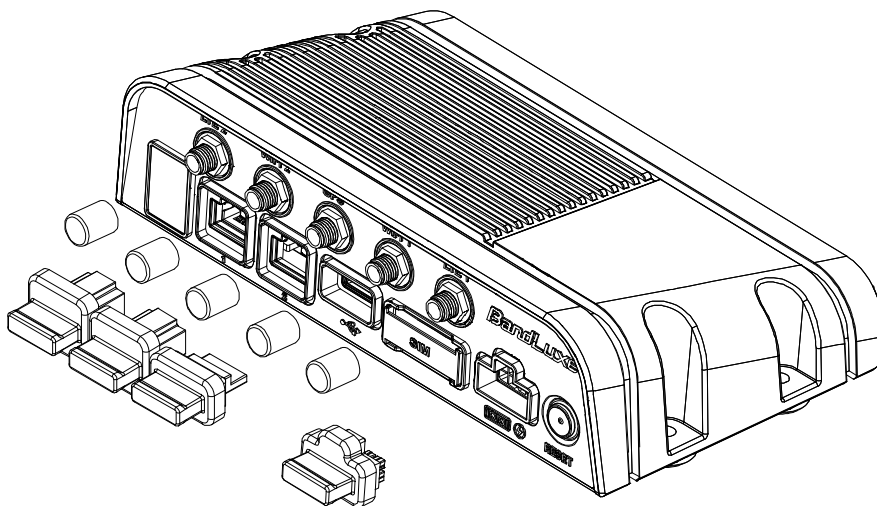


User Manual

BandLuxe **K535 Series** **LTE M2M &** **Vehicle Mount** **Router**



P/N:64003700011 Rev.D

Table of Contents

Package Contents	4
Features	4
Hardware Overview	5
Installation.....	7
Using Web-based Management.....	10
Status	11
Overview	11
System	12
Network	12
DHCP Leases.....	12
Local Network.....	12
System Log	12
GPS	13
VnStat Traffic Monitor	13
Graphs.....	13
Configuration	14
Mobile Internet	15
Signal Quality	15
U/SIM Status	15
Registered Network.....	15
Internet Connection	16
System	17
System	17
System Properties	17
General Settings	17
Language and Style	18
Time Synchronization	18
Remote System Log.....	18
Administration	19
Router Password.....	19
Remote Access	19
Backup / Flash Firmware	20
Backup / Restore.....	20
Download backup	20
Reset to defaults	21
Restore backup.....	21
Flash new firmware image	21
Flash new module firmware image	21
Flash new ipkg package.....	21
FOTA	21
Reboot	22
Services	23
Dynamic DNS.....	23
Network.....	24
Interfaces	24
Interface Overview	24
Common Configuration	25
General Setup.....	25

Advanced Settings	26
Physical Settings	26
Firewall Settings	26
Hotspot	28
Chillispot	28
Mobile Internet	30
WWAN Setting	30
Network Settings	31
Auto APN Information	31
APN Profile Settings	31
Reset Modem	31
U/SIM PIN Management	32
Scenario 1: No mobile internet service	32
Scenario 2: Mobile internet service pending	32
Scenario 3: Mobile internet service enabled	33
SIM Management	35
Scenario 1: SIM lock absent	35
Scenario 2: SIM lock present	35
Preferred Network	35
Router	36
Router Settings	36
Router IP	36
DHCP Service	37
Active DHCP Leases	37
Static Leases	38
Advanced Routing settings	39
Static Routing	39
Routing and Redirection Service	40
VPN Passthrough	40
WiFi	41
Device Configuration	42
Advanced Settings	43
Interface Configuration	44
General Setup	44
Wireless Security	44
MAC-Filter	48
Advanced Settings	49
WPS Settings	49
Switch	52
Diagnostics	52
Network Utilities	52
Ping	52
Traceroute	53
NS Lookup	53
Firewall	54
Single Port Forward	54
Single Port Forward	54
Port Trigger	56
Port Trigger	56
Security Filter	58
Firewall	58
Internet Filter	58
Web Filters	59
DMZ Host	59
IP Filtering	60
IP Filtering	60

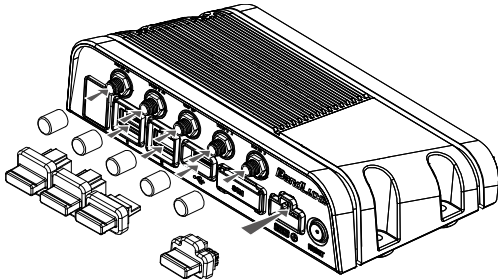
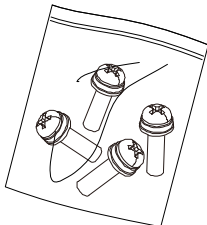
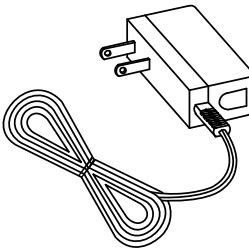
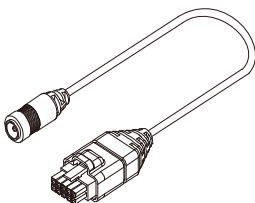
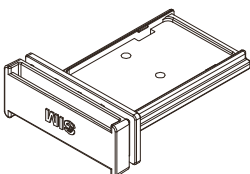
Port Range Forward	62
Port Range Forward	62
UPNP	64
UPnP Settings	64
VPN.....	64
IPSec Setting.....	64
IPSec Profile.....	64
IPSec Certificate.....	64
SSL VPN	65
Help.....	66
Logout.....	66
Appendix A: Vehicle Installation Guide	67
Overview	67
Installation.....	69
General Guidelines.....	69
Power Management	71
Power Management with Filter	72
Appendix B: FAQ.....	74
Appendix C: Specifications	81
Appendix D: Important Safety Information and Glossary	85
Europe – EU Declaration of Conformity	85
Federal Communication Commission Interference Statement	86
Glossary.....	88



Package Contents

Thank you for your purchase of this LTE M2M & Vehicle Mount Router. This product is designed to access the Internet via 4G technology and share the bandwidth through a Wi-Fi network. It is easy to configure and operate even for non-technical users. This manual contains instructions for installing and configuring the product. Read the manual carefully before you use the product, so that you can fully exploit the product functions.

Package Contents

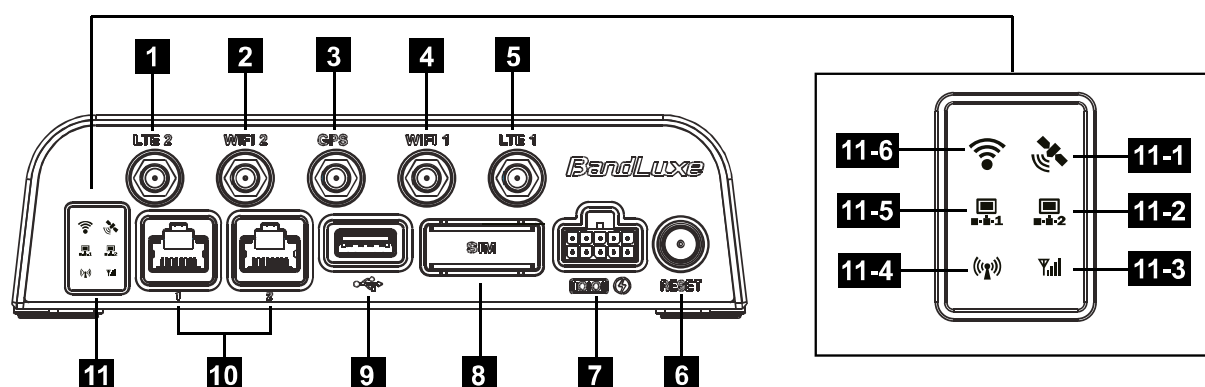
		
<i>BandLuxe K530 LTE/HSPA+ WiFi Router with GPS and Waterproof Connector Protective Caps</i>	<i>Mounting Screws</i>	<i>Power Adapter</i>
		
<i>Power Adapter Cable</i>	<i>Mini-SIM Card Tray</i>	

Features

- LTE* Cat3 and 3GPP Rel9 compatible with HSPA+ fallback support
(*: LTE is a trademark of ETSI.)
- High performance module and router platform targeted for m2m and mission critical applications
- IP 64 and MIL 810G rugged design for extreme environments

- Operation temperature: -20°C to 70°C (-4°F to 158 °F)
- Input voltage: 12V or 24V DC, accepting 9-32V voltage swing
- 802.11 b/g/n 2x2 MIMO wireless networking
- Six status LEDs, two Ethernet ports, and one USB port
- IPSec VPN client and VPN pass-through modes
- Composite GPS and Glonass features for quicker positioning location and better accuracy

Hardware Overview



1	4G External Antenna Port 2	Connect the second 4G External Antenna.
2	WiFi 2	Connect the second WiFi External Antenna.
3	GPS	Connect the GPS External Antenna.
4	WiFi 1	Connect the WiFi External Antenna.
5	4G External Antenna Port 1	Connect the 4G External Antenna.
6	Reset Button	Press this button to reboot the router.
7	Power Connector	Connect the power adapter cable here.
8	SIM Card Tray Slot	Insert the loaded SIM card tray here for mobile internet connection.
9	USB Port	Connect the USB device here.
10	LAN Ports 1 and 2	Connect the LAN device(s) as needed.

11 Network Status LEDs

11-1 GPS

Blue – GPS is ON.
(Solid) Position is fixed.
(Flashing) Position is not yet fixed.

11-2 LAN 2

Blue – LAN Port 2 is transmitting.

11-3 Signal Strength

Blue – Good signal strength
Green – Normal signal strength
Red – Poor signal strength or no signal

11-4 Network Status

Blue – LTE connection
(Solid) Connection is established.
(Flashing) Connection is not yet established.
Green – 3G connection
(Solid) Connection is established.
(Flashing) Connection is not yet established.
Red – No mobile internet connection

11-5 LAN 1

Blue – LAN Port 1 is transmitting.

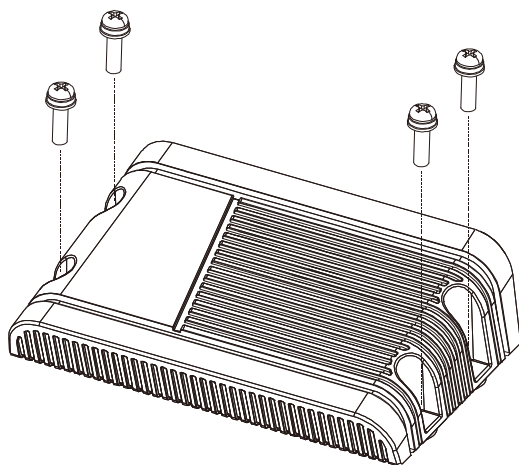
11-6 WiFi

Blue – WiFi is ON.



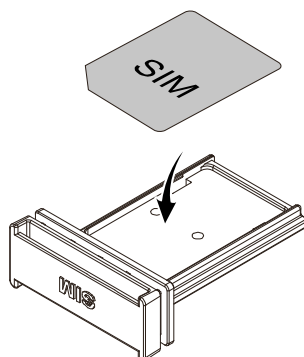
Installation

1. Mount the router with the four screws if needed.

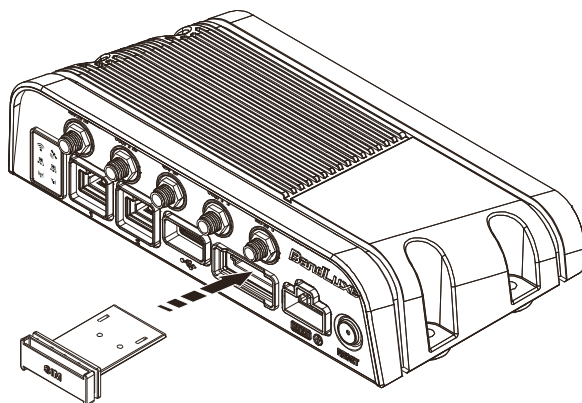


2. This router has its own internal SIM card. If you are using an external SIM card, load the SIM card as shown below:

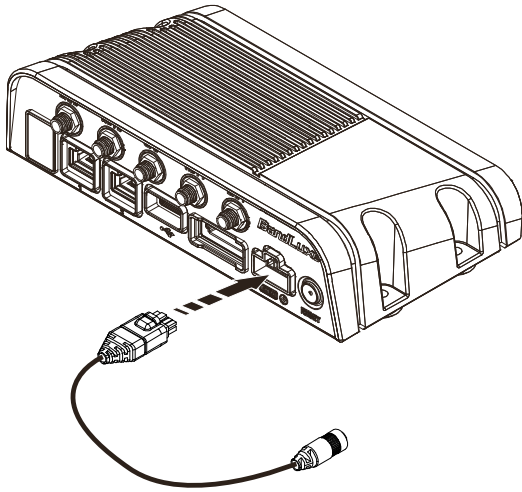
- a) Choose the SIM card tray that matches your SIM card (Mini-SIM or Micro-SIM). Place the SIM card tray upside down. Secure the SIM card (contact side up) onto the SIM card tray.



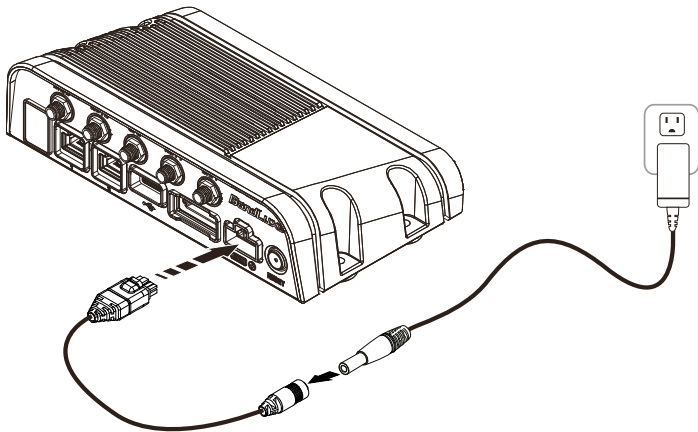
- b) Insert your loaded SIM card tray into the slot on the router.



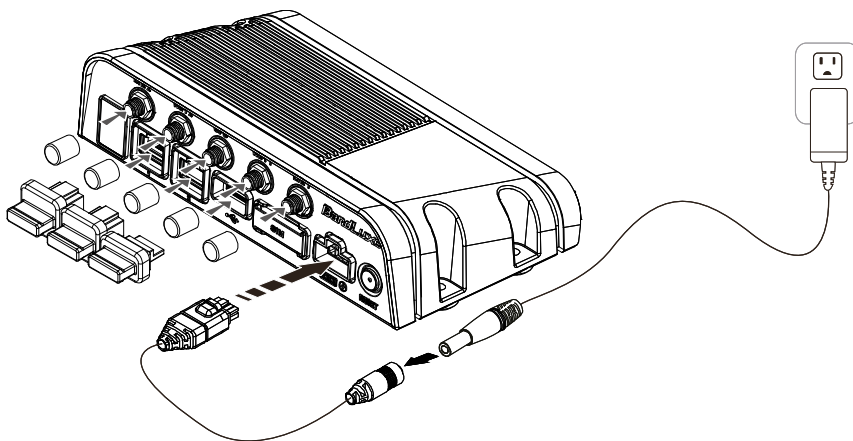
-
3. Connect the power adapter cable to the router.



4. Connect the power adapter cable to either a power outlet (via the power adapter) or a 12VDC power source. The router will automatically be turned ON upon receiving power.



5. To protect the connectors from water and dust intrusion, cover all unused connectors with their respective waterproof connector protective caps.



-
6. One of the following two methods can be chosen to link your PC with the router.

A. Wireless Connection (for Windows)

To link your PC to the router via WiFi, in Microsoft Windows, go to **Control Panel > Network Connections**. Right click on **Wireless Network Connection** and choose **View Available Wireless Networks**. Select default SSID [**BR_LTE_xxxx**] and enter default password (the last 4 digits of MAC address converted into 2-digit decimal numbers, please see table below for conversion method). The “xxxx” corresponds with the last 4 digits of MAC address. Click **Connect**.

Wireless Connection (for Mac)

Click the  on the upper side of the screen to view available wireless networks. Select default SSID [**BR_LTE_xxxx**] and enter default password (the last 4 digits of MAC address converted into 2-digit decimal numbers, please see table below for conversion method). The “xxxx” corresponds with the last 4 digits of MAC address. Click **Join**.

Conversion Table: Each of the last 4 digits of MAC address is hexadecimal. Here is the corresponding table between a hexadecimal digit and its corresponding 2-digit decimal number:

Hexadecimal Digit	Decimal Number	Hexadecimal Digit	Decimal Number
0	00	8	08
1	01	9	09
2	02	A	10
3	03	B	11
4	04	C	12
5	05	D	13
6	06	E	14
7	07	F	15

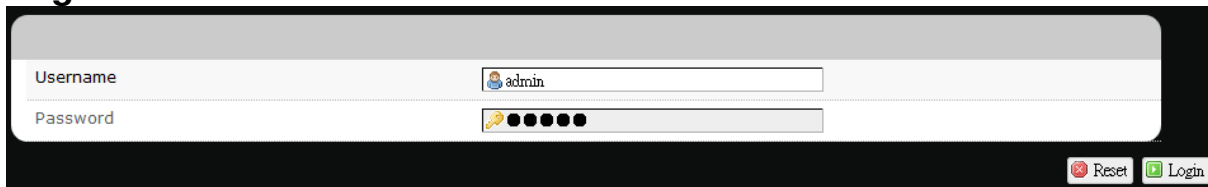
B. Wired Connection

To connect your PC to the router via an Ethernet cable, connect one end of the cable to one of the four LAN ports on the router, and another end of the cable to an Ethernet port on your computer.

Using Web-based Management

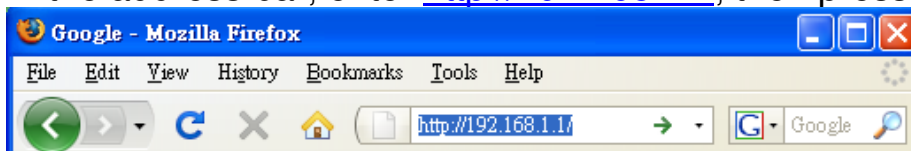
This chapter will guide you on how to configure your router via the web-based utility.

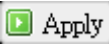
Login

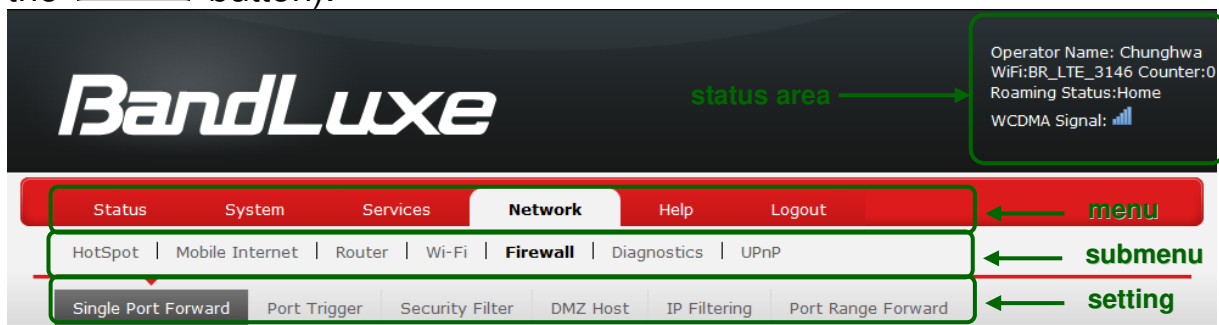


The login form is a simple web interface with a dark background. It features two input fields: 'Username' with the text 'admin' and 'Password' with masked characters. Below the fields are two buttons: 'Reset' and 'Login'.

1. Launch a web browser (e.g. Mozilla Firefox).
2. In the address bar, enter <http://192.168.1.1>, then press **Enter**.



3. On the opening screen, enter the username (**admin**) and password (**admin**).
4. Click **Login** to login to the main screen.
5. Click one of the *menu*, *submenu*, and/or *setting* tabs to configure the system. Additionally, the *status area* displays current wireless network information and setting-related messages (e.g. the message **Unapplied Change** appears whenever new settings are temporarily stored in the router without being applied, which will remind you to click the  button).



Note: If SIM Card's PIN verification is needed, select **Network > Mobile Internet > U/SIM PIN Management**. Enter the PIN code into text box of "**PIN Code Verification**". Click **Verify**. Mobile internet access will be enabled shortly after.

Status

This menu displays various statuses of the router. The associated submenu items are: **Overview**, **System Log**, **VnStat Traffic Monitor**, and **Mobile Internet**.

Overview

StatusSystemServicesNetworkHelpLogout

OverviewSystem LogGPSVnStat Traffic MonitorMobile Internet

Status > Overview

System

Router Model NameK530 serial

Router Firmware VersionAR_1_00000000_1_001_0028

Modem Firmware VersionQC_2_00016739_1_001_0013

IMEI359230050000017

Local TimeWed Nov 20 06:58:40 2013

Network

IPv4 WAN Status

Type: dhcp

Address: 100.69.239.255

Netmask: 255.255.224.0

Gateway: 100.69.224.1

DNS 1: 168.95.192.1

DNS 2: 168.95.1.1

Connected: 0h 5m 56s

IPv6 WAN Status

Not connected

DHCP Leases

Hostname	IPv4-Address	MAC-Address	Leasetime remaining
User-NB2	192.168.1.194	20:89:84:85:1A:56	11h 51m 26s

Local Network

Local MAC Address	Router IP Address	Subnet Mask	DHCP Server	DHCP Server Change	Start IP Address	IP Address Range
1E:29:EB:5D:DD:D1	192.168.1.1	255.255.255.0	Enable	DHCP Server Change	192.168.1.100	192.168.1.249

Wireless

Generic 802.11bgn Wireless Controller (wifi0)

SSID: [BR_LTE_3146](#)

Channel: 9 (2.452 GHz)

Mac address: 00:26:FA:0B:31:46

Encryption: mixed WPA/WPA2 PSK (CCMP)

Associated Stations

MAC-Address	Network
No information available	

The **Overview** submenu renders complete statistics for the router.

System

Displays system information: router model name, router firmware version, modem firmware version, phone number (MDN), ICCID, MIN (MSID), PRL version, IMEI, MEID, and local time.

Network

Displays current network connection information of IPv4 WAN and/or IPv6 WAN: type of network assignment (e.g. DHCP), network address, netmask, gateway, DNS addresses 1 & 2, and time connected since the establishment of the current mobile internet connection.

