RidgeWave by BEC

User Manual

RidgeWave® BEC 7000 R28-G

4G LTE-A Pro Outdoor Router

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Version release: v1.0

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Support Contact Information

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Last revised: April 2021
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CHAPTER 1: INTRODUCTION

Introduction to your Router

Congratulations on your purchase of the **BEC 4G LTE-A Pro Outdoor Router**.

Rugged Weatherproof Design

The RidgeWave® by BEC 7000 R28-G is an industrial-grade outdoor fixed wireless router with an IP68 rated enclosure to withstand extreme weather conditions and harsh rugged deployments. In addition to outdoor, it can be installed in environments such as: manufacturing plants, industrial automation, stadiums, convention halls, stadium facilities, school campuses or virtually any venue requiring a robust wireless solution. The BEC 7000 R28-G of 4G/LTE Outdoor routers create value, enable new growth opportunities and helps operators maximize network ROI.

4G/LTE Mobility

With 4G/LTE-based Internet connection (4G/LTE embedded module, requires an additional SIM card), you can access to the Internet through 4G/LTE whether you are seated at your desk or taking a cross-country trip.

4G/LTE Management Center

BEC 7000 R28-G (4G LTE-A Pro Outdoor Router) Mobile Management Center visually displays its current 4G/LTE signal status also calculates the total amount of hours or data traffic used per month, allowing you to manage your 4G/LTE monthly subscriptions.

24/7 Cloud Management and Network Visibility

Remote monitoring, management and control of devices in real-time is essential for IoT networking devices, M2M and critical applications. BECentral®, BEC's Cloud Based Remote Management, is a comprehensive device management platform designed to minimize deployment, lower support expenses and maximize the operational efficiency and profitability of the operator. BECentral® provides access to critical information for LTE Network diagnostics and troubleshooting, such as: signal quality measurements (RSSI, RSRP, RSRQ and SINR), network status/APN, location ID and Cell ID. Additional functionality includes OTA firmware upgrades (individual or batch), multi-user account management, local network configuration settings on the BEC 7000 R28-G.

IPv6 Supported

Internet Protocol version 6 (IPv6) is a version of the Internet Protocol that is designed to succeed IPv4. IPv6 has a vastly larger address space than IPv4. The router is already supporting IPv6, you can use it in IPv6 environment no need to change device. The dual-stack protocol implementation in an operating system is a fundamental IPv4-to-IPv6 transition technology. It implements IPv4 and IPv6 protocol stacks either independently or in a hybrid form. The hybrid form is commonly implemented in modern operating systems supporting IPv6.

Quick Start Wizard

Support a WEB GUI page to install this device quickly. With this wizard, simple steps will get you connected to the Internet immediately.

Firmware Upgradeable

Device can be upgraded to the latest firmware through the WEB based GUI.

Features & Specifications

- Outdoor 4G for high speed mobile connectivity
- 4G embedded with a built-in SIM card slot
- 4G Management Center for connection monitoring
- Firewall security with DoS prevention and SPI
- Quality of Service control
- Syslog monitoring
- Ease of Use with Quick Installation Wizard
- Ideal for fixed wireless broadband, last mile access, mission-critical & performance intensive networks, industrial connectivity applications, and urban and rural environments

Operational Mode

- Bridge or Routed mode

Network Protocols and Features

- IPv4, IPv6 or IPv4 / IPv6 Dual Stack
- NAT, static (v4/v6) routing and RIP-1 / 2
- DHCPv4 / v6
- Universal Plug and Play (UPnP) Compliant
- Dynamic Domain Name System (DDNS)
- Virtual Server and DMZ
- SNTP, DNS proxy
- IGMP snooping and IGMP proxy
- MLD snooping and MLD proxy

Firewall

- Built-in NAT Firewall
- Stateful Packet Inspection (SPI)
- DoS attack prevention including Land Attack, Ping of Death, etc.
- Access control
- IP&MAC filter, URL Content Filter
- Password protection for system management

- VPN pass-through

Quality of Service Control

- Traffic prioritization management based-on Protocol, Port Number and IP Address (IPv4/ IPv6)

Management

- Quick Installation wizard
- Web-based GUI for remote and local management (IPv4/IPv6)
- Firmware upgrades and configuration data upload and download via web-based GUI
- Supports DHCP server / client / relay
- Supports SNMP v1, v2, v3, MIB-I and MIB-II
- TR-069 supports remote management
- BECentral® Cloud-base Management Platform

Hardware Specifications

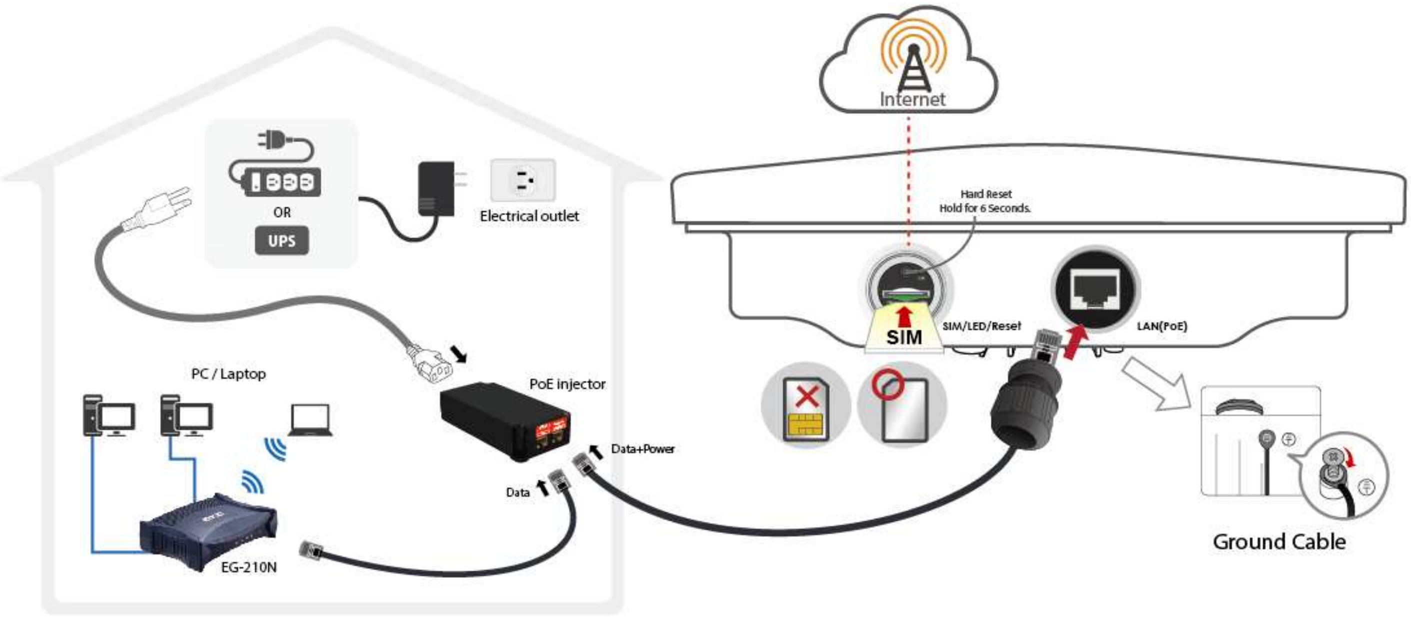
Physical Interface

- 10/100/1000 Gigabit Ethernet LAN with IEEE802.3at compliant Gigabit PoE PD
- IEEE 802.3at PD complaint (25.5W)
- SIM slot: (for the SIM card from Telco / ISP)
- Reset Button
- LED Indicators: Power, LAN (PoE), LTE, and Internet

Physical Specifications

- Dimensions (W*H*D): 12.6" x 12.6" x 2.91" (320mm x 320mm x 74mm)
- Weight: < 1.5kg
- IP-67 Grade Enclosure and Vent integration enclosure
- Top cover material UL-746C compliant for UV-resistant
- Surge Protection: K.21 enhanced mode 6KV

Application Diagram



CHAPTER 2: PRODUCT OVERVIEW

Important Note for Using This Router

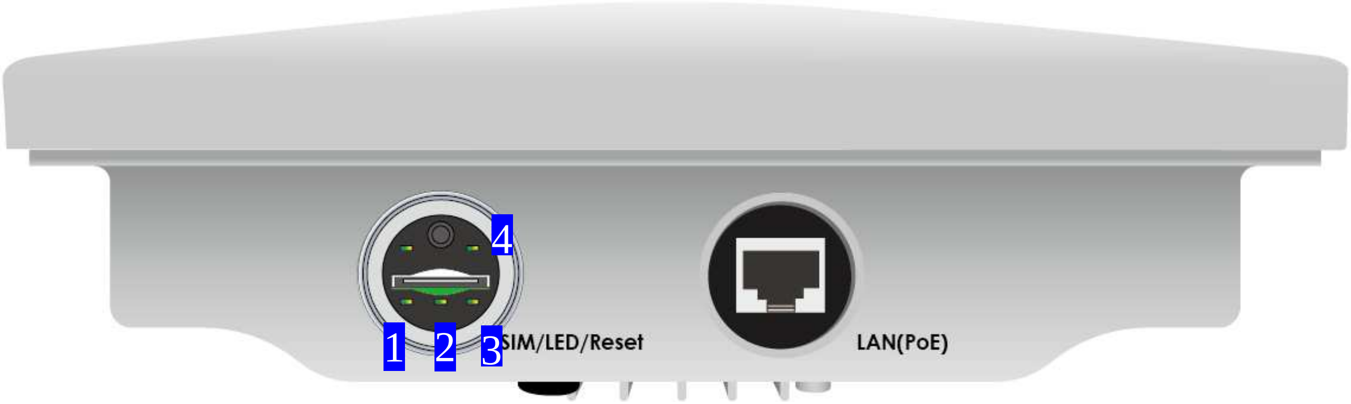
Attention

- ✓ Do not remove, open or repair the case yourself. Contact with your Internet Service Provider or have it repaired at a qualified service center.
- ✓ Use the supplied PoE (Power-over-Ethernet) injector for indoor only or with any 802.3at capable PoE injectors to connect with the RidgeWave® BEC 7000 R28-G
- ✓ It is mandatory to earth ground the BEC 7000 R28-G. Improper grounding not only could damage the unit but also all equipment connected to it.

Package Contents

- ✓ The 4G LTE-A Pro Outdoor Router
- ✓ M25 Cable Gland x 1
- ✓ Quick Start Guide
- ✓ Gigabit Power-over-Ethernet (PoE) Injector x 1
- ✓ Mounting Kit (#LP2S or #RT4R) x 1

Device Description



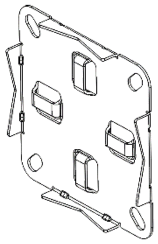
CONNECTORS	DESCRIPTION
SIM / LED / Reset	Insert the SIM card into the SIM slot. Press the reset button to reset device or restore to factory default settings
Gigabit LAN(PoE)	Connect the supplied PoE injector, 802.3at compliant, using an Ethernet cable.

LED	STATUS	DESCRIPTION
1. Power	Orange	System is either in initial startup phase or has boot failure
	Green	System is up and ready
	Off	No input power
2. LAN(PoE)	Orange	Transmission speed is at 10/100Mbps
	Green	Transmission speed is at gigabit speed (1000Mbps)
	Blinking	Data being transmitted/received
	Off	No device is being connected
3. Internet	Orange	IP request failed or System is in initial booting phase
	Green	IP connected and traffic is passing thru the device
4. 4G/LTE Signal Strength	Green	RSSI greater than -69 dBm. Excellent signal condition
	Green Flashing quickly	RSSI from -81 to -69 dBm. Good signal condition
	Orange Flashing quickly	RSSI from -99 to -81 dBm. Fair signal condition
	Orange Flashing slowly	RSSI less than -99 dBm. Poor signal condition
	Orange	No signal. 4G/LTE module is still in connected mode
	Off	No 4G/LTE module or 4G/LTE module has failed

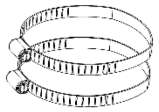
Mounting Kit Installation – Using LP2S Mounting Kit

Mounting Kit includes:

1. Stainless Steel Bracket x 1
2. Hose Clamp x 2
3. M6x15 Screw x 4
4. M6 Washer x 4
5. Spring Washer x 4



Stainless Steel Bracket x 1



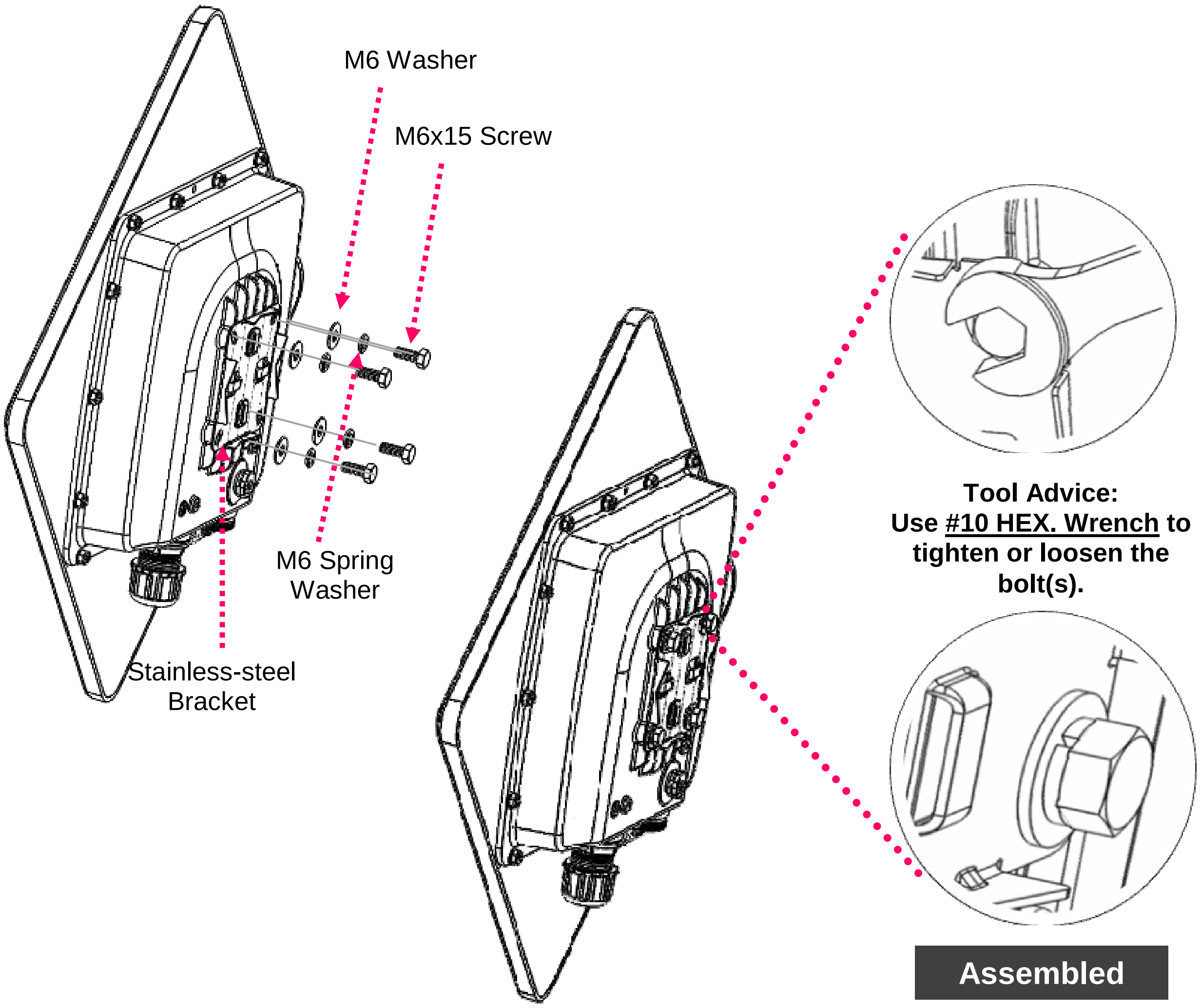
Hose clamp 1” ~3” x 2

M6x15 Screw x 4

M6 Washer x 4

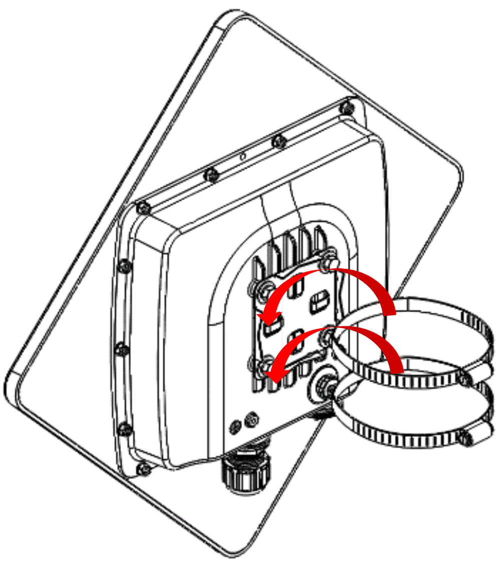
Spring Washer x 4

1. **Attach the Stainless-Steel Bracket to the Enclosure**
   Attach the stainless-steel bracket to the back of the BEC 7000 R28-G enclosure then use the supplied M6 Washer, Spring Washer, and M6x15 screws in the mounting kit to screw the bracket tightly.

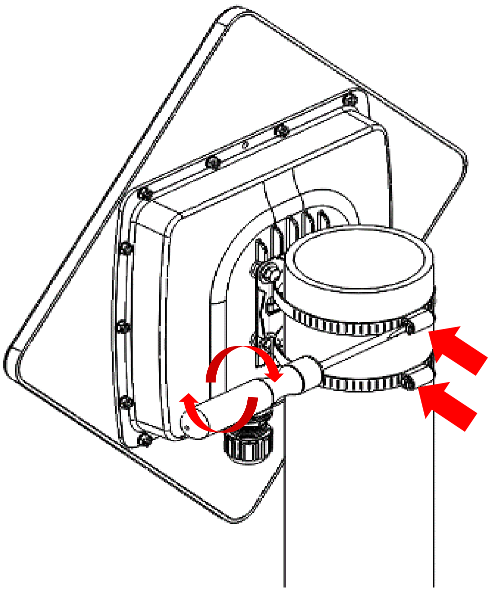


Tool Advice:
Use #10 HEX. Wrench to tighten or loosen the bolt(s).

2. Pole Mounting for Pole 1” ~ 3” (25.4 ~ 76.2mm)

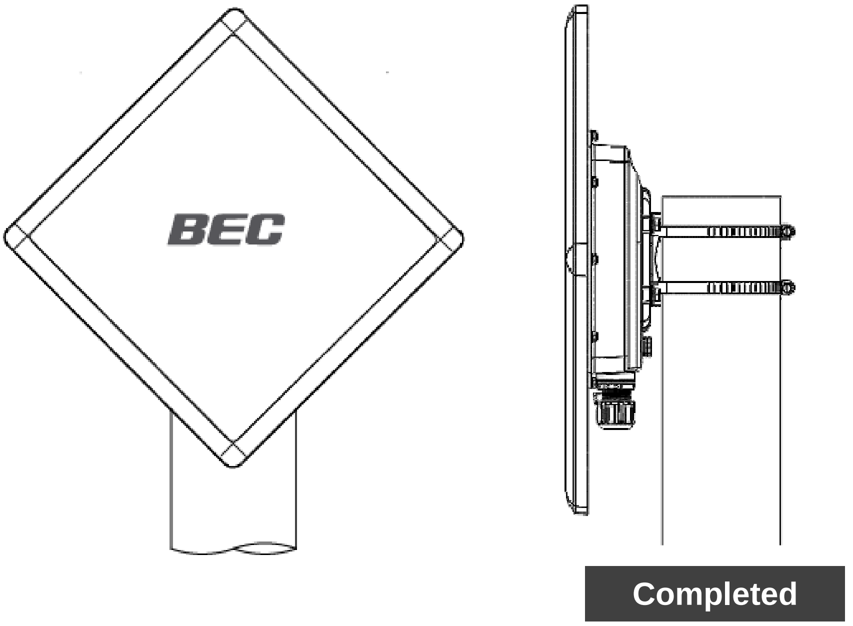


Use 1~3” hose clamps through the stainless-steel bracket.



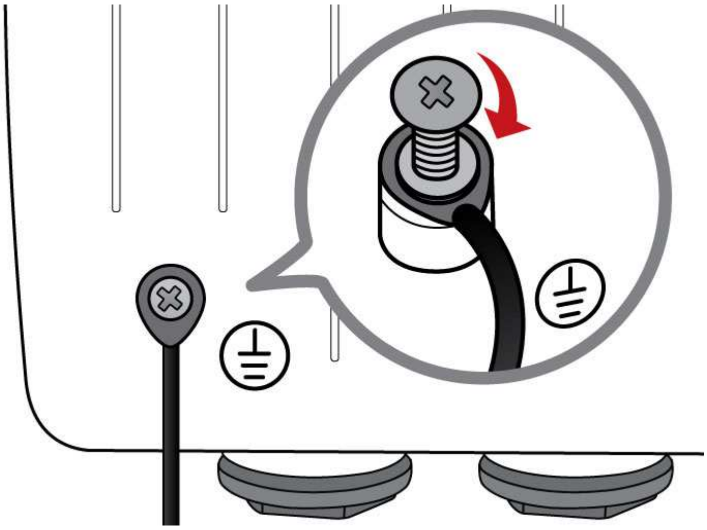
Fix the stainless-steel bracket to the pole by using the supplied stainless hose clamps (1” ~ 3”). Use a flat-head screwdriver to turn the head of the screw clockwise to tighten it.

The BEC 7000 R28-G must be directed towards the nearest base station.



3. Proper Grounding to Complete the Installation

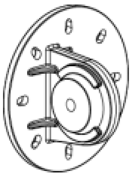
Attach the grounding wire to the BEC 7000 R28-G and tighten the screw.



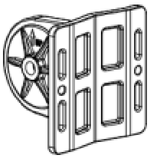
Mounting Kit Installation – Using RT4R Mounting Kit

Mounting Kit includes:

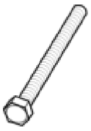
1. Articulation Pole x 1
2. T-formed Bracket x 1
3. M8x40 Screw Bolt x 1
4. M8 Nut x 1
5. M8 Washer x 1
6. M6 Washer x 4
7. M8 Spring Washer x 1
8. M6 Spring Washer x 4
9. M6x16 Screw x 4



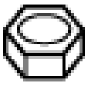
Articulation Pole x 1



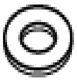
T-form Bracket x 1



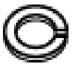
M8x40 Screw Bolt x 1



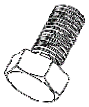
M8 Nut x 1



M8 Washer x 1
M6 Washer x 4



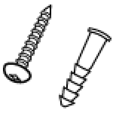
M8 Spring Washer x 1
M6 Spring Washer x 4



M6 x16 Screw x 4

For **Wall Mount Installation**, you'll need:

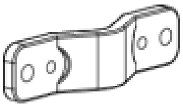
10. Wood Screw x 4
11. Wood / Gyprock x 4



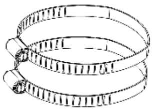
Wood Screw x 4
Wood / Gyprock Plug x 4

For **Pole Mount Installation**, you'll need:

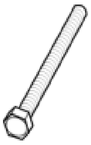
12. W-Bar x 1
13. Stainless Hose Clamp x 2
14. M6x60 Screw Bolt x 2
15. M6 Washer x 2
16. M6 Spring Washer x 2



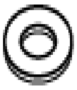
W-Bar x 1



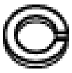
Stainless Hose Clamp 1"-3" x 2



M6 x 60 Screw Bolt x 2



M6 Washer x 2

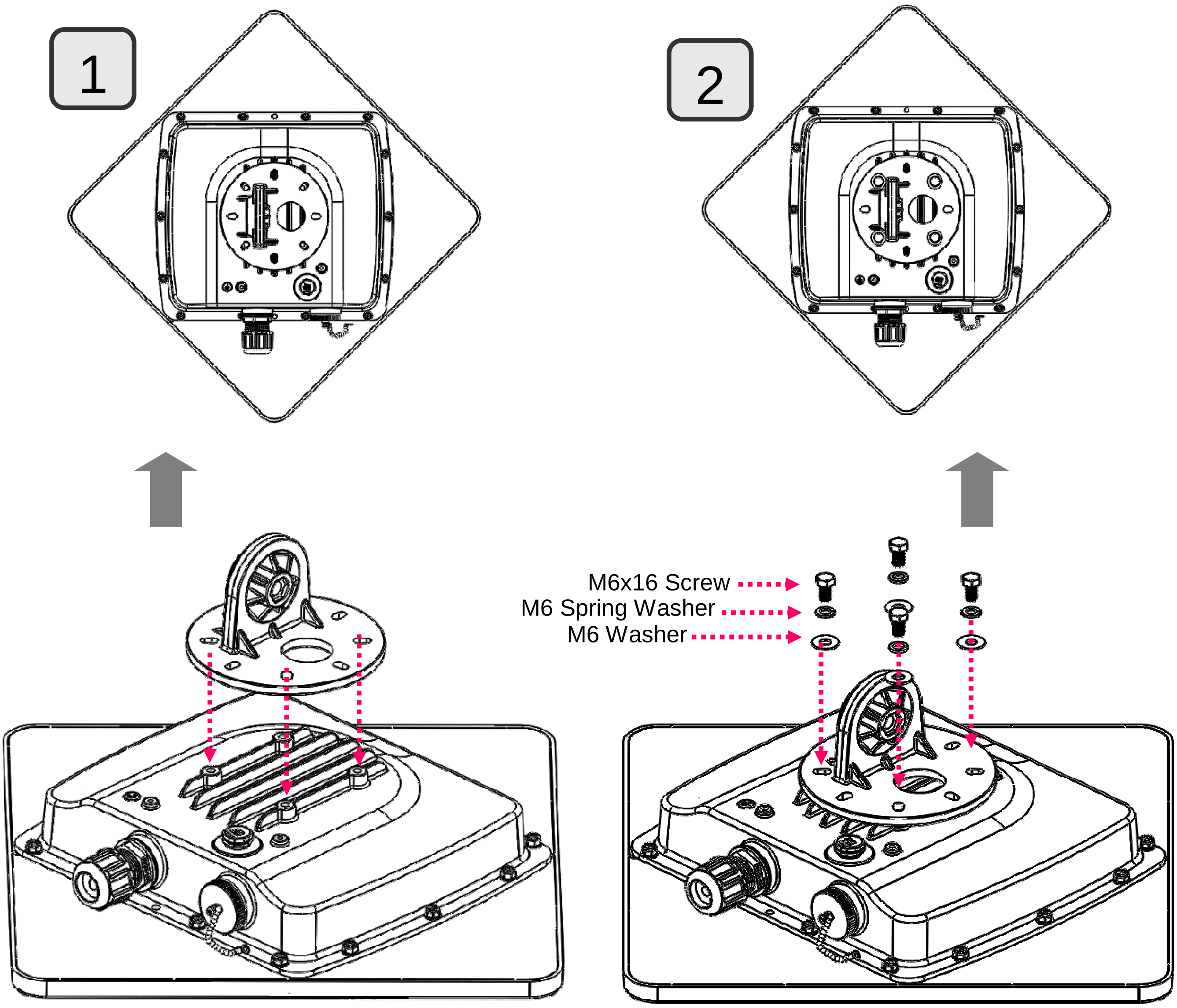


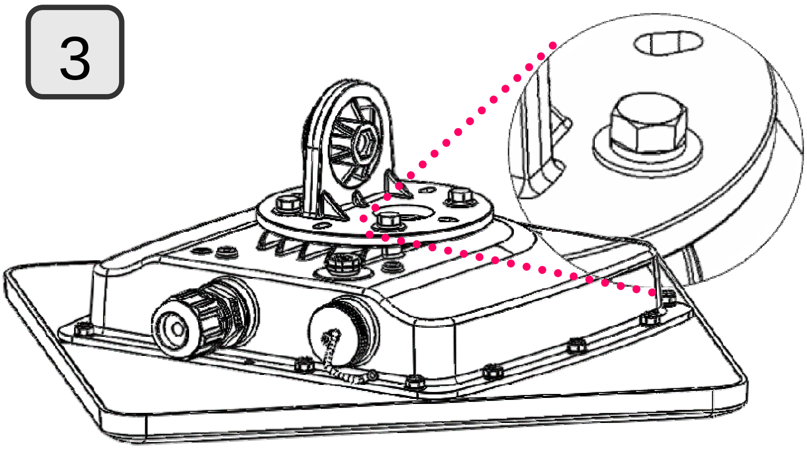
M6 Spring Washer x 2

1.

Attach the Articulation Pole to the Enclosure

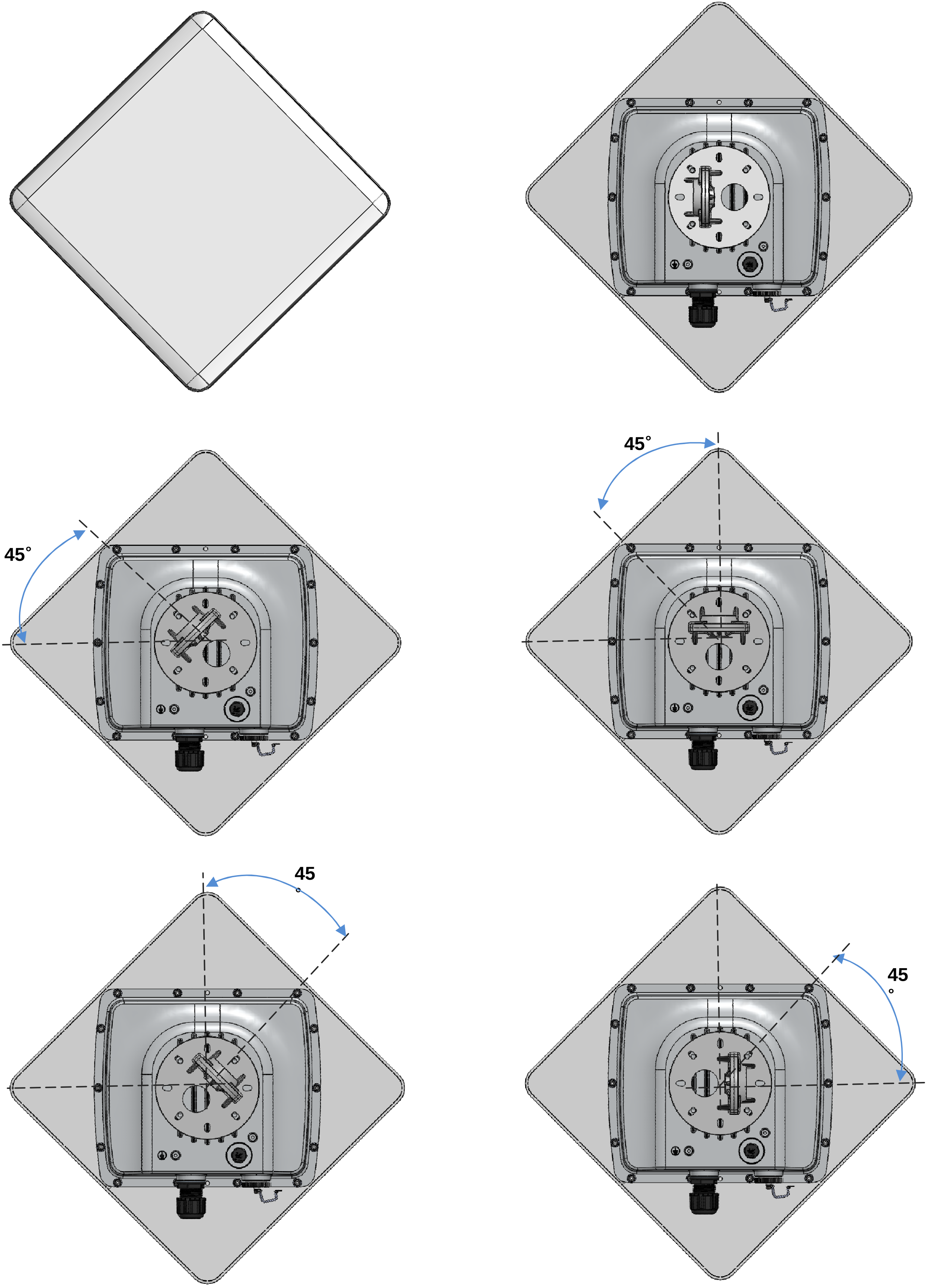
Attach the articulation pole to the back of the BEC 7000 R28-G enclosure using the supplied **M6 screws**, **M6 spring washers** and **M6x16 screws** which are included in the mounting kit.





Tool Advice:
Use #10 HEX. Wrench to tighten or loosen the bolt(s).

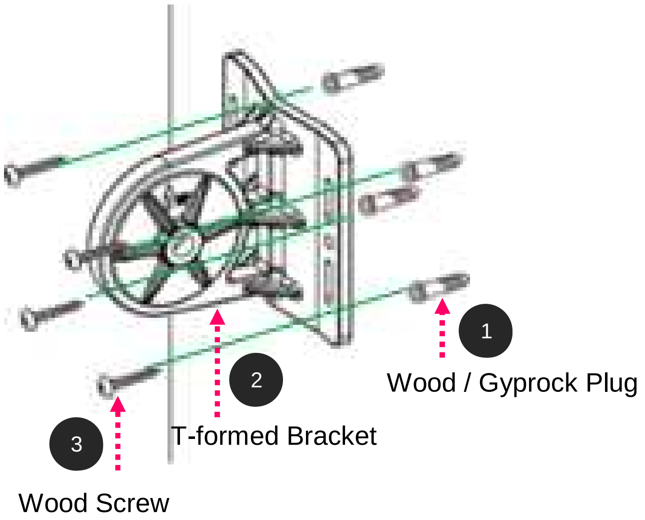
Note: The flexible mounting kit can be adjusted in multiple angles to align with the base station for higher efficiency.



2. Wall or Pole Mount Installation

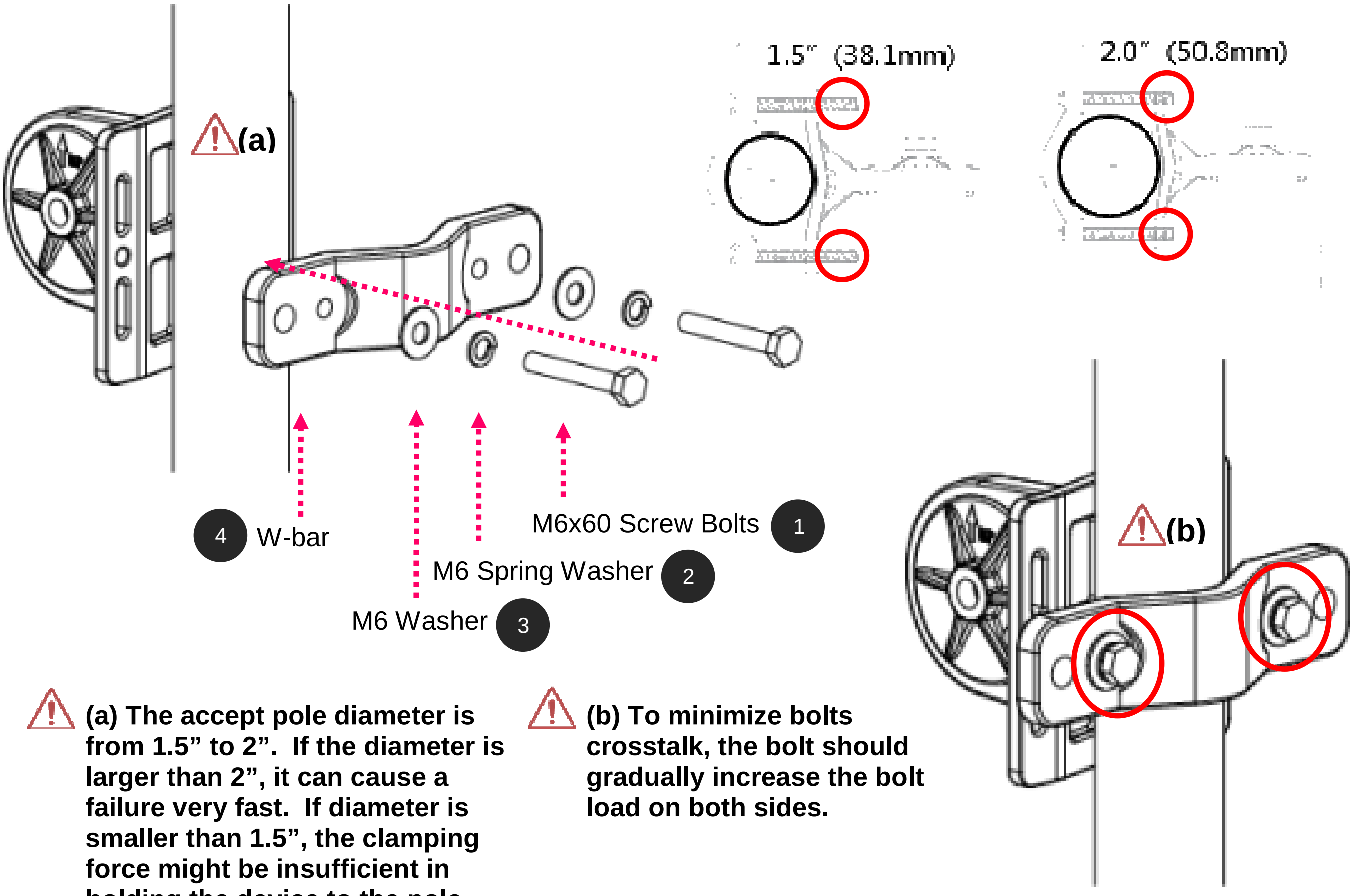
Mounting on Wall

Fix the T-formed Bracket to the wall by using **wood screws** and **Gyprock plugs**.



Mounting on a Pole between 1.5" to 2" (38.1~50.8mm)

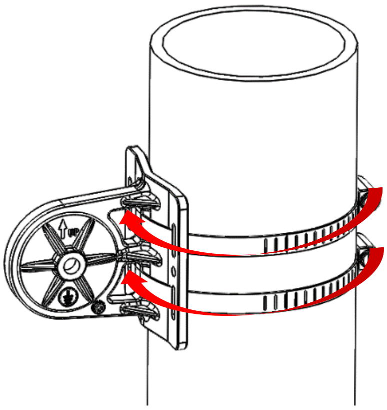
Attach the T-formed Bracket and the W-bar to the pole then use **M6x60 bolts**, **M6 spring washers** and **M6 washers** to fix the mounting kit onto the pole.



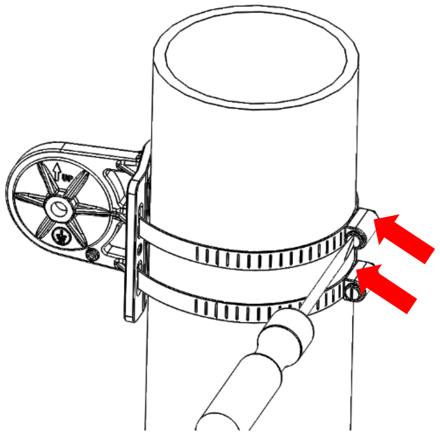
⚠ **(a) The accept pole diameter is from 1.5" to 2". If the diameter is larger than 2", it can cause a failure very fast. If diameter is smaller than 1.5", the clamping force might be insufficient in holding the device to the pole.**

⚠ **(b) To minimize bolts crosstalk, the bolt should gradually increase the bolt load on both sides.**

Mounting on a Pole between 1” to 3” (25.4~76.2mm)



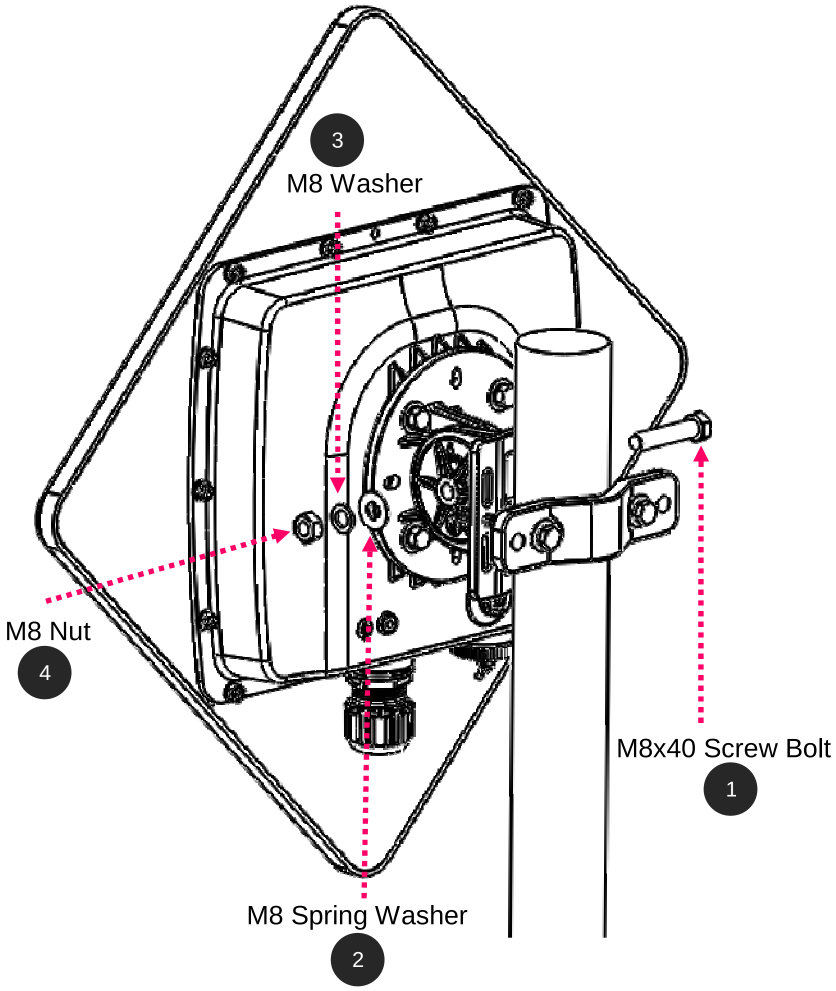
Use the stainless hose clamps through the T-formed Bracket.

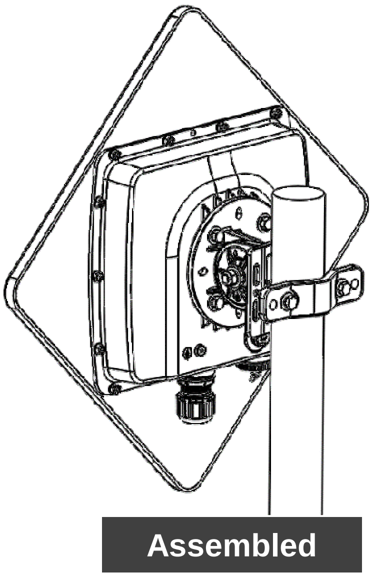


Fix the T-formed Bracket to the pole by using the supplied stainless hose clamps. Use a flat-head screwdriver to turn the head of the screw clockwise to tighten it.

3. Attach the BEC 7000 R28-G Enclosure to the Pole

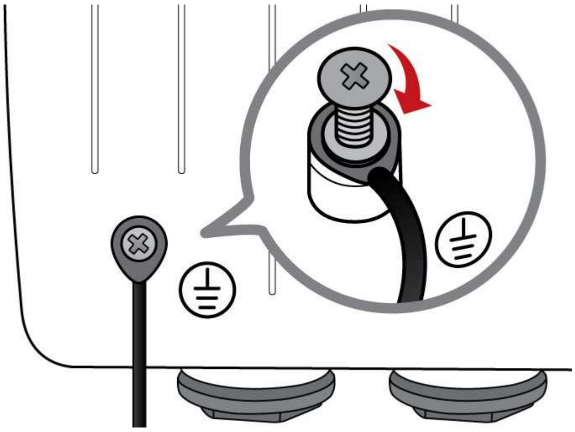
Attach the articulation pole (BEC 7000 R28-G enclosure) to the T-formed bracket using the supplied **M8 nut**, **M8 spring washer**, **M8 washer** and **M8x40 screw bolt**.





