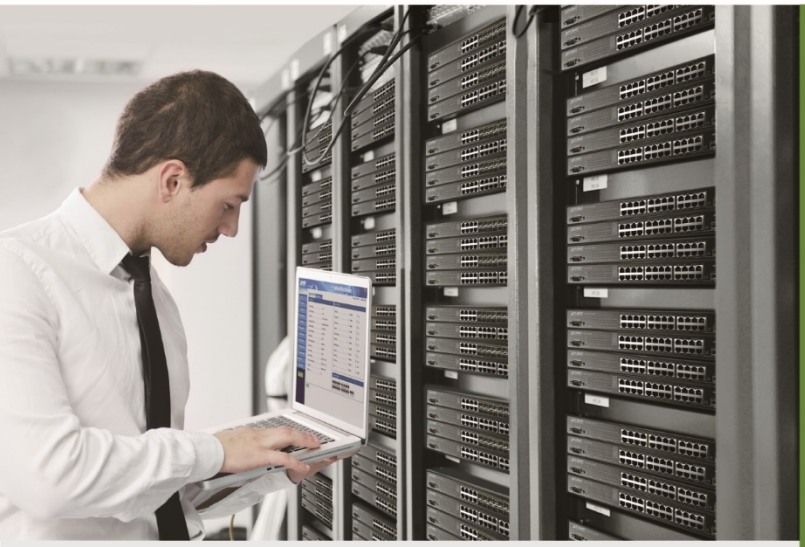
PLANET
Networking & Communication

User's Manual

Industrial 4G LTE Cellular Wireless Gateway with 5-Port 10/100/100T

- **ICG-2510W-LTE/ICG-2510WG-LTE Series**



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FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC Caution:

To assure continued compliance, for example, use only shielded interface cables when connecting to computer or peripheral devices. Any changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference
(2) This device must accept any interference received, including interference that may cause undesired operation.

CE Compliance Statement

This device meets the RED directive 2014/53/EU of EU requirements on the limitation of exposure of the general public to electromagnetic fields by way of health protection.
The device complies with RF specifications when the device used at 20 cm from your body.

Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the equipment.

WEEE Warning

To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Revision

PLANET ICG-2510W(G)-LTE Series User's Manual

Model: ICG-2510W-LTE and ICG-2510WG-LTE Series

Revision: 1.0 (October, 2019)

Part No: EM-ICG-2510W(G)-LTE Series_v1.0

Manufacture: PLANET Technology Corp.
Manufacture address: 10F., No.96, Minquan Rd., Xindian Dist., New Taipei City 231, Taiwan

TABLE OF CONTENTS

1. INTRODUCTION

Thank you for purchasing PLANET Industrial 4G LTE Cellular Wireless Gateway. Please refer to the table list below for the models used in Europe and the U.S.:

Model Name	4G LTE		GPS
	FDD	TDD	
ICG-2510W-LTE-EU	B1/B3/B5/B7/B8/B20	B38/B40/B41	-
ICG-2510WG-LTE-EU			■
ICG-2510W-LTE-US	B2/B4/B12		-
ICG-2510WG-LTE-US			■

"**Cellular Gateway**" is used as an alternative name in this user's manual.

1.1. Packet Contents

Open the box of the **Cellular Gateway** and carefully unpack it. The box should contain the following items:

1. Industrial 4G LTE Cellular Wireless Gateway x 1
2. Quick installation guide x 1
3. I/O connector x 2
4. Power connector x 1
5. Ethernet cable x 1
6. Console cable x 1
7. 4G LTE antenna x 2
8. Wi-Fi antenna x 1
9. GPS antenna x 1 (for ICG-2510WG-LTE)
10. DIN-rail kit x 1
11. Side panel with two screws x 1
12. Antenna dust cap x 4 (ICG-2510W-LTE x 3)

If any item is found missing or damaged, please contact your local reseller for replacement.

1.2. Product Description

Making Network Connection Easy with 4G LTE Cellular Gateway

PLANET ICG-2510W(G)-LTE series is a reliable, secure and high-bandwidth communications industrial-grade cellular gateway for demanding mobile applications, **M2M** (machine-to-machine) and **IoT** deployments. It features **4G LTE** (Long Term Evolution), **2.4G/5G Wi-Fi**, five Ethernet ports (4 LAN and 1 WAN), **serial console port**, **DI** and **DO** interfaces, and **VPN** technology bundled in a compact yet rugged metal case. It establishes a fast cellular connection between Ethernet and serial port equipped devices.

High-performance 4G LTE

The ICG-2510W(G)-LTE series supports LTE 2x1 DL MIMO technology which can reach a download (DL) speed of up to 150Mbps and an upload (UL) speed of 50Mbps. The Cellular Gateway also supports multi-band connectivity including LTE FDD/TDD, WCDMA and GSM for a wide range of applications.

Dual SIM Design

To enhance reliability, the ICG-2510W(G)-LTE series is equipped with dual SIM slots that support failover and roaming over to ensure uninterrupted connectivity for mission-critical cellular communications. Besides, the ICG-2510W(G) series supports load balance function to improve network efficiency. It provides a more flexible and easier way for users to create an instant network sharing service via 4G LTE whenever in public places like transportation, outdoor event, etc.

GPS Included

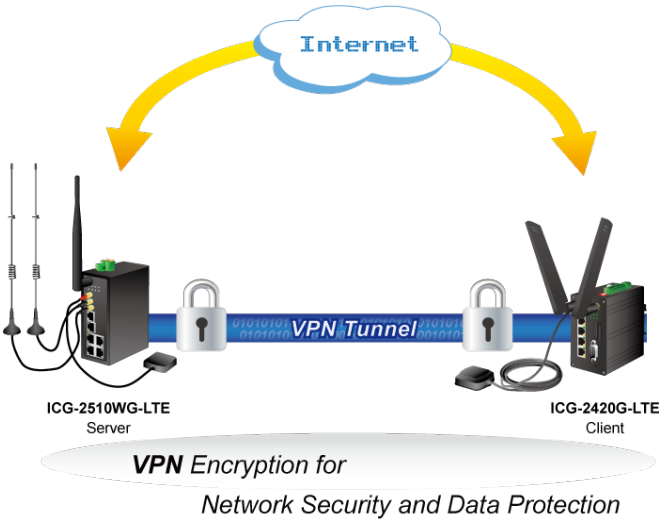
The ICG-2510WG-LTE is equipped with one convenient feature and that is GPS (global positioning system). It is a positioning system based on a network of satellites that continuously transmits necessary data. More signals transmitted from more satellites can triangulate its location on the ground, meaning any location can be easily tracked.

Dual-band WLAN Solution

PLANET ICG-2510W(G) series, adopting the IEEE 802.11b/g/n/ac standard, provides a high-speed transmission of power and data, meaning two remote nodes in the 5GHz frequency band can be bridged. The 2.4GHz wireless connection can also be used simultaneously. The Wireless Protected Access (WPA/WPA2 with TKIP/AES) and Wireless Encryption Protocol (WEP) features enhance the level of transmission security and access control over wireless LAN.

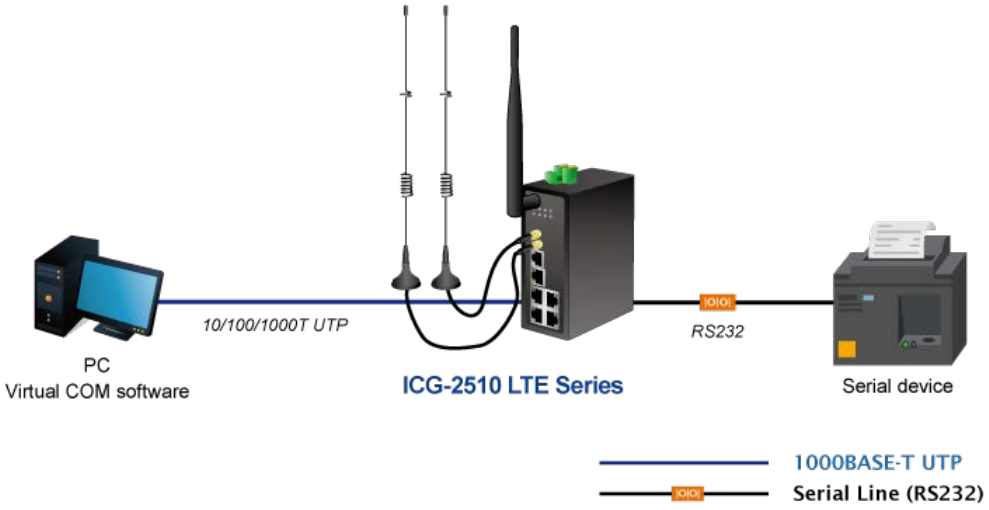
Cost-effective VPN Solution

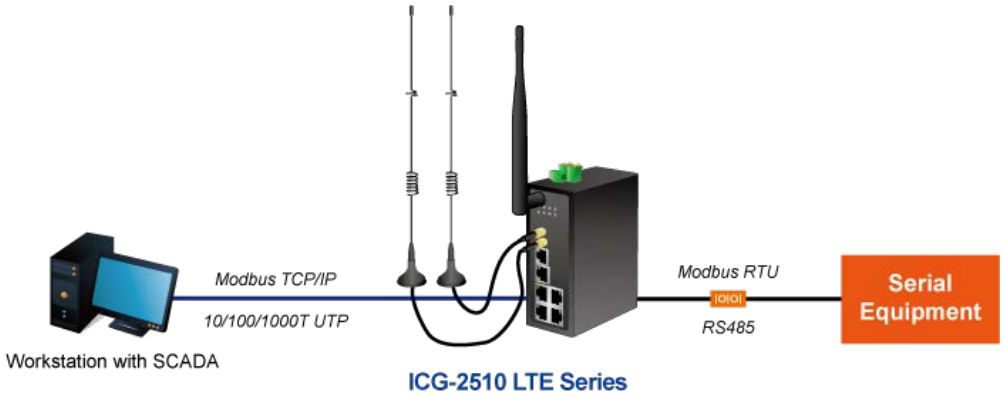
The ICG-2510W(G)-LTE series provides a complete data security and privacy feature for access and exchange of sensitive data. The full VPN capability of the ICG-2510W(G)-LTE series including built-in **PPTP**, **L2TP**, **OpenVPN, GRE** and **IPSec VPN** functions with DES/3DES/AES encryption and MD5/SHA-1/SHA-2 authentication makes the shared connection more secure and flexible. The IPSec VPN also makes the private tunnel over Internet more secure for enterprises doing business transactions.

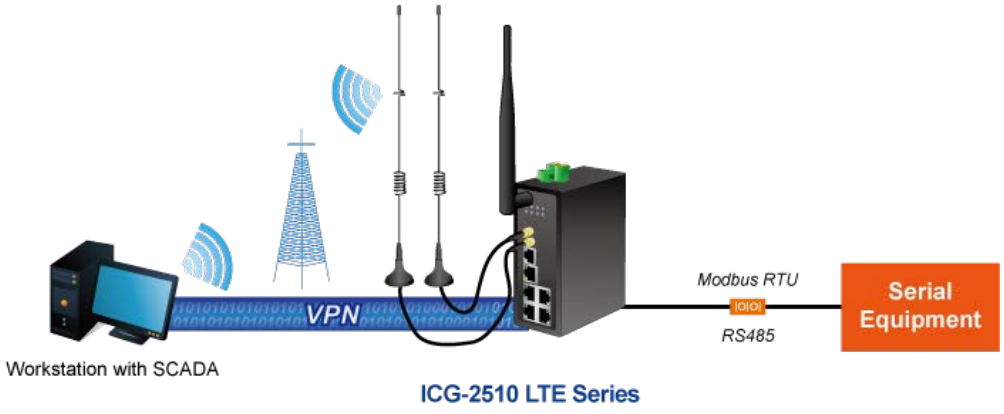


Remote Manageable Solution for Ethernet to RS232/RS485 Application

PLANET ICG-2510W(G)-LTE series' serial RS232/RS485 communication interface can be converted over the Fast Ethernet networking. It can operate as a virtual server or client where IP-based serial equipment can be managed. The ICG-2510W(G)-LTE series helps save the network administrator's valuable time in detecting and locating network problems, rather than visual inspection of cabling and equipment.







1000BASE-T UTP
Serial Line (RS485)

Superior Management Functions

For networking management features, the ICG-2510W(G)-LTE series provides such functions as DHCP server, DMZ and port forwarding, as well as full secure functions including Network Address Translation (NAT), WAN access policy, URL/Packet/MAC filtering. The ICG-2510W(G)-LTE series has 4G and WAN connection failover characteristics, which can automatically switch over to the redundant, stable WAN connection to keep users always online without missing any fascinating moments.

User-friendly and Secure Management

For efficient management, the ICG-2510W(G)-LTE series is equipped with console, web , SNMP and CMS (Central Management System) management interfaces. With the built-in web-based management interface, the ICG-2510W(G)-LTE series offers an easy-to-use, platform-independent management and configuration facility. The ICG-2510W(G)-LTE series supports SNMP and it can be managed via any management software based on the standard SNMP v1 or v2 Protocol. Moreover, the ICG-2510W(G)-LTE series offers the remotely secure management by supporting **SSH** connection where the packet content can be encrypted at each session. The CMS is able to manage multiple devices and achieve instant status.

1.3. How to Use This Manual

This User Manual is structured as follows:

Section 2, **INSTALLATION**

The section explains the functions of the Cellular Gateway and how to physically install the Cellular Gateway.

Section 3, **CELLULAR GATEWAY MANAGEMENT**

The section contains the information about the software function of the Cellular Gateway.

Section 4, **WEB CONFIGURATION**

The section explains how to manage the Cellular Gateway by Web interface.

Section 5 Appendix A

The section contains cable information of the Cellular Gateway.

1.4. Product Features

➢ **Benefits**

- Dual module SIMs for network load balancing and redundancy
- Wi-Fi compliant IEEE 802.11b/g/n/ac dual-band for mobile client connectivity
- 5-port Gigabit Ethernet, built-in redundant VRRP protocol
- 2 DI, 1 DO and 1 serial console port (RS232 or RS485) for Modbus applications
- Multiple VPNs with IPSEC, OpenVPN, RRTP, L2TP, GRE and VPN Failover
- Full security with VLAN, NAT, DMZ, static routing, firewall and IP/MAC/port filtering
- Supports CMS for remote management
- -35 to 75 degrees C operating temperature and fanless design
- GPS antenna allows to detect the location via sat nav system (for ICG-2510WG-LTE only)

➢ **Physical Port**

- Four 10/100/1000BASE-T RJ45 LAN ports, auto-negotiation, auto MDI/MDI-X
- One 10/100/1000BASE-T RJ45 WAN port, auto-negotiation, auto MDI/MDI-X
- Two 4G LTE antennas
- One 2.4G/5G WiFi antenna
- Two SIM card slots
- One GPS antenna (for ICG-2510WG-LTE)
- One serial console port (RS232 or RS485)
- One reset button
- One MicroSD slot to save files for serial port data

➢ **Cellular Interface**

- Supports multi-band connectivity with FDD LTE/ TDD LTE/ WCDMA/ GSM/ LTE Cat4
- Supports failover and load band lancing
- Built-in SIM and broadband backup for network redundancy
- Two detachable antennas for 4G LTE connection
- LED indicators for signal strength and connection status

➢ **Wi-Fi Interface**

- Complies with IEEE 802.11b/g/n/ac 2.4/5GHz
- Supports AP, Client, Repeater and Repeater Bridge modes
- One detachable dual band antenna for wireless connection
- 64/128-bit WEP, WPA/WPA2 with TKIP/AES encryption
- LED indicator for connection status

➢ **Industrial Case and Installation**

- IP30 metal case
- DIN-rail/desktop design
- Power requirement: 9~36V DC
- Supports EFT protection for 1.5KV DC power and 15KV DC Ethernet ESD protection
- -35 to 75 degrees C operating temperature

➢ **Digital Input and Digital Output**

- 2 digital input (DI)
- 1 digital output (DO)
- 1 relay

➢ **Advanced Features**

- Supports NAT, demilitarized zone (DMZ), port forwarding and virtual IP mapping
- Supports VLAN to improve the performance of a network or apply appropriate security features
- Supports static routing and dynamic routing for gateway and router operating modes
- Supports QoS to manage WAN bandwidth
- Supports PPTP, L2TP, OPENVPN, IPSec and GRE VPN modes
- Supports IPSec (3DES, AES128, AES256, MD5, SHA1, SHA2-256, SHA2-512)
- Supports TCP, UDP, TCP Server and Modbus TCP
- Supports Dynamic DNS and PLANET DDNS
- Provides Firewall and access policy functions
- Supports WAN connection types: DHCP-4G, DHCP Client, Static IP, PPPoE Client, 3G Link1, 3G Link 2, DHCP-Backup 4G
- Secures network connection
  - WAN access
  - URL filter
  - Packet filter
  - MAC filter

➢ **Management**

- Switch management interfaces
  - Console/Telnet Command Line interface
  - Web user interface management
  - SNMP v1, v2c
  - SSH secure access
- Keep alive (schedule reboot)
- System Maintenance
  - Firmware upload via HTTP
  - Reset button for system rebooting or resetting to factory default
  - Configuration backup and restore
- System log
- Remote system log
- NTP (Network Time Protocol) client support
- Support CMS to manage multiple devices

1.5. Product Specifications

Product	ICG-2510W-LTE	ICG-2510WG-LTE
Hardware Specifications		
Copper Ports	4 LAN 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports 1 WAN 10/100/1000BASE-T RJ45 auto-MDI/MDI-X port	
Serial Interface	DB9 to RJ45 serial console port ■ TCP/UDP PAD mode ■ Modbus (ASCII, DTU, variable) ■ PPP ■ Reverse Telnet	
SIM Interface	2 SIM card slots with mini SIM card tray	
Cellular Antenna	2 5dBi external antennas with SMA connectors for LTE	
Wi-Fi Antenna	1 1dBi (2.4~2.5G)/3dBi (5.15~5.85G) external antenna with RP-SMA-J connector for dual-band Wi-Fi	
GPS Antenna	-	1 28dB gain external antennas with SMA connectors - 3m
DI & DO Interfaces	■ 2 Digital Input (DI) ■ 1 Digital Output (DO) ■ 1 Relay Input ON Voltage: DC 5 -30 V Input OFF Voltage: DC 0-3 V Output < 50mA@DC 30V Relay: AC 250V/DC 30V, 1A	
Connector	1 removable 2-pin terminal block for power input 2 removable 3-pin terminal block for DI/DO and relay interface	
Storage	1 MicroSD (TF) slot for saving serial port data	
Switch Architecture	Store-and-Forward	
Flow Control	IEEE 802.3x pause frame for full duplex Back pressure for half duplex	
Reset Button	< 15 sec: Factory default	
Surge Protection	1.5KV DC	
ESD Protection	15KV DC	
Enclosure	IP30 metal case	
Installation	DIN rail, desktop	
LED	System: PWR (Blue) SYS (Blue) Wireless Interface : WiFi Active (Blue) Ethernet Interfaces (Port1-4 and WAN Port):	

	LNK/ACT (Green) LTE SIM and Signal : SIM1 and SIM2 (Blue) LTE signal: High and low (Blue)
Dimensions (W x D x H)	133 x 115.7 x 45 mm
Weight	564g
Power Requirements – DC	9~36V DC, 1.5A
Power Consumption	8.4 watts/28.6 BTU
Multi Band Supports	
EU Model	■ FDD LTE B1/B3/B5/B7/B8/B20 (2100/1800/850/2600/900/800) ■ TDD LTE B38/B40/B41 (2600/2300/2500) ■ WCDMA B1/B5/B8 (2100/850/900) ■ GSM/EDGE B3/B8 (1800/900)
US Model	■ FDD LTE B2/B4/B12 (1900/AWS1700/700) ■ WCDMA B2/B4/B5 (1900/AWS1700/850)
LTE Data Rate	1.4/3/5/10/15/20MHz bandwidth: 150Mbps (DL), 50Mbps (UL)
Wireless Specifications	
Standard	IEEE 802.11 b/g/n/ac
Wireless Mode	AP, Client, Repeater, Repeater Bridge
Band Mode	2.4G / 5G concurrent mode
Frequency Range	2.4GHz FCC: 2.412~2.462GHz ETSI: 2.412~2.472GHz 5GHz FCC: 5.180~5.240GHz, 5.745~5.825GHz ETSI: 5.180~5.700GHz
Operating Channels	FCC: 36, 40, 44, 48, 149, 153, 157, 161, 165 (9 Channels) ETSI: 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 132, 136, 140 (16 Channels) *5GHz channel list will vary in different countries according to their regulations.
Channel Width	20MHz, 40MHz, 80MHz
Encryption Security	WEP, WPA Personal, WPA Enterprise, WPA2 Personal, WPA2 Enterprise, WPA2 Personal Mixed, WPA2 Enterprise Mixed
Data Rate	Up to 300Mbps
Max. Transmit Power (dBm)	26
Max. Clients	30
Advanced Functions	
VPN	■ PPTP server and PPTP client ■ L2TP server and L2TP client ■ Open server and Open client ■ IPSec

	■ GRE Tunnel Number ■ PPTP: 1 ■ L2TP: 1 ■ OPENVPN: 1 ■ IPSec: 12 ■ GRE: 12
WAN Connection Types	DHCP-4G, DHCP Client, Static IP, PPPoE Client, 3G Link1, 3G Link 2, DHCP-Backup 4G
Secure Network	WAN access, URL filter, Packet filter, MAC filter
Other	Supports demilitarized zone (DMZ) Supports QoS for bandwidth management Supports VLAN, 15 VLAN ID Supports Modbus TCP (only functions with console) Supports Port Forwarding Supports Dynamic DNS and PLANET DDNS Supports NTP client
Management	
Basic Management Interfaces	Console, Telnet, HTTP, HTTPS, SNMP v1, v2c, CMS
Secure Management Interfaces	SSH, Firewall
SNMP MIBs	RFC 1158 MIB, RFC 1213 MIB, RFC 1269 MIB, RFC 1271 MIB, RFC-1285 MIB, RFC 1316 MIB, RFC 1381 MIB, RFC 1382 MIB, RFC 1414 MIB
Standards Conformance	
Regulatory Compliance	CE
Standards Compliance	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3ab Gigabit 1000BASE-T IEEE 802.3x flow control and back pressure RFC 768 UDP RFC 791 IP RFC 792 ICMP RFC 2068 HTTP
Environment	
Operating	Temperature: -35 ~ 75 degrees C Relative Humidity: 90%@60 degrees C (non-condensing)
Storage	Temperature: -40 ~ 85 degrees C Relative Humidity: 90%@60 degrees C (non-condensing)

2. INSTALLATION

This section describes the hardware features and installation of the Industrial Cellular Gateway on the desktop or mounting. For easier management and control of the Industrial Cellular Gateway, familiarize yourself with its display indicators and ports. Front panel illustrations in this chapter display the unit LED indicators. Before connecting any network device to the Industrial Cellular Gateway, please read this chapter completely.

2.1. Hardware Description

2.1.1. Cellular Gateway Front Panel

The front panel provides the monitoring of the Cellular Gateway's simple interfaces. Figure 2-1 & 2-2 shows the front panels of the Industrial Cellular Gateways.

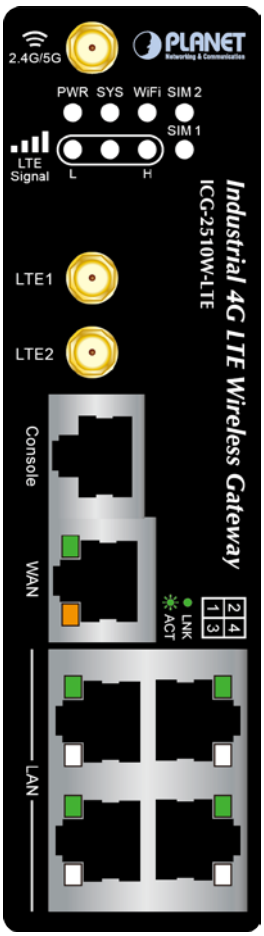


Figure 2-1 ICG-2510W-LTE Front Panel

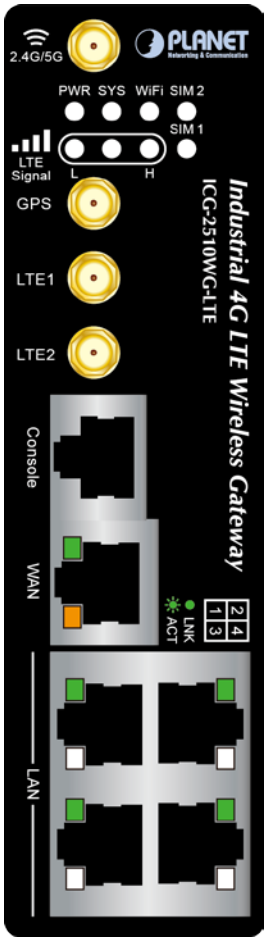
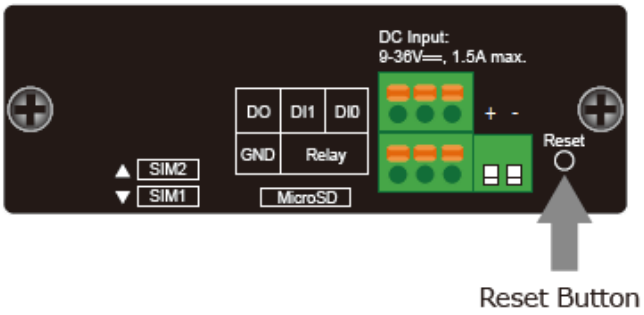


Figure 2-2 ICG-2510WG-LTE Front Panel

■ **Reset Button**

On the front of the ICG-2510W(G)-LTE series, the reset button is designed to reboot the Industrial Cellular Gateway without turning off and on the power. The following is the summary table of the reset button functions:



Reset Button

Figure 2-3 Rest Button of ICG-2510W(G)-LTE Series

Reset Button Pressed and Released	Function
> 15 sec: Factory Default	Reset the Industrial Cellular Gateway to Factory Default configuration. Industrial Cellular Gateway will then reboot and load the default settings shown below: ◦ Default username: **admin** ◦ Default password: **admin** ◦ Default IP address: **192.168.1.1** ◦ Subnet mask: **255.255.255.0**

2.1.2. LED Indications

The front panel LEDs indicate instant status of port links, data activity and system power; it helps monitor and troubleshoot when needed.

■ **System**

LED	Color	Function	
PWR	**Blue**	**Lights**	Indicates the system is powered on.
		Off	Indicates the system is powered off.
SYS	**Blue**	**Blinking**	Indicates the system works properly.
		Off	Indicates the system does not work.
Wi-Fi	**Blue**	**Lights**	Indicates the Wi-Fi is active.
		Off	Indicates the Wi-Fi is not active.
LTE Signal (L)	**Blue**	**Lights**	Indicates the signal is low.
LTE Signal (H)	**Blue**	**Lights**	Indicates the signal is normal or high.
SIM1 & 2	**Blue**	**Lights**	Indicates the SIM1 or SIM2 is connecting successfully.
		Off	Indicates the SIM1 or SIM2 is connecting unsuccessfully or no SIM card inserted.

■ **10/100/1000BASE-T LAN Port Interfaces (Port-1 to Port-4)**

LED	Color	Function	
Ethernet	**Green**	**Lights**	Indicates that the link is successfully established.
		Blinking	Indicates that the port is actively sending or receiving data.

■ **10/100/1000BASE-T WAN Port Interface**

LED	Color	Function	
Ethernet	**Green**	**Lights**	Indicates that the link is successfully established.
		Blinking	Indicates that the port is actively sending or receiving data.

2.1.3. Cellular Gateway Upper Panel

The upper panel of the Industrial Cellular Gateway consists of three terminal block connectors. Figure 2-4 shows the upper panel of the Cellular Gateway.

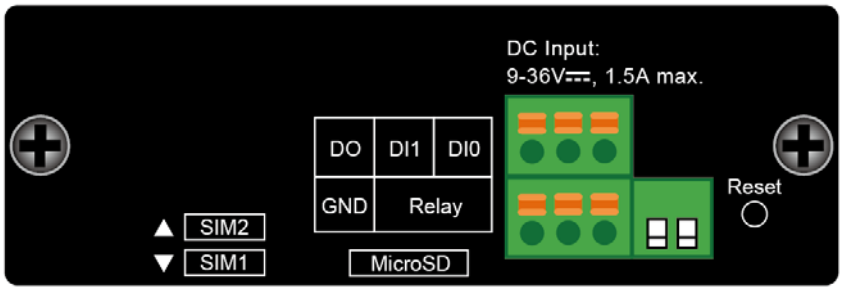


Figure 2-4: ICG-2510W(G)-LTE Series Upper Panel

2.1.4. Wiring the Power Inputs

The 2-contact terminal block connector on the top panel of Industrial Cellular Gateway is used for one DC power input. The power input range is from 9 to 36V DC. Please follow the steps below to insert the power wire.

1. Please read the above description of upper panel carefully before inserting positive/negative DC power wires into the 2-contact terminal block connector.

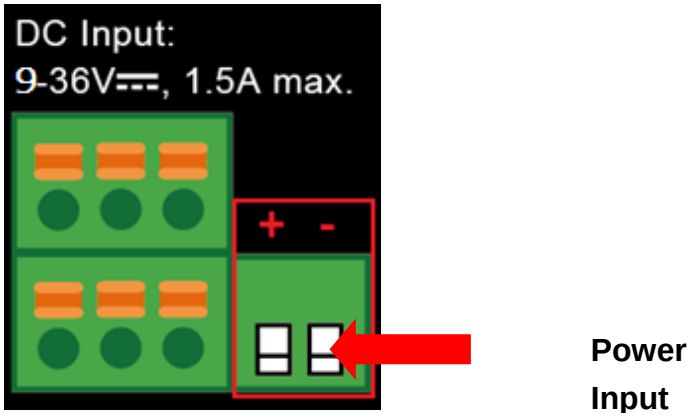


Figure 2-5: Wiring the Power Inputs

2. Confirm that the positive/negative DC power wires will not fall off.

2.1.5. Wiring the Digital Input/Output and Relay

The two 3-contact terminal block connectors on the top panel of ICG-2510W(G)-LTE Series is used for Digital Input, Digital Output and Relay.

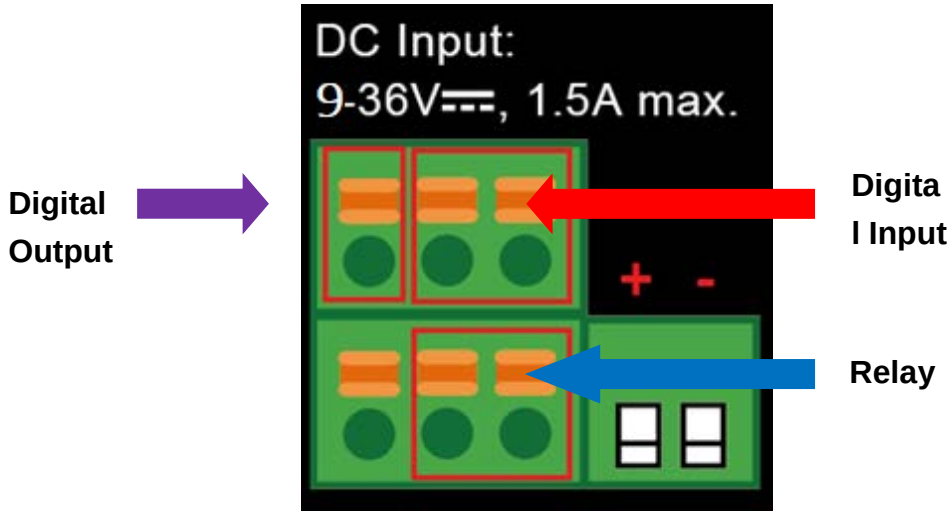


Figure 2-6 Wiring the DI/DO Inputs and Relay

DI	Input ON	5 to 30 VDC
	Input OFF	0 to 3 VDC
DO	Output	< 50mA @ 30VDC
RELAY	Load capability	1A 250VAC/30VDC

2.1.6. Console Line Definition

Insert the RJ45 end of the console cable into the RJ45 outlet with sign “console”, and insert the DB9F end of the console cable into the RS232 serial interface of user’s device.

