Robustel GoRugged R3000 Lite

Dual SIM Industrial Cellular VPN Router

For GSM/GPRS/EDGE/UMTS/TD-SCDMA/EVDO/ HSPA+/LTE Networks

User Guide

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About This Document

This document describes hardware and software of Robustel R3000 Lite, 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 human 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 router 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 following:
- 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
2013-12-20	1.01.00	V1.0.0	Initial Release
2014-12-28	1.02.00	V1.1.0	Removed IP Passthrough Updated section about Dimension/Regulatory and Type Approvals/Install the SIM Card/Power Supply Updated feature about Cellular WAN-PPPoE Bridge, NAT/DMZ-Virtual IP Mapping, Firewall-Basic, Firewall-Filtering, QoS, OpenVPN-Encryption, L2TP Server, Portal, USR LED, RobustVPN, Tools-Sniffer, Tools-Test
2015-05-13	1.2.0	V1.1.1	Modified section about Firmware version/LED Indicators/ Packing List/Mount the Route/file format/Sentence Revision/Approval & Certification/Regulatory and Type Approval Information
2015-07-02	1.2.8	V1.2.0	Added information about Download MIB Moudles File
2015-10-07	1.2.8	V1.2.1	Modified section about Cover Image/packing list/Specification(antenna)/PIN Assignment
2015-11-23	1.2.16	v.1.3.0	Added section about Modbus Master/Modbus over TCP/Alarms/Remote Channels/AAA, FTP, SMTP, DMVPN Modified section about Serial
2016-02-26	1.2.16	v.1.3.1	Modified information about Delete “Environmental Limits” cable in Chapter 1.4
2016-10-14	1.3.0	v.1.4.0	• Changed the Guangzhou area code 020 to 20 • Updated logo • Updated information about EMC in Chapter 1.3 • Added information about CR and CT for debug pin1 and pin 2 respectively in Chapter 2.2 • Corrected description about Ethernet LED in Chapter 2.5 • Corrected picture of Chapter 3.3 • Added new section about Chapter 3.31 • Updated SMS command table in Chapter 4.2.2 • Updated for new firmware 1.3.0, includes information about: o Added Clean Date Mode in Chapter 3.11 o Added import & export of language packet in Chapter 3.44 o Added expert mode of Daylight Saving Time in Chapter 3.46 • Minor editorial changes

2016-11-15	1.3.0	v.1.4.1	• Updated section about 2.11 Power Supply
2017-02-04	1.3.0	v.1.4.2	• Changed Tel number to +86-20-29019902 • Changed CD information in Chapter 1.2
2017-06-22	1.3.0	v.1.4.3	• Updated frequency bands in Chapter 1.5
2018-06-28	1.3.0	v.1.4.4	Revised the company name

Contents

Chapter 1 Product Concept

1.1 Overview

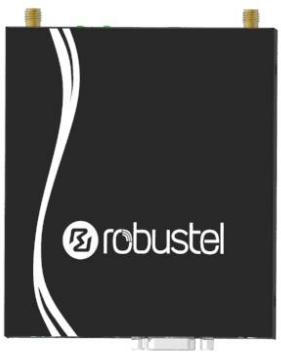
Robustel GoRugged R3000 Lite is a rugged cellular router offering state-of-the-art mobile connectivity for machine to machine (M2M) applications.

- Dual SIM redundancy for continuous cellular connections; supports 2G/3G/4G
- VPN tunnel: IPSec/OpenVPN/PPTP/L2TP/GRE/DMVPN
- Supports GRE over IPSec/L2TP over IPSec
- Supports 802.1Q VLAN Trunk
- Supports PPPoE Bridge
- Supports Modbus gateway (Modbus RTU/ASCII to Modbus TCP) and Modbus Master
- Auto reboot via SMS/Incoming call/Timing
- Supports alarm via Email, SMS, SNMP trap
- Supports AAA and FTP
- Supports RobustLink (centralized M2M management platform, to remote monitor, configure and update firmware)
- Supports RobustVPN (Cloud VPN Portal, to provide easy and secure remote access for PLCs and machines)
- Flexible management methods: Web/CLI/SNMP/RobustLink
- Firmware upgrade via Web/CLI/USB/SMS/RobustLink
- Wide range input voltages from 6 to 26 VDC and extreme operating temperature

1.2 Packing List

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

- Robustel GoRugged R3000 Lite router x 1



OR

Two antennas ***One antenna***

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

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

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

Optional accessories (can be purchased separately):

- SMA antenna x 1 (stubby antenna or magnet antenna optional)
  The number of SMA antenna depend on the model of R3000 Lite, more details please refer to **1.3 Specifications** section.

Stubby antenna

Magnet antenna

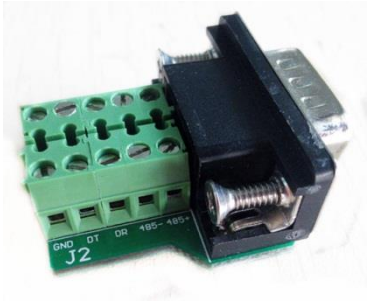
- Ethernet cable x 1

- Wall mounting kit x 2

- 35 mm DIN rail mounting kit x 1

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

- DB9 male to terminal block for serial port
  The detail about the PIN assignment is showed in the **2.2 PIN assignment** section.



1.3 Specifications

Cellular Interface

- Standards: GSM/GPRS/EDGE/UMTS/TD-SCDMA/EVDO/HSPA+/LTE
- GSM: max. 9.6/2.7 Kbps (DL/UL)
- GPRS: max. 86 Kbps (DL & UL), class 10
- EDGE: max. 236.8 Kbps (DL & UL), class 12
- UMTS: max. 384 Kbps (DL & UL)
- TD-SCDMA: max. 2.8 Mbps/384 Kbps (DL/UL)
- EVDO: max. 14.7/5.4 Mbps (DL/UL)
- HSPA+: max. 21.6/5.76 Mbps (DL/UL)
- FDD LTE: max. 100/50 Mbps (DL/UL)
- TDD LTE: max. 100/50 Mbps (DL/UL)
- SIM: 2 x (3 V & 1.8 V)
- Antenna interface: SMA female

Cellular interface	The number of antenna interface
3G HSDPA	1
3G HSPA+	2
4G LTE	2

Ethernet Interface

- Number of ports: 1 x 10/100 Mbps
- Magnet isolation protection: 1.5 KV

Serial Interface

- Number of ports: 1 x RS232 and 1 x RS485
- ESD protection: ±15 KV
- Parameters: 8E1, 8O1, 8N1, 8N2, 7E2, 7O2, 7N2, 7E1
- Baud rate: 300 bps to 230400 bps
- RS232: TxD, RxD, RTS, CTS, GND
- RS485: Data+ (A), Data- (B)
- Interface: DB9 female

System

- LED indicators: RUN, PPP, USR, 3 x RSSI
- Built-in RTC, Watchdog, Timer
- Expansion: 1 x USB 2.0 host up to 480 Mbps

Software

- Network protocols: PPP, PPPoE, TCP, UDP, DHCP, ICMP, NAT, DMZ, RIP v1/v2, OSPF, DDNS, VRRP, HTTP, HTTPs, DNS, ARP, QoS, SNTP, Telnet, IP Passthrough, etc.
- VPN tunnel: IPSec/OpenVPN/PPTP/L2TP/GRE
- Firewall: SPI, anti-DoS, Filter, Access Control

- Management: Web, CLI, SNMP v1/v2/v3, SMS, RobustLink
- Serial port: TCP client/server, UDP, Modbus RTU/ASCII to Modbus TCP, Virtual COM (COM port redirector)
- RobustLink: Centralized M2M management platform
- RobustVPN: Cloud VPN Portal

Power Supply and Consumption

- Power supply interface: 3.5 mm terminal block
- Input voltage: 6 to 26 VDC
- Power consumption: Idle: 100 mA @ 12 V
  Data link: 400 mA (peak) @ 12 V

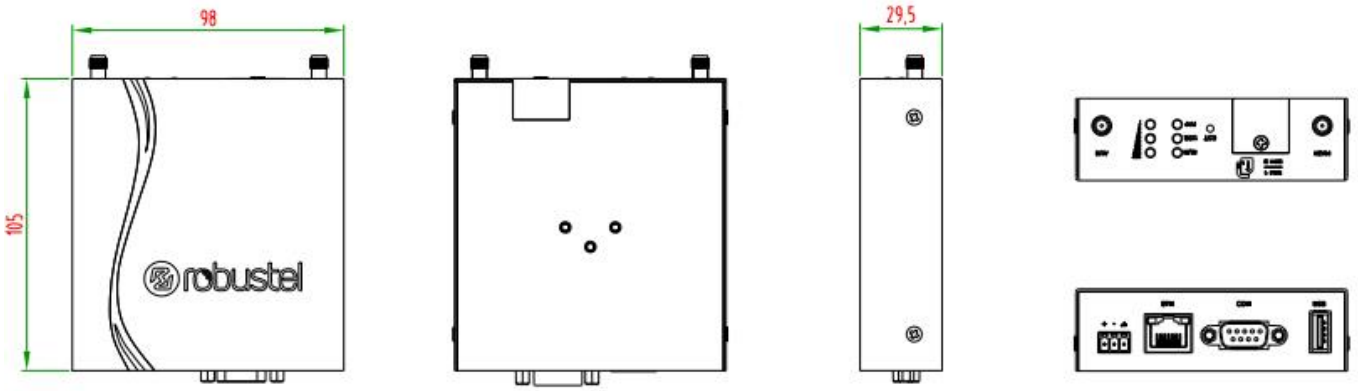
Physical Characteristics

- Housing & Weight: Metal, 300 g
- Dimension (L x W x H): 105 mm x 98 mm x 29.5 mm
- Installation: 35 mm DIN rail or wall mounting or desktop

Regulatory and Type Approvals

- Approvals & Certificates: CE, R&TTE, RCM, RoHS, WEEE
- EMC:
  EMI: EN 55022: 2006/A1: 2007 (CE&RE) Class B
  EMS: IEC 61000-4-2 (ESD) Level 3, IEC 61000-4-3 (RS) Level 4
  IEC 61000-4-4 (EFT) Level 3, IEC 61000-4-5 (Surge) Level 3
  IEC 61000-4-6 (CS) Level 3, IEC 61000-4-8 (M/S) Level 4

1.4 Dimensions



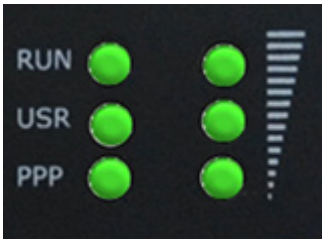
Front View Rear View Side View Top&Bottom View

1.5 Selection and Ordering Data

Model No.	Description	Frequency Range Selection	Operating Environment
R3000-L3H	HSDPA router	UMTS/HSDPA/HSUPA/HSPA+: 800/850/900/1900/2100 MHz GSM/GPRS/EDGE: 850/900/1800/1900 MHz	-40 to 85 °C /5 to 95% RH
R3000-L3P	HSPA+ router	HSDPA/HSUPA/HSPA+: 800/850/900/AWS/1900/2100 MHz GSM/GPRS/EDGE: 850/900/1800/1900 MHz	-40 to 85 °C /5 to 95% RH
R3000-L3E	EVDO router	CDMA450 1xEV-DO Rev-B CDMA450 1xRTT	-25 to 75 °C /5 to 95% RH
R3000-L4L	LTE router	FDD LTE: B1, 2, 3, 4, 5, 7, 8, 18, 19, 20, 21, 28, 31 TDD LTE: B38, 39, 40, 41 UMTS/HSDPA/HSUPA/HSPA+: B1, 2, 5, 6, 8, 9, 19 DC-HSPA+/ WCDMA: B1, B2, B5, B8 TD-SCDMA: B34, 39 GSM/GPRS/EDGE: 850/900/1800/1900 MHz	-30 to 75 °C /5 to 95% RH

Chapter 2 Installation

2.1 LED Indicators

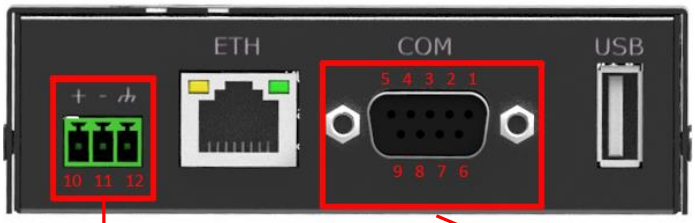


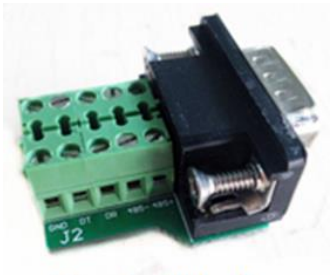
Name	Color	Status	Description
RUN	Green	On, blinking	Router is ready
		On, solid	Router is booting
		Off	Router is powered off
USR	Green	On, blinking	VPN tunnel/PPPoE/DynDNS/GPS is up
		Off	VPN tunnel/PPPoE/DynDNS/GPS is down
PPP	Green	On, blinking	There is dataflow
		On, solid	PPP connection is enabled
		Off	PPP connection is disabled

RSSI LEDs	Description
None	No signal or no SIM card inserted correctly
1 bar (only the first LED is on)	Signal level: 1-10 (Abnormal signal level)
2 bars (the first and the second LED are on)	Signal level: 11-20 (Average signal level)
3 bars (all the RSSI LEDs are on)	Signal level: 21-31 (Optimum signal level)

Note: Please go to **3.41 Configuration > USR LED** for more details.

2.2 PIN Assignment





Terminal block

PIN	Power
10	Positive
11	Negative
12	GND

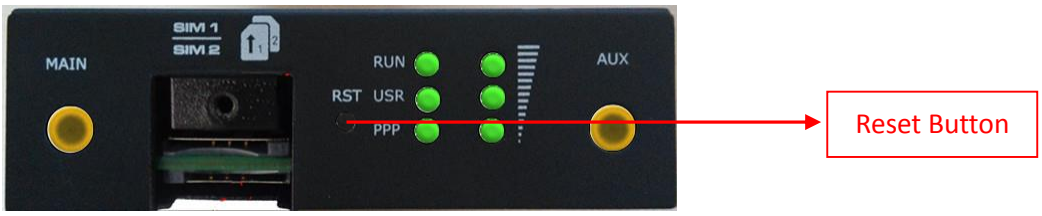
DB9 Female Connector

PIN	Debug	RS232	RS485 (2-wire)	Terminal block	Direction
1	CR		Data+ (A)	485+	-
2	CT	RXD		RXD	R3000 Lite → Device
3		TXD		TXD	Device → R3000 Lite
4	DRXD			DT	Device → R3000 Lite
5	GND	GND		GND x2	-
6			Data- (B)	485-	-
7		RTS		RTS	Device → R3000 Lite
8		CTS		CTS	R3000 Lite → Device
9	DTXD			DR	R3000 Lite → Device

2.3 USB Interface

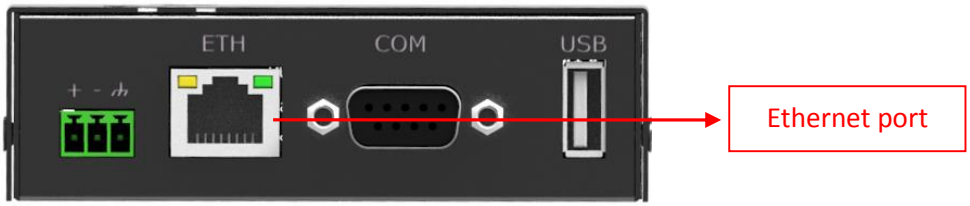
USB interface is used for batch firmware upgrade, cannot used to send or receive data from slave devices which with USB interface. Users can insert a USB storage device, such as U disk or hard disk, into the router's USB interface, if there is configuration file or firmware of R3000 Lite inside the USB storage devices, R3000 Lite will automatically update the configuration file or firmware. For more details, please go to **3.14 Configuration > USB**.

2.4 Reset Button



Function	Operation
Reboot	Press the button for at least 5 seconds in operating status
Restore to factory default settings	After powering up the router, press the RST button by a small non-conductive stick with a blunt end in about 60 seconds until all three LEDs (RUN, PPP, USR) on the left side blinking 5 times simultaneously. Then the router will be restored to factory default settings

2.5 Ethernet Port



The Ethernet port has two LED indicators. The yellow one is **Link Indicator** and the green one is **Speed Indicator**. Each indicator has three status, for details see the table below:

Indicator	Status	Description
Link Indicator	On	Connection is enabled
	On, blinking	Data is being transmitted
	Off	Connection is disabled
Speed Indicator	On	100 Mbps mode
	Off	10 Mbps mode

2.6 Mount the Router

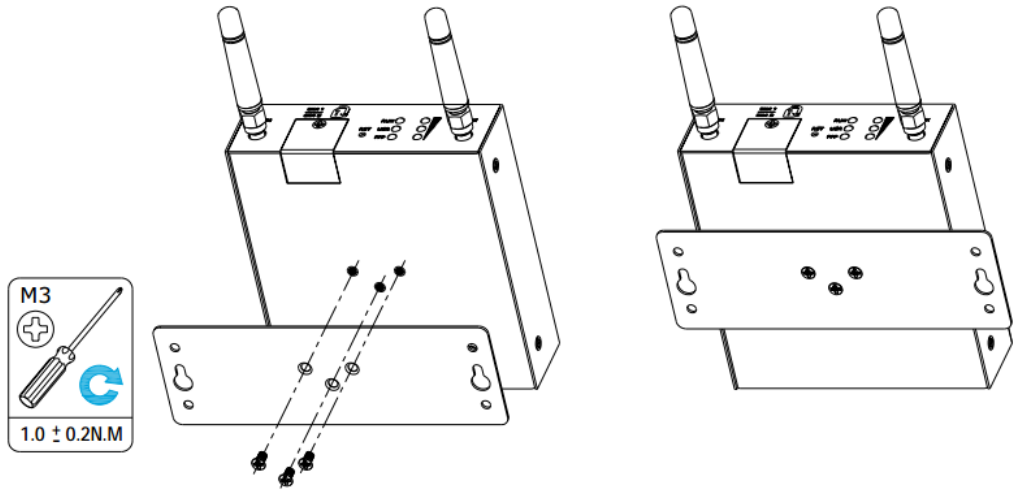
R3000 Lite router supports for horizontal surface placement, DIN rail mounting and wall mounting.

- **Two ways for mounting the router**

1. **Wall mounting**

   Use 3 pcs of M3*4 countersunk Phillips screws to fix the router on the wall mounting kit, and then use 2 pcs of M3 drywall screws to mount the router associated with the wall mounting kit on the wall.

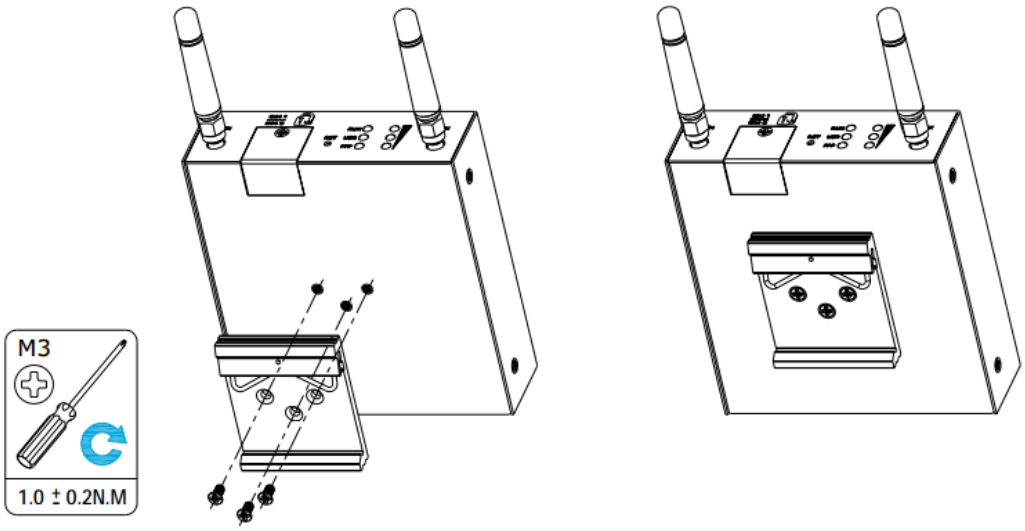
   Note: Recommended torque for mounting is 1.0 N.m, and the maximum allowed is 1.2 N.m.



2. **DIN rail mounting**

   Use 3 pcs of M3*4 countersunk phillips screws to fix the router on the DIN rail, and then hang the DIN rail on the bracket. It is necessary to choose the standard bracket.

   Note: Recommended torque for mounting is 1.0 N.m, and the maximum allowed is 1.2 N.m.



2.7 Install the SIM Card

- **Remove slot cover**

1. Make sure router is powered off.
2. To remove cover, loosen the screws associated with the cover by using a screwdriver and then find the SIM card slot.

- **Insert SIM card**

3. To insert SIM card, press the card with fingers until snap on and then tighten the screws associated with the cover by using a screwdriver.

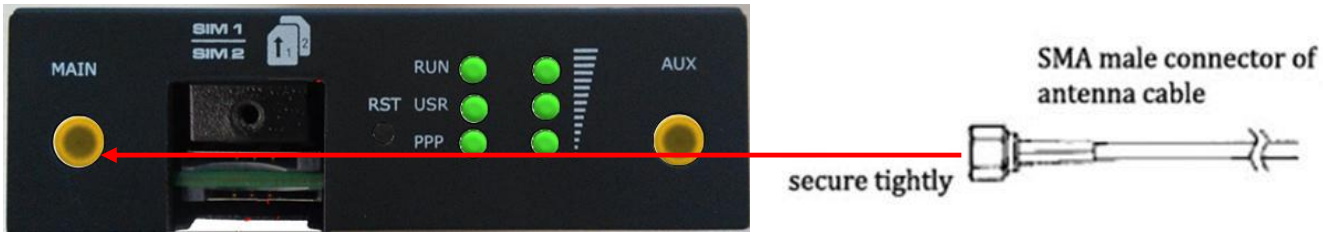
- **Remove SIM card**

4. Make sure router is powered off.
5. To remove SIM card, press the card with fingers until pop out and then take out the SIM card.

Note:

1. Use the specific M2M SIM card when the device is working in extreme temperature, because the regular SIM card for long-time working in harsh environment will be disconnected frequently.
2. Do not forget to twist the cover tightly to avoid being stolen.
3. Do not touch the metal of the SIM card surface in case information in the card will lost or be destroyed.
4. Do not bend or scratch the SIM card.
5. Keep the SIM card away from electricity and magnetism.
6. Make sure router is powered off before inserting or removing the SIM card.

2.8 Connect the External Antenna (SMA Type)



Connect the SMA external antenna connector to the router's antenna interface and twist tightly. Make sure the antenna is within the correct frequency range provided by the operator and with 50 Ohm impedance.

Note: Recommended torque for mounting is 0.35 N.m.

2.9 Grounding the Router

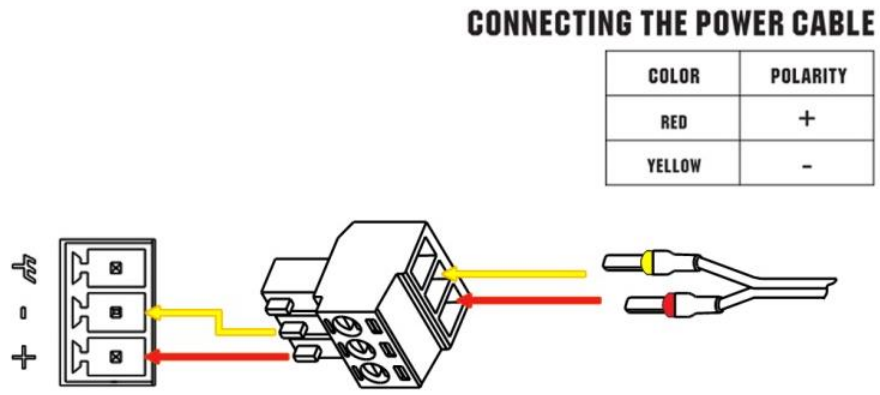
Router grounding helps prevent the noise effect due to electromagnetic interference (EMI). Connect the router to the site ground wire by the ground screw before powering on.

Note: This product is appropriate to be mounted on a sound grounded device surface, such as a metal panel.

2.10 Connect the Router to PC

Connect the router's Ethernet port to a PC through a standard crossed network cable.

2.11 Power Supply



R3000 Lite 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 6 to 26 VDC.

Chapter 3 Configuration Settings over Web Browser

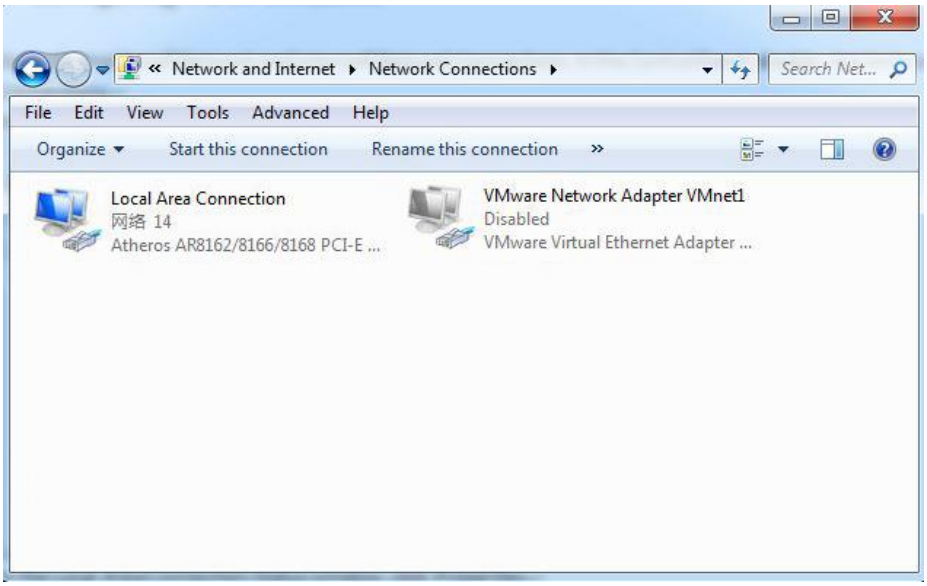
The router can be configured through web browser including IE 8.0 or above, Chrome and Firefox, etc. And the supported operating systems are: Linux, Mac OS, Windows 98/NT/2000/XP/Me/Vista/7/8, etc. There are various ways to connect to the router, either through an external repeater/hub or to PC directly. When the router connects to the PC's Ethernet port directly, and if the router works as the DHCP server, then the PC can obtain IP from router directly; or the PC can be configured with a static IP address in the same network segment with the router, and then the PC and the router will form a small local area network. After the connection has been established successfully, enter the device's default login address in the browser and access the router's web login interface.

3.1 Configuring for the PC

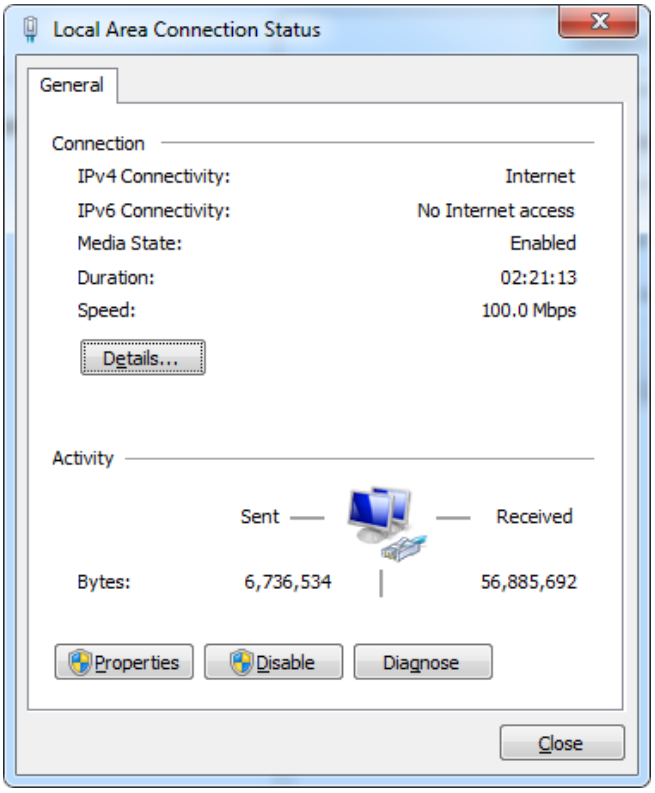
There are two methods to configure the IP address on PC, one is to obtain an IP address automatically from Local Area Connection, and another is to configure a static IP address manually within the same subnet of R3000 Lite router. Please refer to the steps below:

Window 7 System (the configuration for Windows system is similar)

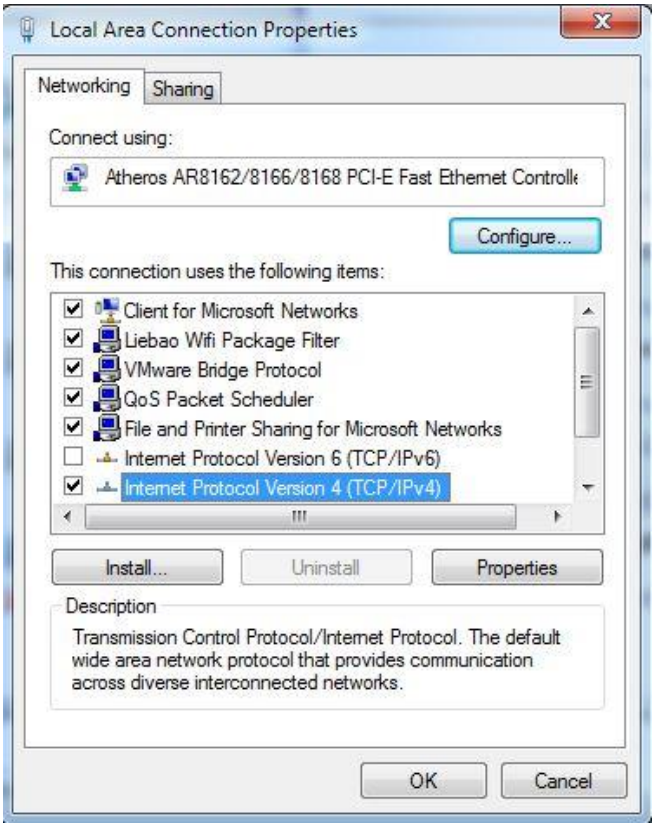
1. Click **Start > Control panel** (in classic view), double-click **Network and Sharing Center**, and then double-click **Local Area Connection**.



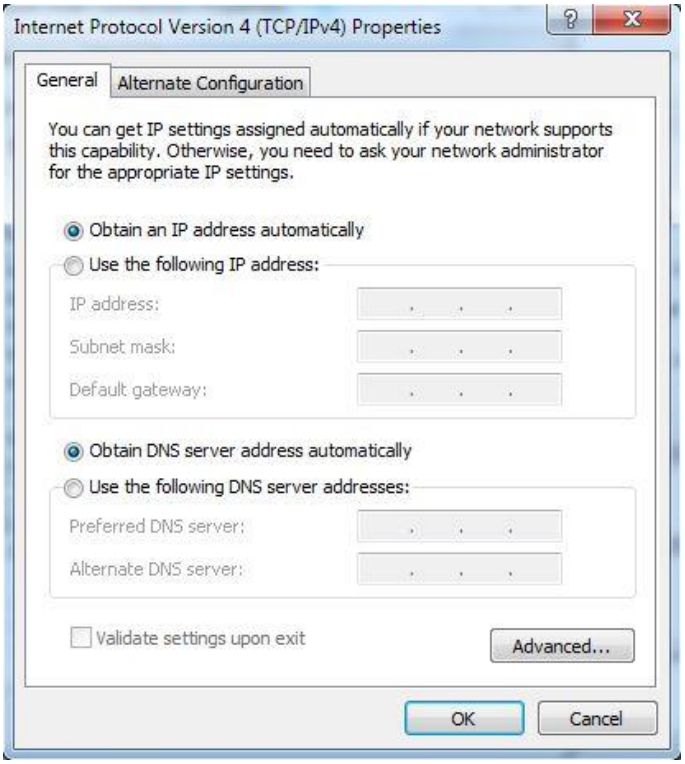
2. Click **Properties** in the window of **Local Area Connection Status**.



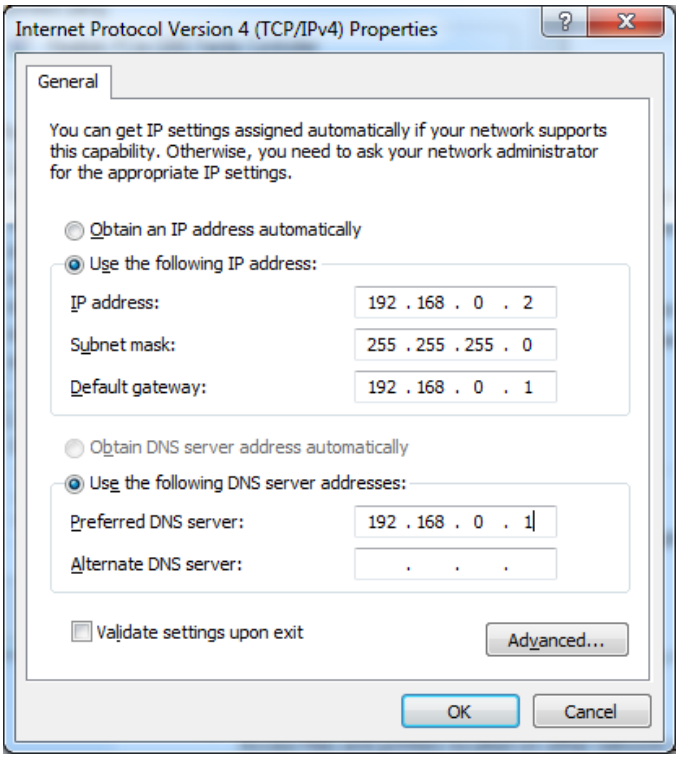
3. Choose **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.



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



   Use the following IP address (configured a static IP address manually within the same subnet of R3000 Lite router):



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

3.2 Logging in the Router

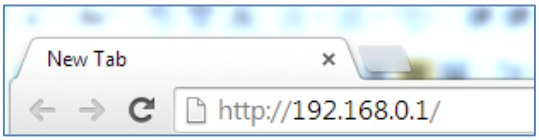
Before configuring your router, you need to know the following default settings.

Item	Description
Username	admin
Password	admin
Ethernet	192.168.0.1/255.255.255.0, LAN mode
DHCP Server	Enabled.

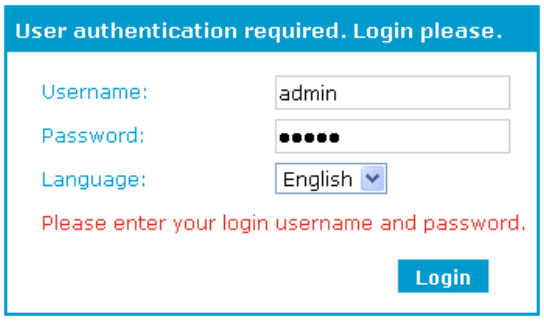
Access the router's web interface

1. On the PC, open a web browser such as Internet Explorer, Google and Firefox etc.

2. From your web browser, enter the IP address of the router. The default IP address of R3000 Lite is 192.168.0.1, though the actual address may vary.
   Note: If a public SIM card is inserted in the R3000 Lite router, you can enter the corresponding public IP address of the SIM card in the browser's address bar, so that to access the R3000 Lite router wirelessly by this public IP.

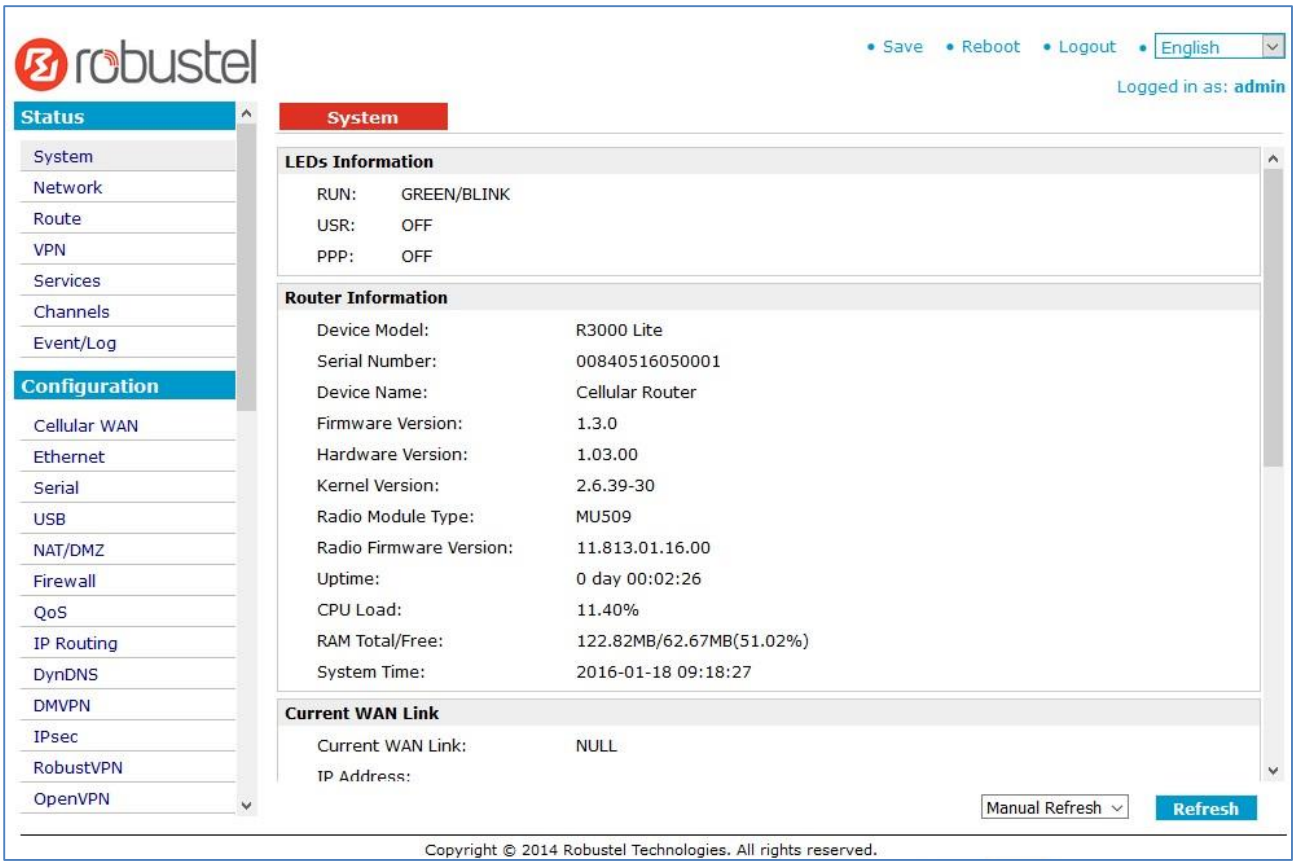


3. In the login page, enter the username and password of R3000 Lite router, choose language and then click **Login**.



3.3 Control Panel

This section allows users to save configuration, reboot router, logout and select language.



Control Panel		
Item	**Description**	**Button**
Save	Click to save the current configuration into router's flash.	• Save
Reboot	After save the current configuration, router needs to be rebooted to make the modification taking effect.	• Reboot
Logout	Click to return to the login page.	• Logout
Language	Select from Chinese, English, German, French and Spanish.	• English
Refresh	Click to refresh the status.	Refresh
Apply	Click to apply the modification on every configuration page.	Apply
Cancel	Click to cancel the modification on every configuration page.	Cancel

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

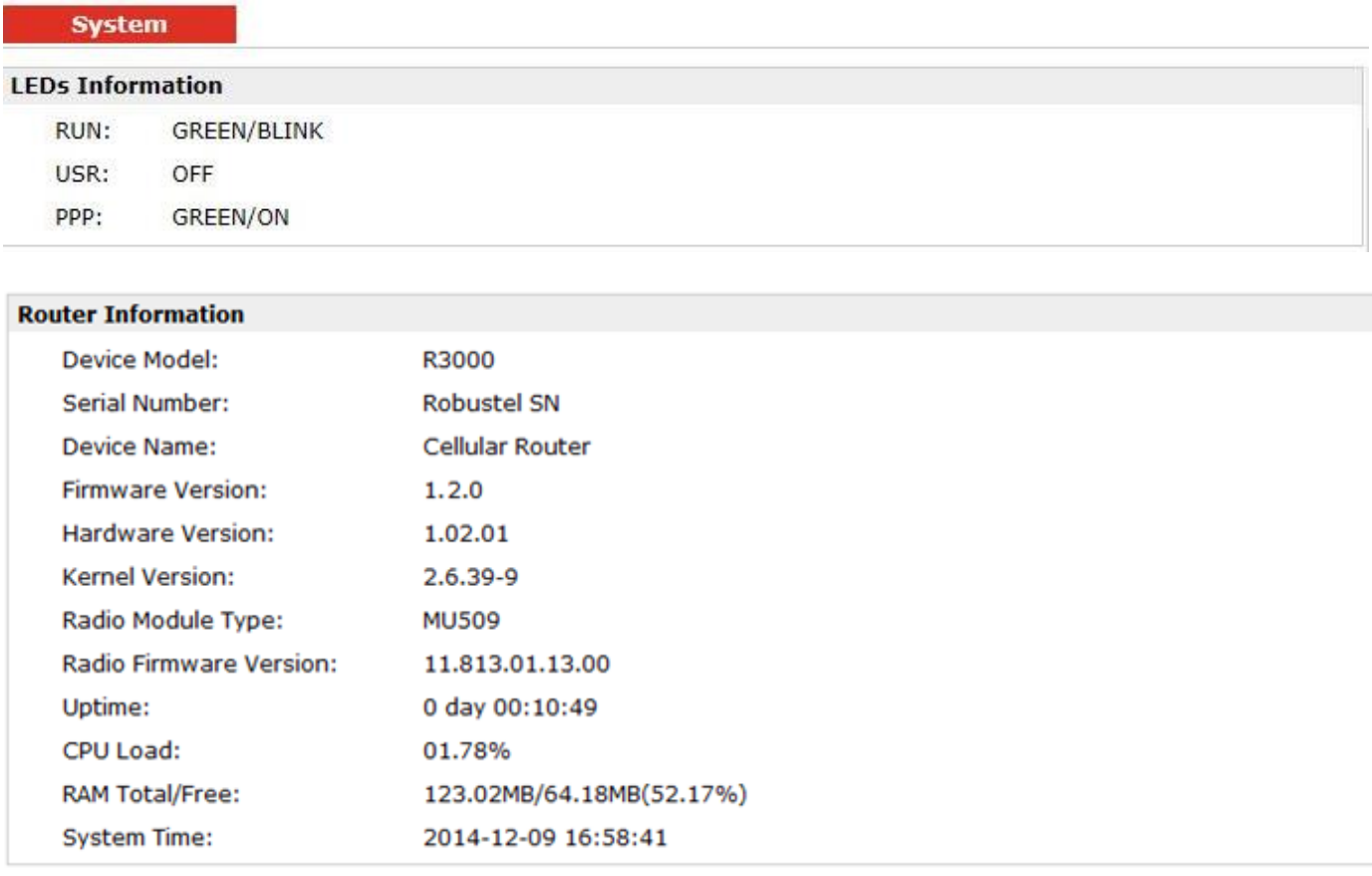
1. Modify in one page;
2. Click Apply under this page;
3. Modify in another page;
4. Click Apply under this page;
5. Complete all modification;
6. Click • Save ;
7. Click • Reboot .

3.4 Status > System

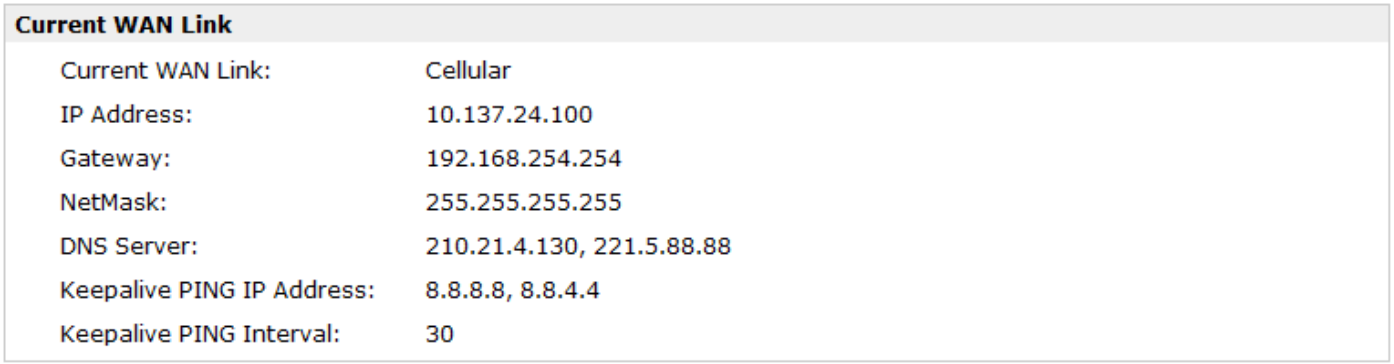
This section displays the router's system status, which shows you a number of helpful information such as the LEDs information, Router information, Current WAN Link and Cellular Information.