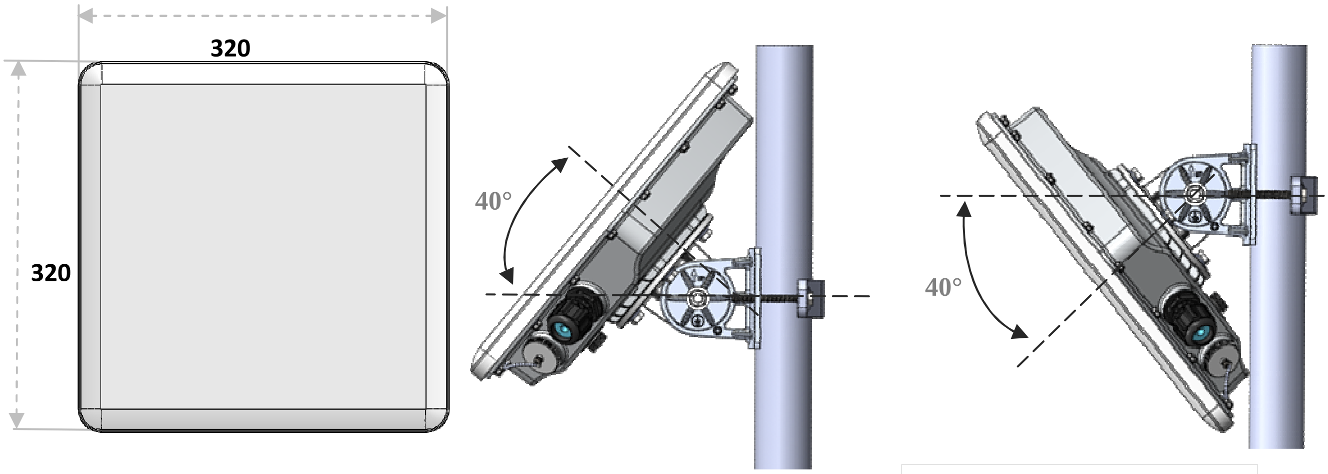
4. Proper Grounding to Complete the Installation

Attach the grounding wire to the BEC 7000 R28-G and tighten the screw.



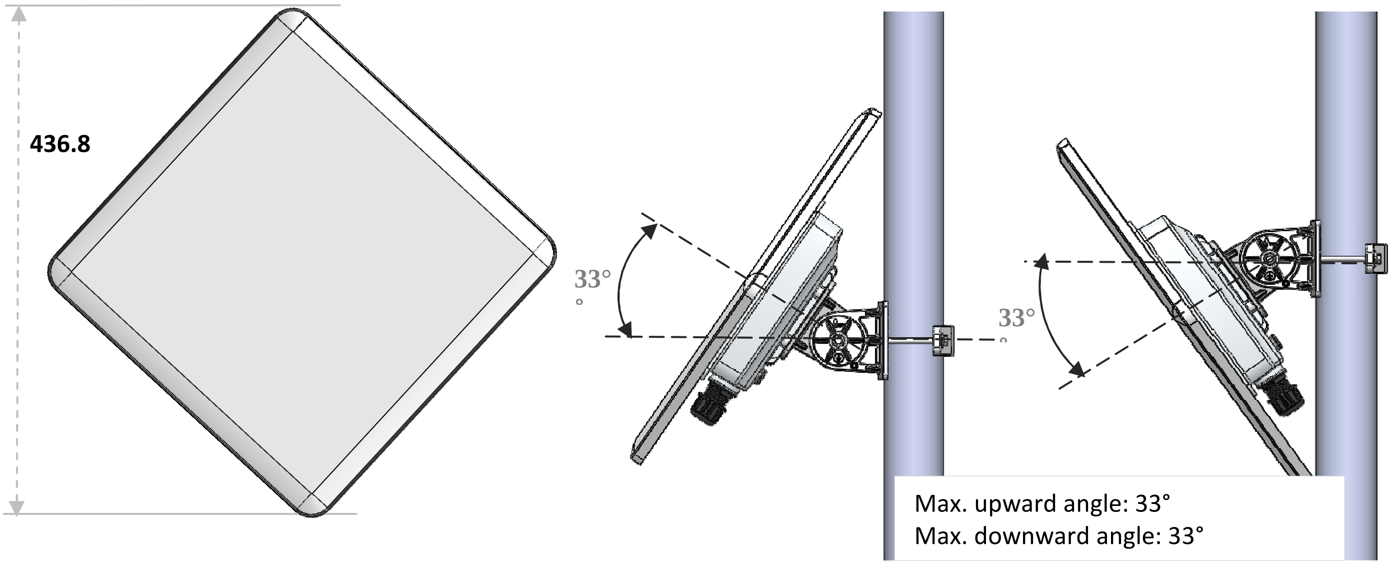
5. Position Adjustment

Adjust the BEC 7000 R28-G until it reaches the desire elevation and depression angle, then tight the **M8 nut** (see **Attach the BEC 7000 R28-G Enclosure to the Pole** for more information)



Max. upward angle: 40°
Max. downward angle: 40°

Completed

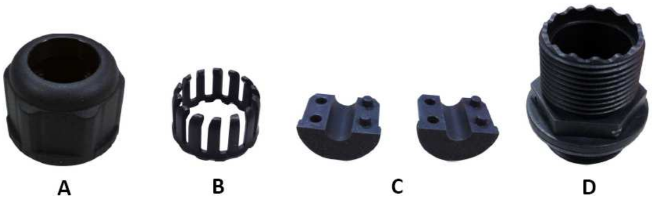


Max. upward angle: 33°
Max. downward angle: 33°

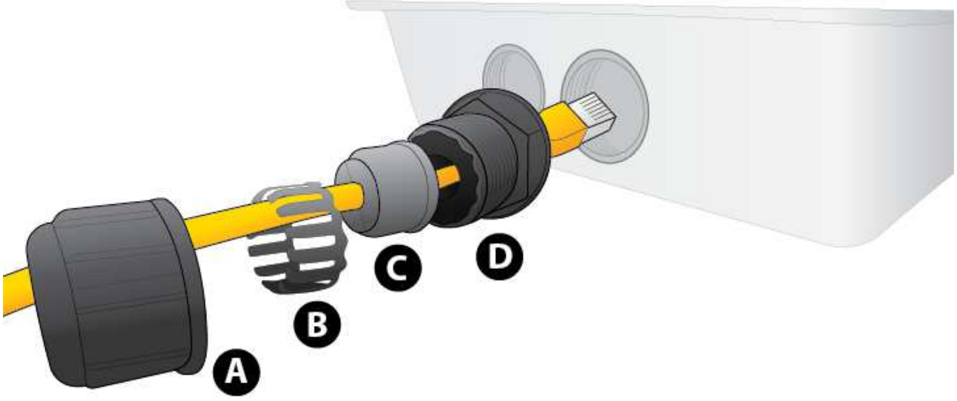
Router Installation Instructions

1. Power on your BEC 7000 R28-G

Step 1: Assemble M25 cable gland



Step 2:
Unscrew the LAN (PoE) cap then insert an outdoor Ethernet cable (RJ-45) through material A-D, and then connect the RJ-45 Ethernet cable into the LAN (PoE) port.



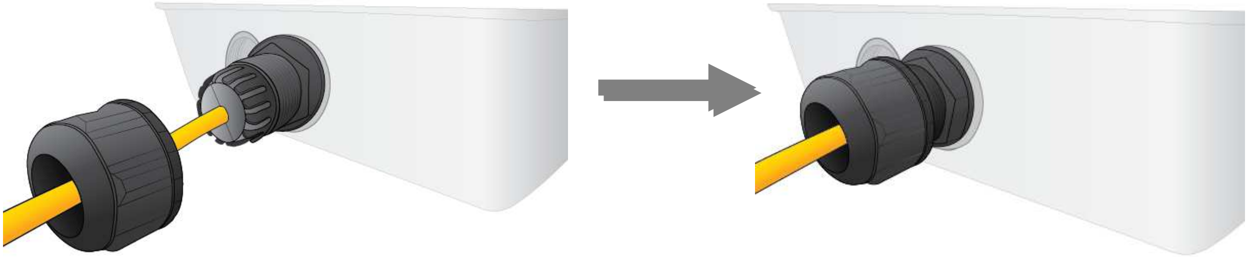
Step 3:

3.1: Insert Ⓒ at the back end of Ⓓ

3.2: clip Ⓑ on Ⓒ

3.3: keep Ⓑ close to Ⓓ

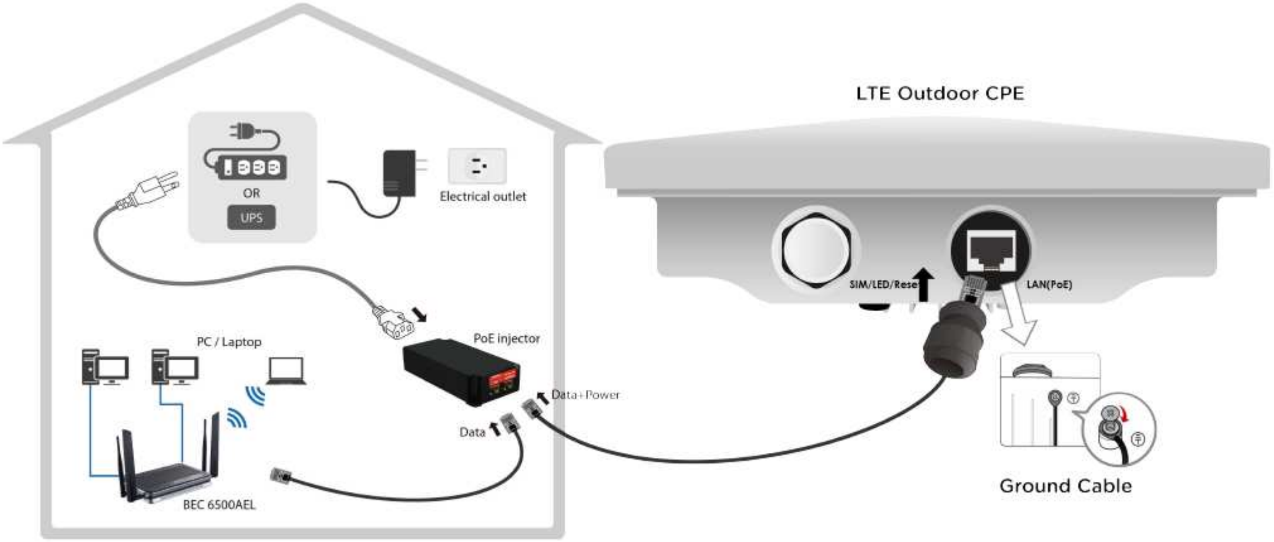
3.4: then tighten Ⓐ.



Step 4:

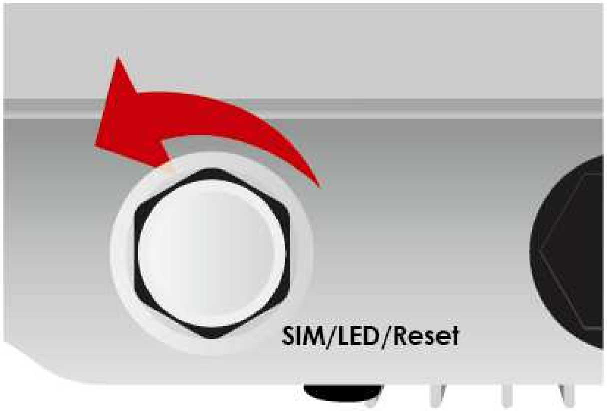
Insert the other end of outdoor Ethernet cable (RJ-45) to the supplied Gigabit PoE injector **Data+Power** port. Connect another Ethernet cable (RJ-45) directly to the **Data** port and the other end of cable to a switch or broadband router.

IMPORTANT: It is recommended to put the Gigabit PoE Injector on an UPS or Surge Protector. Use a grounding wire to ground your BEC 7000 R28-G is REQUIRED!



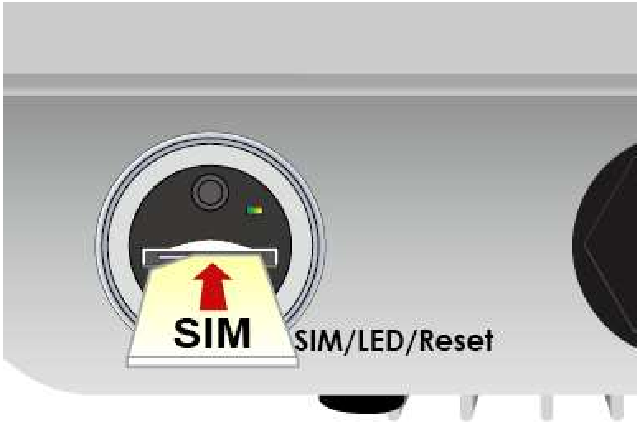
2. **Set up your 4G/LTE Internet Connection**

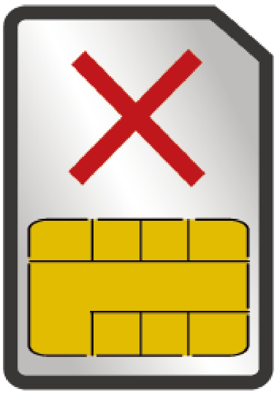
Step 1: Unscrew the cap of SIM card slot.



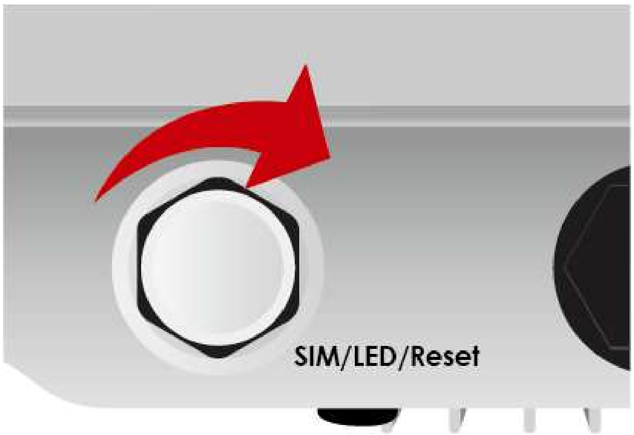
Step 2: Slide the SIM card with the mental contacts (gold plate) facing down to the SIM slot then push it all the way in until you hear the clicking sound.

⚠ **It is recommended to use an industrial-grade SIM card.**





Step 3: Screw the cap back tightly.



⚠ **Please power off the device before inserting or removing the SIM card.**

System Recovery Procedures

The purpose is to allow users to restore the BEC 7000 R28-G to its initial stage when the device is outage, upgraded to a wrong / broken firmware, cannot access to the GUI with wrong username and/or password, etc.

Step 1 – Configure your PC Network IP Address

Before performing the system recovery, assign this IP address and Netmask to your PC, **192.168.1.100** and **255.255.255.0** respectively.

Step 2 – Reset your BEC 7000 R28-G Device

2.1 Power off your BEC 7000 R28-G

2.2 Power on the BEC 7000 R28-G while pushing the RESET button with a small pointed object (such as paper clip, needle, toothpick, and etc.).

2.3 When the POWER LED turns RED, keep holding and pushing the RESET button for more 6 seconds then release it. The INTERNET LED will flash in GREEN afterward.

Step 3 – Restore your BEC 7000 R28-G Device

With INTERNET light flashes green, the BEC 7000 R28-G is in recovery mode and ready for a new Firmware.

3.1 Open a web browser and type the IP address, **192.168.1.1**, to access to the recovery page.

NOTE: In the recovery mode, your BEC 7000 R28-G will not respond to any PING or other requests.

3.2 Browse to the new Firmware image file then click Upload to start the upgrade process.

3.3 INTERNET LED turns red means the Firmware upgrade is in process.

DO NOT power off or reboot the device, it would permanently damage your BEC 7000 R28-G.

3.4 INTERNET LED turns green after the Firmware upgrade completed

3.5 Power cycle on & off to regain access to the BEC 7000 R28-G.

CHAPTER 3: BASIC INSTALLATION

The router can be configured with your web browser. A web browser is included as a standard application in the following operating systems: Windows 7 / 8 / 10, Linux, Mac OS, etc. The product provides an easy and user-friendly interface for configuration.

PCs must have an Ethernet interface installed properly and be connected to the router either directly or through an external repeater hub and have TCP/IP installed or configured to obtain an IP address through a DHCP server or a fixed IP address that must be in the same subnet as the router. The default IP address of the router is **192.168.1.254** and the subnet mask is **255.255.255.0** (i.e. any attached PC must be in the same subnet and have an IP address in the range of 192.168.1.1 to 192.168.1.253). The best and easiest way is to configure the PC to get an IP address automatically from the router using DHCP. If you encounter any problems accessing the router's web interface it may also be advisable to **uninstall** any kind of software firewall on your PCs, as they can cause problems accessing the 192.168.1.254 IP address of the router. Users should make their own decisions on how to best protect their network.

Please follow the steps below for your PC's network environment installation. First of all, please check your PC's network components. The TCP/IP protocol stack and Ethernet network adapter must be installed. If not, please refer to your Windows-related or other operating system manuals.

NOTE:

Any TCP/IP capable workstation can be used to communicate with or through the BEC 4G/LTE ODU. To configure other types of workstations, please consult the manufacturer's documentation.

Network Configuration – IPv4

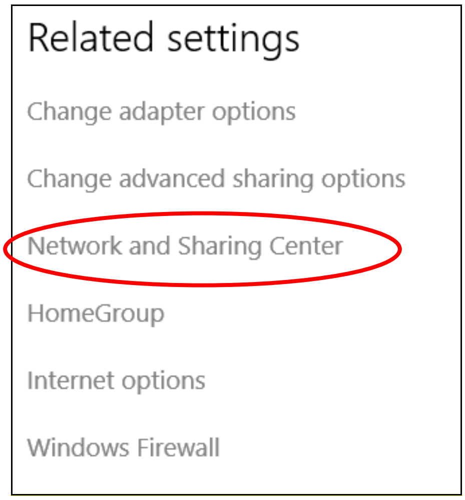
Configuring PC in Windows 10 (IPv4)

1. Click ⊞.

2. Click ⚙ Settings

3. Then click on **Network and Internet**.
🌐

4. Under **Related settings,** select **Network and Sharing Center**



Related settings

Change adapter options

Change advanced sharing options

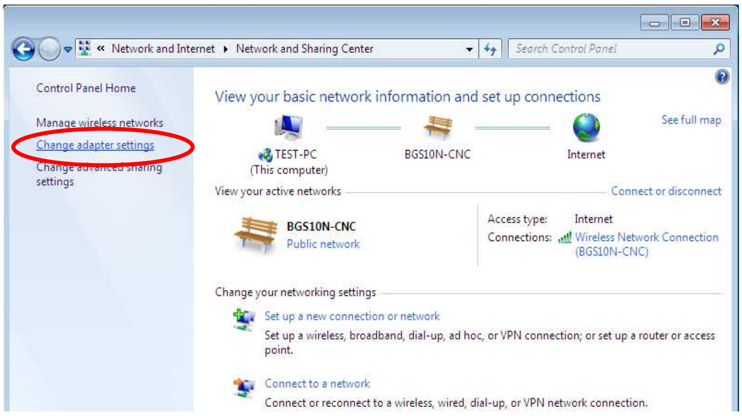
Network and Sharing Center

HomeGroup

Internet options

Windows Firewall

5. When the **Network and Sharing Center** window pops up, select and click on **Change adapter settings** on the left window panel.



View your basic network information and set up connections

View your active networks

BGS10N-CNC
Public network

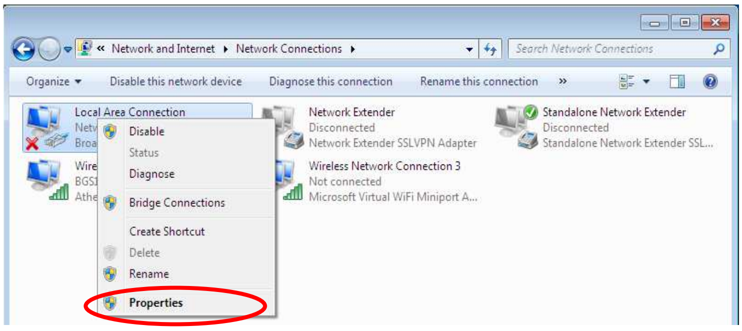
Access type: Internet
Connections: Wireless Network Connection (BGS10N-CNC)

Change your networking settings

Set up a new connection or network
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.

Connect to a network
Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.

6. Select the **Local Area Connection**, and right click the icon to select **Properties**.



Local Area Connection
Netw
Broa

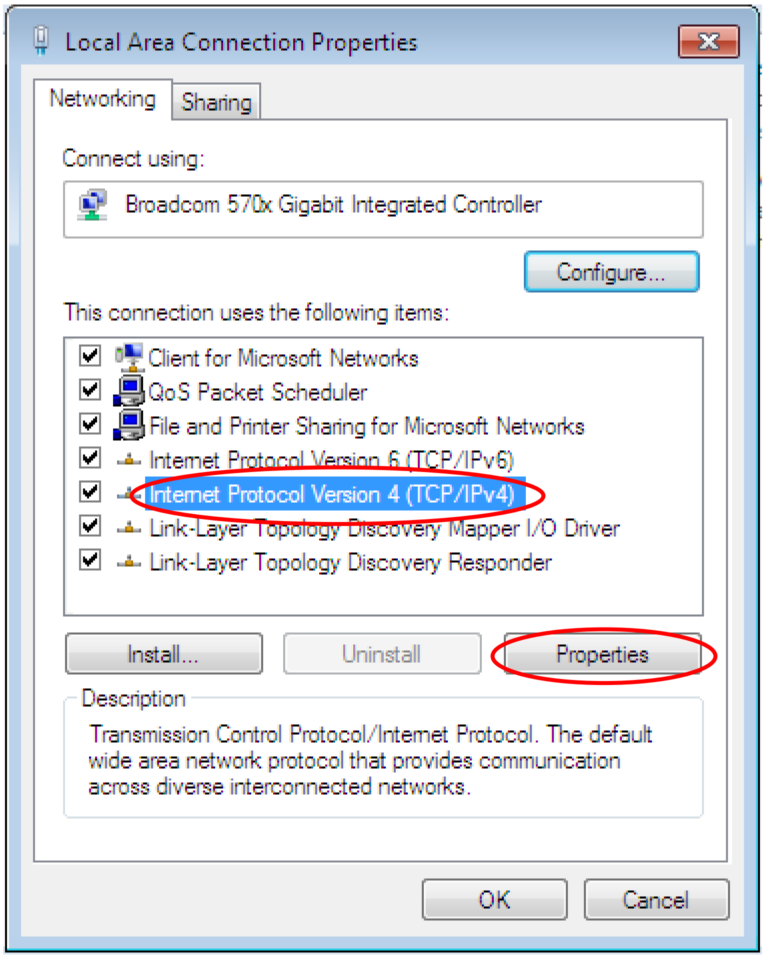
Wire
BGS1
Athe

Network Extender
Disconnected
Network Extender SSLVPN Adapter

Wireless Network Connection 3
Not connected
Microsoft Virtual WiFi Miniport A...

Standalone Network Extender
Disconnected
Standalone Network Extender SSL...

7. Select **Internet Protocol Version 4 (TCP/IPv4)** then click **Properties**.



Local Area Connection Properties

Connect using:

Broadcom 570x Gigabit Integrated Controller

This connection uses the following items:

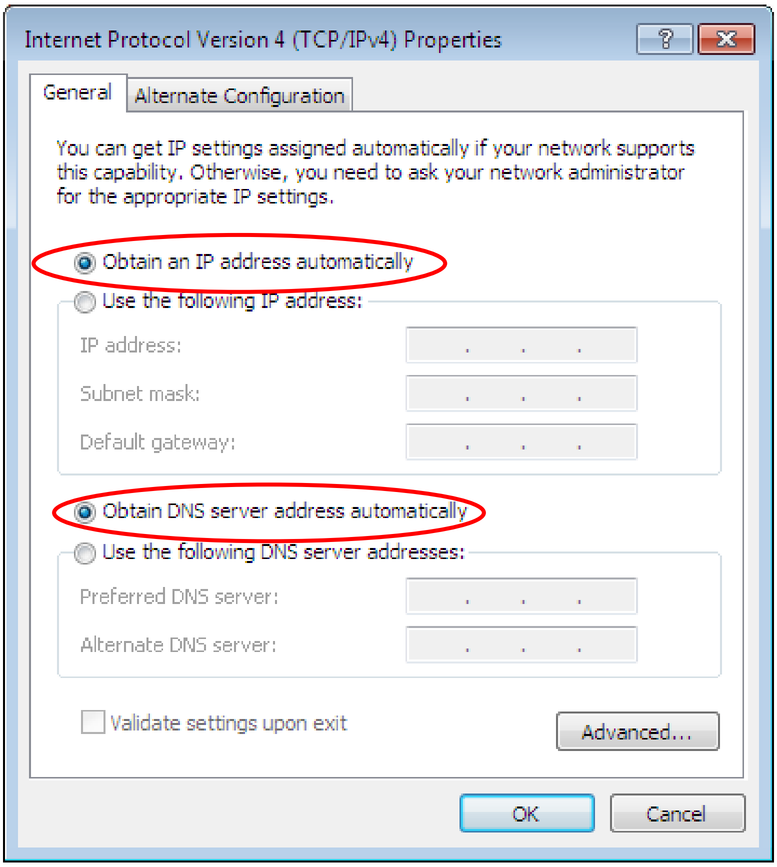
- ☑ Client for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Description

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

8. In the **TCP/IPv4 properties** window, select the **Obtain an IP address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

9. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



Internet Protocol Version 4 (TCP/IPv4) Properties

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

● Obtain an IP address automatically

○ Use the following IP address:

IP address: . . .

Subnet mask: . . .

Default gateway: . . .

● Obtain DNS server address automatically

○ Use the following DNS server addresses:

Preferred DNS server: . . .

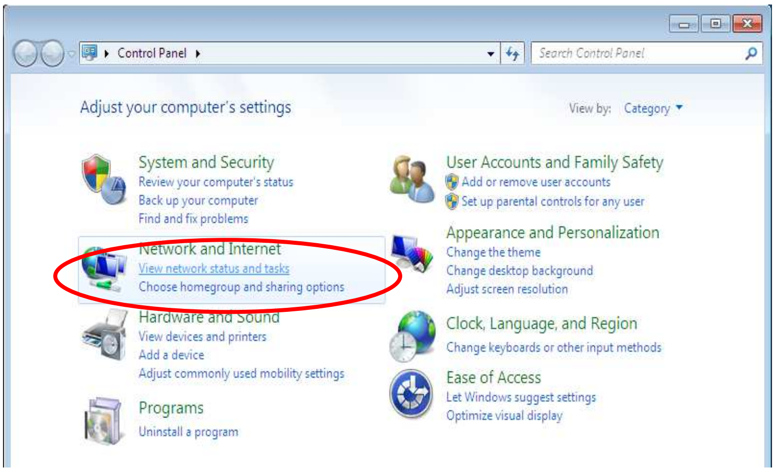
Alternate DNS server: . . .

□ Validate settings upon exit

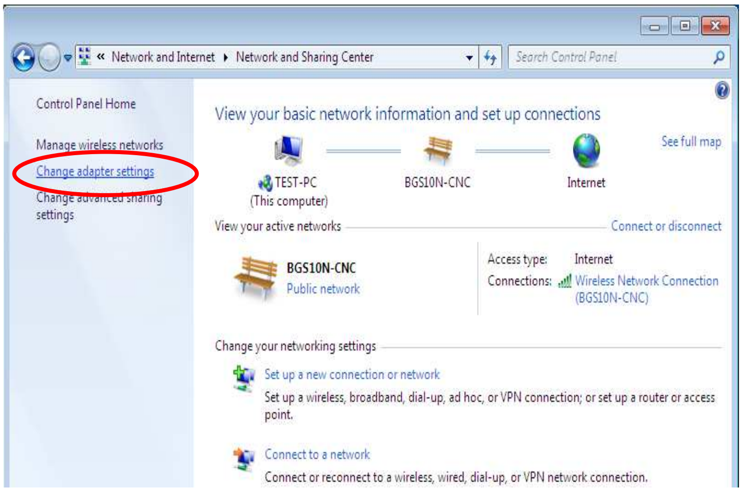
Configuring PC in Windows 7/8 (IPv4)

1. Go to **Start**. Click on **Control Panel**.

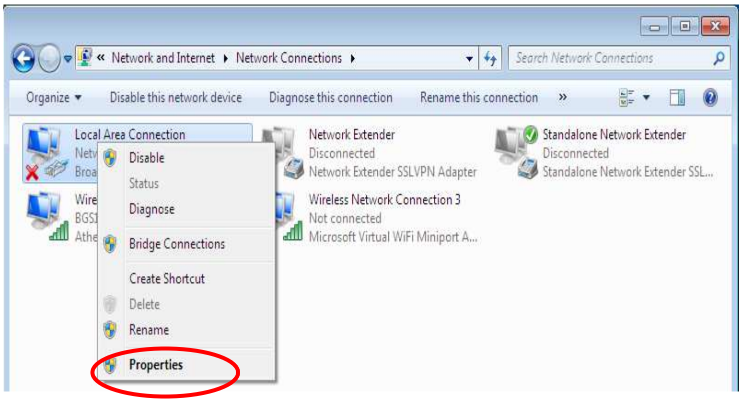
2. Then click on **Network and Internet**.


Control Panel
Search Control Panel
Adjust your computer's settings
View by: Category
System and Security
Review your computer's status
Back up your computer
Find and fix problems
User Accounts and Family Safety
Add or remove user accounts
Set up parental controls for any user
Network and Internet
View network status and tasks
Choose homegroup and sharing options
Appearance and Personalization
Change the theme
Change desktop background
Adjust screen resolution
Hardware and Sound
View devices and printers
Add a device
Adjust commonly used mobility settings
Clock, Language, and Region
Change keyboards or other input methods
Ease of Access
Let Windows suggest settings
Optimize visual display
Programs
Uninstall a program

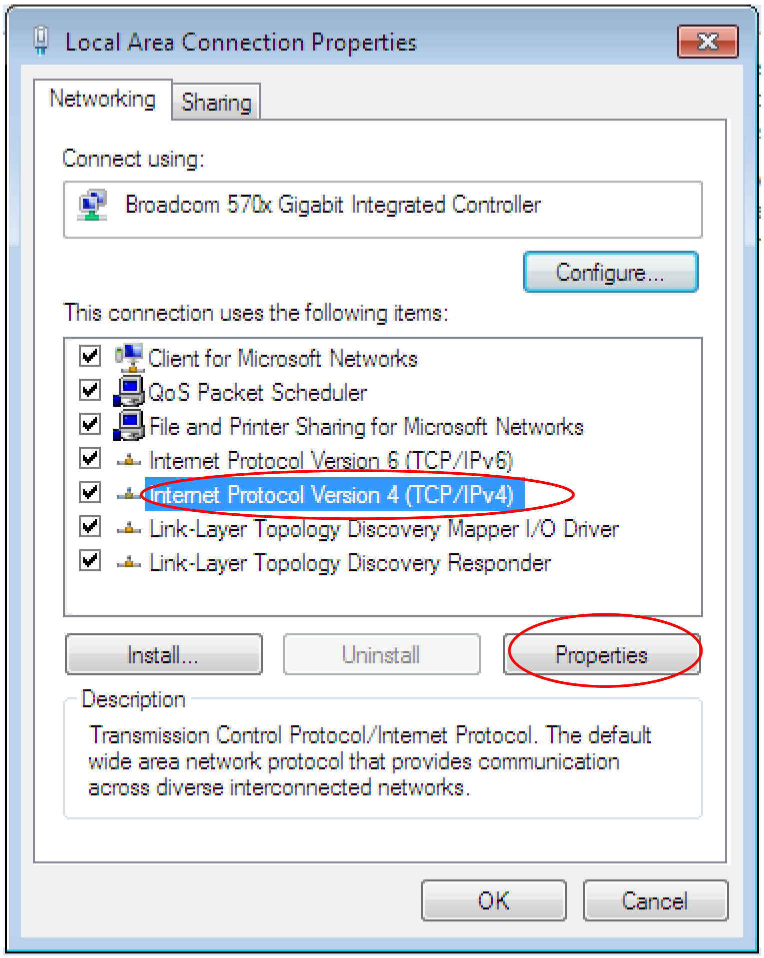
3. When the **Network and Sharing Center** window pops up, select and click on **Change adapter settings** on the left window panel.


Network and Internet ▸ Network and Sharing Center
Search Control Panel
Control Panel Home
Manage wireless networks
Change adapter settings
Change advanced sharing settings
View your basic network information and set up connections
See full map
TEST-PC
(This computer)
BGS10N-CNC
Internet
View your active networks
Connect or disconnect
BGS10N-CNC
Public network
Access type: Internet
Connections: Wireless Network Connection (BGS10N-CNC)
Change your networking settings
Set up a new connection or network
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.
Connect to a network
Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.

4. Select the **Local Area Connection**, and right click the icon to select **Properties**.


Network and Internet ▸ Network Connections ▸
Search Network Connections
Organize ▾
Disable this network device
Diagnose this connection
Rename this connection
»
Local Area Connection
Netw
Broa
Wire
BGS1
Athe
Disable
Status
Diagnose
Bridge Connections
Create Shortcut
Delete
Rename
Properties
Network Extender
Disconnected
Network Extender SSLVPN Adapter
Wireless Network Connection 3
Not connected
Microsoft Virtual WiFi Miniport A...
Standalone Network Extender
Disconnected
Standalone Network Extender SSL...

5. Select **Internet Protocol Version 4 (TCP/IPv4)** then click **Properties**.



Local Area Connection Properties

Networking | Sharing

Connect using:

Broadcom 570x Gigabit Integrated Controller

This connection uses the following items:

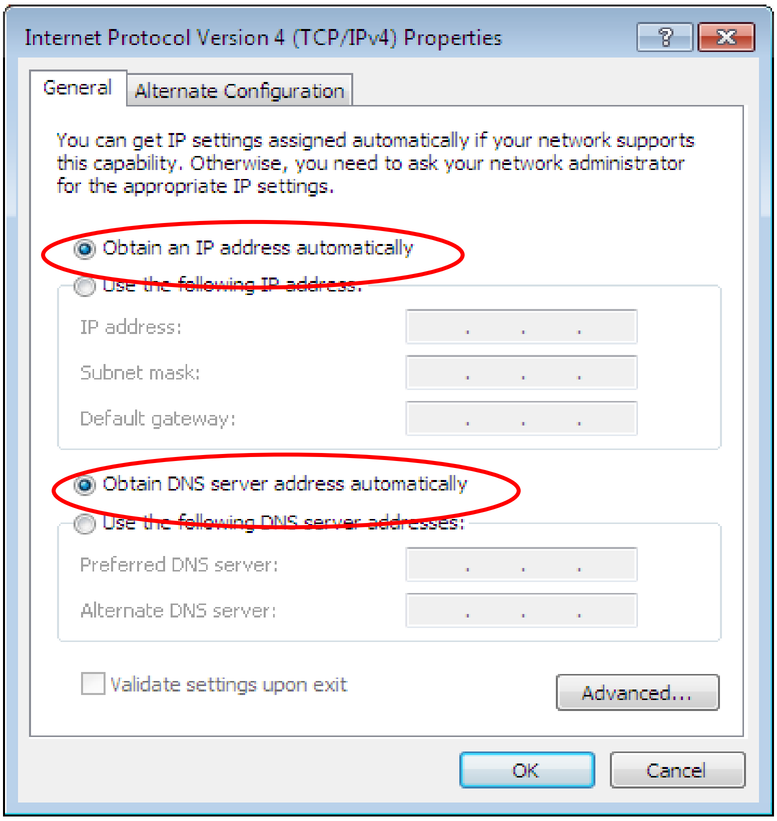
- ☑ Client for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Description

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

6. In the **TCP/IPv4 properties** window, select the **Obtain an IP address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

7. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



Internet Protocol Version 4 (TCP/IPv4) Properties

General | Alternate Configuration

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

● Obtain an IP address automatically

○ Use the following IP address:

IP address: . . .

Subnet mask: . . .

Default gateway: . . .

● Obtain DNS server address automatically

○ Use the following DNS server addresses:

Preferred DNS server: . . .

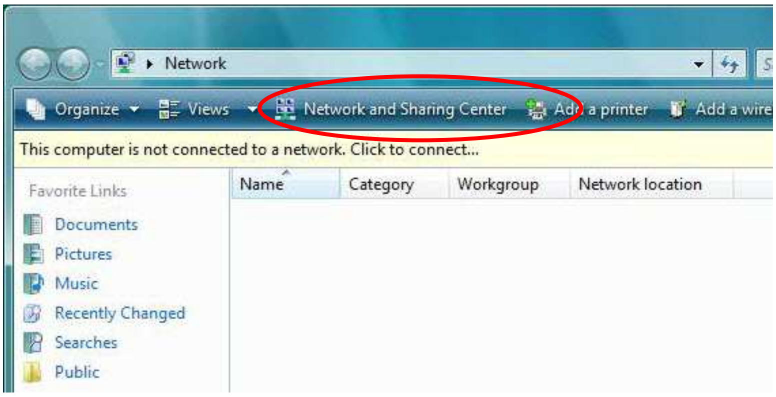
Alternate DNS server: . . .

□ Validate settings upon exit

Configuring PC in Windows Vista (IPv4)

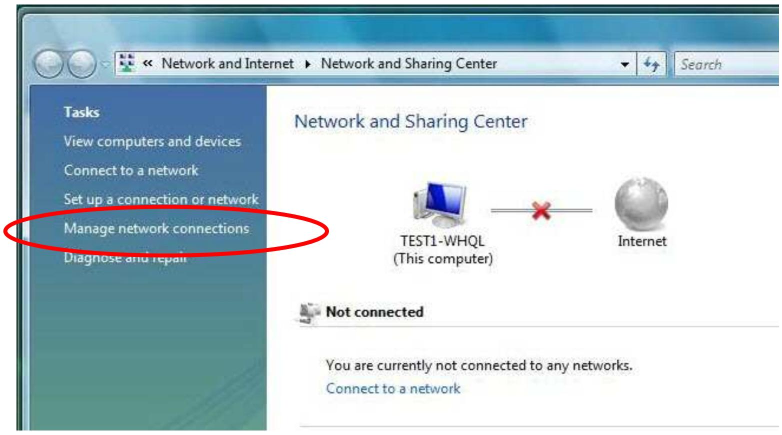
1. Go to **Start**. Click on **Network**.

2. Then click on **Network and Sharing Center** at the top bar.



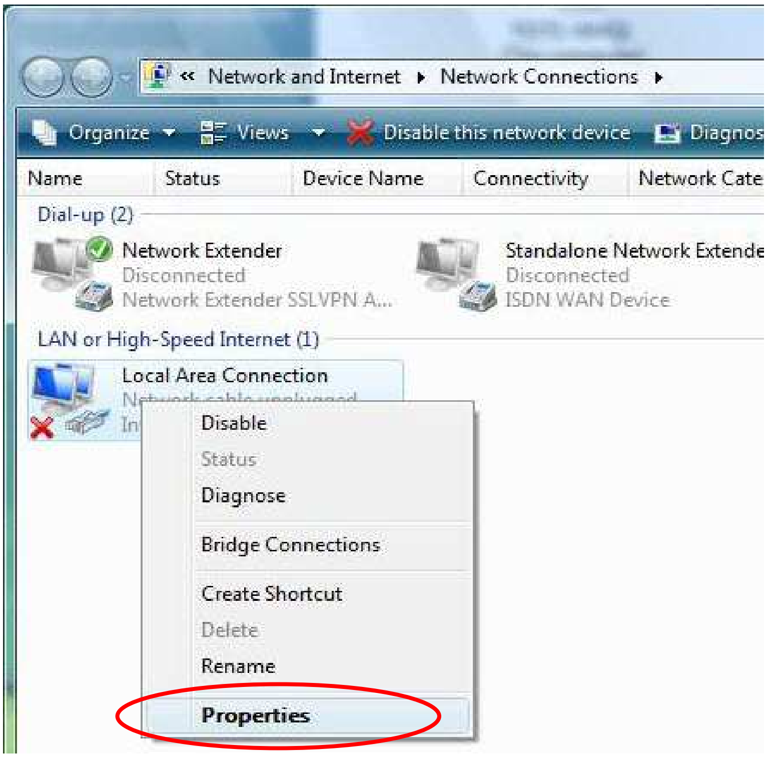
This computer is not connected to a network. Click to connect...

3. When the **Network and Sharing Center** window pops up, select and click on **Manage network connections** on the left windowpane.

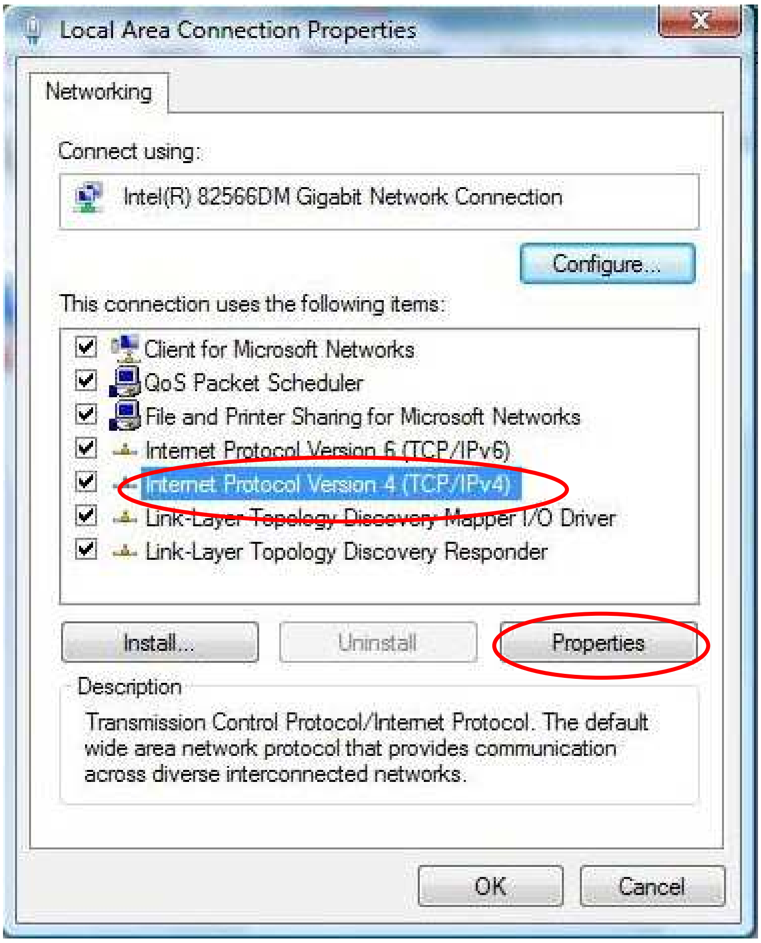

« Network and Internet ▸ Network and Sharing Center
Search
Tasks
View computers and devices
Connect to a network
Set up a connection or network
Manage network connections
Diagnose and repair
Network and Sharing Center
TEST1-WHQL
(This computer)
Internet
Not connected
Connect to a network

You are currently not connected to any networks.

