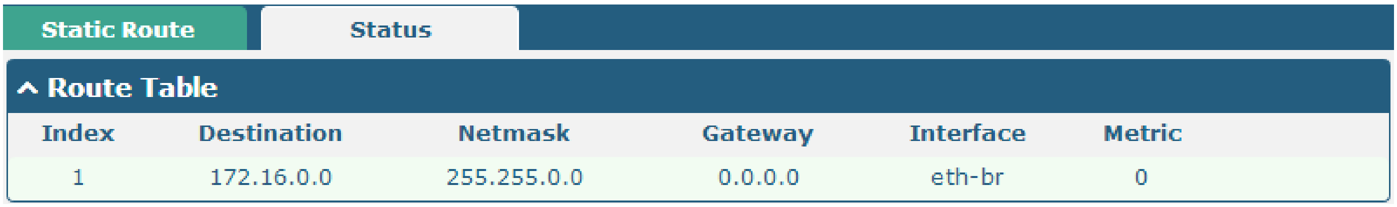
Static Route

^ Static Route

Index	1
Description	
Destination	
Netmask	
Gateway	
Interface	wan

Static Route		
Item	Description	Default
Index	Show the index of the static route.	1
Destination	Define the destination IP address.	Null
Netmask	Define the Netmask of the destination.	Null
Gateway	Define the gateway of the destination.	Null
Interface	Select from "LAN", "WAN", "TUN"	LAN

Status



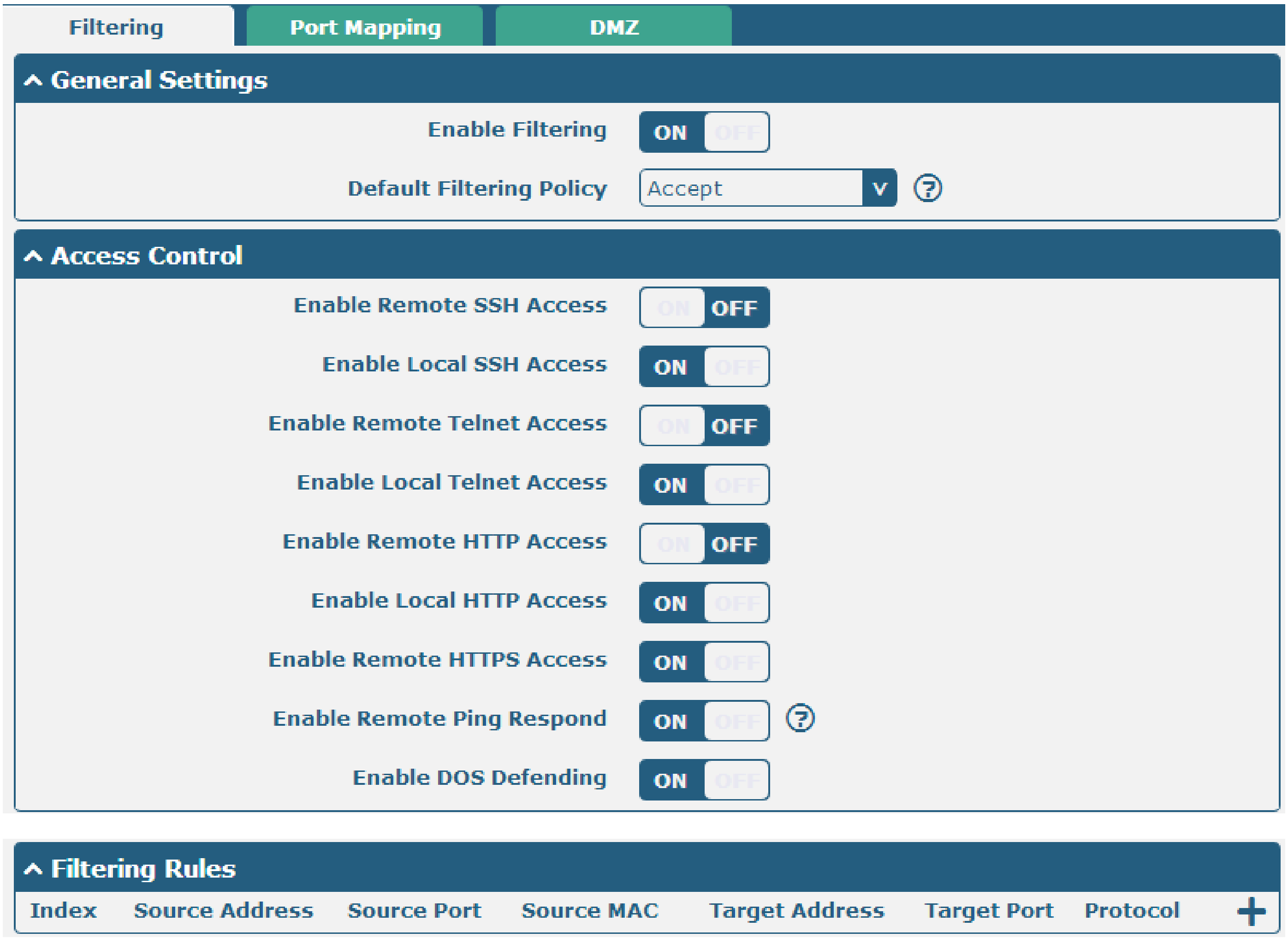
^ Route Table

Index	Destination	Netmask	Gateway	Interface	Metric
1	172.16.0.0	255.255.0.0	0.0.0.0	eth-br	0

3.13 Network > Firewall

This section allows users to set the Firewall and the related parameters, which includes "Filter", "Port Mapping" and "DMZ".

Filtering



General Settings

Enable Filtering: ON

Default Filtering Policy: Accept

Access Control

Enable Remote SSH Access: OFF

Enable Local SSH Access: ON

Enable Remote Telnet Access: OFF

Enable Local Telnet Access: ON

Enable Remote HTTP Access: OFF

Enable Local HTTP Access: ON

Enable Remote HTTPS Access: ON

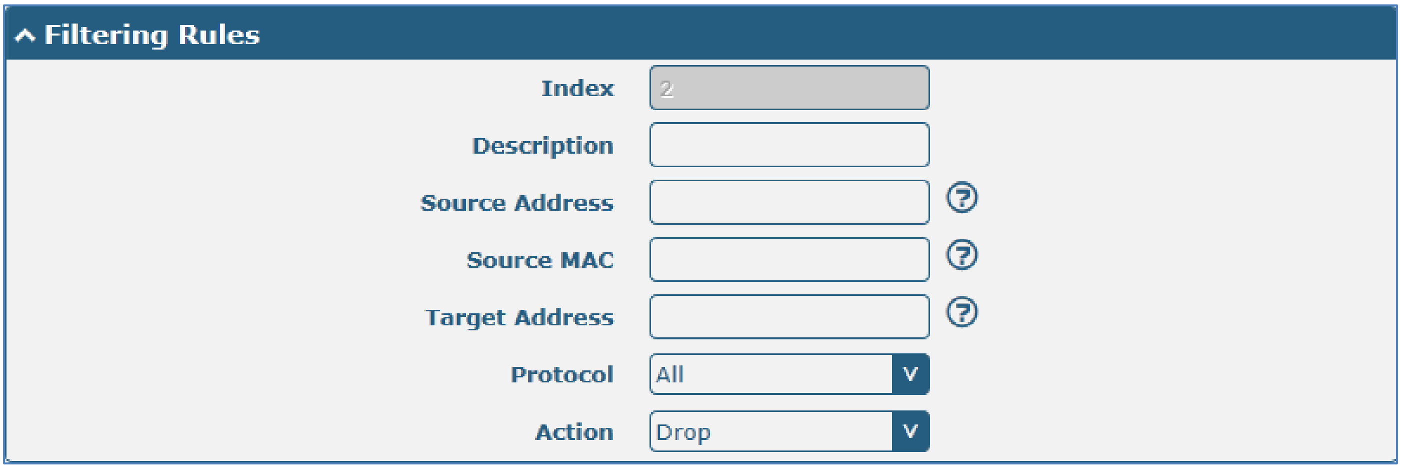
Enable Remote Ping Respond: ON

Enable DOS Defending: ON

Filtering Rules

Index	Source Address	Source Port	Source MAC	Target Address	Target Port	Protocol	+

Click “+” to add filtering rules. (The maximum number of the filtering rule is twenty.)


Filtering Rules

Index: 2

Description:

Source Address:

Source MAC:

Target Address:

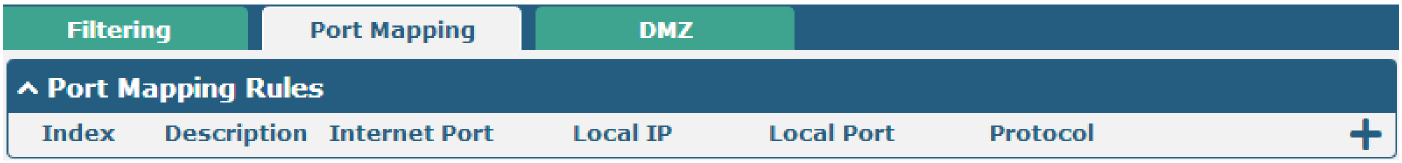
Protocol: All

Action: Drop

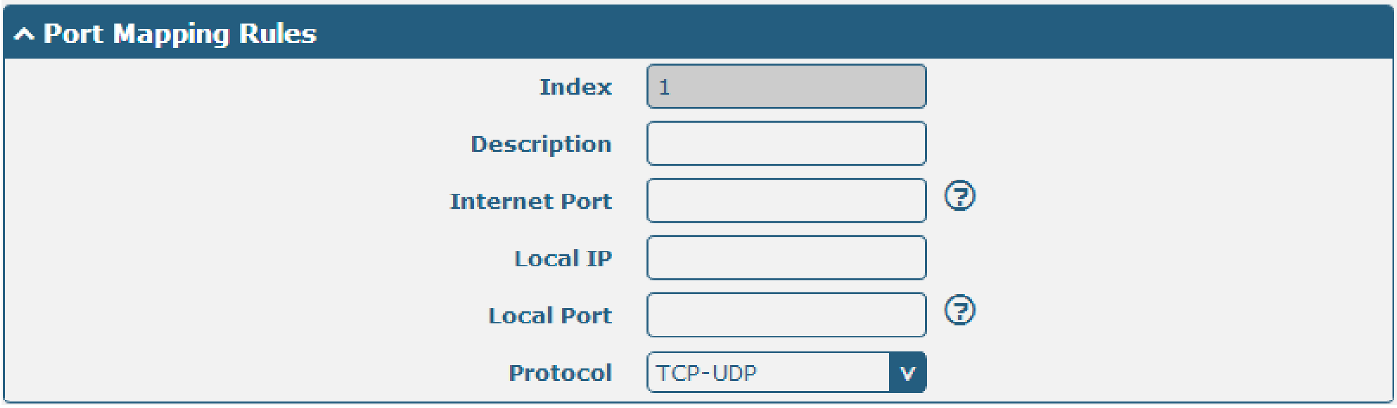
Filtering		
Item	Description	Default
Enable Filtering	Enable filtering rules.	ON

Filtering		
Item	Description	Default
Default Filtering Policy	Select from "Accept" and "Drop". Accept: Router will accept all the connecting requests except the hosts which fit the filter list. Drop: Router will only reject the connecting requests from the hosts which fit the filter list.	accept
Enable Remote SSH Access	Enable to allow users to access the router remotely on the internet side via SSH.	OFF
Enable Local SSH Access	Enable to allow users to access the router on the local Ethernet via SSH.	ON
Enable Remote Telnet Access	Enable to allow users to access the router remotely on the internet side via Telnet.	OFF
Enable Local Telnet Access	Enable to allow users to access the router on the local Ethernet via Telnet.	ON
Enable Remote Http Access	Enable to allow users to access the router remotely on the internet side via Http.	OFF
Enable Local Http Access	Enable to allow users to access the router on the local Ethernet via Http.	ON
Enable Remote Https Access	Enable to allow users to access the router remotely on the internet side via Https.	ON
Enable Remote Ping Respond	Enable to make router reply the Ping requests from the internet side.	ON
Enable DOS Defending	Enable to defend dos attack. Dos attack is an attempt to make a machine or network resource unavailable to its intended users.	ON
Index	Show the index of the filtering rule or the MAC binding rule.	1
Source Address	Defines if access is allowed from one or a range of IP addresses which are defined by Source IP Address, or every IP addresses.	Null
Source MAC	Enter the MAC address of the defined source IP address.	Null
Target Address	Defines if access is allowed to one or a range of IP addresses which are defined by Target IP Address, or every IP addresses.	Null
Protocol	Select from "All", "TCP", "UDP", "ICMP", "TCP-UDP". If you don't know what kinds of protocol of your application, we recommend you select "ALL".	All
Action	Select from "Accept", "Drop".	Drop

Port Mapping



Click "+" to add port mapping rules. (The maximum number of the port mapping rule is forty.)

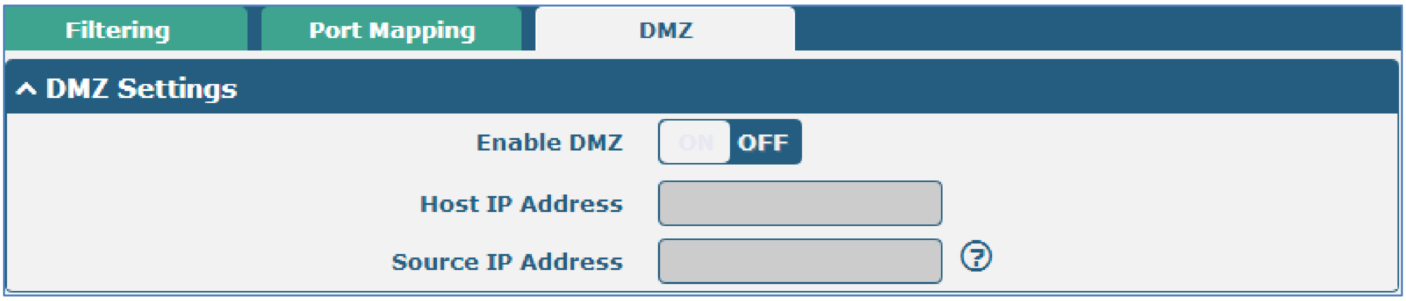


^ Port Mapping Rules

Index	1
Description	
Internet Port	
Local IP	
Local Port	
Protocol	TCP-UDP

Port Mapping		
Item	Description	Default
Index	Show the index of the port mapping rule.	1
Internet Port	The port of the internet side which you want to forward to LAN side.	Null
Local IP	The device's IP on the LAN side which you want to forward the data to.	Null
Local Port	The device's port on the LAN side which you want to forward the data to.	Null
Protocol	Select from "TCP", "UDP" and "TCP-UDP".	TCP-UDP

DMZ



^ DMZ Settings

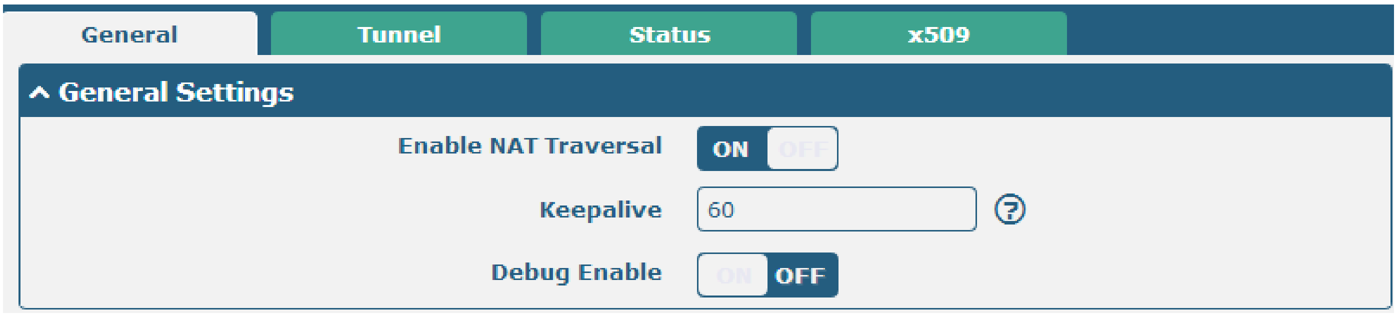
Enable DMZ	ON OFF
Host IP Address	
Source IP Address	

DMZ		
Item	Description	Default
Enable DMZ	Select to enable the DMZ function. DMZ host is a host on the internal network that has all ports exposed, except those ports otherwise forwarded.	OFF
Host IP Address	Enter the IP address of the DMZ host which on the internal network.	Null
Source IP Address	Set the address which can talk to the DMZ host. Null means for any addresses.	Null

3.14 VPN > IPSec

This section allows users to set the IPSec and the related parameters.

General



General Settings

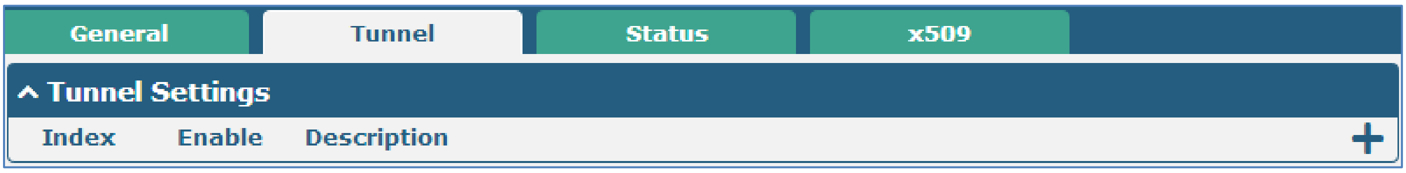
Enable NAT Traversal: ON

Keepalive: 60

Debug Enable: OFF

General		
Item	Description	Default
Enable NAT Traversal	Tick to enable NAT Traversal for IPSec. This item must be enabled when router under NAT environment.	ON
Keepalive	The interval that router sends packets to NAT box so that to avoid it remove the NAT mapping.	60
Debug Enable	Enable this function, and it will output IPSec information to the debug port.	OFF

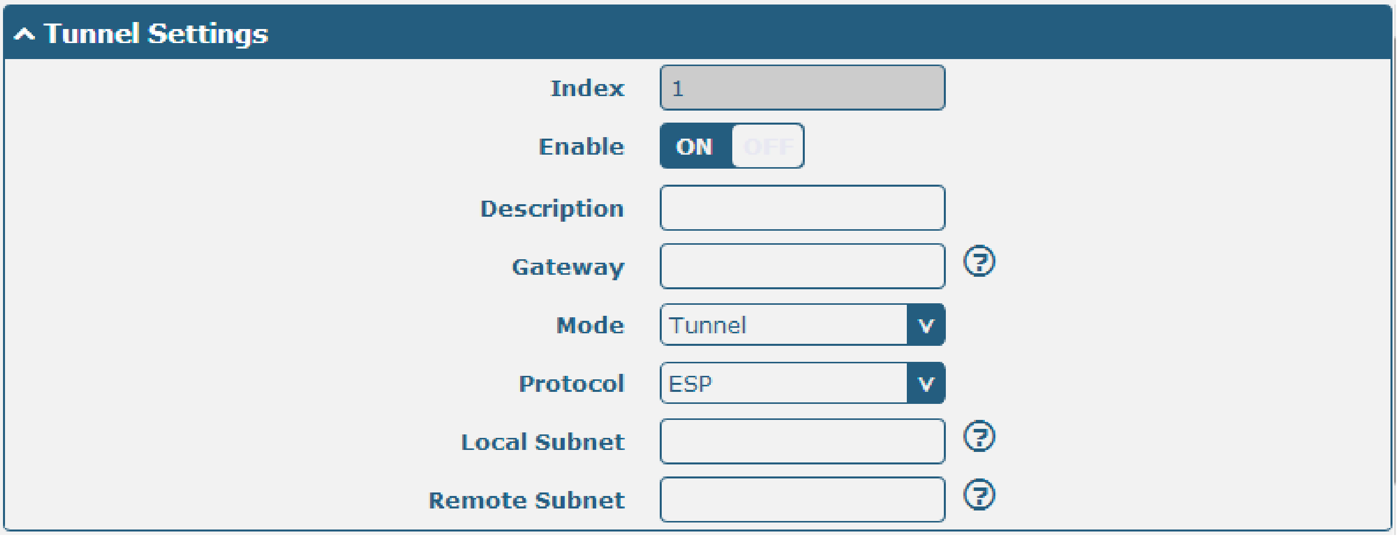
Tunnel



Tunnel Settings

Index	Enable	Description

Click “+” to add tunnel settings. (The maximum number of the tunnel is three.)



Tunnel Settings

Index: 1

Enable: ON

Description:

Gateway:

Mode: Tunnel

Protocol: ESP

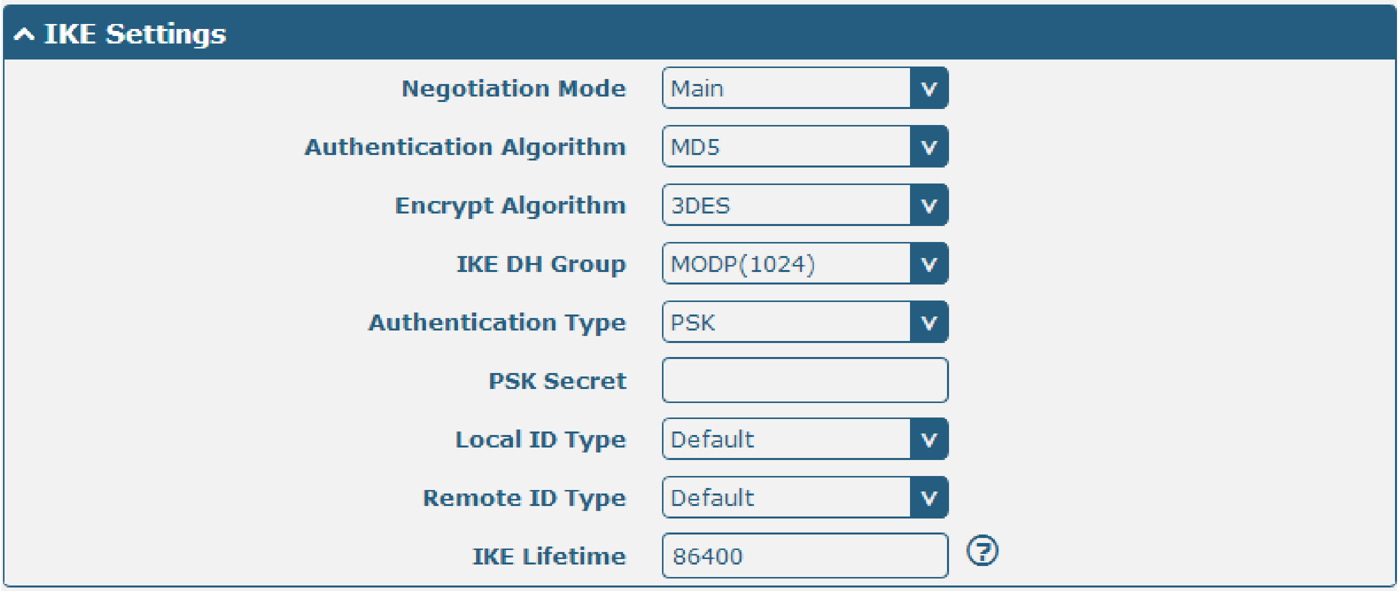
Local Subnet:

Remote Subnet:

Tunnel Settings		
Item	Description	Default
Index	Show the index of the tunnel.	1
Enable	Enable IPSec Tunnel.	ON

Description	Enter some simple words about the IPSec Tunnel.	Null
Gateway	Enter the address of remote side IPSec VPN server.	Null
Mode	Select from "Tunnel" and "Transport". Tunnel: Commonly used between gateways, or at an end-station to a gateway, the gateway acting as a proxy for the hosts behind it. Transport: Used between end-stations or between an end-station and a gateway, if the gateway is being treated as a host-for example, an encrypted Telnet session from a workstation to a router, in which the router is the actual destination.	Tunnel
Protocol	Select the security protocols from "ESP" and "AH". ESP: Uses the ESP protocol. AH: Uses the AH protocol.	ESP
Local Subnet	Enter IPSec Local Protected subnet's address with mask, e.g. 192.168.1.0/24	Null
Remote Subnet	Enter IPSec Remote Protected subnet's address with mask, e.g. 10.8.0.0/24	Null

When choose "Authentication Type" to "PSK".



^ IKE Settings

Negotiation Mode: Main

Authentication Algorithm: MD5

Encrypt Algorithm: 3DES

IKE DH Group: MODP(1024)

Authentication Type: PSK

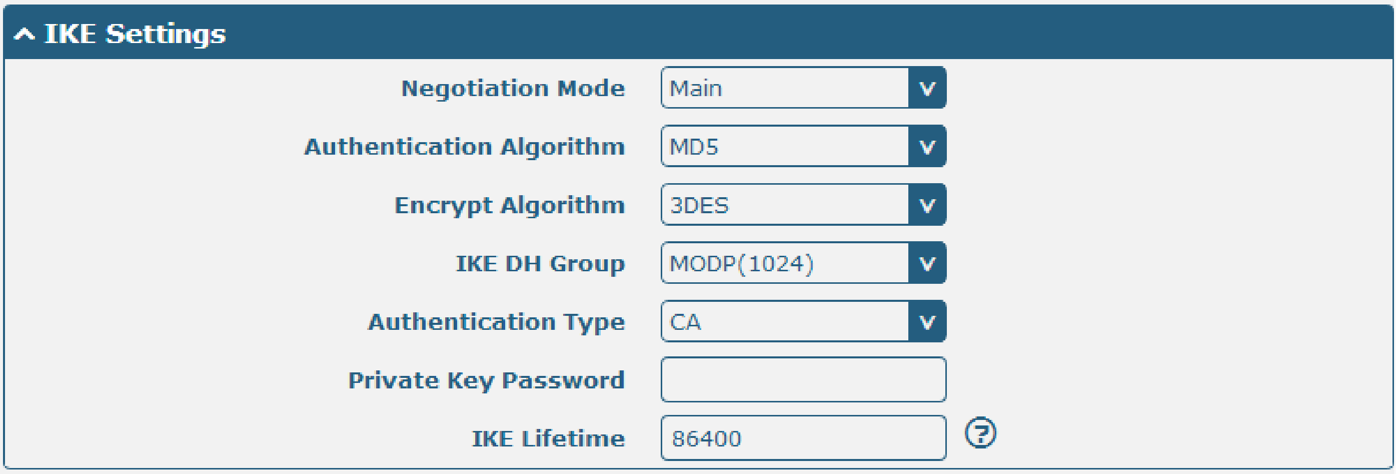
PSK Secret:

Local ID Type: Default

Remote ID Type: Default

IKE Lifetime: 86400

When choose "Authentication Type" to "CA".



^ IKE Settings

Negotiation Mode: Main

Authentication Algorithm: MD5

Encrypt Algorithm: 3DES

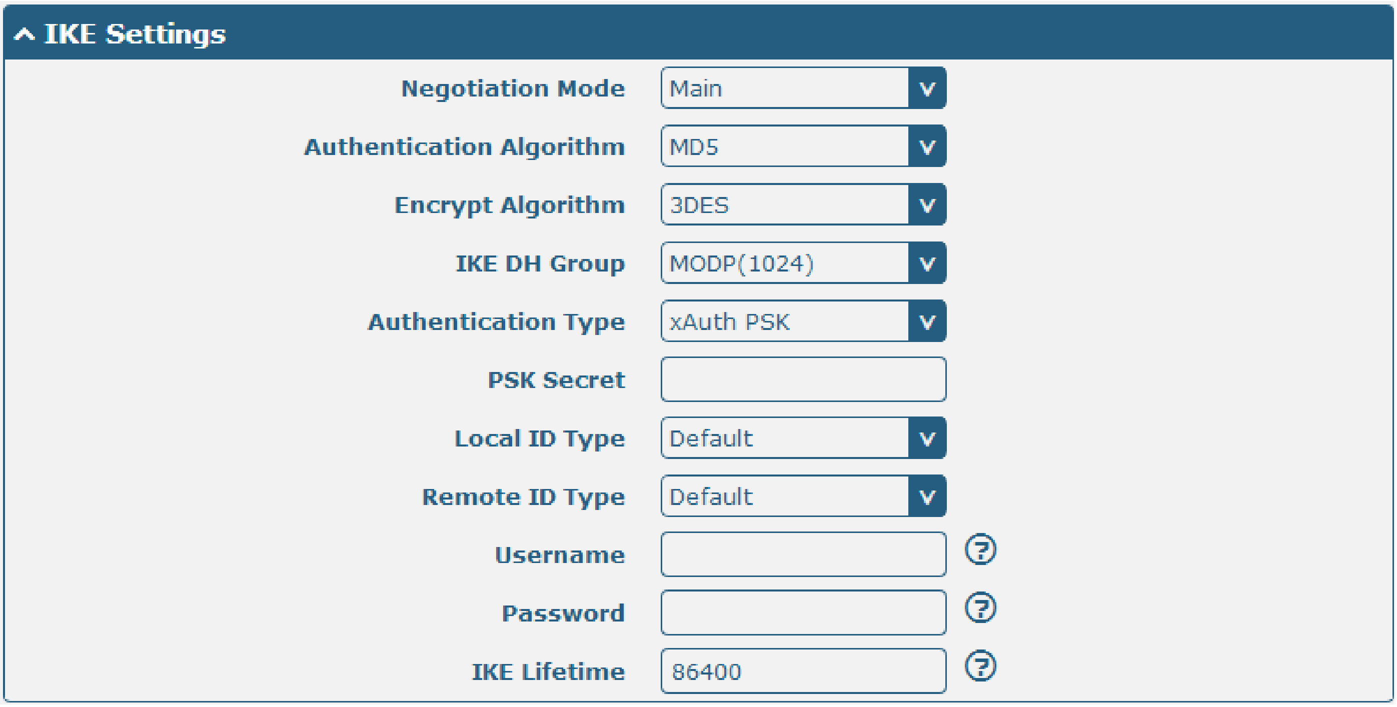
IKE DH Group: MODP(1024)

Authentication Type: CA

Private Key Password:

IKE Lifetime: 86400

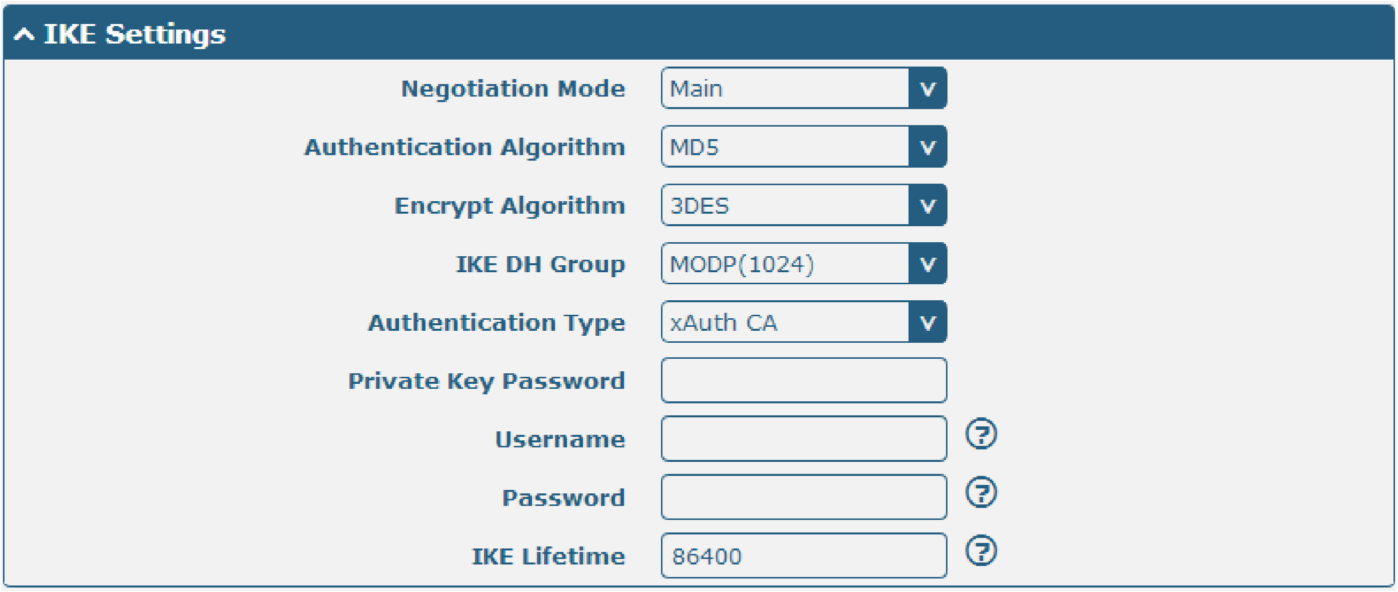
When choose “Authentication Type” to “xAuth PSK”.



^ IKE Settings

Negotiation Mode	Main
Authentication Algorithm	MD5
Encrypt Algorithm	3DES
IKE DH Group	MODP(1024)
Authentication Type	xAuth PSK
PSK Secret	
Local ID Type	Default
Remote ID Type	Default
Username	
Password	
IKE Lifetime	86400

When choose “Authentication Type” to “xAuth CA”.



