

User Manual

BEC MX-1200 (4G/LTE) Gigabit Multi-Service Broadband Router

*Note: BEC MX-1200 Not Supports 3G/4G-LTE feature



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CHAPTER 1: INTRODUCTION

Introduction to your Router

The BEC MX-1200 is a high-performance, versatile, feature-rich platform for organizations that are eager to deploy a reliable, high-performing, secure, and scalable wireless network. Retail, SMB, Enterprise and other business can now accelerate deployments of applications such as business continuity, Point-of-Sales, SD-WAN services and much more.

The MX-1200 supports immediate mobile network expansion via its modular interface and the MX-100U LTE modem. The MX-100U is certified across all major carriers giving customers the ability to select the best carrier for their given location. It integrates Category 6 LTE-A with carrier aggregation, dual-SIM, multi-carrier auto selection and active GPS into an IP-50 hardened enclosure. Future models will support a migration path to higher data rates and LTE Categories.

Vehicle Tracking System

MX-1200 is embedded with a GNSS receiver for GPS or GLONASS. To co-work with On-Board Diagnostics(OBD) system, it eases the central control of geographically-dispersed fleets by presenting individual vehicles' detailed information, including remaining fuel levels, rapid accelerations, and locations.

Mobile and Fixed Broadband Services Ready

MX-1200 platform supports two (2) SIMs for carrier redundancy or seamless failover (with MX-100U) between carrier networks and is equipped up to two (2) versatile Gigabit Ethernet LANs/WANs for wireline connection such as Fiber(FTTH), Cable or DSL with speeds up to 1000Mbps. Using BEC WAN Management in the Web GUI to manage and ensure uninterrupted Internet services by assigning failover to specific WAN interfaces, setting up WAN load balance to smoother traffic to ensure no drops on latency-sensitive application and data.

Maximized Wi-Fi Speed and Coverage

With the next wireless generation, 802.11ac, integrated in the MX-1200, the router delivers fast Wi-Fi speeds of up to 1200Mbps. The MX-1200 supports a link rate up to 300Mbps in 2.4GHz frequency range & 867Mbps in 5GHz range and is also backward

compatible with existing 802.11 a / b / g / n wireless equipment in the network. The Wireless Protected Access (WPA-PSK/WPA2-PSK) and Wireless Encryption Protocol (WEP) features enhance the level of transmission security and access control over Wireless LAN. MX-1200 also supports the Wi-Fi Protected Setup (WPS) standard for easy and secure establishment of a wireless home network. If the user's network requires wider coverage, the built-in Wireless Distribution System (WDS) repeater function expands the wireless network without needing any external wires or cables.

Wi-Fi Hotspot with Captive Portal

MX-1200 offers Wi-Fi hotspot to share the Internet connection via mobile (3G/LTE) or a wired connection, an existing FTTH, cable, DSL network or modem, with any wireless-enabled devices which is completed separate from the private Wi-Fi network. The captive portal enables highly secure connectivity with multiple authentication options and extensive controls for access and bandwidth management. Customization options allow for operator logos, branding or advertisement placement.

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

- Compatible with MX-100U for immediate mobile network expansion
- Dual 4G LTE broadband connectivity (with MX-100U)
- Dual-WAN 4G LTE and Gigabit Ethernet WAN interface for network expandability and reliable connectivity
- High performance antenna for increased coverage, signal reception and efficiency
- Embedded GNSS engine for real-time asset tracking and location data-based applications (with MX-100U)
- Enterprise level routing functionality (Service Key is required)
- Gigabit Ethernet WAN (GbE WAN) for Cable/Fiber/xDSL high WAN throughput
- Gigabit Ethernet LAN
- IPv6 ready (IPv4/IPv6 dual stack)
- Multiple wireless SSIDs with wireless guest access and client isolation
- IEEE 802.11 b/g/n/a/ac compliant Wireless Access Point with Wi-Fi Protected Setup (WPS)
- Wi-Fi Protected Access (WPA-PSK/ WPA2-PSK) and Wired Equivalent Privacy (WEP)
- Wi-Fi Hotspot with captive portal
- Firewall Security with DoS Preventing and Packet Filtering
- Quality of Service Control for traffic prioritization management
- Universal Plug and Play (UPnP) Compliance
- Ease of Use with Quick Installation Wizard
- USB port for NAS (FTP/ SAMBA server)
- Global Navigation Satellite System (GNSS)
- Small form factor with multiple mounting options, easily installed by a single person
- Power ignition control option when mounted within vehicles
- Hardened enclosure with Industrial-graded components

High-speed Mobile Wireless Communication (Optional)

- Embedded single or dual 4G/LTE module (MX-1200U or MX-1200X)
- High performance external antennas

Global Navigation Satellite System (GNSS) (Optional)

- Embedded GNSS receiver for GPS or GLONASS
- Active external antenna (Sold Separately)

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)

Wireless LAN

- Wi-Fi: four (4) Female RP-SMA Connectors
- Compliant with IEEE 802.11 a/b/g/n/ac standards
- 2.4GHz & 5GHz frequency range
- 20/40-MHz channel bandwidth
- Up to 300Mbps (2.4GHz) & 867Mbps (5GHz) wireless data rate
- 64/128 bits WEP supported for encryption
- Wireless security with WPA-PSK, WPA2-PSK, Mixed WPA/WAP2-PSK, (TKIP/AES), 802.1x/Radius

- Multiple SSID (4 SSIDs), BSSID
- Wireless Client Isolation
- Wi-Fi Hotspot with captive portal
- Radius or integrated account database
- Wall Garden support

USB Application Server

- Storage/NAS: SAMBA Server, FTP Server

Intelligent Ignition Sensing

- For In-vehicle connectivity installations

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 Management
- Supports SNMP
- Syslog monitoring

Hardware Specifications

Physical interface

- Wi-Fi: four (4) Female RP-SMA Connectors
- 3G/4G LTE (MX-100U Plug-In): two (2) SMA Female Connectors
- (Optional) GPS (MX-100U Plug-In): one (1) SMA Female Connector
- WAN: 3G/4G LTE and/or ETH WAN
- USB 2.0 Host: two (2) ports
- Ethernet LAN: 4-port 10/100/1000Mbps auto-crossover (MDI/ MDI-X) switch
- SIM Card (MX-100U Plug-In): two (2) slots
- Reset Button
- Power Jack
- LED Indicators

Physical Specifications

- Dimensions (W*H*D): 8.86" x 1.97" x 6.97" (225mm x 50mm x 172.4mm)

CHAPTER 2: PRODUCT OVERVIEW

Important Note for Using This Router



Warning

- ✓ Do not use the router in high humidity or high temperature.
- ✓ Do not use the same power source for the MX-1200 on other equipment.
- ✓ Do not open or repair the case yourself. If the device becomes too hot, turn off the power immediately and have it repaired at a qualified service center.
- ✓ Avoid using this product and all accessories outdoors.



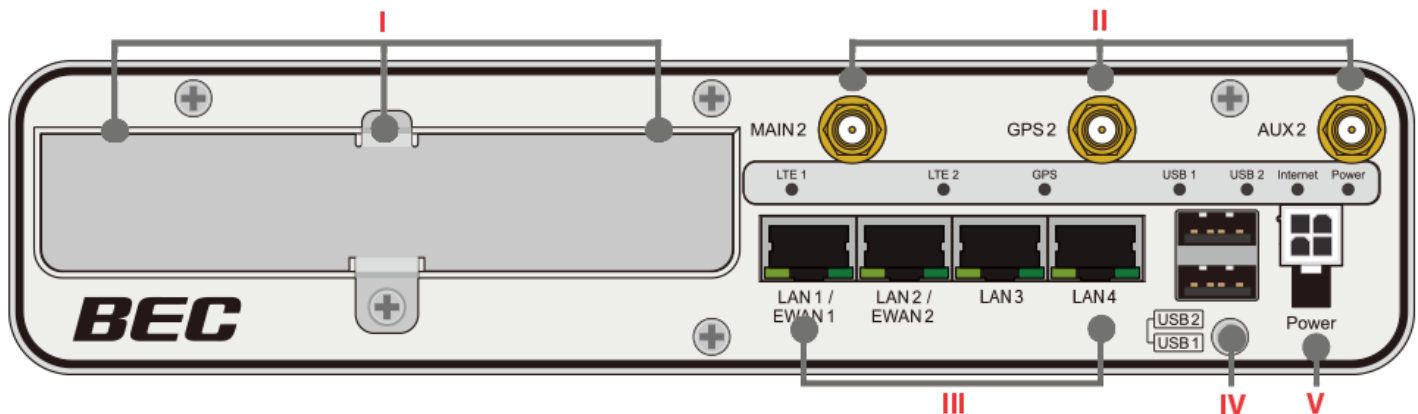
Attention

- ✓ Place the router on a stable surface.
- ✓ Only use the power adapter that comes with the package. Using a different voltage rating power adapter may damage the router.

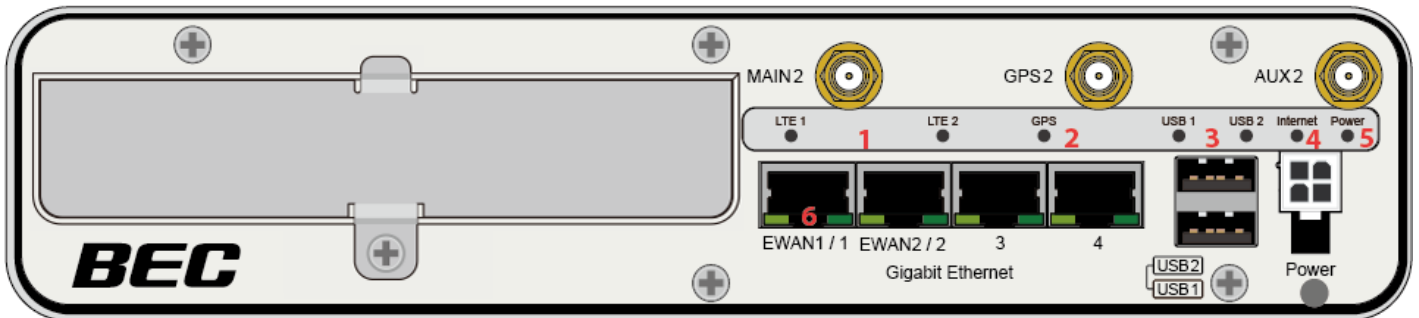
Package Contents

- | | |
|--------------------------------------|-------------------------------|
| ✓ BEC MX-1200 M2M Router * 1 | (Optional Accessories) |
| ✓ Quick Installation Guide * 1 | ✓ 3G/4G Antennas |
| ✓ RJ-45 Ethernet Cable x 1 | ✓ Active GPS Antenna |
| ✓ 2.4GHz Wi-Fi Antennas (Short) x 2 | ✓ MiniFit Vehicle Power Cable |
| ✓ 5GHz Wi-Fi Antennas (Long) x 2 | |
| ✓ MiniFit to DC Jack Power Cable * 1 | |
| ✓ DC Power Adapter x 1 | |

Device Description (Front)

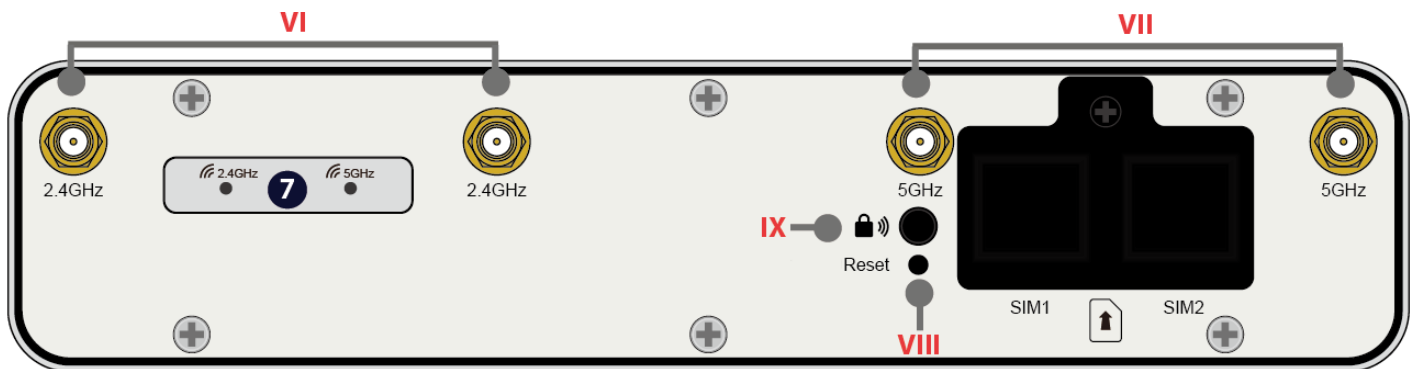


PORTS		MEANING
I	(Optional) WAN1 (Main/GPS/Aux) Antenna Connectors	<u>MX-100U as Primary LTE Connectivity</u> SMA female connectors. Manually screw the 3G/4G and/or GPS antennas tight to the female connectors for Cellular Module 1
II	(Optional) WAN2 (Main/Aux) Antenna Connectors	<u>MX-1200 Embedded as Secondary LTE Connectivity</u> SMA female connectors. Manually screw the 3G/4G and/or GPS antennas tight to the female connectors for Cellular Module 2
III	Gigabit LAN Ethernet (1 - 4)	Connect a UTP Ethernet cable (Cat-5 or Cat-5e) to one of the four LAN ports when connecting to a PC or an office/home network of 10Mbps /100Mbps /1000Mbps * LAN 1/EWAN 1 & LAN 2/EWAN 2 Connect to Fiber/ Cable/ xDSL Modem with a RJ-45 cable, for broadband connectivity. Note: LAN1 and/or LAN2 automatically becomes an EWAN port when EWAN internet interface is configured in the management GUI
IV	USB Ports	The USB can support setup for storage/file sharing. Connect an external USB dongle / hard drive for storage
V	Power	Connect the supplied Power cable to this jack port



LEDS		MEANING	
1	LTE 1 / LTE 2 (Received Signal Strength Indicator)	Green	RSSI greater than -69 dBm. Excellent signal condition
		Green Flashing quickly	RSSI from -81 to -69 dBm. Good signal condition
		Red Flashing quickly	RSSI from -99 to -81 dBm. Fair signal condition
		Red Flashing slowly	RSSI less than -99 dBm. Poor signal condition
		Red	No signal and the 4G LTE module is in service
		Off	No LTE module or LTE module fails
2	GPS LED	Green	GPS is up and ready to use
3	USB 1 / USB 2	Green	Connecting to a USB dongle or a hard drive
4	Internet	Green	Internet is connected, and traffic is passing through the device
		Red	IP request failed
		Off	Either in bridged mode or WAN connection is not present
5	Power	Green	System is up and ready
		Red	Boot failure
6	Gigabit Ethernet (LAN 1 - 4)	Green	Transmission speed is at Gigabit speed (1000Mbps)
		Orange	Transmission speed is at 10/100Mbps
		Blinking	Data being transmitted/received

Device Description (Back)



LEDS		MEANING	
7	Wi-Fi 2.4G / 5G	Green	Wireless connection to 2.4G or/and 5G network is established
		Blinking	Data being transmitted / received

PORTS		MEANING
VI	2.4GHz Wi-Fi Antenna	Find two (2) short 2.4GHz Wi-Fi antennas and screw them onto the antenna connectors
VII	5GHz Wi-Fi Antenna	Find two (2) long 5GHz Wi-Fi antennas and screw them onto the antenna connectors
VIII	Reset	After the device is powered on, press it 6 seconds or above : to restore to factory default settings (this is used when you cannot login to the router, e.g. forgot your password)
IX	WPS & Wireless On/Off	By controlling the pressing time, users can achieve two different effects: (1) WPS : Press &hold the button for less than 6 seconds to trigger WPS function. (2) Wireless ON/OFF button : Press & hold the button for more than 6 seconds to enable or disable the wireless. * Refer to the WPS section in the User Manual for more details.
	SIM 1 / SIM 2 Card Slots	Primary: SIM 1. Secondary: SIM 2 If only have one SIM card, insert it to SIM 1. Insert the mini SIM card (2FF) with the gold contact facing down. Push the mini SIM card (2FF) inwards to eject it * Power off the MX-1200 before inserting or removing the SIM card(s)

System Recovery Procedures

The purpose is to allow users to restore the MX-1200 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 MX-1200 Device

- 2.1 Power off your MX-1200
- 2.2 Power on the MX-1200 while pushing the RESET button with a small pointed object (such as paper clip, needle, toothpick, etc.).
- 2.3 When the POWER LED turns RED, keep holding and pushing the RESET button until the INTERNET LED flashes in GREEN

Step 3 – Restore your MX-1200 Device

With INTERNET light flashes green, MX-1200 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, MX-1200 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 MX-1200.
- 3.4 INTERNET LED turns green after the Firmware upgrade completed
- 3.5 Power cycle on & off to regain access to the MX-1200.

Cabling

One of the most common causes of problems is bad cabling. Make sure that all connected devices are turned on. On the front panel of the product is a bank of LEDs. Verify that the LAN Link and LEDs are lit. If they are not, verify that you are using the proper cables.

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 XP / Vista / 7 / 8/10, Linux, Mac OS, and 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.



Attention

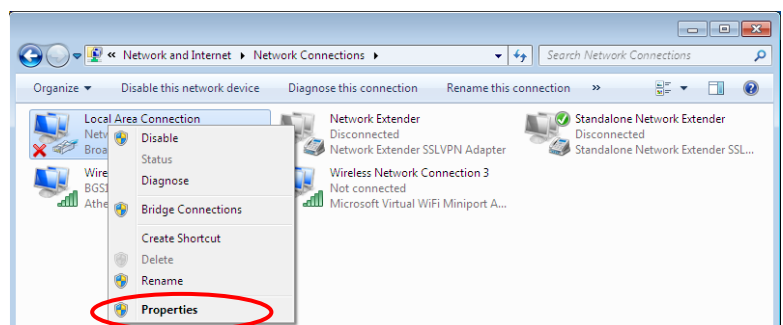
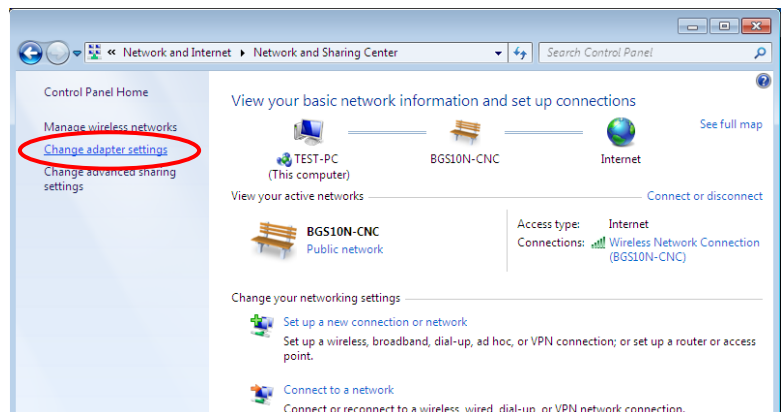
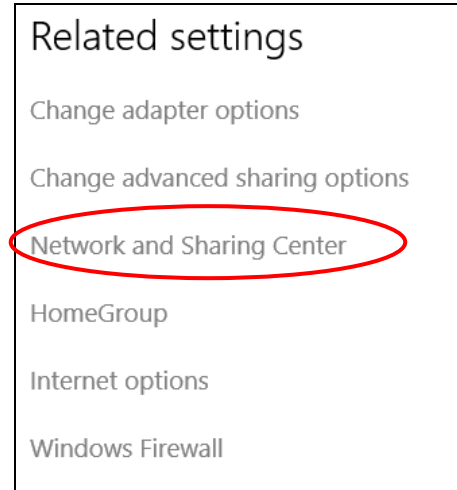
Any TCP/IP capable workstation can be used to communicate with or through the MX-1200. To configure other types of workstations, please consult the manufacturer's documentation.