4. Select the **Local Area Connection**, and right click the icon to select **Properties**.



5. Select **Internet Protocol Version 4 (TCP/IPv4)** then click **Properties**.



Local Area Connection Properties

Networking

Connect using:

Intel(R) 82566DM Gigabit Network Connection

This connection uses the following items:

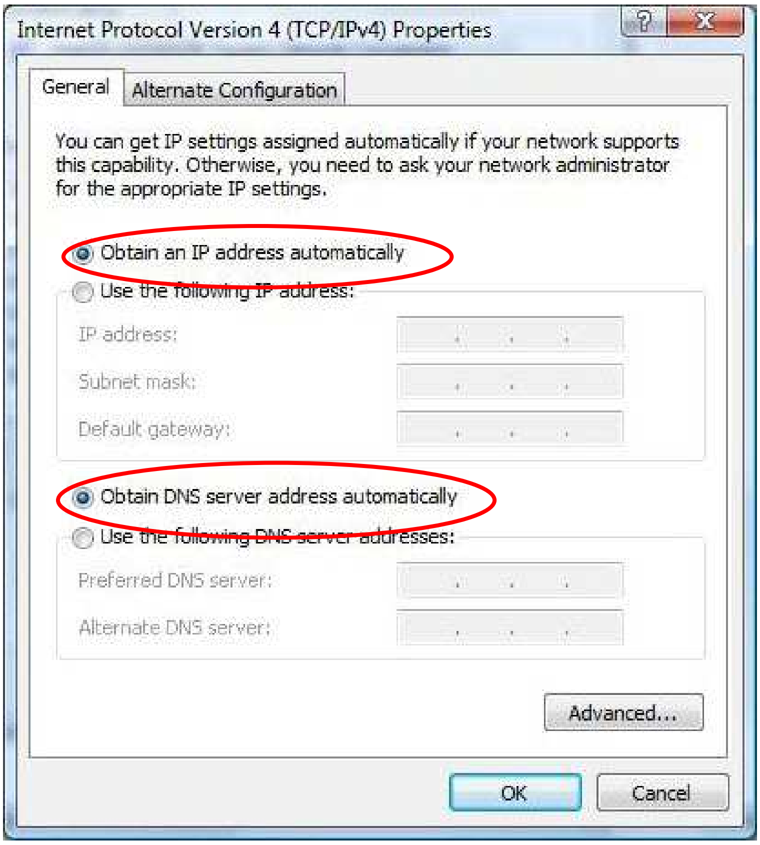
- ☑ Client for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Description

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

6. In the **TCP/IPv4 properties** window, select the Obtain an **IP address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

7. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



Internet Protocol Version 4 (TCP/IPv4) Properties

General | Alternate Configuration

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

● Obtain an IP address automatically

○ Use the following IP address:

IP address: . . .

Subnet mask: . . .

Default gateway: . . .

● Obtain DNS server address automatically

○ Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

Network Configuration – IPv6

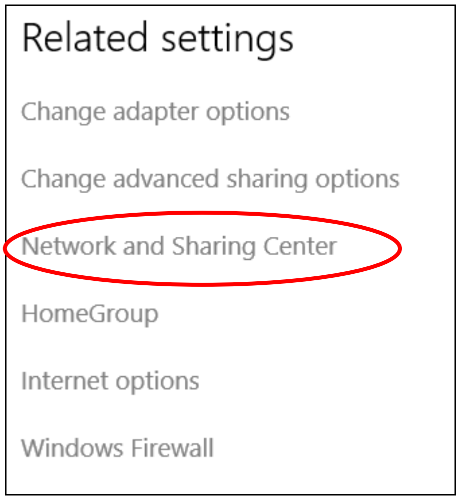
Configuring PC in Windows 10 (IPv6)

1. Click ⊞.

2. Click ⚙ Settings

3. Then click on **Network and Internet**. 🌐

4. Under **Related settings,** select **Network and Sharing Center**



Related settings

Change adapter options

Change advanced sharing options

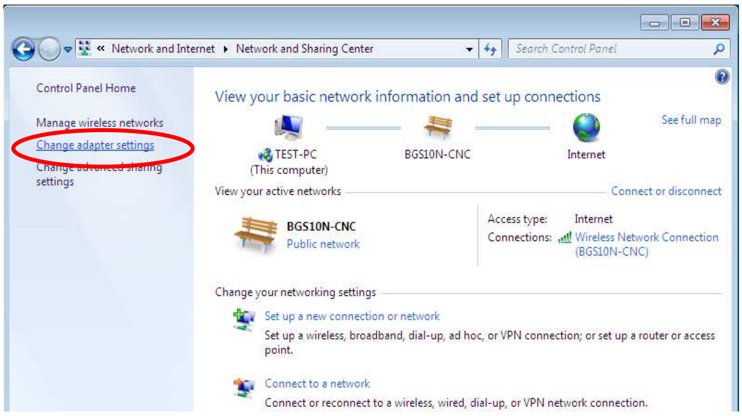
Network and Sharing Center

HomeGroup

Internet options

Windows Firewall

5. When the **Network and Sharing Center** window pops up, select and click on **Change adapter settings** on the left window panel.



« Network and Internet ▸ Network and Sharing Center

Search Control Panel

Control Panel Home

Manage wireless networks

Change adapter settings

Change advanced sharing settings

View your basic network information and set up connections

See full map

TEST-PC (This computer) — BGS10N-CNC — Internet

View your active networks — Connect or disconnect

BGS10N-CNC
Public network

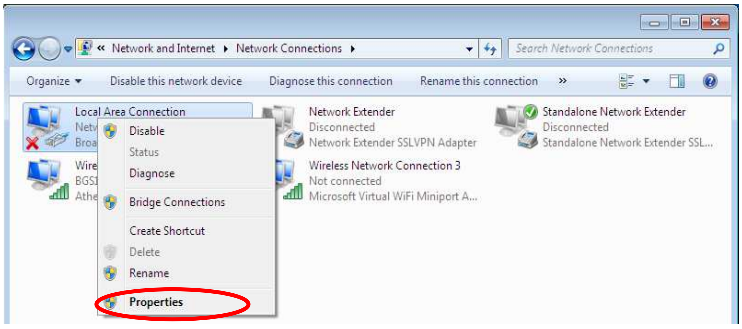
Access type: Internet
Connections: Wireless Network Connection (BGS10N-CNC)

Change your networking settings

Set up a new connection or network
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.

Connect to a network
Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.

6. Select the **Local Area Connection**, and right click the icon to select **Properties**.



« Network and Internet ▸ Network Connections ▸

Search Network Connections

Organize ▾ Disable this network device Diagnose this connection Rename this connection »

Local Area Connection
Netw
Broa

Wire
BGS1
Athe

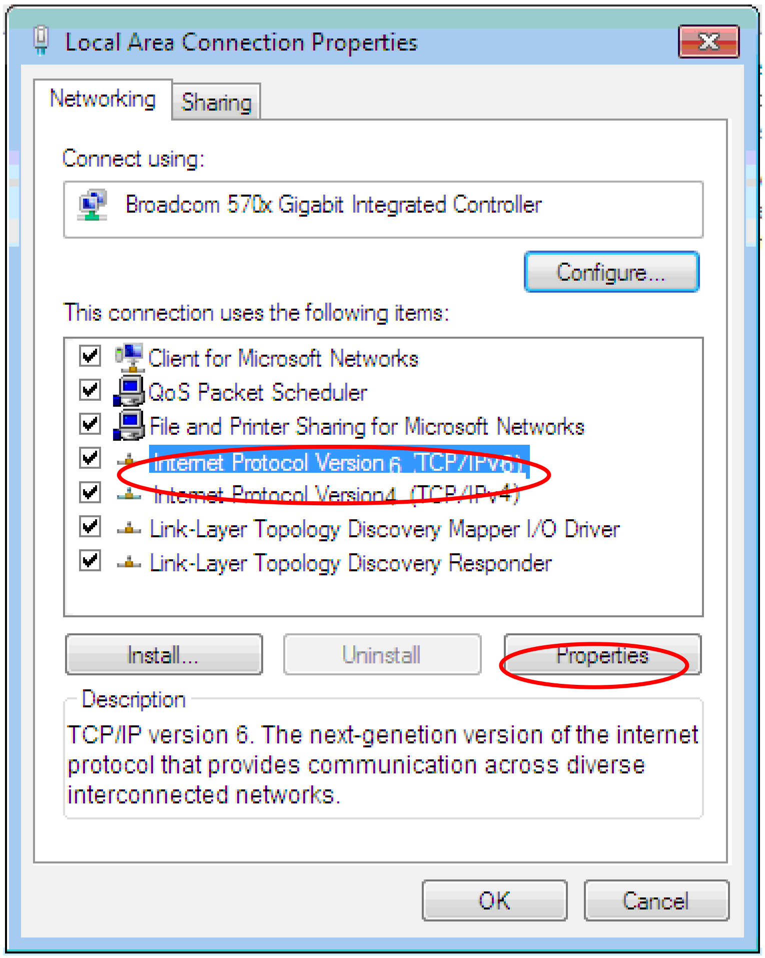
Disable
Status
Diagnose
Bridge Connections
Create Shortcut
Delete
Rename
Properties

Network Extender
Disconnected
Network Extender SSLVPN Adapter

Wireless Network Connection 3
Not connected
Microsoft Virtual WiFi Miniport A...

Standalone Network Extender
Disconnected
Standalone Network Extender SSL...

7. Select **Internet Protocol Version 6 (TCP/IPv6)** then click **Properties**.



Local Area Connection Properties

Networking | Sharing

Connect using:

Broadcom 570x Gigabit Integrated Controller

Configure...

This connection uses the following items:

- ☑ Client for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Install... | Uninstall | Properties

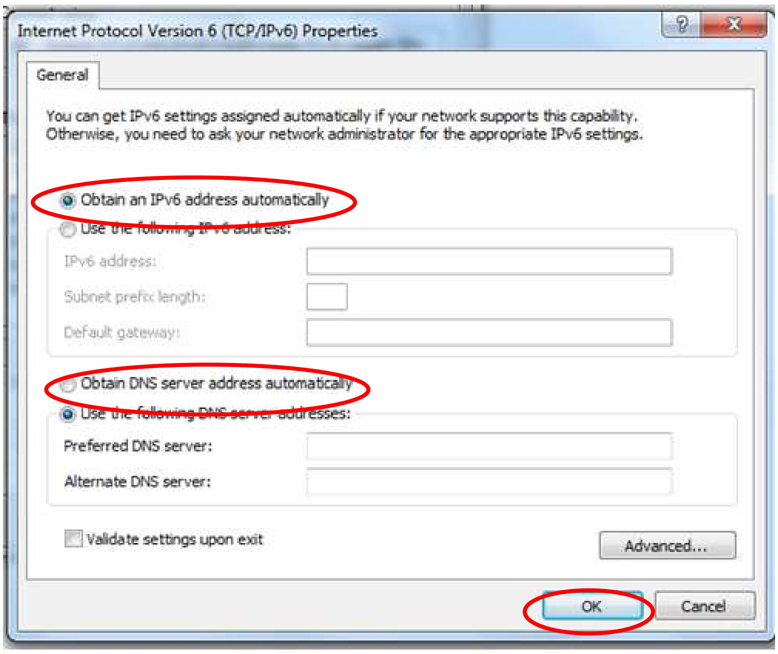
Description

TCP/IP version 6. The next-genetion version of the internet protocol that provides communication across diverse interconnected networks.

OK | Cancel

8. In the **TCP/IPv6 properties** window, select the **Obtain an IPv6 address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

9. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



Internet Protocol Version 6 (TCP/IPv6) Properties

General

You can get IPv6 settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IPv6 settings.

● Obtain an IPv6 address automatically
○ Use the following IPv6 address:

IPv6 address:
Subnet prefix length:
Default gateway:

○ Obtain DNS server address automatically
● Use the following DNS server addresses:

Preferred DNS server:
Alternate DNS server:

☐ Validate settings upon exit

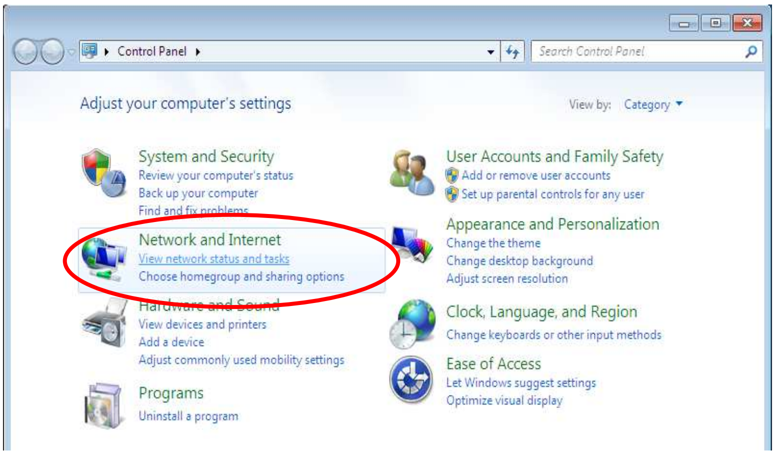
Advanced...

OK | Cancel

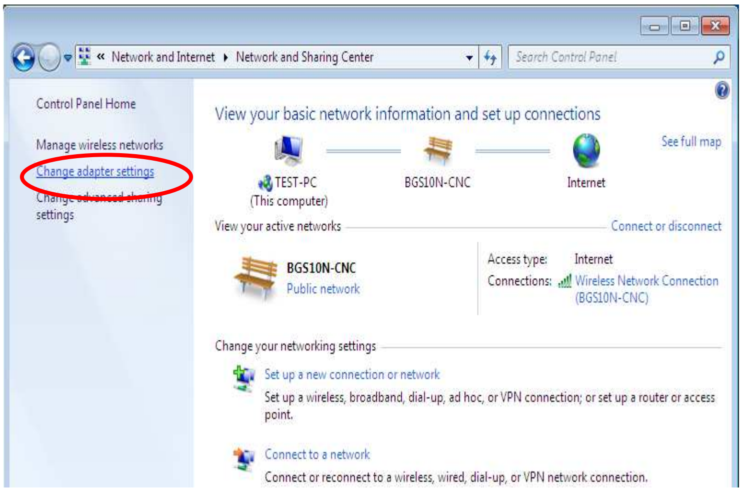
Configuring PC in Windows 7/8 (IPv6)

1. Go to **Start**. Click on **Control Panel**.

2. Then click on **Network and Internet**.


Control Panel
Search Control Panel
Adjust your computer's settings
View by: Category
System and Security
Review your computer's status
Back up your computer
Find and fix problems
Network and Internet
View network status and tasks
Choose homegroup and sharing options
Hardware and Sound
View devices and printers
Add a device
Adjust commonly used mobility settings
Programs
Uninstall a program
User Accounts and Family Safety
Add or remove user accounts
Set up parental controls for any user
Appearance and Personalization
Change the theme
Change desktop background
Adjust screen resolution
Clock, Language, and Region
Change keyboards or other input methods
Ease of Access
Let Windows suggest settings
Optimize visual display

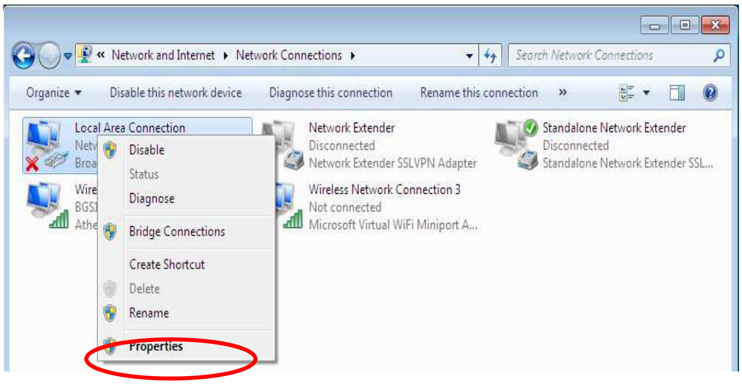
3. When the **Network and Sharing Center** window pops up, select and click on **Change adapter settings** on the left window panel.


« Network and Internet ▸ Network and Sharing Center
Search Control Panel
Control Panel Home
Manage wireless networks
Change adapter settings
Change advanced sharing settings
View your basic network information and set up connections
See full map
TEST-PC
(This computer)
BGS10N-CNC
Internet
View your active networks
Connect or disconnect
BGS10N-CNC
Public network
Access type: Internet
Connections: Wireless Network Connection (BGS10N-CNC)
Change your networking settings
Set up a new connection or network
Connect to a network

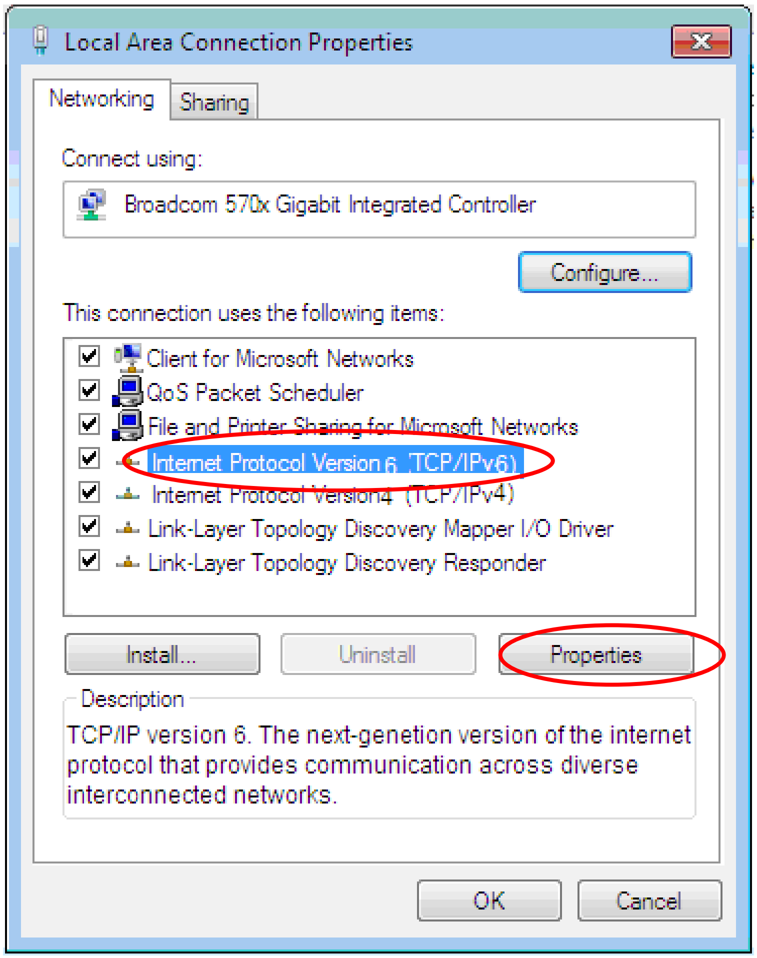
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.

Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.

4. Select the **Local Area Connection**, and right click the icon to select **Properties**.


« Network and Internet ▸ Network Connections ▸
Search Network Connections
Organize
Disable this network device
Diagnose this connection
Rename this connection
»
Local Area Connection
Netw
Broa
Wire
BGS1
Athe
Disable
Status
Diagnose
Bridge Connections
Create Shortcut
Delete
Rename
Properties
Network Extender
Disconnected
Network Extender SSLVPN Adapter
Wireless Network Connection 3
Not connected
Microsoft Virtual WiFi Miniport A...
Standalone Network Extender
Disconnected
Standalone Network Extender SSL...

5. Select **Internet Protocol Version 6 (TCP/IPv6)** then click **Properties**.



Connect using:

Broadcom 570x Gigabit Integrated Controller

This connection uses the following items:

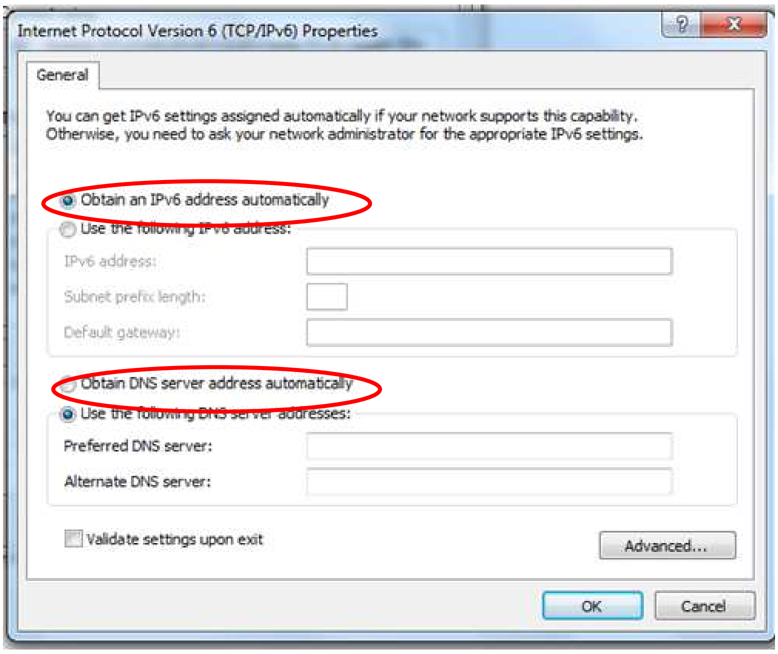
- ☑ Client for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Description

TCP/IP version 6. The next-genetion version of the internet protocol that provides communication across diverse interconnected networks.

6. In the **TCP/IPv6 properties** window, select the **Obtain an IPv6 address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

7. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



You can get IPv6 settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IPv6 settings.

● Obtain an IPv6 address automatically

○ Use the following IPv6 address:

IPv6 address:

Subnet prefix length:

Default gateway:

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server:

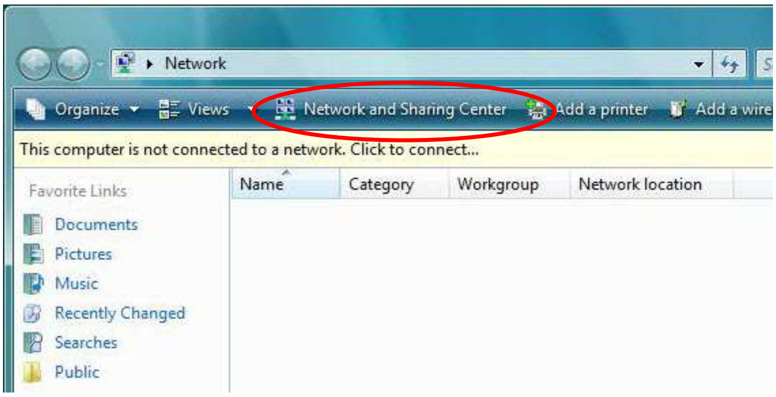
Alternate DNS server:

□ Validate settings upon exit

Configuring PC in Windows Vista (IPv6)

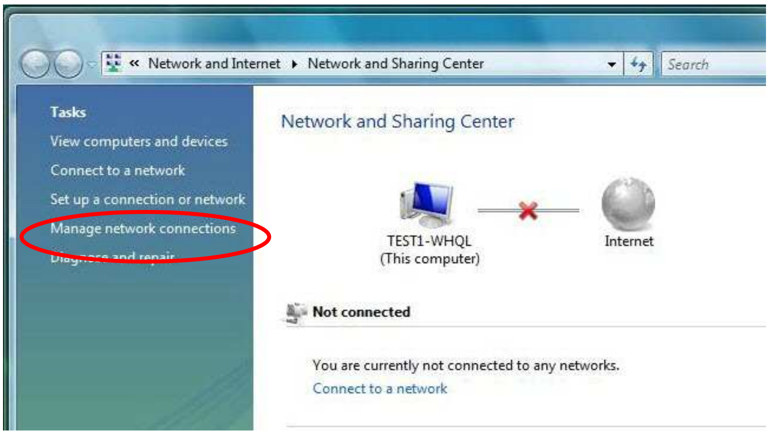
1. Go to **Start**. Click on **Network**.

2. Then click on **Network and Sharing Center** at the top bar.



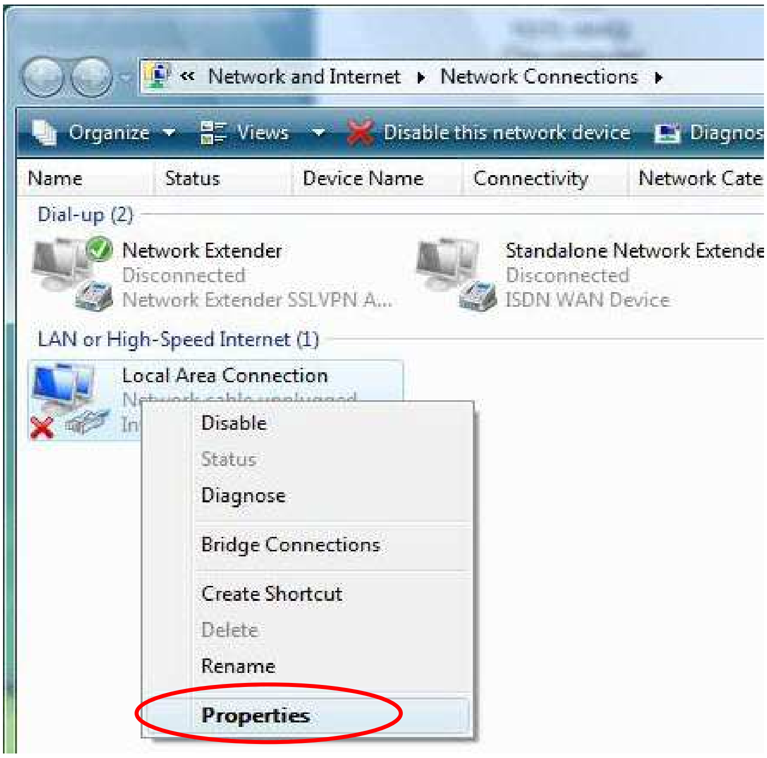
This computer is not connected to a network. Click to connect...

3. When the **Network and Sharing Center** window pops up, select and click on **Manage network connections** on the left windowpane.

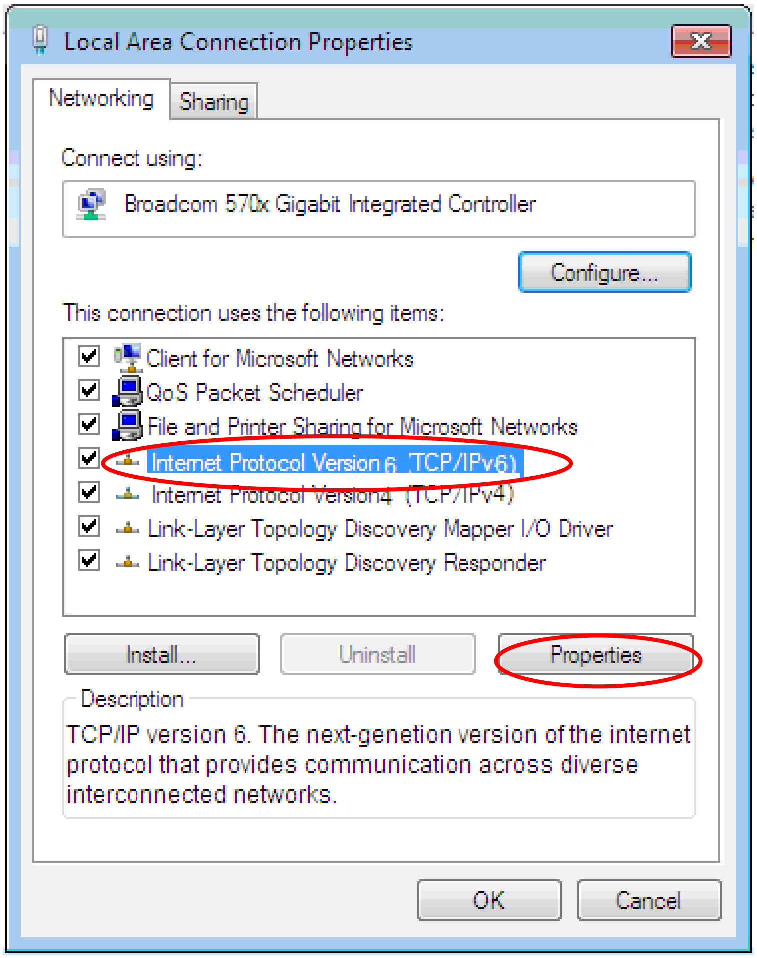


You are currently not connected to any networks.

4. Select the **Local Area Connection**, and right click the icon to select **Properties**.



5. Select **Internet Protocol Version 6 (TCP/IPv6)** then click **Properties**.



Local Area Connection Properties

Networking | Sharing

Connect using:

Broadcom 570x Gigabit Integrated Controller

This connection uses the following items:

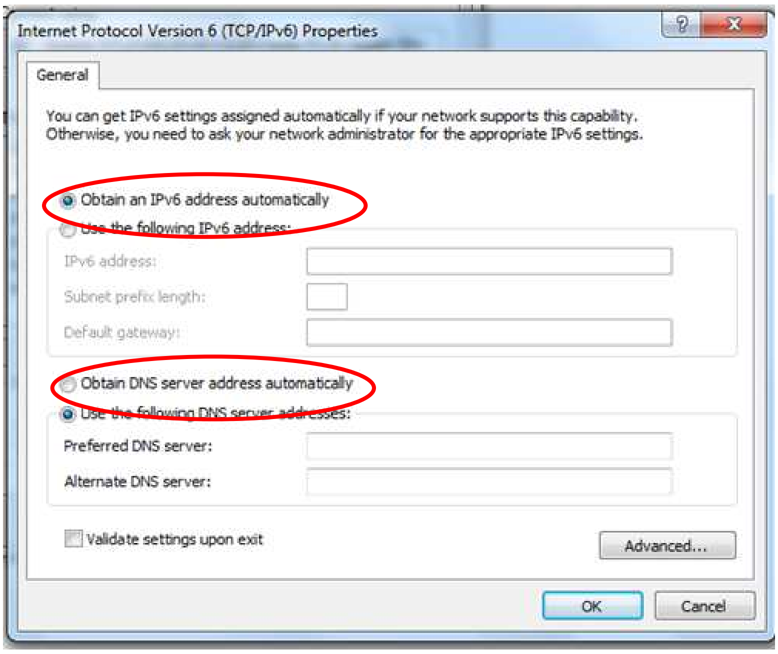
- ☑ Client for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Description

TCP/IP version 6. The next-genetion version of the internet protocol that provides communication across diverse interconnected networks.

6. In the **TCP/IPv6 properties** window, select the Obtain an **IP address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

7. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



Internet Protocol Version 6 (TCP/IPv6) Properties

General

You can get IPv6 settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IPv6 settings.

● Obtain an IPv6 address automatically

○ Use the following IPv6 address:

IPv6 address:

Subnet prefix length:

Default gateway:

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server:

Alternate DNS server:

□ Validate settings upon exit

Default Settings

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

Web Interface: (Username and Password)

Administrator

✔ Username: admin

✔ Password: admin

The default username and password are “**admin**” and “**admin**” respectively.

If you ever forget the username/password to login to the router, you may press the RESET button up to 6 seconds then release it to restore the factory default settings.
Caution: After pressing the RESET button for more than 6 seconds then release it, to be sure you power cycle the device again.

Device LAN IP Settings

✔ IP Address: 192.168.1.254

✔ Subnet Mask: 255.255.255.0

DHCP Server:

✔ DHCP server is enabled.

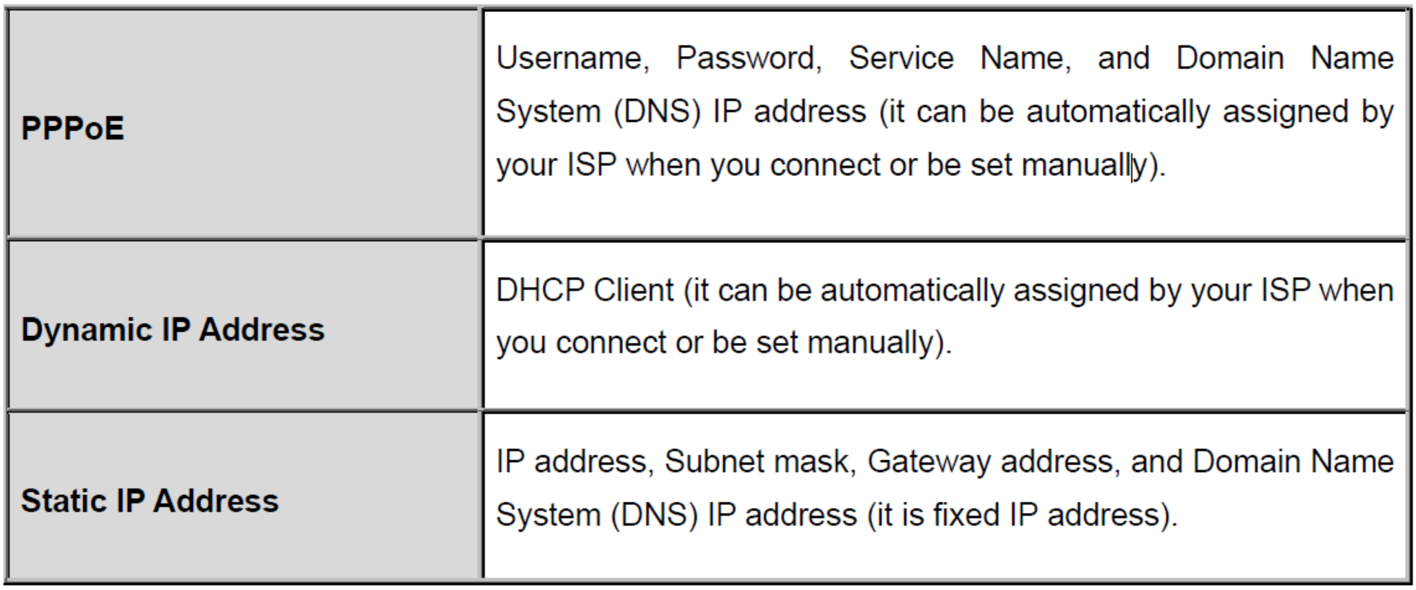
✔ Start IP Address: 192.168.1.100

✔ IP pool counts: 100

Information from Your ISP

Before configuring this device, you have to check with your ISP (Internet Service Provider) what kind of service is provided, Dynamic IP address, Static IP address, PPPoE or Bridge Mode).

Gather the information as illustrated in the following table and keep it for reference.



PPPoE	Username, Password, Service Name, and Domain Name System (DNS) IP address (it can be automatically assigned by your ISP when you connect or be set manually).
Dynamic IP Address	DHCP Client (it can be automatically assigned by your ISP when you connect or be set manually).
Static IP Address	IP address, Subnet mask, Gateway address, and Domain Name System (DNS) IP address (it is fixed IP address).

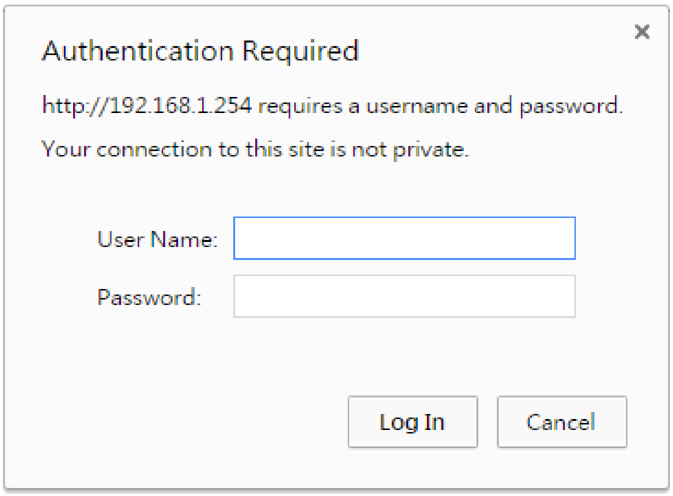
CHAPTER 4: DEVICE CONFIGURATION

Login to your Device

Open your web browser, enter the IP address of your router, which by default is **192.168.1.254**, and click "**Go**", a username and password window prompt appears.

The default username and password are **"admin"** and **"admin"** respectively for the **Administrator.**

NOTE: This username / password may vary by different Internet Service Providers.



Authentication Required

http://192.168.1.254 requires a username and password.

Your connection to this site is not private.

User Name:

Password:

Congratulations! You have successfully logged on to your BEC 7000 R28-G

Once you have logged on to your BEC 7000 R28-G via your web browser, you can begin to set it up according to your requirements. On the configuration homepage, the left navigation pane links you directly to the setup pages, which includes:

Section	Status	Quick Start (Wizard Setup)	Configuration
Sub-Items	Device Info System Status System Log 4G-LTE Status Statistics DHCP Table ARP Table VRRP Status		**Interface Setup** - Internet - LAN - IPv6-464XLAT - Loopback **Advanced Setup** - Firewall - Routing - Dynamic Routing - NAT - VRRP - Static DNS - QoS - Time Schedule - Mail Alert **Access Management** - Device Management - SNMP - Syslog - Universal Plug & Play (UPnP) - Dynamic DNS - Access Control - Packet Filter - CWMP (TR-069) - Parental Control - BECentral Management **Maintenance** - User Management - Time Zone - Firmware & Configuration - System Restart - Auto Reboot - Diagnostic Tool

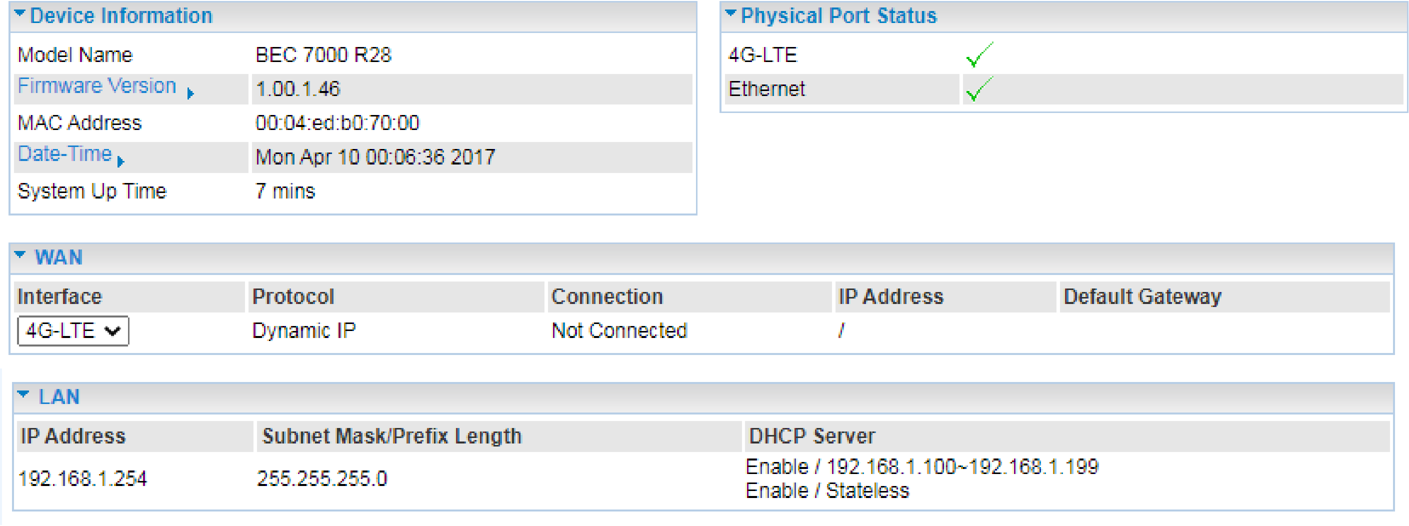
Please see the relevant sections of this manual for detailed instructions on how to configure your **BEC 7000 R28-G** .

Status

In this section, you can check the router working status, including **Device Info**, **System Status, System Log**, **3G/4G-LTE Status, Statistics, DHCP Table, ARP Table** and **VRRP Table**

Device Info

It contains basic information of the device.



Device Information

Model Name	BEC 7000 R28
Firmware Version	1.00.1.46
MAC Address	00:04:ed:b0:70:00
Date-Time	Mon Apr 10 00:06:36 2017
System Up Time	7 mins

Physical Port Status

4G-LTE	✓
Ethernet	✓

WAN

Interface	Protocol	Connection	IP Address	Default Gateway
4G-LTE	Dynamic IP	Not Connected	/	

LAN

IP Address	Subnet Mask/Prefix Length	DHCP Server
192.168.1.254	255.255.255.0	Enable / 192.168.1.100~192.168.1.199 Enable / Stateless

Device Information

Model Name: Name of the router for identification purpose.

Firmware Version: Software version currently loaded in the router

MAC Address: A unique number that identifies the router

Data-Time: Setup correct time on the **BEC 7000 R28-G** with your PC. Check on Time Zone section for more configuration information.

System Uptime: Display how long the **BEC 7000 R28-G** has been powered on.

Physical Port Status

Physical Port Status：Display available connection interfaces supported in the BEC 7000.

WAN

Interface: List current available WAN connections.

Protocol: Display selected WAN connection protocol

Connection: The current connection status.

IP Address: WAN port IP address.

Default Gateway: The IP address of the default gateway.

LAN

IP Address: LAN port IPv4 address.

Subnet Mask/Prefix Length: Display LAN port IP subnet mask of IPv4 and/or Prefix length of IPv6.

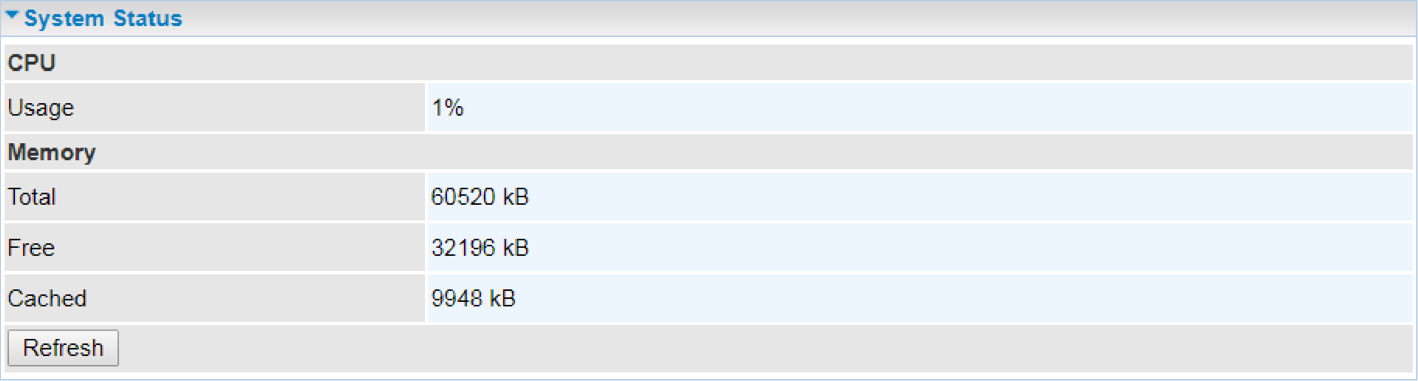
DHCP Server: Display LAN DHCP status of IPv4 and IPv6.

- **Enable / 192.168.1.100~199**: DHCPv4 server status on or off / DHCP IP range
- **Enable / Stateless**: DHCPv6 server status on or off / DHCPv6 server Type

.

System Status

Display device CPU and memory usage information



System Status

CPU	
Usage	1%
Memory	
Total	60520 kB
Free	32196 kB
Cached	9948 kB

CPU

Usage: Display the amount of CPU's processing capacity is being used in percentage (%). Higher the % rate may result in slow Internet loading, experiencing video lags, etc. To reduce high CPU consumption by resetting the device, power off and on, an easiest way to regain the service.