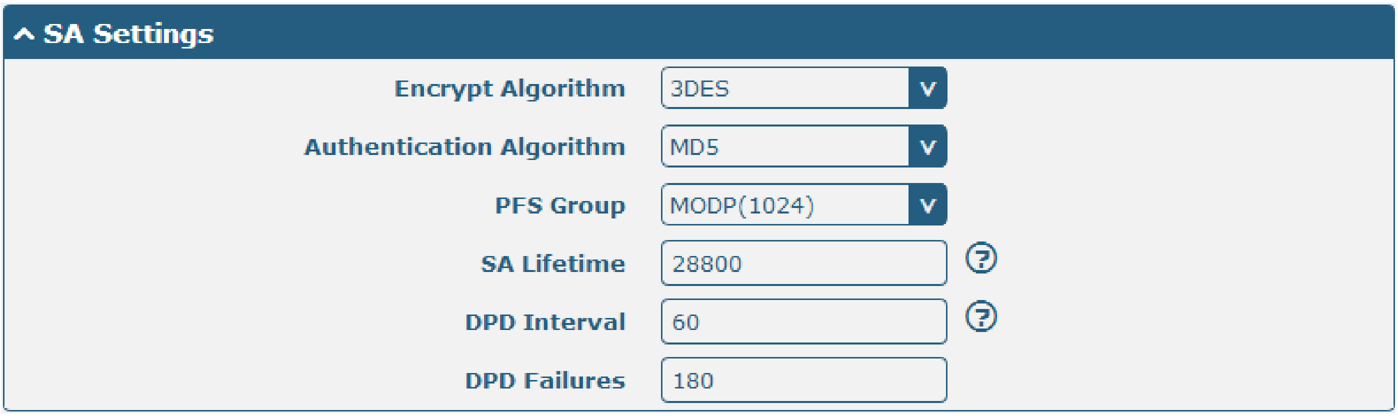
^ IKE Settings

Negotiation Mode	Main
Authentication Algorithm	MD5
Encrypt Algorithm	3DES
IKE DH Group	MODP(1024)
Authentication Type	xAuth CA
Private Key Password	
Username	
Password	
IKE Lifetime	86400

IKE Settings		
Item	Description	Default
Negotiation Mode	Select from “Main” and “Aggressive” for the IKE negotiation mode in phase 1. If the IP address of one end of an IPSec tunnel is obtained dynamically, the IKE negotiation mode must be aggressive. In this case, SAs can be established as long as the username and password are correct.	Main

IKE Settings		
Item	Description	Default
Authentication Algorithm	Select from “MD5” and “SHA1”to be used in IKE negotiation. MD5: Uses HMAC-SHA1. SHA1: Uses HMAC-MD5.	MD5
Encrypt Algorithm	Select from “3DES”, “AES128” and “AES256”to be used in IKE negotiation. 3DES: Uses the 3DES algorithm in CBC mode and 168-bit key. AES128: Uses the AES algorithm in CBC mode and 128-bit key. AES256: Uses the AES algorithm in CBC mode and 256-bit key.	3DES
IKE DH Group	Select from “MODP (1024)” and “MODP (1536)”to be used in key negotiation phase 1. MODP (1024): Uses the 1024-bit Diffie-Hellman group. MODP (1536): Uses the 1536-bit Diffie-Hellman group.	MODP (1024)
Authentication Type	Select from “PSK”, “CA”, “xAuth PSK” and “xAuth CA” to be used in IKE negotiation. PSK: Pre-shared Key. CA: Certification Authority. xAuth: Extended Authentication to AAA server.	PSK
PSK Secret	Enter the pre-shared key.	Null
Local ID Type	Select from “IP Address”, “FQDN” and “User FQDN” for IKE negotiation. “Default” stands for “IP Address”. IP Address: Uses an IP address as the ID in IKE negotiation. FQDN: Uses an FQDN type as the ID in IKE negotiation. If this option is selected, type a name without any at sign (@) for the local security gateway, e.g., test.robustel.com. User FQDN: Uses a user FQDN type as the ID in IKE negotiation. If this option is selected, type a name string with a sign “@” for the local security gateway, e.g., test@robustel.com.	Default
Remote ID Type	Select from “IP Address”, “FQDN” and “User FQDN” for IKE negotiation. IP Address: Uses an IP address as the ID in IKE negotiation. FQDN: Uses an FQDN type as the ID in IKE negotiation. If this option is selected, type a name without any at sign (@) for the local security gateway, e.g., test.robustel.com. User FQDN: Uses a user FQDN type as the ID in IKE negotiation. If this option is selected, type a name string with a sign “@” for the local security gateway, e.g., test@robustel.com.	Default
IKE Lifetime	Set the lifetime in IKE negotiation. Before an SA expires, IKE negotiates a new SA. As soon as the new SA is set up, it takes effect immediately and the old one will be cleared automatically when it expires.	86400
Private Key Password	Enter the private key.	Null
Username	User name used for xAuth.	Null
Password	Password used for xAuth.	Null

When choose the “Tunnel Setting > General Setting > Protocol” to “ESP”.



SA Settings

Encrypt Algorithm: 3DES

Authentication Algorithm: MD5

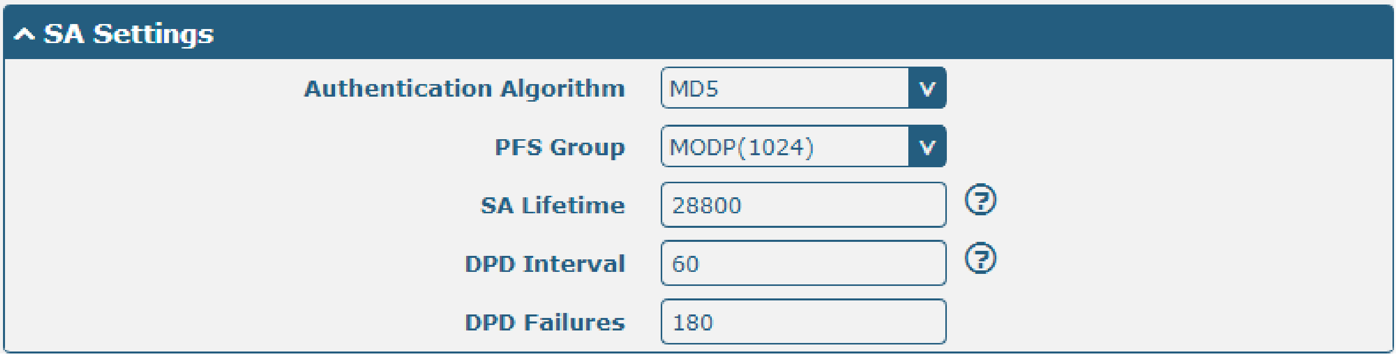
PFS Group: MODP(1024)

SA Lifetime: 28800

DPD Interval: 60

DPD Failures: 180

When choose the “Tunnel Setting > Protocol” to “AH”.



SA Settings

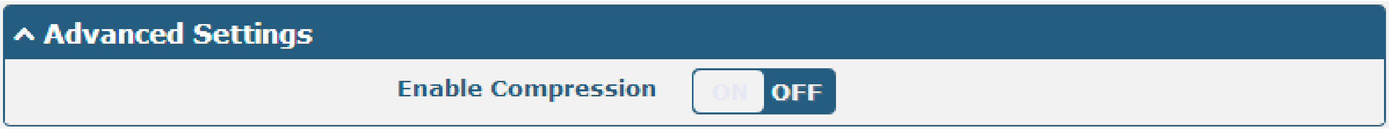
Authentication Algorithm: MD5

PFS Group: MODP(1024)

SA Lifetime: 28800

DPD Interval: 60

DPD Failures: 180



Advanced Settings

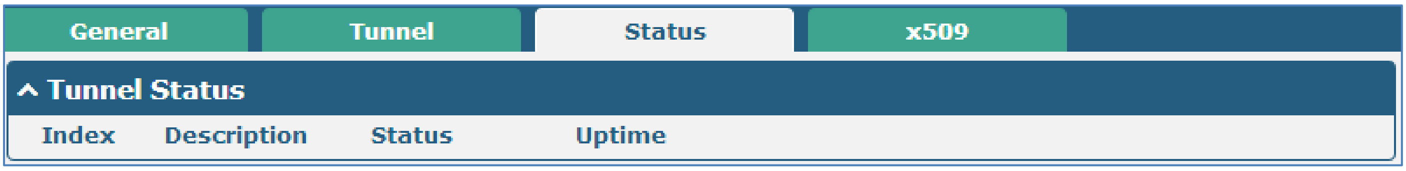
Enable Compression: ON OFF

SA Settings		
Item	Description	Default
Encrypt Algorithm	Select from “3DES”, “AES128” and “AES256” when you select “ESP” in “Protocol”; Note: Higher security means more complex implementation and lower speed. DES is enough to meet general requirements. Use 3DES when high confidentiality and security are required.	3DES
Authentication Algorithm	Select from “MD5” and “SHA1”to be used in SA negotiation.	MD5
PFS Group	Select from “PFS (N/A)”, “MODP (1024)” and“MODP (1536)”. PFS (N/A): Disable PFS Group MODP (1024): Uses the 1024-bit Diffie-Hellman group. MODP (1536): Uses the 1536-bit Diffie-Hellman group.	MODP (1024)
SA Lifetime	Set the IPSec SA lifetime. Note: When negotiating to set up IPSec SAs, IKE uses the smaller one between the lifetime set locally and the lifetime proposed by the peer.	28800

SA Settings		
Item	Description	Default
DPD Interval	Set the interval after which DPD is triggered if no IPSec protected packets is received from the peer. DPD: Dead peer detection. DPD irregularly detects dead IKE peers. When the local end sends an IPSec packet, DPD checks the time the last IPSec packet was received from the peer. If the time exceeds the DPD interval, it sends a DPD hello to the peer. If the local end receives no DPD acknowledgment within the DPD packet retransmission interval, it retransmits the DPD hello. If the local end still receives no DPD acknowledgment after having made the maximum number of retransmission attempts, it considers the peer already dead, and clears the IKE SA and the IPSec SAs based on the IKE SA.	60
DPD Failures	Set the timeout of DPD packets.	180
Advanced Settings		
Enable Compression	Tick to enable compressing the inner headers of IP packets.	OFF

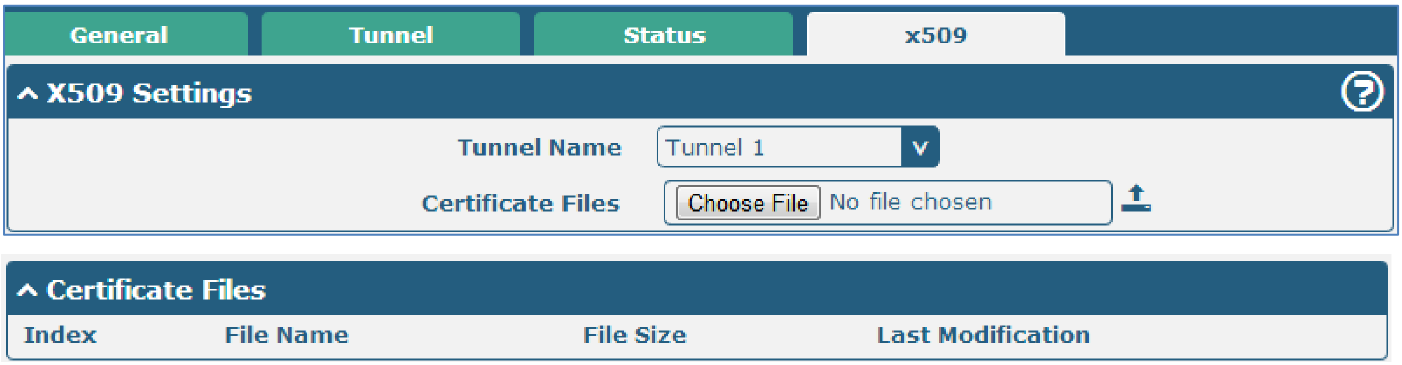
Status

This section allow user to check the status of the IPSec tunnel.



x509

User can upload the X509 certificate for the IPSec tunnel in this section.



Tunnel Name: Tunnel 1

Certificate Files: No file chosen

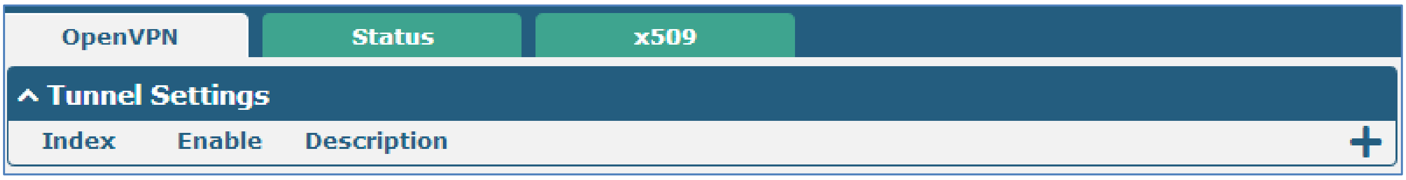
x509		
Item	Description	Default
Tunnel Name	Select the name of the tunnel.	Tunnel 1
Certificate Files	Choose the correct file to import the certificate into the router. The correct file format as followings: @ca.crt @remote.crt	Null

x509		
Item	Description	Default
	@local.crt @private.key @crl.pem	
Index	Show the index of the certificate file.	Null
Filename	Show the name of the certificate file.	Null
File Size	Show the size of the certificate file.	Null
Last Modification	Show the timestamp of that the last time to modify the certificate file.	Null

3.15 VPN > OpenVPN

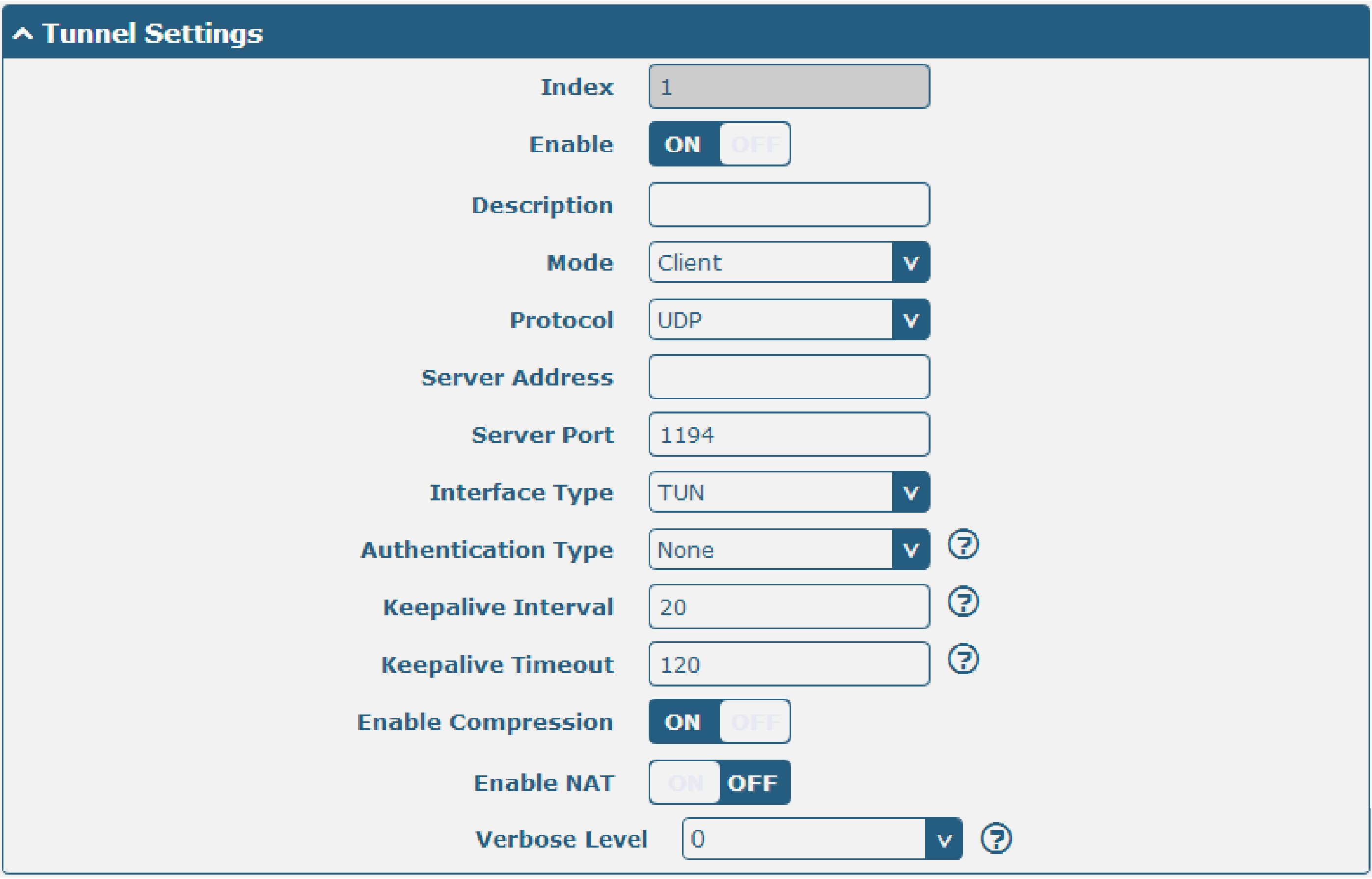
This section allows users to set the OpenVPN and the related parameters.

OpenVPN



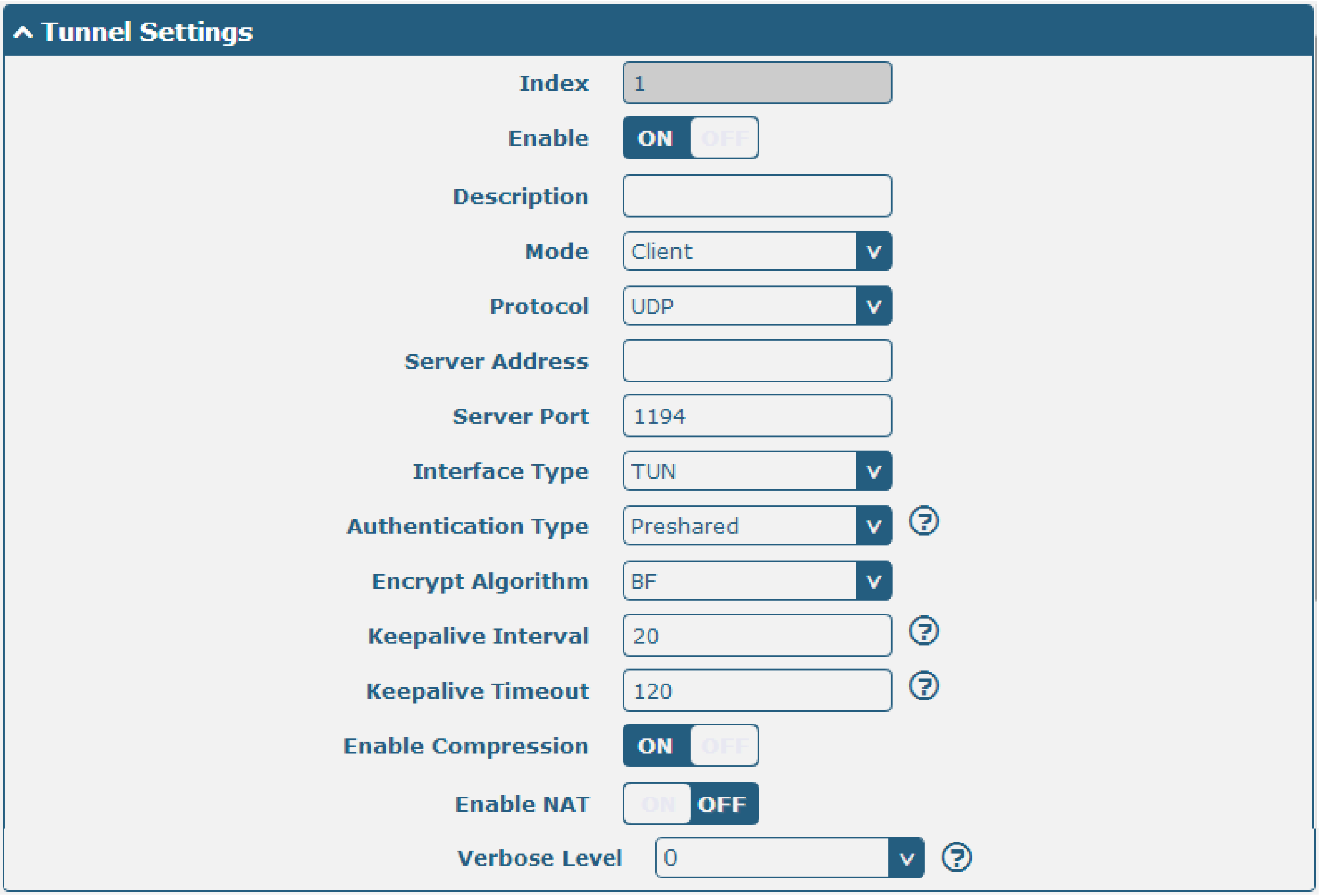
Click “+” to add tunnel settings. (The maximum number of the tunnel is three.)

When choose “Authentication Type” to “None”.



Index	1
Enable	ON
Description	
Mode	Client
Protocol	UDP
Server Address	
Server Port	1194
Interface Type	TUN
Authentication Type	None
Keepalive Interval	20
Keepalive Timeout	120
Enable Compression	ON
Enable NAT	OFF
Verbose Level	0

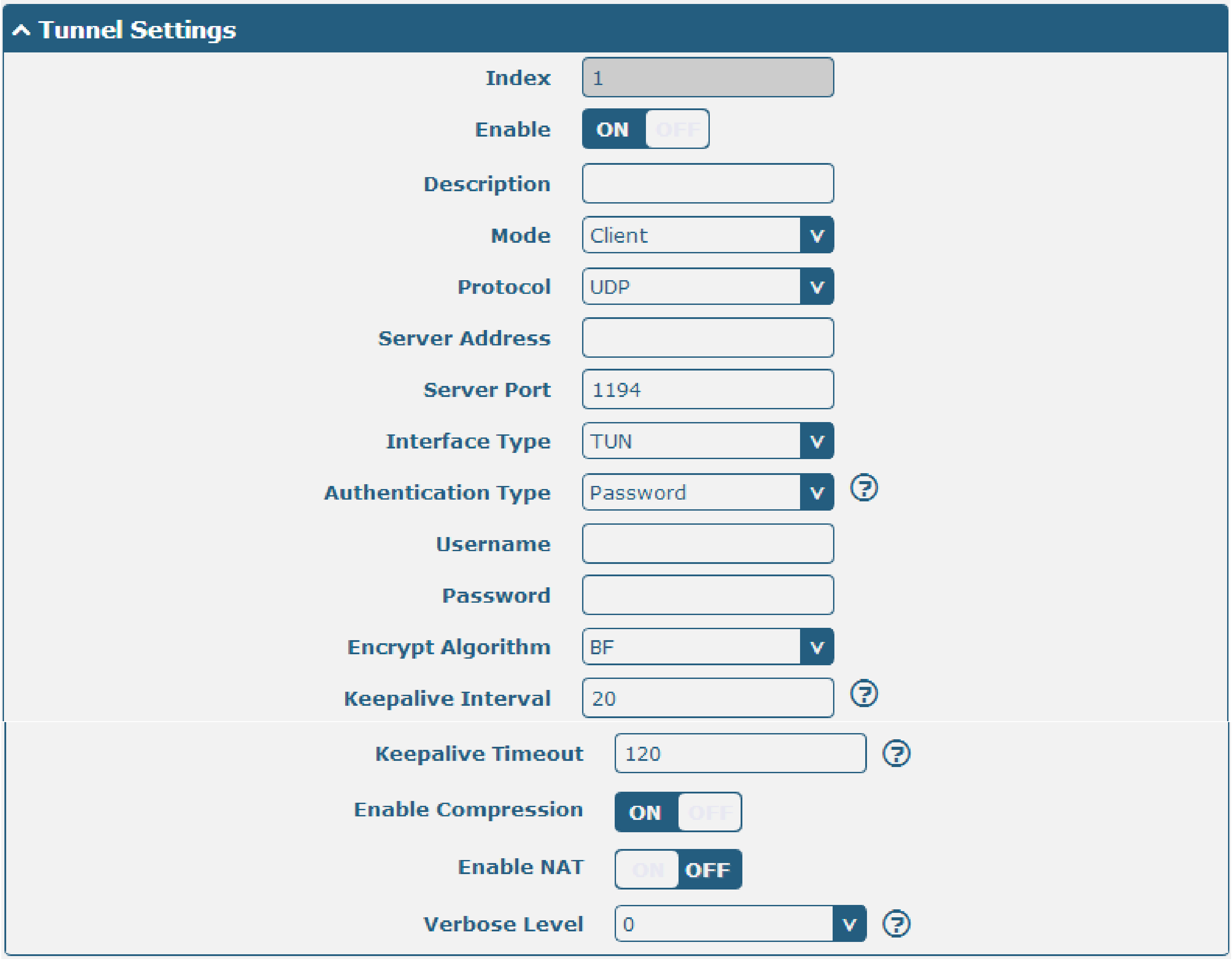
When choose “Authentication Type” to “Preshared”.



^ Tunnel Settings

Index	1
Enable	ON
Description	
Mode	Client
Protocol	UDP
Server Address	
Server Port	1194
Interface Type	TUN
Authentication Type	Preshared
Encrypt Algorithm	BF
Keepalive Interval	20
Keepalive Timeout	120
Enable Compression	ON
Enable NAT	OFF
Verbose Level	0

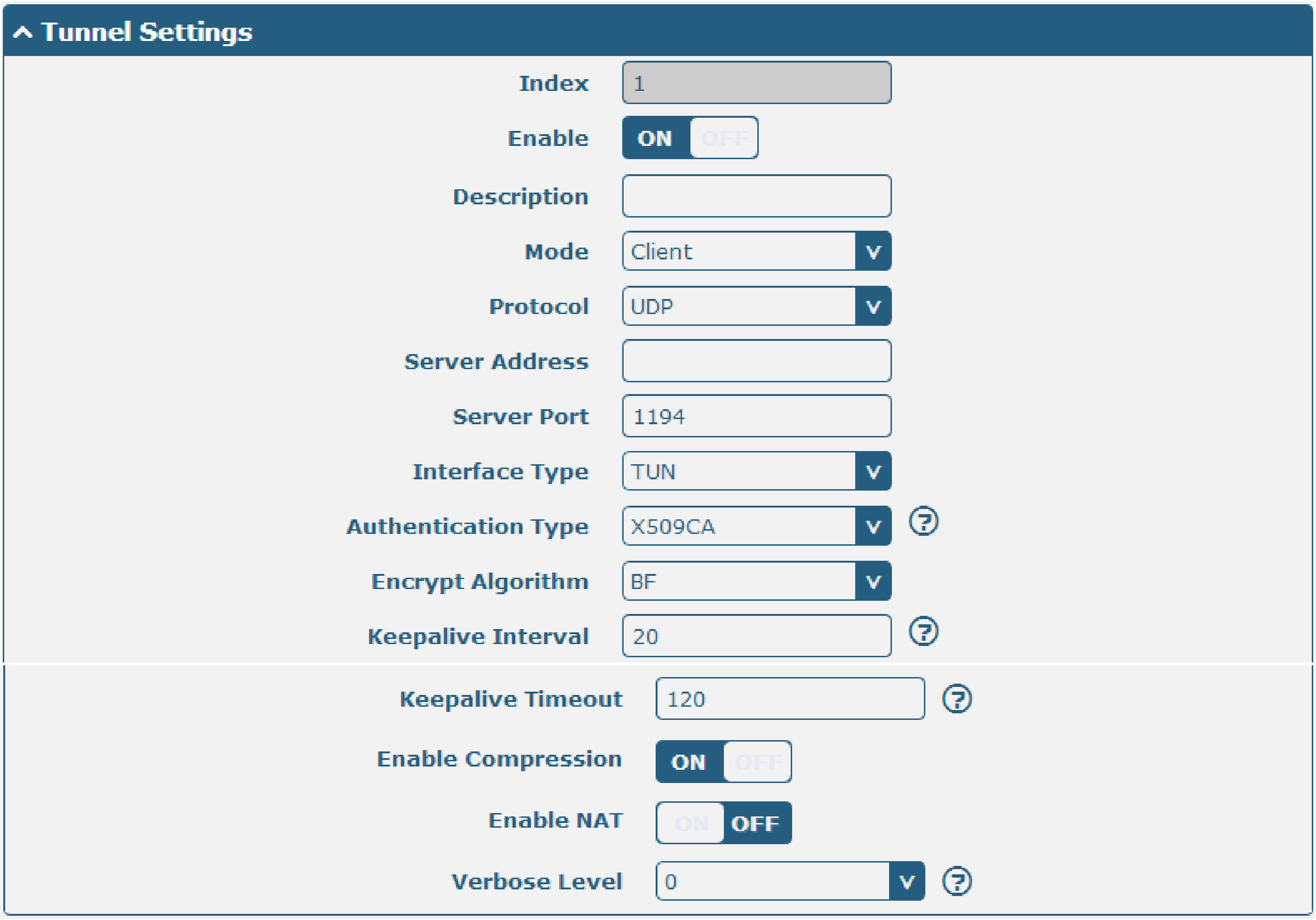
When choose “Authentication Type” to “Password”.



Tunnel Settings

Index	1
Enable	ON
Description	
Mode	Client
Protocol	UDP
Server Address	
Server Port	1194
Interface Type	TUN
Authentication Type	Password
Username	
Password	
Encrypt Algorithm	BF
Keepalive Interval	20
Keepalive Timeout	120
Enable Compression	ON
Enable NAT	OFF
Verbose Level	0

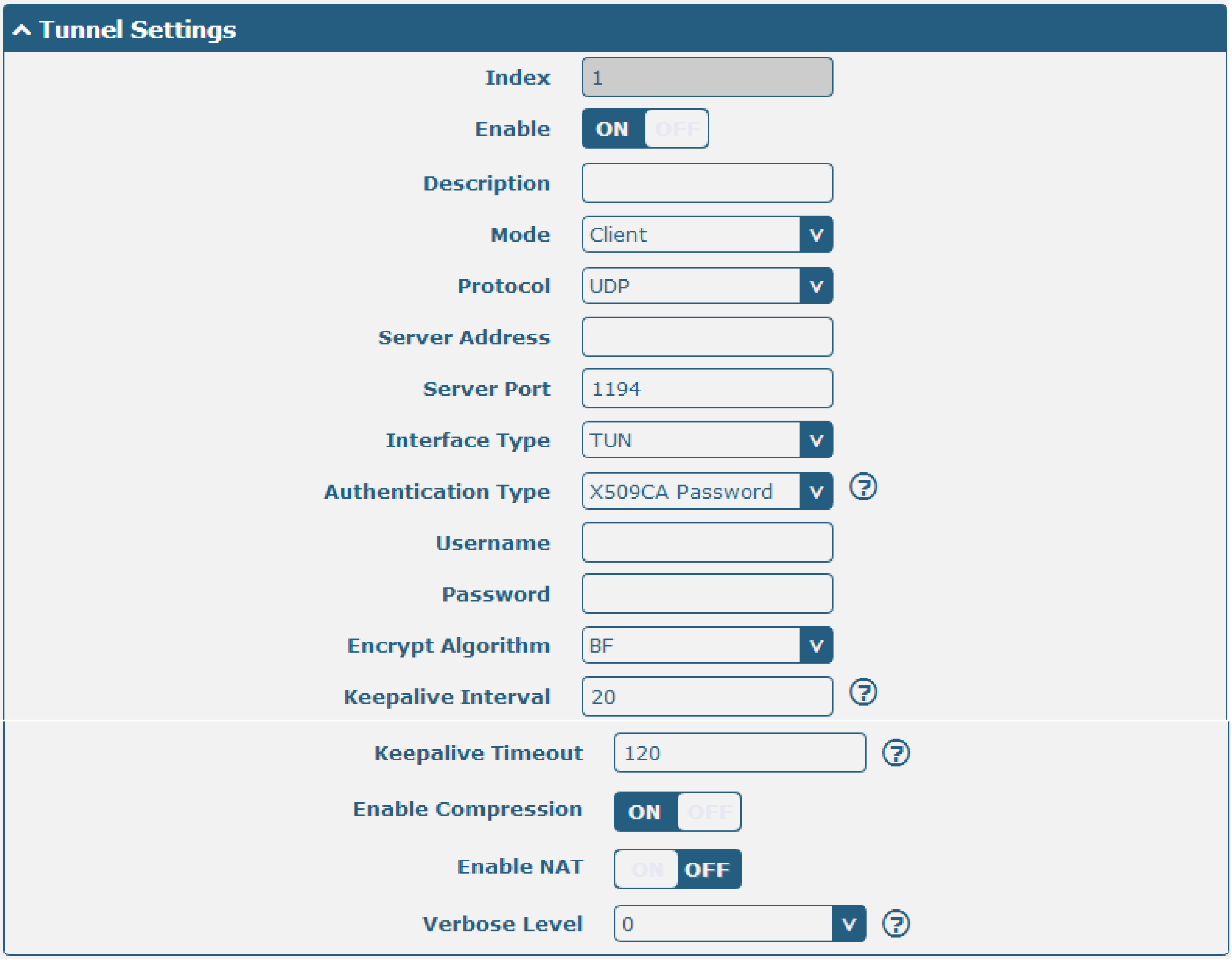
When choose “Authentication Type” to “X509CA”.