The signal connection of the console cable is as follows:

Console line definition (RS232)					
RJ45	Color	Signal	DB9F	Description	Dir (Router)
1	White/ Orange	A	8	RS485-A	Input/Output
2	Orange	B	6	RS485-B	Input/Output
3	White/ Green	RXD	2	Receive Data	Output
4	Blue	DCD	1	Data Carrier Detect	Output
5	White/	GND	5	System Ground	

	Blue				
6	Green	TXD	3	Transmit Data	Input
7	White/ Brown	DTR	4	Data Terminal Ready	Input
8	Brown	RTS	7	Request To Send	Input

2.1.7. Dual SIM Cards Installation

1. Before inserting or removing the SIM card, ensure that the power has been turned off and the power connector has been removed from Cellular Gateway.
2. Unscrew the screws of upper panel.
3. Press the button with a paper clip or suitable tool to eject the SIM card from the drawer.

4. Insert the SIM card with the contact facing up and align the SIM card tray properly with the slot. Make sure the tray is inserted into the slot correctly.

Inserting the tray into the slot

5. Slide the tray back into the slot to lock in place.
6. Tighten the screws of the upper panel.

Note

Make sure the direction is right when sliding the SIM card tray into the slot or else it will get stuck. Turn off the Cellular Gateway before taking the SIM card.

2.1.8. Installing MicroSD Card

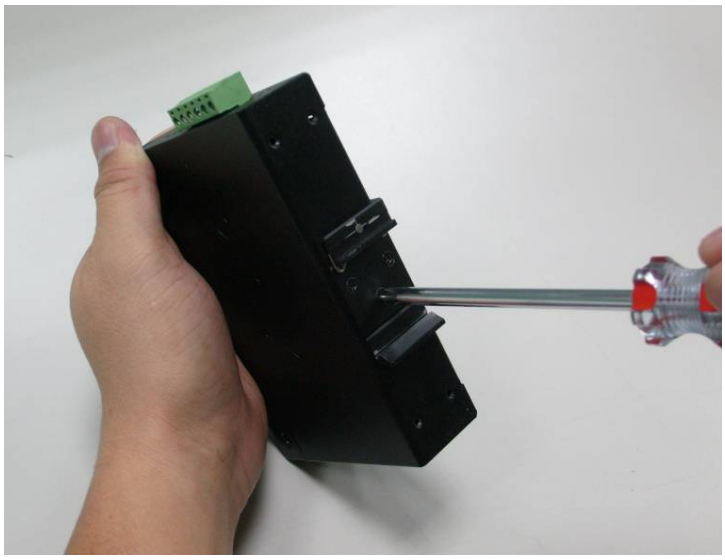
The ICG-2510W(G)-LTE series provides a MicroSD card slot . Refer to the SIM card installation method for inserting the MircoSD card.

2.2. Mounting Installation

This section describes how to install your Industrial Cellular Gateway and make connections to the Industrial Cellular Gateway. Please read the following sections and perform the procedures in the order being presented. To install your Industrial Cellular Gateway on a desktop or shelf, simply complete the following steps.

2.2.1. DIN-rail Mounting

The DIN-rail is screwed on the Industrial Cellular Gateway when out of factory. Please refer to the following figures to screw the DIN-rail on the Industrial Cellular Gateway. To hang the Industrial Cellular Gateway, follow the steps below:



Step 1: Screw the DIN-rail bracket on the Industrial Cellular Gateway.

Step 2: Place the bottom of DIN-rail bracket lightly into the track.

Step 3: Check whether the DIN-rail bracket is tightly on the track.

Step 4: Please refer to the following procedures to remove the Industrial Cellular Gateway from the track.

Step 5: Lightly pull out the bottom of DIN-rail bracket to remove it from the track.

3. CELLULAR GATEWAY MANAGEMENT

This chapter explains the methods that you can use to configure management access to the Industrial Cellular Gateway. It describes the types of management applications and the communication and management protocols that deliver data between your management device (workstation or personal computer) and the system. It also contains information about port connection options.

This chapter covers the following topics:

- Requirements
- Management Access Overview
- Web Management Access
- SNMP Access
- Standards, Protocols and Related Reading

3.1. Requirements

- **Workstations** running Windows 2000/XP, 2003, Vista/7/8, 2008, MAC OS9 or later, Linux, UNIX or other platforms are compatible with **TCP/IP** protocols.
- **Workstation** is installed with **Ethernet NIC** (Network Interface Card).
- Ethernet Port connection
- Network cables -- Use standard network (UTP) cables with RJ45 connectors.
- The above Workstation is installed with **Web browser** and **Java runtime environment** plug-in.

It is recommended to use Internet Explorer 8.0 or above to access Industrial Cellular Gateway.

3.2. Management Access Overview

The Industrial Cellular Gateway gives you the flexibility to access and manage it using any or all of the following methods:

- **Web browser** interface
- An external **SNMP-based network management application**

The Web browser interfaces are embedded in the Industrial Cellular Gateway software and are available for immediate use. Each of these management methods has their own advantages. Table 3-1 compares the two management methods.

Method	Advantages	Disadvantages
Web Browser	• Ideal for configuring the Cellular Gateway remotely • Compatible with all popular browsers • Can be accessed from any location • Most visually appealing	• Security can be compromised (hackers need to only know the IP address and subnet mask) • May encounter lag times on poor connections
SNMP Agent	• Communicates with Cellular Gateway functions at the MIB level • Based on open standards	• Requires SNMP manager software • Least visually appealing of all three methods • Some settings require calculations • Security can be compromised (hackers need to only know the community name)

Table 3-1 Comparison of Management Methods

3.3. Web Management

The Industrial Cellular Gateway offers management features that allow users to manage the Industrial Cellular Gateway from anywhere on the network through a standard browser such as Microsoft Internet Explorer. After you set up your IP address for the cellular gateway, you can access the Industrial Cellular Gateway's Web interface applications directly in your Web browser by entering the IP address of the Industrial Cellular Gateway.

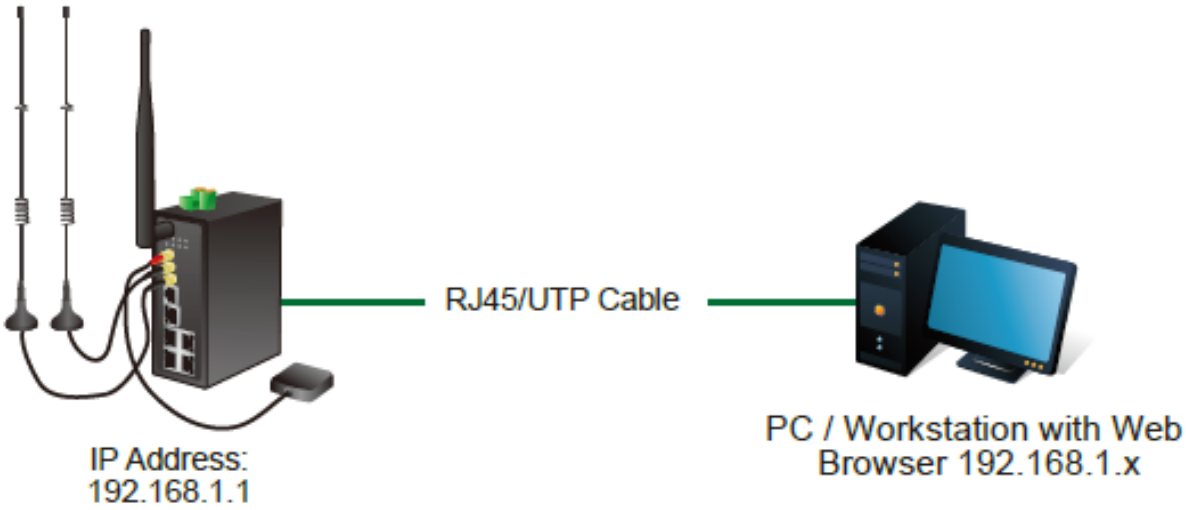


Figure 3-1 Web Management

You can then use your Web browser to list and manage the Industrial Cellular Gateway configuration parameters from one central location. Web Management requires either **Microsoft Internet Explorer 8.0** or later, **Google Chrome**, **Safari** or **Mozilla Firefox 1.5** or later.

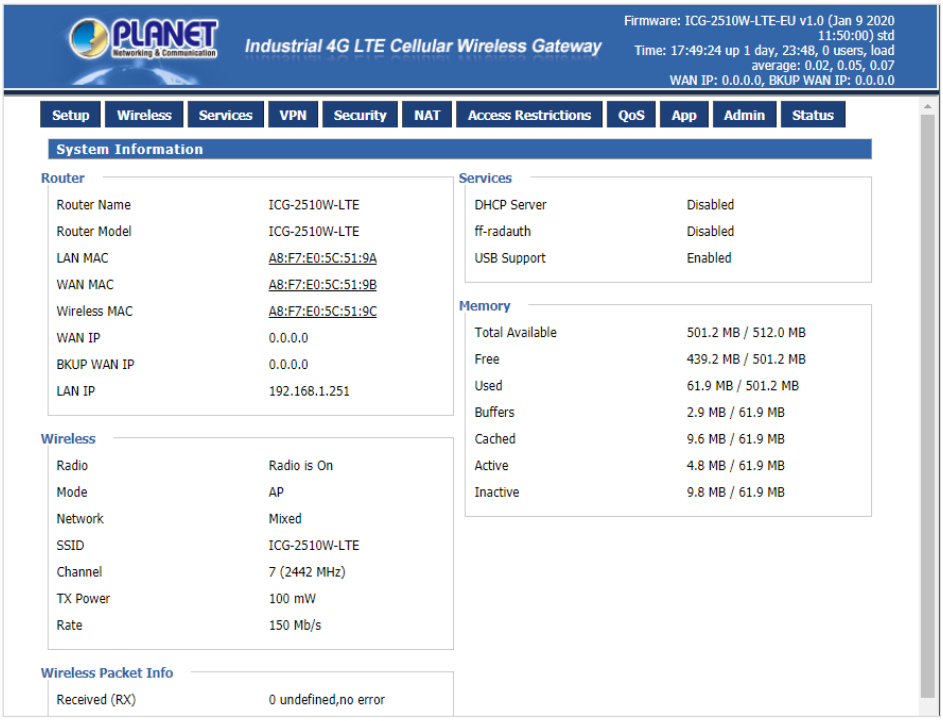


Figure 3-2 Web Main Screen of Industrial Cellular Gateway

3.4. SNMP-based Network Management

You can use an external SNMP-based application to configure and manage the Industrial Cellular Gateway, such as SNMPc Network Manager, HP Openview Network Node Management (NNM) or What's Up Gold. This management method requires the SNMP agent on the cellular gateway and the SNMP Network Management Station to use the **same community string**. This management method, in fact, uses two community strings: the **get community** string and the **set community** string. If the SNMP Network Management Station only knows the set community string, it can read and write to the MIBs. However, if it only knows the get community string, it can only read MIBs. The default get and set community strings for the Industrial Cellular Gateway are public.

Figure 3-3 SNMP Management

4. WEB CONFIGURATION

This chapter describes how to configure and manage the cellular gateway

4.1. Configuration Connection

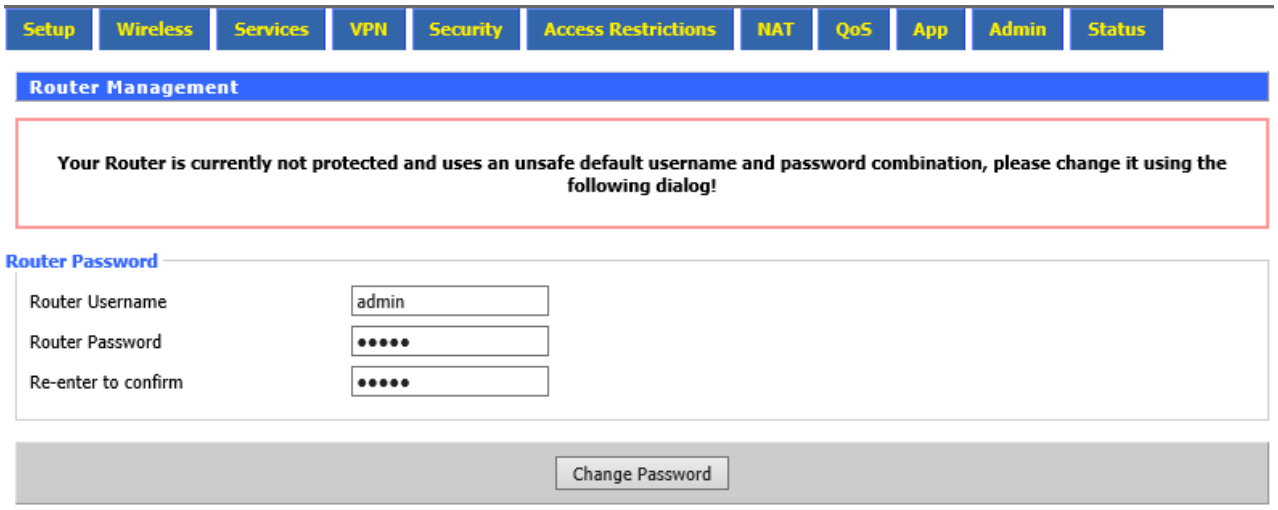
Before configuration, you should connect the cellular gateway and your configuration PC with the supplied network cable. Plug the cable's one end into the Local Network port of the cellular gateway, and another end into your configure PC's Ethernet port. The connection diagram is as follows:

Please modify the IP address of PC to the same network segment address of the router, for instance, 192.168.1.9. Modify the mask code of PC to 255.255.255.0 and set the default gateway of PC as the router's IP address (192.168.1.1).

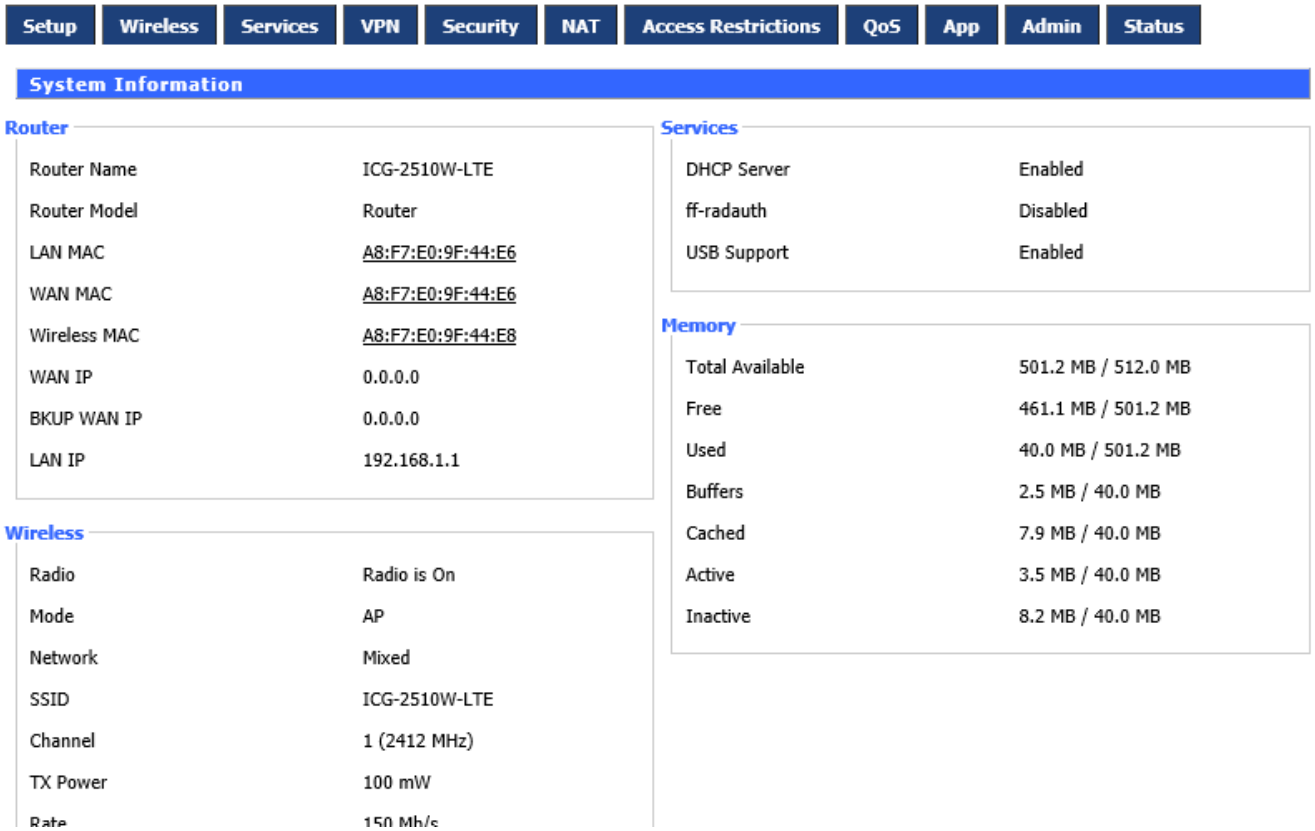
4.2. Accessing the Configuration Web Page

The chapter is to present main functions of each page. Users visit page tool via web browser after connecting user PC to the cellular gateway. There are eleven main pages: Setting, Wireless, Service, VPN, Security, Access Restrictions, NAT, QoS Setting, Applications, Management and Status. Users enable to browse slave pages by clicking one main page.

Users can open IE or others and enter the cellular gateway's default IP address of 192.168.1.1 on address bar, then click on "Enter" to go to the Web management tool of the cellular gateway. Log in to the web page with the first user name, and it will display a page asking you to modify the default user name and password of the cellular gateway. Users have to click "change password" to make it work if they want to modify user name and password.



The information main page is shown below.



Users need to input user name and password if it is their first time to log in.

Input correct user name and password to visit relevant menu page. Default user name and password are **admin.**

4.3. Management and Configuration

The Industrial Cellular Gateway offers management features that allow users to manage the Industrial Cellular Gateway from anywhere on the network through a standard browser such as Microsoft Internet Explorer. After you set up your IP address for the cellular gateway, you can access the Industrial Cellular Gateway's Web interface applications directly in your Web browser by entering the IP address of the Industrial Cellular Gateway.

4.3.1. Setting

The Setup screen is the first screen users will see when accessing the cellular gateway. Most users will be able to configure the gateway and get it work properly using only the settings on this screen. Some Internet Service Providers (ISPs) will require users to enter specific information, such as User Name, Password, IP Address, Default Gateway Address, or DNS IP Address. This information can be obtained from your ISP, if required.

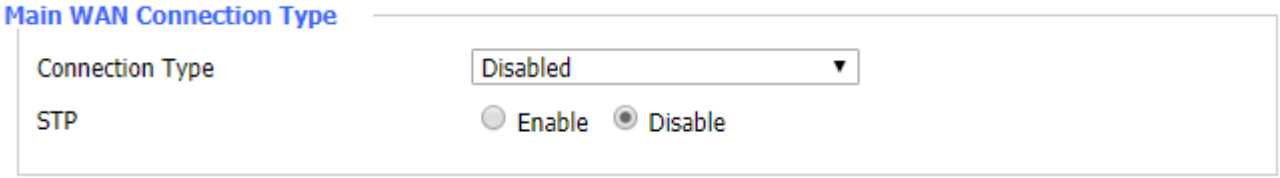
4.3.1.1. Basic Setting

WAN Connection Type

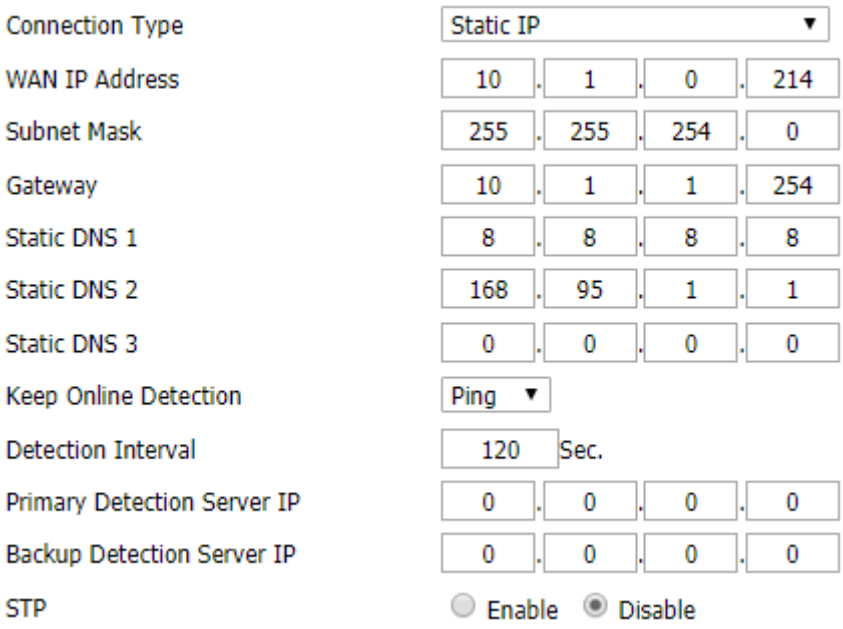
The connection types include Disabled, Static IP, Automatic Configuration-DHCP, dhcp-4G, PPPoE, 3G Link1, 3G Link2 and dhcp-bkup4G.

Disabled

Forbid the setting of WAN port connection type.



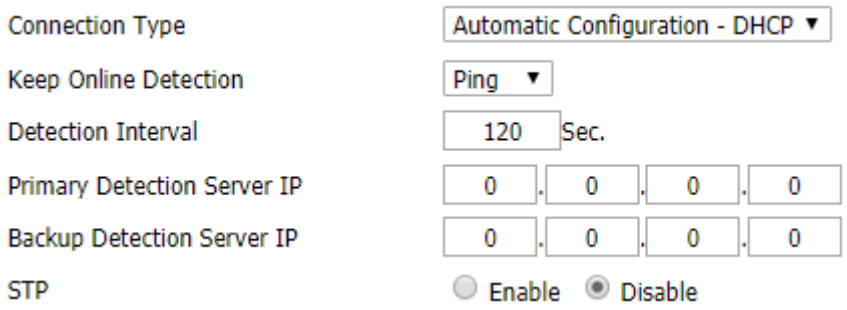
Static IP



Object – Static IP	Description
WAN IP Address	Users set IP address by their own or ISP assigns
Subnet Mask	Users set subnet mask by their own or ISP assigns
Gateway	Users set gateway by their own or ISP assigns
Static DNS1/DNS2/ DNS3	Users set static DNS by their own or ISP assigns

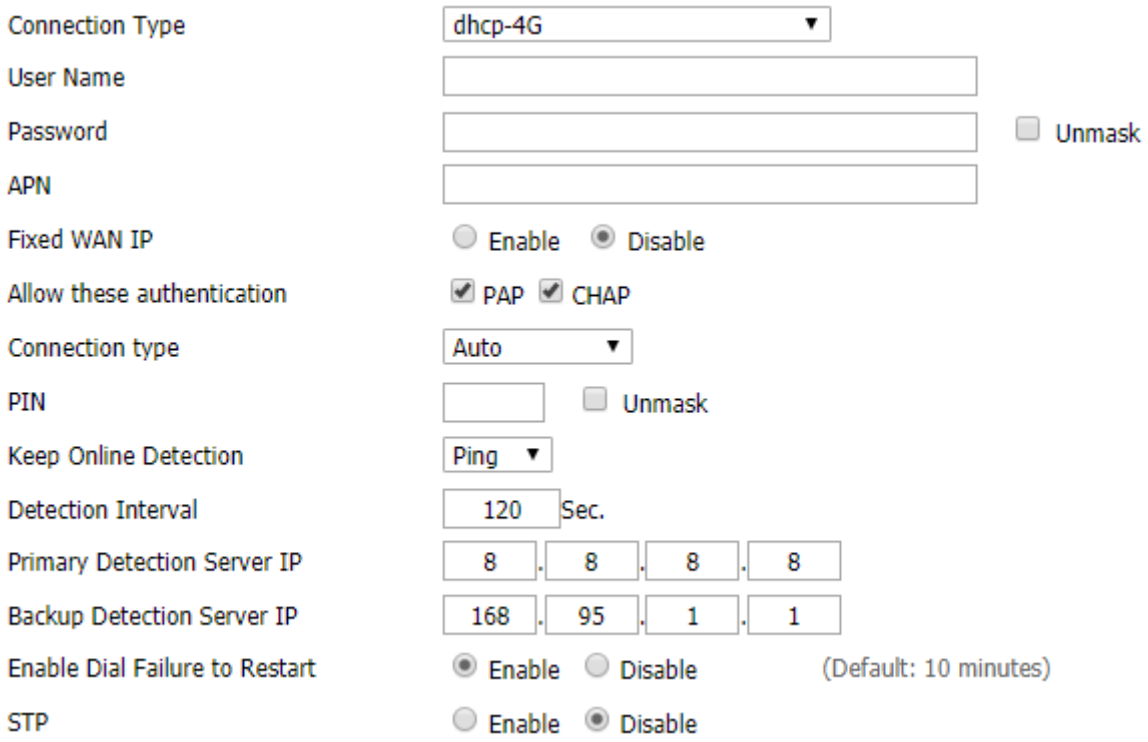
Automatic Configuration-DHCP

IP address of WAN port gets automatic via DHCP.



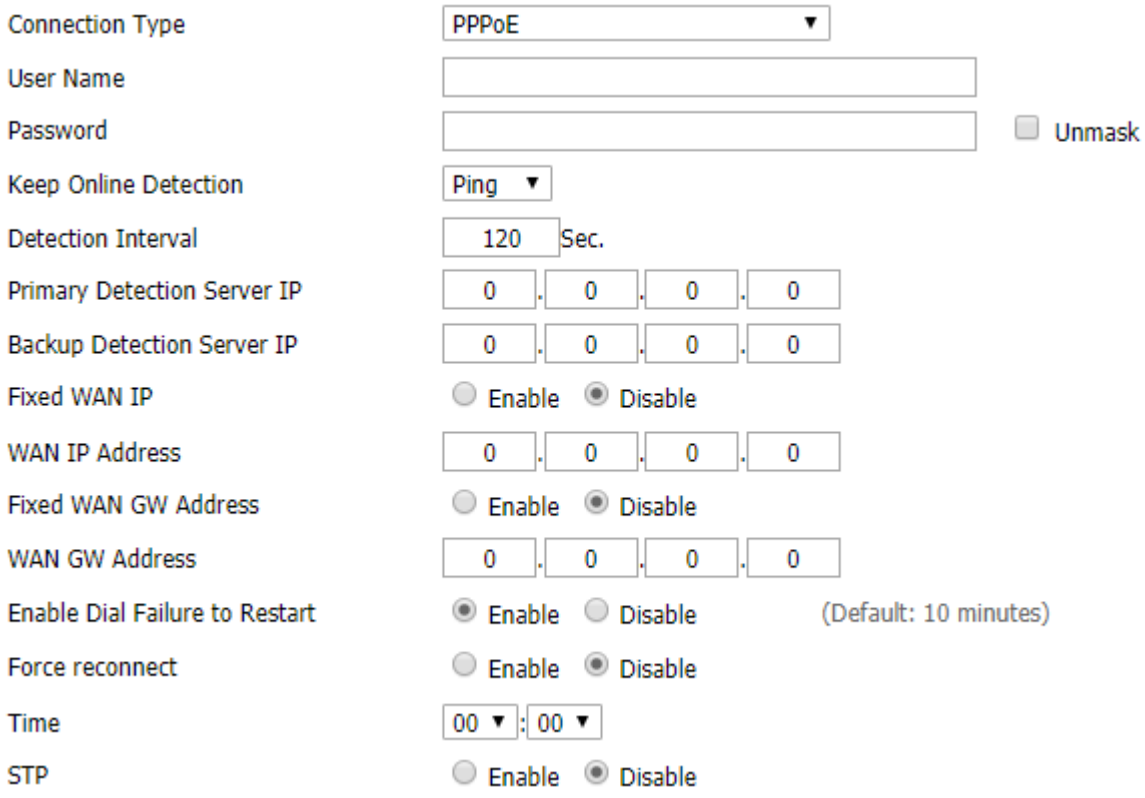
DHCP-4G

IP address of WAN port gets automatic via DHCP-4G



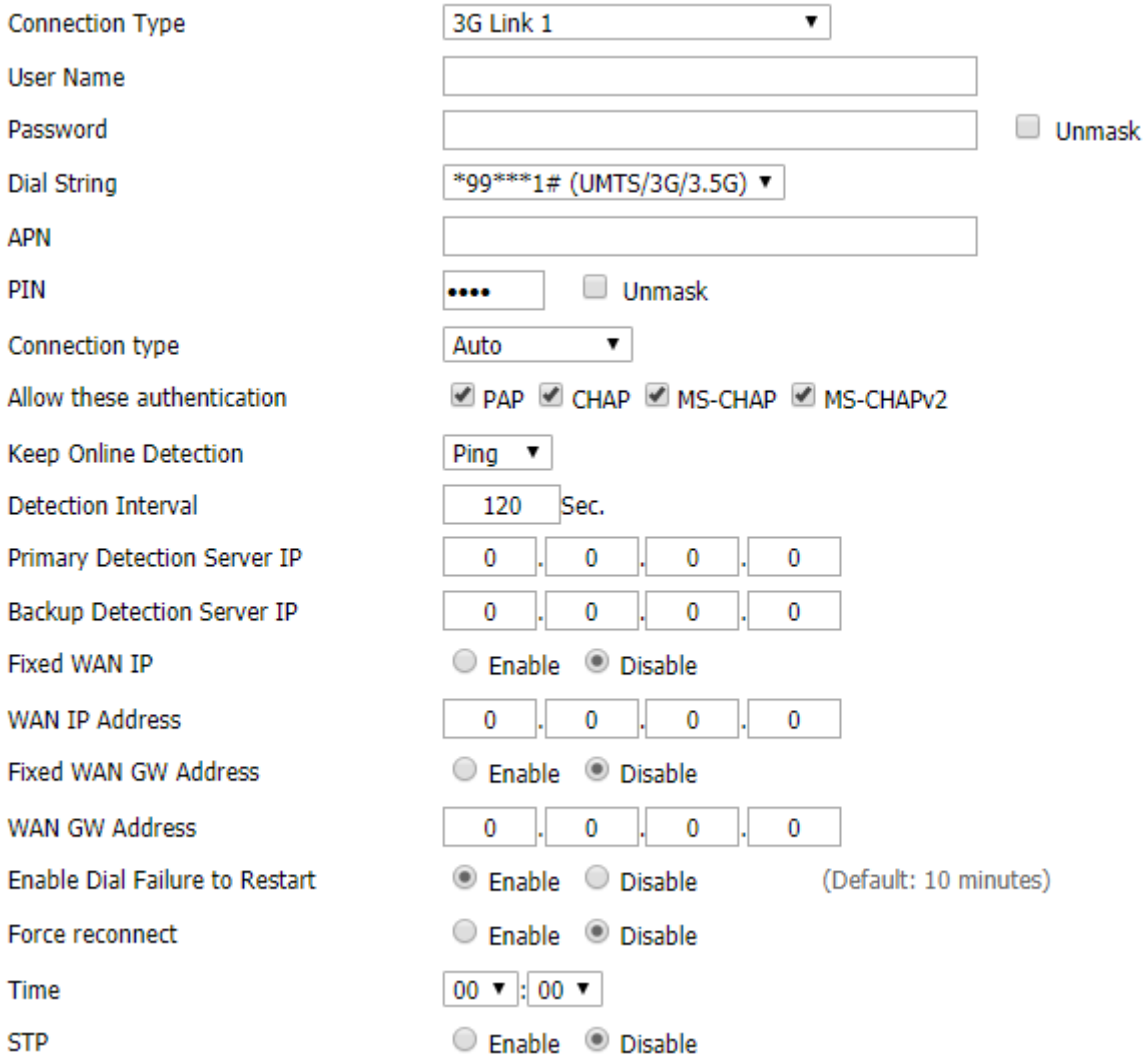
Object – dhcp-4G	Description
User Name	Login user's ISP (Internet Service Provider)
Password	Login user's ISP
APN	Access point name of user's ISP
PIN	PIN code of user's SIM card

