CBV390SL5-X57

DOCSIS 3.1 Compliant
EMTA Gateway with Wi-Fi 6 & 2.5Gb Ethernet
User Manual

Revision 1.0
March 2023

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Note to CATV System Installer

"The EUT must be bonding the screen of the coaxial cable to the earth at the building entrance per ANSI/NFPA 70, the National Electrical Code (NEC), in particular Section 820.93, Grounding of Outer Conductive Shield of a Coaxial Cable."

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to 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 of the following measures:

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

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. The device is for indoor use only.

IMPORTANT NOTE:

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 50cm between the radiator & your body

FCC RF Radiation Exposure Statement:

This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC Statement

This device complies with Class B Part 15 of the FCC Rules. The device generates, uses and can radiate radio frequency energy and, if not installed and used as instructed, may cause harmful interference to

radio communication. Only Coaxial cables are to be used with this device in order to ensure compliance with FCC emissions limits. Accessories connected to this device by the user must comply with FCC Class B limits. The manufacturer is not responsible for any interference which results from use of improper cables, or which results from unauthorized changes or modifications to the device.
"A Minimum 26 AWG Line Core should be used for connection to the cable modem".

Warranty

Items sold by manufacturer/distributor/agent, hereinafter called "Seller", are warranted only as follows: Except as noted below Seller will correct, either by repair or replacement at its option, any defect of material or workmanship which develops within one year after delivery of the item to the original Buyer provided that evaluation and inspection by Seller discloses that such defect developed under normal and proper use. Repaired or replaced items will be further warranted for the unexpired term of their original warranty. All items claimed defective must be returned to Seller, transportation charges prepaid, and will be returned to the Buyer with transportation charges collect unless evaluation proves the item to be defective and that the Seller is responsible for the defect. In that case, Seller will return to Buyer with transportation charge prepaid. Seller may elect to evaluate and repair defective items at the Buyer's site. Seller may charge Buyer a fee (including travel expenses, if needed) to cover the cost of evaluation if the evaluation shows that the items are not defective or that they are defective for reasons beyond the scope of this warranty.

The Seller makes no warranty concerning components or accessories not manufactured by it. However, in the event of failure of such a part, Seller will give reasonable assistance to Buyer in obtaining from the manufacturer whatever adjustment is reasonable in light of the manufacturer's own warranty. Seller will not assume expense or liability for repairs made outside the factory by other than Seller's employees without Seller's written consent.

SELLER IS NOT RESPONSIBLE FOR DAMAGE TO ANY ASSOCIATED EQUIPMENT, NOR WILL SELLER BE HELD LIABLE FOR INCIDENTAL, CONSEQUENTIAL, OR OTHER DAMAGES. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING THE IMPLIED WARRANTY OF "MERCHANTABILITY" AND "FITNESS FOR PARTICULAR PURPOSE."

Trademarks

All trademarks are the property of their respective owners.

1. Introduction

The CBV390SL5-X57 is the integration of 4 ports switch and IEEE 802.11a/b/g/n/ac/ax wireless functionality, the CBV390SL5-X57 could also be used as a Wireless Cable Modem Residential Gateway in your home or small office. The ability to route data information into your broadband network could help you easily extend your local network via wire or wireless.

1.1 Features

- DOCSIS 3.1 Compliant
- DOCSIS/EuroDOCSIS 3.0 Backwards Compatible
- PacketCable 2.0 and EuroPacketCable 1.5 Compliant
- DOCSIS 3.1 2x2 OFDM(A) Channels
- DOCSIS 3.0 32x8 Channel Bonding
- Switchable Diplexer
- Wi-Fi 6 4x4 for 2.4GHz and 5GHz
- 1-port 2.5Gb Ethernet
- 4-Port Gigabit Ethernet
- 2-Port FXS
- 1-Port USB 3.2 Gen1x1

1.2 System Requirement

- IBM Compatible, Macintosh or other workstation supports TCP/IP protocol.
- An Ethernet port supports GbE Ethernet connection.
- Subscribed to a Cable Television company for Cable Modem services.

1.3 Unpacking and Inspection

Included in the kit is the following:

- 1 x CBV390SL5-X57
- 1 x Quick Installation Guide
- 1 x RJ-45 CAT 5e Cable
- 1 x 12V/3.5A Power Supply Adaptor

If any of above items lost or damaged, please contact your retailer or ISP for assistance.

1.4 Safety Precautions

For your protection, observe the following safety precautions when setting up and using your equipment. Failure to observe these precautions can result in serious personal injury and damage to your equipment.

- Make sure the voltages and frequency of the power outlet matches the electrical rating labels on the AC Adapter.
- Do not place any object on top of the device or force it into a confined space.
- Never push objects of any kind through openings in the casing. Dangerous voltages may be present. Conductive foreign objects could produce a short circuit that could cause fire, electrical shock, or damage to the equipment.
- Whenever there is danger of lightning, disconnect the power cable and the Hybrid-Fiber Coax cable from the cable modem to prevent damage to the unit. The use of an AC protection device will not completely protect the cable modem product from damage caused from the transmission across the Hybrid-Fiber Coax network.

2. Hardware Overview

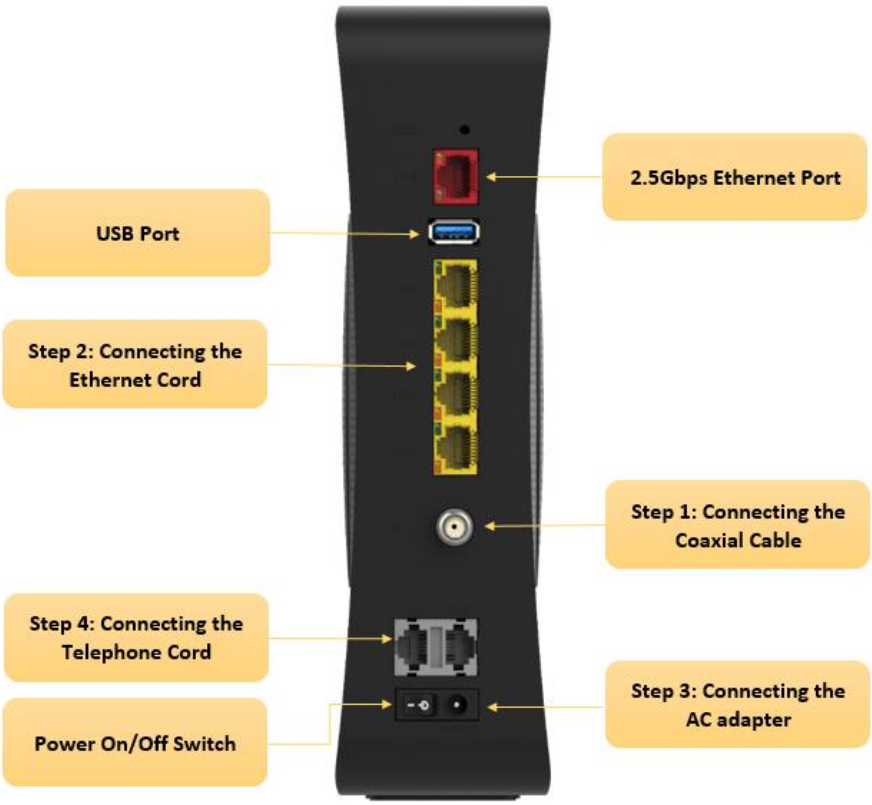
2.1 Front Panel and LEDs

There are 10 Light-Emitting-Diodes (LEDs) located on the front panel top provide status information to the user.

NAME	COLOR	MODE	STATUS
POWER	Green	On	Power Connected
		Off	Power Failure or Disconnect
DS	Green	Blinking	Downstream Scanning
		On	Downstream Locked or W/DS Bonding
		Off	Cable Interface Idle
US	Green	Blinking	Upstream Scanning
		On	Upstream Locked or W/US Bonding
		Off	Cable Interface Idle
ONLINE	Green	Blinking	Registering
		On	Registering Finished
		Off	Cable Interface Idle

WLAN 2.4GHz	Green	On	Wireless Enable
		Blinking	Data Traffic Processing
		Off	Wireless Disable
WLAN 5GHz	Green	On	Wireless Enable
		Blinking	Data Traffic Processing
		Off	Wireless Disable
WPS	Green	Blinking	WPS Paring
		On	WPS Enabled
		Off	WPS Disabled
TEL1	Green	Blinking	TEL1 provisioning of off-hook
		On	TEL1 on-hook
		Off	TEL1 disabled
TEL2	Green	Blinking	TEL2 provisioning of off-hook
		On	TEL2 on-hook
		Off	TEL2 disabled
USB	Green	Blinking	USB Provisioning of Off-hook
		On	USB On-hook
		Off	USB Disabled

2.2 Rear Panel and Hardware Connection



Step 1: Connect a cable by feeding the F-connector on the back of the cable modem. Ensure the center conductor of the 75 ohm coaxial cable is inserted directly into the center of the F-connector. Secure the coaxial cable by carefully threading the outer shell of the coaxial cable connector onto the F-connector in a clockwise direction until tight. Be careful not to over-tighten the connector or you may damage either the connector or the cable modem.

Step2: Connect the cable modem to a GbE Ethernet 10/100/1000 Mbps Network using a RJ-45 male-terminated Ethernet cable. This cable modem equips with four Ethernet ports, you can connect four PCs to the cable modem at the same time if necessary.

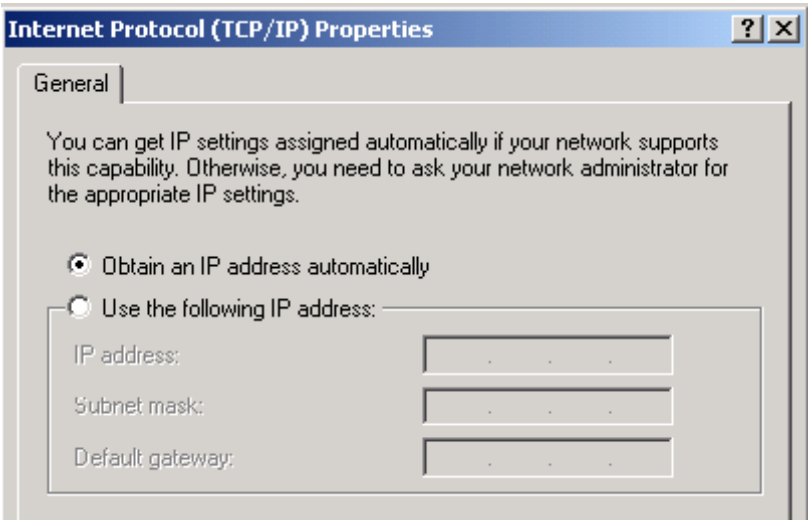
Step 3: Connect the AC Adapter to the cable modem by inserting the barrel- shaped connector into the mating power connector on the back of the cable modem. Exercise carefully to ensure the connectors are properly aligned prior to insertion and ensure the two connectors engage completely. The cable modem is shipped with an AC adapter. Remember to use only power adapter that came with the cable modem. Other power adapters might have voltages that are not correct for your particular cable modem. Using a power adapter with the wrong voltage can damage the cable modem.

Step 4: Connect the telephone sets to TEL1 and TEL2. Use RJ-11 telephone line to connect TEL1/TEL2 port on the cable modem and telephone socket on telephone.

3. Ethernet Installation

The LAN port you are using is auto-negotiating 10/100Mbps (Switch) Ethernet Interface. You can use the Ethernet port to connect to the Internet with an Ethernet network device such as NIC/Hub/Switch through RJ45.

Before you connect to and install the cable modem, please set the IP address to "Obtain an IP address automatically" as below and do ensure the TCP/IP protocol is installed on your system and configured correctly in your PC.



Following is an example of configuring the TCP/IP Protocol on Windows 98 Operating Systems:

1. Click **Start → Settings → Control Panel**. Double click on the **Network** icon click **Properties**.
2. A list of installed network components appears. Look for an entry named TCP/IP. This entry may be followed by an arrow and a description of the NIC hardware device installed in the computer. If you don't see "TCP/IP" listed anywhere in the "The following network components are installed" box, click the **Add** button, choose **Protocol**, and click the **Add** button. Select "Microsoft" as the manufacturer and then scroll down in the list on the right to find "TCP/IP". If you see "TCP/IP" listed, proceed to step 4.
3. Click the **OK** button. You will be prompted to insert the Windows 98 installation/upgrade CD.
4. Scroll down in the box until you find a line that says "TCP/IP -> " followed by the name of your Ethernet adapter. Click on **Properties** and choose "Obtain an address automatically" which means that your PC has been configured to use DHCP (Dynamic Host Configuration Protocol).
5. Click **OK**.