^ Tunnel Settings

Index	1
Enable	ON
Description	
Mode	Client
Protocol	UDP
Server Address	
Server Port	1194
Interface Type	TUN
Authentication Type	X509CA
Encrypt Algorithm	BF
Keepalive Interval	20
Keepalive Timeout	120
Enable Compression	ON
Enable NAT	OFF
Verbose Level	0

When choose “Authentication Type” to “X509CA Password”.

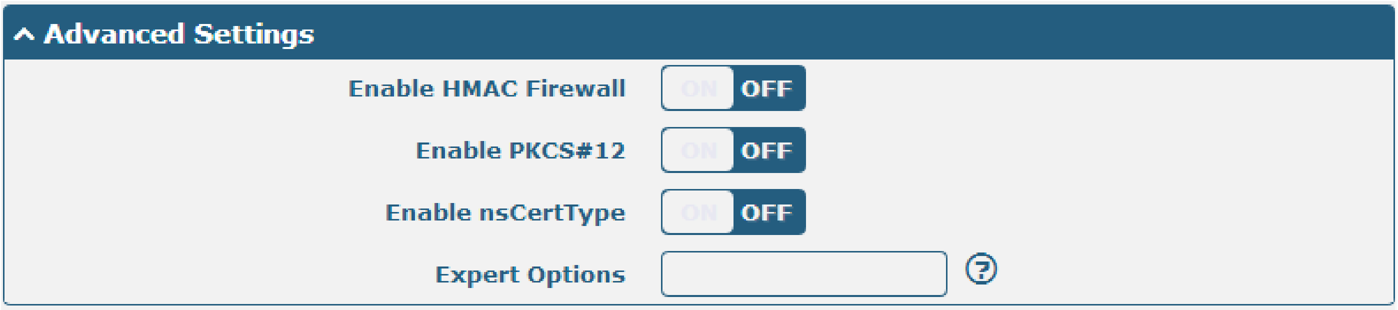


^ Tunnel Settings

Index	1
Enable	ON OFF
Description	
Mode	Client
Protocol	UDP
Server Address	
Server Port	1194
Interface Type	TUN
Authentication Type	X509CA Password
Username	
Password	
Encrypt Algorithm	BF
Keepalive Interval	20
Keepalive Timeout	120
Enable Compression	ON OFF
Enable NAT	ON OFF
Verbose Level	0

Tunnel Settings		
Item	Description	Default
Index	Show the index of the tunnel.	1
Enable	Enable OpenVPN tunnel.	ON
Description	Enter some simple words about the OpenVPN Tunnel.	Null
Mode	Select from “P2P”, “Client”.	Client
Protocol	Select from “UDP”, “TCP-Client”.	UDP
Server Address	Enter the OpenVPN server address.	Null
Server Port	Enter the OpenVPN server port	1194
Interface Type	Select from “TUN”, “TAP” which are two different kinds of device interface for OpenVPN. The difference between TUN and TAP device is this: a TUN device is a virtual IP point-to-point device and a TAP device is a virtual Ethernet device.	TUN

Tunnel Settings		
Item	Description	Default
Authentication Type	Select from “None”, “Preshared”, “Password”, “X509CA” and “X509CA Password”. “None” and “Preshared” type just work with p2p mode.	None
Local IP	When the “Mode” is “P2P”. Define the local IP address of OpenVPN tunnel.	Null
Remote IP	When the “Mode” is “P2P”. Define the remote IP address of OpenVPN tunnel.	Null
Username	User name used for Authentication Type “Password” or “X509CA Password”.	Null
Password	Password used for Authentication Type “Password” or “X509CA Password”.	Null
Encrypt Algorithm	Select from “BF”, “DES”, “DES-EDE3”, “AES128”, “AES192” and “AES256”. BF: Uses the BF algorithm in CBC mode and 128-bit key. DES: Uses the DES algorithm in CBC mode and 64-bit key. DES-EDE3: Uses the 3DES algorithm in CBC mode and 192-bit key. AES128: Uses the AES algorithm in CBC mode and 128-bit key. AES192: Uses the AES algorithm in CBC mode and 192-bit key. AES256: Uses the AES algorithm in CBC mode and 256-bit key.	BF
Keepalive Interval	Set keepalive (ping) interval to check if the tunnel is active.	20
Keepalive Timeout	Trigger OpenVPN restart after n seconds pass without reception of a ping or other packet from remote.	120
Private Key Password	Password of Private Key for Authentication Type “X509CA”	Null
Enable Compression	Enable to compress the data stream.	ON
Enable NAT	Tick to enable NAT for OpenVPN. The source IP address of host behind R2000 will be disguised before accessing the remote OpenVPN client.	OFF
Verbose Level	Select the level of the output log. Values range from 0 to 11. 0 -- No output except fatal errors. 1 to 4 -- Normal usage range. 5 -- Output R and W characters to the console for each packet read and write. 6 to 11 -- Debug info range	0


^ Advanced Settings

Enable HMAC Firewall: ON OFF

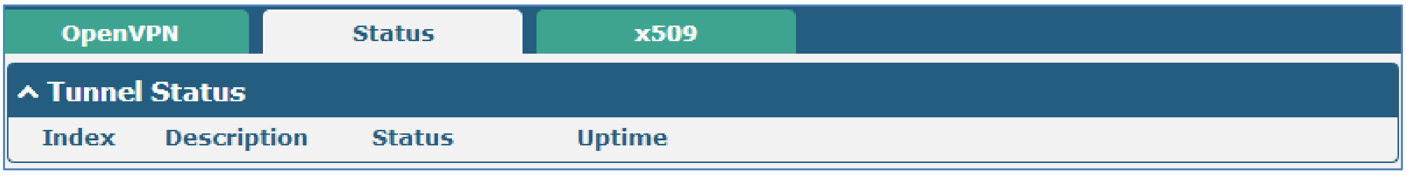
Enable PKCS#12: ON OFF

Enable nsCertType: ON OFF

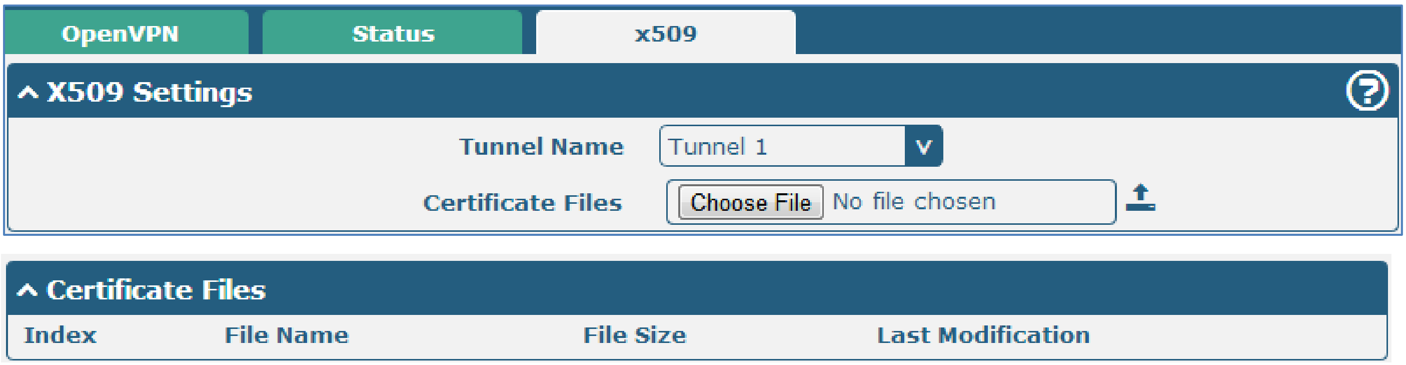
Expert Options:

Advanced Settings		
Item	Description	Default
Enable HMAC Firewall	Add an additional layer of HMAC authentication on top of the TLS control channel to protect against DoS attacks.	OFF
Enable PKCS#12	Enable the PKCS#12 certificate. It is an exchange of digital certificate encryption standard, used to describe personal identity information.	OFF
Enable nsCertType	Require that peer certificate was signed with an explicit nsCertType designation of "server".	OFF
Expert Options	You can enter some other options of OpenVPN in this field. Each expression can be separated by a ‘;’.	Null

Status



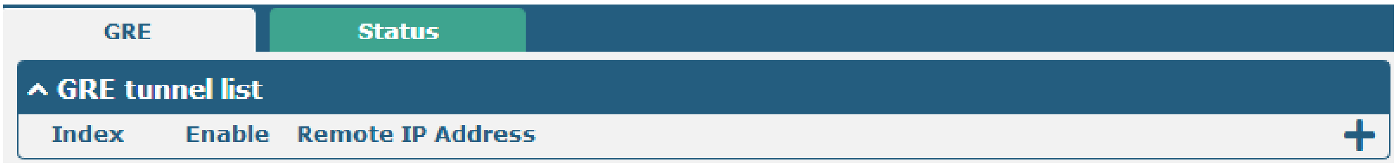
x509



x509		
Item	Description	Default
Tunnel Name	Select the name of the Tunnel1 to Tunnel3. Because the maximum number of the tunnel is three.	Tunnel 1
Certificate Files	Choose the correct file to import the certificate into the router. The correct file format as followings: @ca.crt @remote.crt @local.crt @private.key @crl.pem	Null
Index	Show the index of the certificate file.	Null
Filename	Show the name of the certificate file.	Null
File Size	Show the size of the certificate file.	Null
Last Modification	Show the timestamp of that the last time to modify the certificate file.	Null

3.15 VPN > GRE

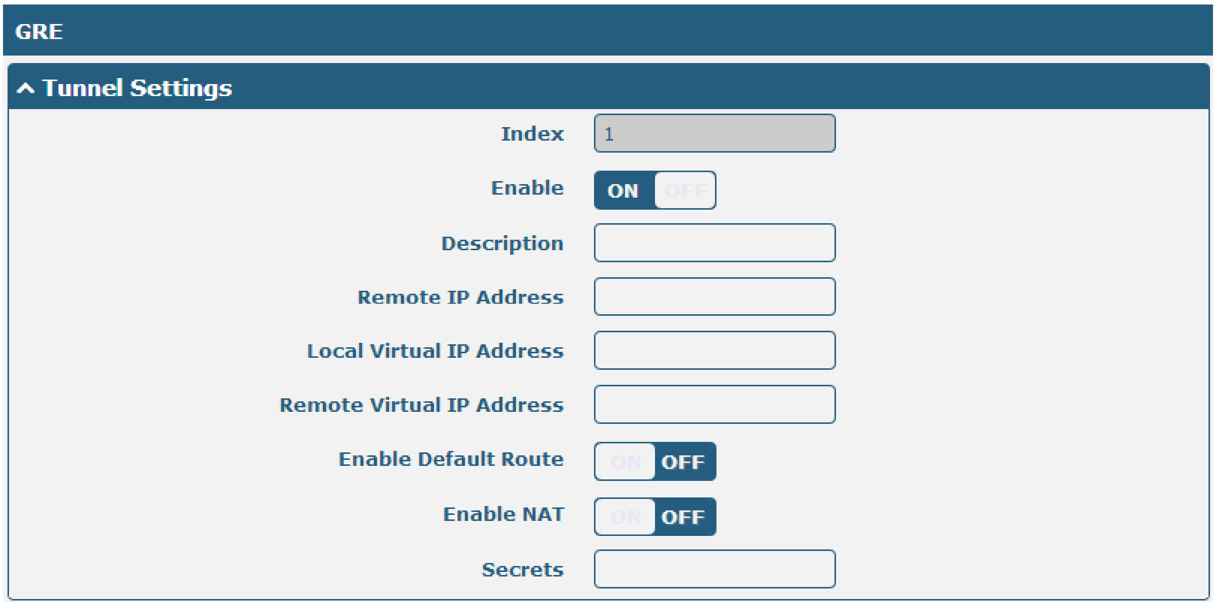
This section allows users to set the OpenVPN and the related parameters.



GRE tunnel list

Index	Enable	Remote IP Address

Click "+" to add tunnel settings. (The maximum number of the tunnel is three.)



Tunnel Settings

Index: 1

Enable: ON

Description:

Remote IP Address:

Local Virtual IP Address:

Remote Virtual IP Address:

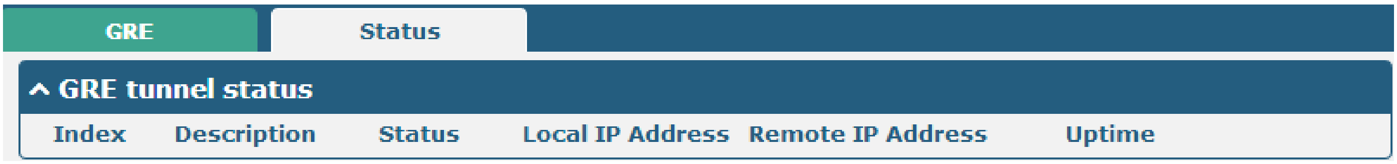
Enable Default Route: OFF

Enable NAT: OFF

Secrets:

GRE		
Item	Description	Default
Index	Show the index of the tunnel.	1
Enable	Enable GRE tunnel. GRE (Generic Routing Encapsulation) is a protocol that encapsulates packets in order to route other protocols over IP networks.	ON
Description	Enter some simple words about the GRE Tunnel.	Null
Remote IP Address	Set remote IP Address of the virtual GRE tunnel.	Null
Local Virtual IP	Set local IP Address of the virtual GRE tunnel.	Null
Remote virtual IP	Set remote IP Address of the virtual GRE tunnel.	Null
Enable Default Route	All the traffics of R2000 router will go through the GRE VPN.	OFF
Enable NAT	Tick to enable NAT for GRE. The source IP address of host Behind R2000 will be disguised before accessing the remote GRE server.	Disable
Secrets	Set Tunnel Key of GRE.	Null

This section allow user to check the status of GRE tunnel.

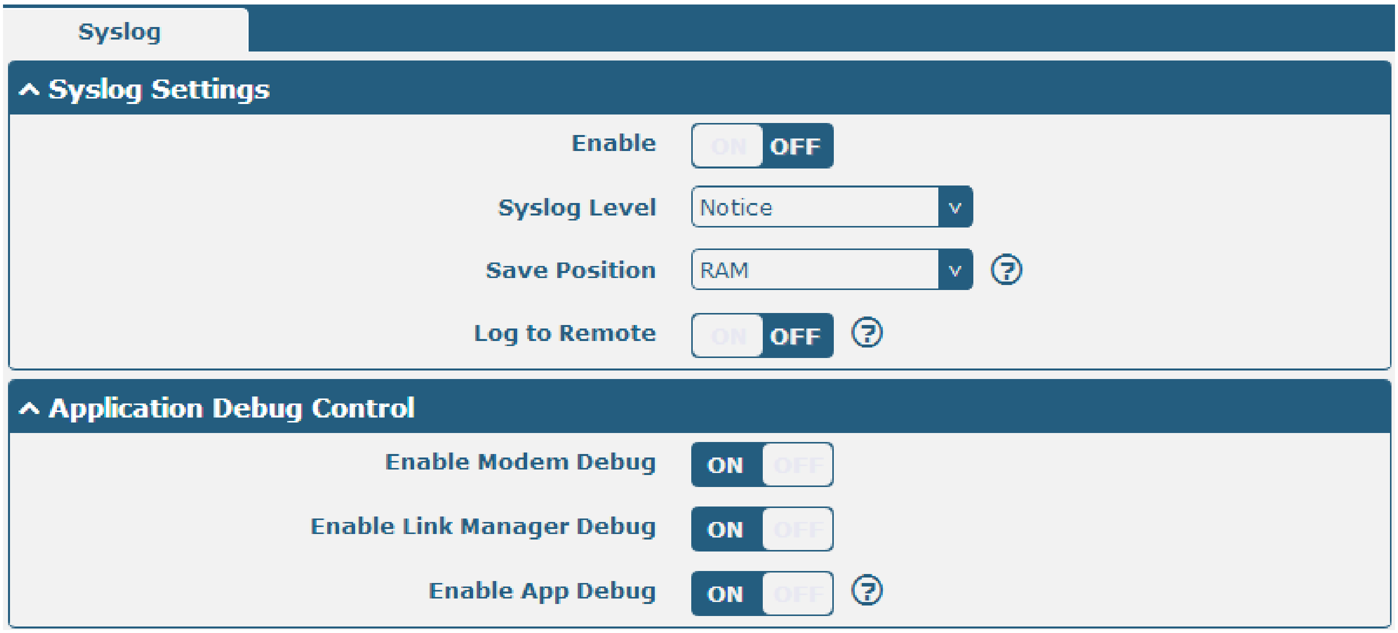


GRE tunnel status

Index	Description	Status	Local IP Address	Remote IP Address	Uptime

3.16 Services > Syslog

This section allows users to set the syslog parameters.



^ Syslog Settings

Enable: ON OFF

Syslog Level: Notice

Save Position: RAM

Log to Remote: ON OFF

^ Application Debug Control

Enable Modem Debug: ON OFF

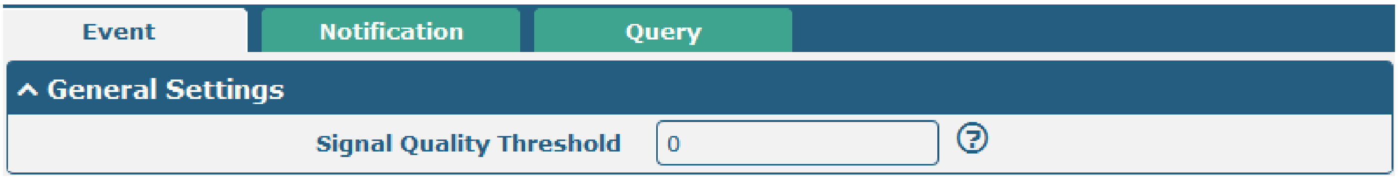
Enable Link Manager Debug: ON OFF

Enable App Debug: ON OFF

Syslog		
Syslog Settings		
Item	Description	Default
Enable	Click to enable Syslog setting.	OFF
Syslog Level	Select form “Debug”, “Info”, “Notice”, “Warning”, “Error” which from low to high. The lower level will output more syslog in detail.	Notice
Save Position	Select the save position from “RAM”, “NVM” and “Console”. Choose “RAM”, the data will be cleared after reboot. But it's not recommended that saving syslog to NVM (Non-Volatile Memory) for a long time.	RAM
Log to Remote	Enable to allow router sending syslog to the remote syslog server. You need to enter the IP and Port of the syslog server.	OFF
Application Debug Control		
Enable Modem Debug	Click to enable router to debug Modem.	ON
Enable Link Manager Debug	Click to enable router to debug Link Manager.	ON
Enable APP Debug	Click to enable router’s debug control for all other applications.	ON

3.17 Services > Event

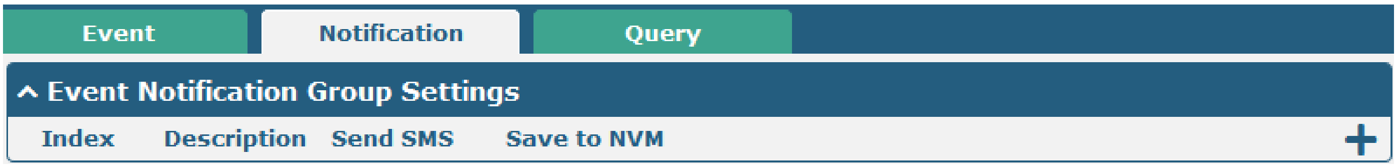
This section allows users to set the Event parameters.



^ General Settings

Signal Quality Threshold: 0

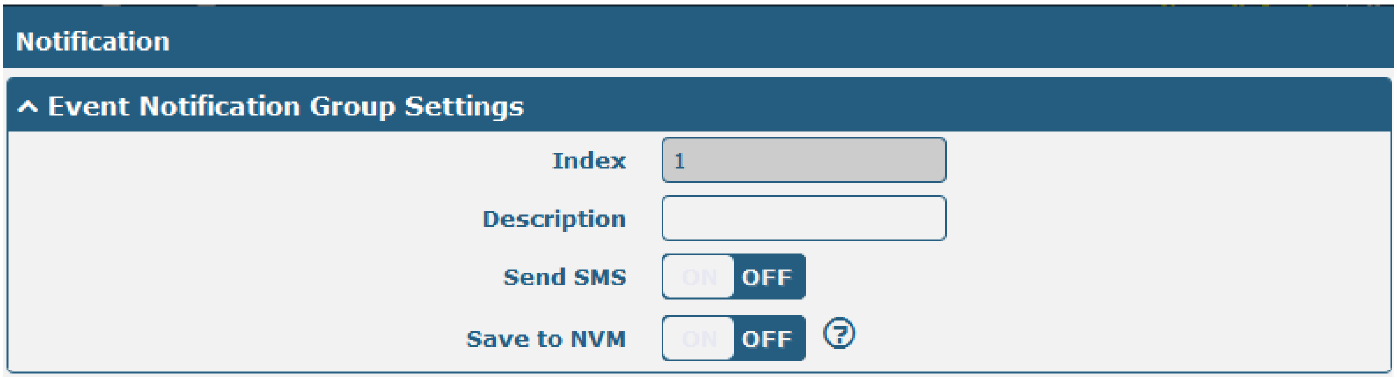
Event @ Event		
Item	Description	Default
Signal Quality Threshold	Router will generate log event when signal quality less than the threshold, 0 means disable.	0



^ Event Notification Group Settings

Index	Description	Send SMS	Save to NVM

Click "+" button to add an Event parameters.


Notification

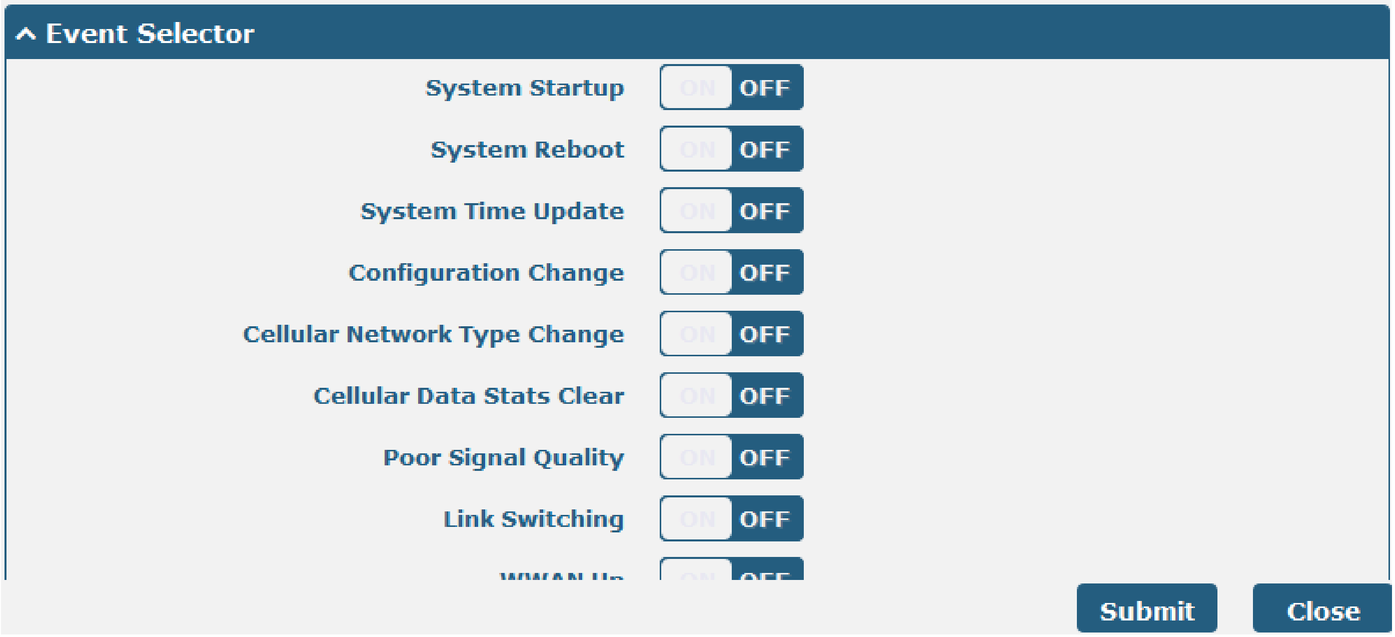
^ Event Notification Group Settings

Index: 1

Description:

Send SMS: ON OFF

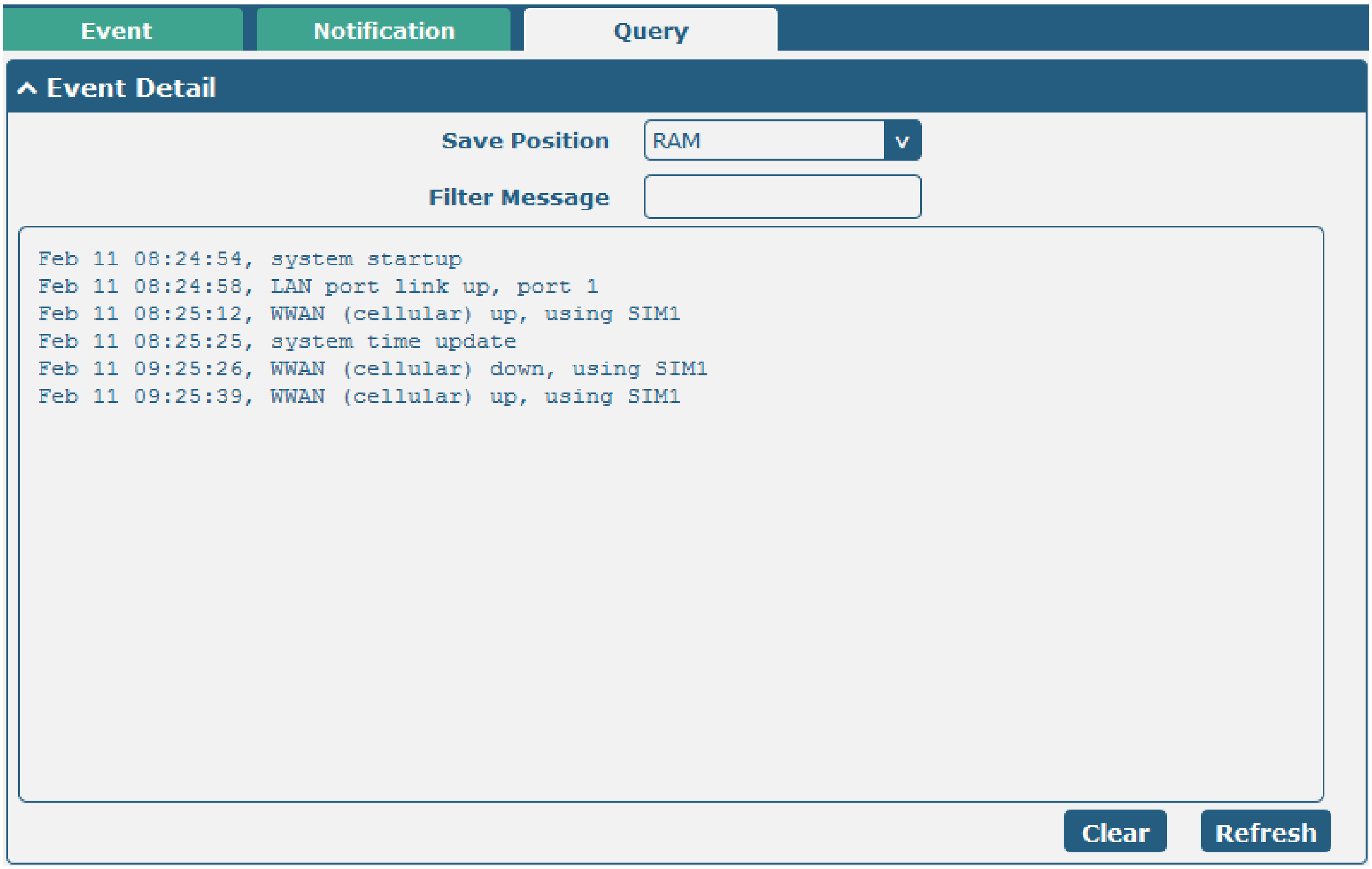
Save to NVM: ON OFF



^ Event Selector

System Startup	ON OFF
System Reboot	ON OFF
System Time Update	ON OFF
Configuration Change	ON OFF
Cellular Network Type Change	ON OFF
Cellular Data Stats Clear	ON OFF
Poor Signal Quality	ON OFF
Link Switching	ON OFF
WWAN Up	ON OFF

Notification@ Event		
Item	Description	Default
Index	The index of event notification group.	1
Description	Enter some simple words to describe the Notify Group.	Null
Sent SMS	Click to enable router to send event notification SMS. Set the phone number that is used for receiving event notification, and use ';'to separate each number.	OFF
Save to NVM	Click to enable router to save event to nonvolatile memory.	OFF
Event Selector	Click to enable Event feature. There are numbers of R2000's main running event code you can select, such as "System Startup", "System Reboot", "System Time Update", etc.	OFF

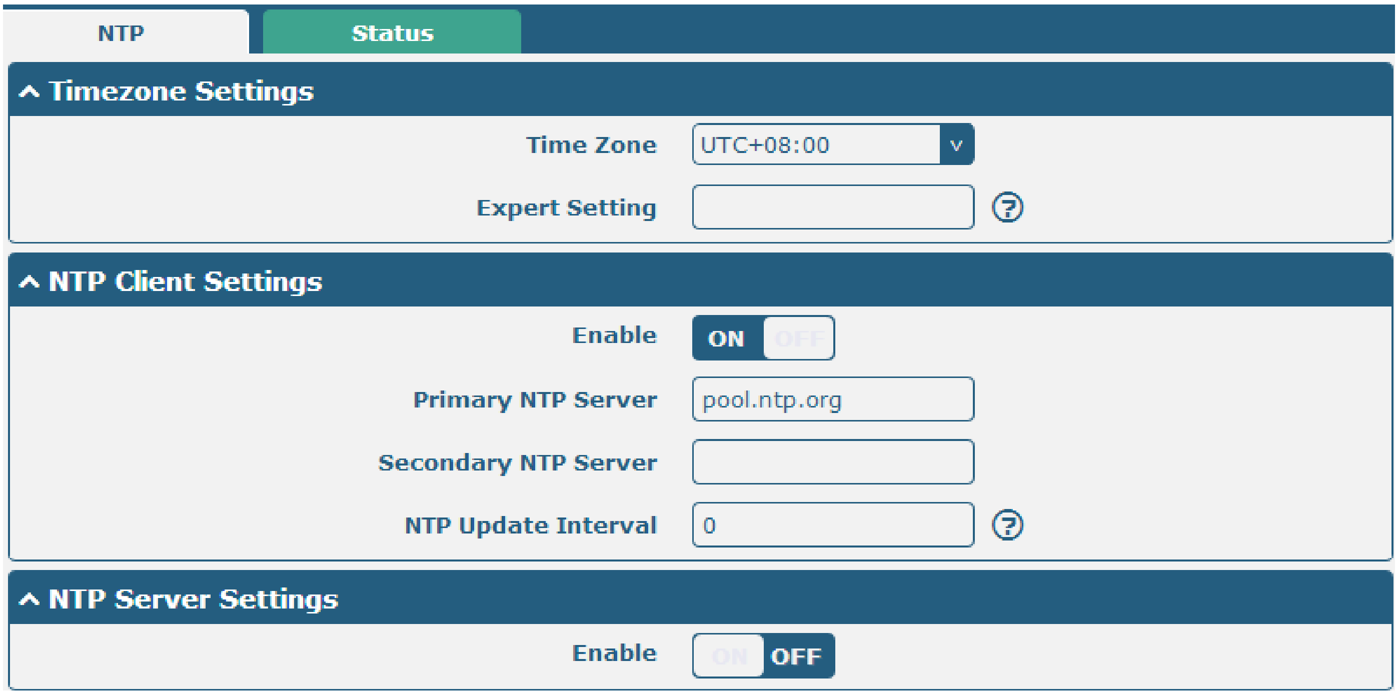


```
Feb 11 08:24:54, system startup
Feb 11 08:24:58, LAN port link up, port 1
Feb 11 08:25:12, WWAN (cellular) up, using SIM1
Feb 11 08:25:25, system time update
Feb 11 09:25:26, WWAN (cellular) down, using SIM1
Feb 11 09:25:39, WWAN (cellular) up, using SIM1
```

Query @ Event		
Item	Description	Default
Save Position	Select the events' save position from "RAM", "NVM". RAM: Random-access memory. NVM: Non-Volatile Memory.	RAM
Filter Message	Event will be filtered according to the Filter Message that the user set. Click the Refresh button, the filtered event will be displayed in the follow box. Use "&" to separate more than one filter message, such as message1&message2.	Null

3.18 Services > NTP

This section allows users to set the NTP parameters.