PPPoE



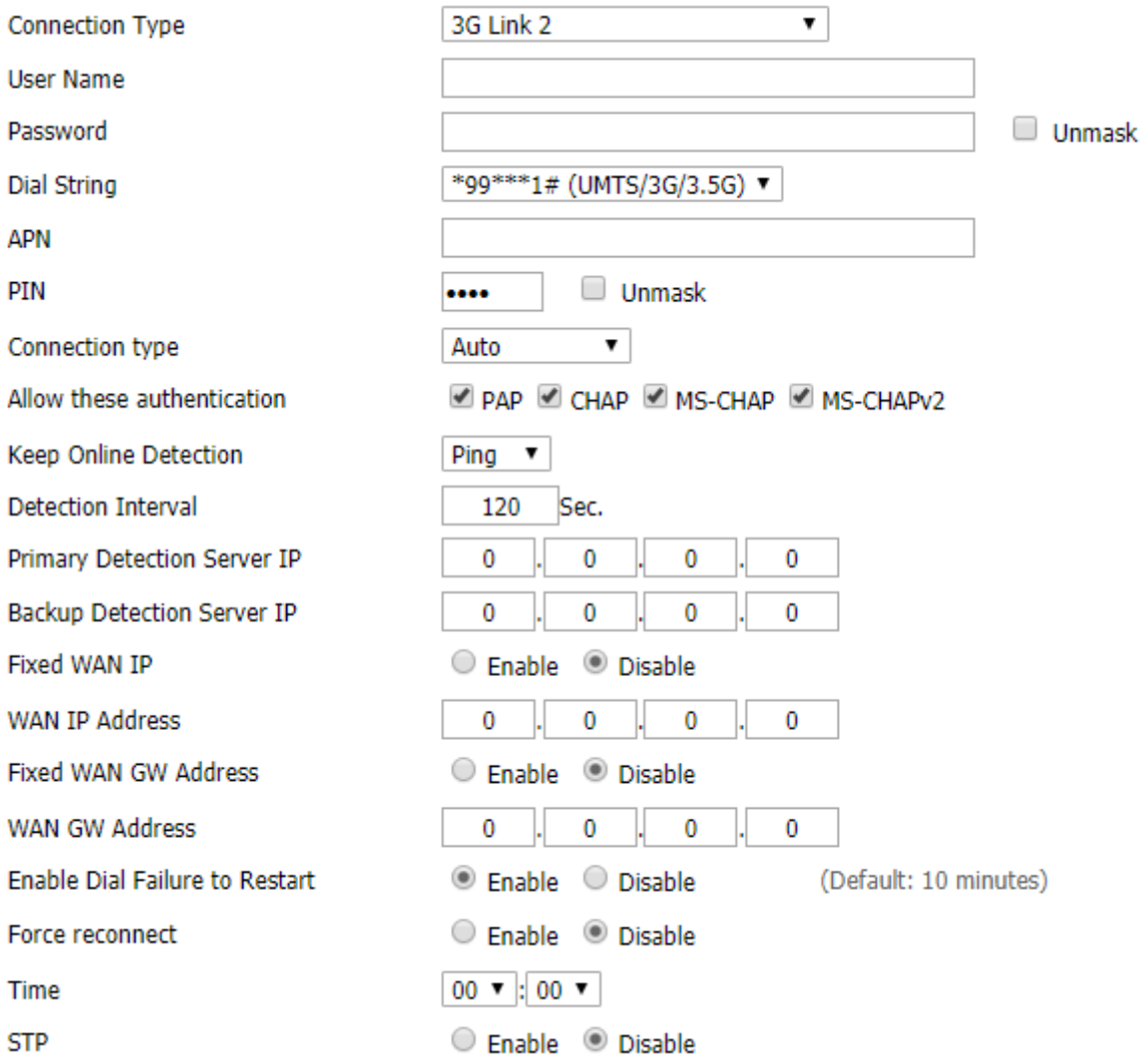
Object – PPPoE	Description
User Name	Login the Internet
Password	Login the Internet

3G Link1



Object – 3G Link1	Description
User Name	Login user's ISP (Internet Service Provider)
Password	Login user's ISP
Dial String	Dial number of user's ISP
APN	Access point name of user's ISP
PIN	PIN code of user's SIM card

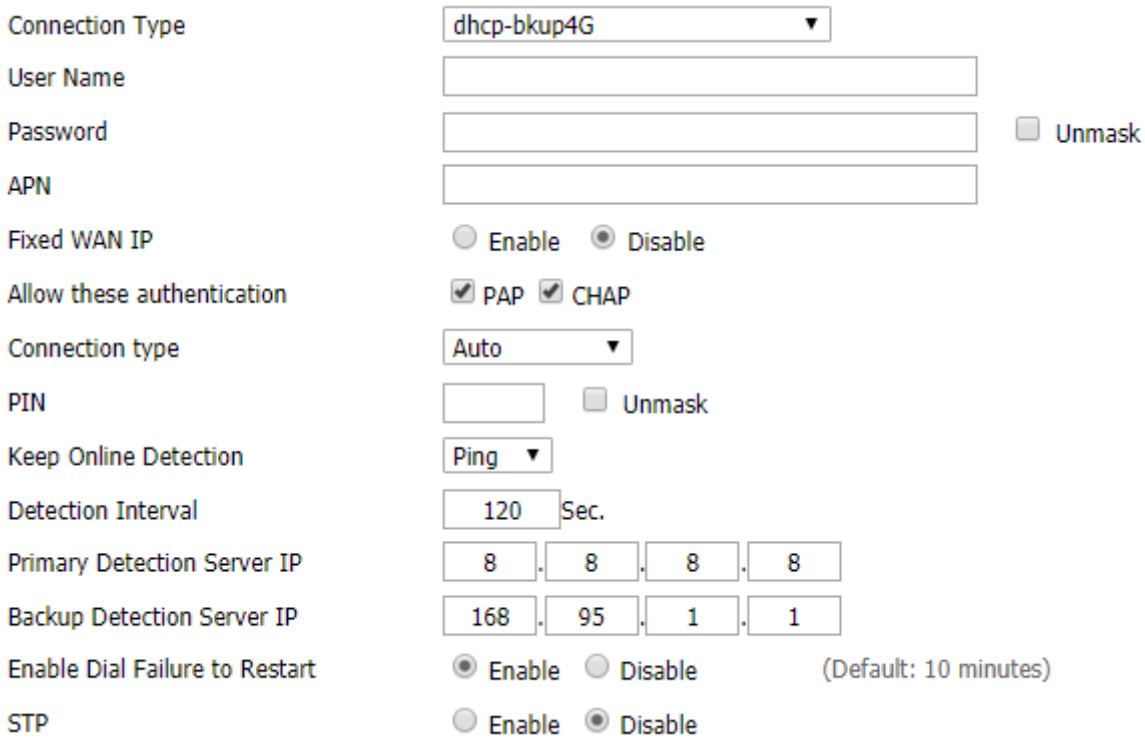
3G Link2



Object – 3G Link2	Description
User Name	Login user's ISP (Internet Service Provider)
Password	Login user's ISP
Dial String	Dial number of user's ISP
APN	Access point name of user's ISP
PIN	PIN code of user's SIM card

dhcp-bkup4G

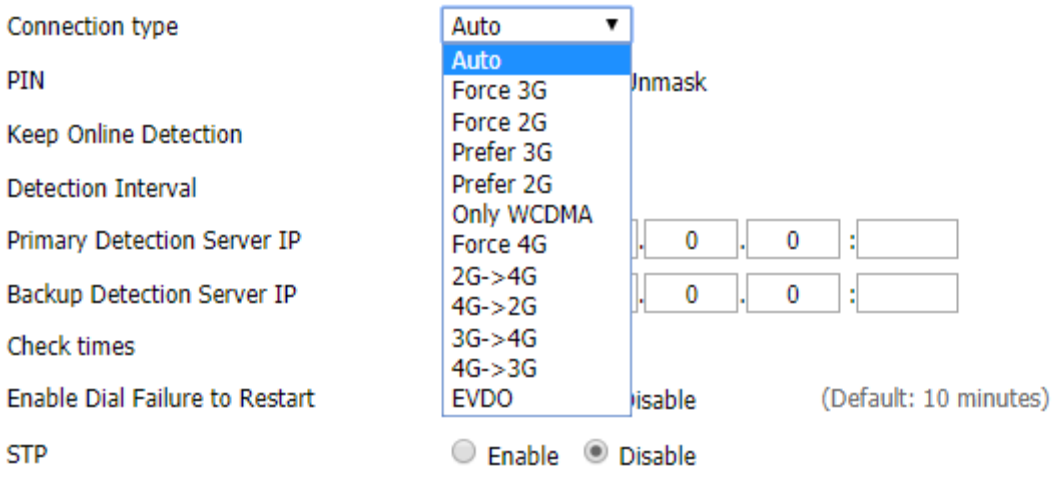
IP address of WAN port gets automatic via DHCP-4G.



Object – dhcp-bkup4G	Description
User Name	Login user's ISP (Internet Service Provider)
Password	Login user's ISP
APN	Access point name of user's ISP
PIN	PIN code of user's SIM card

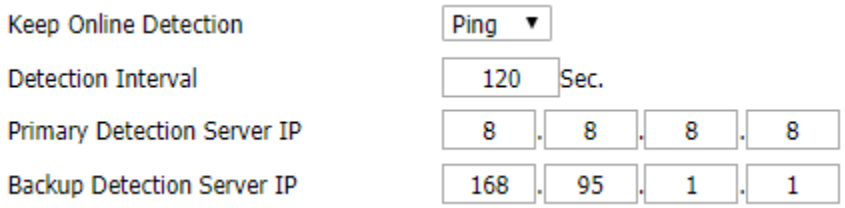
Connection Type

The connection type provides 12 options for required mode. This option allows user to select connection type which he prefers, such as auto, force 3G or force 4G. The default setting is Auto.



Keep Online

This function is used to detect whether the Internet connection is active, if users set it and when the Router detects the connection is inactive, it will redial to users' ISP immediately to make the connection active. If the network is busy or the user is in private network, we recommend that Router mode will be better.



Object – Keep Online	Description
Detection Method-None	Do not set this function
Detection Method-Ping	Send ping packet to detect the connection, when choosing this method. Users should also configure "Detection Interval", "Primary Detection Server IP" and "Backup Detection Server IP" items.
Detection Method-Route	Detect connection with route method, when choosing this method. Users should also configure "Detection Interval", "Primary Detection Server IP" and "Backup Detection Server IP" items.
Detection Method-TCP	Detect connection with TCP method, when choosing this method. Users should also configure "Detection Interval" item.
Detection Interval	Time interval between two detections; unit is second
Primary Detection Server IP	The server is used to response the Router's detection packet. This item is only valid for method "Ping" and "Route".
Backup Detection Server IP	The server is used to response the Router's detection packet. This item is valid for method "Ping" and "Route"

When users choose the "Route" or "Ping" method, it's quite important to make sure that the "Primary Detection Server IP" and "Backup Detection Server IP" are usable and stable, because they have to response the detection packet frequently.

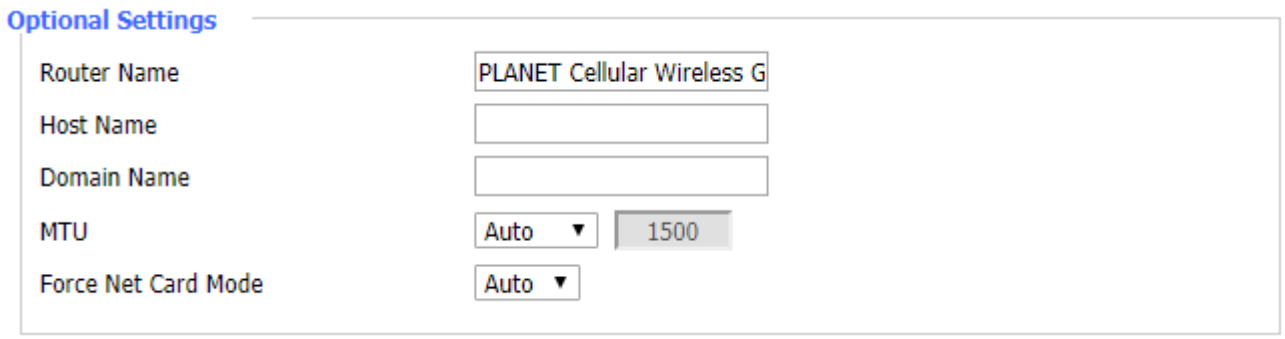
Force reconnect

This option schedules the **PPPoE** or **3G** reconnection by killing the pppd daemon and restarts it. After enabling the function, you are able to set the time to reconnect.

STP

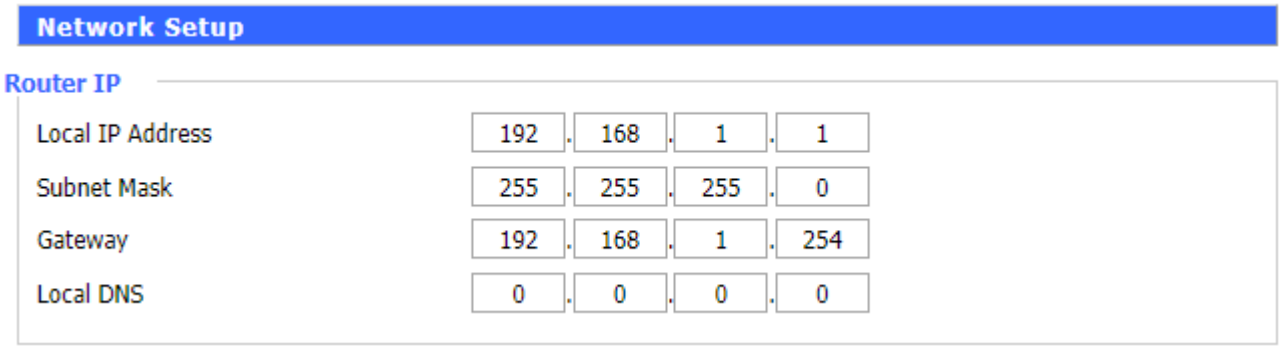
STP (Spanning Tree Protocol) can be applied to loop network. Through certain algorithm achieves path redundancy, and loop network cuts to tree-based network without loop, thus avoiding the hyperplasia and infinite circulation of a message in the loop network.

Optional Settings



Object – Keep Online	Description
Router Name	Set Router name
Host Name	ISP provides
Domain Name	ISP provides
MTU	auto (1500) and manual (1200-1492 in PPPOE/PPTP/L2TP mode, 576-16320 in other modes)

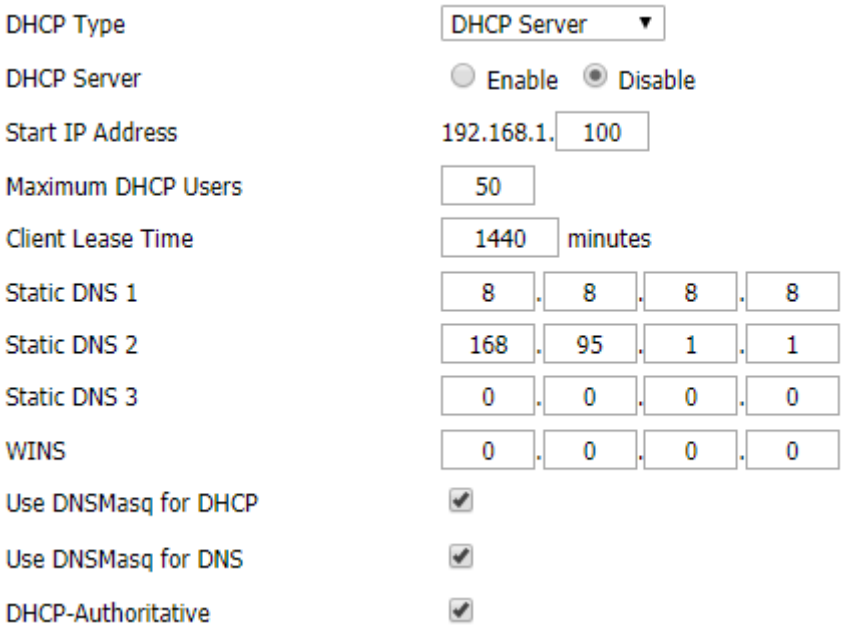
LAN Network Setup



Object – Router IP	Description
Local IP Address	IP address of the gateway. The default IP address is 192.168.1.1
Subnet Mask	The subnet mask of the gateway
Gateway	Set internal gateway of the cellular gateway. By default, internal gateway is the address of the gateway
Local DNS	DNS server is auto assigned by network operator server. Users enable to use their own DNS server or other stable DNS servers, if not, keep it default

Network Address Server Settings (DHCP)

These settings for the gateway's Dynamic Host Configuration Protocol (DHCP) server functionality configuration. The gateway can serve as a network DHCP server. DHCP server automatically assigns an IP address to each computer in the network. If they choose to enable the gatewayr's DHCP server option, users can set all the computers on the LAN to automatically obtain an IP address and DNS, and make sure there are no other DHCP servers in the network.

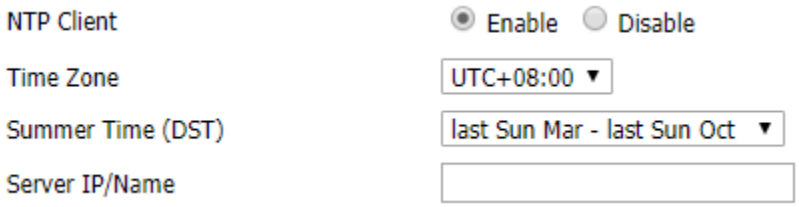


Object – DHCP	Description
DHCP Type	DHCP Server and DHCP Forwarder
DHCP Server	Keep the default Enable to enable the gateway's DHCP server option. If users already have a DHCP server on their network or users do not want a DHCP server, then select Disable.
Start IP Address	Enter a numerical value for the DHCP server to start with when issuing IP addresses. Do not start with 192.168.1.1 (the gateway's own IP address).
Maximum DHCP Users	Enter the maximum number of PCs that users want the DHCP server to assign IP addresses to. The absolute maximum is 253 if 192.168.1.2 is user's starting IP address.
Client Lease Time	The Client Lease Time is the amount of time a network user will be allowed to connect to the Router with their current dynamic IP address. Enter the amount of time, in minutes, that the user will be "leased" with this dynamic IP address.
Static DNS (1-3)	The Domain Name System (DNS) is how the Internet translates domain or website names into Internet addresses or URLs. Users' ISP will provide them with at least one DNS Server IP address. If users wish to utilize another, enter that IP address in one of these fields. Users can enter up to three DNS Server IP addresses here. The Router will utilize them for quicker access to functioning DNS servers
WINS	The Windows Internet Naming Service (WINS) manages each PC's interaction with the Internet. If users use a WINS server, enter that server's IP address here. Otherwise, leave it blank.

DNSMasq	Users' domain name in the field of local search increases the expansion of the host option to adopt DNSMasq that can assign IP addresses and DNS for the subnet. If select DNSMasq, dhcpd service is used for the subnet IP address and DNS.

Time Settings

Select time zone of your location. To use local time, leave the checkmark in the box next to Use local time.



Object – Time Settings	Description
NTP Client	DHCP Server and DHCP Forwarder
Time Zone	Keep the default Enable to enable the gateway's DHCP server option. If users have already a DHCP server on their network or users do not want a DHCP server, then select Disable.
Summer Time (DST)	Enter a numerical value for the DHCP server to start with when issuing IP addresses. Do not start with 192.168.1.1 (the gateway's own IP address).
Server IP/Name	IP address of NTP server is up to 32 characters. If blank, the system will find a server by default.

Adjust Time

To adjust time by the system and refresh to get the time of the web, user can set to modify the time of the system. They can change to adjust time by manual to achieve adjusted time by the system if the system fails to get NTP server.

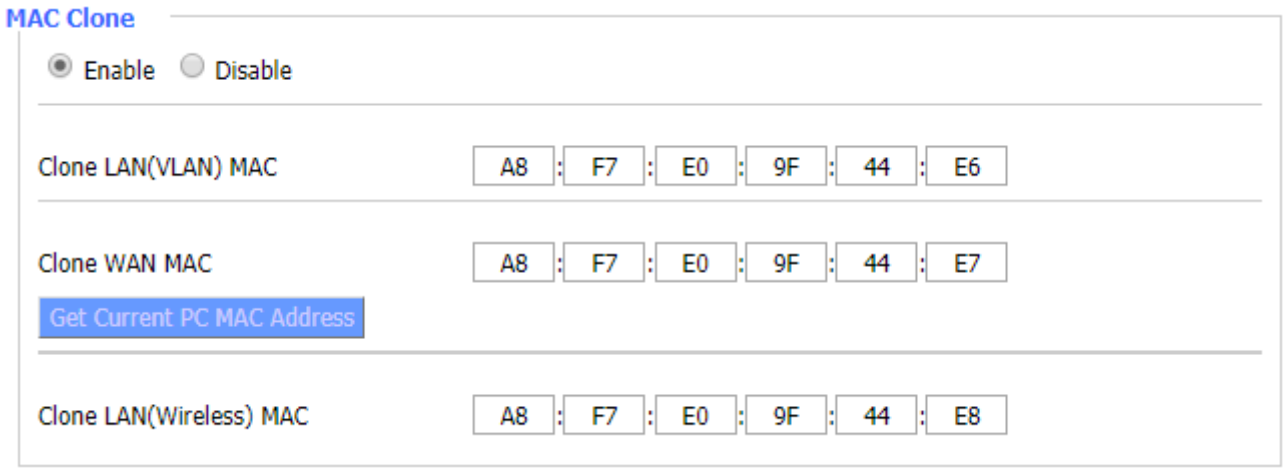
4.3.1.2. DDNS

If user's network has a permanently assigned IP address, users can register a domain name and have that name linked with their IP address by public Domain Name Servers (DNS). However, if their Internet account uses a dynamically assigned IP address, users will not know in advance what their IP address will be, and the address can change frequently. In this case, users can use a commercial dynamic DNS service, which allows them to register their domain to their IP address, and will forward traffic directed at their domain to their frequently-changing IP address.

Object – DDNS	Description
DDNS Service	Supports PLANETDDNS, PLANET EasyDDNS, DynDNS, freedns, Zoneedit, NO-IP, 3322, easyDNS, TZO, DynSIP and Custom based on the user
User Name	Users register in DDNS server, up to 64 characteristic
Host Name	Users register in DDNS server, not limited for input characteristic for now
Type	IP address of NTP server, up to 32 characters. If blank, the system will find a server by default
Wildcard	Supports wildcard or not, the default is OFF. ON means *.host.3322.org is equal to host.3322.org
Do not use external ip check	Enable or disable the function of 'do not use external ip check'
Force Update Interval	Unit is day, try forcing the update dynamic DNS to the server by setting days
Status	DDNS Status shows connection log information

4.3.1.3. Clone MAC Address

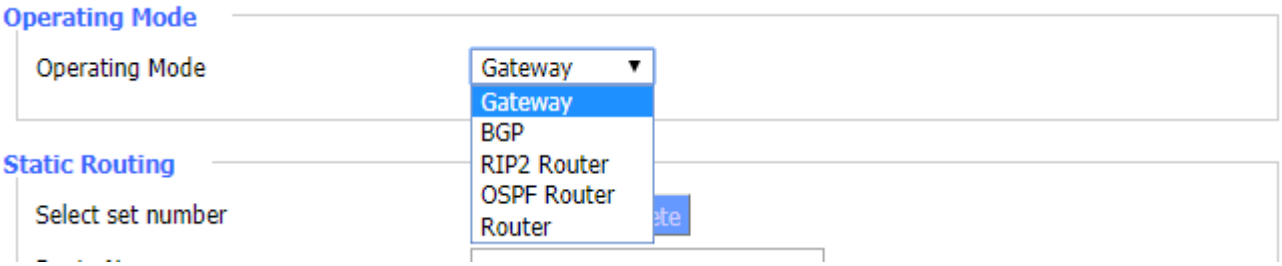
Some ISPs need the users to register their MAC address. The users can clone the gateway MAC address to their MAC address registered in ISP if they do not want to re-register their MAC address. Clone MAC addresses can clone three parts: Clone LAN MAC, Clone WAN MAC, and Clone Wireless MAC.



4.3.1.4. Advanced Routing

Operating Mode: Gateway, BGP, RIP2 Router, OSPF Router and Router

If the Router is hosting users' Internet connection, select Gateway mode. If another Router exists on their network, select Router mode.



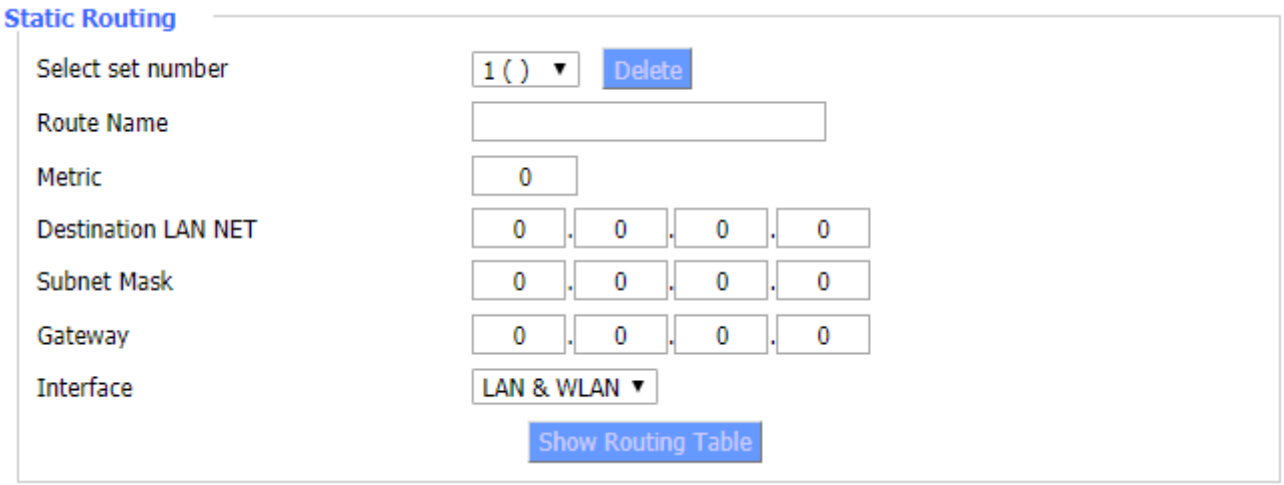
Dynamic Routing

Dynamic Routing enables the Router to automatically adjust to physical changes in the network's layout and exchange routing tables with other Routers. The Router determines the network packets' route based on the fewest number of hops between the source and destination.

To enable the Dynamic Routing feature for the WAN side, select WAN. To enable this feature for the LAN and wireless side, select LAN and WLAN. To enable the feature for both the WAN and LAN, select Both. To disable the Dynamic Routing feature for all data transmissions, keep the default setting, Disable.

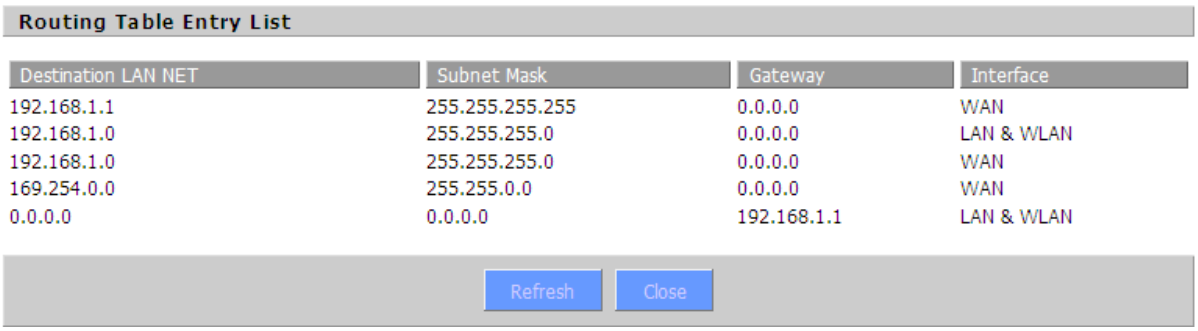
Dynamic Routing is not available in Gateway mode.

Static Routing



Object – Static Routing	Description
Select set number	1-50
Route Name	Defined routing name by users, up to 25 characters
Metric	0-9999
Destination LAN NET	The Destination IP Address is the address of the network or host to which users want to assign a static route
Subnet Mask	The Subnet Mask determines which portion of an IP address is the network portion, and which portion is the host portion
Interface	Indicate whether the Destination IP Address is on the LAN & WLAN (internal wired and wireless networks), the WAN (Internet), or Loopback (a dummy network in which one PC acts like a network, necessary for certain software programs)

Show Routing Table

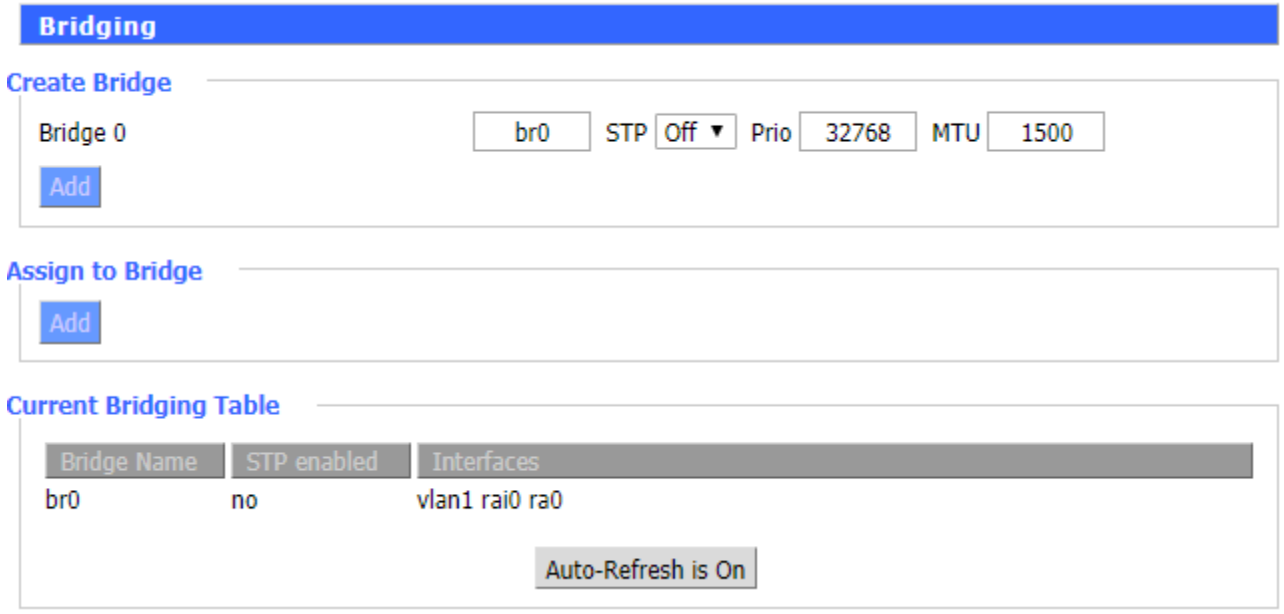


4.3.1.5. VLANS

VLANs function is to divide different VLAN ports by users' will. The system supports 15 VLAN ports from VLAN1-VLAN15. However, there are only 5 ports (1 WAN port and 4 LAN ports) divided by users themselves, and

meanwhile LAN port and WAN port disable is to divide into one VLAN port.