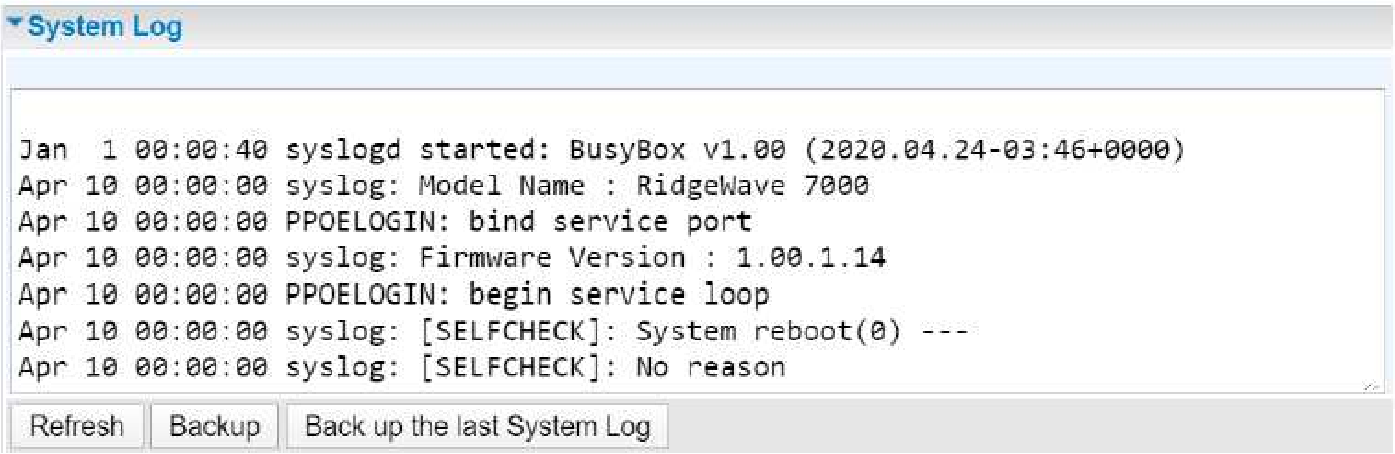
Memory

Total / Free / Cached (in Kbyte): Display the memory consumptions in kilobytes (kB).

Click **Refresh** button to update the status.

System Log

In system log, you can check the operations status and any glitches to the router.



```
Jan  1 00:00:40 syslogd started: BusyBox v1.00 (2020.04.24-03:46+0000)
Apr 10 00:00:00 syslog: Model Name : RidgeWave 7000
Apr 10 00:00:00 PPOELOGIN: bind service port
Apr 10 00:00:00 syslog: Firmware Version : 1.00.1.14
Apr 10 00:00:00 PPOELOGIN: begin service loop
Apr 10 00:00:00 syslog: [SELFCHECK]: System reboot(0) ---
Apr 10 00:00:00 syslog: [SELFCHECK]: No reason
```

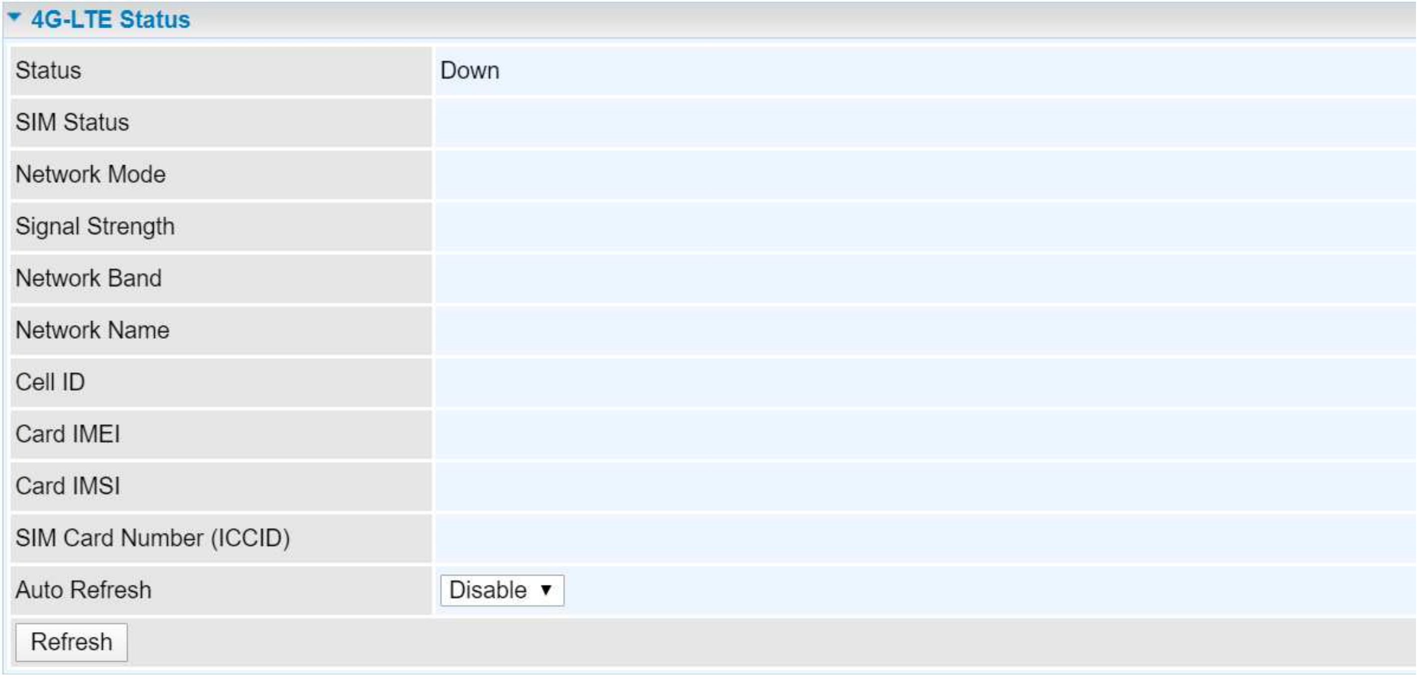
Refresh: Press this button to refresh the statistics.

Backup: Press to save the System log, log.cfg, to your PC.

Backup Last System Log: Press to save the last log saved in the system.

4G/LTE Status

This page contains 4G/LTE connection information.



▾ 4G-LTE Status

Status	Down
SIM Status	
Network Mode	
Signal Strength	
Network Band	
Network Name	
Cell ID	
Card IMEI	
Card IMSI	
SIM Card Number (ICCID)	
Auto Refresh	Disable ▾

Status: Display current status of the 4G/LTE connection.

SIM Status: Identify current status of the SIM, Activate or SIM Card Not Found.

Network Mode: Display current network operating mode.

Network Band: Indicated the current radio frequency band used.

Signal Strength: The signal strength bar and dBm value indicates the current 4G/LTE signal strength. The front panel 4G/LTE Signal Strength LED indicates the signal strength as well.

Network Name: The name of the LTE network the router is connecting to.

Cell ID: The ID of base station that the device is connected to.

Card IMEI: The unique identification number that is used to identify the 4G/LTE module.

Card IMSI: The international mobile subscriber identity used to uniquely identify the 4G/LTE module.

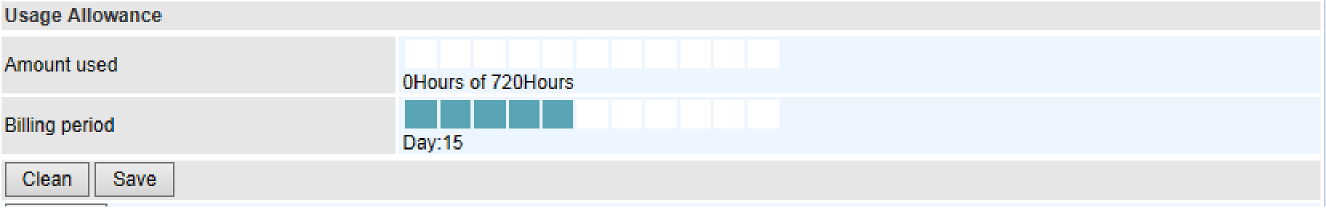
SIM Card Number (ICCID): It is a unique and specific serial number, consists of 19 or 20 characters, assigned to your SIM card.

Auto Refresh: Select Disable or Enable to reload the mobile status information.

Refresh: Click to refresh the statistics.

Usage Allowance

To enable this feature, please go to **Configuration >> Interface Setup >> Internet >>** click **"Usage Allowance" >>** enable **"Save the statistics to ROM"**



Usage Allowance	
Amount used	0Hours of 720Hours
Billing period	Day:15

Amount Used: Display the amount of mobile data used and remaining in current billing cycle.

Billing Cycle: Display the start date and number of days remaining in current billing cycle.

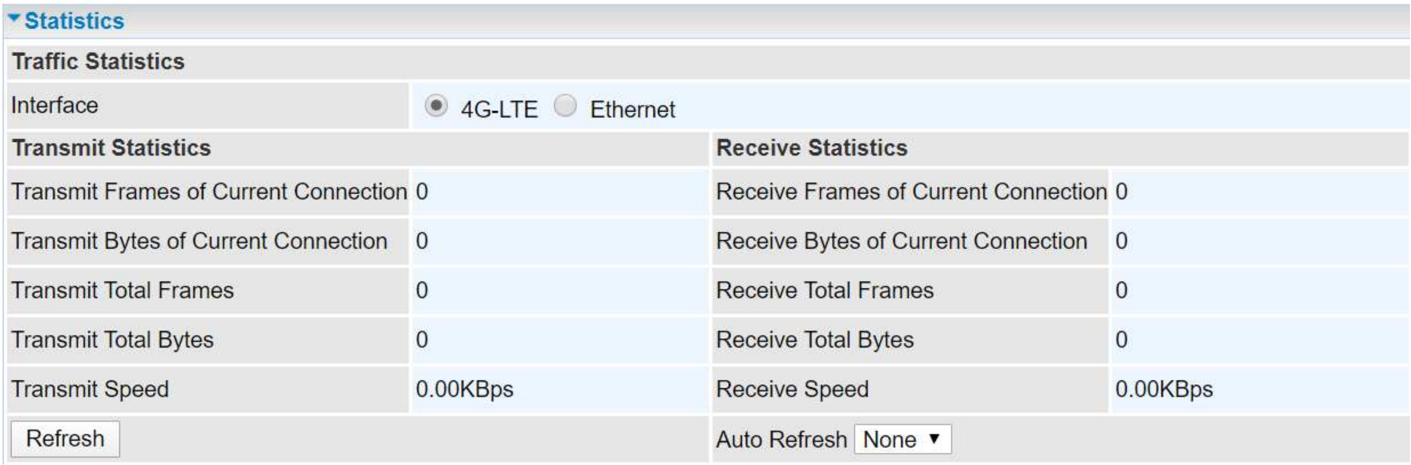
Clean: Reset current saved mobile usage.

Save: Click to save current mobile status to ROM.

Statistics

❖ 4G/LTE Status

Take 4G/LTE as an example to describe the following connection transmission information.



▾Statistics

Traffic Statistics			
Interface	● 4G-LTE ○ Ethernet		
Transmit Statistics		**Receive Statistics**	
Transmit Frames of Current Connection	0	Receive Frames of Current Connection	0
Transmit Bytes of Current Connection	0	Receive Bytes of Current Connection	0
Transmit Total Frames	0	Receive Total Frames	0
Transmit Total Bytes	0	Receive Total Bytes	0
Transmit Speed	0.00KBps	Receive Speed	0.00KBps
Refresh		Auto Refresh	None ▾

Traffic Statistics

Interface: List all available network interfaces in the router. You are currently checking on the physical status of **CBRS** interface.

Transmit Statistics

Transmit Frames of Current Connection: Display the total number of 4G/LTE frames transmitted until the latest second for the current connection.

Transmit Bytes of Current Connection: Display the total bytes transmitted till the latest second for the current connection for the current connection.

Transmit Total Frames: Display the total number of frames transmitted till the latest second since system is up.

Transmit Total Bytes: Display the total number of bytes transmitted until the latest second since system is up.

Transmit Speed: Display the data rate can be transferred to the server, the mobile Internet.

Receive Statistics

Receive Frames of Current Connection: Display the number of frames received until the latest second for the current connection.

Receive Bytes of Current Connection: Display the total bytes received till the latest second for the current connection.

Receive Total Frames: Display the total number of frames received until the latest second since system is up.

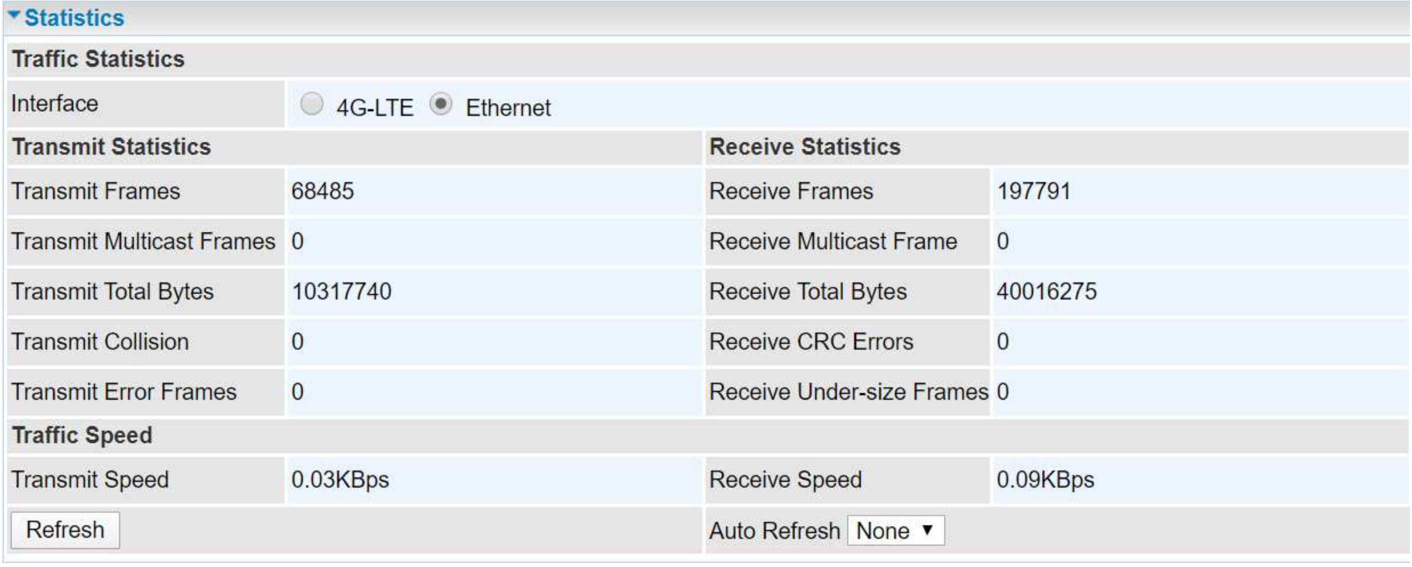
Receive Total Bytes: Display the total frames received till the latest second since system is up.

Receive Speed: Display the data rate receives from the mobile Internet.

Refresh: Click to manually refresh the data.

Auto Refresh: Select a time interval to refresh the data automatically or none to disable the feature.

❖ Ethernet



▾ Statistics

Traffic Statistics			
Interface	○ 4G-LTE ● Ethernet		
Transmit Statistics		**Receive Statistics**	
Transmit Frames	68485	Receive Frames	197791
Transmit Multicast Frames	0	Receive Multicast Frame	0
Transmit Total Bytes	10317740	Receive Total Bytes	40016275
Transmit Collision	0	Receive CRC Errors	0
Transmit Error Frames	0	Receive Under-size Frames	0
Traffic Speed			
Transmit Speed	0.03KBps	Receive Speed	0.09KBps
Refresh		Auto Refresh None ▼	

Traffic Statistics

Interface: List all available network interfaces in the router. You are currently checking on the physical status of the **Ethernet** port**.**

Transmit Statistics

Transmit Frames: Display the number of frames transmitted until the latest second.

Transmit Multicast Frames: Display the number of multicast frames transmitted until the latest second.

Transmit Total Bytes: Display the number of bytes transmitted until the latest second.

Transmit Collision: Numbers of collisions have occurred on this port.

Transmit Error Frames: Display the number of error packets on this port.

Receive Statistics

Receive Frames: Display the number of frames received until the latest second.

Receive Multicast Frames: Display the number of multicast frames received until the latest second.

Receive Total Bytes: Display the number of bytes received until the latest second.

Receive CRC Errors: Display the number of error packets on this port.

Receive Under-size Frames: Display the number of under-size frames received until the latest second.

Traffic Speed

Transmit Speed: Display the data rate can be transferred to the server, the Broadband Internet Service Provider

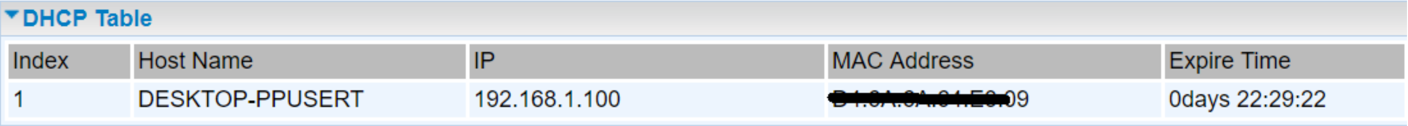
Receive Speed: Display the data rate receives from the Broadband Internet Service Provider

Refresh: Click to manually refresh the data.

Auto Refresh: Select a time interval to refresh the data automatically or none to disable the feature.

DHCP Table

DHCP table displays the devices connected to the router with clear information.



DHCP Table

Index	Host Name	IP	MAC Address	Expire Time
1	DESKTOP-PPUSERT	192.168.1.100	[redacted]	0days 22:29:22

Index #: The numeric indicator for devices using dynamic IP addresses.

Host Name: Display the hostname of the PC.

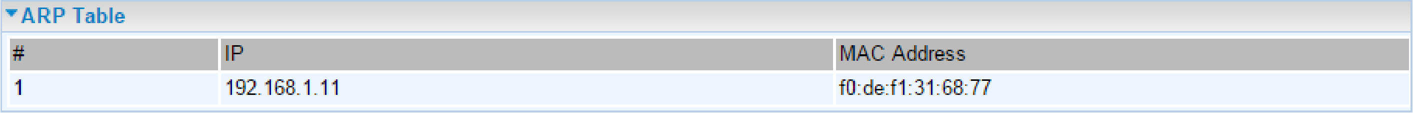
IP Address: The IP allocated to the device.

MAC Address: The MAC of the connected device.

Expire Time: The total remaining interval since the IP assignment to the PC.

ARP Table

ARP (Address Resolution Protocol) table displays a mapping IP address with a PC's MAC address.



ARP Table

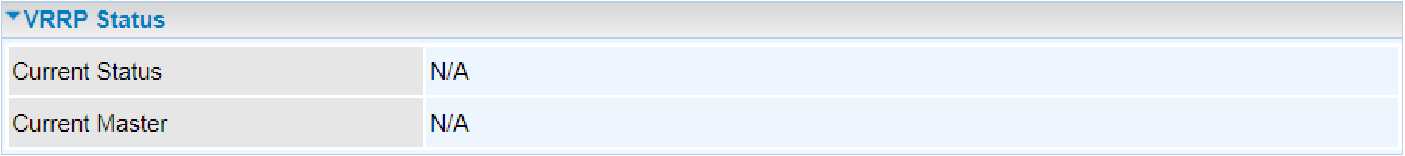
#	IP	MAC Address
1	192.168.1.11	f0:de:f1:31:68:77

#: The numeric table list indicator.

IP Address: It is the internal/local IP address to access to the network.

MAC Address: The MAC address of a device, e.g. PC, notebook, printer, etc., that is corresponded with the IP address.

VRRP Status



VRRP Status

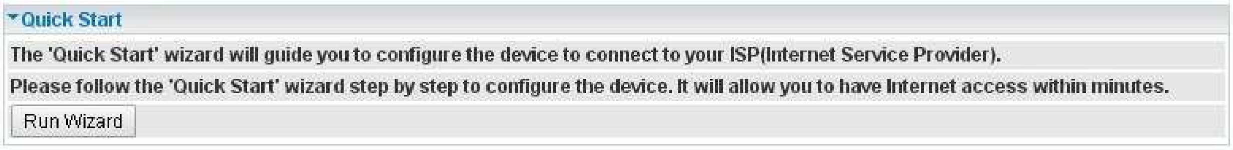
Current Status	N/A
Current Master	N/A

Current Status: Display current VRRP status, Master or Backup.

Current Master: Display the IP address of the Master

Quick Start

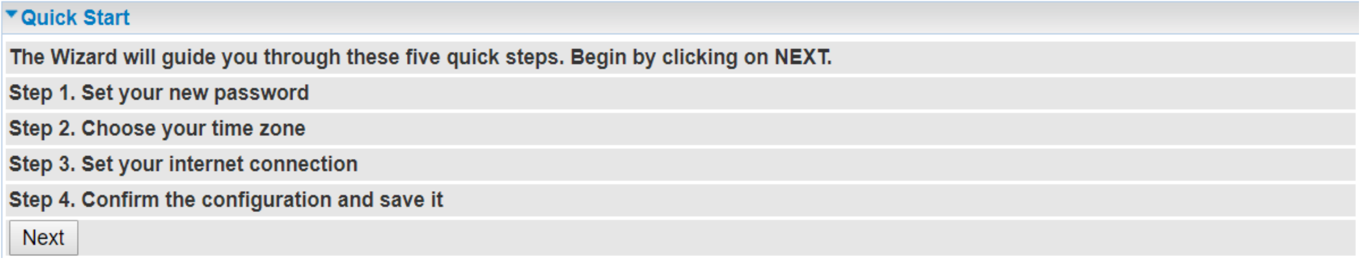
This is a useful and easy utility to help you to setup the router quickly and to connect to your ISP (Internet Service Provider) with only a few steps. It will guide you step by step to setup password, time zone, and WAN settings of your device. The Quick Start Wizard is a helpful guide for the first-time users to the device.


Quick Start

The 'Quick Start' wizard will guide you to configure the device to connect to your ISP(Internet Service Provider).

Please follow the 'Quick Start' wizard step by step to configure the device. It will allow you to have Internet access within minutes.

For detailed instructions on configuring WAN settings, see refer to the **Interface Setup** section.


Quick Start

The Wizard will guide you through these five quick steps. Begin by clicking on NEXT.

Step 1. Set your new password

Step 2. Choose your time zone

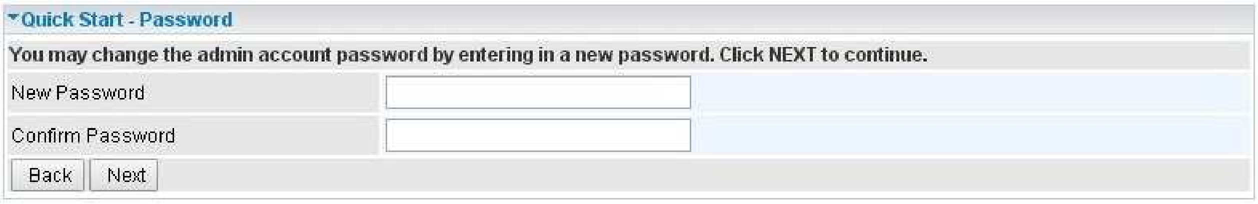
Step 3. Set your internet connection

Step 4. Confirm the configuration and save it

Click **NEXT** to move on to Step 1.

Step 1 – Password

Set new password of the “admin” account to access for router management. The default is “admin”. Once changed, please use this new password next time when accessing to the router. Click **NEXT** to continue.

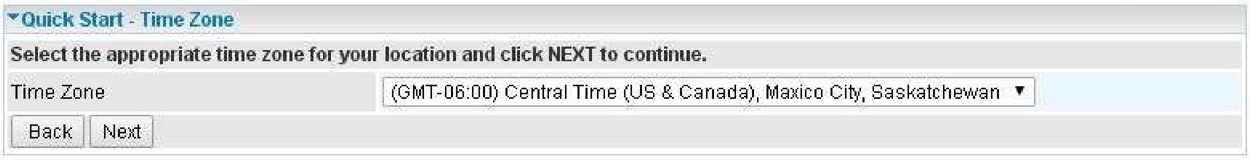

Quick Start - Password

You may change the admin account password by entering in a new password. Click NEXT to continue.

New Password	
Confirm Password	

Step 2 – Time Zone

Choose your time zone. Click **NEXT** to continue.

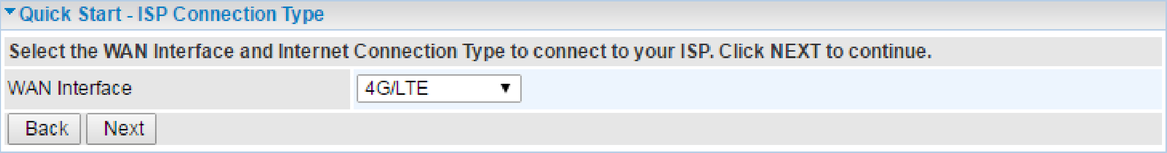

Quick Start - Time Zone

Select the appropriate time zone for your location and click NEXT to continue.

Time Zone	(GMT-06:00) Central Time (US & Canada), Maxico City, Saskatchewan

Step 3 – ISP Connection Type

Set up your 4G/LTE Internet connection.

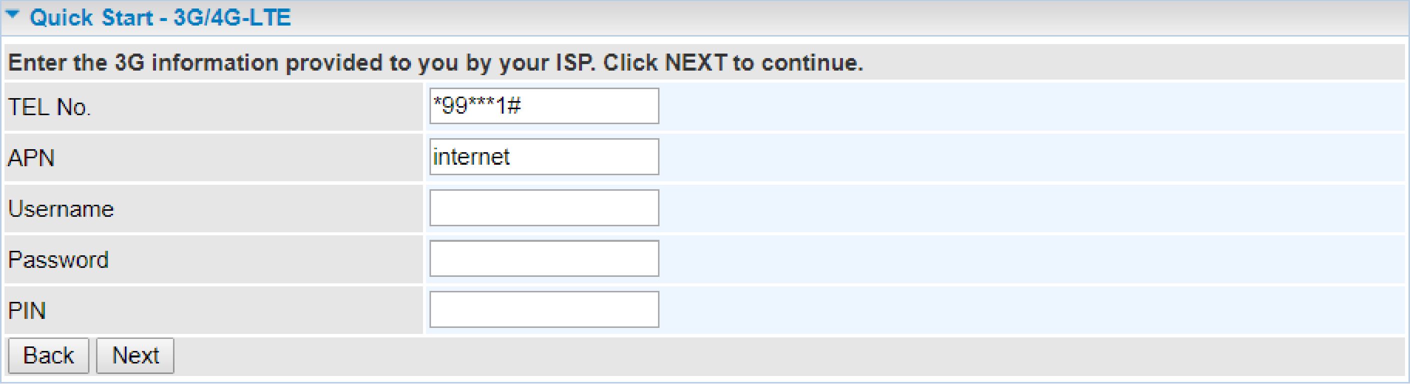


Select the WAN Interface and Internet Connection Type to connect to your ISP. Click NEXT to continue.

WAN Interface	4G/LTE ▾

Click **NEXT** to continue.

Input all relevant 4G/LTE parameters from your cellular provider then click **Next** to continue.

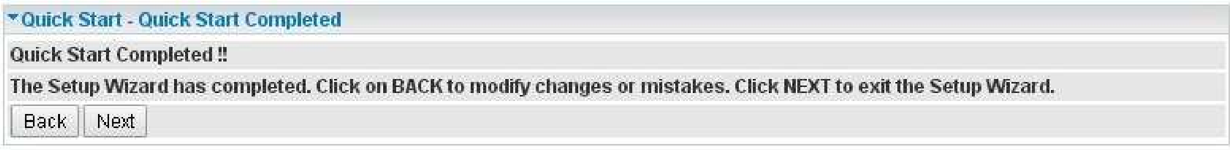


Enter the 3G information provided to you by your ISP. Click NEXT to continue.

TEL No.	*99***1#
APN	internet
Username	
Password	
PIN	

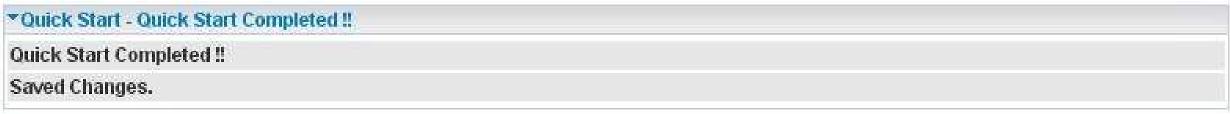
Step 4 – Quick Start Completed

The Setup Wizard has completed. Click on BACK to make changes or correct mistakes. Click **NEXT** to save the current settings and complete the Quick Start setups.



Quick Start Completed !!

The Setup Wizard has completed. Click on BACK to modify changes or mistakes. Click NEXT to exit the Setup Wizard.



Quick Start Completed !!

Saved Changes.

Go back to the **Status > Device Info** to view the status.

Configuration

Click to access and configure the available features in the following: **Interface Setup, Advanced Setup, Access Management** and **Maintenance.**

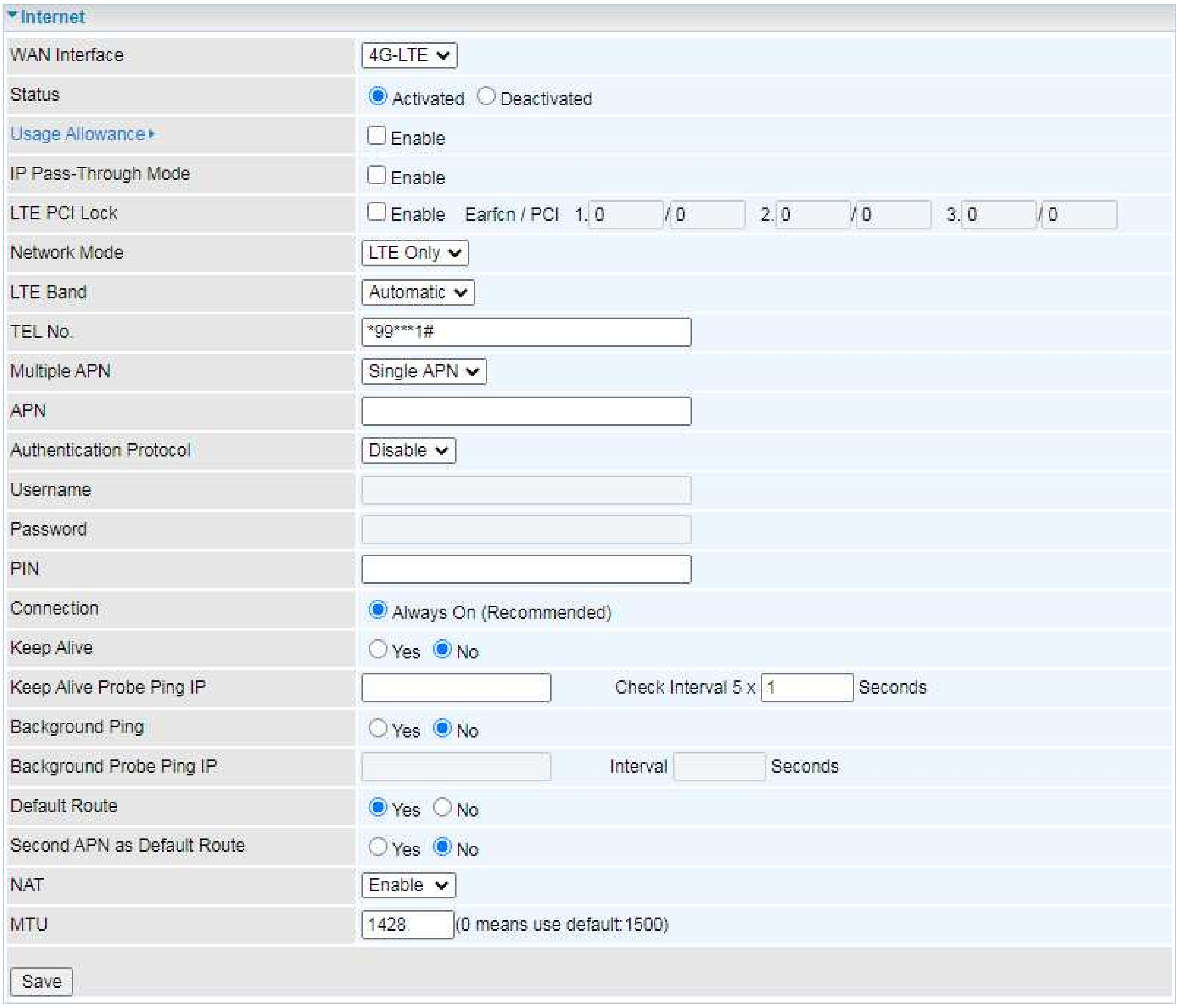
These functions are described in the following sections.

Interface Setup

Here are the features under **Interface Setup**: Internet, LAN, IPv6-464XLAT and Loopback.

Internet

❖ 4G/LTE



▾Internet

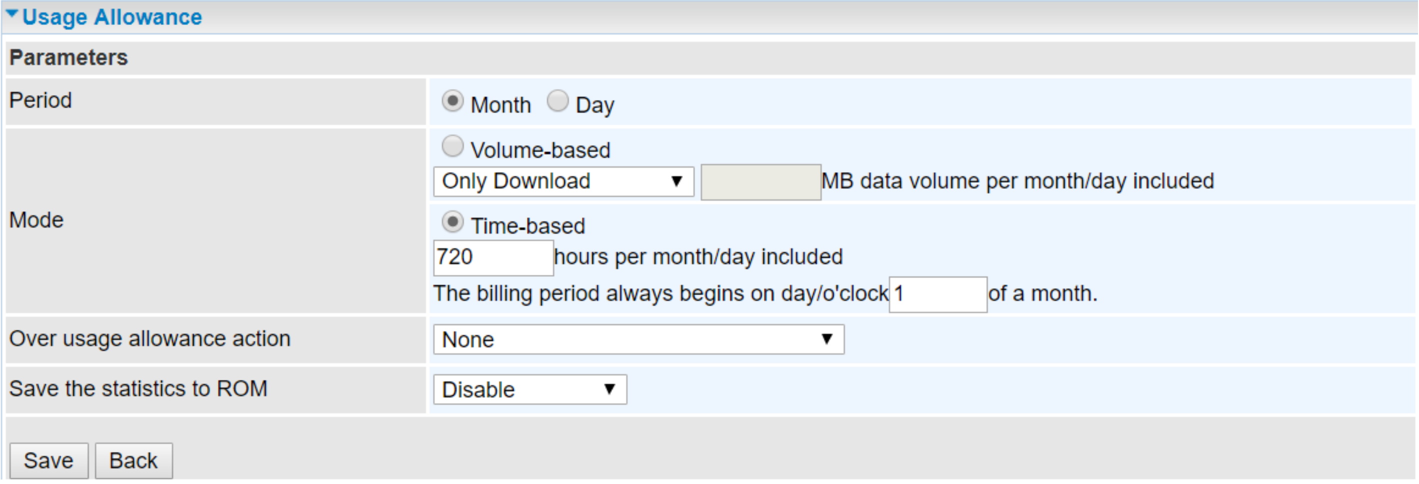
WAN Interface	4G-LTE
Status	● Activated ○ Deactivated
Usage Allowance ▸	□ Enable
IP Pass-Through Mode	□ Enable
LTE PCI Lock	□ Enable Earfcn / PCI 1. 0 / 0 2. 0 / 0 3. 0 / 0
Network Mode	LTE Only
LTE Band	Automatic
TEL No.	*99***1#
Multiple APN	Single APN
APN	
Authentication Protocol	Disable
Username	
Password	
PIN	
Connection	● Always On (Recommended)
Keep Alive	○ Yes ● No
Keep Alive Probe Ping IP	Check Interval 5 x 1 Seconds
Background Ping	○ Yes ● No
Background Probe Ping IP	Interval Seconds
Default Route	● Yes ○ No
Second APN as Default Route	○ Yes ● No
NAT	Enable
MTU	1428 (0 means use default:1500)

WAN Interface: List all available WAN interfaces. (In this section, you have selected to use 4G-LTE)

Status: Choose Activated to enable the 4G/LTE connection.

Usage Allowance: Click Enable to activate the feature. Click the link to setup the usage settings.

LTE Settings



Usage Allowance

Parameters	
Period	● Month ○ Day
Mode	○ Volume-based Only Download ▼ [ ] MB data volume per month/day included ● Time-based 720 hours per month/day included The billing period always begins on day/o'clock 1 of a month.
Over usage allowance action	None ▼
Save the statistics to ROM	Disable ▼

Period: Pick a period, **Month** or **Day**.

Mode: Include **Volume-based** and **Time-based** control.

- Volume-based include “only Download”, "only Upload", and “Download and Upload” to limit the flow.
- Time-based control the flow by providing specific hours per month.
  - 720 hours if selected period Month
  - 12 hours if selected period Day

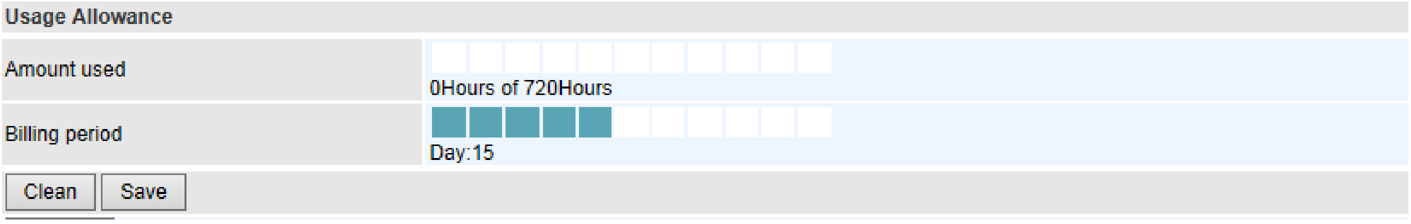
The billing period begins on the beginning day of billing each month.
Over usage allowance action: Here are actions to perform when mobile data usage, defined in Mode, reached to its maximum.

- None: No action taken
- Disconnect: Disconnect mobile connection
- Email Alert: Send an e-mail alert and keep the mobile connection alive.
- Email Alert and Disconnect: Disconnect mobile connection after an alert e-mail is being sent.

Save the statistics to ROM:

- Every hour: Activate the 4G/LTE statistics on data usage and this info will get updated and saved to the internal memory (ROM) in every hour.

  Once the feature is turned on, you can see the amount of data used and how many days left before next billing cycle starts. Go to **Status >> 4G/LTE Status** page for details.



Usage Allowance	
Amount used	0Hours of 720Hours
Billing period	Day:15

NOTE: This statistic information will get deleted after a factory reset.

- **Disable:** No action taken

IP Pass-Through Mode: When enabled, BEC 7000 R28-G in bridge mode and will not obtain a WAN IP address, features such as routing capabilities, NAT, firewall, etc., will be disabled by default. However, the client router behind the BEC 7000 R28-Gn get a WAN IP address instead.

When disabled, BEC 7000 R28-G in router mode that it handles a WAN IP address and all routing-related features become available.

Network Mode: Select a cellular mode. Select Automatic to auto detect the best mode for you.
TEL No.: The dial string to make a 4G/LTE user internetworking call. It may provide by your mobile service provider.

Dual or Multiple APN: BEC 7000 R28-G can support up to two (2) APNs, Single or Dual.

APN: An APN is rsimilar to a URL on the WWW; it is what the unit makes a GPRS / UMTS call. The service provider is able to attach anything to an APN to create a data connection, requirements for APNs varies between different service providers. Most service providers have an internet portal which they use to connect to a DHCP Server, thus giving you access to the internet i.e. some mobile/cellular operators use the APN ‘internet’ for their portal. The default value is “internet”.

Authentication Protocol: Manually specify CHAP (Challenge Handshake Authentication Protocol) or PAP (Password Authentication Protocol). When using PAP, the password is sent unencrypted, while CHAP encrypts the password before sending, and also allows for challenges at different periods to ensure that an intruder has not replaced the client.

Username/Password: Enter the username and password provided by your service provider. The username and password are case sensitive.

PIN: PIN stands for Personal Identification Number. A PIN code is a numeric value used in certain systems as a password to gain access and authenticate. In mobile phones a PIN code locks the SIM card until you enter the correct code. If you enter the PIN code incorrectly into the phone 3 times in a row, then the SIM card will be blocked, and you will require a PUK code from your network/service provider.

Connection: Default set to Always on to keep an always-on 4G/LTE connection.

Keep Alive: Select Yes to ensure the 4G/LTE internet connection is always available.

Keep Alive IP: Enter the IP address that the 7000 can ping the IP to find whether the connection is on or not, if not, router will recover the connection.

Background Ping: Select Yes to keep the 4G/LTE active at all time, prevent 7000 from entering idle state.

Background Ping IP: Enter the IP address that the 7000 can ping the IP address.

Default Route: Select Yes to use this interface as default route interface.

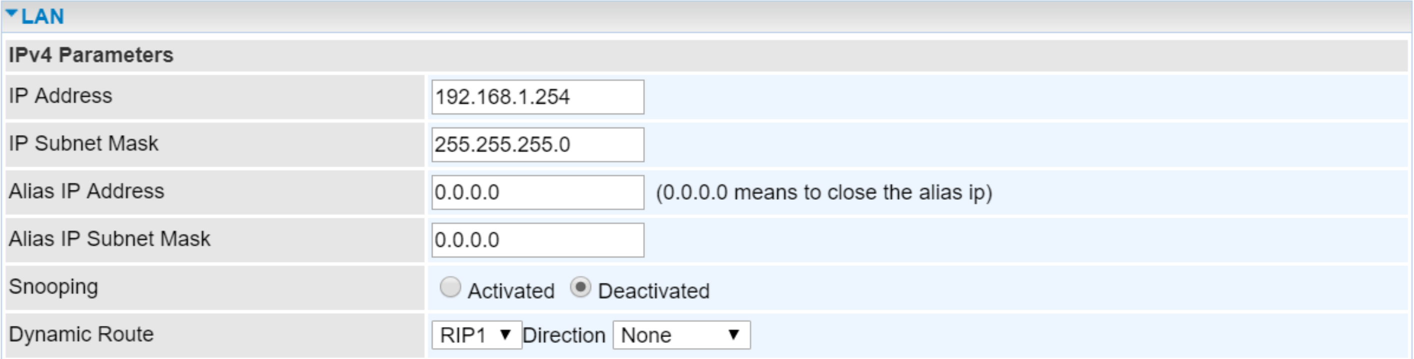
NAT: Select this option to Disabled/Enable the NAT (Network Address Translation) function. Enable NAT to grant multiples devices in LAN to access to the Internet through a single WAN IP.

MTU: Enter the maximum packet that can be transmitted. Use default 1500 bytes by entering MTU 0.

LAN

A Local Area Network (LAN) is a shared communication system to which many computers are attached and is limited to the immediate area, usually the same building or floor of a building.

IPv4 Parameters



▾LAN

IPv4 Parameters	
IP Address	192.168.1.254
IP Subnet Mask	255.255.255.0
Alias IP Address	0.0.0.0 (0.0.0.0 means to close the alias ip)
Alias IP Subnet Mask	0.0.0.0
Snooping	○ Activated ● Deactivated
Dynamic Route	RIP1 ▼ Direction None ▼

IP Address: Enter the IP address of Router in dotted decimal notation, for example, 192.168.1.254 (factory default).

IP Subnet Mask: The default is 255.255.255.0. User can change it to other such as 255.255.255.128.

Alias IP Address: This is for local networks virtual IP interface. Specify an IP address on this virtual interface.

Alias IP Subnet Mask: Specify a subnet mask on this virtual interface.