Network Configuration – IPv4

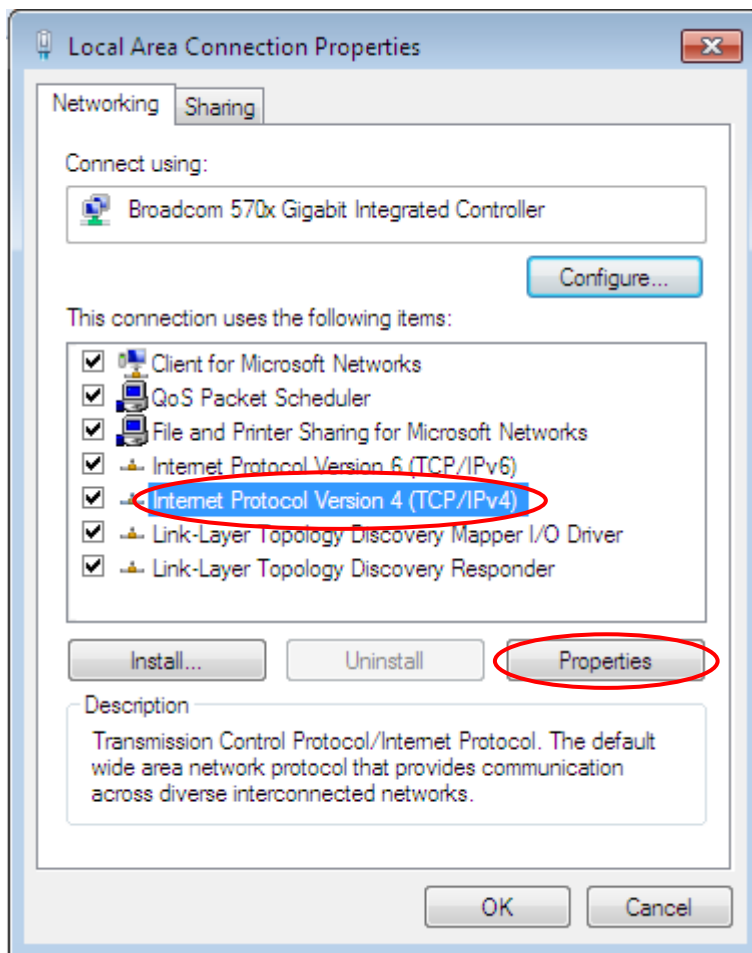
Configuring PC in Windows 10 (IPv4)

1. Click .
2. Click  Settings.
3. Then click on **Network and Internet**.

4. Under **Related settings**, select **Network and Sharing Center**
5. When the **Network and Sharing Center** window pops up, select and click on **Change adapter settings** on the left window panel.
6. Select the **Local Area Connection**, and right click the icon to select **Properties**.

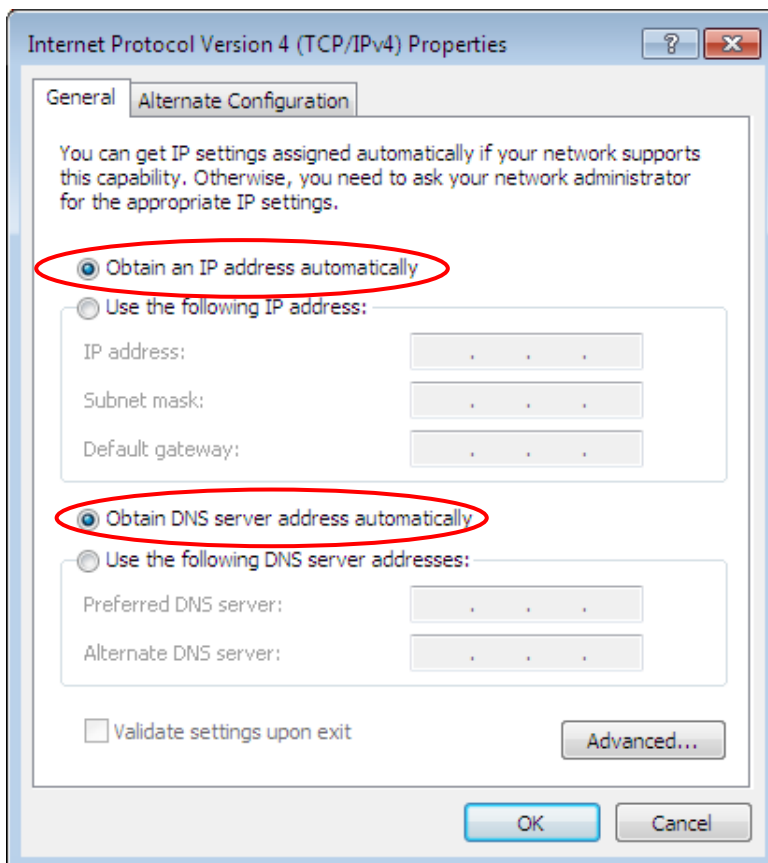


7. Select **Internet Protocol Version 4 (TCP/IPv4)** then click **Properties**.



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.

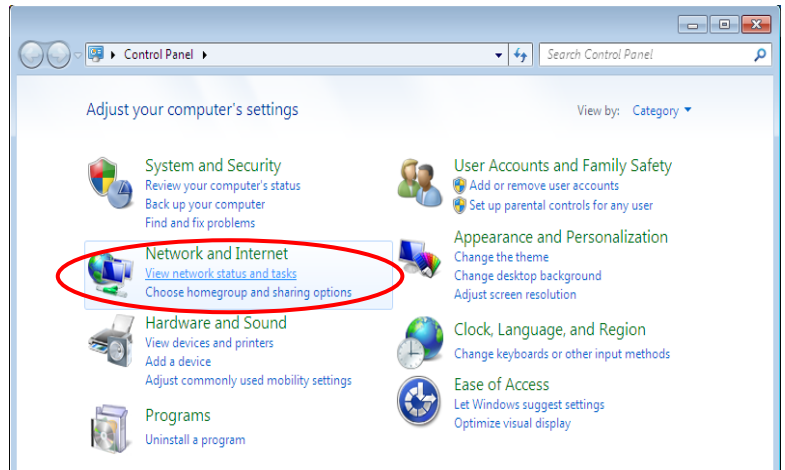
9. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



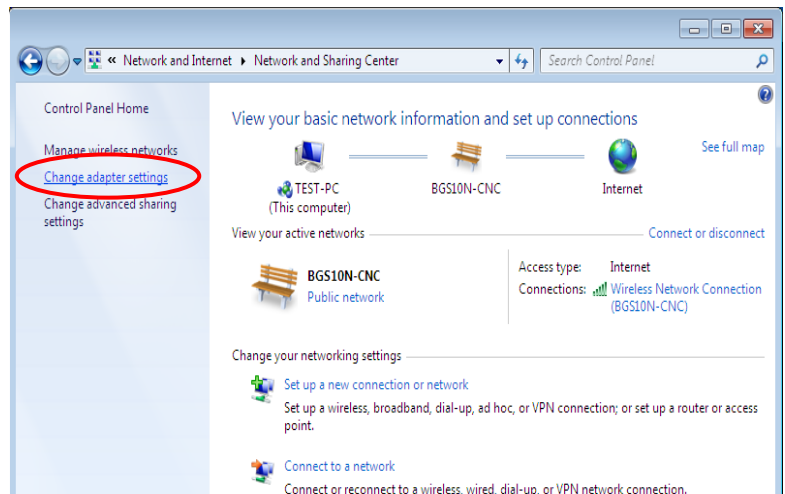
Configuring PC in Windows 7/8 (IPv4)

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

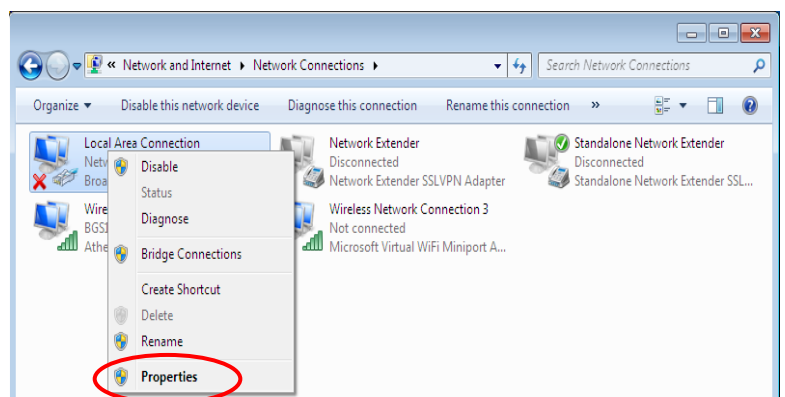
2. Then click on **Network and Internet**.



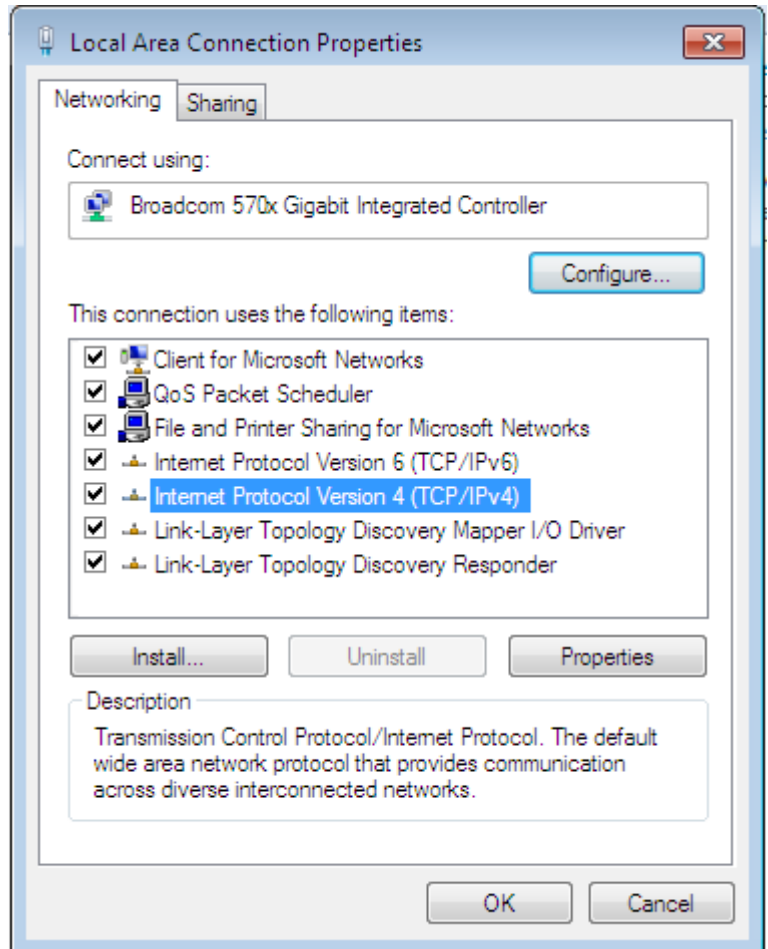
3. When the **Network and Sharing Center** window pops up, select and click on **Change adapter settings** on the left window panel.



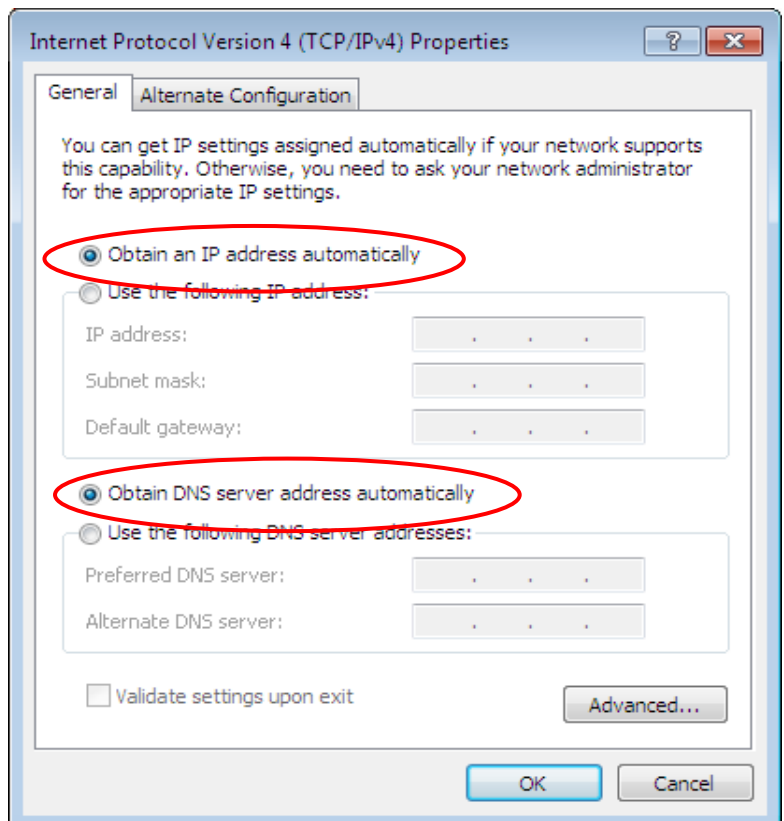
4. Select the **Local Area Connection**, and right click the icon to select **Properties**.



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

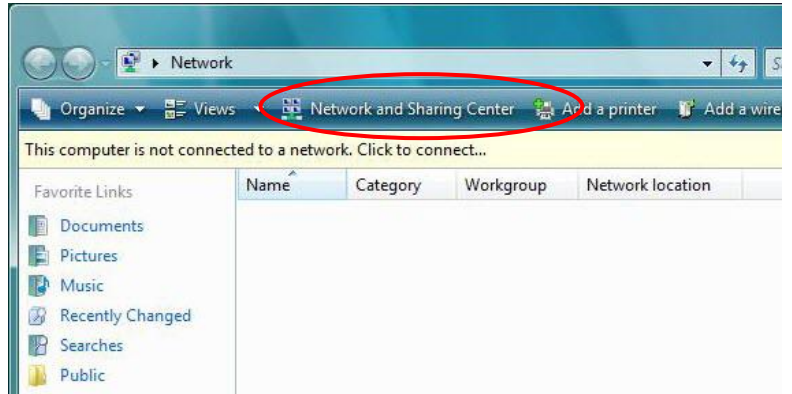


6. In the **TCP/IPv4 properties** window, select the **Obtain an IP address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.
7. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



Configuring PC in Windows Vista (IPv4)

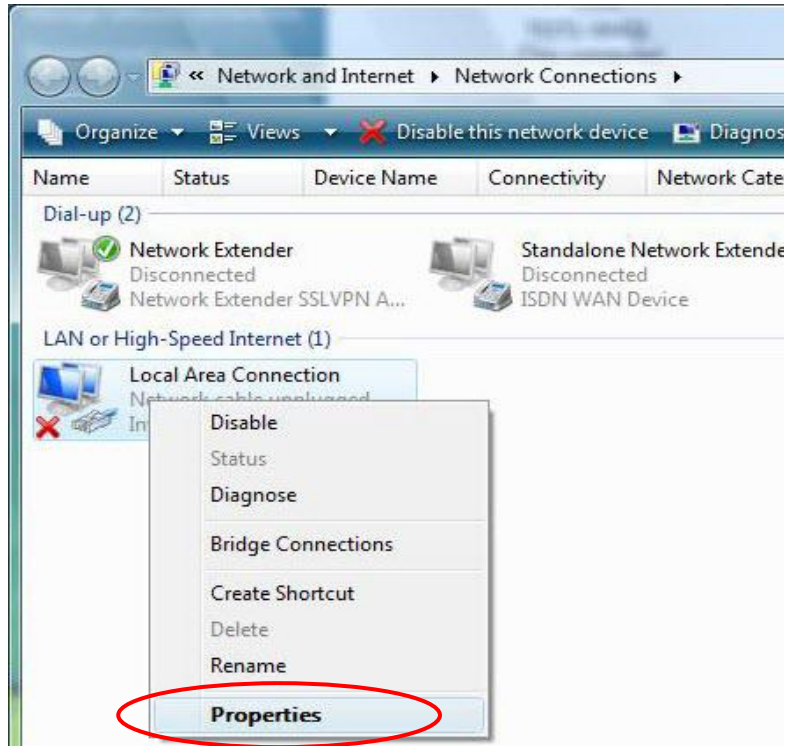
1. Go to **Start**. Click on **Network**.
2. Then click on **Network and Sharing Center** at the top bar.



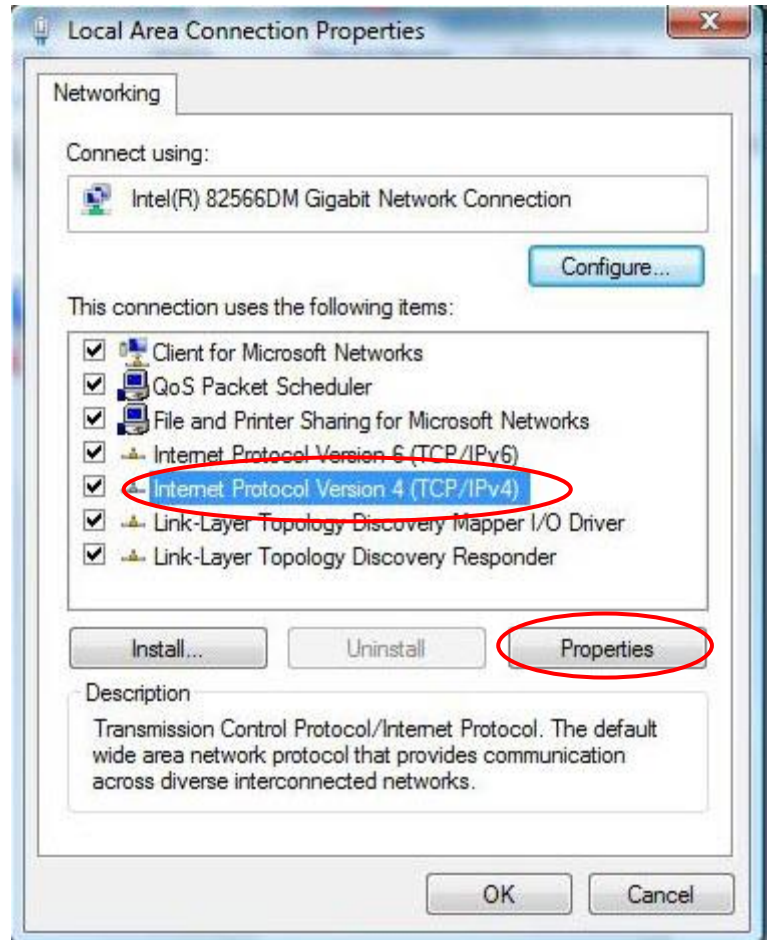
3. When the **Network and Sharing Center** window pops up, select and click on **Manage network connections** on the left window pane.



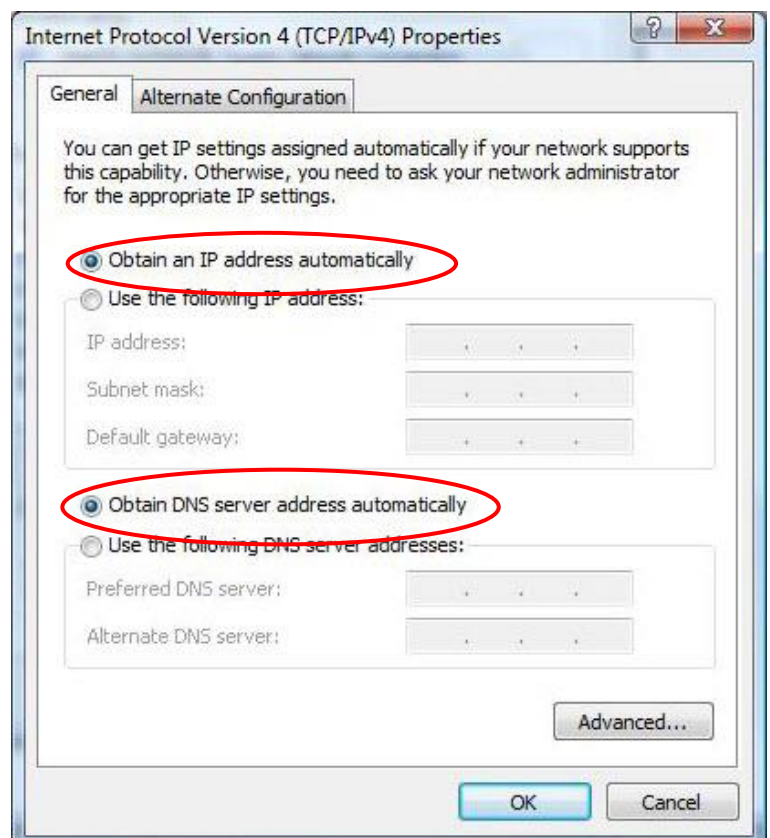
4. Select the **Local Area Connection**, and right click the icon to select **Properties**.