4.3.1.6. Networking

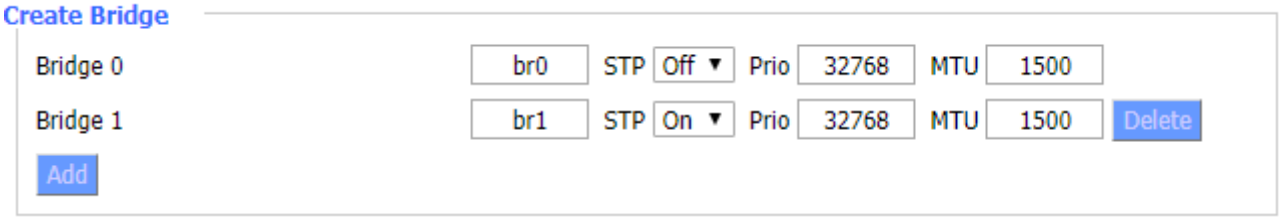


Object – Networking	Description

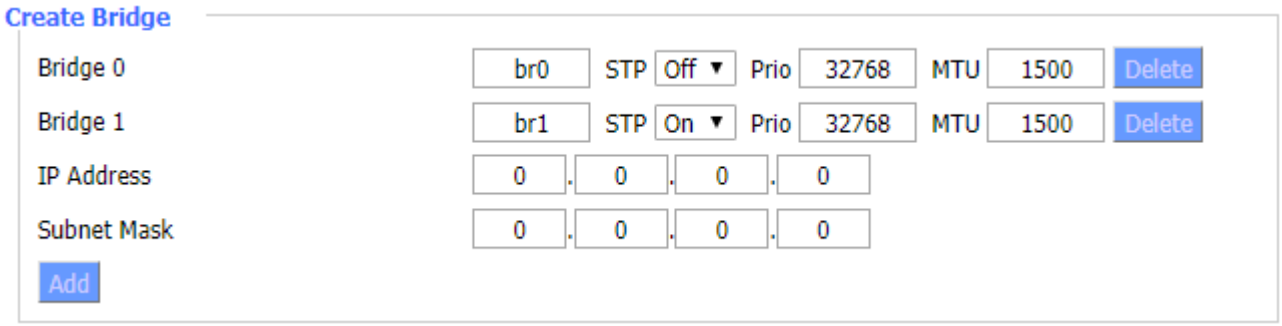
Bridging-Create Bridge	Creates a new empty network bridge for later use. STP means Spanning Tree Protocol and with PRIO users are able to set the bridge priority order. The lowest number has the highest priority.
Bridging-Assign to Bridge	Allows users to assign any valid interface to a network bridge. Consider setting the Wireless Interface options to Bridged if they want to assign any Wireless Interface here. Any system specific bridge setting can be overridden here in this field.
Current Bridging Table	Shows current bridging table

Create Bridge

Click 'Add' to create a new bridge; configuration is shown below:



Create bridge option: the first br0 means bridge name. STP means to on/off spanning tree protocol. Prio means priority level of STP; the smaller the number, the higher the level. MTU means maximum transfer unit; default is 1500. Delete if it is not needed. And then click 'Save' or 'Add'. Bridge properties are shown below:

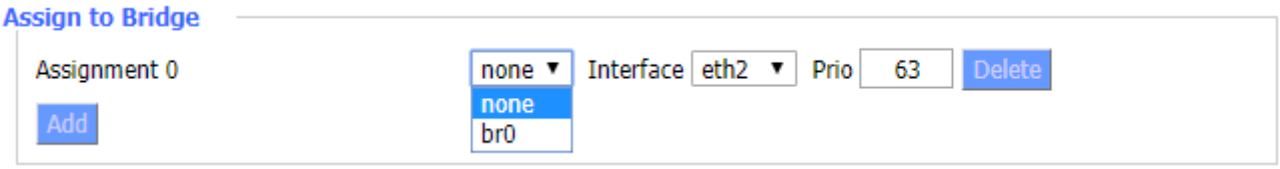


Enter relevant bridge IP address and subnet mask, and then click 'Add' to create a bridge.

Only creating a bridge can be applied.

Assign to Bridge

Assign to Bridge option: To assign different ports to created bridge. For example: assign port (wireless port) is ra0 in br1 bridge as shown below:



Prio means priority level: work if multiple ports are within the same bridge. The smaller the number gets, the higher the level is.

Click 'Add' to take effect.

Note

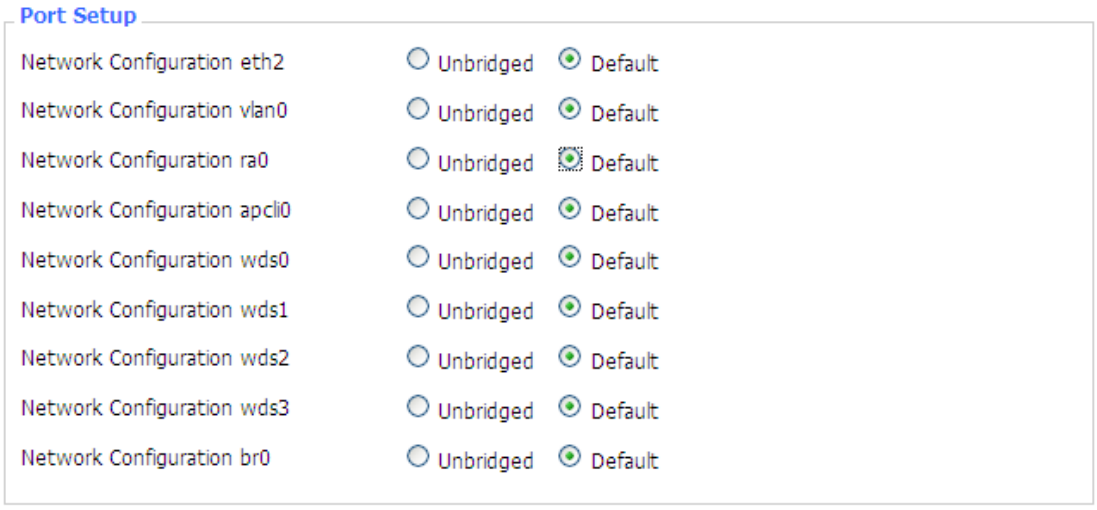
The corresponding interfaces of WAN ports should not be bound; this bridge function is basically used for LAN port, and should not be bound with WAN port

If binding is successful, bridge binding list in the list of current bridging table is shown below:

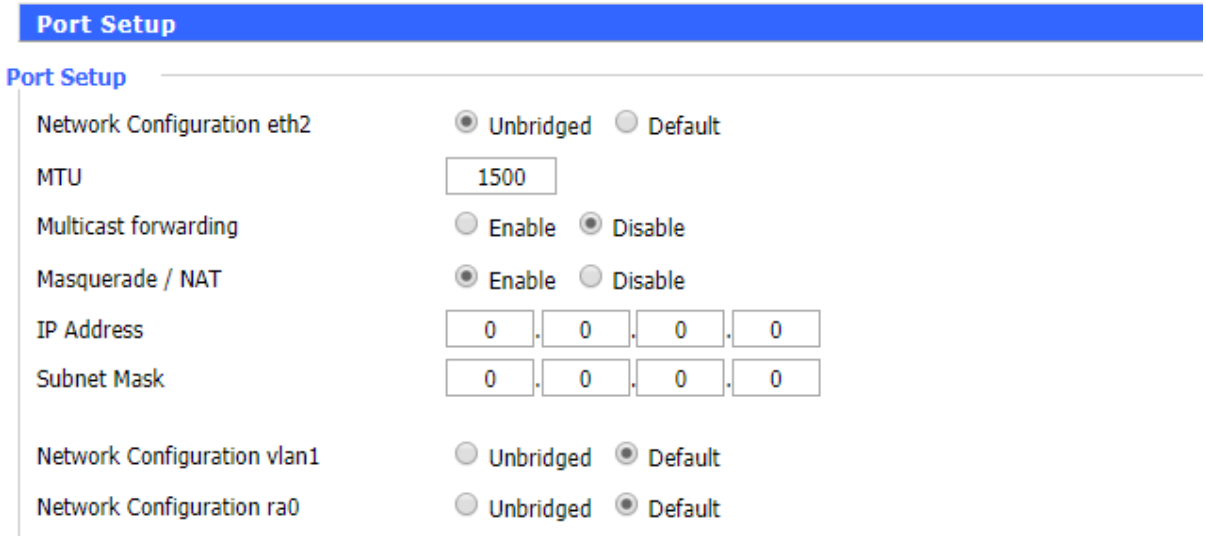
To make br1 bridge have the same function with DHCP assigned address, users need to set multiple DHCP functions. See the introduction of multi-channel DHCPD:

Port Setup

Set the port properly; the default is not set



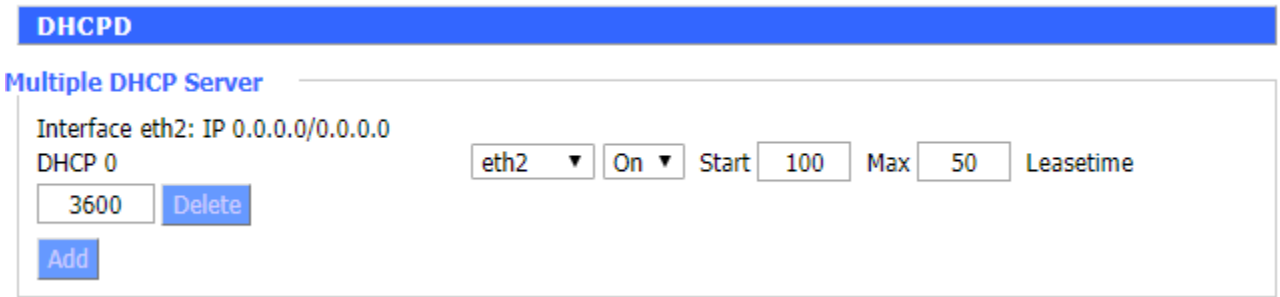
When “Unbridged” is selected, the configuration is shown below.



Object – Port Setup-Unbridged	Description
MTU	Maximum transfer unit
Multicast forwarding	Enable or disable multicast forwarding
Masquerade/NAT	Enable or disable Masquerade/NAT
IP Address	Set ra0's IP address, and do not conflict with other ports or bridge
Subnet Mask	Set the port's subnet mask

Multiple DHCPDs

Using multiple DHCP service -- Click 'Add' in multiple DHCP servers to appear relevant configuration. The first means the name of port or bridge (do not be configured as eth0), the second means whether to on DHCP. Start means start address. Max means maximum assigned DHCP clients. Lease time means the client lease time. The unit is second. Click 'Save' or 'Apply' to put it into effect after setting.

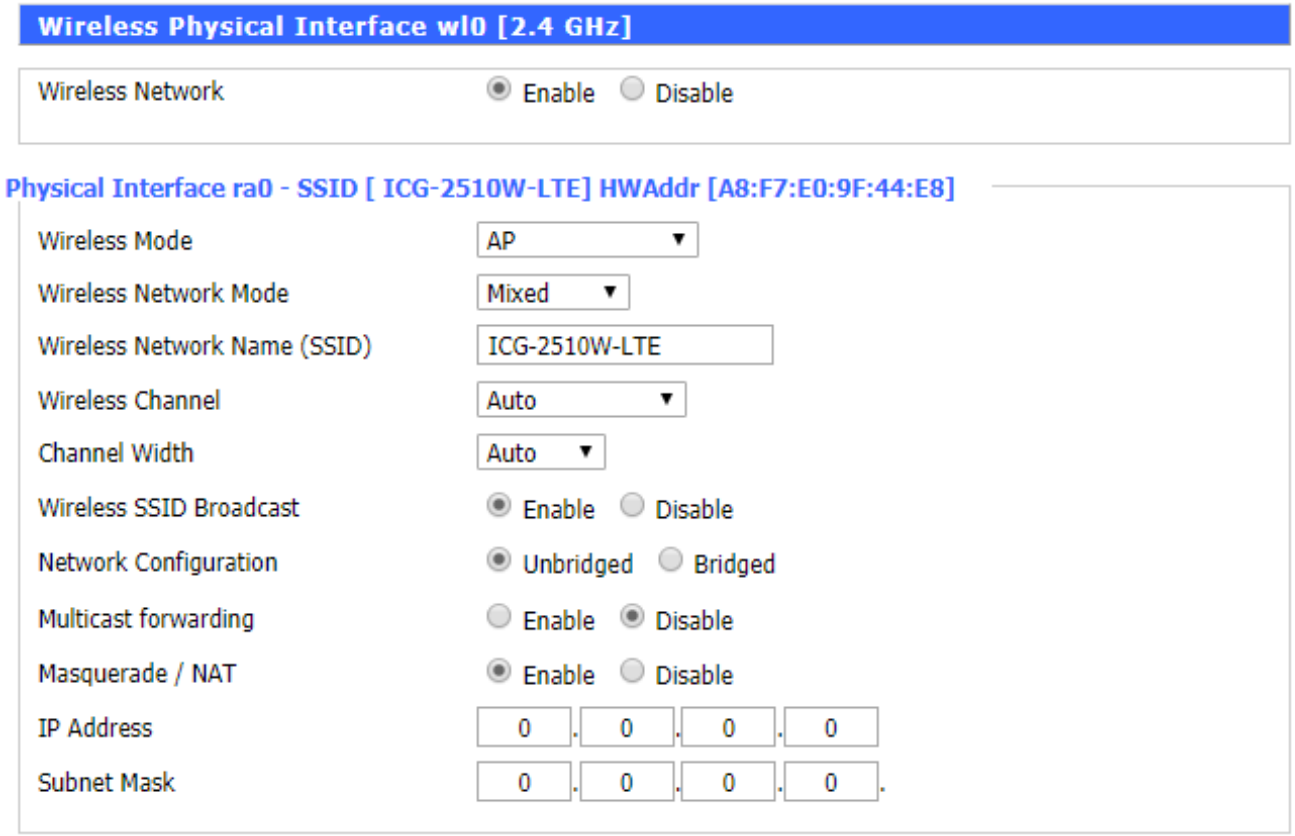


Only configure and click 'Save' to configure the next; configuring multiple DHCPs at the same time is not possible.

4.3.2. Wireless

4.3.2.1. Basic Settings

Wireless Physical Interface

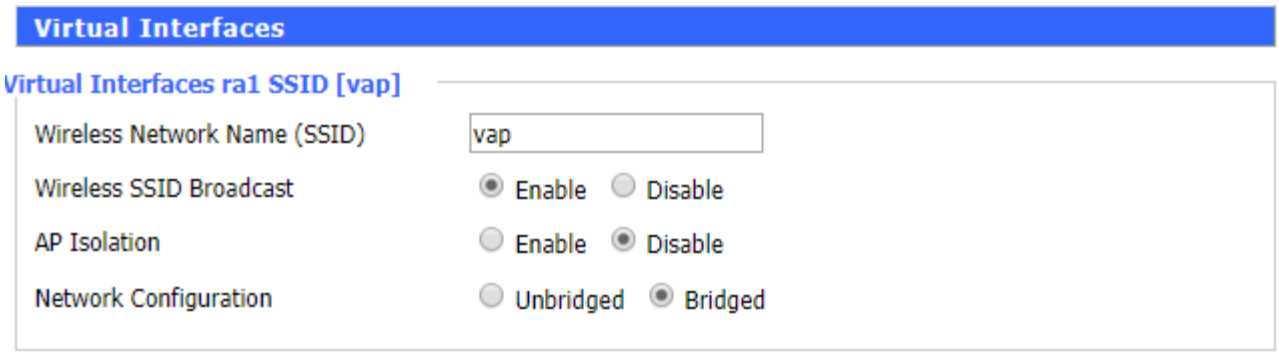


Object – Wireless Basic Settings	Description
Wireless Network	Enable is for radio on and Disable is for radio off
Wireless Mode	AP, Client, Repeater, Repeater Bridge
Wireless Network Mode	Disabled, Mixed, BG-Mixed, B-Only, G-Only, NG-Mixed, N-Only
Wireless Network Name (SSID)	The default is ICG-2510W-LTE or ICG-2510WG-LTE
Wireless Channel	A total of 1-13 channels to choose from for more than one wireless device environment. Please try to avoid using the same channel with other devices
Channel Width	Auto, 20MHz and 40MHz
Wireless SSID	SSID can be hidden when disabled is selected. The default is enabled.

Broadcast	
Network Configuration	IP address needs to be manually configured when unbridged is selected

Virtual Interfaces

Click Add to add a virtual interface. Click on the remove to remove the virtual interface.



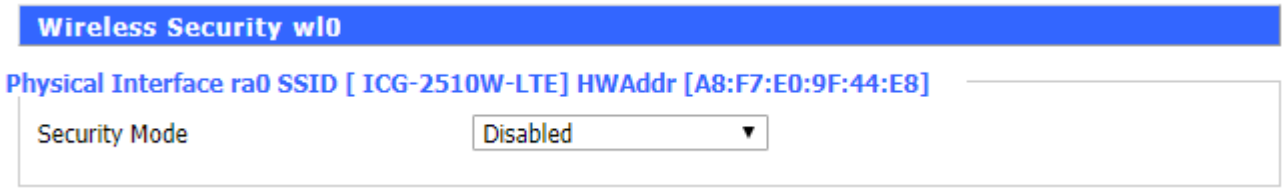
Object – Virtual Server	Description
AP Isolation	This setting isolates wireless client so access to and from other wireless clients are stopped.

Note

Save your changes after changing the "Wireless Mode". For "Wireless Network Mode", "Wireless Width", or "Broadband" option, click on the button you prefer to configure.

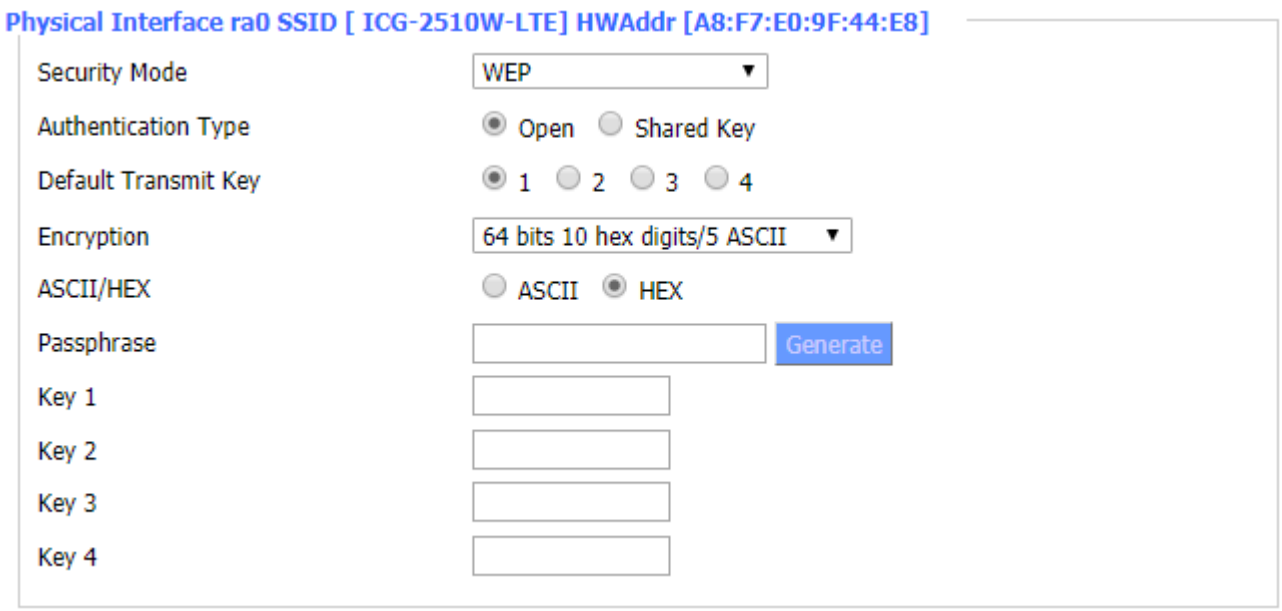
4.3.2.2. Wireless Security

Wireless security option is used to configure the security of your wireless network. This route has a total of seven kinds of wireless security mode. Disabled by default, not safe mode is enabled. For changes in Safe Mode, click Apply to take effect immediately.



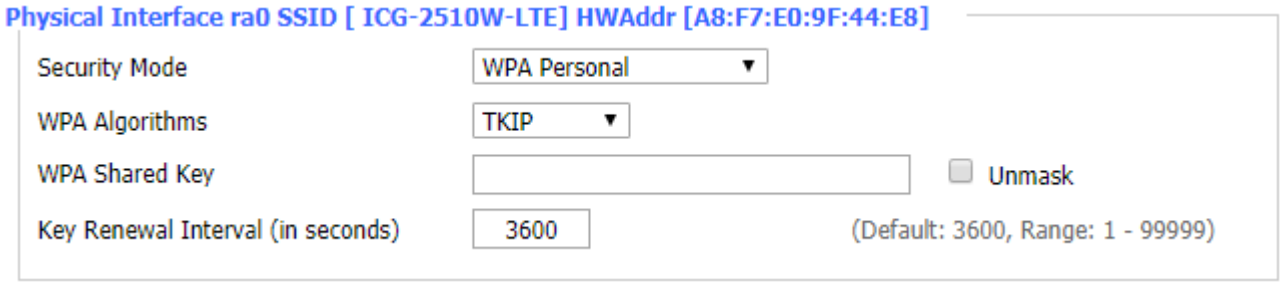
WEP

It is a basic encryption algorithm that is less secure than WPA. Use of WEP is discouraged due to security weaknesses, and one of the WPA modes should be used whenever possible. Only use WEP if you have clients that can only support WEP (usually older, 802.11b-only clients).



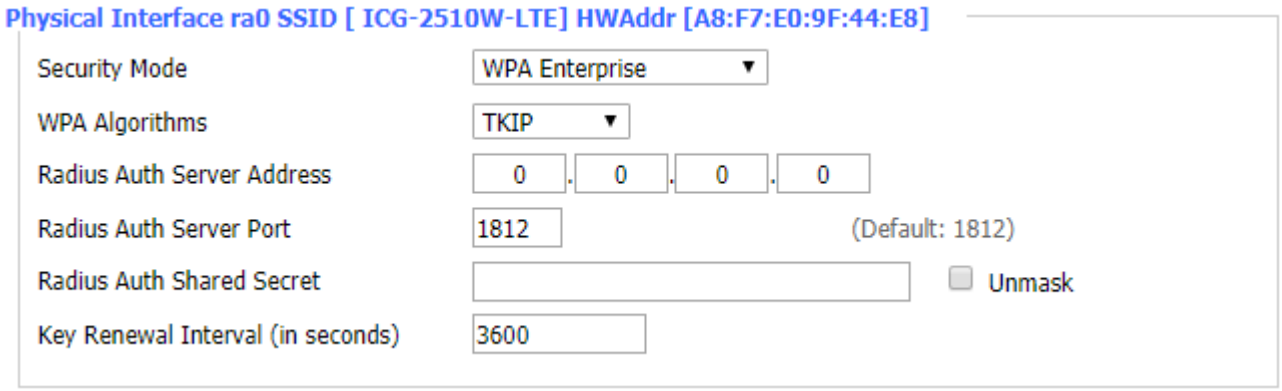
Object – Wireless Security-WEP	Description
Authentication Type	Open or shared key
Default Transmit Key	Select the key from Key 1 to Key 4.
Encryption	There are two levels of WEP encryption, 64-bit (40-bit) and 128-bit. To utilize WEP, select the desired encryption bit, and enter a passphrase or WEP key in hexadecimal format. If you are using 64-bit (40-bit), then each key must consist of exactly 10 hexadecimal characters or 5 ASCII characters. For 128-bit, each key must consist of exactly 26 hexadecimal characters. Valid hexadecimal characters are "0"-"9" and "A"-"F"
ASCII/HEX	ASCII, the keys is 5 bit ASCII characters/13bit ASCII characters HEX, the keys is 10bit/26 bit hex digits
Passphrase	The letters and numbers used to generate a key
Key1-Key4	Manually fill out or generated according to input on the pass phrase

WPA Personal/WPA2 Personal/WPA2 Personal Mixed



Object – Wireless Security-WPA Personal/WPA2 Personal/WPA2 Personal Mixed	Description
WPA Algorithms	TKIP, AES and TKIP + AES
WPA Shared Key	Between 8 and 63 ASCII characters or hexadecimal digits
Key Renewal Interval (in seconds)	1-99999

WPA Enterprise/WPA2 Enterprise/WPA2 Enterprise Mixed



Object – Wireless Security-WPA Enterprise/WPA2 Enterprise/WPA2 Enterprise Mixed	Description
WPA Algorithms	TKIP, AES and TKIP + AES
Radius Auth Server Address	The IP address of the RADIUS server

Radius Auth Server Port	The RADIUS port and the default is 1812
Radius Auth Shared Secret	The shared secret from the RADIUS server
Key Renewal Interval (in seconds)	1-99999

4.3.3. Services

4.3.3.1. Services

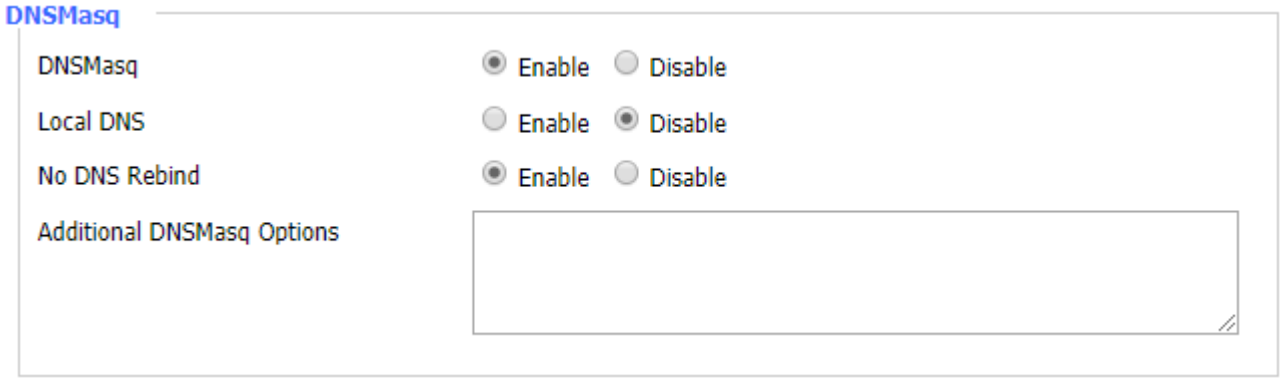
DHCP Server

DHCPd assigns IP addresses to user local devices. While the main configuration is on the setup page users can program some nifty special functions here.

Object – DHCPd	Description
Additional DHCPd Options	Some extra options users can set by entering them
Static Leases	If users want to assign to certain hosts a specific address, they can define them here. This is also the way to add hosts with a fixed address to the gateway's local DNS service (DNSmasq).

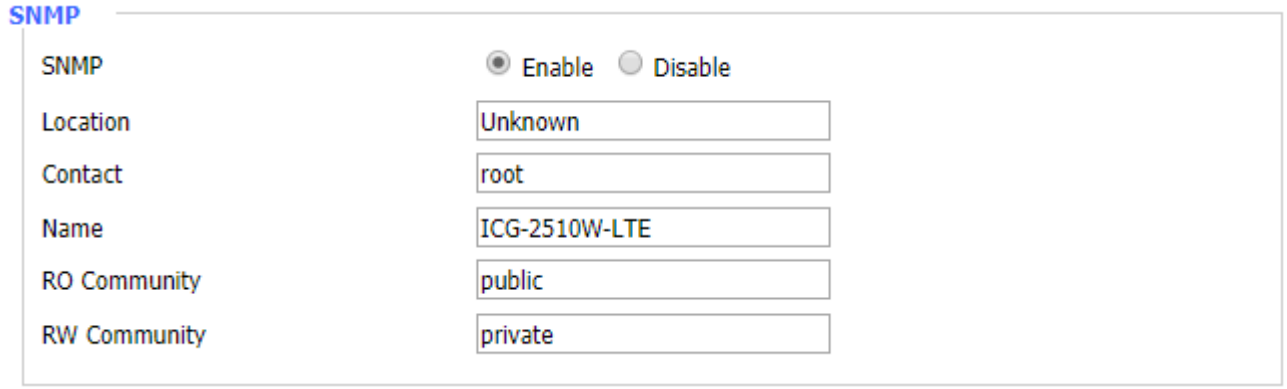
DNSMasq

DNSmasq is a local DNS server. It will resolve all host names known to the Router from dhcp (dynamic and static) as well as forwarding and caching DNS entries from remote DNS servers. Local DNS enables DHCP clients on the LAN to resolve static and dynamic DHCP host names.