IGMP Snooping: Select **Activated** to enable IGMP Snooping function, Without IGMP snooping, multicast traffic is treated in the same manner as broadcast traffic - that is, it is forwarded to all ports. With IGMP snooping, multicast traffic of a group is only forwarded to ports that have members of that group.

Dynamic Route:

RIP Version: (Routing Information protocol) Select this option to specify the RIP version, including RIP-1, RIP-2.

RIP Direction: Select this option to specify the RIP direction.

- **None** is for disabling the RIP function.

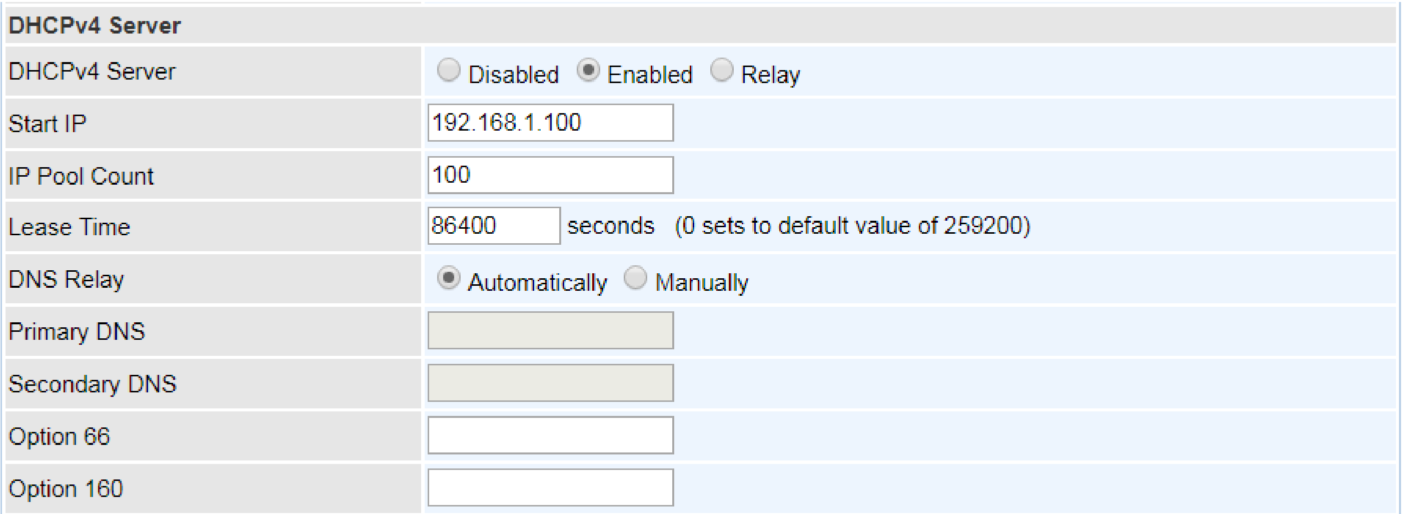
- **Both** means the router will periodically send routing information and accept routing information then incorporate into routing table.

- **IN only** means the router will only accept but will not send RIP packet.

- **OUT only** means the router will only send but will not accept RIP packet.

DHCPv4 Server

DHCP (Dynamic Host Configuration Protocol) allows individual clients to obtain TCP/IP configuration at start-up from a server.



DHCPv4 Server	
DHCPv4 Server	○ Disabled ● Enabled ○ Relay
Start IP	192.168.1.100
IP Pool Count	100
Lease Time	86400 seconds (0 sets to default value of 259200)
DNS Relay	● Automatically ○ Manually
Primary DNS	
Secondary DNS	
Option 66	
Option 160	

DHCPv4 Server: If set to **Enabled**, your BEC 7000 R28-G can assign IP addresses, default gateway and DNS servers to the DHCP client.

- If set to **Disabled**, the DHCP server will be disabled.
- If set to **Relay**, the BEC 7000 R28-G acts as a surrogate DHCP server and relays DHCP requests and responses between the remote server and the clients. Enter the IP address of the actual, remote DHCP server in the Remote DHCP Server field in this case.
- When DHCP is used, the following items need to be set.

Start IP: This field specifies the first of the contiguous addresses in the IP address pool.

IP Pool Count: This field specifies the count of the IP address pool.

Lease Time: The current lease time of client.

DNS Relay Select **Automatically** obtained or **Manually** set. If select **Manually**, please enter DNS IP addresses here.

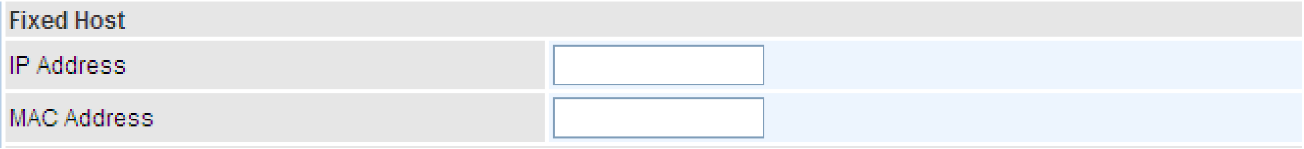
Primary / Secondary DNS Server: Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the subnet mask.

Option 66: Set the IP or hostname of the TFTP server for devices, like IPTV Set Box, to get configuration settings from the TFTP server.

Option 160: Set the IP or hostname of the TFTP server for devices, like IPTV Set Box, to get configuration settings from the TFTP server. (The option 160 is an extended feature in DHCP option, similar to option 66, but using http or https protocols.)

Fixed Host

In this field, users can map the specific IP (must in the DHCP IP pool) for some specific MAC, and this information can be listed in the following table.

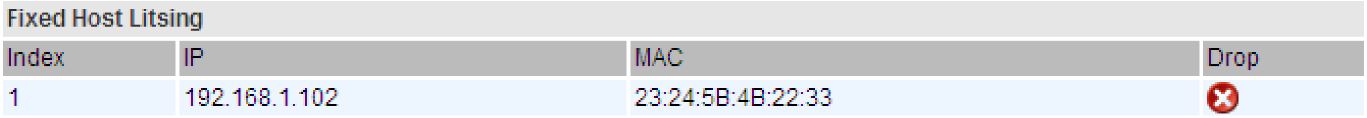


Fixed Host	
IP Address	
MAC Address	

IP Address: Enter the specific IP. For example: 192.168.1.110.

MAC Address: Enter the responding MAC. For example: 00:0A:F7:45:6D:ED

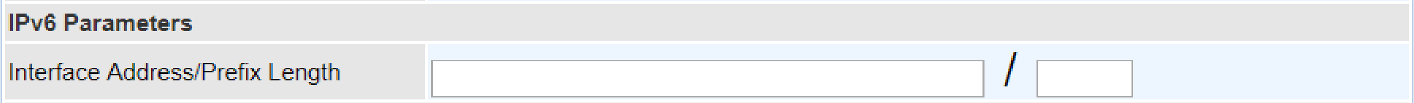
When added, you can see the ones listed as showed below:



Fixed Host Litsing			
Index	IP	MAC	Drop
1	192.168.1.102	23:24:5B:4B:22:33	⊗

IPv6 parameters

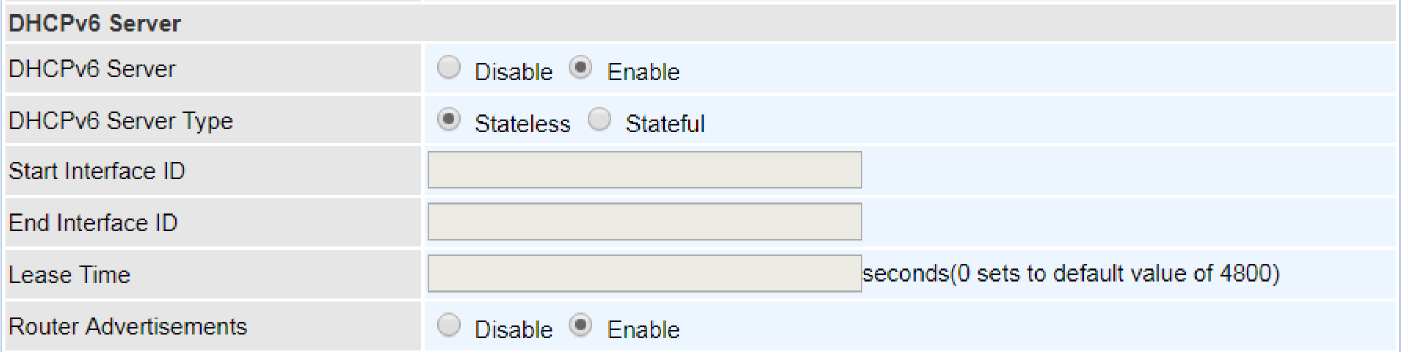
The IPv6 address composes of two parts, thus, the prefix and the interface ID.



IPv6 Parameters	
Interface Address/Prefix Length	______ / ____

Interface Address / Prefix Length: Enter a static LAN IPv6 address. If you are not sure what to do with this field, please leave it empty as if contains false information it could result in LAN devices not being able to access other IPv6 device. Router will take the same WAN’s prefix to LAN side if the field is empty.

DHCPv6 Server



DHCPv6 Server	
DHCPv6 Server	○ Disable ● Enable
DHCPv6 Server Type	● Stateless ○ Stateful
Start Interface ID	
End Interface ID	
Lease Time	seconds(0 sets to default value of 4800)
Router Advertisements	○ Disable ● Enable

There are two methods to dynamically configure IPv6 address on hosts, **Stateless** and **Stateful**.

Stateless auto-configuration requires no manual configuration of hosts, minimal (if any) configuration of routers, and no additional servers. The stateless mechanism allows a host to generate its own addresses using a combination of locally available information (MAC address) and information (prefix) advertised by routers. Routers advertise prefixes that identify the subnet(s) associated with a link, while hosts generate an "interface identifier" that uniquely identifies an interface on a subnet. An address is formed by combining the two. When using stateless configuration, you needn’t configure anything on the client.

Stateful configuration, for example using DHCPv6 (which resembles its counterpart DHCP in IPv4.) In the stateful auto configuration model, hosts obtain interface addresses and/or configuration information and parameters from a DHCPv6 server. The Server maintains a database that keeps track of which addresses have been assigned to which hosts.

DHCPv6 Server: Check whether to enable DHCPv6 server.

DHCPv6 Server Type: Select Stateless or Stateful. When DHCPv6 is enabled, this parameter is available.

- **Stateless:** If selected, the PCs in LAN are configured through RA mode, thus, the PCs in LAN are configured through RA mode, to obtain the prefix message and generate an address using a combination of locally available information (MAC address) and information (prefix) advertised by routers, but they can obtain such information like DNS from DHCPv6 Server.
- **Stateful:** If selected, the PCs in LAN will be configured like in IPv4 mode, thus obtain addresses

and DNS information from DHCPv6 server.

Start interface ID: enter the start interface ID. The IPv6 address composed of two parts, thus, the prefix and the interface ID. Interface is like the Host ID compared to IPv4.

End interface ID: enter the end interface ID.

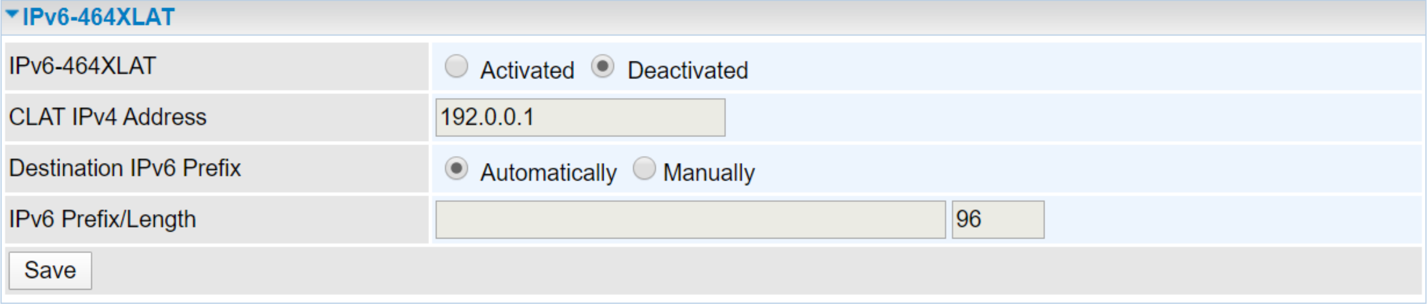
Leased Time (seconds): the leased time, similar to leased time in DHCPv4, is a time limit assigned to clients, when expires, the assigned ID will be recycled and reassigned.

Router Advertisement: Check to Enable or Disable the Issue Router Advertisement feature. This feature is to send Router Advertisement messages periodically which would multicast the IPv6 Prefix information (similar to v4 network number 192.168.1.0) to all LAN devices if the field is enabled. We suggest enabling this field.

Click **Save** to apply settings.

IPv6-464XLAT

This feature is to translate the IPv4 packet into IPv6 then send it over an IPv6 network to the PLAT.



▾IPv6-464XLAT

IPv6-464XLAT	○ Activated ● Deactivated
CLAT IPv4 Address	192.0.0.1
Destination IPv6 Prefix	● Automatically ○ Manually
IPv6 Prefix/Length	96
Save	

IPv6-464XLAT: Choose Activated to enable the 464XLAT feature.

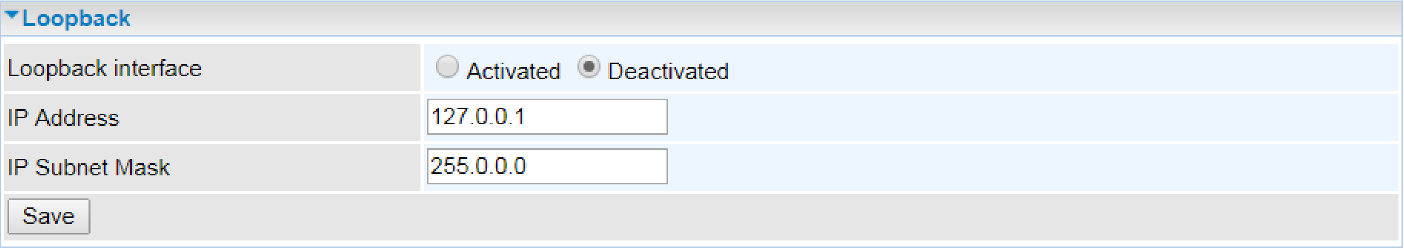
CLAT IPv4 Address: Enter the received WAN IP in IPv4 from your internet service provider.

Destination IPv6 Prefix: if select Manually, enter the IPv6 prefix of the PLAT. If you are not sure what to do with this field, select Automatically; device will request the IPv6 prefix from your internet service provider.

Click Save to apply settings

Loopback

Loopback interface is a widely known virtual interface, not the physical interface, on router and is highly robust and always up. The loopback interface has its own IP and subnet mask, often used for router management as Telnet management IP and involved in BGP as BGP Update-Source and OSPF as Router ID.



Loopback

Loopback interface	○ Activated ● Deactivated
IP Address	127.0.0.1
IP Subnet Mask	255.0.0.0

IP Address: Enter a dedicated IP address for the loopback interface.

IP Subnet Mask: Enter the subnet mask for the loopback interface.

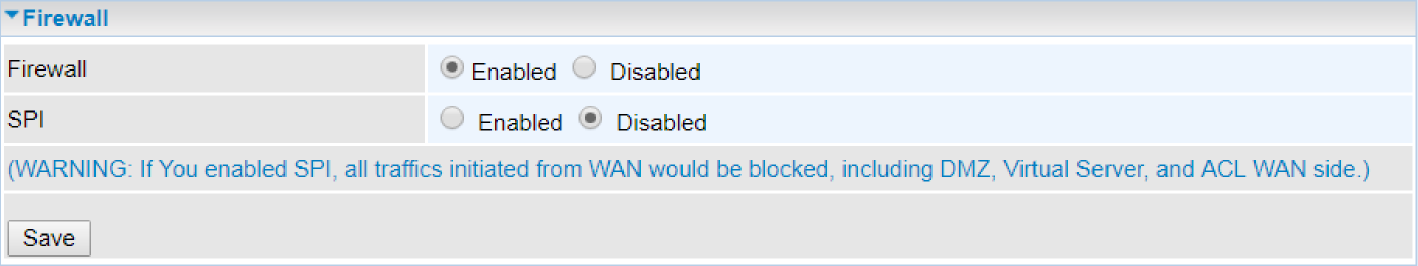
Click **Save** to apply settings.

Advanced Setup

Advanced configuration features provide advanced features, including Firewall, Routing, Dynamic Routing, NAT, VRRP, Static DNS, QoS, Time Schedule and Mail Alert for advanced users.

Firewall

Your router includes a firewall for helping to prevent attacks from hackers. In addition to this, when using NAT (Network Address Translation) the router acts as a “natural” Internet firewall, since all PCs on your LAN use private IP addresses that cannot be directly accessed from the Internet.



▾Firewall

Firewall	● Enabled ○ Disabled
SPI	○ Enabled ● Disabled

(WARNING: If You enabled SPI, all traffics initiated from WAN would be blocked, including DMZ, Virtual Server, and ACL WAN side.)

Firewall: To automatically detect and block Denial of Service (DoS) attacks, such as Ping of Death, SYN Flood, Port Scan and Land Attack.

- **Enabled:** It activates your firewall function.
- **Disabled:** It disables the firewall function.

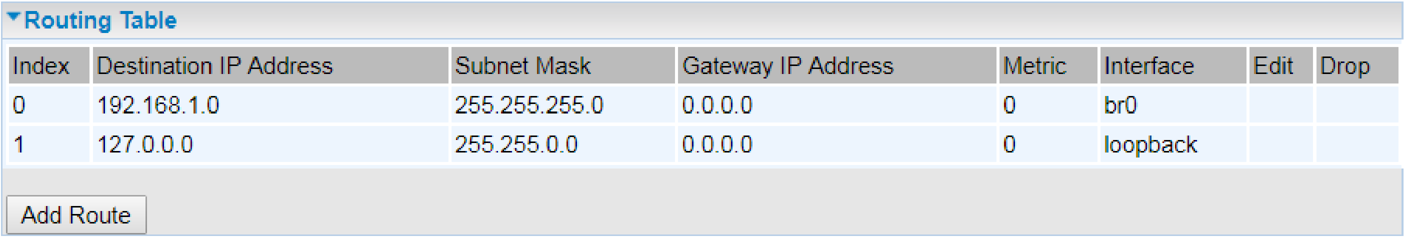
SPI: If you enabled SPI, all traffics initiated from WAN would be blocked, including DMZ, Virtual Server, and ACL WAN side.

- **Enabled:** It activates your SPI function.
- **Disabled:** It disables the SPI function.

Click **Save** to apply settings.

Routing

This is static route feature. You are equipped with the capability to control the routing of all the traffic across your network. With each routing rule created, user can specifically assign the destination where the traffic will be routed to.



Routing Table

Index	Destination IP Address	Subnet Mask	Gateway IP Address	Metric	Interface	Edit	Drop
0	192.168.1.0	255.255.255.0	0.0.0.0	0	br0		
1	127.0.0.0	255.255.0.0	0.0.0.0	0	loopback		

Index #: The numeric route indicator.

Destination IP Address: IP address of the destination network

Subnet Mask: The subnet mask of destination network.

Gateway IP Address: IP address of the gateway or existing interface that this route uses.

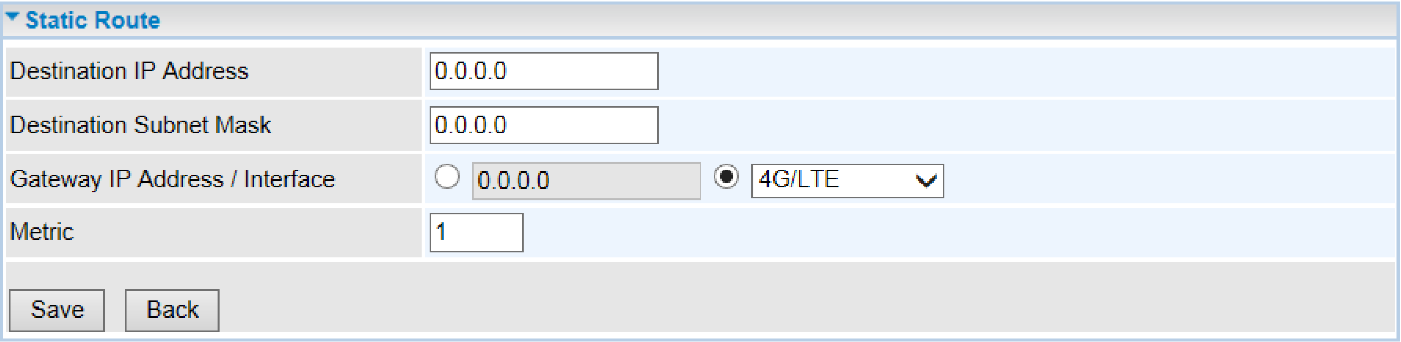
Metric: It represents the cost of transmission for routing purposes. The number need not be precise, but it must be between 1 and 15.

Interface: Media/channel selected to append the route.

Edit: Edit the route; this icon is not shown for system default route.

Drop: Drop the route; this icon is not shown for system default route.

Add Route



Static Route

Destination IP Address	0.0.0.0
Destination Subnet Mask	0.0.0.0
Gateway IP Address / Interface	○ 0.0.0.0 ● 4G/LTE
Metric	1

Destination IP Address: This is the destination subnet IP address.

Destination Subnet Mask: The subnet mask of destination network.

Gateway IP Address or Interface: This is the gateway IP address or existing interface to which packets are to be forwarded.

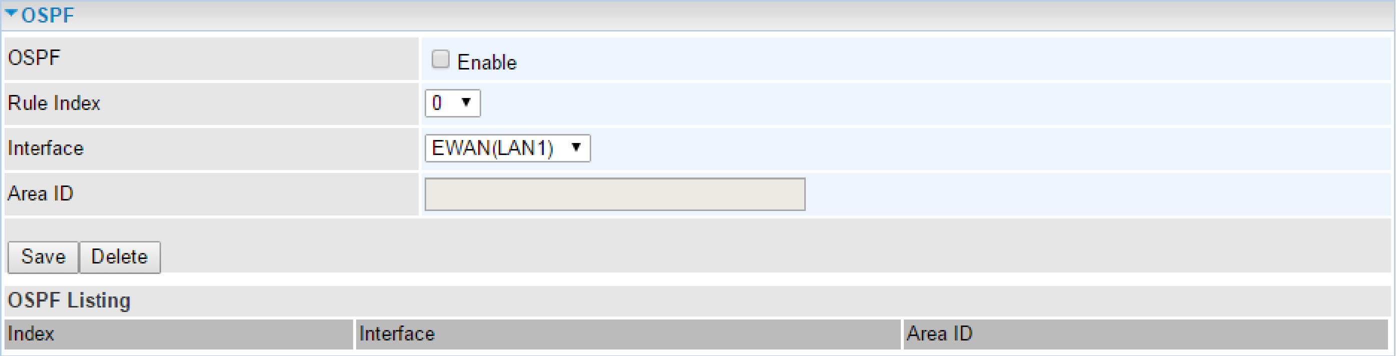
Metric: It represents the cost of transmission for routing purposes. The number need not be precise, but it must be between 1 and 15.

Click **Save** to add this route

Dynamic Routing

The NAT (Network Address Translation) feature transforms a private IP into a public IP, allowing multiple users to access the internet through a single IP account, sharing the single IP address. NAT break the originally envisioned model of IP end-to-end connectivity across the internet so NAT can cause problems where IPSec/ PPTP encryption is applied or some application layer protocols such as SIP phones are located behind a NAT. And NAT makes it difficult for systems behind a NAT to accept incoming communications.

Open Shortest Path First (OSPF)



OSPF

OSPF	□ Enable
Rule Index	0 ▼
Interface	EWAN(LAN1) ▼
Area ID	

OSPF Listing

Index	Interface	Area ID

OSPF: Enable to activate OSPF routing.

Rule Index: The numeric route indicator. The maximum entry is up to 10, ranging from 1 to 10.

Interface: Set the interface which runs the OSPF process (involved in OSPF routing). It can be WAN interfaces or established GRE tunnels.

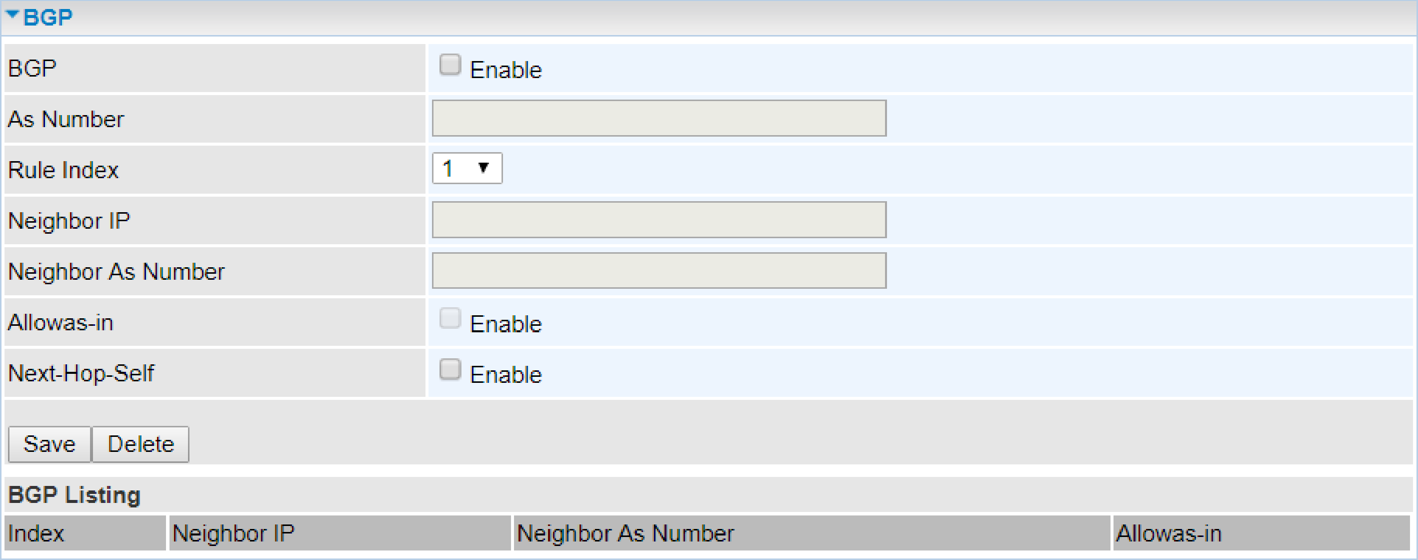
Area ID: The OSPF area identifier. It is a decimal number in the range of 0-4294967295. Enter the area ID in which the interface belongs to. The area with area-id=”0” is the backbone area.

If the router has networks in more than one area, then an area with area-id=”0” (the backbone) must always be present. All other areas are connected to it. The backbone is responsible for distributing routing information between non-backbone areas. The backbone must be contiguous, i.e. there must be no disconnected segments. However, area border routers do not need to be physically connected to the backbone - connection to it may be simulated using a virtual link.

Click **Save** to apply the settings.

Border Gateway Protocol (BGP)

A standardized exterior gateway protocol (an uniquely TCP based inter-Autonomous System routing protocol) designed to allow setting up an inter-domain dynamic routing system that automatically updates routing tables of devices running BGP in case of network topology changes.



BGP	□ Enable
As Number	
Rule Index	1 ▼
Neighbor IP	
Neighbor As Number	
Allowas-in	□ Enable
Next-Hop-Self	□ Enable

BGP Listing

Index	Neighbor IP	Neighbor As Number	Allowas-in

BGP: Enable to activate BGP routing.

AS Number: Designate the AS number of local routers. The AS number is used to identify the IBGP or EBGP your neighbor is running. The same AS number means the IBGP, and the different means EBGP.

Rule Index: The numeric route indicator. The maximum entry is up to 10, ranging from 0 to 9.

Neighbor IP: Enter the neighbor IP address.

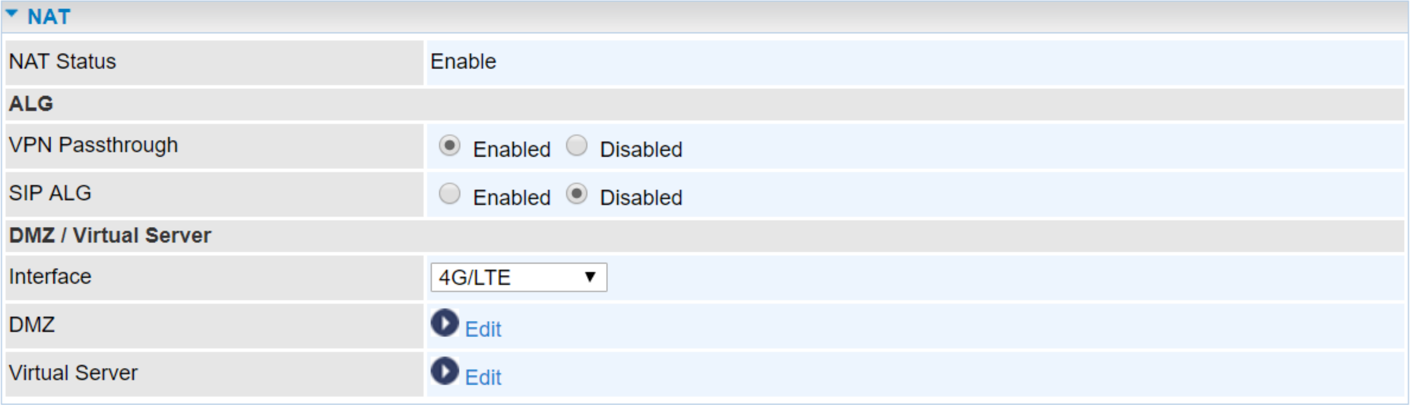
Neighbor AS Number: Enter the neighbor AS number.

Allowas-in: Enable to allow inter-communication between devices in the same AS. If the local and neighbor AS number are the same, thus, an inter-AS communication, please enable the allowas-in. Otherwise, the router only support EBGP routing between different domains.

Next-Hop-Self: Enable to use the router's own loopback address as the next-hop address.

NAT

The NAT (Network Address Translation) feature transforms a private IP into a public IP, allowing multiple users to access the internet through a single IP account, sharing the single IP address. NAT break the originally envisioned model of IP end-to-end connectivity across the Internet, so NAT can cause problems where IPSec/ PPTP encryption is applied or some application layer protocols such as SIP phones are located behind a NAT. And NAT makes it difficult for systems behind a NAT to accept incoming communications.



▾ NAT

NAT Status	Enable
ALG	
VPN Passthrough	● Enabled ○ Disabled
SIP ALG	○ Enabled ● Disabled
DMZ / Virtual Server	
Interface	4G/LTE ▾
DMZ	▶ Edit
Virtual Server	▶ Edit

NAT Status: Enabled. (Disabled if WAN connection is in **BRIDGE** mode)

ALG

VPN Passthrough: VPN pass-through is a feature of routers which allows VPN client on a private network to establish outbound VPNs unhindered.

SIP ALG: Enable the SIP ALG when SIP phone needs ALG to pass through the NAT. Disable the SIP ALG when SIP phone includes NAT-Traversal algorithm.

DMZ / Virtual Server

Interface: Select a WAN interface connection to allow external access to your internal network.

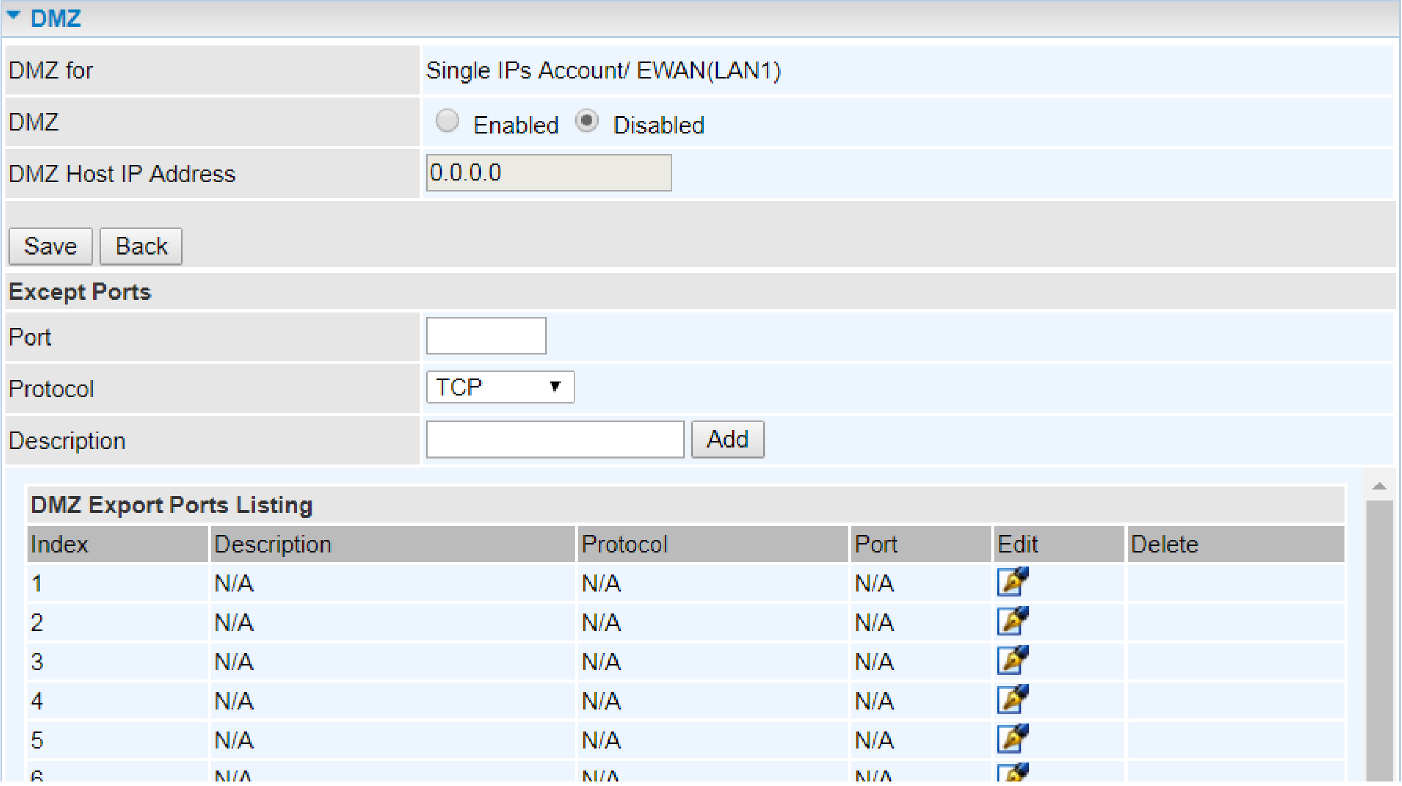
Service Index: Associated to EWAN interface marking each EWAN service (0-7), to select which EWAN service the DMZ and Virtual server are applied to.

Click **DMZ** ▶ Edit or **Virtual Server** ▶ Edit to move on to set the DMZ or Virtual Server parameters, which are represented in the following scenario.

❖ DMZ

NOTE: This feature disables automatically if WAN connection is in BRIDGE mode or NAT is being turned OFF.

The DMZ Host is a local computer exposed to the Internet. When setting a particular internal IP address as the DMZ Host, all incoming packets will be checked by the Firewall and NAT algorithms then passed to the DMZ host, when a packet received does not use a port number used by any other Virtual Server entries.



▾ DMZ

DMZ for	Single IPs Account/ EWAN(LAN1)
DMZ	○ Enabled ● Disabled
DMZ Host IP Address	0.0.0.0

Except Ports

Port	
Protocol	TCP ▾
Description	Add

DMZ Export Ports Listing

Index	Description	Protocol	Port	Edit	Delete
1	N/A	N/A	N/A	✎	
2	N/A	N/A	N/A	✎	
3	N/A	N/A	N/A	✎	
4	N/A	N/A	N/A	✎	
5	N/A	N/A	N/A	✎	
6	N/A	N/A	N/A	✎	

DMZ for (via a WAN Interface): Allows outside network to connect in and communicate with internal LAN devices via a specific WAN interface.

DMZ:

- **Enabled:** Activate the DMZ function.
- **Disabled:** Deactivate the DMZ function.

DMZ Host IP Address: Give a static IP address to the DMZ Host when **Enabled** radio button is checked. Be aware that this IP will be exposed to the WAN/Internet.

Click **Save** to apply settings

Except Ports

Except Ports: Bypass UDP or/and TCP ports, in the list, being forwarded to the DMZ host.

Port: Enter port to be monitored.

Protocol: Enter the protocol to be monitored.

Description: Enter a description to this rule.

Example: Skip port 80 (UDP/TCP) in the list. All Incoming request to access to port 80 (Web GUI) will be forwarded to the embedded HTTP server of BEC 7000 R28-G instead of the DMZ host.

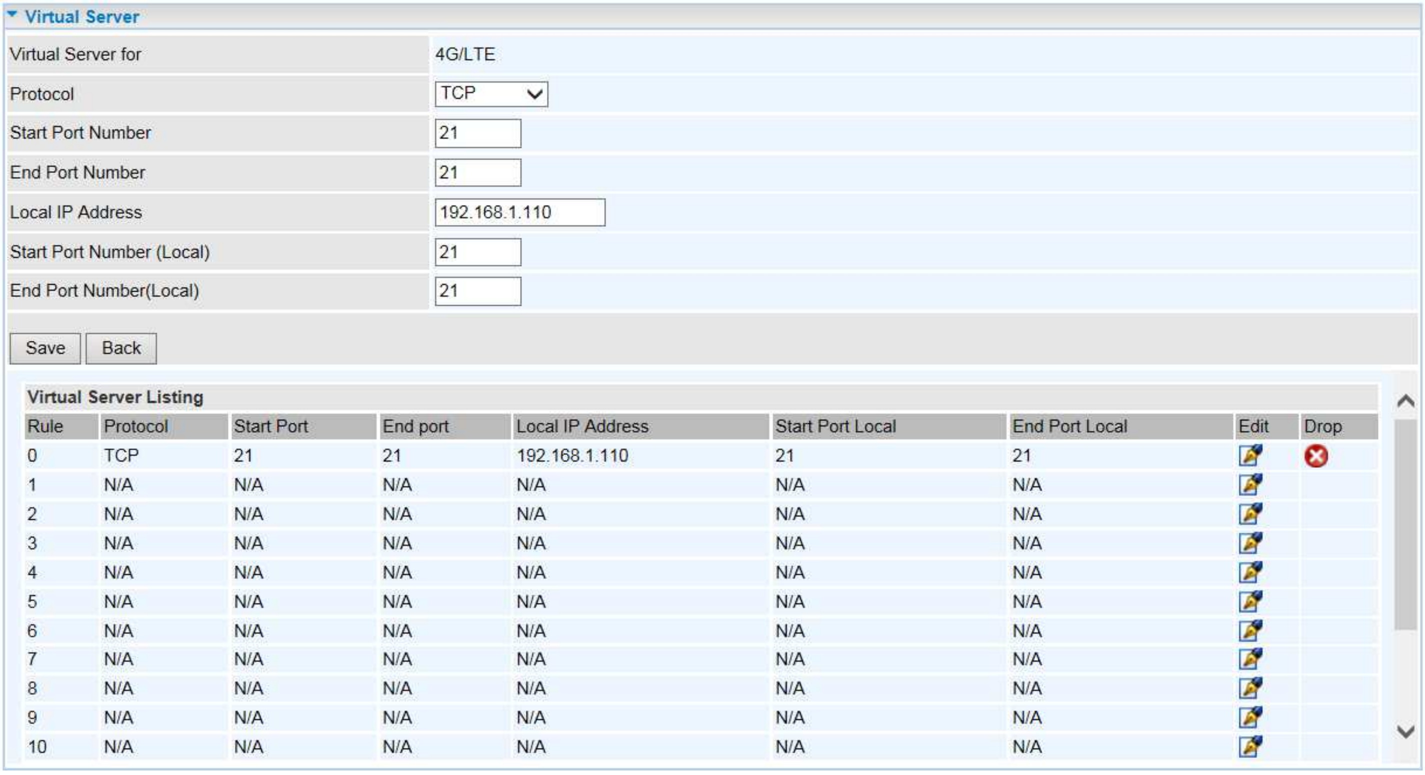
Click **Add** to add an entry to the Except Listing.

❖ Virtual Server

NOTE: This feature disables automatically if WAN connection is in BRIDGE mode or NAT is being turned OFF.

Virtual Server is also known as Port Forwarding that allows BEC 7000 R28-G to direct incoming traffic to a specific device in the network.

Configure a virtual rule in BEC 7000 R28-G for remote users accessing services such as Web or FTP services via the public (WAN) IP address that can be automatically redirected to local servers in the LAN network. Depending on the requested service (TCP/UDP port number), the device redirects the external service request to the appropriate server within the LAN network.



▾ Virtual Server

Virtual Server for	4G/LTE
Protocol	TCP
Start Port Number	21
End Port Number	21
Local IP Address	192.168.1.110
Start Port Number (Local)	21
End Port Number(Local)	21

Virtual Server Listing

Rule	Protocol	Start Port	End port	Local IP Address	Start Port Local	End Port Local	Edit	Drop
0	TCP	21	21	192.168.1.110	21	21	✎	⊗
1	N/A	N/A	N/A	N/A	N/A	N/A	✎	
2	N/A	N/A	N/A	N/A	N/A	N/A	✎	
3	N/A	N/A	N/A	N/A	N/A	N/A	✎	
4	N/A	N/A	N/A	N/A	N/A	N/A	✎	
5	N/A	N/A	N/A	N/A	N/A	N/A	✎	
6	N/A	N/A	N/A	N/A	N/A	N/A	✎	
7	N/A	N/A	N/A	N/A	N/A	N/A	✎	
8	N/A	N/A	N/A	N/A	N/A	N/A	✎	
9	N/A	N/A	N/A	N/A	N/A	N/A	✎	
10	N/A	N/A	N/A	N/A	N/A	N/A	✎	

Virtual Server for: Indicate the related WAN interface to allow outside network to communicate with the internal LAN device.

Protocol: Choose the application protocol.

Start / End Port Number: Enter a port or port range you want to forward.

(Example: Start / End: 1000 or Start: 1000 & End: 2000).

The starting port must be greater than zero (0). The end port must be greater than or equal to the start port.

Local IP Address: Enter the server IP address in the network to receive the traffic/packets.

Start / End Port Number (Local): Enter the start / end port number of the local application (service).

Examples of well-known and registered port numbers are shown below. For further information, please see IANA’s website at http://www.iana.org/assignments/port-numbers

Well-known and Registered Ports

Port Number	Protocol	Description
21	TCP	FTP Control
22	TCP & UDP	SSH Remote Login Protocol
23	TCP	Telnet
25	TCP	SMTP (Simple Mail Transfer Protocol)
53	TCP & UDP	DNS (Domain Name Server)
69	UDP	TFTP (Trivial File Transfer Protocol)
80	TCP	World Wide Web HTTP
110	TCP	POP3 (Post Office Protocol Version 3)
443	TCP & UDP	HTTPS
1503	TCP	T.120
1720	TCP	H.323
7070	UDP	RealAudio

⚠ **Attention**

Using port forwarding does have security implications, as outside users will be able to connect to PCs on your network. For this reason you are advised to use specific Virtual Server entries just for the ports your application requires, instead of using DMZ. As doing so will result in all connections from the WAN attempt to access to your public IP of the DMZ PC specified.

If you have disabled the NAT option in the WAN-ISP section, the Virtual Server function will hence be invalid.

If the DHCP server option is enabled, you have to be very careful in assigning the IP addresses of the virtual servers in order to avoid conflicts. The easiest way of configuring Virtual Servers is to manually assign static IP address to each virtual server PC, with an address that does not fall into the range of IP addresses that are to be issued by the DHCP server. You can configure the virtual server IP address manually, but it must still be in the same subnet as the router.