LEDs Information

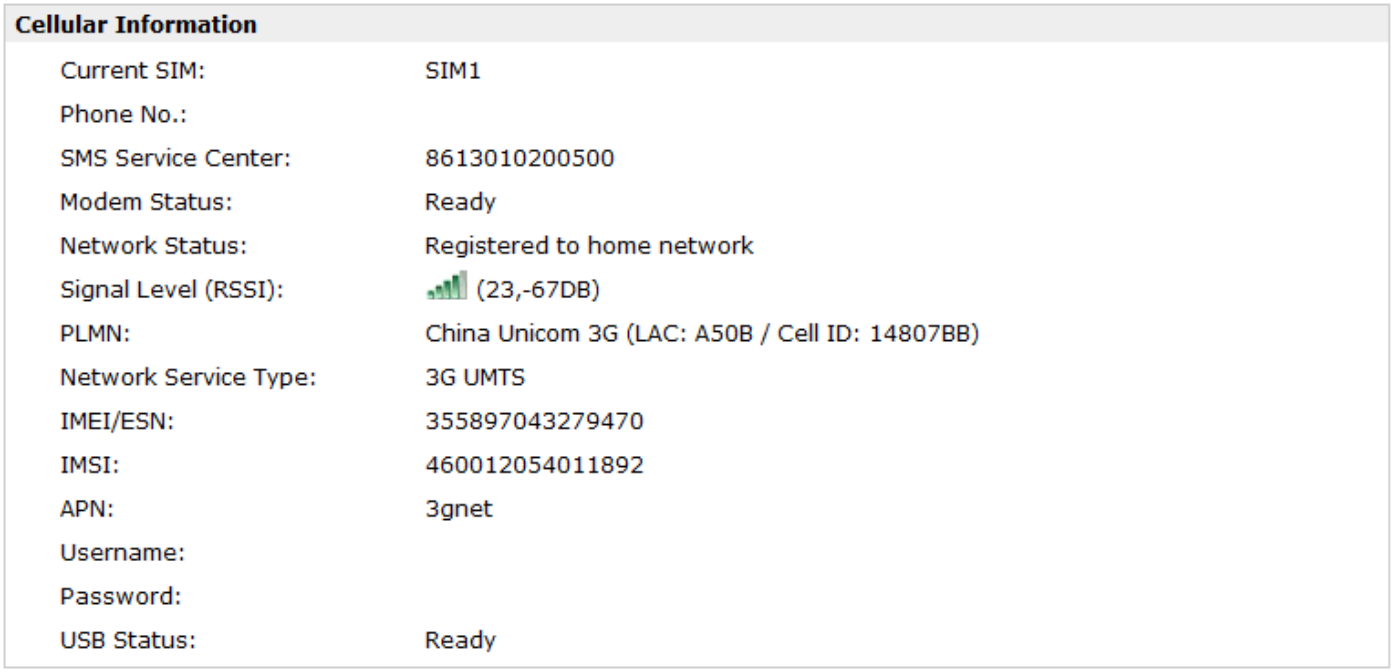
For the detail description, please refer to **2.1 LED Indicators**.



Router Information	
Item	**Description**
Device Model	Show the model name of this device
Serial Number	Show the serial number of this device
Device Name	Show the device name to distinguish different devices you have installed.
Firmware Version	Show the current firmware version
Hardware Version	Show the current hardware version
Kernel Version	Show the current kernel version
Radio Module Type	Show the current radio module type
Radio Firmware Version	Show the current radio firmware version
Uptime	Show how long the router have been working since power on
CPU Load	Show the current CPU load
RAM Total/Free	Show the total capacity /Free capacity of RAM
System Time	Show the current system time



Current WAN Link	
Item	**Description**
Current WAN Link	Show the current WAN link: Cellular WAN.
IP Address	Show the current WAN IP address
Gateway	Show the current gateway
NetMask	Show the current netmask
DNS Server	Show the current primary DNS server and Secondary server
Keepalive PING IP Address	Show the current ICMP detection server, you may click **Configuration > Link Management**.
Keepalive PING Interval	Show the ICMP Detection Interval (s), you may click **Configuration > Link Management**.

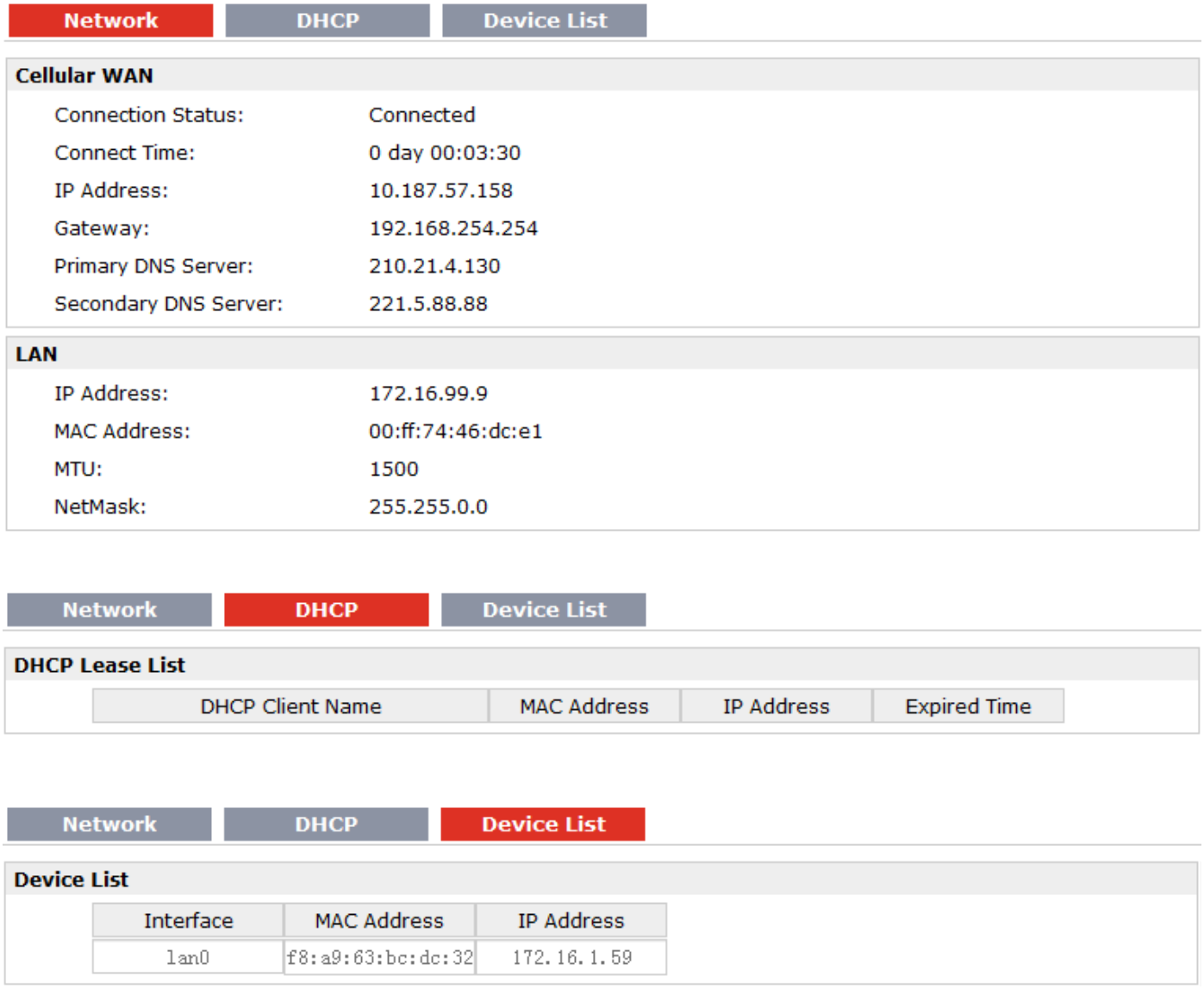


Cellular Information	
Item	**Description**
Current SIM	Show the SIM card which the router work with currently: SIM1 or SIM2
Phone No.	Show the phone number of the current SIM.
SMS Service Center	Show the SMS Service Center.
Modem Status	Show the status of modem. There are 8 different status: 1. Unknown. 2. Ready. 3. Checking AT. 4. Need PIN. 5. Need PUK. 6. Signal level is low. 7. No registered. 8. Initialize APN failed.
Network Status	Show the current network status. There are 6 different status: 1. Not registered, ME is currently not searching for new operator! 2. Registered to home network. 3. Not registered, but ME is currently searching for a new operator. 4. Registration denied. 5. Registered, roaming. 6. Unknown.
Signal Level (RSSI)	Show the current signal level.
Network Operator	Show Mobile Country Code (MCC) +Mobile Network Code (MNC), e.g. 46001. Also it will show the Location Area Code (LAC) and Cell ID.
Network Service Type	Show the current network service type, e.g. GPRS.

IMEI/ESN	Show the IMEI/ESN number of the radio module.
IMSI	Show the IMSI number of the current SIM.
USB Status	Show the current status of USB host.

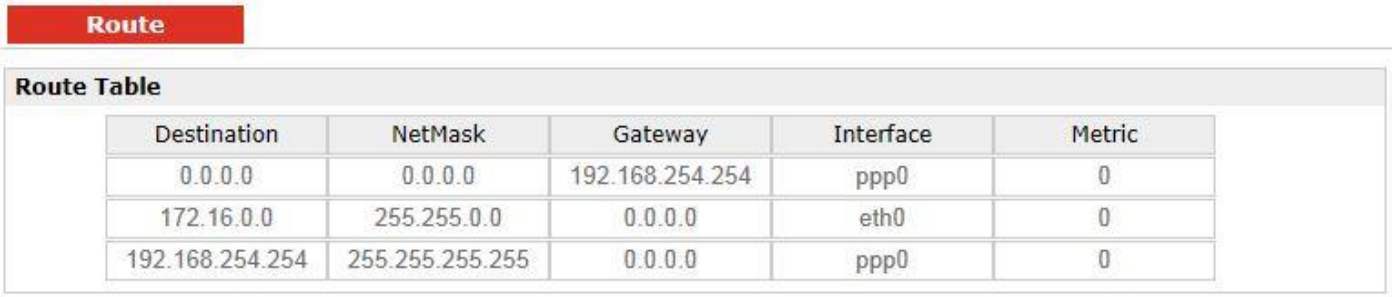
3.5 Status > Network

This section displays the router's Network status, which include status of Cellular WAN and LAN.



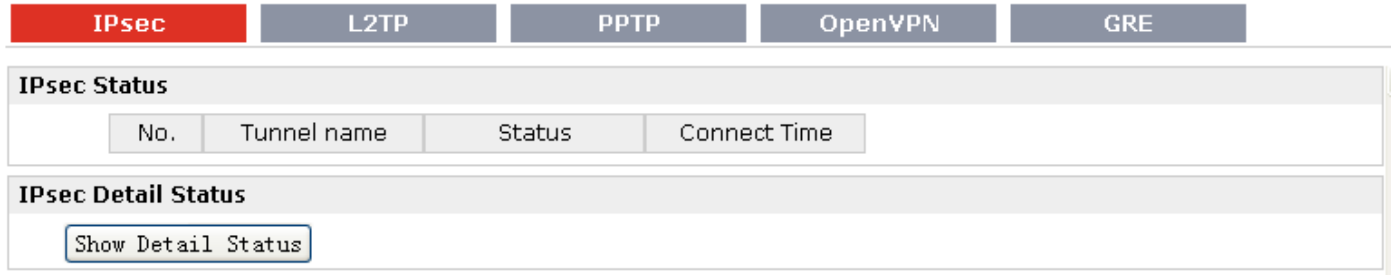
3.6 Status > Route

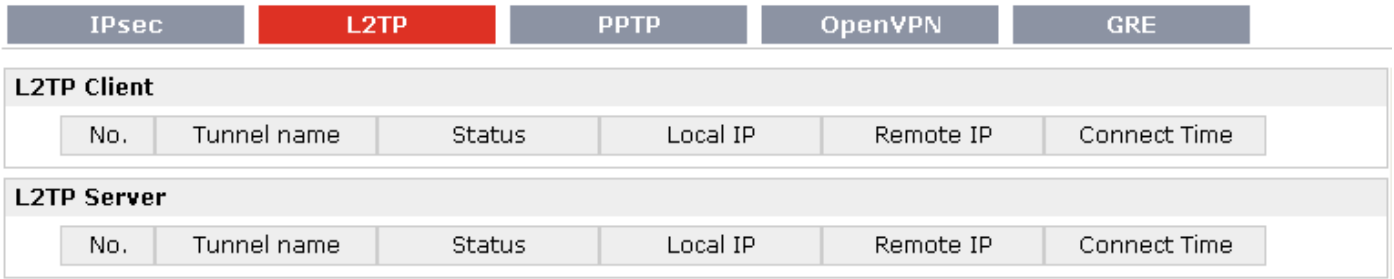
This section displays the router's route table.

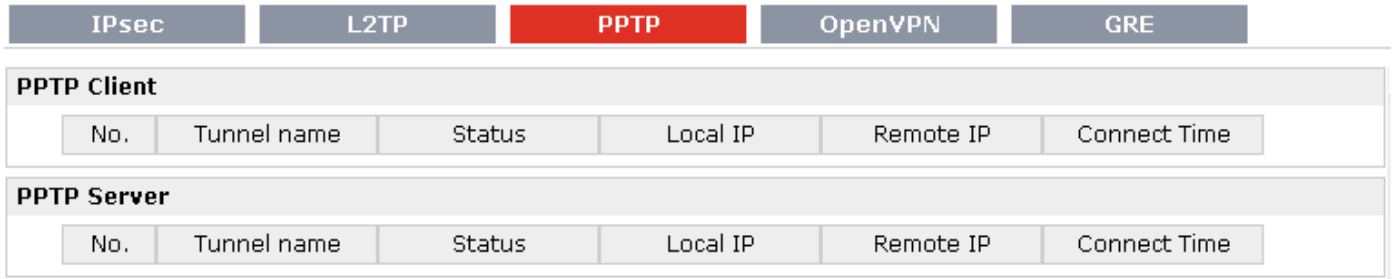


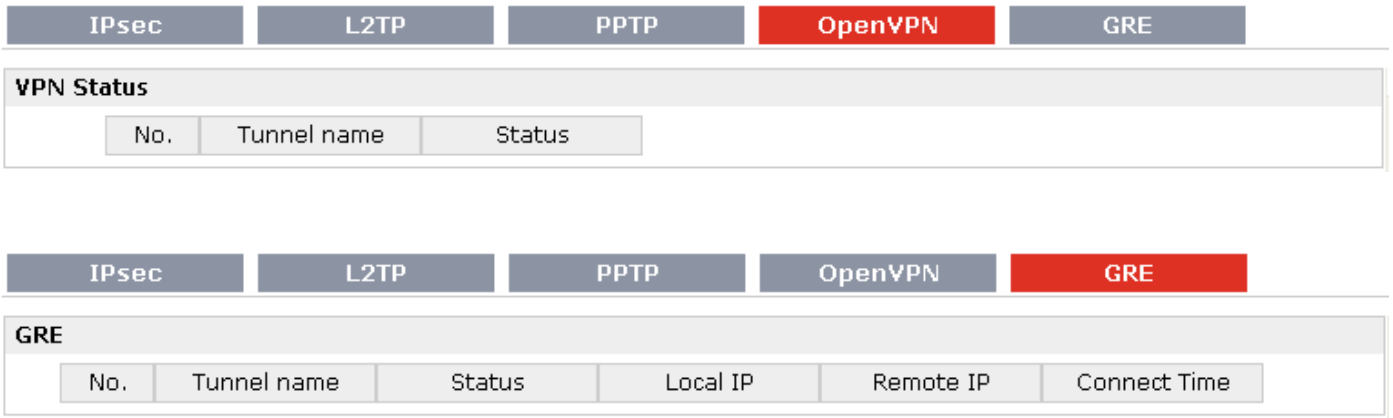
3.7 Status > VPN

This section displays the router's VPN status, which includes IPSec, L2TP, PPTP, OpenVPN and GRE.



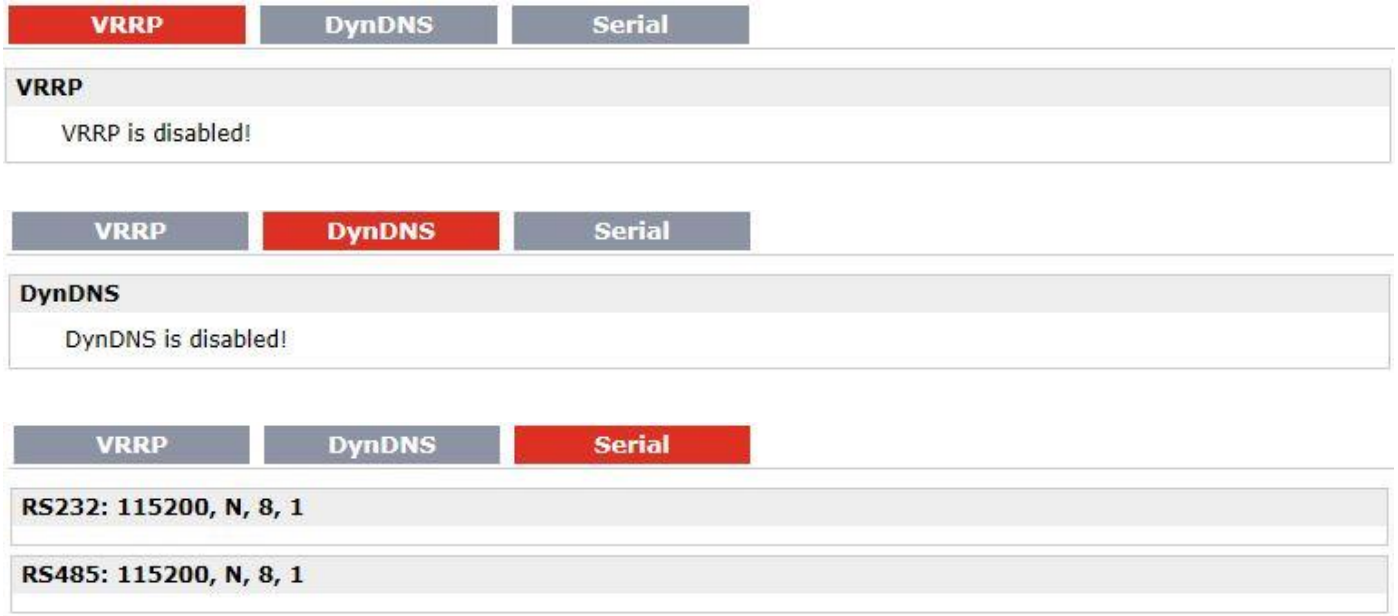






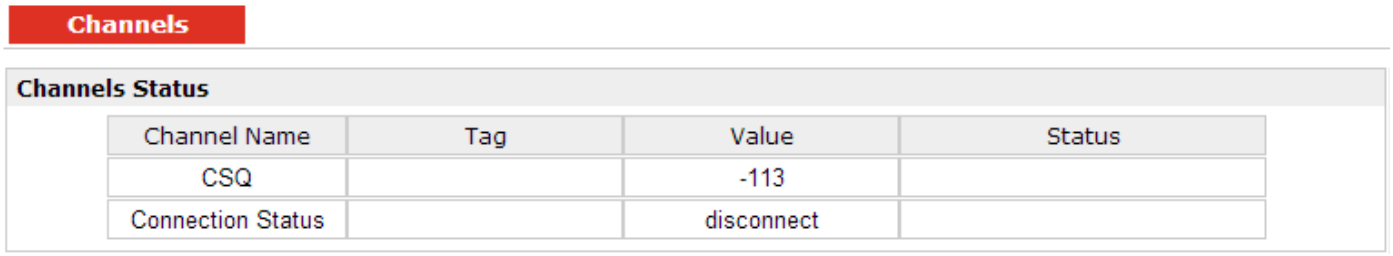
3.8 Status > Services

This section displays the router's Services' status, including VRRP, DynDNS and Serial.



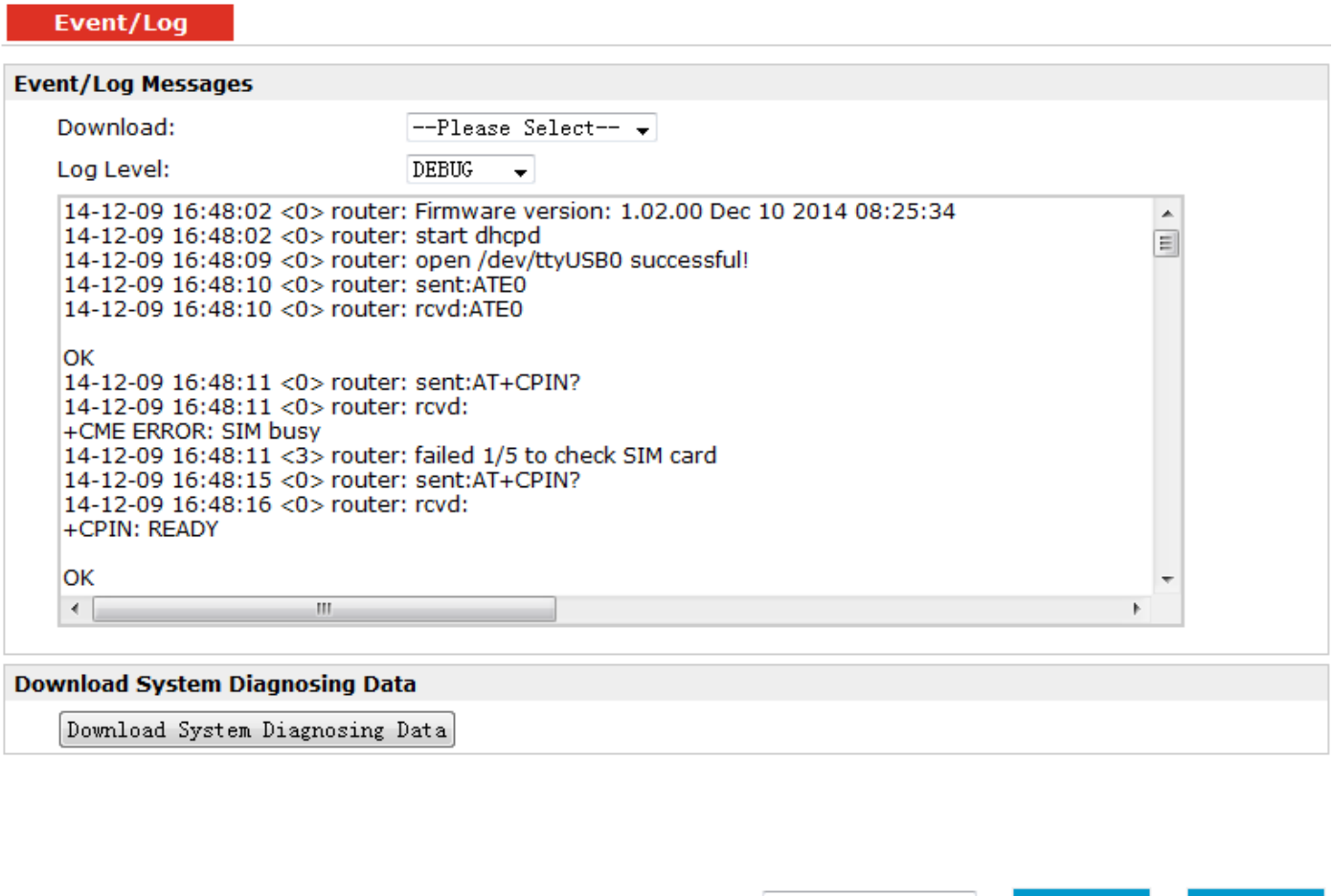
3.9 Status > Channels

This section displays the status of router's channels.



3.10 Status > Event/Log

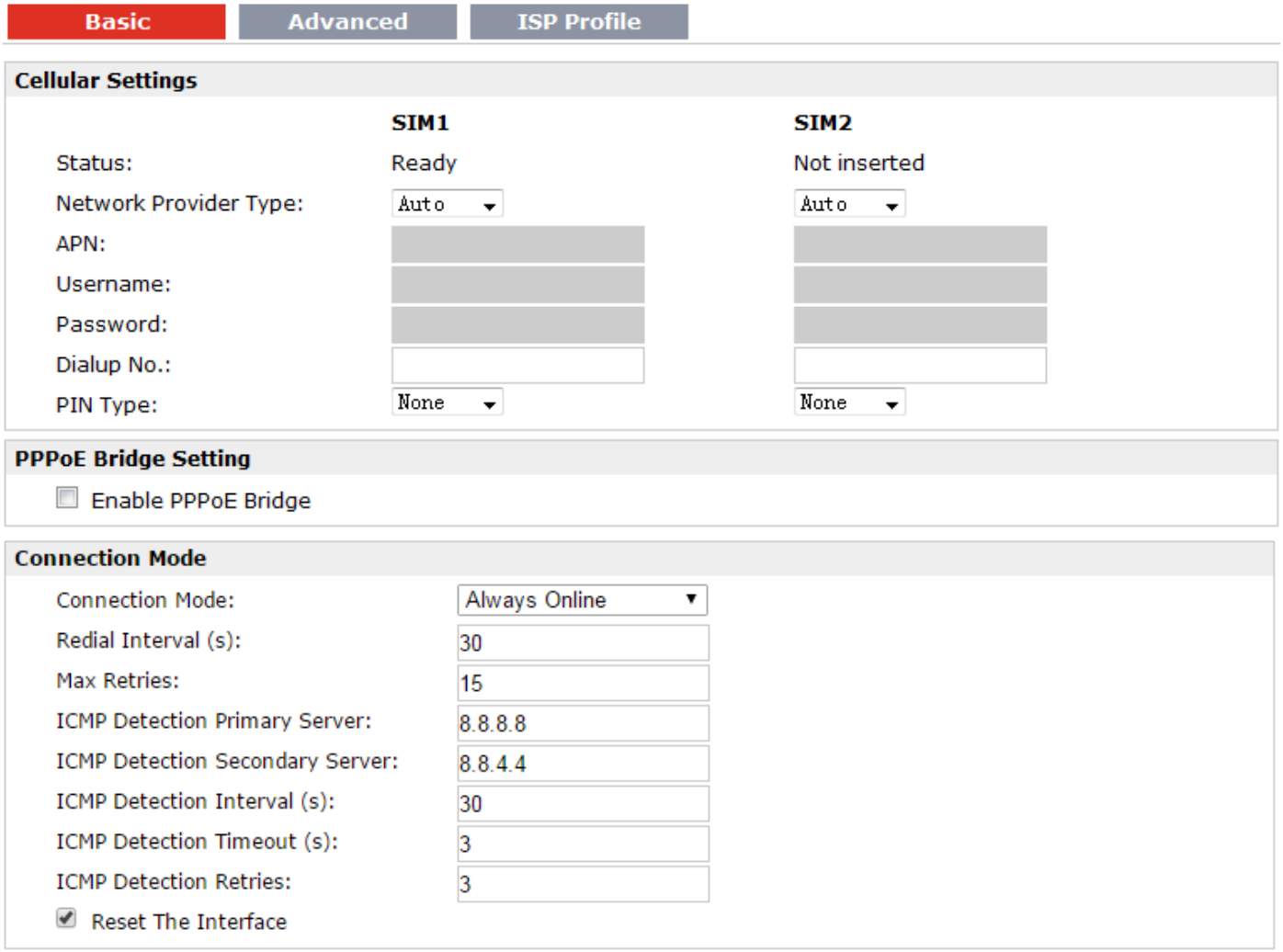
This section displays the router's event/log information. You need to enable router to output the log and select the log level first, then you can view the log information here. Also you can click *Download System Diagnosing Data* to download diagnose data.



Event/Log	
Item	**Description**
Download	Select the log messages you want to download.
Log Level	Select the Log level in the drop-down menu: DEBUG, INFO, NOTICE, WARNING, ERR, CRIT, ALERT, EMERG.
Download System Diagnosing Data	Click *Download System Diagnosing Data* to download diagnose file.
Manual Refresh	Select from "5 Seconds", "10 Seconds", "15 Seconds", "30 Seconds" and "1 Minute". User can select these intervals to refresh the log information.

3.11 Configuration > Cellular WAN

This section allows users to set the Cellular WAN and the related parameters.



Connection Mode

Connection Mode: Connect On Demand
Redial Interval (s): 30
Max Retries: 15
Inactivity Time (s): 0
Serial Output Content (Hex):
☑ Triggered By Serial Data
☑ Triggered By Tel
☑ Triggered By SMS
SMS Connect Command:
SMS Disconnect Command:
SMS Connect Reply:
SMS Disconnect Reply:
Phone Group: NULL
☑ Periodically Connect
Periodically Connect Interval (s): 300
Time Schedule: NULL

Time Range

Name	SUN	MON	TUE	WED	THU	FRI	SAT	Time Range1	Time Range2	Time Range3	
schedule_1	☑	☑	☑	☑	☑	☑	☑	08:10-12:00	14:10-20:15		X

Add

Dual SIM Policy

Main SIM Card: SIM1
☑ Switch To Backup SIM Card When Connection Fails
☑ Switch To Backup SIM Card When ICMP Detection Fails
Total Ping (5~100): 10
Average Ping (100~5000ms): 400
Total Loss (0~100%): 30
☑ Switch To Backup SIM Card When Roaming Is Detected
Preferred PLMN:
☑ Switch To Backup SIM Card When Data Limit Is Exceeded
When Both Data Limit Is Exceeded: Stay in Backup SIM Card
Clean Data Mode: Time of Day

Time of Day(hh:mm):	08:10	12:10
Max Data Limitation (MB):	100	100
Already used (KB):	432	4748
	Clear	Clear

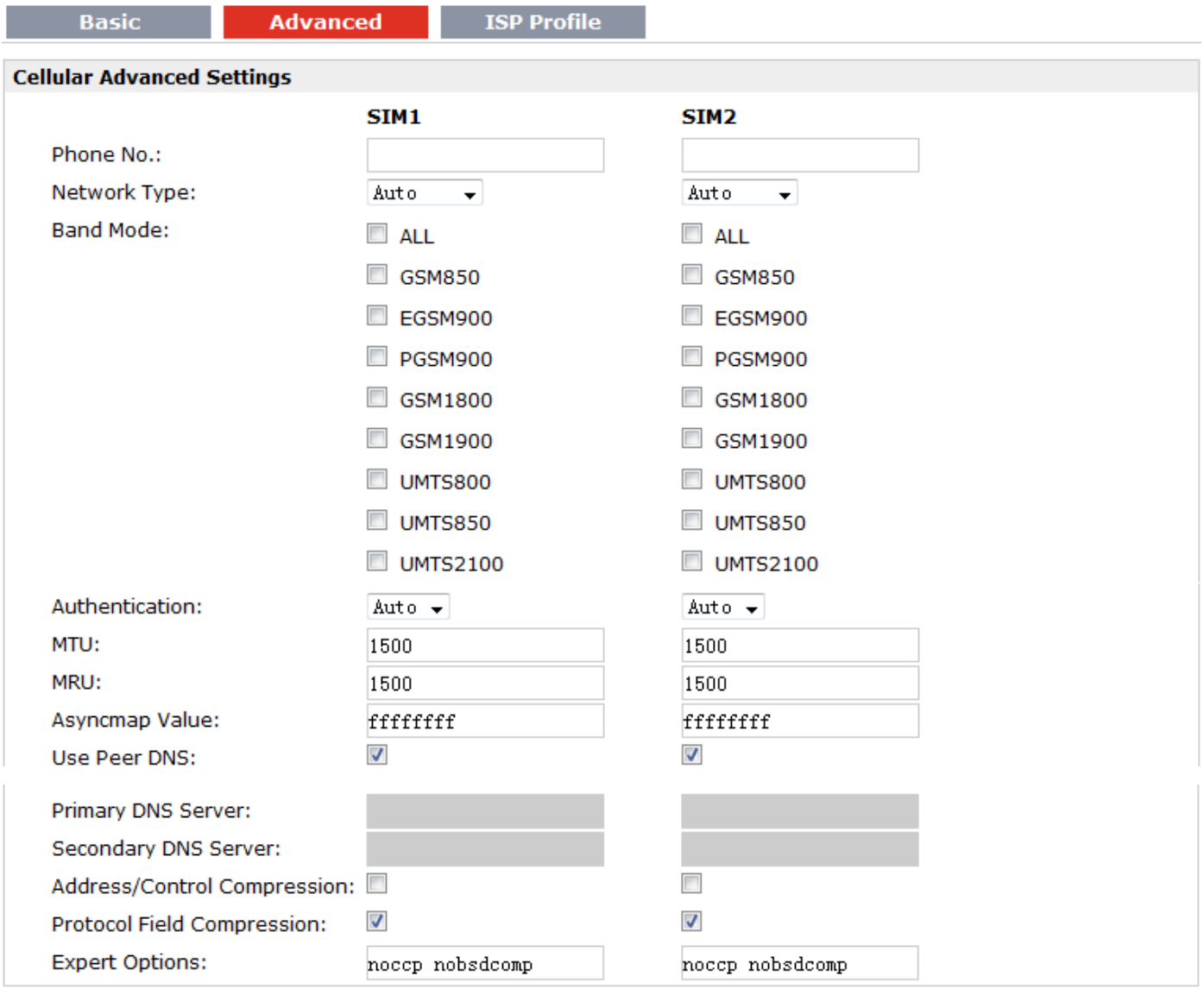
☑ Switch Back Main SIM Card After Timeout
Initial Timeout (min): 60

Basic @Cellular WAN		
Cellular Settings		
Item	**Description**	**Default**
Status	There are the possible statuses of cellular SIM card. "Inserted", "Ready", "Need SIM PIN", "Need SIM PUK", "Check SIM error", "Input PIN Code error", "Input PUK Code error", "Poor signal", "Registration fails", "initializing APN fails", "Linkup fails"; "Not inserted"	/
Network Provider Type	Select from "Auto", "Custom" or the ISP name, you may click **Configuration > Cellular WAN > ISP Profile**. Auto: Router will get the ISP information from SIM card, and set the APN, username and password automatically. This option only works when the SIM card is from well-known ISP. Custom: Users need to set the APN, username and password manually.	Auto
APN	Access Point Name for cellular dial-up connection, provided by local ISP.	Null
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
Dialup No.	Dialup number for cellular dial-up connection, provided by local ISP.	*99***1#
PIN Type	Select from "None", "Input", "Lock", "Unlock". None: Select when SIM card does not enable PIN lock or PUK lock. Input: Select when SIM card has enabled with PIN lock or PUK lock. Correct PIN/PUK code need to be entered. Lock: Select when user needs to lock the SIM card with PIN or PUK code. Unlock: Select when user needs to unlock the SIM card with PIN or PUK code. ***Note**: Please ask your local GSM ISP to see whether your SIM card requiring PIN or not. If you want to change with a new PIN code, you need to input new PIN code in item "New PIN Code" and "Confirm New PIN Code". You can go to tab **Status > Event/Log > AT+CPIN?** to check what the status of the SIM card is.*	None
PPPoE Bridge Setting		
Enable PPPoE Bridge	Click to enable PPPoE Bridge setting.	Disable
Connection Mode		
Connection Mode	Select from "Always Online" and "Connect On Demand". Always Online: Auto activates PPP and keeps the link up after power on.	Connect On Demand

	Connect On Demand: After selection this option, user could configure Triggered by Serial Data, Triggered by Periodically Connect and Triggered by Time Schedule. ***Note***: *If you select several connect on demand polices, router only have to meet one of them to be triggered.*	
Redial Interval (s)	Router will automatically re-dial with this interval when it fails communicating to peer via TCP or UDP.	30
Max Retries	The maximum retries times for automatically re-connect when router fails to dial up. After maximum retries, router will reboot the wireless module. If router still cannot dial up successfully, it will try to switch to the other SIM card. Then router will re-connect with the other SIM card with maximum retries. After successful connection, the Max Retries counter will be set to 0.	3
ICMP Detection Primary Server	Router will ping this primary address/domain name to check that if the current connectivity is active.	8.8.8.8
ICMP Detection Secondary Server	Router will ping this secondary address/domain name to check that if the current connectivity is active.	8.8.4.4
ICMP Detection Interval (s)	Set the ping interval time.	Null
ICMP Detection Timeout (s)	Set the ping timeout.	30
ICMP Detection Retries	If Router ping the preset address/domain name time out continuously for Max Retries time, it will consider that the connection has been lost.	3
Reset The Interface	Enable to reset the cellular/ETH interface after the max ICMP detection retries.	3
Inactivity Time (s)	Set the auto disconnect time when no data flow produced.	0
Serial Output Content (Hex)	The content which output to the serial device which connect to router and inform it that router is ready to receive serial data.	Null
Triggered by Serial Data	Tick this check box to allow router automatically connects to cellular network from idle mode when there is data comes out from serial port.	Enable
Triggered by Tel	Tick this check box to allow router automatically connects to cellular network from idle mode when make a voice call to router.	Disable
Triggered by SMS	Tick this check box to allow router automatically connects to cellular network from idle mode when send a specific SMS to router.	Disable
SMS Connect Command	Users shall send this specific SMS to trigger router to connect to cellular network.	Null
SMS Disconnect Command	Users shall send this specific SMS to trigger router to disconnect to cellular network.	Null
SMS Connect Reply	When router connects to cellular network, it will automatically send out this SMS to specific users (set in the Phone Group).	Null
SMS Disconnect Reply	When router disconnect from cellular network, it will automatically send out this SMS to specific users (set in the Phone Group).	Null
Phone Group	Click to add Phone Group to Set specific users' phone Book and which	Null

	phone Group they are belonged to.	
Periodically Connect	Tick this check box to allow router automatically connects to cellular network with preset interval which you preset in *Periodically Connect Interval*.	Enable
Periodically Connect Interval (s)	Periodically Connect Interval for Periodically Connect.	300
Time Schedule	Select the Time Range to allow router automatically connects to cellular network during this time range.	Null
Time Range	Adding the Time Range for Time Schedule. You can set the days of one week and at most three ranges of time of one day.	Null
Dual SIM Policy		
Main SIM Card	Set the preferred SIM card from SIM 1, SIM 2 or Auto.	SIM1
Switch to backup SIM card when connection fails	Router will switch to another SIM card if main SIM card fail to connect to network.	Disable
Switch to backup SIM card when ICMP detection fails	If the packet loss rate of ICMP's pings or average duration of each ping exceeds the set value, the router will switch to the backup card. There are two critical condition, packet loss rate and average duration of each ping.	Disable
Total Ping (5~100)	Set the total number of pings; fetch value from 5 to 100.	10
Average Ping (100~5000ms)	Set the duration of average ping; fetch value from 100 to 5000ms.	400
Total Loss (0~100%)	Set the total packet loss rate.	30
Switch to backup SIM card when roaming is detected	Router will switch to backup SIM card when preferred SIM card is roaming.	Disable
Preferred PLMN	The identifier for Router to check if it is in home location area or in roaming area, and decide if it needs to switch back to preferred SIM card.	Null
Switch to backup SIM card when data limit is exceeded	If the SIM card that the router worked with currently has reached the data traffic limitation you preset, it will switch to the other SIM card.	Disable
When both data limit is exceeded	"Stay in Backup SIM Card", "Switch Back Main SIM Card" or "Disable Cellular Until Data Is Cleared" is optional.	Stay in Backup SIM Card
Clean Data Mode	"Time of Day", "Day of Week" or "Day of Month" is optional. Time of Day: the format is hh:mm; specify one point-in-time of every day to zero out the data flow. Day of Week: select from Sunday to Saturday; specify one day of every week to zero out the data flow. Day of Month: select from 1 to 31; specify one day of every month to zero out the data flow.	Day of Month
Max Data limitation	Set the monthly data traffic limitation.	100

(MB)		
Already used (KB)	This tab will show how many data traffic has been used.	0
Switch back main SIM card after timeout	Enable to Switch back Main SIM card after the Initial timeout.	Disable
Initial Timeout(min)	Set the initial timeout.	60
Roaming Network Setting		
Roaming Network Selection	Tick to enable the roaming network setting; then the router will automatically search for and connect to the roaming network with good signal.	Disable
Signal Threshold	The network will be switched when the signal value of current network is less than the set signal value. The order of switching network will switch according to the queried PLMN list of R3000 Lite.	0
Preferred PLMN	PLMN list will generally have an optimal PLMN. The specific network will be selected automatically by the module if the optimal PLMN is null; otherwise, the R3000 Lite will choose the corresponding network of the optimal PLMN.	Null
PLMN Status List	If the current SIM card supports multiple networks, R3000 Lite will query all network info of this card supported. This information will be displayed in the PLMN list, click the **Refresh** button to refresh the current SIM card information.	Null
Network Address Translation		
Enable Nat Function	Tick to enable the SNAT function	Enable

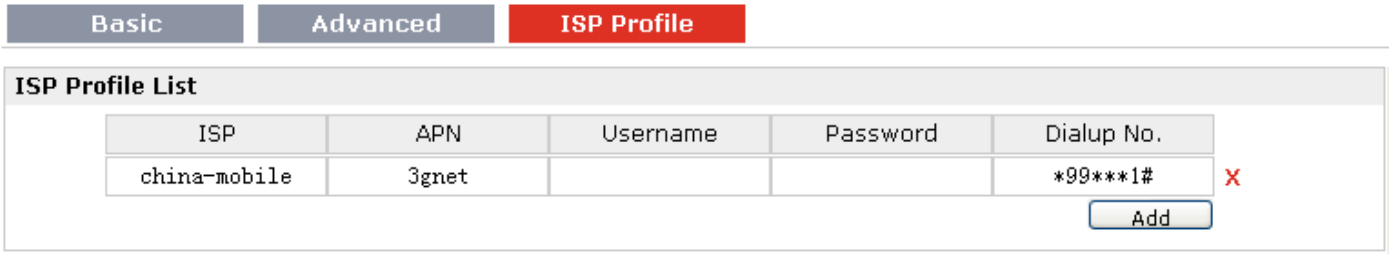


Advanced @Cellular WAN		
Item	**Description**	**Default**
Phone No.	Set the SIM card's phone number, and it will be showed in **Status > System > System > Cellular WAN Information > SIM Phone Number**. In general, you don't need to set this number because router will read it from the SIM card automatically.	Null
Network Type	Select from "Auto", "2G GSM" and "3G UMTS" as the SIM card supported.	Auto
Band Mode	Tick the Band Mode options to fix the bands router working with.	Disable
Authentication	Select from "Auto", "PAP" and "CHAP" as the local ISP required.	Auto
MTU	Maximum Transmission Unit. It is the identifier of the maximum size of packet, which is possible to transfer in a given environment.	1500
MRU	Maximum Receiving Unit. It is the identifier of the maximum size of packet, which is possible to receive in a given environment.	1500

Asyncmap Value	One of the PPP initialization strings. In general, you don't need to modify this value.	1
Use Peer DNS	Enable to obtain the DNS server's address from the ISP.	Enable
Primary DNS Server	Set the primary DNS server's address. This item will be unavailable if you enable "Use Peer DNS".	Null
Secondary DNS Server	Set the secondary DNS server's address. This item will be unavailable if you enable "Use Peer DNS".	Null
Address/Control Compression	Used for PPP initialization. In general, you need to enable it as default.	Enable
Protocol Field Compression	Used for PPP initialization. In general, you need to enable it as default.	Enable
Expert Options	You can enter some other PPP initialization strings in this field. Each string can be separated by a space.	noccp nobsdcomp

ISP Profile

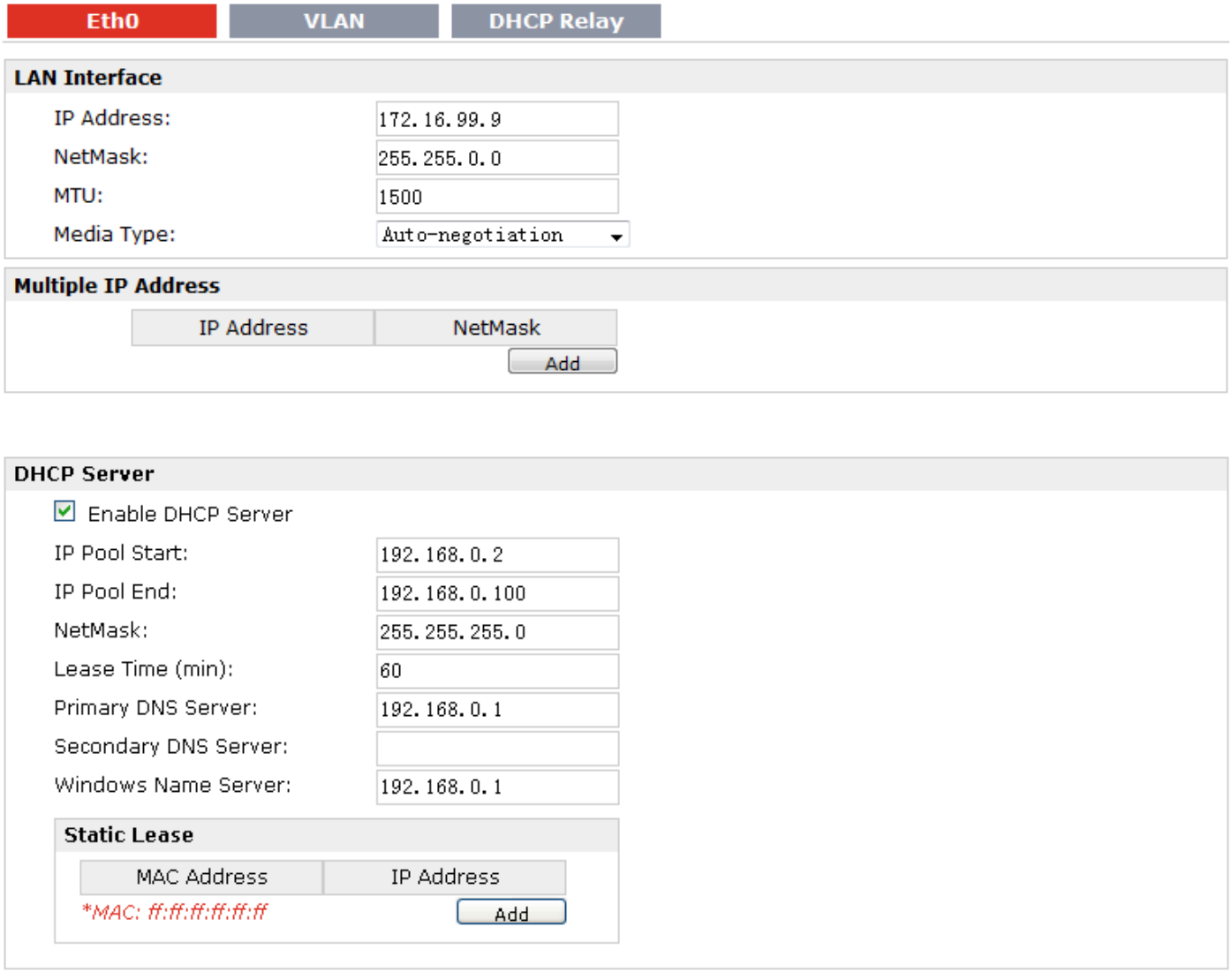
This section allows users to preset some ISP profiles which will be shown in the selection list of **Configuration > Cellular WAN > Network Provider Type.**



ISP Profile @Cellular WAN		
Item	**Description**	**Default**
ISP	Input the ISP's name which will be shown in the selection list of **Configuration > Cellular WAN > Network Provider Type**.	Null
APN, Username, Password, Dialup No.	All these parameters were provided by the ISP.	Null

3.12 Configuration > Ethernet

This section allows users to set the Ethernet LAN parameters of Eth0.