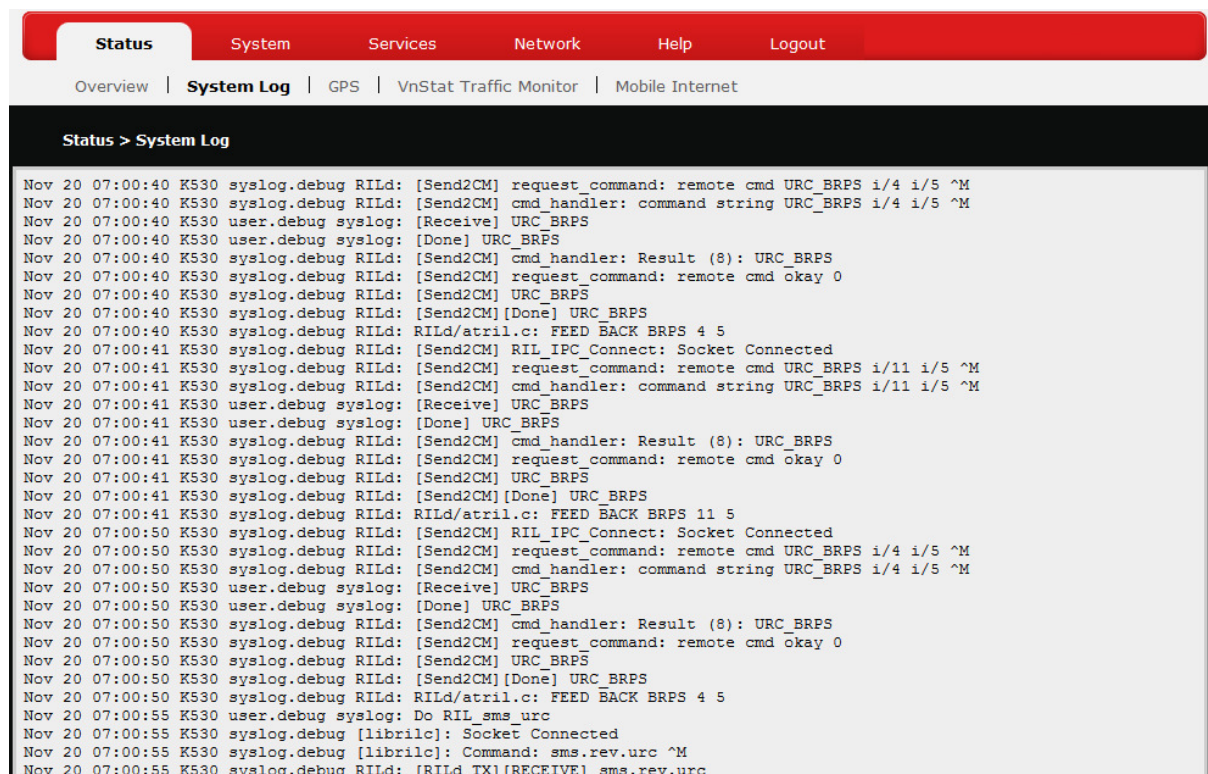
DHCP Leases

Display DHCP lease information for each client: hostname, IPv4 address, MAC address, and lease time remaining.

Local Network

Displays local network information: local MAC address, router IP address, subnet mask, DHCP server, DHCP server change, start IP address, IP and address range

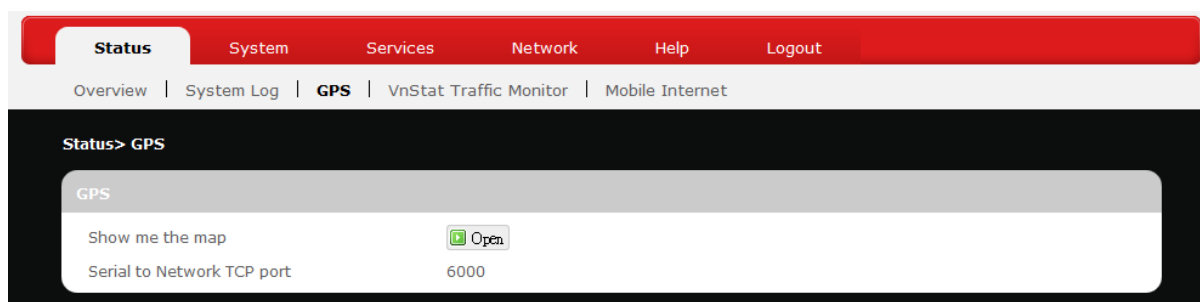
System Log

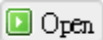


```
Nov 20 07:00:40 K530 syslog.debug RILd: [Send2CM] request_command: remote cmd URC_BRPS i/4 i/5 ^M
Nov 20 07:00:40 K530 syslog.debug RILd: [Send2CM] cmd_handler: command string URC_BRPS i/4 i/5 ^M
Nov 20 07:00:40 K530 user.debug syslog: [Receive] URC_BRPS
Nov 20 07:00:40 K530 user.debug syslog: [Done] URC_BRPS
Nov 20 07:00:40 K530 syslog.debug RILd: [Send2CM] Cmd_handler: Result (8): URC_BRPS
Nov 20 07:00:40 K530 syslog.debug RILd: [Send2CM] request_command: remote cmd okay 0
Nov 20 07:00:40 K530 syslog.debug RILd: [Send2CM] URC_BRPS
Nov 20 07:00:40 K530 syslog.debug RILd: [Send2CM] [Done] URC_BRPS
Nov 20 07:00:40 K530 syslog.debug RILd: RILd/atril.c: FEED BACK BRPS 4 5
Nov 20 07:00:41 K530 syslog.debug RILd: [Send2CM] RIL_IPC_Connect: Socket Connected
Nov 20 07:00:41 K530 syslog.debug RILd: [Send2CM] request_command: remote cmd URC_BRPS i/11 i/5 ^M
Nov 20 07:00:41 K530 syslog.debug RILd: [Send2CM] cmd_handler: command string URC_BRPS i/11 i/5 ^M
Nov 20 07:00:41 K530 user.debug syslog: [Receive] URC_BRPS
Nov 20 07:00:41 K530 user.debug syslog: [Done] URC_BRPS
Nov 20 07:00:41 K530 syslog.debug RILd: [Send2CM] Cmd_handler: Result (8): URC_BRPS
Nov 20 07:00:41 K530 syslog.debug RILd: [Send2CM] request_command: remote cmd okay 0
Nov 20 07:00:41 K530 syslog.debug RILd: [Send2CM] URC_BRPS
Nov 20 07:00:41 K530 syslog.debug RILd: [Send2CM] [Done] URC_BRPS
Nov 20 07:00:41 K530 syslog.debug RILd: RILd/atril.c: FEED BACK BRPS 11 5
Nov 20 07:00:50 K530 syslog.debug RILd: [Send2CM] RIL_IPC_Connect: Socket Connected
Nov 20 07:00:50 K530 syslog.debug RILd: [Send2CM] request_command: remote cmd URC_BRPS i/4 i/5 ^M
Nov 20 07:00:50 K530 syslog.debug RILd: [Send2CM] cmd_handler: command string URC_BRPS i/4 i/5 ^M
Nov 20 07:00:50 K530 user.debug syslog: [Receive] URC_BRPS
Nov 20 07:00:50 K530 user.debug syslog: [Done] URC_BRPS
Nov 20 07:00:50 K530 syslog.debug RILd: [Send2CM] Cmd_handler: Result (8): URC_BRPS
Nov 20 07:00:50 K530 syslog.debug RILd: [Send2CM] request_command: remote cmd okay 0
Nov 20 07:00:50 K530 syslog.debug RILd: [Send2CM] URC_BRPS
Nov 20 07:00:50 K530 syslog.debug RILd: [Send2CM] [Done] URC_BRPS
Nov 20 07:00:50 K530 syslog.debug RILd: RILd/atril.c: FEED BACK BRPS 4 5
Nov 20 07:00:55 K530 user.debug syslog: Do RIL_sms_urg
Nov 20 07:00:55 K530 syslog.debug [librilc]: Socket Connected
Nov 20 07:00:55 K530 syslog.debug [librilc]: Command: sms.rev.urg ^M
Nov 20 07:00:55 K530 syslog.debug RILd: [RILd_TX] [RECEIVE] sms.rev.urg
```

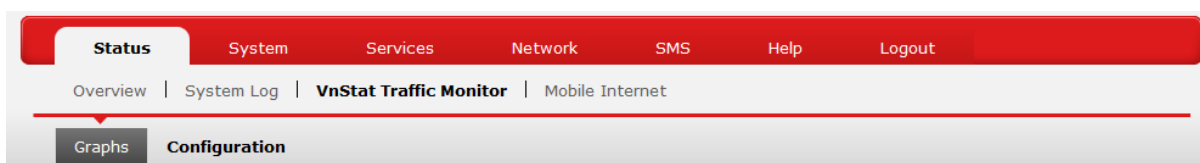
The **System Log** submenu tracks system activities after power on.

GPS



The **GPS** submenu displays Global Positioning System information. Click  to proceed.

VnStat Traffic Monitor

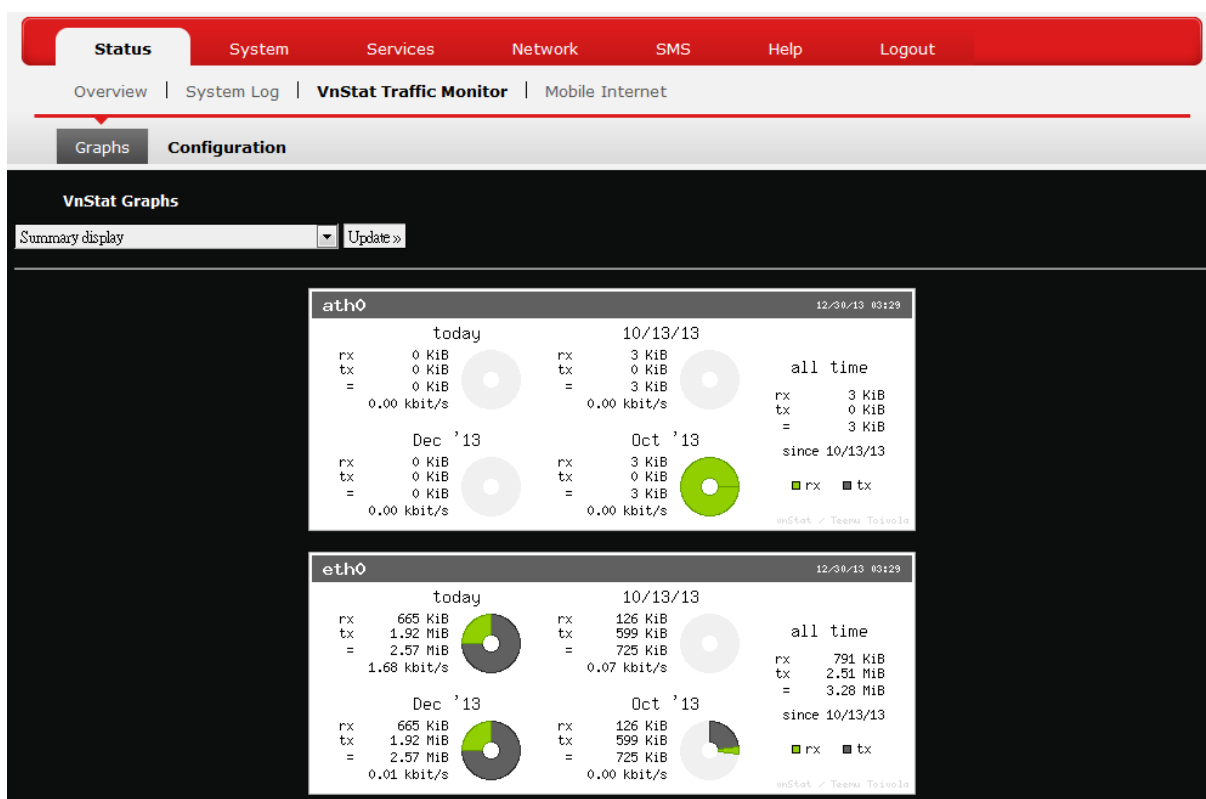


The **VnStat Traffic Monitor** submenu displays graphic analysis of the router's network traffic history.

Graphs

Displays VnStat network traffic history in various graphic analysis options: Summary display, Top 10 display, Hourly traffic, Daily traffic, and Monthly traffic. Click , select an analysis option from the drop-down list, and click **Update**. The VnStat Graphs will be updated accordingly.





Configuration

The screenshot shows the 'Configuration' page of the VnStat Traffic Monitor. It contains two main sections: 'Monitor selected interfaces' and 'Rest Traffic Flow'.

Monitor selected interfaces: A checkbox is checked, and the text 'Ethernet Adapter: "usb0" ([wan](#))' is displayed.

Rest Traffic Flow: A button labeled 'Rest Traffic Flow' is visible.

At the bottom right, there are three buttons: 'Reset', 'Save', and 'Apply'.

VnStat Traffic Monitor configurations can be made here.

a) *Monitor selected devices:* Click the checkbox to enable/disable network monitoring of the displayed interface(s). Click the link [wan](#) to jump to the **Common Configuration** setting under the submenu **Network → Interfaces**.

b) *Rest Traffic Flow:* Click to discard previous network history log and start anew.

Mobile Internet

Status

System

Services

Network

SMS

Help

Logout

Overview

System Log

VnStat Traffic Monitor

Mobile Internet

Signal Quality

Rx Signal Strength(dBm)

-61

U/SIM Status

SIM Status

PIN Enable(Verified)

Register Network

Network Name

Chunghwa

Network Technology

WCDMA

Home/Roaming

Home

Internet Connection

Connection Type

Service Available

Internet IP Address

100.90.146.212

Gateway

100.90.146.213

DNS 1

168.95.192.1

DNS 2

168.95.1.1

The **Mobile Internet** submenu displays mobile internet statistics.

Signal Quality

Displays signal strength of current mobile internet connection in dBm.

U/SIM Status

Displays current SIM card status:

- a) *Read SIM Fail* – No valid SIM card is inserted
- b) *PIN Disable(Verified)* – PIN protection is disabled while the SIM card status is verified; mobile internet service is available with this status.
- c) *PIN Enable(No Verified/Retries:#)* – PIN protection is enabled while the SIM card verification is pending (whereas # is the number of allowed PIN verifications remaining before SIM lock occurs).
- d) *PIN Enable(Verified)* – PIN protection is enabled while the SIM card status is verified; mobile internet service is available with this status.

Registered Network

- a) *Network Name* – name of your mobile internet service provider
- b) *Network Technology* – mobile internet communication signal type. Examples are WCDMA (3G) and LTE (4G).
- c) *Home/Roaming* – displays current network roaming status:

Home indicates mobile internet connection to the home location where the SIM card service is registered. Roaming indicates the extended mobile internet connection service in a location different from the home location where the SIM card service is registered. An example of roaming is when you travel abroad.

Internet Connection

Displays information of current internet connection:
Connection Type, Internet IP Address, Gateway, and DNS 1/2.



System

This menu is for system information and configurations.

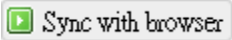
System

The screenshot shows a web interface with a red top navigation bar containing links: Status, System (active), Services, Network, SMS, Help, and Logout. Below this is a breadcrumb trail: System | Administration | Backup / Flash Firmware | Reboot. The main content area is titled 'System Properties' and has two tabs: 'General Settings' (selected) and 'Language and Style'. Under 'General Settings', there are three rows: 'Local Time' showing 'Mon Dec 30 03:42:41 2013', 'Hostname' with a text input field containing 'R550', and 'Time Zone' with a dropdown menu showing 'UTC'. Below this is a 'Time Synchronization' section with 'Enable NTP client' checked, 'NTP server candidates 1' with input 'watch.stdtime.gov.tw', and 'NTP server candidates 2' with an empty input field. The 'Remote System Log' section has 'Router LAN client IP Address' with an empty input field and 'Server port' with input '514'. At the bottom right are buttons for 'Reset', 'Save', and 'Apply'.

System Properties

Click either the “General Settings” or “Language and Style” tab to configure their respective settings.

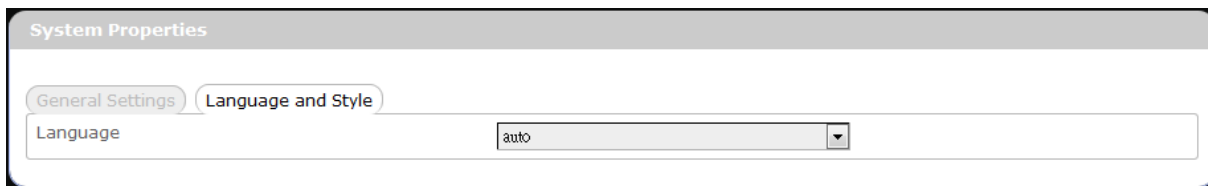
General Settings

Local Time – Displays current local time. To synchronize local time with the browser, click .

Hostname – Enter the desired hostname in this check field.

Time Zone – Sets the time zone associated with this router. Click on  and select the desired region.

Language and Style



The screenshot shows a window titled "System Properties". Inside, there are two tabs: "General Settings" and "Language and Style". The "Language and Style" tab is selected. Below the tabs, there is a label "Language" followed by a dropdown menu. The dropdown menu is currently set to "auto".

Language – Sets the desired display language and style of the router. Click  and select the desired display language and style.

Time Synchronization

Enable NTP client: Click the checkbox to enable/disable. With this option enabled, two more options will appear– “Provide NTP server” and “NTP server candidates”.

NTP server candidates 1/2: Enter the desired server candidates here.

Remote System Log

Router LAN client IP address: Displays the client IP address of the router LAN.

Server port: Displays port number of the server.

Administration

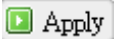
The screenshot shows the BandLuxe router administration interface. At the top is a red navigation bar with tabs: Status, System (selected), Services, Network, SMS, Help, and Logout. Below this is a breadcrumb trail: System | Administration | Backup / Flash Firmware | Reboot. The main content area has a dark background. The first section is 'Router Password' with two input fields: 'Password (limit 16 characters)' and 'Confirmation'. Each field has a password strength indicator (a key icon and a green checkmark). The second section is 'Remote access' with a single input field and two radio buttons: 'Enable' and 'Disable' (selected). At the bottom right are three buttons: 'Reset' (with a red X icon), 'Save' (with a green checkmark icon), and 'Apply' (with a green checkmark icon).

Router Password

Login password of the router can be changed here. Enter the new password in the 'Password' field, and enter the same password once again in the 'Confirmation' field.

Remote Access

This field specifies whether or not to allow remote access of this router.

After changing password and/or specifying remote access, click  . The screen will display a confirmation message after successful password change.

Backup / Flash Firmware

StatusSystemServicesNetworkSMSHelpLogout

SystemAdministrationBackup / Flash FirmwareReboot

Backup / Restore

Click "Generate archive" to download a tar archive of the current configuration files. To reset the firmware to its initial state, click "Perform reset" (only possible with squashfs images).

Download backup:

Generate archive

Reset to defaults:

Perform reset

To restore configuration files, you can upload a previously generated backup archive here.

Restore backup:

Browse...

No file selected.

Upload archive...

Flash new firmware image

Upload a sysupgrade-compatible image here to replace the running firmware. Check "Keep settings" to retain the current configuration.

Keep settings:

Keep settings

Image:

Browse...

No file selected.

Flash image...

Flash new module firmware image

Upload a module upgrade compatible image here to replace the running firmware.

Image:

Browse...

No file selected.

Flash image...

Flash new ipkg package

Upload a new ipkg.

Image:

Browse...

No file selected.

Flash image...

FOTA

Auto check:

Auto check

Check time:

24

hours

Check link for Router:

http://www.bandrich.com/midm9x15/

Check link for Module:

http://www.bandrich.com/midm9x15/

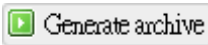
Apply

Check for firmware upgrade:

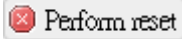
Check

Backup / Restore

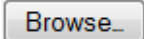
Download backup

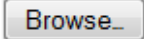
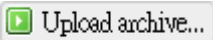
Here you can backup all current settings of the router to a TAR archive file on your computer or mobile device. Just click . A dialog window will prompt you to open or save the archive file. Depending on the browser that you are using, the TAR file may be saved in the system download folder or a location of your choice.

Reset to defaults

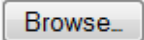
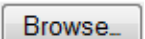
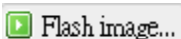
Here you can restore the router to its original factory settings. Just click , and a dialog message will appear to indicate the factory reset process. After completion of the reset process, the router will automatically reboot and return to its initial login prompt.

Restore backup

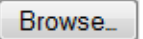
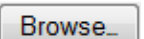
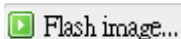
Here you can restore router settings previously saved as a TAR archive file on your computer or mobile device. Just click  to find and select the previously saved TAR archive file, and then click 'Open'.

Confirm that the TAR filename appears beside the  button and click . The system will reboot after completion of backup restoration.

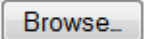
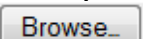
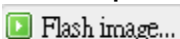
Flash new firmware image

This option allows you to upgrade this router with the updated firmware image. Just click  to find and select the firmware image file, and then click 'Open'. Confirm that the firmware filename appears beside the  button and click . The system will reboot after successful upgrade.

Flash new module firmware image

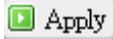
This option allows you to upgrade this router with the updated module firmware image. Just click  to find and select the firmware package file, and then click 'Open'. Confirm that the firmware filename appears beside the  button and click . The system will reboot after successful upgrade.

Flash new ipkg package

This option allows you to upgrade this router with the updated IPKG package. Just click  to find and select the IPKG package file, and then click 'Open'. Confirm that the IPKG package filename appears beside the  button and click . The system will reboot after successful upgrade.

FOTA

This option (Firmware Over The Air) allows you to automatically or manually upgrade this router's firmware wirelessly.

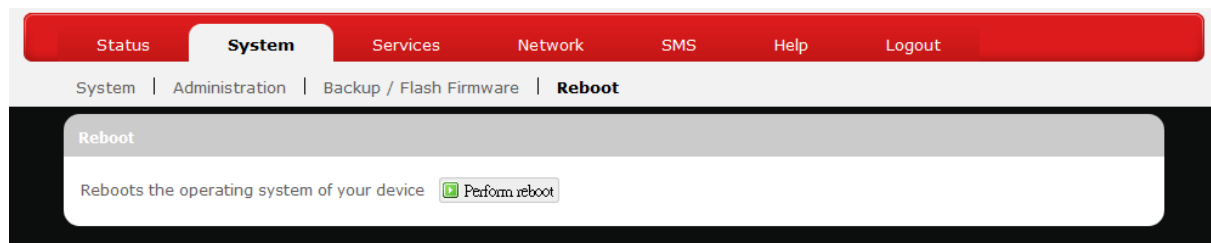
For automatic wireless update, enable “*Auto check*” and enter the desired time interval (in hours) between each check of the BandRich website for firmware update. For manual wireless update, disable “*Auto check*”. Confirm that the “*Check link for Router*” and “*Check link for Module*” fields have appropriate web address(es) present in their text boxes, i.e. <http://www.bandrich.com/mdm9x15/> . Click  to activate the wireless update configurations into effect.

To immediately check for firmware upgrade, click **Check**.



Warning: Upgrading firmware may take a few minutes; do not turn off the power or press the Reset button during upgrade.