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



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.

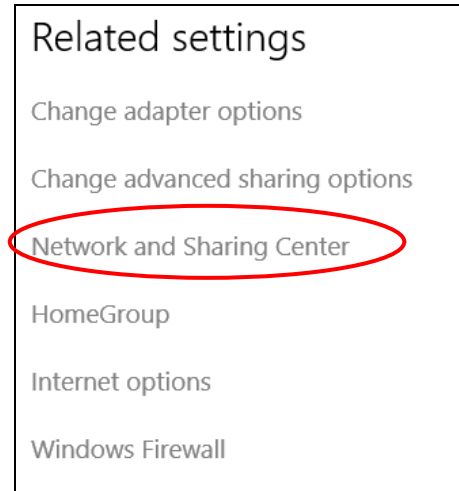


Network Configuration – IPv6

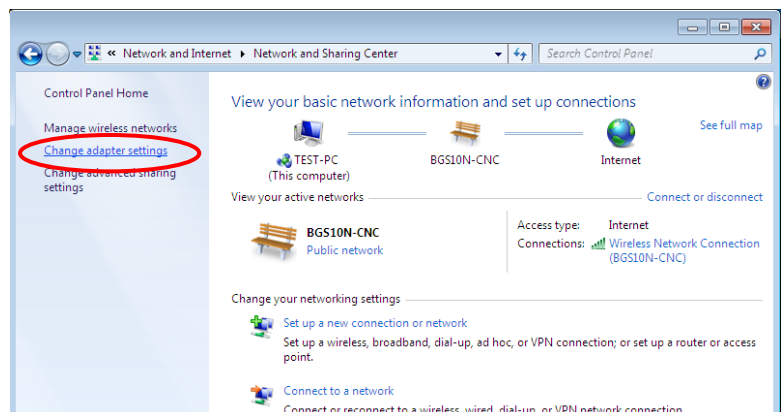
Configuring PC in Windows 10 (IPv6)

1. Click .
2. Click  Settings.
3. Then click on **Network and Internet**.

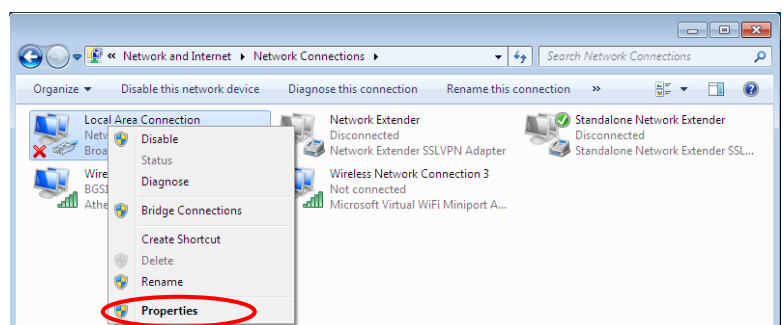
4. Under **Related settings**, select **Network and Sharing Center**



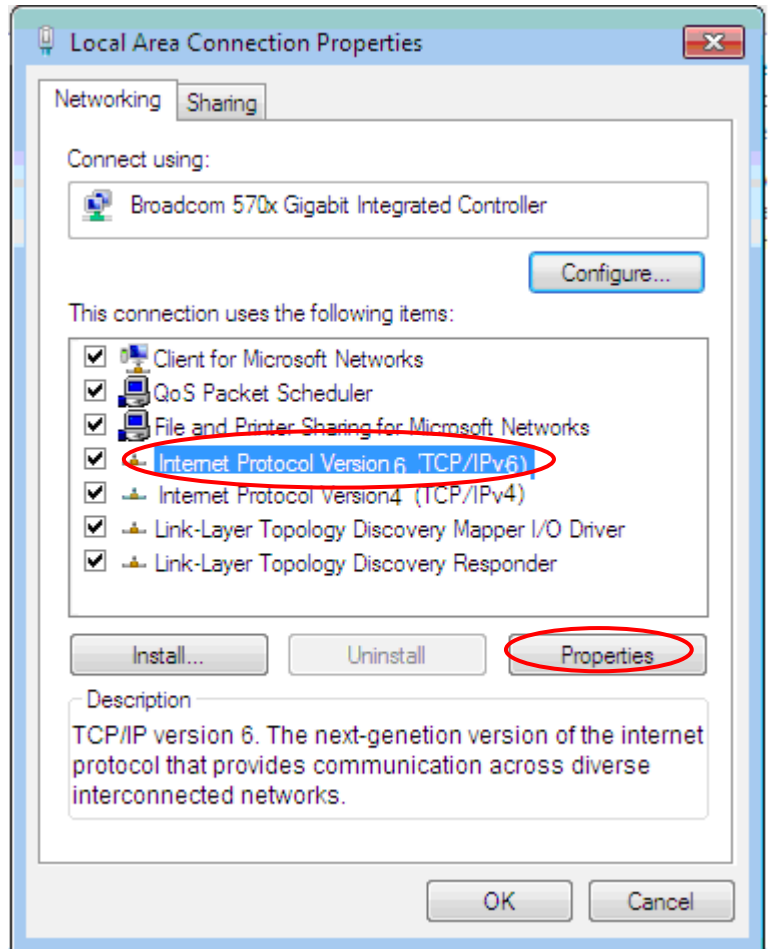
5. When the **Network and Sharing Center** window pops up, select and click on **Change adapter settings** on the left window panel.



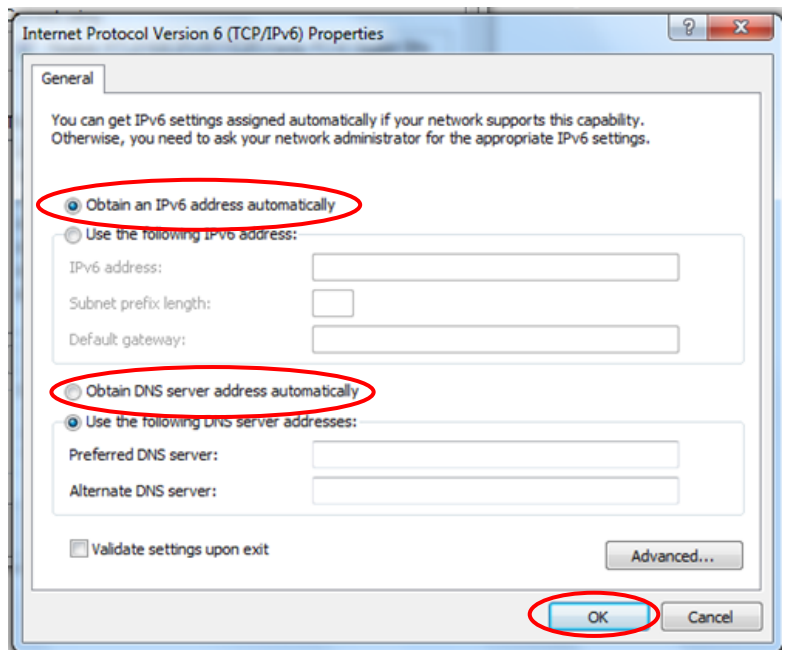
6. Select the **Local Area Connection**, and right click the icon to select **Properties**.



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



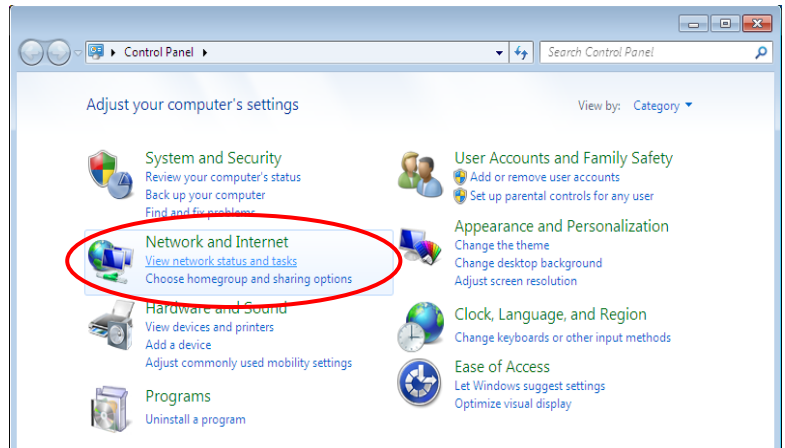
8. In the **TCP/IPv6 properties** window, select the **Obtain an IPv6 address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.
9. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



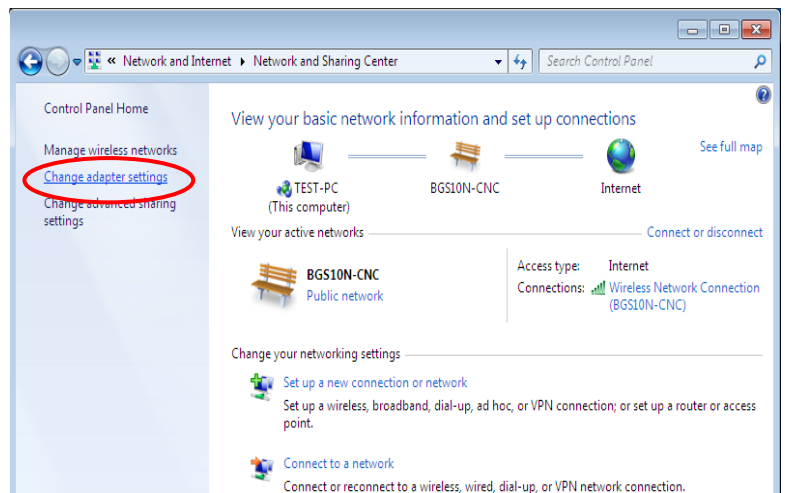
Configuring PC in Windows 7/8 (IPv6)

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

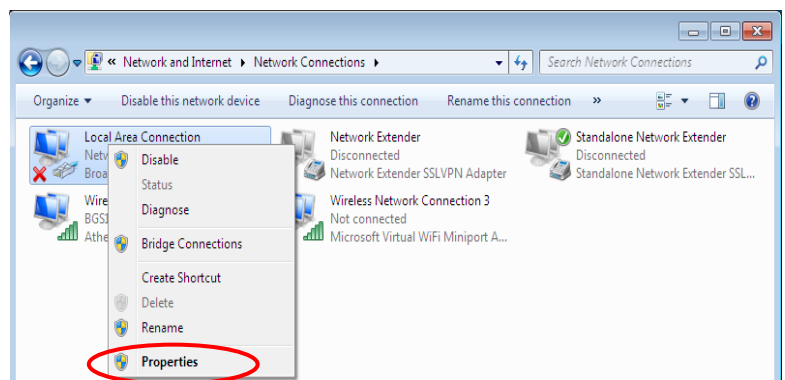
2. Then click on **Network and Internet**.



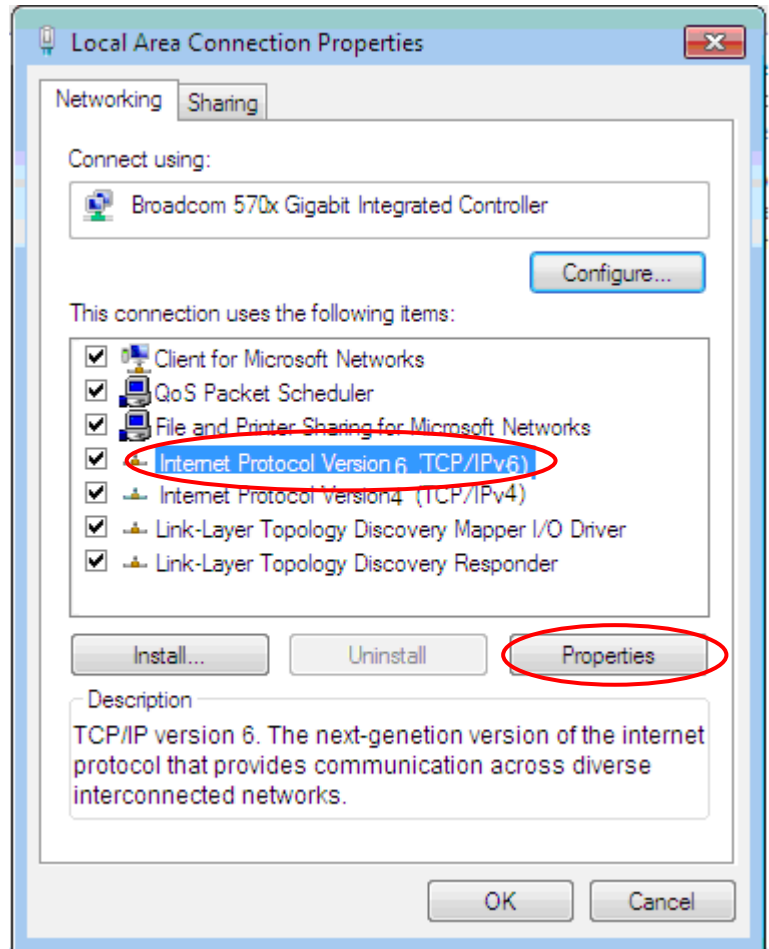
3. When the **Network and Sharing Center** window pops up, select and click on **Change adapter settings** on the left window panel.



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

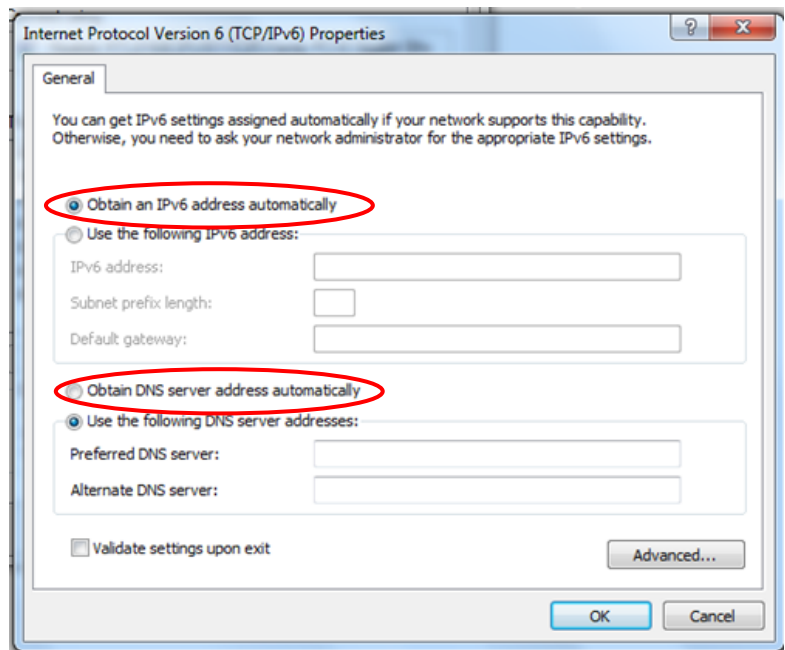


5. Select **Internet Protocol Version 6 (TCP/IPv6)** then click **Properties**.



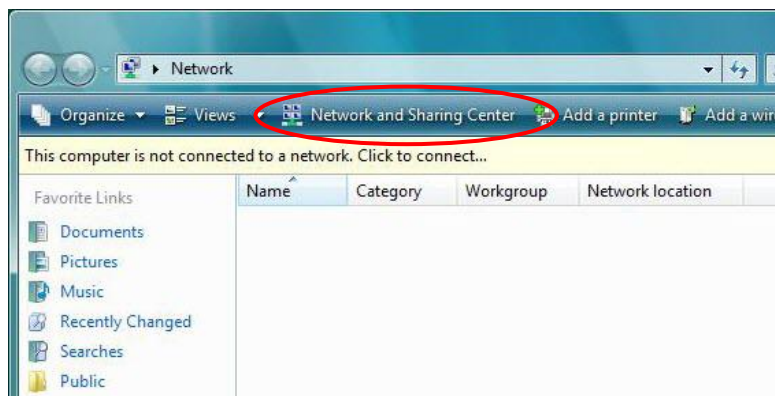
6. In the **TCP/IPv6 properties** window, select the **Obtain an IPv6 address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

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



Configuring PC in Windows Vista (IPv6)

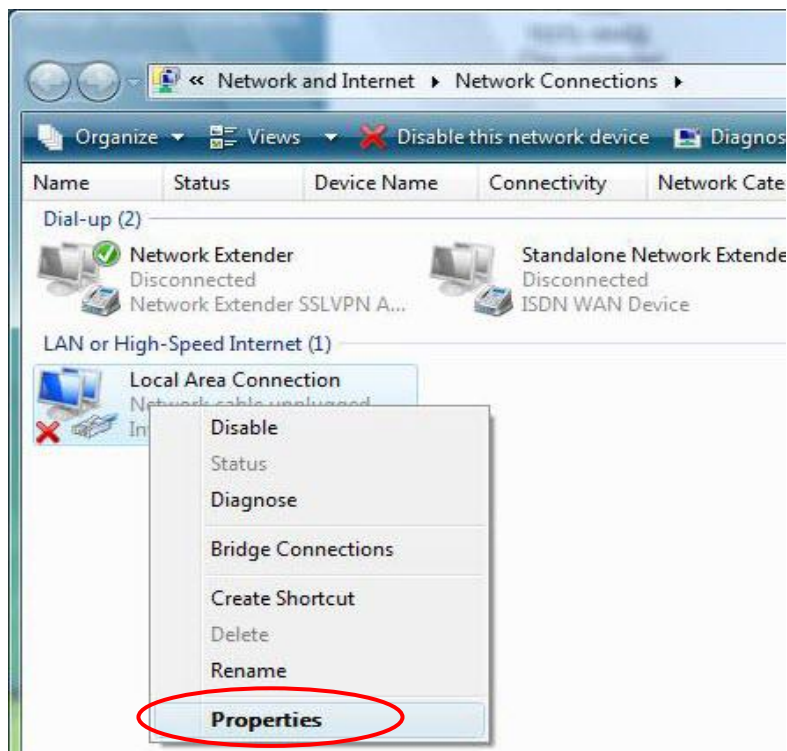
1. Go to **Start**. Click on **Network**.
2. Then click on **Network and Sharing Center** at the top bar.



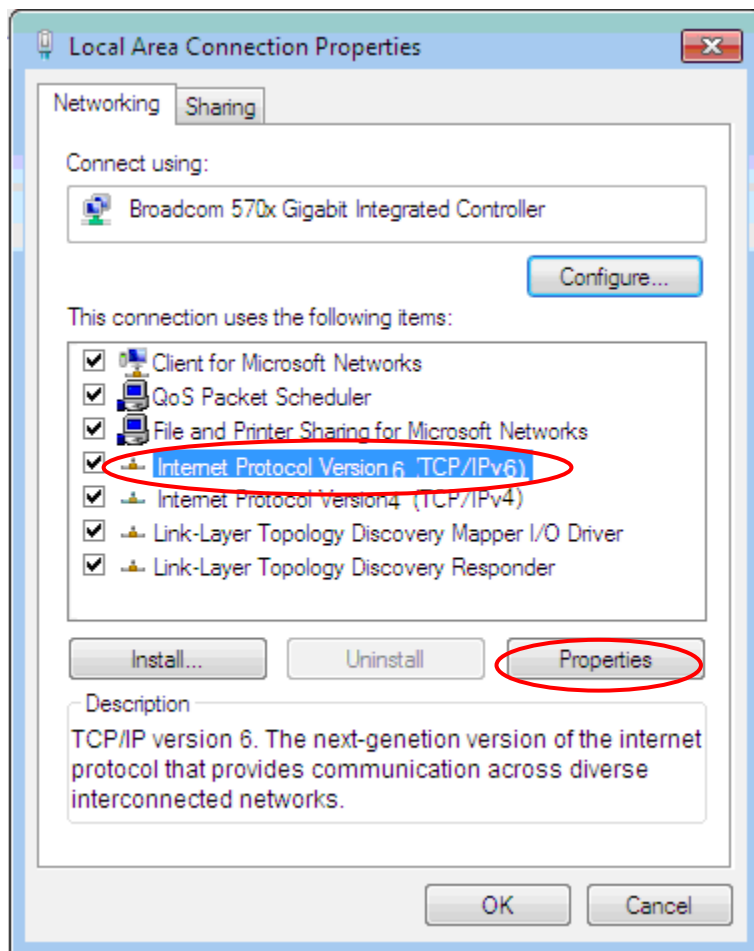
3. When the **Network and Sharing Center** window pops up, select and click on **Manage network connections** on the left window pane.



