DDW2600 Wireless Router (U10CC037) and DDC2700 Commercial Router (U10C038)

Subscriber User Guide

DDW2600 Wireless Cable Modem/Router

DDC2700 Commercial Cable Modem/Router

www.ubeeinteractive.com
8085 S. Chester Street, Suite 200
Englewood, CO 80112
1.888.390.8233
Sales (email): amsales@ubeeinteractive.com
Support (email) amsupport@ubeeinteractive.com

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Notices and Copyrights

Contents

1 Safety and Regulatory Information

The following information provides safety and regulatory standards for anyone installing, maintaining, and using the DDW2600 wireless or the DDM2700 commercial cable modem/router.

1.1 Safety

WARNING: The following information provides safety guidelines for anyone installing and maintaining the DDW2600 or DDM2700 router. Read all safety instructions in this guide before attempting to unpack, install, operate, or connect power to this product. Follow all instruction labels on the device itself. Comply with the following safety guidelines for proper operation of the device:

Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury. To prevent fire or shock hazard, do not expose the unit to rain, moisture, or install this product near water. Never spill any form of liquid on or into this product. Do not use liquid cleaners or aerosol cleaners on or close to the product. Use a soft dry cloth for cleaning.

Do not insert any sharp object into the product's module openings or empty slots. Doing so may accidentally damage its parts and/or cause electric shock.

Electrostatic discharge (ESD) can permanently damage semiconductor devices. Always follow ESD-prevention guidelines for equipment handling and storage.

Use only the power adapter supplied with the device. Do not attach the power supply cable on building surfaces or floorings.

❑ Do not place heavy objects on top of the device.

❑ Rest the power cable freely without any obstacle or heavy items piled on top of it. Refrain from abusing, stepping or walking on the cable. Do not place the device on an unstable stand or table; the device may drop and become damaged.

❑ To protect the equipment from overheating, do not block the slots and openings in the module housing that provides ventilation. Do not expose this device to direct sunlight. Do not place any hot devices close to this device, as it may degrade or cause damage to it.

1.2 Eco-Environmental Statements

The following eco-environmental statements apply to the DDW2600 or DDM2700 router.

1.2.1 Packaging Collection and Recovery Requirements:

Countries, states, localities, or other jurisdictions may require that systems be established for the return and/or collection of packaging waste from the consumer, or other end user, or from the waste stream. Additionally, reuse, recovery, and/or recycling targets for the return and/or collection of the packaging waste may be established. For more information regarding collection and recovery of packaging and packaging waste within specific jurisdictions, contact Ubee Interactive at www.ubeeinteractive.com.

1.3 Regulatory Statements

The following regulatory statements applies to the DDW2600 or DDM2700 router.

1.3.1 Industry North America Statement:

This device complies with RSS-210 of the Industry North America 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.

1.3.2 Radiation Exposure Statement:

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. This device has been designed to operate with an antenna having a maximum gain of 2 dBi. Antenna having a higher gain is strictly prohibited per regulations of Industry North America. The required antenna impedance is 50 ohms.

2 Introduction

Welcome to the Ubee family of data networking products! This document provides instructions for anyone who installs, configures, maintains, and uses the Ubee DDW2600 wireless cable modem/router or the DDM2700 commercial cable modem/router. The following topics are also provided:

- ❑ To define all relevant device compliance standards and physical specifications.
- ❑ To provide device installation, user level instructions, and basic troubleshooting.

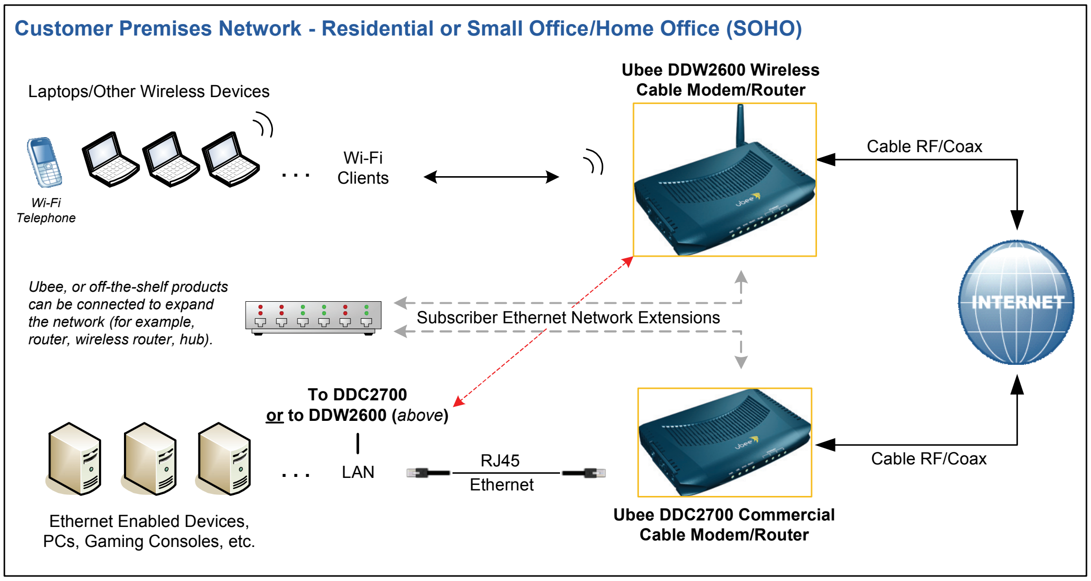
Important: This document can be used for two different Ubee products: the DDW2600 wireless cable modem/router and the DDC2700 commercial cable modem/router. Any instructional differences between the two are noted throughout this document.

Ubee recommends that you review this chapter before installing and using the device. To go directly to installing the device, go to page 13. The following topics are provided:

- ❑ Application Diagram (p. 4)
- ❑ Support (p. 4)
- ❑ Physical Specifications, Standards, Firmware Operations (p. 5)
- ❑ Default Values/Device Logins (p. 7)
- ❑ Device Package Components (p. 8)
- ❑ Device Back Panel Description (p. 9)
- ❑ Device Front Panel & LED Behavior (p. 10)

2.1 Application Diagram

The diagram below illustrates the general connection topology and uses of the device.


Customer Premises Network - Residential or Small Office/Home Office (SOHO)
Laptops/Other Wireless Devices
Wi-Fi Telephone
. . .
Wi-Fi Clients
Ubee DDW2600 Wireless Cable Modem/Router
Cable RF/Coax
INTERNET
Ubee, or off-the-shelf products can be connected to expand the network (for example, router, wireless router, hub).
Subscriber Ethernet Network Extensions
To DDC2700 or to DDW2600 (above)
. . .
LAN
RJ45
Ethernet
Cable RF/Coax
Ethernet Enabled Devices, PCs, Gaming Consoles, etc.
Ubee DDC2700 Commercial Cable Modem/Router

2.2 Support

Subscribers must contact their service provider for direct support. Device documentation support may be available at:

http://www.ubeeinteractive.com

2.3 Physical Specifications, Standards, Firmware Operations

The following list provides the features and specifications of the DDW2600 or DDC2700 cable modem/router:

Interfaces

❑ Cable: F-Connector, Female
❑ LAN: 4 10/100Mbps, Based-T RJ-45 Ports
❑ USB: USB 1.0 Port, provides an alternate network connection
❑ 32MB DDR Ram

Standards/Certifications

❑ DOCSIS/Euro DOCSIS 1.0/1.1/2.0 Certified
❑ CE/ FCC Class B, UL 60950
❑ RoHS, WEEE
❑ IPv4
❑ Wireless: IEEE 802.11; 802.11b/g; DSSS

Downstream*

❑ Frequency Range: 88 MHz ~ 860MHZ
❑ Modulation: 64/256 QAM
❑ Maximum Data Rate: 30Mbits/sec (64QAM), 42.8Mbits/sec (256QAM)
❑ Symbol Rate: 5.057/5.361/Msymbols/sec
❑ RF Input/Output Power:
❑ -17 to +15dBmV (64 QAM)
❑ -15 to +17dBmV (256 QAM)
❑ Input Impedance: 75 Ω
❑ Channel Bandwidth: 6 or 8 MHz

Upstream*

❑ Frequency Range: 5 MHz ~ 42 MHz
❑ Modulation: **A-TDMA**: QPSK 8, 16, 32, 64QAM, **S-CMDA**: QPSK 8, 16, 32, 64, 128QAM
❑ Maximum Data Rate: 0.32 ~ 10.24Mbits (QPSK), 0.64 ~ 20.48Mbits (16QAM), 0.96 ~ 30.72Mbits (64QAM)
❑ RF Output Power: A-TDMA: +8dBmV ~ +58dBmV(QPSK), +8dBmV ~ +55dBmV(QAM), +8dBmV ~ +54dBmV (32/64)

*Actual speeds can vary based on factors including network configuration, service tier, and network conditions.

Wireless (DDW2600 Only)

❑ WiFi Multimedia Support
❑ WPA, WPS, WEP Encryption
❑ 4 SSIDs (1 SSID is Reserved for Service Provider)
❑ Transmit Power: 18dBm

- ❑ Operating Frequency: 2400~2497MHz ISM band
- ❑ Data Rate: 1, 2, 5.5, 6, 9, 11, 12, 24, 36, 48, & 54 Mbps
- ❑ Frequency Range: 11 channels (2.412 to 2.462GHz)
- ❑ Antenna: External, detachable

Security

- ❑ Firewall, Stateful Packet Inspection (SPI)
- ❑ MAC/IP/Port Filtering
- ❑ TACACS/RADUIS Authentication
- ❑ DoS (Denial of Services) Detection/Prevention
- ❑ Parental Control: Add/Remove Users, Time Access Rules

Network

- ❑ NAT, DMZ, RIP, DHCP Client/Server, Static IP Network Assignment, Multiple Subnet Support
- ❑ Dynamic DNS
- ❑ VPN Pass-Through and VPN End-Point Support (IPSec/L2TP/PPTP)
- ❑ Port Forwarding, Port Filtering, Port Triggering
- ❑ RIP v1, v2
- ❑ Ethernet 10/100 BaseT, Full-Duplex Auto-Negotiate Functionality, IPv4 Support

Device Management

- ❑ Power Saving Features/Management
- ❑ DOCSIS and Web Interface Configuration, Local and Remote
- ❑ Telnet Remote Management
- ❑ Firmware Upgrade via TFTP
- ❑ SNMP v1/v2/v2c Agent Built-In

Physical and Environmental

- ❑ DDC2700: 196 x 137 x 32 (W x D x H mm)
- ❑ DDC2600: Same dimensions as DDC2700, includes detachable antenna
- ❑ Power Consumption: Maximum 8W
- ❑ Power Supply: 12V @ 1.0A
- ❑ Input Power: 100 ~ 240VAC, 50 ~ 60Hz
- ❑ Operating Temp.: 0˚C to 40˚C (32˚F to 104˚F)
- ❑ Humidity: 5 ~ 95% (non-condensing)

2.4 Default Values/Device Logins

This device is pre-configured with the following parameters:

Local Port Address: 192.168.0.1, Web Interface: http://192.168.0.1

Operation Mode: NAT Mode (WAN setting)

Subnet Mask: 255.255.255.0

Web/Device Interface Logins:

Subscriber

- Username: user
- Password: user

2.4.1 Wireless Defaults (for DDW2600 only)

When initially connecting a wireless client to the wireless device (for example, a PC), the following default values are used:

- SSID (System Set Identifier): The SSID is what the wireless device uses to advertise itself. The SSID is equal to the last 4 characters of the Cable RF MAC address. Example:

  ```
  If MAC Address is: 00028A1A345
  
  SSID is: A345
  ```

  Note: Refer to page 8 to find the MAC address of the device.

- Encryption Key: The device uses 128-bit WEP encryption by default. The **WEP key** is a 26 digit HEX value. This value is equal to the device MAC address plus 14 zero’s (all lower case without the colons). Example:

  ```
  00028A1A345600000000000000 (MAC address + 14 Zero’s)
  ```

- Broadcast Channel: The default broadcast channel is 1.