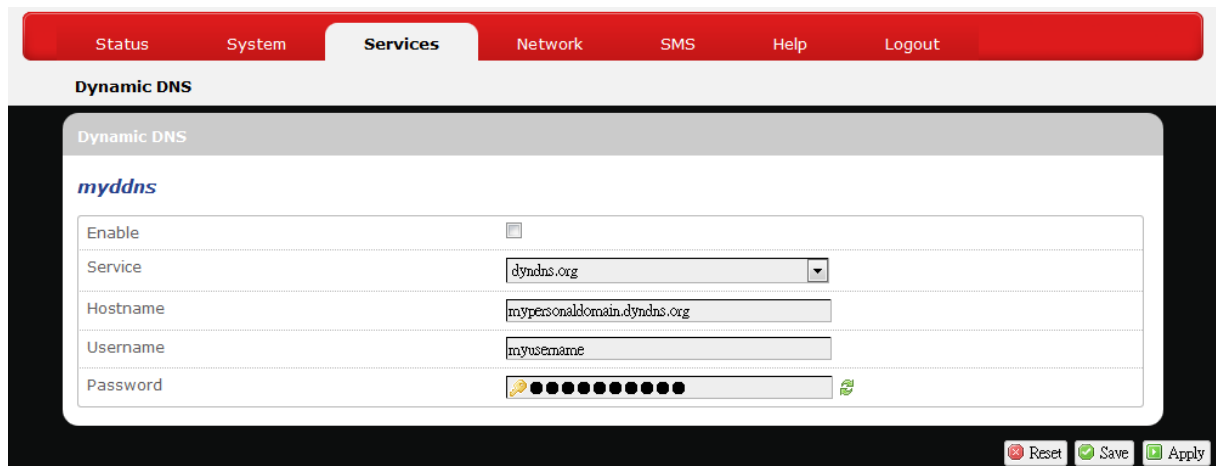
Reboot



Click ‘Perform reboot’ to restart the router.

Services

Dynamic DNS



The screenshot shows a web interface with a red navigation bar at the top containing links: Status, System, Services (selected), Network, SMS, Help, and Logout. Below the navigation bar is a section titled "Dynamic DNS". Inside this section, there is a sub-header "myddns" and a form with the following fields:

Enable	☐
Service	dyndns.org
Hostname	mypersonaldomain.dyndns.org
Username	myusername
Password	••••••••••

At the bottom right of the form, there are three buttons: Reset, Save, and Apply.

The **Services** menu hosts configuration options for DDNS (Dynamic Domain Name Service), which is a system that allows the domain name data held in a name server to be updated in real time. It allows an Internet domain name to be assigned to a computer with a varying (dynamic) IP address. Before you can use this feature, you need to sign up for DDNS with a DDNS provider, www.dyndns.org or www.TZO.com.

Enable: Check or un-check this box to enable or disable DDNS.

Service: Specifies the DDNS service URL. From the drop-down list, click and select an URL from the list.

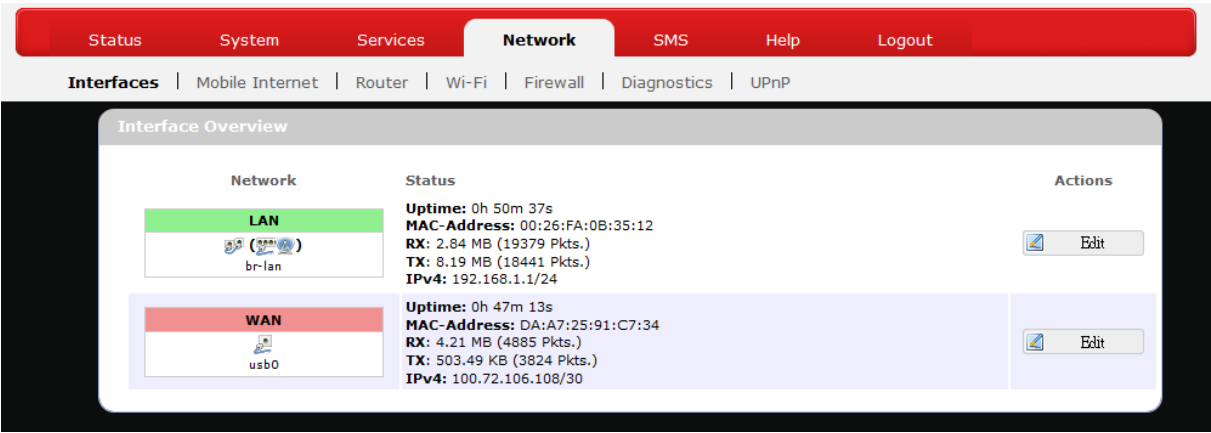
Hostname: Enter the hostname for your DDNS account.

Username: Enter the username for your DDNS account.

Password: Enter the password for your DDNS account.

Network

Interfaces



The **Interfaces** submenu allows interface configurations of different networks connected to this router. The configuration items are the same for each network with different default settings.

Interface Overview

Here you can see the brief network status summary for LAN (local area network) and WAN (wide area network). To configure LAN or WAN interfaces, click the appropriate **Edit** button and follow the below section *Common Configuration* for more details.

General Setup

Common Configuration

General Setup

Advanced Settings

Physical Settings

Firewall Settings

Status

br-lan

Uptime: 0h 51m 21s

MAC-Address: 00:26:FA:0B:35:12

RX: 2.88 MB (19657 Pkts.)

TX: 8.55 MB (18803 Pkts.)

IPv4: 192.168.1.1/24

Protocol	Static address
IPv4 address	192.168.1.1
IPv4 netmask	255.255.255.0
IPv4 gateway	
IPv4 broadcast	
Use custom DNS servers	
Accept router advertisements	☐
Send router solicitations	☒
IPv6 address	
IPv6 gateway	

Status:	Displays protocol-dependent statistics of network connection.
---------	---

Protocol: Specifies the protocol to be used for the network. The available protocols are *Static address*, *DHCP client*, *Unmanaged*, *PPP*, *PPTP*, *PPPoE*, *PPPoATM*, *UTMS/GPRS/EV-DO*, and *L2TP*.

The default LAN protocol is *Static address*, whereas the default WAN protocol is *DHCP client*.

Really switch protocol: This configuration item appears when the protocol is changed. Press  to confirm protocol change and show protocol-dependent configuration items.

(Protocol-dependent configuration items): Different protocol-dependent configuration items will appear according to the protocol chosen.

Advanced Settings

The screenshot shows the 'Common Configuration' window with the 'Advanced Settings' tab selected. The 'General Setup' sub-tab is active, displaying four configuration items: 'Bring up on boot' (checked), 'Override MAC address' (00:26:FA:0B:35:12), 'Override MTU' (1500), and 'Use gateway metric' (0).

This tab is for advanced users to make detailed configurations of protocol-related settings. Actual configuration items will vary according to the protocol chosen in the tab item *General Setup*.

Physical Settings

The screenshot shows the 'Common Configuration' window with the 'Physical Settings' tab selected. The 'Interface' sub-tab is active, showing a list of available physical interfaces: 'Ethernet Switch: "eth0"', 'VLAN Interface: "eth0.1" (lan)', 'Ethernet Adapter: "usb0" (wan)', 'Wireless Network: Master "BR_LTE_3512" (lan)', and 'Custom Interface:'. The 'Wireless Network' option is selected.

This tab is for selection of physical interface of the associated network. Click one of the available physical interfaces or click **Custom Interface:** and enter your own interface name.

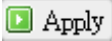
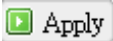
This tab is not available for the following protocols: *PPP*, *PPtP*, *PPPoE*, *PPPoATM*, *UTMS/GPRS/EV-DO*, and *L2TP*.

Firewall Settings

The screenshot shows the 'Common Configuration' window with the 'Firewall Settings' tab selected. The 'Create / Assign firewall-zone' sub-tab is active, displaying four options: 'lan: lan: ', 'wan: wan: ', 'wan2: (empty)', and 'unspecified -or- create:'. The 'lan' option is selected. A note at the bottom states: 'Choose the firewall zone you want to assign to this interface. Select unspecified to remove the interface from the associated zone or fill out the create field to define a new zone and attach the interface to it.'

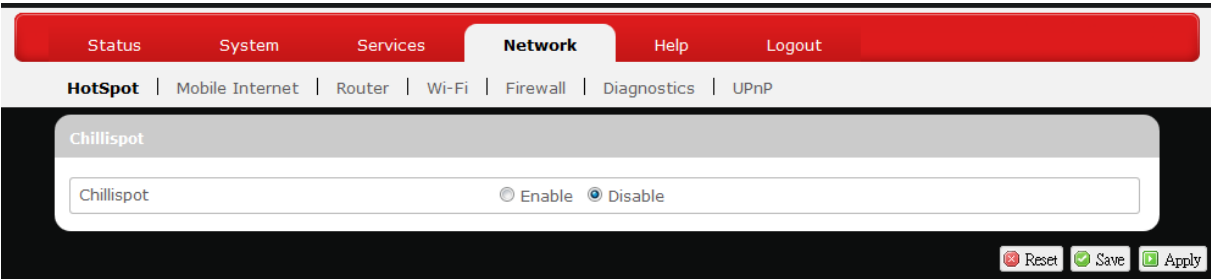
This tab is for adjustment of firewall settings.

Click the desired network as the desired firewall zone assigned to this interface. Furthermore, you can remove the interface from the associated zone by entering “unspecified” in the *unspecified -or- create* field and

clicking , or you can define a new zone by entering your own firewall name in the *unspecified -or- create* field and clicking .

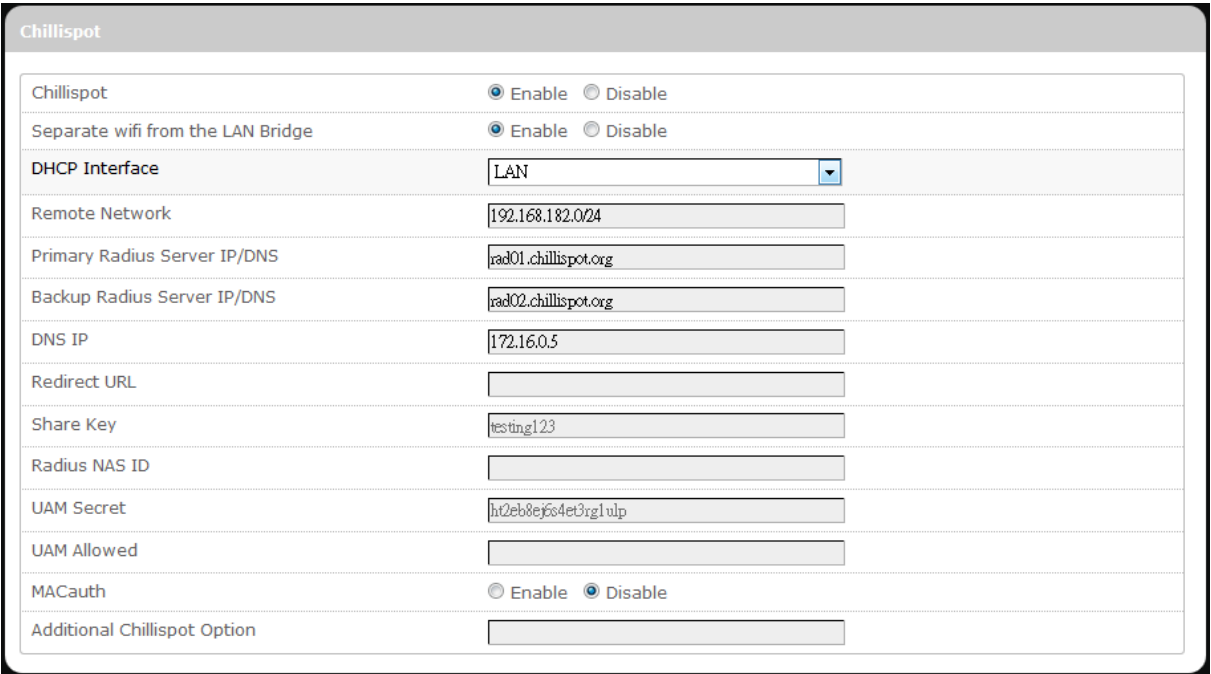


Hotspot



The **Hotspot** submenu is for setup and adjustment of mobile internet connection through WLAN (wireless local area network).

Chillispot



Chillispot: Enable or disable the chillispot (i.e. hotspot) feature.

Separate WiFi from the LAN Bridge: Enable or disable WiFi separation from the LAN bridge. If this option is enabled, two additional configuration items, *DHCP Interface* and *Remote Network*, will appear below.

DHCP Interface Select the appropriate DHCP interface when the configuration item “*WiFi separation from the LAN bridge*” is enabled. The options are *LAN*, *WAN*, or *WLAN&LAN*.

Remote Network Enter the IP address of remote network when the



configuration item “*WiFi separation from the LAN bridge*” is enabled.

Primary RADIUS Server IP/DNS:	Enter the IP/DNS address of primary RADIUS server.
Backup RADIUS Server IP/DNS:	Enter the IP/DNS address of backup RADIUS server.
DNS IP:	Enter the numerical IP address of DNS.
Redirect URL:	Enter the redirection URL if needed.
Share key:	Enter the share key here.
RADIUS NAS ID:	Enter the NAS ID for RADIUS authentication.
UAM Secret:	Enter the secret code for UAM (universal access method).
UAM Allowed:	Enter the name for UAM allowed.
MACauth:	Enable or disables MAC authorization.
Additional Chillispot Option:	Enter the additional chillispot option if needed.



Mobile Internet

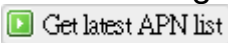
The screenshot shows the 'Mobile Internet' settings page. The top navigation bar includes 'Status', 'System', 'Services', 'Network' (selected), 'Help', and 'Logout'. Below this, a sub-menu bar shows 'HotSpot', 'Mobile Internet' (selected), 'Router', 'Wi-Fi', 'Firewall', 'Diagnostics', and 'UPnP'. The main content area has tabs for 'Mobile IP Setting' (selected), 'U/SIM PIN Management', 'SIM Management', and 'Preferred Network'. The 'Network > Mobile Internet > Mobile IP Setting' breadcrumb is visible. The 'Network Settings' section contains three rows: 'Roaming Connection' (disabled, with an 'Enabled' button), 'APN Update' (Version 3.151, with a 'Get latest APN list' button), and 'APN' (set to 'Auto'). The 'Auto APN Information' section shows the APN is 'internet'.

The **Mobile Internet** submenu is for setup and adjustment of mobile internet connection and furthermore has four setting tabs: **WWAN Setting**, **U/SIM PIN Management**, **SIM Management**, and **Preferred Network**.

WWAN Setting

This screenshot shows the same 'Mobile IP Setting' page as above, but with the 'APN Profile Settings' section expanded. It includes a red warning message: 'Please enter the APN profile name before you press the Add button.' Below this is an 'Add' button. A table with four columns is shown: 'APN', 'User Name', 'Password', and 'Authentication'. The table is currently empty, with a note below it stating 'This section contains no values yet'. At the bottom right, there are 'Reset', 'Save', and 'Apply' buttons.

Network Settings

- Roaming Connection: Enables or disables current roaming setting.
- Update Profile: Click **Update** to update the network profile.
- Update PRL: Click **Update** to update the PRL (Preferred Roaming List).
- APN Update: Displays the current APN (Access Point Name) version. To get the latest version of APN, click .
- APN: 'Auto' – Uses automatic APN profile settings for network; this is the default APN setting.
'Manual' – Allows the manual choice of APN Profile Settings for network.
- Profile Selection: This item appears when APN is set to 'Manual'.

Auto APN Information

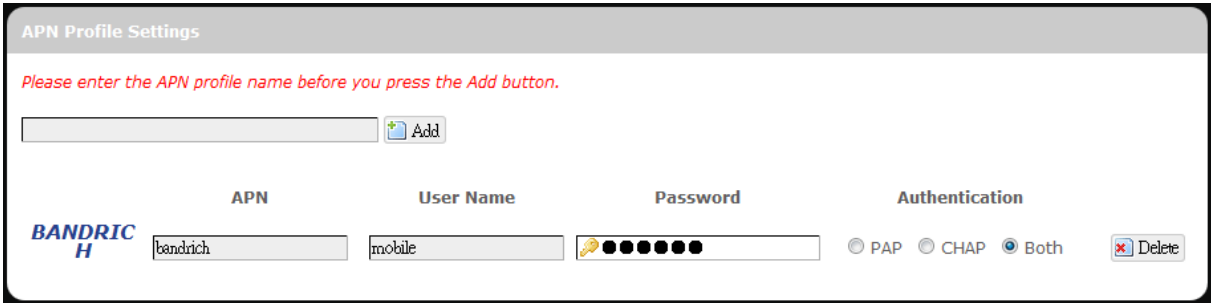
This section displays automatic APN information.

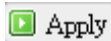
APN Profile Settings

For Advanced Users

This section allows you to establish your own APN profile settings.

To establish a new APN profile, type in a new APN profile name in the text box and click .



Enter the APN, username, and password. Click .

Reset Modem

Click **Perform reset** to reset this router to its factory default settings.

U/SIM PIN Management

The screenshot shows the 'U/SIM PIN Management' page in a web interface. The top navigation bar includes 'Status', 'System', 'Services', 'Network' (selected), 'Help', and 'Logout'. Below this, a secondary navigation bar lists 'HotSpot', 'Mobile Internet' (selected), 'Router', 'Wi-Fi', 'Firewall', 'Diagnostics', and 'UPnP'. A third navigation bar shows 'Mobile IP Setting', 'U/SIM PIN Management' (selected), 'SIM Management', and 'Preferred Network'. The main content area is titled 'Network > Mobile Internet > U/SIM PIN Management'. It contains two sections: 'Setting' and 'Change PIN'. The 'Setting' section has three rows: 'SIM Status' with the value 'PIN Enable(Verified/Retries:3)', 'PIN Protection' with a dropdown menu set to 'enable', and 'PIN Code' with a password input field. The 'Change PIN' section has three rows: 'Old PIN Code', 'New PIN Code', and 'New PIN Confirm', each with a password input field. At the bottom right of the form are three buttons: 'Reset', 'Save', and 'Apply'.

This submenu features configurable items that are dependent on the router's mobile internet status, as detailed below.

Scenario 1: No mobile internet service

Without a valid SIM card inserted into the router, the Verify dialog will show the following SIM card status:

The screenshot shows a 'Verify' dialog box. It has two rows: 'Status:' with the value 'Read SIM Fail' and 'PIN Code verify:' with a password input field.

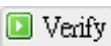
Here the Verify dialog shows SIM status as “Read SIM Fail”, meaning that no valid SIM card is inserted.

Scenario 2: Mobile internet service pending

If a valid SIM card is inserted into the router requiring PIN code verification, the Verify dialog will show the following SIM card status:

The screenshot shows a 'Verify' dialog box. It has two rows: 'Status:' with the value 'PIN Enable(No Verified/Retries:3)' and 'PIN Code verify:' with a password input field.

Here the Verify dialog shows the SIM status as “No Verified/Retries:3”,

meaning that a valid SIM card is inserted with PIN code verification pending. Enter your SIM card verification code in the text box of “PIN Code verify:”, and then click . Once the PIN code verification is finished, the router is ready to use the SIM card’s associated mobile internet access, and the top right status area will be updated accordingly.

Operator Name: No connecting
WiFi:BR_LTE_3512 Counter:0
Roaming Status:Home
Signal: 



Operator Name: Chunghwa
WiFi:BR_LTE_3512 Counter:0
Roaming Status:Home
WCDMA Signal: 

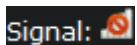
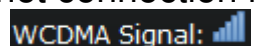
Operator Name: Displays the name of the internet service provider

WiFi: Shows the active WiFi SSID of this router

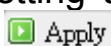
Counter: Shows number of clients currently connected to the active SSID

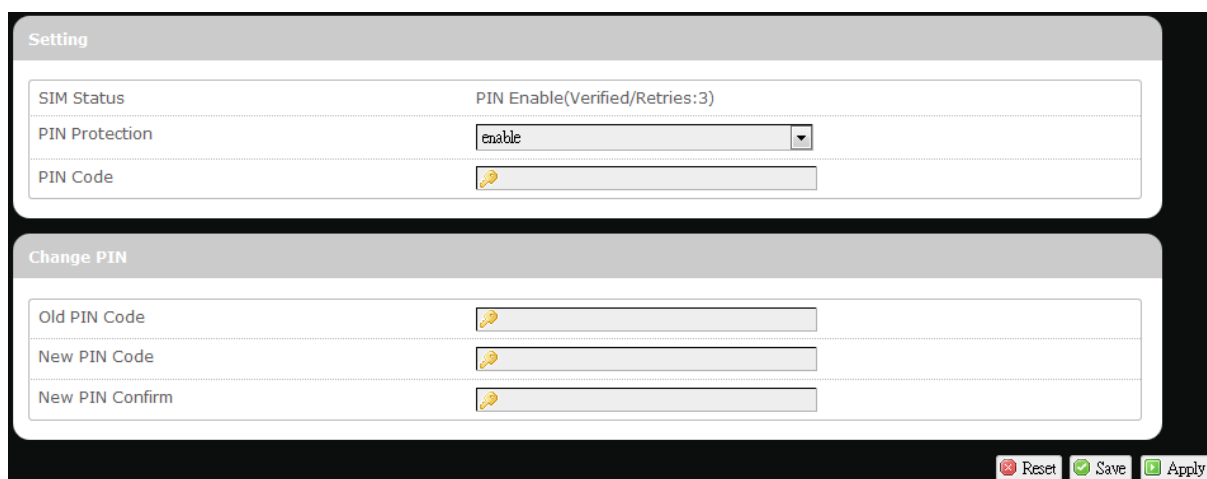
Roaming Status: Displays current roaming status

(Carrier) Signal: Displays strength of the indicated signal type (Carrier)
For example:

1. Without mobile internet connection, the display will be  (no carrier, no signal).
2. If WCDMA (3G) mobile internet connection is established, the display will be  (WCDMA carrier, excellent signal strength).

Scenario 3: Mobile internet service enabled

If a valid SIM card is inserted into the router with PIN code verified, the configuration dialog will be ‘Setting’ and/or “Change PIN” to allow further SIM card management (click  after making changes):



Setting

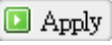
- SIM Status:** Shows current SIM card status.
“*PIN Enable*” means that the SIM card is enabled for mobile internet access.
“*PIN Disable(Verified/Retries:#)*” means that the SIM card is enabled for mobile internet access without requiring PIN code verification. Note that if PIN protection is re-enabled, # is the number of allowed PIN verifications remaining before SIM lock occurs.
- PIN Protection:** Enables or disables the PIN protection by clicking  and making the appropriate choice from the drop-down list.
- PIN Code** If PIN protection is enabled, you need to enter PIN code in this text box for making changes in this ‘Setting’ dialog.

Change PIN

This option is configurable only if PIN Protection is enabled.

Here you can change the PIN code for enhanced SIM card security.

- Old PIN Code:** Enter the old PIN code.
- New PIN code:** Enter the new PIN code.
- New PIN code confirm:** Enter the same new PIN code again for PIN code confirmation.

Click  after making changes in ‘Setting’ and/or “Change PIN”.

SIM Management

The screenshot shows the 'SIM Management' page in a web interface. At the top, there is a red navigation bar with tabs: Status, System, Services, Network (selected), Help, and Logout. Below this is a secondary navigation bar with links: HotSpot, Mobile Internet (selected), Router, Wi-Fi, Firewall, Diagnostics, and UPnP. A third bar contains links: Mobile IP Setting, U/SIM PIN Management, SIM Management (selected), and Preferred Network. The main content area has a breadcrumb trail: Network > Mobile Internet > SIM Management. Below this is a 'Setting' box with a label 'SIM lock Status' and a value 'SIM no lock!'. At the bottom right of the setting box are three buttons: Reset, Save, and Apply.

Here you can see the current SIM lock status.

Scenario 1: SIM lock absent

“SIM no lock” means that the SIM card is unlocked.

This is a close-up of the 'SIM lock Status' field from the previous screenshot, showing the text 'SIM no lock!'.

Scenario 2: SIM lock present

If your SIM card is locked for some reason, here you can also enter the SIM unlock code to unlock it. After entering the SIM unlock code in the text box “SIM Unlock”, click .