Eth0@Ethernet		
Item	**Description**	**Default**
IP Address, Netmask, MTU, Media Type @ LAN Interface	Set the IP address, Netmask, MTU and Media Type of Eth0. These parameters will be un-configurable if you enable Bridge.	Null
Multiple IP Address @ LAN Interface	Assign multiple IP addresses for Eth0.	Null
Enable DHCP Server @ DHCP Server	Enable to make router can lease IP address to DHCP clients which connect to Eth0.	Enable
IP Pool Start, IP Pool End @ DHCP Server	Define the beginning (IP Pool Start) and end (IP Pool End) of the pool of IP addresses which will lease to DHCP clients.	192.168.0.2/ 192.168.0.100

Netmask @ DHCP Server	Define the Netmask which the DHCP clients will obtain from DHCP server.	255.255.255.0
Lease Time @ DHCP Server(min)	Define the time which the client can use the IP address which obtained from DHCP server.	60
Primary/Secondary DNS Server @ DHCP Server	Define the primary/secondary DNS Server which the DHCP clients will obtain from DHCP server.	192.168.0.1/ 0.0.0.0
Windows Name Server @ DHCP Server	Define the WINS Server which the DHCP clients will obtain from DHCP server.	192.168.0.1
Static Lease @ DHCP Server	Define to lease static IP Addresses, which conform to MAC Address of the connected equipment.	Null

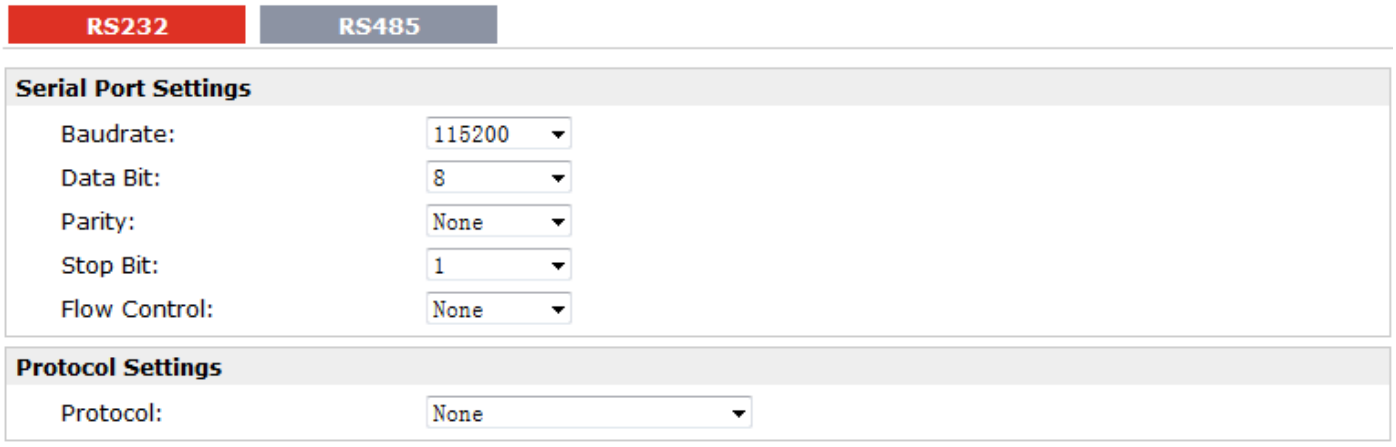
VLAN @ Ethernet		
Item	**Description**	**Default**
Enable VLAN	Enable to make router can encapsulate and de-encapsulate the VLAN tag.	Disable
VLAN ID@ VLAN Settings	Set the Tag ID of VLAN	Null
IP Address, Netmask @ VLAN Settings	Set the IP address, Netmask of VLAN interface	VLAN's IP address, Netmask

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. This section allow user to configure DHCP Relay settings.

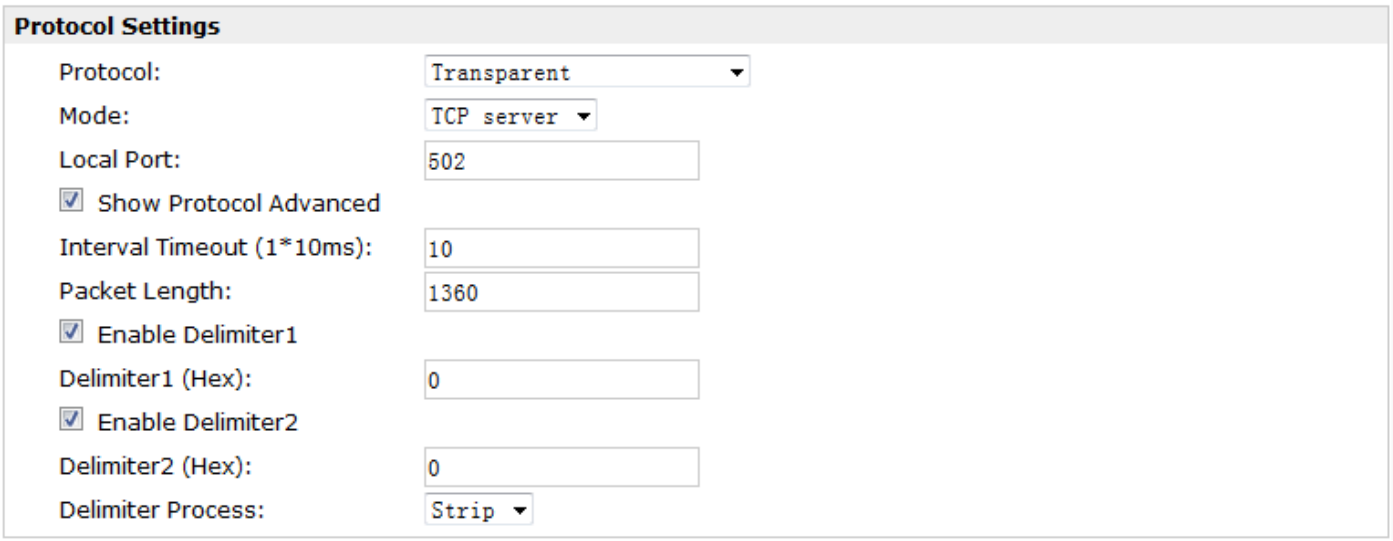
DHCP Relay @ Ethernet		
Item	**Description**	**Default**
DHCP Server	Enter DHCP Server's IP address. Note: Please disable DHCP Server and DHCP Client first to make sure DHCP relay can be enabled.	Null

3.13 Configuration > Serial

This section allows users to set the serial (RS232/RS485) parameters.



- When Select Protocol "Transparent":

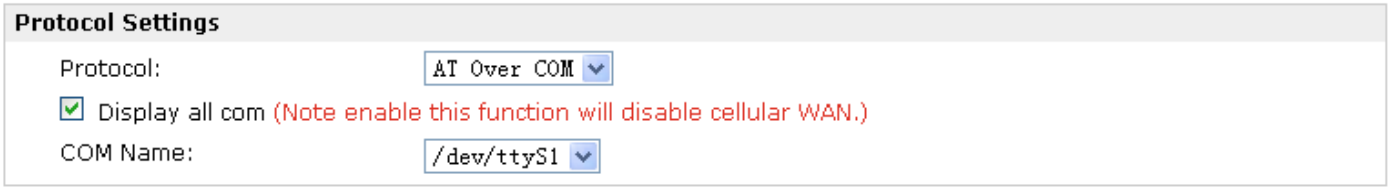


- When Select Protocol "Modbus gateway":

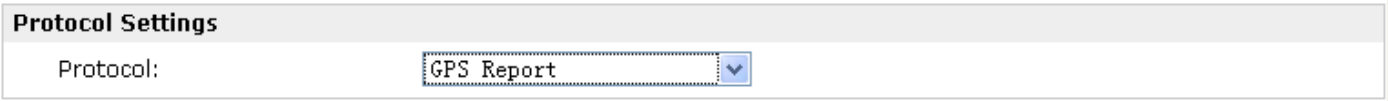
- When Select Protocol “Transparent Over Rlink”:

- When Select Protocol “Modbus Over Rlink”:

- When Select Protocol “AT Over COM”:



- When Select Protocol “GPS Report”:

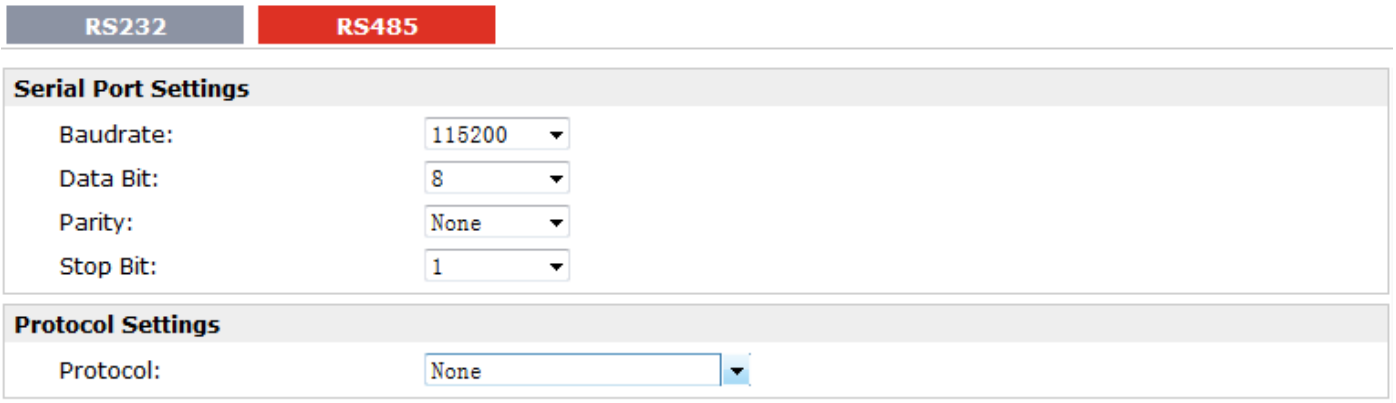


RS232 @ Serial		
Item	**Description**	**Default**
Baud-rate	Select from “300”, “600”, “1200”, “2400”, “4800”, “9600”, “19200”, “38400”, “57600” , “115200”and “230400”.	115200
Data bit	Select from “7” and “8”.	8
Parity	Select from “None”, “Odd” and “Even”.	None
Stop bit	Select from “1” and “2”.	1
Flow control	Select from “None”, “Software” and “Hardware”.	None
Protocol	Select from “None”, “Transparent”, “Modbus gateway”, “Transparent Over Rlink”, “Modbus Over Rlink” “AT Over COM” and “GPS Report”. 1. None: Router does nothing to RS232 serial port. 2. Transparent: Router will transmit the serial data transparently without any protocols. 3. Modbus gateway: Router will translate the Modbus RTU data to Modbus TCP data and vice versa. 4. Transparent Over Rlink: Router will send all data from RS232 serial port to Robustlink, then Robustlink will forward the data to another destination site. 5. Modbus Over Rlink: Router will translate all data from RS232 serial port to	None

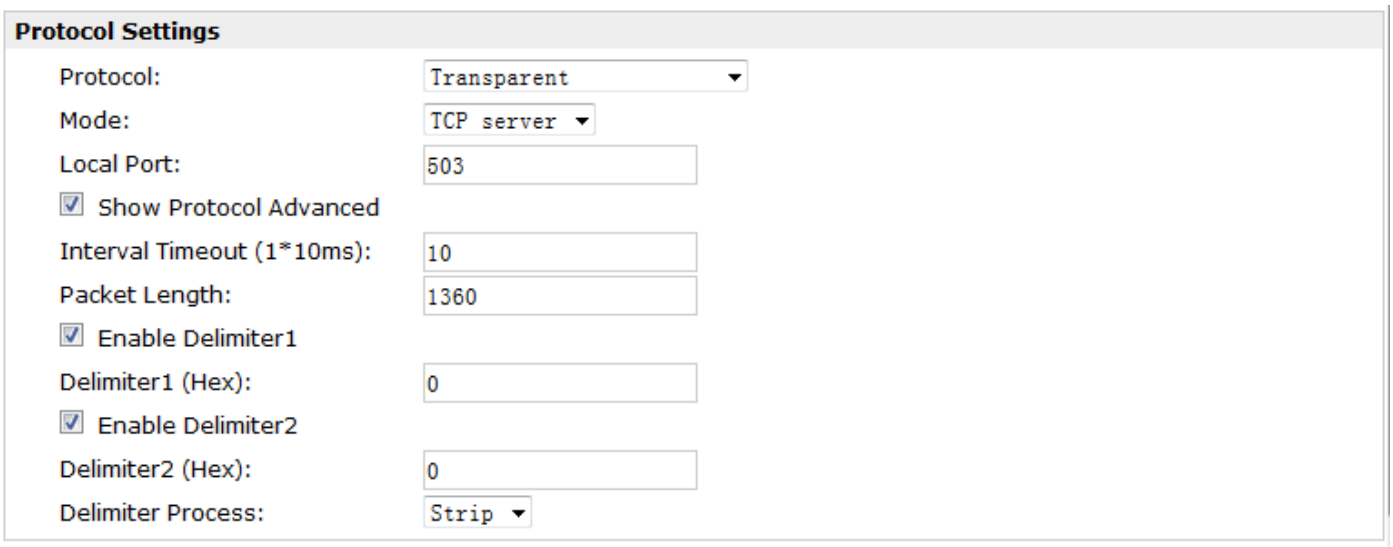
	Modbus TCP protocol data, and then send to Robustlink, after that Robustlink will forward the data to another destination site. 6. AT Over COM: select to operate router via RS232 COM port. For example, enter AT commands to router via RS232 COM port. 7. GPS Report: select to enable router to output GPS status data through RS232 port.	
Mode @Transparent	Select from "TCP Server", "TCP Client" and "UDP". TCP Client: Router works as TCP client, initiate TCP connection to TCP server. Server address supports both IP and domain name. TCP Server: Router works as TCP server, listening for connection request from TCP client. UDP: Router works as UDP client.	TCP Client
Local Port @Transparent	Enter the Local port for TCP or UDP.	0
Multiple Server @Transparent	Click "Add" button to add multiple server. You need to enter the server's IP and port, and enable or disable "Send data to serial". If you disable "Send data to serial", router will not transmit the data from this server to serial port. ***Note:*** *This section will not be displayed if you select "TCP server" in "Mode".*	None
show Protocol Advanced @ Transparent	Tick to enable protocol advanced setting.	Disable
Local IP @ Transparent	This item will show up when you enable any VPN tunnel of R3000 Lite, it means serial data can be matched to this local IP address and be transmitted or received via VPN tunnel. ***Note****: when you do not enable any VPN tunnel, this item will not show up.*	Null
Interval Timeout @Transparent	The serial port will queue the data in the buffer and send the data to the Cellular WAN/Ethernet WAN when it reaches the Interval Timeout in the field. ***Note****: Data will also be sent as specified by the packet length or delimiter settings even when data is not reaching the interval timeout in the field.*	10
Packet Length @Transparent	The Packet length setting refers to the maximum amount of data that is allowed to accumulate in the serial port buffer before sending. 0 for packet length, no maximum amount is specified and data in the buffer will be sent as specified by the interval timeout or delimiter settings or when the buffer is full. When a packet length between 1 and 1024 bytes is specified, data in the buffer will be sent as soon it reaches the specified length. ***Note****: Data will also be sent as specified by the interval timeout or delimiter settings even when data is not reaching the preset packet length.*	1360
Enable Delimiter1/2	When Delimiter 1 is enabled, the serial port will queue the data in the buffer and send the data to the Cellular WAN/Ethernet WAN when a specific character, entered in hex format, is received. A second delimiter character may be enabled and specified in the Delimiter 2 field, so that both characters act as the delimiter to control when data should be sent.	Disable
Delimiter1/2 (Hex)	Enter the delimiter in Hex.	0

@Transparent		
Delimiter Process @Transparent	The Delimiter process field determines how the data is handled when a delimiter is received. None: Data in the buffer will be transmitted when the delimiter is received; the data also includes the delimiter characters. Strip: Data in the buffer is first stripped of the delimiter before being transmitted.	Strip
Local IP @ Modbus gateway	This item will show up When you enable any VPN tunnel of R3000 Lite, it means serial data can be matched to this local IP address and be transmitted or received via VPN tunnel. ***Note**: when you do not enable any VPN tunnel, this item will not show up.*	0
Local Port @ Modbus gateway	Enter the Local port for Modbus.	0
Attached serial device type @Modbus gateway	Select From "Modbus RTU slave", "Modbus ASCⅡ slave", "Modbus RTU master" and "Modbus ASCⅡ master". Modbus RTU slave: router connects to Modbus slave device which works under Modbus RTU protocol. Modbus ASCⅡ slave: router connects to Modbus slave device which works under Modbus ASCⅡ protocol. ***Note**: When select "Modbus RTU slave" and "Modbus ASCⅡ slave" protocol, router is as TCP Server site, user need to enter a local port number in "Local Port @Modbus" and wait to be connected.* Modbus RTU master: router connects to master device which works under Modbus RTU protocol. Modbus ASCⅡ master: router connects to master device which works under Modbus ASCⅡ protocol. ***Note**: When select "Modbus RTU* master*" and "Modbus ASCⅡ*master*" protocol, router is as TCP Client site, user need to enter slave address and slave port number in "*Slave Address @ Modbus Slave *" and "*Slave Port @ Modbus Slave*", and connect to Server site.*	Modbus RTU slave
Modbus Slave @Modbus gateway	Add the Modbus slaves which will be polled by Modbus master (router). This section only displayed when you select "Modbus RTU master" or "Modbus ASCⅡ master" in "Attached serial device type".	Null
Slave Address @ Modbus Slave	This connection is usually used to connect to the Modbus slave devices which as TCP server. Enter IP address of the TCP server.	Null
Slave Port @ Modbus Slave	Enter the port number of TCP server.	Null
ID @ Modbus Slave	Enter the ID number of TCP server.	Null
Interval Timeout @ Transparent Over Rlink	The serial port will queue the data in the buffer and send the data to the Cellular WAN/Ethernet WAN when it reaches the Interval Timeout in the field.	10
Attached serial device type @	Select From "Modbus RTU slave", "Modbus ASCⅡ slave". Modbus RTU slave: router connects to slave device which works under Modbus	Null

Modbus Over Rlink	RTU protocol. Modbus ASCⅡ slave: router connects to slave device which works under Modbus ASCⅡ protocol.	
Display all com @ AT Over COM	Enable to display all virtual com of the module inside the router. Generally, router will occupy /dev/ttyUSB0 and /dev/ttyUSB2 for dialing up to GPRS. ***Note**: Enable this function will disable Cellular WAN function.*	Disable
COM Name	Show the virtual com name of the module inside.	/dev/ttyUSB1



- When Select Protocol "Transparent":



- When Select Protocol "Modbus Master":

When you select protocol "Modbus Master", you can configure the "Modbus Master" in section 3.32.

- When Select Protocol “Modbus gateway”:

- When Select Protocol “Transparent Over Rlink”:

- When Select Protocol “Modbus Over Rlink”:

RS485 @ Serial		
Item	**Description**	**Default**
Baud-rate	Select from “300”, “600”, “1200”, “2400”, “4800”, “9600”, “19200”, “38400”, “57600” , “115200”and “230400”.	115200
Data bit	Select from “7” and “8”.	8
Parity	Select from “None”, “Odd” and “Even”.	None
Stop bit	Select from “1” and “2”.	1
Protocol	Select from “None”, “Transparent”, “Modbus Master” and “Modbus gateway”, “Transparent Over Rlink” and “Modbus Over Rlink”. Transparent: Router will transmit the serial data transparently without any protocols. Modbus gateway: Router will transmit the serial data with Modbus protocol. Modbus Master: R3000 Lite router could be configured as a modbus master, and will automatically poll the slave sides. Transparent Over Rlink: Router will send all data from RS232 serial port to Robustlink, and then Robustlink will forward the data to another destination site. Modbus Over Rlink: Router will translate all data from RS232 serial port to Modbus TCP protocol data, and then send to Robustlink, after that Robustlink will forward the data to another destination site.	Transparent
Mode @Transparent	Select from “TCP Server”, “TCP Client” and “UDP”.	TCP Client
Local Port	Enter the Local port for TCP or UDP.	0

@Transparent		
Multiple Server @Transparent	Click “Add” button to add multiple server. You need to enter the server’s IP and port, and enable or disable “Send data to serial”. If you disable “Send data to serial”, router will not transmit the data from this server to serial port. ***Note:*** *This section will not be displayed if you select “TCP server” in “Mode”.*	Null
Enable Protocol @Transparent	Tick to enable protocol advanced setting.	Disable
Local IP @ Transparent	This item will show up When you enable any VPN tunnel of R3000 Lite, it means serial data can be matched to this local IP address and be transmitted or received via VPN tunnel. ***Note****: when you do not enable any VPN tunnel, this item will not show up.*	0
Interval Timeout @Transparent	The serial port will queue the data in the buffer and send the data to the Cellular WAN/Ethernet WAN when it reaches the Interval Timeout in the field. ***Note****: Data will also be sent as specified by the packet length or delimiter settings even when data is not reaching the interval timeout in the field.*	10
Packet Length @Transparent	The Packet length setting refers to the maximum amount of data that is allowed to accumulate in the serial port buffer before sending. 0 for packet length, no maximum amount is specified and data in the buffer will be sent as specified by the interval timeout or delimiter settings or when the buffer is full. When a packet length between 1 and 1024 bytes is specified, data in the buffer will be sent as soon it reaches the specified length. ***Note****: Data will also be sent as specified by the interval timeout or delimiter settings even when data is not reaching the preset packet length.*	1360
Enable Delimiter1	When Delimiter 1 is enabled, the serial port will queue the data in the buffer and send the data to the Cellular WAN/Ethernet WAN when a specific character, entered in hex format, is received. A second delimiter character may be enabled and specified in the Delimiter 2 field, so that both characters act as the delimiter to control when data should be sent.	Disable
Delimiter1 (Hex) @ Transparent	Enter the delimiter in Hex.	0
Delimiter Process @ Transparent	The Delimiter process field determines how the data is handled when a delimiter is received. None: Data in the buffer will be transmitted when the delimiter is received; the data also includes the delimiter characters. Strip: Data in the buffer is first stripped of the delimiter before being transmitted.	Strip
Local IP @ Modbus gateway	This item will show up When you enable any VPN tunnel of R3000 Lite, it means serial data can be matched to this local IP address and be transmitted or received via VPN tunnel. ***Note****: when you do not enable any VPN tunnel, this item will not show up.*	0

Local Port @ Modbus gateway	Enter the Local port for Modbus.	0
Attached serial device type @ Modbus gateway	Select From "Modbus RTU slave", "Modbus ASCⅡ slave", "Modbus RTU master" and "Modbus ASCⅡ master". Modbus RTU slave: router connects to slave device which works under Modbus RTU protocol. Modbus ASCⅡ slave: router connects to slave device which works under Modbus ASCⅡ protocol. Modbus RTU master: router connects to master device which works under Modbus RTU protocol. Modbus ASCⅡ master: router connects to master device which works under Modbus ASCⅡ protocol.	Modbus RTU slave
Modbus Slave @ Modbus gateway	Add the Modbus slaves which will be polled by Modbus master (router). This section only displayed when you select "Modbus RTU master" or "Modbus ASCII master" in "Attached serial device type".	Null
Slave Address @ Modbus Slave	This connection is usually used to connect to the Modbus slave devices which as TCP server. Enter IP address of the TCP server.	Null
Slave Port @ Modbus Slave	Enter the port number of TCP server.	Null
ID @ Modbus Slave	Enter the ID number of TCP server.	Null
Interval Timeout @ Transparent Over Rlink	Serial port will queue the data in buffer and then send it to the Cellular WAN/Ethernet WAN when it reaches the Interval Timeout in this field.	10
Attached serial device type @ Modbus Over Rlink	Select From "Modbus RTU slave", "Modbus ASCⅡ slave". Modbus RTU slave: router connects to slave device which works under Modbus RTU protocol. Modbus ASCⅡ slave: router connects to slave device which works under Modbus ASCⅡ protocol.	Modbus RTU slave

3.14 Configuration > USB

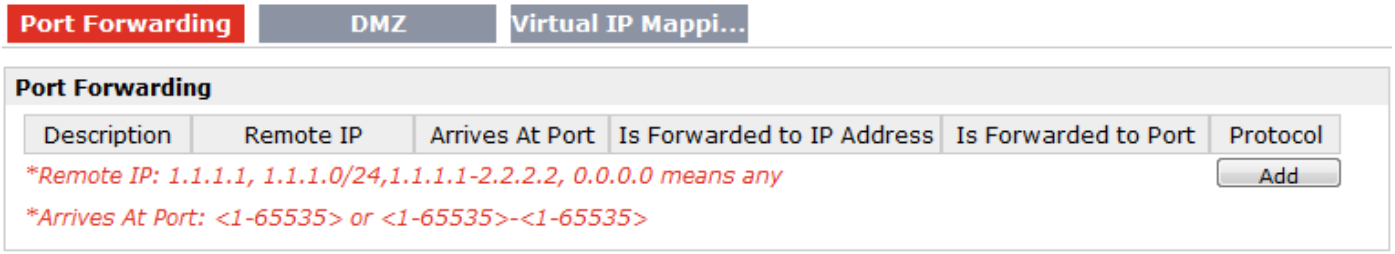
This section allows users to set the USB parameters.

Note: Users can insert a USB storage device, such as U disk and hard disk, into the router's USB interface. If there is configuration file or firmware of R3000 Lite inside the USB storage devices, R3000 Lite will automatically update the configuration file or firmware. We will provide another file to show how to do USB automatic update.

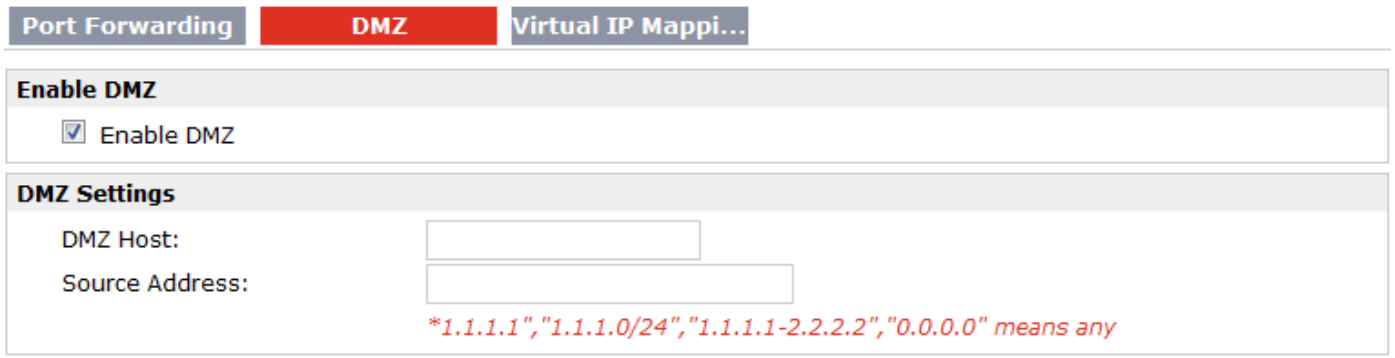
USB		
Item	**Description**	**Default**
Enable automatic update of configuration	Click Enable to automatically update the configuration file of R3000 when insert the USB storage devices which has R3000's configuration file.	Disable
Enable automatic update of firmware	Click Enable to automatically update the firmware of R3000 when insert the USB storage devices which has R3000's firmware.	Disable

3.15 Configuration > NAT/DMZ

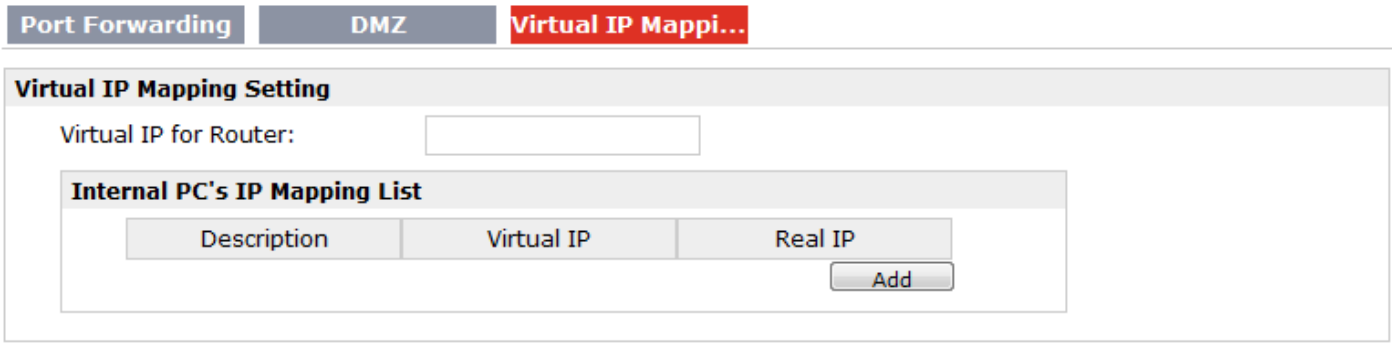
This section allows users to set the NAT/DMZ parameters.



Port Forwarding @ NAT/DMZ		
Item	**Description**	**Default**
Port Forwarding	Manually defining a rule in the router to send all data received on some range of ports on the internet side to a port and IP address on the LAN side.	Null
Remote IP	Set the remote IP address.	Null
Arrives At Port	The port of the internet side which you want to forward to LAN side.	Null
Is Forwarded to IP Address	The device's IP on the LAN side which you want to forward the data to.	Null
Is Forwarded to Port	The device's port on the LAN side which you want to forward the data to.	Null
Protocol	Select from "TCP", "UDP" or "TCP&UDP" which depends on the application.	TCP



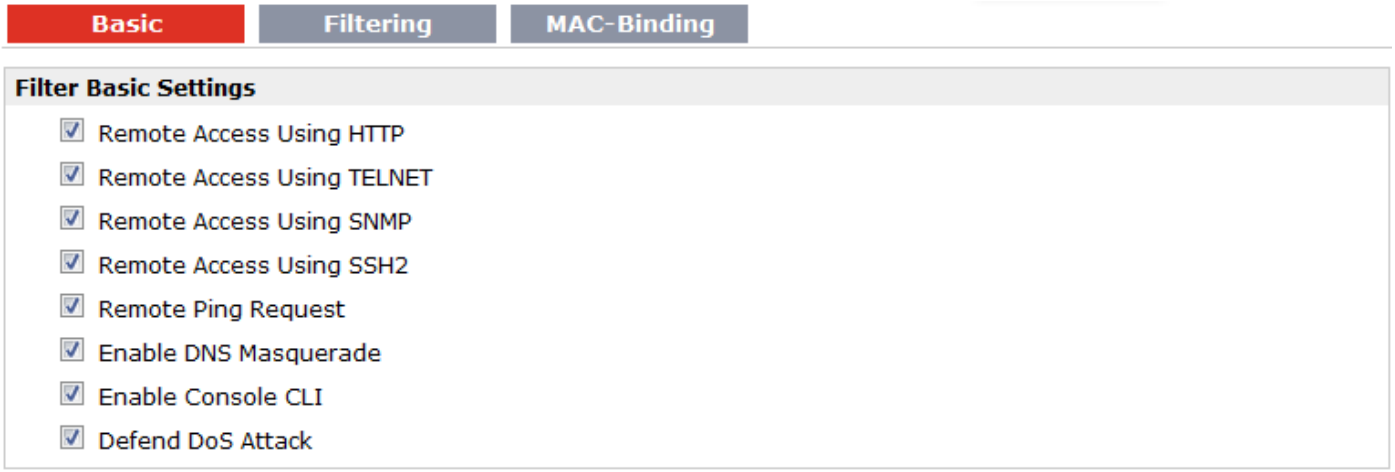
DMZ @ NAT/DMZ		
Item	**Description**	**Default**
DMZ	DMZ host is a host on the internal network that has all ports exposed, except those ports otherwise forwarded.	Null
Enable DMZ	Select to enable the DMZ function.	Enable
DMZ Host	Enter the IP address of the DMZ host which on the internal network.	0.0.0.0
Source Address	Set the address which can talk to the DMZ host. Null means for any addresses.	0.0.0.0



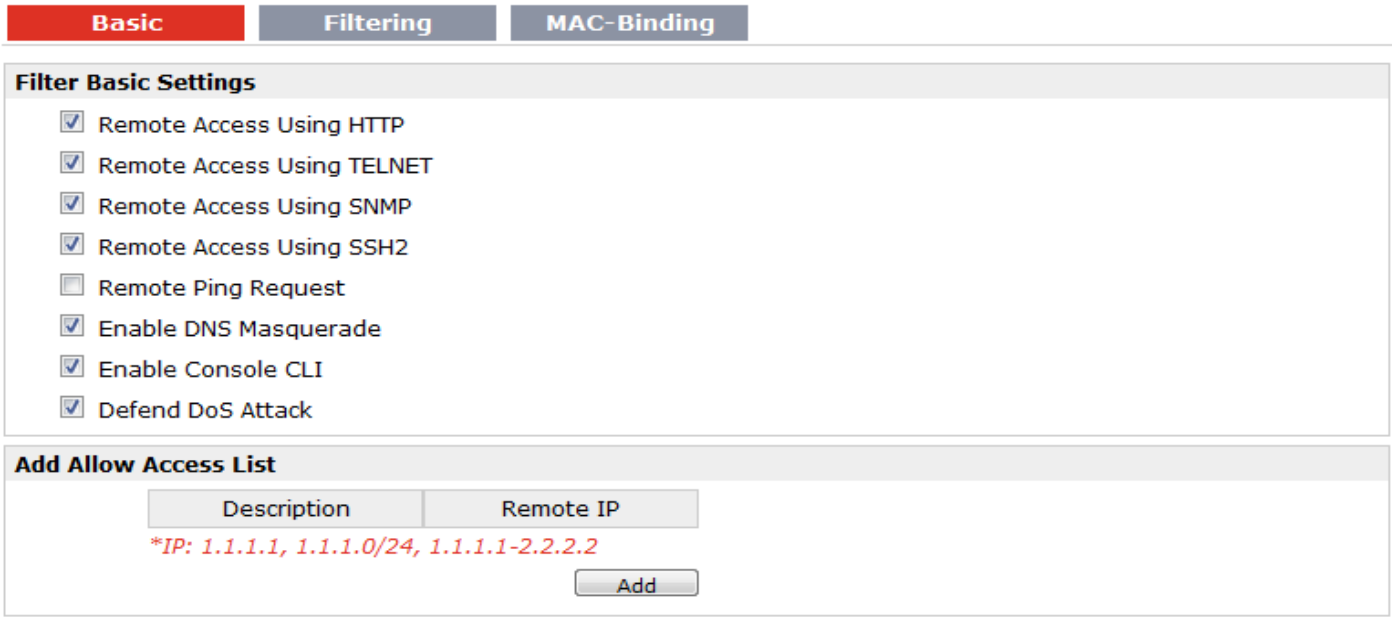
Virtual IP Mapping@ NAT/DMZ		
Item	**Description**	**Default**
Virtual IP for Router	Set a Virtual IP for router.	Null
Virtual IP @ Internal PC's IP Mapping List	Set a Virtual IP for the Internal PC.	Null
Real IP @ Internal PC's IP Mapping List	The Internal PC's Real IP, which is mapping the PC's Virtual IP one-to-one.	Null

3.16 Configuration > Firewall

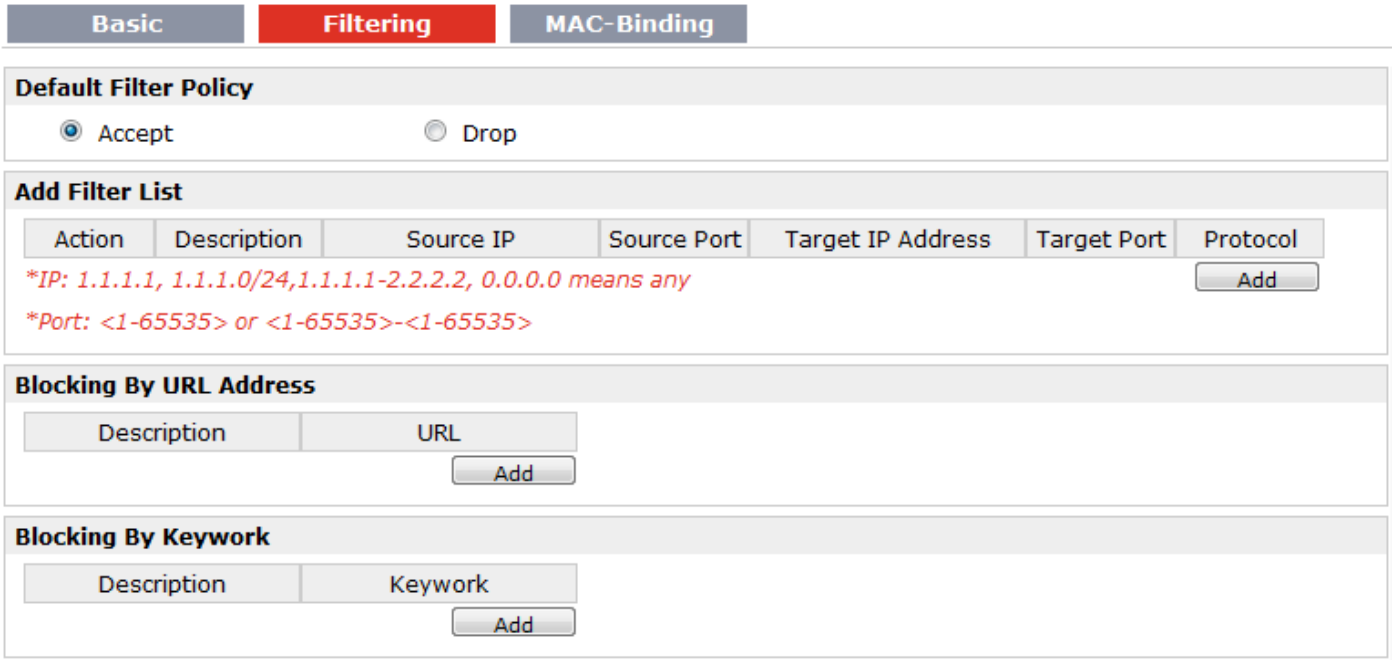
This section allows users to set the firewall parameters.



If you disable one of tabs: “Remote Access Using HTTP”, “Remote Access Using TELNET”, “Remote Access Using SNMP”, “Remote Access Using SSH2” or “Remote Ping Request”, it will pop up “Add Allow Access List” to allow you to preset specific user to access to WAN interface of R3000. For example, if you disable “Remote Ping Request” and add “Remote IP” then only these specific users can ping to WAN interface of R3000.



Basic @ Firewall		
Item	**Description**	**Default**
Remote Access Using HTTP	Enable to allow users to access the router remotely on the internet side via HTTP.	Enable
Remote Access Using TELNET	Enable to allow users to access the router remotely on the internet side via Telnet.	Enable
Remote Access Using SNMP	Enable to allow users to access the router remotely on the internet side via SNMP.	Enable
Remote Access Using SSH2	Enable to allow users to access the router remotely on the internet side via SSH2.	Enable
Remote Ping Request	Enable to make router reply the Ping requests from the internet side.	Enable
Enable DNS Masquerade	Open the 53 port of the router; enable users to use the DNS function of the router.	Enable
Enable Console CLI	Enable to configure router through Command Line Interface.	Enable
Defend Dos Attack	Enable to defend dos attack. Dos attack is an attempt to make a machine or network resource unavailable to its intended users.	Enable

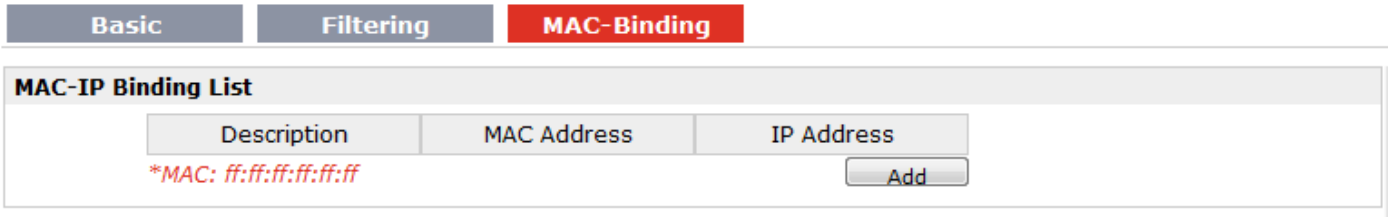


Filtering @ Firewall		
Item	**Description**	**Default**
Default Filter Policy	Select from “Accept” and “Drop”. Accept: Router will accept all the data traffic except the hosts which were added in the drop list. Drop: Router will drop all the data traffic except the hosts which were added in the accept list.	Accept
Add Filter List	Click “Add” to add a filter list.	Null
Action	Select from “Accept” and “Drop”. Accept: Router will reject all the connecting requests except the hosts which fit this filter rule. Drop: Router will only accept the connecting requests from the hosts which fit this filter rule.	Accept
Source IP	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 Port	Defines if access is allowed from one or a range of port which is defined by Source Port.	Null
Target IP 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
Target Port	Defines if access is allowed tone or a range of port which is defined by Target Port.	Null
Protocol	Select from “TCP”, “UDP”, “TCP&UDP”, “ICMP” or “ALL”. If you don’t know what kinds of protocol of your application, we recommend you select “ALL”.	TCP
Blocking By URL Address	Click “Add” to add a URL list.	Null

URL@ Blocking By URL Address	Block the access according to the URL Address that filled in the blank.	Null
Blocking By Keywork	Click "Add" to add a Keywork list.	Null
Keywork@ Blocking By Keywork	Block the access according to the Keywork that filled in the blank.	Null

Note: You can use "-"to define a range of IP addresses or ports, e.g.1.1.1.1-2.2.2.2, 10000-12000.

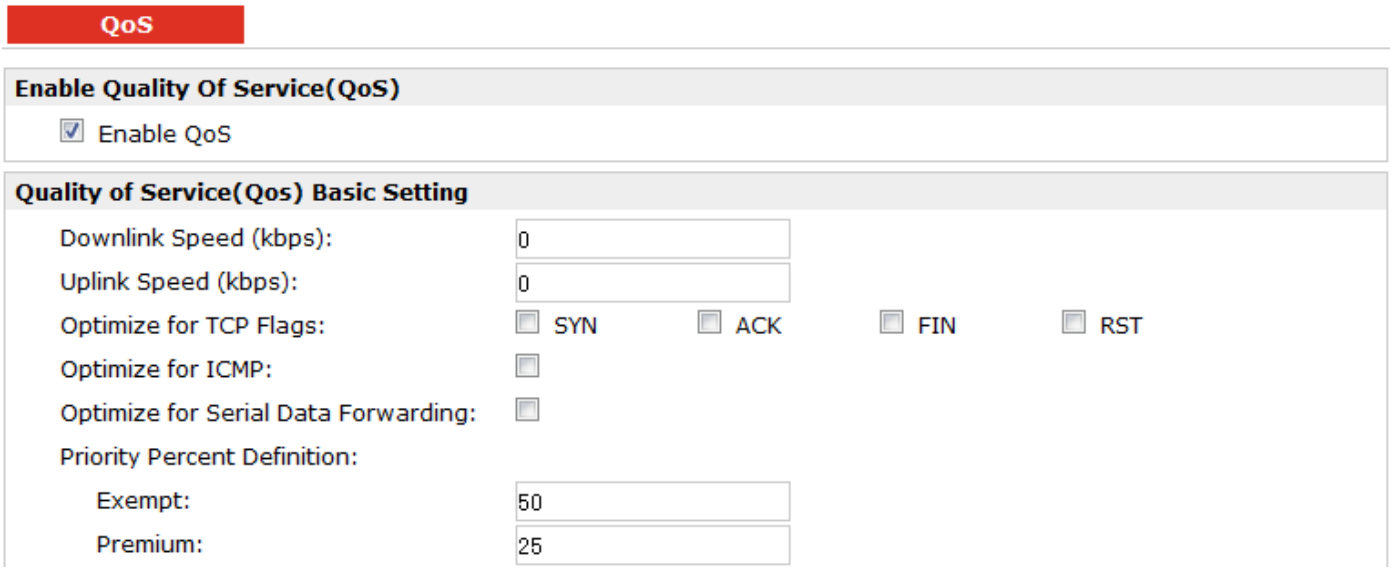
The filtering settings should be divided into two parts. Part 1 is the Exact Filter List and Part 2 is the Default Filter Policy. The priority of Exact Filter List is higher than Default Filter Policy. It means that while Router receive IP packets from WAN side, it will check the Exact Filter List first, if the IP packets mismatch the Exact Filter List, then Router will execute the Default Filter Policy.

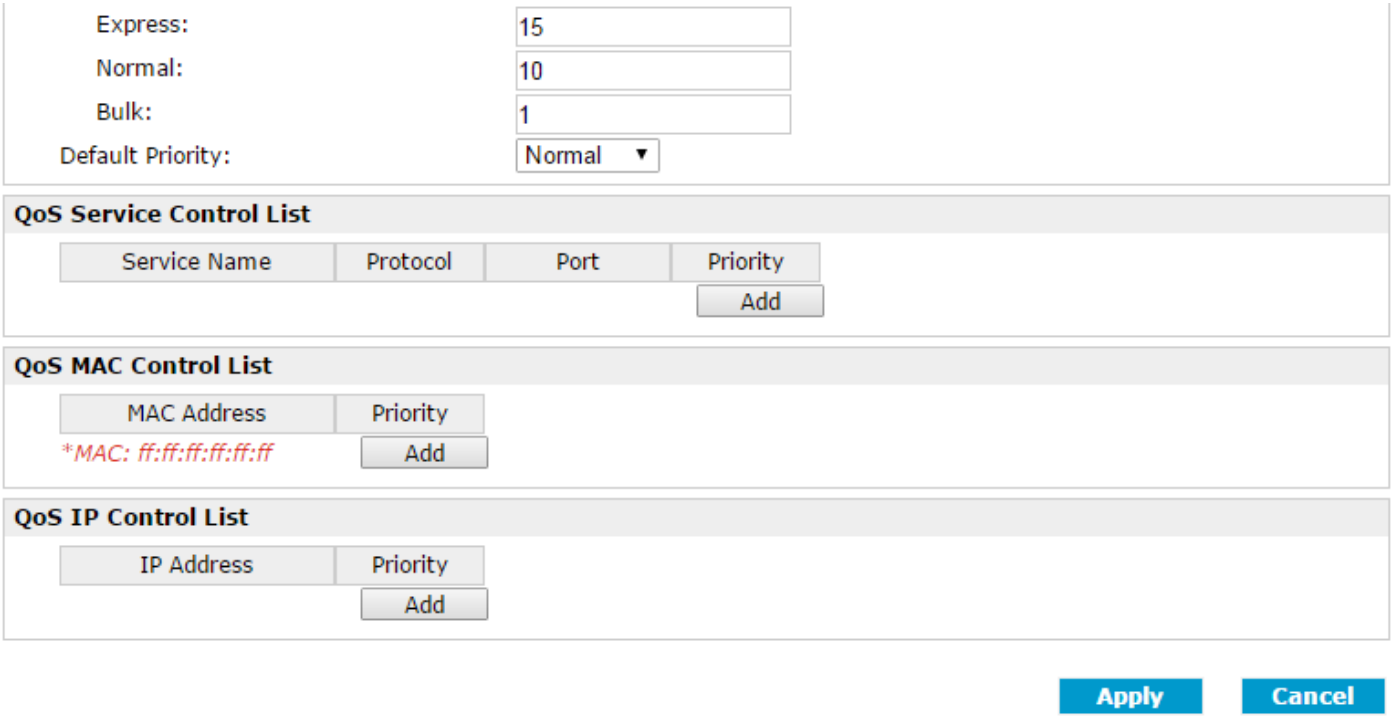


Mac-Binding @ Firewall		
Item	**Description**	**Default**
Mac-IP Bounding	The defined host (MAC) on the LAN side only can use the defined IP address to communicate with router, or will be rejected.	Null
Mac Address	Enter the defined host's Mac Address.	Null
IP Address	Enter the defined host's IP Address.	Null

3.17 Configuration > QoS

This section allows users to set the QoS parameters.