Object – DNSMasq	Description
Local DNS	Enables DHCP clients on the LAN to resolve static and dynamic DHCP host names.
No DNS Rebind	When enabled, it can prevent an external attacker to access the gateway's internal Web interface. It is a secure measure.
Additional DNSMasq Options	Some extra options users can set by entering them in Additional DNS Options. For example: **static allocation:** dhcp-host=AB:CD:EF:11:22:33,192.168.0.10,myhost,myhost.domain,12h **max lease number:** dhcp-lease-max=2 **DHCP server IP range:** dhcp-range=192.168.0.110,192.168.0.111,12h

SNMP

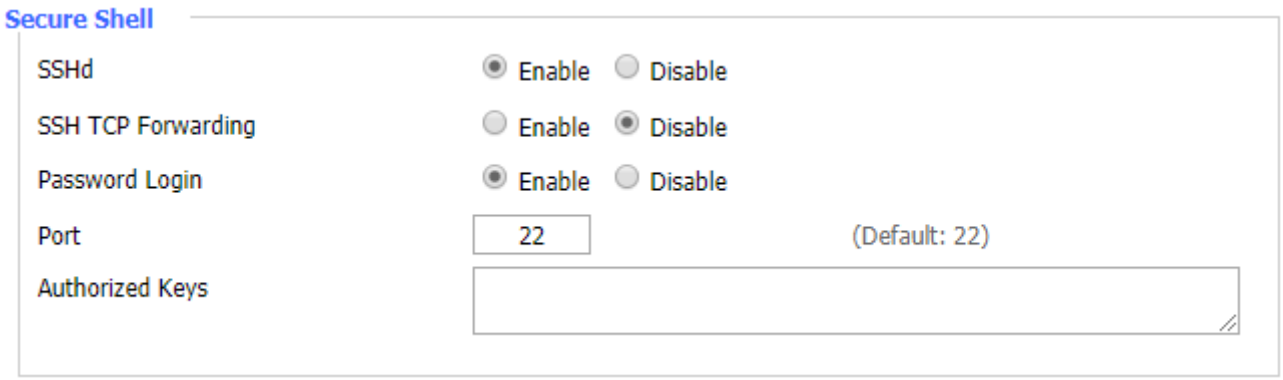


Object – SNMP	Description
Location	Enables DHCP clients on the LAN to resolve static and dynamic DHCP hostnames.
Contact	When enabled, it can prevent an external attacker to access the gateway's internal Web interface. It is a secure measure.
Name	Some extra options users can set by entering them in Additional DNS

	Options. For example: **Static allocation:** dhcp-host=AB:CD:EF:11:22:33,192.168.0.10,myhost,myhost.domain,12h **Max lease number:** dhcp-lease-max=2 **DHCP server IP range:** dhcp-range=192.168.0.110,192.168.0.111,12h
RO Community	SNMP RO community name, the default is public, Only to read
RW Community	SNMP RW community name, the default is private, Read-write permissions

SSHD

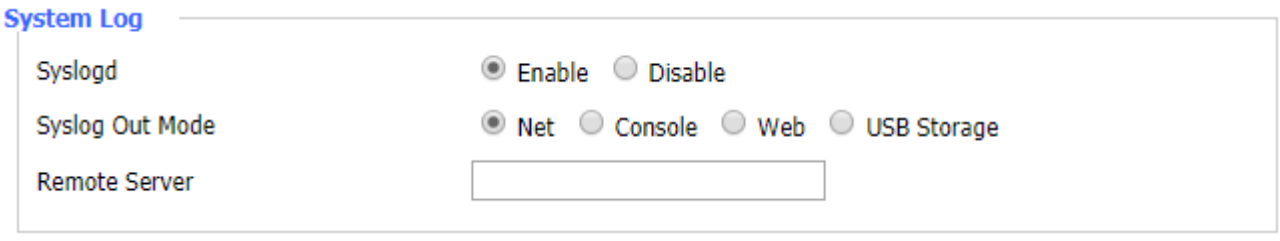
Enabling SSHd allows users to access the Linux OS of their Router with an SSH client.



Object – Secure Shell	Description
SSH TCP Forwarding	Enable or disable to support the TCP forwarding
Password Login	Allows login with the gateway password (username is admin)
Port	Port number for SSHd and the default is 22
Authorized Keys	Here users paste their public keys to enable key-based login (more secure than a simple password)

System Log

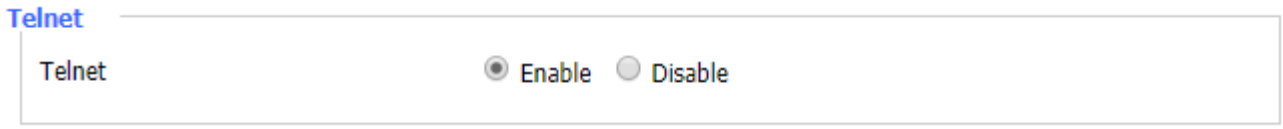
Enable Syslogd to capture system messages. By default, they will be collected in the local file /var/log/messages. To send them to another system, enter the IP address of a remote syslog server.



Object – System Log	Description
Syslog Out Mode	The Syslog Out Mode supports four log modes. **Net:** the log information output to a syslog server **Console:** the log information output to console port
Remote Server	If net mode is chosen, users should input a syslog server's IP Address and run a syslog server program on it

Telnet

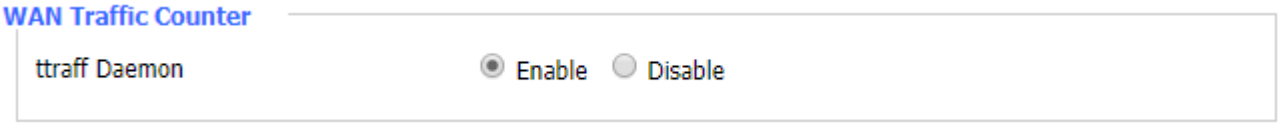
Enable a telnet server to connect to the gateway with telnet. The username is admin and the password is the gateway's password.



If users use the gateway in an untrusted environment (for example, a public hotspot), it is strongly recommended to use SSHd and disable telnet.

WAN Traffic Counter

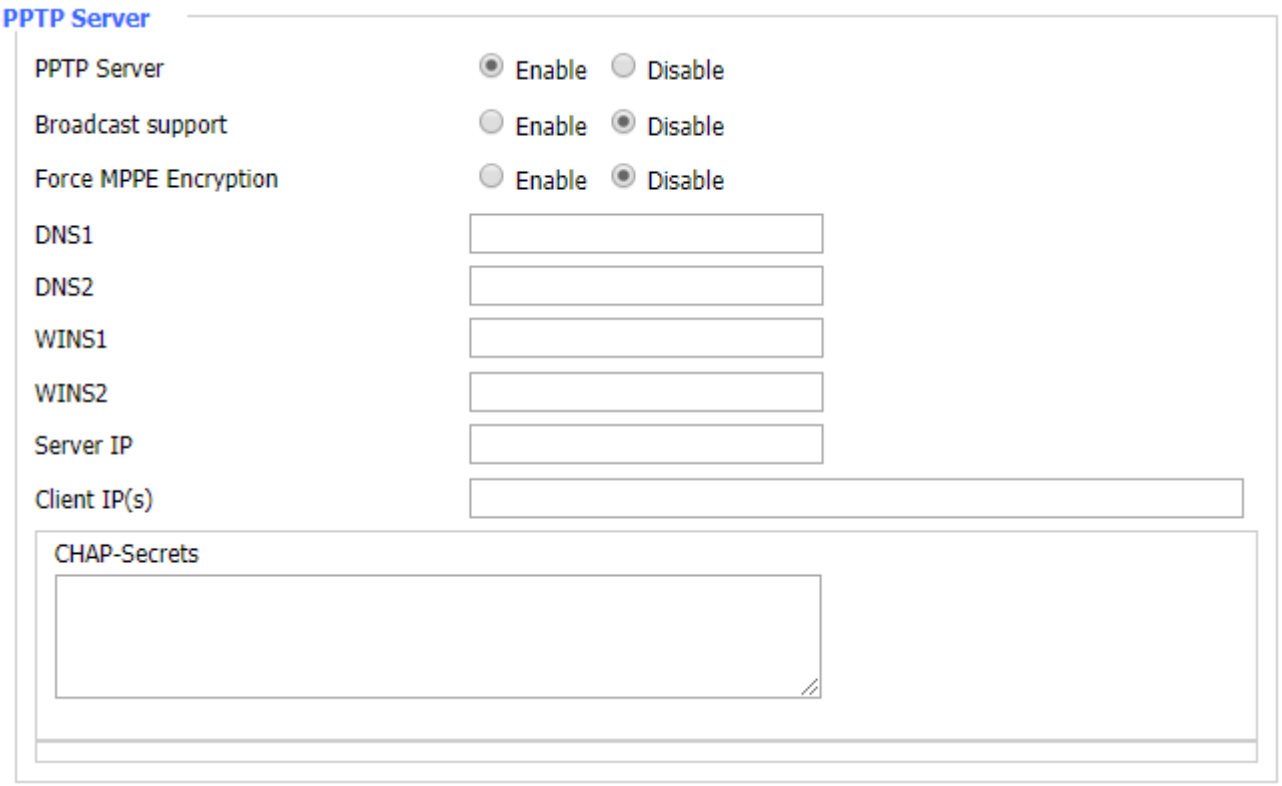
Enable or disable WAN traffic counter function.



4.3.4. VPN

4.3.4.1. PPTP

PPTP Server

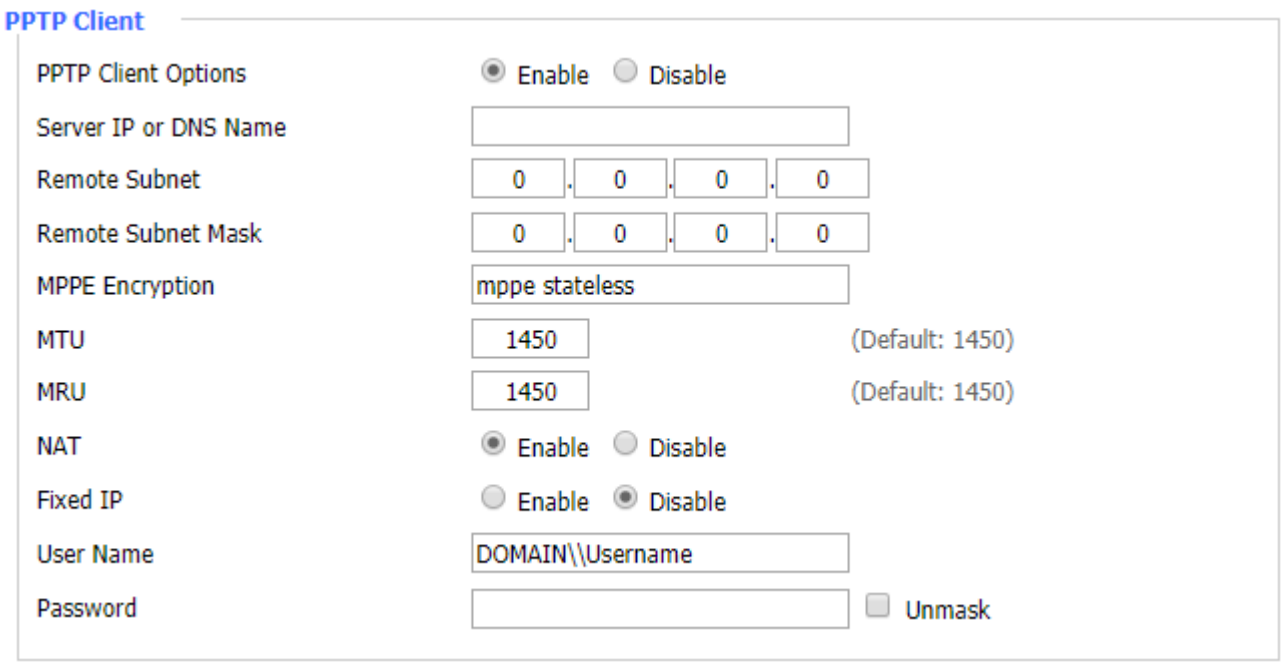


Object – PPTP Server	Description
Broadcast Support	Enable or disable broadcast support of PPTP server
Force MPPE Encryption	Enable of disable force MPPE encryption of PPTP data
DNS1/DNS2/WINS1/WINS-2	Set DNS1/DNS2/WINS1/WINS2
Server IP	Input IP address of the gateway as PPTP server, different from LAN address
Client IP(s)	IP address is assigned to the client; the format is xxx.xxx.xxx.xxx-xxx
CHAP-Secrets	User name and password of the client using PPTP service

Client IP must be different with IP assigned by gateway DHCP.

The format of CHAP Secrets is user * password *.

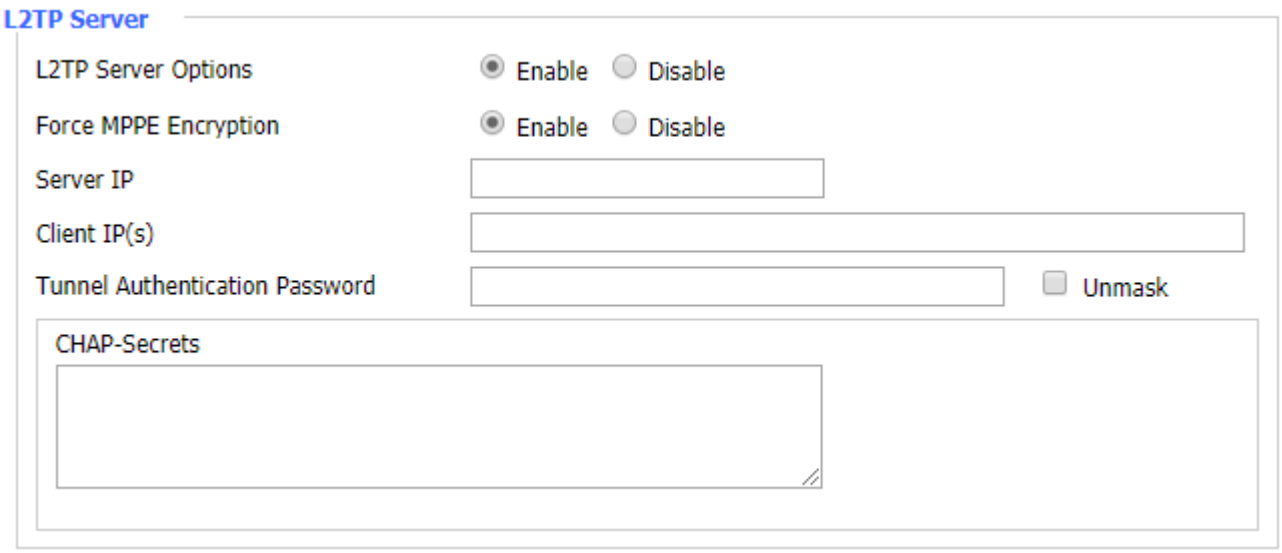
PPTP Client



Object – PPTP Client	Description
Server IP or DNS Name	PPTP server's IP address or DNS name
Remote Subnet	The network of the remote PPTP server
Remote Subnet Mask	Subnet mask of remote PPTP server
MPPE Encryption	Enable or disable Microsoft Point-to-Point Encryption
MTU	Maximum transmission unit
MRU	Maximum receive unit
NAT	Enable or Disable network address translation
Fixed IP	
User Name	User name to log into PPTP Server
Password	Password to log into PPTP Server

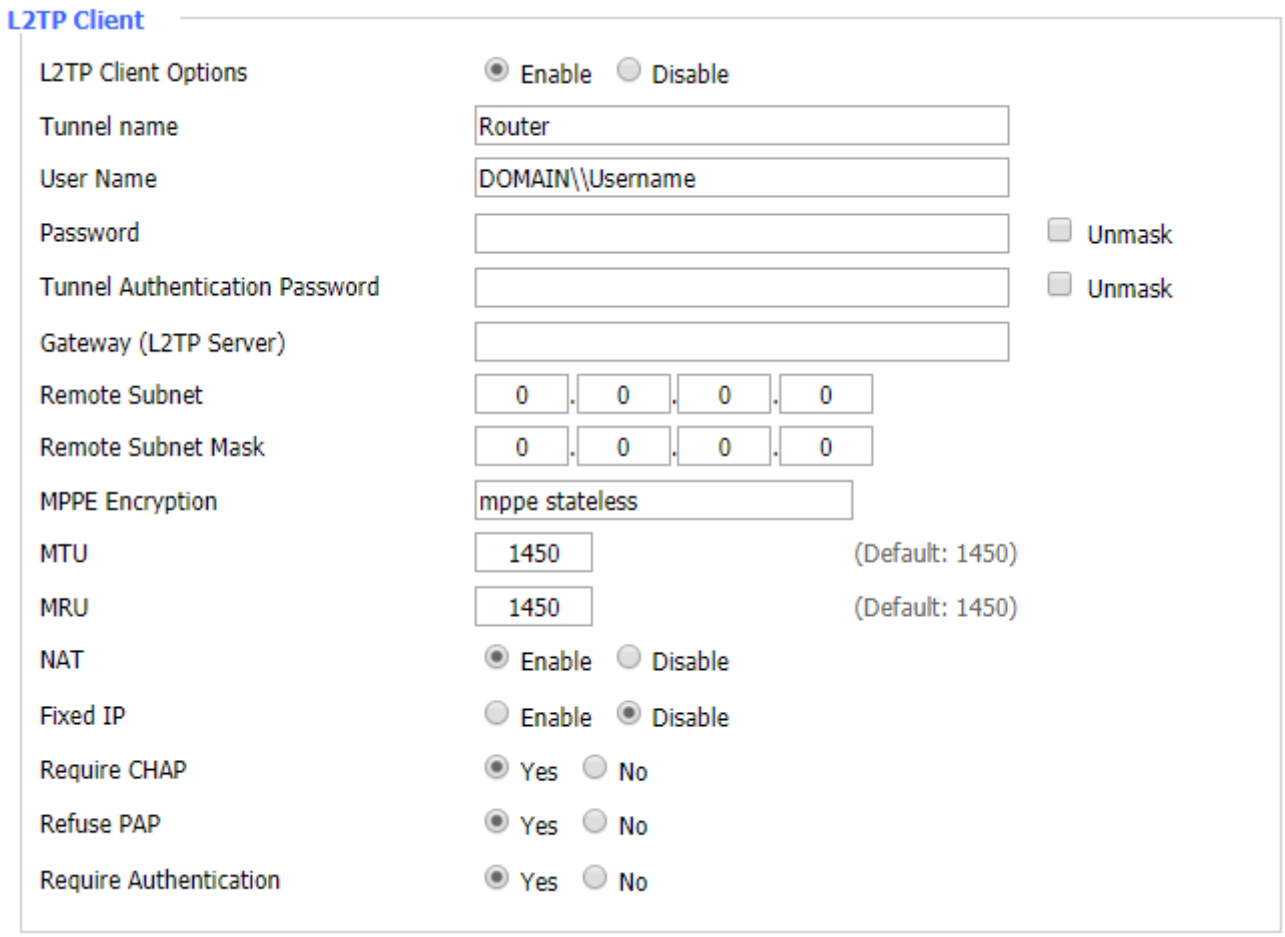
4.3.4.2. L2TP

L2TP Server



Object – L2TP Server	Description
Force MPPE Encryption	Enable or disable force MPPE encryption of L2TP data
Server IP	Input IP address of the gateway as PPTP server, different from LAN address
Client IP(s)	IP address is assigned to the client; the format is xxx.xxx.xxx.xxx-xxx.xxx.xxx.xxx
CHAP Secrets	User name and password of the client using L2TP service

L2TP Client

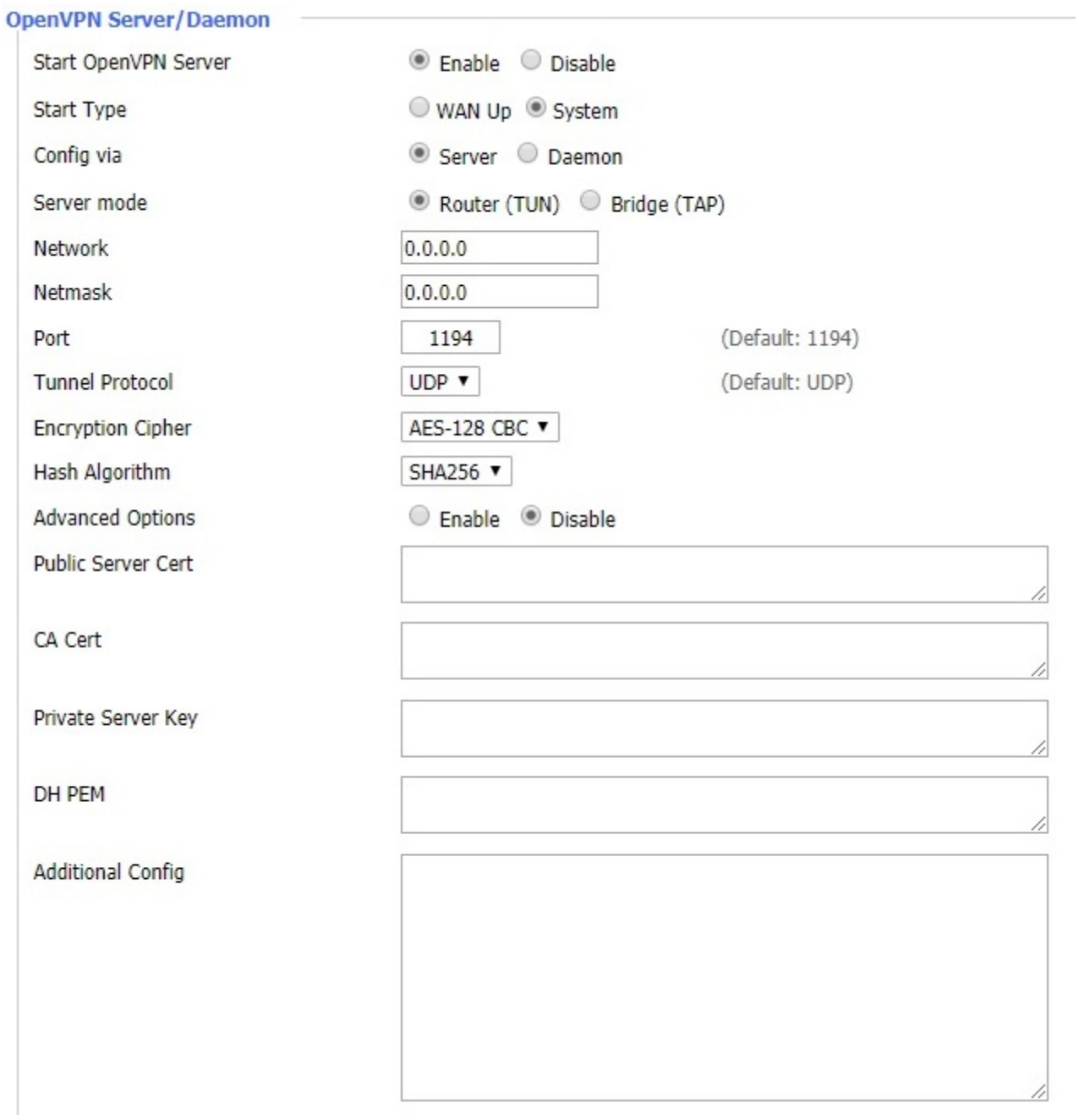


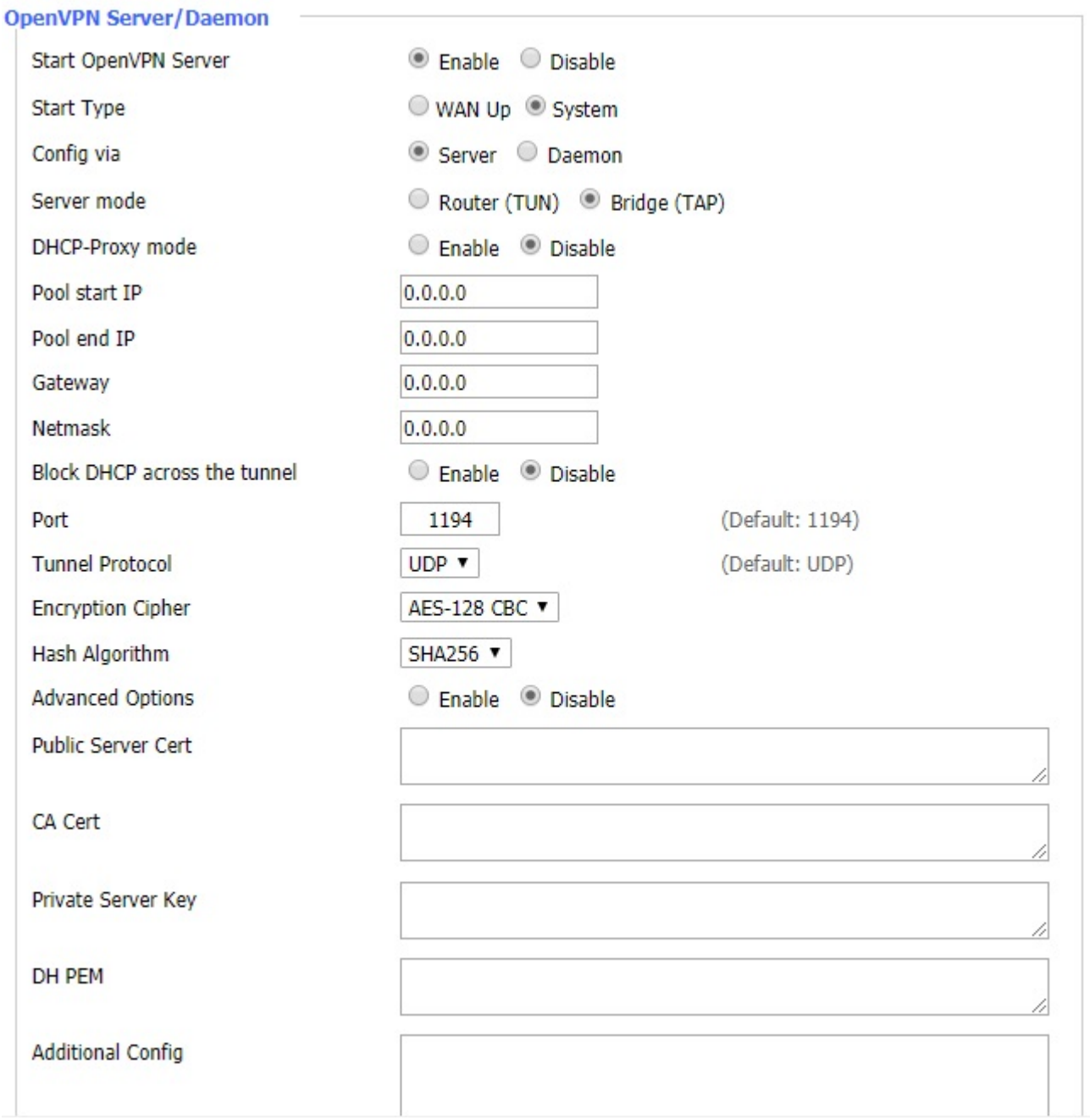
Object – L2TP Client	Description
User Name	User name to log in L2TP server
Password	Password to log in L2TP server
Gateway (L2TP Server)	L2TP server's IP Address or DNS Name
Remote Subnet	The network of remote PPTP server
Remote Subnet Mask	The subnet mask of remote PPTP server
MPPE Encryption	Enable or disable Microsoft Point-to-Point Encryption
MTU	Maximum transmission unit
MRU	Maximum receive unit
NAT	Enable or disable network address translation
Require CHAP	Enable or disable supporting chap authentication protocol
Refuse PAP	Enable or disable refusing to support the pap authentication
Require	Enable or disable supporting authentication protocol

Authentication	

4.3.4.3. OPENVPN

OPENVPN Server

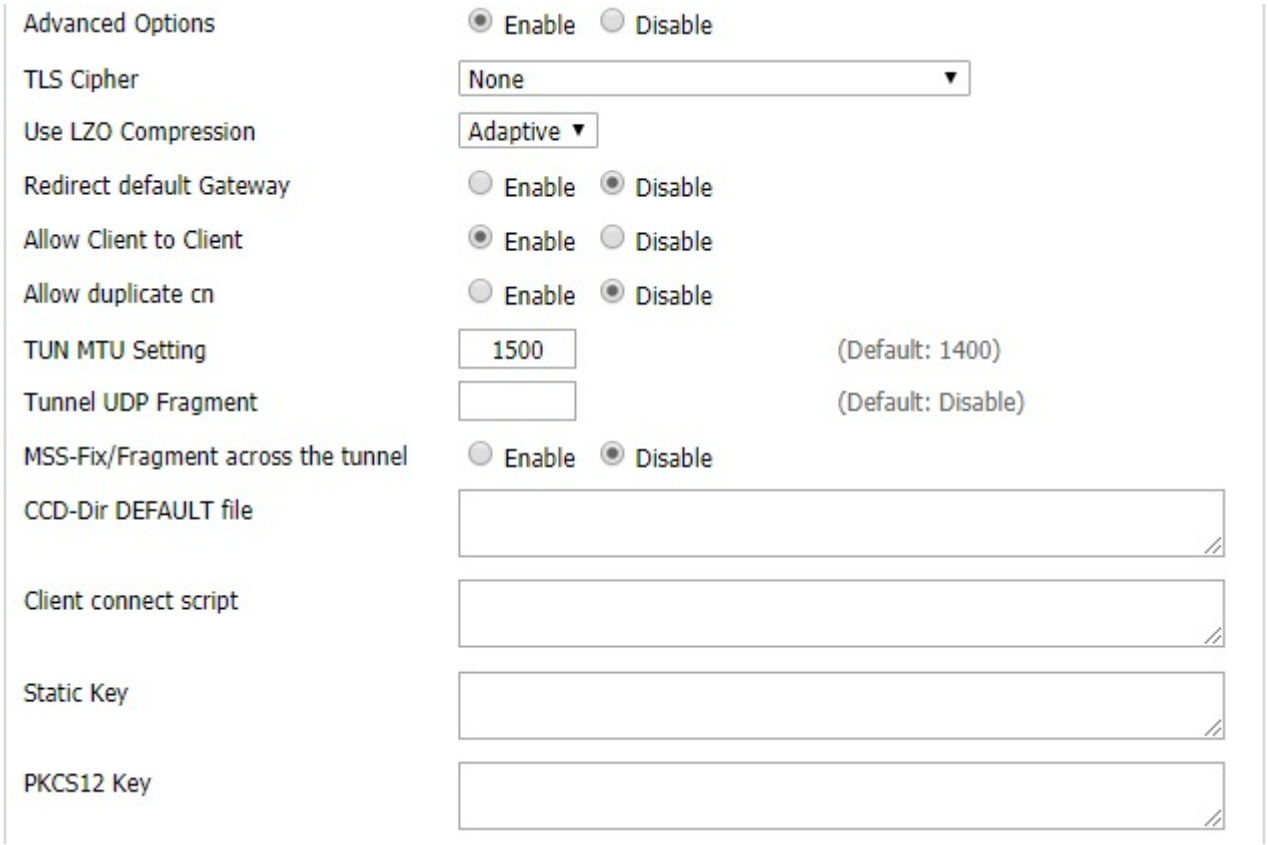




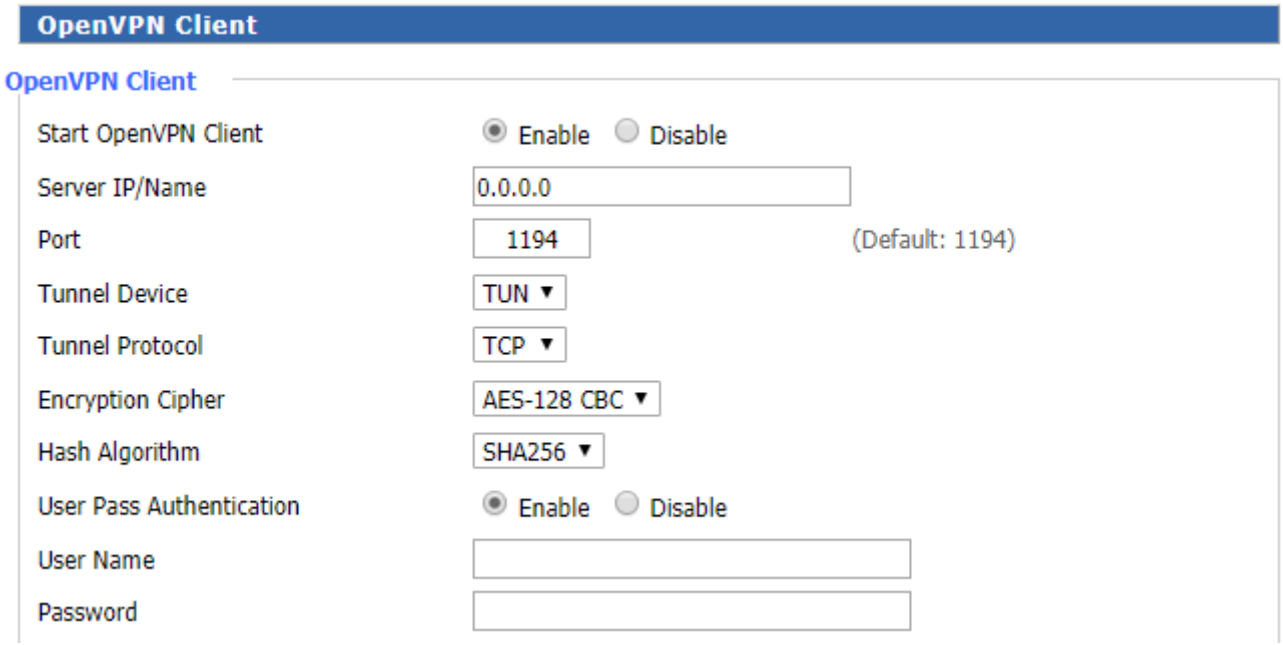
Object – OPENVPN Server	Description
Start Type	WAN UP: Start after online System: Start when booting up
Config via	Server or Daemon
Server Mode	Router (TUN) and Bridge (TAP) modes
Router (TUN) Mode	Network: Network address allowed by OPENVPN server Netmask: Netmask allowed by OPENVPN server