This is a close-up of the 'SIM Unlock' field, showing a text input box with a label 'SIM Unlock'.

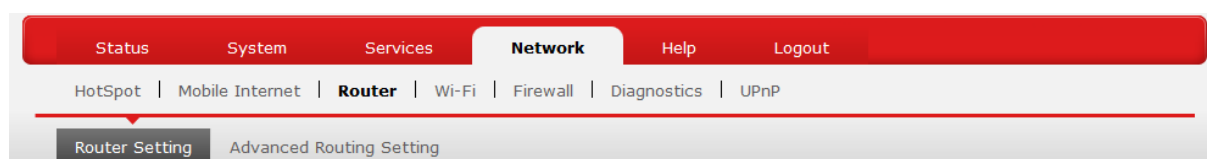
Preferred Network

The screenshot shows the 'Preferred Network' page in the same web interface. The navigation bars are identical to the SIM Management page. The breadcrumb trail is: Network > Mobile Internet > Preferred Network. The main content area has a 'Network Type' box with a label 'Network Type:' and a drop-down menu currently set to 'Auto'. At the bottom right of the box are 'Reset' and 'Apply' buttons.

Here you can select the preferred mobile network type by clicking  and making a choice from the drop-down list. The default choice is *Auto*. Other available choice examples are *LTE (4G)*, *WCDMA (3G)*, and *GSM (2G)*.

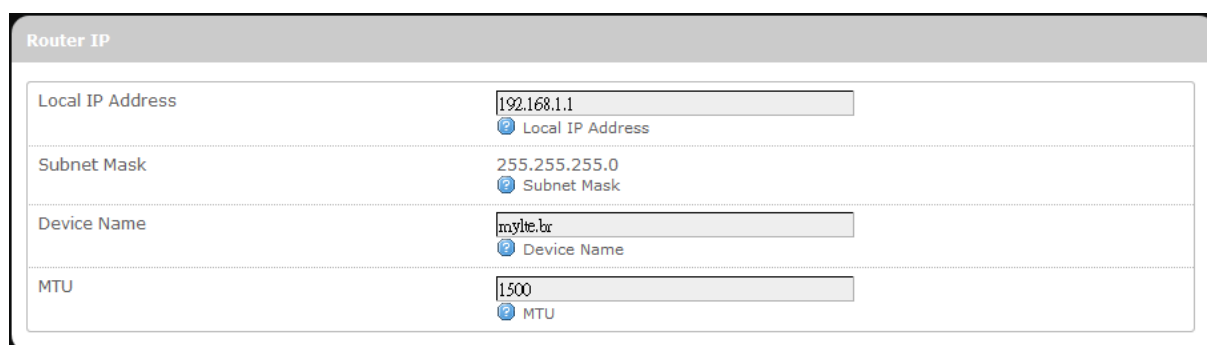
Router

Router Settings



The navigation bar features a red header with tabs for Status, System, Services, Network (selected), Help, and Logout. Below this is a secondary bar with links for HotSpot, Mobile Internet, Router (selected), Wi-Fi, Firewall, Diagnostics, and UPnP. A third bar contains 'Router Setting' (selected) and 'Advanced Routing Setting'.

Router IP



The 'Router IP' configuration form contains four rows, each with a label, a text input field, and a help icon. The values are: Local IP Address (192.168.1.1), Subnet Mask (255.255.255.0), Device Name (myite.br), and MTU (1500).

Router IP	
Local IP Address	192.168.1.1 Local IP Address
Subnet Mask	255.255.255.0 Subnet Mask
Device Name	myite.br Device Name
MTU	1500 MTU

Local IP Address: The default local IP address of this router is 192.168.1.1. If this address conflicts with another local network device, you can enter another local IP address here.

Subnet Mask: Displays current Subnet Mask

Device Name: The current device name is displayed in gray color. The device name can be changed by typing in the new device name in this text box.

MTU: The current MTU (maximum transmission unit with default value of 1500 bytes) is displayed in gray color. The MTU can be changed by typing in the new MTU value in this text box.

DHCP Service

DHCP Service

DHCP Server

☒ Enable ☐ Disable

Start IP Address

100

Start IP Address

Maximum Number of Users

150

Maximum Number of Users

Client Lease Time

720

Expiry time of leased addresses, minimum is 2 Minutes (The unit is Minutes).

IP Address Range

192.168.1.100-249

IP Address Range

Primary DNS

Primary DNS

Secondary DNS

Secondary DNS

DHCP Server: Enables or disables the DHCP Server feature.

Start IP Address: Specifies the starting number of the last 3 digits of assigned client IP address. For example, the default value of **100** means that the first assigned client IP address will be 192.168.1.**100**; the next assigned client IP address will be 192.168.1.**101**; and so on...

Maximum Number of Users:	Specifies maximum number of users for this router. The default setting is 150 users.
--------------------------	---

Client Lease Time:	Specifies the amount of lease time allocated to clients of this router, i.e. the expiry time of leased addresses. Use 'h' to indicate hours or use 'm' to indicate minutes.
--------------------	---

IP Address Range:	Displays assignable local IP address range of this router
-------------------	---

Primary DNS: If needed, specify the primary Domain Name System here.

Secondary DNS: If needed, specify the secondary Domain Name System here.

Active DHCP Leases

Active DHCP Leases			
Hostname	IPv4-Address	MAC-Address	Leasetime remaining
User-NB2	192.168.1.194	20:89:84:85:1A:56	11h 48m 18s

This section displays active DHCP lease information for each client: **Hostname**, **IPv4 address**, **MAC address**, and **Lease time remaining**.

Static Leases

The screenshot shows the 'Static Leases' configuration page. At the top, there is a header 'Static Leases'. Below it, a paragraph explains that static leases are used to assign fixed IP addresses and symbolic hostnames to DHCP clients. It also mentions that they are required for non-dynamic interface configurations where only hosts with a corresponding lease are served. A note states: 'Use the Add Button to add a new lease entry. The MAC-Address identifies the host, the IPv4-Address specifies the fixed address to use and the Hostname is assigned as symbolic name to the requesting host.' Below this text is a table with three columns: 'Hostname', 'MAC-Address', and 'IPv4-Address'. The table is currently empty, and a message below it says 'This section contains no values yet'. At the bottom left of the table area is an 'Add' button with a plus icon. At the bottom right of the page are three buttons: 'Reset', 'Save', and 'Apply'.

This option allows fixed IP address and symbolic hostname assignments for DHCP clients.

To add a static lease, first click .

The screenshot shows the 'Static Leases' configuration page with the form fields for adding a new lease. The table now has three input fields: 'Hostname', 'MAC-Address', and 'IPv4-Address'. The 'MAC-Address' and 'IPv4-Address' fields are dropdown menus. To the right of the 'IPv4-Address' dropdown is a 'Delete' button with a red X icon. At the bottom left of the table area is an 'Add' button with a plus icon. At the bottom right of the page are three buttons: 'Reset', 'Save', and 'Apply'.

Enter the desired hostname. Choose the desired MAC address and IPv4-Address (click  and select a rule from the drop-down list; if "--Custom--" is selected, the drop-down list will change to a text box to allow you to enter your custom address).

The MAC address is for host identification, whereas the IPv4 address specifies the fixed address for static lease.

To remove any unwanted static lease, just click the corresponding  button.

Click  after making any changes.

Advanced Routing settings

StatusSystemServicesNetworkHelpLogout

HotSpot | Mobile Internet | Router | Wi-Fi | Firewall | Diagnostics | UPnP

Router SettingAdvanced Routing Setting

Network > Router > Advanced Routing Setting

Static Routing

Interface	Target Host-IP or Network	IPv4-Netmask if target is a network	IPv4-Gateway	Metric
This section contains no values yet				
				

Routing and Redirection Service

NAT Service☒ Enable ☐ Disable

VPN Passthrough

IPSec Passthrough☒ Enable ☐ Disable

PPTP Passthrough☒ Enable ☐ Disable

L2TP Passthrough☒ Enable ☐ Disable

Static Routing

This option allows fixed network routing path assignment (as opposed to the initial adaptive routing).

To add a static network routing path, click . To remove any unwanted static network routing path, click the corresponding  button. Click  after making any changes.

Static Routing

Interface	Target Host-IP or Network	IPv4-Netmask if target is a network	IPv4-Gateway	Metric	
lan lan wan	192.168.1.123	255.255.255.255	192.168.1.2	0	

Interface: Click  and choose 'lan' (local area network) or 'wan' (wide area network).

Target: Enter the target host IP or network address here.

IPv4-Netmask: Displays the IPv4-Netmask address (the default is 255.255.255.255). A custom IPv4-Netmask can also be specified here.

IPv4-Gateway: If needed, a custom IPv4-Gateway address can be specified here.

Metric: Specifies the network path priority number (usually associated with the network path's administrative distance). The lower the metric number, the higher priority of this static route in the network routing protocol.

The default value is 0 (highest priority). A different metric number can also be specified here.

Note: If contents in the text box is invalid, a  will appear on the right side of the text box, and the text color changes to red. For example, the following demonstrates an invalid target Host-IP or Network address: 

Routing and Redirection Service

This option enables or disables Network Address Translation (NAT) service, which is a standard that allows multiple computers on a private network to share a single IP address.

VPN Passthrough

A Virtual Private Network (VPN) is a type of secured private network connection, built upon publicly-accessible infrastructure such as the Internet. They usually provide connectivity to various devices behind a gateway or firewall.

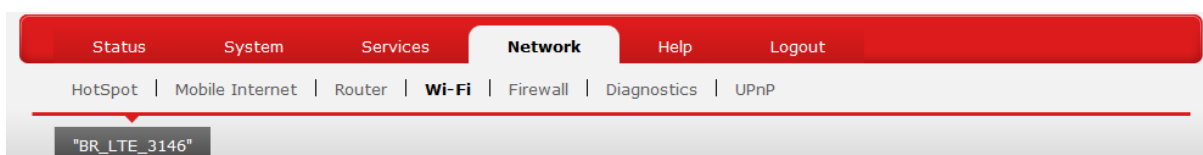
IPSec Passthrough: IP Security (IPSec) provides authentication and encryption. Since it is mainly a Layer 3 technology, it can secure all data on the network. To allow IPSec tunnels to pass through the Router, click 'Enabled'.

PPTP Passthrough: Point-to-Point Tunneling Protocol (PPTP) allows you to establish a connection to an enterprise network. To allow PPTP tunnels to pass through the Router, click Enabled.

L2TP Passthrough: Layer 2 Tunneling Protocol (L2TP) is an extension of the Point-to-Point Tunneling Protocol and is also used to establish virtual private networks. To allow L2TP

tunnels to pass through the Router, click Enabled.

WiFi



This submenu item is for configuring all Wi-Fi-related settings. This router supports up to two WiFi SSIDs. The default SSID is as follows:

Tab Name	Corresponding SSID	Default Password
"BR_LTE_xxxx"	BR_LTE_xxxx	The last 4 digits of MAC address (xxxx) converted into 2-digit decimal numbers, please see table below for conversion method.

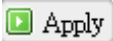
Hexadecimal Digit	Decimal Number	Hexadecimal Digit	Decimal Number
0	00	8	08
1	01	9	09
2	02	A	10
3	03	B	11
4	04	C	12
5	05	D	13
6	06	E	14
7	07	F	15

SSID and Password Example:

MAC Address	Corresponding SSID	Default Password
0026FA0B314A	BR_LTE_314A	03010410

Each tab has identical sets of configuration categories:

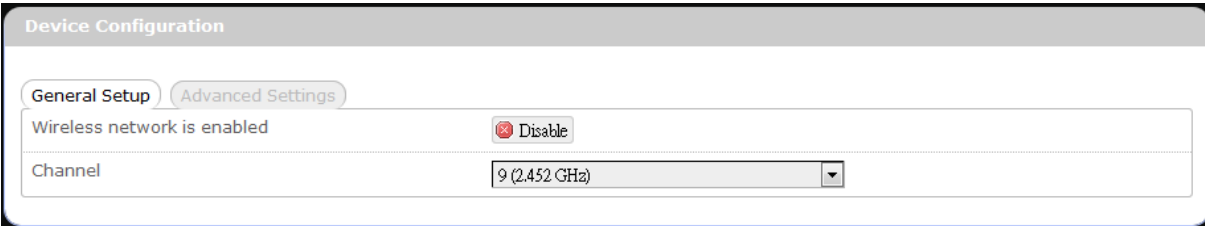
Device Configuration and **Interface Configuration**.

Please click  **Apply** after making any changes in this submenu.



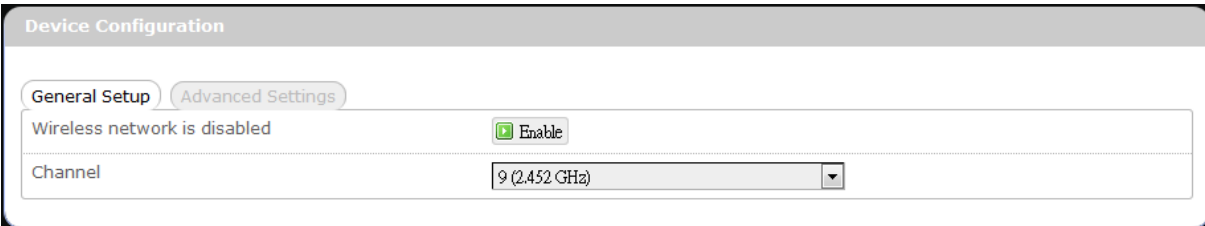
Device Configuration

General Setup



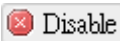
The screenshot shows the 'Device Configuration' window with the 'General Setup' tab selected. It displays 'Wireless network is enabled' with a red 'Disable' button. The 'Channel' dropdown is set to '9 (2.452 GHz)'.

or

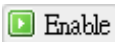


The screenshot shows the 'Device Configuration' window with the 'General Setup' tab selected. It displays 'Wireless network is disabled' with a green 'Enable' button. The 'Channel' dropdown is set to '9 (2.452 GHz)'.

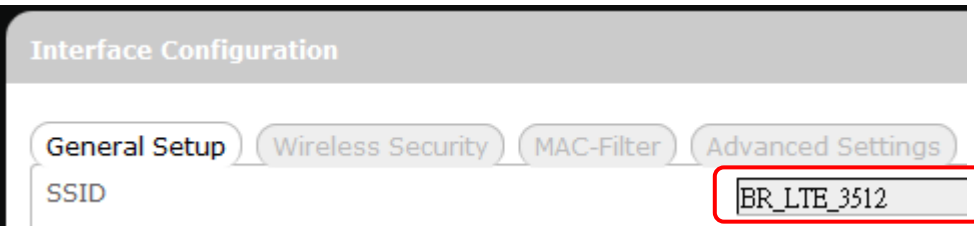
Wireless network is enabled*

WiFi connection of the associated SSID is enabled.
To disable WiFi connection of this SSID, click .

Wireless network is disabled*

WiFi connection of the associated SSID is disabled.
To enable WiFi connection of this SSID, click .

* Note: The associated SSID is displayed either in the selected submenu tab under WiFi or in the WiFi category item **Interface Configuration → General Setup → SSID**.



The screenshot shows the 'Interface Configuration' window with the 'General Setup' tab selected. The 'SSID' field contains the text 'BR_LTE_3512', which is highlighted with a red rectangular box.

Channel: Selects the WiFi channel for communication. The available choices are:

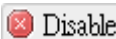
- Channel (carrier frequency)
- 1 (2.412 GHz)
 - 2 (2.417 GHz)
 - 3 (2.422 GHz)
 - 4 (2.427 GHz)
 - 5 (2.432 GHz)
 - 6 (2.437 GHz)

- 7 (2.442 GHz)
- 8 (2.447 GHz)
- 9 (2.452 GHz)
- 10 (2.457 GHz)
- 11 (2.462 GHz)
- auto ← assigns channel automatically
- custom -- ← manually specifies WiFi channel

Normally one of the channels is already selected, and no change is needed unless there exists interference problems with other WiFi or Bluetooth devices (that also use the 2.4GHz frequency range for communications). Alternatively, you can select 'auto' to let the system select the channel automatically, or you can select "-- custom --" and enter your own channel specification in the text box.

Advanced Settings

The screenshot shows the 'Device Configuration' window with the 'Advanced Settings' tab selected. It contains three rows: 'Mode' with a dropdown menu set to 'Auto', 'HT mode' with a dropdown menu set to '20MHz', and 'Dual SSID is disabled' with a green 'Enable' button.

Mode	Specifies the IEEE wireless standard for WiFi communication. The choices are:
	Auto: (Default choice) The router automatically chooses the optimal IEEE wireless standard. 802.11b: Data speed up to 11 Mbps 802.11g: Data speed up to 54 Mbps 802.11n: Data speed up to 300 Mbps
HT mode	Specifies channel width for data communications. The choices are:
	20MHz: Single 20MHz channel 20MHz / 40MHz: Single or dual 20MHz channels
Dual SSID is disabled/enabled	Click  to activate the second SSID, or click  to deactivate the second SSID.

Interface Configuration

General Setup

Interface Configuration

General Setup

Wireless Security

MAC-Filter

Advanced Settings

WPS Settings

SSID	BR_LTE_3512
Mode	ap
Hide SSID	☐

SSID Service Set Identification
To change the SSID, click the text box and enter the new SSID (up to 32 alphanumeric characters)

Mode Wireless operating mode of this router.
AP: Wireless Access Point

Hide SSID Enable this option to make wireless network of *this* SSID unavailable to nearby WiFi clients.
Disable this option to make wireless network of *this* SSID available to nearby WiFi clients (default setting).



CAUTION: To enable “Hide SSID”, we strongly advise you to do so via wired LAN connection, since wireless LAN connection with this SSID will be lost with this option applied! If both SSIDs are hidden, then the communications with this router must be done via a LAN port, or this router must be reset to factory default settings.

Wireless Security

Interface Configuration

General Setup

Wireless Security

MAC-Filter

Advanced Settings

WPS Settings

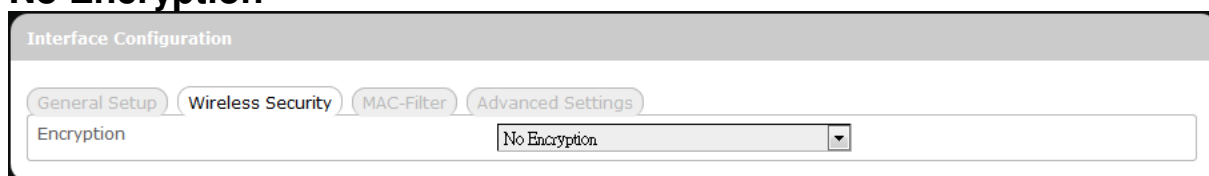
Encryption	WPA-PSK
Cipher	Force CCMP (AES)
Key	●●●●●●●●

This router supports wireless data encryption, a must for wireless data security. The Wireless Security Interface Configuration items will change according to the chosen encryption method.



The encryption options are:

1. No Encryption

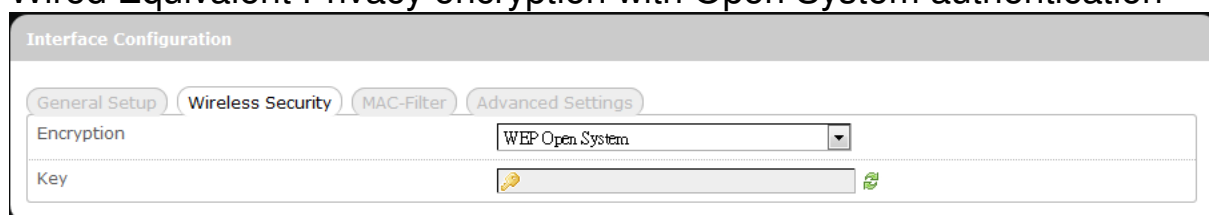


The screenshot shows the 'Interface Configuration' page with tabs for 'General Setup', 'Wireless Security', 'MAC-Filter', and 'Advanced Settings'. The 'Wireless Security' tab is active. Under the 'Encryption' section, a dropdown menu is set to 'No Encryption'.

Data transmitted over wireless networks can be seen by others.

2. WEP Open System

Wired Equivalent Privacy encryption with Open System authentication

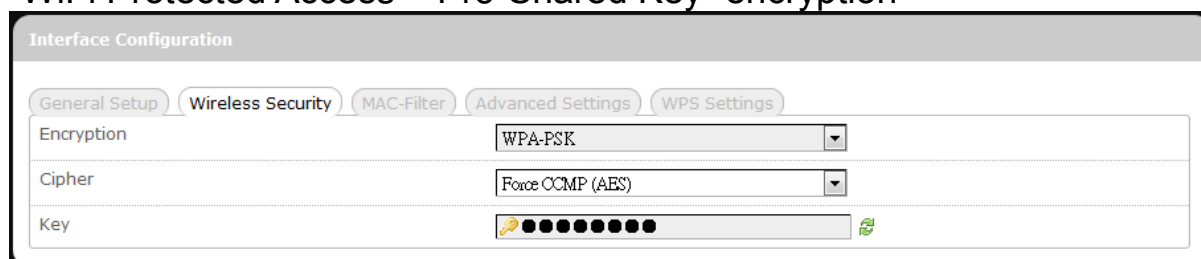


The screenshot shows the 'Interface Configuration' page with the 'Wireless Security' tab active. The 'Encryption' dropdown is set to 'WEP Open System'. Below it, the 'Key' field contains a password, indicated by a key icon and a green checkmark.

Key: Enter a password for accessing this SSID's wireless network.

3. WPA-PSK

"WiFi Protected Access – Pre-Shared Key" encryption



The screenshot shows the 'Interface Configuration' page with the 'Wireless Security' tab active. The 'Encryption' dropdown is set to 'WPA-PSK'. The 'Cipher' dropdown is set to 'Force CCMP (AES)'. The 'Key' field contains a password, indicated by a key icon and a green checkmark.

Cipher: Specify the desired encryption protocol by clicking  and selecting an option from the drop-down list:

auto – (default setting) the system automatically chooses the optimal encryption protocol

Force CCMP (AES) – Use CCMP (AES) encryption exclusively (stronger than TKIP)

Force TKIP – Use TKIP encryption exclusively

Force TKIP and CCMP (AES) – Use TKIP and CCMP (AES) encryption protocols together

Key: Enter a password for accessing this SSID's wireless network.

4. WPA2-PSK

"WiFi Protected Access II – Pre-Shared Key" encryption

Interface Configuration

General Setup Wireless Security MAC-Filter Advanced Settings WPS Settings

Encryption WPA2-PSK

Cipher Force CCMP (AES)

Key [12 black dots]

Cipher: Specifies the desired encryption protocol by clicking  and selecting an option from the drop-down list:

auto – (Default setting) the system automatically chooses the optimal encryption protocol

Force CCMP (AES) – Use CCMP (AES) encryption exclusively (stronger than TKIP)

Force TKIP – Use TKIP encryption exclusively

Force TKIP and CCMP (AES) – Use TKIP and CCMP (AES) encryption protocols together

Key: Enter a password for accessing this SSID's wireless network.