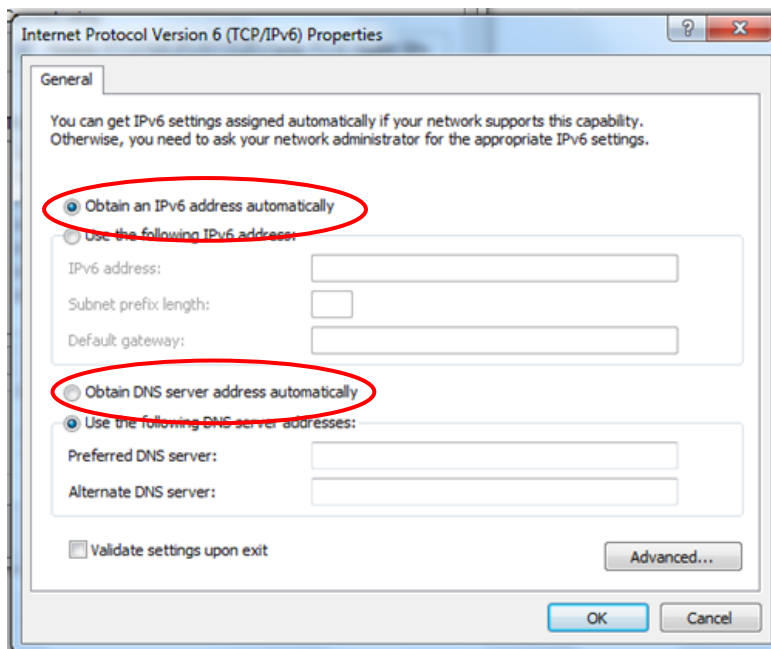
4. Select the **Local Area Connection**, and right click the icon to select **Properties**.



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



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.



Default Settings

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

Web Interface: (Username and Password)

Administrator

- Username: admin
- Password: admin or a unique 12-digit password can be found on the device label.

User

- Username: user
- Password: user



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

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 user name and password window prompt appears.

Inset the management GUI username and password.

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



Congratulations! You have successfully logged on to your MX-1200

Once you have logged on to your MX-1200 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		Interface Setup - Internet - LAN - Wireless - Wireless MAC Filter
	System Status		Dual WAN - General Setting - Outbound Load Balance - Protocol Binding
	System Log		Hotspot - General Setting - Built-in User Account - Authorized of Client - Walled Garden - Advertisement - Session Log - Customization
	3G/4G-LTE Status		Advanced Setup - Firewall - Routing - NAT - VRRP - Static DNS - Time Schedule - Mail Alert
	GPS Status		Access Management - Device Management - SNMP - Syslog - Universal Plug & Play - Dynamic DNS - Access Control - Packet Filter - CWMP (TR-069) - Parental Control - SAMBA & FTP Server - BECentral Management
	Hardware Monitor		Maintenance - User Management - Certificate Management - Time Zone - Firmware & Configuration - System Restart - Auto Reboot - Diagnostic Tool - Ignition Sensing
	Hotspot Status		
	Statistics		
	DHCP Table		
	Disk Status		
	ARP Table		
	VRRP		

Please see the relevant sections of this manual for detailed instructions on how to configure your **MX-1200**.

Status

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

Device Info

It provides brief status summary of the device.

▼ Device Information					▼ Physical Port Status	
Model Name	MX-1000				4G LTE -1	✓
Firmware Version					4G LTE -2	✓
MAC Address	00:04:ed:01:23:45				EWAN	✗
Date-Time	Wed May 20 21:42:32 UTC 2015				Ethernet	✓
System Up Time	19 mins				Wireless	✓

▼ WAN				
Interface	Protocol	Connection	IP Address	Default Gateway
4G LTE -1	Dynamic IP	0d: 0h:17m:13s Connected	100.79.1.235/255.255.255.248	100.79.1.233

▼ 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

▼ Wireless			
Mode	SSID	Channel	Security
802.11b+g+n	BEC345	6	Mixed WPA2/WPA-PSK

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 **MX-1200** with your PC. Check on [Time Zone](#) section for more configuration information.

System Uptime: Display how long the **MX-1200** has been powered on.

Physical Port Status

Physical Port Status : Display available connection interfaces supported in the MX-1200.

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

Wireless

Mode: Display selected Wireless mode.

SSID: Display the name of the Wireless AP(s) to use

Channel: Display radio frequency to be used for this wireless link

Security: Display security method to be used for this wireless link

System Log

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

System Log

```

Jan  1 00:00:31 syslogd started: BusyBox v1.00 (2015.12.28-02:11+0000)
Jan  1 00:00:33 pptpd[1492]: MGR: Manager process started
Jan  1 00:00:33 pptpd[1492]: MGR: Maximum of 100 connections available
Jan  1 00:00:39 PPOELOGIN: bind service port
Jan  1 00:00:39 PPOELOGIN: begin service loop
Jan  1 00:00:39 syslog: [Hardware monitor]: START
Jan  1 00:03:54 WEB: WEB user <admin> login

```

Refresh

Backup

Refresh: Press this button to refresh the statistics.

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

System Status

System status displays the current router system (CPU and Memory) usage.

System Status	
CPU	
Usage	16%
Memory	
Total	61092 kB
Free	21304 kB
Cached	16072 kB
Refresh	

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).

3G/4G-LTE Status

This page contains 3G/4G-LTE connection information.

3G/4G-LTE Status	
WAN	3G/4G-LTE ▼
Status	Up
SIM Status	SIM Card Not Found
Signal Strength	
Network Name	
Cell ID	
Card IMEI	359225054110101
Card IMSI	
Network Mode	
Network Band	
Refresh	

Status: The current status of the 3G/4G-LTE connection.

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

Signal Strength: The signal strength bar and dBm value indicates the current 3G/4G-LTE signal strength. The front panel 3G/4G-LTE Signal Strength LED indicates the signal strength as well.

Signal Information: Shows important LTE signal parameters such as RSRP (Reference Signal Receiving Power), RSRQ (Reference Signal Receiving Quality), SINR (Signal to Interference plus Noise Ratio).

- ▶ **RSRP (Reference Signal Receiving Power):** is the average power of all resource elements which carry cell-specified reference signals over the entire bandwidth.
- ▶ **RSRQ (Reference Signal Receiving Quality):** measures the signal strength and is calculated based on both RSRP and RSSI.
- ▶ **RSSI (Received Signal Strength Indicator):** parameter which provides information about total received wide-band power (measure in all symbols) including all interference and thermal noise.
- ▶ **SNR (Signal Noise Ratio):** is also a measure of signal quality as well. It is widely used by the operators as it provides a clear relationship between RF conditions and throughput.

Note: Some LTE modules do not provide this information.

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 3G/4G-LTE module.

Card IMSI: The international mobile subscriber identity used to uniquely identify the 3G/4G-LTE module.

Network Mode: Display current network operating mode.

Network Band: Indicated the current radio frequency band used.

Refresh: Click to refresh the statistics.

GPS Status

In GPS status, you can check the UTC time, position of the router.

▼GPS Status

GPS 6 Satellites
UTC Time (hh:mm:ss): 03:31:22
Latitude: N2447.899658
Longitude: E12100.429688
Speed: 0 MPH, 0 km/h

Refresh

Hardware Monitor

In hardware monitor, you can check the voltage, current and temperature of system.

▼Hardware Monitor

Voltage:14.32V Current:0.35A
Temperature:41.75C / 107.15F

Refresh

Hotspot Status

The status table displays a list of connected Wi-Fi clients via the hotspot. .

HotSpot Status							
MAC Address	IP Address	Authenticated	User Name	Duration Time	Idle Time	Upload	Download
70:80:80:70:80:80	10.0.0.2	Authorized	hu-1	318/3600	167/180	0%/0	0%/0
Refresh							

MAC Address: The MAC of the connected wireless device.

IP Address: The LAN IP address assigned to the wireless device.

Authentication: Identification of the wireless device is being authorized or not.

User Name: The authentication username used to login to the hotspot. Go to Built-in User Account for detailed login account list.

Duration Time (remaining time / available session time interval): Display remaining interval available before session expires/timeout.

Idle Time (current idle time / total idle timeout period): Display current idle time of the Wi-Fi device. If it reaches to total idle timeout period, the Internet connection will get disconnected immediately.

Upload / Download (used / available bandwidth in %): Display current used bandwidths, in upload and download, out of the maximum allow usage in %.

Statistics

❖ 3G/4G-LTE

Take 3G/4G-LTE as an example to describe the following connection transmission information.

Statistics

Traffic Statistics

Interface

☒ 4G/LTE -1
 ☐ 4G/LTE -2
 ☐ EWAN(LAN4)
 ☐ Ethernet
 ☐ Wireless

Transmit Statistics

Transmit Frames of Current Connection

0

Transmit Bytes of Current Connection

0

Transmit Total Frames

0

Transmit Total Bytes

0

Receive Statistics

Receive Frames of Current Connection

0

Receive Bytes of Current Connection

0

Receive Total Frames

0

Receive Total Bytes

0

Refresh

Traffic Statistics

Interface: List all available network interfaces in the router. You are currently checking on the physical status of **3G/4G-LTE** interface.

Transmit Statistics

Transmit Frames of Current Connection: Display the total number of 3G/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.

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.

Refresh: Click to refresh this page.

❖ EWAN (LAN Port #4)

Statistics	
Traffic Statistics	
Interface	☐ 4G/LTE -1 ☐ 4G/LTE -2 ☒ EWAN(LAN4) ☐ Ethernet ☐ Wireless
Transmit Statistics	
Transmit Frames	0
Transmit Multicast Frames	0
Transmit Total Bytes	0
Transmit Collision	0
Transmit Error Frames	0
Receive Statistics	
Receive Frames	0
Receive Multicast Frame	0
Receive Total Bytes	0
Receive CRC Errors	0
Receive Under-size Frames	0
Refresh	

Traffic Statistics

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

Transmit Statistics

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

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

Transmit Total Bytes: Display the total 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.

Refresh: Click to refresh this page.

❖ Ethernet

▼ Statistics	
Traffic Statistics	
Interface	☐ 4G/LTE -1 ☐ 4G/LTE -2 ☐ EWAN(LAN4) ☒ Ethernet ☐ Wireless
Transmit Statistics	
Transmit Frames	6521
Transmit Multicast Frames	3899
Transmit Total Bytes	1834547
Transmit Collision	0
Transmit Error Frames	0
Receive Statistics	
Receive Frames	3575
Receive Multicast Frame	1350
Receive Total Bytes	1006843
Receive CRC Errors	0
Receive Under-size Frames	0
Refresh	

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 s 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.

Refresh: Click to refresh this page.

❖ Wireless

Statistics

Traffic Statistics

Interface

☐ 4G/LTE -1
 ☐ 4G/LTE -2
 ☐ EWAN(LAN4)
 ☐ Ethernet
 ☒ Wireless

Transmit Statistics

Transmit Frames

16602

Transmit Error Frames

0

Transmit Drop Frames

0

Receive Statistics

Receive Frames

99926

Receive Error Frames

46373

Receive Drop Frames

46373

Refresh

Traffic Statistics

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

Transmit Statistics

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

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

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

Receive Statistics

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

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

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

Refresh: Click to refresh this page.

DHCP Table

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

▼ DHCP Table				
Index	Host Name	IP Address	MAC Address	Expire Time
1	Billion-HC-ee	192.168.1.101	00:C0:9F:D1:E1:CA	0days 23:36:1

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

Host Name: Show 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.

Disk Status

▼ Disk Status		
Partition	Disk Space(KB)	Free Space(KB)
usb1_1	15718272	14033064
usb2_1	15734652	11170204

Partition: Display the USB storage partition.

Disk Space (KB): Display the total storage space of the NAS in Kbytes unit.

Free Space (KB): Display the available space in Kbytes unit.

ARP Table

This section displays the router's ARP (Address Resolution Protocol) Table, which shows the mapping of Internet (IP) addresses to Ethernet (MAC) addresses. This is useful as a quick way of determining the MAC address of the network interface of your PCs to use with the router's **Firewall - MAC Address Filter** function. See the Firewall section of this manual for more information on this feature.

▼ ARP Table		
#	IP	MAC Address
1	192.168.1.11	00:0C:29:00:00:00

Index #: The numeric indicator for the ARP table.

IP Address: It is IP Address of internal host that join this network.

MAC Address: The MAC address of internal host.

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, wireless, 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.

Run Wizard

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 wireless connection

Step 4. Set your internet connection

Step 5. Confirm the configuration and save it

Next

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

Back Next

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), Mexico City, Saskatchewan ▼

Back Next

Step 3 – Wireless

Set up your wireless connection if you want to connect to the Internet wirelessly on your PCs. Click **NEXT** to continue.

Quick Start - Wireless

Configure your wireless network, authentication type and click NEXT to continue.

Access Point	☒ Activated ☐ Deactivated
SSID	BEC345
Broadcast SSID	☒ Yes ☐ No
Channel	UNITED STATES 06
Security Type	Mixed WPA2/WPA-PSK
WPA Algorithms	TKIP+AES
Pre-Shared Key	842CFFDE (8~63 characters or 64 Hex string)
Key Renewal Interval	600 seconds (10 ~ 4194303)

Back Next

Step 4 – ISP Connection Type

Set up your 3G/4G-LTE Internet connection.

4.1 Select an appropriate WAN connection protocol then click **NEXT** to continue.

Quick Start - ISP Connection Type

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

WAN Interface	4G LTE -1
---------------	-----------

Back Next

4.2(1) If selected **4G LTE-1 or 4G LTE-2**

Input all relevant 3G/4G-LTE parameters from your ISP.

Click **Next** to continue.

Quick Start - 3G/4G-LTE

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

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

Back Next

4.2(2) If selected **EWAN / PPPoE**, please enter PPPoE account information provided by your ISP.

Click **NEXT** to continue.

▼ Quick Start - PPPoE

Provide the PPPoE information. Click NEXT to continue.

Username

Password

Back

Next

Step 5 – 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 - Quick Start Completed

Quick Start Completed !!

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

Back

Next

▼ Quick Start - Quick Start Completed !!

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**, **Dual WAN**, **Hotspot**, **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**, **Wireless**, and **Wireless MAC Filter**

Internet

❖ 3G/4G-LTE

Internet	
WAN Interface	4G/LTE ▼
Status	☒ Activated ☐ Deactivated
Usage Allowance ▶	☐ Enable
IP Pass-Through Mode	☐ Enable
LTE Antenna Diversity ▶	Enabled
Network Mode	Automatic ▼
PLMN Selection	Operator Numeric RAT Scan
TEL No.	*99***1#
Dual APN	Single APN ▼
APN	internet
PDN Type	☒ IPv4 ☐ IPv4/IPv6 ☐ IPv6
Authentication Protocol	Disable ▼
Username	
Password	
PIN	
Connection	☒ Always On (Recommended)
Keep Alive	☐ Yes ☒ No
Keep Alive IP	
Default Route	☒ Yes ☐ No
NAT	Enable ▼
MTU	1428 (0 means use default:1500)
Save	

Status: Choose Activated to enable the 3G/4G-LTE connection.

IP Pass-Through Mode: When **enabled**, MX-1200 is 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 MX-1200 can get a WAN IP address instead.

When **disabled**, MX-1200 is in router mode that it handles a WAN IP address and all routing-related

features become available.

LTE Mode (This feature is not supported in some LTE modules): Display current selected LTE frequency band. To change the band, please click “**LTE Band**” to access to the band selection page.

LTE Band

LTE Band: A list of available LTE bands to choose from.

▼ LTE Mode

Parameters

LTE Band

B12 ▼

***Please save config and restart to activate the setting. Please make sure device had get WAN IP, then config this feature.

Apply

Save Config & Restart

LTE Antenna Diversity (This feature is not supported in some LTE modules): When **enabled**, the auxiliary antenna will be activated. With **disabled**, only the primary antenna is receiving and transmitting data.

To change it, please click “**LTE Antenna Diversity**” to access to the LTE antenna diversity selection page.

NOTE: When using Yagi antenna, please **DISABLE** the Antenna Diversity feature for utmost performance.

LTE Antenna Diversity

To enable or disable the LTE antenna diversity feature.

▼ LTE Mode

Parameters

LTE Antenna Diversity

▼

***Please save config and restart to activate the setting. Please make sure device had get WAN IP, then config this feature.

Apply

Save Config & Restart

PLMN (Public Land Mobile Network) Selection: Either manually enter the information or click **Scan** button to scanning all closest base stations in the area.

TEL No.: The dial string to make a GPRS / 3G/4G-LTE user internetworking call. It may provide by your mobile service provider.

Dual APN*: MX-1200 can support up to two (2) APNs. Select **Single** / **Dual** or a **different LTE/3G APN**.

- ▶ **APN (3G):** If select **LTE/3G with different APN**, enter the APN here.

*** Feature is available with specific cellular module**

APN: An APN is similar 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 3G operators use the APN ‘internet’ for their portal. The default value is “internet”.

PDN Type: The IP type for PDN connections. Available types are **IPv4**, **IPv6**, and **IPv4v6**.

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 3G/4G-LTE connection.

Keep Alive: Select **Yes** to keep the 3G/4G-LTE connection always on.

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

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. Default MTU **0** means it is set to 1500 bytes.

❖ EWAN (LAN # 4)

▼ Internet	
WAN Interface	EWAN(LAN4) ▼
Status	☒ Activated ☐ Deactivated
IPv4/IPv6	
IP Version	☐ IPv4 ☒ IPv4/IPv6 ☐ IPv6
ISP Connection Type	
ISP	☐ Dynamic IP Address ☐ Static IP Address ☒ PPPoE
802.1q Options	
802.1q	☐ Activated ☒ Deactivated
VLAN ID	0 (range: 0~4095)
PPPoE	
Username	
Password	
Bridge Interface for PPPoE	☐ Activated ☒ Deactivated
Connection Setting	
Connection	☒ Always On (Recommended) ☐ Connect Manually
TCP MSS Option	TCP MSS 0 bytes(0 means use default)
IP Options	
IP Common Options	
Default Route	☒ Yes ☐ No
TCP MTU Option	TCP MTU 0 bytes(0 means use default: 1492)
IPv4 Options	
Get IP Address	☐ Static ☒ Dynamic
Static IP Address	0.0.0.0
IP Subnet Mask	0.0.0.0
Gateway	0.0.0.0
NAT	Enable ▼
Dynamic Route	RIP1 ▼ Direction None ▼
IGMP Proxy	☐ Enable ☒ Disable
IPv6 Options	
IPv6 Address	/
Obtain IPv6 DNS	☒ Enable ☐ Disable
Primary DNS	
Secondary DNS	
MLD Proxy	☐ Enable ☒ Disable
Save	

Status: Select to enable or disable the service.

IPv4/IPv6

IP Version: Choose **IPv4**, **IPv4/IPv6**, or **IPv6** based on your environment. If you don't know which one to choose from, please choose IPv4/IPv6 instead.

ISP Connection Type:

ISP: Select the encapsulation type your ISP uses.

- **Dynamic IP:** Select this option if your ISP provides you an IP address automatically.

- ▶ **Static IP:** Select this option to set static IP information. You will need to enter in the Connection type, IP address, subnet mask, and gateway address, provided to you by your ISP. Each IP address entered in the fields must be in the appropriate IP form. IP address from by four IP octets separated by a dot (xx.xx.xx.xx). The Router will not accept the IP address if it is not in this format.
- ▶ **PPPoE:** Select this option if your ISP requires you to use a PPPoE connection.

802.1q Options

802.1q: When activated, please enter a VLAN ID.

VLAN ID: It is a parameter to specify the VLAN which the frame belongs. Enter the VLAN ID identification, tagged: 0-4095.

PPPoE (If selected PPPoE as WAN Connection Type; otherwise, skip this part)

Username: Enter the user name provided by your ISP.

Password: Enter the password provided by your ISP.

Bridge Interface for PPPoE: When “Activated”, the device will gain WAN IP from your ISP with the PPPoE account. But if your PC is connected to the router working as a DHCP client, in this mode, the device acts as a NAT router; while if you dial up with the account within your PC, the device will then work as a bridge forwarding the PPPoE information to the PPPoE server and send the response to your PC, thus your PC gets a WAN IP working in the internet.