Bridge (TAP) Mode	DHCP-Proxy mode: enable or disable DHCP-Proxy mode Pool start IP: Pool start IP of the client allowed by OPENVPN server Pool end IP: Pool end IP of the client allowed by OPENVPN server Gateway: The gateway of the client allowed by OPENVPN server Netmask: Netmask of the client allowed by OPENVPN server
Port	Listen port of OPENVPN server
Tunnel Protocol	UCP or TCP of OPENVPN tunnel protocol
Encryption Cipher	Blowfish CBC, AES-128 CBC, AES-192 CBC, AES-256 CBC, AES-512 CBC
Hash Algorithm	Hash algorithm provides a method of quick access to data, including SHA1, SHA256, SHA512, MD4, MD5
MRU	Maximum receive unit
NAT	Enable or disable network address translation
Require CHAP	Enable or disable supporting chap authentication protocol
Refuse PAP	Enable or disable refusing to support the pap authentication
Require Authentication	Enable or disable supporting authentication protocol

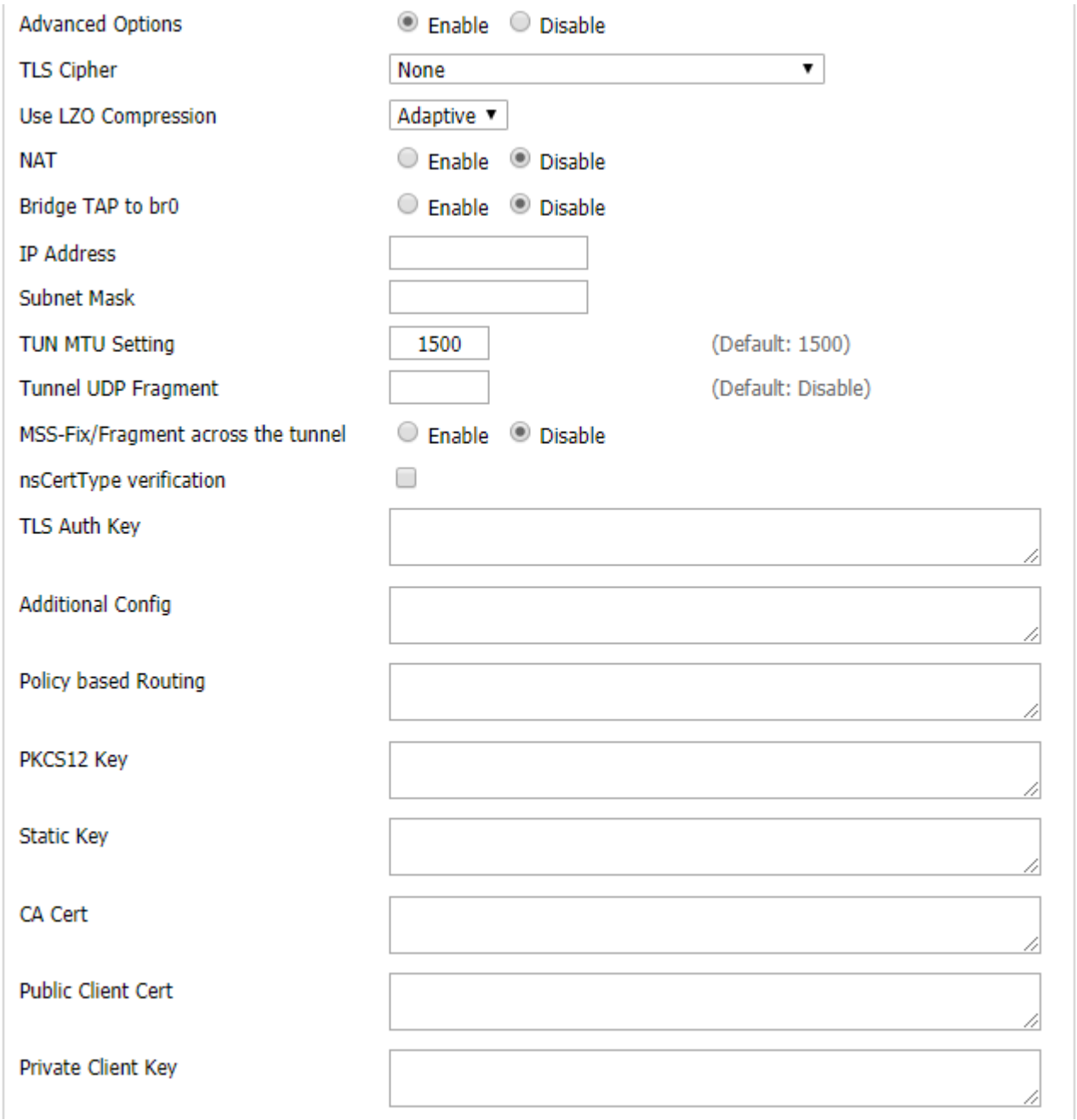
Advanced Options



OPENVPN Client



Object – OPENVPN Client	Description
Server IP/Name	IP address or domain name of OPENVPN server
Port	listen port of OPENVPN client
Tunnel Device	TUN: Router mode TAP: Bridge mode
Tunnel Protocol	UDP and TCP protocol
Encryption Cipher	Blowfish CBC, AES-128 CBC, AES-192 CBC, AES-256 CBC, AES-512 CBC
Hash Algorithm	Hash algorithm provides a method of quick access to data, including SHA1, SHA256, SHA512, MD5



Object – OPENVPN Client	Description
TLS Cipher	TLS (Transport Layer Security) encryption standard supports multiple options
Use LZO Compression	Enable or disable use LZO compression for data transfer
NAT	Enable or disable NAT through function
Bridge TAP to br0	Enable or disable bridge TAP to br0
IP Address	Set IP address of local OPENVPN client
Subnet mask	Set IP subnet of local OPENVPN client

TUN MTU Setting	Set MTU value of the tunnel
TLS Auth Key	Authority key of Transport Layer Security
Additional Config	Additional configurations of OPENVPN server
Policy based Routing	Input some defined routing policy
CA Cert	CA certificate
Public Client Cert	Client certificate
Private Client Key	Client key

4.3.4.4. IPSEC

Connect Status and Control

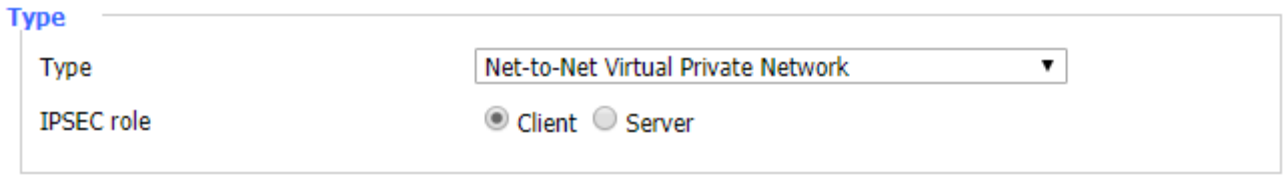
Show IPSEC connection and status of current router on IPSEC page.

Object – IPSEC	Description
NAME	The name of IPSEC connection
Type	The type and function of current IPSEC connection
Common Name	Local subnet, local address, opposite end address and opposite end subnet of current connection
Status	Closed: This connection does not launch a connection request to opposite end Negotiating: This connection launch a request to opposite end, is under negotiating, the connection has not been established yet Establish: The connection has been established, enabled to use this tunnel
Action	The action of this connection, current is to delete, edit, reconnect and enable. Delete: To delete the connection, also will delete IPSEC if IPSEC has set up Edit: To edit the configure information of this connection, reload this connection to make the configuration effect after edit

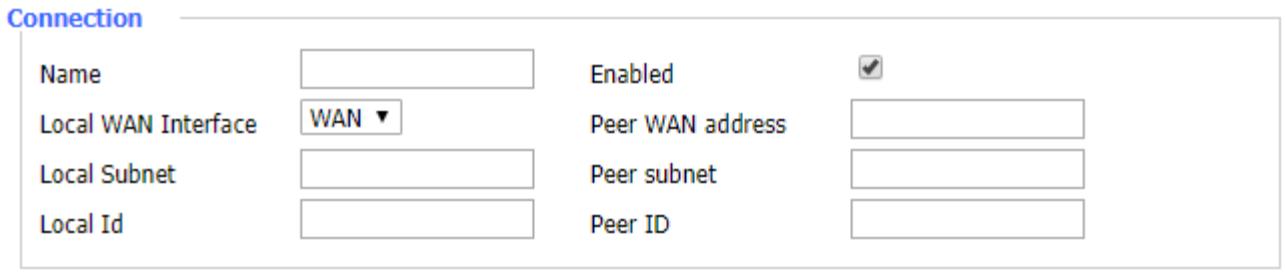
	Reconnect: This action will remove current tunnel, and re-launch tunnel establish request Enable: When the connection is enable, it will launch tunnel establish request when the system reboot or reconnect, otherwise the connection will not do it
Add	To add a new IPSEC connection

Add IPSEC connection or edit IPSEC connection

Type: To choose IPSEC mode and relevant functions in this part, supports tunnel mode client, tunnel mode server and transfer mode currently



Connection: This part contains basic address information of the tunnel

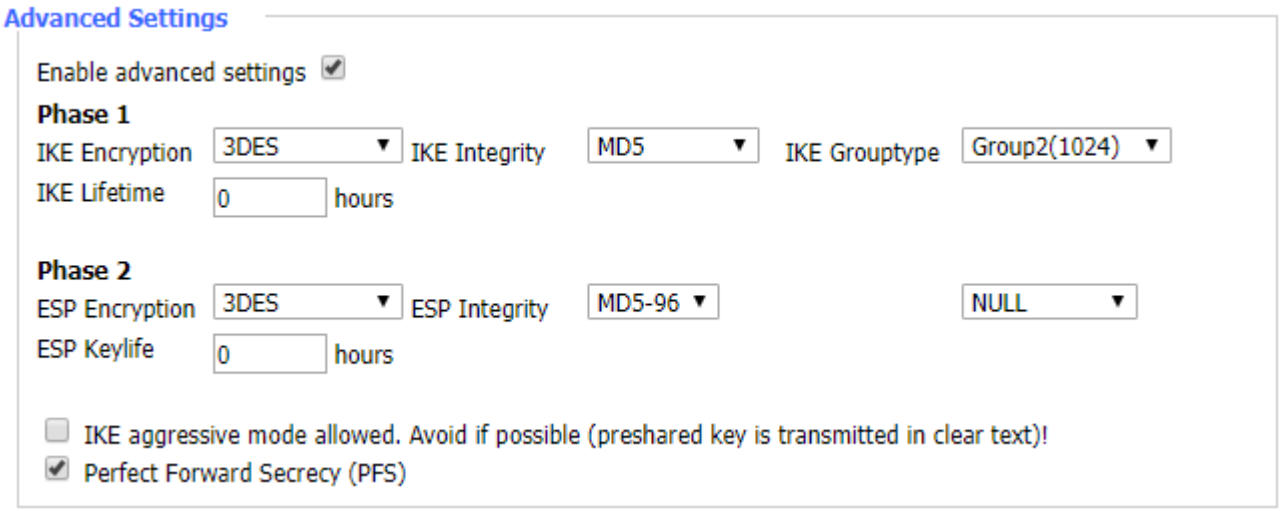


Object – IPSEC	Description
NAME	To indicate this connection name, must be unique
Enabled	If enabled, the connection will send tunnel connection request when it is reboot or re-connection, otherwise it is no need if disable
Local WAN Interface	Local addresses of the tunnel
Peer WAN address	IP/domain name of end opposite; this option can not fill in if using tunnel mode server
Local Subnet	IPSec local protects subnet and subnet mask, i.e. 192.168.1.0/24; this option cannot fill in if transfer mod is used.
Remote Subnet	IPSec opposite end protects subnet and subnet mask, i.e.192.168.7.0/24; this option cannot fill in if transfer mode is used.
Local ID	Tunnel local end identification, IP and domain name are available
Remote ID	Tunnel opposite end identification, IP and domain name are available

Detection: This part contains configure information of connection detection

Object – IPSEC	Description
Enable DPD Detection	Enable or disable this function, tick means enable
Time Interval	Set time interval of connect detection (DPD)
Timeout	Set the timeout of connect detection
Action	Set the action of connect detection

Advanced Settings: This part contains relevant setting of IKE, ESP, negotiation mode, etc.



Object – IPSEC	Description
Enable Advanced Settings	Enable to configure 1st and 2nd phase information, otherwise it will automatically negotiate according to opposite end
IKE Encryption	IKE phased encryption mode
IKE Integrity	IKE phased integrity solution
IKE Grouptype	DH exchange algorithm
IKE Lifetime	Set IKE lifetime, current unit is hour, the default is 0
ESP Encryption	ESP encryption type
ESP Integrity	ESP integrity solution

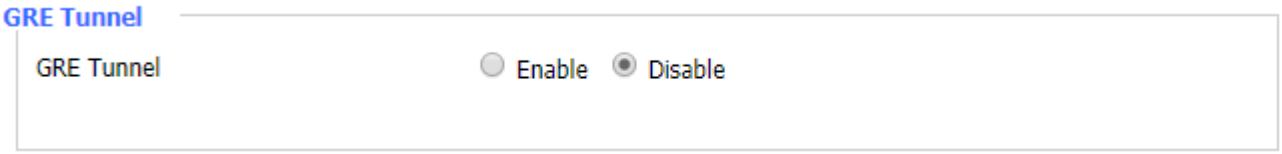
ESP Keylife	Set ESP keylife, current unit is hour, the default is 0
IKE aggressive mode allowed	Negotiation mode adopt aggressive mode if tick; it is main mode if non-tick
Perfect Forward Security (PFS)	Tick to enable PFS, non-tick to disable PFS

Authentication: Choose use share encryption option or certificate authentication option. Current is only to choose use share encryption option.

4.3.4.5. GRE

GRE (Generic Routing Encapsulation, Generic Routing Encapsulation) protocol is a network layer protocol (such as IP and IPX). Data packets are encapsulated, so these encapsulated data packets go to another network layer protocol (IP). GRE Tunnel technology is Layer Two Tunneling Protocol VPN (Virtual Private Network).

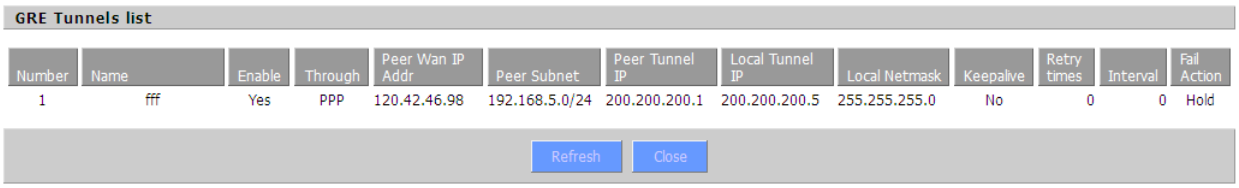
GRE Tunnel: Enable or disable GRE function.



When GRE tunnel is enabled, the configuration page is shown below.

Object – GRE	Description
Number	Switch on/off GRE tunnel app
Status	Switch on/off someone GRE tunnel app
Name	GRE tunnel name
Through	The GRE packet transmit interface
Peer Wan IP addr	The remote WAN address
Peer Subnet	The remote gateway local subnet, eg: 192.168.1.0/24
Peer Tunnel IP	The remote tunnel ip address
Local Tunnel IP	The local tunnel ip address
Local Netmask	Netmask of local network
Keepalive	Enable or disable GRE Keepalive function
Retry times	GRE keepalive detects fail retries
Interval	The time interval of GRE keepalive packet sent
Fail Action	The action would be exec after keeping alive failed

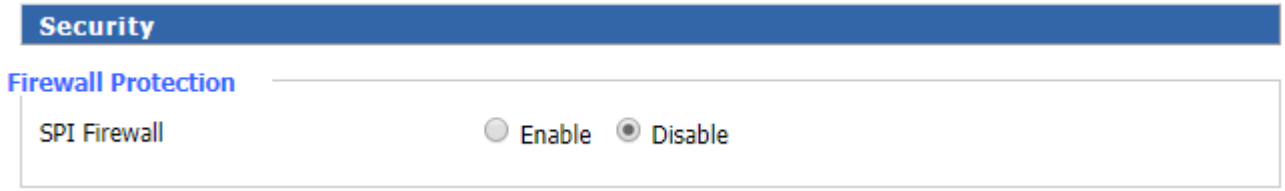
Users can view the information of GRE by clicking on the “View GRE tunnels” button.



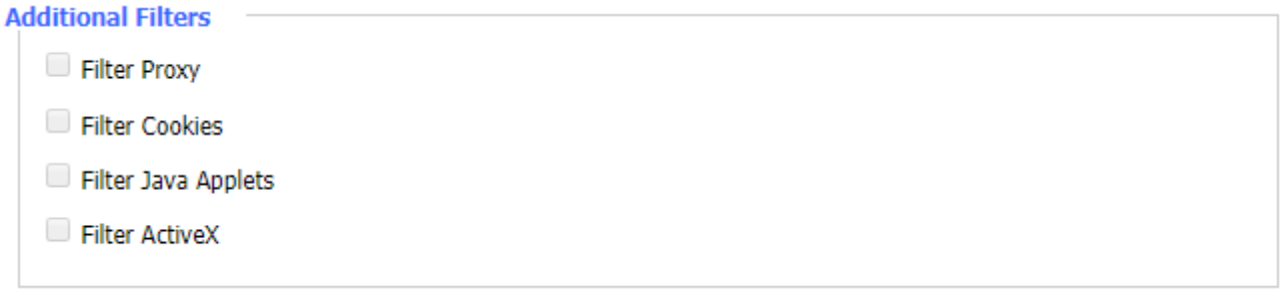
4.3.5. Security

4.3.5.1. Firewall

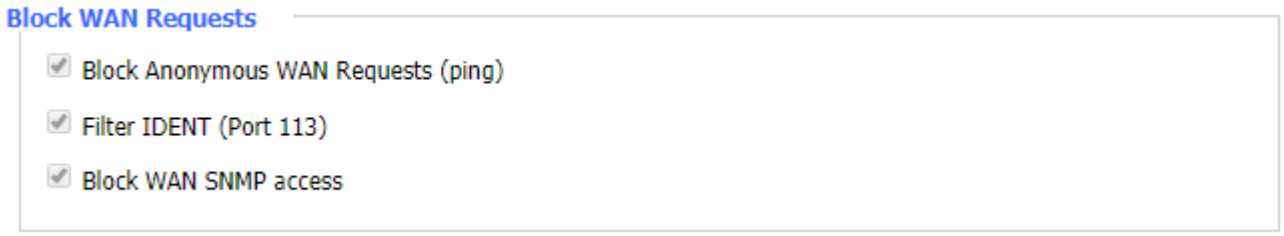
You can enable or disable the firewall, filter specific Internet data types, and prevent anonymous Internet requests, ultimately enhancing network security.



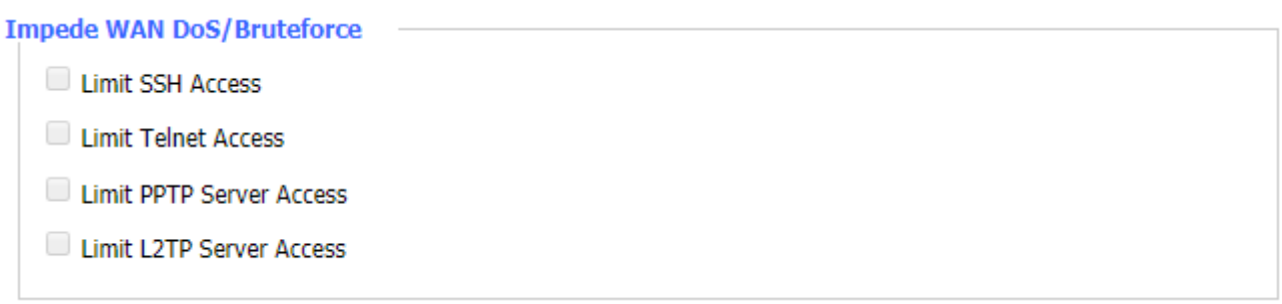
Firewall enhances network security and use SPI to check the packets in the network. To use firewall protection, choose enable otherwise disable. Only enable the SPI firewall; you can use other firewall functions: filtering proxy, block WAN requests, etc.



Object – Security	Description
Filter Proxy	WAN proxy server may reduce the security of the gateway. Filtering Proxy will refuse any access to any WAN proxy server. Click the check box to enable the function otherwise disabled.
Filter Cookies	Cookies are the website of data the data stored on your computer. When you interact with the site, the cookies will be used. Click the check box to enable the function otherwise disabled.
Filter Java Applets	If Java is refused, you may not be able to open web pages using the Java programming. Click the check box to enable the function, otherwise disabled.
Filter ActiveX	If ActiveX is refused, you may not be able to open web pages using the ActiveX programming. Click the check box to enable the function otherwise disabled.



Object – Security	Description
Block Anonymous WAN Requests (ping)	By selecting “Block Anonymous WAN Requests (ping)” box to enable this feature, you can prevent your network from the Ping or detection of other Internet users. The default state of this feature is enabled. When disable is selected, it allows anonymous Internet requests.
Filter IDENT (Port 113)	Enable this feature can prevent port 113 from being scanned from outside. Click the check box to enable the function otherwise disabled.
Block WAN SNMP access	This feature prevents the SNMP connection requests from the WAN.

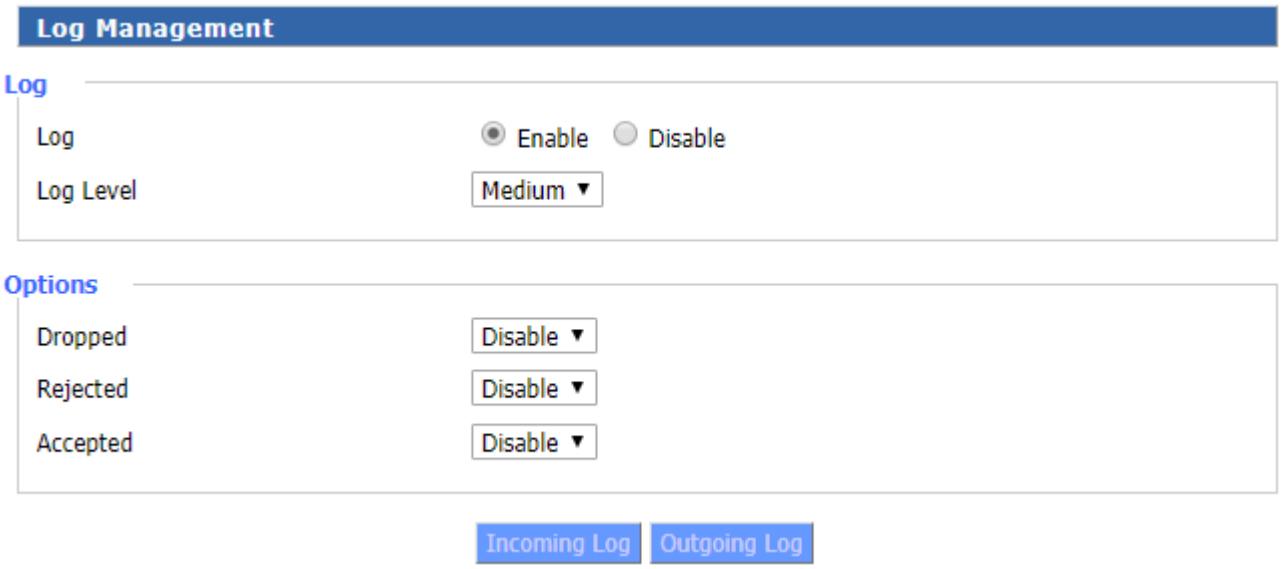


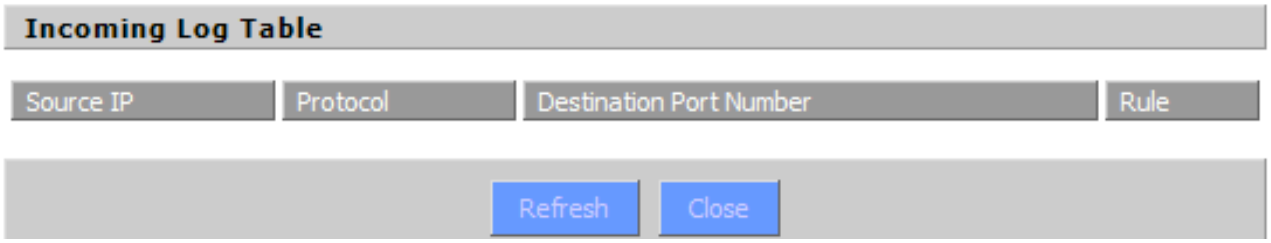
Object – Security	Description
Limit SSH Access	This feature limits the access request from the WAN by SSH, and per minute up to accept two connection requests on the same IP. Any new access request will be automatically dropped.
Limit Telnet Access	This feature limits the access request from the WAN by Telnet, and per minute up to accept two connection requests on the same IP. Any new access request will be automatically dropped.
Limit PPTP Server Access	When build a PPTP Server in the Router, this feature limits the access request from the WAN by SSH, and per minute up to accept two connection requests on the same IP. Any new access request will be automatically dropped.
Limit L2TP Server Access	When building a L2TP Server in the Router, this feature limits the access request from the WAN by SSH. It accepts up to two connection requests per minute on the same IP. Any new access request will be

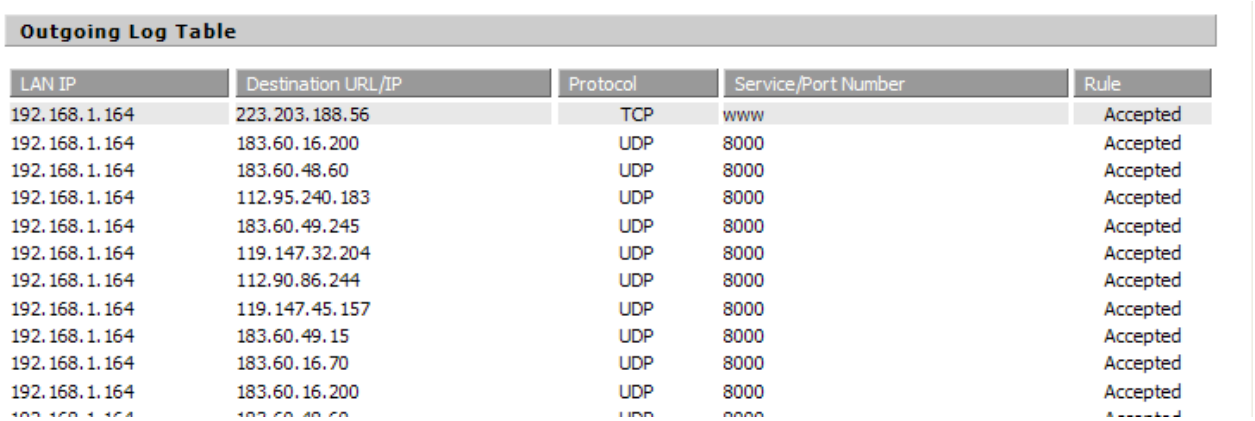
	automatically dropped.

Log Management

The gateway can keep logs of all incoming or outgoing traffic for your Internet connection.







Outgoing Log Table

LAN IP	Destination URL/IP	Protocol	Service/Port Number	Rule
192.168.1.164	223.203.188.56	TCP	www	Accepted
192.168.1.164	183.60.16.200	UDP	8000	Accepted
192.168.1.164	183.60.48.60	UDP	8000	Accepted
192.168.1.164	112.95.240.183	UDP	8000	Accepted
192.168.1.164	183.60.49.245	UDP	8000	Accepted
192.168.1.164	119.147.32.204	UDP	8000	Accepted
192.168.1.164	112.90.86.244	UDP	8000	Accepted
192.168.1.164	119.147.45.157	UDP	8000	Accepted
192.168.1.164	183.60.49.15	UDP	8000	Accepted
192.168.1.164	183.60.16.70	UDP	8000	Accepted
192.168.1.164	183.60.16.200	UDP	8000	Accepted

Object – Log Management	Description
Log	To keep activity logs, select Enable. To stop logging, select Disable. When selecting enable, the following page will appear.

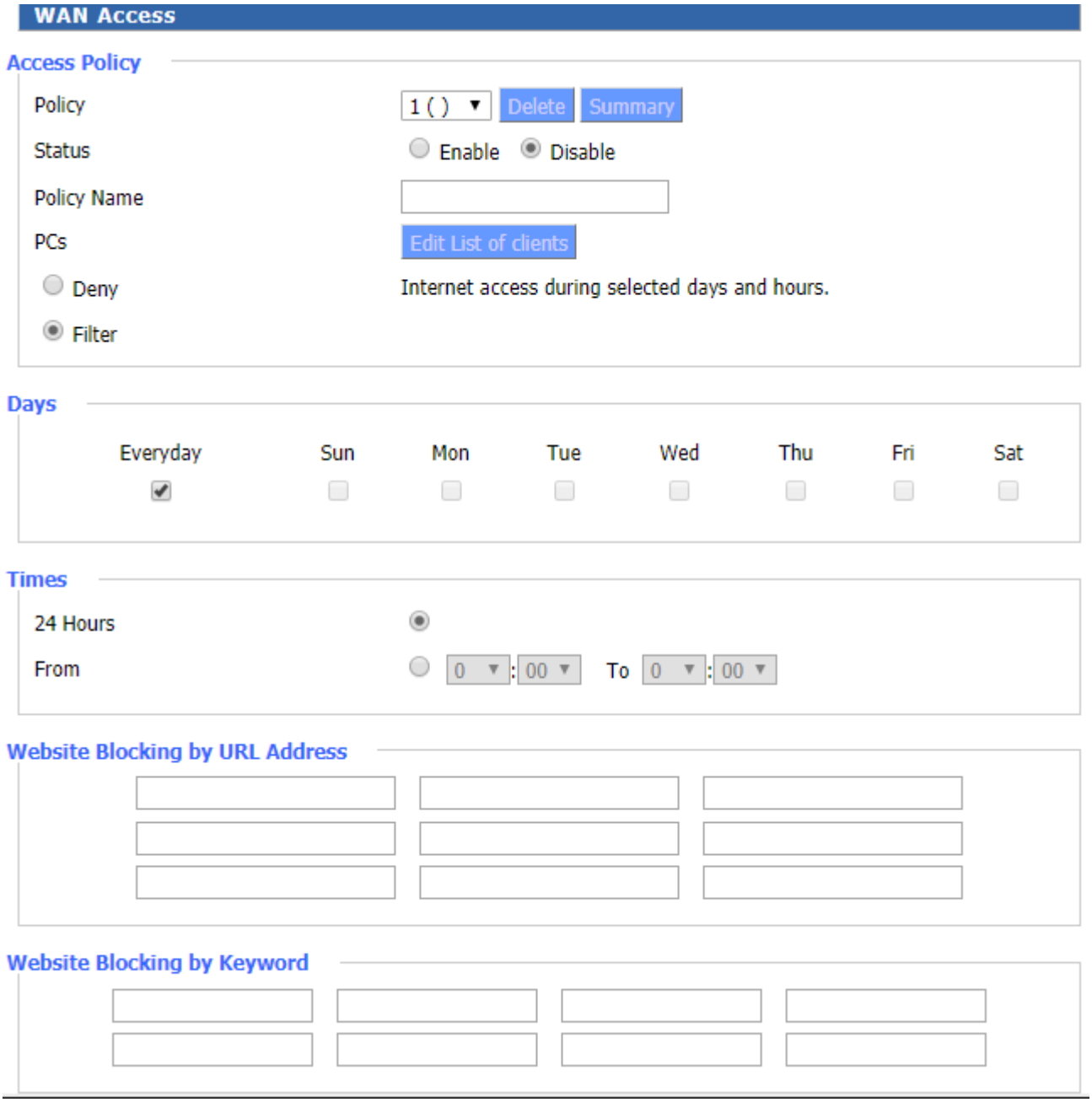
Log Level	Set this to the required log level. Set Log Level higher to log more actions.
Options	When selecting Enable, the corresponding connection will be recorded in the journal; disable is not recorded.
Incoming Log	To see a temporary log of the Router's most recent incoming traffic, click the Incoming Log button.
Outgoing Log	To see a temporary log of the Router's most recent outgoing traffic, click the Outgoing Log button.