2.4.2 How to Find the MAC Address of the Device

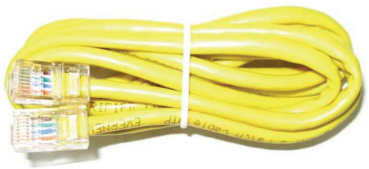
Use one of the following options to find the MAC address of the device:

□ Option 1: Look on the bottom of the device for the Cable RF MAC Address.

□ Option 2: Access the device web interface and find the MAC address in the opening screen, (the Cable Modem Information screen). To access the web interface, refer to page 13.

2.5 Device Package Components

The package for the DDW2600 wireless cable modem/router or the DDM2700 commercial cable modem/router contains the following items:

Item	Description
DDW2600 DDM2700 	DDW2600 wireless cable modem/router or the DDM2700 commercial cable modem/router
	RJ-45 * RJ-45 Cable Length ~ 6.0 ft RoHS & UL compliant

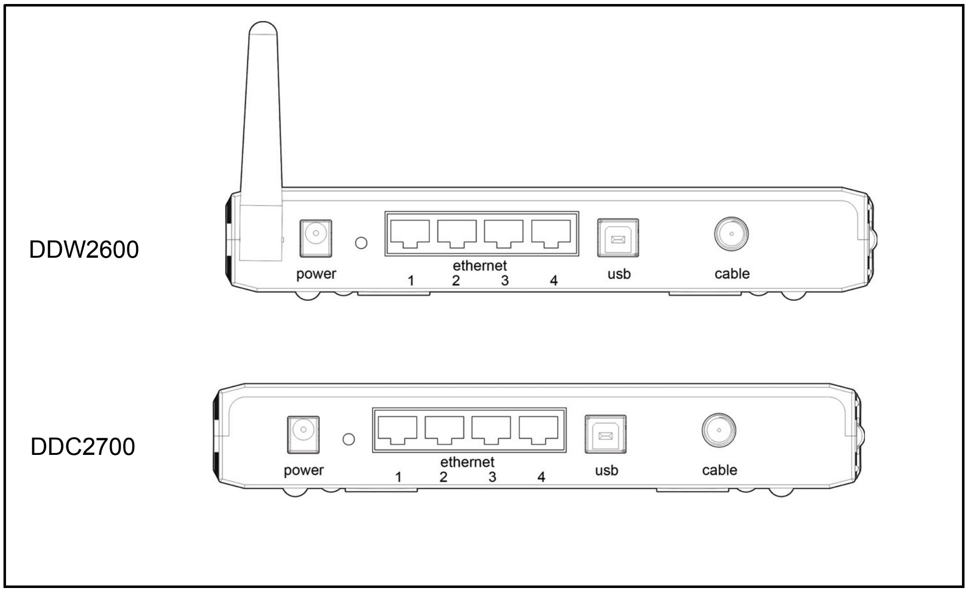
	AC Adapter
	Vin = 230V 50Hz
	Vout = 12V; 1.5A
	Example: Actual appearance subject to change.

	USB Cable and Driver CD (not shown). Drivers are also available at: www.ubeeinteractive.com

2.6 Device Back Panel Description

Review the images below and the descriptions that follow for an explanation of the device back panel.

2.6.1 DDW2600 and DDC2700 Back Panel Images

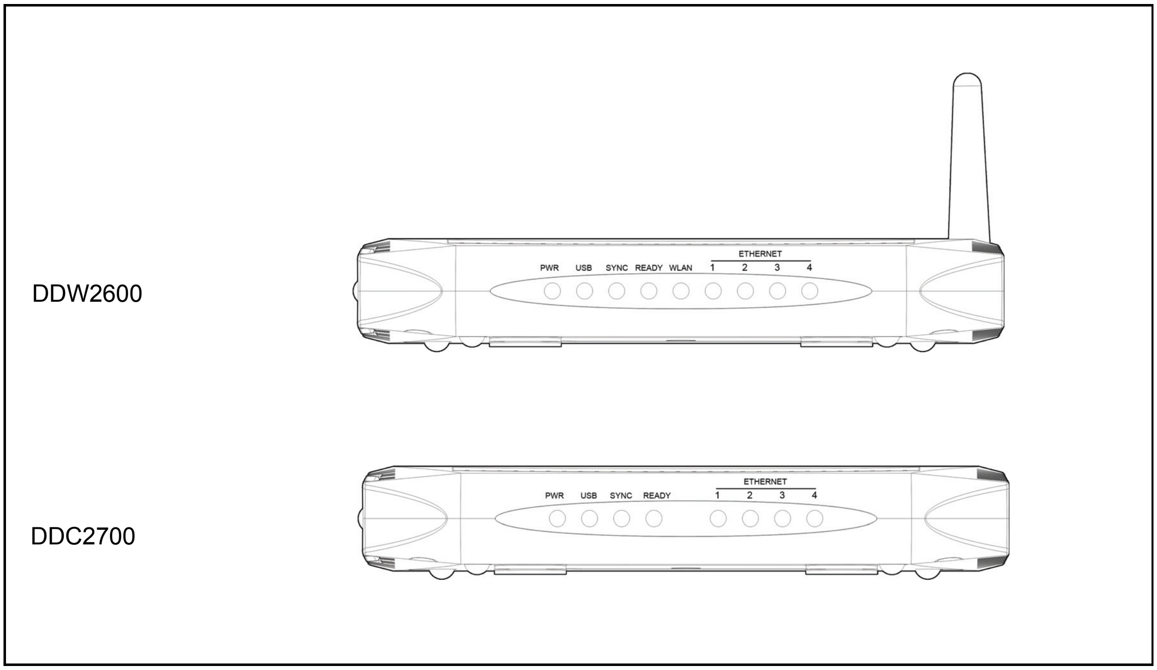


Back Panel Item/Number	Description
1 - Power Inlet	⚠ The power inlet is used for connecting the device's power adapter to the device. WARNING: Use only the power adapter shipped with this device. Failure to do so may cause damage to the device.
2 - Reset	The reset switch restores the default settings of the device including wireless (DDW2600 only) and custom gateway settings. Use a pointed object to push down on the reset button for 5 seconds (until power LED turns off). After the power LED turns off, release the button.
3 - Ethernet 1 to 4 Ports	These four RJ45 Ethernet ports are used to connect Ethernet devices, such as computers and gaming consoles, to the internet.
4 - USB Port	Using the USB cable included in the product package, subscribers can connect a device to the network using this port, as long as the device also has a USB port. This may be useful for devices that do not have an ethernet network adapter/port.
5 - Cable Port	The Cable port is where the device connects to the cable wall outlet, or a cable splitter connected to the wall outlet.

2.7 Device Front Panel & LED Behavior

This section describes what the device LEDs indicate on the front panel of the DDW2600 wireless cable modem/router or the DDM2700 commercial cable modem/router. Review the device images below and the LED table on the following page.

2.7.1 DDW2600 and DDC2700 Front Panel Images



2.7.2 LED Behavior Table

The following table describes what the device LEDs indicate.

Note: The **WLAN** LED is available on the DDW2600 only.

LED Label:		**Power**	**USB Host**	**Sync**	**Ready**	**WLAN**	**Eth-1**	**Eth-2**	**Eth-3**	**Eth-4**
Color		Green	Green	Green	Green	Green	Green/Orange	Green/Orange	Green/Orange	Green/Orange
CM Initialization	driver init.	On	Flash then Off	Flash then Off	Flash then Off	Off	Flash then Off	Flash then Off	Flash then Off	Flash then Off
	DS Scanning	On	**Depends on Ethernet Status, On if Connected**	Slow Flash	Off	On	**Depends on Ethernet Status, On if Connected**	**Depends on Ethernet Status, On if Connected**	**Depends on Ethernet Status, On if Connected**	**Depends on Ethernet Status, On if Connected**
	DS Locked	On		Slow Flash	Off	On				
	US Ranging	On		On	Slow Flash	On				
	US Ranged	On		On	Slow Flash	On				
	IP Init. and Registration	On		On	Fast Flash	On				
	Network Access Enabled	On		On	On	On				
	Network Access Disabled	On		On	Off	On				
CM Operation	Normal Operations, Cable Interface Traffic, Network Access Enabled	On		On	On	On				
	USB/WLAN/ Ethernet Connected	On	On, if Connected			On, if Connected	On, if Connected at 100Mbps, Orange if Connected at 10Mbps	On, if Connected at 100Mbps, Orange if Connected at 10Mbps	On, if Connected at 100Mbps, Orange if Connected at 10Mbps	On, if Connected at 100Mbps, Orange if Connected at 10Mbps
	USB/WLAN/ Ethernet Traffic	On	Slow Flash			Slow Flash if Traffic	Slow Flash	Slow Flash	Slow Flash	Slow Flash
	Upgrade In Progress	On	On, if Connected	Slow Flash	On	On, Slow Flash if Traffic	On, if Connected	On, if Connected	On, if Connected	On, if Connected

3 Install the Device

This chapter explains how to install the DDW2600 wireless cable modem/router or the DDM2700 commercial cable modem/router.

3.1 Connect the Device and Access the Web Interface

Use the instructions in this section to connect the device and access the web user interface to configure initial settings.

3.1.1 Connect the Device

Complete the following steps to connect the DDW2600 wireless cable modem/router or the DDM2700 commercial cable modem/router.

1. **Important**: Subscribers must contact their service provider to enable internet access. Typically, the service provider initially connects and configures the device. These steps are also provided below. If you wish to confirm the setup, or add devices to your network, refer to Confirm Installation and Connect Devices to the Network, on page 16.

2. Remove all contents from the device packaging. Place the DDW2600 or DDM2700 in an optimal location for connection to other devices, such as PCs or gaming consoles. Keep the following in mind:
   - ❑ **For the DDW2600 Wireless Cable Modem Only**: Keep the wireless cable modem and wireless clients in open areas or far away from transformers, heavy-duty motors, microwave ovens, refrigerators, fluorescent lights, and other manufacturing equipment. These items can impact wireless signals. A wireless signal may become weaker after it has passed through metal, concrete, brick, walls, or floors.
   - ❑ **For the DDW2600 and DDM2700**: Place the device in a location that has an operating temperature of 0˚C to 40˚C (32˚F to 104˚F). Refer to page 1 for more safety information.

3. Have a PC available and powered on. The PC must have an Ethernet network adapter/Ethernet port. The PC must also have an internet browser installed (for example, Netscape or Internet Explorer). The following are supported:
   - ❑ For Windows 2000, XP, Vista: Firefox 1.07 and higher, Internet Explorer v7 and above, Netscape
   - ❑ For MAC OS X, 10.2, and higher: Firefox 1.07 and higher, Safari 1.x and higher

4. Connect the power adapter that is included with the product package to the cable modem and to the power outlet.

5. Connect one end of a network cable (supplied in the product package) to your computer’s Ethernet port. Connect the other end to one of the Ethernet ports (for example, Ethernet 1) on the cable modem.

6. Connect a coaxial cable from the Cable port on the device to the cable wall outlet.

7. Continue to the following section.

3.1.2 Access the Web Interface

Use the following procedure to access the web interface.