Congratulations! You have successfully set up your cable modem.

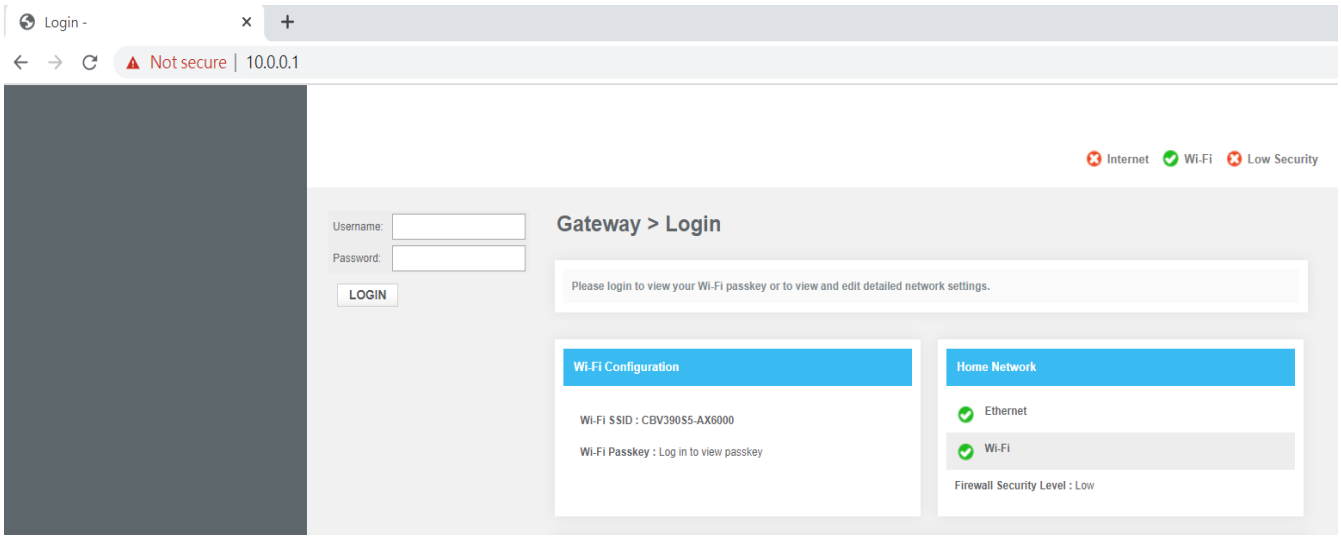
4. Web Management

For easy-changing the default setting or quick-checking diagnostics for troubleshooting, a Web-based GUI is built-in for your access.

4.1 Enter Modem's IP Address

Use the following procedures to login to your CBV390SL5-X57.

1. Open your web browser.
   You may get an error message. This is normal. Continue on to the next step.
2. Type the default IP address of the CBV390SL5-X57 (e.g. 10.0.0.1) and press Enter.
   The Log In page appears. Type the user name (admin) and your password (password) in the respective fields.



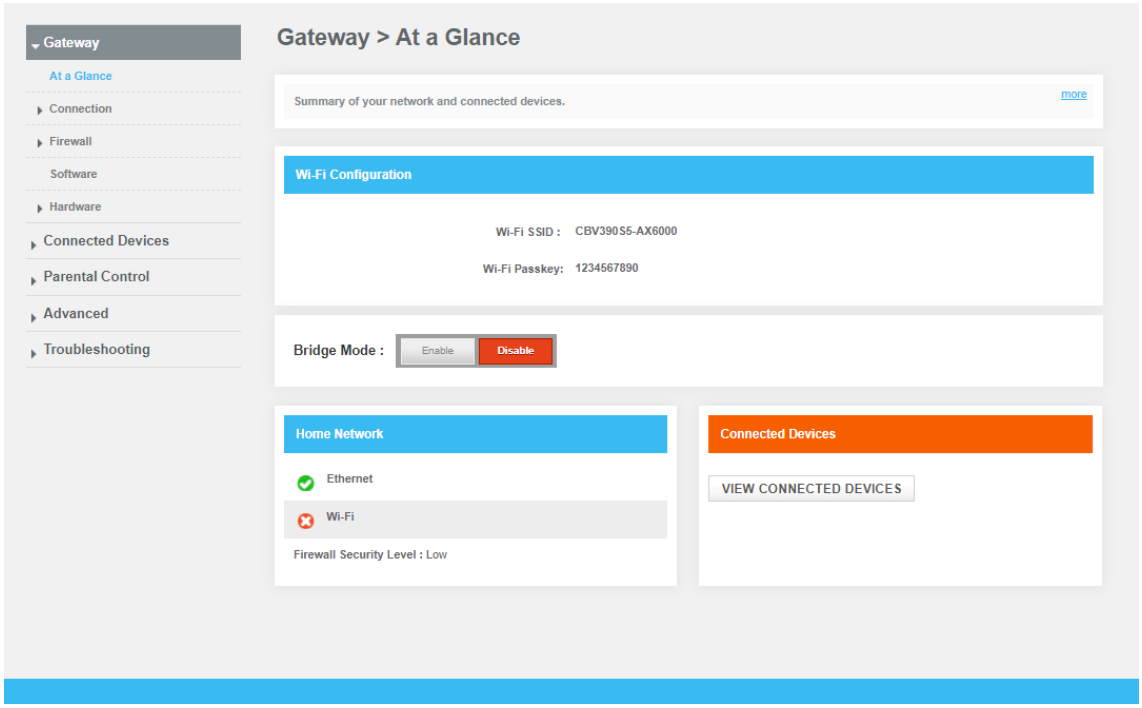
3. There are five categories in this web management including Gateway, Connected Devices, Parental Control, Advanced, and Troubleshooting. The following sections describe their details.

4.2 Gateway

There are five sections under this category, including At a Glance, Connection, Firewall, Software, and Hardware.
This page shows the summary of your network and connected devices.

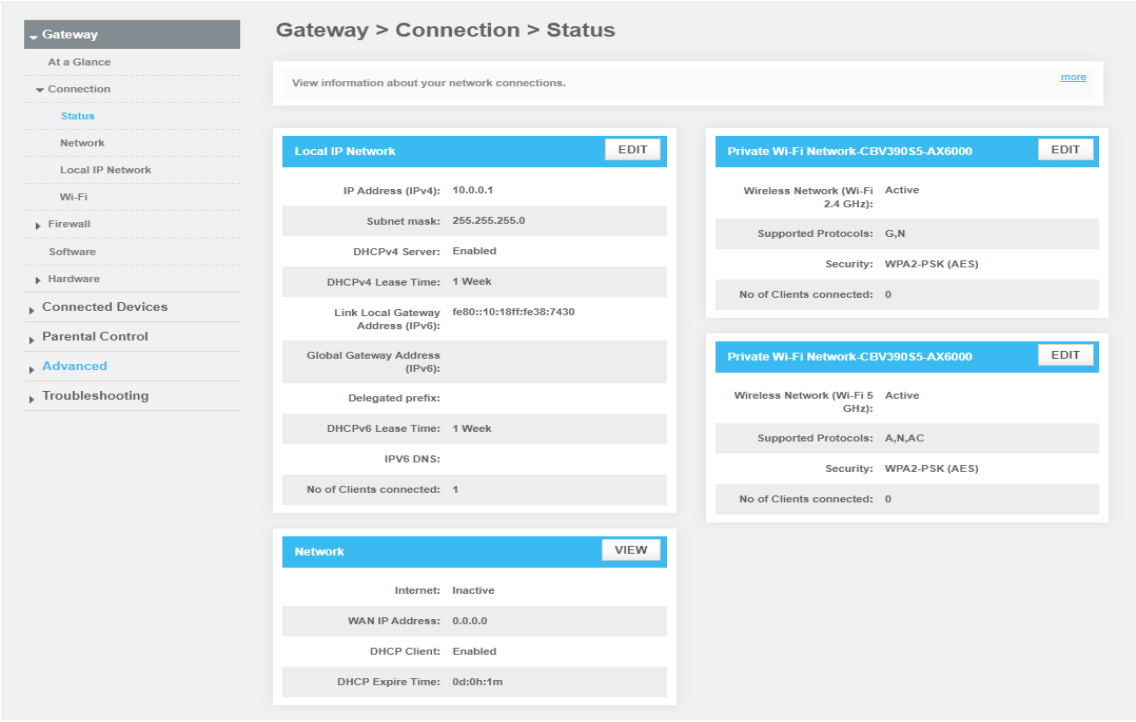
4.2.1 At a Glance

This page shows the summary of your network and connected devices. Select VIEW CONNECTED DEVICES to manage devices connected to your network.



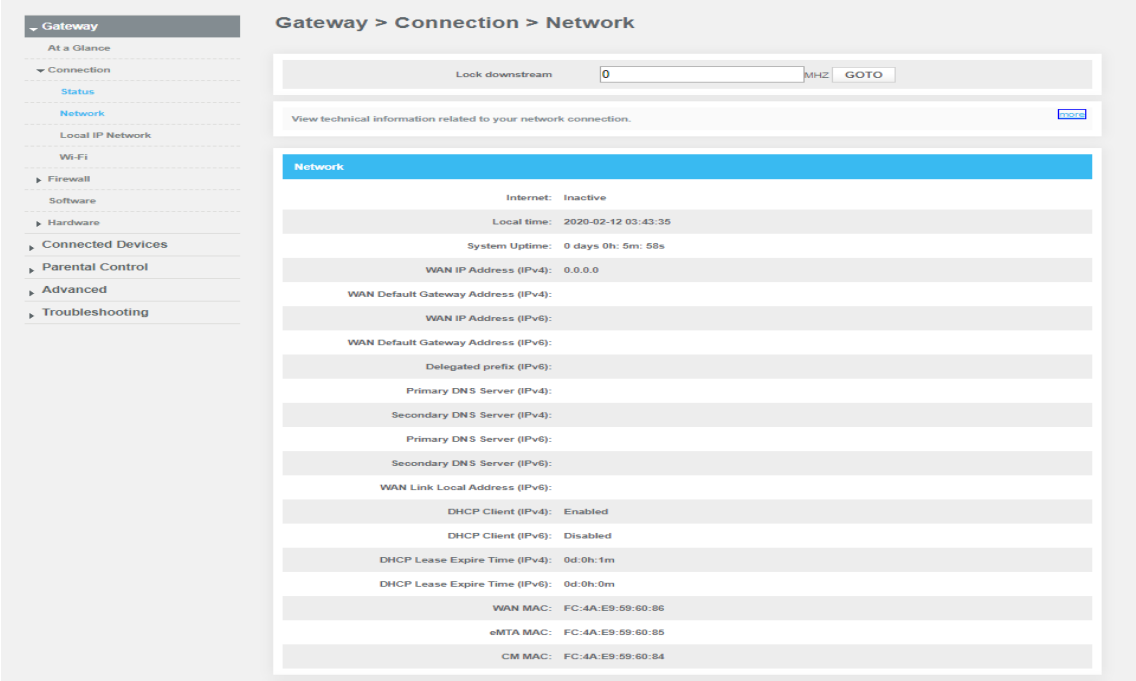
4.2.2 Connection_Status

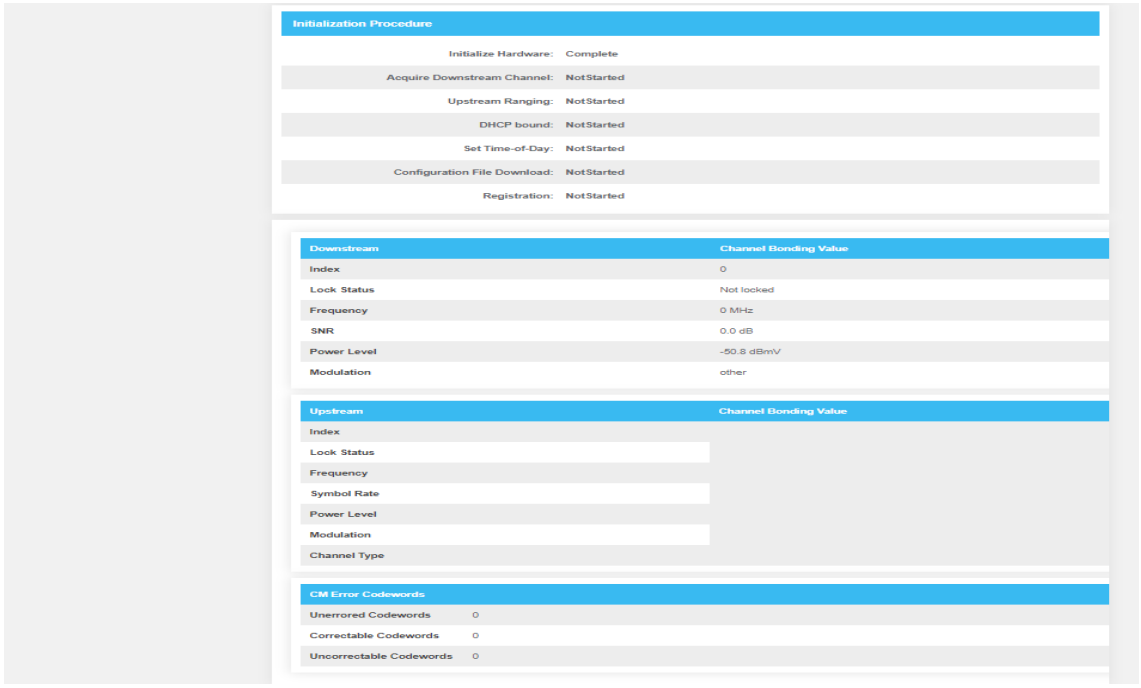
This page shows the information about your network connections. To view and manage the settings of your local IP, Wi-Fi and Networks