4.3.6. Access Restrictions

4.3.6.1. WAN Access

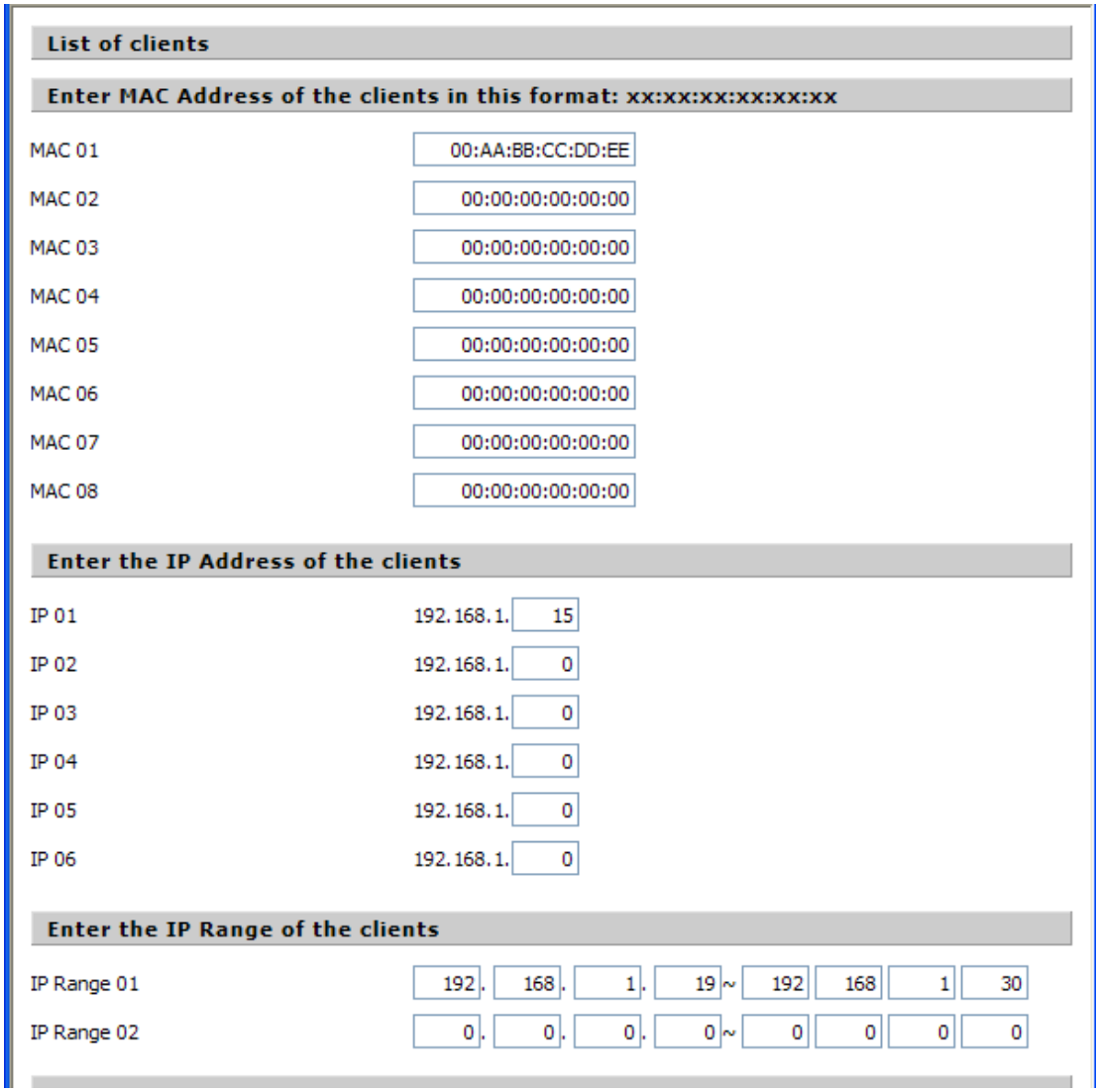
You can block or allow specific types of Internet applications for WAN access restrictions. You can set specific PC-based Internet access policies. This feature allows you to customize up to 10 different Internet Access Policies for particular PCs, which are identified by their IP or MAC addresses.

Two options in the default policy rules: "Filter" and "reject". If selecting "Deny", you will deny specific computers to access any Internet service at a particular time period. If you choose "filter", It will block specific computers to access the specific sites at a specific time period. You can set up 10 Internet access policies filtering specific PCs access Internet services at a particular time period.



Object – WAN Access	Description
Access Policy	You may define up to 10 access policies. Click Delete to delete a policy or Summary to see a summary of the policy.
Status	Enable or disable a policy.
Policy Name	You may assign a name to your policy.
PCs	The part is used to edit client list; the strategy is only effective for the PC in the list.
Days	Choose the day of the week to have your policy applied.
Times	Enter the time of the day to have your policy applied.
Website Blocking by URL	You can block access to certain websites by entering their URL.

Address	
Website Blocking by Keyword	You can block access to certain website by the keywords contained in their webpage



The steps of setting up Internet access policy

1. Select the policy number (1-10) in the drop-down menu.
2. For this policy to be enabled, click the radio button next to "Enable"
3. Enter a name in the Policy Name field.
4. Click the Edit List of PCs button.
5. On the list of PC screen, specify PCs by IP address or MAC address. Enter the appropriate IP addresses into the IP fields. If you have a range of IP addresses to filter and complete the appropriate IP Range fields. Enter the appropriate MAC addresses into the MAC fields.
6. Click the Apply button to save your changes. Click the Cancel button to cancel your unsaved changes. Click the Close button to return to the Filters screen.
7. If you want to block the listed PCs from Internet access during the designated days and time, then keep the default

setting, Deny. If you want the listed PCs to have Internet filtered during the designated days and time, then click the radio button next to Filter.

8. Set the days when access will be filtered. Select Everyday or the appropriate days of the week.

9. Set the time when access will be filtered. Select 24 Hours, or check the box next to From and use the drop-down boxes to designate a specific time period.

10. Click the Add to Policy button to save your changes and activate it.

11. To create or edit additional policies, repeat steps 1 to 9.

12. To delete an Internet Access Policy, select the policy number, and click the Delete button.

Note

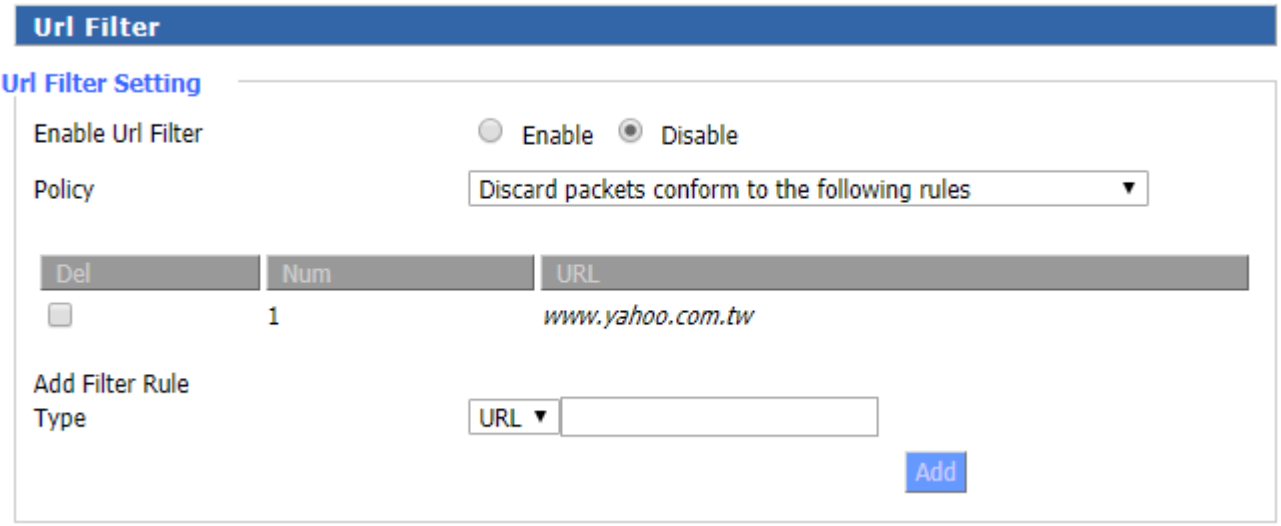
The default factory value of policy rules is "filtered". If the user chooses the default policy rules for "refuse", editing strategies to directly save the settings. If the strategy edited is the first, it will be automatically saved into the second, if not, the first to keep the original number.

Note

Turning off the power of the Router or rebooting the Router can cause a temporary failure。After the failure of the Router, if NTP timer server cannot be automatically synchronized, you need to recalibrate to ensure the correct implementation of the relevant period control function.

4.3.6.2. URL Filter

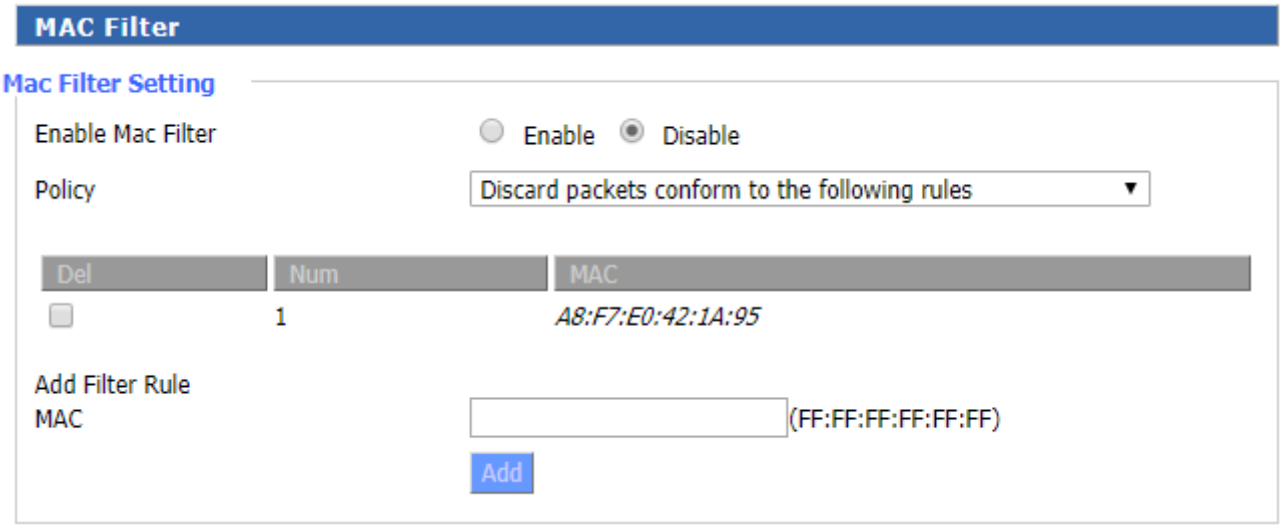
If you want to prevent certain client access to specific network domain name, such as www.yahoo.com.tw., achieve it through the function of URL filtering.



Object – URL Filter	Description
Discard packets that conform to the following	Only discard the matching URL address in the list.

rules	
Accept only the data packets that conform to the following rules	Receive only custom rules of network address; discard all other URL addresses.

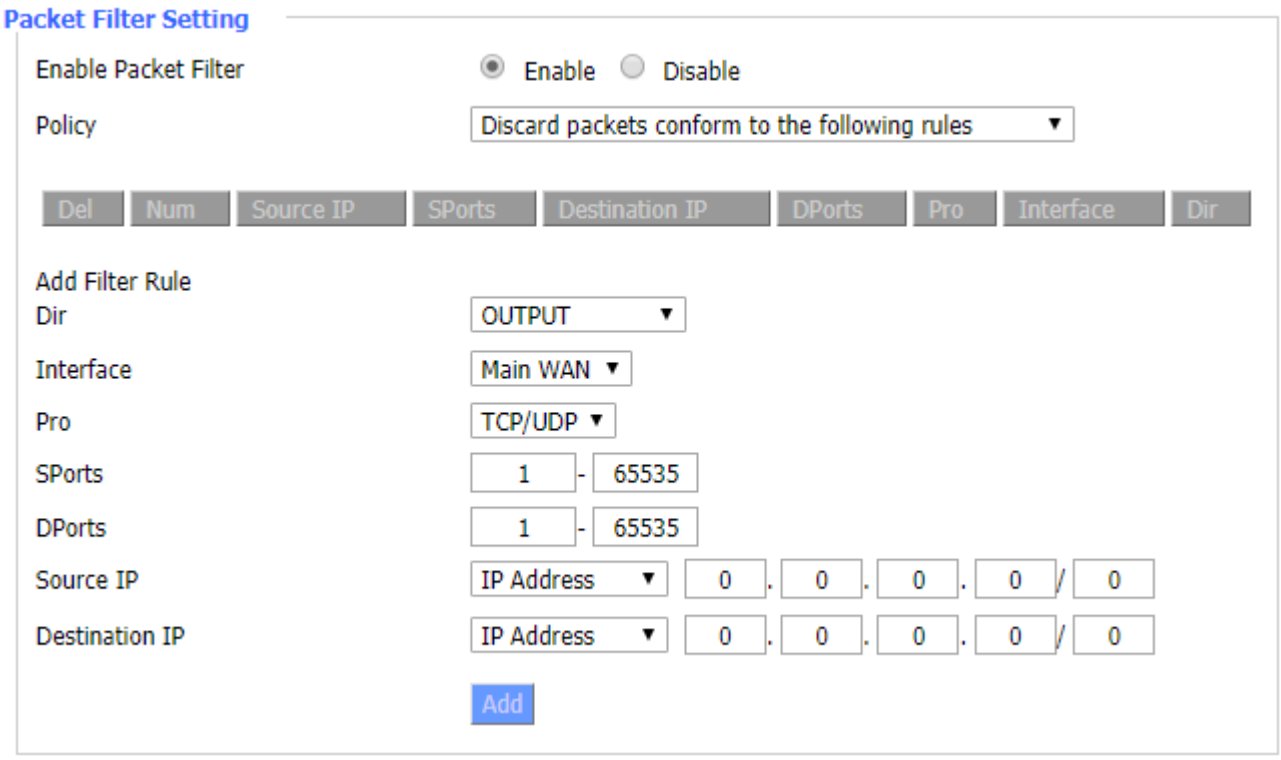
MAC Filter



Object –MAC Filter	Description
Discard packets conform to the following rules	Only discard the matching MAC address in the list.
Accept only the data packets conform to the following rules	Receive only custom rules of MAC address; discard all other MAC addresses.

4.3.6.3. Packet Filter

To block some packets getting Internet access or block some Internet packets getting local network access, you can configure filter items to block these packets. Packet filter function is realized based on IP address or port of packets.



Object –Packet Filter	Description
Enable Packet Filter	Enable or disable “packet filter” function
Policy	Two policies are provided. One is Discard packets conform to the following rules and the other is Accept only the data packets conform to the following rules.
Add Filter Rule Direction	Input: packet from WAN to LAN Output: packet from LAN to WAN
Protocol	Packet protocol type
Source Ports	Packet’s source port
Destination Ports	Packet’s destination port
Source IP	Packet’s source IP address
Destination IP	Packet’s destination IP address

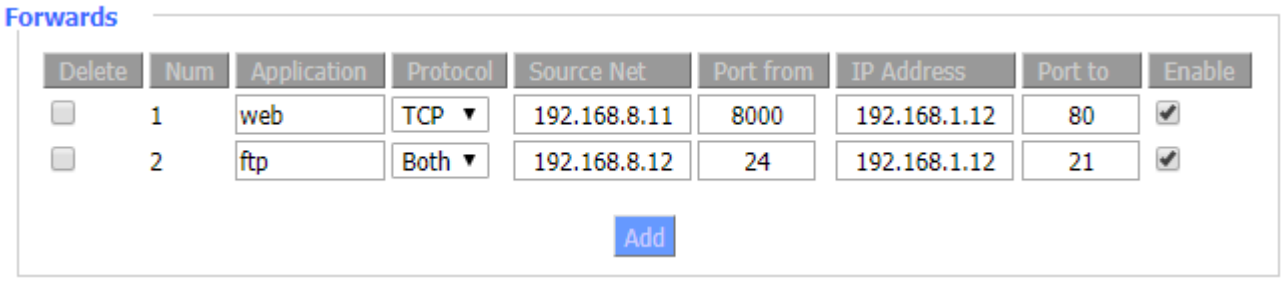
Note

"Source Port”," Destination Port" ,"Source IP" ,"Destination IP" could not be all empty.

4.3.7. NAT

4.3.7.1. Port Forwarding

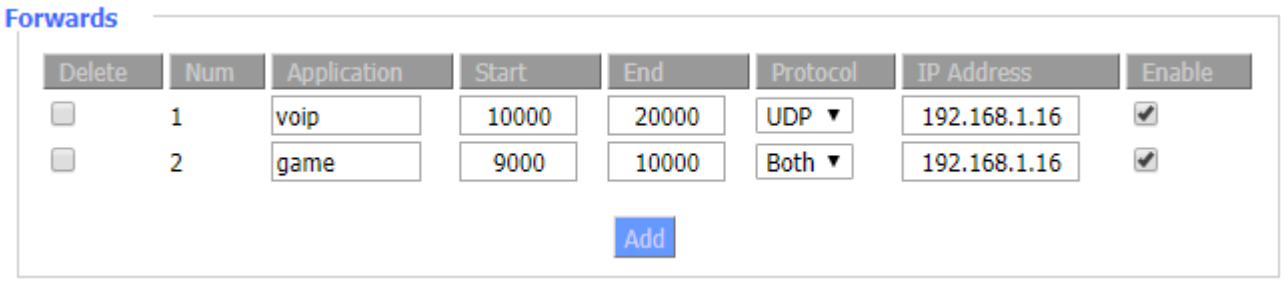
Port Forwarding allows you to set up public services on your network, such as web servers, ftp servers, e-mail servers, or other specialized Internet applications. Specialized Internet applications are any applications that use Internet access to perform functions such as videoconferencing or online gaming. When users send this type of request to your network via the Internet, the Router will forward those requests to the appropriate PC. If you want to forward a whole range of ports, see Port Range Forwarding.



Object –Port Forward	Description
Application	Enter the name of the application in the field provided.
Protocol	Chose the right protocol TCP, UDP or Both. Set this to what the application requires.
Source Net	Forward only if sender matches this ip/net (example 192.168.1.0/24).
Port from	Enter the number of the external port (the port number seen by users on the Internet).
IP Address	Enter the IP Address of the PC running the application.
Port to	Enter the number of the internal port (the port number used by the application).
Enable	Click the Enable checkbox to enable port forwarding for the application.

4.3.7.2. Port Range Forward

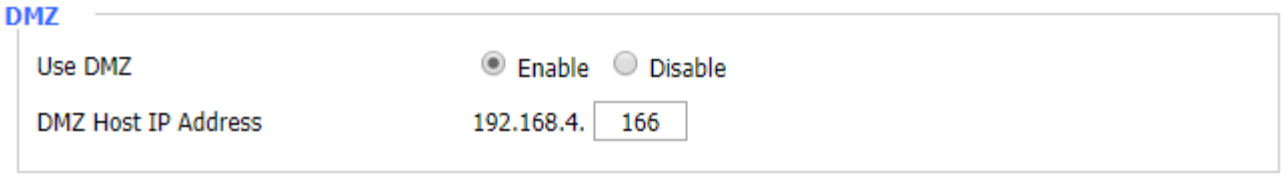
Port Range Forwarding allows you to set up public services on your network, such as web servers, ftp servers, e-mail servers, or other specialized Internet applications. Specialized Internet applications are any applications that use Internet access to perform functions such as videoconferencing or online gaming. When users send this type of request to your network via the Internet, the Router will forward those requests to the appropriate PC. If you only want to forward a single port, see Port Forwarding.



Object –Port Range Forward	Description
Application	Enter the name of the application in the field provided.
Start	Enter the number of the first port of the range you want to be seen by users on the Internet and forwarded to your PC.
End	Enter the number of the last port of the range you want to be seen by users on the Internet and forwarded to your PC.
Protocol	Chose the right protocol TCP, UDP or Both. Set this to what the application requires.
IP Address	Enter the IP Address of the PC running the application.
Enable	Click the Enable checkbox to enable port forwarding for the application.

4.3.7.3. DMZ

The DMZ (DeMilitarized Zone) hosting feature allows one local user to be exposed to the Internet for use of a special-purpose service such as Internet gaming or videoconferencing. DMZ hosting forwards all the ports at the same time to one PC. The Port Forwarding feature is more secure because it only opens the ports you want to have opened, while DMZ hosting opens all the ports of one computer, exposing the computer so the Internet can see it.



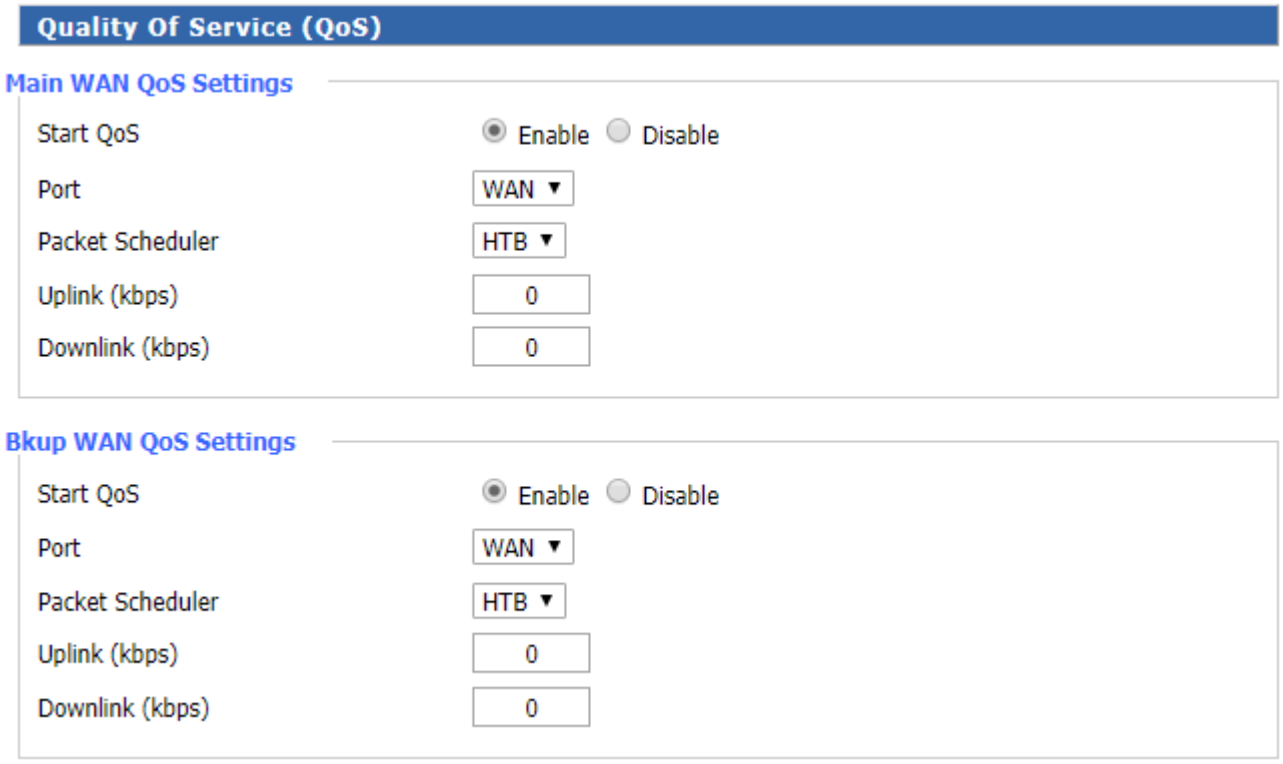
Any PC whose port is being forwarded must have a new static IP address assigned to it because its IP address may change when using the DHCP function.

DMZ Host IP Address: To expose one PC to the Internet, select Enable and enter the computer's IP address in the DMZ Host IP Address field. To disable the DMZ, keep the default setting: Disable

4.3.8. QoS Setting

4.3.8.1. Basic

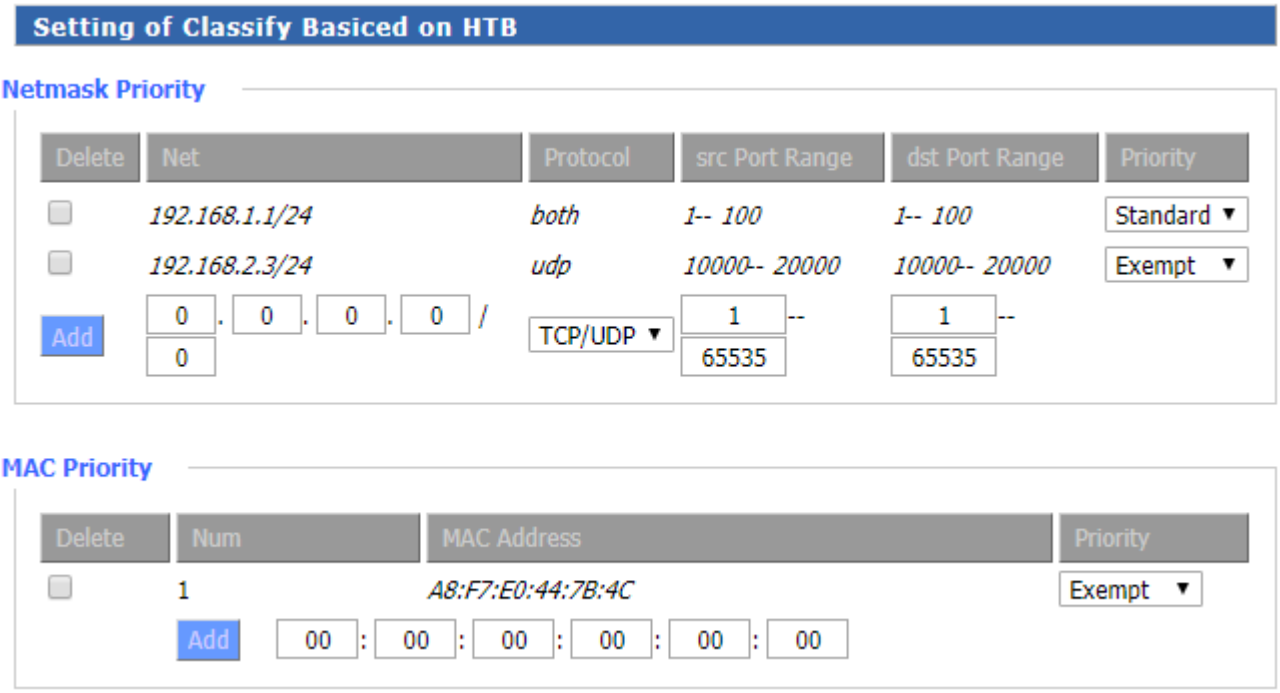
Bandwidth management prioritizes the traffic on your Router. Interactive traffic (telephony, browsing, telnet, etc.) gets priority and bulk traffic (file transfer, P2P) gets low priority. The main goal is to allow both types to work side-by-side leaving out unimportant traffic. All of this is more or less automatic.



Object –QoS	Description
Uplink (kbps)	In order to use bandwidth management (QoS) you must enter bandwidth values for your uplink. These are generally 80% to 90% of your maximum bandwidth.
Downlink (kbps)	In order to use bandwidth management (QoS) you must enter bandwidth values for your downlink. These are generally 80% to 90% of your maximum bandwidth.

4.3.8.2. Classification

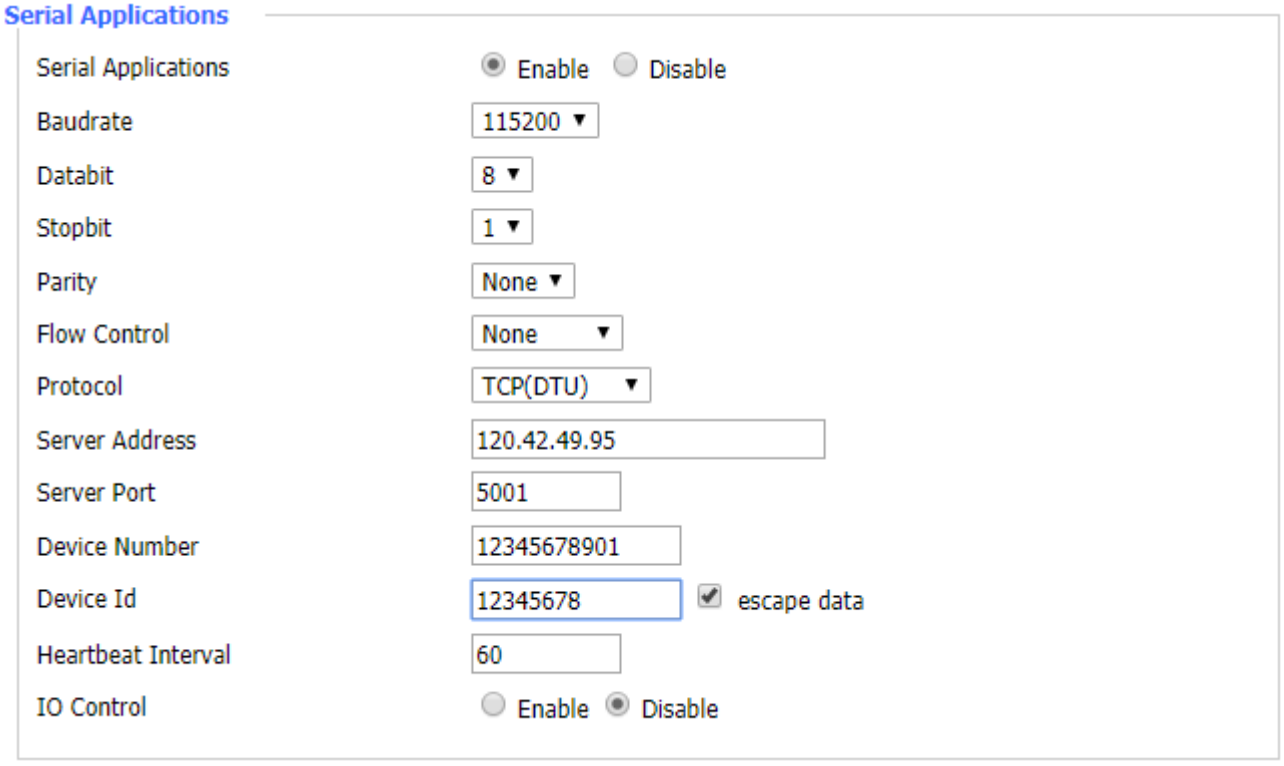
The classification part includes netmask priority and MAC priority. You are able to specify priority for all traffic from a given IP address, port range or MAC address. Check all values and click Save Settings to save your settings. Click the Cancel changes button to cancel your unsaved changes.