1. From the computer, launch an internet browser (for example, Internet Explorer, Netscape, Safari, Firefox).

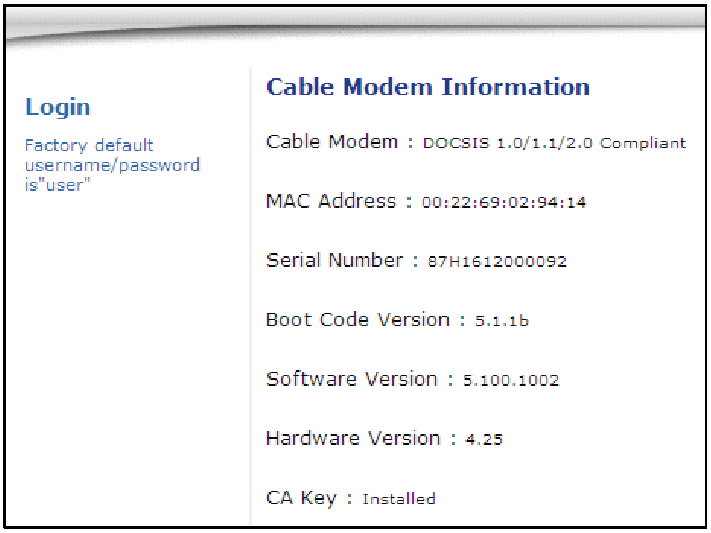
Note: The computer must be connected to an Ethernet port on the cable modem, as explained in the previous section.

---

2. In the internet browser, enter the following address and press <**Enter/Return**>:

```
http://192.168.0.1
```

3. The Cable Modem Information window is displayed. Click the **Login** link on the left side of the window.



Login

Factory default username/password is"user"

Cable Modem Information

Cable Modem : DOCSIS 1.0/1.1/2.0 Compliant

MAC Address : 00:22:69:02:94:14

Serial Number : 87H1612000092

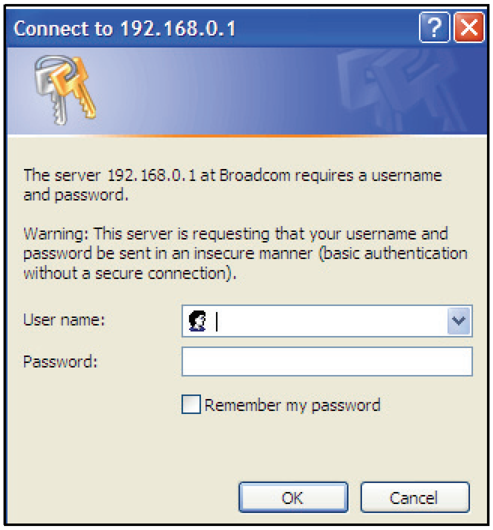
Boot Code Version : 5.1.1b

Software Version : 5.100.1002

Hardware Version : 4.25

CA Key : Installed

4. Enter the login credentials as shown below.



Connect to 192.168.0.1

The server 192.168.0.1 at Broadcom requires a username and password.

Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).

User name:

Password:

□ Remember my password

Subscriber Login:

- ❑ Username: user
- ❑ Password: user

5. Accessing the web interface is an initial way to validate the installation. No extra steps are required at this point for a basic LAN and/or wireless network (DDW2600 only).

6. Proceed to page 16 to test network connectivity and/or to add both Ethernet LAN devices and wireless devices (DDW2600 only) to the network.

Note: The web interface allows you to customize the configurations and capabilities the device. For full explanation of all web interface functions, refer to page 19.

3.2 Confirm Installation and Connect Devices to the Network

To confirm network/internet operations, or to connect an Ethernet device to the network (for example, a computer), do the following:

1. Make sure the Ethernet device is connected to the cable modem. Refer to page 13.
2. Use the device LEDs to confirm operations. The PWR, SYNC, and Ready LEDs are solidly lit in normal operations, as are the Ethernet LEDs that have devices connected to their associated ports. Refer to LED Behavior Table, on page 11 for more detailed information.
3. Open a web browser and go to any web site to validate network connectivity (for example, http://www.wikipedia.org).
4. If the connected device is a gaming console, perform any online task supported by the console (for example, log into gaming server, play online game, download content, etc.).
5. Refer to page 17 for troubleshooting information if needed.

3.2.1 DDW2600 Wireless Cable Modem/Router Only

To confirm operations or to connect wireless devices to the network (for example, a laptop computer), do the following:

1. Use the device LEDs to confirm operations. The WLAN LED must be solidly lit. The PWR, SYNC, and Ready LEDs must also be solidly lit in normal operations. Refer to LED Behavior Table, on page 11 for more detailed information.
2. Connect a wireless device to the DDW2600 (for example, a laptop computer). Use the following steps:

   ❑ **Access the wireless networking feature on your wireless device**. On a Windows computer, for example, double-click the Wireless Networking icon in the system tray (lower-right side of the Windows desktop).

   ❑ **Click View Wireless Networks**. The DDW2600 is shipped with a default SSID. The SSID is the name of the wireless network broadcast from the DDW2600 so that wireless clients can connect to it.

   ❑ **Double-click your SSID in the wireless networks window**. The SSID is equal to the last 4 characters of the Cable RF MAC address, which is **printed on the bottom of the DDW2600**. Example:

   ```
   If MAC Address is: 00028A12345

   SSID is: 2345
   ```

   ❑ **Enter the Network Key**. This value is equal to the device MAC address plus 14 zero’s (all lower case without the colons). Example:

   ```
   00028A12345600000000000000 (MAC address + 14 Zero’s)
   ```

3. Confirm connectivity by opening a web browser and going to any web site (for example, http://www.wikipedia.org).
4. The SSIDs and Network Keys used to access the wireless network can be changed. Refer to page 49.

3.2.2 Additional Troubleshooting Information

Use the following tips for troubleshooting the installation.

❑ None of the LEDs are on when I power on the Wireless LAN Cable Modem.

- ❑ Check the connection between the power adapter and the cable modem. Power off cable modem and wait for 5 seconds and power on the modem again. If the problem still exists, there may have a hardware problem.

❑ The Ethernet 1, 2, 3, or 4 LED on the cable modem is not lit.

- ❑ Try restarting the computer so that is could re-establish a connection with the cable modem.
- ❑ Check for a resource conflict (Windows users only). To do this: (1) Right-click on the My Computer icon on your desktop and choose Properties. (2) Click the Device Manager tab and look for a yellow exclamation point or red X over the NIC in the Network Adapters field. If you see either one, you may have an IRQ conflict. Refer to the manufacturers documentation or you cable service provider for further assistance.
- ❑ Verify that TCP/IP is the default protocol for your network interface card (NIC).
- ❑ Power cycle the cable modem by removing the power adapter from the electrical outlet and plugging it back in. Wait several minutes for the cable modem to re-establish communications with your cable service provider.

❑ General Connectivity Issues:

- ❑ If your PC is connected to a hub or gateway, try connecting the PC directly into an Ethernet port on the cable modem.
- ❑ If you are using a cable splitter, try removing the splitter and connect the cable modem directly to the cable wall outlet. Wait several minutes for the cable modem to re-establish communications with the cable service provider.
- ❑ The Ethernet cable may be damaged. Try another cable.

❑ If none of these suggestions work, contact your cable service provider for further assistance.

4 Web User Interface Instructions

This chapter explains how to use the web interface to configure, monitor, or troubleshoot the DDW2600 wireless cable modem/router or the DDM2700 commercial cable modem/router.

❑ Access the web interface. Refer to Access the Web Interface, on page 14.

❑ Each web interface option is discussed in the following sections.

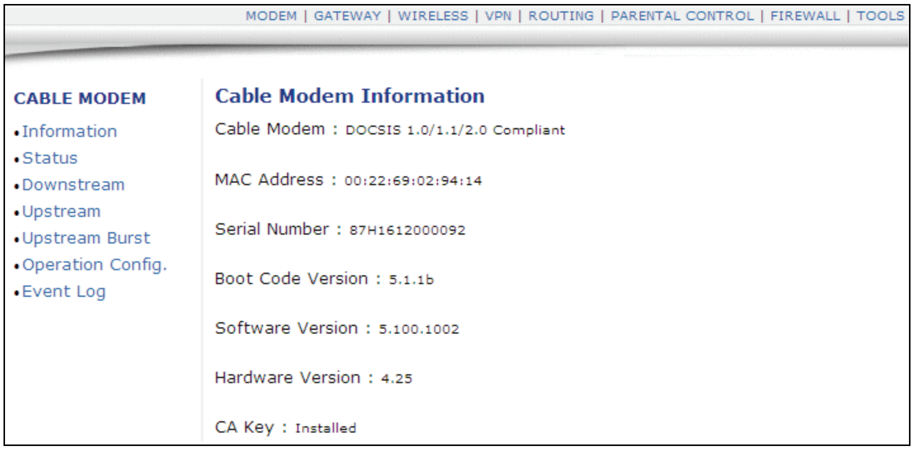
4.1 Modem Menu

This section explains all options under the **Modem** menu of the device web user interface.

4.1.1 Modem - Cable Modem Information

This section explains how to use the **Cable Modem Information** screen. This is a read-only screen and it displays the device's basic software/hardware configuration.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Modem** link from the top menu and then the **Information** link from the left side of the screen. Field explanations are listed below the following screen example.



Cable Modem Information

Cable Modem : DOCSIS 1.0/1.1/2.0 Compliant

MAC Address : 00:22:69:02:94:14

Serial Number : 87H1612000092

Boot Code Version : 5.1.1b

Software Version : 5.100.1002

Hardware Version : 4.25

CA Key : Installed

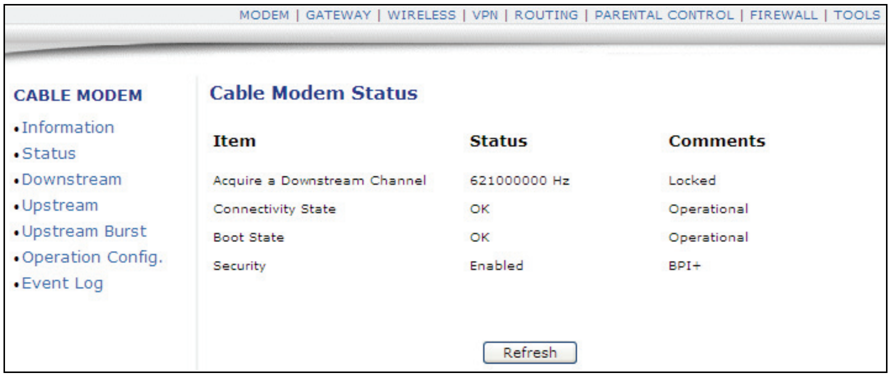
Label	Description
Cable Modem	The current DOCSIS standard of the device.
MAC Address	The unique Media Access Control (MAC) hardware address of cable modem.
Serial Number	The unique manufacturer serial number of the device.

Label	Description
Boot Code Version	The boot software code version of the device.
Software Version	The general software version of the device.
Hardware Version	The internal version number that identifies the hardware design.
CA Key	The device installs a Certificate Authority (CA) key that is transferred from the service provider's server after the cable modem is authenticated. The key is used to secure communication between the service provider and the cable modem.

4.1.2 Modem - Status

This section explains how to use the **Status** screen of the web interface. This is a read-only screen and it displays the device's general connection information.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Modem** link from the top menu and then the **Status** link from the left side of the screen. Field explanations are listed below the following screen example.