4.2.3 Connection_Network

View technical information related to your network connection.
View and manage the settings for your local IP, Wi-Fi and networks





Initialization Procedure

Initialize Hardware:	Complete
Acquire Downstream Channel:	NotStarted
Upstream Ranging:	NotStarted
DHCP bound:	NotStarted
Set Time-of-Day:	NotStarted
Configuration File Download:	NotStarted
Registration:	NotStarted

Downstream	Channel Bonding Value
Index	0
Lock Status	Not locked
Frequency	0 MHz
SNR	0.0 dB
Power Level	-50.8 dBmV
Modulation	other

Upstream	Channel Bonding Value
Index	
Lock Status	
Frequency	
Symbol Rate	
Power Level	
Modulation	
Channel Type	

CM Error Codewords	
Unerrored Codewords	0
Correctable Codewords	0
Uncorrectable Codewords	0

4.2.4 Connection_Local IP Network

Manage your home network settings.

Gateway address: Enter the IP address of the Gateway.

Subnet Mask: The subnet mask is associated with the IP address. Select the appropriate subnet mask based on the number of devices that will be connected to your network.

DHCP Beginning and Ending Addresses: The DHCP server in the Gateway allows the router to manage IP address assignment for the connected devices.

DHCP Lease time: The lease time is the length of time the Gateway offers an IP address to a connected device. The lease is renewed while it is connected to the network. After the time expires, the IP address is freed and may be assigned to any new device that connects to the Gateway.

4.2.5 Connection_Wi-Fi

Manage your Wi-Fi connection settings.

Click EDIT next to the Network Name you'd like to modify its Wi-Fi network settings: Network Name (SSID), Mode, Security Mode, Channel, Network Password (Key), and Broadcasting feature.

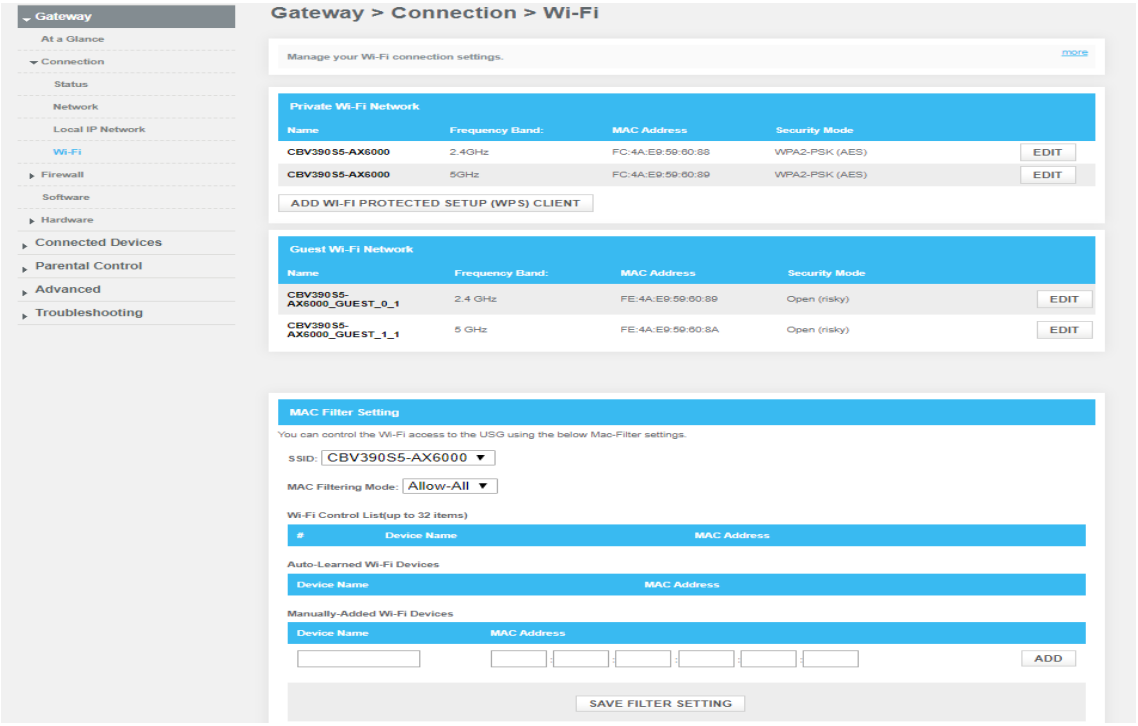
MAC Filter Setting is specific to each Network Name (SSID). Select a MAC Filtering Mode.

Allow- All (Default): All wireless client stations can connect to the Gateway; no MAC filtering rules.
Allow: Only the devices in the "Wireless Control List" are allowed to connect to the Gateway.
Deny: Wireless devices in the "Wireless Control List" are not allowed to connect to the Gateway.
Wireless Control List: Displays the wireless devices (by Network Name and MAC Address) that were manually added or auto-learned.

Auto-Learned Wireless Devices are currently connected to the Gateway.

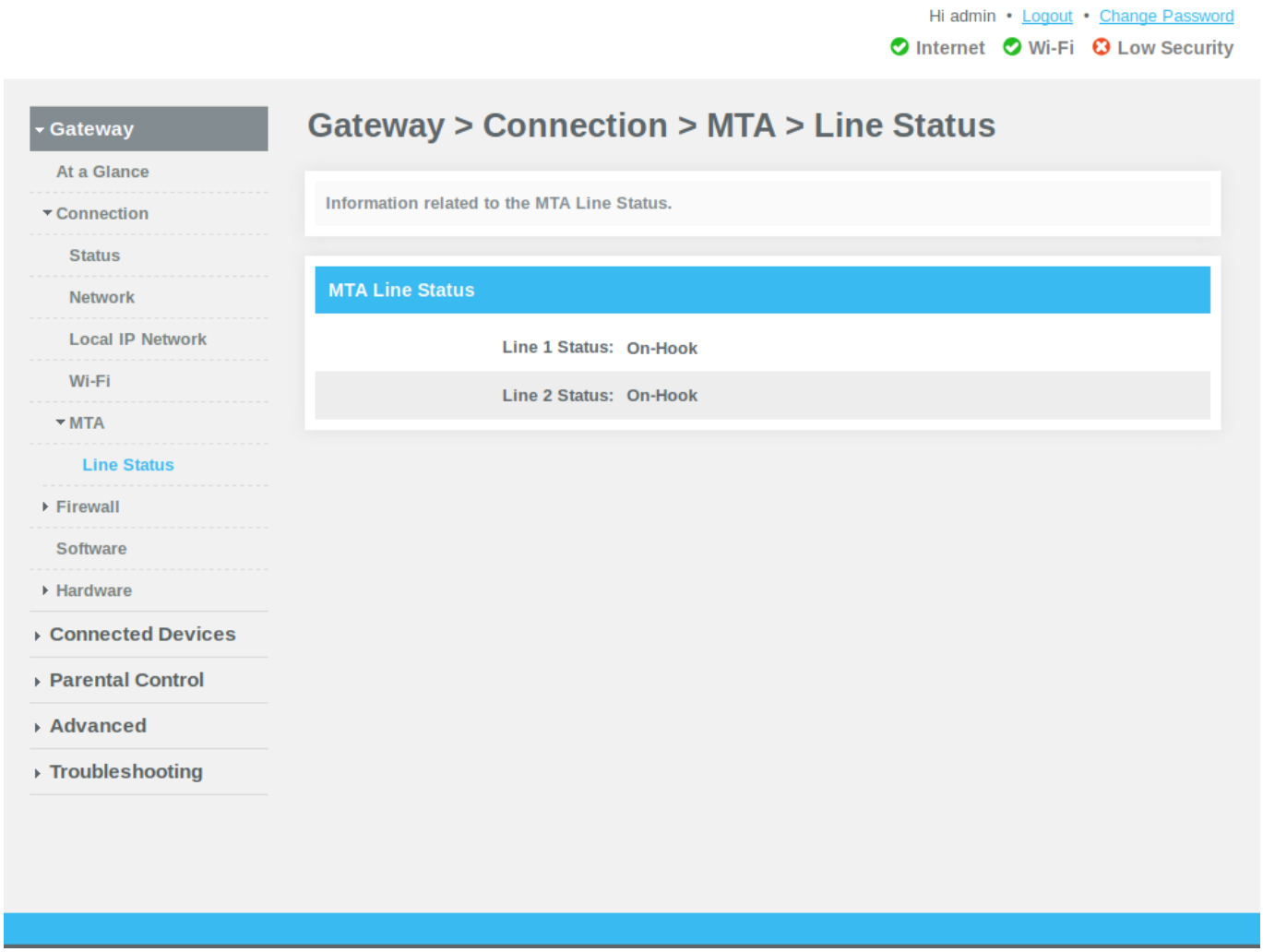
Manually-Added Wireless Devices: Enter a unique name and MAC address for the wireless device you want to manually add, then click ADD.

Band Steering: The device will connect to 5G by default if it supports both 2.4G and 5G,if you want to use 2.4G by default, please use different SSID.



4.2.6 Connection_MTA_Line Status

Information related to the MTA Line Status



4.3 Firewall

Manage your firewall settings.

4.3.1 Firewall_IPv4

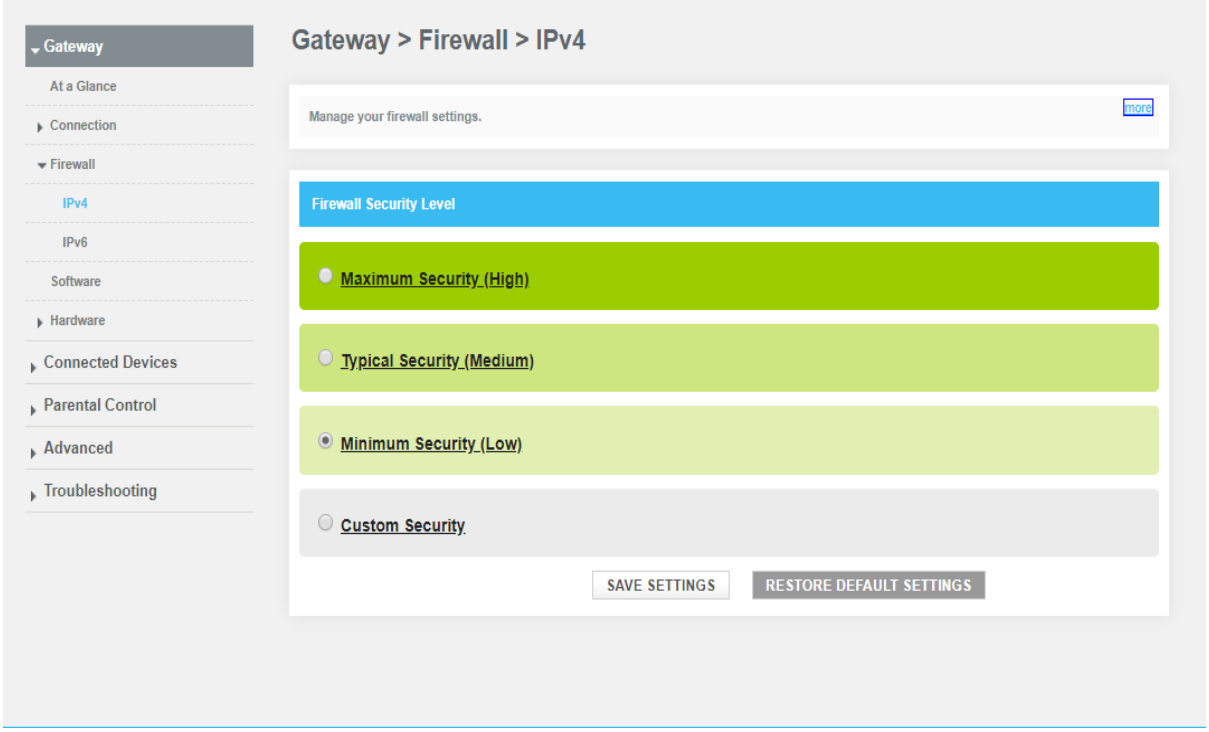
Select a security level for details. If you're unfamiliar with firewall settings, keep the default security level, Minimum Security (Low).