Example: How to setup Port Forwarding for port 21 (FTP server)

If you have an FTP server in your LAN network and want others to access it through WAN.

Step 1: Assign a static IP to your local computer that is hosting the FTP server.

Step 2: Login to the Gateway and go to **Configuration / Advanced Setup / NAT / Virtual Server.**

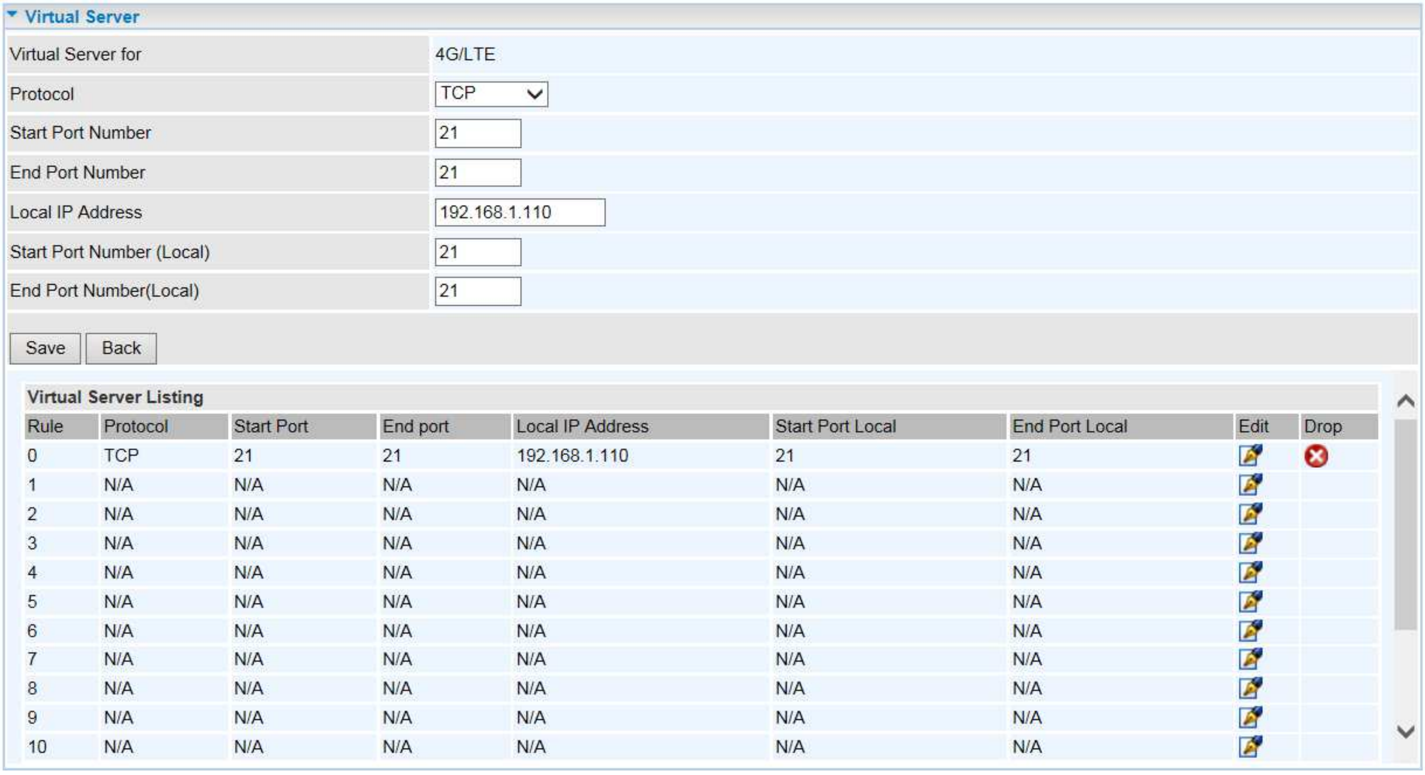
FTP server uses TCP protocol with port 21.

Enter “21” to Start and End Port Number. The BEC 7000 R28-G will accept port 21 requests from WAN side.

Enter the static IP assigned to the local PC that is hosting the FTP server. Ex: 192.168.1.102

Enter “21” to Local Start and End Port number. The BEC 7000 R28-G will forward port 21 request from WAN to the specific LAN PC (Example: 192.168.1.102) in the network.

Step 3: Click **Save** to save settings.



▾ Virtual Server

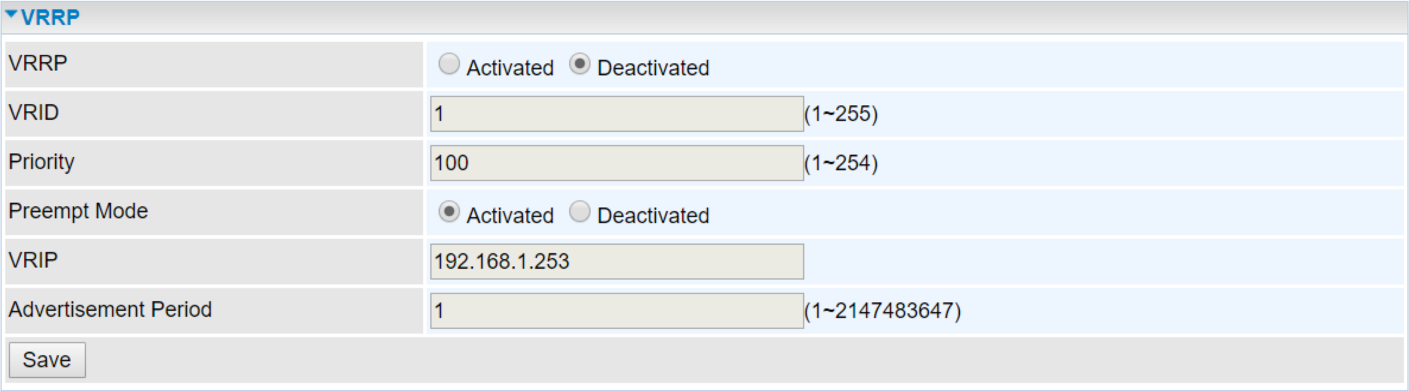
Virtual Server for	4G/LTE
Protocol	TCP
Start Port Number	21
End Port Number	21
Local IP Address	192.168.1.110
Start Port Number (Local)	21
End Port Number(Local)	21

Virtual Server Listing

Rule	Protocol	Start Port	End port	Local IP Address	Start Port Local	End Port Local	Edit	Drop
0	TCP	21	21	192.168.1.110	21	21	✎	⊗
1	N/A	N/A	N/A	N/A	N/A	N/A	✎	
2	N/A	N/A	N/A	N/A	N/A	N/A	✎	
3	N/A	N/A	N/A	N/A	N/A	N/A	✎	
4	N/A	N/A	N/A	N/A	N/A	N/A	✎	
5	N/A	N/A	N/A	N/A	N/A	N/A	✎	
6	N/A	N/A	N/A	N/A	N/A	N/A	✎	
7	N/A	N/A	N/A	N/A	N/A	N/A	✎	
8	N/A	N/A	N/A	N/A	N/A	N/A	✎	
9	N/A	N/A	N/A	N/A	N/A	N/A	✎	
10	N/A	N/A	N/A	N/A	N/A	N/A	✎	

VRRP

VRRP is designed to eliminate the single point of failure inherent in the static default routed environment. VRRP specifies an election protocol that dynamically assigns responsibility for a virtual router to one of the VRRP routers in a LAN. The VRRP router controlling the IP address associated with a virtual router is called the Master, and forwards packets sent to these IP addresses. The election process provides dynamic fail-over in the forwarding responsibility should the Master become unavailable. Any of the virtual router's IP addresses in a LAN can then be used as the default first hop router by end-hosts. The advantage gained from using VRRP is a higher availability default path without requiring configuration of dynamic routing or router discovery protocols on every end-host.



▾VRRP

VRRP	○ Activated ● Deactivated
VRID	1 (1~255)
Priority	100 (1~254)
Preempt Mode	● Activated ○ Deactivated
VRIP	192.168.1.253
Advertisement Period	1 (1~2147483647)

VRRP: Click to activate the feature.

VRID: Virtual Router Identifier, range from 1-255 (decimal). A master or backup router running the VRRP protocol may participate in one VRID instance.

Priority: Specifies the sending VRRP router's priority for the virtual router. Higher values equal higher priority. The priority value for the VRRP router that owns the IP address associated with the virtual router MUST be 255. VRRP routers backing up a virtual router MUST use priority values between 1 and 254. The default priority value for VRRP routers backing up a virtual router is 100. The priority value zero (0) has special meaning indicating that the current Master has stopped participating in VRRP. This is used to trigger Backup routers to quickly transition to Master without having to wait for the current Master to timeout.

Preempt Mode: When preempt mode is activated, a backup router always takes over the responsibility of the master router. When deactivated, the lower priority backup is left in the master state.

VRIP: An IP address which is associated with the virtual router.

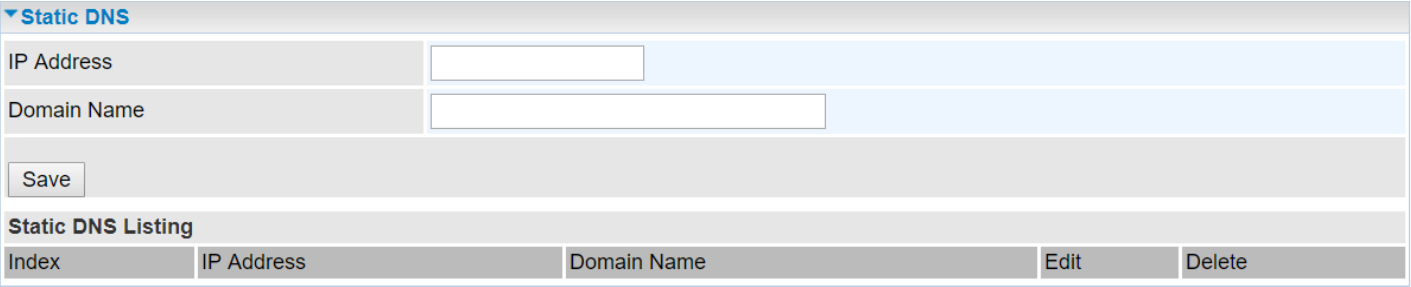
Advertisement period: Indicates the time interval in seconds between advertisements. Default in 1 second.

Click **Save** to apply settings.

Static DNS

The Domain Name System (DNS) is a hierarchical naming system built on a distributed database for computers, services, or any resource connected to the Internet or a private network associates with various information with domain names assigned to each of the participating entities. Most importantly, it translates domain names meaningful to humans into the numerical identifiers associated with networking equipment for locating and addressing these devices worldwide.

An often-used analogy to explain the Domain Name System is that it serves as the phone book for the Internet by translating human-friendly computer hostnames into IP addresses. For example, the domain name www.example.com can be translated into the addresses 192.0.32.10 (IPv4).



Static DNS

IP Address	
Domain Name	

Static DNS Listing

Index	IP Address	Domain Name	Edit	Delete

IP Address: The IP address you are going to give a specific domain name.

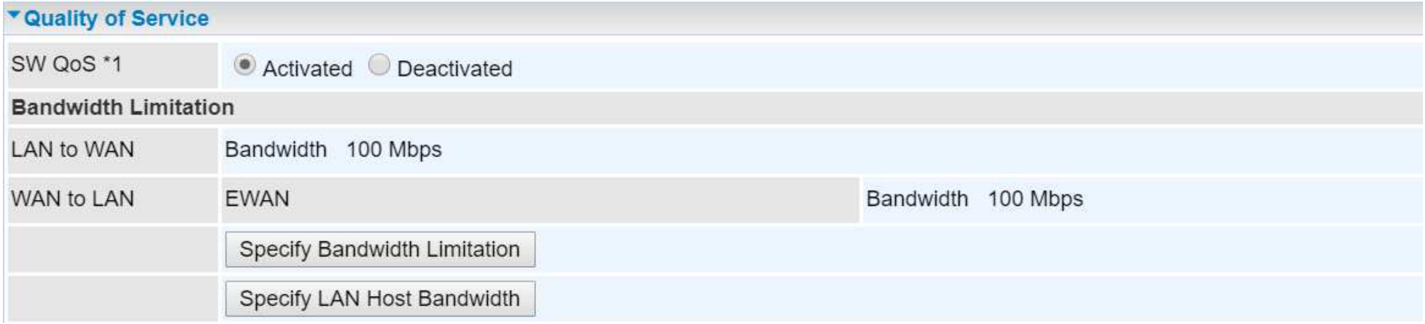
Domain Name: The friendly domain name for the IP address.

Click **Save** to apply settings.

QoS

QoS helps you control the upload traffic of each application from LAN (Ethernet) to WAN (Internet).

It facilitates you the features to control the quality of throughput for each application. This is useful when there on certain types of data you want giver higher priority to, such as voice data packets given higher priority than web data packets.



Quality of Service

SW QoS *1	● Activated ○ Deactivated	
Bandwidth Limitation		
LAN to WAN	Bandwidth 100 Mbps	
WAN to LAN	EWAN	Bandwidth 100 Mbps
	Specify Bandwidth Limitation	
	Specify LAN Host Bandwidth	

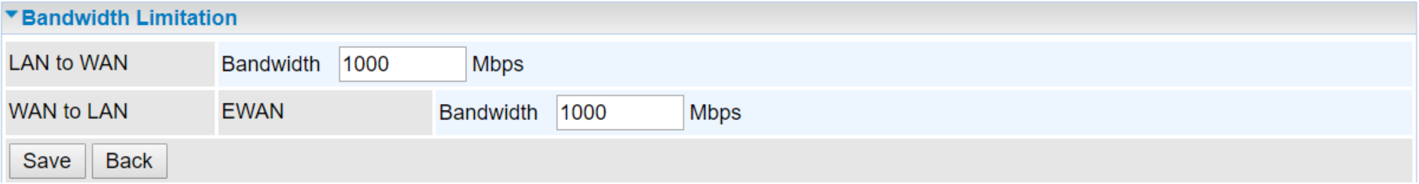
SW QoS: Select **Activate** to enable the QoS

LAN to WAN (Bandwidth): You want to control the traffic from local network to the outside (Upstream). You can assign the priority for the application or you can limit the rate of the application.

Example: you have a FTP server inside the local network, and you want to have a limited control by the QoS policy and so you need to add a policy with LAN to WAN direction setting.

WAN to LAN (Bandwidth): Control traffic from WAN to LAN (Downstream).

Click **Bandwidth Save** to save settings.



Bandwidth Limitation

LAN to WAN	Bandwidth 1000 Mbps		
WAN to LAN	EWAN	Bandwidth	1000 Mbps
Save Back			

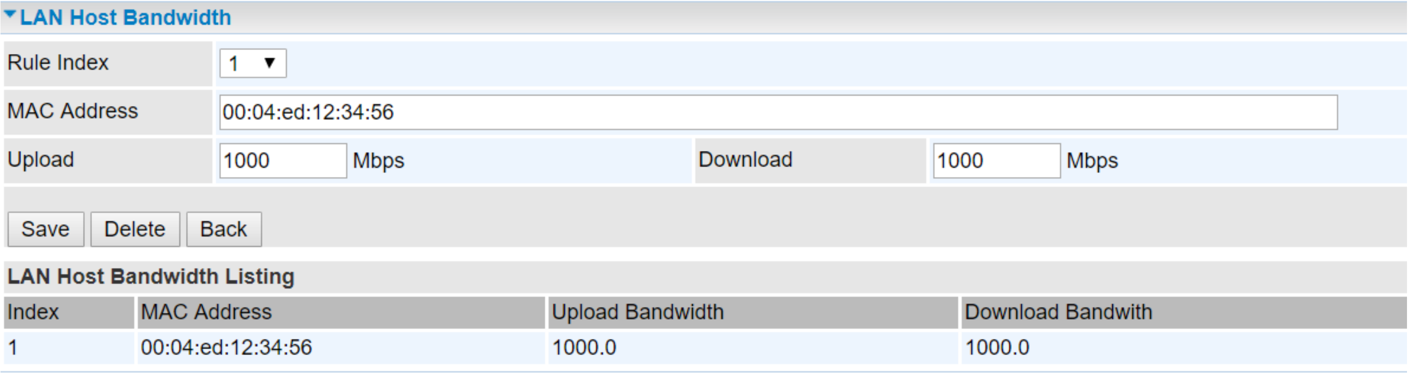
Specify LAN Host Bandwidth: Allow specific LAN device(s) to skip the bandwidth control.

Index: The rule indicator (1-32) for identifying each host device.

MAC Address: Enter the host's MAC address. For example: 00:04:ed:12:34:56

Upload / Download (Bandwidth): Enter maximum available upload and download bandwidth for the specific device.

Click Save to apply settings.



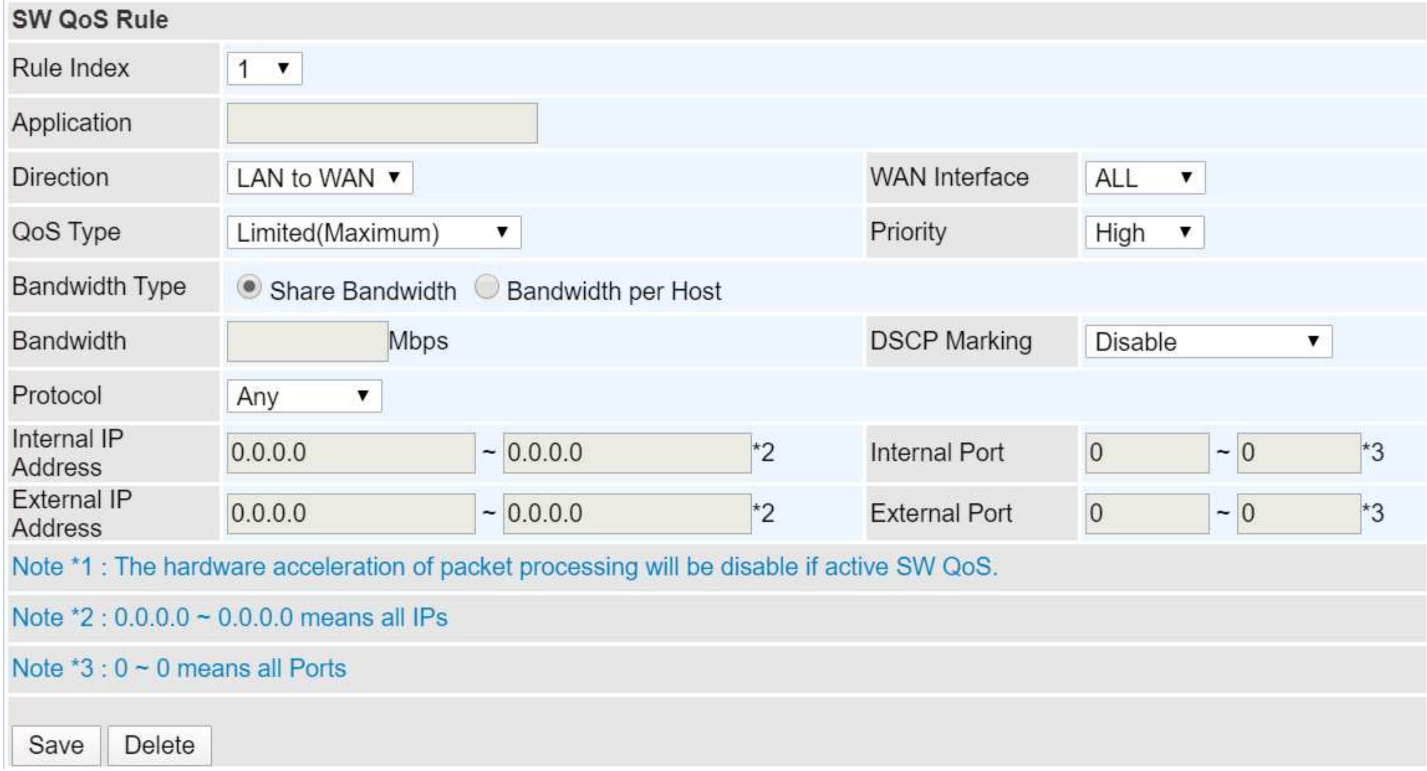
▾LAN Host Bandwidth

Rule Index	1 ▾		
MAC Address	00:04:ed:12:34:56		
Upload	1000 Mbps	Download	1000 Mbps

LAN Host Bandwidth Listing

Index	MAC Address	Upload Bandwidth	Download Bandwith
1	00:04:ed:12:34:56	1000.0	1000.0

SW QoS Rule



SW QoS Rule

Rule Index	1 ▾		
Application			
Direction	LAN to WAN ▾	WAN Interface	ALL ▾
QoS Type	Limited(Maximum) ▾	Priority	High ▾
Bandwidth Type	● Share Bandwidth ○ Bandwidth per Host		
Bandwidth	Mbps	DSCP Marking	Disable ▾
Protocol	Any ▾		
Internal IP Address	0.0.0.0 ~ 0.0.0.0 *2	Internal Port	0 ~ 0 *3
External IP Address	0.0.0.0 ~ 0.0.0.0 *2	External Port	0 ~ 0 *3

Note *1 : The hardware acceleration of packet processing will be disable if active SW QoS.

Note *2 : 0.0.0.0 ~ 0.0.0.0 means all IPs

Note *3 : 0 ~ 0 means all Ports

Rule Index: Index marking for each rule up to maximum of 16.

- **WAN Interface:** Select a WAN interface connection to allow external access to your internal network.
- **Application:** Assign a name that identifies the new QoS application rule. Select from the list box for quick setup.

Direction: Select the direction mode of the QoS application

- **Protocol:** Select a protocol from the drop-down list
- **DSCP Marking:** Differentiated Services Code Point (DSCP), it is the first 6 bits in the ToS byte. DSCP Marking allows users to classify the traffic of the application to be executed according to the DSCP value.

Rate Type: Choose ***Limited*** (Maximum) or ***Guaranteed*** (Minimum) to specify the date rate is allowed for this policy.

- **Rate:** Specify the date rate in Kbps.
- **Priority:** Set the priority given to each policy/application. Specify the priority for the use of bandwidth. You can specify which application can have higher priority to acquire the bandwidth.

Its default setting is set to High. You may adjust this setting to fit your policy / application.

Internal IP Address: The IP address values for Local LAN devices you want to give control.

- **Internal Port:** The Port number on the LAN side, it is used to identify an application.

External IP Address: The IP address on remote / WAN side.

- **External Port:** The Port number on the remote / WAN side.

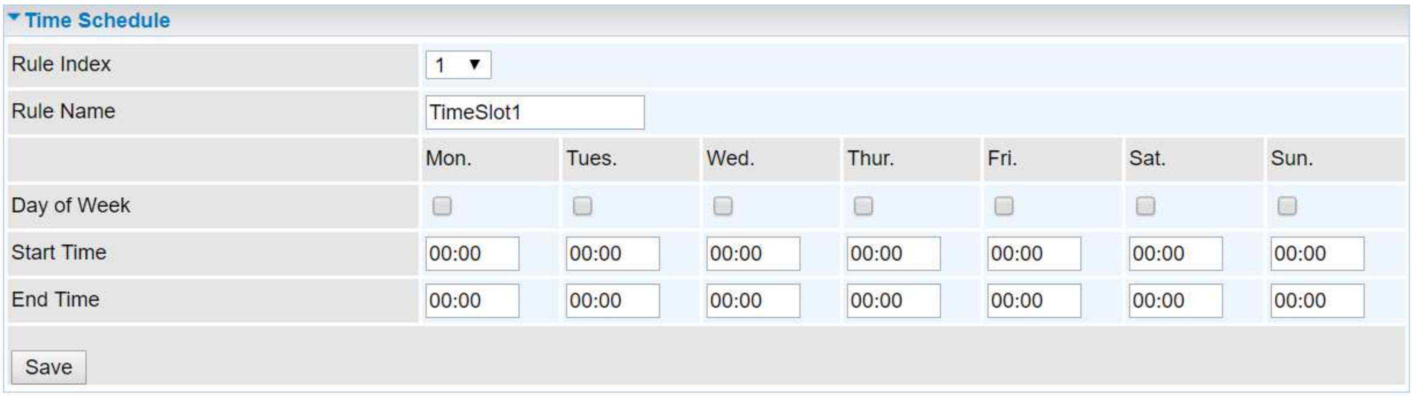
Click **Save** to apply settings.

To Remove a Policy: Simply select the Index then hit the **Delete** button to remove from the list.

Time Schedule

The Time Schedule supports up to **16** timeslots which helps you to manage your Internet connection. In each time profile, you may schedule specific day(s) i.e. Monday through Sunday to restrict or allowing the usage of the Internet by users or applications.

This Time Schedule correlates closely with router's time, since router does not have a real time clock on board; it uses the Simple Network Time Protocol (SNTP) to get the current time from an SNTP server from the Internet.



▾Time Schedule

Rule Index	1 ▼						
Rule Name	TimeSlot1						
	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
Day of Week	□	□	□	□	□	□	□
Start Time	00:00	00:00	00:00	00:00	00:00	00:00	00:00
End Time	00:00	00:00	00:00	00:00	00:00	00:00	00:00

Time Index: The rule indicator (1-16) for identifying each timeslot.

Name: User-defined identification for each time period.

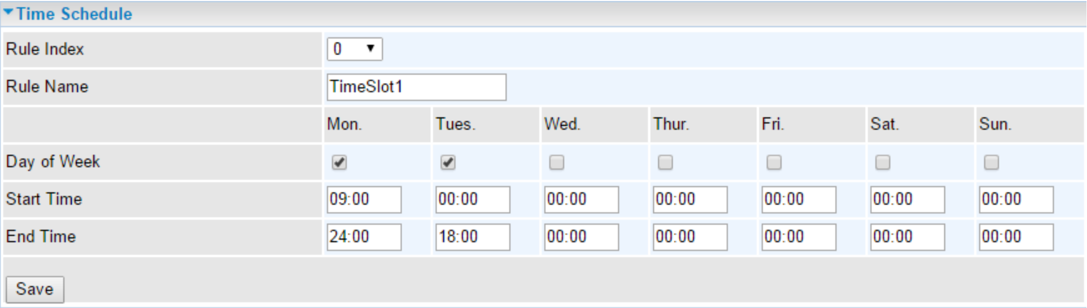
Day of Week: Mon. to Sun. Specify the time interval for each timeslot from "Day of Week".

Start Time: The starting point of the interval for the timeslot, anytime in 00:00 – 24:00.

End Time: The ending point of the interval for the timeslot, anytime in 00:00 – 24:00.

Click **Save** to apply your settings.

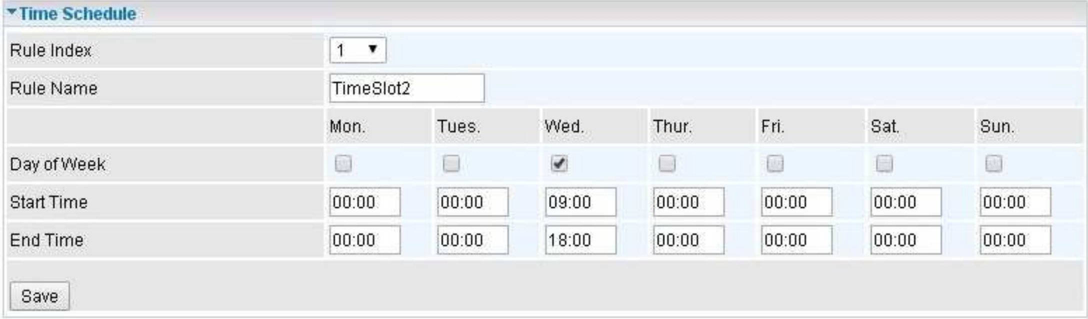
Example, you can add a timeslot named "TimeSlot1" which features a period from 9:00 of Monday to 18:00 of Tuesday.



▾Time Schedule

Rule Index	0 ▼						
Rule Name	TimeSlot1						
	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
Day of Week	☑	☑	□	□	□	□	□
Start Time	09:00	00:00	00:00	00:00	00:00	00:00	00:00
End Time	24:00	18:00	00:00	00:00	00:00	00:00	00:00

Another TimeSlot2

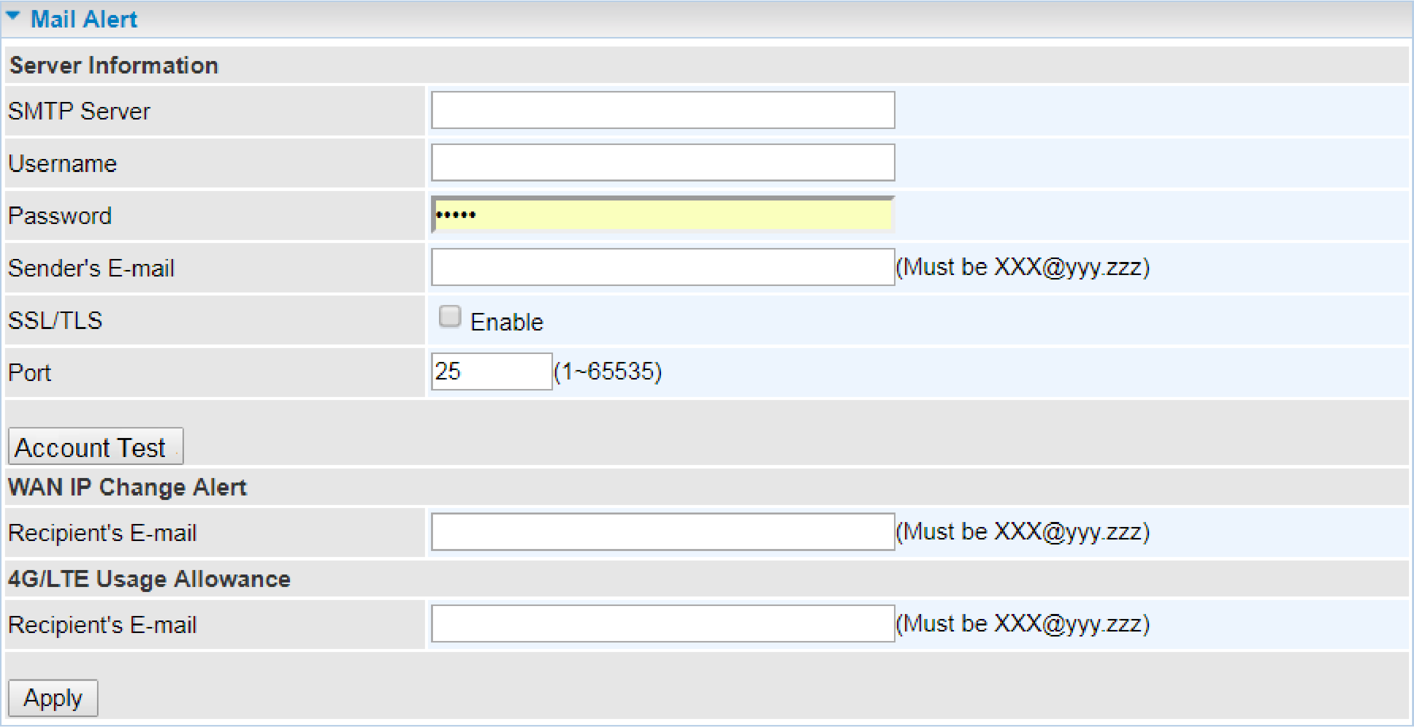


▾Time Schedule

Rule Index	1 ▼						
Rule Name	TimeSlot2						
	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
Day of Week	□	□	☑	□	□	□	□
Start Time	00:00	00:00	09:00	00:00	00:00	00:00	00:00
End Time	00:00	00:00	18:00	00:00	00:00	00:00	00:00

Mail Alert

Mail alert is designed to keep system administrator or other relevant personnel alerted of any unexpected events that might have occurred to the network computers or server for monitoring efficiency. With this alert system, appropriate solutions may be tackled to fix problems that may have arisen so that the server can be properly maintained.



▾ Mail Alert

Server Information	
SMTP Server	
Username	
Password	•••••
Sender's E-mail	(Must be XXX@yyy.zzz)
SSL/TLS	□ Enable
Port	25 (1~65535)
Account Test	
WAN IP Change Alert	
Recipient's E-mail	(Must be XXX@yyy.zzz)
4G/LTE Usage Allowance	
Recipient's E-mail	(Must be XXX@yyy.zzz)
Apply	

Server Information

SMTP Server: Enter the SMTP server that you would like to use for sending emails.

Username: Enter the username of your email account to be used by the SMTP server.

Password: Enter the password of your email account.

Sender's Email: Enter your email address.

SSL/TLS: Check to whether to enable SSL encryption feature.

Port: the port, default is 25.

Account Test: Click the button to test the connectivity and feasibility to your sender's e-mail.

WAN IP Change Alert

Recipient's Email (WAN IP Change Alert): Enter a valid e-mail address to receive an alert message when WAN IP change has been detected.

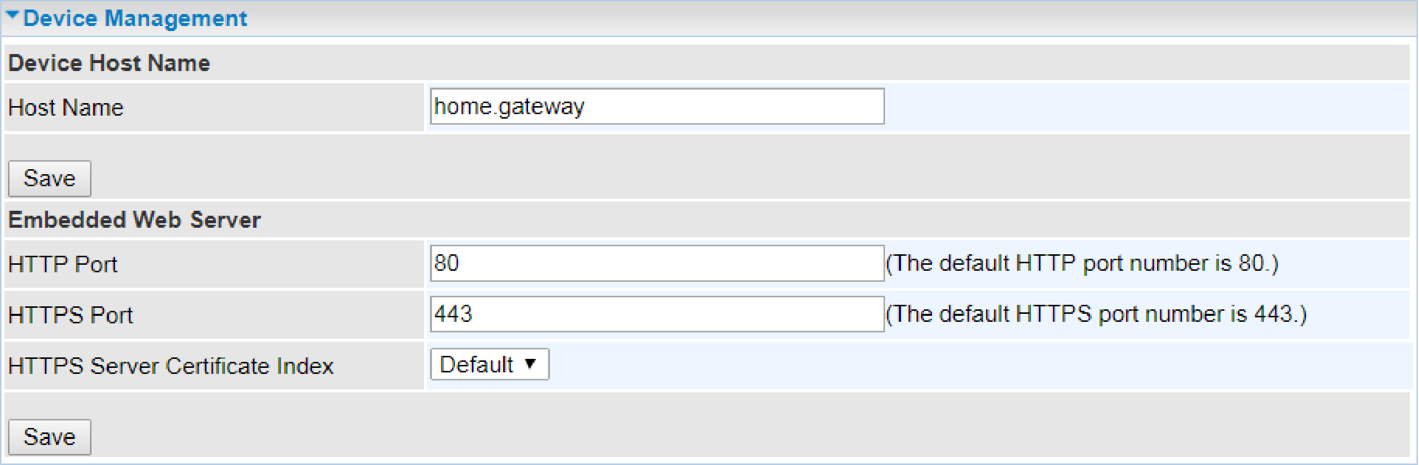
Recipient's Email (4G/LTE Usage Allowance): Enter a valid e-mail address to receive an alert message when the 4G/LTE over Usage Allowance occurs.

Click **Apply** button to save settings.

Access Management

Access Management provides advanced users / administrators to grant accessibilities to authorized users or service systems.   Features including Device Management, SNMP, Syslog, Universal Plug & Play, Dynamic DNS, Access Control, Packet Filter, CWMP (TR-069), Parental Control and BECentral Management.

Device Management



Device Host Name

Host Name	home.gateway

Embedded Web Server

HTTP Port	80 (The default HTTP port number is 80.)
HTTPS Port	443 (The default HTTPS port number is 443.)
HTTPS Server Certificate Index	Default ▾

Device Host Name

Host Name: Enter the host name of the router. Default is **home.gateway**

Embedded Web Server

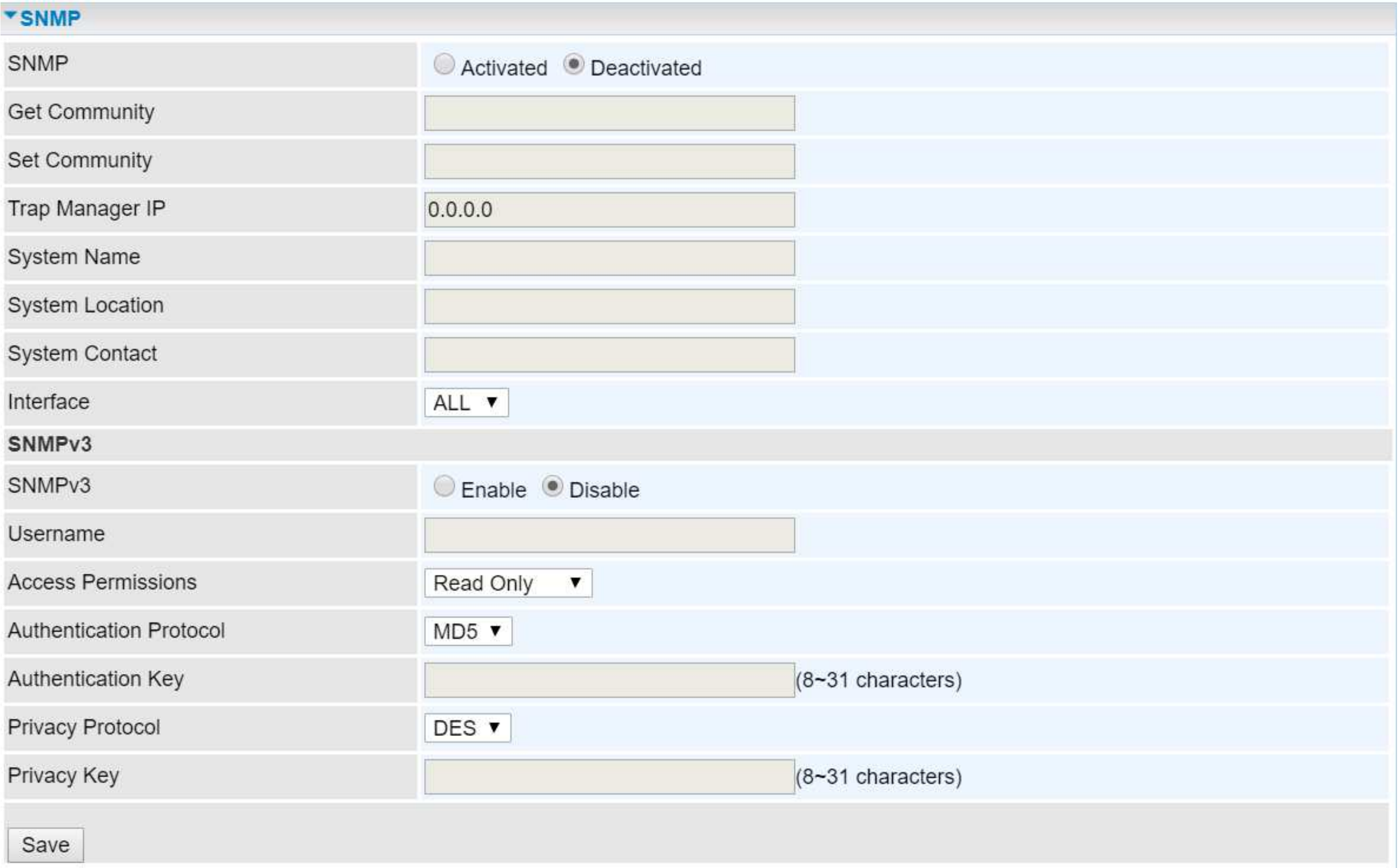
HTTP Port: It is the embedded web server (Web GUI) accessing port, default is **80**. It can be changed other port other than port 80, e.g. port 8080.

HTTPS Port: Similar to HTTP which is an unencrypted communication using port 80. HTTPS is encrypted by SSL using port 443 instead.

Click **Save** to apply settings.

SNMP

Simple Network Management Protocol (SNMP) is a protocol used for exchanging management information between network devices. The BEC 7000 R28-G serves as a SNMP agent that allows a manager station to manage and monitor the router through the network.



▾SNMP

SNMP	○ Activated ● Deactivated
Get Community	
Set Community	
Trap Manager IP	0.0.0.0
System Name	
System Location	
System Contact	
Interface	ALL ▾
SNMPv3	
SNMPv3	○ Enable ● Disable
Username	
Access Permissions	Read Only ▾
Authentication Protocol	MD5 ▾
Authentication Key	(8~31 characters)
Privacy Protocol	DES ▾
Privacy Key	(8~31 characters)

SNMP: Activate to enable SNMP.

Get Community: Type the Get Community, which is the password for the incoming Get-and-Get Next requests from the management station.

Set Community: Type the Set Community, which is the password for incoming Set requests from the management station.

Trap Manager IP: Enter the IP of the server receiving the trap message (when some exception occurs) sent by this SNMP agent.

System Name / Location / Contact: String descriptions of the SNMP agent.

Interface: Select the access interface. Choices are **LAN** or **ALL** (Both LAN and WAN).

SNMPv3

SNMPv3: Enable to activate the SNMPv3.

Username: Enter the name allowed to access the SNMP agent.

Access Permissions: Set the access permissions for the user; RO--read only and RW--read and writer.

Authentication Protocol: Select the authentication protocol, MD5 and SHA. SNMP agent can communicate with the manager station through authentication and encryption to secure the message exchange. Set the authentication and encryption information here and below.

Authentication Key: Set the authentication key, 8-31 characters.

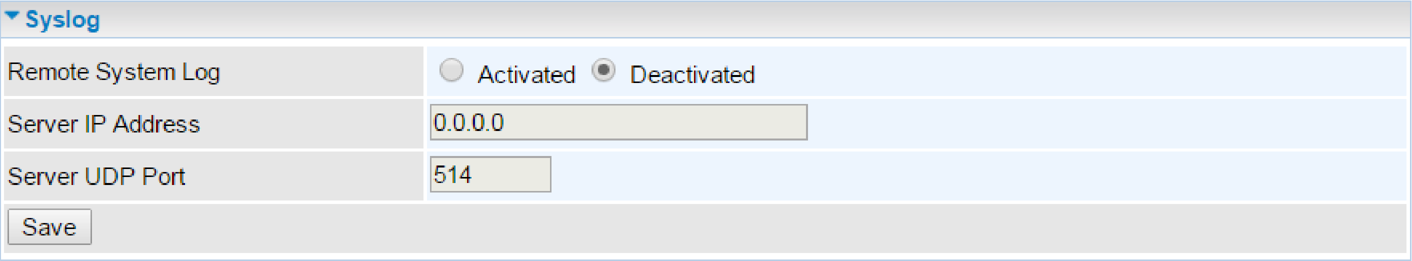
Privacy Protocol: Select the privacy mode, DES and AES.

Privacy Key: Set the privacy key, 8-31 characters.

Click **Save** to apply settings.

Syslog

Use the Syslog to collect system event information to a remote log server.



Syslog

Remote System Log	○ Activated ● Deactivated
Server IP Address	0.0.0.0
Server UDP Port	514

Remote System Log: Select **Activated** to enable this feature

Server IP Address: Assign the remote log server IP address.

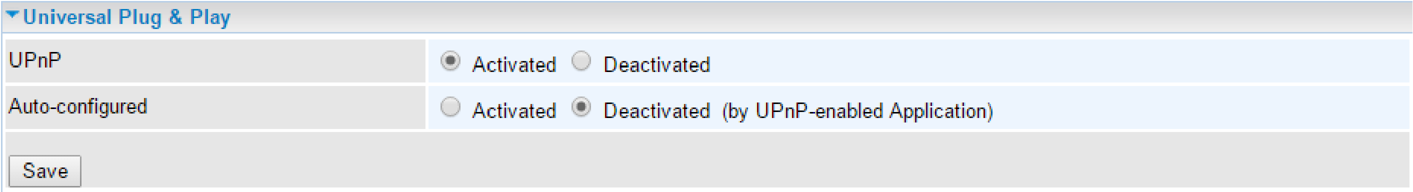
Server UDP Port: Assign the remote log server port, 514 is commonly used.