Cable Modem Status

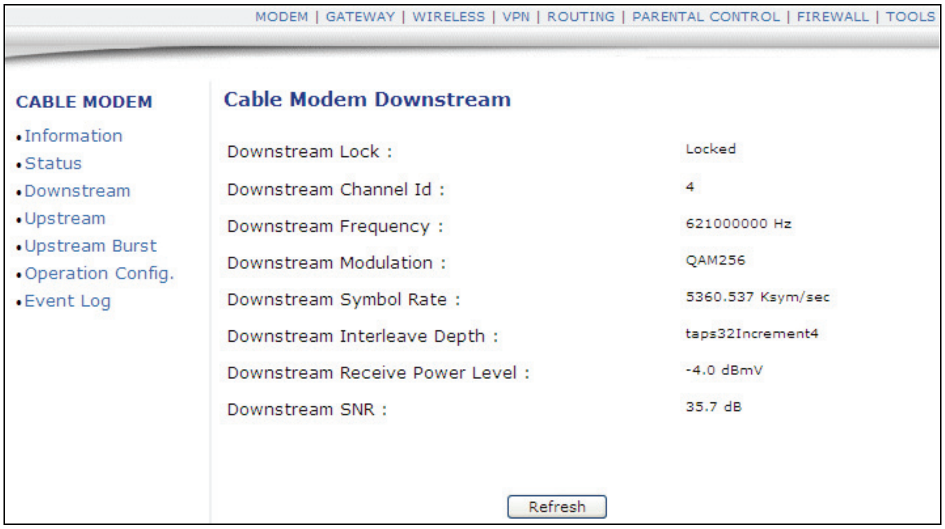
Item	Status	Comments
Acquire a Downstream Channel	621000000 Hz	Locked
Connectivity State	OK	Operational
Boot State	OK	Operational
Security	Enabled	BPI+

Label	Description
Acquire Downstream Channel	Displays a Downstream channel that the cable modem is trying to lock to and the progress.
Connectivity State	After initialization, the cable modem is configured by a DHCP server to obtain an IP address. Once successful, the cable modem is Online. The Status column shows the progress and status (Online/Offline). The Comments column displays the reason why cable modem's connectivity state is not Online.
Boot State	Shows the registration status of the device.
Security	If BPI is enabled, the status will displays Enabled.

4.1.3 Modem - Downstream

This section explains how to use the **Downstream** screen of the web interface. The **Downstream** screen displays detailed information on the device's connection to downstream channels from the service provider.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Modem** link from the top menu and then the **Downstream** link from the left side of the screen. Field explanations are listed below the following screen example.



Cable Modem Downstream

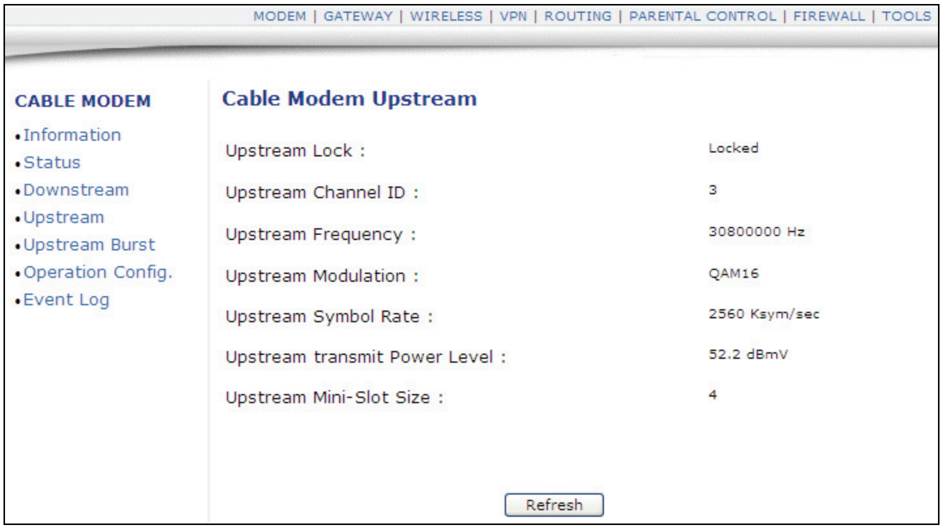
Downstream Lock :	Locked
Downstream Channel Id :	4
Downstream Frequency :	621000000 Hz
Downstream Modulation :	QAM256
Downstream Symbol Rate :	5360.537 Ksym/sec
Downstream Interleave Depth :	taps32Increment4
Downstream Receive Power Level :	-4.0 dBmV
Downstream SNR :	35.7 dB

Label	Description
Downstream Lock	Displays if the cable modem succeeded in locking to a downstream channel (Locked/Not Locked).
Downstream Channel ID	Displays the downstream channel ID.
Downstream Frequency	Displays the downstream channel frequency on which the cable modem is scanning.
Downstream Modulation	Displays the modulation method that's required for the downstream channel to lock on to by the cable modem. This method is determined by the service provider.
Downstream Symbol Rate	Displays the symbol rate. The current cable modem downstream symbol rates are: QAM64 is 5056941 sym/sec, QAM256 is 5360537 sym/sec.
Downstream Interleave Depth	Displays the current cable modem downstream Interleave depth (4/8/16/32/64/128/other).
Downstream Power Level	Displays the receiver power level after ranging process.
Downstream SNR	Display the SNR of this downstream channel.
Refresh	Click this button to refresh the active screen data.

4.1.4 Modem - Upstream

This section explains how to use the **Upstream** screen of the web interface. The **Upstream** screen displays detailed information on the device's connection to upstream channels to the service provider.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Modem** link from the top menu and then the **Upstream** link from the left side of the screen. Field explanations are listed below the following screen example.



Cable Modem Upstream

Upstream Lock : Locked

Upstream Channel ID : 3

Upstream Frequency : 30800000 Hz

Upstream Modulation : QAM16

Upstream Symbol Rate : 2560 Ksym/sec

Upstream transmit Power Level : 52.2 dBmV

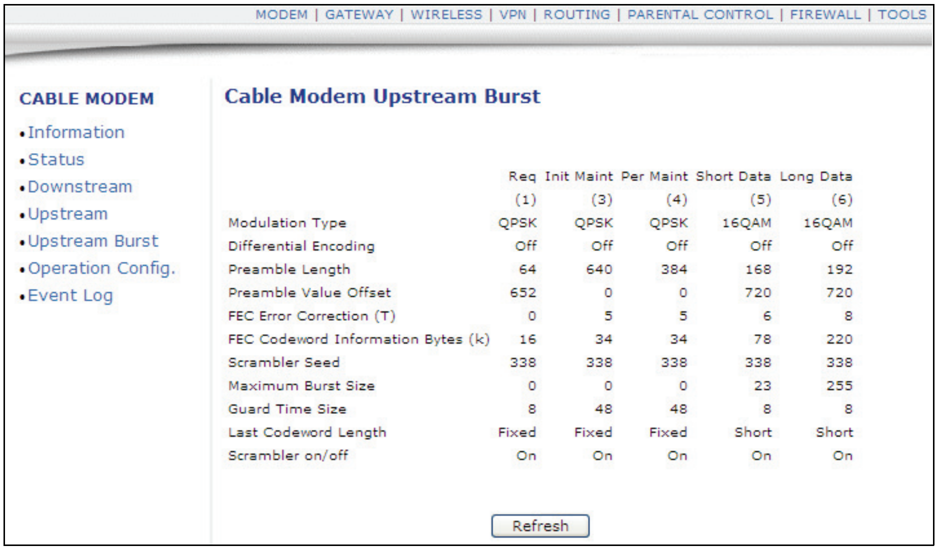
Upstream Mini-Slot Size : 4

Label	Description
Upstream Lock	Current cable modem upstream lock status (Locked/Not Locked).
Upstream Channel ID	Displays the current cable modem upstream channel ID.
Upstream Frequency	Displays the current cable modem upstream frequency (Hz).
Upstream Modulation	Displays the current cable modem upstream modulation type (QPSK/ QAM8 /QAM16/ QAM32/ QAM64/ QAM128/ QAM256).
Upstream Symbol Rate	Displays the symbol rate (Ksym/sec).
Upstream Transmit Power Level	Displays the current cable modem upstream transmit power (dBmV).
Upstream Mini-Slot Size	Displays the current cable modem upstream mini-slot size in Timebase Ticks of 6.25.
Refresh	Click this button to refresh the active screen data.

4.1.5 Modem - Upstream Burst

This section explains how to use the **Upstream Burst** screen of the web interface. The **Upstream Burst** screen displays detailed information on the device's upstream data flow to the service provider.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Modem** link from the top menu and then the **Upstream Burst** link from the left side of the screen. Field explanations are listed below the following screen example.



Cable Modem Upstream Burst

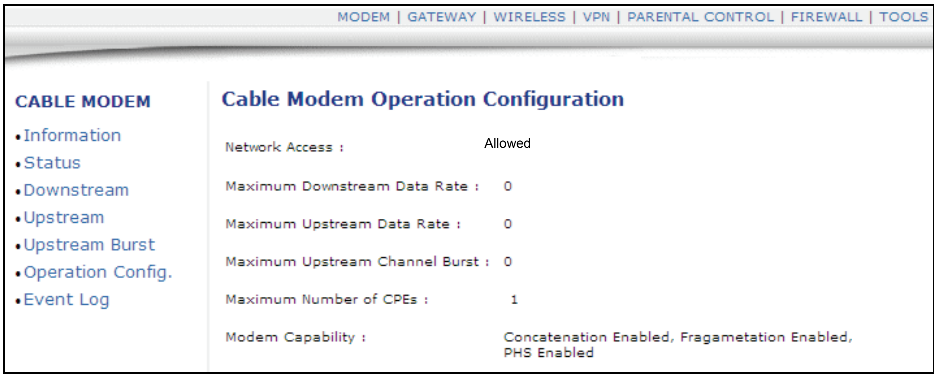
	Req	Init Maint	Per Maint	Short Data	Long Data
	(1)	(3)	(4)	(5)	(6)
Modulation Type	QPSK	QPSK	QPSK	16QAM	16QAM
Differential Encoding	Off	Off	Off	Off	Off
Preamble Length	64	640	384	168	192
Preamble Value Offset	652	0	0	720	720
FEC Error Correction (T)	0	5	5	6	8
FEC Codeword Information Bytes (k)	16	34	34	78	220
Scrambler Seed	338	338	338	338	338
Maximum Burst Size	0	0	0	23	255
Guard Time Size	8	48	48	8	8
Last Codeword Length	Fixed	Fixed	Fixed	Short	Short
Scrambler on/off	On	On	On	On	On

Label	Description
Modulation Type	QPSK/16QAM.
Differential Encoding	On/Off
Preamble Length	0-1024 (bits).
Preamble Value Offset	0-1022 (bits).
FEC Error Correction (T)	0 to 10 (0 implies no FEC. The number of codeword parity bytes is 2*T)
FEC Codeword Information Bytes (k)	Fixed: 16 to 253 (assuming FEC on). Shortened: 16 to 253 (assuming FEC on)
Scrambler Seed	15 bits (Not used if scrambler is off)
Maximum Burst Size	0-255 (mini-slots)
Guard Time Size	4-255 (symbols)
Last Codeword Length	Fixed/shortened
Scrambler on/off	On/Off

4.1.6 Modem - Operation Config

This section explains how to use the **Operation Config** screen of the web interface. The **Operation Config** screen displays general information on the device's active operational capabilities.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Modem** link from the top menu and then the **Operation Config** link from the left side of the screen. Field explanations are listed below the following screen example.



Cable Modem Operation Configuration

Network Access :	Allowed
Maximum Downstream Data Rate :	0
Maximum Upstream Data Rate :	0
Maximum Upstream Channel Burst :	0
Maximum Number of CPEs :	1
Modem Capability :	Concatenation Enabled, Fragametation Enabled, PHS Enabled

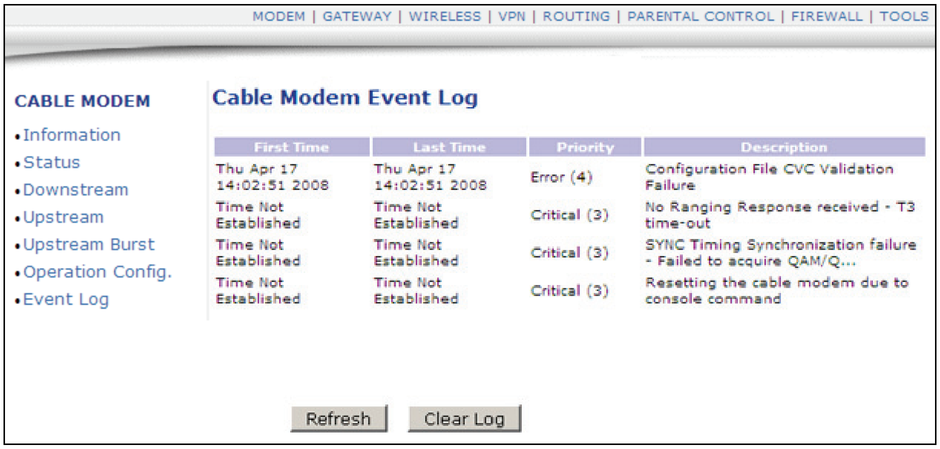
Label	Description
Network Access	Displays the status of cable modem, Denied means no connectivity is established. Allowed means connectivity is established to Internet.
Maximum Downstream Data Rate	Displays the maximum downstream data rate.
Maximum Upstream Data Rate	Displays the maximum upstream data rate.
Maximum Upstream Channel Burst	Displays the maximum upstream Channel burst
Maximum Number of CPEs	Displays the maximum number of Ethernet devices that can be connected (LAN side) to access the network/internet at the same time.
Modem Capability	Displays device attributes that indicate aspects of its throughput and latency.