Maximum Security (High): Blocks all applications, including voice applications (such as Gtalk, Skype) and P2P applications, but allows Internet, email, VPN, DNS, and iTunes services.

Typical Security (Medium): Blocks P2P applications and pings to the Gateway, but allows all other traffic.

Minimum Security (Low): No application or traffic is blocked. (Default setting)

Custom security: Block specific services.

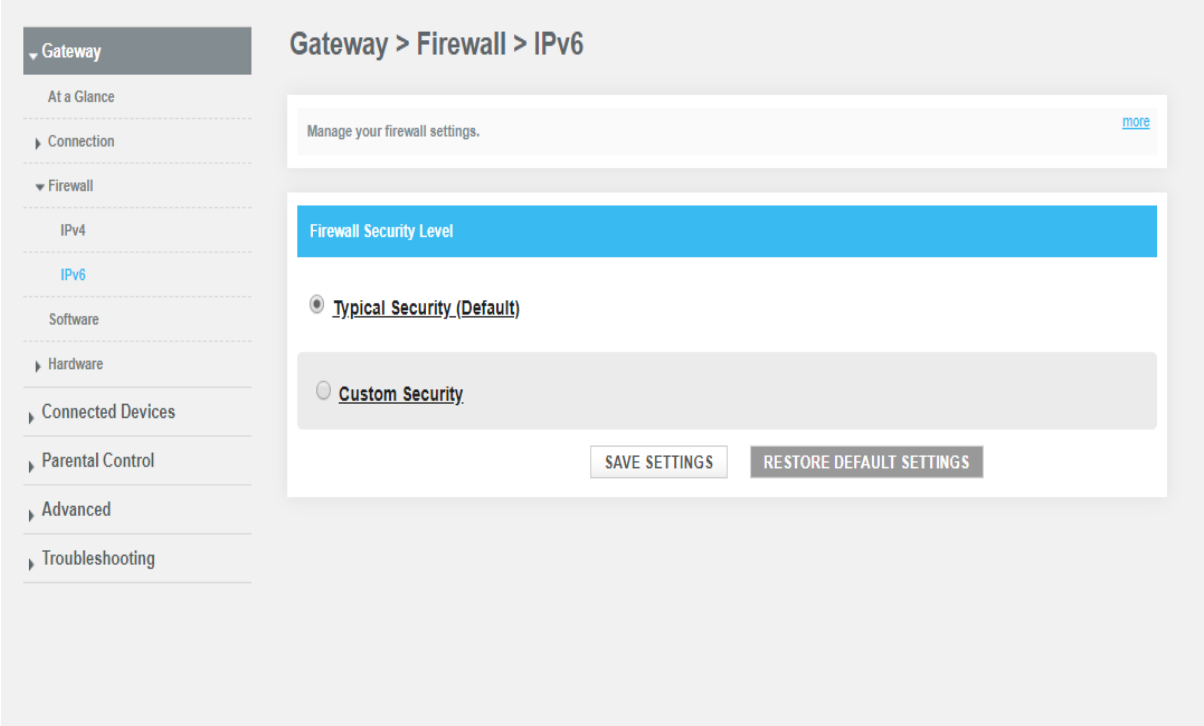


4.3.2 Firewall_IPv6

The Software Manage your firewall settings.

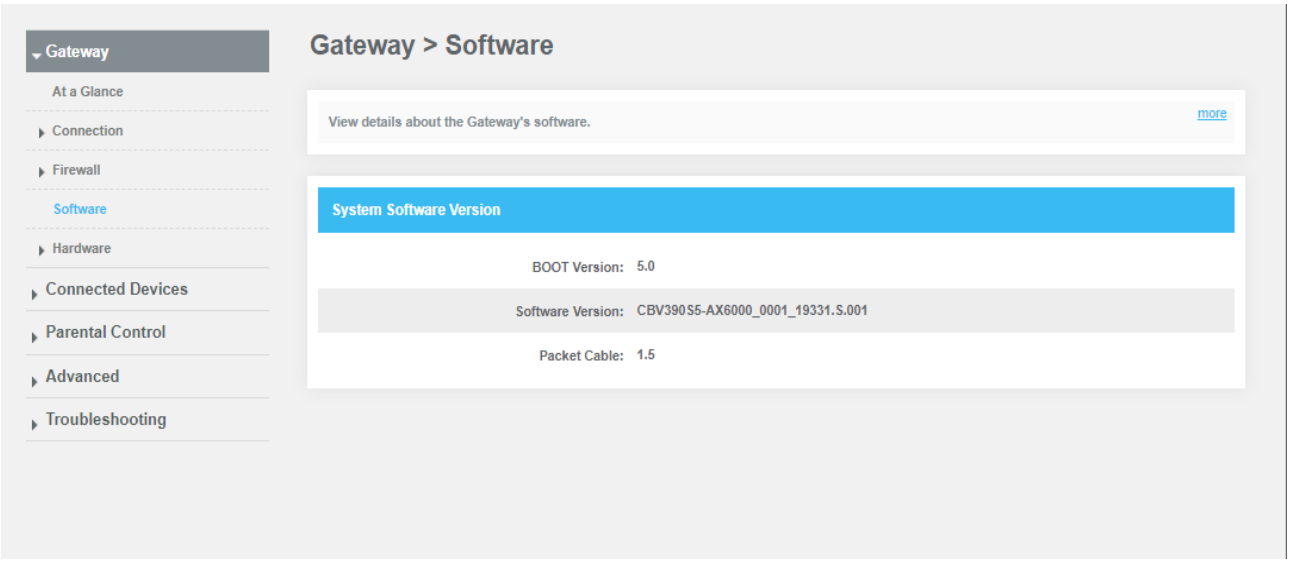
Select a security level for details. If you're unfamiliar with firewall settings, keep the default security level, Minimum Security (Low).

Typical Security (Default): Allows all traffic from home network to internet and blocks all unrelated traffic from internet to home network.



4.4 Software

View details about the Gateway's software.
You may need this information for troubleshooting assistance.

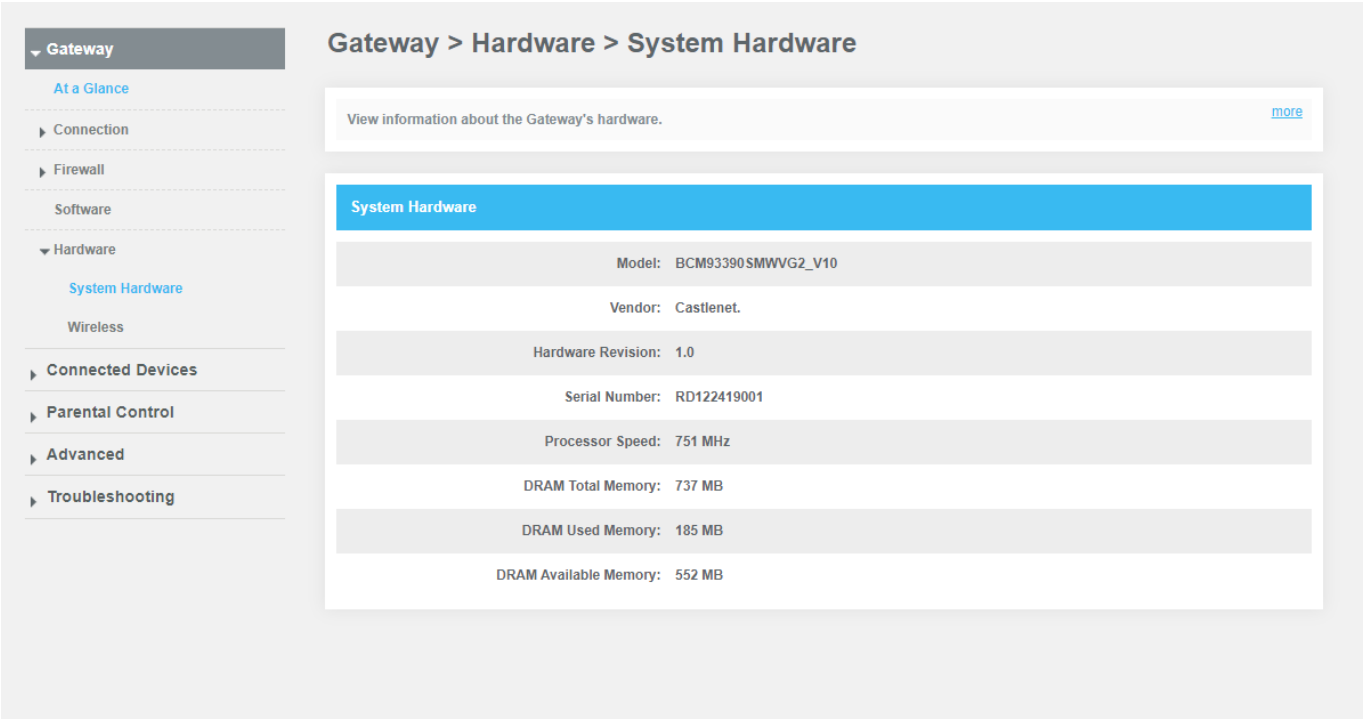


4.5 Hardware

View information about the Gateway’s hardware.

4.5.1 Hardware_System Hardware

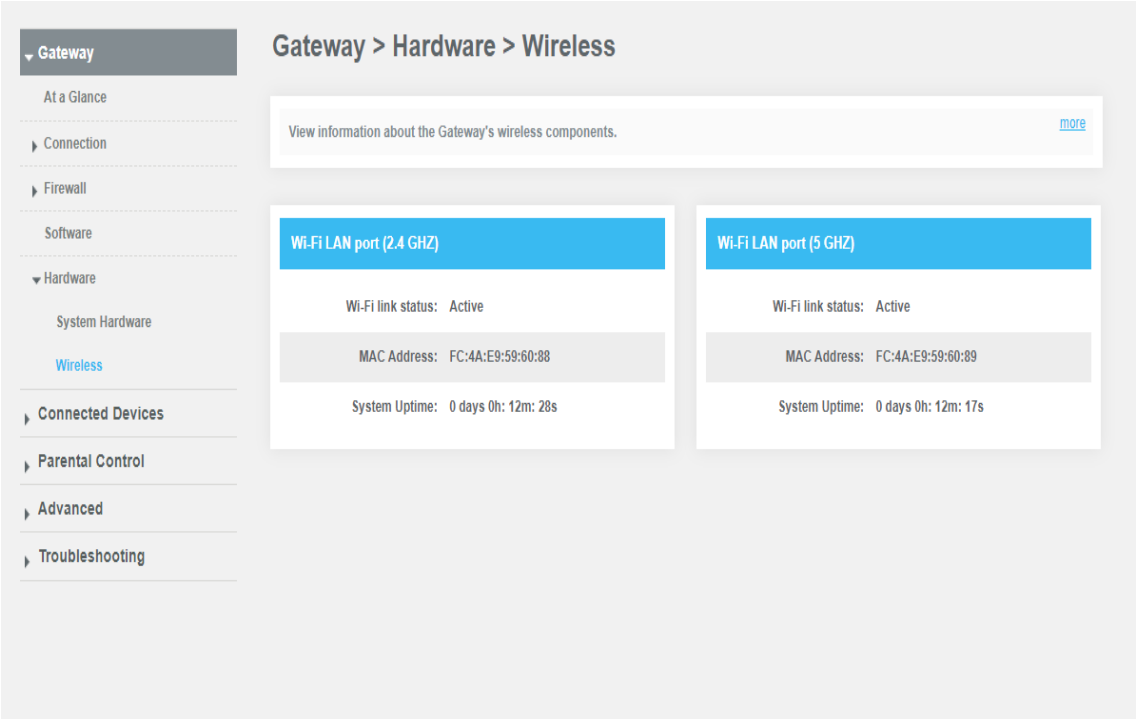
View information about the Gateway’s hardware.



4.5.2 Hardware_Wireless

View information about the Gateway's wireless components.