Time Zone: UTC+08:00

Expert Setting:

Enable: ON

Primary NTP Server: pool.ntp.org

Secondary NTP Server:

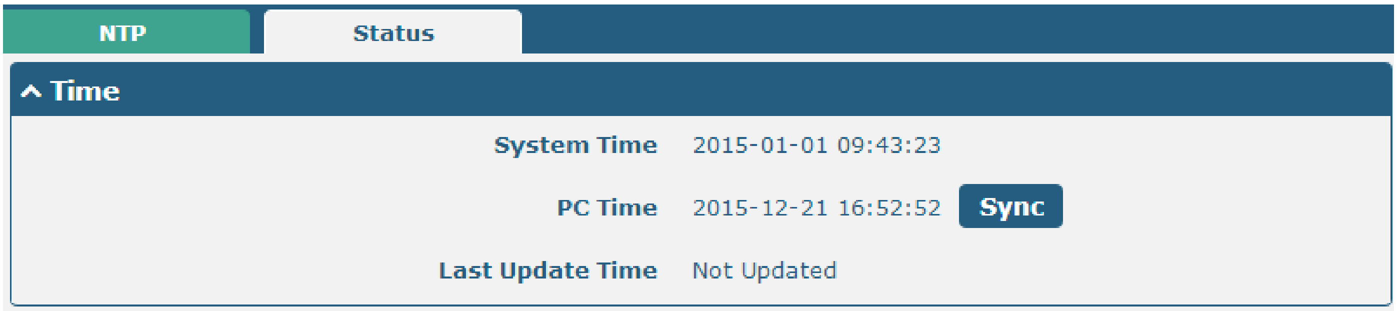
NTP Update Interval: 0

Enable: OFF

Timezone Settings @ NTP		
Item	Description	Default
Time Zone	Select your local time zone.	UTC +08:00
Expert Setting	Specify the time zone with Daylight Saving Time in TZ environment variable format. The Time Zone option will be ignored in this case.	Null
NTP Client Setting @ NTP		
Enable	Click to enable the router to synchronize time from NTP server. ***Note:*** *R2000 doesn't have the RTC, so NTP client function must always be ON.*	ON
Primary NTP Server	Enter primary NTP Server's IP address or domain name.	pool.ntp.org
Secondary NTP Server	Enter secondary NTP Server's IP address or domain name.	Null
NTP Update interval	Enter the interval (minutes) which NTP client synchronize the time from NTP server. Minutes wait for next update, 0 means update only once.	0
NTP Client Setting @ NTP		
Enable	Click to enable the NTP server function of router.	OFF

The status part of NTP allows user to check the current time of R2000 and also synchronize the router time with PC.

Click **Sync** button to make the router time synchronize with PC.



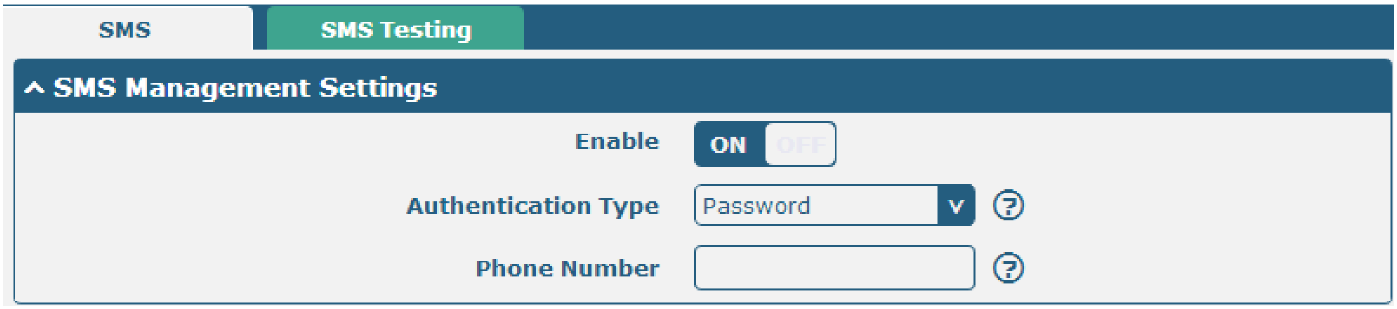
System Time 2015-01-01 09:43:23

PC Time 2015-12-21 16:52:52 Sync

Last Update Time Not Updated

3.19 Services > SMS

This section allows users to set the SMS parameters.



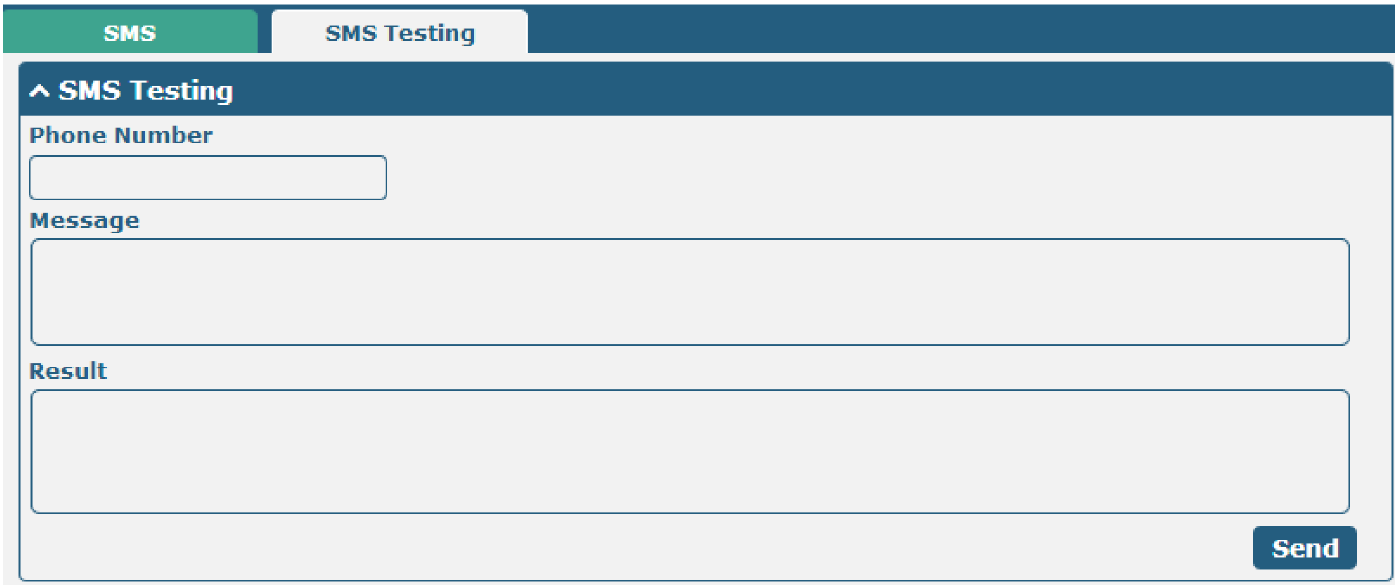
Enable ON OFF

Authentication Type Password

Phone Number

SMS		
Item	Description	Default
Enable SMS Management	Click to enable SMS Management function.	ON
Authentication Type	Select Authentication Type from “Password”, “Phonenum”, “Both”. Password: use the same username and password as WEB manager for authentication. For example, the format of the SMS should be “username: password; cmd1; cmd2; …” ***Note:*** *Set the WEB manager password in* ***System > User Management*** *section.* Phonenum: use the Phone number for authenticating, user should set the Phone Number that is allowed for SMS management. The format of the SMS should be “cmd1; cmd2; …” Both: use both the “Password” and “Phonenum” for authentication. User should set the Phone Number that is allowed for SMS management. The format of the SMS should be “username: password; cmd1; cmd2; …”	Password
Phone Number	Set the Phone Number that is allowed for SMS management, and use ‘; ‘to separate each number.	Null

User can test the current SMS service whether it is available in this section.



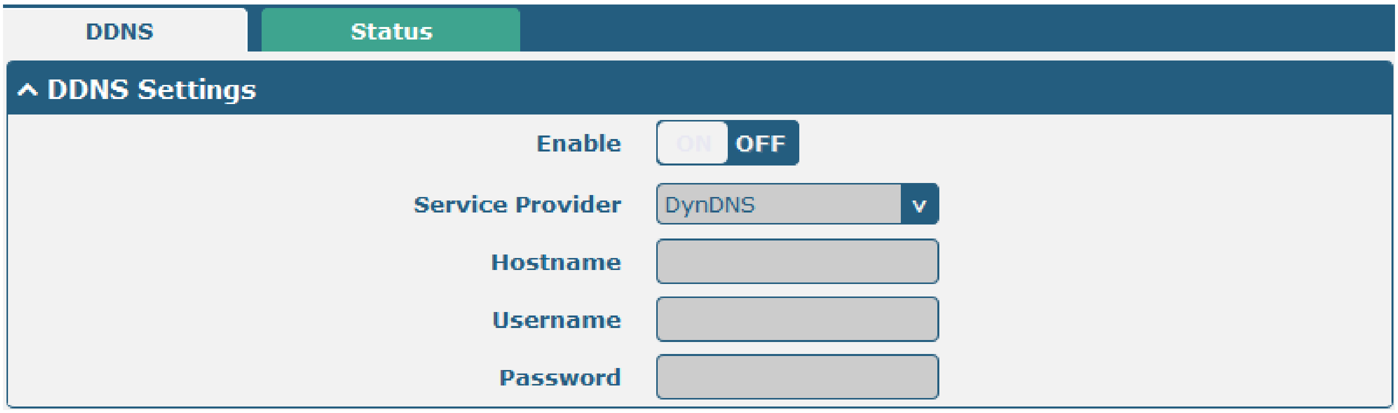
SMS Testing		
Item	Description	Default
Phone Number	Enter the specified phone number which will receive the SMS from R2000 router.	Null
Message	Enter the message that R2000 router will sent it to the specified phone number.	Null
Result	The result of the SMS test will display in the result box.	Null

Note: For examples of SMS control, please go to 4.1.2 SMS Remote Control.

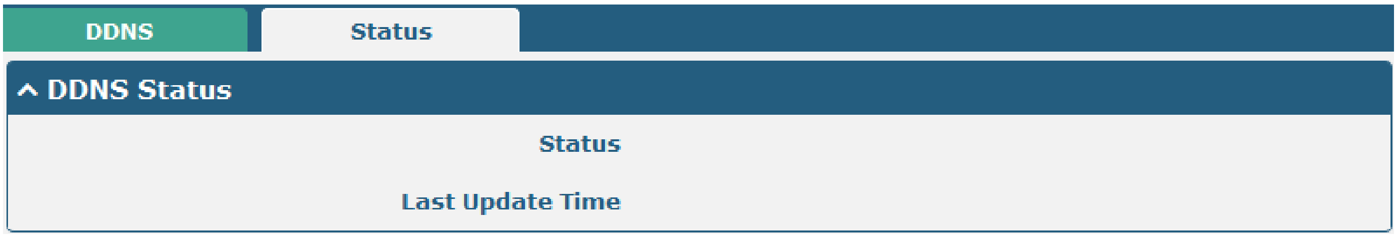
3.20 Services > DDNS

This section allows users to set the DDNS parameters.

The Dynamic DNS function allows you to alias a dynamic IP address to a static domain name, allows users whose ISP does not assign them a static IP address to use a domain name. This is especially useful for hosting servers via your connection, so that anyone wishing to connect to you may use your domain name, rather than having to use your dynamic IP address, which changes from time to time. This dynamic IP address is the WAN IP address of the router, which is assigned to you by your ISP.



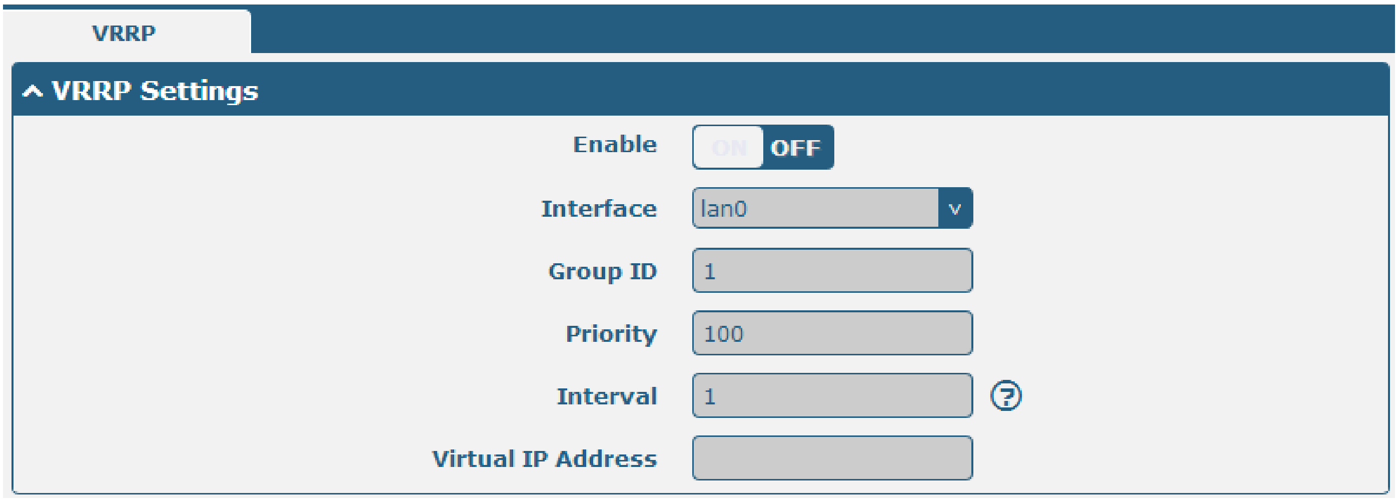
DDNS		
Item	Description	Default
Enable	Click to enable DDNS function.	OFF
Service Provider	Select the DDNS service from “DynDNS”, “NO-IP”, “3322”. ***Note:*** the DDNS service only can be used after registered by Corresponding service provider.	DynDNS
Hostname	Enter the Host name of the DDNS server provided.	Null
Username	Enter the user name of the DDNS server provided.	Null
Password	Enter the password of the DDNS server provided.	Null



Status		
Item	Description	Default
Status	Show current status of DDNS service.	Null
Last Update Time	Show the time that DDNS updated successfully at last time.	Null

3.21 Services > VRRP

This section allows users to set the VRRP parameters.



VRRP

^ VRRP Settings

Enable: ON OFF

Interface: lan0

Group ID: 1

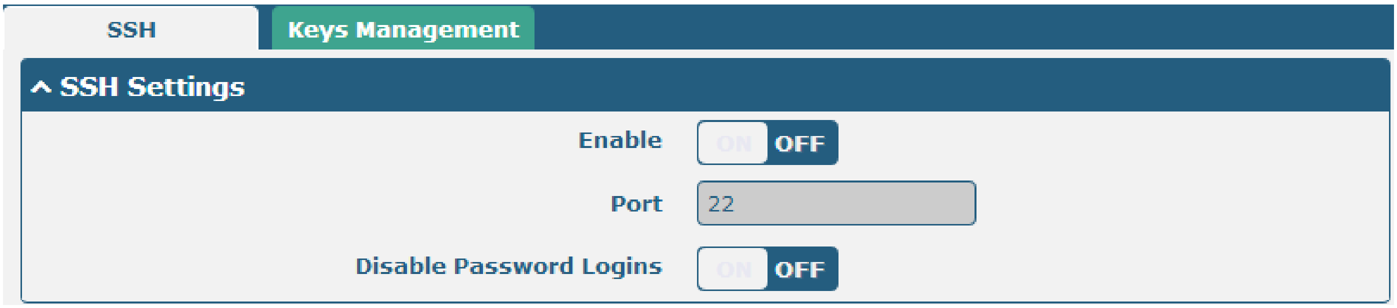
Priority: 100

Interval: 1

Virtual IP Address:

VRRP		
Item	Description	Default
VRRP	VRRP (Virtual Router Redundancy Protocol) is an Internet protocol that provides a way to have one or more backup routers when using a statically configured router on a local area network (LAN).Using VRRP, a virtual IP address can be specified manually.	Null
Enable	Click to enable VRRP protocol.	OFF
Interface	Select from “lan0” and “lan1”.	lan0
Group ID	Specify which VRRP group of this router belong to.	1
Priority	Enter the priority value from 1 to 255. The larger value has higher priority.	120
Interval	The interval that master router sends VRRP packets to backup routers.	5
Virtual IP Address	A virtual IP address is shared among the routers, with one designated as the master router and the others as backups. In case the master fails, the virtual IP address is mapped to a backup router's IP address. (This backup becomes the master router)	192.168.0.1

3.22 Services > SSH



SSH | Keys Management

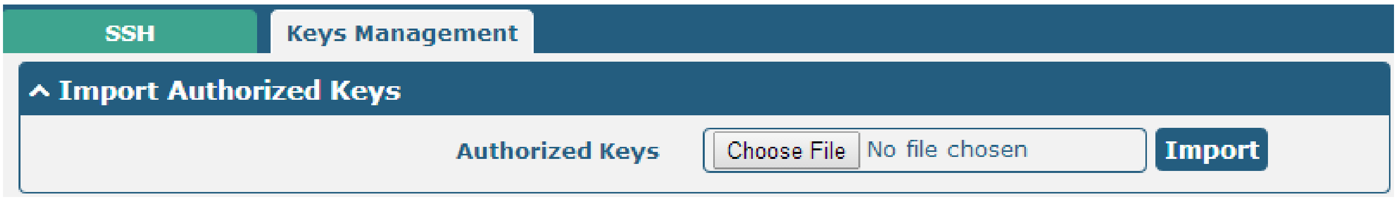
^ SSH Settings

Enable: ON OFF

Port: 22

Disable Password Logins: ON OFF

SSH		
Item	Description	Default
Enable	Enable the function that user can access R2000 router via SSH.	OFF
Port	Set the port of the SSH access.	22
Disable Password Logins	Switch to "ON" and disable password logins, so that user cannot access R2000 via SSH. In this situation, you should import the authorized key into R2000 in **Keys Management** part for accessing R2000. Switch to "OFF", you can access R2000 via SSH normally.	OFF

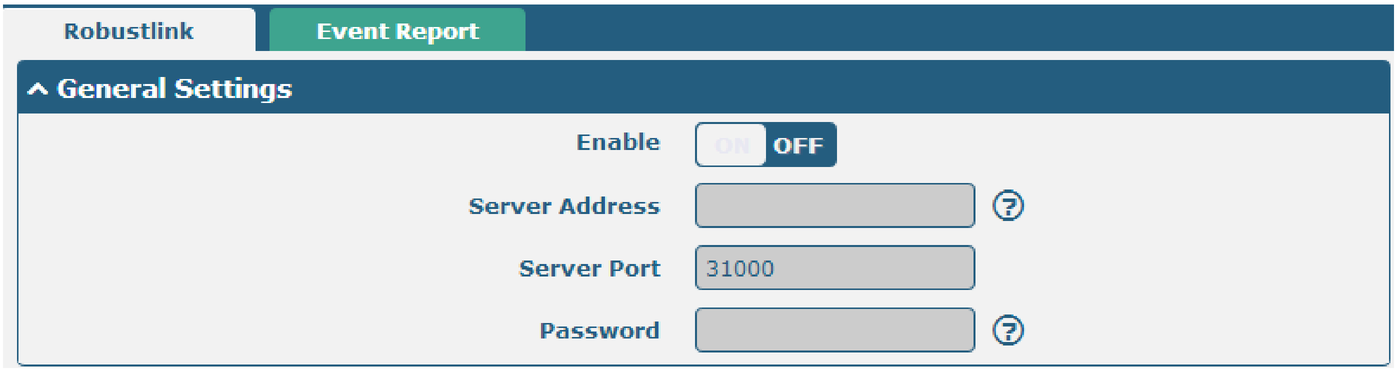


Authorized Keys: No file chosen

Keys Management	
Item	Description
Authorized Keys	Effective when **SSH > Disable Password Logins** is "ON". Select a key file from PC, then click Import button to import the key file in R2000. So that you can access R2000 via SSH without password.

3.23 Services > Robustlink (optional APP)

Robustlink is a M2M management platform, which is developed independently by the Robustel Company. R2000 can be managed by Robustlink. User can set the relative parameters in this section. This function is as an APP which needs to install into R2000 in **System > APP Center** unit.



Enable: ON OFF

Server Address:

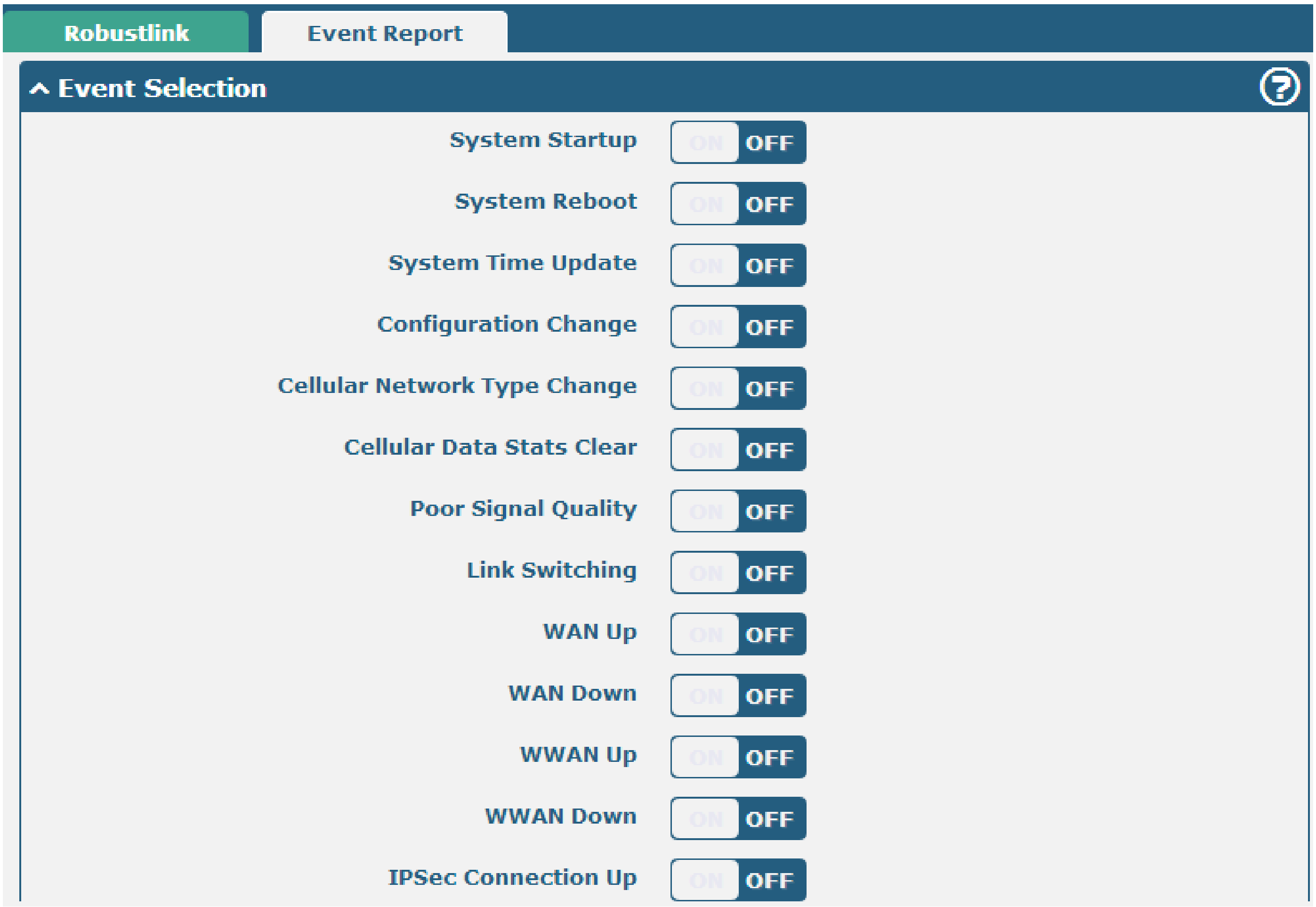
Server Port: 31000

Password:

Robustlink		
Item	Description	Default
Enable	Switch to ON to enable the Robustlink.	

Server address	Enter IP address or domain name of RobustLink.	Null
Port	Enter port number of RobustLink.	31000
Password	Enter the password preset in RobustLink. Valid characters: a-z, A-Z, 0-9, @, ., -, #, $, *. *Note: The passwords set in R2000 and RobustLink need to be the same.*	Null

R2000 support report the Event which has happened to Robustlink platform. In this section, user can select the events those will be reported to Robustlink.



System Startup: ON OFF

System Reboot: ON OFF

System Time Update: ON OFF

Configuration Change: ON OFF

Cellular Network Type Change: ON OFF

Cellular Data Stats Clear: ON OFF

Poor Signal Quality: ON OFF

Link Switching: ON OFF

WAN Up: ON OFF

WAN Down: ON OFF

WWAN Up: ON OFF

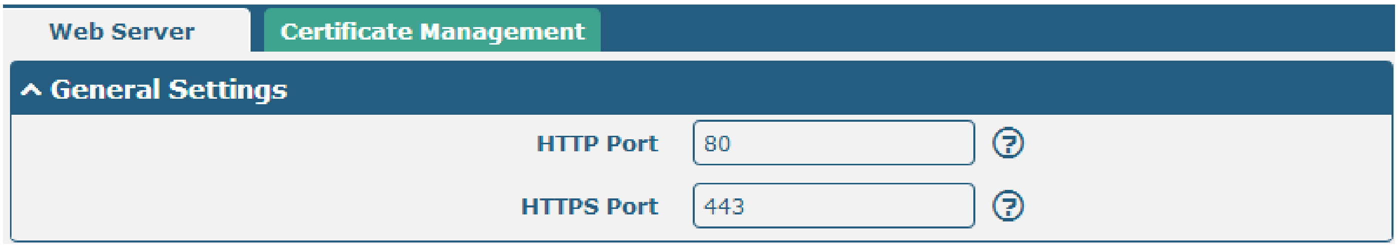
WWAN Down: ON OFF

IPSec Connection Up: ON OFF

Event Report	
Item	Description
Events	Switch “ON” to enable the event.

3.24 Services > Web Server

This section allows users to modify the parameters of Web Server.

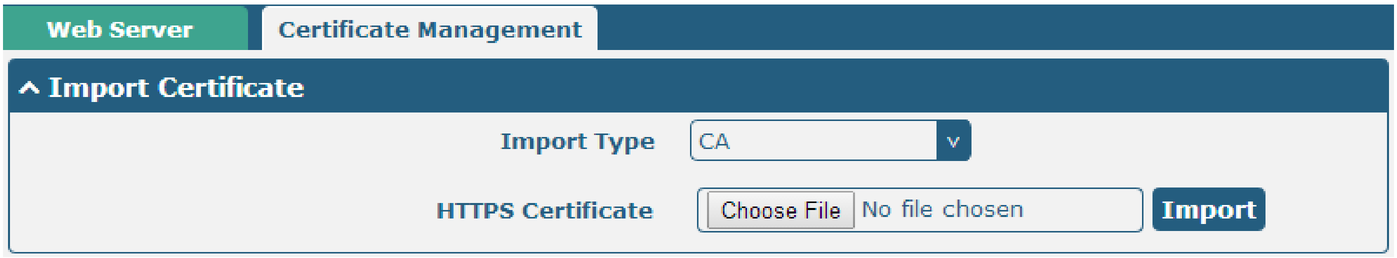


HTTP Port 80

HTTPS Port 443

Basic @ Web Server		
Item	Description	Default
HTTP Port	Enter the HTTP port number you want to change in R2000's Web Server. On a Web server, port 80 is the port that the server "listens to" or expects to receive from a Web client. If you configure the router with other HTTP Port number except 80, only adding that port number then you can login R3000's Web Server.	80
HTTPS Port	Enter the HTTPS port number you want to change in R2000's Web Server. On a Web server, port 443 is the port that the server "listens to" or expects to receive from a Web client. If you configure the router with other HTTPS Port number except 443, only adding that port number then you can login R2000's Web Server. ***Note***: *HTTPS is more secure than HTTP. In many cases, clients may be exchanging confidential information with a server, which needs to be secured in order to prevent unauthorized access. For this reason, HTTP was developed by Netscape corporation to allow authorization and secured transactions.*	443
Login Timeout (s)	Enter the Login timeout you want to change in R3000's Web Server. After "Login Timeout", R3000 will force to log out the Web GUI and then you need to re-login again to Web GUI.	1800

This section allows users to import the certificate file into the route.



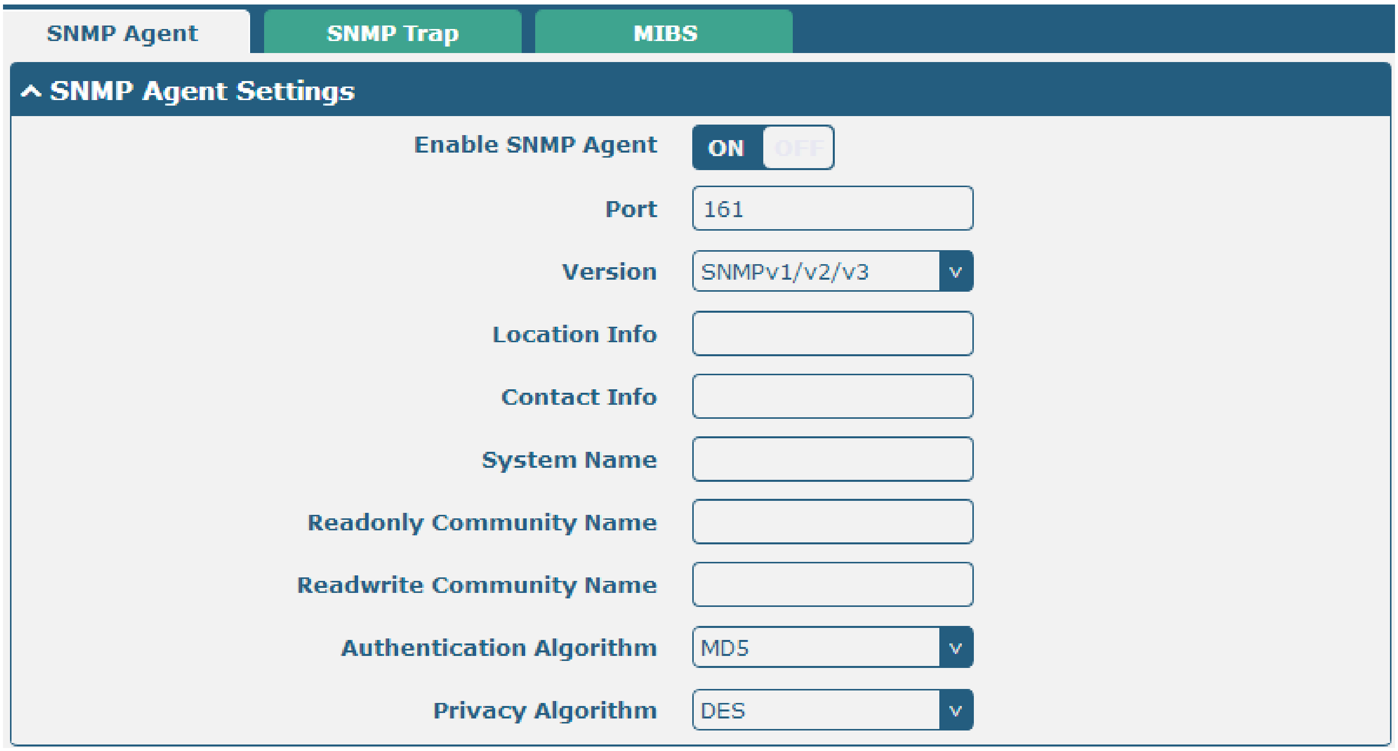
Import Type CA

HTTPS Certificate

Certificate Management		
Item	Description	Default
Import Type	Select from "CA" and "Private Key". CA: a digital certificate issued by CA center. Private Key: a private key file.	CA
HTTPS Certificate	Click "Browse" to select the certificate file in your computer, and then click "Import" to import this file into your router.	