5. WPA-PSK/WPA2-PSK Mixed Mode

“WiFi Protected Access I + II – Pre-Shared Key” encryption

Interface Configuration

General Setup Wireless Security MAC-Filter Advanced Settings WPS Settings

Encryption WPA-PSK/WPA2-PSK Mixed Mode

Cipher Force CCMP (AES)

Key [12 black dots]

Cipher: Specifies the desired encryption protocol by clicking  and selecting an option from the drop-down list:

auto – (Default setting) the system automatically chooses the optimal encryption protocol

Force CCMP (AES) – Use CCMP (AES) encryption exclusively (stronger than TKIP)

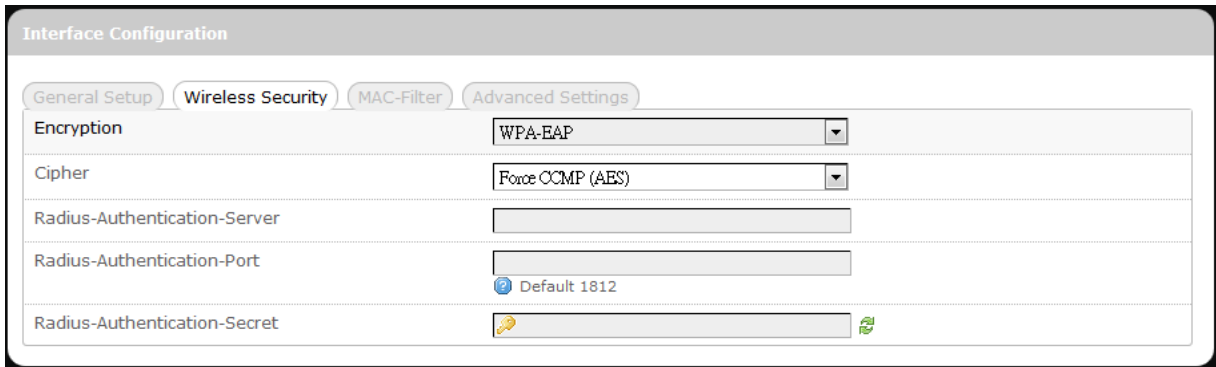
Force TKIP – Use TKIP encryption exclusively

Force TKIP and CCMP (AES) – Use TKIP and CCMP (AES) encryption protocols together

Key: Enter a password for accessing this SSID's wireless network.

6. WPA-EAP

“WiFi Protected Access – Extensible Authentication Protocol”
encryption



The screenshot shows the 'Interface Configuration' window with the 'Wireless Security' tab selected. The 'Encryption' dropdown is set to 'WPA-EAP'. The 'Cipher' dropdown is set to 'Force CCMP (AES)'. The 'Radius-Authentication-Server' field is empty. The 'Radius-Authentication-Port' field is empty with a hint 'Default 1812'. The 'Radius-Authentication-Secret' field is empty with a key icon and a green checkmark.

Interface Configuration	
General Setup Wireless Security MAC-Filter Advanced Settings	
Encryption	WPA-EAP
Cipher	Force CCMP (AES)
Radius-Authentication-Server	
Radius-Authentication-Port	Default 1812
Radius-Authentication-Secret	

Cipher: Specifies the desired encryption protocol by clicking  and selecting an option from the drop-down list:

auto – (default setting) the system automatically chooses the optimal encryption protocol

Force CCMP (AES) – Use CCMP (AES) encryption exclusively (stronger than TKIP)

Force TKIP – Use TKIP encryption exclusively

Force TKIP and CCMP (AES) – Use TKIP and CCMP (AES) encryption protocols together

Radius-Authentication-Server: Enter the name of the RADIUS authentication server.

Radius-Authentication-Port: Enter the port number of the RADIUS authentication port (the default port number is 1812).

Radius-Authentication-Secret: Enter the desired RADIUS secret password.

7. WPA2-EAP

“WiFi Protected Access II – Extensible Authentication Protocol”
encryption

Interface Configuration

General Setup Wireless Security MAC-Filter Advanced Settings

Encryption WPA2-EAP

Cipher Force CCMP (AES)

Radius-Authentication-Server

Radius-Authentication-Port

Radius-Authentication-Secret

Cipher: Specifies the desired encryption protocol by clicking  and selecting an option from the drop-down list:

auto – (default setting) the system automatically chooses the optimal encryption protocol

Force CCMP (AES) – Use CCMP (AES) encryption exclusively (stronger than TKIP)

Force TKIP – Use TKIP encryption exclusively

Force TKIP and CCMP (AES) – Use TKIP and CCMP (AES) encryption protocols together

Radius-Authentication-Server: Enter the name of the RADIUS authentication server.

Radius-Authentication-Port: Enter the port number of the RADIUS authentication port (the default port number is 1812).

Radius-Authentication-Secret: Enter the desired RADIUS secret password.

MAC-Filter

MAC-Address Filter:

Interface Configuration

General Setup Wireless Security MAC-Filter Advanced Settings

MAC-Address Filter

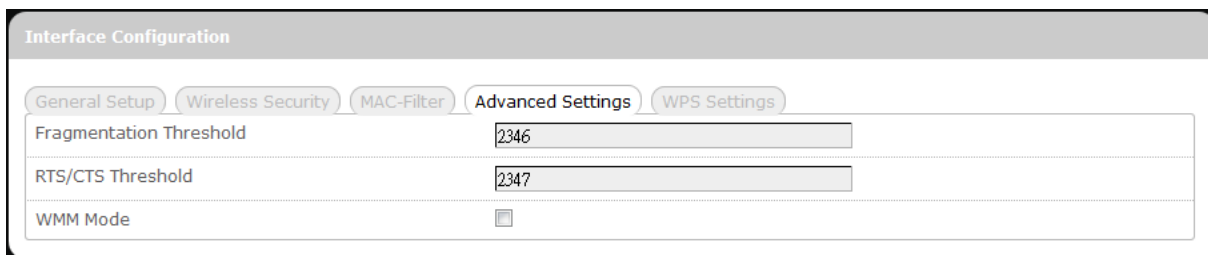
Disable

This tab item allows you to selectively allow or block clients from network access. Click  and select an option from the drop-down list:

1. Disable – The MAC address filter is disabled (default option).
2. White list* – Click  and select a desired MAC address from the drop-down list, or select "-- custom --" and enter a specific client's MAC address.

3. Black list* – Click ☐ and select an undesired MAC address from the drop-down list, or select "-- custom --" and enter a specific client's MAC address.
- * To add another MAC address to the list, click  to add a new drop-down list; then repeat the MAC address selection/specification. To remove a MAC address from the list, click .

Advanced Settings



Interface Configuration

General Setup Wireless Security MAC-Filter **Advanced Settings** WPS Settings

Fragmentation Threshold

RTS/CTS Threshold

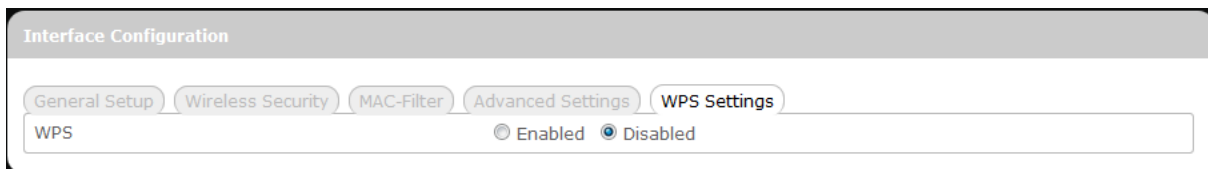
WMM Mode ☒

This tab item is for advanced adjustment settings for WiFi connection.

Fragmentation Threshold	Maximum transmittable data packet frame size without frame fragmentation; the default value is 2346
RTS/CTS Threshold	Defines Request-To-Send (transmitter) and Clear-To-Send (receiver) control packet size; the default value is 2347
WMM Mode	Enables or disables Wi-Fi Multimedia Mode, which gives multimedia data contents (voice, video, and audio) higher priority over wireless networks. The default setting of WMM Mode is Disabled.

WPS Settings

WiFi Protected Setup Settings



Interface Configuration

General Setup Wireless Security MAC-Filter Advanced Settings **WPS Settings**

WPS ☒ Enabled ☐ Disabled

This tab item appears when 'Encryption' in "Wireless Security" is set to one of the following: **WPA-PSK**, **WPA2-PSK**, or **WPA-PSK/WPA2-PSK Mixed Mode**.

WPS: To enable the WPS button for quick WiFi connection setup, click 'Enabled', and 2 additional items will appear: Mode and Start.

Interface Configuration

General Setup Wireless Security MAC-Filter Advanced Settings WPS Settings

WPS ☒ Enabled ☐ Disabled

Mode ☒ PBC Mode ☐ PIN Mode

Start

Mode: Specifies WPS setup mode

PBC Mode – Push Button Configuration Mode
(Note: To use this setup method, the client must have a WPS button configured to PBC Mode.)

PIN Mode – Personal Identification Number Mode
(Note: To use this setup method, the client must have a WPS button configured to PIN Mode.)

After choosing PIN Mode, an additional text box item “PIN Code” will appear.

PIN Code: This text box item appears when ‘Mode’ is set to “PIN Mode”.

Enter the 8-digit alphanumeric PIN in the text box. This PIN must match the PIN of the router client.

Interface Configuration

General Setup Wireless Security MAC-Filter Advanced Settings WPS Settings

WPS ☒ Enabled ☐ Disabled

Mode ☐ PBC Mode ☒ PIN Mode

PIN Code

Start

If the PIN entered is invalid, the text color will become red with  on the right.

12ABC3 

Whenever the PIN entered becomes valid, the text color will be black without  on the right.

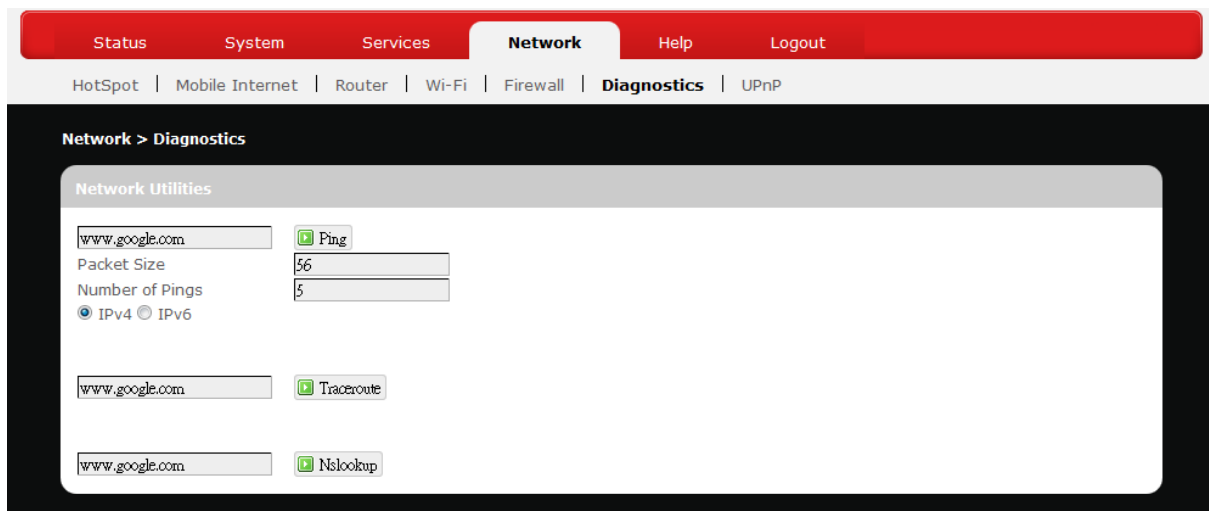
12ABC345

Start: After setting up WPS Mode (PBC or PIN), click the router client's corresponding hardware/software WPS button (actual router client hardware/software WPS button behavior will depend on router client manufacturer's design).

Click  or press-and-hold the router's physical SS/WPS/Reset button for just over 3 seconds to start the WPS process.

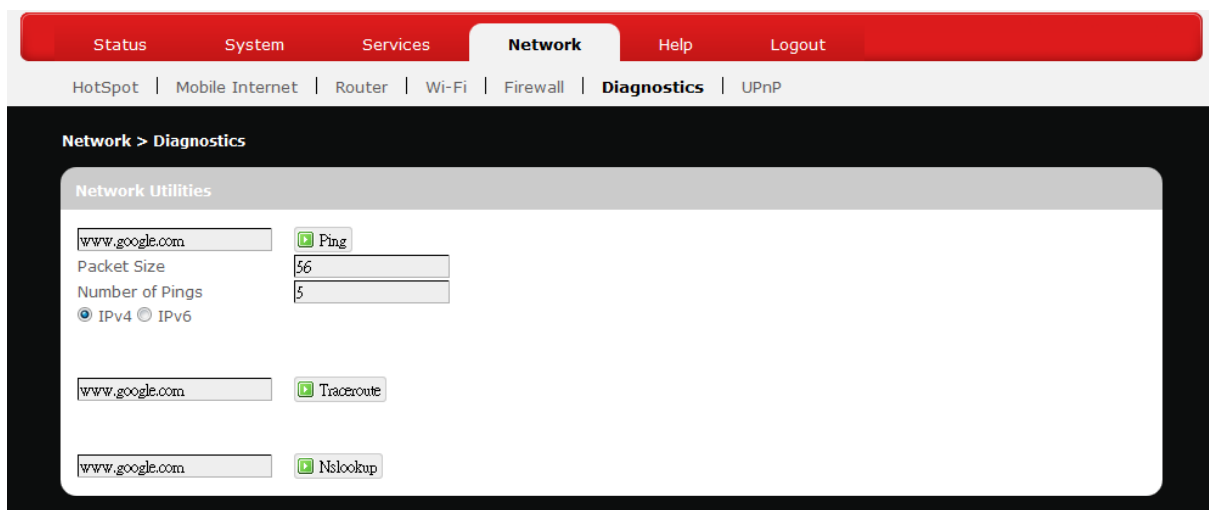


Switch



Details of the submenu **Switch** go here.

Diagnostics



This menu contains tools for effective network analysis and troubleshooting.

Network Utilities

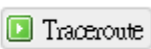
Ping

www.google.com	Ping
Packet Size	56
Number of Pings	5
☒ IPv4 ☐ IPv6	

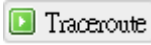
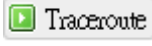
This feature allows you to check the status of a connection.

-
1. In the text box next to , enter the IP address or URL that you want to ping, and then select its corresponding internet protocol by clicking either the IPv4 or IPv6 radial button.
 2. In the text box of “Packet Size”, enter the desired value (default packet size is 56).
 3. In the text box of “Number of Pings”, enter the number of times you wish to ping (default value is 5).
 4. Click  to begin the connection status check. ‘Ping’ messages will appear below.

Traceroute



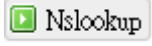
This feature allows you to check the performance of a connection.

1. In the text box next to , enter the IP address or URL that you want to trace route, and then click  to start the performance test. ‘Traceroute’ messages will appear below.

NS Lookup



This feature allows you to retrieve name server information.

1. In the text box next to , enter the IP address or URL that you want to trace route, and then click  to get name server information. ‘Nslookup’ messages will appear below.

Firewall

Single Port Forward

The screenshot shows the BandLux Firewall configuration interface. At the top, there is a navigation bar with tabs: Status, System, Services, Network (selected), Help, and Logout. Below this is a sub-navigation bar with links: HotSpot, Mobile Internet, Router, Wi-Fi, Firewall (selected), Diagnostics, and UPnP. The main content area is titled 'Network > Firewall > Single Port Forward'. It features a table with columns: Name, Match, Forward to, and Enable. The table is currently empty, with a message 'This section contains no values yet'. Below the table is a 'New port forward:' section with input fields for Name (containing 'New port forward'), Protocol (a dropdown menu showing 'TCP+UDP'), External port, Internal IP address, and Internal port. An 'Add' button is next to these fields. At the bottom right, there are 'Reset', 'Save', and 'Apply' buttons.

Single Port Forward

Port Forwarding allows you to set up public services on your network, such as web servers, ftp servers, e-mail servers, and other specialized Internet applications.

To forward a single port:

The screenshot shows the 'New port forward:' form with the following values entered: Name: LuxeFWD1, Protocol: TCP+UDP (selected from a dropdown), External port: 9001, Internal IP address: 192.168.1.194, and Internal port: 9001. An 'Add' button is visible to the right of the form.

1. **Name:** Enter an application name for this port forwarding rule.
2. **Protocol:** Click and select a protocol from the drop down list – *TCP+UDP* (default), *TCP*, *UDP*, or *Other...*
3. **External port:** Enter the port number of the external port used by the server or Internet application. Afterward, this port number will be echoed to the text box of “Internal port”.
4. **Internal IP address:** Click and select an IP address from drop-down list, or select “--custom--” and enter IP address in text box.
5. **Internal port:** This text box will automatically receive port number entered in the text box of “External port”, or you can enter your own port number in the same text box.
6. Click . The port forwarding rule you have just entered will be added to the Port Forwards list.

Name	Match	Forward to	Enable
LuxeFWD1	IPv4-TCP, UDP From <i>any host in wan</i> Via <i>any router IP</i> at port <i>9001</i>	192.168.1.194, port 9001 in lan	☒

(a) (b)

New port forward:

Name	Protocol	External port	Internal IP address	Internal port
New port forward	TCP+UDP			

In the status area, the message **Unapplied Change** may appear next to “Operator Name” to indicate configuration changes temporarily stored in the router.

7. More rules can be added to the Port Forwards list by repeating Steps 1-6.
8. (a) To enable or disable a Port Forwards list rule, click its check box under ‘Enable’.
(b) To remove any Port Forwards rule, click its corresponding button.
9. To edit a particular Port Forwards rule in detail, click its corresponding button, and the rule’s associated configuration page (much more flexible and detailed than express settings in Steps 1-5) will appear. After making any changes, click . Finally click to exit this configuration page.

Rule is enabled

Name: LuxeFWD1

Protocol: TCP+UDP

External port: 9001

Internal IP address: 192.168.1.194 (User-NB2)

Internal port: 9001

Enable NAT Loopback: ☒

Note: Numerical and text values shown in the illustrative examples are for demonstration purposes only and are not for actual operation.

Port Trigger

Network > Firewall > Port Trigger

Name	Trigger Range	Forward Range	Enable
This section contains no values yet			

Triggers

Name	Protocol	Triggered Range	Forwarded Range		
		Start Port	End Port	Start Port	End Port
New port trigger	TCP+UDP				

Buttons: Add, Reset, Save, Apply

Port Trigger

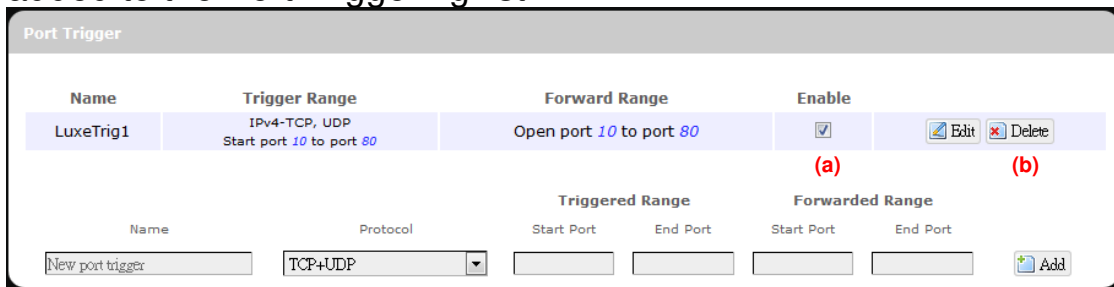
Port Triggering allows the Router to watch outgoing data for specific port numbers. The Router remembers the IP address of the computer that sends the matching data, so that when the requested data returns through the Router, the data is pulled back to the proper computer by way of IP address and port mapping rules.

To add a new Port Triggering rule:

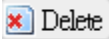
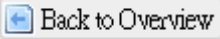
Name	Protocol	Triggered Range	Forwarded Range		
		Start Port	End Port	Start Port	End Port
LuxTrig1	TCP+UDP	10	80	10	80

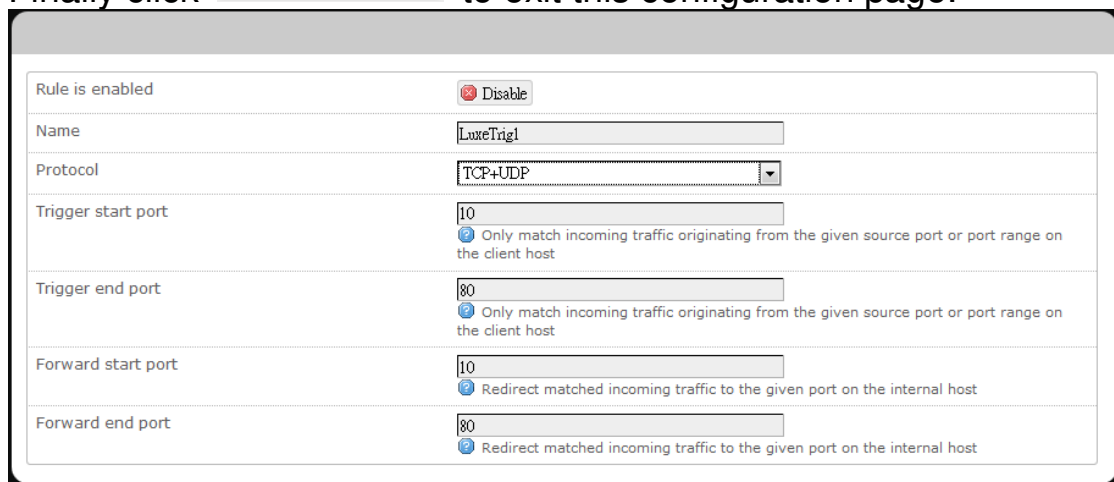
1. **Name:** enter an application name for this port triggering rule.
2. **Protocol:** click and select a protocol from the drop down list – *TCP+UDP* (default), *TCP*, *UDP*, or *Other...*
3. **Triggered Range:** enter the **Start Port** and **End Port** for the triggered port number range of the Internet application (please check its documentation for the port number(s) needed).
4. **Forwarded Range:** enter the **Start Port** and **End Port** for the forwarded port number range of the Internet application (please check its documentation for the port number(s) needed).

- Click . The port triggering rule you have just entered will be added to the Port Triggering list.



In the status area, the message **Unapplied Change** may appear next to “Operator Name” to indicate configuration changes stored in the router.

- More rules can be added to the Port Triggering list by repeating Steps 1-5.
- To enable or disable a Port Forwards list rule, click its check box under ‘Enable’.
 - To remove any Port Triggering rule, click its corresponding  button.
- To edit a particular Port Triggering rule in detail, click its corresponding  button, and the rule’s associated configuration page (more flexible and detailed than express settings in Steps 1-4) will appear. After making any changes, click . Finally click  to exit this configuration page.



Note: Numerical and text values shown in the illustrative examples are for demonstration purposes only and are not for actual operation.

Security Filter

StatusSystemServicesNetworkHelpLogout

HotSpot | Mobile Internet | Router | Wi-Fi | Firewall | Diagnostics | UPnP

Single Port Forward | Port Trigger | Security Filter | DMZ Host | IP Filtering | Port Range Forward

Network > Firewall > Security Filter

Firewall

SPI Firewall Protection ☒ Enable ☐ Disable

Internet Filter

Filter Anonymous Internet Requests	☐
Filter Multicast	☐
Filter Internet NAT Redirection	☒
Filter IDENT(Port 113)	☐

Web Filters

Proxy	☐
Java	☐
ActiveX	☐
Cookies	☐

Reset Save Apply

Here you can make **Firewall**, **Internet Filter**, and **Web Filters** adjustments for network security.

Firewall

SPI Firewall Protection: Enable or Disable Stateful Packet Inspection (SPI) feature of the firewall. The default setting is ‘Enable’.