Wi-Fi: The Gateway provides concurrent 2.4 GHz and 5 GHz for Wi-Fi connections.

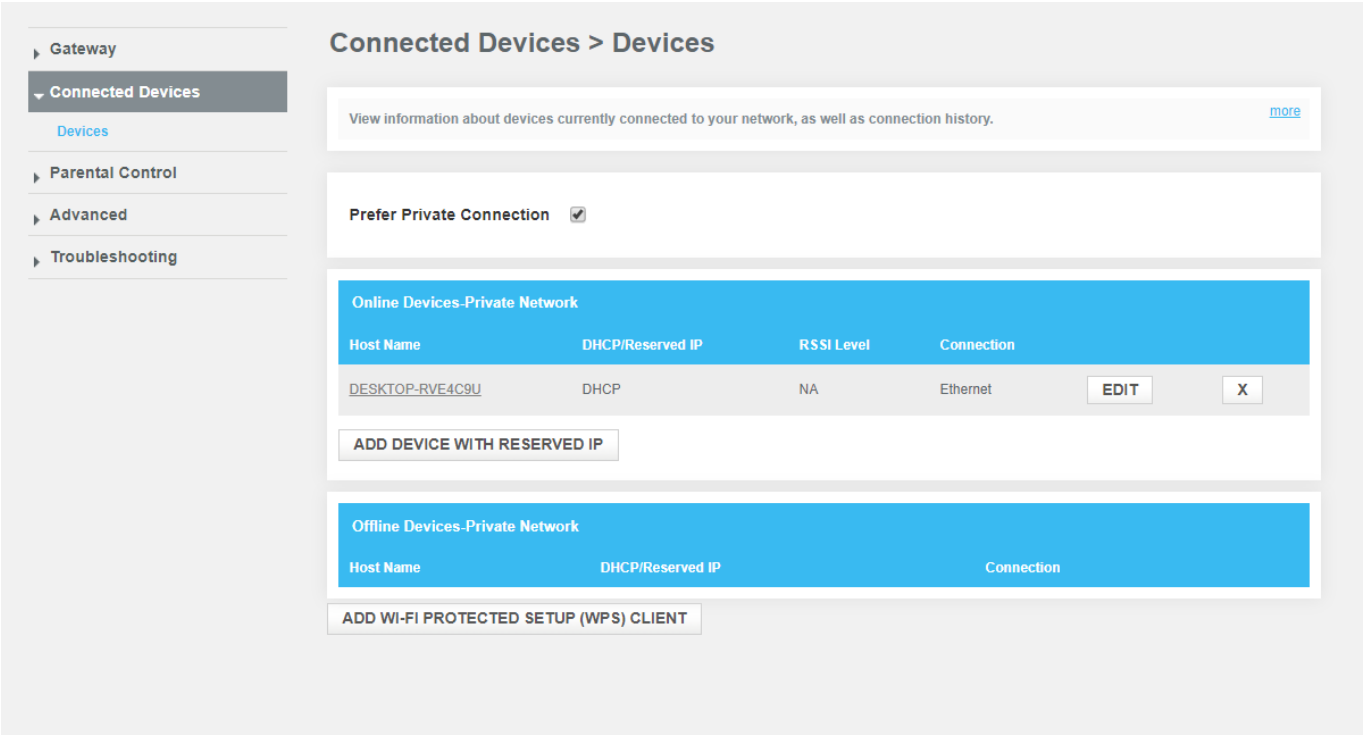


4.6 Connected Devices

View information about devices currently connected to your network, as well as connection history.

4.6.1 Connected Devices_Devices

Every device listed below was auto discovered via DHCP.
Online Devices are currently connected to your Gateway.
Offline Devices were once connected to your network, but not currently.
To block Internet access to a device connected to your Gateway, click the X button.



4.7 Parental Control

4.7.1 Parental Control_Managed Sites

Manage access to specific websites by network devices.

Select Enable to manage sites, or Disable to turn off.

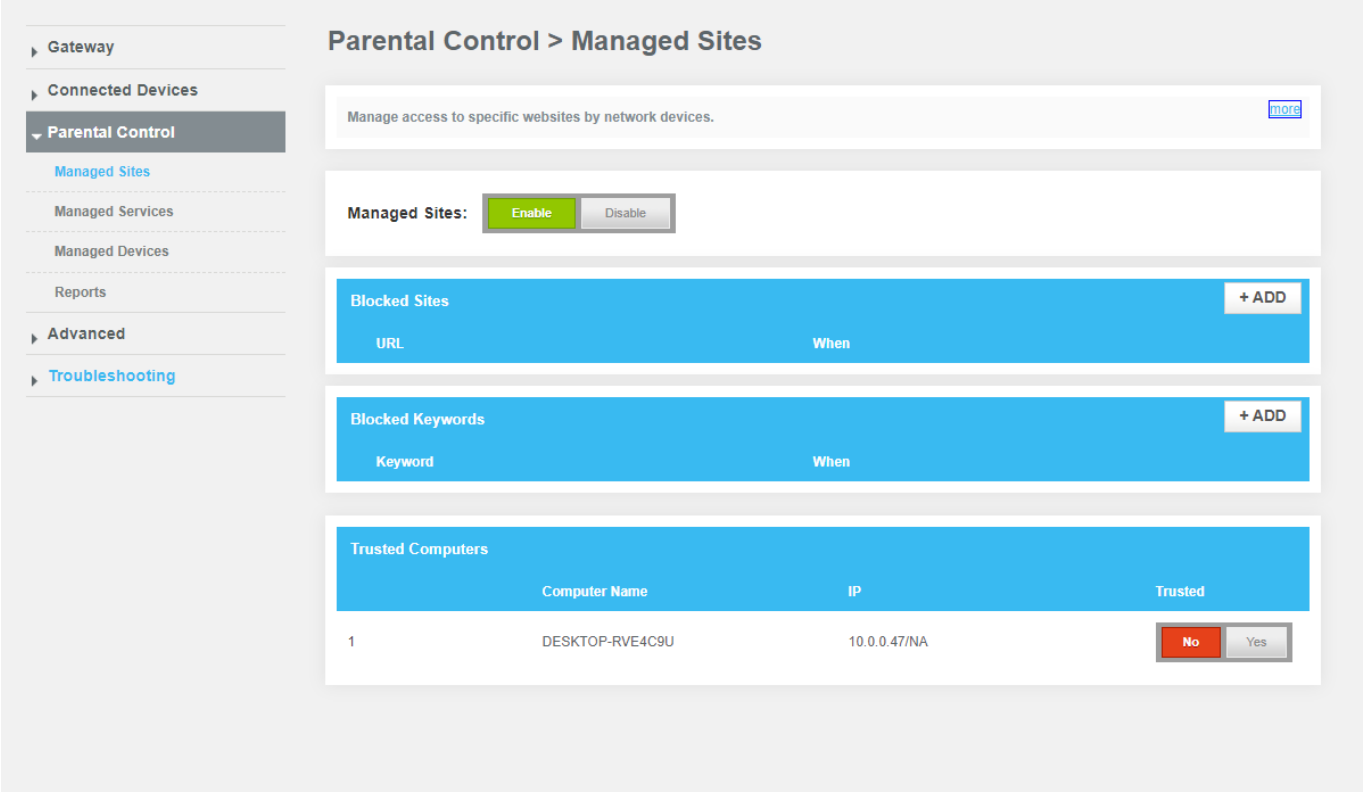
+ADD: Add a new website or keyword.

Blocked Sites: Deny access to specific websites (URLs).

Blocked Keywords: Deny access to websites containing specific words.

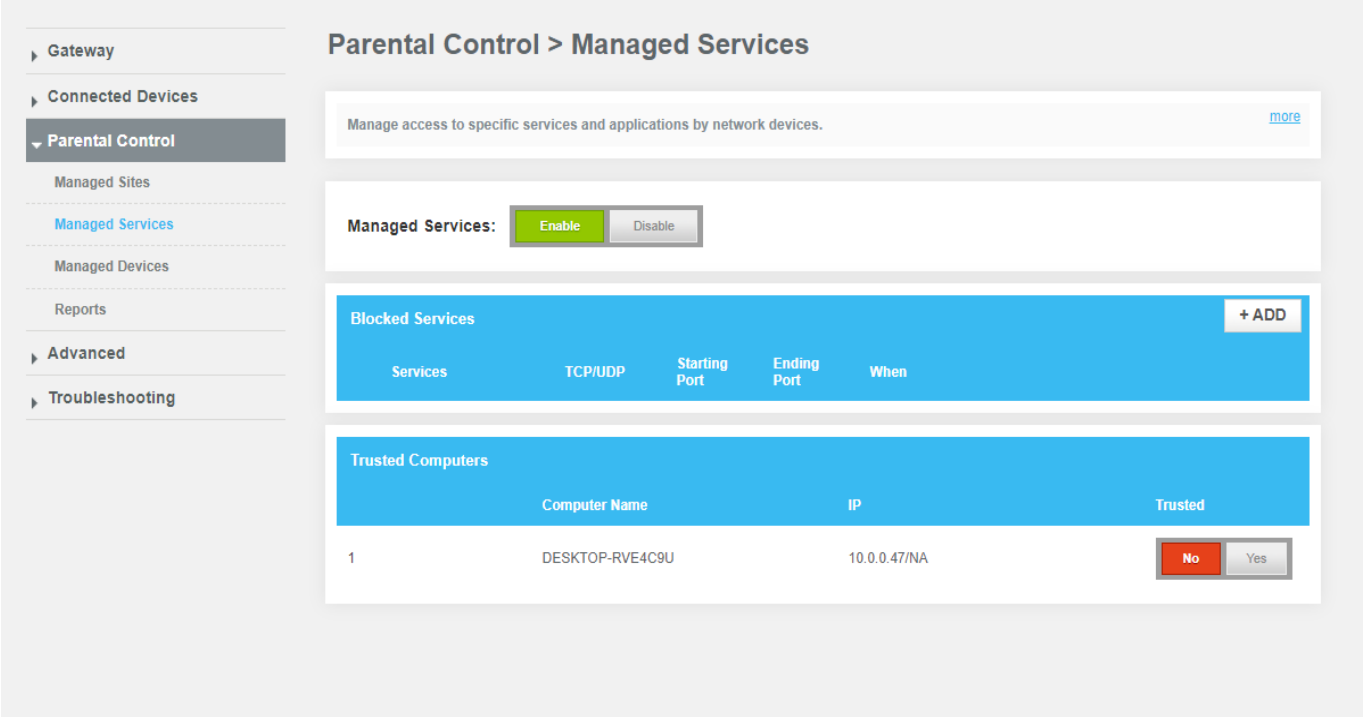
The Gateway will block connections to websites on all untrusted computers, based on the specified rules.

If you don't want restrictions for a particular computer, select Yes under Trusted Computers.



4.7.2 Parental Control_Managed Services

Manage access to specific services and applications by network devices.
Select Enable to manage services and applications, or Disable to turn off.
+ADD: Add to block a new service or application.
The Gateway will block services and applications on all untrusted computers, based on the specified rules. If you don't want restrictions for a particular computer, select Yes under Trusted Computers.



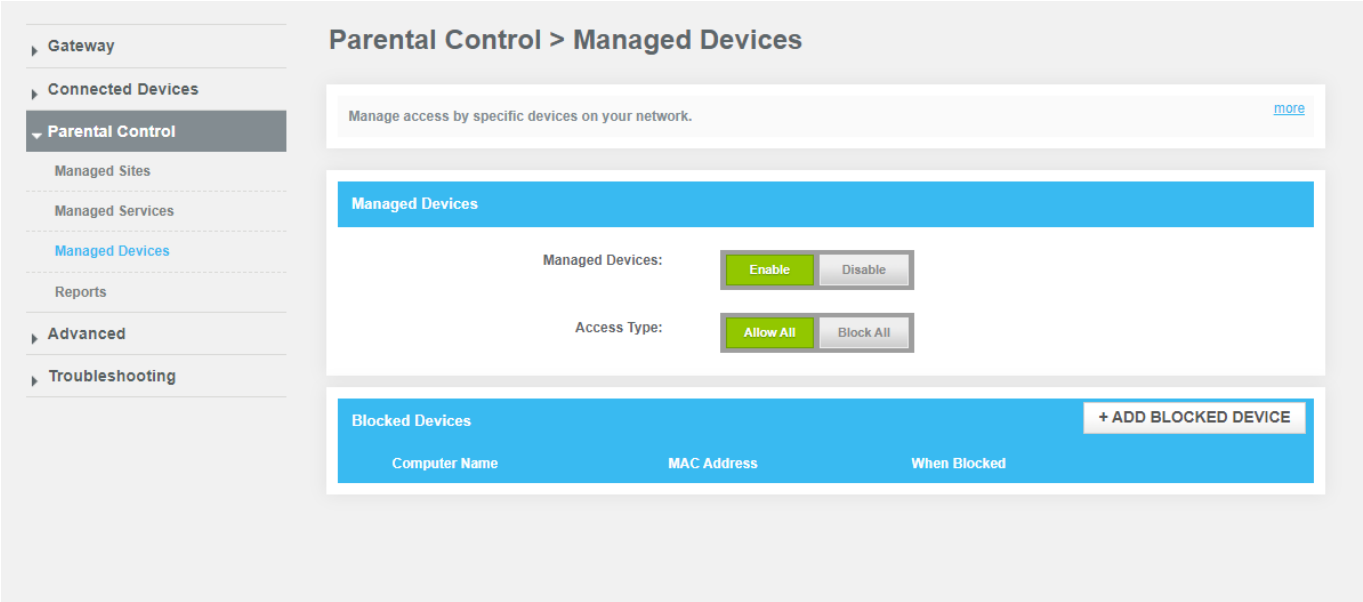
4.7.3 Parental Control_Managed Devices

Manage access by specific devices on your network.