3.25 Services > SNMP (optional APP)

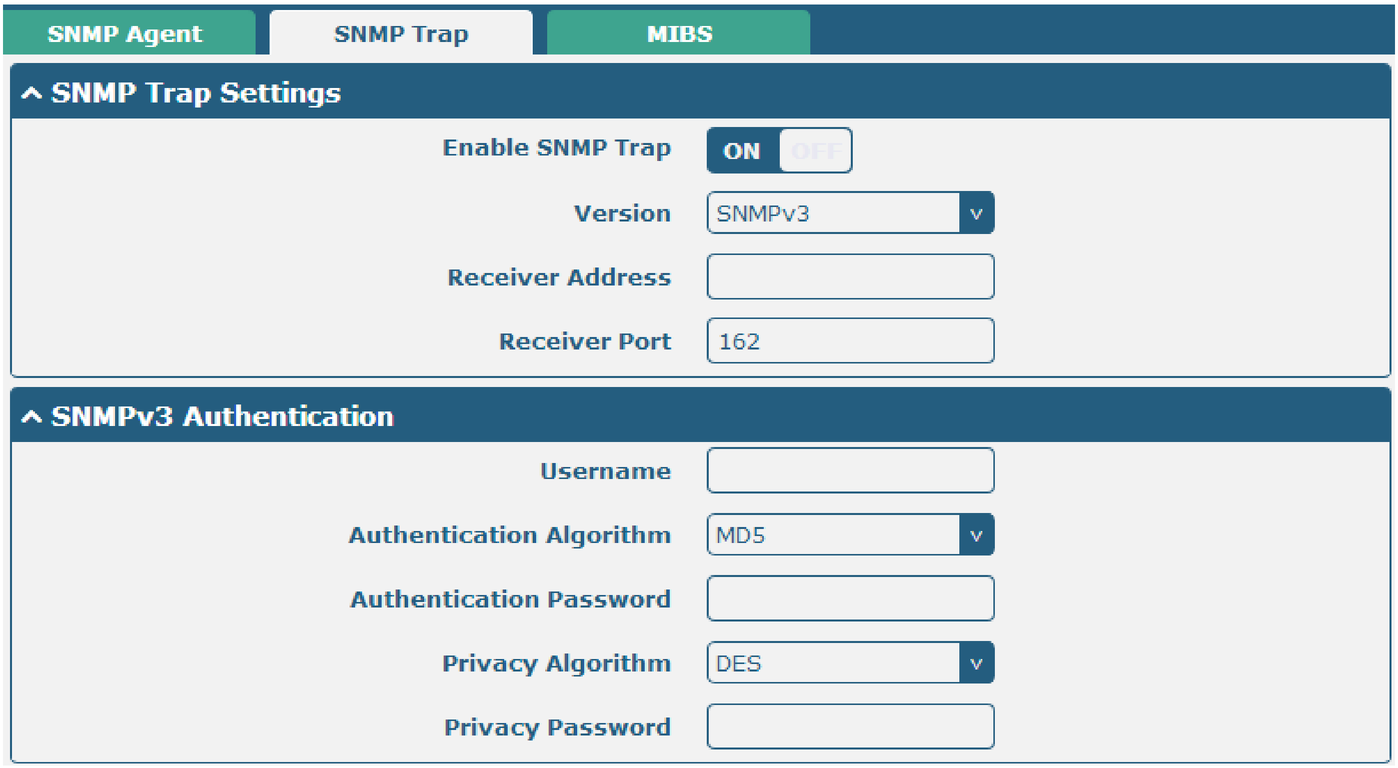
This function is as an APP which needs to install into R2000 in **System > APP Center** unit. We can download the MIB file directly from web interface. And then we can manage the R2000 router via SNMP tool with the MIB file.



Enable SNMP Agent: ON OFF
Port: 161
Version: SNMPv1/v2/v3
Location Info:
Contact Info:
System Name:
Readonly Community Name:
Readwrite Community Name:
Authentication Algorithm: MD5
Privacy Algorithm: DES

SNMP Agent @ SNMP		
Item	Description	Default
Enable SNMP Agent	Switch “ON” to enable SNMP Agent.	OFF
Port	UDP port for sending and receiving SNMP requests.	161
Version	Select from “SNMPv1”, “SNMPv2” and “SNMPv3”.	SNMPv3
Location Info	Enter the router’s location info which will send to NMS (Network Management System).	null
Contact Info	Enter the router’s contact info which will send to NMS	null
System name	Enter the router’s system name which will send to NMS.	null
Readonly Community Name	Enter the community name which was allowed only to get the status of router.	null
Readwrite Community Name	Enter the community name which was allowed to get the status and set the configuration of router.	null
Authentication Algorithm	Select from “MD5” or “SHA”. The authentication password default to be the login password of router. The Factory Default login password of router is “admin”. We can change the password in **System > User Management** section. The authentication password must be the same as privacy password on NMS.	MD5
Privacy Algorithm	Select from “DES” or “AES”. The privacy password default to be the login	DES

SNMP Agent @ SNMP		
Item	Description	Default
	password of router. The Factory Default login password of router is “admin”. We can change the password in **System > User Management** section. The privacy password must be the same as authentication password on NMS.	


SNMP Agent | SNMP Trap | MIBS

^ SNMP Trap Settings

Enable SNMP Trap [✓ ON] OFF

Version SNMPv3

Receiver Address

Receiver Port 162

^ SNMPv3 Authentication

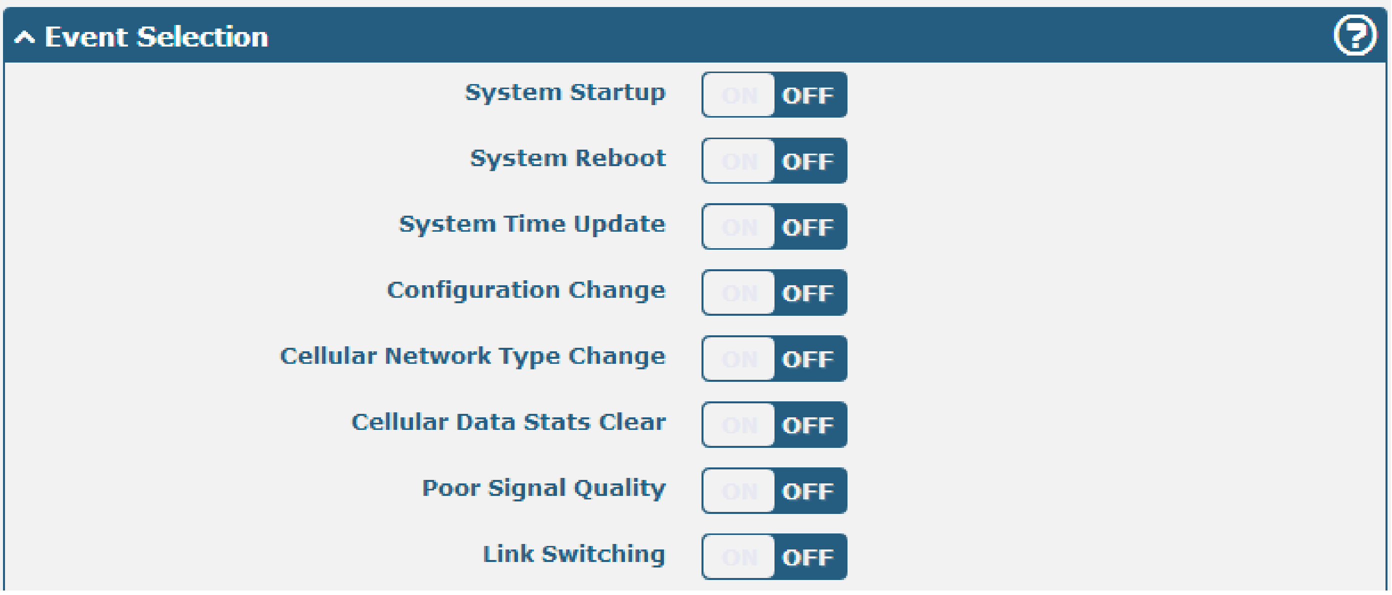
Username

Authentication Algorithm MD5

Authentication Password

Privacy Algorithm DES

Privacy Password


^ Event Selection

System Startup ON [✓ OFF]

System Reboot ON [✓ OFF]

System Time Update ON [✓ OFF]

Configuration Change ON [✓ OFF]

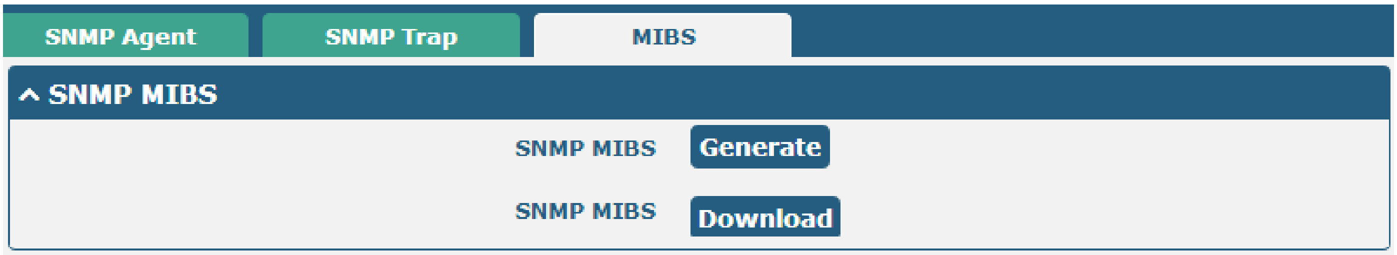
Cellular Network Type Change ON [✓ OFF]

Cellular Data Stats Clear ON [✓ OFF]

Poor Signal Quality ON [✓ OFF]

Link Switching ON [✓ OFF]

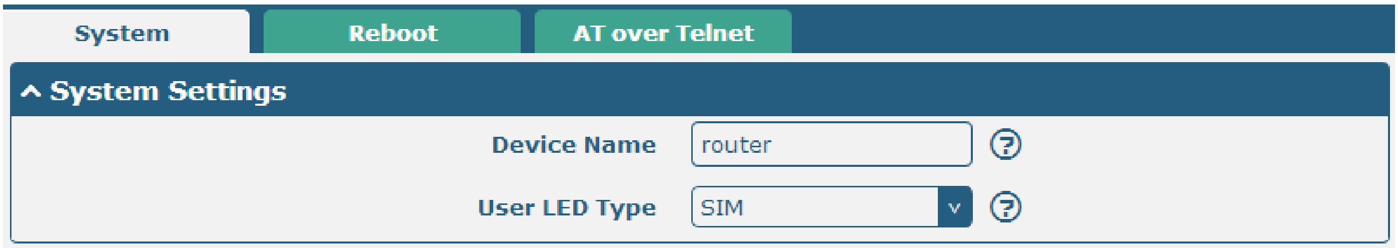
SNMP Trap		
Item	Description	Default
Enable SNMP Trap	Switch "ON" to enable SNMP Trap feature.	Disable
Version	Select from "SNMPv1", "SNMPv2" and "SNMPv3".	SNMPv2
Receiver Address	Enter NMS (Network Management System) IP address.	Null
Receiver Port	Enter NMS port number	0
SNMPv3 Authentication		
Username	Set the username for NMS to receive the SNMP trap.	null
Authentication Algorithm	Select from "MD5" or "SHA".	MD5
Authentication Password	Set the authentication password for NMS to receive the SNMP trap.	null
Privacy Algorithm	Select from "DES" or "AES".	DES
Privacy password	Set the privacy password for NMS to receive the SNMP trap.	null
Event Selection		
Switch "ON" to enable the event. When the enabled event occurs, router will sent the related SNMP trap to NMS.		



MIBS	
Item	Description
Generate	Click to generate the SNMP MIB file.
Download	Click to download the SNMP MIB file which is used to manage the R2000 router via SNMP tool.

3.26 Services > Advanced

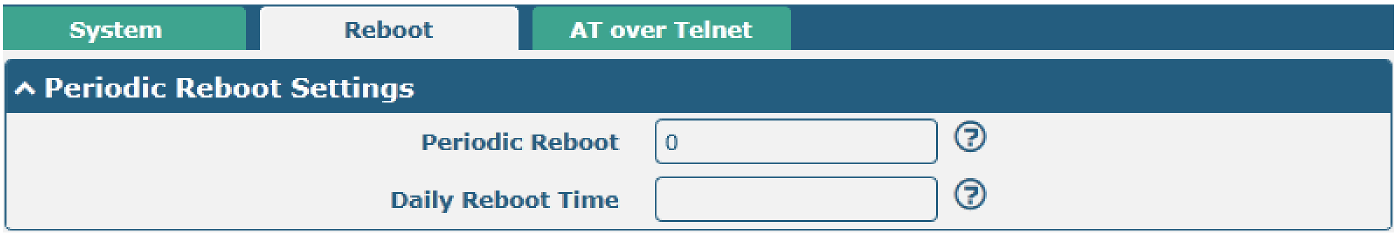
This section allows users to set the Advanced and parameters.



Device Name: router

User LED Type: SIM

System @ Advanced		
Item	Description	Default
Device Name	Set the device name to distinguish different devices you have installed. Valid characters: a-z, A-Z, 0-9, ., -.	router
User LED Type	Select from “None”, “SIM”, “NET”, “OpenVPN” and “IPSec”.	SIM

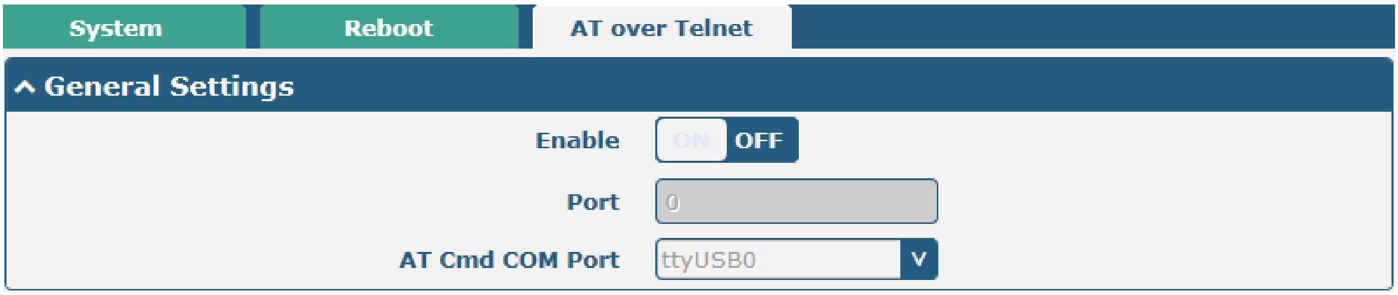


Periodic Reboot Settings

Periodic Reboot: 0

Daily Reboot Time:

Reboot		
Item	Description	Default
Periodic Reboot	Set the reboot period of the router, 0 means disable.	0
Daily Reboot Time	Set the daily reboot time of the router, you should follow the format as HH: MM, in 24h time frame, otherwise the data will be invalid. Leave it empty means disable.	Null



General Settings

Enable: ON OFF

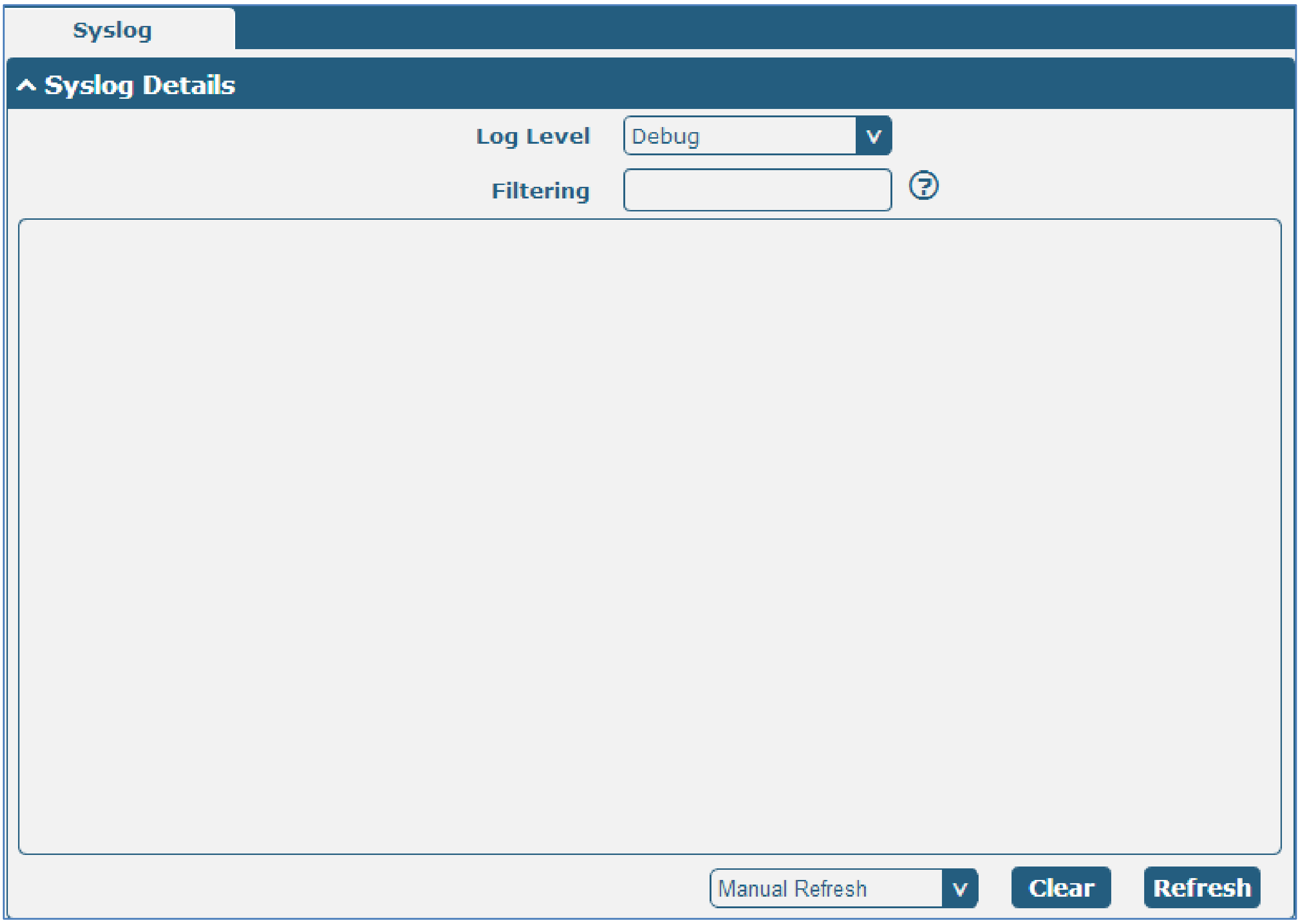
Port: 0

AT Cmd COM Port: ttyUSB0

AT over Telnet @ Advanced		
Item	Description	Default
Enable	Click to enable AT over Telnet function.	OFF
Port	Enter a specific port number to allow user sent AT command to this router over telnet.	0
AT Cmd COM Port	Select a COM port used for identifying the AT command.	ttyUSB0

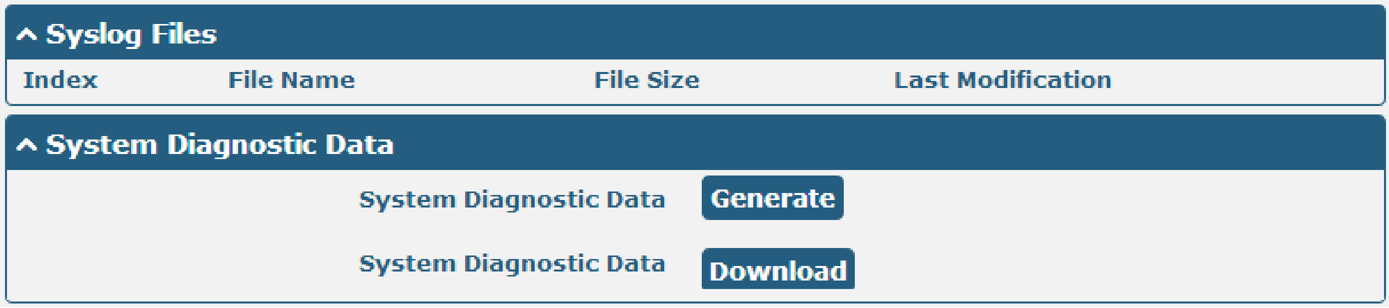
3.27 System > Debug

This section allow user to check and download the syslog details.



Log Level: Debug

Filtering:

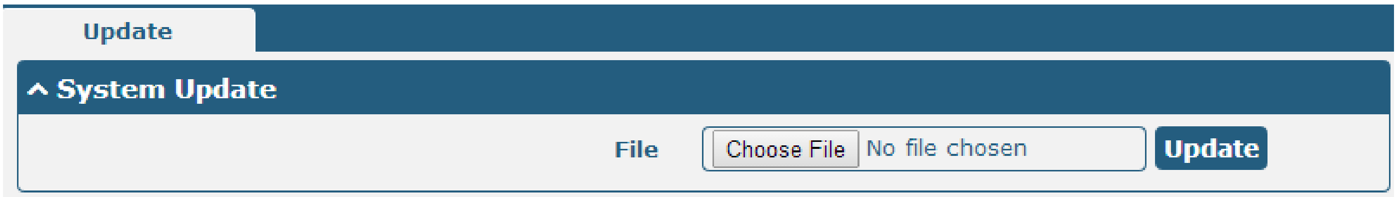


Index	File Name	File Size	Last Modification

Syslog Details @ Syslog		
Item	Description	Default
Log Level	Select form “Debug”, “Info”, “Notice”, “Warn”, “Error” which from low to high. The lower level will output more syslog in detail.	Debug
Filtering	Log will be filtered according to the Filter Message that the user set. Click the Refresh button, the filtered log will be displayed in the follow box. Use “&” to	Null

	separate more than one filter message, such as “keyword1&keyword2”.	
Refresh	Select from “Manual Refresh”, “5 Seconds”, “10 Seconds”, “20 Seconds”and“30 Seconds”. User can select these intervals to refresh the log information displayed in the follow box. Select “manual refresh”, user should click the refresh button to refresh the syslog.	Manual Refresh
Syslog Files List @ Syslog		
Syslog Files List	It can show at most 5 syslog files in the list, the files’ name range from message0 to message 4. And the newest syslog file will be placed on the top of the list.	/
System Diagnosing Data @ Syslog		
Generate	Click to generate the syslog diagnosing file.	/
Download	Click to download system diagnosing file.	/

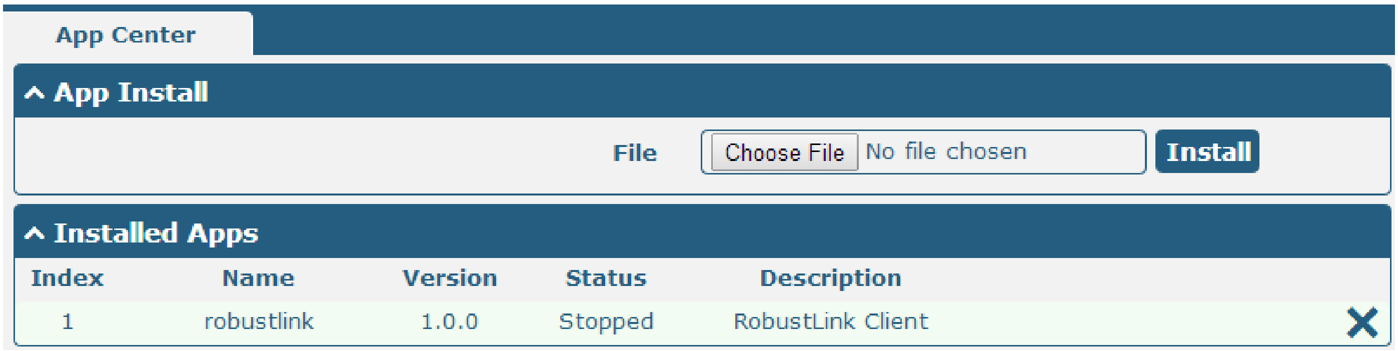
3.28 System > Update



Update		
Item	Description	Default
System Update	Click “Browse” button to select the correct firmware in your PC, and then click “Update” button to update. After updating successfully, you need to click “save and apply”, and then reboot the router to take effect.	Null

3.29 System > APP Center

This section allow user to add a new function to R2000 router. And the new function will be in the form of an APP file which could be installed in R2000 router. In general, the App which had installed will display in **Service** section.

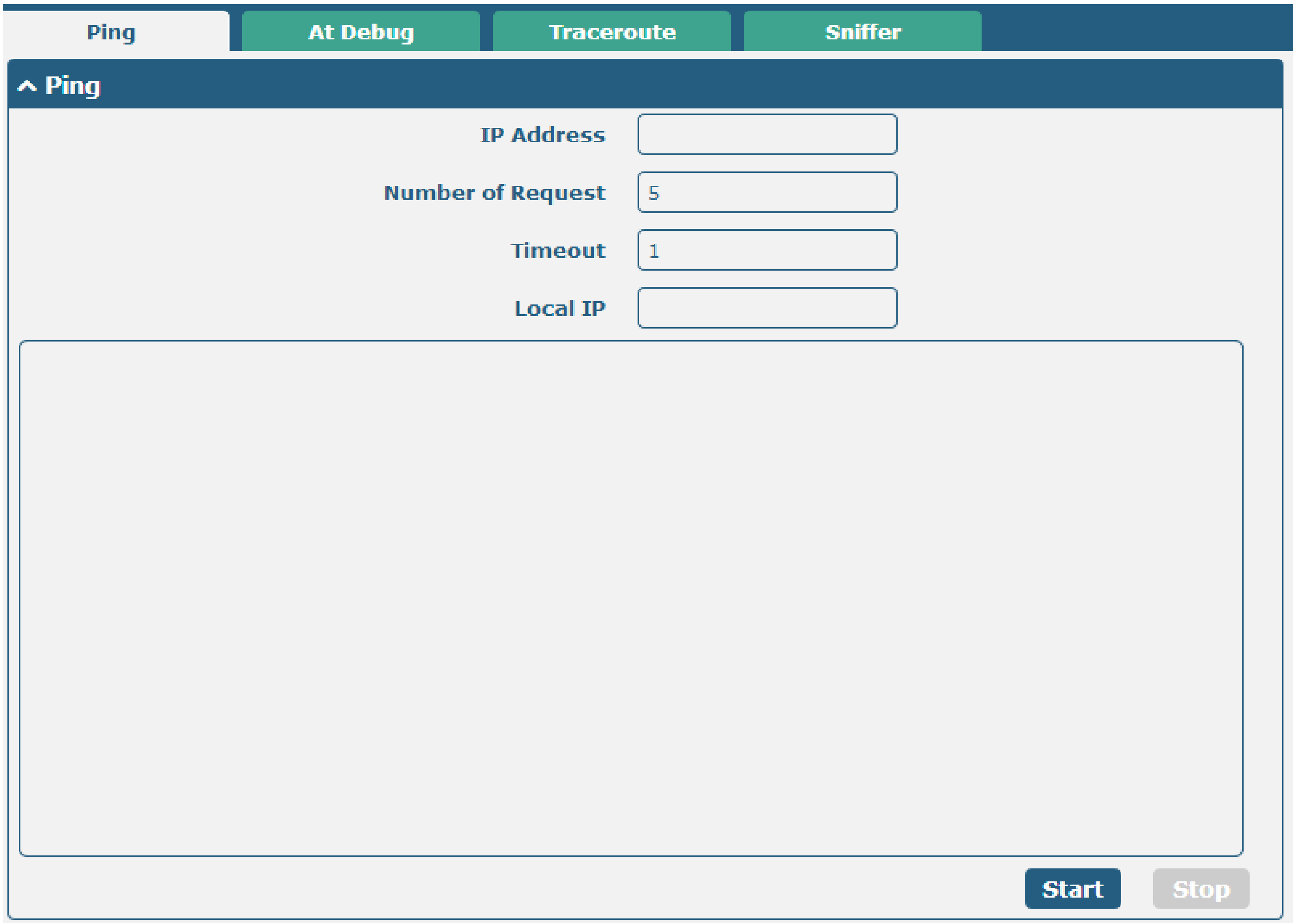


Index	Name	Version	Status	Description
1	robustlink	1.0.0	Stopped	RobustLink Client

App Center		
Item	Description	Default
File	Choose the correct App file from your PC, and click Install button to import to R2000 router. File format: xxx.rpk, e.g. R2000-robustlink-1.0.0.rpk.	/
Install Apps	Those Apps which had installed in R2000 will be listed in **Installed Apps**.	Null
Index	Show the index of the App.	Null
Name	Show the name of the App.	Null
Version	Show the version of the App.	Null
Status	Show the Status of the App.	Null
Description	Show the description of the App.	Null

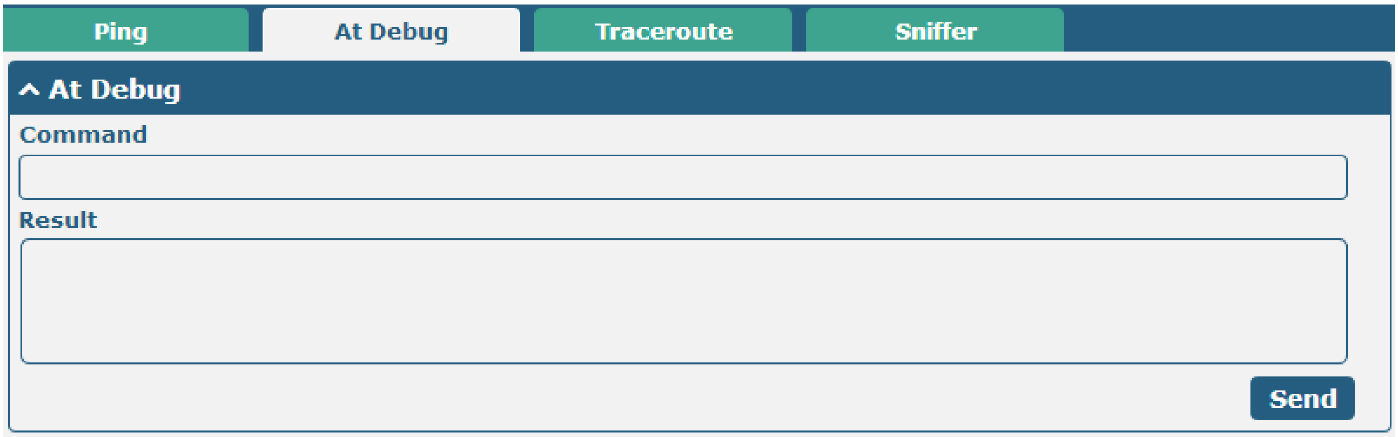
3.30 System > Tools

This section provides users three tools: Ping, Traceroute and Sniffer.

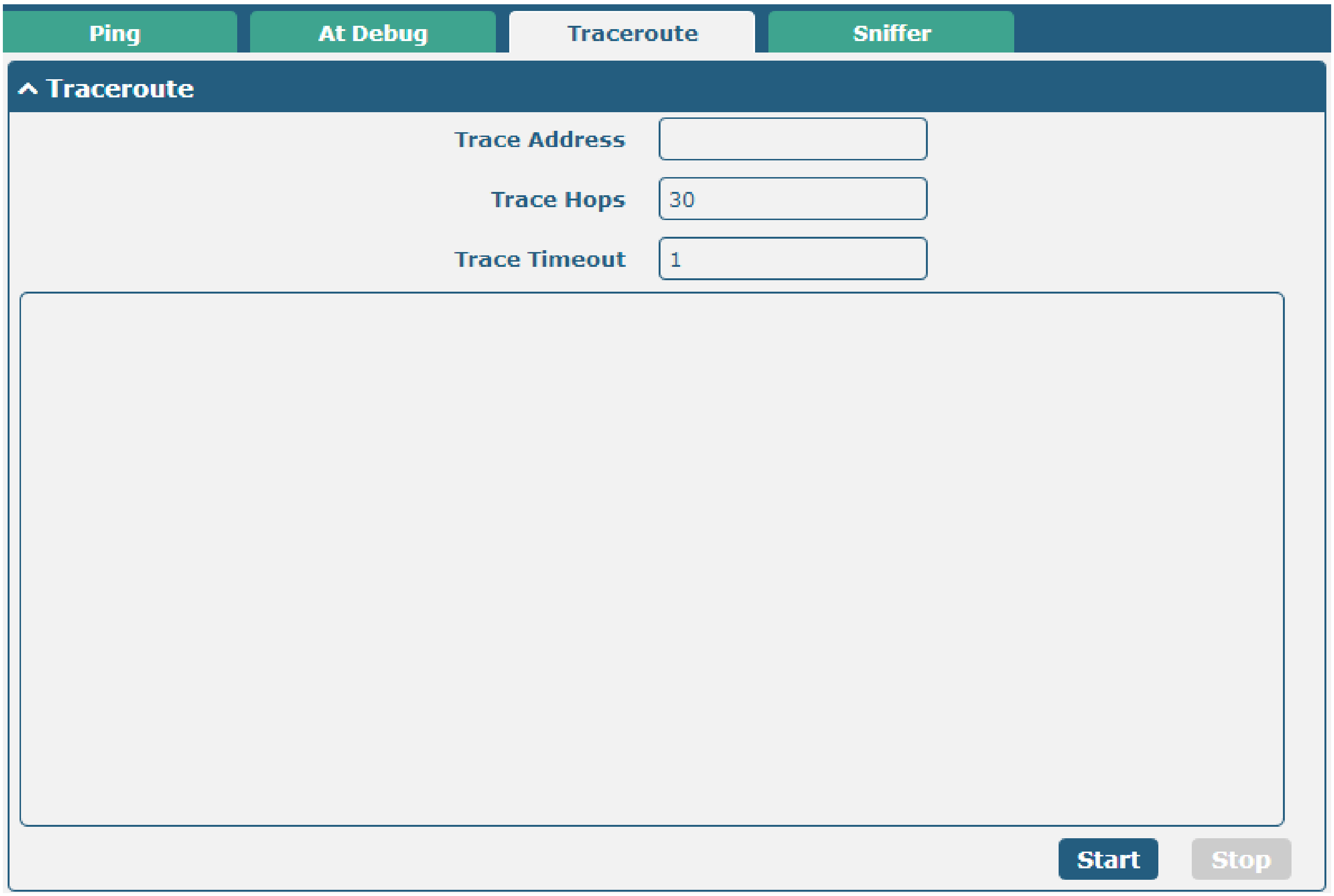


IP Address	
Number of Request	5
Timeout	1
Local IP	

Ping @ Tools		
Item	Description	Default
IP address	Enter the ping destination IP address or domain name.	Null
Number of requests	Specify the number of ping requests.	5
Timeout	Specify timeout of ping request.	1
Local IP	Specify the local IP from cellular WAN, Ethernet WAN or Ethernet LAN. Null stands for selecting local IP address from these three automatically.	Null
Start	Click this button to start ping request, and the log will be displayed in the follow box.	Null
Stop	Click this button to stop ping request.	