Internet Filter

Filter Anonymous Internet Requests: This filter blocks anonymous internet requests from outside network. The default setting is ‘disabled’.

Filter Multicast: Multicasting allows for multiple transmissions to specific recipients at the same time, i.e. the Router allows IP multicast packets to be forwarded to the appropriate computers.
To allow multicasting, disable “Filter Multicast” (this is the default setting).
To block multicasting, enable “Filter Multicast”.

Filter Internet NAT Redirection: This filter blocks local resource access via NAT (Network Address Translation) redirection (i.e. external address) from other local computers. The default setting is 'enabled'.

Filter IDENT (Port113): This feature keeps Port 113 from being scanned by devices outside of your local network. The default setting is 'disabled'.

Web Filters

Using the Web Filters feature, you may enable up to four specific filtering methods.

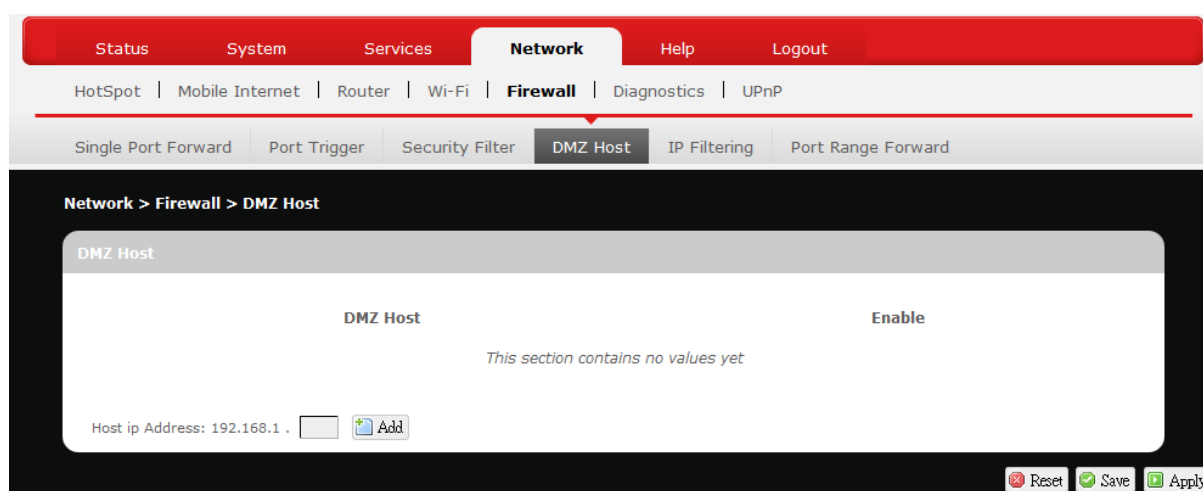
Proxy: Use of WAN proxy servers may compromise the Router's security. Select this option to disable access to any WAN proxy servers.

Java: Java is a programming language for websites. Select this option to disable Java. If you disable Java, you run the risk of not having access to Internet sites created using this programming language.

ActiveX: ActiveX is a programming language for websites. Select this option to disable ActiveX. If you disable ActiveX, you run the risk of not having access to Internet sites created using this programming language.

Cookies: A cookie is data stored on your PC and used by Internet sites when you interact with them. Select this option to disable cookies.

DMZ Host

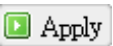


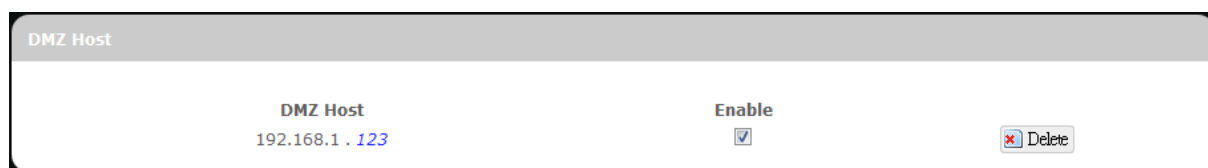
When a firewall is used, it is sometimes necessary to place some clients

(for example Internet games, video conferencing, or VPN connections) outside of the firewall while leaving the others protected. You can do this using a Demilitarized Zone (DMZ). This DMZ Host feature allows you to specify the IP address of the computers that are placed outside the firewall of your network.

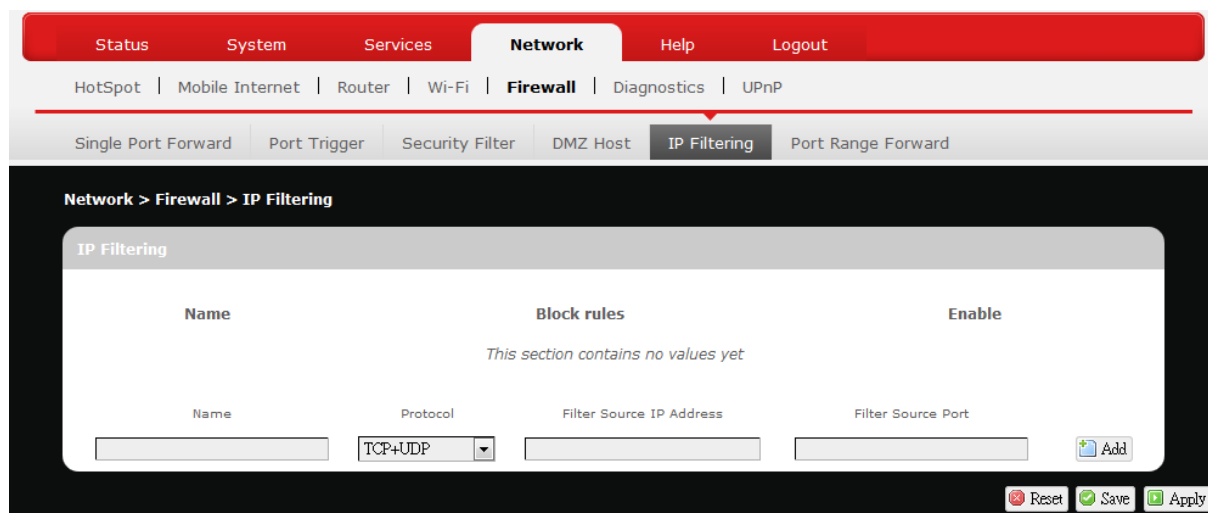
In the text box, enter the last 3 digits of the DMZ host address (the prefix is 192.168.1 for this router), and then click .

Host ip Address: 192.168.1. 

The host IP address will be added to the DMZ Host list, which can be further disabled or enabled by clicking the 'Enable' checkbox. To remove this DMZ Host, click . After setting up the DMZ host, click .



IP Filtering



IP Filtering

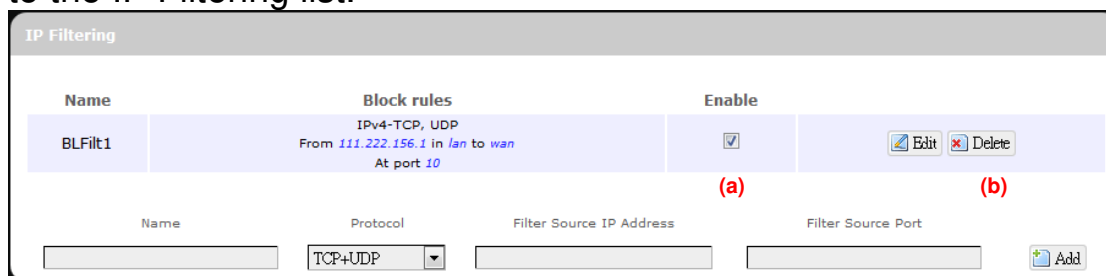
IP Filtering allows the Router to discard data from certain IP addresses.

To add a new IP filtering rule:

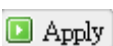
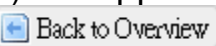
Name: Protocol: Filter Source IP Address: Filter Source Port: 

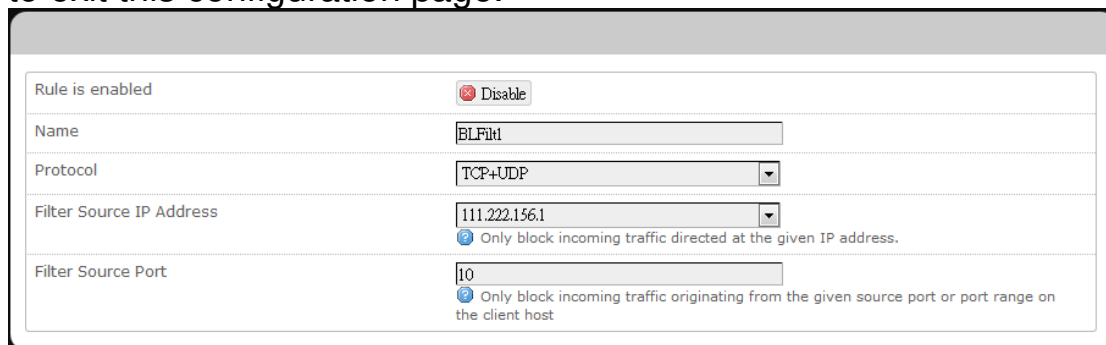
1. **Name:** Enter an application name for this IP filtering rule.
2. **Protocol:** Click  and select a protocol from the drop down list – *TCP+UDP* (default), *TCP*, *UDP*, or *Other...*

3. **Filter Source IP Address:** Enter the source IP address to be filtered. The text color will turn red with  on the right for any invalid IP address entered (e.g. 192.168.234. ). When the IP address entered becomes valid, the text color changes back to black without  on the right (e.g. 192.168.234.5).
4. **Filter Source Port:** Enter the source port number to be filtered.
5. Click . The IP filtering rule you have just entered will be added to the IP Filtering list.



In the status area, the message **Unapplied Change** may appear next to “Operator Name” to indicate configuration changes stored in the router.

6. More rules can be added to the IP filtering list by repeating Steps 1-5.
7. (a) To enable or disable an IP filtering list rule, click its check box under ‘Enable’.
(b) To remove any Port Triggering rule, click its corresponding  button.
8. To edit a particular IP filtering rule in detail, click its corresponding  button, and the rule’s associated configuration page (more flexible and detailed than express settings in Steps 1-4) will appear. After making any changes, click . Finally click  to exit this configuration page.



Note: Numerical and text values shown in the illustrative examples are for

demonstration purposes only and are not for actual operation.

Port Range Forward

The screenshot shows a web interface for configuring network settings. At the top, there is a red navigation bar with tabs: Status, System, Services, Network (selected), Help, and Logout. Below this is a secondary navigation bar with links: HotSpot, Mobile Internet, Router, Wi-Fi, Firewall (selected), Diagnostics, and UPnP. A third navigation bar contains sub-links: Single Port Forward, Port Trigger, Security Filter, DMZ Host, IP Filtering, and Port Range Forward (selected). The main content area is titled 'Network > Firewall > Port Range Forward'. It features a table with columns 'Name', 'Match', and 'Enable'. Below the table, there is a section titled 'Port Range Forward' with input fields for 'Name', 'Protocol' (a dropdown menu showing 'TCP+UDP'), 'Start Port', 'End Port', and 'IP Address'. An 'Add' button is next to the IP Address field. At the bottom right, there are 'Reset', 'Save', and 'Apply' buttons.

Port Range Forward

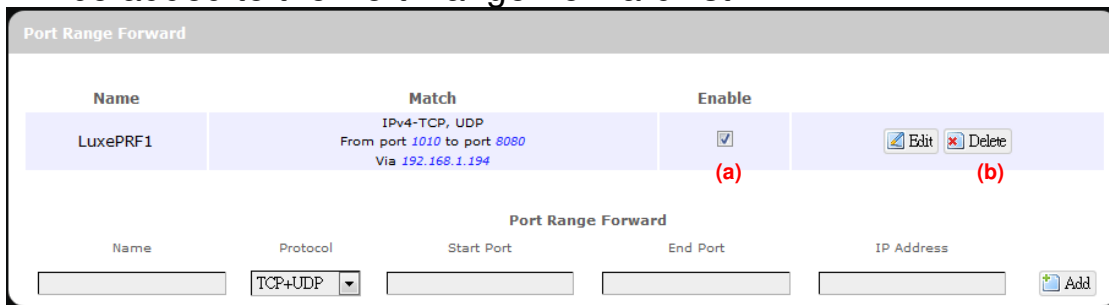
Port Range Forward allows you to set up public services on your network, such as web servers, ftp servers, e-mail servers, and other specialized Internet applications.

To forward a port range:

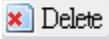
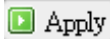
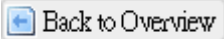
This screenshot shows the 'Port Range Forward' configuration form with the following values entered: Name: LuxePRF1, Protocol: TCP+UDP (selected from a dropdown), Start Port: 1010, End Port: 8080, and IP Address: 192.168.1.194. An 'Add' button is located to the right of the IP Address field.

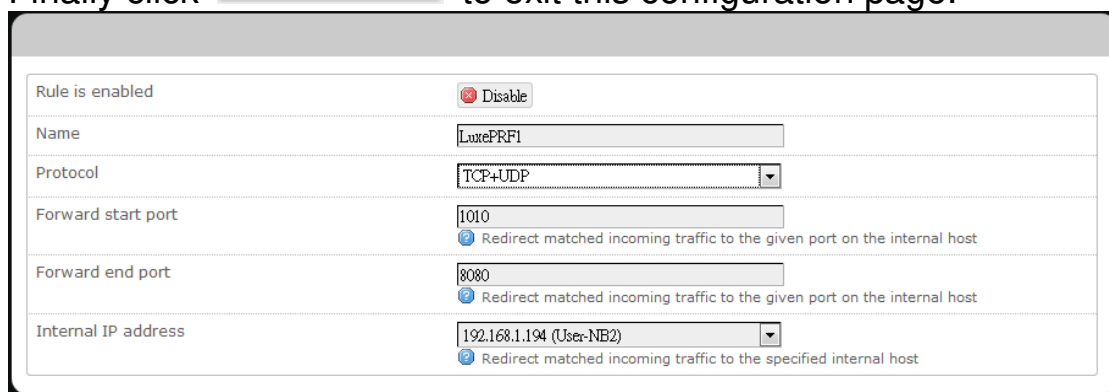
1. **Name:** Enter an application name for this port range forwarding rule.
2. **Protocol:** Click  and select a protocol from the drop down list – *TCP+UDP* (default), *TCP*, *UDP*, or *Other...*
3. **Port Range Forward:** Specify the range of port forwarding by entering the **Start Port** number and the **End Port** number.
4. **IP address:** Enter the IP address of the PC running the specific application.

- Click . The port range forwarding rule you have just entered will be added to the Port Range Forward list.



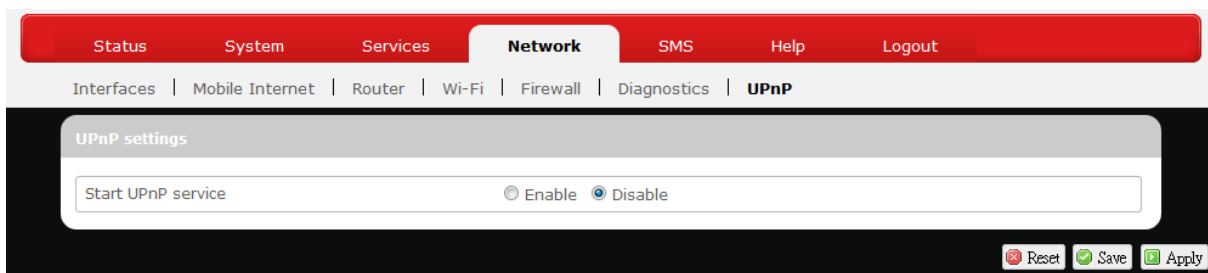
In the status area, the message **Unapplied Change** may appear next to “Operator Name” to indicate configuration changes temporarily stored in the router.

- More rules can be added to the Port Range Forward list by repeating Steps 1-5.
- To enable or disable a Port Forwards list rule, click its check box under ‘Enable’.
 - To remove any Port Forwards rule, click its corresponding  button.
- To edit a particular Port Forwards rule in detail, click its corresponding  button, and the rule’s associated configuration page (more flexible and detailed than express settings in Steps 1-4) will appear. After making any changes, click . Finally click  to exit this configuration page.



Note: Numerical and text values shown in the illustrative examples are for demonstration purposes only and are not for actual operation.

UPNP

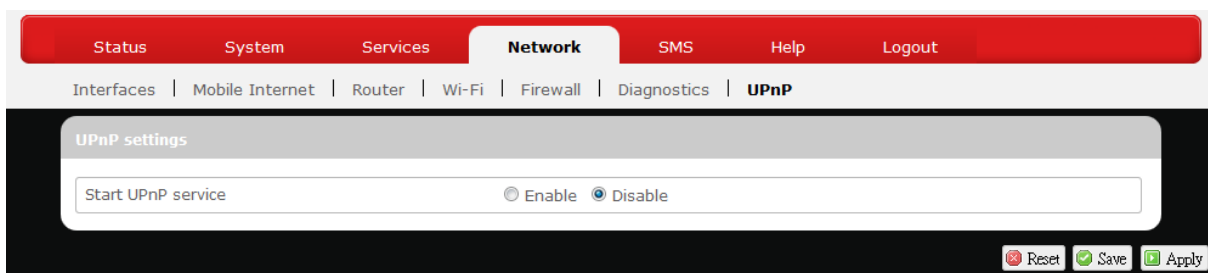


Universal Plug and Play – Allows wired and wireless network devices to discover each other and establish network services.

UPnP Settings

Here you can 'Enable' or 'Disable' the UPnP service.

VPN



Virtual Private Network – Allows use of mobile internet for secured private network.

IPSec Setting

IPSec Setting details go here.

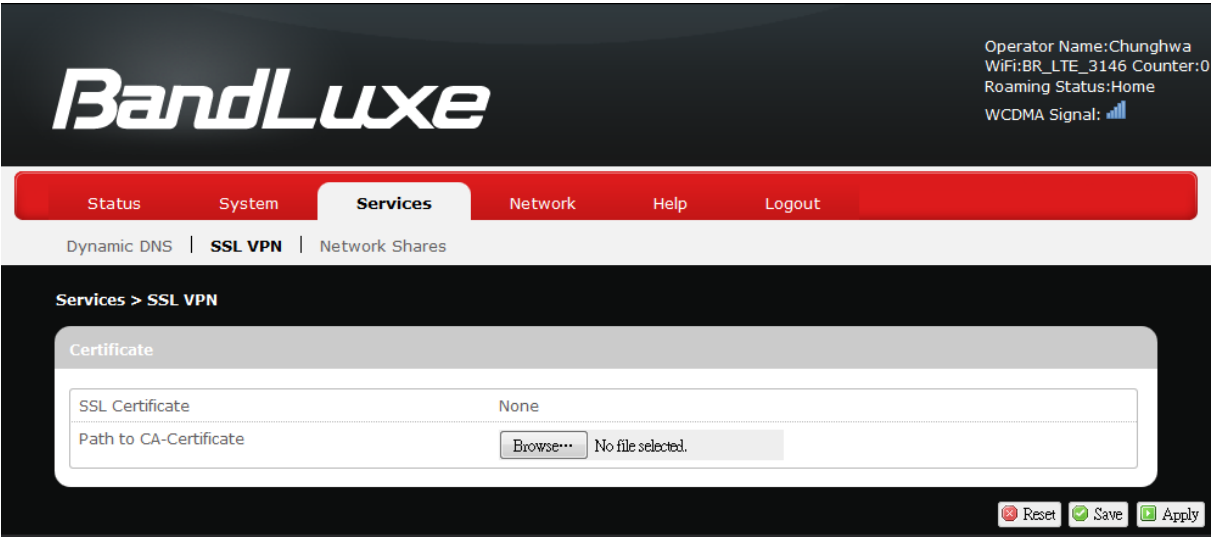
IPSec Profile

IPSec Profile details go here.

IPSec Certificate

IPSec Certificate details go here.

SSL VPN



This submenu setting hosts configuration options for SSL VPN (Secure Socket Layer Virtual Private Network).

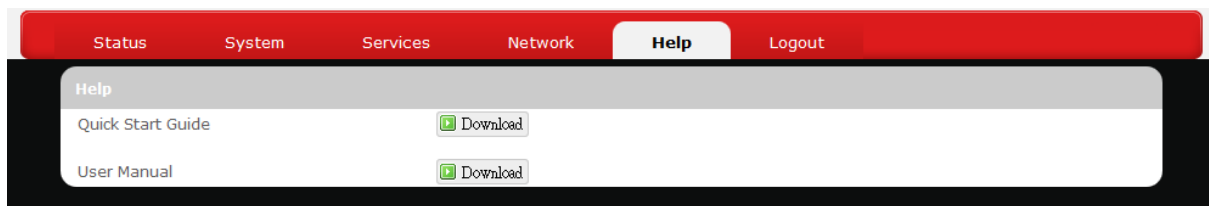
SSL Certificate: Displays SSL Certificate information.

Path to CA-Certificate: Click  and select an appropriate CA-Certificate file.

.

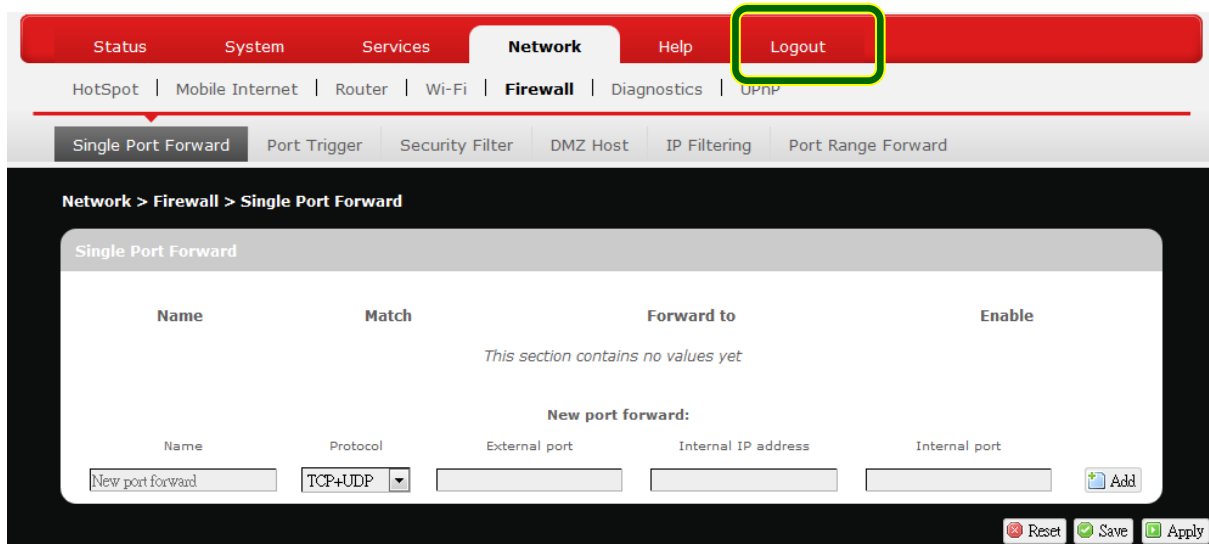


Help



Click the appropriate download link to download the latest Quick Start Guide or User Manual of this product.