Select Enable to manage network devices, or Disable to turn off.

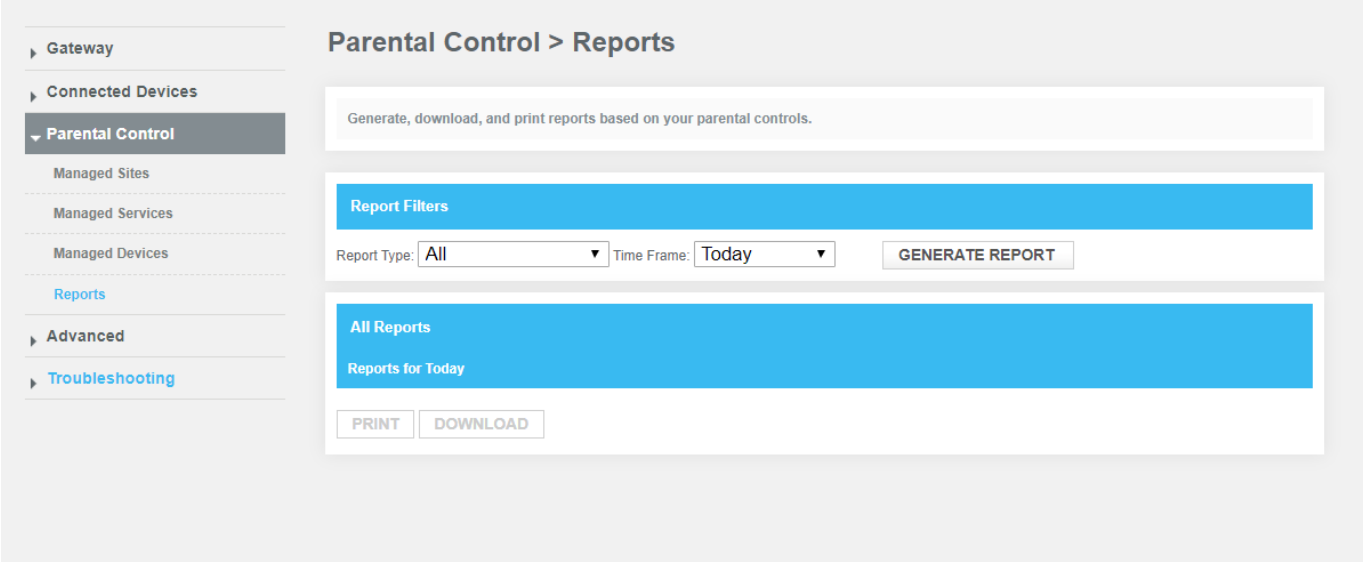
Access Type: If you don't want your devices to be restricted, select Allow All. Then select +ADD BLOCKED DEVICE to add only the device you want to restrict.

If you want your devices to be restricted, select Block All. Click +ADD ALLOWED DEVICE to add the device you don't want to restrict.



4.7.4 Parental Control_Reports

Generate, download, and print reports based on your parental controls.

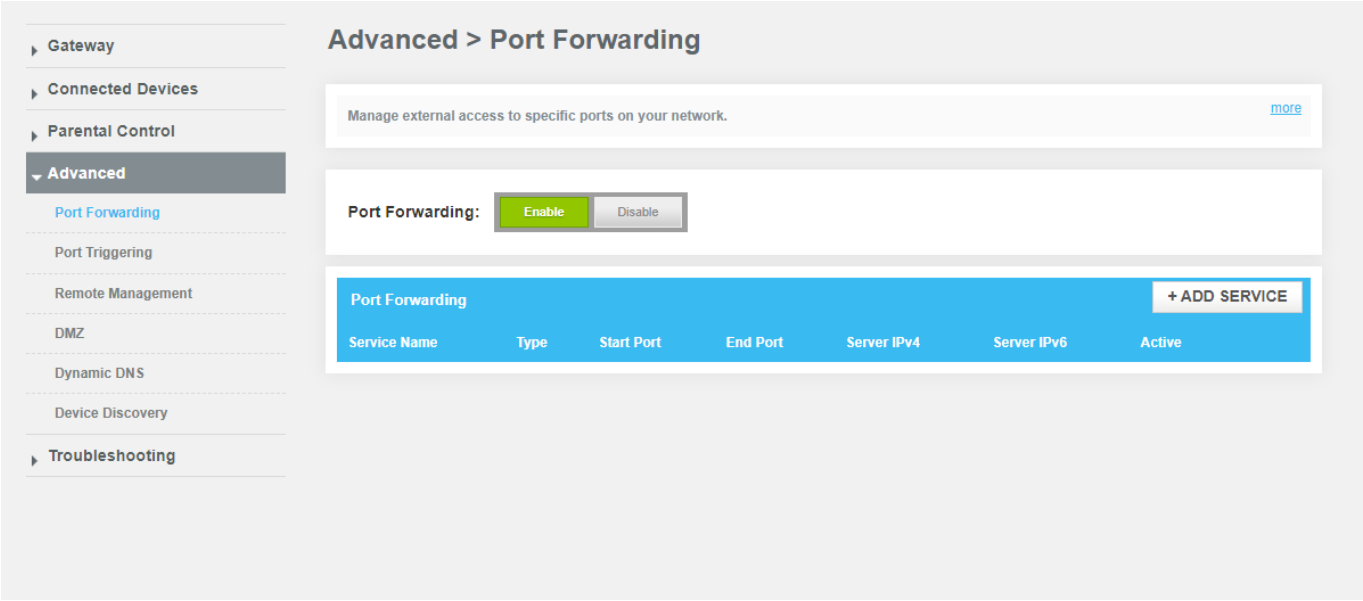


4.8 Advanced

Manage external access to specific ports on your network.

4.8.1 Advanced_Port Forwarding

Port forwarding permits communications from external hosts by forwarding them to a particular port.
Select Enable to manage external access to specific ports on your network.
Click +ADD SERVICE to add new port forwarding rules.
Port forwarding settings can affect the Gateway's performance.



4.8.2 Advanced_Port Triggering

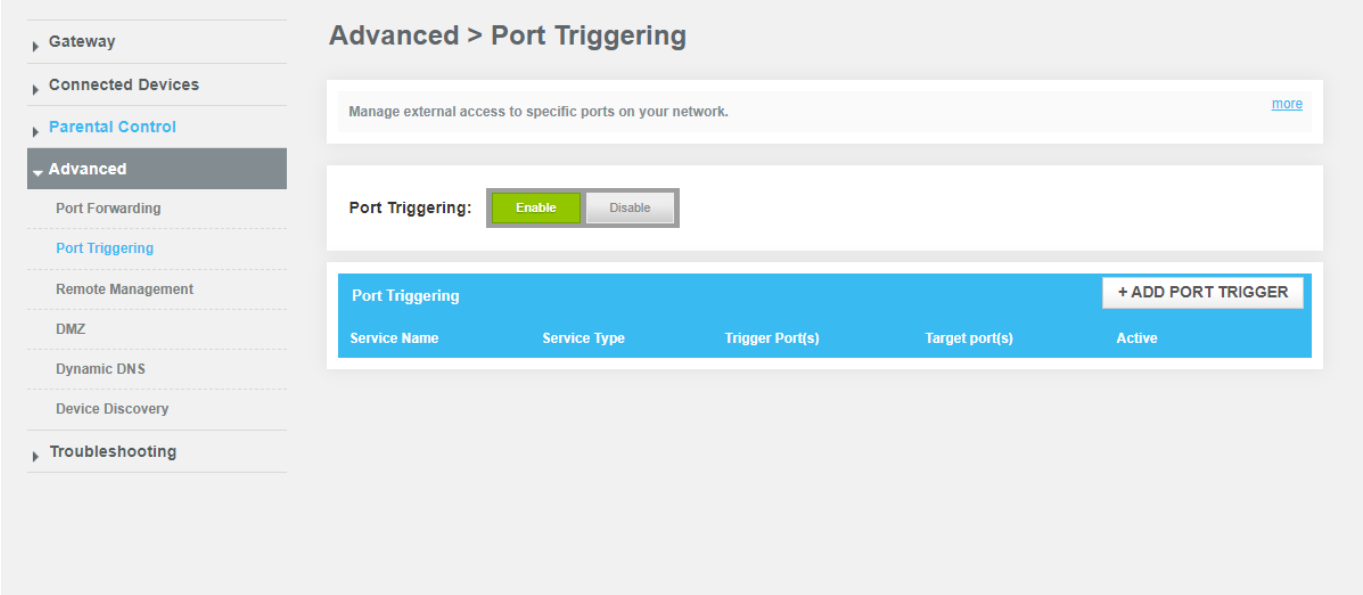
Manage external access to specific ports on your network.

Port triggering monitors outbound traffic on your network. When traffic is detected on a particular outbound port, the Gateway remembers that computer's IP address, triggers the inbound port to accept the incoming traffic, and directs the communications to the same computer.

Select Enable to manage external access to specific ports on your network.

Click +ADD PORT TRIGGER to add new port triggering rules.

Port triggering settings can affect the Gateway's performance.



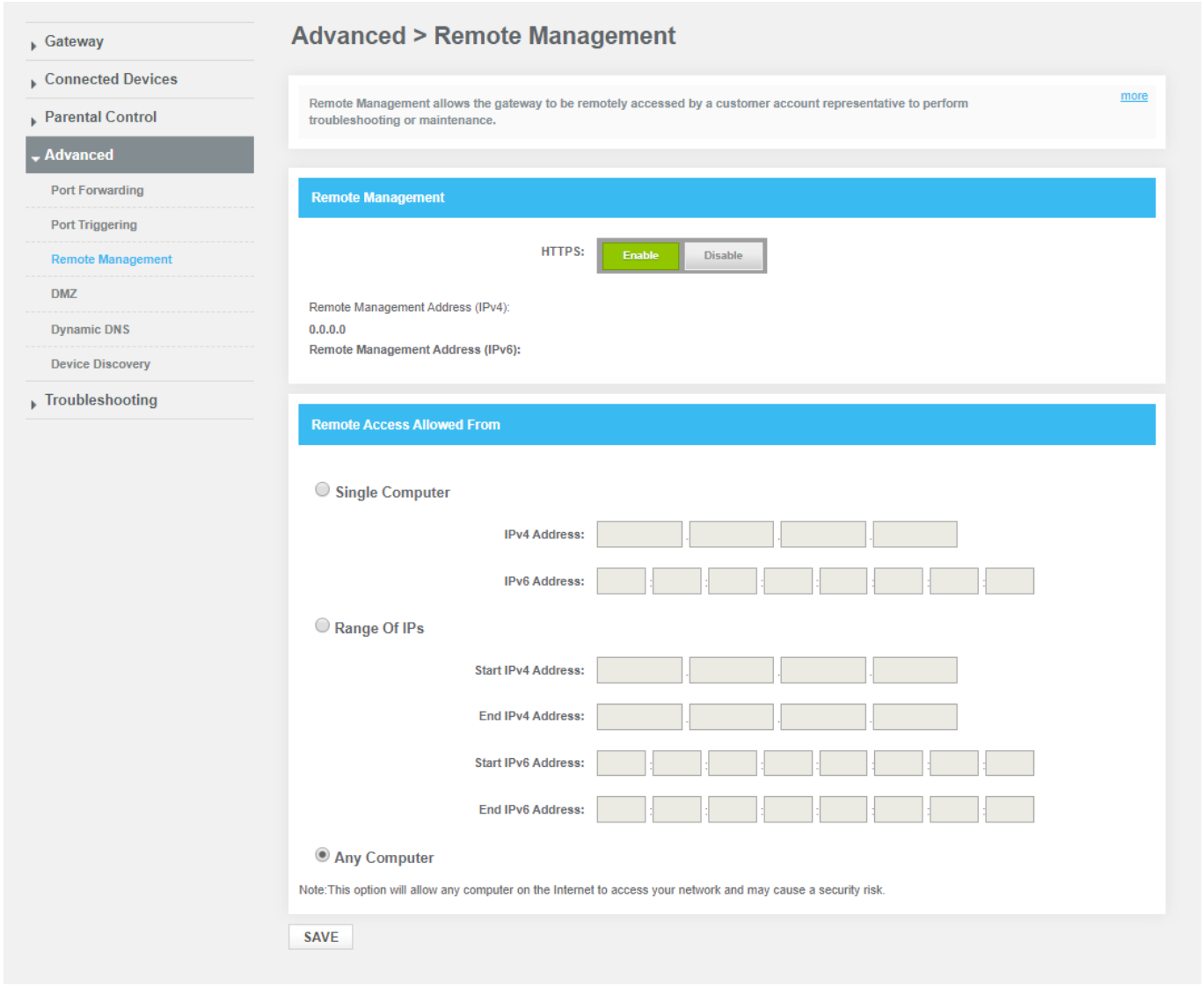
4.8.3 Advanced_Remote Management

Remote Management allows the gateway to be remotely accessed by a customer account representative to perform troubleshooting or maintenance.