Connection Setting

Connection:

- ▶ **Always On:** Click on **Always On** to establish a PPPoE session during start up and to automatically re-establish the PPPoE session when disconnected by the ISP.
- ▶ **Connect Manually:** Select Connect Manually when you don't want the connection up all the time.

TCP MSS Option: Enter the maximum size of the data that TCP can send in a segment. Maximum Segment Size (MSS).

IP Options – next page

IP Options

IP Options	
IP Common Options	
Default Route	☒ Yes ☐ No
TCP MTU Option	TCP MTU 0 bytes(0 means use default:1492)
IPv4 Options	
Get IP Address	☐ Static ☒ Dynamic
Static IP Address	0.0.0.0
IP Subnet Mask	0.0.0.0
Gateway	0.0.0.0
NAT	Enable
Dynamic Route	RIP1 Direction None
IGMP Proxy	☐ Enable ☒ Disable
IPv6 Options	
IPv6 Address	/
Obtain IPv6 DNS	☒ Enable ☐ Disable
Primary DNS	
Secondary DNS	
MLD Proxy	☐ Enable ☒ Disable

IP Common Options

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

TCP MTU Option: Enter the maximum packet that can be transmitted. Default MTU **0** means it is set to 1492 bytes.

IPv4 Options

Get IP Address: Choose Static or Dynamic

Static IP Address: If **Static** is selected in the above field, please enter the specific IP address you get from ISP and the following IP subnet mask and gateway address.

IP Subnet Mask: The default is 0.0.0.0. User can change it to other such as 255.255.255.0. Type the subnet mask assigned to you by your ISP (if given).

Gateway: Enter the specific gateway IP address you get from ISP.

NAT: Enable to allow MX-1200 to assign private network IPs to all devices in the network for get Internet access.

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.

IGMP Proxy: IGMP (Internet Group Multicast Protocol) is a network-layer protocol used to establish membership in a Multicast group. Choose whether enable IGMP proxy.

[IPv6 options](#) (only when choose IPv4/IPv6 or just IPv6 in IP version field above):

IPv6 Address: Type the WAN IPv6 address from your ISP.

Obtain IPv6 DNS: Choose if you want to obtain DNS automatically.

Primary/Secondary: if you choose Disable in the Obtain IPv6 DNS field, please type the exactly primary and secondary DNS.

MLD Proxy: MLD (Multicast Listener Discovery Protocol) is to IPv6 just as IGMP to IPv4. It is a Multicast Management protocol for IPv6 multicast packets.

When router's Internet configuration is finished successfully, you can go to status to get the connection information.

Click **Save** to apply the settings.

❖ Wireless Client

Internet

WAN Interface

WirelessClient ▼

Status

☒ Activated
 ☐ Deactivated

ISP Connection Type

ISP

☒ Dynamic IP Address
 ☐ Static IP Address

Dynamic IP Address

IP Common Options

Default Route

☒ Yes
 ☐ No

IPv4 Options

NAT

Enable ▼

Wireless Options

SSID

BEC_N2G

Channel

1 ▼

Security Type

WPA2-PSK ▼

Pre-Shared Key

(8~63 characters or 64 Hex string)

☒ Show Character

Save

Scan

Site Survey

CH	SSID	BSSID	Security	Signal(%)
----	------	-------	----------	-----------

Status: Select to enable or disable the service.

ISP Connection Type:

ISP: Select the encapsulation type your ISP uses.

- ▶ **Dynamic IP:** Select this option to get an assigned IP address automatically from a Wi-Fi AP unit.
- ▶ **Static IP:** Select to enter the access IP address manually.

IP Options

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

IPv4 Options

NAT: Enable to allow MX-1200 to assign private network IPs to all devices in the network for get Internet access.

Wireless Options

Enter the basic information of the Wireless base station.

SSID / Channel / Pre-Shared Key: Enter the SSID, Wi-Fi channel, and Pre-shared key of the wireless station to provide the Internet access.

Scan: Click **Scan** button to search all available and active wireless stations (AP) around the area, and then choose the desired AP. The SSID and Channel will be filled automatically

Click **Save** to apply the settings.

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.

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

IGMP Snooping

☐ Activated
 ☒ Deactivated

Dynamic Route

RIP1

Direction

None

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)

Physical Ports

☒ LAN1
 ☒ LAN2
 ☒ LAN3

DNS Relay

☒ Automatically
 ☐ Manually

Primary DNS

Secondary DNS

Option 66

Option 160

Fixed Host

IP Address

MAC Address

IPv6 Parameters

Interface Address/Prefix Length

/

MLD Snooping

☐ Activated
 ☒ Deactivated

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

Save

Fixed Host List			
Index	IP Address	MAC Address	Delete

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

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)

Physical Ports

☒ LAN1
☒ LAN2
☒ LAN3
☒ LAN4
☒ WLAN1

DNS Relay

☒ Automatically
☐ Manually

Primary DNS

Secondary DNS

Fixed Host

IP Address

MAC Address

IPv6 Parameters

Interface Address/Prefix Length

/

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

Save

Fixed Host List			
Index	IP	MAC	Drop

IPv4 Parameters

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	20
Lease Time	86400 seconds (0 sets to default value of 259200)
Physical Ports	☒ LAN1 ☒ LAN2 ☒ LAN3 ☒ WLAN1
DNS Relay	☒ Automatically ☐ Manually
Primary DNS	
Secondary DNS	

DHCPv4 Server: If set to **Enabled**, your MX-1200 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 MX-1200 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.

Physical Ports: Select to determine if the DHCPv4 server is applicable to the specific port or ports. By default, all ports can obtain local IP from DHCPv4 server.

DNS Relay:

- ▶ Select **Automatic** detection or
- ▶ **Manually** specific Primary and Secondary DNS IP addresses

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 Listing			
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.

MLD Snooping: Similar to IGMP Snooping, but applicable for IPv6.

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 (hour): 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.

Wireless

This section introduces the wireless LAN and some basic configurations. Wireless LANs can be as complex as a number of computers with wireless LAN cards communicating through access points which bridge network traffic to the wired LAN.

NOTE: WLAN1 / 2 / 3 / 4 Interface refers to as SSID1 / 2 / 3 / 4 Wi-Fi networks.

Wireless	
Access Point Settings	
Access Point	☒ Activated ☐ Deactivated
AP MAC Address	00:04:ED:01:23:45
Wireless Mode	802.11b+g+n ▼
Channel	UNITED STATES ▼ 06 ▼ Current Channel : 6
Beacon Interval	100 (range: 20~1000)
RTS/CTS Threshold	2347 (range: 1500~2347)
Fragmentation Threshold	2346 (range: 256~2346, even numbers only)
DTIM Interval	1 (range: 1~255)
TX Power	100 (range: 1~100)
IGMP Snooping	☒ Yes ☐ No
11n Settings	
Channel Bandwidth	20 MHz ▼
Guard Interval	Auto ▼
MCS	Auto ▼
SSID Settings	
Available SSID	1 ▼
SSID Index	☒ SSID1
SSID	BEC345
Broadcast SSID	☒ Yes ☐ No
SSID Activated	Always ▼
WPS Settings	
Use WPS	☒ Yes ☐ No
WPS State	Configured
WPS Mode	☐ PIN code ☒ PBC
Security Settings	
Security Type	Mixed WPA2/WPA-PSK ▼
WPA Algorithms	TKIP+AES ▼
Pre-Shared Key	842CFFDE (8~63 characters or 64 Hex string)
Key Renewal Interval	600 seconds (10 ~ 4194303)
WDS Settings	
AP MAC Address	00:04:ED:01:23:45
WDS Mode	☐ Activated ☒ Deactivated
WDS Peer MAC #1	00:00:00:00:00:00
WDS Peer MAC #2	00:00:00:00:00:00
WDS Peer MAC #3	00:00:00:00:00:00
WDS Peer MAC #4	00:00:00:00:00:00
Save	

Access Point Settings

Access Point Settings	
Access Point	☒ Activated ☐ Deactivated
AP MAC Address	00:04:ED:01:23:45
Wireless Mode	802.11b+g+n ▼
Channel	UNITED STATES ▼ 06 ▼ Current Channel : 6
Beacon Interval	100 (range: 20~1000)
RTS/CTS Threshold	2347 (range: 1500~2347)
Fragmentation Threshold	2346 (range: 256~2346, even numbers only)
DTIM Interval	1 (range: 1~255)
TX Power	100 (range:1~100)
IGMP Snooping	☒ Yes ☐ No

Access Point: Default setting is set to **Activated**. If you want to close the wireless interface, select **Deactivated**.

AP MAC Address: The MAC address of wireless AP.

Wireless Mode: The default setting is **802.11b+g+n** (Mixed mode). If you do not know or have both 11g and 11b devices in your network, then keep the default in **mixed mode**. From the drop-down manual, you can select **802.11g** if you have only 11g card. If you have only 11b card, then select **802.11b** and if you only have 802.11n then select **802.11n**.

Channel: The range of radio frequencies used by IEEE 802.11b/g/n wireless devices is called a channel. There are Regulation Domains and Channel ID in this field. The Channel ID will be different based on Regulation Domains. Select a channel from the drop-down list box.

Beacon interval: The Beacon Interval value indicates the frequency interval of the beacon. Enter a value between 20 and 1000. A beacon is a packet broadcast by the Router to synchronize the wireless network.

RTS/CTS Threshold: The RTS (Request To Send) threshold (number of bytes) for enabling RTS/CTS handshake. Data with its frame size larger than this value will perform the RTS/CTS handshake. Enter a value between 1500 and 2347.

Fragmentation Threshold: The threshold (number of bytes) for the fragmentation boundary for directed messages. It is the maximum data fragment size that can be sent. Enter a value between 256 and 2346, even number only.

DTIM Interval: This value, between 1 and 255, indicates the interval of the Delivery Traffic Indication Message (DTIM).

TX Power: The transmission power of the antennas, ranging from 1-100, the higher the more powerful of the transmission performance.

IGMP Snooping: Enable or disable the IGMP Snooping function for wireless. 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."

11n Settings	
Channel Bandwidth	20 MHz ▼
Guard Interval	Auto ▼
MCS	Auto ▼
SSID Settings	
Available SSID	1 ▼
SSID Index	☒ SSID1
SSID	BEC345
Broadcast SSID	☒ Yes ☐ No
SSID Activated	Always ▼

11n Settings

Channel Bandwidth: Select **20 MHz**, **40 MHz**, or **20/40 MHz** for the channel bandwidth. The wider the Channel bandwidth the better the performance will be.

Extension Channel: This is for the 20/40MHz clients to use and is predefined to **Auto** by default.

Guard Interval: Select either **800nsec** or **Automatic** for the guard interval. The guard interval is here to ensure that data transmission do not interfere with each other. It also prevents propagation delays, echoing and reflections. The shorter the Guard Interval, the better the performance will be. We recommend users to select **Auto**.

MCS (Modulation and Coding Scheme): There are options **0~15** and **AUTO** to select from. **AUTO** is recommended.

SSID Settings

NOTE: SSID1 will reserve for Hotspot when it is enabled.

Available SSID: User can determine how many virtual SSIDs to be used. Default is 1, maximum is 4.

SSID Index: Select the number of SSIDs you want to use; up to 4 SSIDs are available in the list.

- ▶ **SSID1 / Hotspot SSID** known as **WLAN1** Interface
- ▶ **SSID2** known as **WLAN2** Interface
- ▶ **SSID3** known as **WLAN4** Interface
- ▶ **SSID4** known as **WLAN5** Interface

SSID: The SSID is the unique name of a wireless access point (AP) to be distinguished from another. For security propose, change the default **wlan-ap** to a unique ID name to the AP which is already built-in to the router's wireless interface. Make sure your wireless clients have exactly the SSID as the device, in order to get connected to your network.

Broadcast SSID: Select **Yes** to make the SSID visible so a station can obtain the SSID through passive scanning. Select **No** to hide the SSID in so a station cannot obtain the SSID through passive scanning.

SSID Activated: Select the time period during which the SSID is active. Default is in **Always** which means the SSID is active at all time without time control. See [Time Schedule](#) to set the timeslot to flexibly control when the SSID functions.

WPS Settings

WPS (Wi-Fi Protected Setup) feature is a standard protocol created by Wi-Fi Alliance. This feature greatly simplifies the steps needed to create a Wi-Fi network for a residential or an office setting. WPS supports 2 types of configuration methods which are commonly known among consumers: [PIN Method](#) (Personal Information Number) & [PBC Method](#) (Push Button Configuration).

WPS Settings	
Use WPS	☒ Yes ☐ No
WPS State	Configured
WPS Mode	☐ PIN code ☒ PBC

Use WPS: Enable this feature by choosing “Yes” radio button.

WPS State: Display whether the WPS is **configured** or **unconfigured**.

WPS Mode: Select the mode which to start WPS, choose between **PIN Code** and **PBC** (Push Button). Selecting **Pin Code** mode will require you to know the enrollee PIN code.

To future understand the two modes of configuration; please refer to the example of the **Wi-Fi Protected Setup**.

Security Settings

Security Type: You can disable or enable wireless security for protecting wireless network. The default type of wireless security is OPEN and to allow all wireless stations to communicate with the access points without any data encryption.

To prevent unauthorized wireless stations from accessing data transmitted over the network, the router offers secure data encryption, known as WEP and WPA.

There are five alternatives to select from: WEP 64-bit, WEP 128-bit, WPA-PSK, WPA2-PSK, and Mixed WPA/WPA2-PSK. If you require high security for transmissions, please select WPA-PSK, WPA2-PSK or WPA/WPA2-PSK.

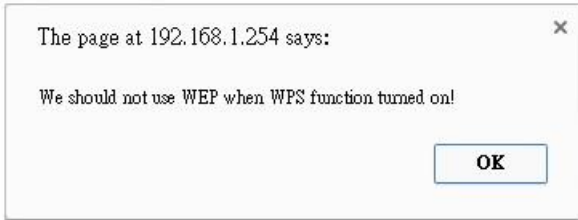
► WEP

Security Settings	
Security Type	WEP 64-bit
WEP Authentication Method	Both
WEP 64-bit	For each key, please enter either (1) 5 characters, or (2) 10 characters ranging from 0~9, a, b, c, d, e, f.
☒ Key#1	
☐ Key#2	
☐ Key#3	
☐ Key#4	

WEP Authentication Method: WEP authentication method, there are two methods of authentication used, Open System authentication (OPENWEB) and Share Key authentication (SHAREDWEB). We suggest you select OPENWEB.

Key 1 to Key 4: Enter the key to encrypt wireless data. To allow encrypted data transmission, the WEP Encryption Key values on all wireless stations must be the same as the router. There are four keys for your selection. The input format is in HEX style, 5 and 13 HEX codes are required for 64-bitWEP and 128-bitWEP respectively.

If chose **WEP 64-bit**, then enter any 5 ASCII characters or 10 hexadecimal characters ("0-9", "A-F").
If chose **WEP 128-bit**, then enter 13 ASCII characters or 26 hexadecimal characters ("0-9", "A-F").
You must configure all four keys, but only one key can be activated at any one time. The default key is key 1.



NOTE: WPS requires a higher level of security than WEP, 64bits or 128bits. Select WAP / WAP2 security when using WPS.

► WPA-PSK / WPA2-PSK / Mixed WPA & WPA2

Security Settings	
Security Type	Mixed WPA2/WPA-PSK ▼
WPA Algorithms	TKIP+AES ▼
Pre-Shared Key	(8~63 characters or 64 Hex string)
Key Renewal Interval	600 seconds (10 ~ 4194303)

WPA Algorithms: TKIP (Temporal Key Integrity Protocol) or AES (Advanced Encryption System) utilizes a stronger encryption method and incorporates Message Integrity Code (MIC) to provide protection against hackers.

Pre-Shared key: The key for network authentication. The input format should be 8-63 ASCII characters or 64 hexadecimal characters

Key Renewal Interval: The time interval for changing the security key automatically between wireless client and AP.

WDS Settings

WDS (Wireless distributed system) is a wireless access point mode that enables wireless link and communication with other access point. It is easy to be installed, just define the peer's MAC of the connected AP.

WDS Mode: select Activated to enable WDS feature and Deactivated to disable this feature.

MAC Address: Enter the AP MAC addresses (in XX:XX:XX:XX:XX:XX format) of the peer connected AP.

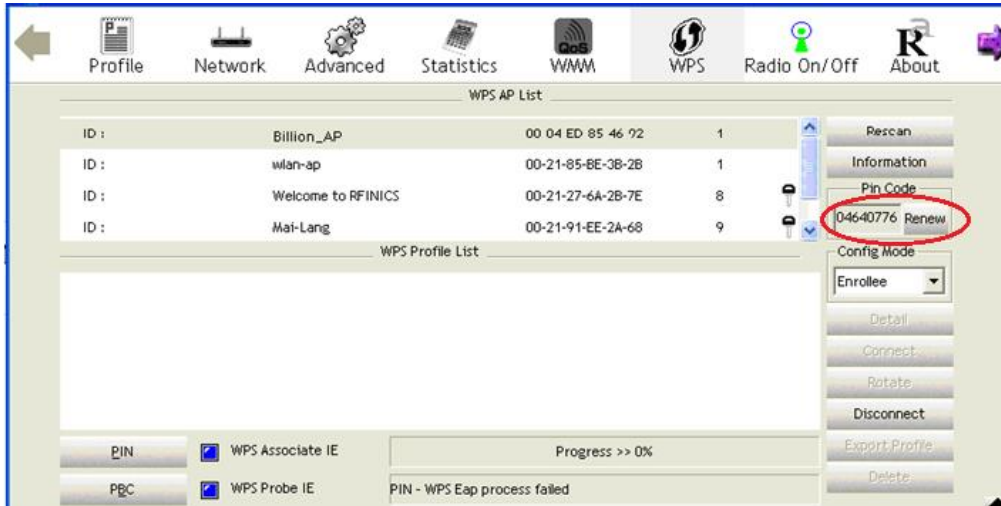
WDS Settings	
AP MAC Address	60:03:47:6C:48:00
WDS Mode	☐ Activated ☒ Deactivated
WDS Peer MAC #1	00:00:00:00:00:00
WDS Peer MAC #2	00:00:00:00:00:00
WDS Peer MAC #3	00:00:00:00:00:00
WDS Peer MAC #4	00:00:00:00:00:00

Click **Save** to apply the settings.