At Debug @ Tools	
Item	Description
Command	Enter a At command in Command box, then click Send button to send the At command to the cellular module.
Result	It will display the AT commands which respond from the cellular module in this box.

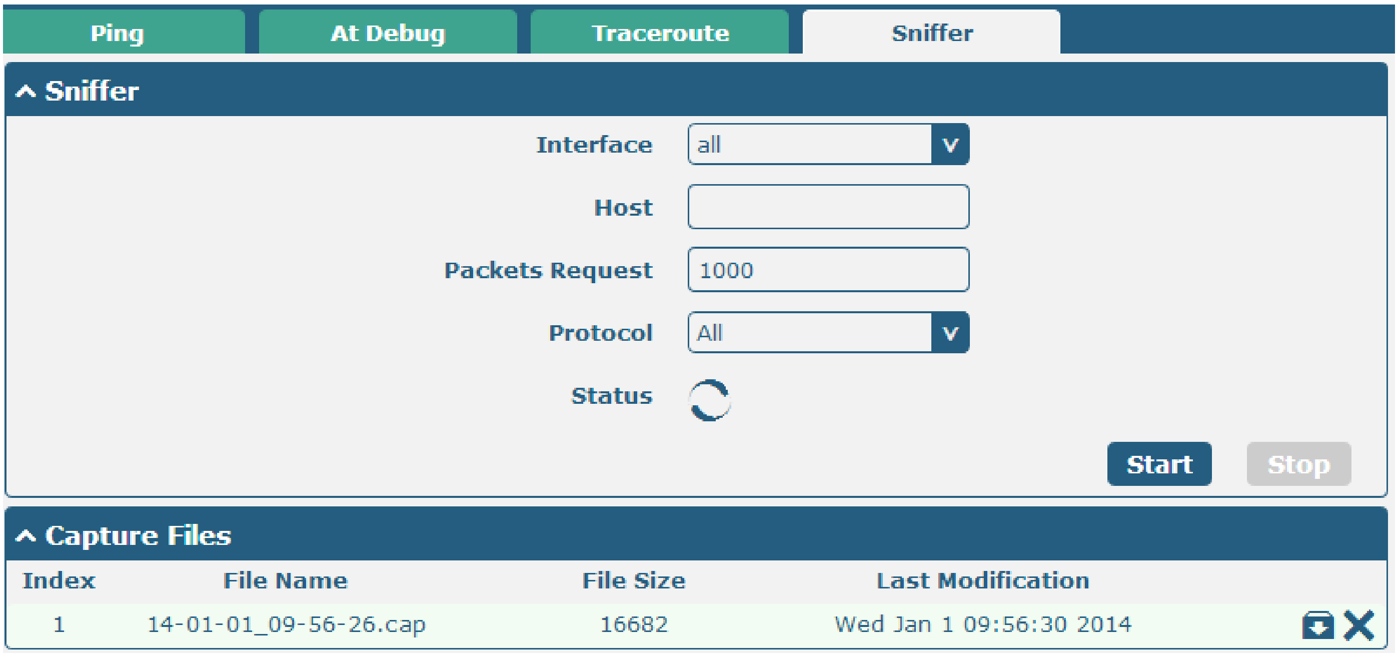


Trace Address

Trace Hops 30

Trace Timeout 1

Traceroute @ Tools		
Item	Description	Default
Trace Address	Enter the trace destination IP address or domain name.	Null
Trace Hops	Specify the max trace hops. Router will stop tracing if the trace hops has met max value no matter the destination has been reached or not.	30
Trace Timeout	Specify timeout of Traceroute request.	1
Start	Click this button to start Traceroute request, and the log will be displayed in the follow box.	
Stop	Click this button to stop Traceroute request	



^ Sniffer

Interface: all

Host:

Packets Request: 1000

Protocol: All

Status

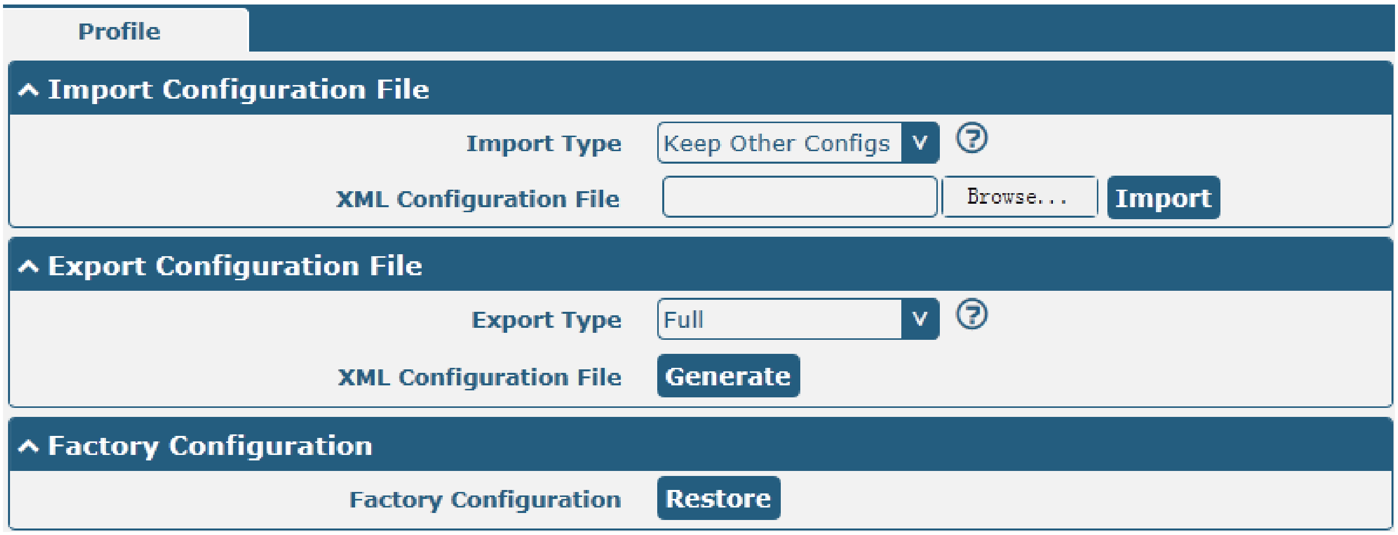
^ Capture Files

Index	File Name	File Size	Last Modification
1	14-01-01_09-56-26.cap	16682	Wed Jan 1 09:56:30 2014

Sniffer @ Tools		
Item	Description	Default
Interface	Select form “All”, “ETH1”, and “ETH2”: All: contain all the interface; ETH1: Ethernet interface1; ETH2: Cellular WAN.	All
Host	Filter the packet that contain the specify IP address.	Null
Packets Request	Set the packet number that the router can sniffer at a time.	1000
Protocol	Select from “All”, “IP”, “TCP”, “UDP” and “ARP”.	All
Port	Set the port number for TCP or UDP that is used in sniffer.	Null
Status	Show the current status of sniffer.	Null
Start	Click this button to start the sniffer.	/
Stop	Click this button to stop the sniffer. Once click the stop button, a new log file will be displayed in the follow List.	/
Capture Files	Every times of sniffer log will be saved automatically as a new file. You can find the file from this Sniffer Traffic Data List and click ⤓ to download the log, click ✕ to delete the log file. It can cache a maximum of 5 files.	Null

3.31 System > Profile

This section allows users to import or export the configuration file, and restore the router to factory default setting.



Profile

Import Configuration File

Import Type: Keep Other Configs

XML Configuration File

Export Configuration File

Export Type: Full

XML Configuration File

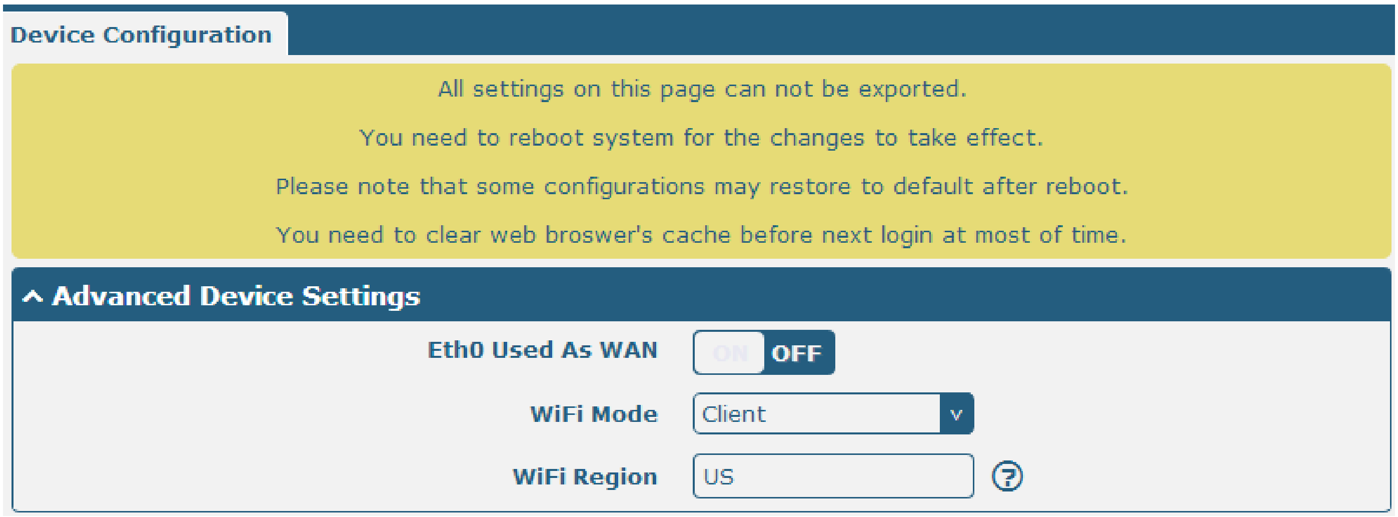
Factory Configuration

Factory Configuration

Import Configuration File @ Profile		
Import Type	Define what to do about the configs that is not contained in the imported file. There are two Import Types: Keep Other Configs: Keep other configuration unchanged when import XML configuration file. Set Others To Default: Set other configuration to factory default when import XML configuration file.	Keep Other Configs
XML Configuration File	Click "Browse" to select the XML file in your computer, and then click "Import" to import this file into your router.	
Export Configuration File @ Profile		
Export Type	There are four export Types : Essential: export the configuration file that only include enabled features. Essential && Detailed: export the configuration file that only include enabled features, and attach extra information such as **range** and **default** setting of those enable config option. Full: export the configuration file of all features; include both the enabled and disabled features. Full && Detailed: export the configuration file of all features, and attach extra information such as **range** and **default** setting of every config option.	Full
Export	Click "Export" and the configuration will be showed in the new popup browser window, then you can save it as a XML file.	
Factory Configuration @ Profile		
Restore	Click the "Restore" button to restore the router to factory default setting.	

3.32 System > Device Configuration

Enable or disable the WAN interface.



All settings on this page can not be exported.

You need to reboot system for the changes to take effect.

Please note that some configurations may restore to default after reboot.

You need to clear web broswer's cache before next login at most of time.

Eth0 Used As WAN: ON OFF

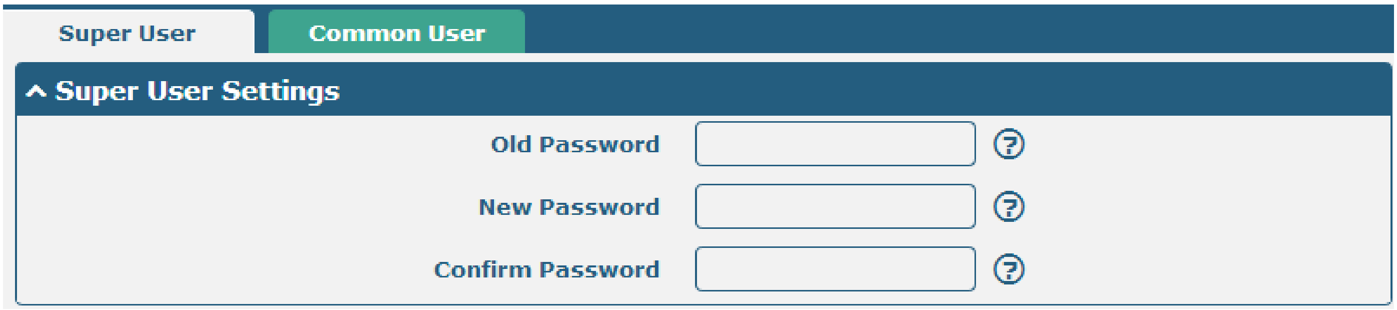
WiFi Mode: Client

WiFi Region: US

Advanced Device Settings		
Item	Description	Default
eth0 Used As WAN	Switch button to ON to configure eth0 as WAN interface. Switch button to OFF, it will disable the WAN interface, eth0 will recovery to be LAN interface.	OFF
Wi-Fi Mode	Select from "Client" and "AP". Wi-Fi AP: When enable the Wi-Fi AP mode, R2000 could be accessed by the specified Clients. Please go to Interface > Wi-Fi to configure the parameter of Wi-Fi AP. Wi-Fi Client: When enable the Wi-Fi Client mode, R2000 can access the specified Wi-Fi AP. Please go to Interface > WLAN to configure the parameter of Wi-Fi Client.	Client
Wi-Fi Region	Specify a two-letter country code which defined in ISO 3166-1 alpha-2 standard.	US

3.33 System > User Management

This section allows users to modify or add management user accounts.

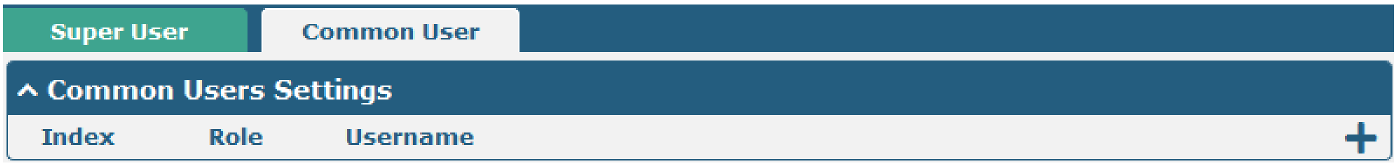


Old Password

New Password

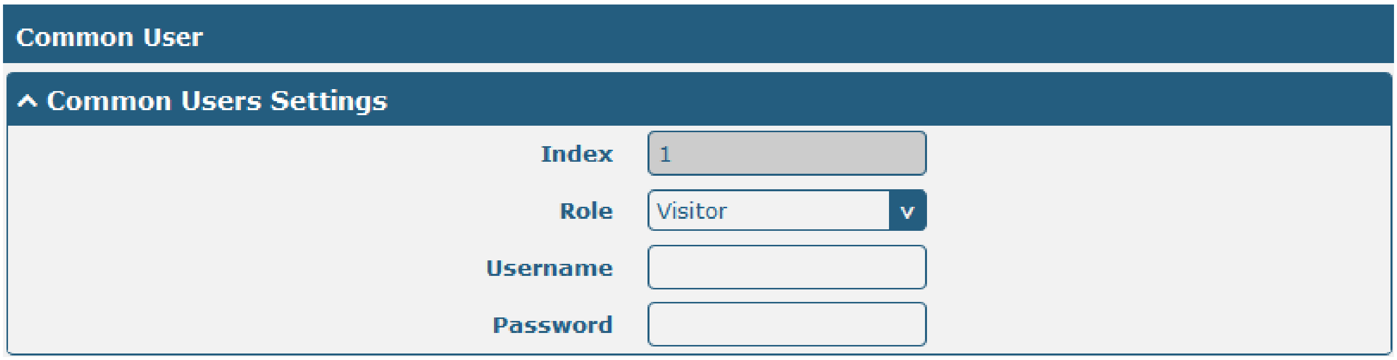
Confirm Password

Super User		
Item	Description	Default
Super User	One router has only one super user account. Under this account, user has the highest authority include modify, add and manage those user accounts.	/
Old Password	The old password of super user which default is “admin”, valid characters: a-z, A-Z, 0-9, @, ., -, #, $, *.	Null
New Password	Enter a new password for the super user, valid characters: a-z, A-Z, 0-9, @, ., -, #, $, *.	Null
Confirm Password	Enter the new password again which had added in New Password item.	Null



Click the “+” button to add a new common user.

***Note**: One router has 5 common user accounts at most.*



Index	1
Role	Visitor
Username	
Password	

Common User		
Item	Description	Default
Role	Select from “Visitor” and “Editor”. Visitor: Users only can view the configuration of router under this level; Editor: Users can view and set the configuration of router under this level.	Visitor
Username	Set the Username. Valid characters: a-z, A-Z, 0-9, ., -.	Null
Password	Set the password which at least contains 5 characters. Valid characters: a-z, A-Z, 0-9, @, ., -, #, $, *.	Null

Chapter 4 Configuration Examples

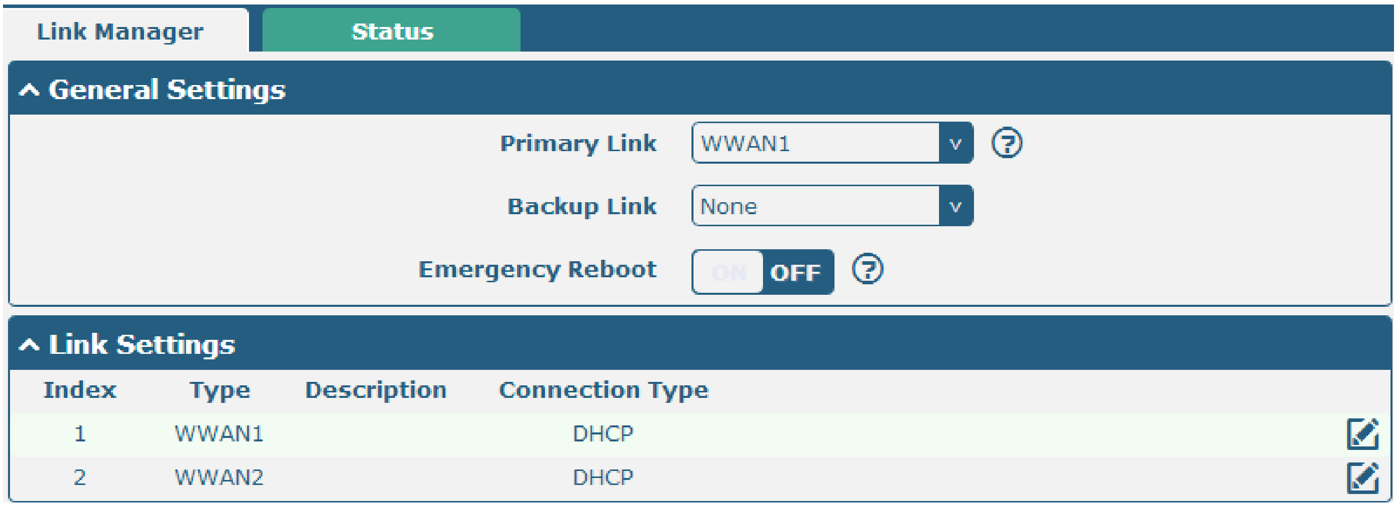
4.1 Cellular

4.1.1 Cellular Dial-Up

This section shows users how to configure the primary and backup SIM card of Cellular Dial-up.

Interface- > Link Manager > General Setting

Select WWAN1 as Primary Link.



Link Manager | Status

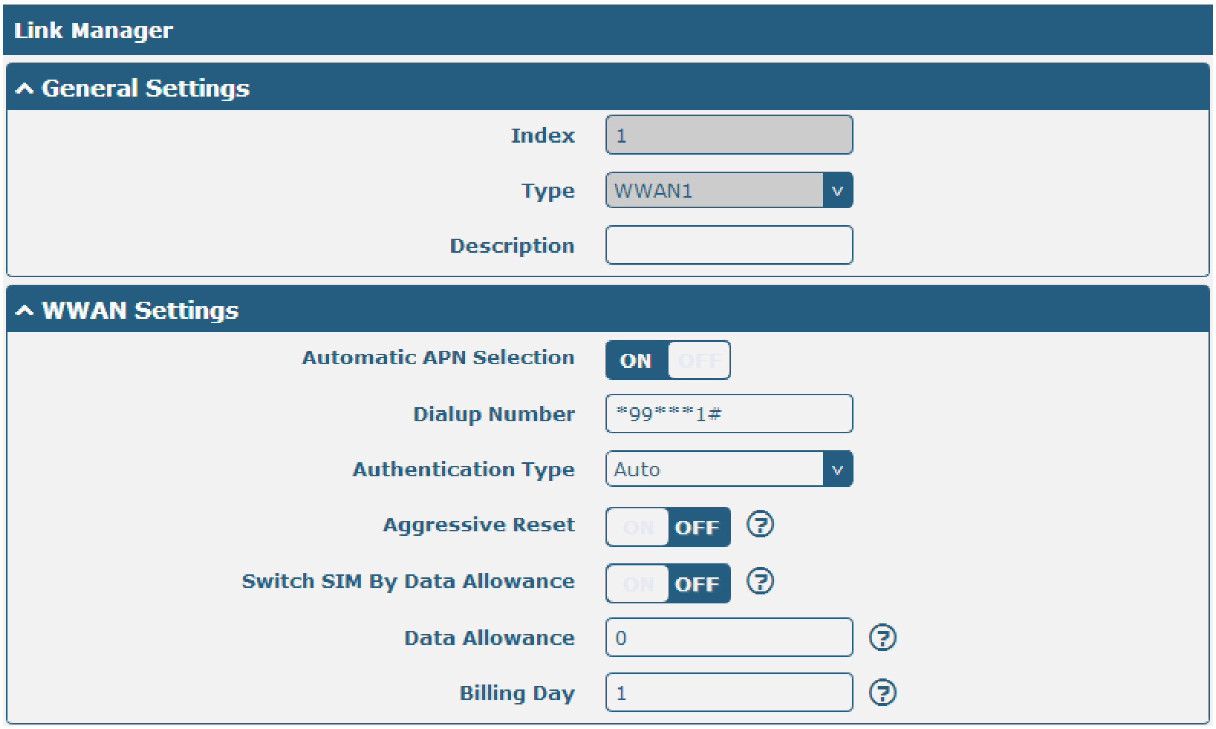
General Settings

Primary Link	WWAN1
Backup Link	None
Emergency Reboot	OFF

Link Settings

Index	Type	Description	Connection Type
1	WWAN1		DHCP
2	WWAN2		DHCP

Click ✎ to set the WWAN1's parameter according to the current ISP.



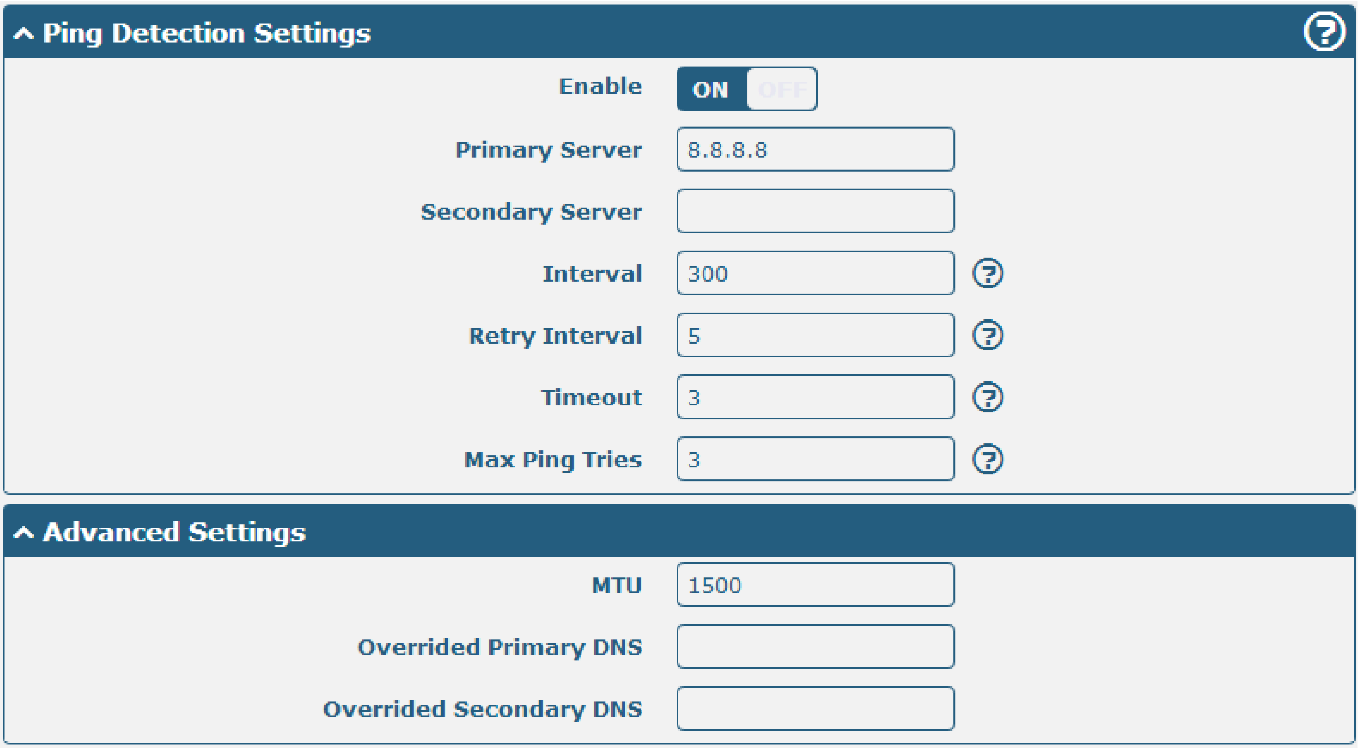
Link Manager

General Settings

Index	1
Type	WWAN1
Description	

WWAN Settings

Automatic APN Selection	ON
Dialup Number	*99***1#
Authentication Type	Auto
Aggressive Reset	OFF
Switch SIM By Data Allowance	OFF
Data Allowance	0
Billing Day	1



^ Ping Detection Settings

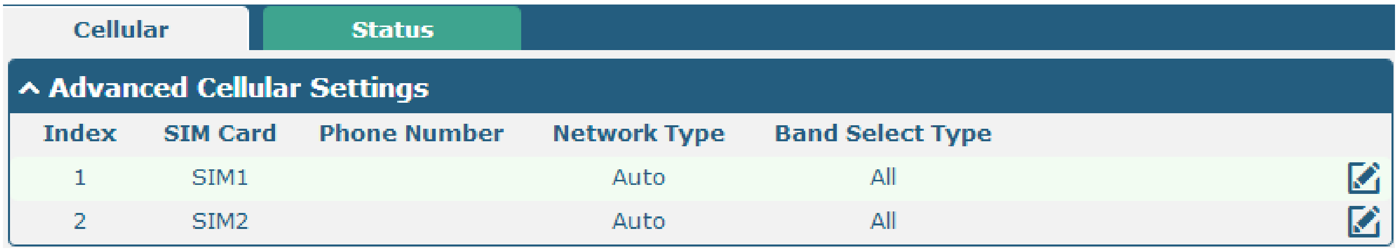
Enable	ON / OFF
Primary Server	8.8.8.8
Secondary Server	
Interval	300
Retry Interval	5
Timeout	3
Max Ping Tries	3

^ Advanced Settings

MTU	1500
Overrided Primary DNS	
Overrided Secondary DNS	

The modifications will take effect after click “Submit” and “save and apply” button.

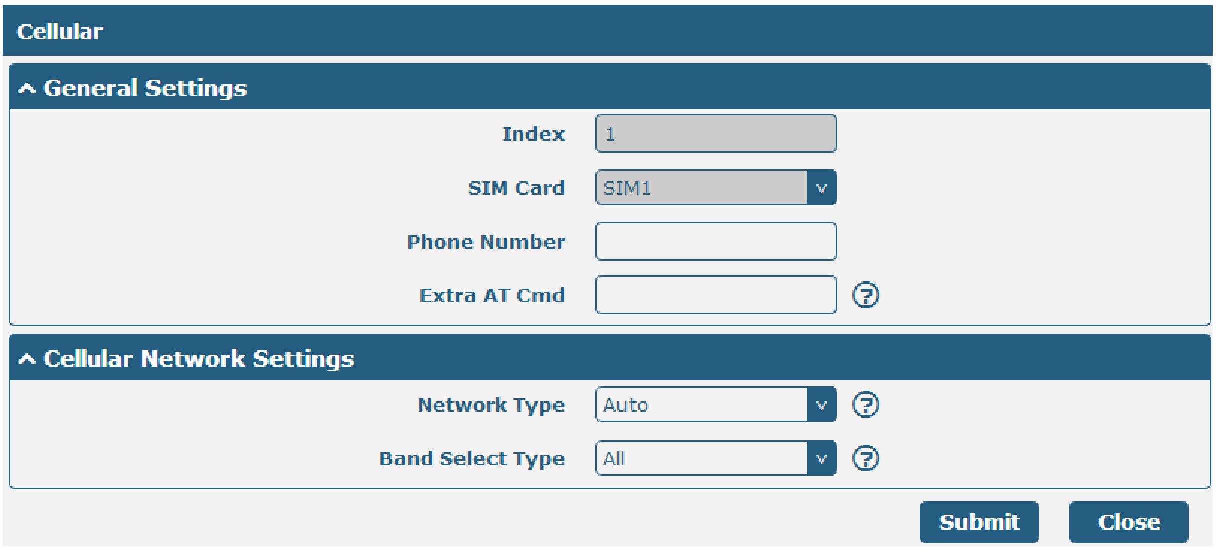
Interface- > Cellular



^ Advanced Cellular Settings

Index	SIM Card	Phone Number	Network Type	Band Select Type
1	SIM1		Auto	All
2	SIM2		Auto	All

Click ✎ to set the SIM card’s parameter according to the application requirement.



Cellular

^ General Settings

Index	1
SIM Card	SIM1
Phone Number	
Extra AT Cmd	

^ Cellular Network Settings

Network Type	Auto
Band Select Type	All

The modifications will take effect after click “Submit” and “save and apply” button.

4.1.2 SMS Remote Control

R2000 supports remote control via SMS. User can use following commands to get the status of R2000, and set all the parameters of R2000.

There are three authentication types for SMS control. You can select from “Password”, “Phonenum” and “Both”.

An SMS command has following structure:

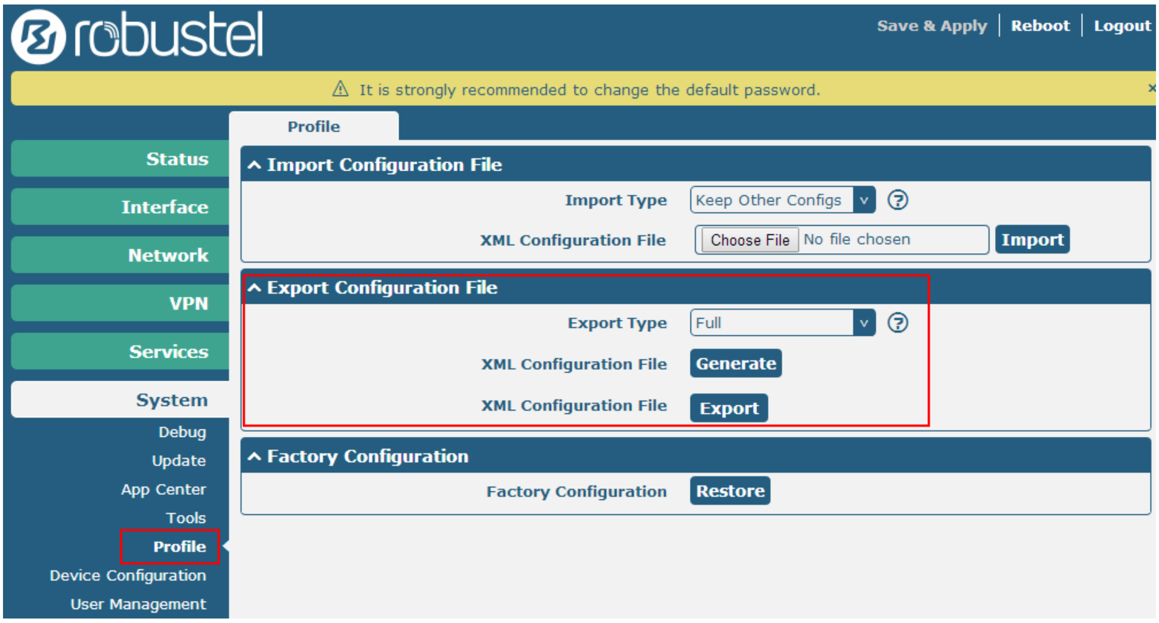
1. Password mode—Username: Password;cmd1;cmd2;cmd3; …cmdn (available every phone number).
2. Phonenum mode--cmd1; cmd2; cmd3; … cmdn (available when the SMS was sent from the phone number which had been added in R2000’s phone group).
3. Both mode-- Username: Password;cmd1;cmd2;cmd3; …cmdn (available when the SMS was sent from the phone number which had been added in R2000’s phone group).