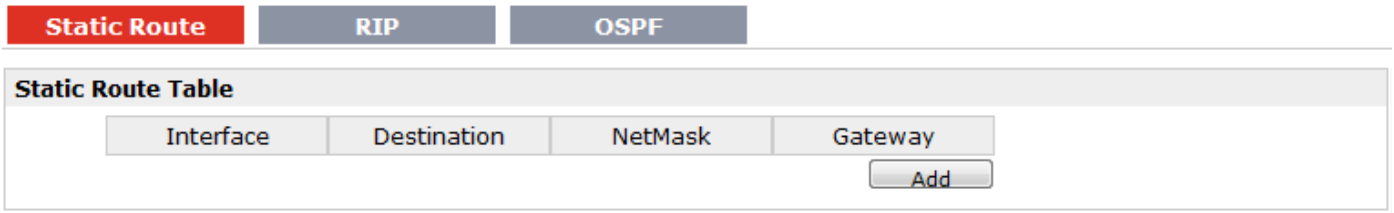
QoS		
Item	**Description**	**Default**
Enable QoS	Click to enable "QoS" function.	Disable
Downlink Speed (kbps)	Prescribe downlink speed of router. ***Note**: Default setting"0" means that there is no limitation of downlink speed.*	0
uplink Speed (kbps)	Prescribe uplink speed of router. ***Note**: Default setting"0" means that there is no limitation of uplink speed.*	0
Optimize for TCP Flags	User can choose to enable TCP flags: "SYN", "ACK", "FIN", "RST", which means data with above TCP Flags will get the highest priority to occupy bandwidth. After enabled, router will enhance respond timeout of TCP control, in case that data resend frequently.	Disable
Optimize for ICMP	Enable to optimize for ICMP, which means ICMP will get the highest priority to occupy bandwidth. After enabled respond interval of PING control will be shorter. ***Note**: if user click to enable "Optimize for TCP Flags", "Optimize for Serial Data Forwarding", and "Optimize for ICMP" at the same time (these three services are in the same priority level), router will automatically start Stochastic Fairness Queuing (SFQ) strategy to make a fair bandwidth allocation, in case of one service occupy all the bandwidth.*	Disable
Optimize for Serial Data Forwarding	Enable to optimize for serial data forwarding, which means serial data forwarding will get the highest priority to occupy bandwidth. When enable serial data forwarding it need to enable local port number for controlling. Therefore, it needs to set local port number of router even if router is as TCP Client.	Disable

Default Percent Definition	Select from “Exempt”, “Premium”, “Express”, “Normal” and “Bulk”. Users (Services) with no other pre-priority set will use this default priority. Exempt: this is the highest priority which guarantees that the minimum global rate of router is 50% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Premium: guarantees that the minimum global rate of router is 25% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Express: guarantees that the minimum global rate of router is 15% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Normal: guarantees that the minimum global rate of router is 10% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Bulk: guarantees that the minimum global rate of router is 1% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”.	Normal
Default Priority	Select from “Exempt”, “Premium”, “Express”, “Normal” and “Bulk”.	Normal
Service Name @ QoS Service Control List	Set server name of the service that you want to set it with QoS Control. Router supports up to 20 users set with QoS Service Control. Priority of QoS Service Control is higher than that of both QoS IP control and QoS MAC control.	Null
Protocol @ QoS Service Control List	Select from “TCP”, “UDP” and “TCP&UDP”.	TCP
Port @ Service Control List	Enter the port number of the service that you want to set it with QoS Control.	Null
Priority @ QoS Service Control List	Select from “Exempt”, “Premium”, “Express”, “Normal” and “Bulk”. Select the priority of the service that you want to set it with QoS Control. Exempt: this is the highest priority which guarantees that the minimum global rate of router is 50% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Premium: guarantees that the minimum global rate of router is 25% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Express: guarantees that the minimum global rate of router is 15% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Normal: guarantees that the minimum global rate of router is 10% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Bulk: guarantees that the minimum global rate of router is 1% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”.	Exempt
MAC Address @ QoS MAC Control List	Enter MAC address of the user (for example, PC) who you want to set it with QoS Control. Router supports up to 20 users set with QoS MAC Control. Priority of QoS MAC Control is higher than that of QoS IP control.	Null
Priority @ QoS MAC Control List	Select from “Exempt”, “Premium”, “Express”, “Normal” and “Bulk”. Select the priority of the user (for example, PC) who you want to set it with QoS Control. Exempt: this is the highest priority which guarantees that the minimum global	Exempt

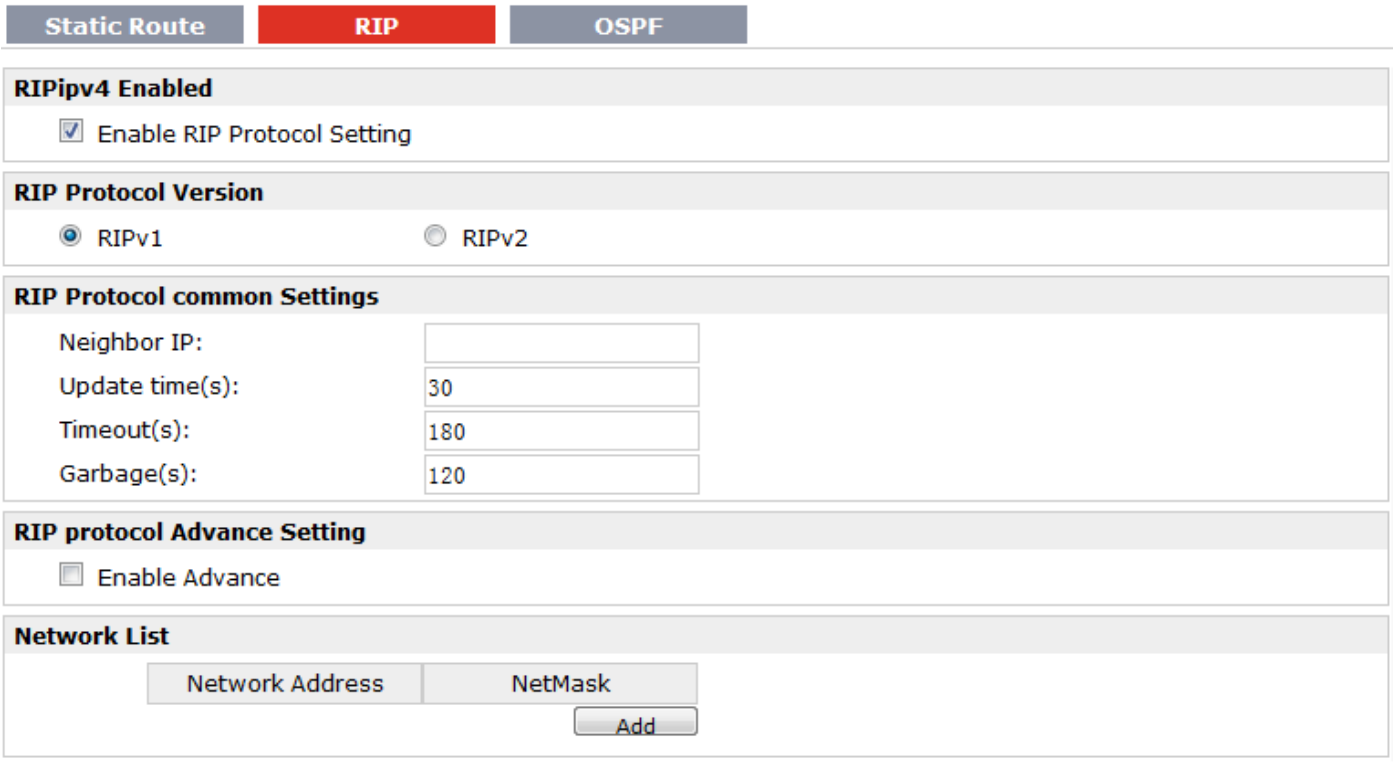
	rate of router is 50% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Premium: guarantees that the minimum global rate of router is 25% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Express: guarantees that the minimum global rate of router is 15% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Normal: guarantees that the minimum global rate of router is 10% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Bulk: guarantees that the minimum global rate of router is 1% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”.	
IP Address @ QoS IP Control List	Enter IP address of the user (for example, PC) who you want to set it with QoS Control. Router supports up to 20 users set with QoS IP Control. If want to control one network segment, user can set “IP Address” as format “x.x.x.x/24” or “x.x.x.x/255.255.255.0”. For example, if we to control network segment “172.16. x.x”, we can set “172.16.0.0/16” or “172.16.0.0/255.255.0.0” in “IP Address”.	Null
Priority @ QoS IP Control List	Select from “Exempt”, “Premium”, “Express”, “Normal” and “Bulk”. Select the priority of the user (for example, PC) who you want to set it with QoS Control. Exempt: this is the highest priority which guarantees that the minimum global rate of router is 50% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Premium: guarantees that the minimum global rate of router is 25% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Express: guarantees that the minimum global rate of router is 15% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Normal: guarantees that the minimum global rate of router is 10% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”. Bulk: guarantees that the minimum global rate of router is 1% of “Downlink Speed”, and the maximum rate can reach to 100% of “Downlink Speed”.	Exempt
Note: *If services are in the same priority level, router will automatically start Stochastic Fairness Queueing (SFQ) strategy to make a fair bandwidth allocation.*		

3.18 Configuration > IP Routing

This section allows users to set the IP routing parameters.



Static Route @ IP Routing		
Item	**Description**	**Default**
Static Route Table	Allow users to add, delete or modify static route rules manually.	Null
Interface	Select from “WAN”, “LAN_0”.	WAN
Destination	Enter the destination host’s IP address or destination network.	Null
Netmask	Enter the Netmask of the destination or destination network.	Null
Gateway	Enter the gateway’s IP address of this static route rule. Router will forward all the data which fit for the destination and Netmask to this gateway.	Null

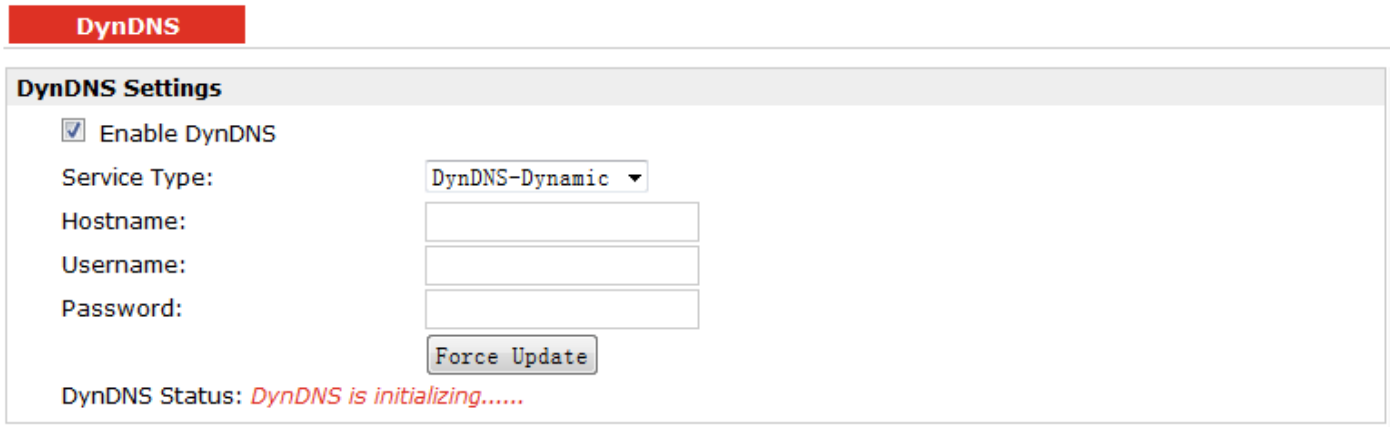


RIP @ IP Routing		
Item	**Description**	**Default**
RIP	RIP (Routing Information Protocol) is a distance-vector routing protocol, which employs the hop count as a routing metric. RIP prevents routing loops by implementing a limit on the number of hops allowed in a path from the source to a destination.	Null
Enable RIP Protocol Setting	Tick to enable RIP function.	Disable
RIP Protocol Version	Select from “RIPv1” and “RIPv2”.	RIPv1
Neighbor IP	If you input this neighbor IP, router will only send RIP request massage to this IP instead of broadcast. This item only needs to be set in some unicast network.	0.0.0.0
Update times	Defines the interval between routing updates.	30
Timeout	Defines the route aging time. If no update for a route is received after the aging time elapses, the metric of the route is set to 16 in the routing table.	180
Garbage	Defines the interval from when the metric of a route becomes 16 to when it is deleted from the routing table. During the Garbage-Collect timer length, RIP advertises the route with the routing metric set to 16. If no update is announced for that route after the Garbage-Collect timer expires, the route will be deleted from the routing table.	120
Enable Advance	Tick to enable RIP protocol Advance Setting.	Disable
Default Metric	This value is used for redistributed routes.	1
Distance	The first criterion that a router uses to determine which routing protocol to use if two protocols provide route information for the same destination.	120
Passive	Select from “None”, “Eth0”, and “Default”. This command sets the specified interface to passive mode. On passive mode interface, all receiving packets are processed as normal and Rip info does not send either multicast or unicast RIP packets except to RIP neighbors specified with neighbor command. The default is to be passive on all interfaces.	None
Enable Default Origination	Enable to make router send the default route to the other routers which in the same IGP AS.	Disable
Enable Redistribute Connect	Redistribute connected routes into the RIP tables.	Disable
Enable Redistribute Static	Redistributes routing information from static route entries into the RIP tables.	Disable
Enable Redistribute OSPF	Redistributes routing information from OSPF route entries into the RIP tables.	Disable
Network List	Router will only report the RIP information in this list to its neighbor.	Null
Network Address	Enter the Network address which Eth0 or Eth 1 connects directly.	Null
Netmask	Enter the Network’s Netmask which Eth0 or Eth 1 connects directly.	Null

OSPF @ IP Routing		
Item	**Description**	**Default**
OSPF	OSPF (Open Shortest Path First) is a link-state routing protocol for IP networks. It uses a link state routing algorithm and falls into the group of interior routing protocols, operating within a single autonomous system (AS).	Null
Enable OSPFv2	Tick to enable OSPF function.	Disable

3.19 Configuration > DynDNS

This section allows users to set the DynDNS parameters.

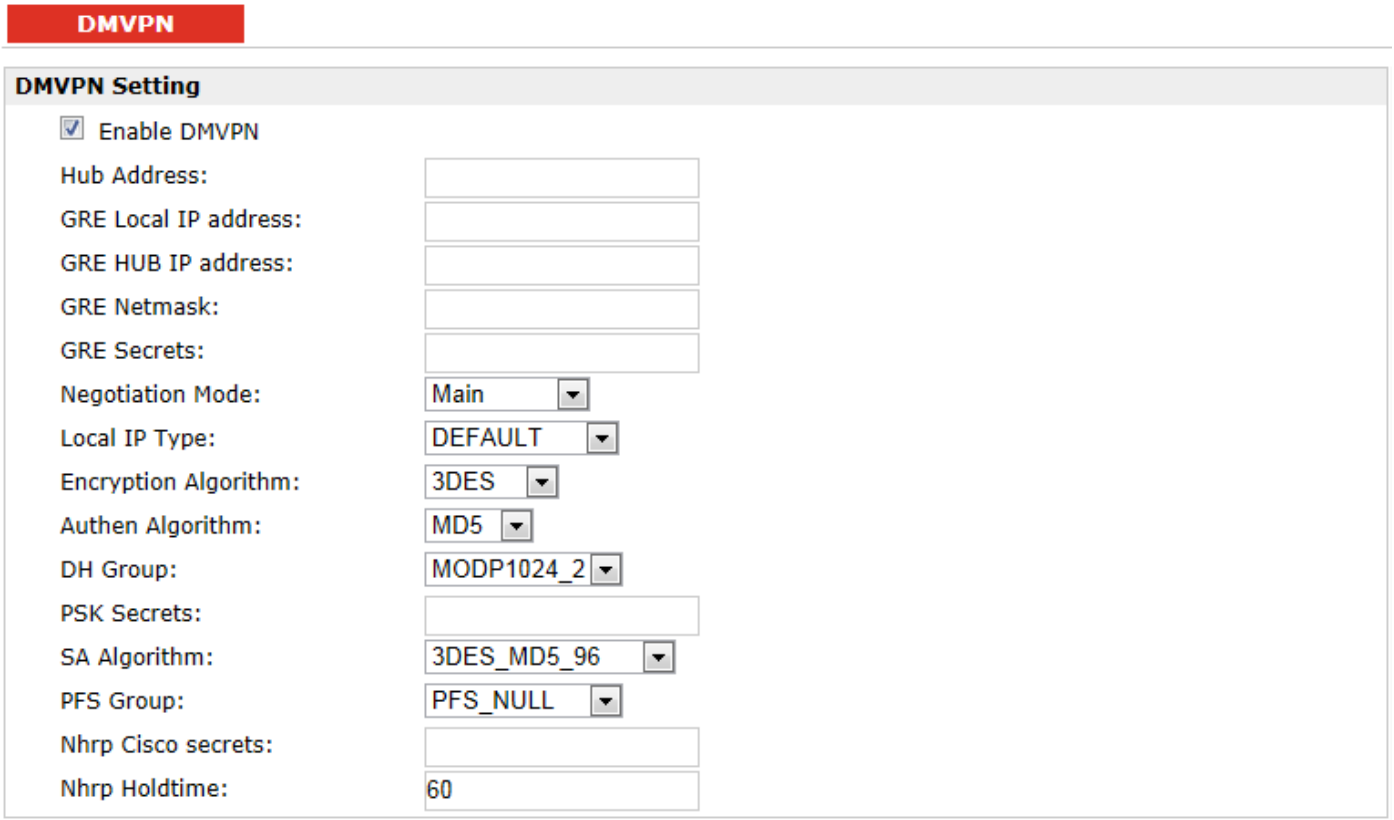


DynDNS		
Item	**Description**	**Default**
DynDNS	The Dynamic DNS function allows you to alias a dynamic IP address to a static domain name, allowing users whose ISP does not assign them a static IP address to use a domain name. This is especially useful for hosting servers via your connection, so that 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.	Null
Enable DynDNS	Tick to enable DynDNS function.	Disable
Service Type	Select the DDNS service from “DynDNS–Dynamic”, “QDNS (3322)”, “NOIP” and “Custom” which you have established an account with.	DynDNS–Dynamic
Hostname	Enter the Host name the DDNS server provided.	Null

Username	Enter the user name the DDNS server provided.	Null
Password	Enter the password the DDNS server provided.	Null
Force Update	Click to the update and use the DynDNS settings.	Null
DynDNS Status	Show current status of DynDNS	Null

3.20 Configuration > DMVPN

This section allows users to set the DMVPN parameters.



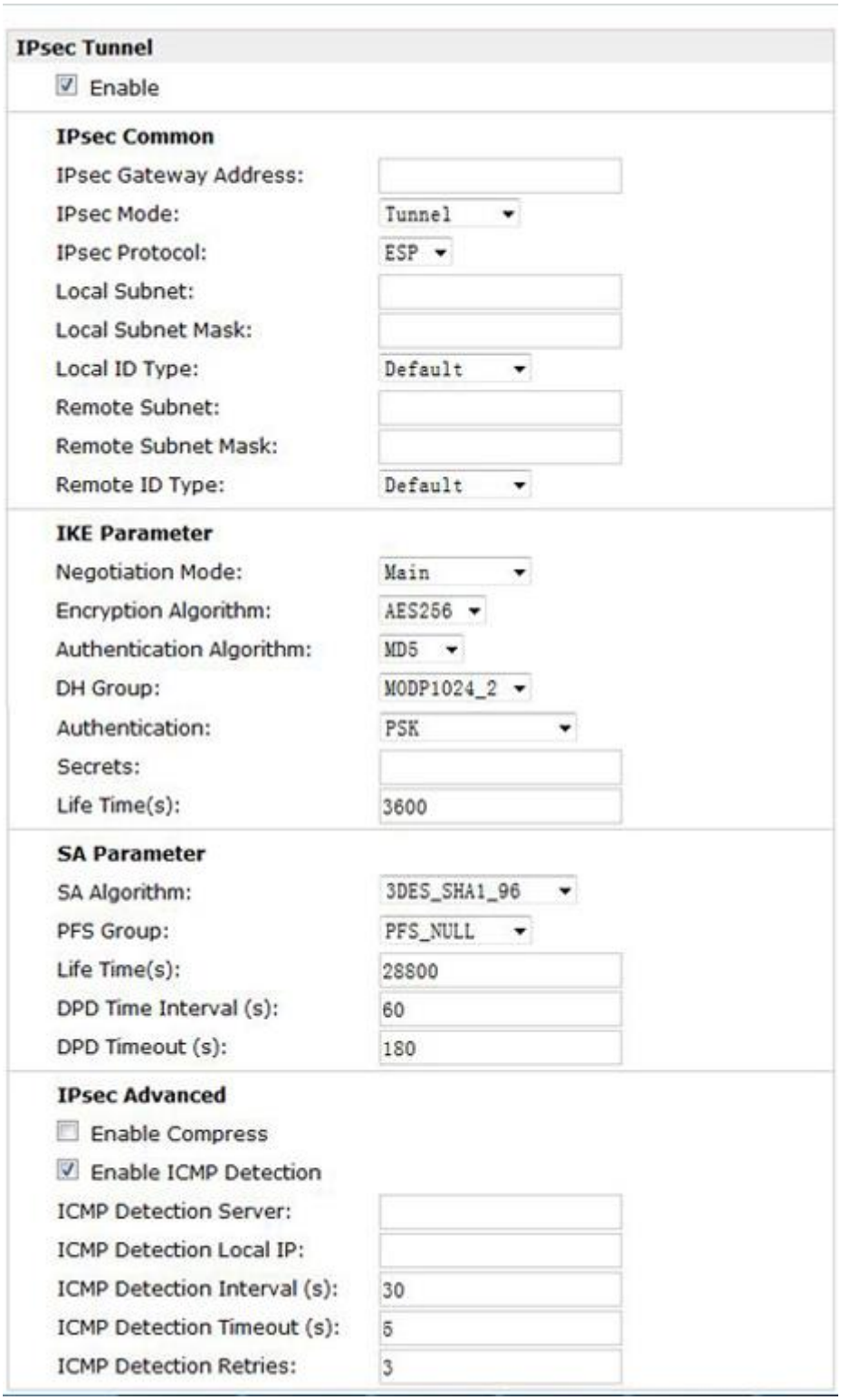
DMVPN		
Item	**Description**	**Default**
Hub Address	DMVPN Hub's IP address or domain	Null
GRE Local IP address	GRE Local tunnel IP address	Null
GRE HUB IP address	GRE Hub tunnel IP address	Null
GRE Netmask	GRE tunnel Netmask	Null
GRE Secrets	GRE tunnel secret key	Null
Negotiation Mode	Select from "Main" 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
Local IP Type	Select from "ID", "FQDN" and "User FQDN" for IKE negotiation. "Default"	default

	stands for “Router’s extern IP”. ID: Uses custom string 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.	
Encryption Algorithm	Select from “DES”, “3DES” and “AES128” to be used in IKE negotiation. DES: Uses the DES algorithm in CBC mode and 56-bit key. 3DES: Uses the 3DES algorithm in CBC mode and 168-bit key. AES128: Uses the AES algorithm in CBC mode and 128-bit key.	3DES
Authen Algorithm	Select from “MD5” and “SHA1”to be used in IKE negotiation. MD5: Uses HMAC-SHA1. SHA1: Uses HMAC-MD5.	MD5
DH Group	Select from “MODP768_1”, “MODP1024_2” and “MODP1536_5”to be used in key negotiation phase 1. MODP768_1: Uses the 768-bit Diffie-Hellman group. MODP1024_2: Uses the 1024-bit Diffie-Hellman group. MODP1536_5: Uses the 1536-bit Diffie-Hellman group.	MODP1024_2
PSK Secrets	Enter Pre-shared Key	Null
SA Algorithm	Select from “DES_MD5_96”, “DES_SHA1_96”, “3DES_MD5_96”, “3DES_ SHA1_96”, “AES128_MD5_96”, “AES128_ SHA1_96” when you select “ESP” in “Protocol”; Select from “AH_MD5_96” and “AH_ SHA1_96” when you select “AH” 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_MD5_96
PFS Group	Select from “PFS_NULL”, “MODP768_1”, “MODP1024_2” and “MODP1536_5”. PFS_NULL: Disable PFS Group MODP768_1: Uses the 768-bit Diffie-Hellman group. MODP1024_2: Uses the 1024-bit Diffie-Hellman group. MODP1536_5: Uses the 1536-bit Diffie-Hellman group.	PES_NULL
Nhrp Cisco secret	Cisco Nhrp secret key	Null
Nhrp holdtime	The hold time of Nhrp protocol	60

3.21 Configuration > IPSec

This section allows users to set the IPSec parameters.

IPSec Basic @ IPSec		
Item	**Description**	**Default**
Enable NAT Traversal	Tick to enable NAT Traversal for IPSec. This item must be enabled when router under NAT environment.	Enable
Keepalive Interval	The interval that router sends keepalive packets to NAT box so that to avoid it to remove the NAT mapping.	30

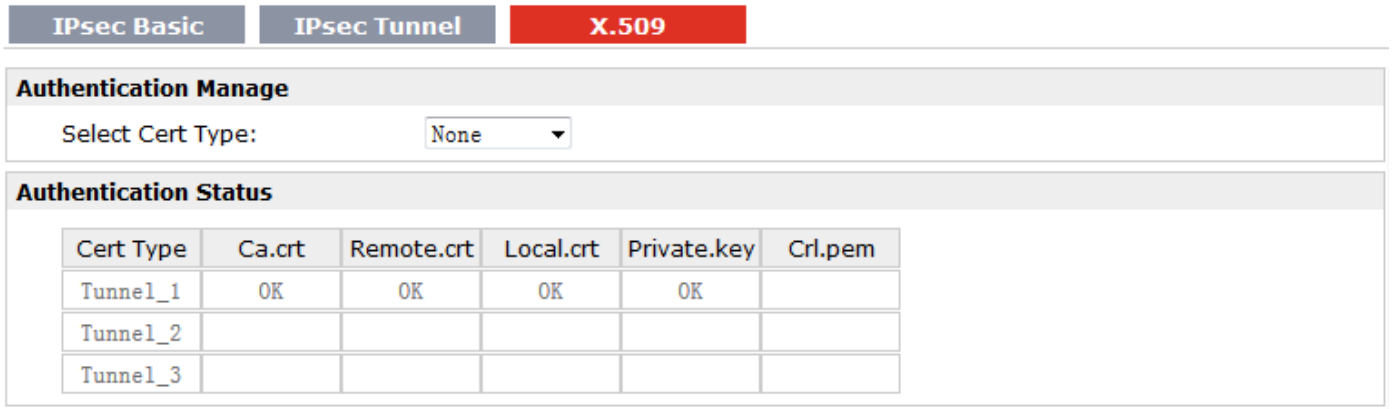


IPSec Tunnel @ IPSec		
Item	**Description**	**Default**
Add	Click Add to add new IPSec Tunnel	Null
Enable	Enable IPSec Tunnel, the max tunnel account is 3	Null
IPSec Gateway	Enter the address of remote side IPSec VPN server.	Null

Address		
IPSec 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
IPSec 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.	0.0.0.0
Local Subnet Mask	Enter IPSec Local Protected subnet’s mask.	0.0.0.0
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 an sign “@” for the local security gateway, e.g., test@robustel.com.	Default
Remote Subnet	Enter IPSec Remote Protected subnet’s address.	0.0.0.0
Remote Subnet Mask	Enter IPSec Remote Protected subnet’s mask.	0.0.0.0
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
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
Encryption Algorithm	Select from “DES”, “3DES”, “AES128”, “AES192” and “AES256”to be used in IKE negotiation. DES: Uses the DES algorithm in CBC mode and 56-bit key. 3DES: Uses the 3DES algorithm in CBC mode and 168-bit key. AES128: Uses the AES algorithm in CBC mode and 128-bit key.	3DES

	AES192: Uses the AES algorithm in CBC mode and 192-bit key. AES256: Uses the AES algorithm in CBC mode and 256-bit key.	
Authentication Algorithm	Select from “MD5” and “SHA1”to be used in IKE negotiation. MD5: Uses HMAC-SHA1. SHA1: Uses HMAC-MD5.	MD5
DH Group	Select from “MODP768_1”, “MODP1024_2” and “MODP1536_5”to be used in key negotiation phase 1. MODP768_1: Uses the 768-bit Diffie-Hellman group. MODP1024_2: Uses the 1024-bit Diffie-Hellman group. MODP1536_5: Uses the 1536-bit Diffie-Hellman group.	MODP1024_2
Authentication	Select from “PSK”, “CA”, “XAUTH Init PSK” and “XAUTH Init CA” to be used in IKE negotiation. PSK: Pre-shared Key. CA: Certification Authority. XAUTH: Extended Authentication to AAA server.	PSK
Secrets	Enter the Pre-shared Key.	Null
Life Time @ IKE Parameter	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
SA Algorithm	Select from “DES_MD5_96”, “DES_SHA1_96”, “3DES_MD5_96”, “3DES_ SHA1_96”, “AES128_MD5_96”, “AES128_ SHA1_96”, “AES192_MD5_96”, “AES192_ SHA1_96”, “AES256_MD5_96” and “AES256_ SHA1_96” when you select “ESP” in “Protocol”; Select from “AH_MD5_96” and “AH_ SHA1_96” when you select “AH” 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_MD5_96
PFS Group	Select from “PFS_NULL”, “MODP768_1”, “MODP1024_2” and “MODP1536_5”. PFS_NULL: Disable PFS Group MODP768_1: Uses the 768-bit Diffie-Hellman group. MODP1024_2: Uses the 1024-bit Diffie-Hellman group. MODP1536_5: Uses the 1536-bit Diffie-Hellman group.	PFS_NULL
Life Time @ SA Parameter	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
DPD Time 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	180

	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.	
DPD Timeout	Set the timeout of DPD packets.	60
Enable Compress	Tick to enable compressing the inner headers of IP packets.	Disable
Enable ICMP Detection	Click to enable ICMP detection.	Disable
ICMP Detection Server	Enter the IP address or domain name or remote server. Router will ping this address/domain name to check that if the current connectivity is active.	Null
ICMP Detection Local IP	Set the local IP address.	Null
ICMP Detection Interval	Set the ping interval time.	30
ICMP Detection Timeout	Set the ping timeout.	5
ICMP Detection Retries	If Router ping the preset address/domain name time out continuously for Max Retries time, it will try to re-establish the VPN tunnel.	3

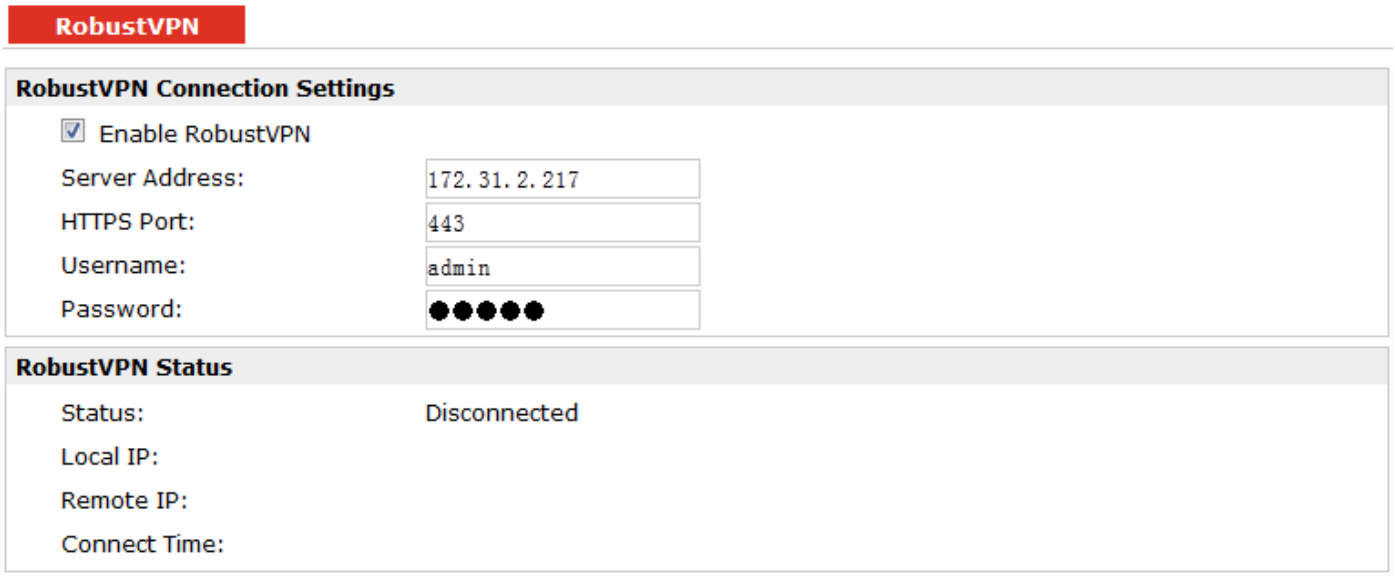


X.509 @ IPSec		
Item	**Description**	**Default**
Select Cert Type	Select the IPSec tunnel which the certification used for.	Null
CA	Click “Browse” to select the correct CA file from your PC, and then click “Import” to import it to the router. Click “Export” you can export the CA file from router to your PC. File format: ca.crt	Null
Remote Public Key	Click “Browse” to select the correct Remote Public Key file from your PC, and then click “Import” to import it to the router. Click “Export” you can export the Remote Public Key file from router to your PC. File format: xxx.crt	Null

Local Public Key	Click “Browse” to select the correct Local Public Key file from your PC, and then click “Import” to import it to the router. Click “Export” you can export the Local Public Key file from router to your PC. File format: xxx.key	Null
Local Private Key	Click “Browse” to select the correct Local Private Key file from your PC, and then click “Import” to import it to the router. Click “Export” you can export the Local Private Key file from router to your PC.	Null
CRL	Click “Browse” to select the correct CRL file from your PC, and then click “Import” to import it to the router. Click “Export” you can export the CRL file from router to your PC.	Null
Authentication Status	Show current status parameters of IPSec.	Null

3.22 Configuration > RobustVPN

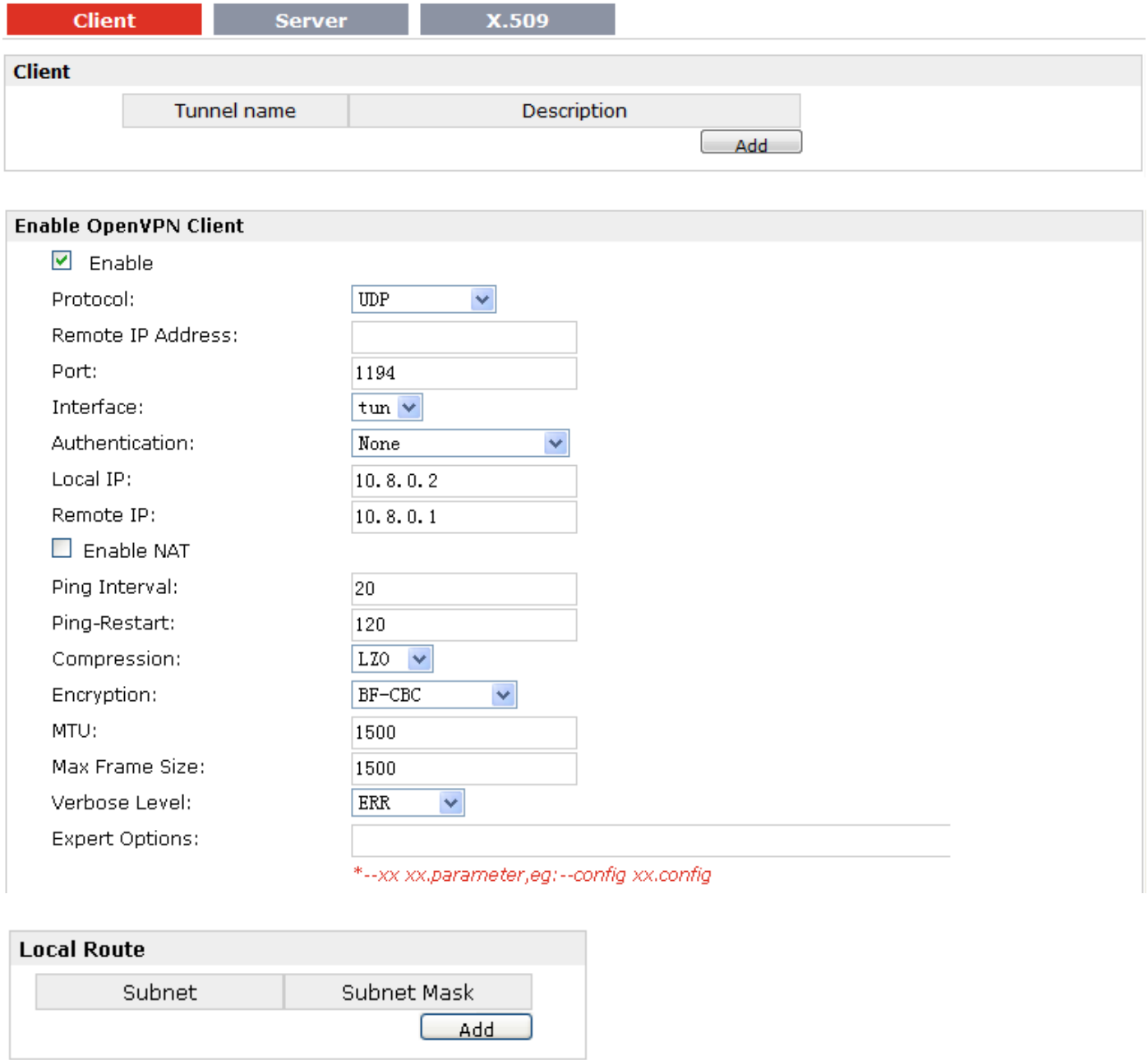
This section allows users to configure the settings of RobustVPN, which is based on a hosted web service designed to connect customer to their machines through Internet. The hosted acts as data transit platform and offer communication originated by the customers to their machines. It is intended to be used in the industrial M2M communication sector.



RobustVPN		
Item	**Description**	**Default**
Enable RobustVPN	Click to enable RobustVPN.	Disable
Server Address	Enter the IP address or Domain Name of RobustVPN server.	Null
HTTPS Port	Enter the HTTPS Port of RobustVPN server.	443
Username	Enter the Username of RobustVPN server.	admin
Password	Enter the Password of RobustVPN server.	admin
RobustVPN Status	Show status of RobustVPN, including connection status, Local IP, Remote IP and Connect Time.	

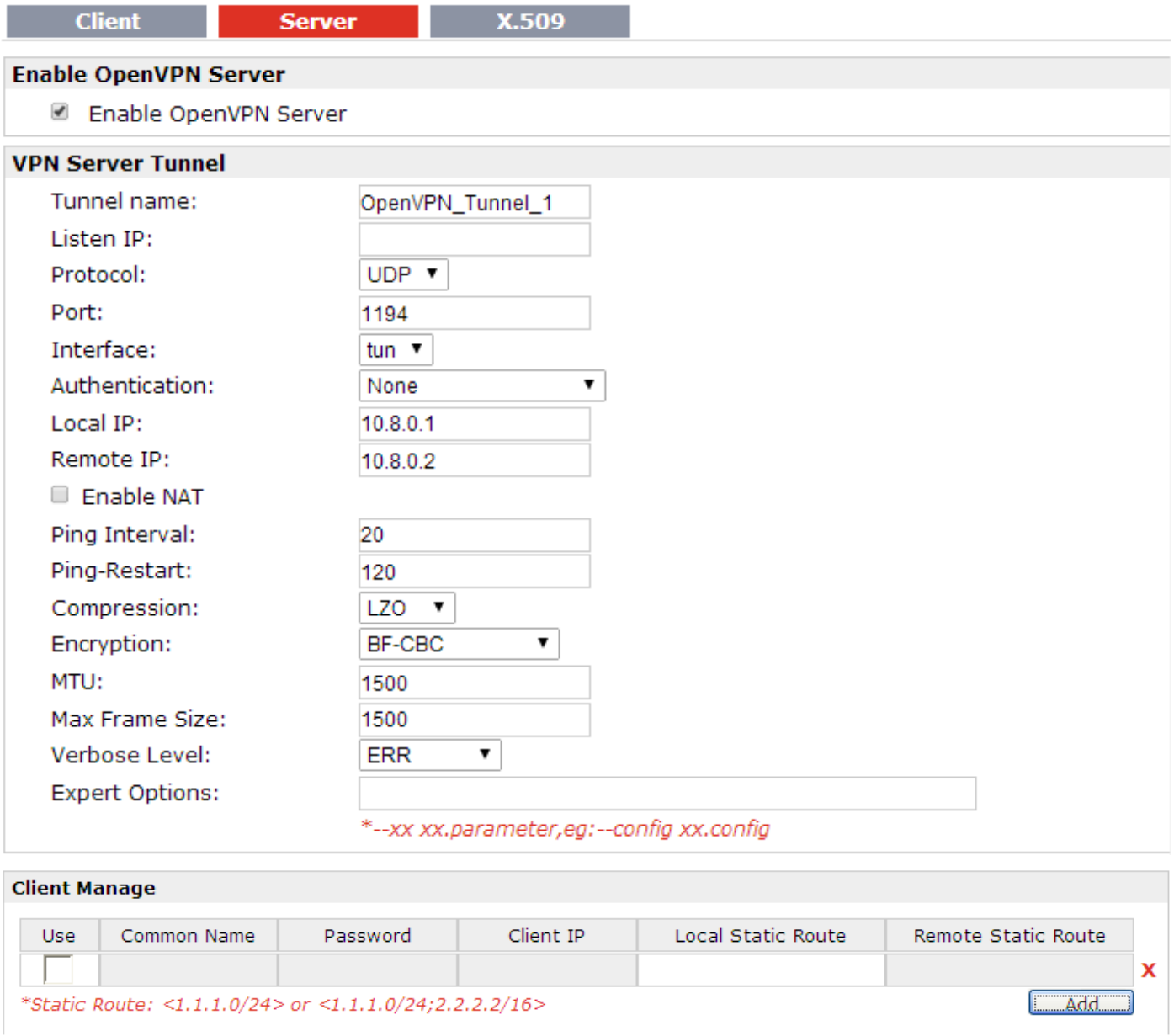
3.23 Configuration > Open VPN

This section allows users to set the Open VPN parameters.