Click **Save** to apply settings.

Universal Plug & Play

UPnP offers peer-to-peer network connectivity for PCs and other network devices, along with control and data transfer between devices. UPnP offers many advantages for users running NAT routers through UPnP NAT Traversal, and on supported systems makes tasks such as port forwarding much easier by letting the application control the required settings, removing the need for the user to control advanced configuration of their device.

Both the user’s Operating System and the relevant application must support UPnP in addition to the router.



▾Universal Plug & Play

UPnP	● Activated ○ Deactivated
Auto-configured	○ Activated ● Deactivated (by UPnP-enabled Application)

UPnP: Select this checkbox to activate UPnP. Be aware that anyone could use an UPnP application to open the web configuration’s login screen without entering the BEC 7000 R28-G's IP address

Auto-configured: Select this check box to allow UPnP-enabled applications to automatically configure the BEC 7000 R28-G so that they can communicate through the BEC 7000 R28-G, for example by using NAT traversal, UPnP applications automatically reserve a NAT forwarding port in order to communicate with another UPnP enabled device; this eliminates the need to manually configure port forwarding for the UPnP enabled application.

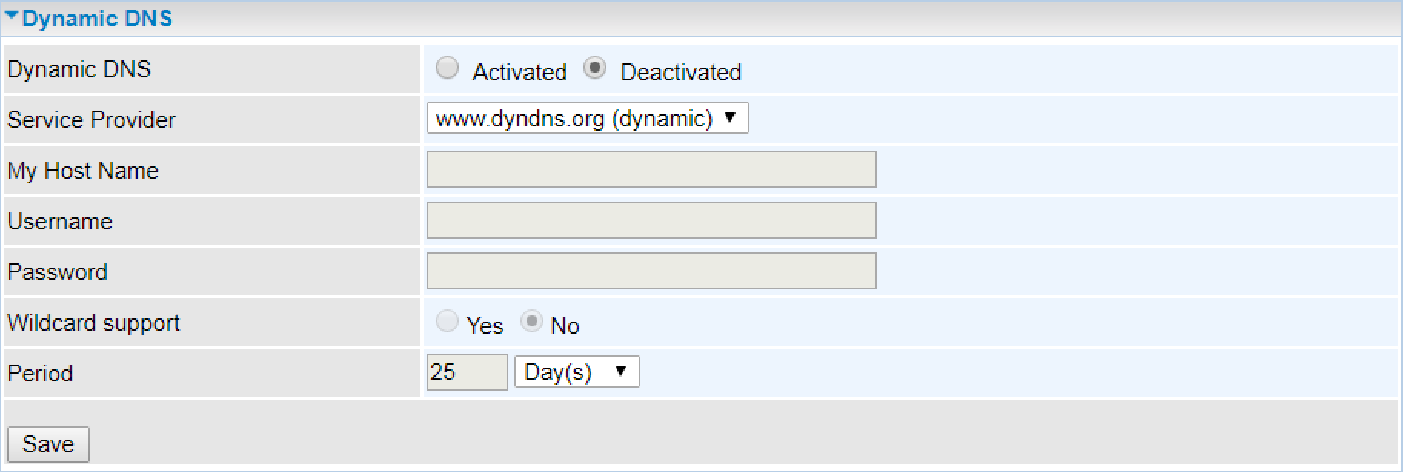
Click **Save** to apply settings.

Dynamic DNS (DDNS)

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

Here users can register different WAN interfaces with different DNS Providers.

If you do not have a DDNS account, please choose a DDNS Service Provider from the list then go to their website to create an account first.



Dynamic DNS

Dynamic DNS	○ Activated ● Deactivated
Service Provider	www.dyndns.org (dynamic) ▼
My Host Name	
Username	
Password	
Wildcard support	○ Yes ● No
Period	25 Day(s) ▼

Dynamic DNS: Select this check box to activate Dynamic DNS.

Service Provider: Select from drop-down menu for the appropriate service provider, for example: www.dyndns.org.

My Host Name: Type the domain name assigned to your BEC 7000 R28-G by your Dynamic DNS provider.

Username / Password: Enter the username and password of the account you created with this service provider.

Wildcard support: Select this check box to enable DYNDNS Wildcard.

Period: Set the time period on how often the BEC 7000 R28-G will update the DDNS server with your current external IP address.

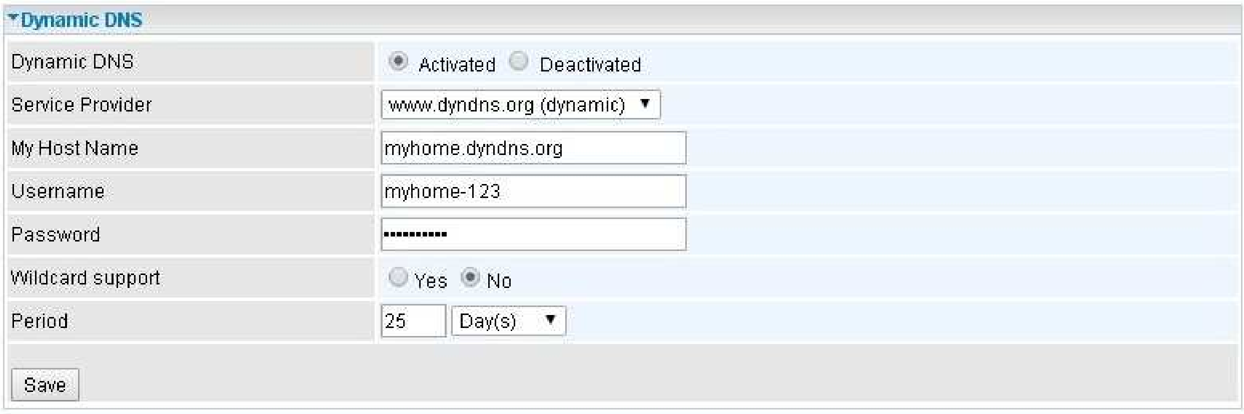
.

Example: How to register a DDNS account

If you do not have an account with Dynamic DNS, please go to www.dyndns.org to register an account first.

User ***test1*** register a Dynamic Domain Names in DDNS provider **http://www.dyndns.org/** .

DDNS: www.hometest.com using username/password test/test



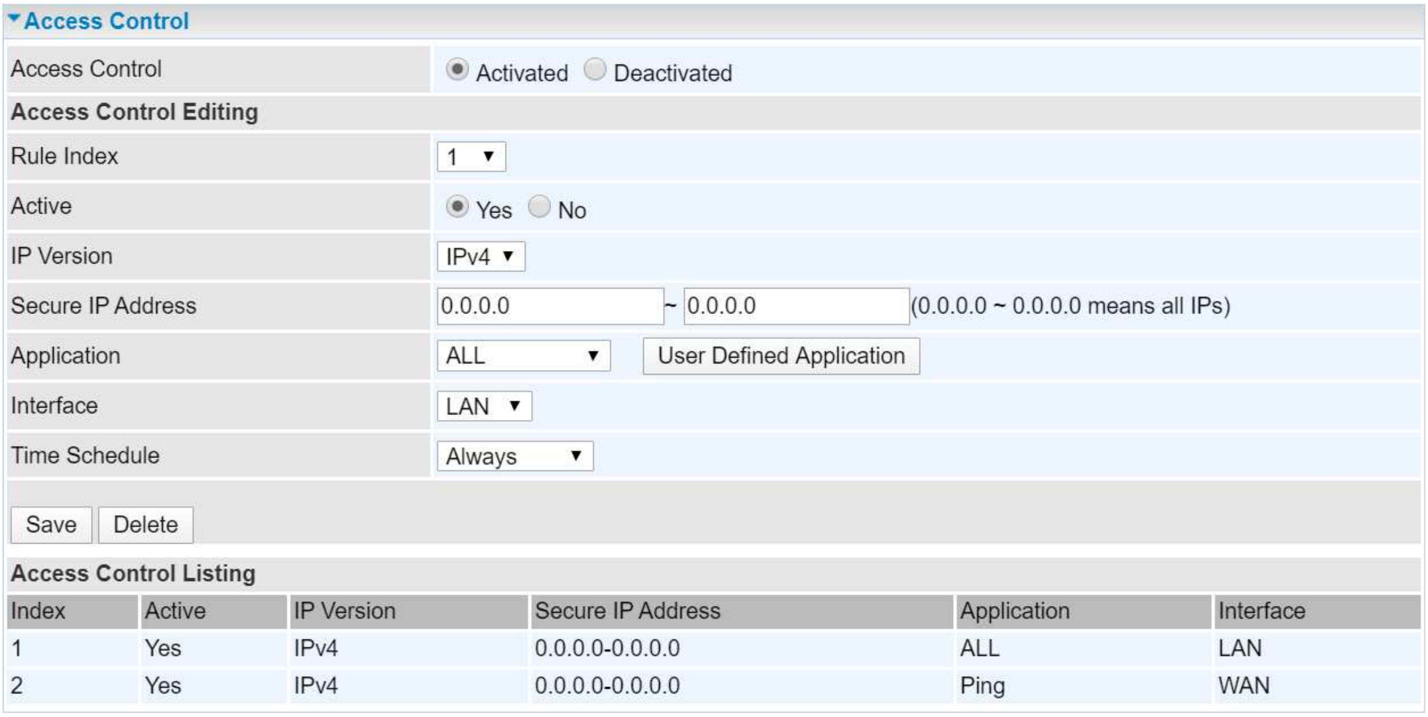
Dynamic DNS

Dynamic DNS	● Activated ○ Deactivated
Service Provider	www.dyndns.org (dynamic) ▼
My Host Name	myhome.dyndns.org
Username	myhome-123
Password	•••••••••••
Wildcard support	○ Yes ● No
Period	25 Day(s) ▼

Access Control

Access Control Listing allows you to determine which services/protocols can access your BEC 7000 R28-G interface from which computers. It is a management tool aimed to allow IPs (set in secure IP address) to access specified embedded applications (Web, etc., user can set) through some specified interface (LAN, WAN or both). User can have an elaborate understanding in the examples below.

The maximum number of entries is **16**.



Access Control

Access Control	● Activated ○ Deactivated
Access Control Editing	
Rule Index	1 ▾
Active	● Yes ○ No
IP Version	IPv4 ▾
Secure IP Address	0.0.0.0 ~ 0.0.0.0 (0.0.0.0 ~ 0.0.0.0 means all IPs)
Application	ALL ▾ User Defined Application
Interface	LAN ▾
Time Schedule	Always ▾

Access Control Listing

Index	Active	IP Version	Secure IP Address	Application	Interface
1	Yes	IPv4	0.0.0.0-0.0.0.0	ALL	LAN
2	Yes	IPv4	0.0.0.0-0.0.0.0	Ping	WAN

Access Control: Select whether to make Access Control function available.

Rule Index: The numeric rule indicator.

Active: Yes to activate the rule.

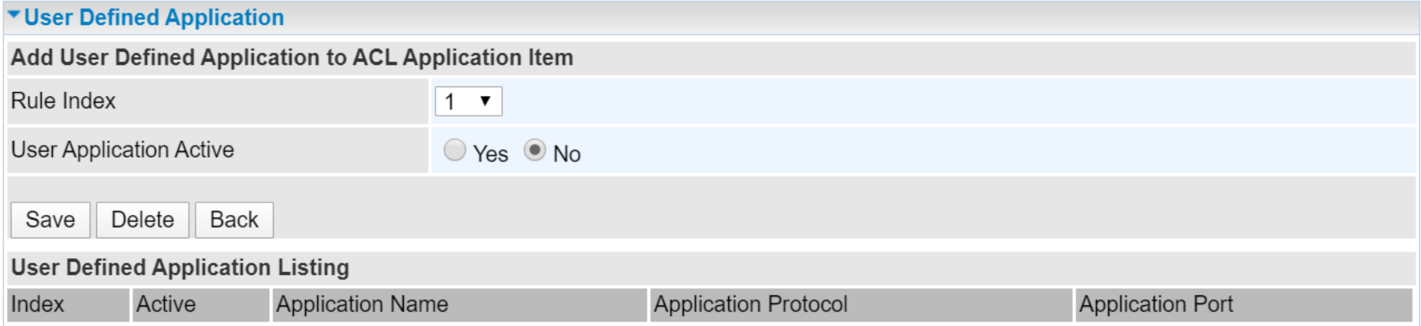
Secure IP Address: The default 0.0.0.0 allows any client to use this service to manage the BEC 7000 R28-G. Type an IP address range to restrict access to the client(s) without a matching IP address.

Application: Choose a service that you want to all access to all the secure IP clients. The drop-down menu lists all the commonly used applications.

Interface: Select the access interface. Choices are **LAN**, **WAN** and **ALL**.

Click **Save** to apply settings.

User Defined Application



User Defined Application

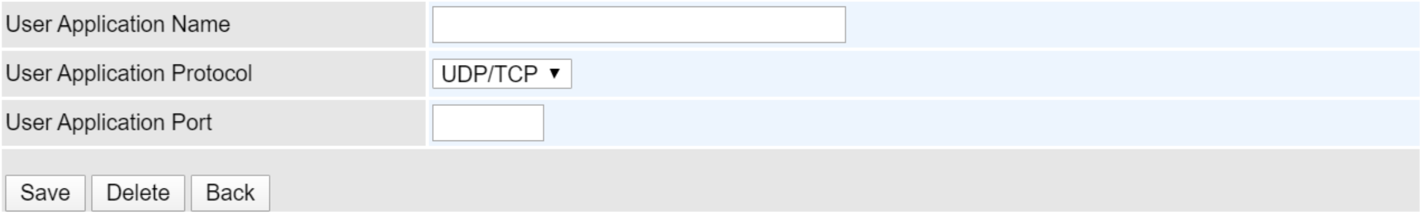
Add User Defined Application to ACL Application Item	
Rule Index	1 ▾
User Application Active	○ Yes ● No

User Defined Application Listing

Index	Active	Application Name	Application Protocol	Application Port

Rule Index: The numeric rule indicator.

User Application Active: Yes to add a new rule.



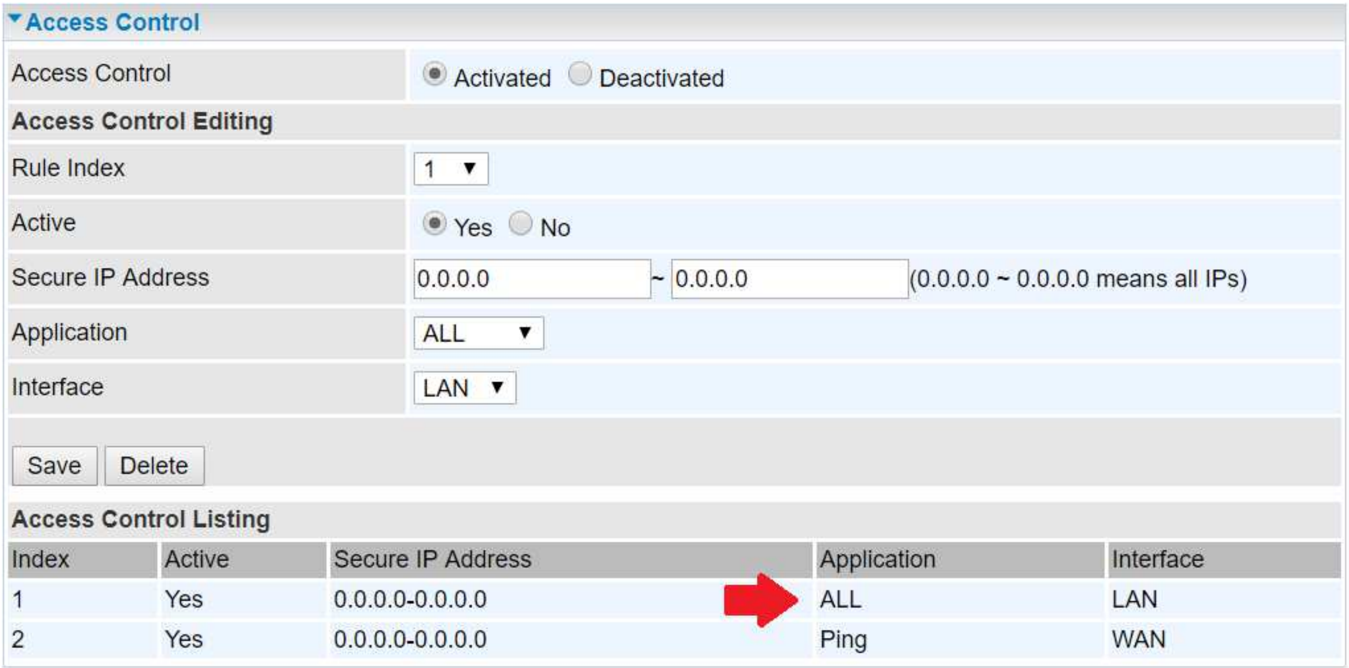
User Application Name	
User Application Protocol	UDP/TCP ▼
User Application Port	

User Application Name: A self-define name to identify the application.
User Application Protocol: Enter a protocol, TCP, UDP, UDP/TCP, to use for this application.
User Application Port: Enter the port number which defines the application.

Click **Save** to save the rule.

By default, the "Access Control" has **two default rules**.

Default Rule 1: (Index 1), a rule to allow only clients from LAN to have access to all embedded applications (Web, FTP, etc.). Under this situation, clients from WAN cannot access the router even from Ping.

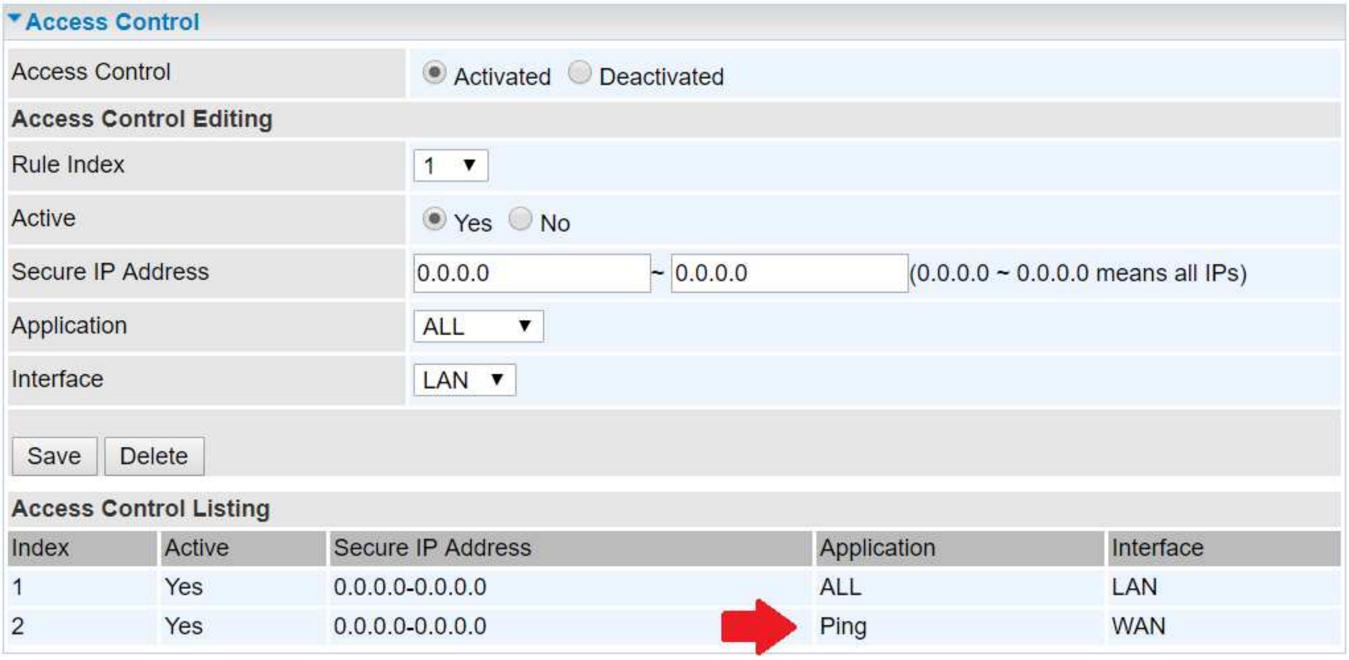


Access Control	● Activated ○ Deactivated
Access Control Editing	
Rule Index	1 ▼
Active	● Yes ○ No
Secure IP Address	0.0.0.0 ~ 0.0.0.0 (0.0.0.0 ~ 0.0.0.0 means all IPs)
Application	ALL ▼
Interface	LAN ▼

Access Control Listing

Index	Active	Secure IP Address	Application	Interface
1	Yes	0.0.0.0-0.0.0.0	ALL	LAN
2	Yes	0.0.0.0-0.0.0.0	Ping	WAN

Default Rule 2: (Index 2), an ACL rule to open Ping to WAN side.



Access Control

Access Control	● Activated ○ Deactivated
Access Control Editing	
Rule Index	1
Active	● Yes ○ No
Secure IP Address	0.0.0.0 ~ 0.0.0.0 (0.0.0.0 ~ 0.0.0.0 means all IPs)
Application	ALL
Interface	LAN

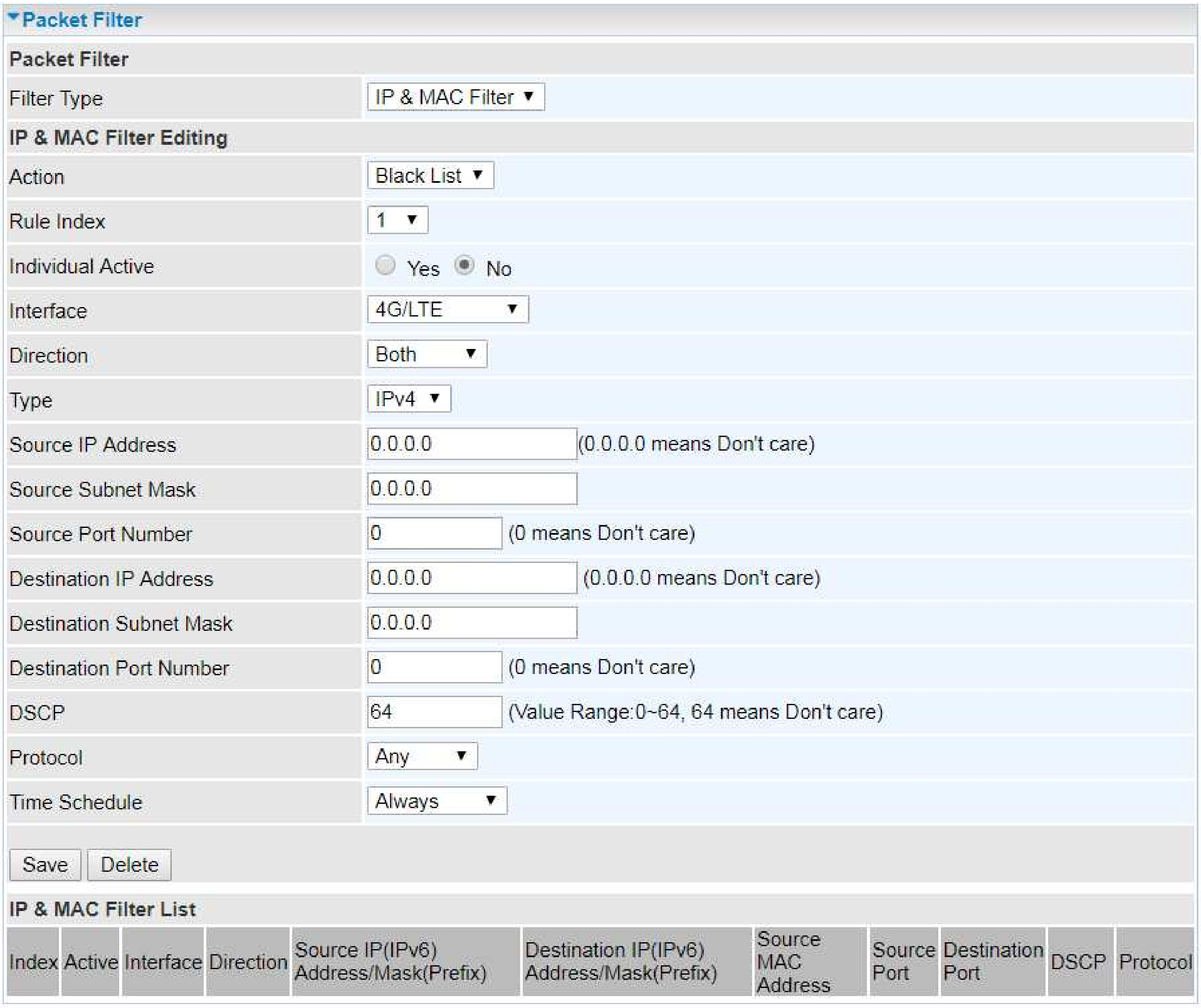
Access Control Listing

Index	Active	Secure IP Address	Application	Interface
1	Yes	0.0.0.0-0.0.0.0	ALL	LAN
2	Yes	0.0.0.0-0.0.0.0	Ping	WAN

Packet Filter

You can filter the packages by MAC address, IP address, Protocol, Port number and Application or URL.

❖ Packet Filter - IP & MAC Filter



▾Packet Filter

Packet Filter

Filter Type	IP & MAC Filter ▼

IP & MAC Filter Editing

Action	Black List ▼
Rule Index	1 ▼
Individual Active	○ Yes ● No
Interface	4G/LTE ▼
Direction	Both ▼
Type	IPv4 ▼
Source IP Address	0.0.0.0 (0.0.0.0 means Don't care)
Source Subnet Mask	0.0.0.0
Source Port Number	0 (0 means Don't care)
Destination IP Address	0.0.0.0 (0.0.0.0 means Don't care)
Destination Subnet Mask	0.0.0.0
Destination Port Number	0 (0 means Don't care)
DSCP	64 (Value Range:0~64, 64 means Don't care)
Protocol	Any ▼
Time Schedule	Always ▼

Save Delete

IP & MAC Filter List

Index	Active	Interface	Direction	Source IP(IPv6) Address/Mask(Prefix)	Destination IP(IPv6) Address/Mask(Prefix)	Source MAC Address	Source Port	Destination Port	DSCP	Protocol

IP & MAC Filter Editing

Rule Index: The indication of the rule number.

Individual Active: Yes to enable the rule.

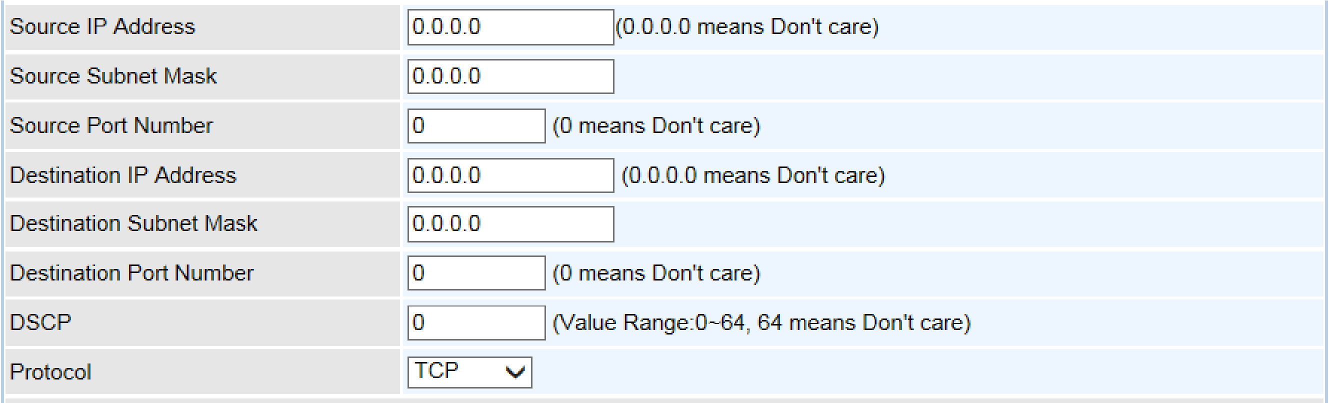
Action: This is how to deal with the packets matching the rule. Allow please select White List or Black selecting Blacklist.

Interface: Select to determine which interface the rule will be applied to.

Direction: Select to determine whether the rule applies to outgoing packets, incoming packets or packets of both directions.

Type: Choose type of field you want to specify to monitor. Select “IPv4” for IPv4 address, port number and protocol. Select “IPv6” for IPv6 address, port number and protocol. Select “MAC” for MAC address.

IPv4



Source IP Address	0.0.0.0 (0.0.0.0 means Don't care)
Source Subnet Mask	0.0.0.0
Source Port Number	0 (0 means Don't care)
Destination IP Address	0.0.0.0 (0.0.0.0 means Don't care)
Destination Subnet Mask	0.0.0.0
Destination Port Number	0 (0 means Don't care)
DSCP	0 (Value Range:0~64, 64 means Don't care)
Protocol	TCP

Source IP Address: The source IP address of packets to be monitored. 0.0.0.0 means “Don’t care”.

Source Subnet Mask: Enter the subnet mask of the source network.

Source Port Number: The source port number of packets to be monitored. 0 means “Don’t care”.

Destination IP Address: The destination IP address of packets to be monitored. 0.0.0.0 means “Don’t care”.

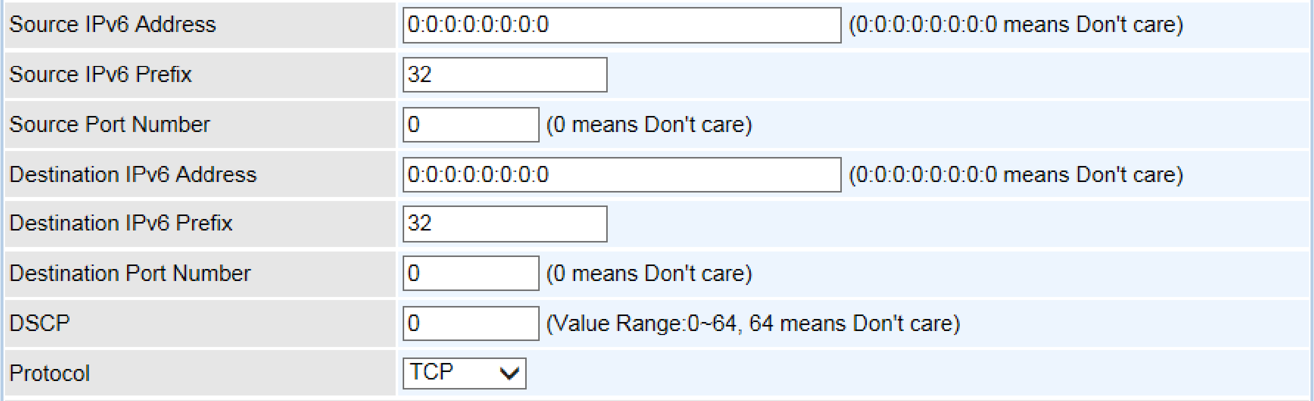
Destination Subnet Mask: Enter the subnet mask of the destination network.

Destination Port Number: This is the Port that defines the application. (E.g. HTTP is port 80.)

DSCP: DSCP: Differentiated Services Code Point, it is recommended that this option be configured by an advanced user or keep 0. (0 means Don’t care.)

Protocol: Specify the packet type (TCP, UDP, ICMP, and ICMPv6) that the rule applies to.

IPv6



Source IPv6 Address	0:0:0:0:0:0:0:0 (0:0:0:0:0:0:0:0 means Don't care)
Source IPv6 Prefix	32
Source Port Number	0 (0 means Don't care)
Destination IPv6 Address	0:0:0:0:0:0:0:0 (0:0:0:0:0:0:0:0 means Don't care)
Destination IPv6 Prefix	32
Destination Port Number	0 (0 means Don't care)
DSCP	0 (Value Range:0~64, 64 means Don't care)
Protocol	TCP

Source IP (IPv6) Address/ Prefix: The source IP address or range of packets to be monitored.

Source Port Number: The source port number of packets to be monitored.

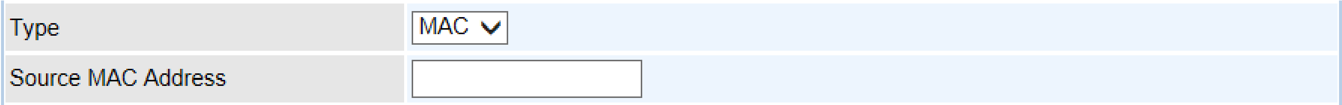
Destination IP (IPv6) Address/ Prefix: The destination subnet IP address.

Destination Port Number: This is the Port or Port Ranges that defines the application.

DSCP: show the set DSCP.

Protocol: It is the packet protocol type used by the application. Select either **TCP** or **UDP** or **ICMP or ICMPv6**

MAC



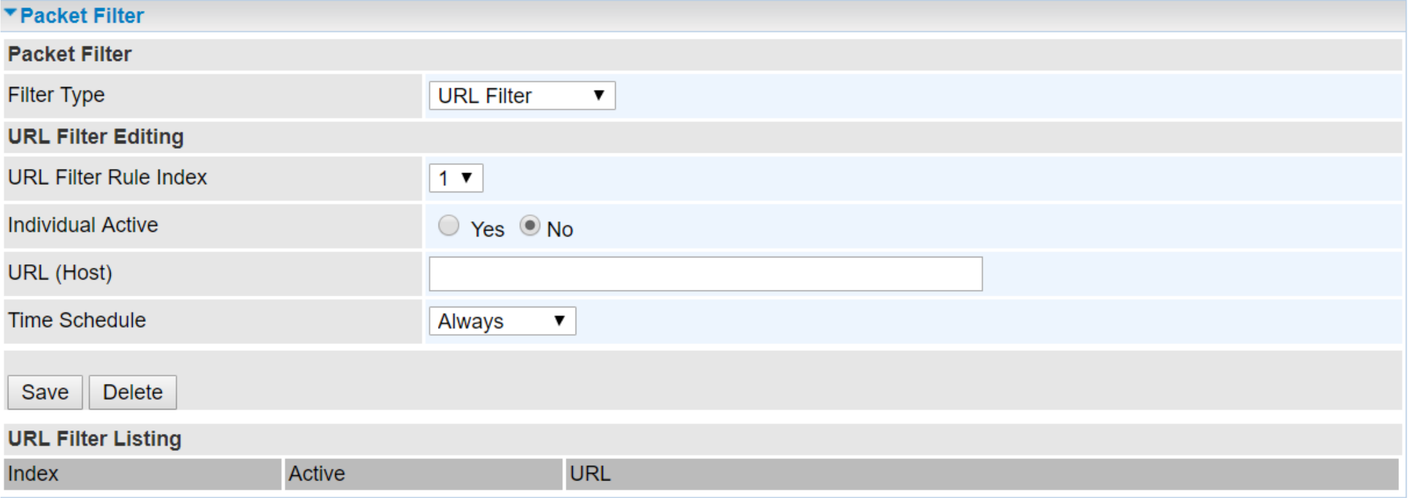
Type	MAC
Source MAC Address	

Source MAC Address: show the MAC address of the rule applied.

Time Schedule: Select a TimeSlot to activate the rule. Go to **Time Schedule** to configure a time control first.

Click **Save** to apply settings.

❖ Filter Type- URL Filter



Packet Filter	
Filter Type	URL Filter ▼
URL Filter Editing	
URL Filter Rule Index	1 ▼
Individual Active	○ Yes ● No
URL (Host)	
Time Schedule	Always ▼

URL Filter Listing

Index	Active	URL

URL Filter: Select **Activated** to enable URL Filter.

URL Filter Rule Index: The numeric rule indicator.

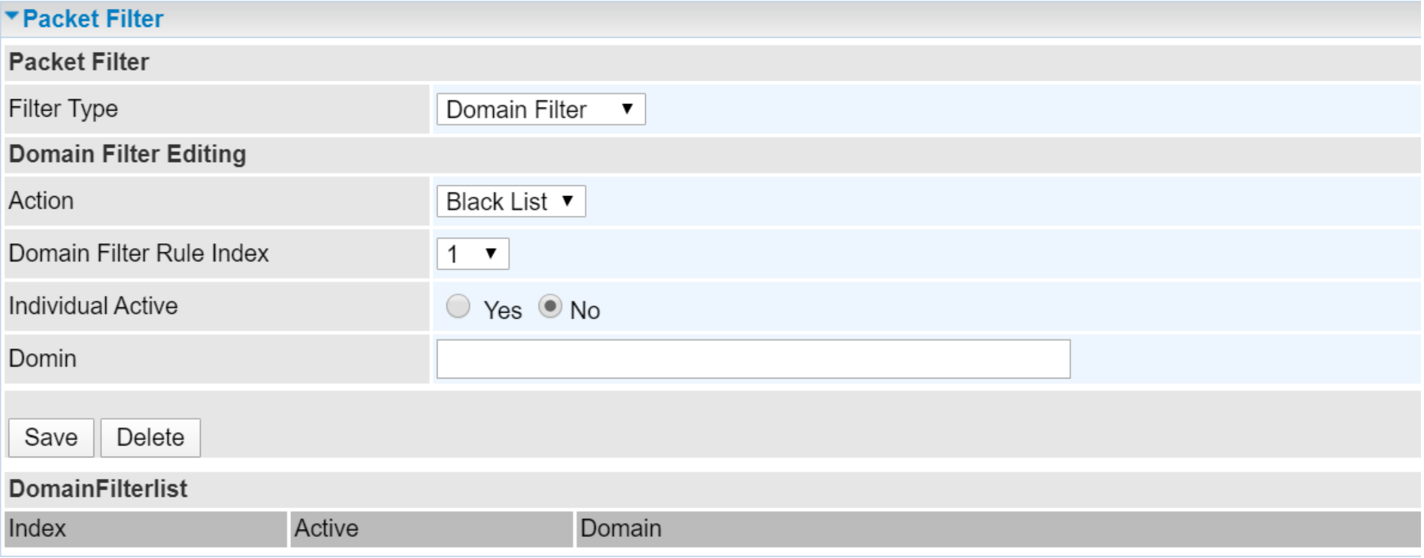
Individual Active: To give control to the specific URL access individually, for example, you want to prohibit access to www.yahoo.com, please first press Activated in “URL Filter” field, and also Yes in “Individual Active” field; if some time you want to allow access to this URL, you simply select No in individual active field. In a word, the command serves as a switch to the access of some specific URL with the filter on.

URL (Host): Specified URL which is prohibited from accessing.

Time Schedule: Select a TimeSlot to activate the rule. Go to **Time Schedule** to configure a time control first.

Click **Save** to apply settings.

Filter Type- URL Filter



▾ Packet Filter

Packet Filter	
Filter Type	Domain Filter ▼
Domain Filter Editing	
Action	Black List ▼
Domain Filter Rule Index	1 ▼
Individual Active	○ Yes ● No
Domin	

DomainFilterlist

Index	Active	Domain

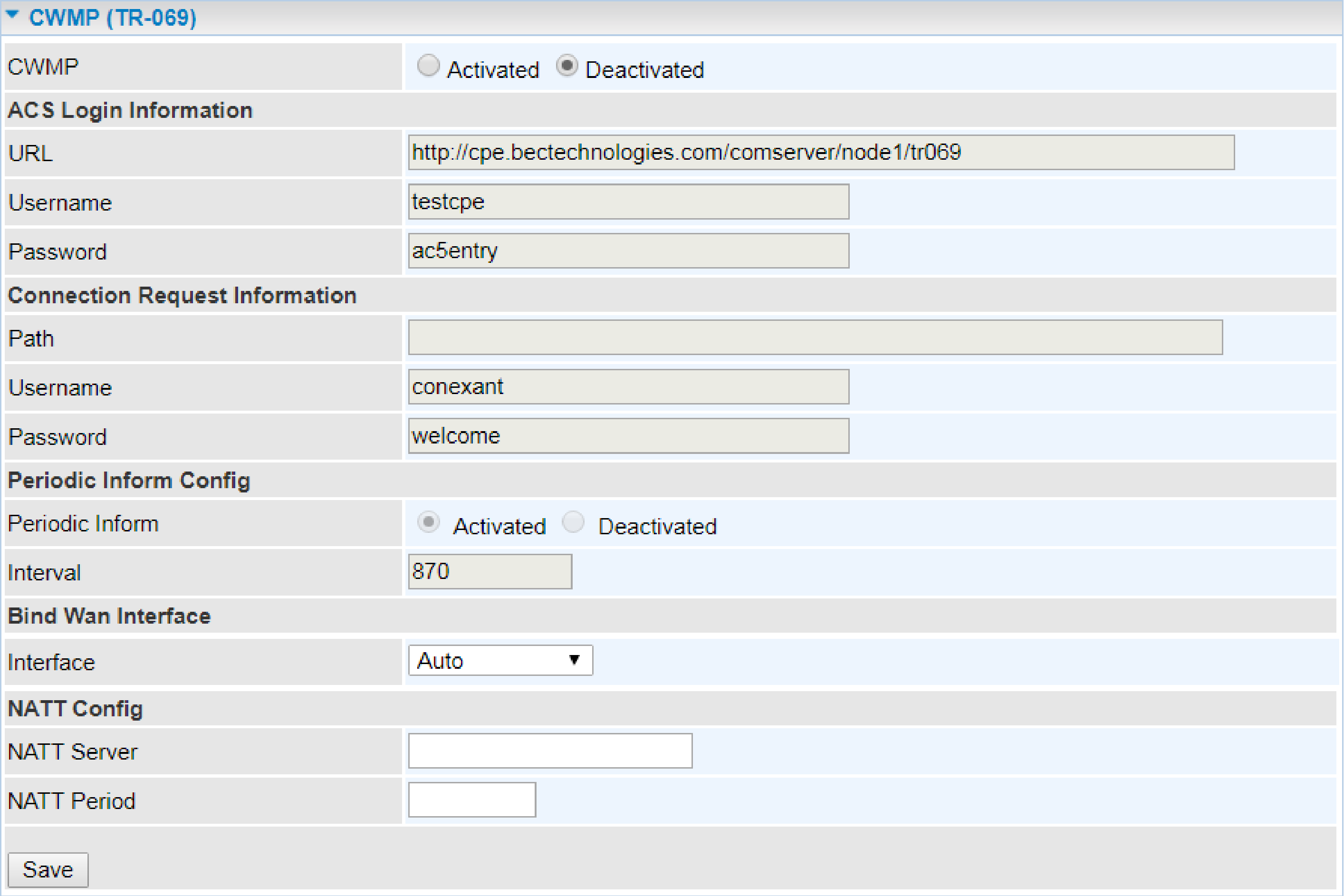
Action: This is how to deal with the packets matching the rule. Allow please select White List or Black selecting Blacklist.
Domain Filter Rule Index: The indication of the rule number.
Individual Active: Click **Yes** to enable this rule/policy.
Domain: Enter the domain name in the blank field to be allowed or prohibited.

Click **Save** to apply settings.

CWMP (TR-069)

CWMP, short for CPE WAN Management Protocol, also called TR069 is a Broadband Forum technical specification entitled CPE WAN Management Protocol (CWMP). It defines an application layer protocol for remote management of end-user devices. It defines an application layer protocol for remote management of end-user devices.

As a bidirectional SOAP/HTTP based protocol it can provides the communication between customer premises equipment (CPE) and Auto Configuration Server (ACS). It includes both a safe configuration and the control of other CPE management functions within an integrated framework. In the course of the booming broadband market, the number of different internet access possibilities grew as well (e.g. modems, routers, gateways, set-top box, VoIP-phones).At the same time the configuration of this equipment became more complicated –too complicated for end-users. For this reason, TR-069 was developed. It provides the possibility of auto configuration of the access types. Using TR-069 the terminals can get in contact with the Auto Configuration Servers (ACS) and establish the configuration automatically and let ACS configure CPE automatically.