4.1.7 Event Log

This section explains how to use the **Event Log** screen of the web interface. The **Event Log** screen displays log information that may be useful to diagnose operational issues with the device.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Event Log** link from the left side of the screen. Field explanations are

listed below the following screen example.



Cable Modem Event Log

First Time	Last Time	Priority	Description
Thu Apr 17 14:02:51 2008	Thu Apr 17 14:02:51 2008	Error (4)	Configuration File CVC Validation Failure
Time Not Established	Time Not Established	Critical (3)	No Ranging Response received - T3 time-out
Time Not Established	Time Not Established	Critical (3)	SYNC Timing Synchronization failure - Failed to acquire QAM/Q...
Time Not Established	Time Not Established	Critical (3)	Resetting the cable modem due to console command

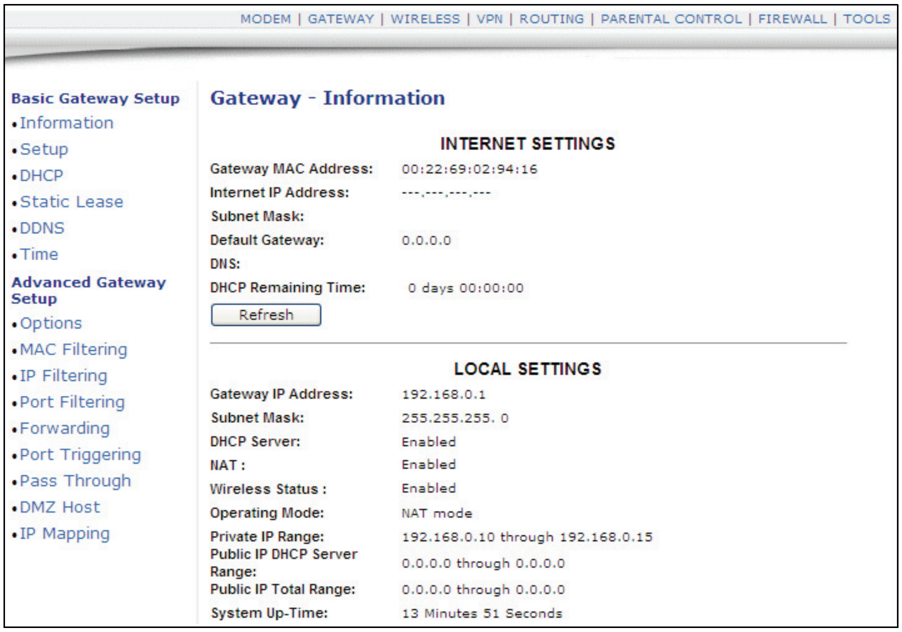
Label	Description
First Time	Displays the time of the event.
Last Time	Displays the last time of the event.
Priority	Displays the event log severity.
Description	Displays a detailed description of the event log.
Refresh/Clear Log	Refreshes the event log record. Click Clear Log to clear the screen.

4.2 Gateway Menu

This chapter explains how to use the **Gateway** functions of the web interface. The Gateway functions provide the majority of configuration for the device including WAN IP addresses, LAN IP addresses, DHCP, and DDNS. Also, advanced setting like DMZ, MAC filtering, and port forwarding are provided.

4.2.1 Gateway - Information

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Gateway** link from the top of the screen. Then select **Information**.
3. The **Information** fields are defined following this screen example.



Gateway - Information

INTERNET SETTINGS

Gateway MAC Address:	00:22:69:02:94:16
Internet IP Address:	---.---.---.---
Subnet Mask:	
Default Gateway:	0.0.0.0
DNS:	
DHCP Remaining Time:	0 days 00:00:00

LOCAL SETTINGS

Gateway IP Address:	192.168.0.1
Subnet Mask:	255.255.255. 0
DHCP Server:	Enabled
NAT :	Enabled
Wireless Status :	Enabled
Operating Mode:	NAT mode
Private IP Range:	192.168.0.10 through 192.168.0.15
Public IP DHCP Server Range:	0.0.0.0 through 0.0.0.0
Public IP Total Range:	0.0.0.0 through 0.0.0.0
System Up-Time:	13 Minutes 51 Seconds

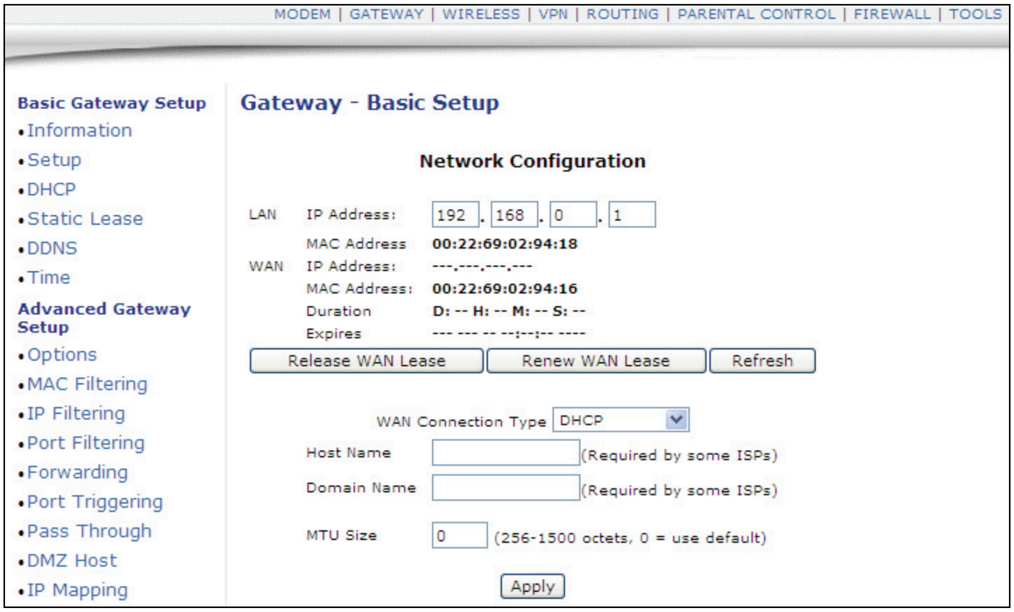
Label	Description
	Internet Settings
Gateway MAC Address	Displays the Media Access Control (MAC) address of the cable modem.
Internet IP Address	Displays the Internet IP address obtained from the service provider.
Subnet Mask	Displays the subnet mask of the Internet IP address.
Default Gateway	Displays the default gateway IP address.
DNS	Displays the DNS server IP address.
DHCP Remaining Time	Displays the remaining DHCP lease time before expiration

Label	Description
Refresh	Click to refresh the information.
	Local Settings
Gateway IP Address	Displays the local IP address of the LAN interface.
Subnet Mask	Displays the subnet mask value.
DHCP Server	Displays the status of the DHCP sever feature (Enabled/Disabled).
NAT	Displays the status of the NAT feature (Enabled/Disabled).
Wireless Status	Displays the status of the wireless feature (Enabled/Disabled).
Operating Mode	Displays what mode the router is working in (Bridge, NAT, Router, or NAT Router). **Note**: Firewall menu options are not available when the device is in Bridge mode. Firewall options are available only when the device is in NAT, NATRoute, or Route modes.
Private IP Range	Displays the private IP address assigned to DHCP client.
Public IP DHCP Server Range	Displays the Public IP DHCP Server Range.
Public IP Total Range	Displays the Public IP total range.
System Up-Time	Displays the accumulated time since the last power cycle.

4.2.2 Gateway - Setup

The **Setup** option allows you to make key network configurations to the device.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Gateway** link from the top of the screen.
3. Click **Setup** from the left side of the screen. The **Setup** fields are explained following this screen example.



Gateway - Basic Setup

Network Configuration

LAN IP Address: 192 . 168 . 0 . 1
MAC Address 00:22:69:02:94:18
WAN IP Address: ---.---.---.---
MAC Address: 00:22:69:02:94:16
Duration D: -- H: -- M: -- S: --
Expires --- --- -- --:--:-- ----

WAN Connection Type DHCP
Host Name (Required by some ISPs)
Domain Name (Required by some ISPs)
MTU Size 0 (256-1500 octets, 0 = use default)

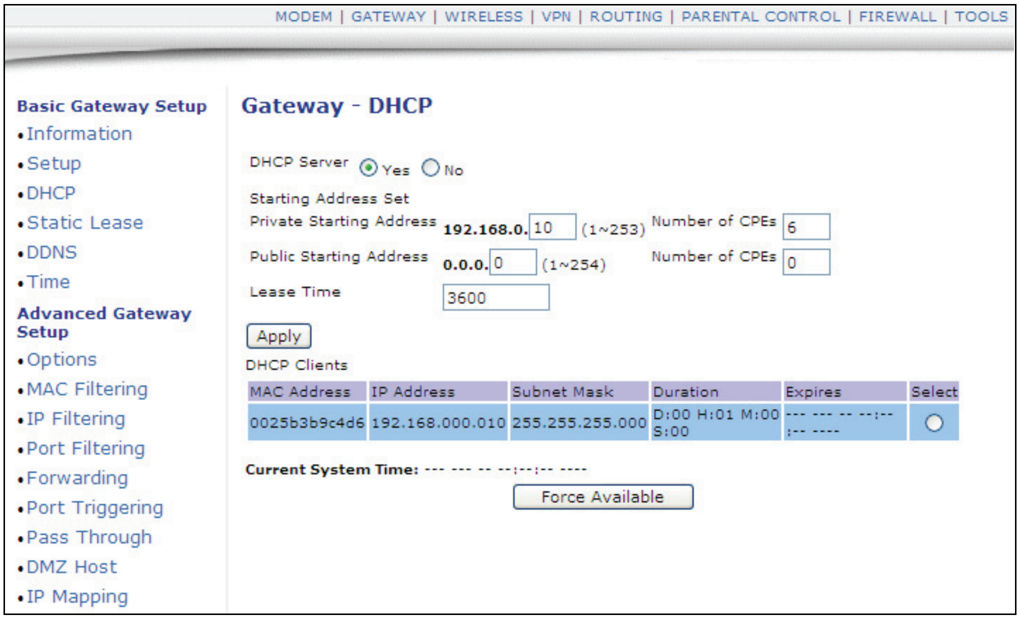
Label	Description
LAN IP Address	Defines the local IP address, which will be the default gateway address for all wired LAN hosts that connect to the cable modem.
MAC Address	Displays the LAN interface's hardware address.
WAN IP Address	Displays the current WAN public IP address that is obtained from the service provider.
WAN MAC Address	Displays the WAN interface's hardware address.
Duration	Displays the accumulated time since successfully acquiring a WAN public IP address.
Expires	Displays the remaining time before the expiration of the WAN IP address, if applicable.
Release WAN Lease	Click to release the WAN public IP address.
Renew WAN Lease	Click to renew the WAN IP address.
Refresh	Click to refresh the status of this page.