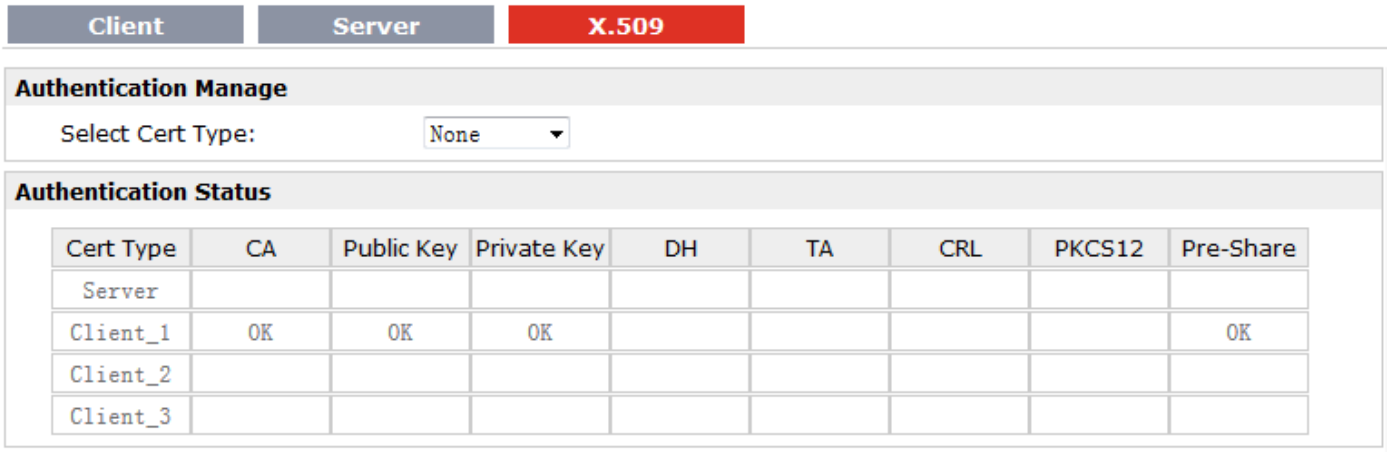
Client @ Open VPN		
Item	**Description**	**Default**
Enable	Enable OpenVPN Client, the max tunnel account is 3	Null
Protocol	Select from “UDP” and “TCP Client” which depends on the application.	UDP
Remote IP Address	Enter the remote IP address or domain name of remote side OpenVPN server.	Null
Port	Enter the listening port of remote side OpenVPN server.	1194

Interface	Select from “tun” and “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
Authentication	Select from four different kinds of authentication ways: “Pre-shared”, “Username/Password”, “X.509 cert” and “X.509 cert+user”.	None
Local IP	Define the local IP address of OpenVPN tunnel.	10.8.0.2
Remote IP	Define the remote IP address of OpenVPN tunnel.	10.8.0.1
Enable NAT	Tick to enable NAT Traversal for OpenVPN. This item must be enabled when router under NAT environment.	Disable
Ping Interval	Set ping interval to check if the tunnel is active.	20
Ping -Restart	Restart to establish the OpenVPN tunnel if ping always timeout during this time.	120
Compression	Select “LZO” to use the LZO compression library to compress the data stream.	LZO
Encryption	Select from “NONE”, “BF-CBC”, “DES-CBC”, “DES-EDE3-CBC”, “AES-128-CBC”, “AES-192-CBC” and “AES-256-CBC”. BF-CBC: Uses the BF algorithm in CBC mode and 128-bit key. DES-CBC: Uses the DES algorithm in CBC mode and 64-bit key. DES-EDE3-CBC: Uses the 3DES algorithm in CBC mode and 192-bit key. AES128-CBC: Uses the AES algorithm in CBC mode and 128-bit key. AES192-CBC: Uses the AES algorithm in CBC mode and 192-bit key. AES256-CBC: Uses the AES algorithm in CBC mode and 256-bit key.	NONE
MTU	Maximum Transmission Unit. It is the identifier of the maximum size of packet, which is possible to transfer in a given environment.	1500
Max Frame Size	Set the Max Frame Size for transmission.	1500
Verbose Level	Select the log output level which from low to high: “ERR”, “WARNING”, “NOTICE” and “DEBUG”. The higher level will output more log information.	ERR
Expert Options	You can enter some other PPP initialization strings in this field. Each string can be separated by a space.	Null
Subnet&Subnet Mask@Local Route	Set the subnet and subnet Mask of local route.	Null



Server @ Open VPN		
Item	**Description**	**Default**
Enable OpenVPN Server	Tick to enable OpenVPN server tunnel.	Disable
Tunnel name	Name the OpenVPN server tunnel.	Tunnel_OpenVPN_0
Listen IP	You can enter the IP address of cellular WAN, Ethernet WAN or Ethernet LAN. Null or 0.0.0.0 stands for using the active WAN link currently-cellular WAN or Ethernet WAN.	0.0.0.0
Protocol	Select from “UDP” and “TCP Client” which depends on the application.	UDP
Port	Set the local listening port	1194

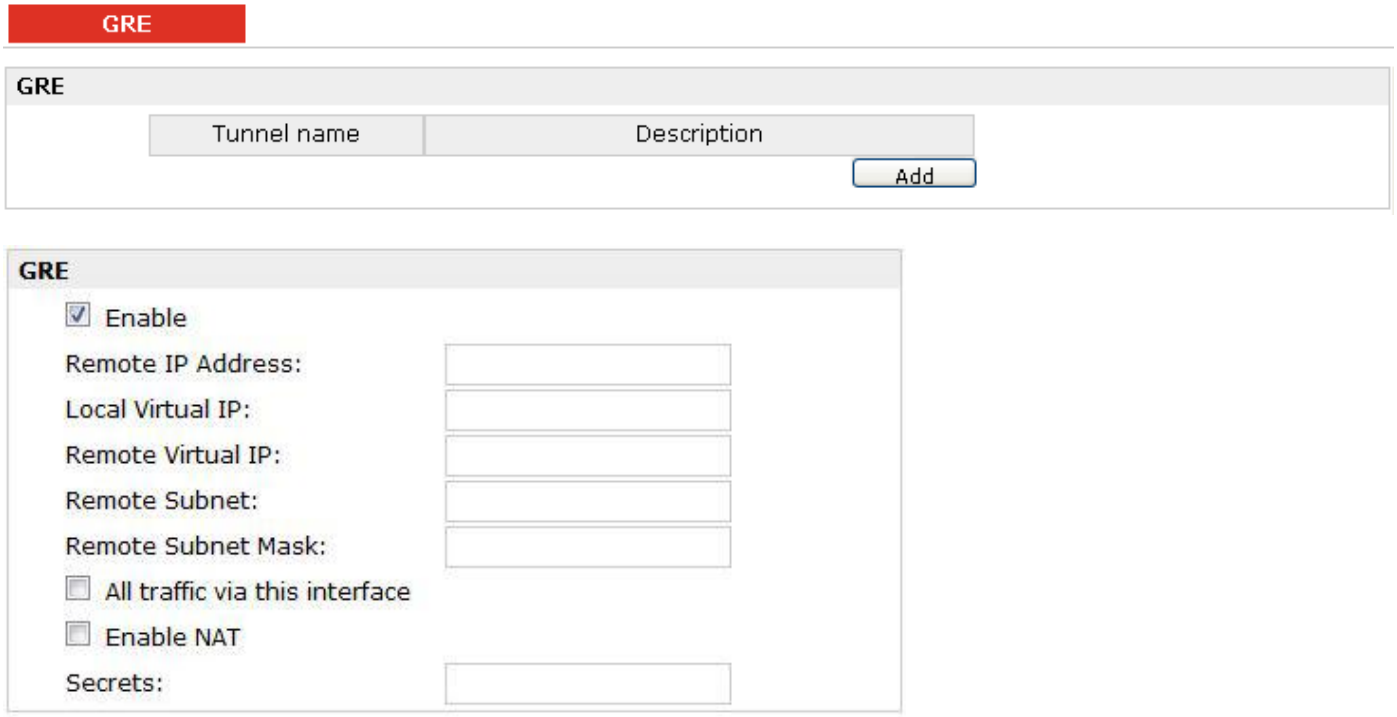
Interface	Select from “tun” and “tap” which are two different kinds of device interface for OpenVPN. The difference between a tun and tap device is this: a tun device is a virtual IP point-to-point device and a tap device is a virtual Ethernet device.	tun
Authentication	Select from four different kinds of authentication ways: “Pre-shared”, “Username/Password”, “X.509 cert” and “X.509 cert+user”.	None
Local IP	Define the local IP address of OpenVPN tunnel.	10.8.0.1
Remote IP	Define the remote IP address of OpenVPN tunnel.	10.8.0.2
Enable NAT	Tick to enable NAT Traversal for OpenVPN. This item must be enabled when router under NAT environment.	Disable
Ping Interval	Set ping interval to check if the tunnel is active.	20
Ping -Restart	Restart to establish the OpenVPN tunnel if ping always timeout during this time.	120
Compression	Select from “None”and”LZO”, Select “LZO” to use the LZO compression library to compress the data stream.	LZO
Encryption	Select from “NONE”, “BF-CBC”, “DES-CBC”, “DES-EDE3-CBC”, “AES128-CBC”, “AES192-CBC” and “AES256-CBC”. BF-CBC: Uses the BF algorithm in CBC mode and 128-bit key. DES-CBC: Uses the DES algorithm in CBC mode and 64-bit key. DES-EDE3-CBC: Uses the 3DES algorithm in CBC mode and 192-bit key. AES128-CBC: Uses the AES algorithm in CBC mode and 128-bit key. AES192-CBC: Uses the AES algorithm in CBC mode and 192-bit key. AES256-CBC: Uses the AES algorithm in CBC mode and 256-bit key.	NONE
MTU	Maximum Transmission Unit. It is the identifier of the maximum size of packet, which is possible to transfer in a given environment.	1500
Max Frame Size	Set the Max Frame Size for transmission.	1500
Verbose Level	Select the log output level which from low to high: “ERR”, “WARNING”, “NOTICE” and “DEBUG”. The higher level will output more log information.	ERR
Expert Options	You can enter some other PPP initialization strings in this field. Each string can be separated by a space.	Null
Client Manage	Click “Add” to add a OpenVPN client info which include “Common Name”, “Password”, “Client IP”, “Local Static Route” and “Remote Static Route”. This field only can be configured when you select “Username/Password” in “Authentication”.	Null



X.509 @ Open VPN		
Item	**Description**	**Default**
Select Cert Type	Select the OpenVPN client or server which the certification used for.	Null
CA	Click “Browse” to select the correct CA file from your PC, and then click “Import” to import it to the router. Click “Export” you can export the CA file from router to your PC.	Null
Public Key	Click “Browse” to select the correct Public Key file from your PC, and then click “Import” to import it to the router. Click “Export” you can export the Public Key A file from router to your PC.	Null
Private Key	Click “Browse” to select the correct Private Key file from your PC, and then click “Import” to import it to the router. Click “Export” you can export the Private Key file from router to your PC.	Null
DH	Click “Browse” to select the correct DH A file from your PC, and then click “Import” to import it to the router. Click “Export” you can export the DH file from router to your PC.	Null
TA	Click “Browse” to select the correct TA file from your PC, and then click “Import” to import it to the router. Click “Export” you can export the TA file from router to your PC.	Null
CRL	Click “Browse” to select the correct CRL file from your PC, and then click “Import” to import it to the router. Click “Export” you can export the CRL file from router to your PC.	Null
Pre-Share Static Key	Click “Browse” to select the correct Pre-Share Static Key file from your PC, and then click “Import” to import it to the router. Click “Export” you can export the Pre-Share Static Key file from router to your PC.	Null

3.24 Configuration > GRE

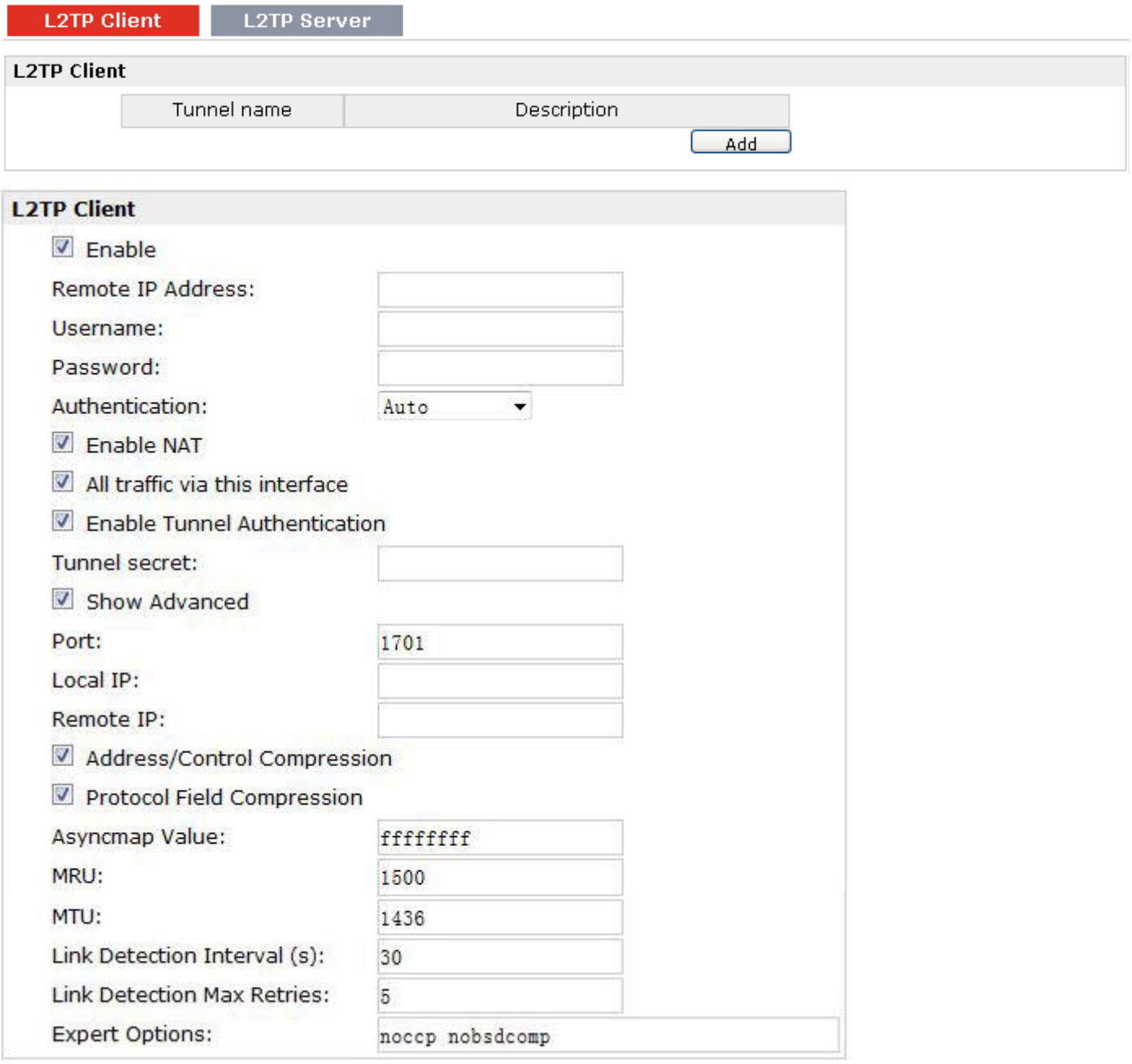
This section allows users to set the GRE parameters.



GRE		
Item	**Description**	**Default**
Add	Click “Add” to add a GRE tunnel.	
Enable	Click to enable GRE (Generic Routing Encapsulation). GRE is a protocol that encapsulates packets in order to route other protocols over IP networks.	Disable
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
Remote Subnet	Add a static route to the remote side’s subnet so that the remote network is known to the local network.	Null
Remote Subnet Mask	Set remote subnet net mask.	Null
All traffic via this interface	After click to enable this feature, all data traffic will be sent via GRE tunnel.	Disable
Enable NAT	Tick to enable NAT Traversal for GRE. This item must be enabled when router under NAT environment.	Disable
Secrets	Set Tunnel Key of GRE.	Null

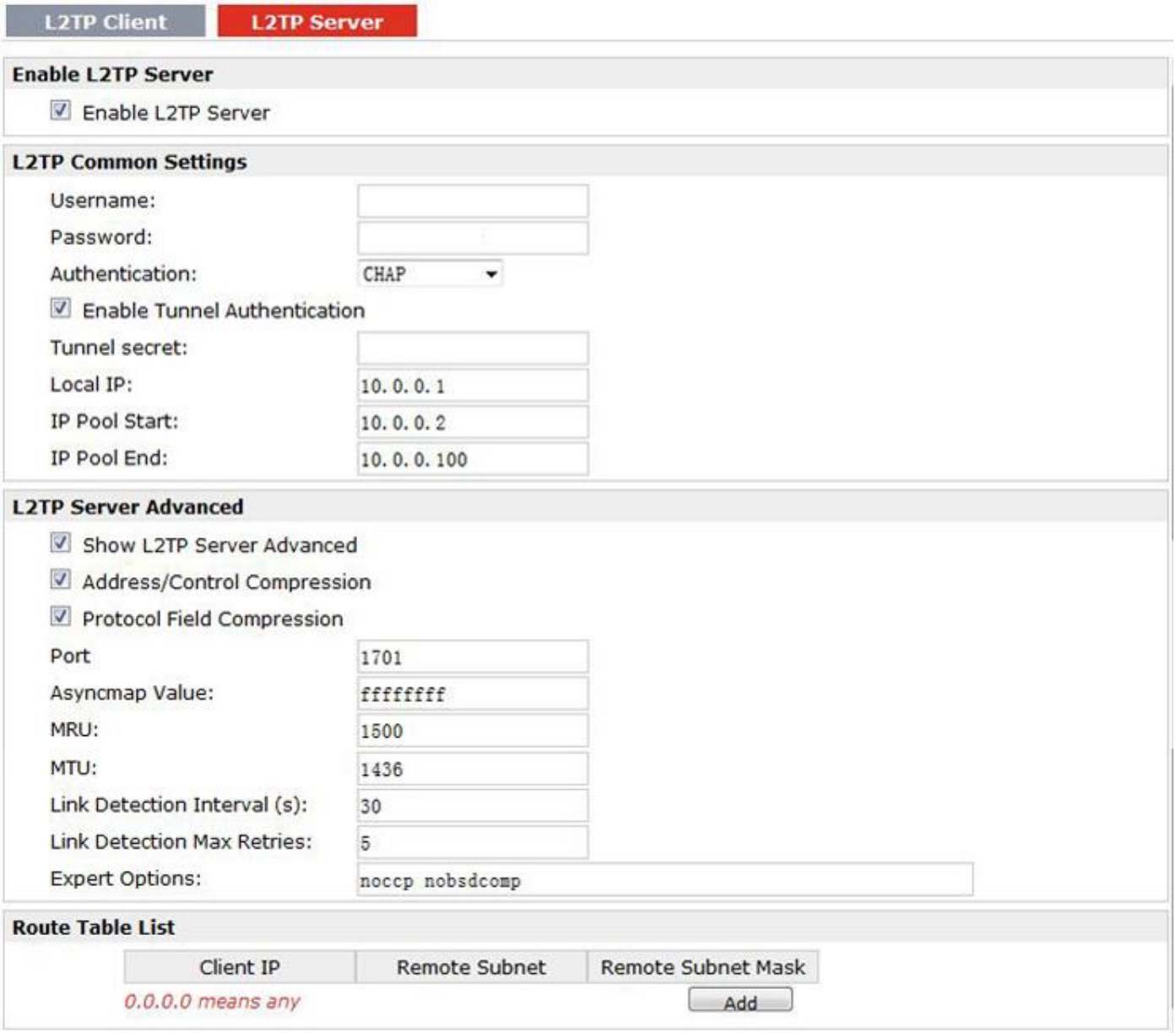
3.25 Configuration > L2TP

This section allows users to set the L2TP parameters.



L2TP Client @ L2TP		
Item	**Description**	**Default**
Add	Click “Add” to add a L2TP client. You can add at most 3 L2TP clients.	Null
Remote IP Address	Enter your L2TP server’s public IP or domain name.	Null
Username	Enter the username which was provided by your L2TP server.	Null

Password	Enter the password which was provided by your L2TP server.	Null
Authentication	Select from “Auto”, “PAP”, “CHAP”, “MS-CHAP v1” and “MS-CHAP v2”. You need to select the corresponding authentication method based on the server’s authentication method. When you select “Auto”, router will auto select the correct method based on server.	Disable
Remote Subnet	Enter L2TP remote Protected subnet’s address.	Null
Remote Subnet Mask	Enter L2TPremote Protected subnet’s mask.	Null
Enable NAT	Click to enable NAT feature of L2TP.	Disable
All traffic via this interface	After click to enable this feature, all data traffic will be sent via L2TP tunnel.	Disable
Enable Tunnel Authentication	Tick to enable tunnel authentication and enter the tunnel secret which provided by L2TP server.	Disable
Tunnel Secret	Enter L2TP tunnel secret in this item.	Null
Show Advanced	Tick to enable the L2TP client advanced setting.	Disable
Port	Set the Port number of the L2TP client.	Null
Local IP	Set the IP address of the L2TP client. You can enter the IP which assigned by L2TP server. Null means L2TP client will obtain an IP address automatically from L2TP server’s IP pool.	Null
Remote IP	Enter the remote peer’s private IP address or remote subnet’s gateways address.	Null
Address/Control Compression	Used for PPP initialization. In general, you need to enable it as default.	Enable
Protocol Field Compression	Used for PPP initialization. In general, you need to enable it as default.	Enable
Asyncmap Value	One of the L2TP initialization strings. In general, you don’t need to modify this value.	ffffffff
MRU	Maximum Receiving Unit. It is the identifier of the maximum size of packet, which is possible to receive in a given environment.	1500
MTU	Maximum Transmission Unit. It is the identifier of the maximum size of packet, which is possible to transfer in a given environment.	1436
Link Detection Interval	Specify the interval between L2TP client and server. To check the connectivity of a tunnel, the client and server regularly send PPP Echo to each other. If the client or server receives no response from the peer within a specified period of time, it retransmits the PPP echo. If it receives no response from the peer after transmitting the PPP echo for max retries times, it considers that the L2TP tunnel is down and tries tore-establish a tunnel with the peer.	30
Link Detection Max Retries	Specify the max retries times for L2TP link detection.	5
Expert Options	You can enter some other PPP initialization strings in this field. Each string can be separated by a space.	noccp nobsdcomp

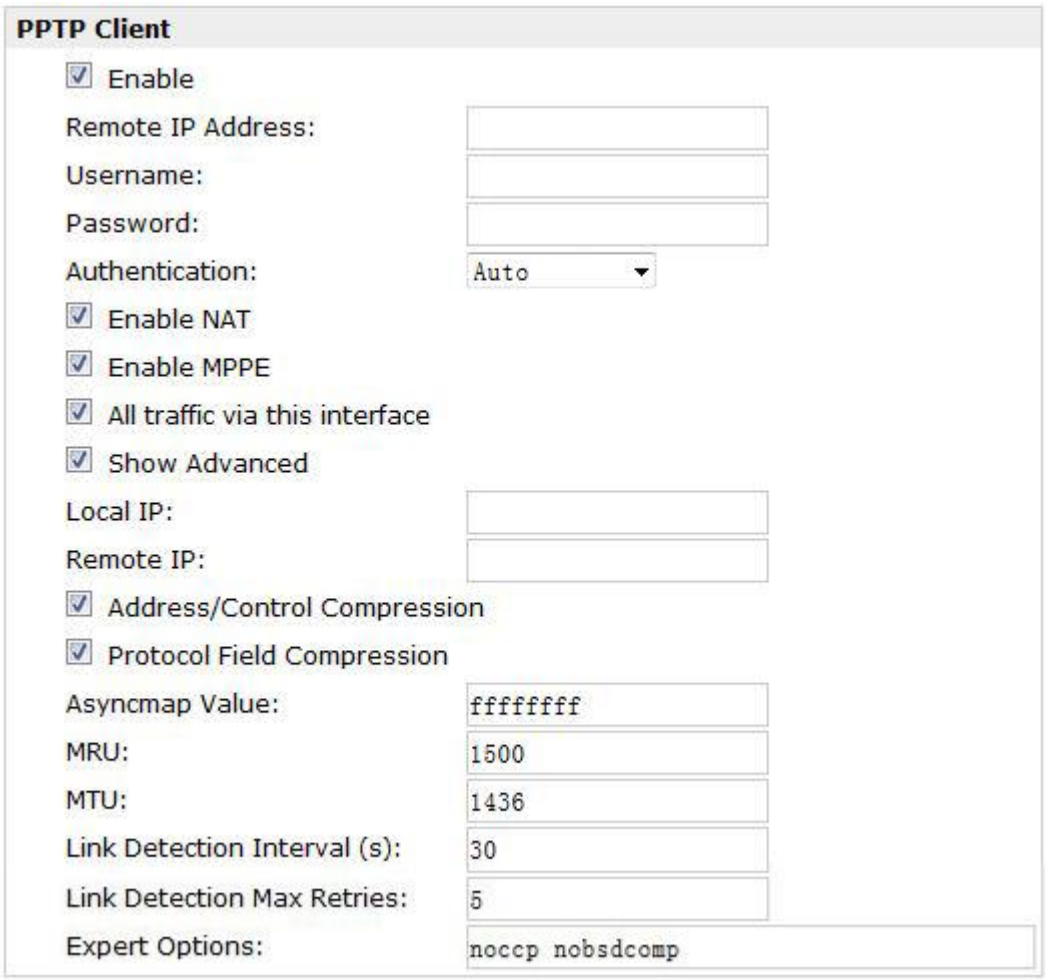


L2TP Server @ L2TP		
Item	**Description**	**Default**
Enable L2TP Server	Tick to enable L2TP server.	Disable
Username	Set the username which will assign to L2TP client.	Null
Password	Set the password which will assign to L2TP client.	Null
Authentication	Select from “PAP”, “CHAP”, “MS-CHAP v1” and “MS-CHAP v2”. L2TP client need to select the same authentication method based on this server’s authentication method.	CHAP
Enable Tunnel Authentication	Tick to enable tunnel authentication and enter the tunnel secret which will provide to L2TP client.	Disable
Local IP	Set the IP address of L2TP server.	10.0.0.1
IP Pool Start	Set the IP pool start IP address which will assign to the L2TP clients.	10.0.0.2

IP Pool End	Set the IP pool end IP address which will assign to the L2TP clients.	10.0.0.100
Show L2TP Server Advanced	Tick to show the L2TP server advanced setting.	Disable
Address/Control Compression	Used for PPP initialization. In general, you need to enable it as default.	Enable
Protocol Field Compression	Used for PPP initialization. In general, you need to enable it as default.	Enable
Port	Set the Port number of the L2TP server.	Null
Asyncmap Value	One of the L2TP initialization strings. In general, you don't need to modify this value.	ffffffff
MRU	Maximum Receiving Unit. It is the identifier of the maximum size of packet, which is possible to receive in a given environment.	1500
MTU	Maximum Transmission Unit. It is the identifier of the maximum size of packet, which is possible to transfer in a given environment.	1436
Link Detection Interval	Specify the interval between L2TP client and server. To check the connectivity of a tunnel, the client and server regularly send PPP Echo to each other. If the client or server receives no response from the peer within a specified period of time, it retransmits the PPP echo. If it receives no response from the peer after transmitting the PPP echo for max retries times, it considers that the L2TP tunnel is down and tries tore-establish a tunnel with the peer.	30
Link Detection Max Retries	Specify the max retries times for L2TP link detection.	5
Expert Options	You can enter some other PPP initialization strings in this field. Each string can be separated by a space.	noccp nobsdcomp
Route Table List	Click "Add" to add a route rule from L2TP server to L2TP client.	Null

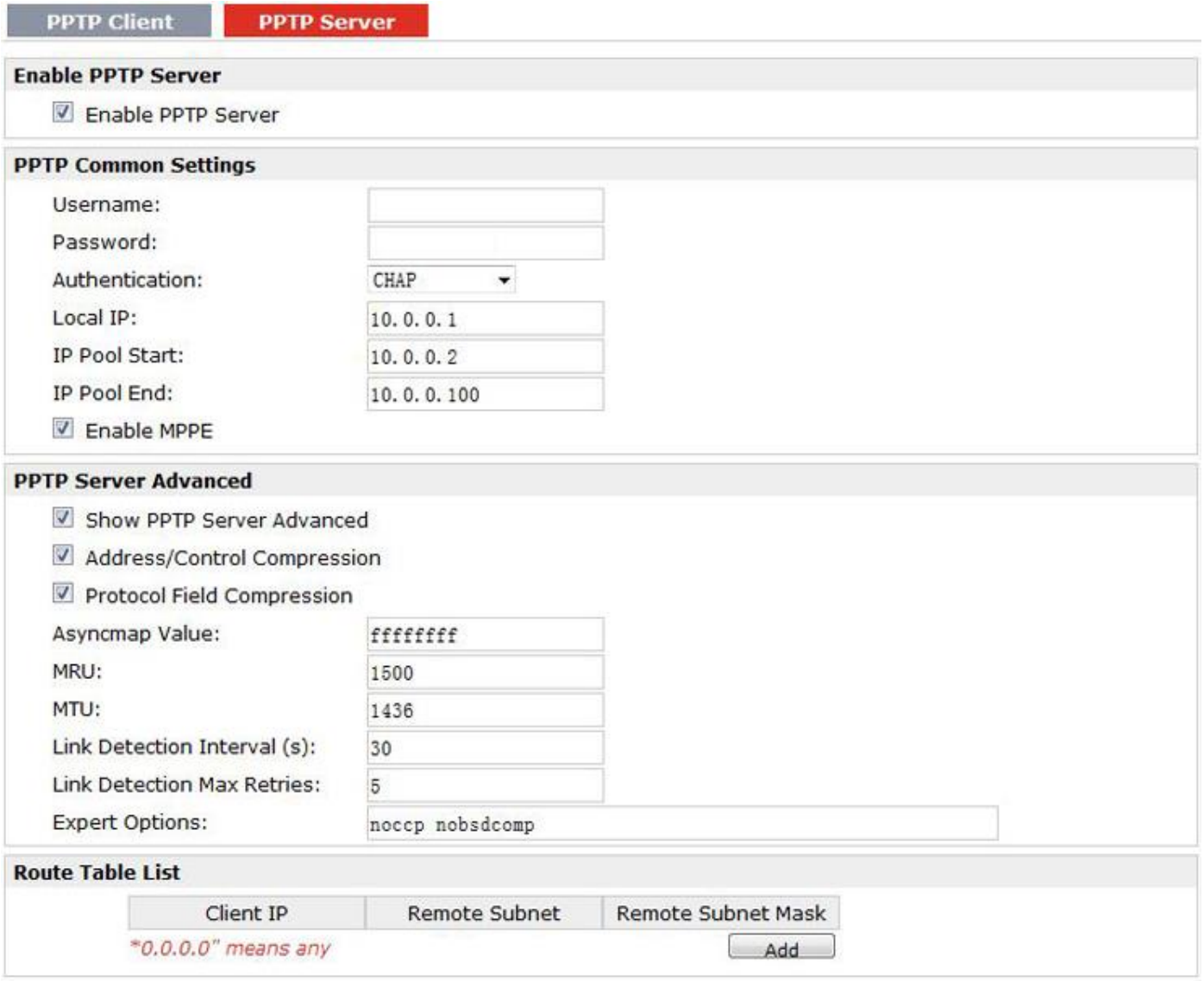
3.26 Configuration > PPTP

This section allows users to set the PPTP parameters.



PPTP Client @ PPTP		
Item	**Description**	**Default**
Add	Click “Add” to add a PPTP client	/
Enable	Enable PPTP Client. The max tunnel accounts are 3.	Null
Disable	Disable PPTP Client.	Null
Remote IP Address	Enter your PPTP server’s public IP or domain name.	Null
Username	Enter the username which was provided by your PPTP server.	Null
Password	Enter the password which was provided by your PPTP server.	Null
Authentication	Select from “Auto”, “PAP”, “CHAP”, “MS-CHAP v1” and “MS-CHAP v2”. You need to select the corresponding authentication method based on the server’s authentication method. When you select “Auto”, router will auto select the correct method based on server’s method.	Auto
Enable NAT	Click to enable NAT feature of PPTP.	Disable
Enable MPPE	Tick to enable MPPE (Microsoft Point-to-Point Encryption). It’s a protocol for encrypting data across PPP and VPN links.	Disable
All traffic via this interface	After click to enable this feature, all data traffic will be sent via PPTP tunnel.	Disable
Show Advanced	Tick to enable the PPTP client advanced setting.	Disable

Local IP	Set the IP address of the PPTP client. You can enter the IP which assigned by PPTP server. Null means PPTP client will obtain an IP address automatically from PPTP server's IP pool.	Null
Remote IP	Enter the remote peer's private IP address or remote subnet's gateways address.	Null
Address/Control Compression	Used for PPP initialization. In general, you need to enable it as default.	Enable
Protocol Field Compression	Used for PPP initialization. In general, you need to enable it as default.	Enable
Asyncmap Value	One of the PPTP initialization strings. In general, you don't need to modify this value.	ffffffff
MRU	Maximum Receiving Unit. It is the identifier of the maximum size of packet, which is possible to receive in a given environment.	1500
MTU	Maximum Transmission Unit. It is the identifier of the maximum size of packet, which is possible to transfer in a given environment.	1436
Link Detection Interval	Specify the interval between PPTP client and server. To check the connectivity of a tunnel, the client and server regularly send PPP Echo to each other. If the client or server receives no response from the peer within a specified period of time, it retransmits the PPP echo. If it receives no response from the peer after transmitting the PPP echo for max retries times, it considers that the PPTP tunnel is down and tries tore-establish a tunnel with the peer.	30
Link Detection Max Retries	Specify the max retries times for PPTP link detection.	5
Expert Options	You can enter some other PPP initialization strings in this field. Each string can be separated by a space.	noccp nobsdcomp



PPTP Server @ PPTP		
Item	**Description**	**Default**
Enable PPTP Server	Tick to enable PPTP server.	Disable
Username	Set the username which will assign to PPTP client.	Null
Password	Set the password which will assign to PPTP client.	Null
Authentication	Select from “PAP”, “CHAP”, “MS-CHAP v1” and “MS-CHAP v2”. PPTP client need to select the same authentication method based on this server’s authentication method.	CHAP
Local IP	Set the IP address of PPTP server.	10.0.0.1
IP Pool Start	Set the IP pool start IP address which will assign to the PPTP clients.	10.0.0.2
IP Pool End	Set the IP pool end IP address which will assign to the PPTP clients.	10.0.0.100
Enable MPPE	Tick to enable MPPE (Microsoft Point-to-Point Encryption). It’s a protocol for encrypting data across PPP and VPN links.	Disable
Show PPTP Server	Tick to show the PPTP server advanced setting.	Disable

Advanced		
Address/Control Compression	Used for PPP initialization. In general, you need to enable it as default.	Enable
Protocol Field Compression	Used for PPP initialization. In general, you need to enable it as default.	Enable
Asyncmap Value	One of the PPTP initialization strings. In general, you don't need to modify this value.	ffffffff
MRU	Maximum Receiving Unit. It is the identifier of the maximum size of packet, which is possible to receive in a given environment.	1500
MTU	Maximum Transmission Unit. It is the identifier of the maximum size of packet, which is possible to transfer in a given environment.	1436
Link Detection Interval	Specify the interval between PPTP client and server. To check the connectivity of a tunnel, the client and server regularly send PPP Echo to each other. If the client or server receives no response from the peer within a specified period of time, it retransmits the PPP echo. If it receives no response from the peer after transmitting the PPP echo for max retries times, it considers that the PPTP tunnel is down and tries tore-establish a tunnel with the peer.	30
Link Detection Max Retries	Specify the max retries times for PPTP link detection.	5
Expert Options	You can enter some other PPP initialization strings in this field. Each string can be separated by a space.	noccp nobsdcomp
Route Table List	Click "Add" to add a route rule from PPTP server to PPTP client.	Null

3.27 Configuration > Modbus over TCP

This section allows users to configure the Modbus over TCP. Modbus over TCP slave functions, the remote can access the R3000 Lite's internal registers through Modbus over TCP.

Modbus over TCP

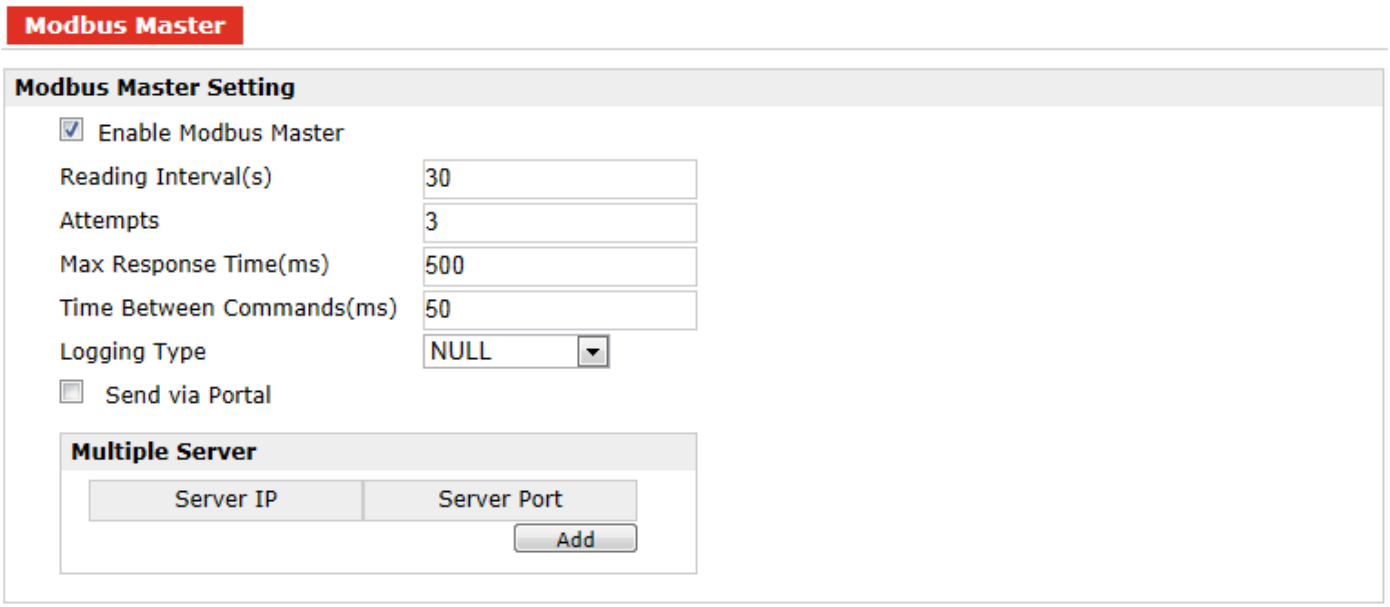
Modbus over TCP		
Item	**Description**	**Default**
Enable Modbus over TCP	Click to enable Modbus over TCP.	Disable
Slave ID	Enter the slave ID.	Null
Port	Enter the port which used to forward data.	Null

3.28 Configuration > Modbus Master

R3000 Lite router could be configured as a Modbus master, and will automatically poll the slave sides and report the collected data to specified server.

This section allows users to configure the Modbus Master.

Note: Before the salve device transmits the data via serial interface, you should select protocol as "Modbus Master" in Serial.



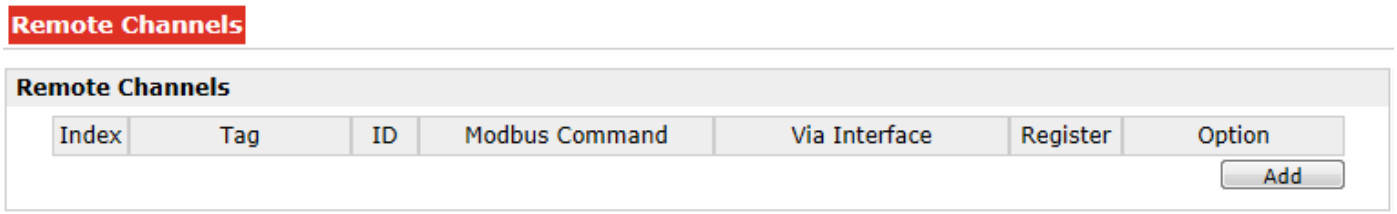
Modbus Master		
Item	**Description**	**Default**
Reading Interval(s)	In this set of cycle, read Remote Channels one by one. The equipment begins the reading of the channels in the order they were created at the time of configuration. This way, it continues reading all the channels, respecting the time between commands, until it has read them all. Every time the reading interval is reached, it restarts the reading of all of the remote channels. If the reading of the channels takes longer that the configured reading interval, it should wait for all channels to be read before starting a new reading interval.	30
Attempts	The max times of instruction attempts. If a read instruction in Remote Channels failure to perform the read command in a row, when the times achieve Attempts, R3000 Lite identifies automatically this instruction is not read, and the skip this instruction next read cycle. Only when this state duration keep over 30 seconds, it will become a new readable, and then try to execute the command next read cycle.	3
Max Response Time (ms)	The response time of the maximum waiting to read instructions. When you perform a read command, this time is the response time of R3000 Lite waiting for the command. If it didn't get response from the	500

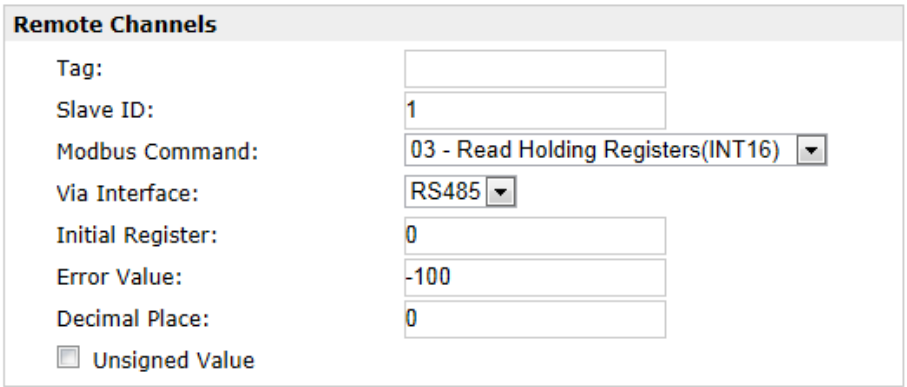
	instructions after the Max Response Time, the instructions read timeout.	
Time Between Commands (ms)	The execution of the interval between each instruction.	50
Logging Type	Read the save site of Modbus's data. Only save when it can't upload to the server, upload the data after the upload channel recovering. Delete the data after finishing uploading.	Null
Send via Portal	Enable to send data via portal.	
Server IP	Set the server IP address of receive Modbus data.	Null
Server Port	Set the server port of receive Modbus data.	Null

3.29 Configuration > Remote Channels

This section allows users to configure the remote channels.

Note: Only configure the Modbus Master parameters at first, it can configure Remote Channels, otherwise it's disabled.



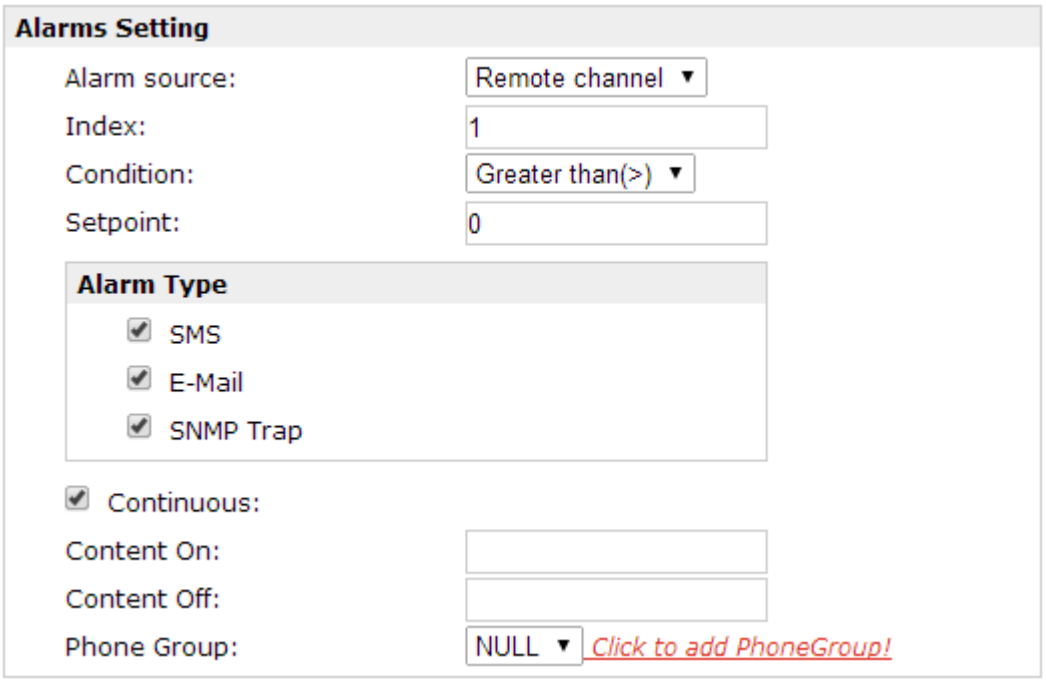


Remote Channels		
Item	**Description**	**Default**
Tag	The sign of remote channel, it can be null or not null. If not null, alarm or upload information in platform will carry this description.	Null
Slave ID	Modbus slave ID	1
Modbus Command	Read the command.	Read Holding Registers (INT 16)
Via Interface	Select from "RS485", "RS232", "TCP"	RS485
Initial Register	The starting point for execution to read while reading instruction.	0
Error Value	When reading failure, the Error Value in the Value will be assigned to	-100

	the channel, for the alarm and upload platform.	
Decimal Place	Used to indicate a dot in the read into the position of the channel. For example: read the channel value is 1234, and a Decimal Place is equal to 2, then the actual value of 12.34.	0
Unsigned Value	A value used to identify the channel for unsigned.	Disable

3.30 Configuration > Alarms

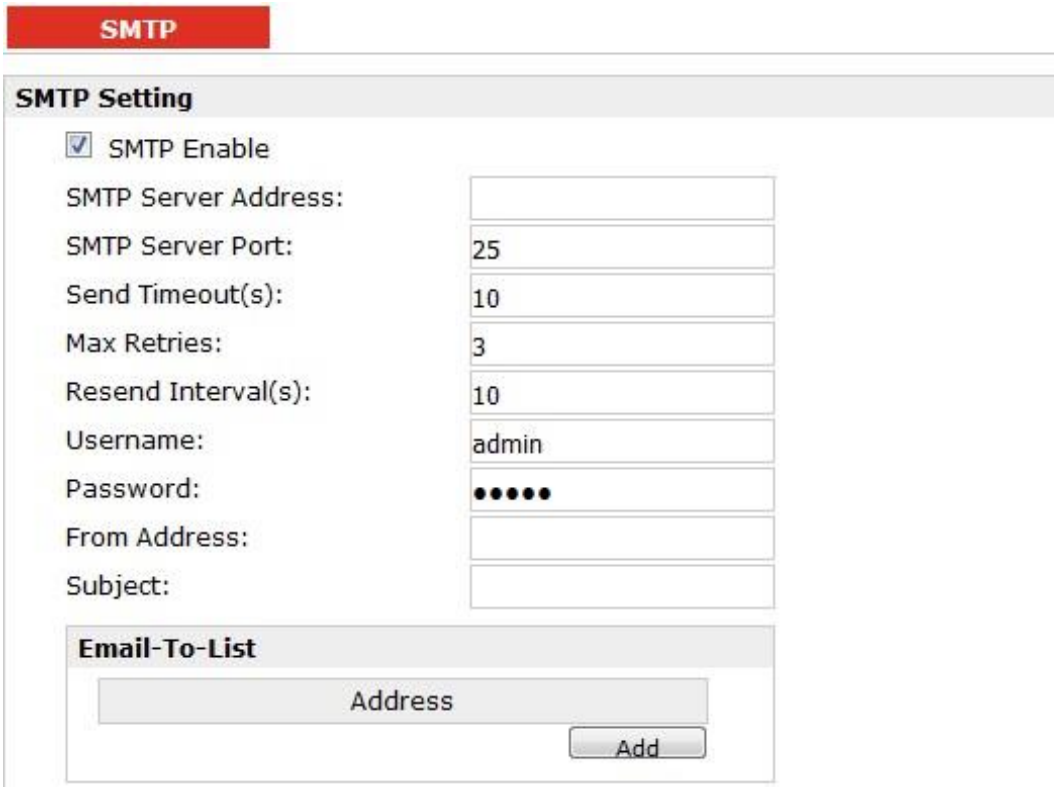
This section allows users to configure the alarms.