▾ CWMP (TR-069)

CWMP	○ Activated ● Deactivated
ACS Login Information	
URL	http://cpe.bectechnologies.com/comserver/node1/tr069
Username	testcpe
Password	ac5entry
Connection Request Information	
Path	
Username	conexant
Password	welcome
Periodic Inform Config	
Periodic Inform	● Activated ○ Deactivated
Interval	870
Bind Wan Interface	
Interface	Auto ▼
NATT Config	
NATT Server	
NATT Period	

CWMP: Select activated to enable CWMP.

ACS Login Information

URL: Enter the ACS server login URL.

Username: Specify the ACS Username for ACS authentication to the connection from CPE.

Password: Enter the ACS server login password.

Connection Request Information

Path: Local path in HTTP URL for an ACS to make a Connection Request notification to the CPE.

Username: Username used to authenticate an ACS making a Connection Request to the CPE.

Password: Password used to authenticate an ACS making a Connection Request to the CPE.

Periodic Inform Config

Periodic Inform: Select Activated to authorize the router to send an Inform message to the ACS automatically.

Interval(s): Specify the inform interval time (sec) which CPE used to periodically send inform message to automatically connect to ACS. When the inform interval time arrives, the CPE will send inform message to automatically connect to ACS.

Bind WAN Interface

Interface: Specify any available or a single WAN interface to handle TR-069 requests.

NATT Config **- This is a proprietary feature provided by BEC. May leave them in blank, no configuration is required.**

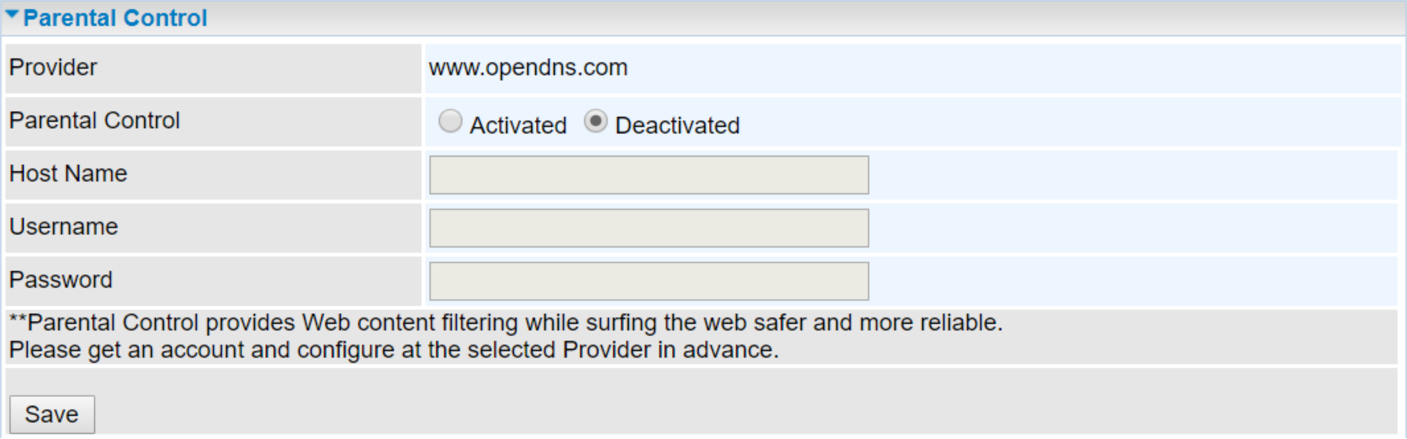
NATT Server: By BEC administrator only.

NATT Period: By BEC administrator only.

Click **Save** to apply settings.

Parental Control

This feature provides Web content filtering offering safer and more reliable web surfing for users especially for parents to protect network security and control the contents for children at home.



Provider	www.opendns.com
Parental Control	○ Activated ● Deactivated
Host Name	
Username	
Password	

**Parental Control provides Web content filtering while surfing the web safer and more reliable.
Please get an account and configure at the selected Provider in advance.

To activate this feature, please log on to www.opendns.com to get an OpenDNS account first.

Parent Control Provider: Hosted by www.opendns.com

Parent Control: Enable the feature by clicking the **Activated**

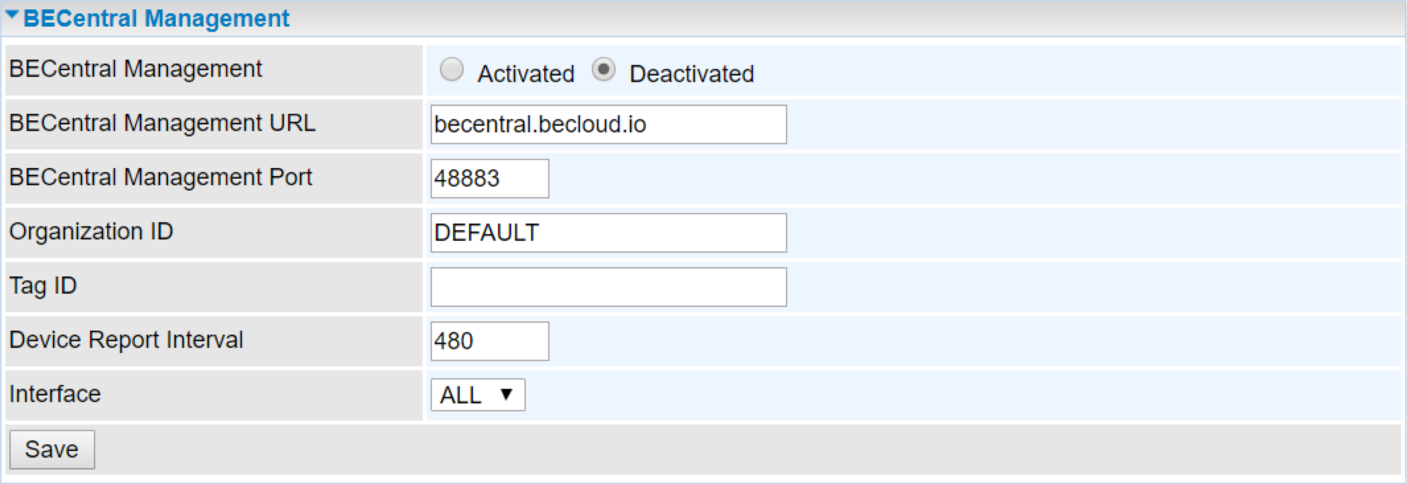
Host Name: It is the domain name of your OpenDNS. If you don't have one, please leave it blink.

Username / Password: Put down your OpenDNS account username and password

Click **Save** to apply settings.

BECentral Management

BECentral is a cloud-based device management platform that provides operators with a comprehensive suite of services to manage devices in real-time.



BECentral Management	○ Activated ● Deactivated
BECentral Management URL	becentral.becloud.io
BECentral Management Port	48883
Organization ID	DEFAULT
Tag ID	
Device Report Interval	480
Interface	ALL ▾

BECentral Management: Activate to enable the feature.

BECentral Management URL: Access path to the BECentral.

BECentral Management Port: Port listened by the BECentral.

Organization ID: Customer ID (By BE C administrator only)

Tag ID: By BEC administrator only.

Device Report Interval: Enter the interval time in seconds to send inform message periodically to the BECentral.

Interface: Specify any available or a single WAN interface to handle BECentral requests.

Click **Save** to apply settings.

Maintenance

Maintenance equipment the users with the ability of maintaining the device as well as examining the connectivity of the WAN connections, including User Management, Time Zone, Firmware & Configuration, System Restart, Auto Reboot and Diagnostic Tool.

User Management

User Management provides the Administrator with the ability to grant access control and manage GUI login credentials for each user.

There are two access management levels, Administrator and User.

The default root account, Administrator (admin), has full access to all the features listed and ability to create other accounts with features to allow other users to access to. The User account is with limited access (specified by advanced users with admin account) to the GUI.

Total of **8** accounts can be created to grant access to manage the BEC 7000 R28-G via the web page.

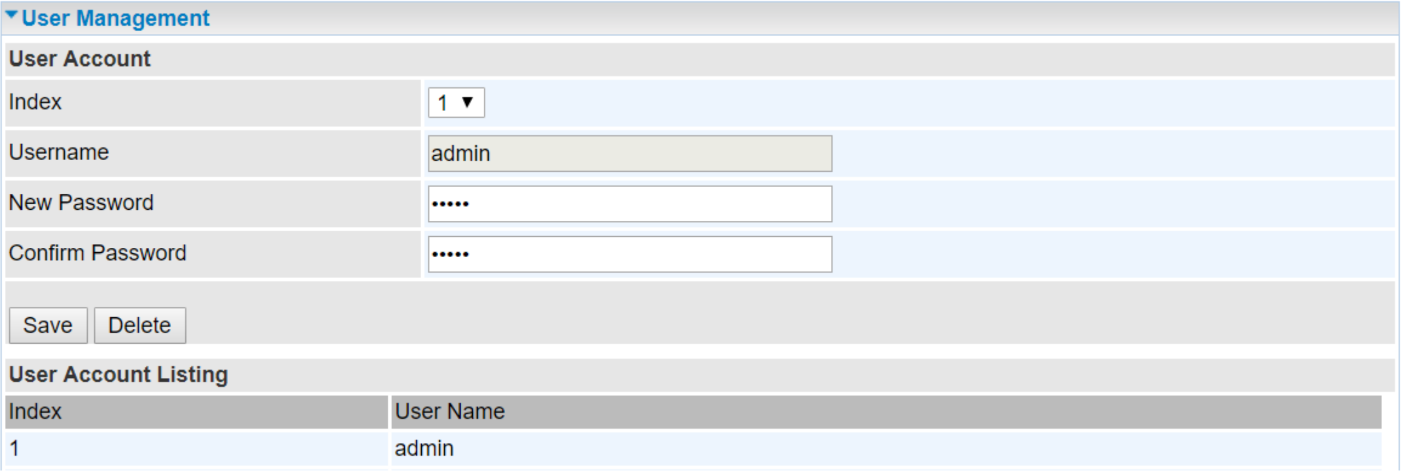
❖ Administrator Account

admin/admin is the root/default account username and password.

NOTE: This username / password may vary by different Internet Service Providers.

Login using the Administrator account, you will have the full accessibility to manage & control your gateway device and can also create user accounts for others to control some of the open configuration settings.

The Administrator account cannot be deleted or removed.



▾User Management

User Account

Index	1 ▼
Username	admin
New Password	•••••
Confirm Password	•••••

User Account Listing

Index	User Name
1	admin

User Account

Index: The numeric account indicator. The maximum entry is up to 8 accounts.

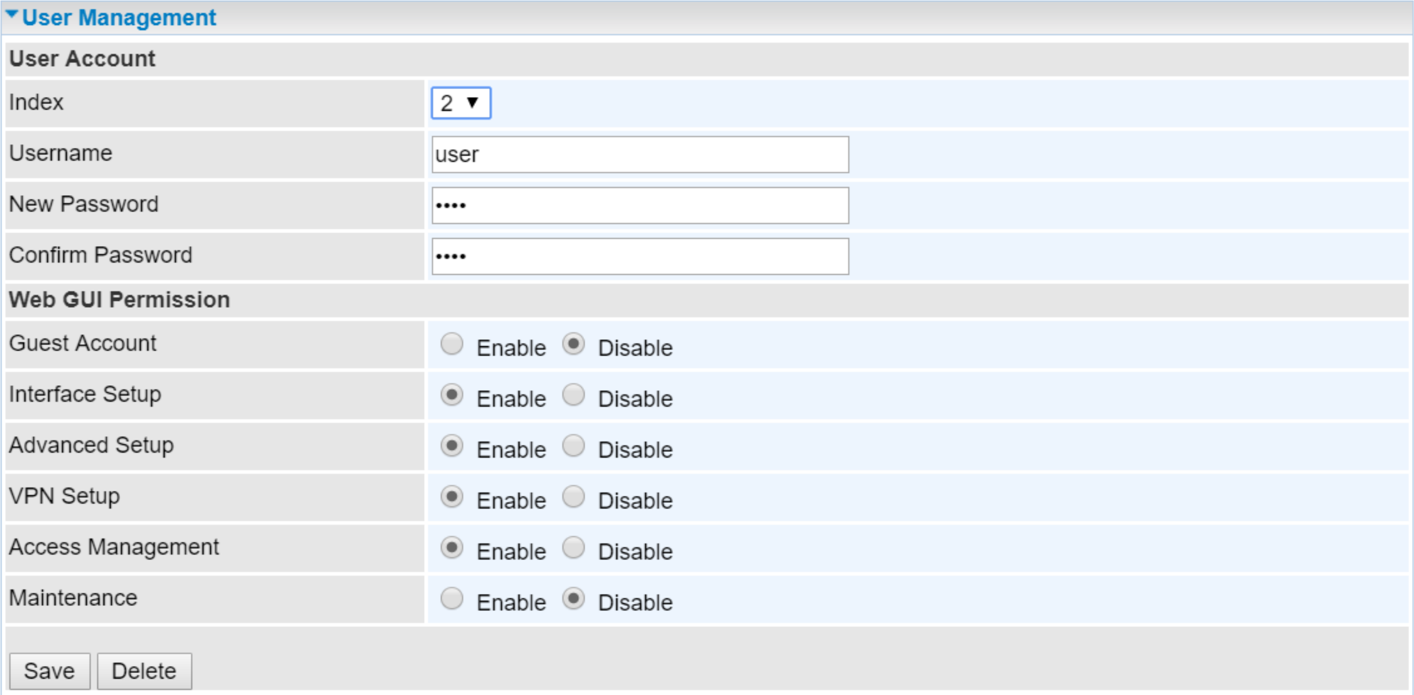
Username: Create account(s) username for GUI management.

New Password: Enter a new password for this user account.

Confirmed Password: Re-enter the new password again; you must enter the password exactly the same as in the previous field.

Click Save to apply settings.

❖ Creating Other User Accounts



▾User Management

User Account	
Index	2 ▾
Username	user
New Password	••••
Confirm Password	••••
Web GUI Permission	
Guest Account	○ Enable ● Disable
Interface Setup	● Enable ○ Disable
Advanced Setup	● Enable ○ Disable
VPN Setup	● Enable ○ Disable
Access Management	● Enable ○ Disable
Maintenance	○ Enable ● Disable

User Account Setup

Index #: The numeric account indicator. The maximum entry is up to 7.

Username: Create account(s) username for GUI management.

New Password: Password for the user account.

Confirm Password: Re-enter the password.

Web GUI Permission

Guest Account: Enable to create this new guest account and select features to allow user account to access to.

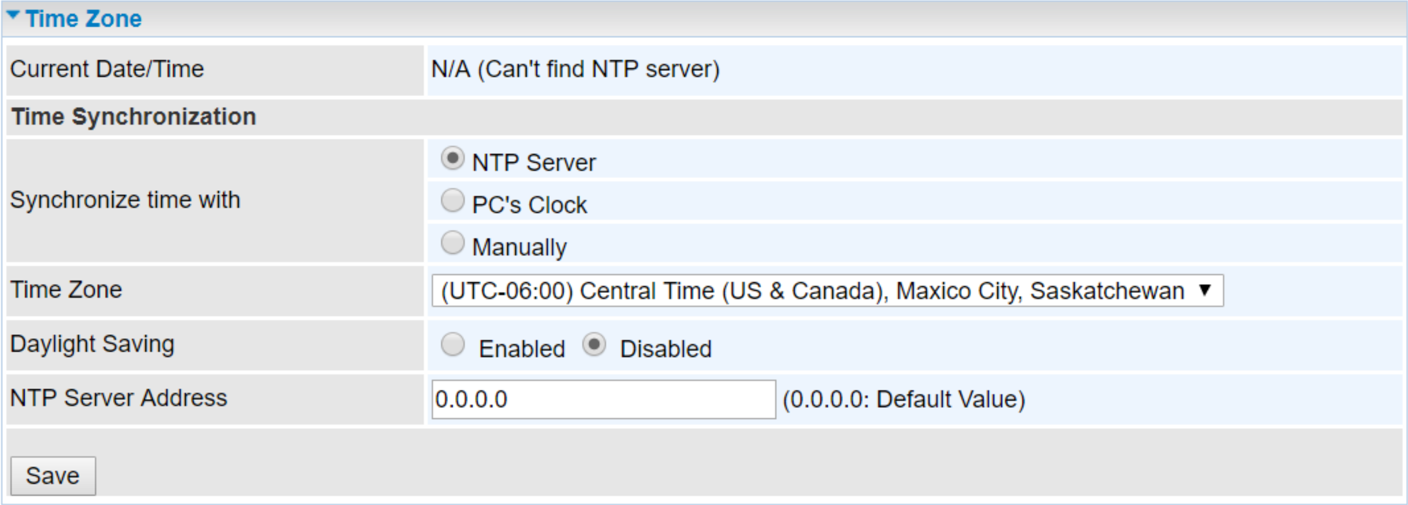
When someone accesses to the BEC 7000 R28-G using this “user” account, he/she can only manage and configure the features that is pre-selected in **Web GUI Permission** for this account.

Click **Save** to apply settings.

Time Zone

With default, BEC 7000 R28-G does not contain the correct local time and date.

There are several options to setup, maintain, and configure current local time/date on the BEC 7000 R28-G. If you plan to use **Time Schedule** feature, it is extremely important you set up the Time Zone correctly.



▾ Time Zone

Current Date/Time	N/A (Can't find NTP server)
Time Synchronization	
Synchronize time with	● NTP Server ○ PC's Clock ○ Manually
Time Zone	(UTC-06:00) Central Time (US & Canada), Maxico City, Saskatchewan ▼
Daylight Saving	○ Enabled ● Disabled
NTP Server Address	0.0.0.0 (0.0.0.0: Default Value)

Synchronize time with: Select the methods to synchronize the time.

- **NTP Server automatically:** To synchronize time with the SNTP servers to get the current time from an SNTP server outside your network then choose your local time zone. After a successful connection to the Internet, BEC 7000 R28-G will retrieve the correct local time from the SNTP server this is specified.
- **PC's Clock:** To synchronize time with the PC's clock.
- **Manually:** Select this to enter the SNMP server IP address manually.
  - **Date:** Month / Date / Year. Month – 1 ~ 12 (January ~ December).
  - **Time:** Hour: Minute: Second

Time Zone: Choose the time zone of your location. This will set the time difference between your time zone and Greenwich Mean Time (GMT).

Daylight Saving: Select this option if you use daylight savings time.

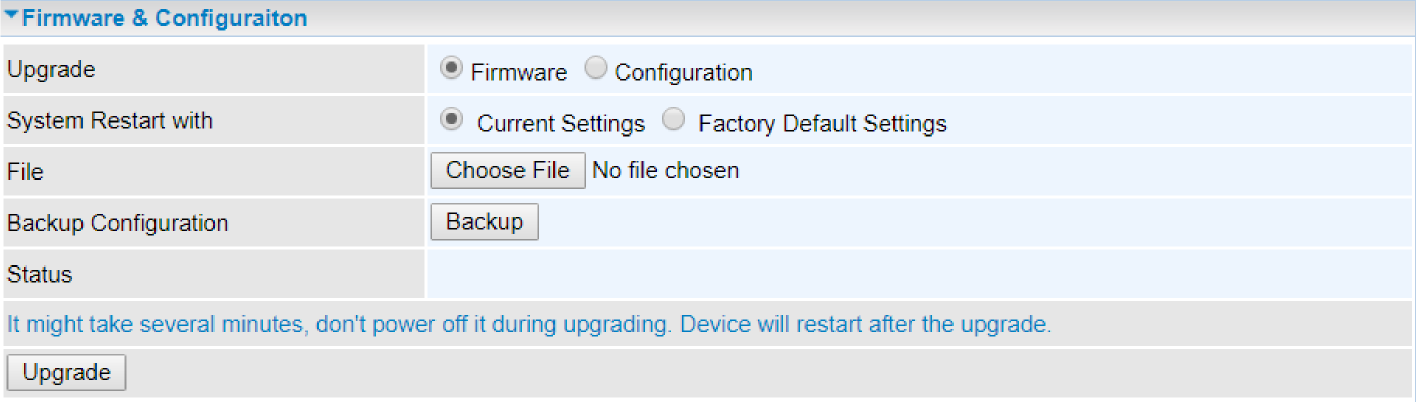
NTP Server Address: Enter the IP address of your time server. Check with your ISP/network administrator if you are unsure of this information.

Click **Save** to apply settings.

Firmware & Configuration

Firmware is the software that controls the hardware and provides all functionalities which are available in the GUI. This software may be improved and/or modified; your BEC 7000 R28-G provides an easy way to update the code to take advantage of the changes. .

To upgrade the firmware of the BEC 7000 R28-G, you should download or copy the firmware to your local environment first. Click **"Choose File"** to specify the path of the firmware file. Then, click **"Upgrade"** to start upgrading process. After completing the firmware upgrade, the BEC 7000 R28-G will automatically restart and run the new firmware.



▾Firmware & Configuraiton

Upgrade	● Firmware ○ Configuration
System Restart with	● Current Settings ○ Factory Default Settings
File	Choose File No file chosen
Backup Configuration	Backup
Status	

It might take several minutes, don't power off it during upgrading. Device will restart after the upgrade.

Upgrade

Upgrade: Choose Firmware or Configuration you want to update.

System Restart with:

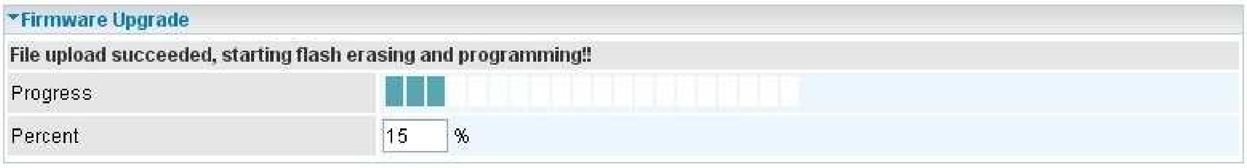
- **Current Settings:** Restart the device with the current settings automatically when finishing upgrading.
- **Factory Default Settings:** Restart the device with factory default settings automatically when finishing upgrading.

File: Type in the location of the file you want to upload in this field or click **Browse** to find it.

Choose File: Click **"Choose File"** to find the configuration file or firmware file you want to upload. Remember that you must extract / decompress / unzip the .zip files before you can upload them.

Backup Configuration: Click **Backup** button to back up the current running configuration file and save it to your computer in the event that you need this configuration file to be restored back to your BEC 7000 R28-G device when making false configurations and want to restore to the original settings.

Upgrade: Click **"Upgrade"** to begin the upload process. This process may take up to two minutes.



▾Firmware Upgrade

File upload succeeded, starting flash erasing and programming!!

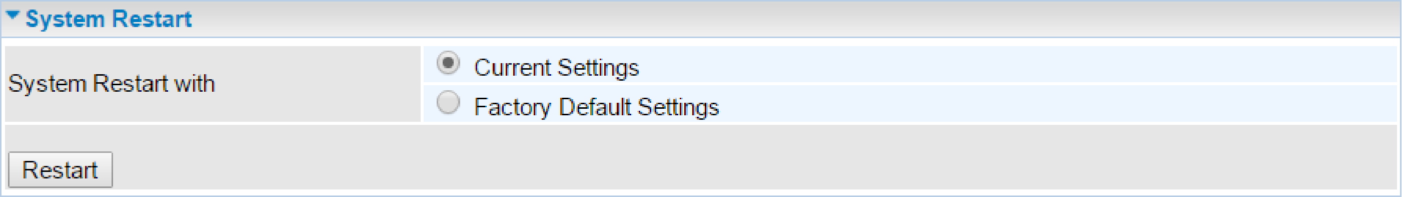
Progress	▮▮▮
Percent	15 %

DO NOT turn off or power cycle the device while firmware upgrading is still in process.

Improper operation could damage your RidgeWave 6900.

System Restart

Click **System Restart** with option **Current Settings** to reboot your router.



System Restart

System Restart with	● Current Settings ○ Factory Default Settings

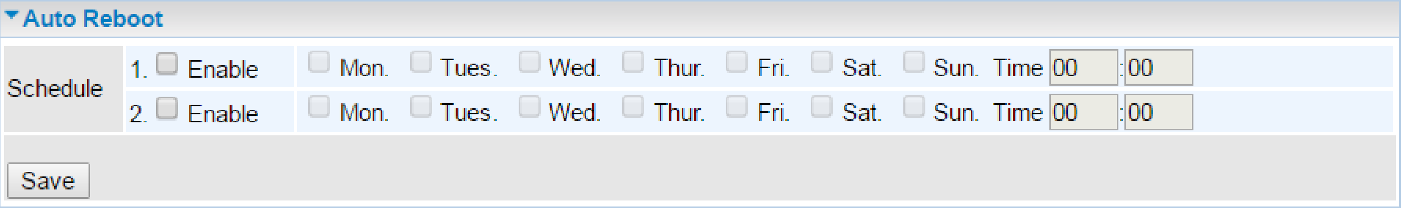
If you wish to restart the router using the factory default settings (for example, after a firmware upgrade or if you have saved an incorrect configuration), select **Factory Default Settings** to restore to factory default settings.

You may also restore your router to factory settings by holding the small Reset pinhole button on the back of your router in about more than 6s seconds whilst the router is turned on.

Auto Reboot

Schedule an automatic reboot for your BEC 7000 R28-G to ensure proper operation and best performance.

This reboot will only reboot with current configuration settings and not overwrite any existing settings.

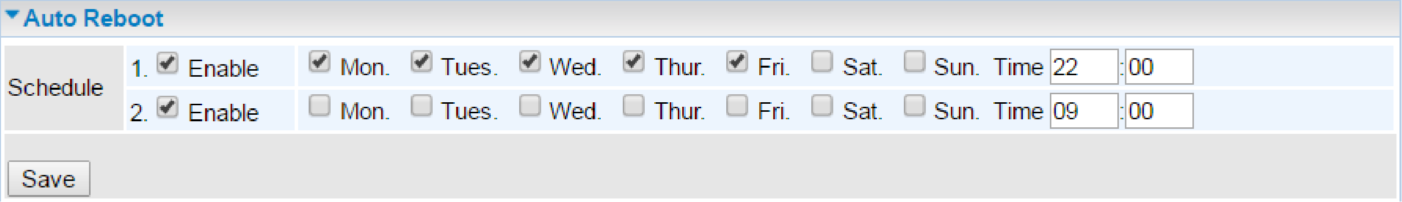


Auto Reboot

Schedule	1. ☐ Enable	☐ Mon.	☐ Tues.	☐ Wed.	☐ Thur.	☐ Fri.	☐ Sat.	☐ Sun.	Time	00	:00
	2. ☐ Enable	☐ Mon.	☐ Tues.	☐ Wed.	☐ Thur.	☐ Fri.	☐ Sat.	☐ Sun.	Time	00	:00

Click **Save** to apply settings

Example: Schedule BEC 7000 R28-G to reboot at 10:00pm (22:00) every weekday (Monday thru Friday) and reboot at 9:00am on Saturday and Sunday.



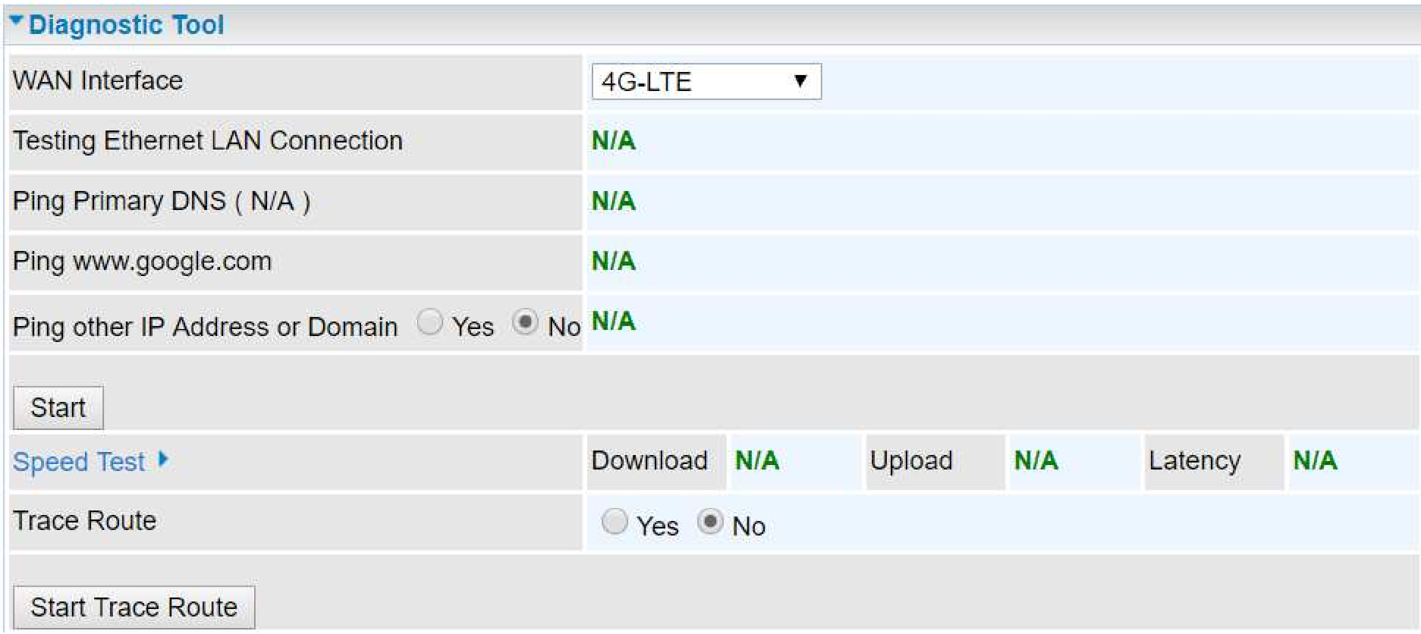
Auto Reboot

Schedule	1. ☑ Enable	☑ Mon.	☑ Tues.	☑ Wed.	☑ Thur.	☑ Fri.	☐ Sat.	☐ Sun.	Time	22	:00
	2. ☑ Enable	☐ Mon.	☐ Tues.	☐ Wed.	☐ Thur.	☐ Fri.	☐ Sat.	☐ Sun.	Time	09	:00

Diagnostics Tool

The Diagnostic Test page shows the test results for the connectivity of the physical layer and protocol layer for both LAN and WAN sides.

4G/LTE

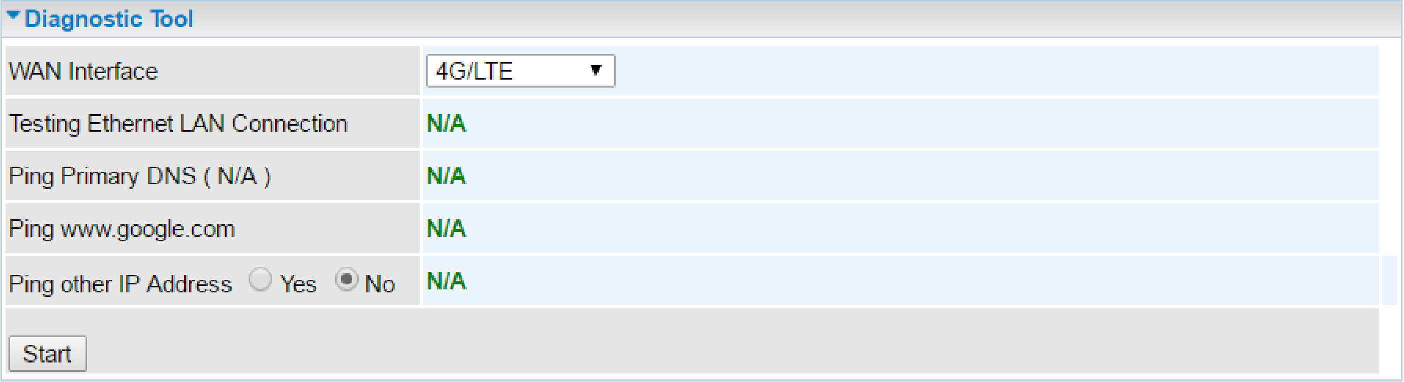


▾Diagnostic Tool

WAN Interface	4G-LTE ▾				
Testing Ethernet LAN Connection	N/A				
Ping Primary DNS (N/A)	N/A				
Ping www.google.com	N/A				
Ping other IP Address or Domain ○ Yes ● No	N/A				
Start					
Speed Test ▸	Download	N/A	Upload	N/A	Latency N/A
Trace Route	○ Yes ● No				
Start Trace Route					

Ping other IP Address: Click **Yes** if you wish to ping other IP address rather than google.com

Click **START** to begin to diagnose the connection.

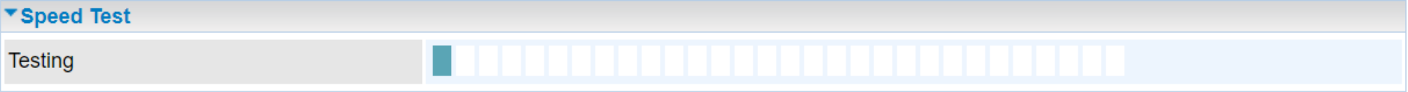


▾Diagnostic Tool

WAN Interface	4G/LTE ▾
Testing Ethernet LAN Connection	N/A
Ping Primary DNS (N/A)	N/A
Ping www.google.com	N/A
Ping other IP Address ○ Yes ● No	N/A
Start	

Speed Time: Measure the current uplink and downlink speed rate.

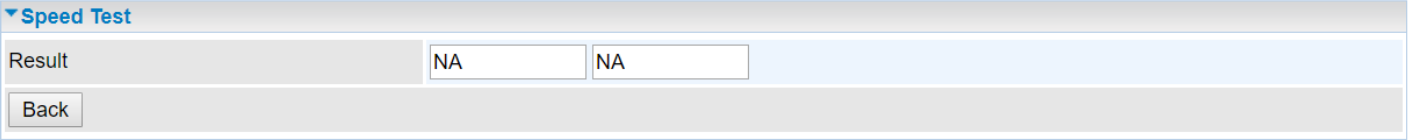
- Take less than a minute to run the test.



▾Speed Test

Testing	

- Result in Uplink / Downlink

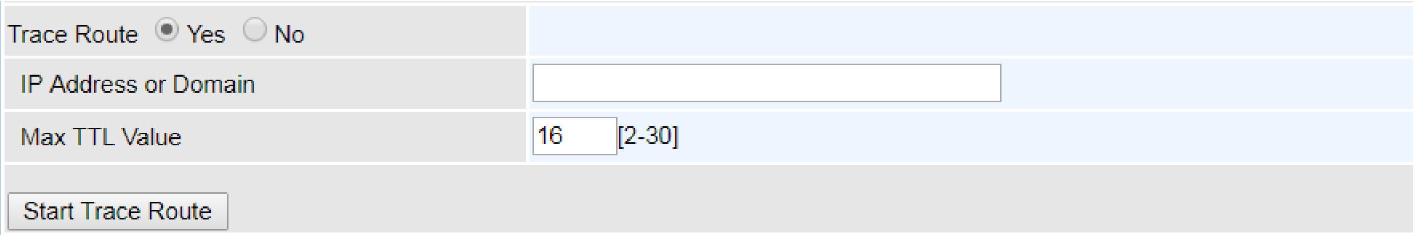


▾Speed Test

Result	NA	NA
Back		

Click **Back** to go back to the Diagnostic Tool

Trace Route is to display how many hops (also view the exact hops) required to get to the destination. Click **Yes**, enter the IP address or domain then **Start Trace Route**.

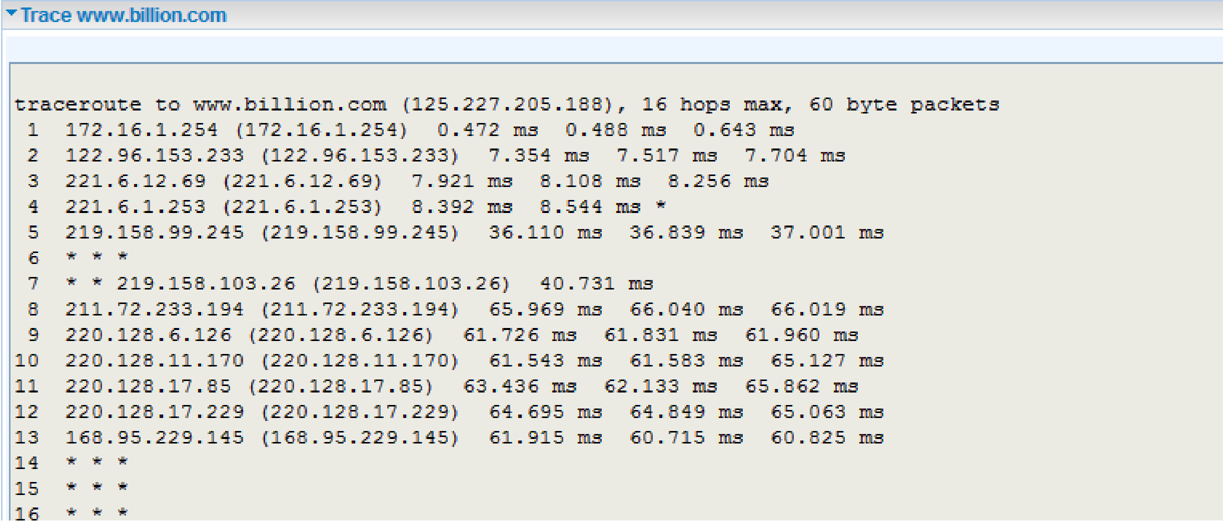


Trace Route ● Yes ○ No	
IP Address or Domain	
Max TTL Value	16 [2-30]

IP Address or Domain: Set the destination host (IP, domain name) to be traced.

Max TTL value: Set the max Time to live (TTL) value.

Shown as we "trace" www.billion.com below.



Trace www.billion.com

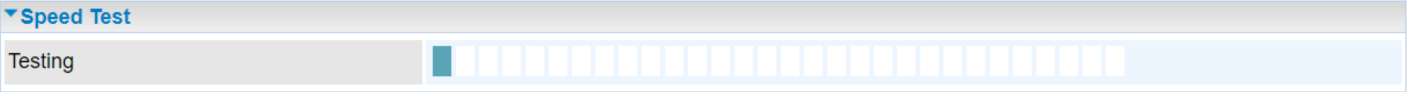
```
traceroute to www.billion.com (125.227.205.188), 16 hops max, 60 byte packets
 1  172.16.1.254 (172.16.1.254)  0.472 ms  0.488 ms  0.643 ms
 2  122.96.153.233 (122.96.153.233)  7.354 ms  7.517 ms  7.704 ms
 3  221.6.12.69 (221.6.12.69)  7.921 ms  8.108 ms  8.256 ms
 4  221.6.1.253 (221.6.1.253)  8.392 ms  8.544 ms *
 5  219.158.99.245 (219.158.99.245)  36.110 ms  36.839 ms  37.001 ms
 6  * * *
 7  * * 219.158.103.26 (219.158.103.26)  40.731 ms
 8  211.72.233.194 (211.72.233.194)  65.969 ms  66.040 ms  66.019 ms
 9  220.128.6.126 (220.128.6.126)  61.726 ms  61.831 ms  61.960 ms
10  220.128.11.170 (220.128.11.170)  61.543 ms  61.583 ms  65.127 ms
11  220.128.17.85 (220.128.17.85)  63.436 ms  62.133 ms  65.862 ms
12  220.128.17.229 (220.128.17.229)  64.695 ms  64.849 ms  65.063 ms
13  168.95.229.145 (168.95.229.145)  61.915 ms  60.715 ms  60.825 ms
14  * * *
15  * * *
16  * * *
```

LAN

Ping other IP Address: Click **Yes** to ping any desired IP address or a domain.

Speed Time: Measure the current uplink and downlink speed rate.

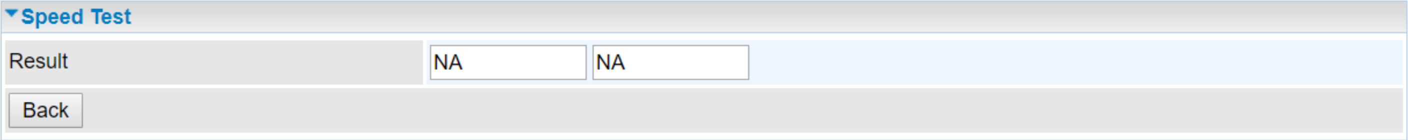
- Take less than a minute to run the test.



Speed Test

Testing	

- Result in Uplink / Downlink



Speed Test

Result	NA	NA

Click **Back** to go back to the Diagnostic Tool

Click **START** to begin to diagnose the connection.

Chapter 5: Troubleshooting

If your **BEC 7000 R28-G** is not functioning properly, you can refer to this chapter for simple troubleshooting before contacting your service provider support. This can save you time and effort but if symptoms persist, consult your service provider.

Problems with the Router

Problem	Suggested Action
None of the LEDs is on when you turn on the router	Check the connection between the router and the adapter. If the problem persists, most likely it is due to the malfunction of your hardware. Please contact your service provider or BEC for technical support.
You have forgotten your login username or password	Try the default username "admin" and password "admin". If this fails, you can restore your router to its factory settings by pressing the reset button on the device rear side.

Problem with LAN Interface

Problem	Suggested Action
Cannot PING any PC on LAN	Check the Ethernet LEDs on the front panel. The LED should be on for the port that has a PC connected. If it does not light, check to see if the cable between your router and the PC is properly connected. Make sure you have first uninstalled your firewall program before troubleshooting.
	Verify that the IP address and the subnet mask are consistent for both the router and the workstations.

Recovery Procedures

Problem	Suggested Action
- The front LEDs display incorrectly **- Still cannot access to the router management interface after pressing the RESET button.** **- Software / Firmware upgrade failure**	Before starting recovery process, please configure the IP address of the PC as 192.168.1.100 and proceed with the following step-by-step guide. 1. Power the router off. 2. Press reset button and power on the router, once the Power lights Red, keeping press reset button over 6 seconds. 3. Internet LED flashes Green, router entering recovery procedure and router's IP will reset to Emergency IP address (Say 192.168.1.1). 4. Open browser and access http://192.168.1.1 to upload the firmware. 5. Internet LED lit Red, and router starts to write firmware into flash. Please DO NOT power off the router at this step. 6. Internet LED lit Green when successfully upgrade firmware. 7. Power cycle off/on the BEC 7000 R28-G

APPENDIX: PRODUCT SUPPORT & CONTACT

If you come across any problems, please contact the dealer from where you have purchased the product.

Contact BEC @ http://www.bectechnologies.net

FCC Statement

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to FCC Part 15 and FCC 47 CFR Part 96 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 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.

FCC Caution:
This device complies with FCC Part 15 and FCC 47 CFR Part 96 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.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 30cm between the radiator & your body.

Professional Installation Instructions (RidgeWave® BEC 7000 R28-G)

1. **Installation Personal**
   This product is designed for specific application and needs to be installed by a qualified personal who has RF and related rule knowledge. The general user shall not attempt to install or change the setting.

2. **Installation Location**
   The product shall be installed at a location where the radiating antenna can be kept 30 cm from nearby person in normal operation condition to meet regulatory RF exposure requirement.

3. **External Antenna**
   Use only the antennas which have been approved by the applicant. The non-approved antenna(s) may produce unwanted spurious or excessive RF transmitting power which may lead to the violation of FCC limit and is prohibited.

4. **Installation Procedure**
   Please refer to user's manual for the detail.

5. **Warning**
   Please carefully select the installation position and make sure that the final output power does not exceed the limit set force in relevant rules. The violation of the rule could lead to serious federal penalty.