Label	Description
WAN Connection Type	Select the WAN connection type. For each type, different data entry is required, as explained below: 1. DHCP: The WAN interface is set to be a DHCP client, and the IP address is assigned by the service provider's DHCP server. For more detailed configuration of the DHCP server on the device, refer to page 30. 2. Static IP: For Static IP, you must manually enter the IP address for the WAN interface. 3. PPTP (DHCP): For Point to Point Tunneling Protocol (PPTP), you must enter a username, password, and the PPTP server's hostname or IP address. 4. PPTP (Static): For Point to Point Tunneling Protocol Static (PPTP), you must enter the static IP address, IP mask, default gateway, username, password, and the PPTP server's hostname or IP address.
Host Name	Enter the host name for the router. This may be required by some service providers.
Domain Name	Enter the domain for the router. This may be required by some service providers.
MTU Size	Enter the Maximum Transmission Unit size, which defines the largest size of the packet or frame that the device can transfer (256-1500). If this is not given by the Service Provider, leave it as is using 0 for the default.
Apply	Click to save all changes made in the screen.

4.2.3 Gateway - DHCP

The **DHCP** option allows you to configure DHCP server-specific behavior on the device.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Gateway** link from the top of the screen.
3. Click **DHCP** from the left side of the screen. The **DHCP** fields are explained following this screen example.



Gateway - DHCP

DHCP Server ● Yes ○ No

Starting Address Set

Private Starting Address 192.168.0. 10 (1~253) Number of CPEs 6

Public Starting Address 0.0.0. 0 (1~254) Number of CPEs 0

Lease Time 3600

DHCP Clients

MAC Address	IP Address	Subnet Mask	Duration	Expires	Select
0025b3b9c4d6	192.168.000.010	255.255.255.000	D:00 H:01 M:00 S:00	--- --- -- --:--:-- ----	○

Current System Time: --- --- -- --:--:-- ----

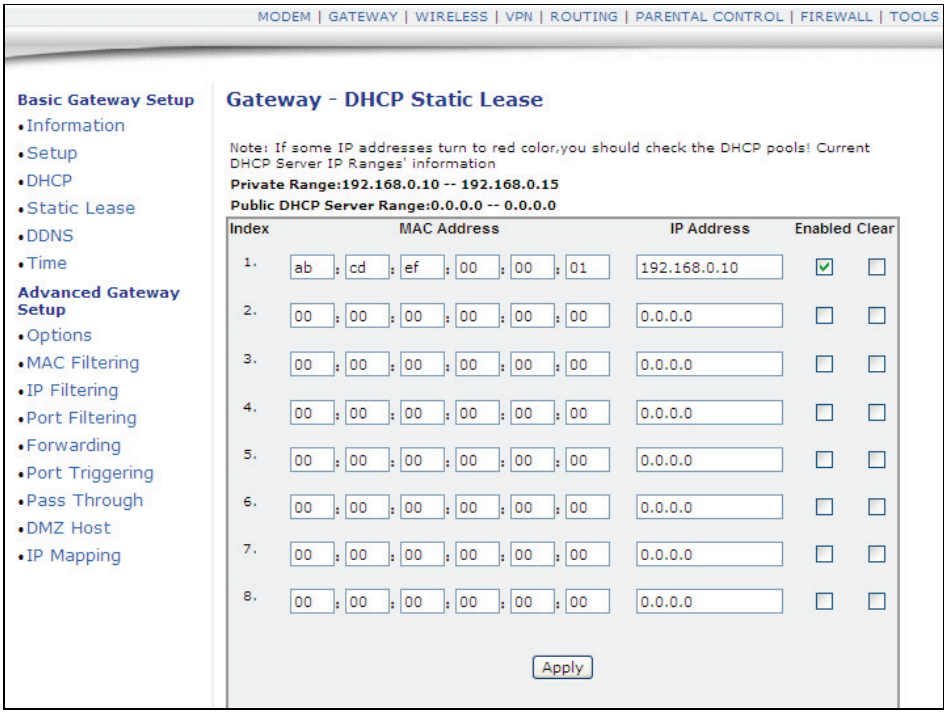
Label	Description
DHCP Server	Select Yes to enable or No to disable the DHCP server on the device. If No is selected, all of the static DHCP rules in this screen are ignored.
Private Starting Address	Define the starting private IP address for the pool of IP addresses that may be used by connecting clients. Private addresses are translated to public IPs in order to be used on the network.
Number of CPEs	Define the maximum number of Customer Premises equipment (CPE) that can connect to the network, via the cable modem using private IP addresses. This number determines the end of the private IP address range started above.
Public Starting Address	Define the starting public IP address. Public addresses can be recognized on the network.
Number of CPEs	Define the maximum number of Customer Premises equipment (CPE) that can connect to the network, via the cable modem. This number determines the end of the public IP address range started above.

Label	Description
Lease Time	Enter the time in minutes between 1 and 71582788. This field defines the DHCP lease time duration. A DHCP user's PC gets an IP address with a lease time. When the lease time expires, the PC must connect to the DHCP server and be reissued another, unused IP address.
DHCP Clients	This list to shows all DHCP clients currently connected to the cable modem, either via Ethernet link, or via wireless connection (DDW2600 only). Each client is also listed with the following information: ♦ MAC Address / IP Address / Subnet Mask ♦ Duration / Expires: Duration displays the accumulated time since the client acquired the IP address. Expires is the time until the IP expires and must be recycled. If the IP address is reserved to a certain host, it will show "STATIC IP ADDRESS." ♦ Select: Click the Select radio button to reserve the current private IP address to be assigned to this host statically.
Apply	Click Apply to save all changes.
Force Available	Click Force Available to activate a selected rule in the DHCP Clients List, and assign the displayed private IP address statically to the connected network client. Note: The Select checkbox must be clicked.

4.2.4 Gateway - DHCP Static Lease

The **Static Lease** option allows you to assign static IP addresses to clients on your network using the IP addresses acquired through the DHCP server on the cable modem.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Gateway** link from the top of the screen.
3. Click **Static Lease** from the left side of the screen. The **Static Lease** fields are explained following this screen example.



Gateway - DHCP Static Lease

Note: If some IP addresses turn to red color,you should check the DHCP pools! Current DHCP Server IP Ranges' information

Private Range:192.168.0.10 -- 192.168.0.15

Public DHCP Server Range:0.0.0.0 -- 0.0.0.0

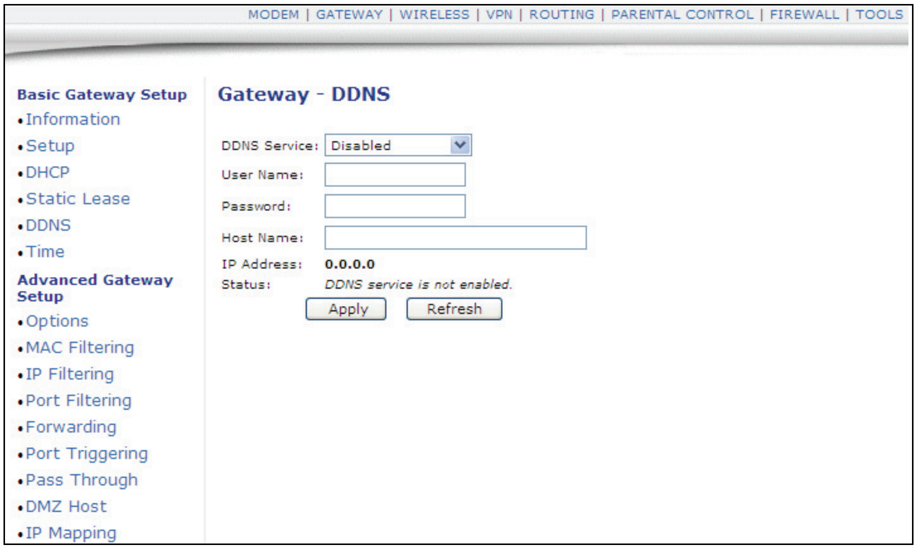
Index	MAC Address	IP Address	Enabled	Clear
1.	ab : cd : ef : 00 : 00 : 01	192.168.0.10	☑	□
2.	00 : 00 : 00 : 00 : 00 : 00	0.0.0.0	□	□
3.	00 : 00 : 00 : 00 : 00 : 00	0.0.0.0	□	□
4.	00 : 00 : 00 : 00 : 00 : 00	0.0.0.0	□	□
5.	00 : 00 : 00 : 00 : 00 : 00	0.0.0.0	□	□
6.	00 : 00 : 00 : 00 : 00 : 00	0.0.0.0	□	□
7.	00 : 00 : 00 : 00 : 00 : 00	0.0.0.0	□	□
8.	00 : 00 : 00 : 00 : 00 : 00	0.0.0.0	□	□

Label	Description
Index	Index number of the each client that connects to your network.
MAC Address	This field is populated with the MAC address of the client that you may want to assign a static IP address to.
IP Address	Enter a specific IP address to assign to the specific client/host.
Enabled	Click Enabled to activate this rule.
Clear	Click Clear to delete the rule.
Apply	Click Apply to save all screen changes.

4.2.5 Gateway - DDNS

The Dynamic Domain Name Service (DDNS) option allows you to configure your registered Domain Name with a dynamic IP address.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Gateway** link from the top of the screen.
3. Click **DDNS** from the left side of the screen. The **DDNS** fields are explained following this screen example.



Gateway - DDNS

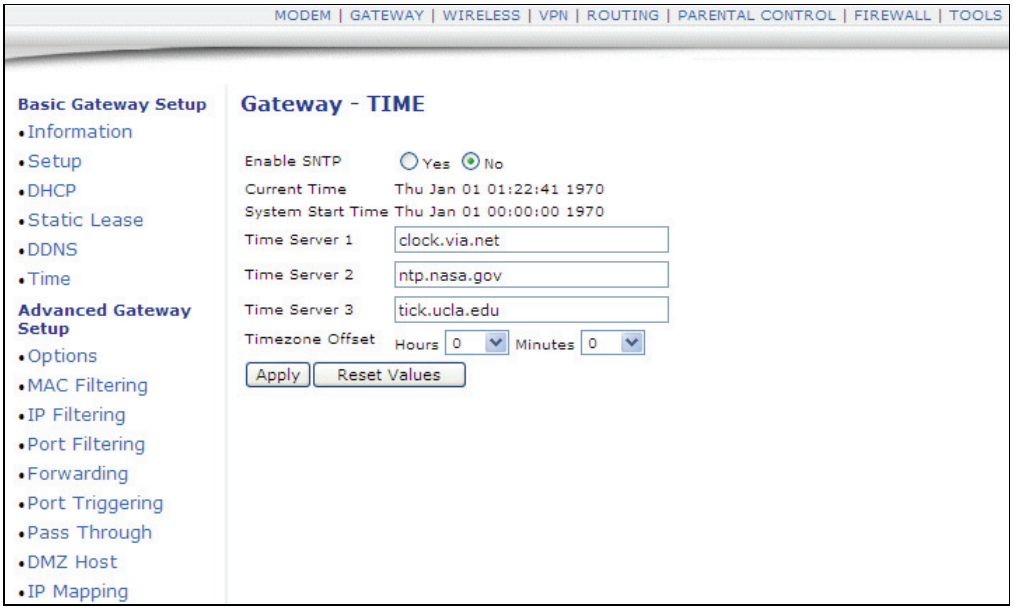
DDNS Service: Disabled
User Name:
Password:
Host Name:
IP Address: 0.0.0.0
Status: *DDNS service is not enabled.*

Label	Description
DDNS Service	Select the service provider used for your DDNS Service or Disabled. www. DyDNS.org www.no-ip.com
User Name	Input your DDNS account username as subscribed to the service provider.
Password	Enter your password for the above account.
Host Name	Input the host name, as specified by the DDNS service provider.
IP address/Status	These fields are automatically populated once the User Name and Password are entered.
Apply	Click Apply to save all screen changes.
Refresh	Click to refresh the page.