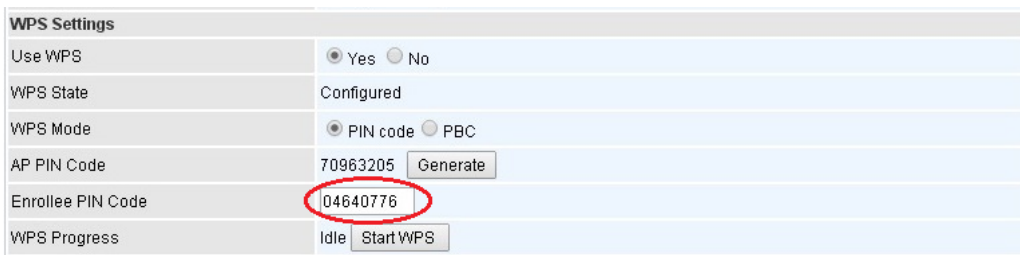
Example: WPS using PIN Method (Personal Information Number)

PIN Method – Configure MX-1200 as a Registrar

1. Jot down the client's Pin (e.g. 04640776) from the WPS utility (e.g. Ralink Utility)

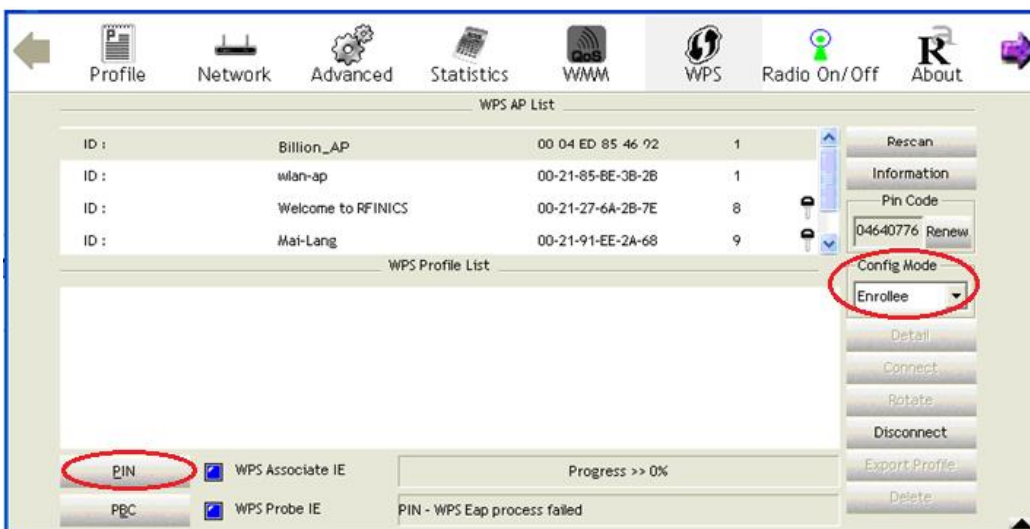


2. Enter the Enrollee (Client) PIN code and then press **Start WPS**.

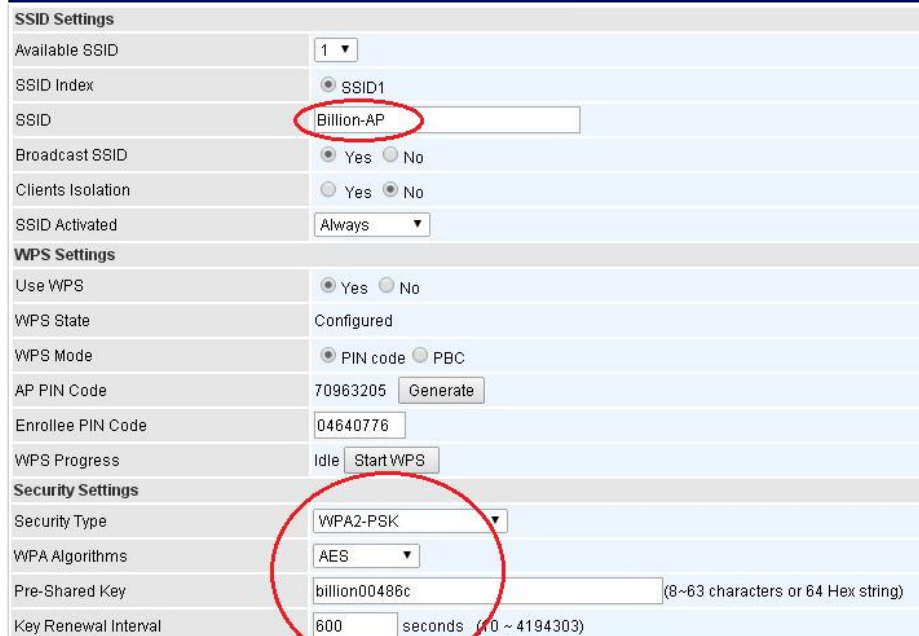
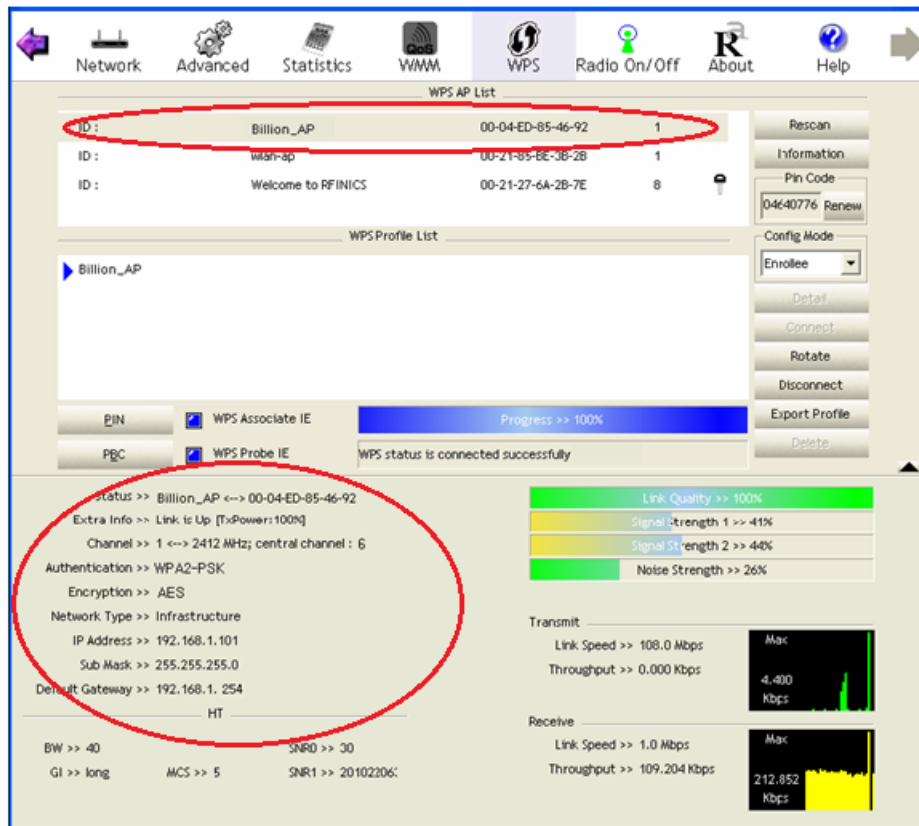


3. Go back to the wireless client's WPS utility (e.g. Ralink Utility).

Set the Config Mode as **Enrollee**, press the WPS button on the top bar, select the AP (e.g. Billion_AP) from the WPS AP List column. Then press the PIN button located on the middle left of the page to run the scan.



4. The client's SSID and security setting will now be configured to match the SSID and security setting of the registrar, the MX-1200 router.



PIN Method – Configure MX-1200 as an Enrollee

1. Jot down the AP PIN Code (e.g. 03454435) from the MX-1200. Press **Start WPS**.

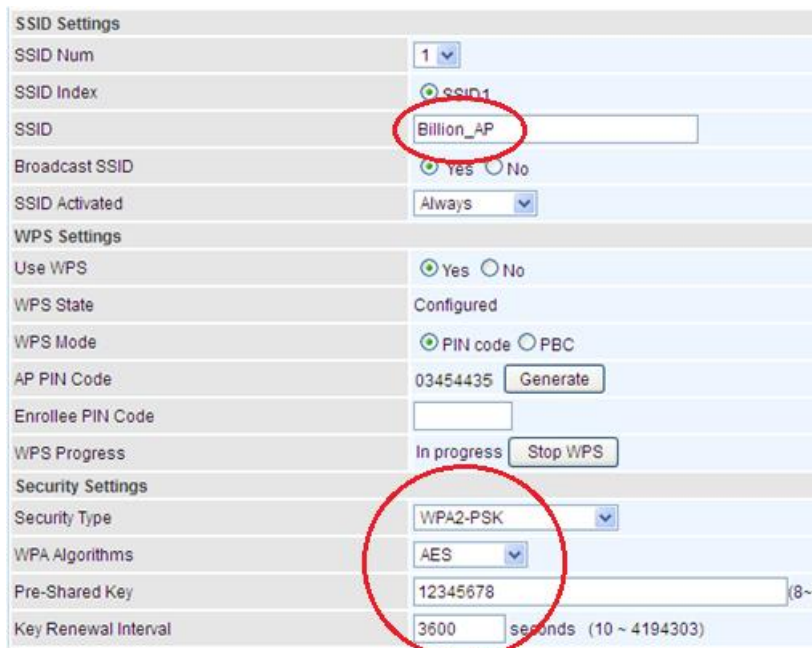
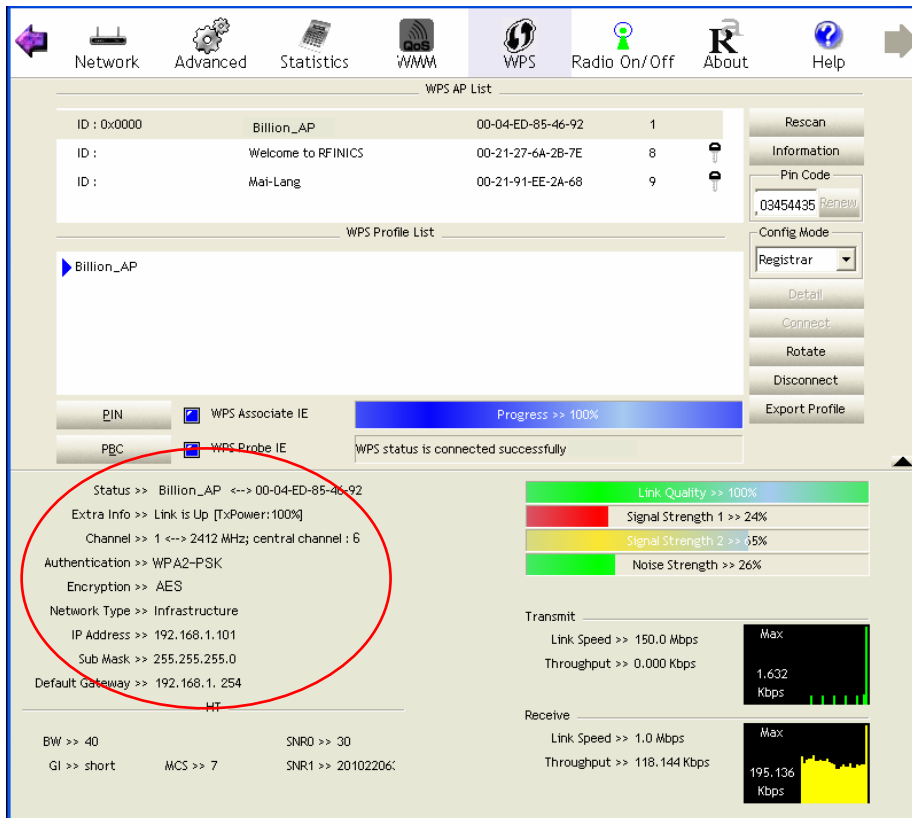
WPS Settings	
Use WPS	☒ Yes ☐ No
WPS State	Configured
WPS Mode	☒ PIN code ☐ PBC
AP PIN Code	03454435 Generate
Enrollee PIN Code	
WPS Progress	In progress Stop WPS

2. Launch the wireless client's WPS utility (e.g. Ralink Utility). Set the Config Mode as Registrar. Enter the PIN number in the PIN Code (e.g. 03454435) column then choose the correct AP (e.g. Billion_AP) from the WPS AP List before pressing the PIN button to run the scan.

The screenshot shows the Ralink WPS utility interface. The top menu bar includes Network, Advanced, Statistics, WMM, WPS, Radio On/Off, About, and Help. The main window is divided into several sections:

- WPS AP List:** A table listing available APs. The first entry, "Billion_AP", is circled in red. Its ID is 0x0000, and its PIN is 03454435.
- WPS Profile List:** A list of WPS profiles. The first entry, "Billion_AP", is circled in red.
- WPS Status:** A section showing the current WPS status. The "PIN" button is circled in red. The "WPS Associate IE" checkbox is checked. The "WPS Probe IE" checkbox is also checked. The "Progress" bar is at 100%.
- WPS Settings:** A section showing various WPS settings. The "Config Mode" dropdown is set to "Registrar" and is circled in red. The "Pin Code" field is set to "03454435" and is circled in red.
- WPS Progress:** A section showing the WPS progress. The "PIN" button is circled in red. The "WPS Associate IE" checkbox is checked. The "WPS Probe IE" checkbox is also checked. The "Progress" bar is at 100%.
- WPS Status:** A section showing the current WPS status. The "PIN" button is circled in red. The "WPS Associate IE" checkbox is checked. The "WPS Probe IE" checkbox is also checked. The "Progress" bar is at 100%.

3. The router's (AP's) SSID and security setting will now be configured to match the SSID and security setting of the registrar (client).



Example: WPS using PBC Method (Push Button Configuration)

1. Click the **PBC** radio button and click **Save** to apply the settings

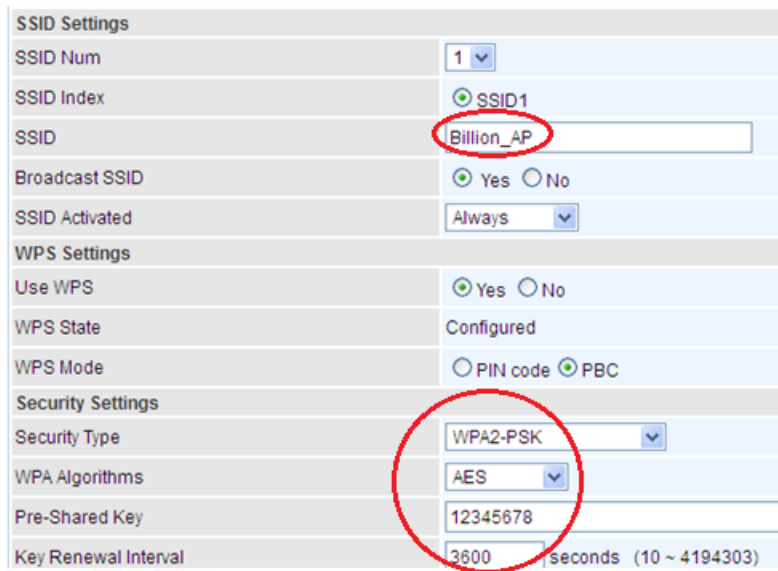
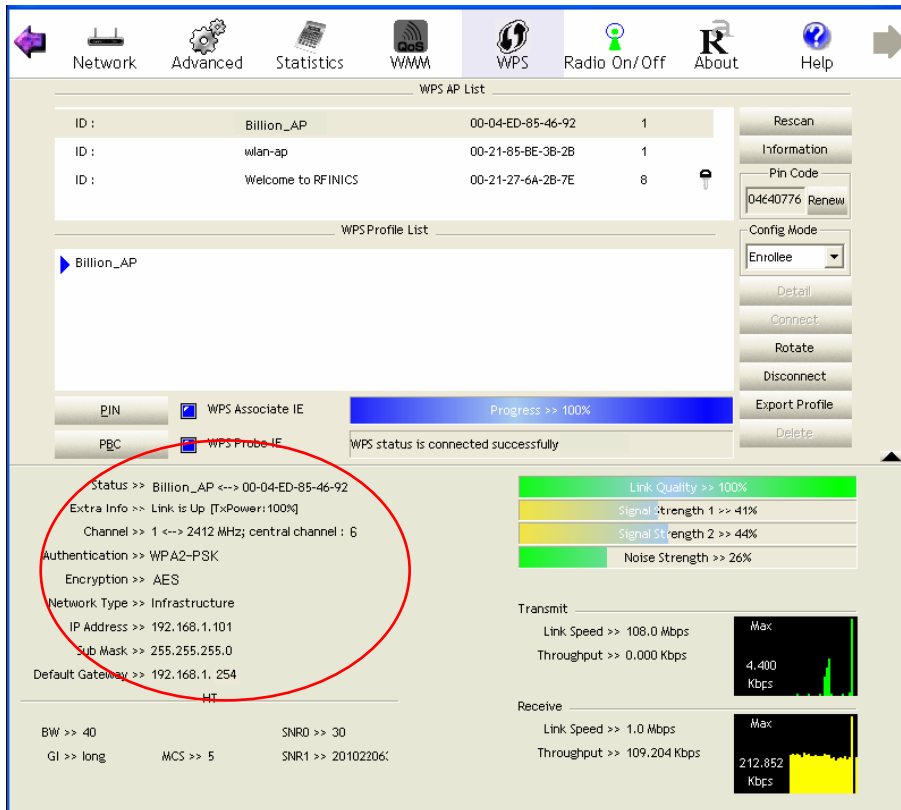
SSID Settings	
SSID Num	1
SSID Index	SSID1
SSID	Billion_AP
Broadcast SSID	Yes No
SSID Activated	Always
WPS Settings	
Use WPS	Yes No
WPS State	Configured
WPS Mode	PIN code PBC
Security Settings	

2. Launch the wireless client's WPS Utility (e.g. Ralink Utility). Set the Config Mode as **Enrollee**. Then press the **WPS button** and choose the correct AP (e.g. **Billion_AP**) from the WPS AP List section before pressing the **PBC** button to run the scan.

Profile	Network	Advanced	Statistics	WMM	WPS	Radio On/Off	About
WPS AP List							
ID :	Billion_AP	00 04 ED 85 46 92	1				
ID :	wlan-ap	00-21-85-BE-3B-2B	1				
ID :	Welcome to RFINICS	00-21-27-6A-2B-7E	8				
ID :	Mai-Lang	00-21-91-EE-2A-68	9				
WPS Profile List							
PIN WPS Associate IE WPS Probe IE Progress >> 0% PIN - WPS Eap process failed							
Rescan Information Pin Code 04640776 Renew Config Mode Enrollee Detail Connect Rotate Disconnect Export Profile Delete							

Interface Setup – Wireless (Example on WPS using PBC)

3. When the PBC button is pushed, a wireless communication will be established between your router and the PC. The client's SSID and security setting will now be configured to match the SSID and security setting of the router.



Wireless MAC Filter

The MAC filter screen allows you to configure the router to give exclusive access to up to 8 devices (Allow Association) or exclude up to 8 devices from accessing the router (Deny Association). Every Ethernet device has a unique MAC (Media Access Control) address. The MAC address is assigned at the factory and consists of six pairs of hexadecimal characters, for example, 00:AA:BB:00:00:02.

You need to know the MAC address of the devices you wish to filter.

SSID Index	☒ SSID1		
Active	☐ Activated ☒ Deactivated		
Action	Allow ▾ the follow Wireless LAN station(s) association.		
MAC Address			
Save			
Wireless MAC Address Filter Listing			
Index	MAC Address	Edit	Delete

SSID Index: Select the targeted SSID you want the MAC filter rules to apply to.

Active: Select **Activated** to enable MAC address filtering.

Action: Define the filter action for the list of MAC addresses in the MAC address filter table.

- ▶ Select **Deny** to block access to the AP, MAC addresses not listed will be allowed to access the router.
- ▶ Select **Allow** to permit access to the router, MAC addresses not listed will be denied access to the router.

MAC Address: Enter the MAC addresses (in XX:XX:XX:XX:XX:XX format) of the wireless station that are allowed or denied access to the specified in these address fields.

Click **Save** to apply the settings.

Dual WAN

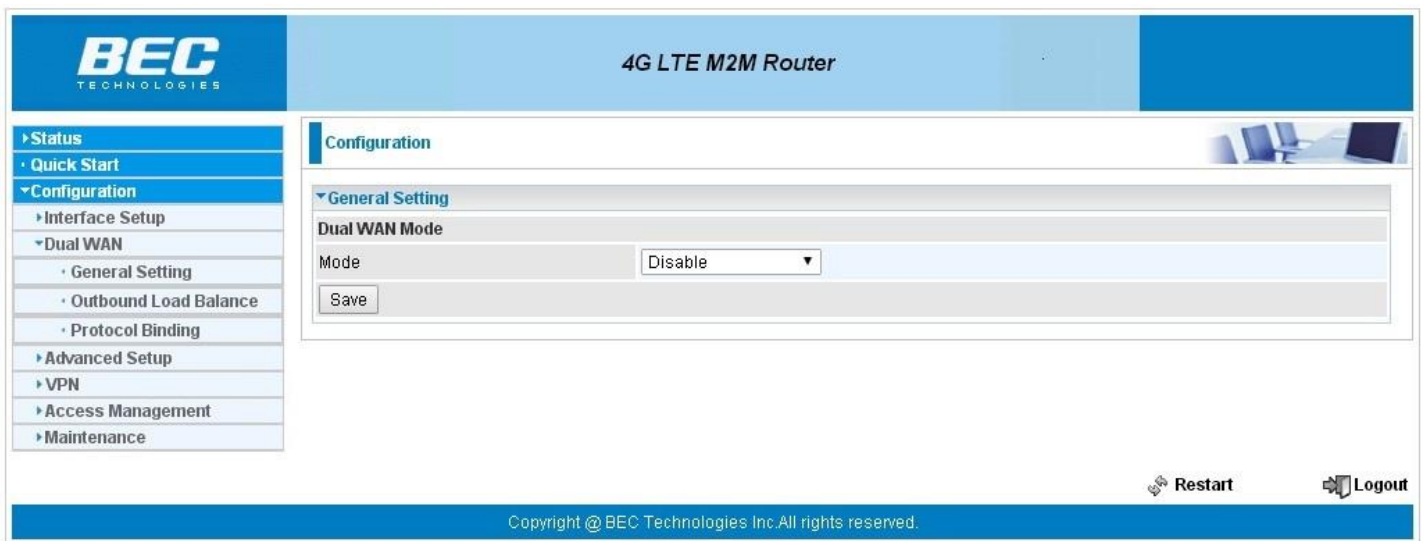
Dual WAN, is a feature to have two independent Internet connections connected concurrently, offers a reliable Internet connectivity and maximize bandwidth utilization for critical applications delivery.