Remote Management can be used via HTTPS.

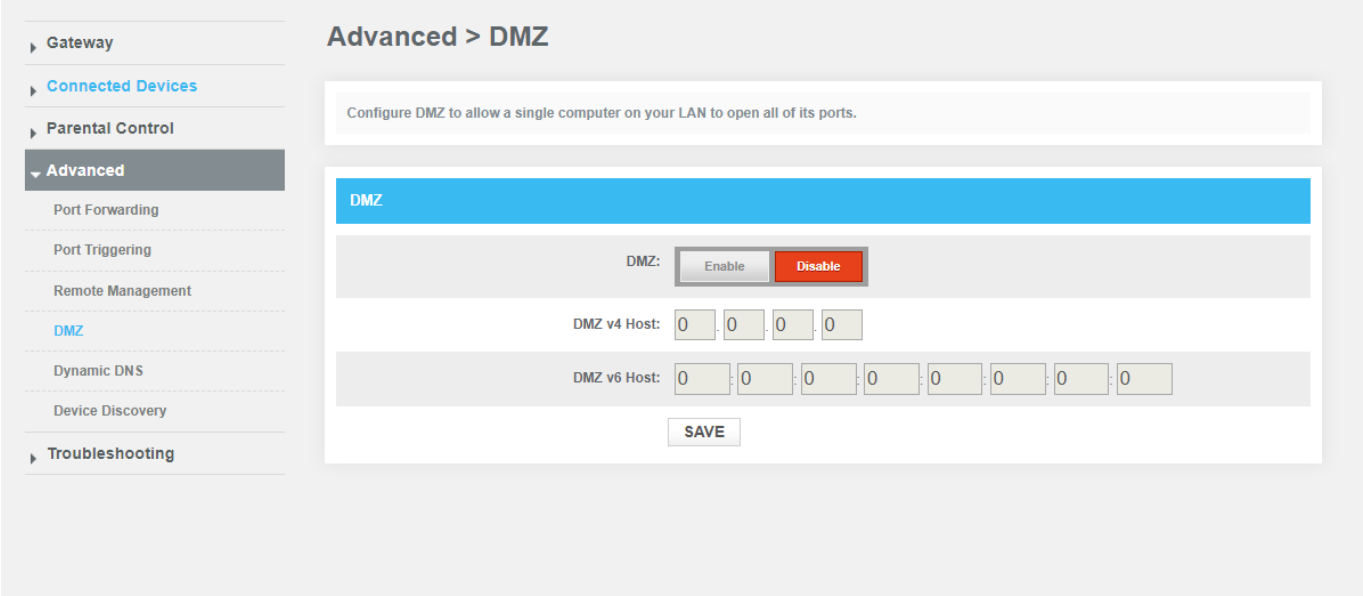
Enable the HTTPS option, then you can access your device from HTTP. For example, if the WAN IP address is 11.22.11.22, then you would use https://11.22.11.22

Select whether you would like to have Remote Management open to all Internet IP Addresses, an Internet IP Address range, or a single Internet IP Address.



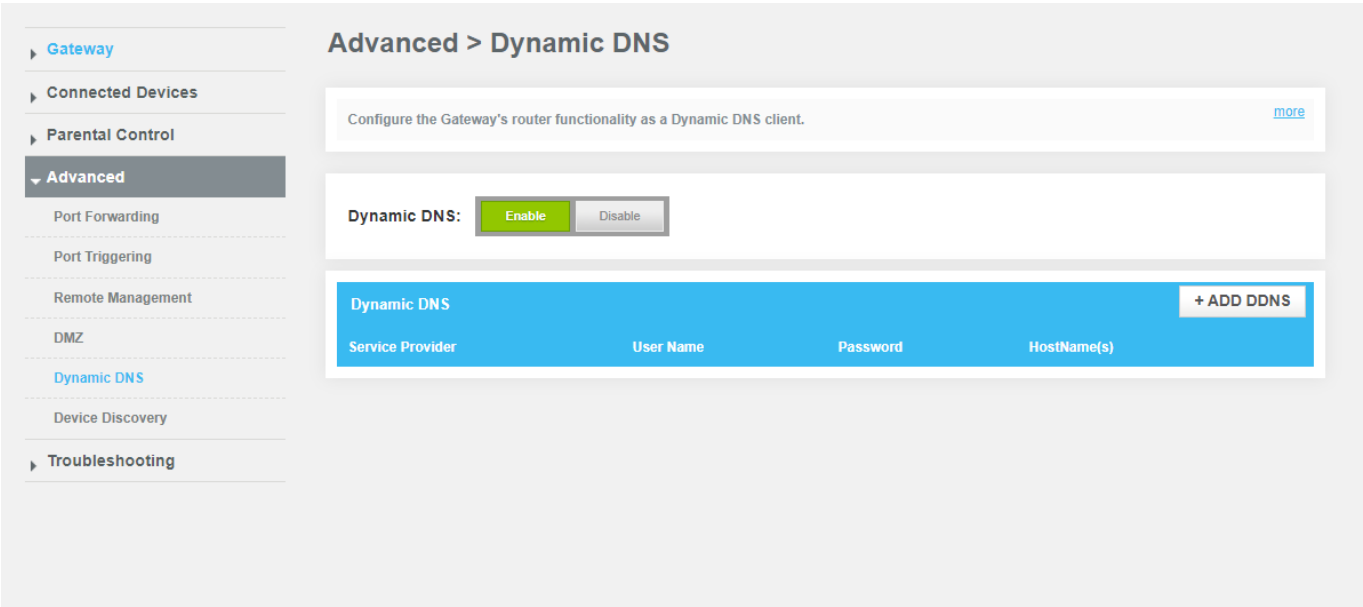
4.8.4 Advanced_DMZ

Configure DMZ to allow a single computer on your LAN to open all of its ports.



4.8.5 Advanced_Dynamic DNS

Configure the Gateway's router functionality as a Dynamic DNS client.
Service Provider: Dynamic DNS Service Provider Domain name
User Name: Name registered with the service provider
Password: Password registered with the service provider
Host Name: Host Name registered with the service provider



4.8.6 Advanced_Device Disvoery

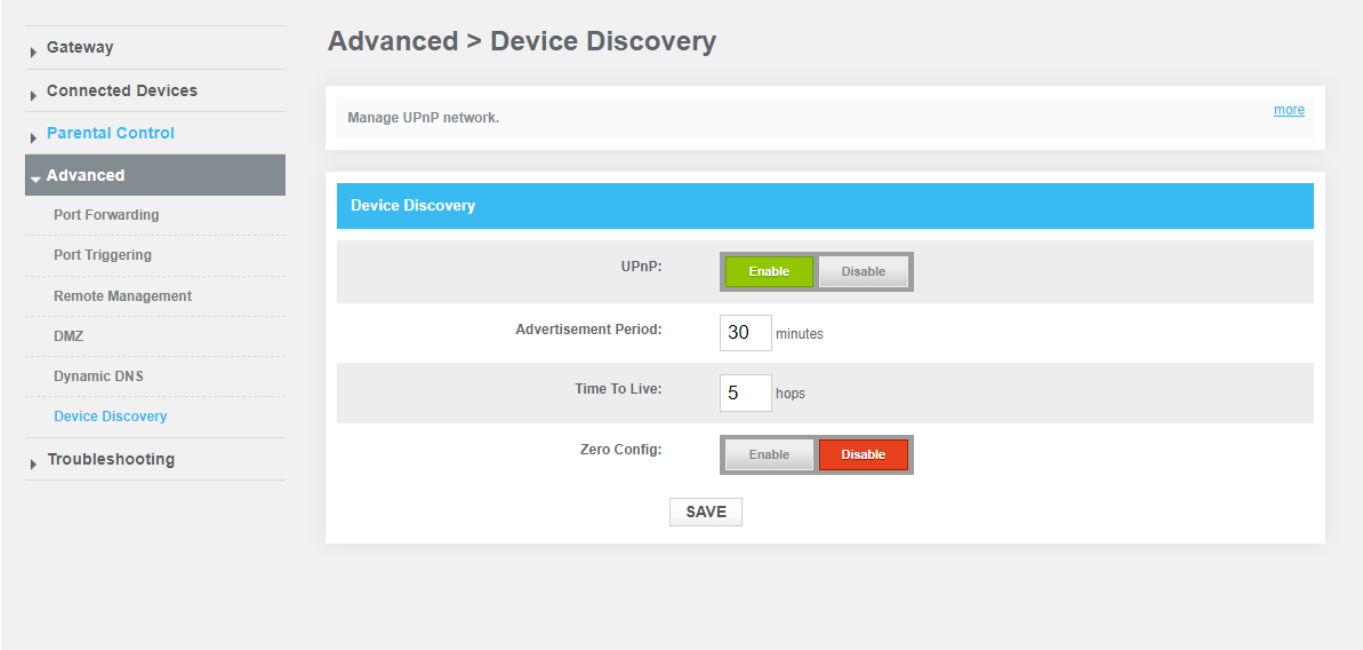
Manage UPnP network.

The UPnP enabled Gateway discovers all UPnP enabled client devices, such as network printers and laptops. Using UPnP, the ports are opened automatically for the appropriate services and applications. The UPnP devices will be auto configured in the network.

Advertisement Period: The Advertisement Period is how often the gateway will advertise (broadcast) its UPnP information.

Time to Live: Measured in hops for each UPnP packet sent. A hop is the number of steps an UPnP advertisement is allowed to propagate before disappearing.

Zero Config: Discovery protocol which allows devices, such as printers and computers, to connect to a network automatically.

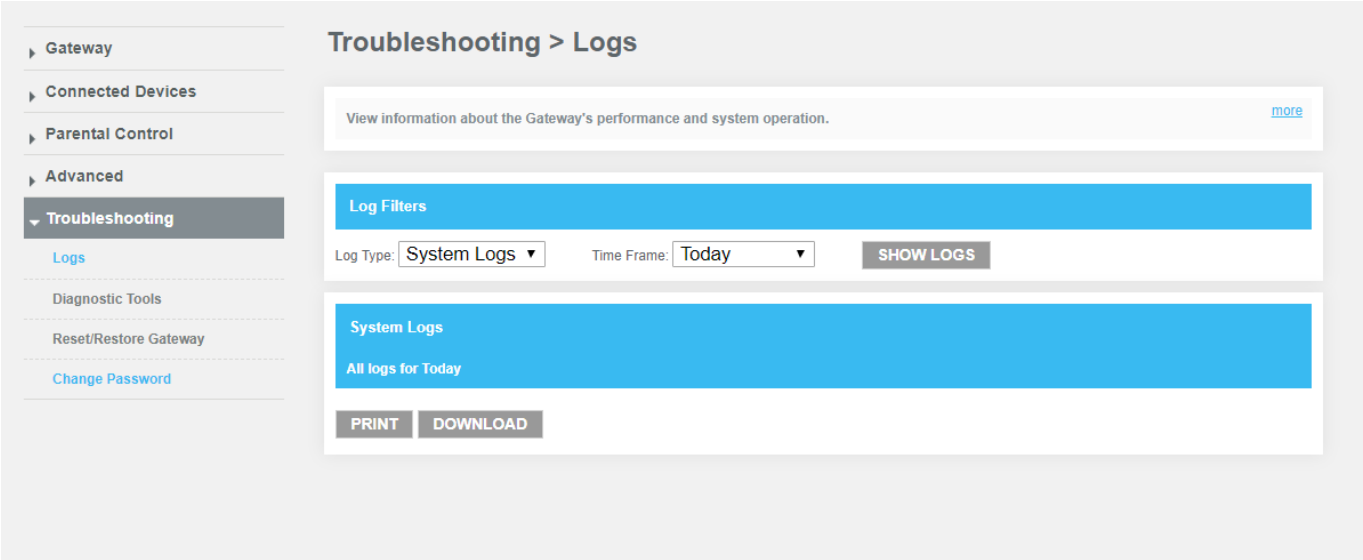


4.9 Troubleshooting

View information about the Gateway's performance and system operation.