4.2.6 Gateway - Time

The **Time** option allows you to configure the system time obtained from network servers via Simple Network Time Protocol (SNTP). The device must be reset for any changes to take effect.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Gateway** link from the top of the screen.
3. Click **Time** from the left side of the screen. The **Time** fields are explained following this screen example.



Gateway - TIME

Enable SNTP ○ Yes ● No

Current Time Thu Jan 01 01:22:41 1970

System Start Time Thu Jan 01 00:00:00 1970

Time Server 1 clock.via.net

Time Server 2 ntp.nasa.gov

Time Server 3 tick.ucla.edu

Timezone Offset Hours 0 Minutes 0

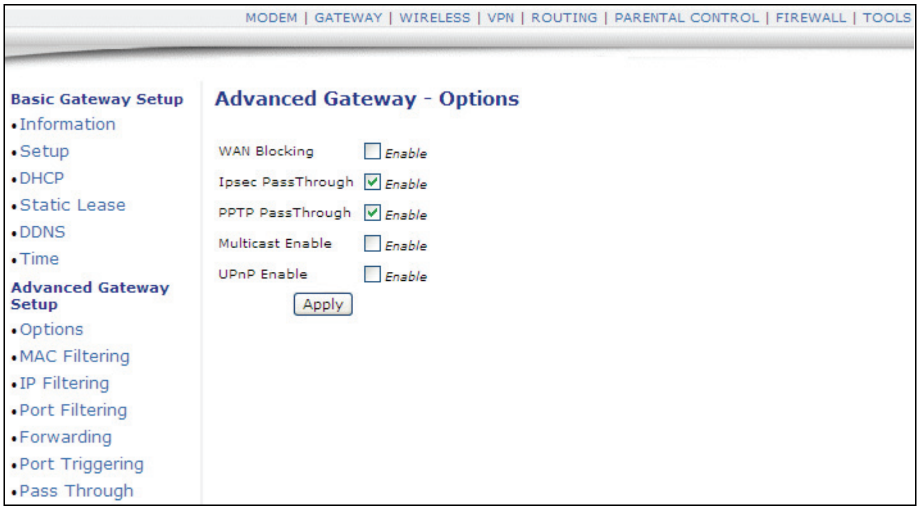
Label	Description
Enable SNTP	Click Yes to enable SNTP (Network Time Protocol). Click No to disable the feature. SNTP is a protocol for synchronizing the clocks of computing devices over networks.
Current Time	Displays the current system time.
System Start Time	Displays the accumulated time since system was started.
Time Server 1	Defines the Time server IP address or Domain name. Use the one provided, or enter an alternative choice.
Time Server 2	Defines the Time server IP address or Domain name. Use the one provided, or enter an alternative choice.
Time Server 3	Defines the Time server IP address or Domain name. Use the one provided, or enter an alternative choice.

Time Zone Offset	If needed, define the time zone offset in Hours and Minutes. For example: 8 means GMT + 08, -1 means GMT -01.
Apply	Click Apply to save all screen changes.
Reset Values	Click Reset Values to reset the screen to factory defaults.

4.2.7 Advanced Gateway Setup - Options

The **Options** selection allows you to define what networking protocols are enabled or disabled on the device.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Gateway** link from the top of the screen.
3. Click **Options** from the left side of the screen. The **Options** fields are explained following this screen example.



Advanced Gateway - Options

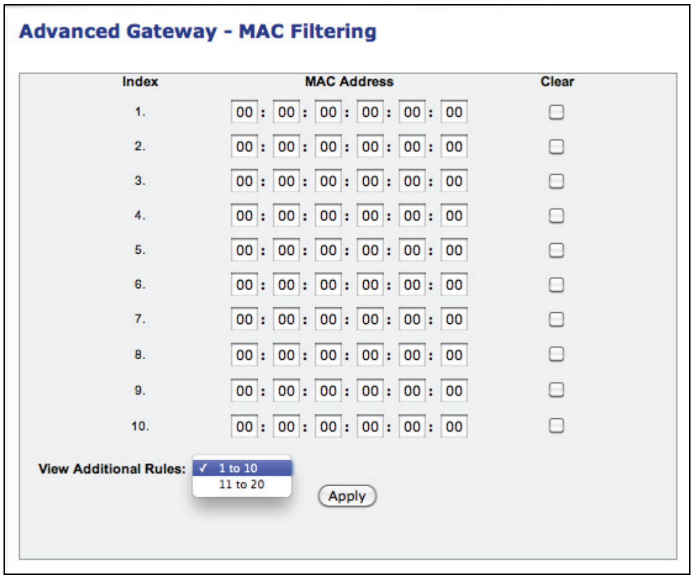
WAN Blocking	□ Enable
Ipsec PassThrough	☑ Enable
PPTP PassThrough	☑ Enable
Multicast Enable	□ Enable
UPnP Enable	□ Enable

Label	Description
WAN Blocking	Select Enable to block connection requests initialized from Internet users.
Ipsec PassThrough (Enabled by default)	If Internet users initialize an IPSec VPN request to a host located behind the router, NAT makes this attempt fail. Select Enable to force the router to redirect the IPSec request to the local host.
PPTP PassThrough (Enabled by default)	If Internet users initialize a PPTP VPN request to a host located behind the router, NAT will make this attempt fail. Select Enable to force the router to redirect the PPTP request to the local host.
Multicast Enable	Multicast optimizes the bandwidth utilization compared with unicast especially video streaming applications. Select Enable to enable multicast.
UPnP Enable	Select Enable to activate Universal Plug and Play (UPnP). A UPnP device can dynamically join a network, obtain an IP address, convey its capabilities, and learn about other devices on the network. In turn, a device can leave a network smoothly and automatically when it is no longer in use.
Apply	Click Apply to save all screen changes.

4.2.8 Advanced Gateway Setup - Mac Filtering

The **MAC Filtering** option allows you to filter MAC addresses in order to block internet traffic from specific network devices on the LAN. This filtering establishes a black list. Any host listed on this list will not be able to access the network/internet through the cable modem.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Gateway** link from the top of the screen.
3. Click **MAC Filtering** from the left side of the screen. The **MAC Filtering** fields are explained following this screen example.



Advanced Gateway - MAC Filtering

Index	MAC Address	Clear
1.	00 : 00 : 00 : 00 : 00 : 00	□
2.	00 : 00 : 00 : 00 : 00 : 00	□
3.	00 : 00 : 00 : 00 : 00 : 00	□
4.	00 : 00 : 00 : 00 : 00 : 00	□
5.	00 : 00 : 00 : 00 : 00 : 00	□
6.	00 : 00 : 00 : 00 : 00 : 00	□
7.	00 : 00 : 00 : 00 : 00 : 00	□
8.	00 : 00 : 00 : 00 : 00 : 00	□
9.	00 : 00 : 00 : 00 : 00 : 00	□
10.	00 : 00 : 00 : 00 : 00 : 00	□

View Additional Rules: ✓ 1 to 10

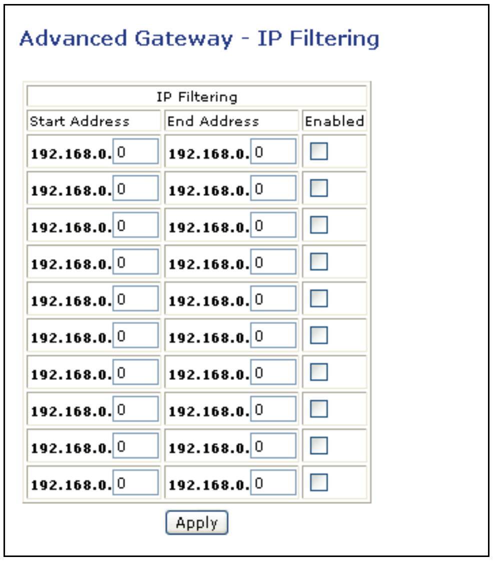
Label	Description
Index	The Index number of the rule.
MAC Address	Enter the MAC address to block.
Clear	Select Clear to delete the filtering rule.
View Additional Rules:	Select from the pull-down to display the remaining 10 rules, if they exist. 20 rules total are supported.
Apply	Click Apply to save all screen changes.

4.2.9 Advanced Gateway Setup - IP Filtering

The **IP Filtering** option allows you to filter IP addresses in order to block internet traffic to specific network devices on the LAN. Any host listed on this list will not be accessible to internet traffic.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Gateway** link from the top of the screen.

3. Click **IP Filtering** from the left side of the screen. The **IP Filtering** fields are explained following this screen example.



Advanced Gateway - IP Filtering

IP Filtering		
Start Address	End Address	Enabled
192.168.0. 0	192.168.0. 0	□
192.168.0. 0	192.168.0. 0	□
192.168.0. 0	192.168.0. 0	□
192.168.0. 0	192.168.0. 0	□
192.168.0. 0	192.168.0. 0	□
192.168.0. 0	192.168.0. 0	□
192.168.0. 0	192.168.0. 0	□
192.168.0. 0	192.168.0. 0	□
192.168.0. 0	192.168.0. 0	□
192.168.0. 0	192.168.0. 0	□

Label	Description
Start Address	Enter the start IP address.
End Address	Enter the end IP address.
Enabled	Select Enabled to activate the rule.
Apply	Click Apply to save all screen changes.

4.2.10 Advanced Gateway Setup - Port Filtering

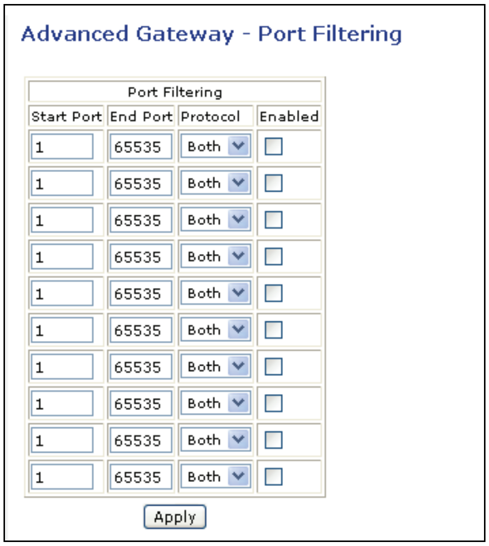
The **Port Filtering** option allows you to configure port filters in order to block specific internet services on specific ports to all devices on the LAN.

1. Access the web interface. Refer to page 14, if needed.

2. Click the **Gateway** link from the top of the screen.

3. Click **Port Filtering** from the left side of the screen. The **Port Filtering** fields are

explained following this screen example.



Advanced Gateway - Port Filtering

Port Filtering			
Start Port	End Port	Protocol	Enabled
1	65535	Both	□
1	65535	Both	□
1	65535	Both	□
1	65535	Both	□
1	65535	Both	□
1	65535	Both	□
1	65535	Both	□
1	65535	Both	□
1	65535	Both	□
1	65535	Both	□

Label	Description
Start Port	Enter the start port.
End Port	Enter the end port.
Protocol	Select the protocol type, or select Both for UDP and TCP.
Enabled	Select Enabled to activate the rule and filter out all traffic on the specified ports.
Apply	Click Apply to save all screen changes.

4.2.11 Advanced Gateway Setup - Forwarding

The **Forwarding** option allows you to configure incoming requests on specific port numbers to reach your internal servers such as web servers, FTP servers, mail servers, gaming consoles, and others, so they can be accessible from the public internet.

Note: If your host system(s) do not have communications issues with the internet, Forwarding is **not** typically needed.