General Setting

Mode: Select a mode. Available modes: **Disable**, **Failover & Failback**, **Failover Priority**, and **Load Balancing**

Mode (Disable): For MX-1200U and MX-1200X only. Primary SIM (SIM1) will get activated first.

Click **Save** to proceed



The screenshot displays the web management interface of a BEC 4G LTE M2M Router. The top header features the BEC Technologies logo and the device name '4G LTE M2M Router'. A left sidebar contains a navigation menu with options: Status, Quick Start, Configuration (selected), Interface Setup, Dual WAN (expanded), General Setting (selected), Outbound Load Balance, Protocol Binding, Advanced Setup, VPN, Access Management, and Maintenance. The main content area is titled 'Configuration' and shows the 'General Setting' for 'Dual WAN Mode'. The 'Mode' is currently set to 'Disable' in a dropdown menu, with a 'Save' button below it. At the bottom right, there are 'Restart' and 'Logout' buttons. The footer contains the copyright notice: 'Copyright © BEC Technologies Inc. All rights reserved.'

❖ Failover & Failback

Auto failover/failback ensures always-online network connectivity. When primary WAN link (WAN1) fails, all traffic will switch over to the backup WAN (WAN2) seamlessly.

Again, when the primary link is restored, traffic will be handled over from WAN2 to WAN1.

General Setting	
Dual WAN Mode	
Mode	Failover & Failback
WAN Port Service Detection Policy	
WAN1	4G LTE -1
WAN2	EWAN(LAN4)
Keep Backup Interface Connected	Disable
Minimum RSRP/RSSI	-105 / -90 dbm(-111~ -5, 0:disable)
Connectivity Decision	Auto failover takes place after straight 3 consecutive failure in every 30 seconds.
Probe By Ping	☒ Enable
Ping Setting	☐ Gateway ☒ Host 8.8.8.8
Probe By Signal Strength	☒ Enable
Minimum RSRP/RSSI	-105 / -90 dbm(-111~ -5, 0:disable)
Save	

WAN Port Service Detection Policy

WAN1 (Primary): Choose a desired WAN as the primary WAN Link from the list.

WAN2 (Backup): Choose a desired WAN as the backup WAN Link from the list.

Keep Backup Interface Connected: Select the following option whether to keep the backup WAN (WAN2) interface connected to the Internet.

- ▶ **Disable:** Inactivate this feature.
- ▶ **Always:** Keep the backup WAN (WAN2) interface always connected to the Internet
- ▶ **By Signal Strength:** Enable and initiate automatic backup WAN to connect to the Internet at all time until the RSRP / RSSI of primary WAN is greater than the Minimum RSRP / RSSI.
 - **Minimum RSRP / RSSI:** Set a minimum requirement for RSRP and RSSI for the primary WAN. Value range from -111 ~ -5. 0 means don't care/no need to check this value.

NOTE: Both the RSRP and RSSI cannot be 0 at the same time.

Connectivity Decision & Probe Cycle: Set a number of times and time in seconds to determine when to switch to the backup link (WAN2) when primary link (WAN1) fails and vise versa.

Example, *Auto failover takes place after straight 3 consecutive failures in every 30 seconds* meaning all traffic will hand over to backup link (WAN2) after primary link fails to response in total of 90 seconds, 30 seconds for 3 consecutive failures.

NOTE: Failover and Failback follow the same **Connectivity Decision & Probe Cycle** rule to failover from WAN1 to WAN2 or failback from WAN2 to WAN1.

Failover/Failback Rule Decisions:

1. **Probe by Ping:** Enable Ping to the gateway or an IP address
 - ▶ **Gateway:** Internal system will wait for responses to the pings from the gateway of the WAN.
 - ▶ **Host:** Internal system will wait for responses to the pings from a fixed IP address.
2. **Probe by Signal Strength:** Enable to measure the LTE signal strength

- ▶ **Minimum RSRP / RSSI:** Set a minimum requirement for RSRP and RSSI for initiating automatic WAN failback or failover procedures.

Click **Save** to apply the settings.

❖ Failover & Priority

General Setting	
Dual WAN Mode	
Mode	Failover & Priority ▼
WAN Port Service Detection Policy	
WAN1	4G LTE -1 ▼
WAN2	4G LTE -2 ▼
Connectivity Decision	Auto failover takes place after straight 3 consecutive failure in every 30 seconds.
Priority By	Signal Strength ▼
Save	

WAN Port Service Detection Policy

WAN1 (Primary): Choose a desired WAN as the primary WAN Link from the list.

WAN2 (Backup): Choose a desired WAN as the backup WAN Link from the list.

Connectivity Decision & Probe Cycle: Set a number of times and time in seconds to determine when to switch to the backup link (WAN2) when primary link (WAN1) fails and vice versa.

Example, *Auto failover takes place after straight 3 consecutive failures in every 30 seconds* meaning all traffic will hand over to backup link (WAN2) after primary link fails to response in total of 90 seconds, 30 seconds for 3 consecutive failures.

NOTE: Failover and Failback follow the same **Connectivity Decision & Probe Cycle** rule to failover from WAN1 to WAN2 or fallback from WAN2 to WAN1.

Priority by Signal Strength: Use LTE signal strength measurement to initiating automatic WAN failback or failover procedures.

Click **Save** to apply the settings

❖ Load Balance

General Setting	
Dual WAN Mode	
Mode	Load Balance ▼
WAN Port Service Detection Policy	
WAN1	4G LTE -1 ▼
WAN2	4G LTE -2 ▼
Service Detection	☒ Enable ☐ Disable
Connectivity Decision	Auto failover takes place after straight 3 consecutive failure in every 30 seconds.
Probe WAN1	☐ Gateway ☒ Host 8.8.8.8
Probe WAN2	☐ Gateway ☒ Host 8.8.4.4
Save	

WAN Port Service Detection Policy

WAN1 (Primary): Choose a desired WAN as the primary WAN Link from the list.

WAN2 (Backup): Choose a desired WAN as the backup WAN Link from the list.

Service Detection: Enable to detect WAN connectivity automatically.

Connectivity Decision & Probe Cycle: Set a number of times and time in seconds to determine when to turn-off the Load Balancing service.

Example, *Disable Load Balance after straight 3 consecutive failures in every 30 seconds* meaning all traffic will hand over to backup link (WAN2) after primary link fails to response in total of 90 seconds, 30 seconds for 3 consecutive failures.

Deactivate Load Balance Decision:

Probe Ping on WAN 1 / WAN2: Enable Ping to the gateway or an IP address

- ▶ **Gateway:** Internal system will wait for responses to the pings from the gateway of the WAN.
- ▶ **Host:** Internal system will wait for responses to the pings from a fixed IP address.

Click **Save** to apply the settings

Outbound Load Balance

The connections are distributed over WAN1 and WAN2 so that it can utilize bandwidth of both WAN ports. With Outbound load balance, traffic may be routed to a faster link when one of the WAN links is slower or congested so that user gains better throughput and less delay.

In **General Setting**, select **Load Balance** mode prior to configure this feature.

▼ Outbound Load Balance

Outbound Load Balance

Based on Session Mechanism ☒ Balance by Session (Round Robin)

☐ Balance by Session weight :

Based on IP Hash Mechanism ☐ Balance by weight :

Save

User can distribute outbound traffic based on **Session Mechanism** or **IP Hash Mechanism**.

Base on Session Mechanism:

Balance by Session (Round Robin): Automatically assign requests/traffics to each WAN interface based on real-time WAN traffic-handling capacity.

OR

Balance by Session weight: Manually Balance session traffic based on a weight ratio.

Example: Session weight by 3:1 meaning forward 3 requests to WAN1 and 1 request to WAN2.

Base on IP Hash Mechanism:

Balance by weight: Use an IP hash to balance traffic based on a ratio. It is to guarantee requests from the same IP address get forward to the same WAN interface.

Click **Save** to apply the settings

Protocol Binding

Protocol Binding lets you direct specific traffic to go out from a specific WAN port. Policies determine how specific types of internet traffic are routed, for example, traffic from a particular IP address(es) granted access to only one WAN port rather than using both of the WAN ports as with load balancing.

▼Protocol Binding

Rule Index

1 ▼

Active

☒ Yes
 ☐ No

Bind Interface

WAN1 ▼ (Current WAN1 Mode: 4G LTE -1 , Current WAN2 Mode: 4G LTE -2)

Source IP Address

0.0.0.0 (0.0.0.0 means Don't care)

Subnet Mask

0.0.0.0

Port Number

0 (0 means Don't care)

Destination IP Address

0.0.0.0 (0.0.0.0 means Don't care)

Subnet Mask

0.0.0.0

Port Number

0 (0 means Don't care)

DSCP

0 (Value Range:0~64, 64 means Don't care)

Protocol

TCP ▼

Save

Delete

Protocol Binding List

Index	Active	Interface	Source IP Address/Mask	Destination IP Address/Mask	Source Port	Destination Port	DSCP	Protocol
-------	--------	-----------	------------------------	-----------------------------	-------------	------------------	------	----------

Rule Index: The numeric rule indicator. The maximum entry is up to 16.

Active: Click YES to activate the rule

Bind Interface: The dedicated WAN interface that guarantees to handle this traffic request.

Source IP Address: Enter the source IP address featuring the traffic origin.

Subnet Mask: Enter the subnet of the source network.

Port Number: Enter the port number which defines the application.

Destination IP Address: Enter the destination IP address featuring the traffic destination.

Subnet Mask: Enter the subnet of the designation network.

Port Number: Enter the port number which defines the application.

DSCP: The DSCP value. Value Range from 0~64; 64 means Don't care

Protocol: Select a protocol, TCP, UDP, ICMP, to use for this traffic.

Click **Save** to apply the settings

Example:

All traffics from IP 192.168.1.100/255.255.255.0 with port 8080 will go through WAN1 interface.

The only time it would go through WAN2 interface is when WAN1 has no Internet connection.

Protocol Binding List								
#	Active	Interface	Source IP Address/Mask	Destination IP Address/Mask	Source Port	Destination Port	DSCP	Protocol
1	Yes	WAN1	192.168.1.100/ 255.255.255.0	0.0.0.0/ 0.0.0.0	8080	0	0	TCP

Hotspot

The Wi-Fi hotspot offers Internet access for mobile devices like smart phones, laptops, or smart pad to connect wirelessly in public locations such as in coffee shops, train station, airport, hotel, and much more. A captive portal with a login page will prompt on the mobile devices and require all Wi-Fi clients to accept the term of use before accessing to the Internet.

NOTE 1: Hotspot uses wireless network name, SSID1, to provide public Wi-Fi Internet access.

NOTE 2: To broadcast and see the hotspot ssid (SSID1), your MX-1200 router must be connected to the Internet first.

NOTE 3: It is ideal to change the Wi-Fi Hotspot (SSID) security type to **OPEN** (no encryption). Go to [Wireless >> Security Settings](#)

General Setting

General Setting	
Hotspot	☐ Activated ☒ Deactivated
Interface	☒ WLAN1
IP Address	10.0.0.1
IP Subnet Mask	255.255.255.0
Login Mode	Authentication
Redirection On Successful Authentication To	(empty string: user intended to visit)
Authentication	
Authentication Method	☒ RADIUS ☐ Built-in User Account
Primary RADIUS Server	
Secondary RADIUS Server	
Shared Secret Key	
Session Settings	
Session Timeout	3600 seconds (0~86400,0:disable)
Idle Timeout	180 seconds (0~3600,0:disable)
Upload Bandwidth	0 Kbps (0~5120,0:not limited)
Download Bandwidth	0 Kbps (0~5120,0:not limited)
Captive Portal	
UAM Server	☒ Build-in ☐ External
Login URL	
Shared Secret	
NAS ID	
Location Name	
Save	

Hotspot: Activate to enable the Wi-Fi hotspot feature.

Interface: The dedicated interface, WLAN1 (SSID1 network name) handles the Wi-Fi hotspot traffic

IP Address: The IP address for the Wi-Fi hotspot network.

Subnet Mask: Enter the subnet of the network.

Login Mode: Two (2) types of login modes to join the network.

- ▶ **Authentication:** Username and Password (credential) is required to join the hotspot network. Go down to the Authentication section below and select a method.
- ▶ **Agreement:** No Username and Password is required. Automatically login to the hotspot network after accept and agree to the terms (“Terms”) of use.

Redirect URL after Successful Login: Enter the URL (**http://** is not required). After Wi-Fi client is successful login to the network, the page will get redirected to this URL.

OR leave it blank to stay in current page.

NOTE: This new URL will be added to the Walled Garden automatically.

Authentication

Authentication	
Authentication Method	☐ RADIUS ☒ Built-in User Account
Primary RADIUS Server	
Secondary RADIUS Server	
Shared Secret Key	

Authentication Methods: Two (2) network authentication methods, local built-in user account or a remote, external RADIUS server. If the credential matches, the Wi-Fi client is granted access to the network.

- ▶ **RADIUS (an external authentication server)**
 - ▶ **Primary RADIUS Server:** The main IP address of the server.
 - ▶ **Secondary RADIUS Server:** The backup IP address of the server, if any.
 - ▶ **Shared Secret Key:** Enter the shared Secret given by the server
- ▶ **Built-in User Account (local database handled by the MX-1200)**

Go to the [Built-in User Account](#) to setup account usernames and passwords for the hotspot.

Session Settings

Session Settings	
Session Timeout	3600 seconds (0~86400,0:disable)
Idle Timeout	180 seconds (0~3600,0:disable)
Upload Bandwidth	0 Kbps (0~5120,0:not limited)
Download Bandwidth	0 Kbps (0~5120,0:not limited)

Session Timeout (in seconds): The time period of a Wi-Fi client is allowed to access to the Internet. After this timeout period, a new authentication is required.

Idle Timeout (in seconds): The allowed inactivity time of a Wi-Fi client. After this timeout period, a new authentication is required.

Upload / Download Bandwidth (in Kbps): The maximum upload and download link speed, value range from 0 ~ 5120Kbps; 0 means no speed limitation.

Captive Portal

Captive Portal	
UAM Server	☒ Build-in ☐ External
Login URL	
Shared Secret	
NAS ID	
Location Name	

UAM Server: Choose between **Build-in** and **External**. Fill in the blanks to use External UAM server. Information can be obtained from the UAM server.

Login URL: Enter the login URL offered by the UAM server.

Shared Secret: Set the shared secret password offered.

NAS ID: An assigned string for identification.

Location Name: An assigned string for identification.

Click **Save** to save settings

Built-in User Account

It is a local database on the router with pre-defined user accounts authorized by the MX-1200 to grant and provide Wi-Fi hotspot access for Wi-Fi capable devices/users.

16, maximum, accounts are allowed.

▼ Built-in User Account

Rule Index

0 ▼

Active

☒ Yes
 ☐ No

User Name

hu-1

Password

....

Save

Delete

Built-in User Account List

Index	Active	Username
0	Yes	hu-1

Rule Index: The numeric rule indicator. The maximum entry is up to 16.

Active: Select **Yes** to enable the rule of the account.

Username / Password: Create a user name and password for this user account.

Save: Click the **Save** button to apply the settings

Delete: Use the **Rule Index** to select an unwanted rule then click **Delete** button to remove it from the Account list.

Click **Save** to save settings

Authorized of Client

Add and predefine a trusted wireless MAC address of a Wi-Fi capable device for an immediate hotspot/Internet access. Hotspot/Internet access requires no authentication.

16, maximum, accounts are allowed.

Authorized of Client

☐ Activated
 ☒ Deactivated

Rule Index

0 ▼

Active

☐ Yes
 ☒ No

MAC Address

Save

Delete

Authorized of Client List

Index	Active	MAC Address
-------	--------	-------------

Authorized of Client: Select **Activated** to enable this feature.

Rule Index: The numeric rule indicator. The maximum entry is up to 16.

Active: Select **Yes** to enable the rule of the client.

MAC Address: Enter the wireless MAC address of the Wi-Fi device.

Save: Click the **Save** button to apply the settings

Delete: Use the **Rule Index** to select an unwanted rule then click **Delete** button to remove it from the Client list.

Walled Garden

Add and predefine websites (domain names) or web IP address to allow Wi-Fi devices / clients to access to. Web site access requires no authentication.

16, maximum, websites / domains are allowed.

▼ Walled Garden

Rule Index

0 ▼

Active

☒ Yes ☐ No

Allow Type

Host/Network ▼

Host / Domain

www.bectechnologies.net

Note * :

Host/Network : www.example.com or www.example.com ; 10.11.12.0/24
Domain : www.example.com or .example.com

Save

Delete

Walled Garden List

Index	Active	Allow Type	Host / Domain
0	Yes	HOST	www.bectechnologies.net

- Rule Index:** The numeric rule indicator. The maximum entry is up to 16.
- Active:** Select **Yes** to enable the rule of the walled garden.
- Allow Type:** Either a **Host/Network** or **Domain**.
- Host / Domain name:** Enter a valid domain, network, or website for unauthorized clients to access to.
- Save:** Click the **Save** button to apply the settings
- Delete:** Use the **Rule Index** to select an unwanted rule then click **Delete** button to remove it from the Walled Garden list.

Advertisement

Add pop-ups ads and redirects to MX-1200 Wi-Fi Hotspot, and only a random ad will be displayed per a login.

16, maximum, ads are allowed.

Advertisement

☐ Activated
 ☒ Deactivated

Mode

Frame

Rule Index

0

Active

☐ Yes
 ☒ No

URL

Save

Delete

Advertisement List

Index	Active	URL
-------	--------	-----

Advertisement: Select **Activated** to enable this feature.

Mode: Two (2) web advertising methods are available.

- ▶ **Frame:** Redirect to a random ad site, a full-page ad, before reaching to the login page. This full-page ad will get redirect to the login page after 5-10 seconds.
- ▶ **Popup:** A random pop-up ad display in a separate window after the login page.

Rule Index: The numeric rule indicator. The maximum entry is up to 16.

Active: Select **Yes** to enable the rule.

URL: Enter a valid

Save: Click the **Save** button to apply the settings

Delete: Use the **Rule Index** to select an unwanted rule then click **Delete** button to remove it from the Walled Garden list.

Session Log

Record all hotspot access information and e-mail the statistics report of the hotspot clients in a specific duration.

▼ Session Log	
Session Log	☒ Activated ☐ Deactivated
Log Session data every	1 minutes (1~60)
Mail Session Log file every	5 minutes (5~1440)
Save	

Session Log: Select **Activated** to enable this feature.

Log Session Data in every (minute): Input session log time duration, (min) 1 to (max) 60 minutes.

Mail Session Log File in every (minute): MX-1200 will send all access information, such as access IP addresses, NAT tables, etc., to the administrator's mail box in the specific time/minute.

NOTE: Please set up a dedicated or administrator e-mail account to receive Hotspot access information in the [Mail Alert](#).

Customization

Allow modification to some of the captive portal settings.

Customization

☐ Activated
☒ Deactivated

Title
HotSpot

Login Subtitle
Welcome to my HotSpot!

Login Successfully Message
Success

Footnote
This service is provided for free and used at your own risk.

Show Logo
☐ Activated
☒ Deactivated

Terms and Conditions

Terms Part1

Terms Part2

Terms Part3

Terms and Conditions TextBox can not accept newline.

Save

Customization: Select **Activated** to enable this feature.

Title: The Banner message. Default is “Hotspot”

Login Subtitle: Default is “Welcome to my Hotspot”

Term Part 1 / 2 / 3: Create your own Terms and Conditions. To use default, same terms, please skip this part.

NOTE: No newline is accepted in each text box.

Login Successfully Message: MX-1200 will send all access information, such as access IP addresses, NAT tables, etc., to the administrator’s mail box in the specific time/minute.



Login Successfully Message: A greeting message after successful login to the Wi-Fi hotspot. Default is “Success!”

Footnote: Additional information, if needed.

Default is “This service is provided for free and used at your own risk.”