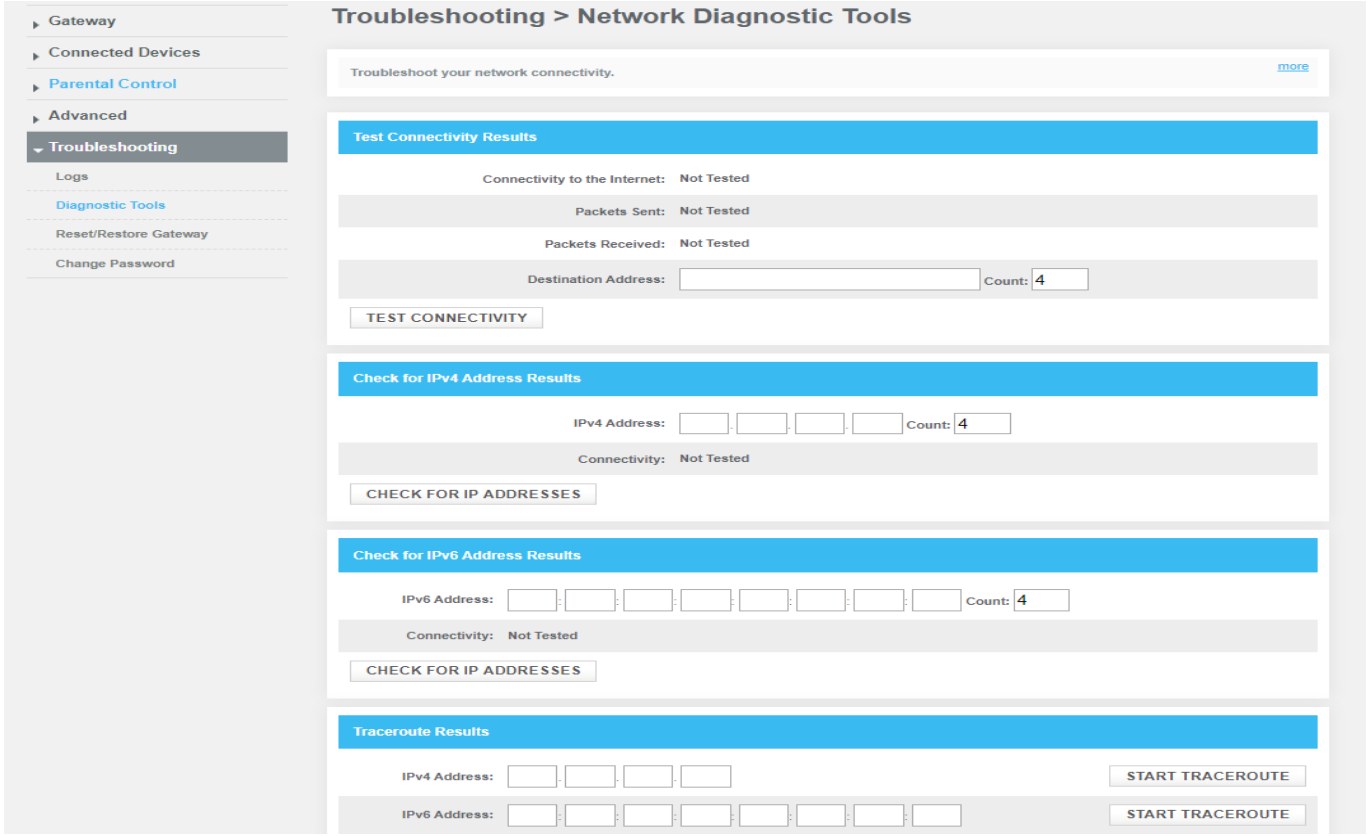
4.9.1 Troubleshooting_Logs

View information about the Gateway's performance and system operation.
Use the logs to troubleshoot issues and to identify potential security risks.



4.9.2 Troubleshooting_Diagnostic Tools

Troubleshoot your network connectivity.
Test Connectivity Results: Checks your connectivity to the Internet.
Check IPv4 and IPv6 Address Results: Identifies accessibility to specific IP addresses.
Trace route Results: Displays the route of packets across an Internet Protocol (IP) network.

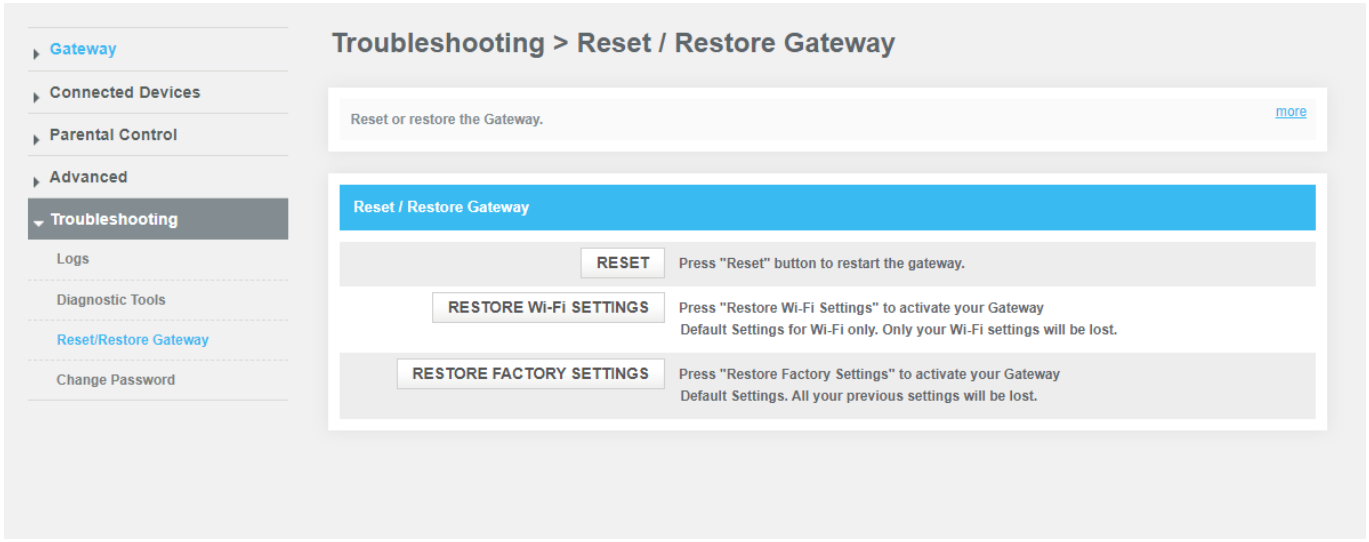


4.9.3 Troubleshooting_Reset/Restore Gateway

Reset or restore the Gateway.

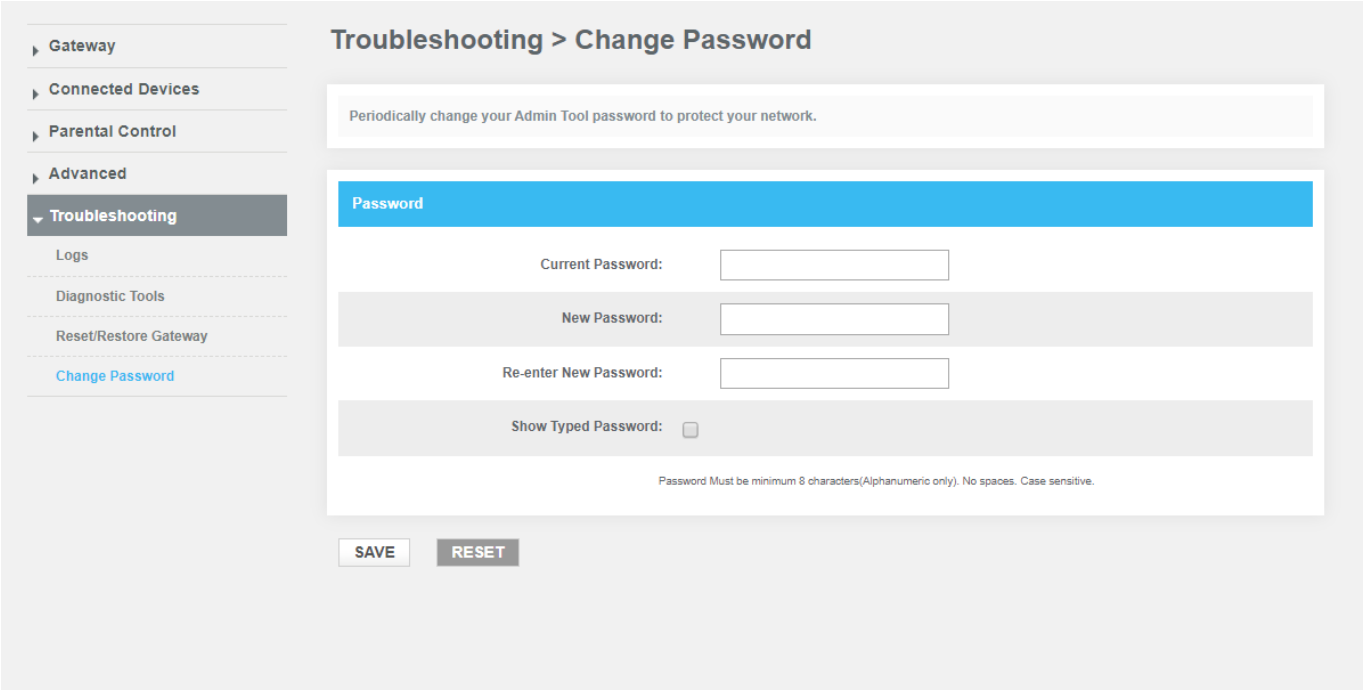
If you're having problems with the Gateway, click RESET to restart or RESTORE to the default factory settings.

CAUTION: RESTORE will erase all your settings (passwords, parental controls, firewall).



4.9.4 Troubleshooting_Change Password

Periodically change your Admin Tool password to protect your network.



Appendix: Cable Modem Specification

Table 1. RF Downstream Specification

Parameter	Value
Frequency range	108-1002 / 258-1218 MHz switchable
Bonded Channels	DOCSIS 3.1: 2 (OFDM)
	DOSCIS 3.0: up to 32
Capture Bandwidth	1.2 GHz
Carrier Bandwidth	DOCSIS 3.1 : 192 MHz
	DOCSIS 3.0 : 6 MHz
	EuroDOCSIS 3.0 : 8 MHz
Modulation	DOCSIS 3.1 : 4096 QAM
	DOCSIS 3.0 : 1024 QAM
Data Rate	DOCSIS 3.1 : up to 5 Gbps
	DOCSIS 3.0 : up to 1.2 Gbps
	EuroDOCSIS 3.0 : 1.6 Gbps

Table 2. RF Upstream Specification (DOCSIS)

Parameter	Value
Frequency Range	5-85 / 5-204 MHz switchable
Bonded Channels	DOCSIS 3.1: 2 (OFDM) DOSCIS 3.0: up to 8
Modulation	4096 QAM (DOCSIS 3.1), 256 QAM, QPSK
Data Rate	DOCSIS 3.1 : up to 2 Gbps DOCSIS 3.0 : up to 200 Mbps

Table 3. Electrical Specification

Parameter	Measured Value	Notes
Input Voltage	12VDC/3.5A	
Power consumption	TBD	With AC adaptor

Table 4. Physical Specification

Parameter	Value
Size	205 mm (W) x 230mm(H) x 64.3 mm (L)
Weight	740 +/- 10g (device only)

Table 5. Environmental Specification

Parameter	Value
Operating Temperature	0 °C ~ +40 °C
Operating Relative Humidity	5% ~ 95% (Non-condensing)
Storage Temperature	-10 °C ~ +60 °C