4.3.9. Applications

4.3.9.1. Serial Applications

There is a console port on Router. Normally, this port is used to debug the Router. This port can also be used as a serial port. The Router has embedded a serial to TCP program. The data sent to the serial port is encapsulated by TCP/IP protocol stack and then is sent to the destination server. This function can work as a DTU (Data Terminal Unit).

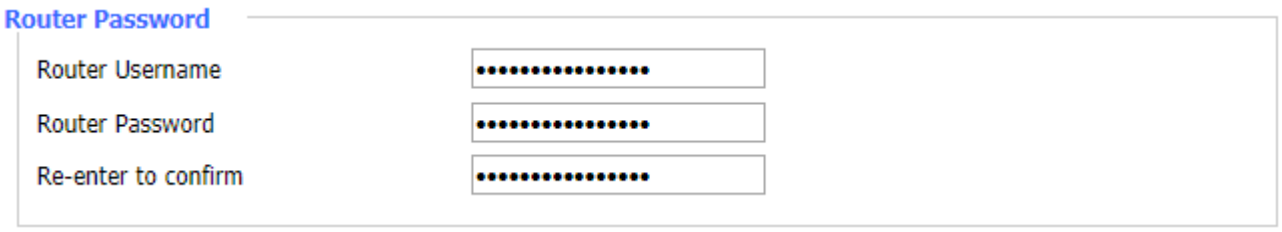


Object –Serial Applications	Description
Baudrate	Baud rate indicates the number of bytes per second transported by device, commonly used baud rate is115200, 57600, 38400, and 19200.
Databit	The data bits can be 4, 5, 6, 7, 8, constitute a character. The ASCII code is usually used. Starting from the most significant bit is transmitted.
Stopbit	It marks the end of a character data. It is a high level of 1, 1.5, and 2.
Parity	Use a set of data to check the data error.
Flow control	Including the hardware part and software part in two ways.
Protocol	The protocol type for transmitting data. UDP (DTU): Data transmission in UDP protocol works as an IP MODEM device which has application protocol. Pure UDP: Data transmission in standard UDP protocol. TCP (DTU): Data transmission with TCP protocol works as an IP MODEM device which has application protocol. Pure TCP: Data transmission in standard TCP protocol, Router is the client. TCP Server: Data transmission in standard TCP protocol, Router is the server. TCST: Data transmission in TCP protocol that uses a custom data
Server Address	The data service center's IP Address or domain name.
Server Port	The data service center's listening port.
Device ID	The Router's identity ID.
Device Number	The Router's phone number.
Heartbeat Interval	The time interval to send heart beat packet. This item is valid only when you choose UDP (DTU) or TCP (DTU) protocol type.
TCP Server Listen Port	This item is valid when Protocol Type is "TCP Server".
Custom Heartbeat Packet	This item is valid when Protocol Type is "TCST".
Custom Registration Packet	This item is valid when Protocol Type is "TCST".

4.3.10. Admin

4.3.10.1. Management

The Management screen allows you to change the Router's settings. On this page you will find most of the configurable items of the Router code.



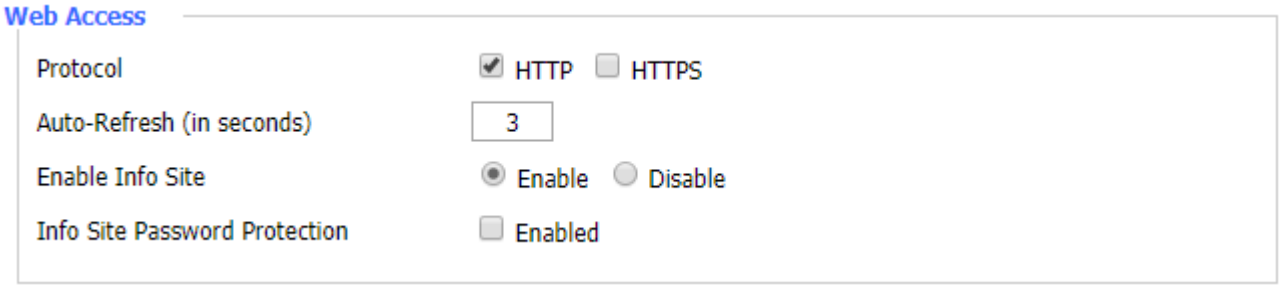
The new password must not exceed 32 characters in length and must not include any spaces. Enter the new password twice to confirm it.

Note

Default username is admin. It is strongly recommended that you change the factory default password of the Router, which is admin.

Web Access

This feature allows you to manage the Router using either HTTP protocol or the HTTPS protocol. If you choose to disable this feature, a manual reboot will be required. You can also activate or inactivate the Router information web page. It's now possible to have a password to protect this page (same username and password as the above).



Object –Web Access	Description
Protocol	This feature allows you to manage the Router using either HTTP protocol or the HTTPS protocol.
Auto-Refresh (in seconds)	Adjust the Web GUI automatic refresh interval. 0 disables this feature completely.
Enable Info Site	Enable or disable the login system information page.

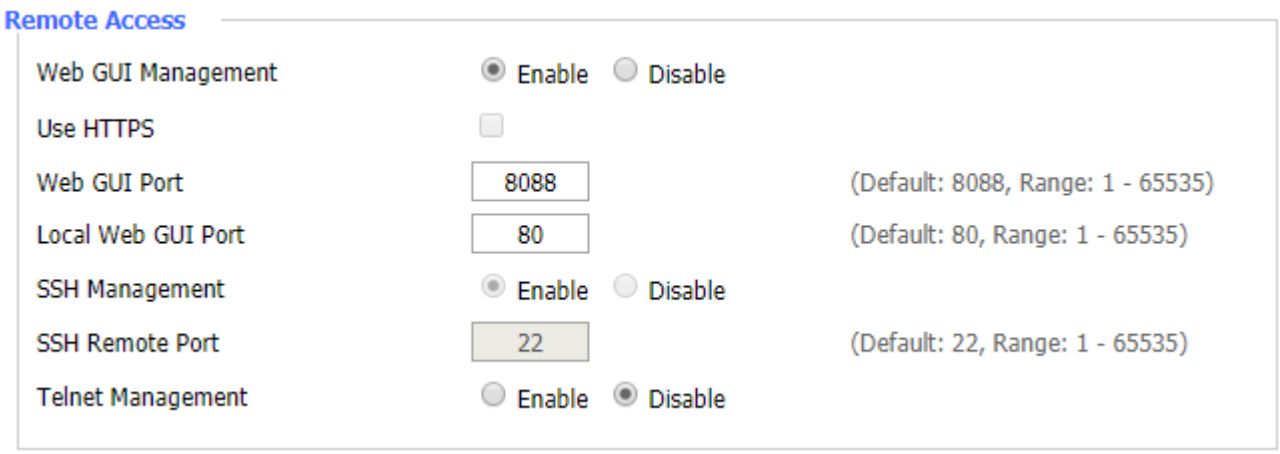
Info Site Password Protection	Enable or disable the password protection feature of the system information page.

Remote Access

This feature allows you to manage the Router from a remote location via the Internet. To disable this feature, keep the default setting, Disable. To enable this feature, select Enable, and use the specified port (default is 8080) on your PC to remotely manage the Router. You must also change the Router's default password to one of your own, if you haven't already.

To remotely manage the Router, enter http://xxx.xxx.xxx.xxx:8080 (the x's represent the Router's Internet IP address, and 8080 represents the specified port) in your web browser's address field. You will be asked for the Router's password.

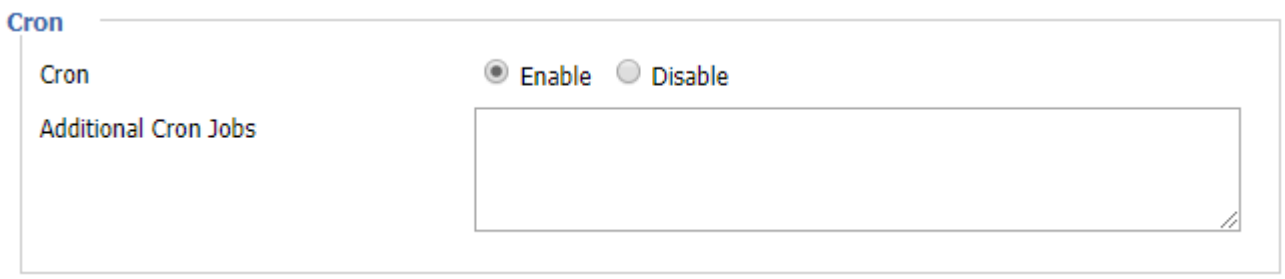
If you use https you need to specify the url as https://xxx.xxx.xxx.xxx:8080 (not all firmwares do support this without rebuilding with SSL support).



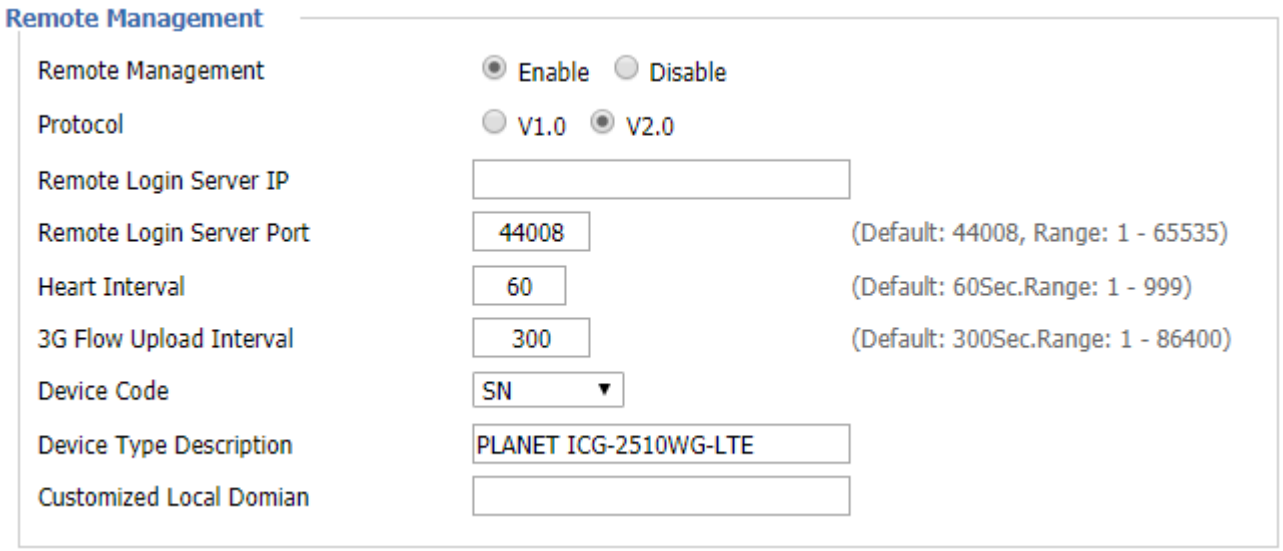
Object –Remote Access	Description
SSH Management	You can also enable SSH to remotely access the Router by Secure Shell. Note that SSH daemon needs to be enabled in Services page.
Telnet Management	Enable or disable remote Telnet function.

Cron

The cron subsystem schedules execution of Linux commands. You'll need to use the command line or startup scripts to actually use this.

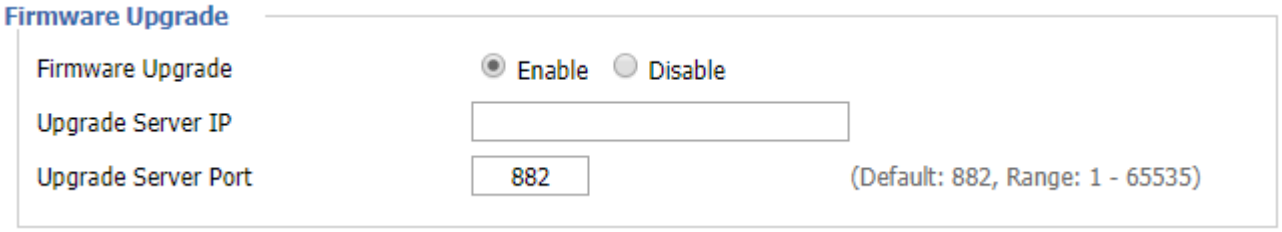


Remote Management



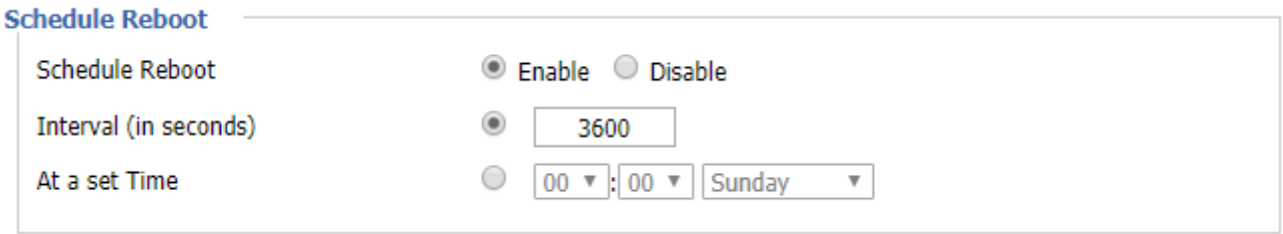
Firmware Upgrade

Choose Enable to have a firmware upgrade.



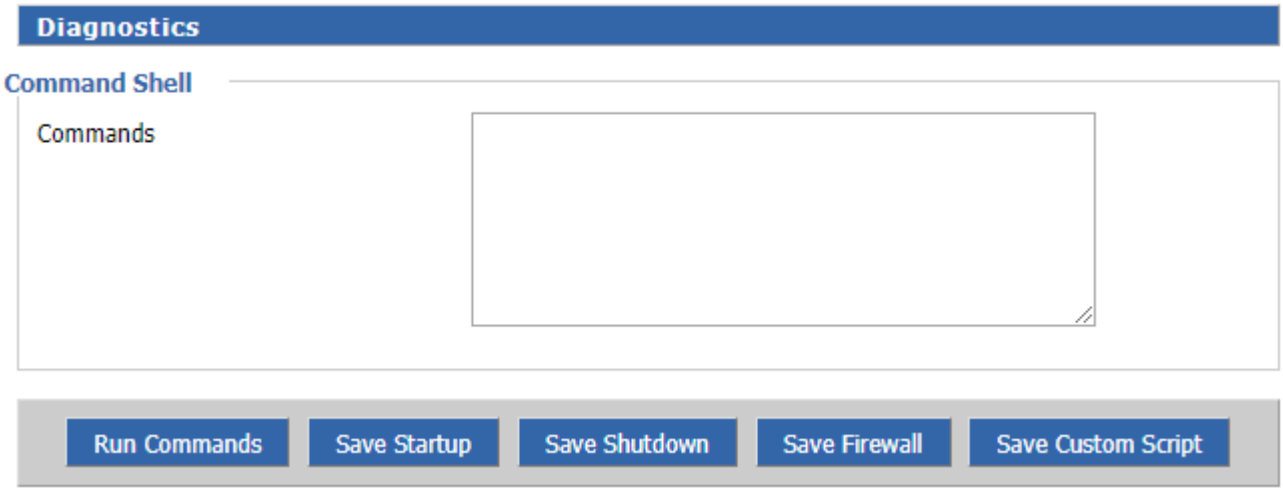
4.3.10.2. Keep Alive

User is able to reboot the device automatically by interval or specific time.



4.3.10.3. Commands

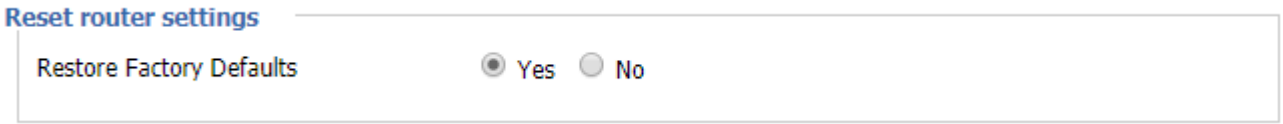
The function allows you to run command line directly via the Web interface.



Object – Commands	Description
Run Commands	You can run command lines via the web interface. Fill the text area with your command and click Run Commands to submit.
Save Startup	You can save some command lines to be executed at startup's Router. Fill out the text area with commands (only one command by row) and click Save Startup.
Save Shutdown	You can save some command lines to be executed at shutdown's Router. Fill out the text area with commands (only one command by row) and click Save Shutdown.
Save Firewall	Each time the firewall is started, it can run some custom ip tables instructions. Fill out the text area with firewall's instructions (only one command by row) and click Save Firewall.
Save Custom Script	Custom script is stored in /tmp/custom.sh file. You can run it manually or use cron to call it. Fill out the text area with script's instructions (only one command by row) and click Save Custom Script.

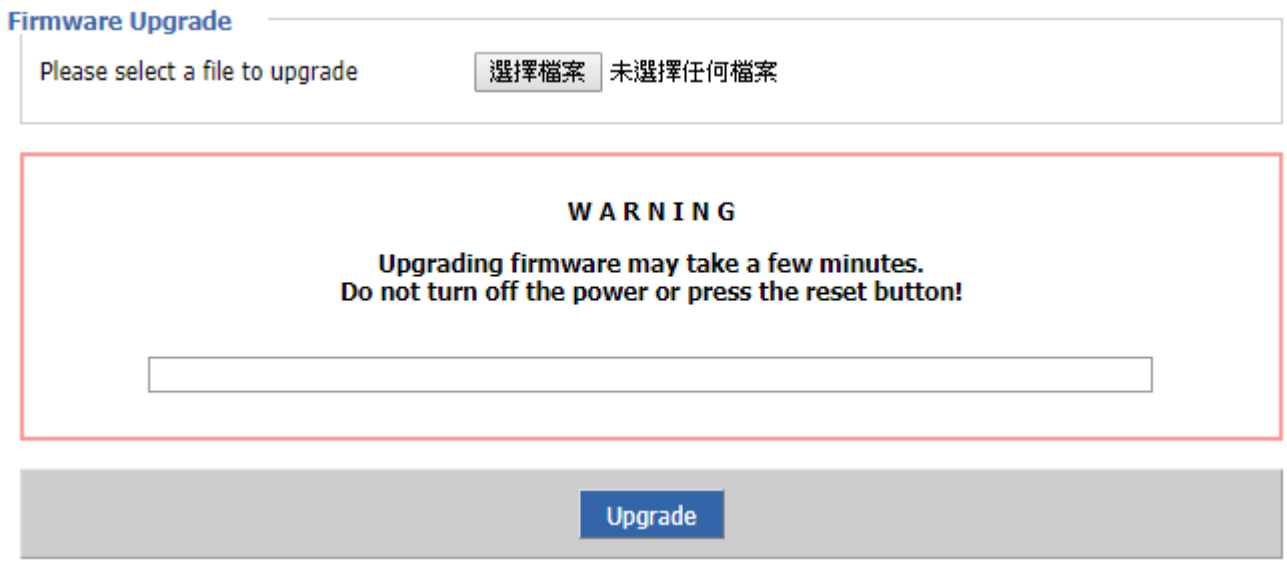
4.3.10.4. Factory Defaults

Select the “Yes” button to reset all configuration settings to their default values then click the Apply Settings button to take effect.

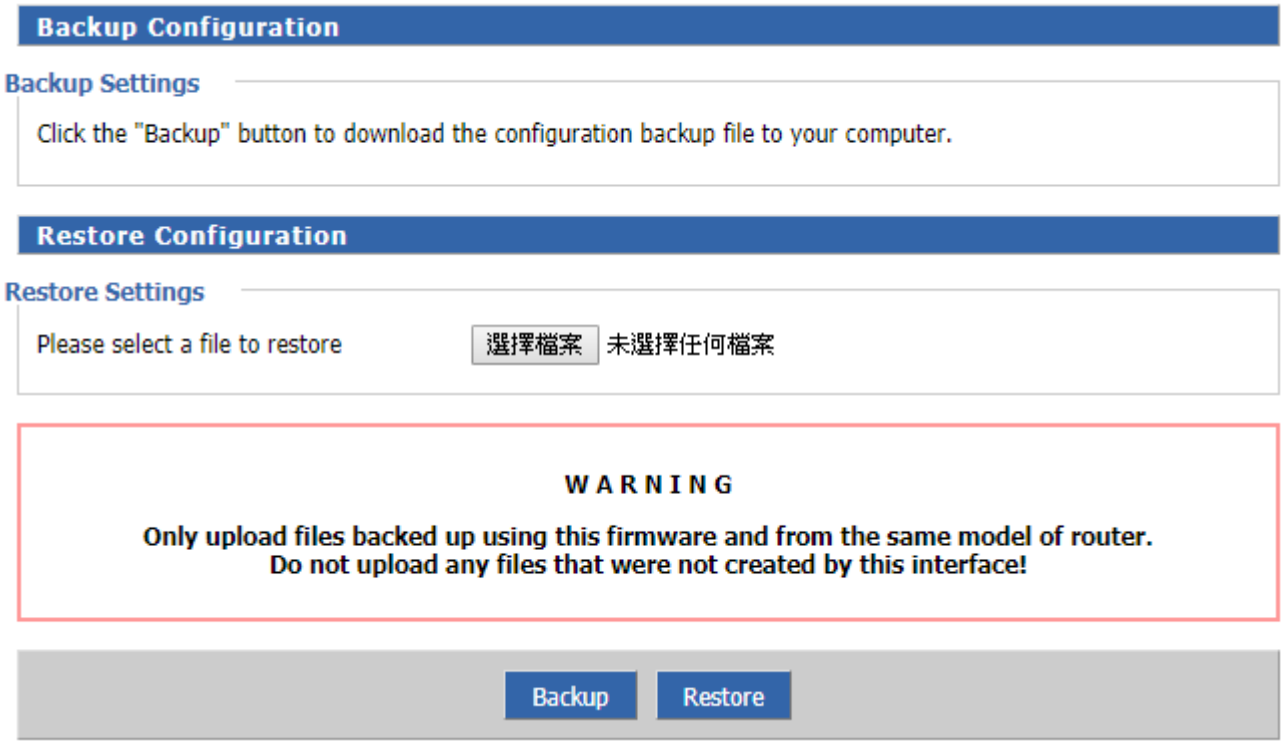


Note	Any settings you have saved will be lost when the default settings are restored. The default IP address is 192.168.1.1 and the default password is admin.

4.3.10.5. Firmware Upgrade



4.3.10.6. Backup

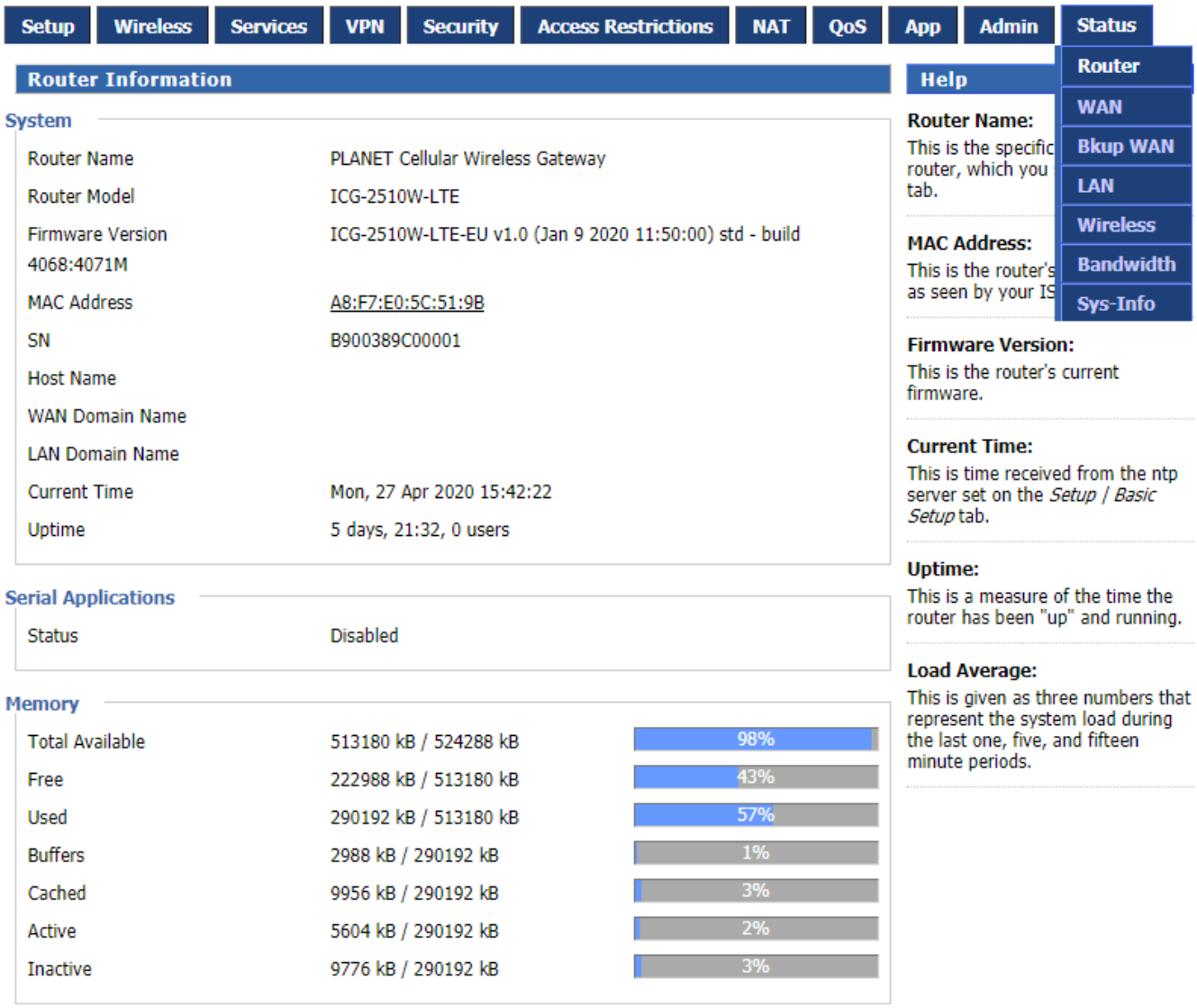


Object –Backup	Description
Backup Settings	You may back up your current configuration in case you need to reset the Router back to its factory default settings. Click the Backup button to

	back up your current configuration.
Restore Settings	Click the “Browse...” button to browse for a configuration file that is currently saved on your PC. Click the Restore button to overwrite all current configurations with the ones in the configuration file.

4.3.11. Status

The Status function provides different system and real-time information such as Router, WAN, Backup WAN, LAN, Wireless, Bandwidth and Sys-Info. It can help the user to monitor the current state of the machine at any time.



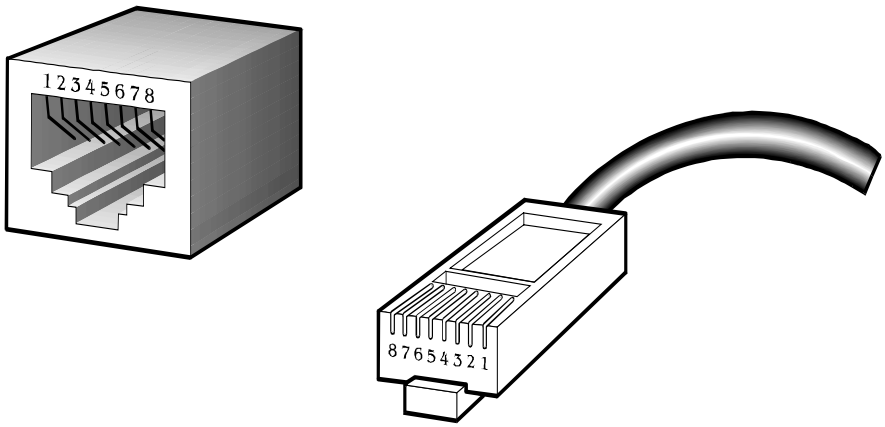
5. APPENDIX A RJ45 Pin Assignments

5.1. A.1 10/100/1000Mbps, 10/100/1000BASE-T

When connecting your 10/100/1000Mbps Cellular Gateway to another device, a bridge or a hub, a straight-through or crossover cable is necessary. Each port of the Cellular Gateway supports auto-MDI/MDI-X detection. That means you can directly connect the Cellular Gateway to any Ethernet devices without making a crossover cable. The following table and diagram show the standard RJ45 receptacle/connector and their pin assignments:

RJ45 Connector pin assignment		
Contact	**MDI** **Media Dependent** **Interface**	**MDI-X** **Media Dependent** **Interface-Cross**
1	**Tx + (transmit)**	**Rx + (receive)**
2	**Tx - (transmit)**	**Rx - (receive)**
3	**Rx + (receive)**	**Tx + (transmit)**
4, 5	**Not used**	
6	**Rx - (receive)**	**Tx - (transmit)**
7, 8	**Not used**	

The standard cable, RJ45 pin assignment



The standard RJ45 receptacle/connector

There are 8 wires on a standard UTP/STP cable and each wire is color-coded. The following shows the pin allocation and color of straight-through cable and crossover cable connection:

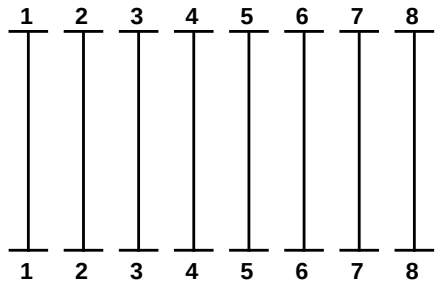
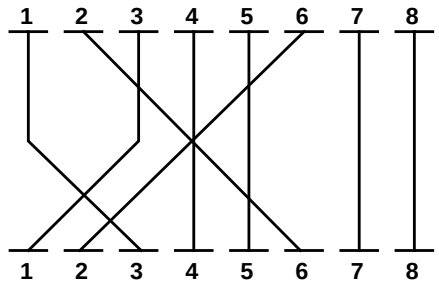
Straight-through Cable		SIDE 1	SIDE 2
	SIDE 1	1 = White / Orange	1 = White / Orange
		2 = Orange	2 = Orange
		3 = White / Green	3 = White / Green
		4 = Blue	4 = Blue
		5 = White / Blue	5 = White / Blue
		6 = Green	6 = Green
		7 = White / Brown	7 = White / Brown
	SIDE 2	8 = Brown	8 = Brown
Crossover Cable		**SIDE 1**	**SIDE 2**
	SIDE 1	1 = White / Orange	1 = White / Green
		2 = Orange	2 = Green
		3 = White / Green	3 = White / Orange
		4 = Blue	4 = Blue
		5 = White / Blue	5 = White / Blue
		6 = Green	6 = Orange
		7 = White / Brown	7 = White / Brown
	SIDE 2	8 = Brown	8 = Brown

Figure A-1: Straight-through and Crossover Cables

Please make sure your connected cables are with the same pin assignment and color as the above table before deploying the cables into your network.