Alarms		
Item	**Description**	**Default**
Alarm Source	Select from “Remote channel”, “CSQ” and “Cellular Status”.	Remote channel
Index	Used to identify the way of Remote Channel.	1
Condition	The conditions of trigger the alarm.	Greater than (>)
Setpoint	The alarm threshold.	0
Alarm Type	The alarm types, you can choose more. Select from “SMS”, “Email”, “SNMP Trap”.	off
Content On	The content when the alarm on.(for email)	Null
Content Off	The content when the alarm off.(for email)	Null
Phone Group	You should add Phone Group at Phonebook firstly.	Null

3.31 Configuration > SMTP

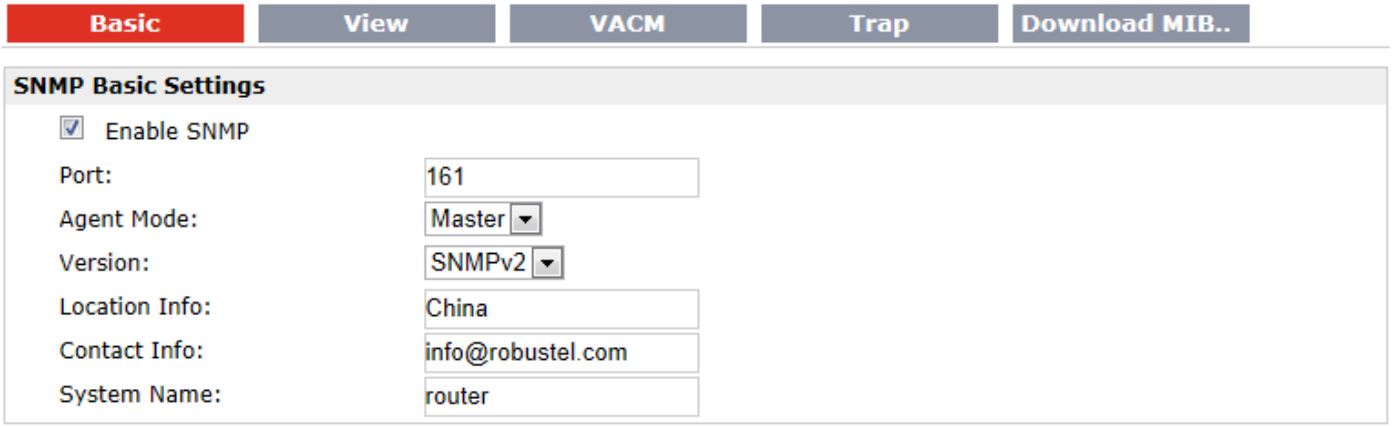
Simple Mail Transfer Protocol (SMTP) is an Internet standard for electronic mail (email) transmission.
This section allows users to set the SMTP parameters.



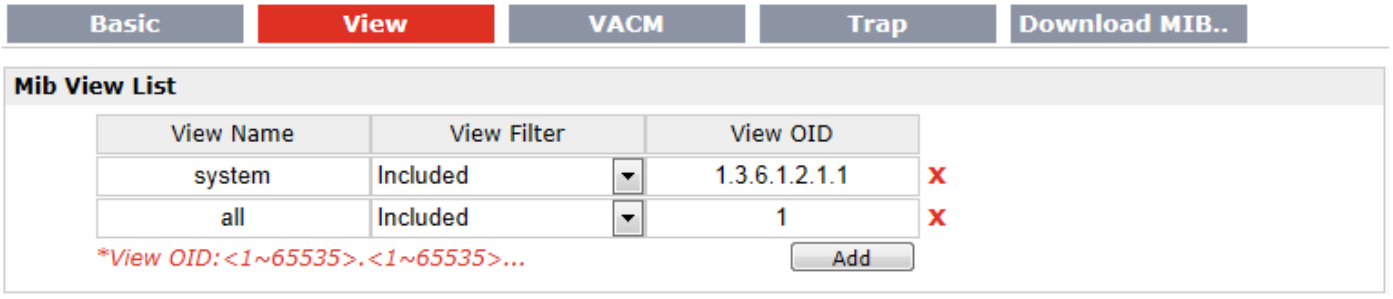
SMTP		
Item	**Description**	**Default**
SMTP Enable	Tick to enable SMTP feature	Disable
SMTP Server Address	The address or domain name of the SMTP server	Null
SMTP Server Port	The port of the SMTP server	25
Send Timeout (s)	The max time interval to send the email to SMTP server; router will send the email again if the server cannot check the email within the max time interval	10
Max Retries	The max retry times of email to resend	3
Resend Interval (s)	Specify the time interval used to resend the email	10
Username	The username of the mailbox	Null
Password	The password of the mailbox	Null
From Address	The email address of the sender	Null
Subject	The subject of the email	Null
Email-To-List	The list of the addressee, which can add the related addressee here	Null

3.32 Configuration > SNMP

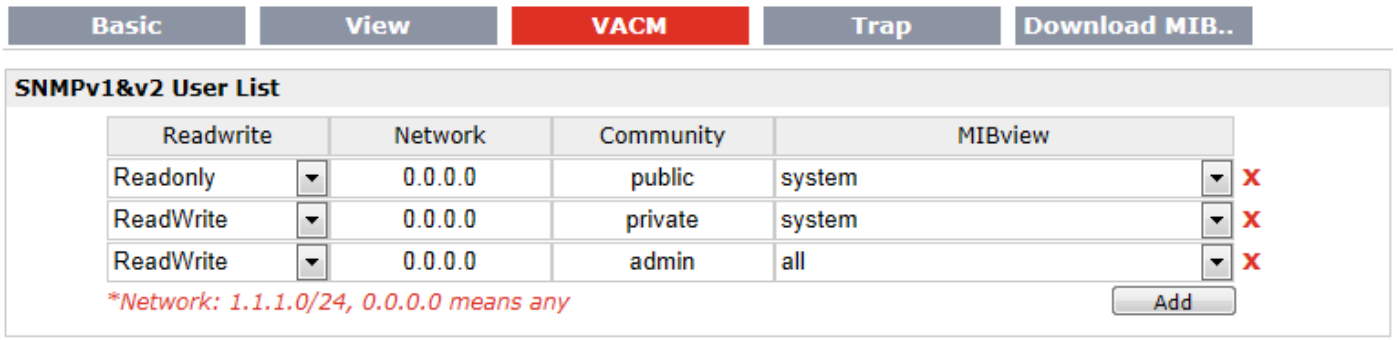
This section allows users to set the SNMP parameters.



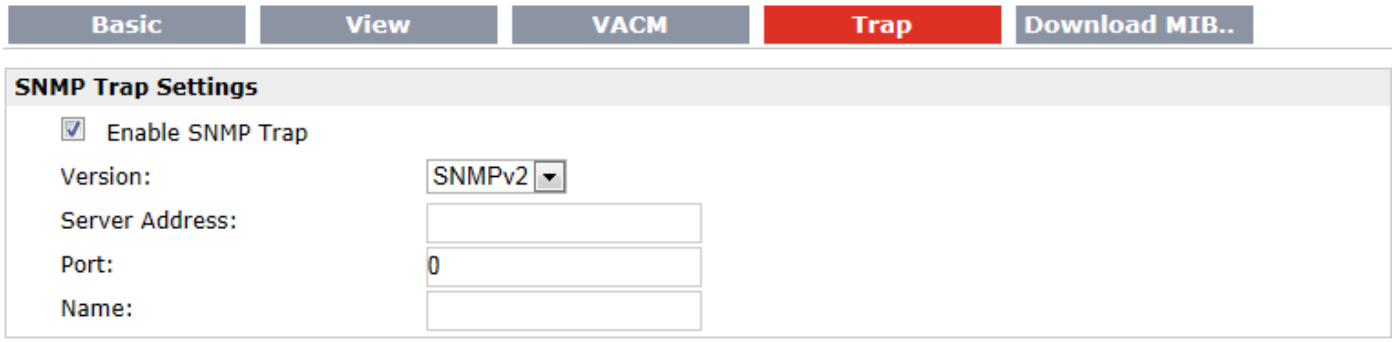
Basic @ SNMP		
Item	**Description**	**Default**
Port	UDP port for sending and receiving SNMP requests.	161
Agent Mode	Select the correct agent mode.	Master
Version	Select from “SNMPv1”, “SNMPv2” and “SNMPv3”.	SNMPv2
Location Info	Enter the router’s location info which will send to SNMP client.	China
Contact Info	Enter the router’s contact info which will send to SNMP client.	info@robustel.com
System name	Enter the router’s system name which will send to SNMP client.	router



View @ SNMP		
Item	**Description**	**Default**
View Name	Enter the View Name	Null
View Filter	Select from “Include” and “Exclude”.	Include
View OID	Enter the Object Identifiers (OID)	Null



VACM @ SNMP		
Item	**Description**	**Default**
Readwrite	Select the access rights from “Readonly” and “ReadWrite”.	Readonly
Network	Define the network from which is allowed to access. E.g. 172.16.0.0.	Null
Community	Enter the community name.	Null
MIBview	Select from “none”, “system” and “all”	none

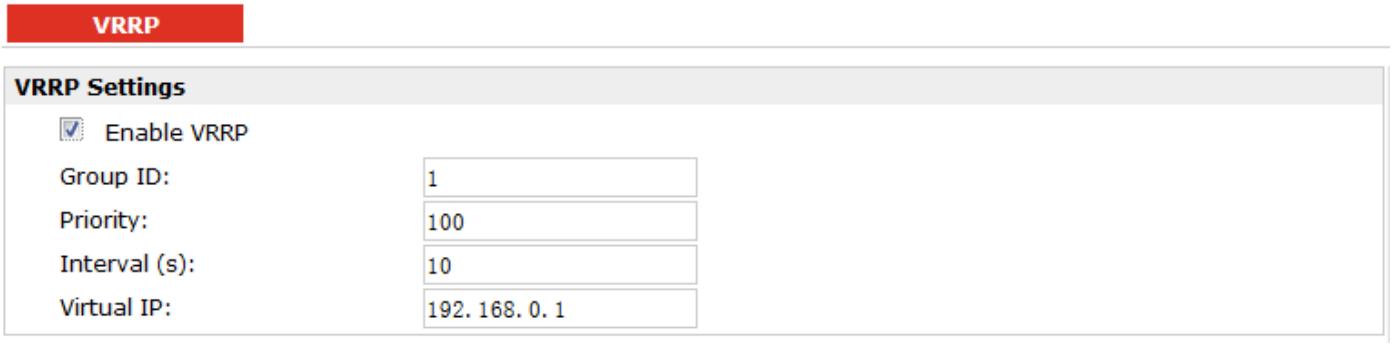


Trap @ SNMP		
Item	**Description**	**Default**
Enable SNMP Trap	Click to enable SNMP Trap feature.	Disable
Version	Select from “SNMPv1”, “SNMPv2” and “SNMPv3”.	SNMPv2
Server Address	Enter SNMP server’s IP address.	Null
Port	Enter SNMP server’s port number	0
Name	Enter SNMP server’s name.	Null

Download MIB Moudles File @ SNMP	
Item	**Description**
Download MIB Moudles File	Click to download the MIB Moudles File

3.33 Configuration > VRRP

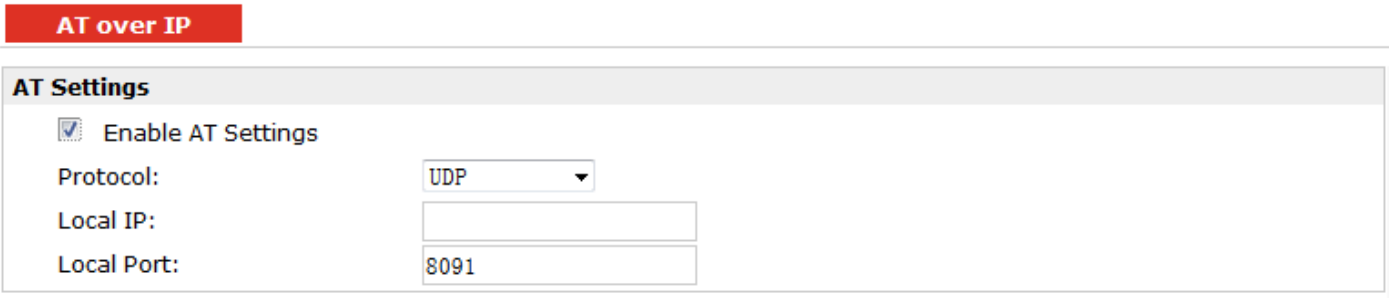
This section allows users to set the VRRP parameters.



VRRP		
Item	**Description**	**Default**
Enable VRRP	Tick to enable VRRP protocol. 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.	Disable
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.	100
Interval	The interval that master router sends keepalive packets to backup routers.	10
Virtual IP	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

3.34 Configuration > AT over IP

This section allows users to set the AT over IP parameters.

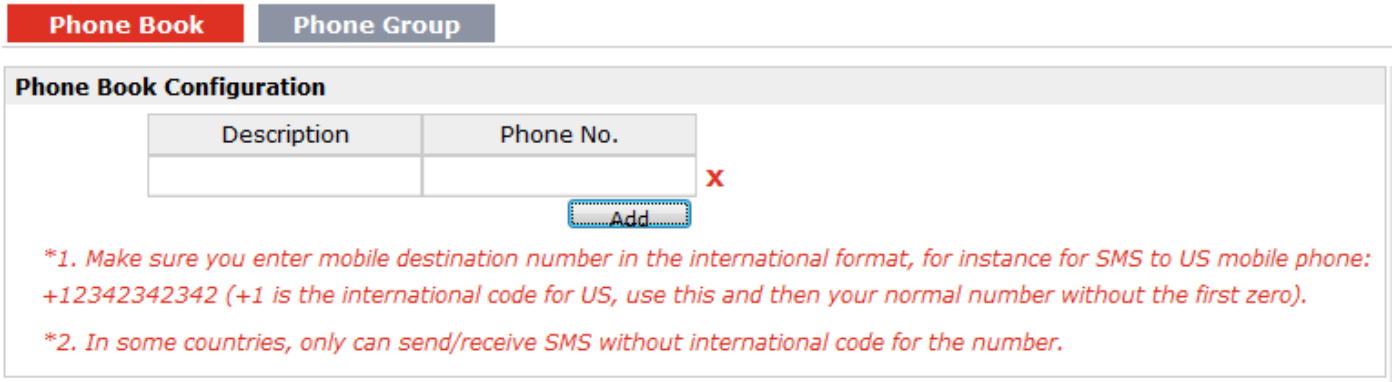


AT over IP		
Item	**Description**	**Default**
Enable AT Settings	Tick to enable AT over IP to control cellular module via AT command	Disable

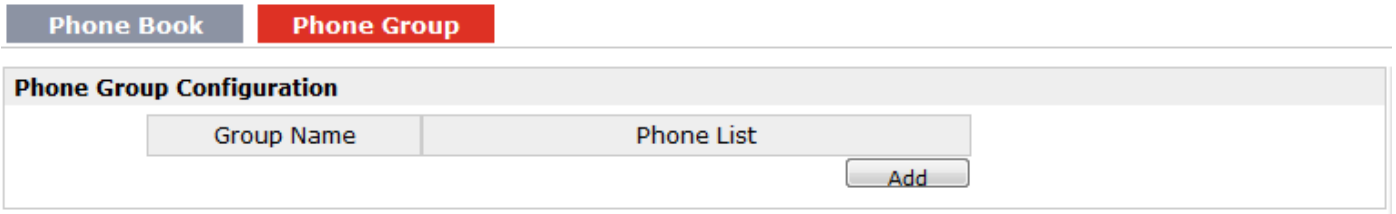
	remotely.	
Protocol	Select from “TCP server” or “UDP”	UDP
Local IP	You can enter the IP address of cellular WAN, Ethernet WAN or Ethernet LAN. Null stands for all these three IP addresses.	0.0.0.0
Local Port	Enter the local TCP or UDP listening port.	8091

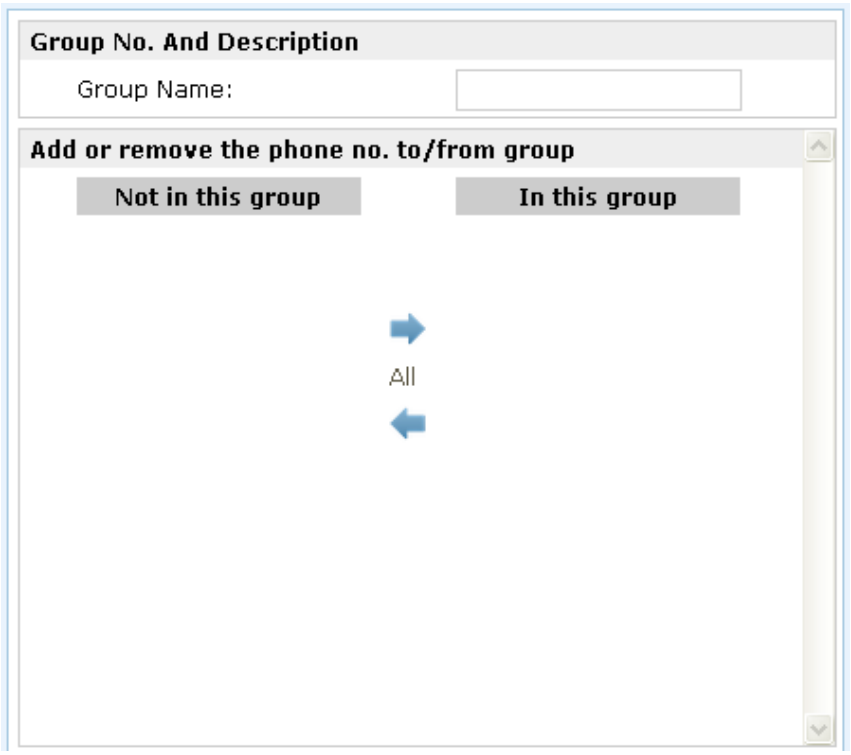
3.35 Configuration > Phone Book

This section allows users to set the Phone Book parameters.



Phone Book		
Item	**Description**	**Default**
Description	Set the name to your relevant phone No.	Null
Phone No.	Enter your phone No. ***Note:*** *In some countries, the **Phone No.** is required to be written in international format, starting with “**+**” followed by the country code.*	Null

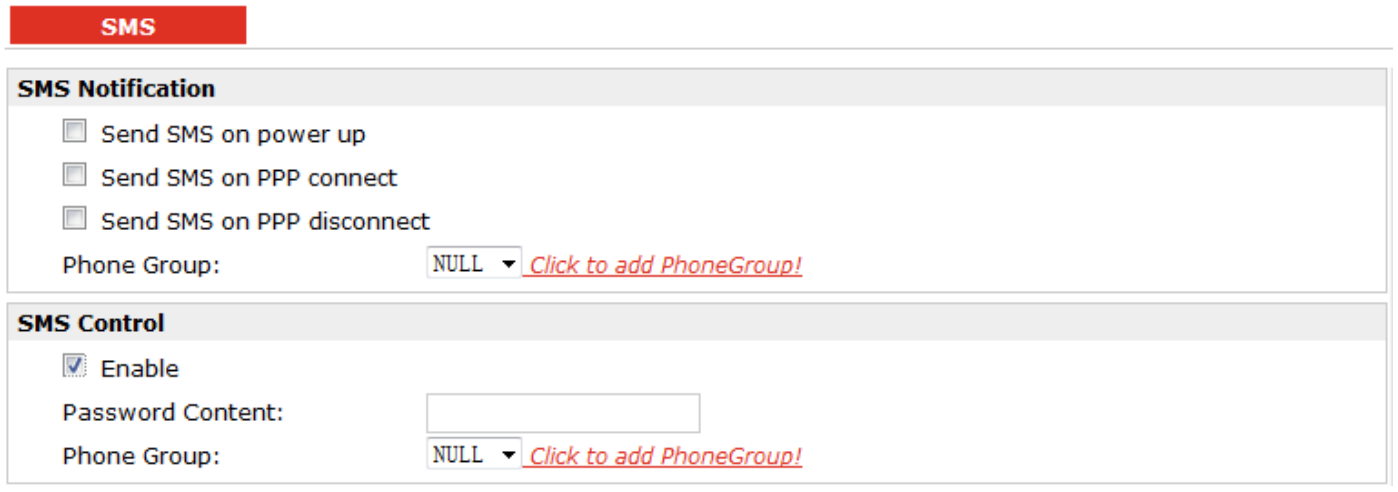




Phone Group		
Group Name	Set the Group Name.	Null
Phone List	Show the phone list in the Group.	Null
Add or remove the phone no.to/from group	Click right arrow to add the phone no.to this group; Click left arrow to remove the phone No. from group.	Null

3.36 Configuration > SMS

This section allows users to set the SMS Notification and SMS Control parameters.

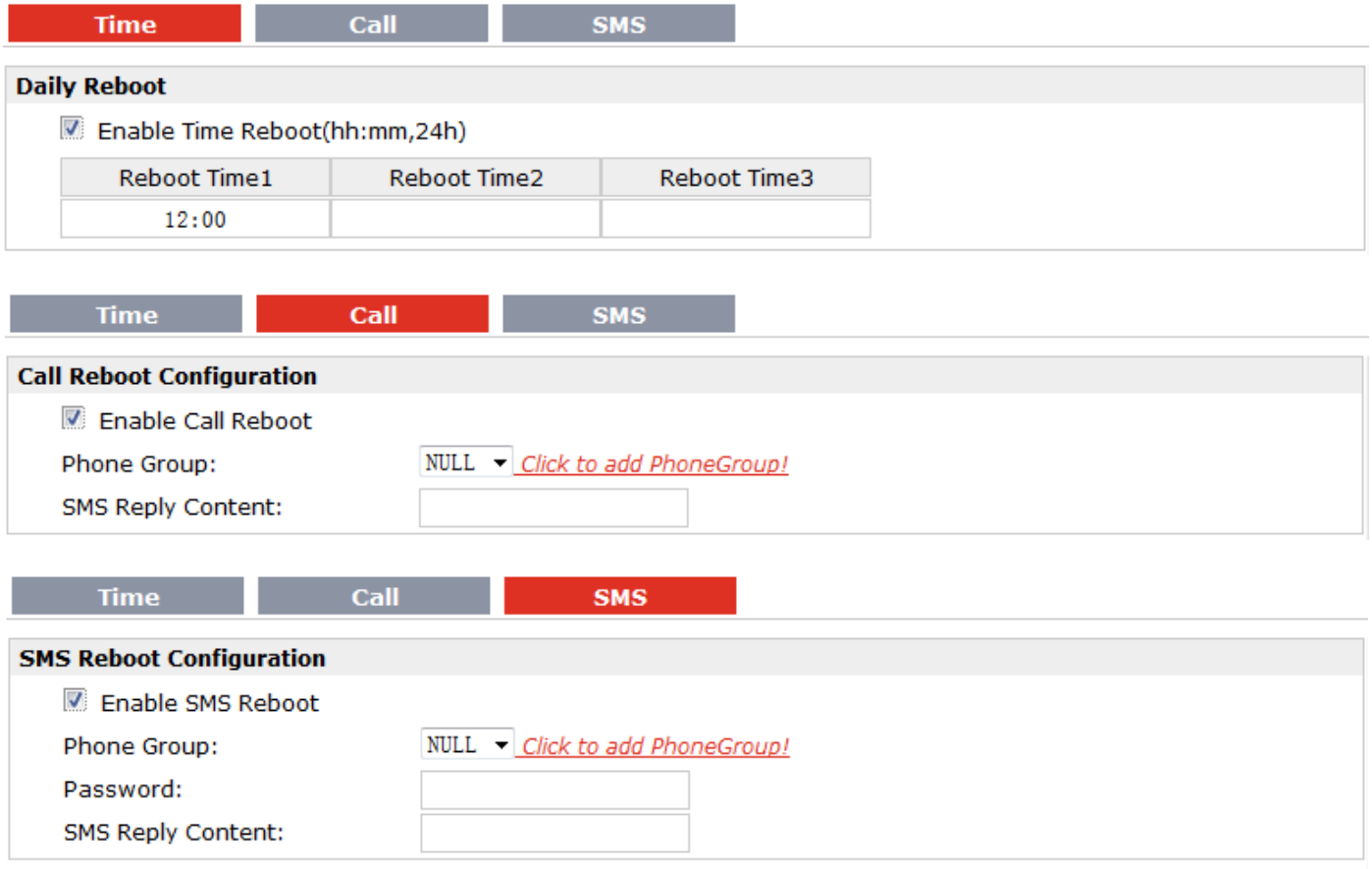


SMS		
Item	**Description**	**Default**
Send SMS on power up	Enable to send SMS to specific user after router was powered up.	Disable
Send SMS on PPP connect	Enable to send SMS to specific user when router PPP up.	Disable
Send SMS on PPP disconnect	Enable to send SMS to specific user when router PPP down.	Disable
Phone Group	Select the Phone Group you set in *3.2.27 Configuration > Phone Book*	Null
Enable @ SMS Control	Click to enable SMS remote control.	Disable
Password Content	Set the password content characters. ***Note**: Only support text format. For example 123 or ABC123.*	Null
Phone Group	Select the Phone Group you set in *3.2.27 Configuration > Phone Book*	Null

Note: please refer to section 4.2.2 SMS Commands for Remote Control.

3.37 Configuration > Reboot

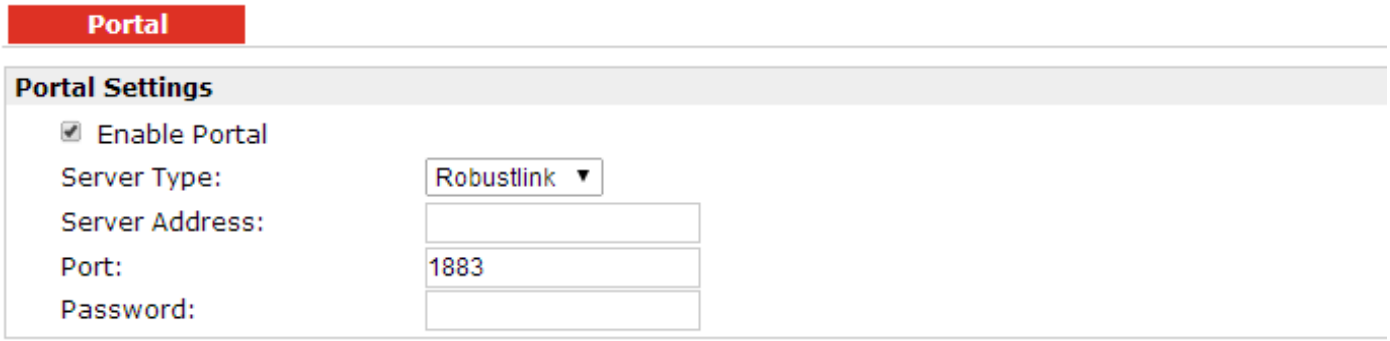
This section allows users to set the Reboot policies.

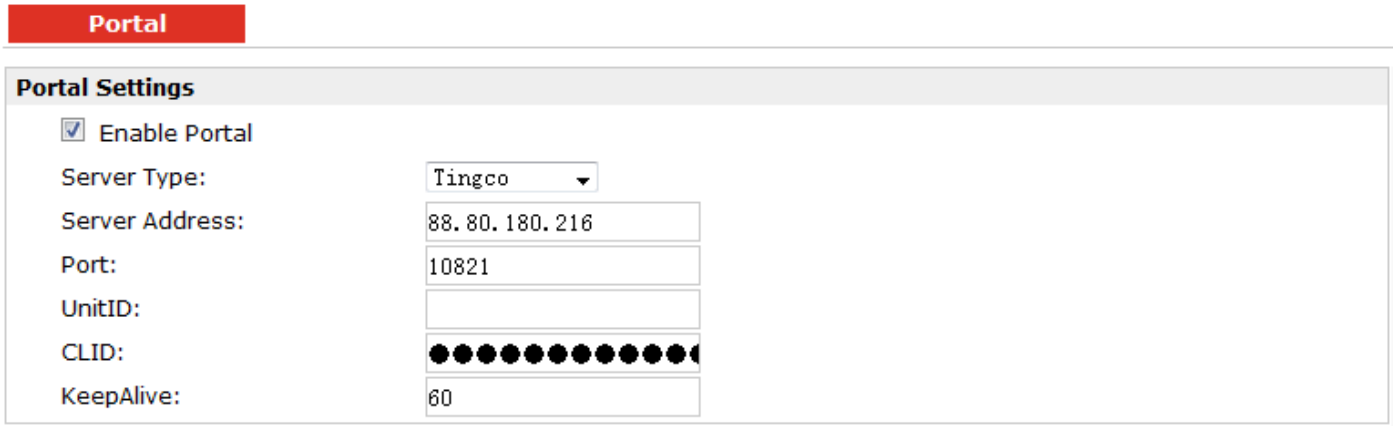


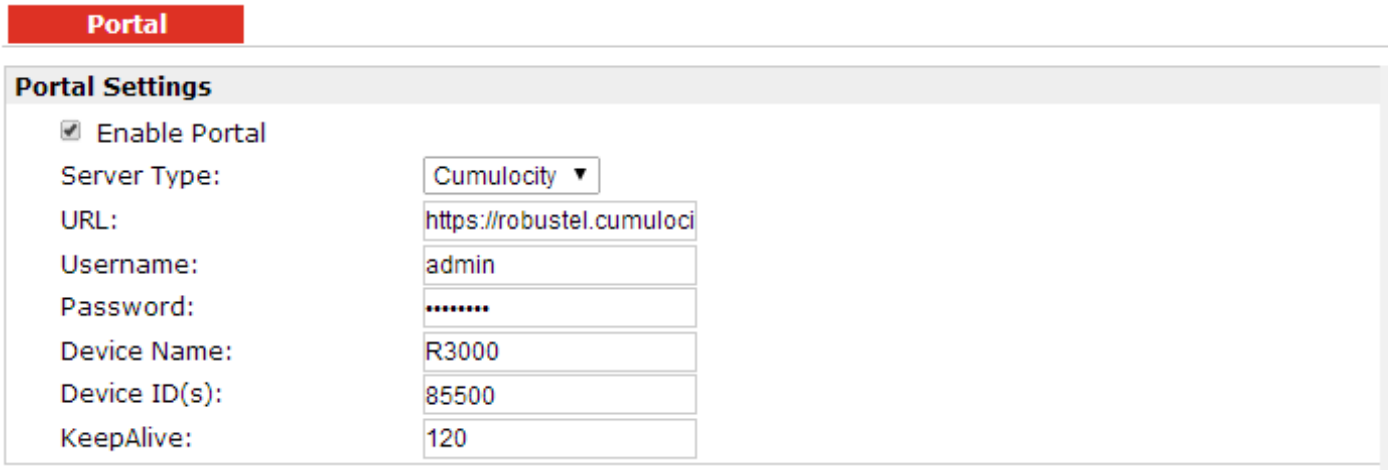
Time @ Reboot		
Item	**Description**	**Default**
Enable(ahh:mm,24h)	Enable daily reboot, you should follow ahh:mm,24h time frame, or the data will be invalid.	Disable
Reboot Time1	Specify time1 when you need router reboot.	Null
Reboot Time2	Specify time2 when you need router reboot.	Null
Reboot Time3	Specify time3 when you need router reboot.	Null
Call @ Reboot		
Enable Call Reboot	Click to enable call reboot function	Disable
Phone Group	Set the Phone Group which was allowed to reboot the router by call.	Null
SMS Reply Content	Send reply short message after auto Call reboot from specified Caller ID (e.g. Reboot ok!). ***Note**: Only support text format SMS.*	Null
SMS @ Reboot		
Enable SMS Reboot	Click to enable SMS reboot function	Disable
Phone Group	Set the Phone Group which was allowed to reboot the router by SMS.	Null
Password	Users could send this specific Password to trigger router to reboot.	Null
SMS Reply Content	Send reply short message after auto SMS reboot from specified Caller ID (e.g. Reboot ok!). ***Note**: Only support text format SMS.*	Null

3.38 Configuration > Portal

This section allows users to configure parameters about RobustLink Tingco and Cumulosity, which are industrial-grade centralized management and administration system. It allows you to monitor, configure and manage large numbers of remote devices on a private network over the web.



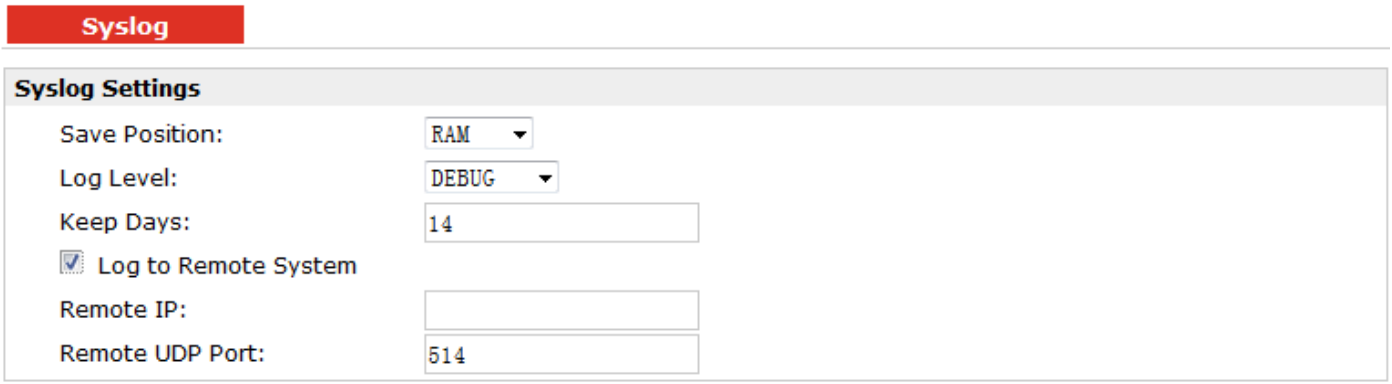




Robustlink @ Portal		
Item	**Description**	**Default**
Server address	Enter IP address of RobustLink.	Null
Port	Enter port number of RobustLink.	1883
Password	Enter the password preset in RobustLink. *Note: The passwords set in R3000 and RobustLink need to be the same.*	Null
Tingco@ Portal		
Server Address, Port, UnitID, CLID, KeepAlive	Fill in the Server Address, Port, UnitID, CLID, KeepAlive. After settings are activated, R3000 will update information to Tingco automatically.	
Cumulosity@Portal		
URL, Username, Password, Device Name, Device ID (S), KeepAlive	Fill in the URL, Username, Password, Device Name, Device ID (S), KeepAlive of Cumulosity. Default settings will be ok. After settings are activated, R3000 will update information to Cumulosity automatically.	

3.39 Configuration > Syslog

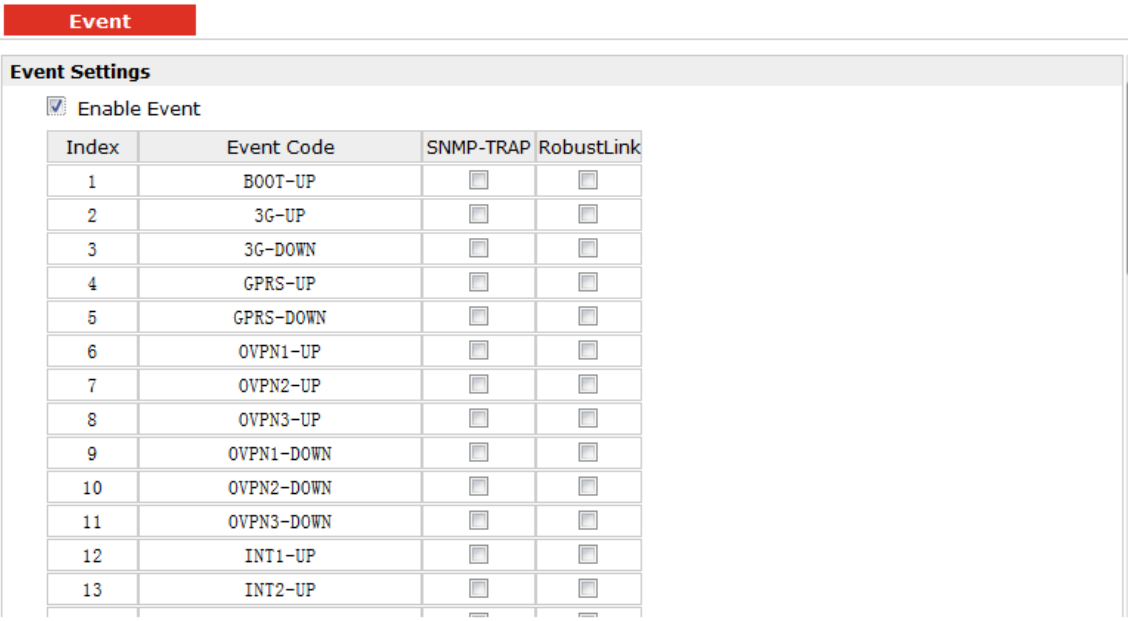
This section allows users to set the syslog parameters.



Syslog		
Item	**Description**	**Default**
Save Position	Select the save position from “None”, “Flash” and “SD”. “None” means syslog is only saved in RAM, and will be cleared after reboot.	NONE
Log Level	Select form “DEBUG”, “INFO”, “NOTICE”, “WARNING”, “ERR”, “CRIT”, “ALERT” and “EMERG” which from low to high. The lower level will output more syslog in detail.	DEBUG
Keep Days	Specify the syslog keep days for router to clear the old syslog.	14
Log to Remote System	Enable to allow router sending syslog to the remote syslog server. You need to enter the IP and Port of the syslog server.	Disable

3.40 Configuration > Event

This section allows users to set the Event parameters.



Event		
Item	**Description**	**Default**
Enable Event	Click to enable Event feature. This feature is used to report R3000 Lite's main running event to SNMP-TRAP or RobustLink. There are numbers of Event code you can select, such as "BOOT-UP", "3G-UP", "3G-DOWN", etc. For example if you click "3G-UP" and select "RobustLink" as the server, when R3000 Lite dial up to connect to 3G network, it will send event code "3G-UP" as well as relevant information to RobustLink.	Disable

3.41 Configuration > USR LED

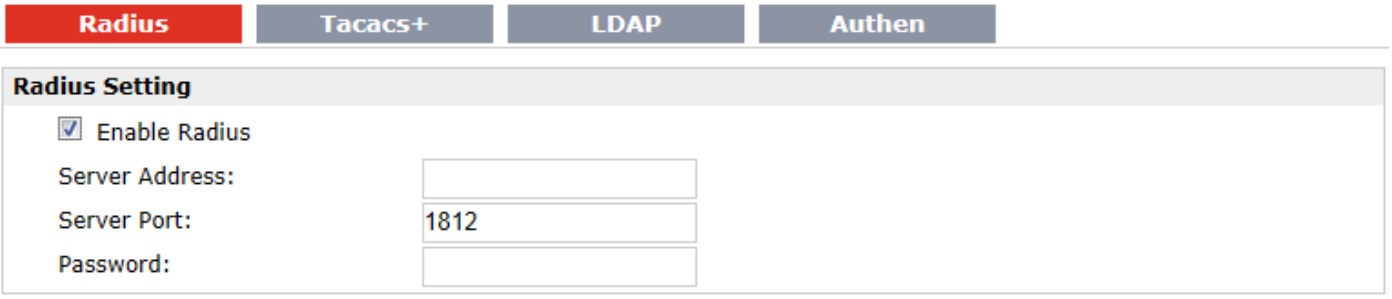
This section allows users to change the display status of USR LED.

***Note**: Please refer to "Configuration" > "USR LED".*

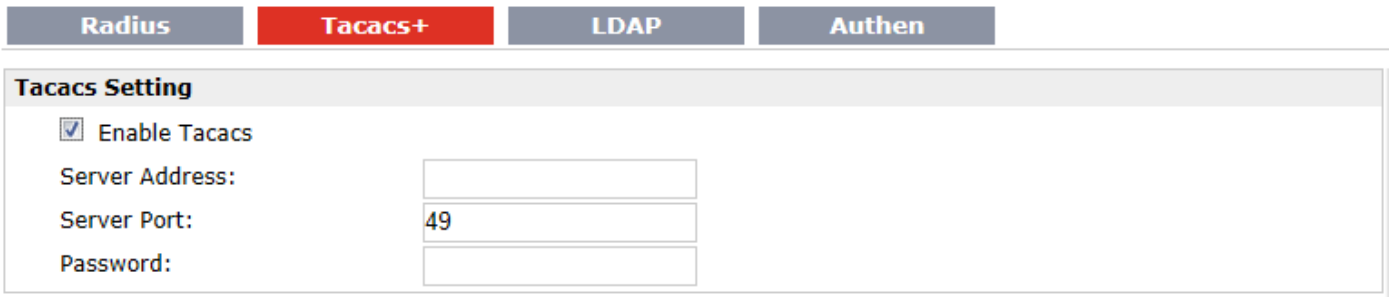
USR LED		
Item	**Description**	**Default**
USR LED Type	Select from "VPN", "DynDNS".	VPN
Indication	Select from "ON", "Blink". For example, if "USR LED Type" is set as "VPN" and "Indication" is set as "Blink", when any VPN tunnel is up USR LED will blink.	ON

3.42 Configuration > AAA

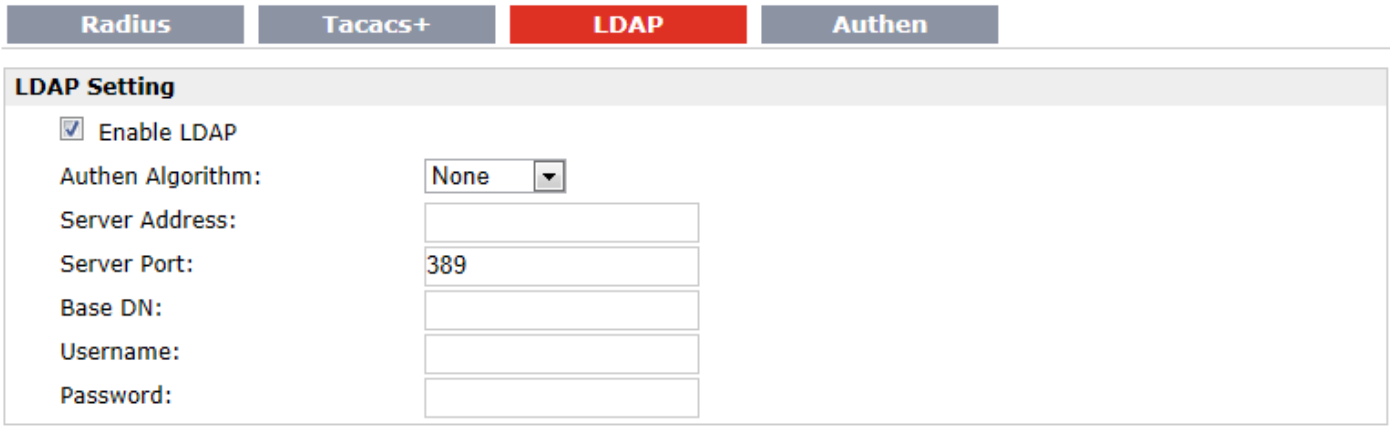
This section allows users to set the Radius, Tacacs+, LDA Pand Authen parameters.