Show Logo: Select **Activated** to display company Logo on the portal.



HotSpot

 **Success!**

You are about to be redirected to:

<http://www.msftncsl.com/redirect>

To log out, type "logout" (or "http://logout/") in your browser. **enjoy!**

This service is provided for free and used at your own risk. 



Advanced Setup

Advanced Setup provides advanced features including **Firewall**, **Routing**, **Dynamic Routing**, **NAT**, **VRRP**, **Static DNS**, **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.)	
Save	

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

- ▶ **Enabled:** Activate your firewall function.
- ▶ **Disabled:** Deactivate 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:** Activate your SPI function.
- ▶ **Disabled:** Deactivate the SPI function.

Click **Save** to apply the 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	100.87.150.196	255.255.255.252	0.0.0.0	0	ppp12		
1	100.72.1.208	255.255.255.248	0.0.0.0	0	ppp11		
2	192.168.1.0	255.255.255.0	0.0.0.0	0	br0		
3	127.0.0.0	255.255.0.0	0.0.0.0	0	lo		
4	239.0.0.0	255.0.0.0	0.0.0.0	0	br0		
5	0.0.0.0	0.0.0.0	100.72.1.209	0	ppp11		

Add Route

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 -1 ▼
Metric	1
Save Back	

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

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	EWAN(LAN4) ▼
DMZ	▶ Edit
Virtual Server	▶ Edit

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

Save

Back

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 MX-1200 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 MX-1200 to direct all incoming traffic to the servers on the LAN.

Configure a virtual rule in MX-1200 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

Save

Back

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 connect in and communicate with internal LAN devices.

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 your server IP address in this field.

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 a 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 MX-1200 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 MX-1200 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 -1
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

Save

Back

Virtual Server Listing

Index	Protocol	Start Port	End port	Local IP Address	Start Port Local	End Port Local	Edit	Delete
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		

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 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 the purpose of 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

Save

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 your settings.

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	0 ▼						
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
Save							

Time Index: The rule indicator (0-15) 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
Save							

Another TimeSlot2 spanning from 09:00 to 18:00 of Wednesday

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
Save							

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)

3G/4G LTE Usage Allowance

Recipient's E-mail

(Must be XXX@yyy.zzz)

Hotspot Session Log

Recipient's E-mail

(Must be XXX@yyy.zzz)

Apply

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.

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 (3G/4G-LTE Usage Allowance): Enter a valid e-mail address to receive an alert message when the 3G over Usage Allowance occurs.

Hotspot Session Log: Enter a valid e-mail address to receive hotspot access information.

Click **Apply** to save settings

Access Management

Features including **Device Management**, **SNMP**, **Syslog**, **Universal Plug & Play**, **Dynamic DNS**, **Access Control**, **Packet Filter**, **CWMP (TR-069)**, **Parental Control**, **SAMBA & FTP Server**, and **BECentral Management**.

Device Management

▼ Device Management

Device Host Name

Host Name

home.gateway

Save

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 ▼

Save

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.

HTTPS Server Certificate Index: *HTTPS* known as HTTP-over-SSL tunnel protocol. Select a certificate to identify the system web server. When accessing to the web server (Web GUI), the browser will issue a warning page.

To import certificates, go to **Maintenance >> Certificate Management** to upload files. Otherwise, select **Default** certificate and CA.

Click **Save** to apply settings.

SNMP

Simple Network Management Protocol (SNMP) is a protocol used for exchanging management information between network devices. The MX-1200 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	
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)
Save	

SNMP: Activate to enable SNMP.

Get Community: Type the Get Community, which is the password for the incoming Get-and-GetNext 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.

SNMPv3

SNMPv3: Enable to activate the SNMPv3.

User Name: 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
Save	

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

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

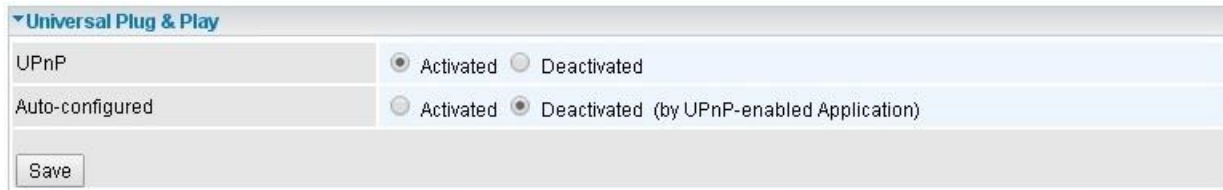
Server UDP Port: Assign the remote log server port, 514 is commonly used.

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)
Save	

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 MX-1200's IP address

Auto-configured: Select this check box to allow UPnP-enabled applications to automatically configure the MX-1200 so that they can communicate through the MX-1200, 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 the 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) ▼
Save	

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 MX-1200 by your Dynamic DNS provider.

Username / Password: Enter the user name 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 MX-1200 will update the DDNS server with your current external IP address.

Click **Save** to apply the settings.

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)
Save	

Access Control

Access Control Listing allows you to determine which services/protocols can access the MX-1200 interface from which computers. It is a management tool aimed to allow IPs (set in secure IP address) to access specified embedded applications (Web, FTP, 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 entry is **16**.

▼ Access Control

Access Control

☒ Activated
☐ Deactivated

Access Control Editing

Rule Index

0 ▼

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 ▼

Save

Delete

Access Control Listing

Index	Active	Secure IP Address	Application	Interface
0	Yes	0.0.0.0-0.0.0.0	ALL	LAN
1	Yes	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. The maximum entry is up to 16, ranging from 0 to 15.

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 MX-1200. 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 common used applications.

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

Click **Save** to apply the settings.

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 ▼

Save

Delete

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

☒ Activated
 ☐ Deactivated

Access Control Editing

Rule Index

2 ▼

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

Ping ▼

Interface

WAN ▼

Save

Delete

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.

❖ Filter Type - 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 numeric rule indicator.

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 Black List.

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.

Click **Save** to apply settings.

❖ **Filter Type- URL Filter**

▼Packet Filter

Packet Filter

Filter Type
URL Filter ▼

URL Filter Editing

URL Filter
☐ Activated ☒ Deactivated

URL Filter Rule Index
1 ▼

Individual Active
☐ Yes ☒ No

URL (Host)

Save
Delete

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.

Click **Save** to apply settings.

❖ Filter Type- URL Filter

▼Packet Filter

Packet Filter

Filter Type

URL Filter ▼

URL Filter Editing

URL Filter

☐ Activated
☒ Deactivated

URL Filter Rule Index

1 ▼

Individual Active

☐ Yes
☒ No

URL (Host)

Save

Delete

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.

Click **Save** to apply the 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

Save

CWMP: Select activated to enable CWMP.

ACS Login Information

URL: Enter the ACS server login URL.

User Name: Specify the ACS User Name 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.

▼ Parental Control	
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.	
Save	

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 blank.

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

Click **Save** to apply the settings.

SAMBA & FTP Server

Samba and FTP are served as network sharing.

▼ SAMBA & FTP Server	
SAMBA	
SAMBA Server	☒ Activated ☐ Deactivated
Work Group	MyGroup
Net BIOS Name	SambaSvr
FTP	
FTP Server	☒ Activated ☐ Deactivated
FTP Server Port	21
Save	

SAMBA:

SAMBA Server: Activated to enable SAMBA sharing.

Work Group: The same mechanism like in Microsoft work group, please set the Work Group name.

NetBIOS Name: The sharing NetBIOS name.

FTP:

FTP Server: Activated to enable FTP sharing.

FTP Server Port: Set the working port. Well-known one is 21. User can change it.

SAMBA/FTP Login Account: See [User Management](#) for more information.

- ▶ **Default user:** admin/admin, it is the administrative user and a super user; it has the full authority of SAMBA /FTP access and operation permission of objects in SAMBA and FTP server.
- ▶ **New user:** users can create new user(s) to grant it (them) access and permission to the SAMBA & FTP server.

Example: How to setup Samba

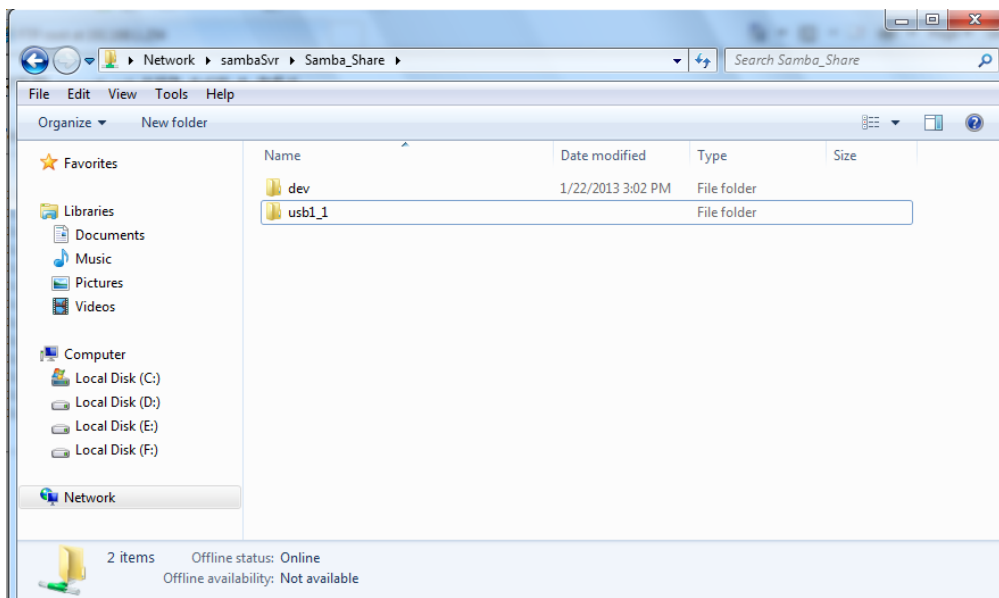
1. Go directly to Start > Run (enter [\\192.168.1.254](#) (from LAN side), [\\SambaSvr](#) , but if you enter [\\SambaSvr](#), please be sure your working PC is in the same workgroup as set in the samba server set above.)



2. Enter the Username and password.



3. Users can browse and access USB storage.

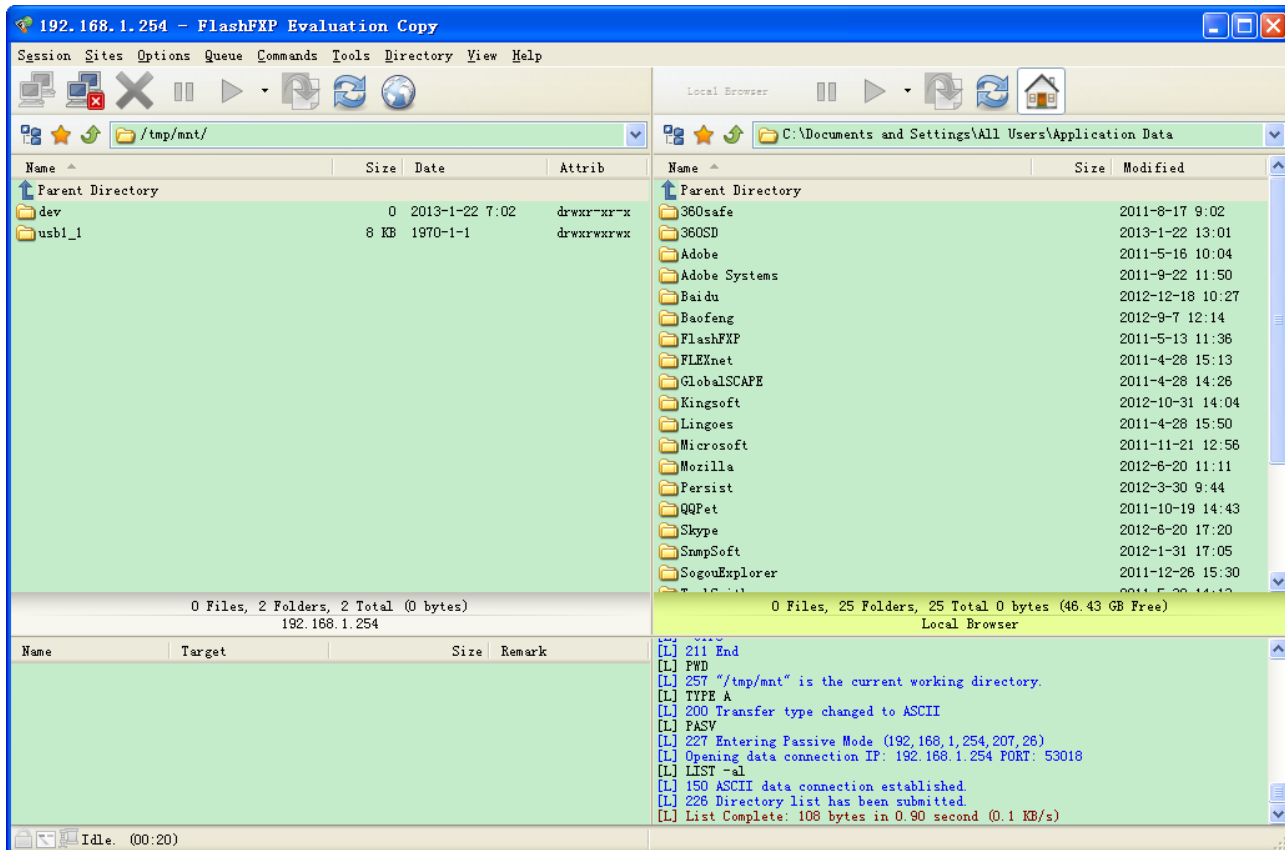


Example: How to setup FTP :

1. Access via FTP tools

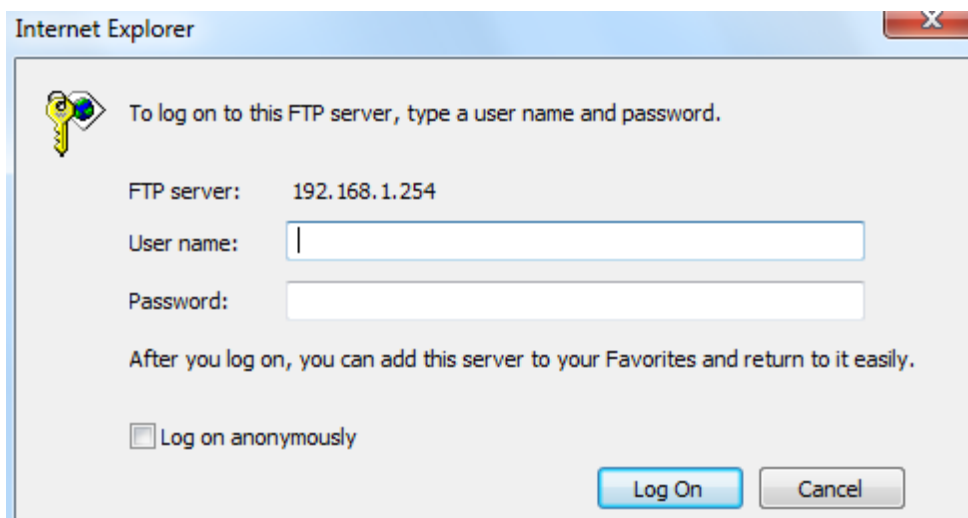
Take popular FTP tool of FlashFXP for example:

- 1) Open FlashFXP
- 2) Create ftp sites (LAN IP / WAN IP, 192.168.1.254, and set the account, port).
- 3) Connect to the ftp site.



2. Web FTP access

- 1) Enter <ftp://192.168.1.254> at the address bar of the web page.
- 2) Enter the account's username and password.



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	
BECentral Management	☐ Activated ☒ Deactivated
BECentral Management URL	becentral.becloud.io
BECentral Management Port	48883
Organization ID	DEFAULT
Device Report Interval	480
Interface	ALL ▼
Save	

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

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.

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, Certificate Management, Time Zone, Firmware & Configuration, System Restart, Auto Reboot, Diagnostic Tool** and **Ignition Sensing**.

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 MX-1200 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.

User Management

User Account

Index

1 ▼

Username

admin

New Password

Confirm Password

FTP Authority Setup

FTP Access

☒ Enable
 ☐ Disable

Permission

☒ Read/Write
 ☐ Read

SAMBA Authority Setup

SAMBA Access

☒ Enable
 ☐ Disable

Permission

☒ Read/Write
 ☐ Read

Please restart the Storage server after config changed

Save

Delete

User Account Listing

Index	User Name	FTP Access	FTP Permission	SAMBA Access	SAMBA Permission
1	admin	Enable	Read/Write	Enable	Read/Write
2	user	Disable	Read	Disable	Read

User Setup

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

User Name: Create account(s) user name 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

FTP Authority Setup

FTP Access: Enable to grant the user access to the FTP server.

Permission: Set the operation permission for the user, Read/Write or Read.

SAMBA Authority

SAMBA Access: Enable to grant the user access to the SAMBA server.

Permission: Set the operation permission for the user, Read/Write or Read.

Web GUI Permission

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.

Web GUI Permission

Guest Account: Enable to create this new guest account.

Interface Setup / Advanced Setup / Access Management Setup / Maintenances: Enable to grant this user access to these features.

When someone accesses to the MX-1200 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 the settings.

Time Zone

With default, MX-1200 does not contain the correct local time and date.

There are several options to setup, maintain, and configure current local time/date on the MX-1200. 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	(GMT) Greenwich Mean Time : Dublin, Edinburgh, Lisbon, London ▼
Daylight Saving	☐ Enabled ☒ Disabled
NTP Server Address	0.0.0.0 (0.0.0.0: Default Value)
Save	

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, MX-1200 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:** Enter the Date and Time 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.

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 MX-1200 provides an easy way to update the code to take advantage of the changes.

To upgrade the firmware of the MX-1200, 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 MX-1200 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 MX-1200 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 MX-1200.

System Restart

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



▼ System Restart

System Restart with

☒ Current Settings

☐ Factory Default Settings

Restart

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 MX-1200 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
Save											

Click **Save** to apply the settings

Example: Schedule MX-1200 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
Save											

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.

3G/4G-LTE / 3G/4G-LTE USB / EWAN / WirelessClient

Diagnostic Tool	
WAN Interface	EWAN(LAN1) ▼
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	
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	

Trace Route is to display how many hops (also view the exact hops) the packet of data has to take 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]
Start Trace Route	

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

▼ Diagnostic Tool

WAN Interface	LAN ▼
Testing Ethernet LAN Connection	PASS
Ping other IP Address or Domain ☒ Yes ☐ No	Skipped
IP Address or Domain	N/A
Start	

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

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

Ignition Sensing

With On/Off delay timer (ignition sensing interval time) enables the MX-1200 to get powered on with ignition key turns to ACC/ON automatically and powered off after ignition key to VCC/OFF for a specific time delay.

A good example of using the ignition sensing is after delivery truck or school bus drivers arrive at the destination, they can turn off the vehicles and still be able to access to the Internet over 4G/LTE and don't have to worry about losing the GPS data. The MX-1200 remains on until the delay timer is up and automatically powers off so it doesn't drain the vehicle battery.

NOTE: Restart the router is required.

▼ Ignition Sensing

Ignition Sensing Interval Time

600

Please restart the Device after config changed

Apply

Ignition Sensing Interval Time (seconds): It is the off delay timer. Default value is in 10 minutes (600 seconds). MX-1200 will get power off in 10 minutes after the vehicle engine is turned off.

Click **Apply** to change the setting.

Chapter 5: Troubleshooting

If your MX-1200 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 lit, 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 MX-1200

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>

MAC OS is a registered Trademark of Apple Computer, Inc. Windows 10/8/7, Windows XP, and Windows Vista are registered Trademarks of Microsoft Corporation.

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Class B: (Section 15.105)**FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE STATEMENT**

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

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

(Section 15.21)**CAUTION:**

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

RF exposure warning

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

This radio transmitter FCCID: **QI3BIL-MX1200** has been approved by FCC to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	BILLION	AAZAND2S2942510000	Dipole Antenna	1.8dBi for 2.4GHz
2	BILLION	AAZAND5S5510090A00	Dipole Antenna	5dBi For 5.15~5.25GHz 5dBi For 5.725~5.825GHz

Note: 1. The antenna connector is Reverse SMA type.

2. When using IEEE 802.11a wireless LAN, this product is restricted to indoor use due to its operation in the 5.15- to 5.25 GHz frequency range.