Logout

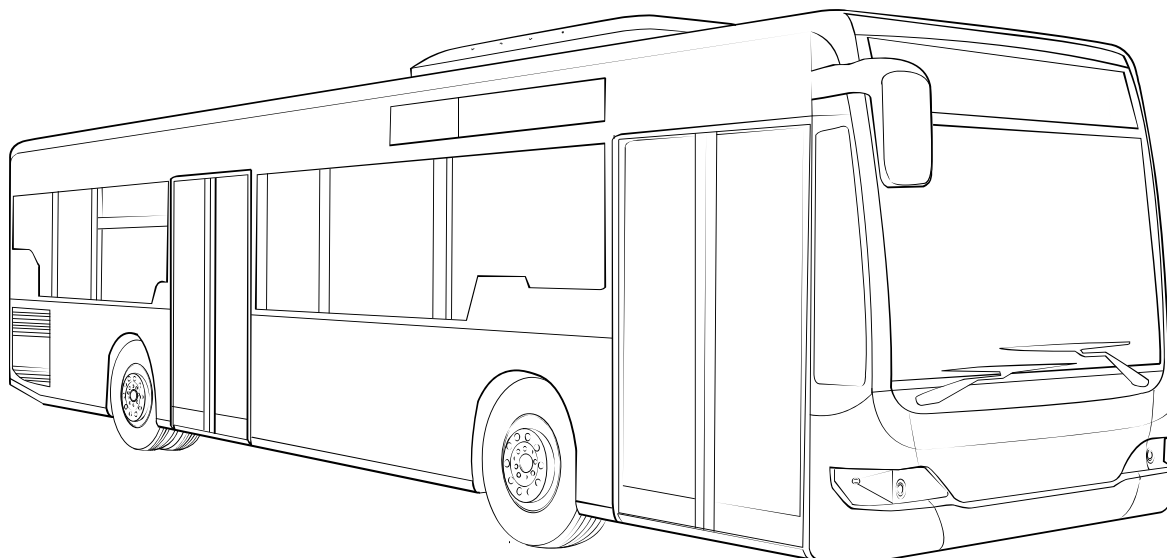


Exits the web configuration interface and re-directs to login prompt.

Note: After a period of inactivity, automatic logout will occur. After clicking any menu item, the login prompt will appear as re-login is needed to continue using the web configuration interface.

Appendix A: Vehicle Installation Guide

Overview

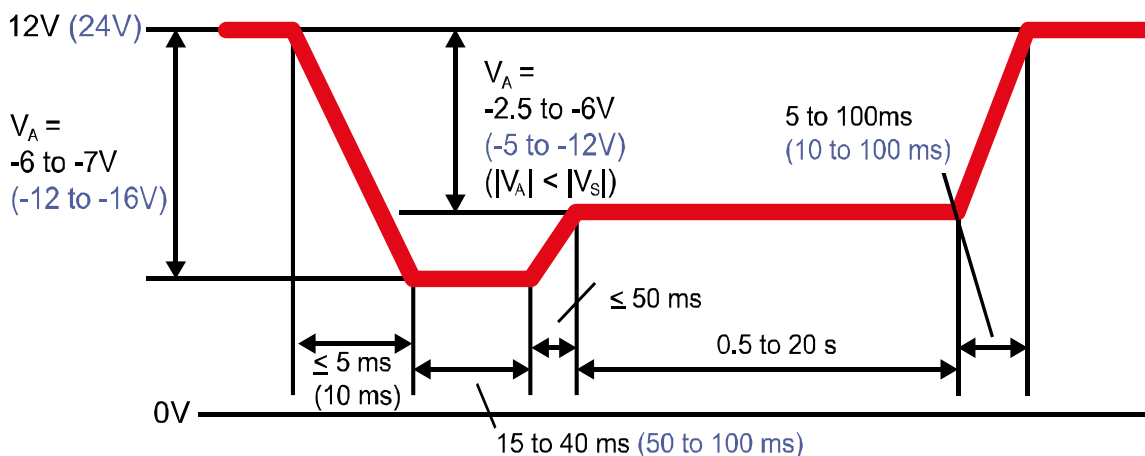


Your K530 is designed for rugged vehicle use with IP64 and MIL810G compliances. The IP64 rating ensures that your K530 is dust-tight and is well-protected against liquid intrusion. The MIL810G rating ensures that your K530 is well-guarded against tough environmental and climate conditions. To ensure proper operation of K530, a stable power supply is essential in addition to secure mount.

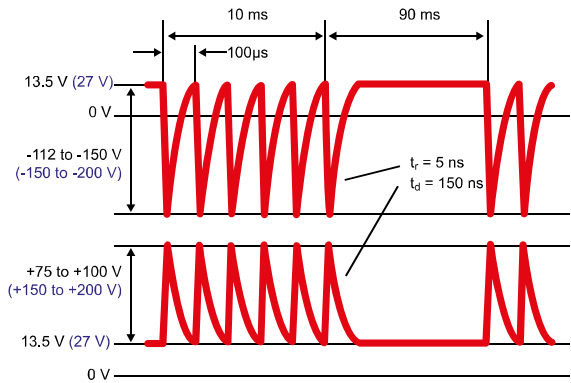
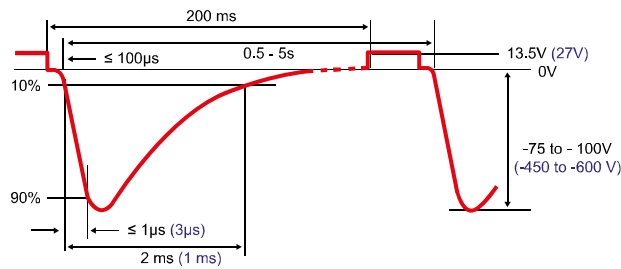
However, getting a stable power supply from an operating vehicle can be a major challenge. Due to constantly changing vehicle and environmental conditions, as well as different circuit loadings due to different stages of vehicle operation and use of its onboard electronic products, the raw voltage supplied by a vehicle's battery may vary largely. Therefore, if untreated, vehicular electrical systems are generally harsh for electrical equipment onboard. There are two types of voltage supply problems in a vehicle. One is called *brown-out* voltage problem, and the other is called *transient voltage* problem.

Brown out usually occurs during the start of the engine. In general, when the car engine starts, the spark plug draws significant stream of

instantaneous electrical power from the car battery (ultra high instantaneous electrical current in terms of hundreds of cranking amps or more), leaving not much instantaneous electrical energy useful for other electrical equipment on the vehicle, therefore the voltage supplied to other electrical equipment drops significantly lower than its normal level. It is after such instantaneous high demand of electrical power that the voltage level returns to normal. The diagram below demonstrates the brown-out phenomenon when the engine is starting.



Transient voltage, sometimes known as *spikes*, is generally very noticeable positive or negative voltage changes over a short period of time. Such voltage fluctuations may be occasional or may be periodic. The fluctuations are typically caused by interference from the electrical-mechanical components in the vehicle (alternators, electric windows and door locks, light switches, loose or corroded connectors or battery terminals, etc.), or even from additional electrical equipment connected to the vehicle's electrical power system. Without treatment, sharp *spikes* are a potential threat to your K530 as well as other electrical equipment on the vehicle. The diagram below shows some standardized examples of automotive voltage transients (ISO-7637-2):



Your K530 is designed to handle large voltage swings from 9V to 32V, in case of undesirable voltage transients or brown-outs. However, for best use and proper protection of your K530, it is necessary to regulate input voltage before feeding it to the power input of your K530.

There are two ways of electrical voltage regulation. One way is to implement a power management block that harnesses battery power during engine startup. The more effective way is to implement a power management block with filters that further smoothes out residual spikes.

Installation

General Guidelines

Follow these guidelines for optimal vehicle installation of your K530:

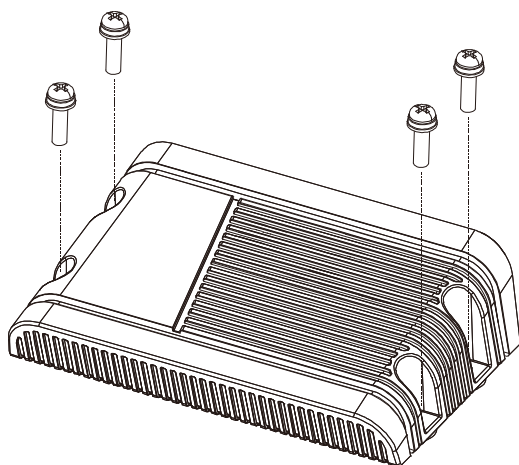
1. Place the router as close to the voltage regulators, such as power management block and filters, as possible. In other words, keep the power cables short between the router and the output connectors of the voltage regulators.

-
2. Use the proper wire size according to the expected current load.

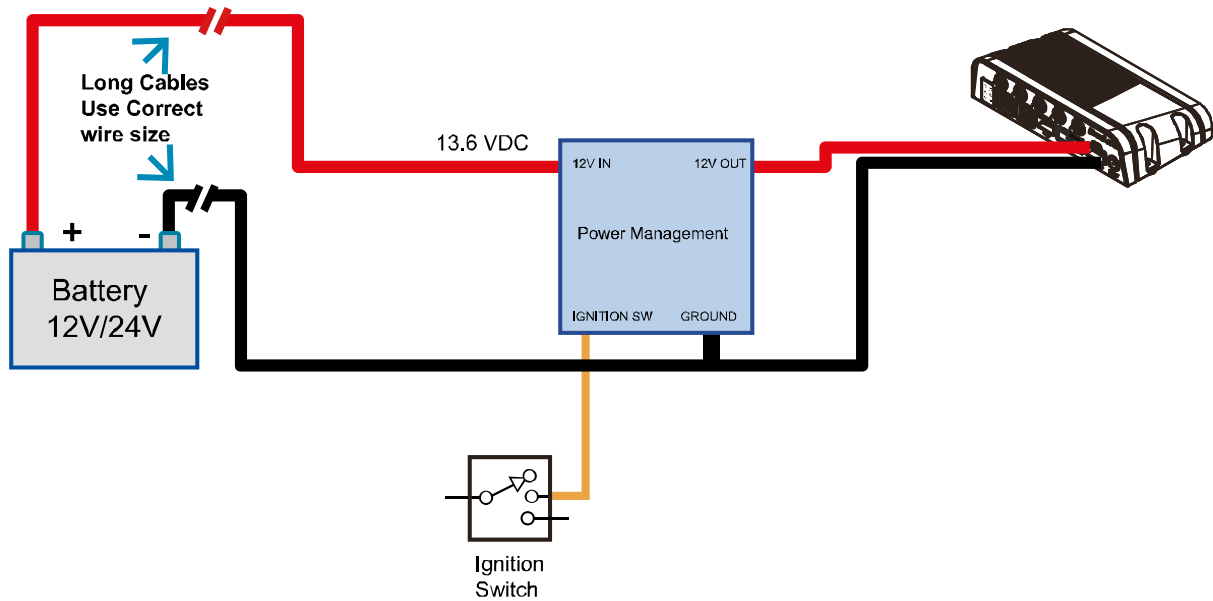
Please see the table below:

Electric Current Load (Amps)	AWG Rating	
	10-Feet Cable	20-Feet Cable
3-10	14 AWG	12 AWG
11-20	14 AWG	10 AWG
21-35	8 AWG	6 AWG

3. To avoid problems caused by corrosion and other imperfections, use a dedicated ground wire instead of direct attachment to chassis ground.
4. To minimize noise interference, implementation of isolation or filters among the router and other electrical devices is recommended.
5. Ensure that your K530 is securely mounted on the vehicle. In addition to electrical requirements, also consider vibration and temperature factors when choosing the optimal location for mounting your K530. If vibration problem is noticeable, anti-vibration rubber grommets may be used to reduce shock on your K530. Also avoid mounting your K530 near a spot subject to extreme heat, such as a poorly ventilated spot that is near the engine or is prone to direct sunlight.

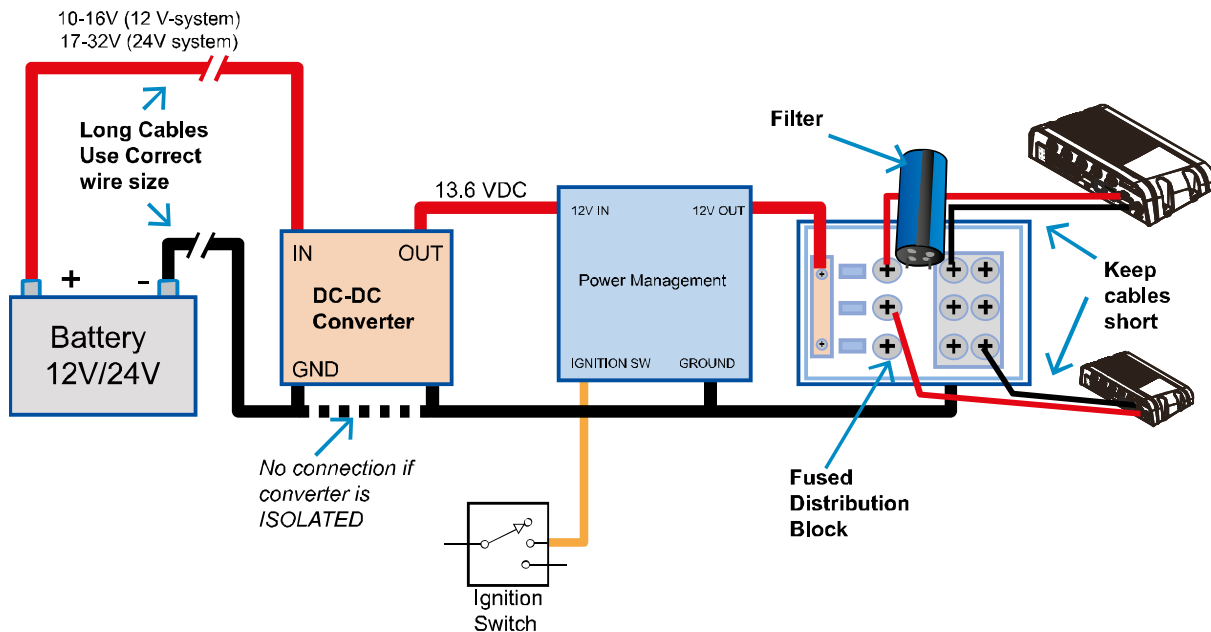


Power Management



In this type of installation, voltage regulation is done solely on the power management block, which routes battery power to the ignition switch during engine startup, while rendering conditioned output DC power to the vehicle's electrical parts. First connect the long positive red power cable to the input of power management block, then connect the conditioned positive power output to your K530. On the ground side, connect the ground from your K530 together with the ground of the power management block and the ground of the battery.

Power Management with Filter



In this type of installation, voltage regulation is done in two parts. The first part is on the power management block, which routes battery power to the ignition switch during engine startup while rendering conditioned output DC power to the vehicle's electrical parts. First connect the long positive red power cable to the input of the power management block, then connect the conditioned positive power output to your K530. On the ground side, connect the ground from your K530 together with the ground of the power management block and the ground of the battery.

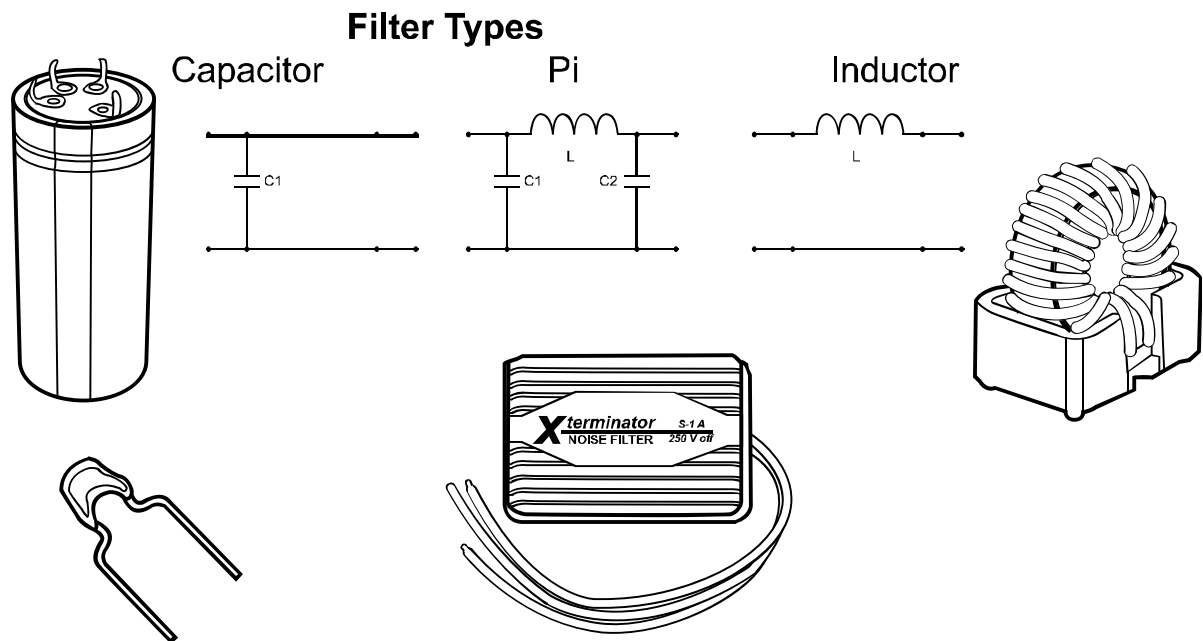
The second part further conditions power voltage with the use of a filter, which can further smooth out residual transients left over by the power management block. There are three types of filters: capacitor, inductor, and Pi.

The capacitor reduces transients by temporarily storing some electrical energy in the electrostatic field (electrical capacitance caused by voltage differences between two plates with the dielectric material in between) and gradually releasing them over time.

The inductor reduces transients by temporarily storing some electrical energy in the magnetic field (electrical induction caused by electric currents) and gradually releasing them over time.

The Pi filter reduces transients by a specially designed RLC circuit, which combines both capacitors and inductors utilizing transient-reducing characteristics of both types of filters.

While any of the three types of filters will do the job, the Pi type is the optimal choice, combining advantages of both capacitor and inductor types of filters.



Appendix B: FAQ

Q: What should I know and how long does it take when I upgrade the firmware of router or modem?

- A:
1. While upgrading the firmware requires some time to finish. During that, you **MUST NOT** turn off the power or interrupt the progress.
 2. You may use an Ethernet cable or a wireless connection to upgrade the firmware. We **suggest the use of an Ethernet cable**.
 3. It may take **2 minutes to upgrade the firmware of the router** and **5 minutes to upgrade the firmware of the modem**.
 4. When the firmware of the modem is upgrading, the UMTS LED will flash among **Blue-Green-Red**. You should wait until the LED is in single color (about 4-5 minutes).

Q: How do I connect to the router?

- A:
1. Connect an Ethernet cable between PC/Notebook (NB) and the router.
 2. Use WiFi to connect.

Q: What's the default "User name" and "Password" for the router?

- A:
- User name: admin
Password: admin

Q: How do I enter GUI and setup the configuration for the router?

- A:
1. Connect PC/NB to the router.
 2. Open Internet Explorer or other Web browser.
 3. Input "http://192.168.1.1".
 4. Input User name and Password.

Q: Why can't I connect to the network via built-in 3G module?

- A:
1. Check the SIM/USIM to see if it is inserted well.
 2. Check the UMTS LED on the router to see if it is solid.
 3. Check the Status on GUI to see if the SIM/USIM detected well.
 4. Check the Status on GUI to see if the APN it is correct.
 5. Check the Internet on GUI to see if the Connection is "Keep Alive" or not.

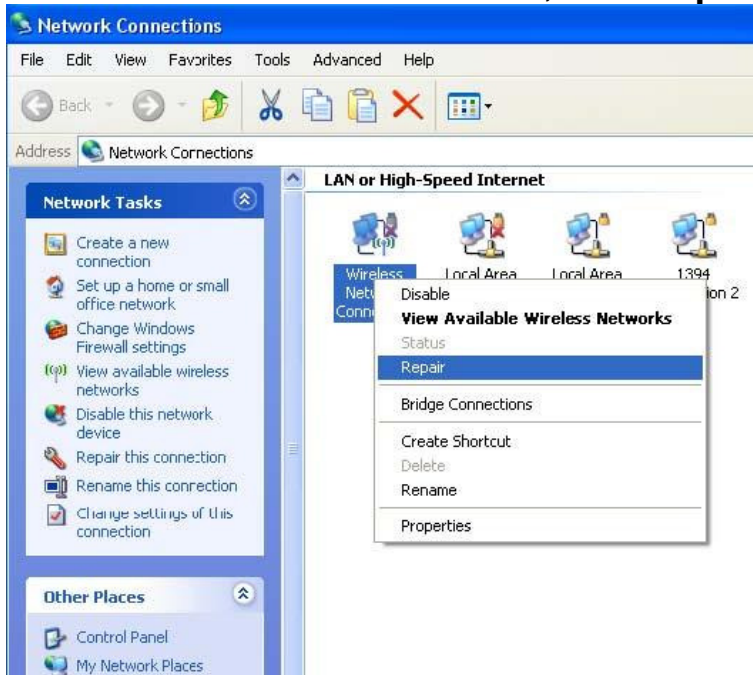
Q: Why can't I link on the GUI?

A: If you have changed your WiFi security, SSID, Local IP address, you have to repair your network to get a new IP that you can link the GUI.

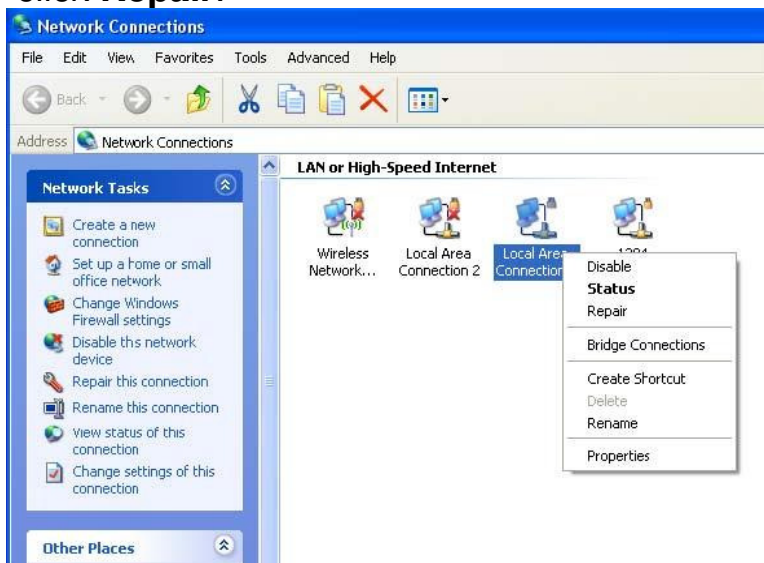
XP:

If you are a WiFi user, click **Network Connections** and right click on

Wireless Network Connection, click **Repair**.