SMS command Explanation:

1. User name and Password: it uses the same username and password as WEB manager for authentication.
2. cmd1, cmd2, cmd3 to Cmdn, the command format is the same as the CLI command, more details about CLI cmd please refer to **chapter 5 Introductions for CLI**.

Note: Download the configure XML file from the configured web browser. The format of SMS control command can refer to the data of the XML file.

*Go to System > Profile > Export Configuration File, select Export type as **Full**, click* Generate to generate the XML file and then click Export to export the XML file.



^ Import Configuration File

Import Type: Keep Other Configs

XML Configuration File: Choose File No file chosen

^ Export Configuration File

Export Type: Full

XML Configuration File: Generate

XML Configuration File: Export

^ Factory Configuration

Factory Configuration: Restore

XML command:

```
<lan>
<network max_entry_num="2">
<id>1</id>
<interface>lan0</interface>
<ip>172.16.99.11</ip>
```

```
<netmask>255.255.0.0</netmask>
<mtu>1500</mtu>
```

SMS cmd:

set lan network 1 interface lan0
set lan network 1 ip 172.16.99.11
set lan network 1 netmask 255.255.0.0
set lan network 1 mtu 1500

3. The semicolon character (';') is used to separate more than one commands packed in a single SMS.
4. E.g.

admin:admin;status system

In this command, username is admin, password is admin, and the function of the command is getting the system status.

SMS received:

hardware_version = 1.0
firmware_version = "1.2.2 (Rev 399)"
kernel_version = 3.10.49
device_model = R2000
serial_number = 15090140040008
uptime = "0 days, 00:04:07"
system_time = "Tue Dec 22 15:02:36 2015"

admin:admin;reboot

In this command, username is admin, password is admin, and the command is reboot R2000.

SMS received:

OK

admin:admin;set firewall remote_ssh_access false;set firewall remote_telnet_access false

In this command, username is admin, password is admin, and the function of the command is disabling the remote_ssh and remote_telnet access.

SMS received:

OK
OK

admin:admin; set lan network 1 interface lan0;set lan network 1 ip 172.16.99.11;set lan network 1 netmask 255.255.0.0;set lan network 1 mtu 1500

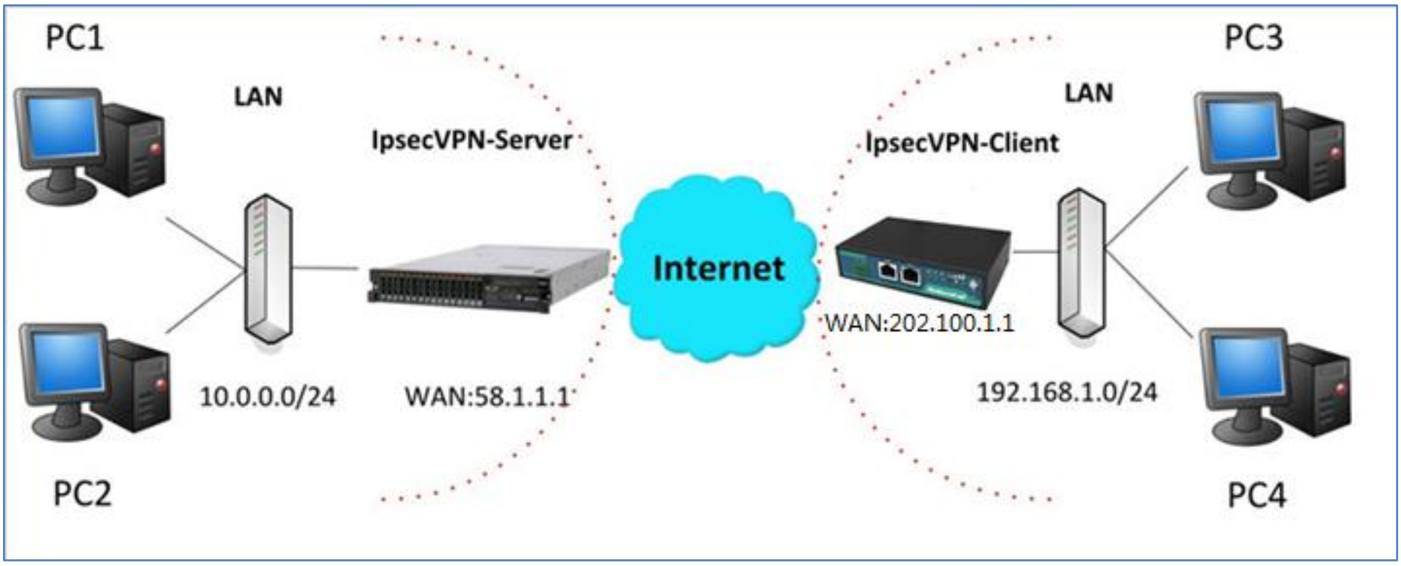
In this command, username is admin, password is admin, and the function of those commands is configuring the LAN parameter.

SMS received:

OK
OK
OK
OK

4.2 Network

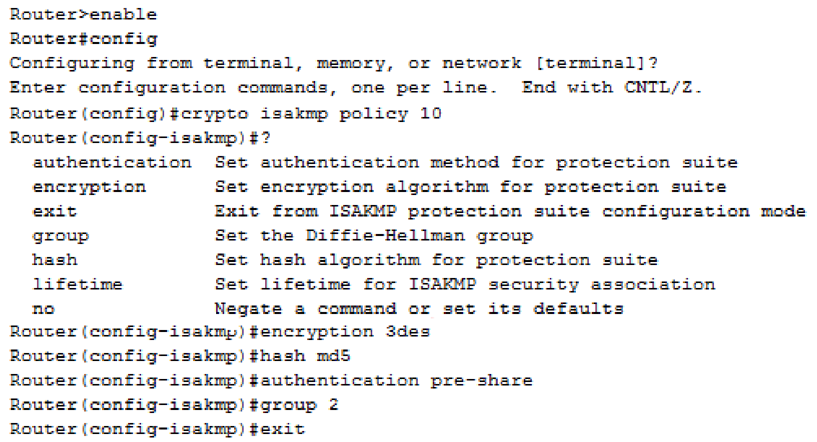
4.2.1 IPSEC VPN



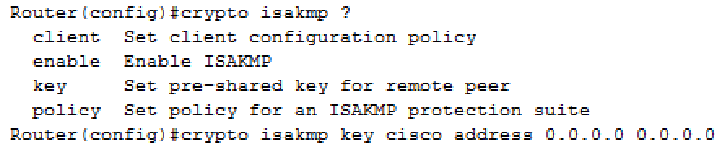
Note: *the configuration of server and client is as follows.*

IPSecVPN_SERVER:

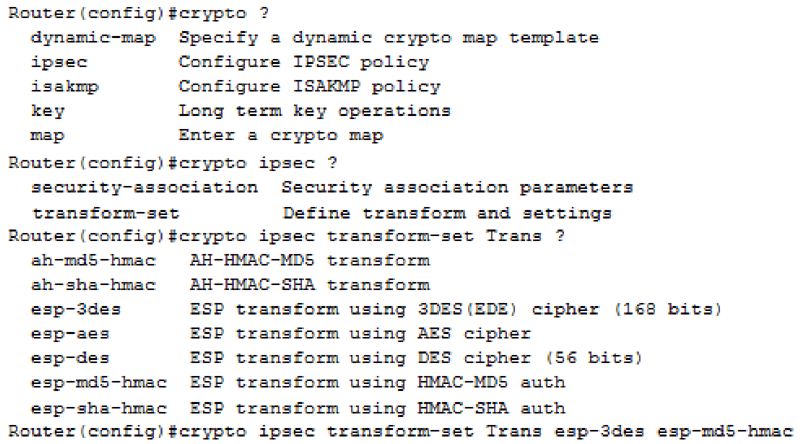
Cisco 2811:



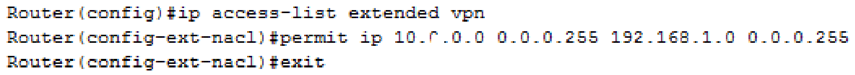
```
Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#crypto isakmp policy 10
Router(config-isakmp)#?
  authentication  Set authentication method for protection suite
  encryption      Set encryption algorithm for protection suite
  exit            Exit from ISAKMP protection suite configuration mode
  group           Set the Diffie-Hellman group
  hash            Set hash algorithm for protection suite
  lifetime        Set lifetime for ISAKMP security association
  no              Negate a command or set its defaults
Router(config-isakmp)#encryption 3des
Router(config-isakmp)#hash md5
Router(config-isakmp)#authentication pre-share
Router(config-isakmp)#group 2
Router(config-isakmp)#exit
```



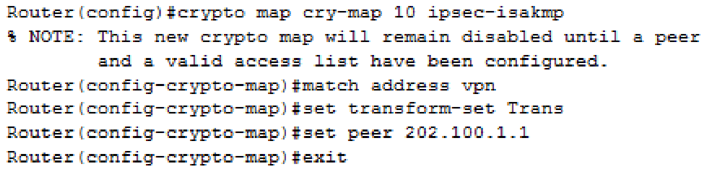
```
Router(config)#crypto isakmp ?
  client  Set client configuration policy
  enable  Enable ISAKMP
  key     Set pre-shared key for remote peer
  policy  Set policy for an ISAKMP protection suite
Router(config)#crypto isakmp key cisco address 0.0.0.0 0.0.0.0
```



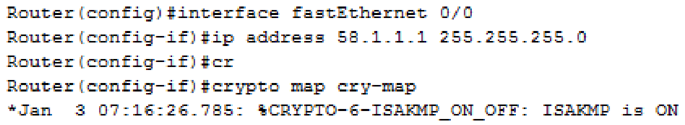
```
Router(config)#crypto ?
  dynamic-map  Specify a dynamic crypto map template
  ipsec        Configure IPSEC policy
  isakmp       Configure ISAKMP policy
  key          Long term key operations
  map          Enter a crypto map
Router(config)#crypto ipsec ?
  security-association  Security association parameters
  transform-set         Define transform and settings
Router(config)#crypto ipsec transform-set Trans ?
  ah-md5-hmac   AH-HMAC-MD5 transform
  ah-sha-hmac   AH-HMAC-SHA transform
  esp-3des      ESP transform using 3DES(EDE) cipher (168 bits)
  esp-aes       ESP transform using AES cipher
  esp-des       ESP transform using DES cipher (56 bits)
  esp-md5-hmac  ESP transform using HMAC-MD5 auth
  esp-sha-hmac  ESP transform using HMAC-SHA auth
Router(config)#crypto ipsec transform-set Trans esp-3des esp-md5-hmac
```



```
Router(config)#ip access-list extended vpn
Router(config-ext-nacl)#permit ip 10.0.0.0 0.0.0.255 192.168.1.0 0.0.0.255
Router(config-ext-nacl)#exit
```



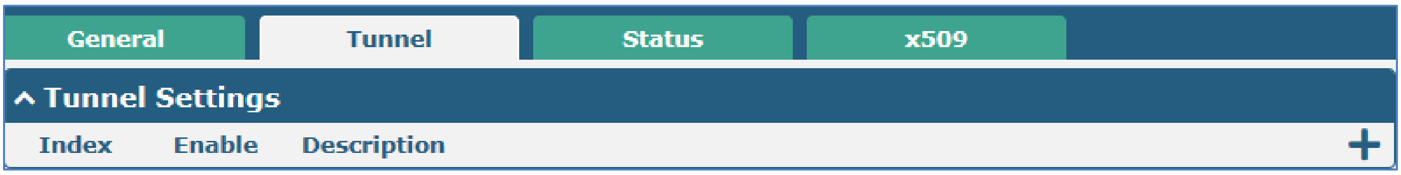
```
Router(config)#crypto map cry-map 10 ipsec-isakmp
% NOTE: This new crypto map will remain disabled until a peer
        and a valid access list have been configured.
Router(config-crypto-map)#match address vpn
Router(config-crypto-map)#set transform-set Trans
Router(config-crypto-map)#set peer 202.100.1.1
Router(config-crypto-map)#exit
```



```
Router(config)#interface fastEthernet 0/0
Router(config-if)#ip address 58.1.1.1 255.255.255.0
Router(config-if)#cr
Router(config-if)#crypto map cry-map
*Jan  3 07:16:26.785: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is ON
```

IPSecVPN_CLIENT:

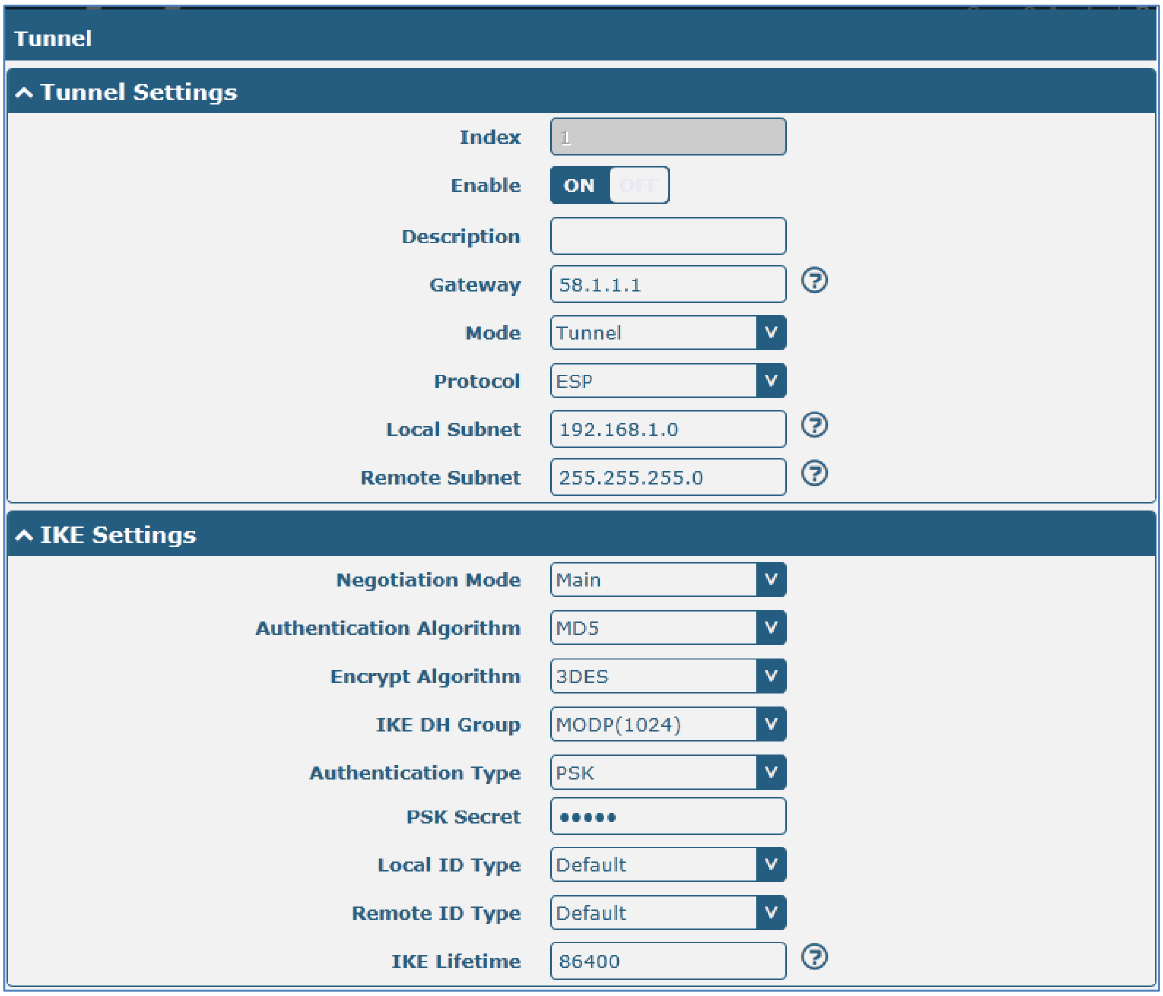
VPN-- > IPSec-- > Tunnel



^ Tunnel Settings

Index	Enable	Description

Then click “+”.

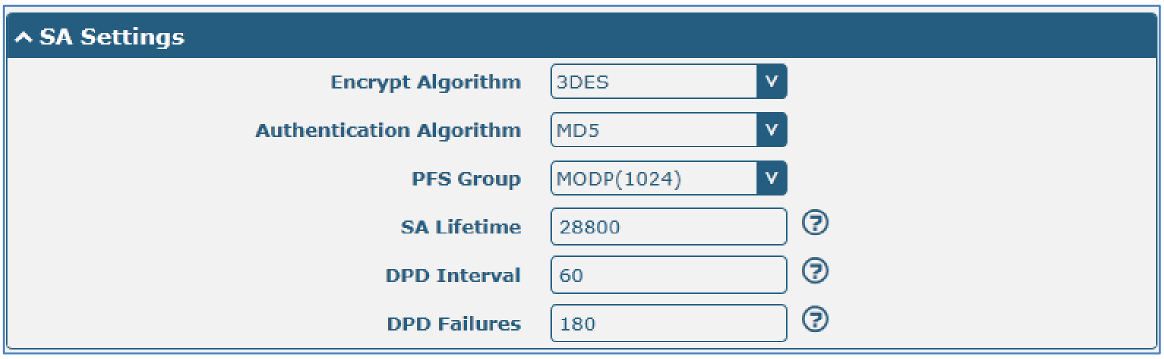

Tunnel

^ Tunnel Settings

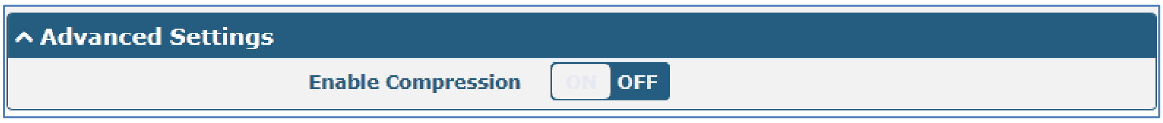
Index	1
Enable	ON OFF
Description	
Gateway	58.1.1.1
Mode	Tunnel
Protocol	ESP
Local Subnet	192.168.1.0
Remote Subnet	255.255.255.0

^ IKE Settings

Negotiation Mode	Main
Authentication Algorithm	MD5
Encrypt Algorithm	3DES
IKE DH Group	MODP(1024)
Authentication Type	PSK
PSK Secret	●●●●●
Local ID Type	Default
Remote ID Type	Default
IKE Lifetime	86400


^ SA Settings

Encrypt Algorithm	3DES
Authentication Algorithm	MD5
PFS Group	MODP(1024)
SA Lifetime	28800
DPD Interval	60
DPD Failures	180

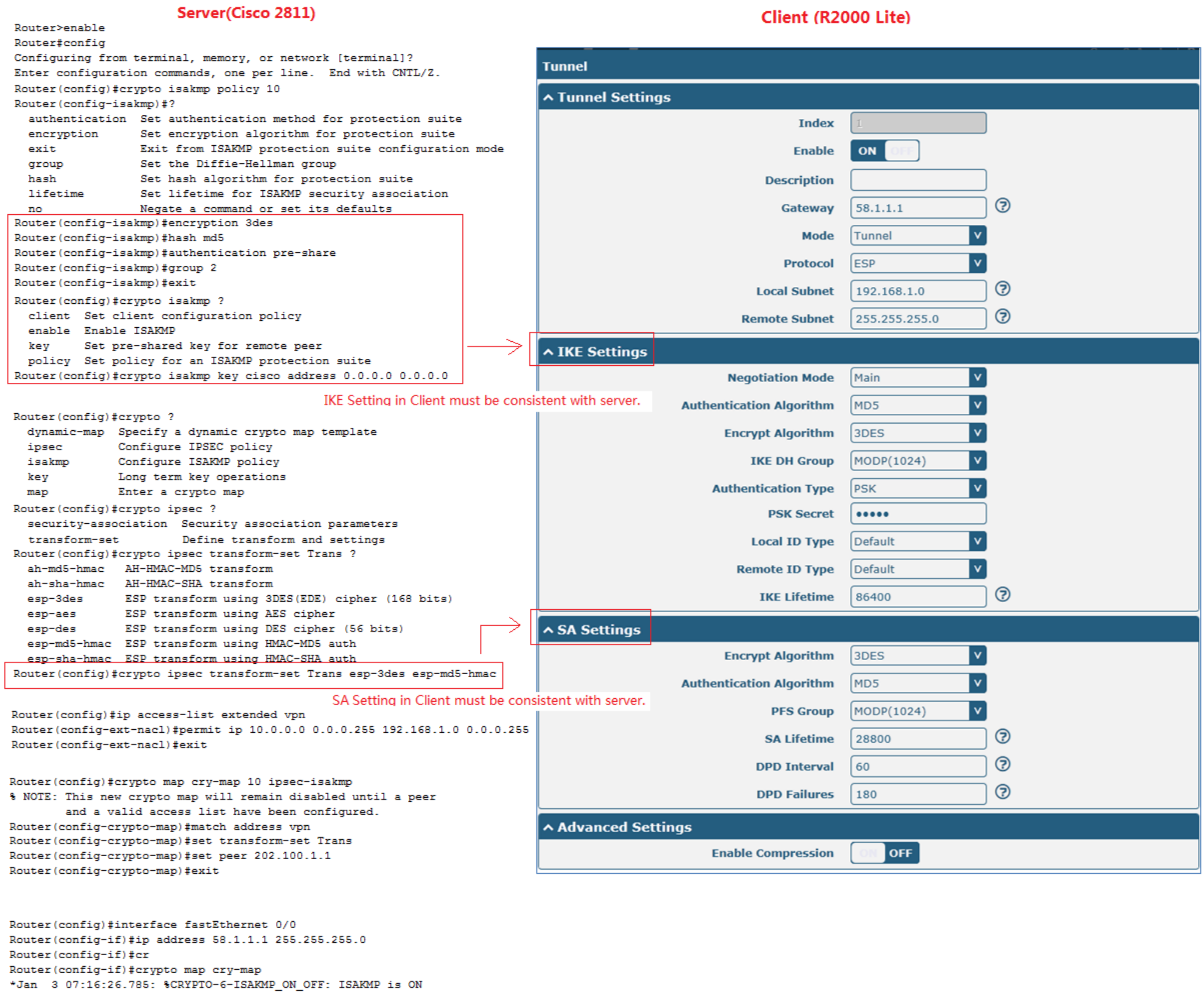


^ Advanced Settings

Enable Compression: ON [✓ OFF]

The modification will take effect after “Submit- > Save&Apply- > Reboot”.

The comparison between server and client is as following picture:



Server(Cisco 2811)

```
Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#crypto isakmp policy 10
Router(config-isakmp)#?
  authentication  Set authentication method for protection suite
  encryption      Set encryption algorithm for protection suite
  exit            Exit from ISAKMP protection suite configuration mode
  group           Set the Diffie-Hellman group
  hash            Set hash algorithm for protection suite
  lifetime        Set lifetime for ISAKMP security association
  no              Negate a command or set its defaults
Router(config-isakmp)#encryption 3des
Router(config-isakmp)#hash md5
Router(config-isakmp)#authentication pre-share
Router(config-isakmp)#group 2
Router(config-isakmp)#exit
Router(config)#crypto isakmp ?
  client  Set client configuration policy
  enable  Enable ISAKMP
  key     Set pre-shared key for remote peer
  policy  Set policy for an ISAKMP protection suite
Router(config)#crypto isakmp key cisco address 0.0.0.0 0.0.0.0
```

IKE Setting in Client must be consistent with server.

```
Router(config)#crypto ?
  dynamic-map  Specify a dynamic crypto map template
  ipsec        Configure IPSEC policy
  isakmp       Configure ISAKMP policy
  key          Long term key operations
  map          Enter a crypto map
Router(config)#crypto ipsec ?
  security-association  Security association parameters
  transform-set         Define transform and settings
Router(config)#crypto ipsec transform-set Trans ?
  ah-md5-hmac   AH-HMAC-MD5 transform
  ah-sha-hmac   AH-HMAC-SHA transform
  esp-3des      ESP transform using 3DES(EDE) cipher (168 bits)
  esp-aes       ESP transform using AES cipher
  esp-des       ESP transform using DES cipher (56 bits)
  esp-md5-hmac  ESP transform using HMAC-MD5 auth
  esp-sha-hmac  ESP transform using HMAC-SHA auth
Router(config)#crypto ipsec transform-set Trans esp-3des esp-md5-hmac
```

SA Setting in Client must be consistent with server.

```
Router(config)#ip access-list extended vpn
Router(config-ext-nacl)#permit ip 10.0.0.0 0.0.0.255 192.168.1.0 0.0.0.255
Router(config-ext-nacl)#exit


Router(config)#crypto map cry-map 10 ipsec-isakmp
% NOTE: This new crypto map will remain disabled until a peer
        and a valid access list have been configured.
Router(config-crypto-map)#match address vpn
Router(config-crypto-map)#set transform-set Trans
Router(config-crypto-map)#set peer 202.100.1.1
Router(config-crypto-map)#exit


Router(config)#interface fastEthernet 0/0
Router(config-if)#ip address 58.1.1.1 255.255.255.0
Router(config-if)#cr
Router(config-if)#crypto map cry-map
*Jan  3 07:16:26.785: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is ON
```

Client (R2000 Lite)

Tunnel

^ Tunnel Settings

Index: 1

Enable: [✓ ON] OFF

Description:

Gateway: 58.1.1.1

Mode: Tunnel

Protocol: ESP

Local Subnet: 192.168.1.0

Remote Subnet: 255.255.255.0

^ IKE Settings

Negotiation Mode: Main

Authentication Algorithm: MD5

Encrypt Algorithm: 3DES

IKE DH Group: MODP(1024)

Authentication Type: PSK

PSK Secret: •••••

Local ID Type: Default

Remote ID Type: Default

IKE Lifetime: 86400

^ SA Settings

Encrypt Algorithm: 3DES

Authentication Algorithm: MD5

PFS Group: MODP(1024)

SA Lifetime: 28800

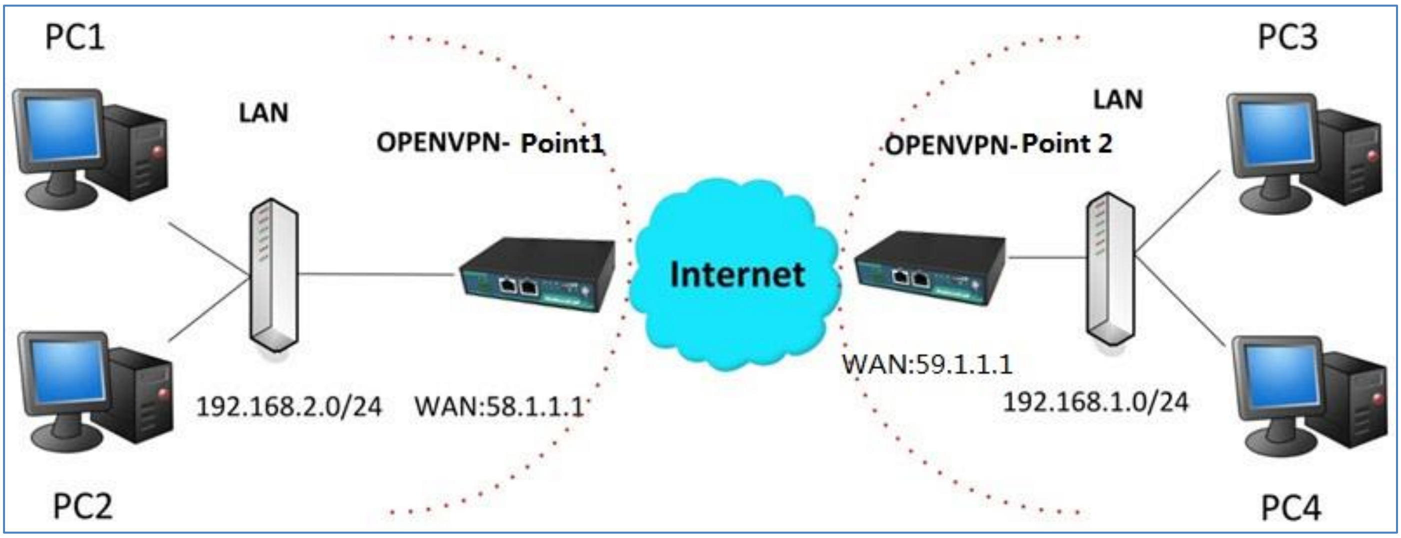
DPD Interval: 60

DPD Failures: 180

^ Advanced Settings

Enable Compression: ON [✓ OFF]

4.2.2 OPENVPN

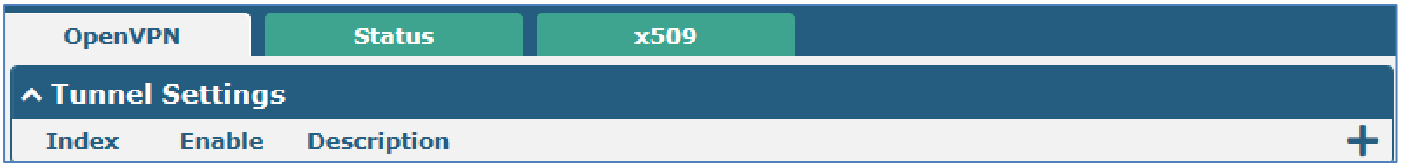


Note: *the configuration of two points is as follows.*

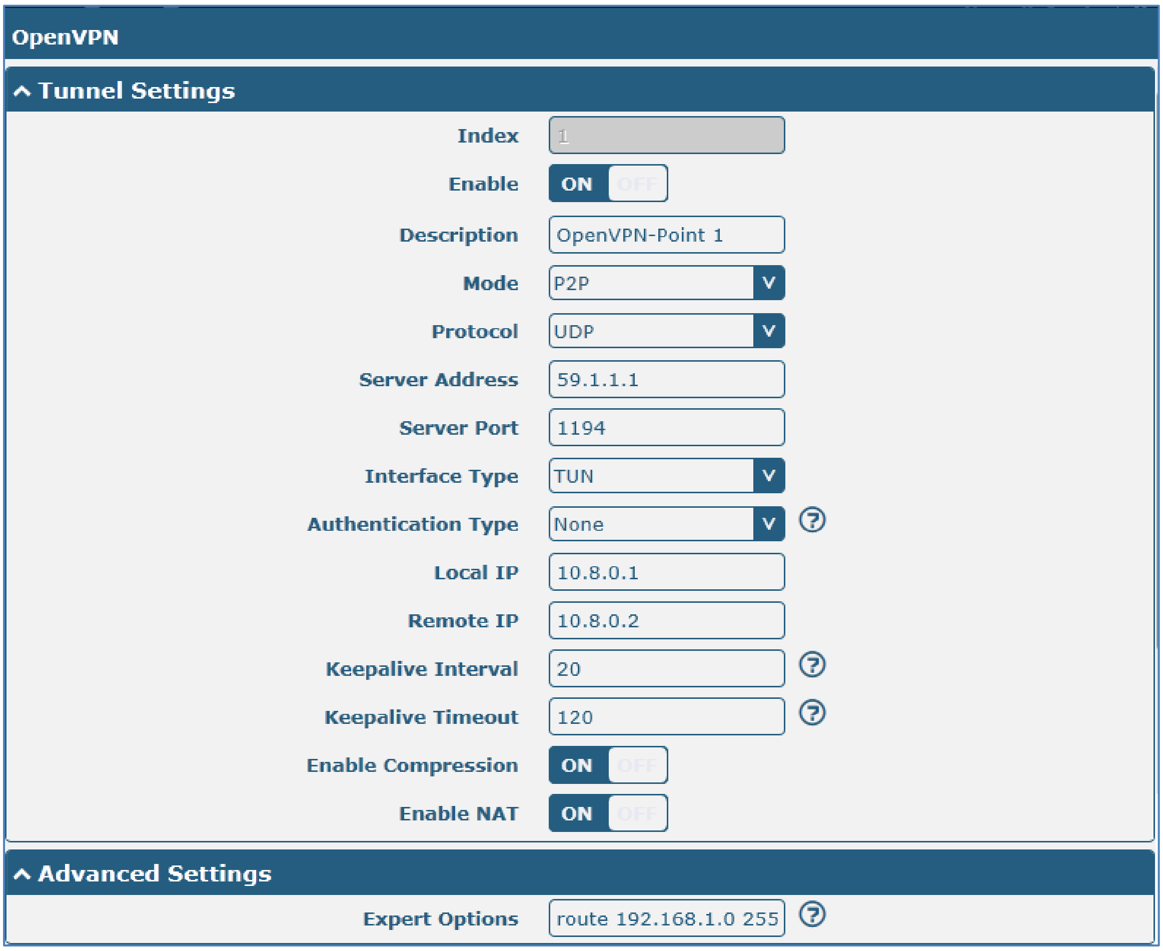
OPENVPN (p2p):

Point 1

VPN-- > OpenVPN-- > OpenVPN



Click "+".