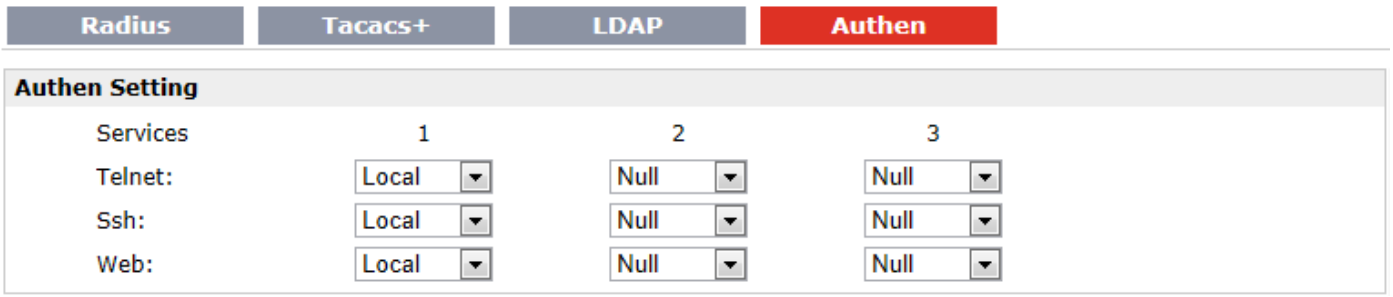
Radius		
Item	**Description**	**Default**
Server Address	Radius server address (domain or IP)	Null
Server Port	Radius server port	1812
Password	The password to access the server	Null



Tacacs+		
Item	**Description**	**Default**
Server Address	Tacacs+ server address (domain or IP)	Null
Server Port	Tacacs+ server port	49
Password	The password to access the server	Null

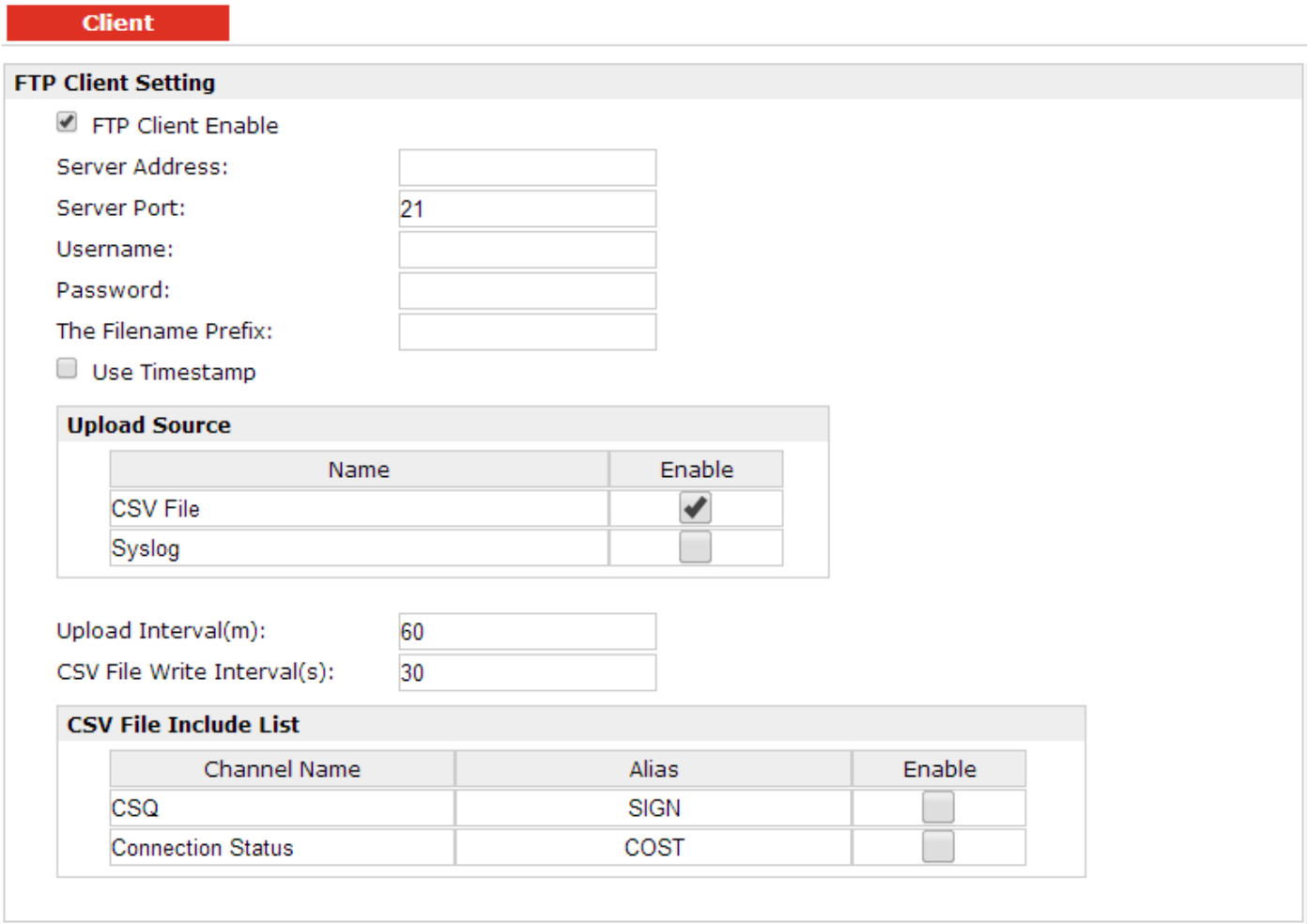


LDAP		
Item	**Description**	**Default**
Authen Algorithm	Select from “None”, “StartTLS”, “SSL”	
Server Address	LDAP server address (domain or IP)	
Server Port	LDAP server port	389
Base DN	The top of the LDAP directory tree	
Username	The user name to access the server	
Password	The password to access the server	



Radius		
Item	**Description**	**Default**
Services	There are “Telnet”, “Ssh” and “Web”. When set the Radius, Tacacs+ and local in the meanwhile, the priority order to follow: 1>2>3	
1	Select from “Null”, “Local”, “Radius”, “Tacacs+” and “Ldap”. Null: No user authorization processing. Local: The authorization according to the relevant properties of local user accounts configured by network access server. Radius: Authentication and authorization are tied together; it can’t use Radius alone to authorize. Tacacs+: Tacacs+ server authorizes to users. Ladp: Ladp authorization.	Null
2	Select from “Null”, “Local”, “Radius”, “Tacacs+” and “Ldap”.	Null
3	Select from “Null”, “Local”, “Radius”, “Tacacs+” and “Ldap”.	Null

3.43 Configuration > FTP

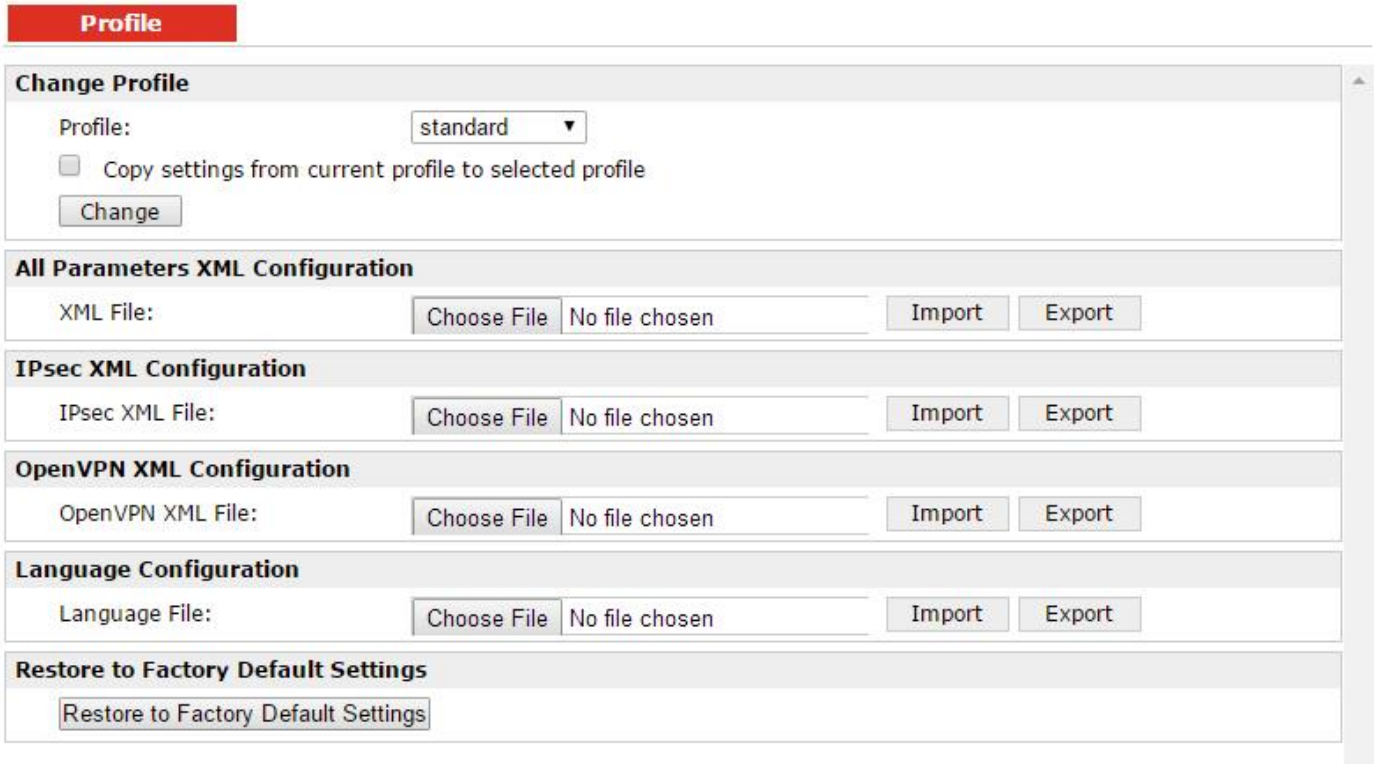


FTP		
Item	**Description**	**Default**
FTP Client Enable	click to enable FTP client	Null
Server Address	Enter FTP server's IP address or domain name.	Null
Server port	Enter FTP server's port	21
Username	Enter the username which can be used to access FTP server.	Null
Password	Enter the password which can be used to access FTP server.	Null
The Filename Prefix	Set a name for the file which will be sent to the FTP server.	Null
Use Timestamp	Enable Timestamp, the upload file will include the date.	Enable
Upload Source	Choose the file type, CSV file or Syslog. CSV file: sData will be collected in CSV file and save in local memory. Syslog: System log record file.	Null
Upload Interval (m)	Set the upload interval of uploading file.	60
CSV File Write Intervals (s)	Set the interval of data writing.	30

CSV File Include List	All the local CSV files will display in this list.	/
Channel Name	Modbus remote channel name	/
Alias	Set the file's alias.	/
Enable	Select the CSV files which you want to send to the FTP server.	Null

3.44 Administration > Profile

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



Profile		
Item	**Description**	**Default**
Profile	This item allow users store different configuration profiles into different positions; or save one configuration profile into different positions just for configuration data backup. Selected from "Standard", "Alternative 1", "Alternative 2", "Alternative 3".	Standard
All Parameters XML Configuration	Import: Click "Browse" to select the XML file in your computer, then click "Import" to import this file into your router. Export: Click "Export" and the configuration will be showed in the new popup browser window, then you can save it as a XML file.	Null
IPsec XML Configuration	Only import or export the configuration of the IPsec management, other configurations remain unchanged.	/
OpenVPN XML Configuration	Only import or export the configuration of the OpenVPN management, other configurations remain unchanged.	/

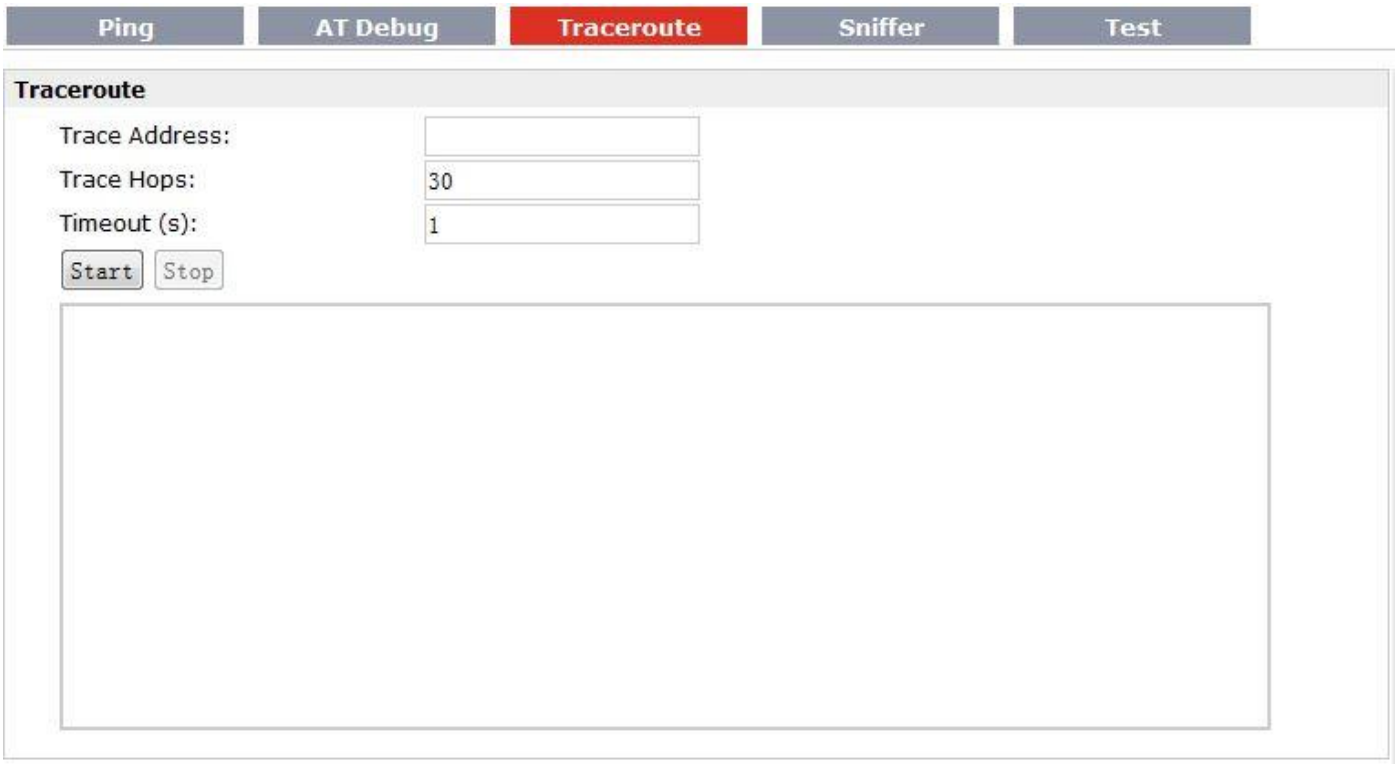
Language Configuration	Router system supports multiple languages, and imports via language pack.	/
Restore to Factory Default Settings	Click the button of “Restore to Factory Default Settings” to restore the router to factory default setting.	Null

3.45 Administration > Tools

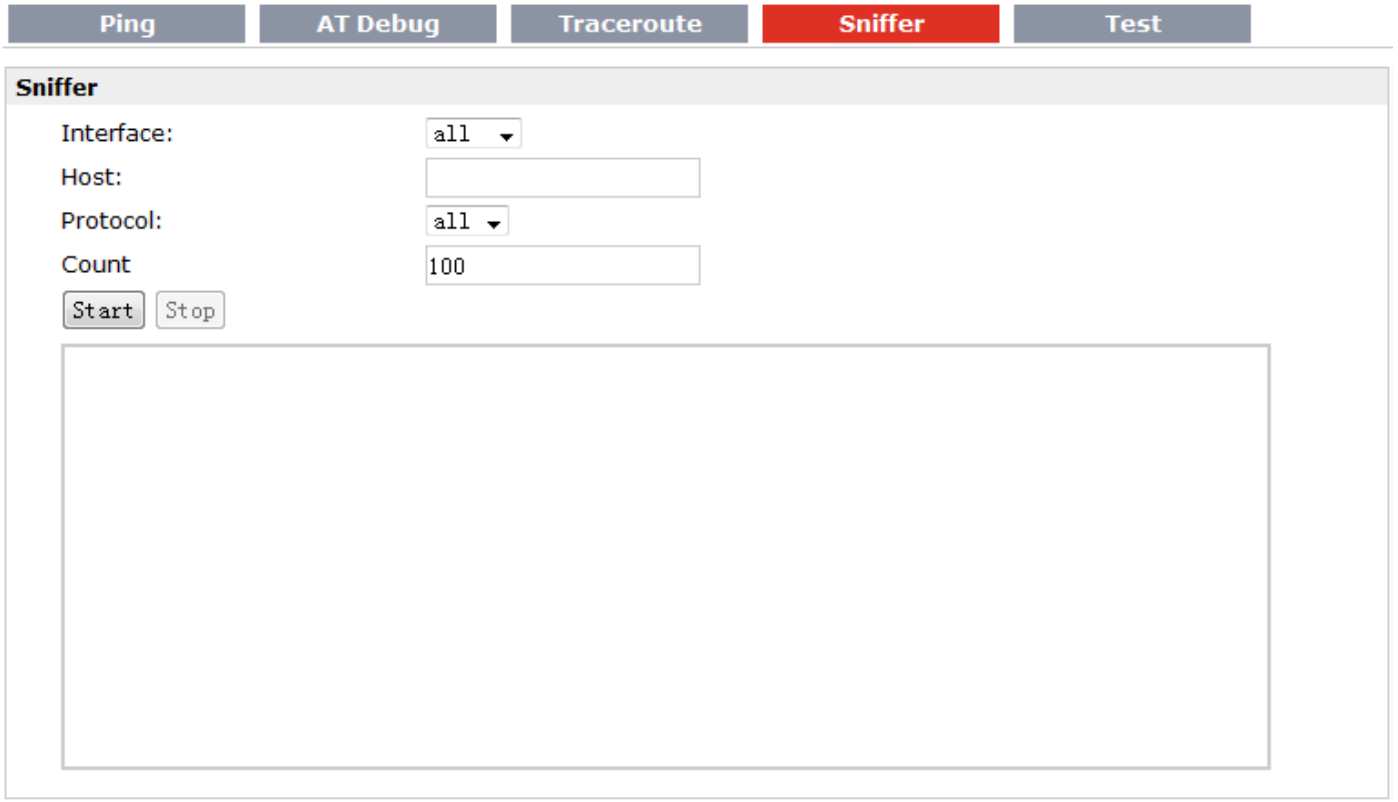
This section provides users four tools: Ping, AT Debug, Traceroute and Test.

Ping @ Tools		
Item	**Description**	**Default**
Ping 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

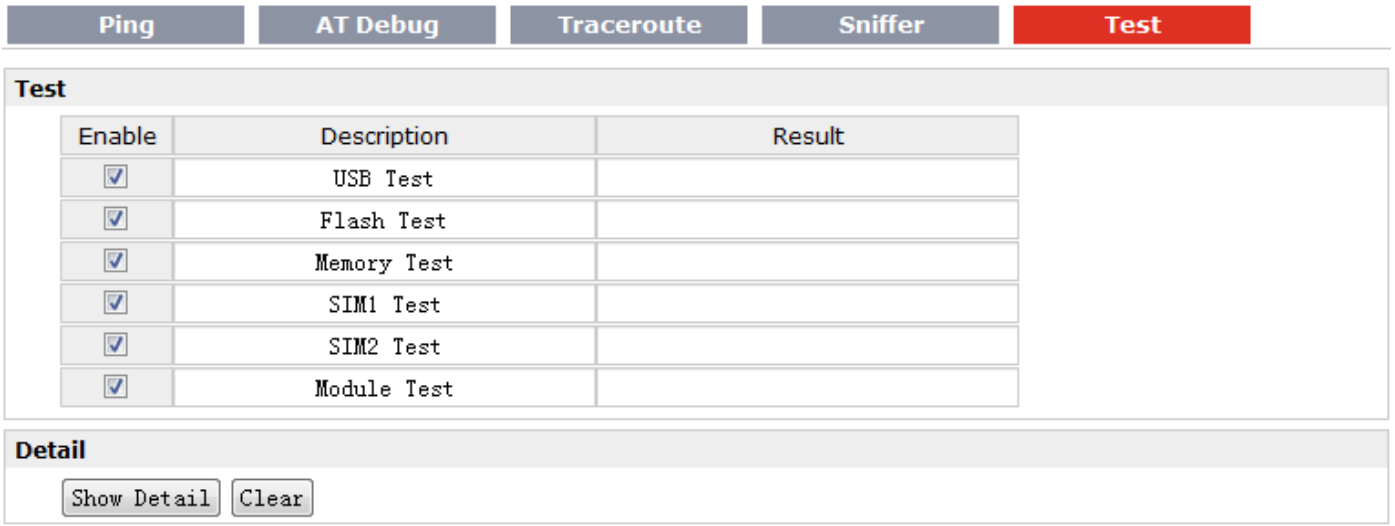
AT Debug @ Tools		
Item	**Description**	**Default**
Send AT Commands	Enter the AT commands which you need to send to cellular module in this box.	Null
Send	Click this button to send the AT commands.	Null
Receive AT Commands	Router will display the AT commands which respond from the cellular module in this box.	Null



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
Timeout	Specify timeout of Traceroute request.	1
Send	Click this button to start Traceroute request, and the log will be displayed in the follow box.	Null



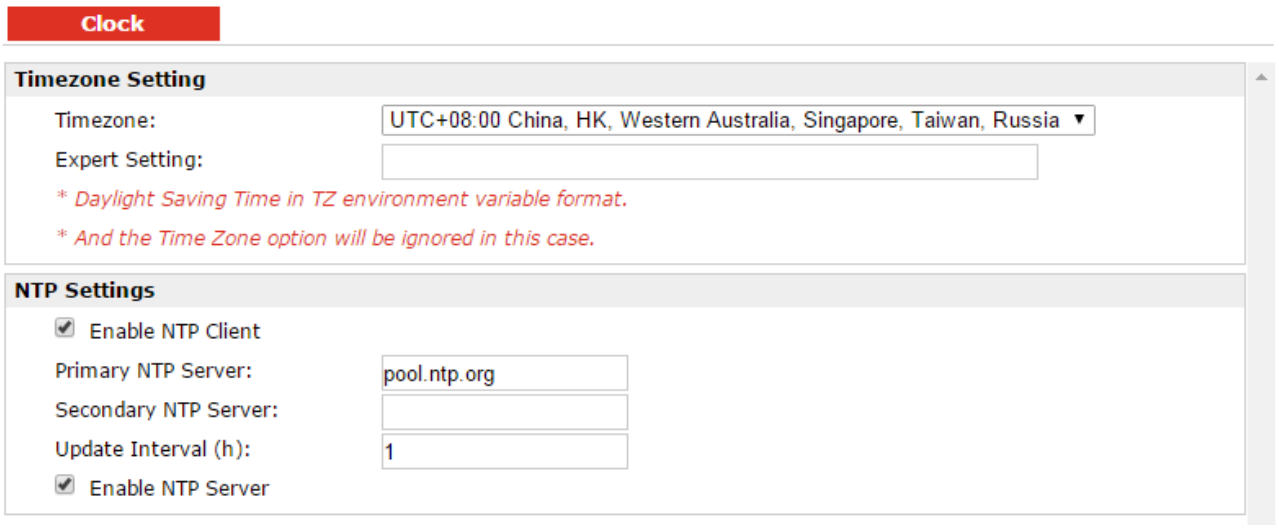
Sniffer @ Tools		
Item	**Description**	**Default**
Interface	Select form “all”, “lo”, “imq0”, “imq1”, “eth0”, “gre0”, and “ppp0”: all: contain all the interface; lo: Local Loopback interface; imq0/1: virtual interface for QoS, which used to limit the download and upload speed; eth0: Ethernet interface; gre0: GRE tunnel interface; ppp0: Cellular PPP interface;	All
Host	Filter the packet that contain the specify IP address.	Null
Protocol	Select from “all”, “ip”, “arp”, “tcp” and “udp”.	All
Count	Set the packet number that can be sniffered at a time.	100
Start	Click this button to start the sniffer, and the log will be displayed in the follow box.	Null



Test @ Tools		
Item	**Description**	**Default**
Enable	Click “Enable” to select the hardware component whose status you want to check.	Enable
Description	Select from “USB Test”, “Flash Test”, “Memory Test”, “Ethernet Test”, “SIM1 Test”, “SIM2 Test” and “Module Test”.	/
Result	Show the current status of the selected hardware component. There are 3 status “Testing”, “Success” and “Failure”. Testing: Router is testing the selected hardware component. Success: Correspond hardware component is properly inserted and detected. Failure: Correspond hardware component is not inserted into the router or the router fails to detect.	Null
Show Detail	Show the current test details of the hardware component.	Null
Clear	Clear the current test details of the hardware component.	Null
***Note**: click “Apply” to start testing.*		

3.46 Administration > Clock

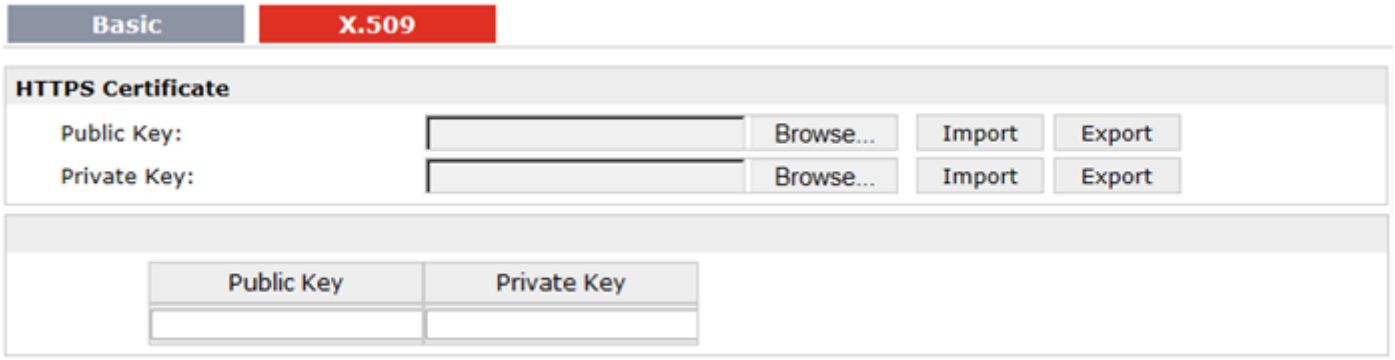
This section allows users to set clock of router and NTP server.



Clock		
Item	**Description**	**Default**
Time zone	Select your local time zone.	UTC +08:00
Expert Setting	Support expert mode of Daylight Saving Time.	Null
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
Update interval (h)	Enter the interval which NTP client synchronize the time from NTP server.	1
Enable NTP Server	Click to enable the NTP server function of router.	Disable

3.47 Administration > Web Server

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

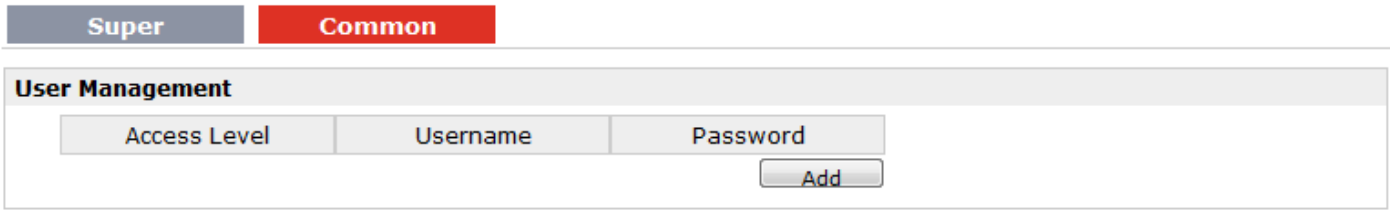


Basic @ Web Server		
Item	**Description**	**Default**
HTTP Port	Enter the HTTP port number you want to change in R3000's Web Server. On a Web server, port 80 is the port that the server "listens to" or expects to receive from a Web client. If you configure the router with other HTTP Port number except 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 R3000'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 R3000'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
X.509 @ Web Server		
HTTPS Certificate	In this tab, user can import or export "Public Key" and "Private Key" for HTTPS certification.	Null

3.48 Administration > User Management

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

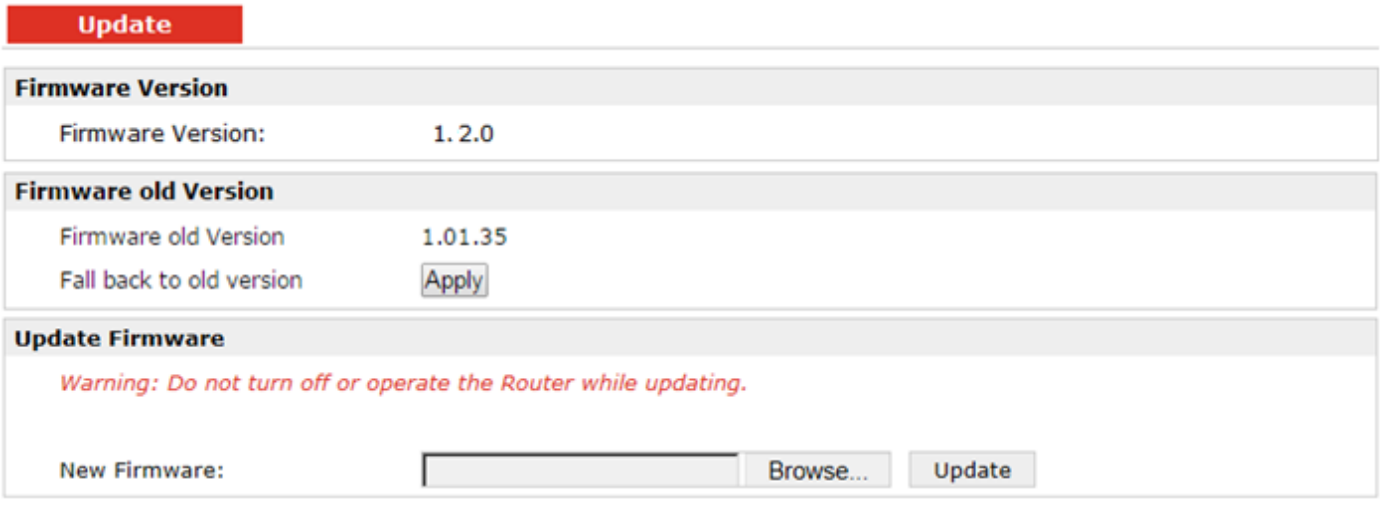
Super @ User Management		
Item	**Description**	**Default**
Super	One router has only one super user account. Under this account, user has the highest authority include modify and add management user accounts.	Admin
User Management	Set Username and Password.	Null
Login Timeout	Specify the login timeout value. You need to re-login after this timeout of user inactively.	1800



Common @ User Management		
Item	**Description**	**Default**
Common	One router has at most 9 common user accounts. There are two access level of common user account: “ReadWrite” and “ReadOnly”.	Null
Access Level	Select from “ReadWrite” and “ReadOnly”. ReadWrite: Users can view and set the configuration of router under this level; ReadOnly: Users only can view the configuration of router under this level	Null
Username/ Password	Set Username and Password.	Null
Add	Click this button to add a new account.	Null

3.49 Administration > Update Firmware

This section allows users to update the firmware of router.



Update		
Item	**Description**	**Default**
Firmware Version	Show the current firmware version.	Null
Firmware Old Version	Show the old firmware version of the router. Click “Apply” button to fall back to the old version, after updating successfully, you need to reboot router to take effect.	
Update firmware	Click “Select File” button to select the correct firmware in your PC, and then click “Update” button” to update. After updating successfully, you need to reboot router to take effect.	Null

Chapter 4 Configuration Examples

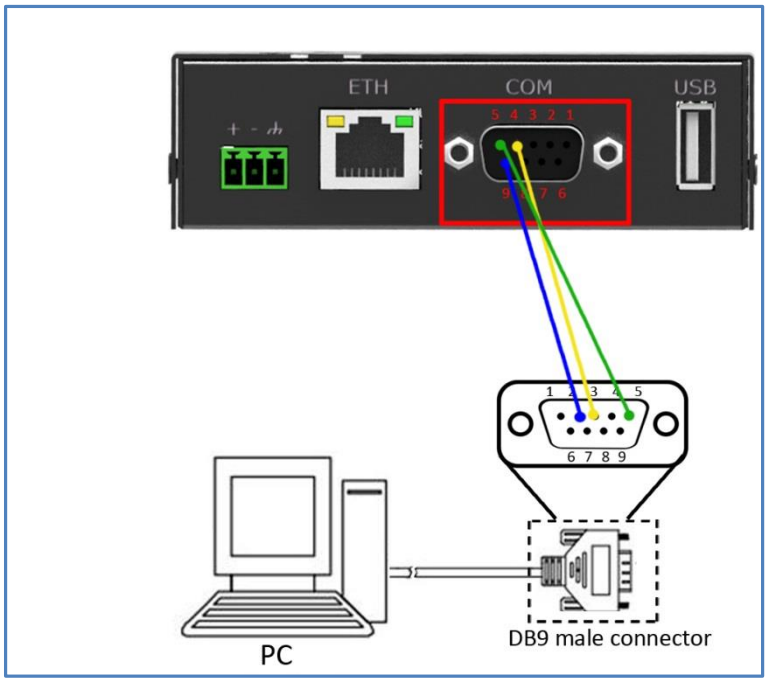
4.1 Interface

DB9 Female Connector

PIN	Debug	RS232	RS485 (2-wire)	Direction
1			Data+ (A)	-
2		RXD		R3000 Lite → Device
3		TXD		Device → R3000 Lite
4	DRXS			Device → R3000 Lite
5	GND	GND		-
6			Data- (B)	-
7		RTS		Device → R3000 Lite
8		CTS		R3000 Lite → Device
9	DTXD			R3000 Lite → Device

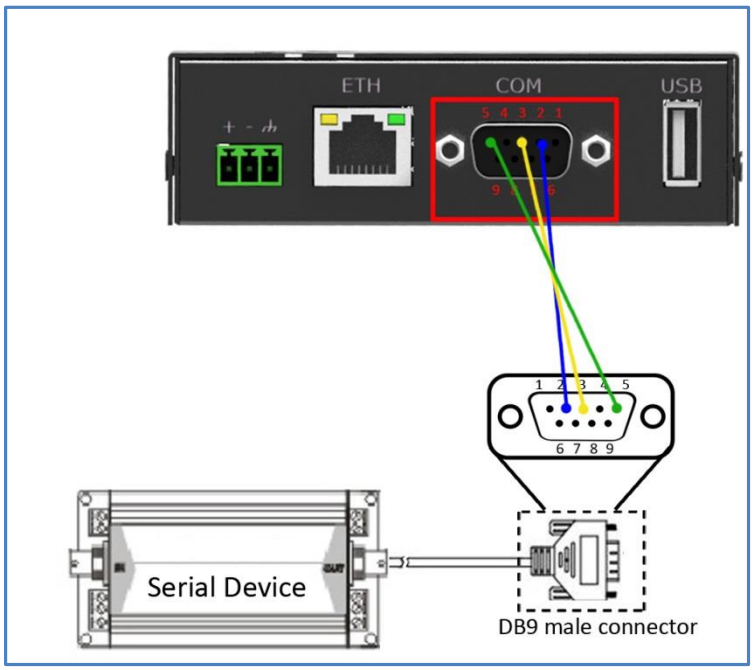
4.1.1 Console Port

User can use the console port to manage the router via CLI commands.
Please check section Introductions for CLI.



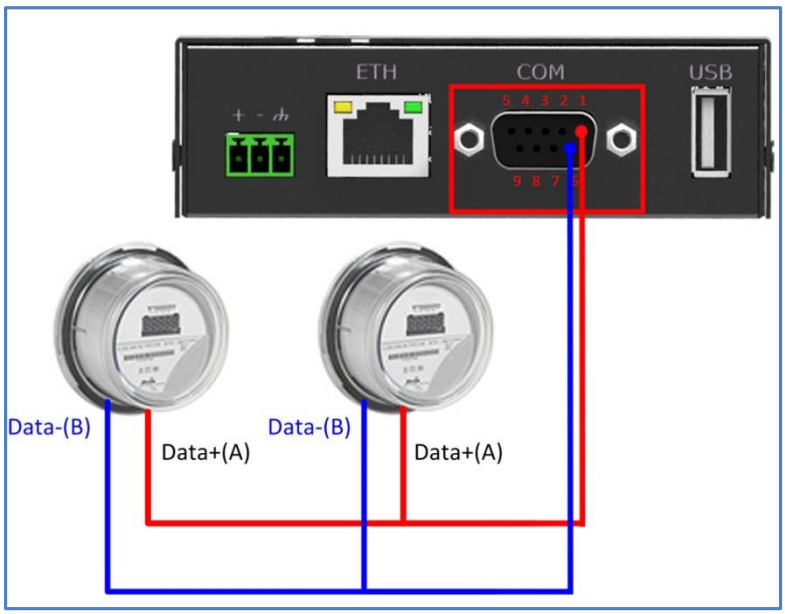
4.1.2 RS232

R3000 Lite supports one RS232 for serial data communication.
Please refer to the connection diagram at the right site.



4.1.3 RS485

R3000 Lite supports one RS485 for serial data communication.
Please refer to the connection diagram at the right site.



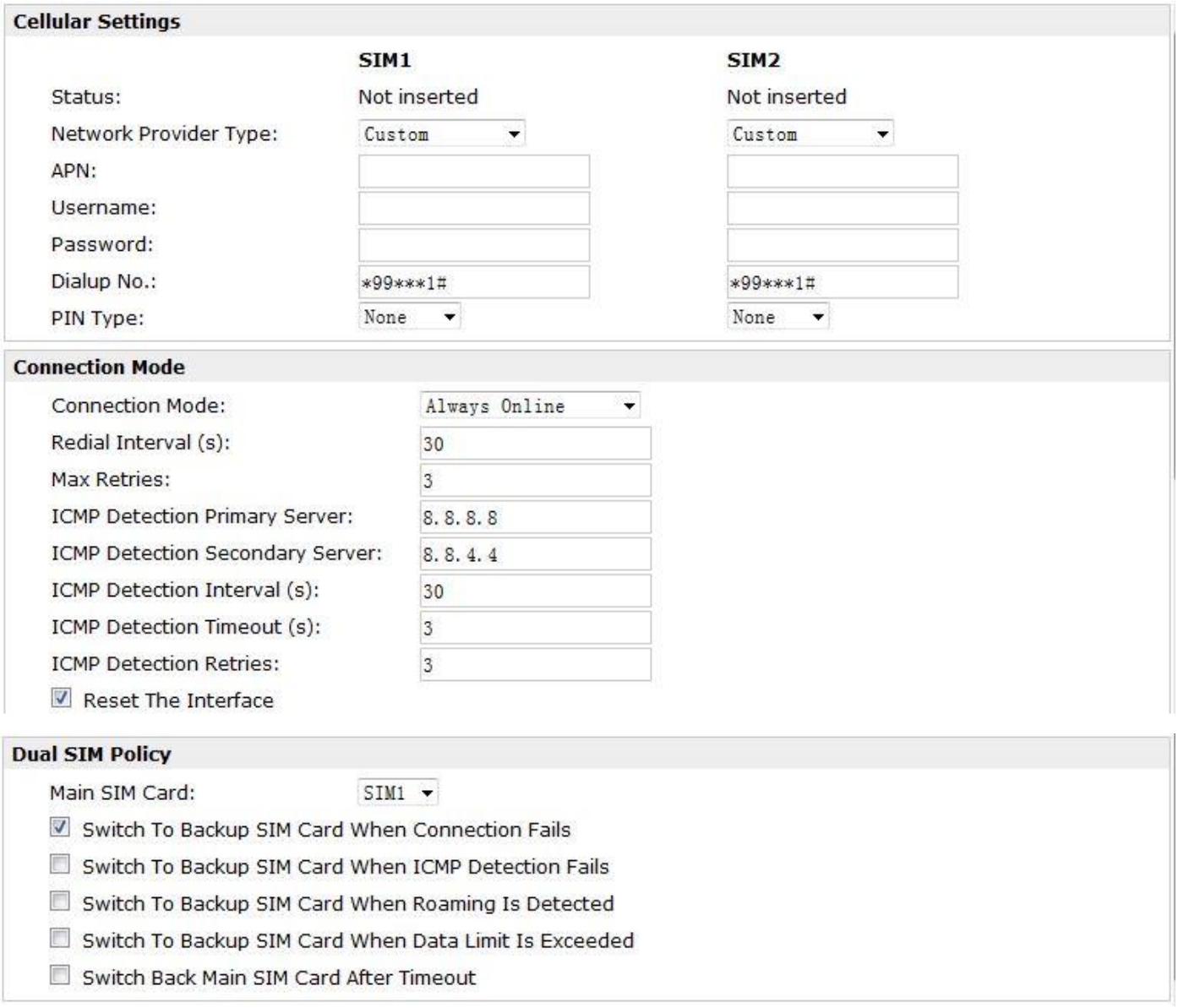
4.2 Cellular

4.2.1 Cellular Dial-Up

This section shows users how to configure the parameters of Cellular Dial-up within two configuration methods: "Always Online" and "Connect on Demand".

1. Always Online

Configuration > Cellular WAN > Basic

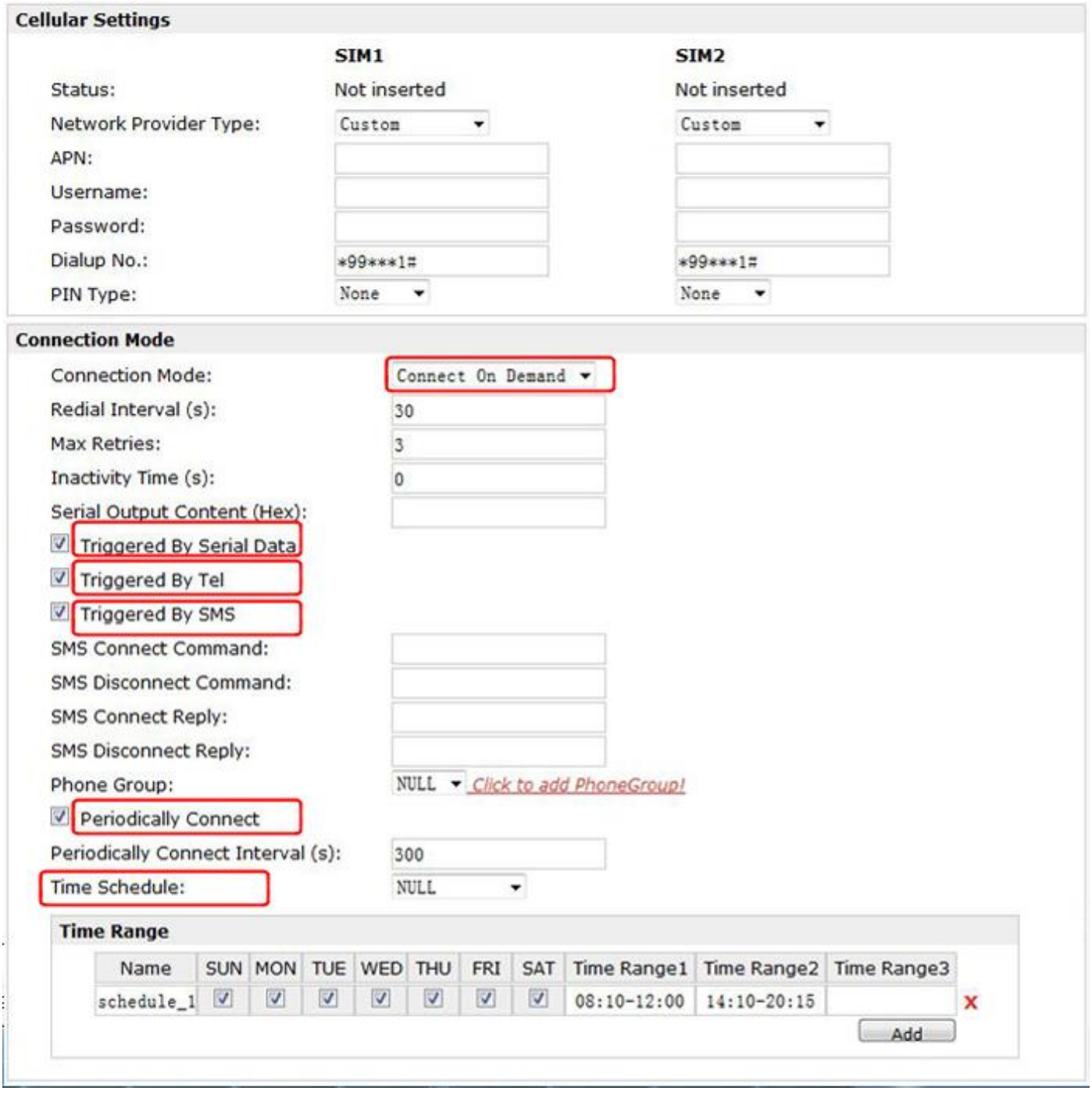


The modifications will take effect after click "Apply" button.

If a customized SIM card is using, please select "Custom" instead of "Auto" in "Network Provider Type", and some relative settings should be filled in manually.

2. Connect on Demand

Configuration > Cellular WAN > Basic



Select the trigger policy you need.

Note: *If you select multiple trigger policies, the router will be triggered under anyone of them.*

4.2.2 SMS Remote Status Reading

R3000 Lite supports remote control via SMS. Users can use following commands to get the status of R3000 Lite, cannot set new parameters of R3000 Lite at present.

An SMS command has following structure:

Password:cmd1,a,b,c;cmd2,d,e,f;cmd3,g,h,i;...;cmdn,j,k,n

SMS command Explanation:

1. Password: SMS control password is configured at **Basic->SMS Control->Password**, which is an optional parameter.
   a) When there is no password, SMS command has following structure: **cmd1;cmd2;cmd3;…;cmdn**
   b) When there is a password, SMS command has following structure: **Password:cmd1;cmd2;cmd3;…;cmdn**
2. cmd1, cmd2, cmd3 to Cmdn, which are command identification number 0001 – 0010.
3. a, b, c to n, which are command parameters.
4. The semicolon character (';') is used to separate more than one commands packed in a single SMS.
5. E.g., 1234:0001
   In this command, password is 1234, 0001 is the command to reset R3000 Lite.

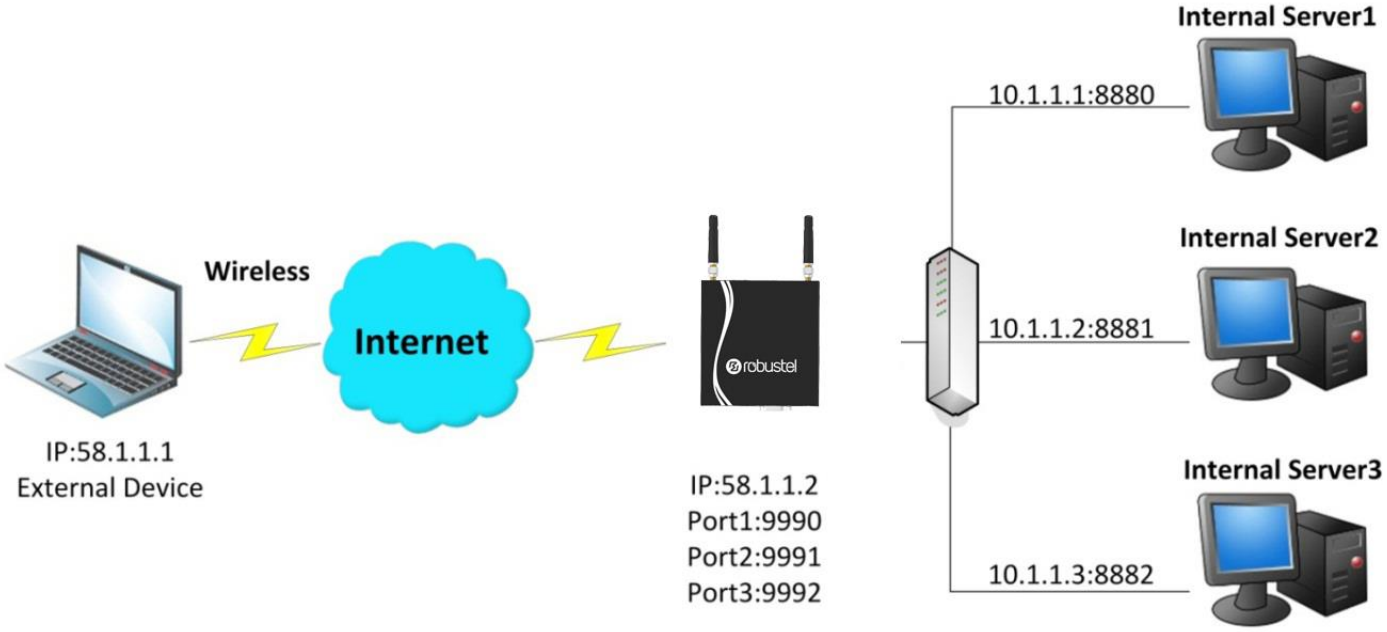
Cmd	Description	Syntax	Comments
Control Commands			
0001	Reset device	cmd	if no passwd, please use command "cmd", or use command" passwd:cmd" cmd1 + cmd2: cmd1;cmd2 * - means can be null
0002	Save parameters	cmd	
0003	Save parameters	cmd	
0004	Start PPP dialup	cmd	
0005	Stop PPP	cmd	
0006	Switch SIM card	cmd	
0007	Enable/disable event counter	cmd, channel, flag	channel: 1 - DI_1 2 - DI_2 flag: 0 - disable 1 - enable
0008	Get event count value	cmd, channel	channel: 1 - DI_1 2 - DI_2
0009	Clear event count	cmd, channel	channel: 1 - DI_1 2 - DI_2
0010	Clear SIM card's data limitation	cmd, simNumber	simNumber: 1 - SIM_1

			2 - SIM_2
0011	Get system status	cmd	
0012	Upload and download ftp xml	cmd, function Number, server, address	functionNumber: 1 - upload datalog.log 2 - download config.xml
Set Commands			
1000	Set SIM card (APN, username, passwd)	cmd, simNumber, APN, username, passwd	simNumber: 1 - SIM_1 2 - SIM_2
1001	Start Rlink	cmd, server address, port	
1002	Start RVPN	cmd, server address, port, username, password	

4.3 Network

4.3.1 NAT

This section shows users how to set the NAT configuration of router.
Parameter Remote IP defines if access is allowed to route to the Forwarded IP and Port via WAN IP and "Arrives At Port".