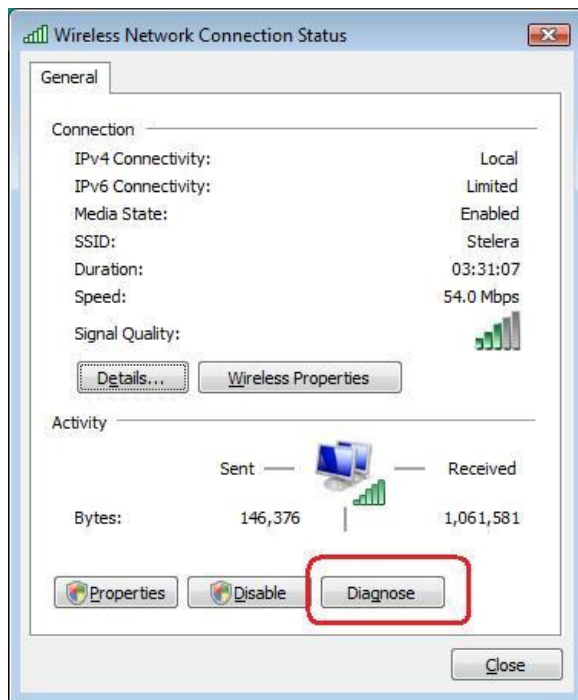


If you use Local Area Connection to connect the Router, click **Network Connections** and right click on **Local Area Connection**, click **Repair**.



Vista/7:

1. If you are a WiFi user, please click **Network and Sharing Center > Manage network connections > Wireless Network Connection > Diagnose**.



2. Please click **Reset the network adapter “Wireless Network Connection”** and it will begin to repair.

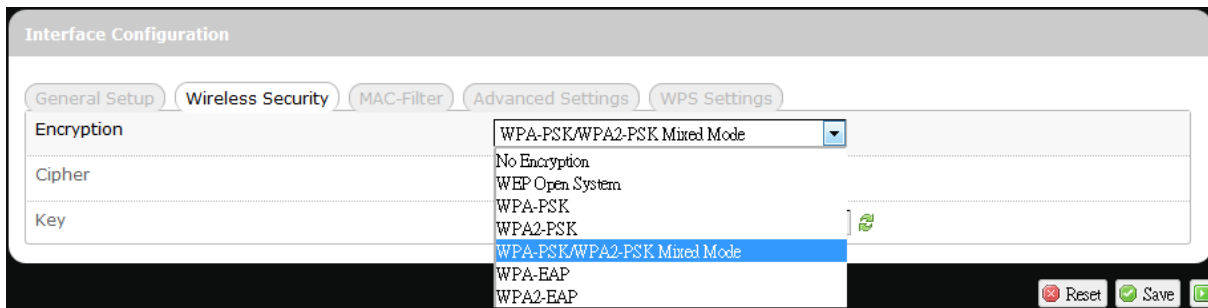


3. If you use Local Area Connection to connect the Router, please click **Network and Sharing Center > Manage network connections > Local Area Connection > Diagnose**, follow step 1 and the subsequent messages to repair it.

Q: How do I configure my WiFi settings from GUI?

A: Click the menu tabs **Network → Wi-Fi** to access to the [Wi-Fi](#) submenu, and then click the submenu tab of a particular ESSID. If you want to configure WiFi Security please click the “[Wireless Security](#)” tab under “Interface Configuration”.

There are seven wireless security encryption options supported by the Router: **WEP Open System**, **WEP Shared Key**, **WPA-PSK**, **WPA2-PSK**, **WPA-PSK/WPA2-PSK Mixed Mode**, **WPA-EAP**, and **WPA2-EAP**.



Q: How can I have a long-time link?

A: Click the menu tabs **Network** → **Router** → **Router Setting**. Under “DHCP Service”, set Client Lease Time to a large value (e.g. 120h = 120 hours = 5 days).

Q: Why can't I use the router in the office?

A: Your router's IP address might conflict with the office default settings.

Q: Why is my internet speed is so slow with the router?

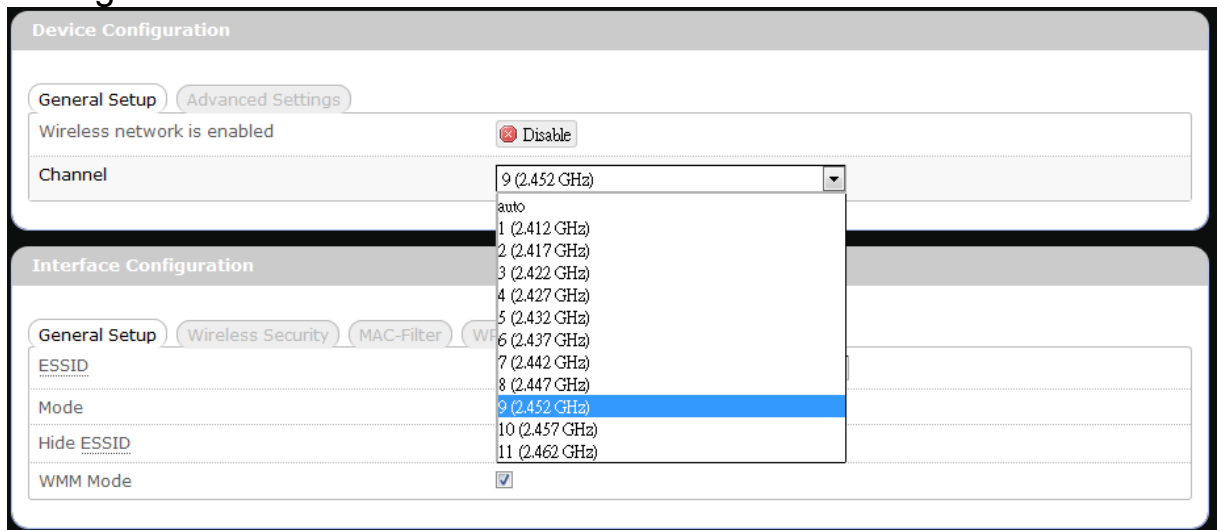
A: 1. Click the menu tabs **Status** → **Mobile Internet** to check the Rx Signal Strength in dBm. Weak signals will significantly slow down internet speed.



LEDs ON	Signal Strength	3G/2G/WCDMA RSSI reading	4G LTE RSRP reading
none	0 bars	Weaker than -100 dBm	Weaker than -115 dBm
#12	1 bar	-100 dBm to (just below) -95 dBm	-115 dBm to (just below) -109 dBm
#12to#13	2 bars	-95 dBm to (just below) -90 dBm	-109 dBm to (just below) -103 dBm
#12to#14	3 bars	-90 dBm to (just below) -83 dBm	-103 dBm to (just below) -95 dBm
#12to#15	4 bars	-83 dBm to (just below) -76 dBm	-95 dBm to (just below) -87 dBm
#12to#16	5 bars	-76 dBm or stronger	-87 dBm or stronger

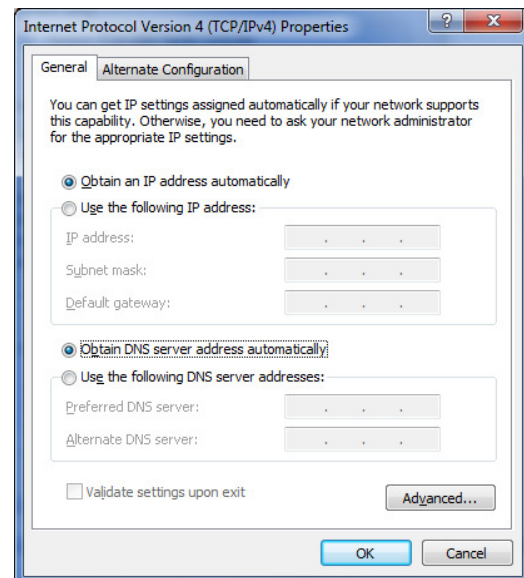


2. Click the menu tabs **Network → Wi-Fi** to access the [Wi-Fi](#) submenu, and then click the submenu tab of the currently used ESSID. Then select a different WiFi Channel under “Device Configuration.”



Q: I have connected the computer with the router via LAN connection. Why can't I access the router's IP address "http://192.168.1.1" ?

A: Your computer's IP address and DNS server addresses may have been assigned manually. Please set your computer's IP address and DNS server addresses to be obtained automatically. The Windows setup path is:
Control Panel → All Control Panel Items → Network and Sharing Center → Local Area Connection → Properties → Internet Protocol Version 4 (TCP/IPv4).



Q: Why can't I use VPN via Router?

A: You may check your office IP settings, the IP settings must not conflict with each other.

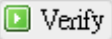
Q: How do I configure the settings when I use xDSL to link the router?

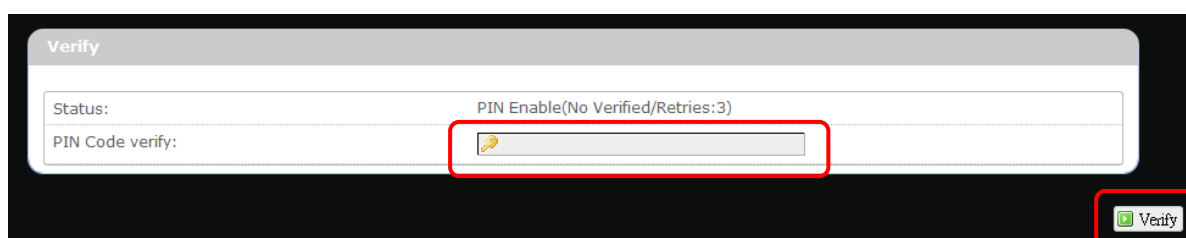
- A:
1. PPPoE: Go to the GUI **Internet > Basic Setting > Ethernet Setting**. Change Connection Type to PPPoE. Enter the Username and Password provided by your ISP. Remember to connect your xDSL or Modem to the WAN Port on your Router.
 2. Static IP: Go to the GUI **Internet > Basic Setting > Ethernet Setting**. Change Connection Type to Static IP. Enter the information in the blank provided by your ISP. Remember to connect your xDSL or Modem to the WAN Port on your Router.

Q: Can I prevent others from using my router?

- A: Yes, there are some ways to prevent others from using your router.
1. Enable your WiFi client filter.
 2. Disabled your SSID Broadcast.
 3. Setting your WiFi security.

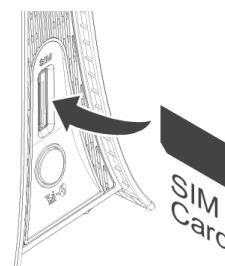
Q: My PIN code is enabled and where can I input the PIN code to use my Router?

A: Click the menu tabs **Network → Mobile Internet → U/SIM PIN Management**; enter your PIN Code and click .

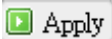


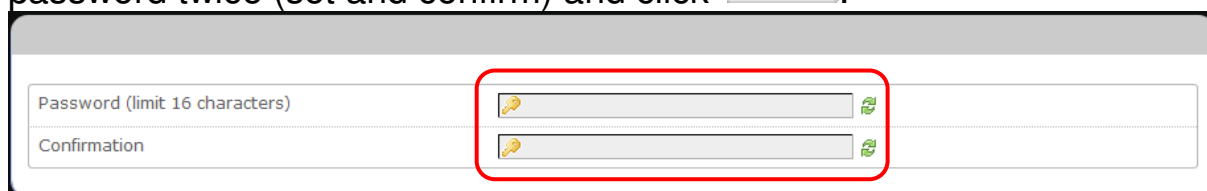
Q: Why does my U/SIM status display “PIN Disable”?

A: Check that the SIM card (which is properly activated by your mobile internet service provider) is inserted correctly in your router.

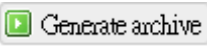
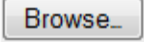
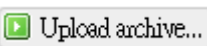


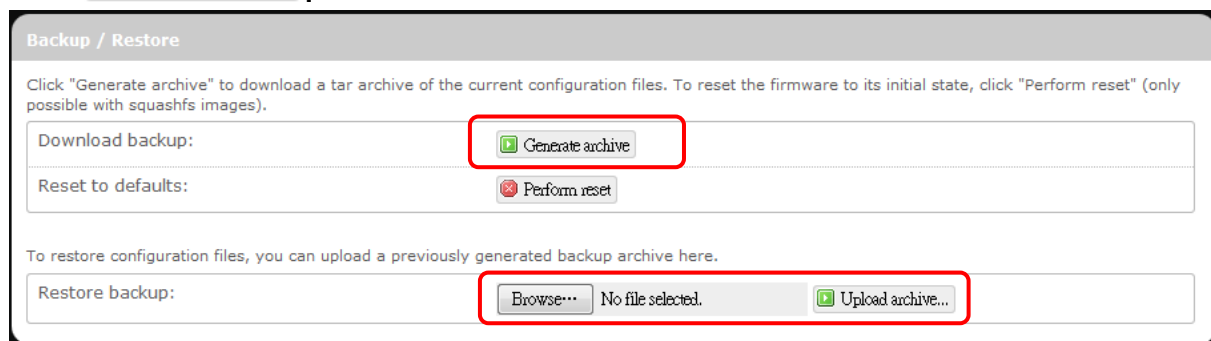
Q: Where can I change the password of the router?

A: Click the menu tabs **System → Administration**. Enter the new password twice (set and confirm) and click .



Q: Can I backup and restore all my settings of the router?

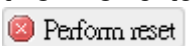
A: Yes. Click the menu tabs **System → Backup / Flash Firmware** and click , then follow instructions on the screen to save router settings as a TAR file at a desired location on your computer or mobile device. Conversely, to restore previously saved router settings, click  (of “Restore backup”); follow screen instructions to choose the previously saved TAR file; and then click .



Q: How do I use the **Reset** button on the router?

A: 1. Short press the Reset button to restart the router.
2. Long press the Reset for more than 10 sec to reset the router to factory default settings.

Q: Where can I reset the router to factory default settings?

A: 1. Long press the **Reset** button on the router for more than 10 sec.
2. Click the menu tabs **System → Backup / Flash Firmware** and click .

Q: If I remove the SIM when 3G is connected, why can't I see the SIM status change?

A: You have to restart the router to see the status. It is best to remove the SIM card when the router is OFF.

Appendix C: Specifications

Note: Specifications are subject to change without notice.

Physical	
WLAN	802.11 b/g/n (2x2 MIMO)
Cellular modem	Embedded, 3GPP Rel 9, LTE FDD&TDD/WCDMA
Dimensions (LxWxH, mm)	160 x 94 x 44
Weight (g)	474
Interface	
Reset Button	Yes
RJ45 Ports	2 x RJ-45, 10/100 LAN ports
DC Power Jack	12V or 24V, accepting 9-32 V voltage swing
SIM slot	Embedded SIM as default, also 1 x SIM slot for external plug in for back up
USB Port	1 x USB port, for USB client device plug in only. K530S serve as USB host.
Connectivity and Data Speed	
4G LTE Band	Band 2, Band 4, Band 12, Band 14, Band 17, Band 25
LTE Data Rate	FDD Downlink up to 100Mbps, Uplink up to 50Mbps TDD Downlink up to 68Mbps, Uplink up to 17Mbps (in configuration 3)
LTE Bandwidth	Up to 20 MHz
3G WCDMA Band	Band 2, Band4, Band 5
WLAN	802.11 b/g/n, 2x2 MIMO
Antenna	
Cellular embedded main antenna	No
Cellular embedded diversity antenna	No
Cellular external main antenna port	Yes SMA type

Cellular external diversity antenna port	Yes SMA type
WiFi antenna	No Embedded
WiFi external antenna port	2 x SMA ports
GPS antenna port	Yes SMA type, supporting 3.3V DC Active Antenna
Router Features	
Routing	Static Routing, Dynamic Routing (RIP, BGP, OSPF)
Security	Multiple VPN pass-through (IPSec, PPTP, L2TP), Stateless and SPI Firewall
NAT-NAPT	Single Port Forwarding, Port Range Forwarding, Port Range Triggering, Port Filtering, IP Filtering, DMZ, UPnP, Multicast Pass-Through
VPN	IPSec, SSL
DNS	DNS Agent, DDNS
Other features	IPv4 and IPv6, TCP, UDP, ICMP, ARP, DHCP Server/Client, HTTP/HTTPs, NTP, ALGs
Wireless LAN	
802.11b data rate	1/2/5.5/11 Mbps
802.11g data rate	Up to 54 Mbps
802.11n data rate	Up to 300 Mbps
Security Types	WPA/WPA2 AES/TKIP Encryption, WPA/WPA2 PSK, WPA/WPA2 Enterprise, None/64/128 bits WEP Encryption, open system authentication.
Device Unique Default Encryption Key	Such unique key is linked to IMEI address of the device
Channel Selection	Auto or Manual
Other features	SSID broadcast disable, Dual SSID, Access control (MAC filtering), WLAN on/off software switch.
Status Indication	
LED Display	6 x LEDs: #1 cellular technology (Blue: LTE, Green: WCDMA, Red: SIM

	error or service failure) #2 signal strength (tri-color) #3 LAN 1 #4 LAN 2 #5 GPS #6 WiFi
Software Features	
Web Graphic User Interface (GUI)	Yes, Browser supported: IE, Firefox, Safari, Chrome
Web Graphic User Interface (GUI) Language Support	English
Connection Status in Web Graphic User Interface (GUI)	Network name, Signal strength, Roaming indication, Radio technology, Connection status, Connection time, Connection Statistics.
Connection management	Connection on demand, Connection when available, Auto APN matching with USIM , APN database update through browser-based Graphic User Interface (GUI), APN profile, PIN management, Preferred radio NW type selection
System protection	Password protected administrator and user access authority (provisioning, configuration, authentication).
GNSS	Supports GPS and Glonass composite location data for remote server and local access
Support FW version upgrade	Yes
Device Management	TR-069, OMA-DM, Remote Graphic User Interface (GUI) Log-in
Accessories	
Power Adapter	Input: 100to240V, 50to60Hz AC; Output: 12V DC

Environment	
Operation Temperature	-20°C to 70°C (-4°F to 158°F)
Storage Temperature	-40°C to 80°C (-40°F to 185°F)
Operating Humidity	10% to 85% Non-Condensing
Storage Humidity	5% to 90% Non-Condensing

Certification & Conformance

	RoHS, IP64, MIL 810-G, FCC, Sprint Certification
--	--



Appendix D: Important Safety Information and Glossary

Europe – EU Declaration of Conformity



European Union Notice

Products with CE marking comply with the R&TTE Directive (99/5/EC), the EMC Directive (2004/108/EC), and the Low Voltage Directive (2006/95/EC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (in parentheses are the equivalent international standards).

EN 60950-1 (IEC 60950-1)

Safety of Information Technology Equipment.

EN 300 328

Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; data transmission equipment operating in the 2.4 GHz ISM band and using spread spectrum modulation techniques.

EN 301 489-24

Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 24: Specific conditions for WCDMA direct spread (UTRA) for mobile and portable (UE) radio and ancillary equipment.

ETSI EN 301 511

Global system for mobile communications (GSM); Harmonised EN for mobile stations in the GSM 900 and GSM 1800 bands, covering essential requirements of article 3.2 of the R&TTE directive (1995/5/EC).

ETSI EN 301 489-1

Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.

ETSI EN 301 489-7

Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 7: Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS).



ETSI EN 301 489-17

Electromagnetic compatibility and Radio spectrum Matters (ERM);
Electromagnetic Compatibility (EMC) standard for radio equipment and services;
Part 17: Specific conditions for 2.4 GHz wideband transmission systems.

ETSI EN 301 908-1 & -2

Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS),
Repeaters and User Equipment (UE) for IMT-2000 Third Generation cellular networks;
Part 1: Harmonised EN for IMT-2000, introduction and common requirements,
covering essential requirements of article 3.2 of the R&TTE Directive.

EN 50385

Product standard to demonstrate the compliance of radio base stations and fixed
terminal stations for wireless telecommunication systems with the basic restrictions or
the reference levels related to human exposure to radio frequency electromagnetic
fields (110 MHz - 40 GHz) - General public.

Federal Communication Commission Interference Statement

15.21

You are cautioned that changes or modifications not expressly approved by the part
responsible for compliance could void the user's authority to operate the equipment.

15.105(b)

Federal Communications Commission (FCC) Statement

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

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

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference and
- 2) This device must accept any interference received, including interference that may cause undesired operation of the device.

FCC RF Radiation Exposure Statement:

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.



Glossary

2G: Second-generation mobile networking technology. Represents a switchover from analog to digital; most 2G networks use GSM.

3G: Third-generation mobile networking technology that enables simultaneous transfer of voice and non-voice data; most 3G networks use WCDMA.

3.5G: A more recent standard of mobile networking technology; generally uses HSDPA.

3.75G: A more recent standard of mobile networking technology; generally uses HSUPA.

4G: A more recent standard of mobile networking technology; generally uses LTE.

APN (Access Point Name/Network): Provides GPRS routing information. Consists of:

Network ID: Identifies the external service requested by a GPRS user.

Mobile network operator ID: Specifies routing information.

ARFCN (Absolute Radio Frequency Channel Number): The specific ID numbers for all radio channels used in cellular mobile communications.

bps (bits per second): How data flow is measured.

CHAP (Challenge Handshake Authentication Protocol): CHAP identifiers are changed frequently and authentication can be requested by the server at any time.

DNS (Domain Name System): Helps route network traffic by making the addressing process more user-friendly.

DHCP (Dynamic Host Configuration Protocol): How devices obtain IP addresses from a server.

DUN (Dial-Up Network): Windows component that enables online access via a modem.

EDGE (Enhanced Data GSM Environment/Enhanced Data for Global Evolution): Advanced GPRS that delivers multimedia and other data needing greater bandwidth at up to 237 kbps.

GPRS (General Packet Radio Service): Delivers data in packets at up to 86 kbps.

GSM (Global System for Mobile Communications): The most popular cellular network, mostly operates in 850-900 or 1800-1900 MHz; the primary 2G system.

HSDPA (High Speed Downlink Packet Access): Advanced WCDMA that delivers downlink bandwidth intensive data at up to 7.2Mbps; typically associated with 3.5G.

HSUPA (High Speed Uplink Packet Access): Advanced WCDMA that delivers uplink bandwidth intensive data at up to 5.76Mbps; typically associated with 3.75G.

HSPA+ (High Speed Packet Access +): This is also known as HSPA Evolved, is the next step and is more focused on delivering data services enabling speeds of up to 42Mbps in the downlink and 11Mbps in the uplink.

IMEI (International Mobile Equipment Identity): A number unique to each GSM/UMTS device that can be used block network access by a stolen mobile device.

IP (Internet Protocol): Routes packets over a network.

Kbps (Kilobits per second): A data flow measure; 1024 bits/second.

LAN (Local Area Network): A data network with limited range but good bandwidth.

Mbps (Megabits per second): A data flow measure; 1,048,576 bits/second.

Load Balance: A method for distributing network loads across different networks to optimize network traffic flow and increase network reliability.

LTE (Long Term Evolution): High-speed mobile communication standard based on the GSM/EDGE and UMTS/HSPA network technologies. LTE provides downlink peak rates up to 300 Mbit/s and uplink peak rates up to 75 Mbit/s.

PAP (Password Authentication Protocol): The difference between PAP authentication and a manual or scripted login, is that PAP is not interactive. The username and password are entered in the client's dialing software and sent as one data package as soon as the modems have established a connection, rather than the server sending a login prompt and waiting for a response.

PPP (Point-to-Point Protocol): An internet connection method.

PIN (Personal Identity Number): Four to eight digital numbers SIM card security code; allows access to the carrier's network.

Rx: Shorthand for Reception.

SIM (Subscriber Identity Module): A small card that contains key mobile device identification, subscription and contact information.

Tx: Shorthand for Transmission.

WCDMA (Wideband Code Division Multiple Access): Advanced EDGE that supports 384kbps data flow. Most 3G networks use this standard, the same as UMTS.

UAM (Universal Access Method): A method to allow WiFi access to a wireless network while roaming. Using a regular web browser, the roaming customer enters a login page and provides user information (usually username and password) to access the network.