OpenVPN

^ Tunnel Settings

Index	1
Enable	ON OFF
Description	OpenVPN-Point 1
Mode	P2P
Protocol	UDP
Server Address	59.1.1.1
Server Port	1194
Interface Type	TUN
Authentication Type	None
Local IP	10.8.0.1
Remote IP	10.8.0.2
Keepalive Interval	20
Keepalive Timeout	120
Enable Compression	ON OFF
Enable NAT	ON OFF

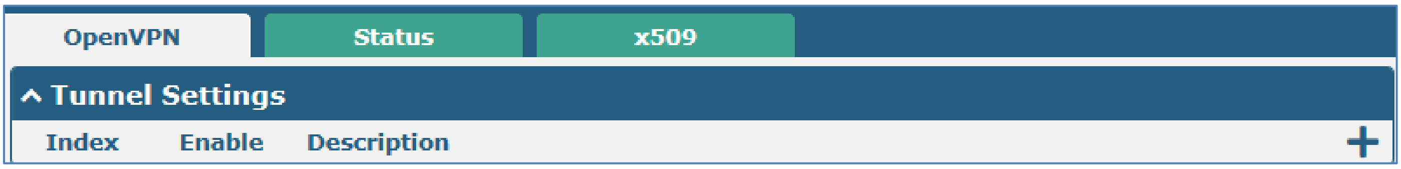
^ Advanced Settings

Expert Options	route 192.168.1.0 255

The modifications will take effect after click “Submit- > Save&Apply”.

Point 2

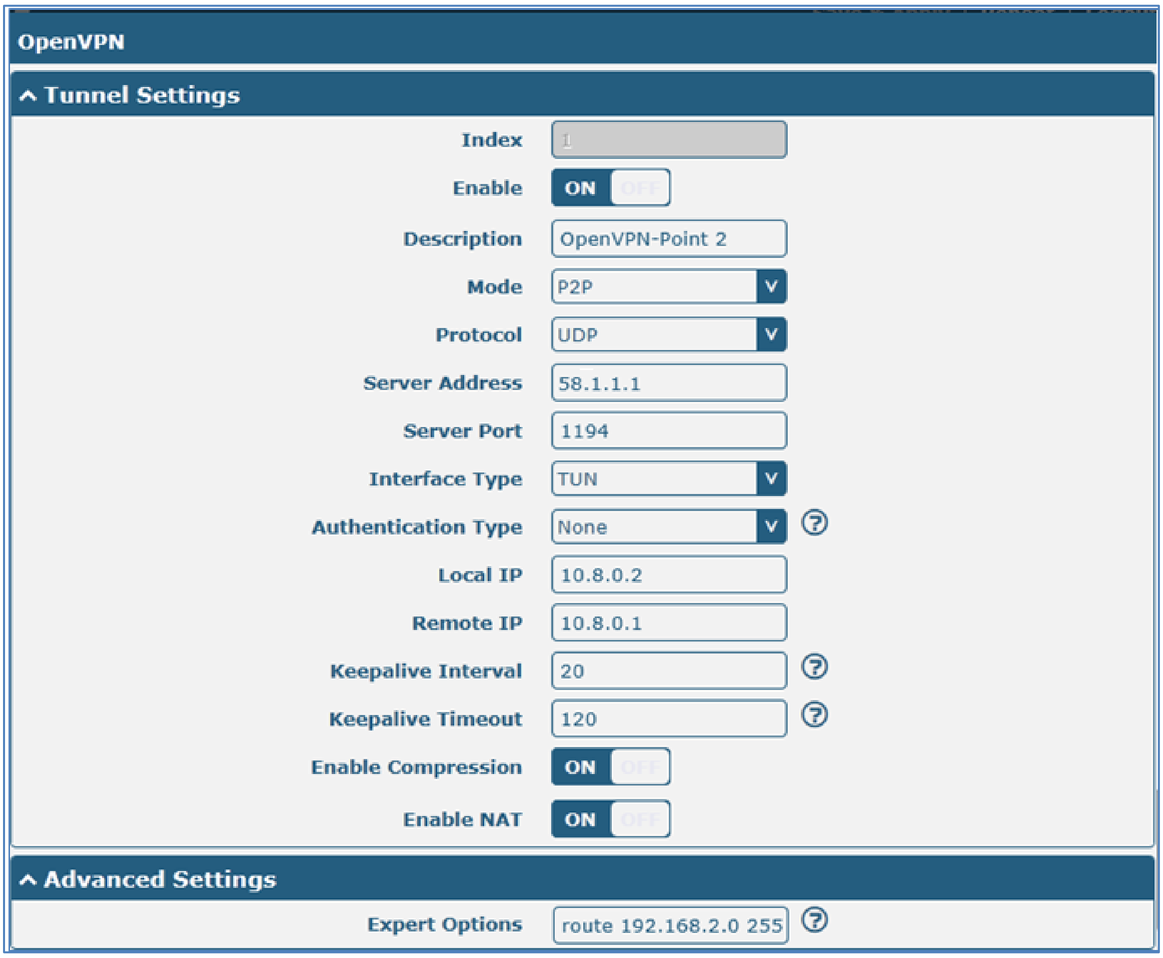
VPN-- > OpenVPN-- > OpenVPN



^ Tunnel Settings

Index	Enable	Description	+

Click “+”.



OpenVPN

^ Tunnel Settings

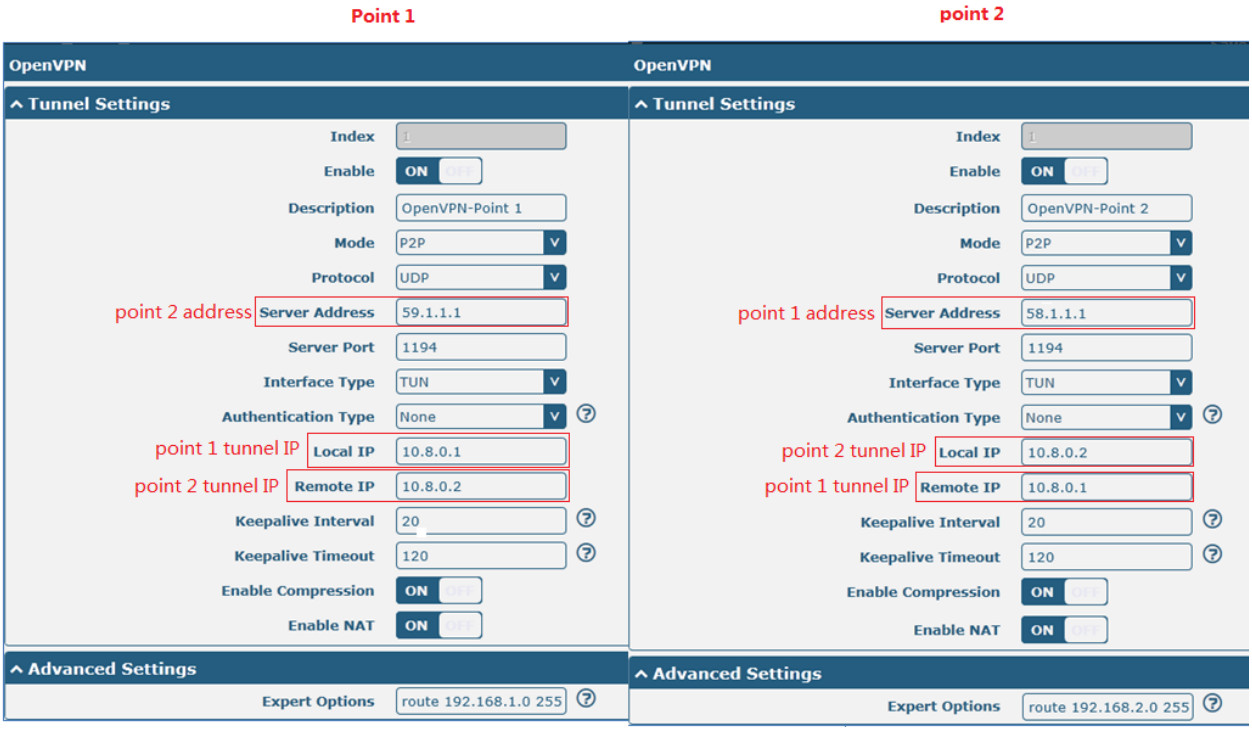
Index	1
Enable	ON OFF
Description	OpenVPN-Point 2
Mode	P2P
Protocol	UDP
Server Address	58.1.1.1
Server Port	1194
Interface Type	TUN
Authentication Type	None
Local IP	10.8.0.2
Remote IP	10.8.0.1
Keepalive Interval	20
Keepalive Timeout	120
Enable Compression	ON OFF
Enable NAT	ON OFF

^ Advanced Settings

Expert Options	route 192.168.2.0 255

The modifications will take effect after click “Submit- > Save&Apply”.

The comparison between point 1 and point 2 is as following picture:



OpenVPN

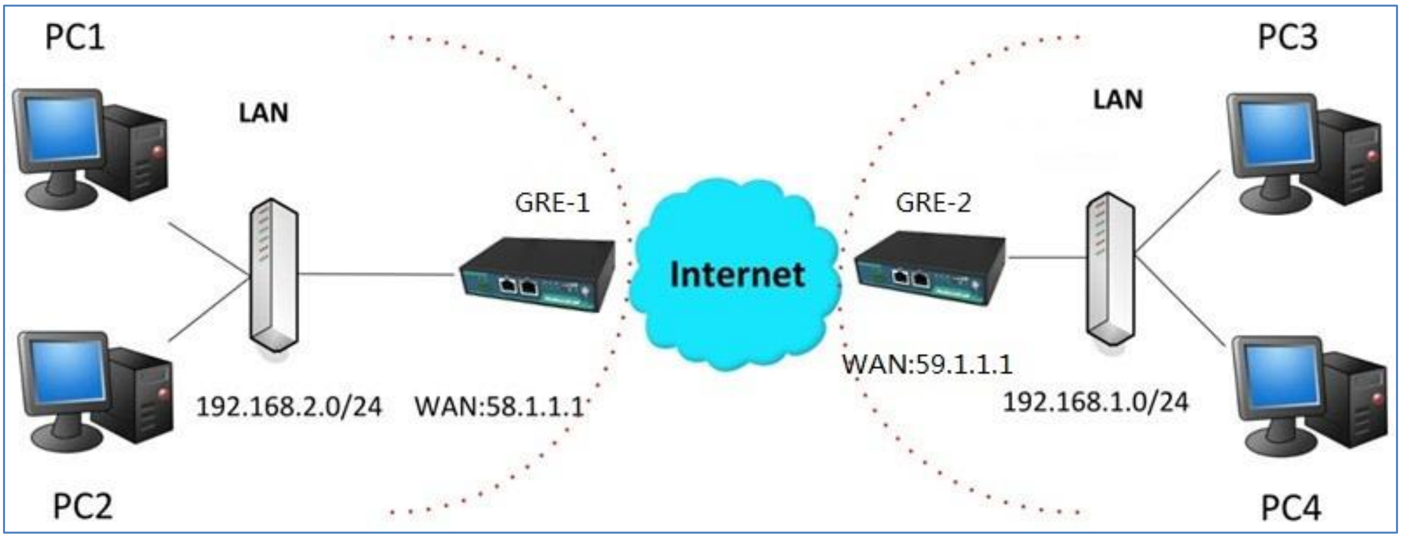
^ Tunnel Settings

	Point 1	point 2
Index	1	1
Enable	ON OFF	ON OFF
Description	OpenVPN-Point 1	OpenVPN-Point 2
Mode	P2P	P2P
Protocol	UDP	UDP
Server Address	59.1.1.1	58.1.1.1
Server Port	1194	1194
Interface Type	TUN	TUN
Authentication Type	None	None
Local IP	10.8.0.1	10.8.0.2
Remote IP	10.8.0.2	10.8.0.1
Keepalive Interval	20	20
Keepalive Timeout	120	120
Enable Compression	ON OFF	ON OFF
Enable NAT	ON OFF	ON OFF

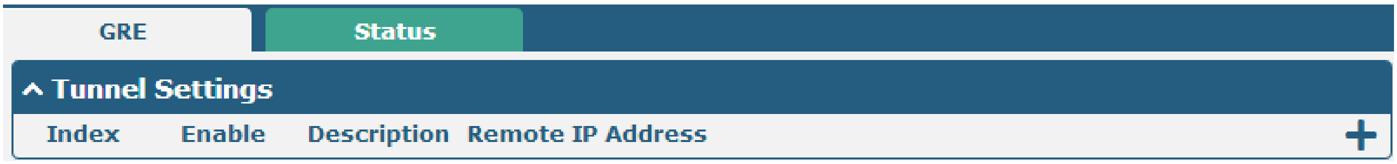
^ Advanced Settings

	Point 1	point 2
Expert Options	route 192.168.1.0 255	route 192.168.2.0 255

4.2.3 GRE VPN



VPN-- > GRE-- > GRE

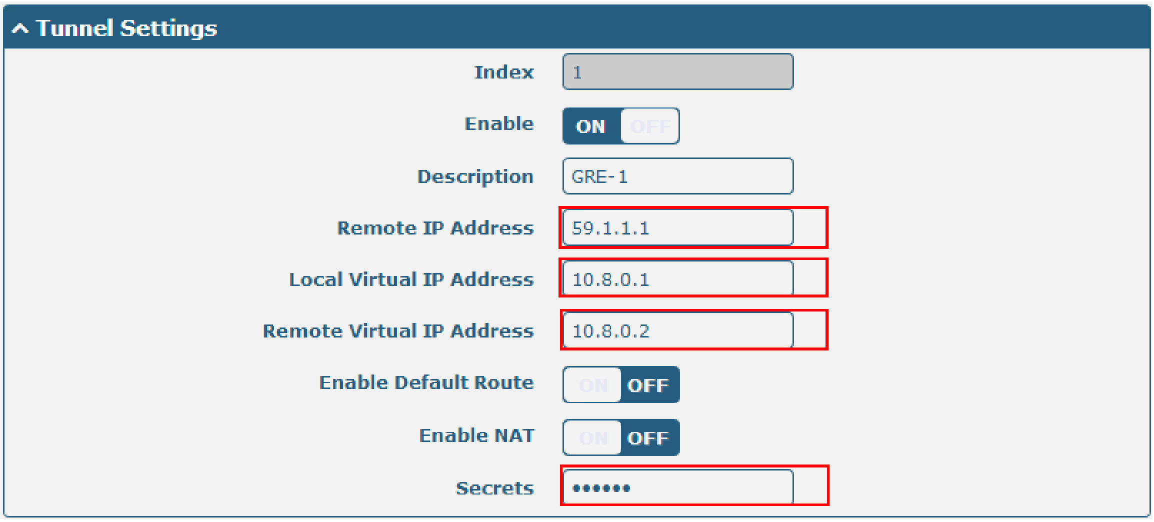


^ Tunnel Settings

Index	Enable	Description	Remote IP Address	+

Click “+”.

GRE-1：

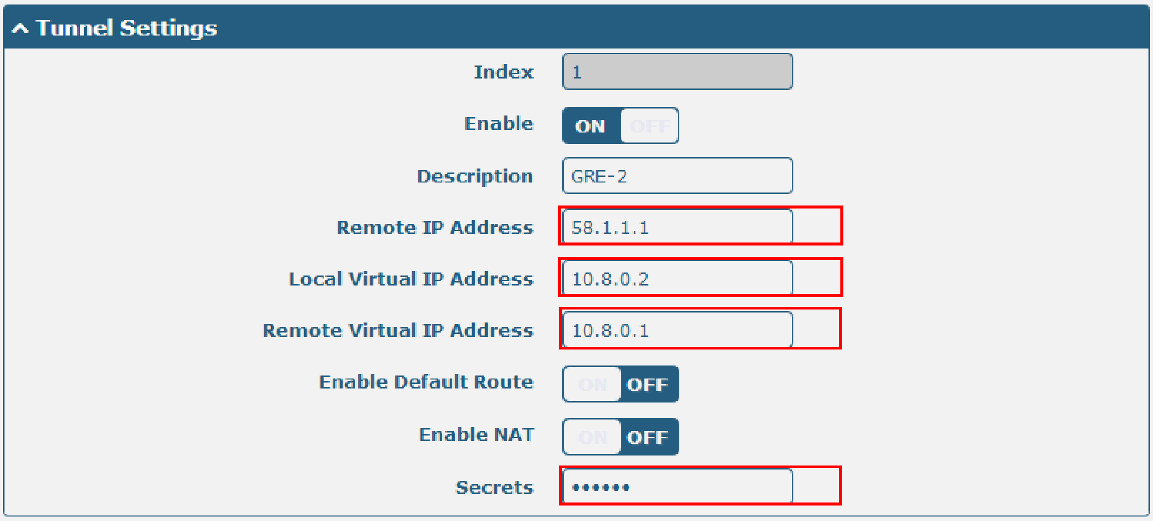


^ Tunnel Settings

Index	1
Enable	ON
Description	GRE-1
Remote IP Address	59.1.1.1
Local Virtual IP Address	10.8.0.1
Remote Virtual IP Address	10.8.0.2
Enable Default Route	OFF
Enable NAT	OFF
Secrets	••••••

The modifications will take effect after click “Submit- > Save&Apply”.

GRE-2:

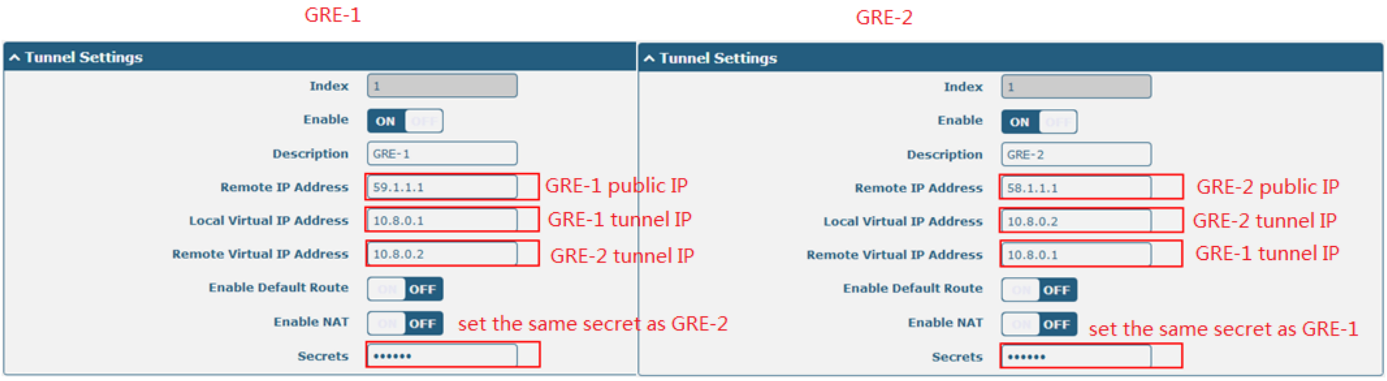


Tunnel Settings

Index	1
Enable	ON
Description	GRE-2
Remote IP Address	58.1.1.1
Local Virtual IP Address	10.8.0.2
Remote Virtual IP Address	10.8.0.1
Enable Default Route	OFF
Enable NAT	OFF
Secrets	••••••

The modifications will take effect after click “Submit- > Save&Apply”.

The comparison between point 1 and point 2 is as following picture:



GRE-1

Tunnel Settings

Index	1	
Enable	ON	
Description	GRE-1	
Remote IP Address	59.1.1.1	GRE-1 public IP
Local Virtual IP Address	10.8.0.1	GRE-1 tunnel IP
Remote Virtual IP Address	10.8.0.2	GRE-2 tunnel IP
Enable Default Route	OFF	
Enable NAT	OFF	set the same secret as GRE-2
Secrets	••••••	

GRE-2

Tunnel Settings

Index	1	
Enable	ON	
Description	GRE-2	
Remote IP Address	58.1.1.1	GRE-2 public IP
Local Virtual IP Address	10.8.0.2	GRE-2 tunnel IP
Remote Virtual IP Address	10.8.0.1	GRE-1 tunnel IP
Enable Default Route	OFF	
Enable NAT	OFF	set the same secret as GRE-1
Secrets	••••••	

Chapter 5 Introductions for CLI

5.1 What’s CLI

The R2000 command-line interface (CLI) is a software interface providing another way to set the parameters of equipment from the SSH or through a telnet network connection.

Route login:

Router login: admin
Password: admin
#

CLI commands:

# ? (***Note***: the ‘?’ won’t display on the page.)

!	Comments
add	Add a list entry of configuration
clear	Clear statistics
config	Configuration operation
debug	Output debug information to the console
del	Delete a list entry of configuration
exit	Exit from the CLI
help	Display an overview of the CLI syntax
ping	Send messages to network hosts
reboot	Halt and perform a cold restart
route	Static route modify dynamically, this setting will not be saved
set	Set system configuration
show	Show system configuration
status	Show running system information
tftpupdate	Update firmware using tftp
traceroute	Print the route packets trace to network host
urlupdate	Update firmware using http or ftp
ver	Show version of firmware

5.2 How to Configure the CLI

Following is a list about the description of help and the error should be encountered in the configuring program.

Commands /tips	Description
?	Typing a question mark "?" will show you the help information.
Ctrl+c	Press these two keys at the same time, except its "copy" function but also can be used for "break" out of the setting program.
Syntax error: The command is not completed	Command is not completed.
Tick space key+ Tab key	It can help you finish you command. Example: # config (tick Enter key) Syntax error: The command is not completed # config (tick space key+ Tab key) commit save_and_apply loaddefault
# config save_and_apply / #config commit	When you finish your setting, you should enter those commands to make your setting take effect on the device. ***Note:*** commit and save_and_apply plays the same role.

5.2.1 QuickStart with Configuration Examples

The best and quickest way to master CLI is firstly to view all features from the webpage and then reading all CLI commands at a time, finally learn to configure it with some reference examples.

Example 1: Show current version

```
# status system
hardware_version = 1.0
firmware_version = "1.2.2 (Rev 399)"
kernel_version = 3.10.49
device_model = R2000
serial_number = 15090140040008
uptime = "0 days, 00:04:07"
system_time = "Tue Dec 22 15:02:36 2015"
```

Example 2: Update firmware via tftp

```
# tftpupdate (space+?)
  firmware    New firmware
# tftpupdate firmware (space+?)
  String    Firmware name
# tftpupdate firmware R2000-firmware-sysupgrade-unknown.bin host 192.168.100.99 //enter a new firmware name
```

```
Downloading
R2000-firmware-s 100% |*******************************|    5018k    0:00:00 ETA
Flashing
Checking 100%
Decrypting 100%
Flashing 100%
Verifying 100%
Verfify Success
upgrade success                                    //update success
# config save_and_apply
OK                                          // save and apply current configuration, make you configuration effect
```

Example 3: Set link-manager

```
# set
# set
   at_over_telnet         AT Over Telnet
   cellular               Cellular
   ddns                   Dynamic DNS
   ethernet               Ethernet
   event                  Event Management
   firewall               Firewall
   gre                    GRE
   ipsec                  IPSec
   lan                    Local Area Network
   link_manager           Link Manager
   ntp                    NTP
   openvpn                OpenVPN
   reboot                 Automatic Reboot
   robustlink             Robustlink
   route                  Route
   sms                    SMS
   snmp                   SNMP agent
   ssh                    SSH
   syslog                 Syslog
   system                 System
   user_management        User Management
   vrrp                   VRRP
   web_server             Web Server
# set link_manager
   primary_link           Primary Link
   backup_link            Backup Link
   backup_mode            Backup Mode
   emergency_reboot       Emergency Reboot
   link                   Link Settings
```

```
# set link_manager primary_link (space+?)
Enum    Primary Link (wwan1/wwan2/wan/Wi-Fi)
# set link_manager primary_link wwan1                        //select “wwan1” as primary_link
OK                                                           //setting succeed
# set link_manager link 1
  type                   Type
  desc                   Description
  connection_type        Connection Type
  wwan                   WWAN Settings
  static_addr            Static Address Settings
  pppoe                  PPPoE Settings
  ping                   Ping Settings
  mtu                    MTU
  dns1_overrided         Overrided Primary DNS
  dns2_overrided         Overrided Secondary DNS
# set link_manager link 1 type wwan1
OK
# set link_manager link 1 wwan
  auto_apn                       Automatic APN Selection
  apn                            APN
  username                       Username
  password                       Password
  dialup_number                  Dialup Number
  auth_type                      Authentication Type
  aggressive_reset               Aggressive Reset
  switch_by_data_allowance       Switch SIM By Data Allowance
  data_allowance                 Data Allowance
  billing_day                    Billing Day
# set link_manager link 1 wwan switch_by_data_allowance true
OK
#
# set link_manager link 1 wwan data_allowance 100                    //open cellular switch_by_data_traffic
OK                                                                   //setting succeed
# set link_manager link 1 wwan billing_day 1                      //setting specifies the day of month for billing
OK                                                                   // setting succeed
…
# config save_and_apply
OK                                  // save and apply current configuration, make you configuration effect
```

Example 4: Set LAN IP address

```
# show lan all
network {
    id = 1
    interface = lan0
    ip = 192.168.0.1
    netmask = 255.255.255.0
    mtu = 1500
    dhcp {
        enable = true
        mode = server
        relay_server = ""
        pool_start = 192.168.0.2
        pool_end = 192.168.0.100
        netmask = 255.255.255.0
        gateway = ""
        primary_dns = ""
        secondary_dns = ""
        wins_server = ""
        lease_time = 120
        expert_options = ""
        debug_enable = false
    }
}
multi_ip {
    id = 1
    interface = lan0
    ip = 172.16.99.11
    netmask = 255.255.0.0
}
#
# set lan
  network     Network Settings
  multi_ip    Multiple IP Address Settings
  vlan        VLAN
# set lan network 1(space+?)
  interface   Interface
  ip          IP Address
  netmask     Netmask
  mtu         MTU
  dhcp        DHCP Settings
# set lan network 1 interface lan0
OK
# set lan network 1 ip 172.16.99.22                //set IP address for lan
OK                                                 //setting succeed
# set lan network 1 netmask 255.255.0.0
OK
#
```

```
…
# config save_and_apply
OK                                              // save and apply current configuration, make you configuration effect
```

Example 5: CLI for setting Cellular

```
# show cellular all
sim {
    id = 1
    card = sim1
    phone_number = ""
    extra_at_cmd = ""
    network_type = auto
    band_select_type = all
    band_gsm_850 = false
    band_gsm_900 = false
    band_gsm_1800 = false
    band_gsm_1900 = false
    band_wcdma_850 = false
    band_wcdma_900 = false
    band_wcdma_1900 = false
    band_wcdma_2100 = false
    band_lte_800 = false
    band_lte_850 = false
    band_lte_900 = false
    band_lte_1800 = false
    band_lte_1900 = false
    band_lte_2100 = false
    band_lte_2600 = false
    band_lte_1700 = false
    band_lte_700 = false
    band_tdd_lte_2600 = false
    band_tdd_lte_1900 = false
    band_tdd_lte_2300 = false
    band_tdd_lte_2500 = false
}
sim {
    id = 2
    card = sim2
    phone_number = ""
    extra_at_cmd = ""
    network_type = auto
    band_select_type = all
    band_gsm_850 = false
    band_gsm_900 = false
    band_gsm_1800 = false
    band_gsm_1900 = false
    band_wcdma_850 = false
    band_wcdma_900 = false
    band_wcdma_1900 = false
    band_wcdma_2100 = false
    band_lte_800 = false
    band_lte_850 = false
    band_lte_900 = false
    band_lte_1800 = false
    band_lte_1900 = false
    band_lte_2100 = false
    band_lte_2600 = false
    band_lte_1700 = false
    band_lte_700 = false
    band_tdd_lte_2600 = false
    band_tdd_lte_1900 = false
    band_tdd_lte_2300 = false
    band_tdd_lte_2500 = false
}
# set(space+?)
at_over_telnet      cellular        ddns        dhcp        dns
event               firewall        ipsec       lan         link_manager
ntp                 openvpn         reboot      route       serial_port
sms                 snmp            syslog      system      user_management
vrrp
# set cellular(space+?)
  sim    SIM Settings
# set cellular sim(space+?)
  Integer    Index (1..2)

# set cellular sim 1(space+?)
  card                  SIM Card
  phone_number          Phone Number
  extra_at_cmd          Extra AT Cmd
  network_type          Network Type
  band_select_type      Band Select Type
  band_gsm_850          GSM 850
  band_gsm_900          GSM 900
  band_gsm_1800         GSM 1800
  band_gsm_1900         GSM 1900
  band_wcdma_850        WCDMA 850
```

```
   band_wcdma_900        WCDMA 900
   band_wcdma_1900       WCDMA 1900
   band_wcdma_2100       WCDMA 2100
   band_lte_800          LTE 800 (band 20)
   band_lte_850          LTE 850 (band 5)
   band_lte_900          LTE 900 (band 8)
   band_lte_1800         LTE 1800 (band 3)
   band_lte_1900         LTE 1900 (band 2)
   band_lte_2100         LTE 2100 (band 1)
   band_lte_2600         LTE 2600 (band 7)
   band_lte_1700         LTE 1700 (band 4)
   band_lte_700          LTE 700 (band 17)
   band_tdd_lte_2600     TDD LTE 2600 (band 38)
   band_tdd_lte_1900     TDD LTE 1900 (band 39)
   band_tdd_lte_2300     TDD LTE 2300 (band 40)
   band_tdd_lte_2500     TDD LTE 2500 (band 41)
# set cellular sim 1 phone_number 18620435279
OK
…
# config save_and_apply
OK                                   // save and apply current configuration, make you configuration effect
```

5.3 Commands Reference

commands	**syntax**	**description**
Debug	Debug *parameters*	Turn on or turn off debug function
Show	Show *parameters*	Show current configuration of each function , if we need to see all please using "show running "
Set	Set *parameters* Add *parameters*	All the function parameters are set by commands set and add, the difference is that set is for the single parameter and add is for the list parameter
Add		

Note: Download the config.XML file from the configured web browser. The command format can refer to the config.XML file format.

Glossary

Abbreviations	Description
AC	Alternating Current
APN	Access Point Name of GPRS Service Provider Network
ASCII	American Standard Code for Information Interchange
CE	Conformité Européene (European Conformity)
CHAP	Challenge Handshake Authentication Protocol
CLI	Command Line Interface for batch scripting
CSD	Circuit Switched Data
CTS	Clear to Send
dB	Decibel
dBi	Decibel Relative to an Isotropic radiator
DC	Direct Current
DCD	Data Carrier Detect
DCE	Data Communication Equipment (typically modems)
DCS 1800	Digital Cellular System, also referred to as PCN
DI	Digital Input
DO	Digital Output
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi-frequency
DTR	Data Terminal Ready
EDGE	Enhanced Data rates for Global Evolution of GSM and IS-136
EMC	Electromagnetic Compatibility
EMI	Electro-Magnetic Interference
ESD	Electrostatic Discharges
ETSI	European Telecommunications Standards Institute
EVDO	Evolution-Data Optimized
FDD LTE	Frequency Division Duplexing Long Term Evolution
GND	Ground
GPRS	General Packet Radio Service
GRE	generic route encapsulation
GSM	Global System for Mobile Communications
HSPA	High Speed Packet Access
ID	identification data
IMEI	International Mobile Equipment Identification
IP	Internet Protocol
IPSec	Internet Protocol Security

Abbreviations	Description
kbps	kbits per second
L2TP	Layer 2 Tunneling Protocol
LAN	local area network
LED	Light Emitting Diode
M2M	Machine to Machine
MAX	Maximum
Min	Minimum
MO	Mobile Originated
MS	Mobile Station
MT	Mobile Terminated
OpenVPN	Open Virtual Private Network
PAP	Password Authentication Protocol
PC	Personal Computer
PCN	Personal Communications Network, also referred to as DCS 1800
PCS	Personal Communication System, also referred to as GSM 1900
PDU	Protocol Data Unit
PIN	Personal Identity Number
PLCs	Program Logic Control System
PPP	Point-to-point Protocol
PPTP	Point to Point Tunneling Protocol
PSU	Power Supply Unit
PUK	Personal Unblocking Key
R&TTE	Radio and Telecommunication Terminal Equipment
RF	Radio Frequency
RTC	Real Time Clock
RTS	Request to Send
RTU	Remote Terminal Unit
Rx	Receive Direction
SDK	Software Development Kit
SIM	subscriber identification module
SMA antenna	Stubby antenna or Magnet antenna
SMS	Short Message Service
SNMP	Simple Network Management Protocol
TCP/IP	Transmission Control Protocol / Internet Protocol
TE	Terminal Equipment, also referred to as DTE
Tx	Transmit Direction
UART	Universal Asynchronous Receiver-transmitter
UMTS	Universal Mobile Telecommunications System
USB	Universal Serial Bus
USSD	Unstructured Supplementary Service Data

Abbreviations	Description
VDC	Volts Direct current
VLAN	Virtual Local Area Network
VPN	Virtual Private Network
VSWR	Voltage Stationary Wave Ratio
WAN	Wide Area Network