Configuration > NAT/DMZ > Port Forwarding

Port Forwarding

Remote IP	Arrives At Port	Is Forwarded to IP Address	Is Forwarded to Port	Protocol
58.1.1.1	9990	10.1.1.1	8880	TCP
58.1.1.1	9991	10.1.1.2	8881	UDP
58.1.1.1	9992	10.1.1.3	8882	TCP&UDP

*Remote IP: 1.1.1.1, 1.1.1.0/24,1.1.1.1-2.2.2.2, 0.0.0.0 means any

Add

*Arrives At Port: <1-65536> or <1-65536>-<1-65536>

Explanations for above diagram:

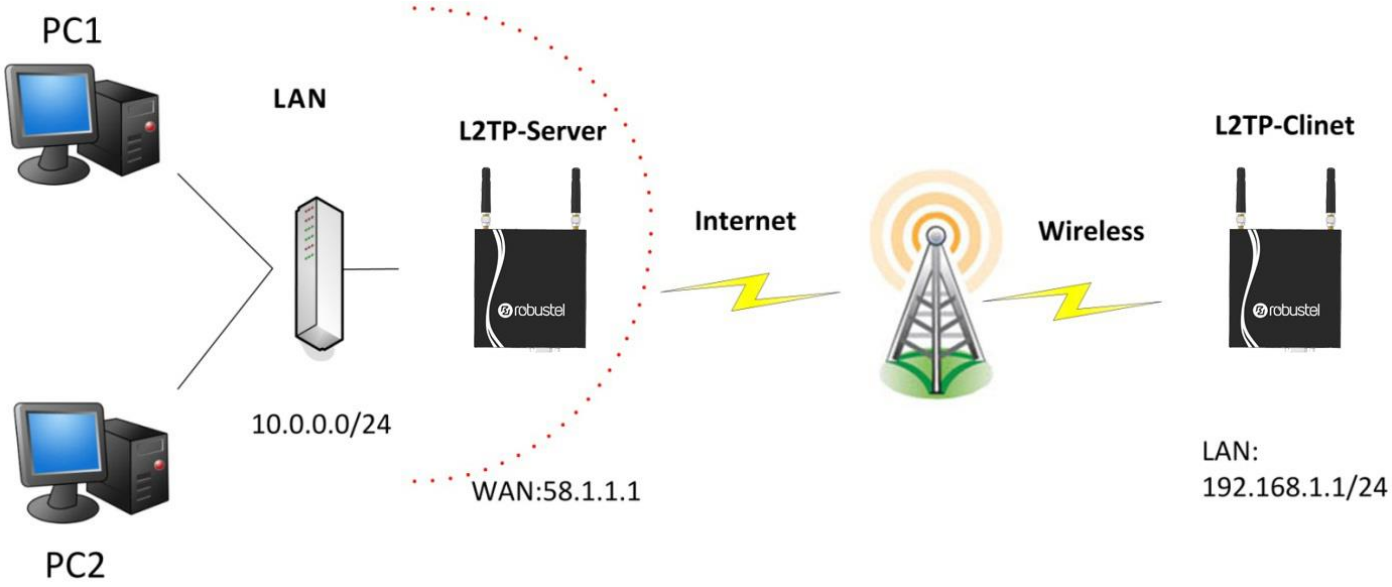
If there are two IP addresses 58.1.1.1 and 59.1.1.1 for the External Devices, that the result will be different from the test when the NAT is working at R3000.

58.1.1.1----------access to--------->58.1.1.2:9990----------be forwarded to------->10.1.1.1:8000 TCP

58.1.1.1----------access to--------->58.1.1.2:9991----------be forwarded to------->10.1.1.2:8001 UDP

58.1.1.1----------access to--------->58.1.1.2:9992----------be forwarded to------->10.1.1.3:8002 TCP&UDP

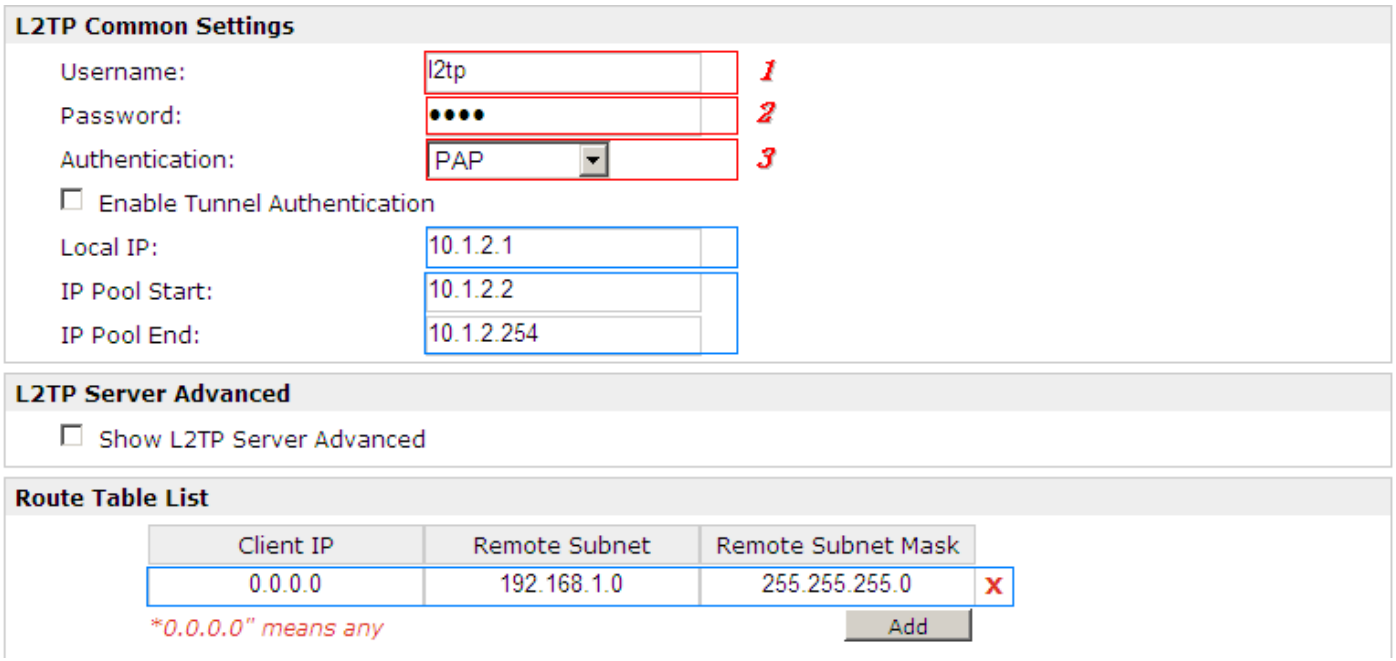
4.3.2 L2TP



L2TP_SERVER:

Configuration > L2TP > L2TP Server

Tick “Enable L2TP Server”, and fill in the blank textbox



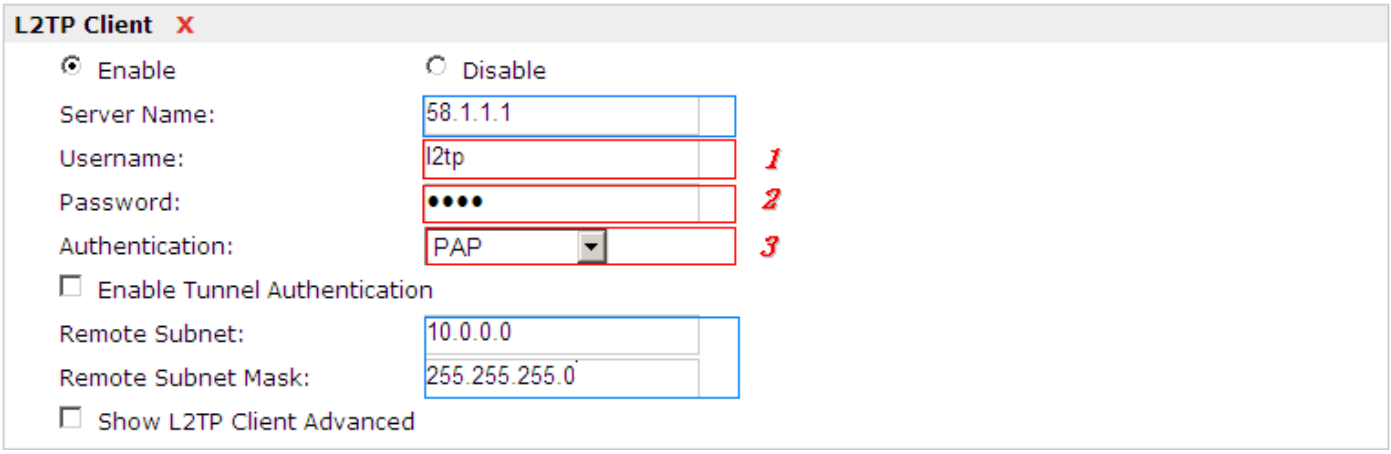
The modification will take effect after **Apply > Save > Reboot**.

Note: *The following diagrams with red color numbers mean these are the matches between server and client, and with the blue color number means it must be set locally for the tunnel.*

L2TP_CLIENT:

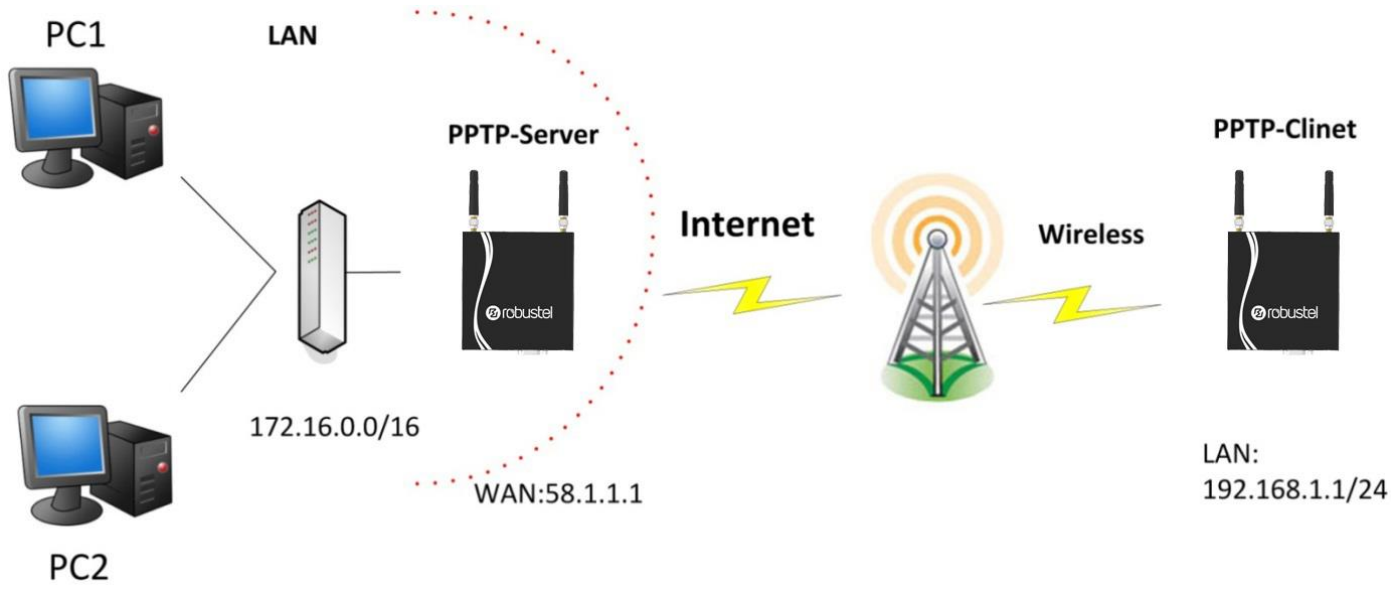
Configuration > L2TP > L2TP Client

Click “Add” button, and fill in the blank textbox



The modification will take effect after **Apply > Save > Reboot**.

4.3.3 PPTP

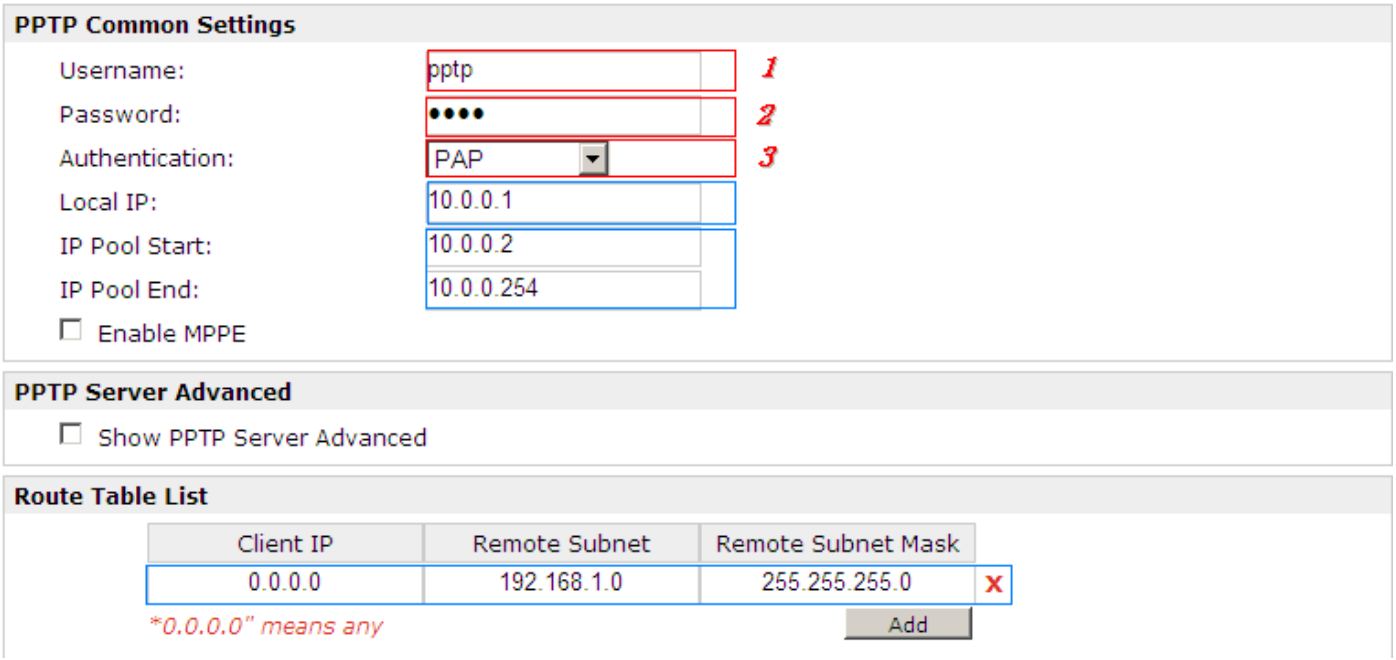


Note: *The following diagrams with red color numbers mean these are the matches between server and client, and with the blue color number means it must be set locally for the tunnel.*

PPTP_SERVER:

Configuration > PPTP > PPTP Server

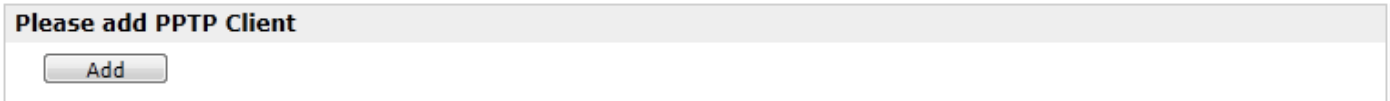
Tick “Enable PPTP Server”, and fill in the blank textbox



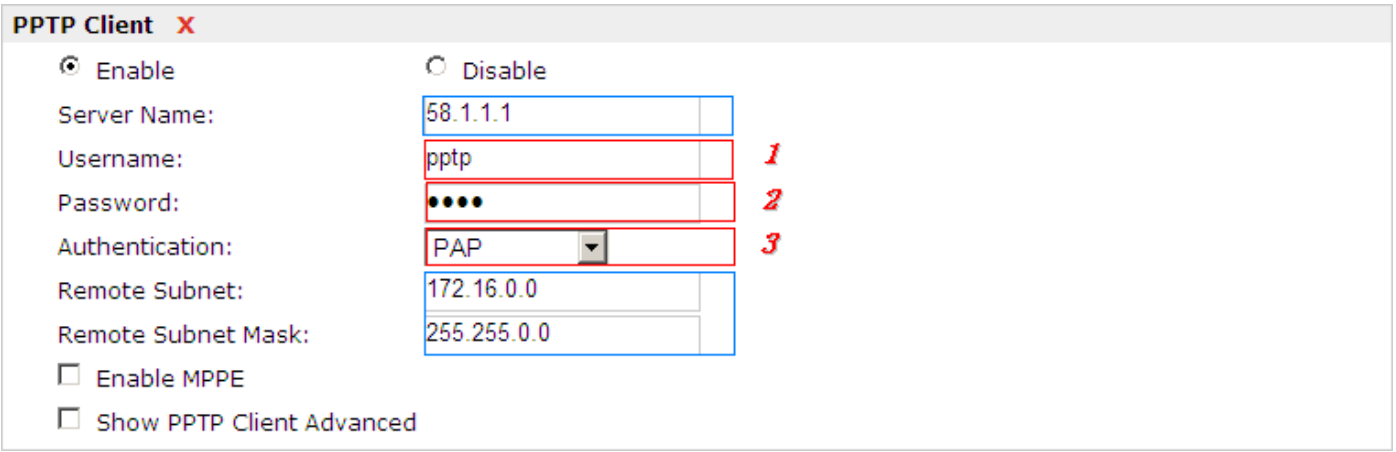
The modification will take effect after **Apply > Save > Reboot.**

PPTP_CLIENT:

Configuration > PPTP > PPTP Client

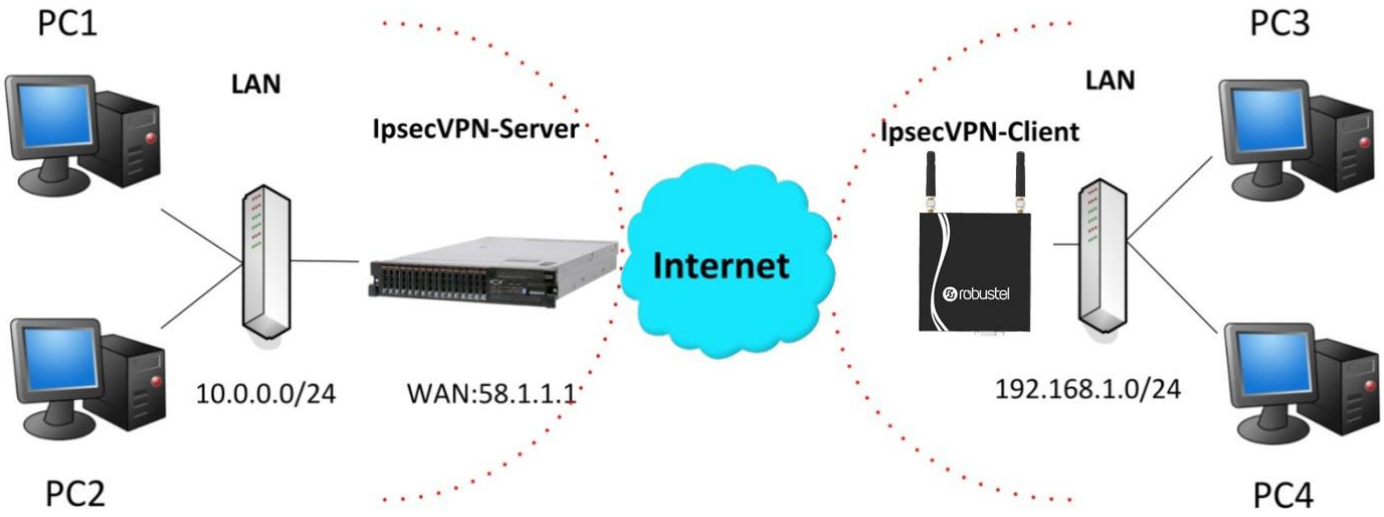


Click “Add” button, and fill in the blank textbox



The modification will take effect after **Apply > Save > Reboot**.

4.3.4 IPSEC VPN



Note: *The following diagrams with red color numbers mean these are the matches between server and client, and with the blue color number means it must be set locally for the tunnel.*

IPsecVPN_SERVER:

Cisco 2811:

```
crypto isakmp policy 10
 encr aes 256                                          8
 hash md5                                              9
 authentication pre-share                              11
 group 2                                               10
crypto isakmp key cisco address 0.0.0.0 0.0.0.0
                          12
!
crypto ipsec transform-set trans esp-3des esp-md5-hmac   2, 13
!
crypto dynamic-map dyn 10
  set transform-set trans
  match address 101
!
crypto map map1 10 ipsec-isakmp dynamic dyn
!
interface FastEthernet0/0
  crypto map map1
!
access-list 101 permit ip 10.0.0.0 0.0.0.255 any      3, 5
!
```

Note: *Polices 1,4,6,7 are default for Cisco router and do not display at the CMD.*

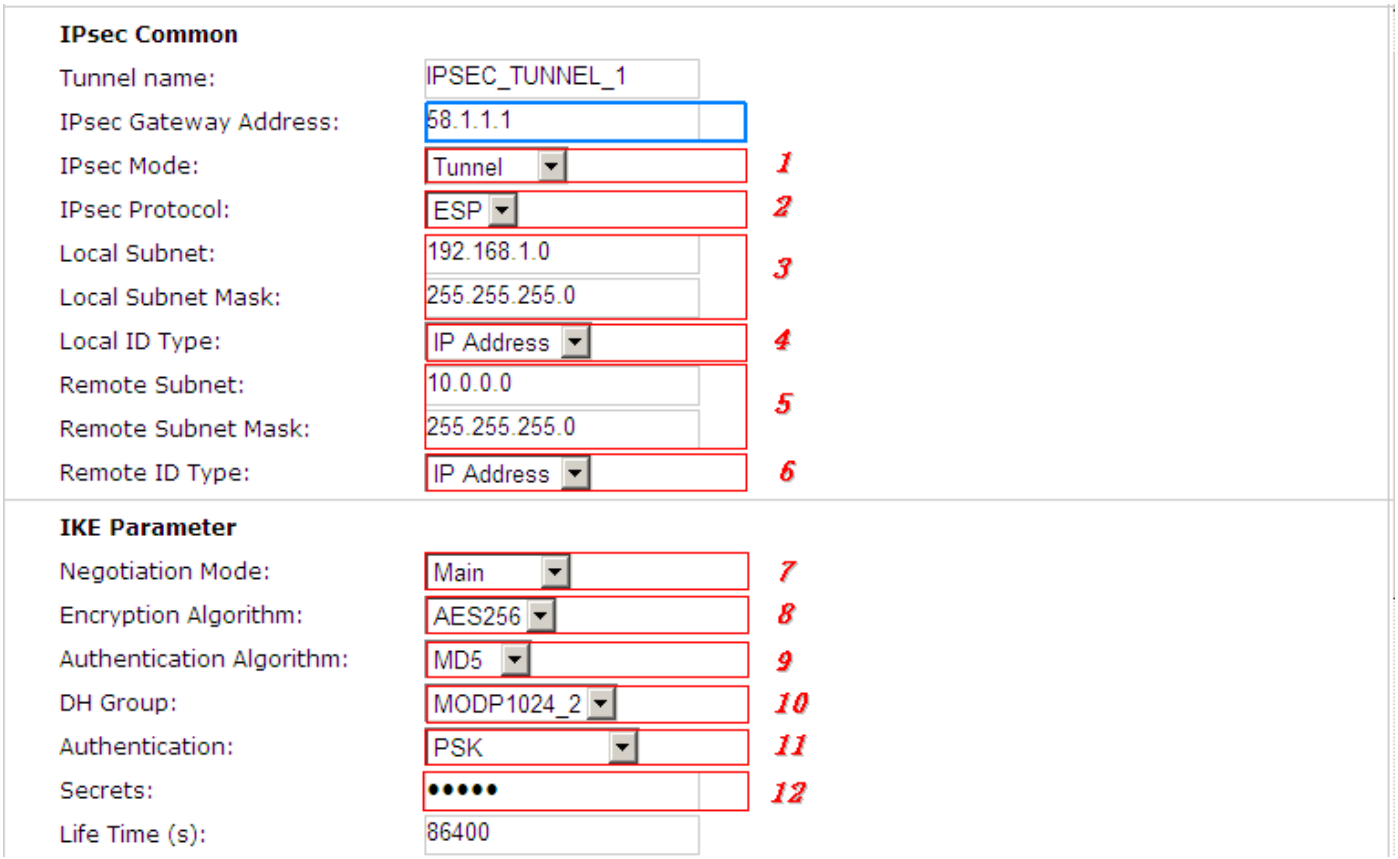
IPsecVPN_CLIENT:

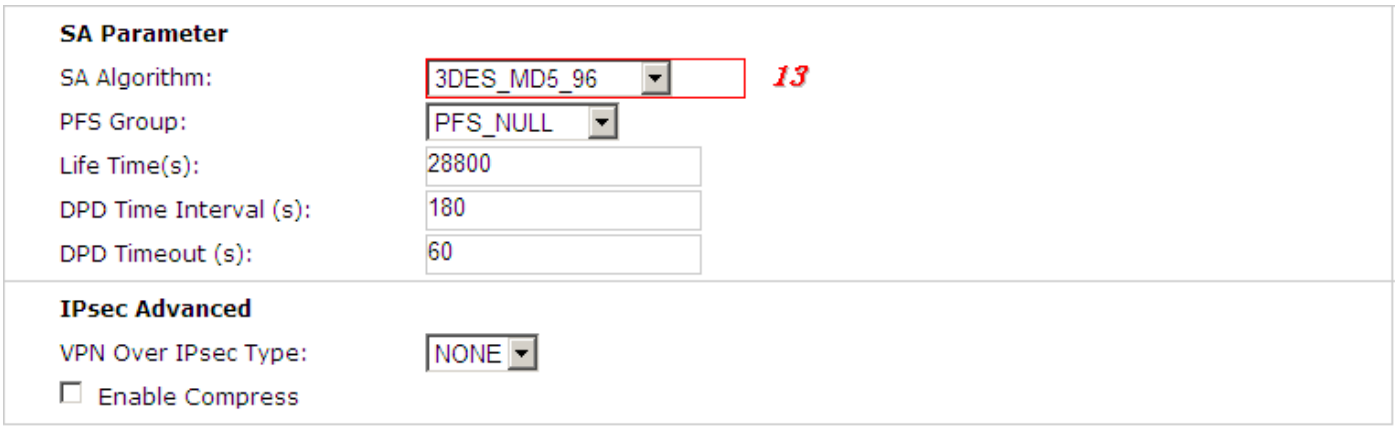
Configuration > IPSec > IPSec Basic

Then click “Apply”.

Configuration > IPSec > IPSec Tunnel

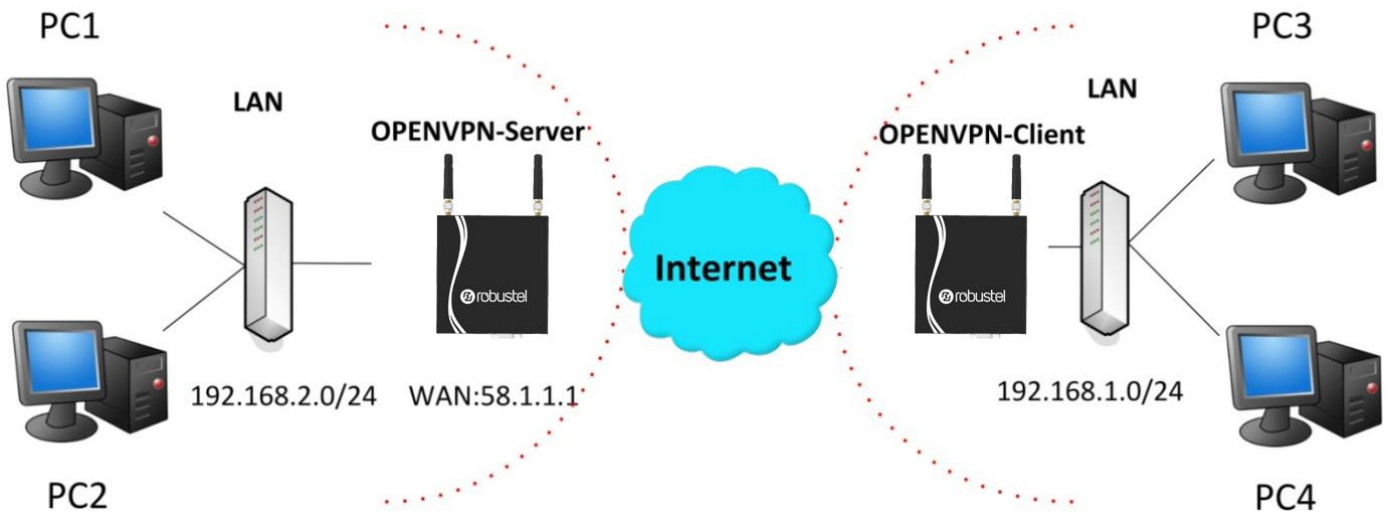
Tick “Enable IPSec Tunnel1”





The modification will take effect after **Apply > Save > Reboot**.

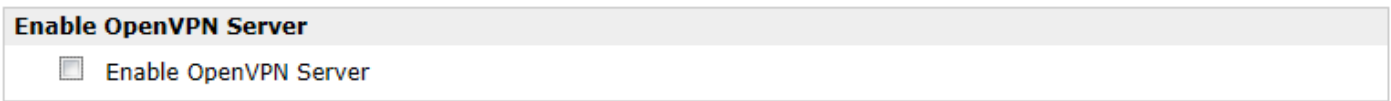
4.3.5 OPENVPN



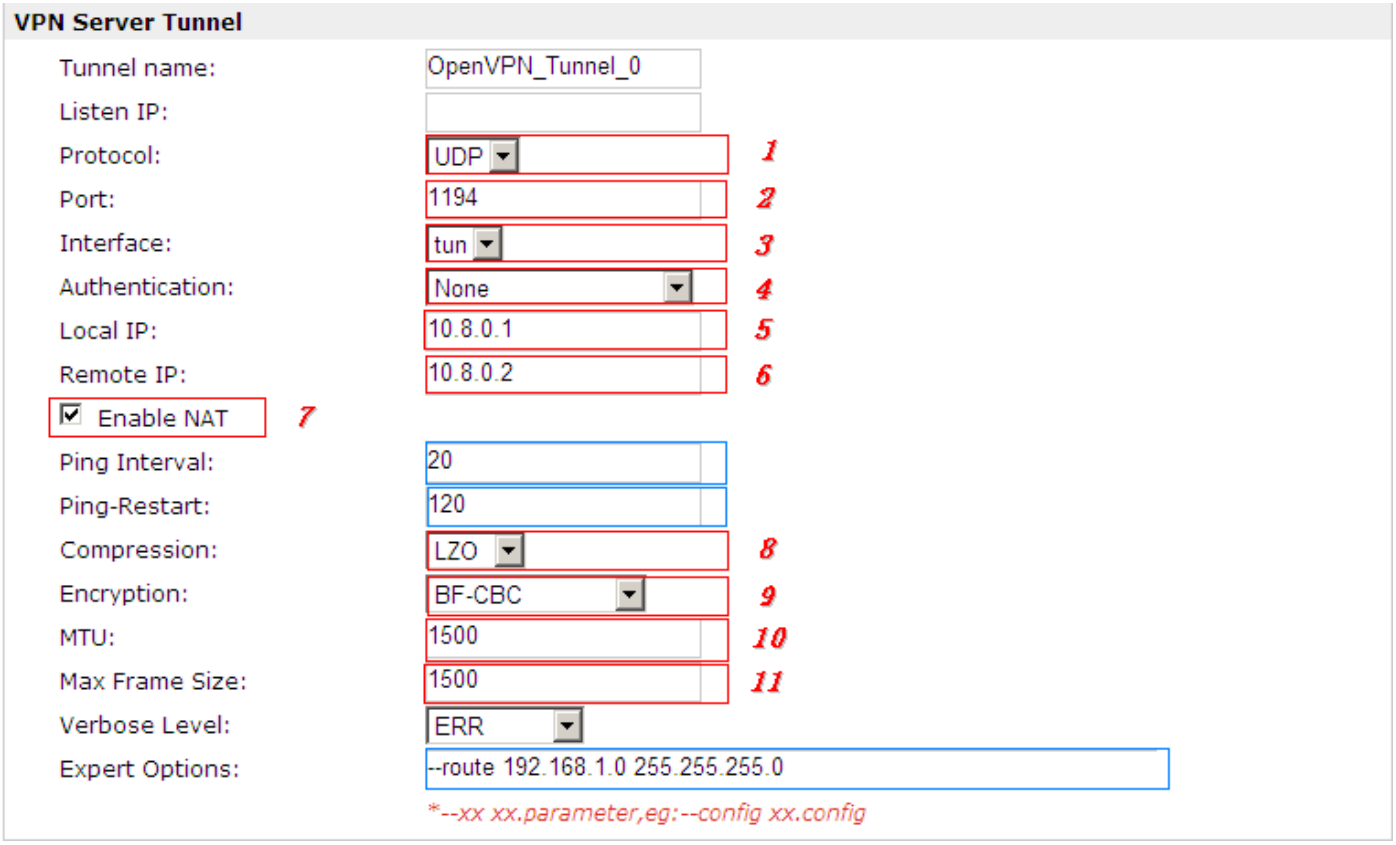
Note: *The following diagrams with red color numbers mean these are the matches between server and client, and with the blue color number means it must be set locally for the tunnel.*

OPENVPN_SERVER:

Configuration > OpenVPN > Server



Tick “Enable OpenVPN Server”.

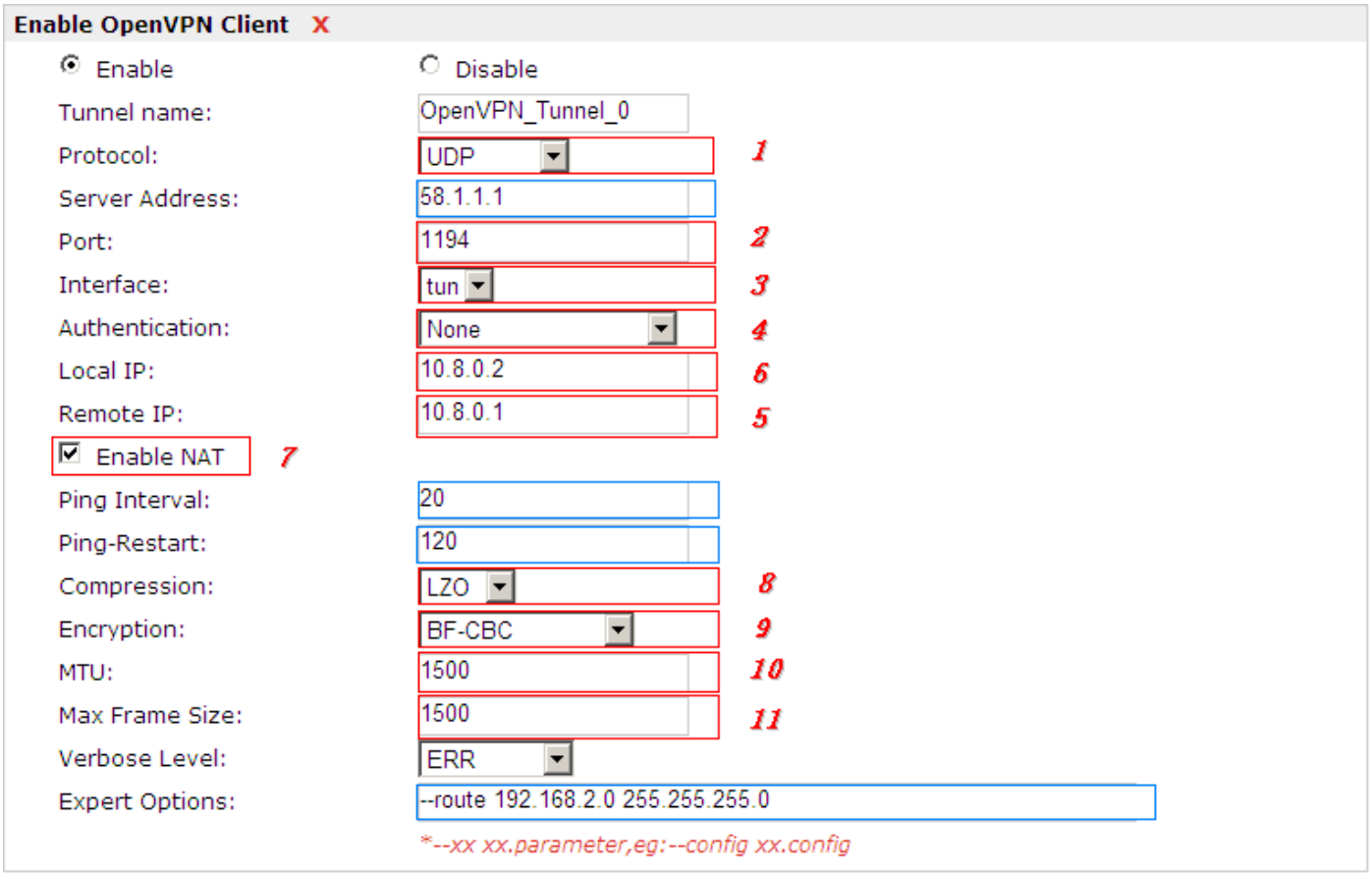


The modifications will take effect after click **Apply > Save > Reboot.**

OPENVPN_CLIENT:

Configuration > OpenVPN > Client

Tick “Enable OpenVPN Client1”, and fill in the blank textbox



The modification will take effect after **Apply > Save > Reboot**.

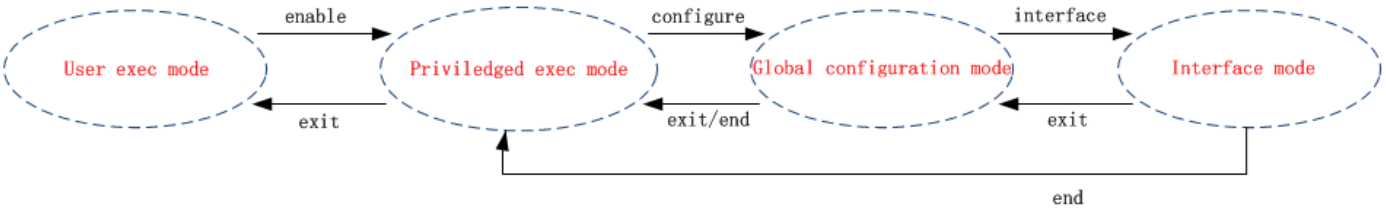
Chapter 5 Introductions for CLI

5.1 What's CLI and Hierarchy Level Mode

The R3000 Lite command-line interface (CLI) is a software interface providing another way to set the parameters of equipment from the console or through a telnet network connection. There are four different CLI hierarchy level modes which have different access rights:

- User exec mode—The command prompt ">" shows you are in the user mode , in this mode user can only use some simple commands to see the current configuration and the status of the device, or enter the "ping" command to troubleshoot the network connectivity.
- Privileged exec mode—When you enter Privileged mode ,the prompt will change to "#" which user can do not only what is allowed in the user exec mode but also the new additions like importing and exporting for files , system log , debug and so on .
- Global configuration mode—The global configuration mode with prompt "<config>#" allows user to add, set,modify and delete current configuration .
- Interface mode—Prompt "<config-xx>" means in this mode we can set both IP address and mtu for this interface.

Following is the relationship diagram about how to access or quit among the different modes:



USER EXEC MODE:

R3000 Configure Environment

Username: admin

Password: *****

R3000> ? //check what commands can be used in **user exec mode**

enable	Turn on privileged commands
exit	Exit from current mode
ping	Ping test
reload	Halt and perform a cold restart
telnet	Startup a telnet client shell
tracert	Tracert test
show	Show running system information

PRIVILEDGED EXEC MODE:

R3000> enable

Password: ***** //type “admin”

R3000# ? //check what commands can be used in **Privileged exec mode**

debug	Debug configure information
enable	Turn on privileged commands
exit	Exit from current mode
export	Export file using tftp
syslog	Export system log
import	Import file using tftp
load	Load configure information
ping	Ping test
reload	Halt and perform a cold restart
telnet	Startup a telnet client shell
module-at	module at test
sniffer	catch network traffic
tracert	Tracert test
write	Write running configuration
wpadebug	set wpa_supplicant debug level
tracert	Tracert test
write	Write running configuration
tftp	Copy from tftp: file system
show	Show running system information
configure	Enter configuration mode
end	Exit to Normal mode

GLOBAL CONFIGURATION MODE:

R3000# configure

R3000(config)# ? //check what commands can be used in **global configuration mode**

exit	Exit from current mode
end	Exit to Normal mode
interface	Configure an interface
set	Set system parameters
add	Add system parameters list
modify	Modify system parameters list
delete	Delete system parameters list

INTERFACE MODE:

```
R3000(config)# interface Ethernet 0
R3000(config-e0)# ?          //check what commands can be used in interface mode
  exit                       Exit from current mode
  end                        Exit to Normal mode
  ip                         Set the IP address of an interface
  mtu                        Set the IP address of an interface
```

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.
Invalid command "xxx"	Parameters "xxx" are not supported by the system, in this case, enter a mark "?" instead of "xxx" will help to find out the correct parameters about this issue.
Incomplete command	Command is not incomplete.
% Invalid input detected at '^' marker	'^' marker indicates the location where the error is.

***Note**: Most of the parameters setting are in the **Global configuration mode**. Commands **set ,add** are very important for this mode. If some parameters can't be found in the Global configuration mode, please move back to **Privileged exec mode** or move up to **Interface mode**.*

***Note:** Knowing the **CLI hierarchy level modes** is necessary before configuring the CLI. If not, please go back and read it quickly in chapter 5.*

Quick Start 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

```
R3000> show version
  software version : 1.01.01-sub-131211 Dec 11 2013 18:58:20
  kernel version      : v2.6.39-5 PREEMPT Mon Dec 9 09:49:58 HKT 2013
  hardware version : 1.00.03
```

Example 2: Update firmware via tftp

```
R3000> enable
Password: *****
```

```
R3000#
R3000# tftp 172.16.3.3 get rootfs R3k.1.01.01-sub-131211.01.fs

Tftp transfering
tftp succeeded!downloaded
R3000# write                                    //save current configuration
Building configuration...
OK
R3000#reload
!Reboot the system?'yes'or 'no':yes             //reload to take effect
```

Example 3: Set IP address for Eth0

```
R3000> enable
Password: *****
R3000 # configure
R3000 (config) # set eth0
ethernet interface type: LAN
->IP address [192.168.0.1]:172.16.1.231         //set IP address for eth0
->Netmask [255.255.255.0]:255.255.0.0
->mtu value (1024-1500)[1500]:

this parameter will be take effect when reboot!
really want to modify[yes]:
R3000 (config) # end
R3000# write                                    //save current configuration
Building configuration...
OK
R3000 # reload
! Reboot the system? 'yes' or 'no': yes         //reload to take effect
```

Example 4: CLI for Cellular dialup

```
R3000> enable
Password: *****
R3000# configure
R3000 (config) # set cellular
  1. set SIM_1 parameters
  2. set SIM_2 parameters
->please select mode (1-2)[1]:
SIM 1 parameters:
network provider
  1. Auto
```

```
  2. Custom
  3. china-mobile
->please select mode(1-3)[1]:
->dial out using numbers[]:
PIN mode:
  1. input only
  2. PIN locked
  3. PIN unlocked
->please select mode(1-3)[1]:
->pin code[]:
->PUK[]:
connection Mode:
  1. Always online
  2. Connect on demand
->please select mode(1-2)[1]:
->redial interval(1-120)[30]:
->max connect try(1-60)[3]:
->ICMP detection primary server[8.8.8.8]:
->ICMP detection second server[8.8.4.4]:
->ICMP detection interval(1-1800)[30]:
->ICMP detection timeout(1-10)[3]:
->ICMP detection retries(1-20)[3]:
->reset the interface?'yes'or'no'[yes]:
main SIM select:
  1. Auto
  2. SIM_1
  3. SIM_2
->please select mode(1-3)[2]:
->when connect fail?'yes'or'no'[yes]:
->when ICMP Detection fails fails?'yes'or'no'[no]:
->when roaming is detected?'yes'or'no'[no]:
->month date limitation?'yes'or'no'[no]:
->Call back Main SIM card after timeout?'yes'or'no'[no]:
->show advanced options?'yes'or'no'[no]:

this parameter will be take effect when reboot!
really want to modify[yes]:R3000(config)# end
R3000# write                                          //save current configuration
Building configuration...
OK

R3000# show      cellular
*********************************************************************************
   Cellular enable                  : yes
```

```
  1. show SIM_1 parameters
  2. show SIM_2 parameters
->please select mode(1-2)[1]:
SIM 1 parameters:
   network provider              : Auto
   dial numbers                  :
   pin code                      : NULL
   connection Mode               : Always online
   redial interval               : 30 seconds
   max connect try               : 3
   ICMP primary server           : 8.8.8.8
   ICMP second server            : 8.8.4.4
   ICMP detection interval       : 30 seconds
   ICMP detection timeout        : 3 seconds
   ICMP detection retries        : 3
   reset the interface           : yes
   main SIM select               : SIM_1
   when connect fail             : yes
   when roaming is detected      : no
   month date limitation         : no
   SIM phone number              :
   network select Type           : Auto
   authentication type           : AUTO
   mtu value                     : 1500
   mru value                     : 1500
   asyncmap value                : 0xffffffff
   use peer DNS                  : yes
   primary DNS                   : 0.0.0.0
   secondary DNS                 : 0.0.0.0
   address/control compressio: yes
   protocol field compression: yes
   expert options                : noccp nobsdcomp
************************************************************************
R3000# reload
!Reboot the system ?'yes'or 'no':yes                    //reload to take effect
```

5.3 Commands Reference

Commands	Syntax	Description
Debug	Debug *parameters*	Turn on or turn off debug function
Export	Export *parameters*	Export vpn ca certificates
Import	Import *parameters*	Import vpn ca cerfiticates

Syslog	syslog	Export log information to tftp server
Load	Load default	Restores default values
Write	Write	Save current configuration parameters
tftp	Tftp *IP-address* get {cfg|rootfs} *file-name*	Import configuration file or update firmware via tftp
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		

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

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
VDC	Volts Direct current

VLAN	Virtual Local Area Network
VPN	Virtual Private Network
VSWR	Voltage Stationary Wave Ratio
WAN	Wide Area Network