4.2.11.1 Overview, Recommendations, Examples

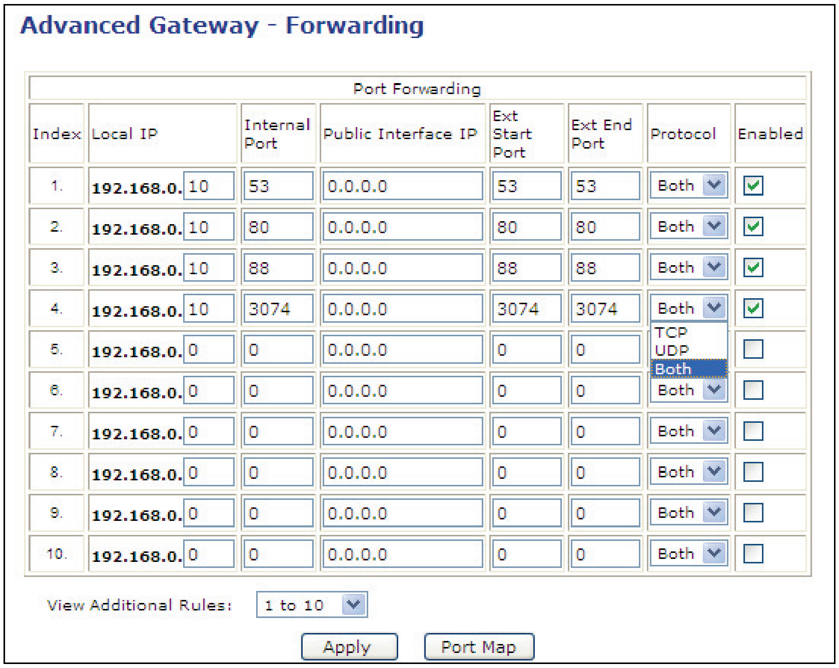
When setting up forwarding, you are recommended to assign a **static IP lease** to the client/host for which you are setting up forwarding. This way, the IP does not change and disrupt your forwarding rules. For example, if you are hosting a telnet server in your internal network and you wish to setup a forwarding rule for it, you should assign a static IP lease to that system to keep the IP from renewing and disrupting the forwarding rule. The following tasks are recommended to support the setup of forwarding rules:

- ❑ Tools - Client List, on page 82 — Use this option to obtain the MAC and IP address of the internal host for which you are setting up a forwarding rule. You will need these for the following step.
- ❑ Gateway - DHCP Static Lease, on page 32 — Use this option to setup the static lease for the internal network host.
- ❑ Refer to page 43 for more detailed information on Forwarding.

To setup forwarding, use the following procedure:

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Gateway** link from the top of the screen.
3. Click **Forwarding** from the left side of the screen.
   Example: The following screen example shows how to setup an XBOX running Modern Warfare 2. Since multiple ports are used for XBOX, separate forwarding rules are setup for each port. The XBOX IP is entered in the Local IP field. The ports used by the XBOX are defined in the Internal Port field. The ports used by XBOX are also defined in the External Port Start and End fields. This configuration now allows the XBOX to receive data from the internet.
   - ❑ For detailed information on port forwarding, including how to set it up for specific applications using specific network devices (for example, cable modems), refer to: http://portforward.com

❑ For additional information, consult your host device's or specific application's user manual.



Advanced Gateway - Forwarding

Port Forwarding

Index	Local IP	Internal Port	Public Interface IP	Ext Start Port	Ext End Port	Protocol	Enabled
1.	192.168.0.10	53	0.0.0.0	53	53	Both	☑
2.	192.168.0.10	80	0.0.0.0	80	80	Both	☑
3.	192.168.0.10	88	0.0.0.0	88	88	Both	☑
4.	192.168.0.10	3074	0.0.0.0	3074	3074	Both	☑
5.	192.168.0.0	0	0.0.0.0	0	0	TCP UDP Both	☐
6.	192.168.0.0	0	0.0.0.0	0	0	Both	☐
7.	192.168.0.0	0	0.0.0.0	0	0	Both	☐
8.	192.168.0.0	0	0.0.0.0	0	0	Both	☐
9.	192.168.0.0	0	0.0.0.0	0	0	Both	☐
10.	192.168.0.0	0	0.0.0.0	0	0	Both	☐

View Additional Rules: 1 to 10

Label	Description
Index	Displays the Index number of the rule.
Local IP	Enter the last digits of the IP address of the server for which to setup the forwarding rule.
Internal Port	Enter the port number listened to by the server host located in your LAN.
Public Interface IP	Normally, this field is not modified unless you wish to designate another router on the network to forward data through.
Ext. Start Port	Define the port number to start the range of ports to publish to the Internet.
Ext. End Port	Define the port number to end the range of ports published to Internet. Note: Be very careful with ranges. Ports within a range will not be usable by other applications that may require them. It is common and safer to enter the same port number as the start and end of the range.
Protocol	Select the protocol type, UDP, TCPIP, or Both.
Enabled	Select to enable this rule.
Apply	Click to save.
Port Map	Click to show a list of common applications and their ports.

4.2.12 Additional Information - Forwarding

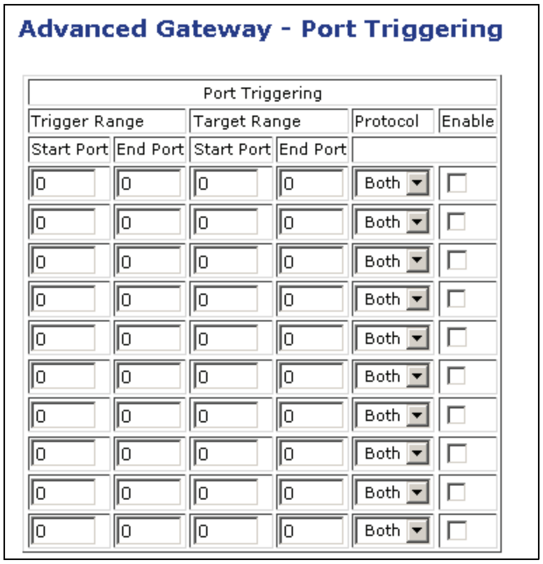
Internal Ports are the ports that local servers listen to. External Ports are the ports that the cable modem listens to. For example, a local user on your network (e.g. John) is running a Telnet Daemon on port 64623; the internal port is 64623, the external port is 23. If an **internet user** initializes a Telnet connection request to this router's public IP address, the router recognizes that this is a Telnet connection request to a station. According to existing forwarding rules, the router first translates the packet's destination port to be 64623, and then forward this request to John's Telnet host.

In summary, when you have port forwarding rules set up, your router takes the data off of the external IP address:port number and sends that data to an internal IP address:port number. Port Forwarding rules are created per port. So a rule set up for port 53 will only work for port 53. A port can only be used by one program at a time.

4.2.13 Advanced Gateway Setup - Port Triggering

The **Port Triggering** option allows you to configure dynamic triggers to specific devices on the LAN. This allows for special applications that require specific port numbers with bi-directional traffic to function properly. Applications such as video conferencing, voice, gaming, and some messaging program features may require these special settings. Refer to page 46 for more information on how to setup Port Triggering.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Gateway** link from the top of the screen.
3. Click **Port Triggering** from the left side of the screen. The **Port Triggering** fields are explained following this screen example.



Advanced Gateway - Port Triggering

Port Triggering					
Trigger Range		Target Range		Protocol	Enable
Start Port	End Port	Start Port	End Port		
0	0	0	0	Both ▾	□
0	0	0	0	Both ▾	□
0	0	0	0	Both ▾	□
0	0	0	0	Both ▾	□
0	0	0	0	Both ▾	□
0	0	0	0	Both ▾	□
0	0	0	0	Both ▾	□
0	0	0	0	Both ▾	□
0	0	0	0	Both ▾	□
0	0	0	0	Both ▾	□

Label	Description
Trigger Range	The trigger port is a port (or a range of ports) that triggers the router to record the IP address of the LAN computer that sent the traffic to a server on the WAN.
Start Port	Enter a port number or the starting port number in a range of port numbers.
End Port	Enter a port number or the ending port number in a range of port numbers.
Target Range	Target Range is a port (or a range of ports) that a server on the WAN uses when it responds to service requests. The router forwards the traffic with this port (or range of ports) to the client computer on the LAN that requested the service
Start Port	Enter a port number or the starting port number in a range of port numbers.

End Port	Enter a port number or the ending port number in a range of port numbers.
Protocol	Define the protocol type for this rule, UDP, TCP, or Both.
Enable	Click to activate this rule.
Apply	Click to save.

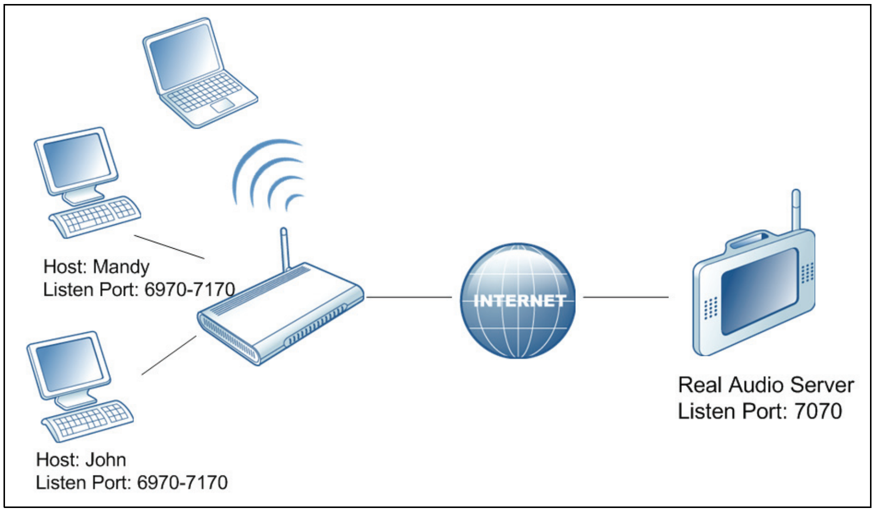
4.2.14 Additional Information - Port Triggering

Some services use a dedicated range of ports on the client side and a dedicated range of ports on the server side. With regular port forwarding you set a forwarding rule to forward a service to the IP address of a LAN side host. The problem is that port forwarding forwards a service to a **single** LAN IP address.

With port triggering, we define 2 kinds of ports: Trigger Port and Target Port. Trigger port is defined as the service request with a specific destination port number sent from a LAN side host. Target Port is defined as the ports this specific application requires a LAN host to listen to. Thus, the server returns responses to these ports.

Example:

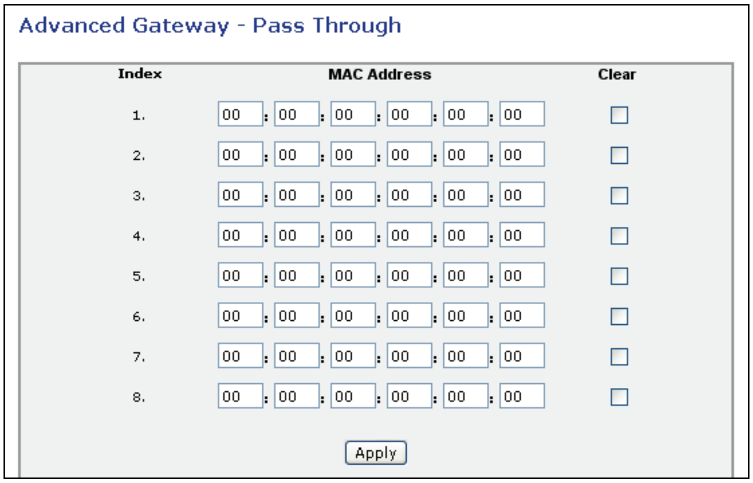
1. John requests a file from the Real Audio server (port 7070). Port 7070 is a “trigger” port and causes the cable modem to record John’s computer IP address. The cable modem associates John's computer IP address with the "target" port range of 6970-7170.
2. The Real Audio server responds to a port number ranging between 6970-7170.
3. The cable modem forwards the traffic to John’s computer IP address.
4. Only John can connect to the Real Audio server until the connection is closed or times out.



4.2.15 Advanced Gateway Setup - Pass Through

The **Pass Through** option allows you to configure a pass through table. Devices in the pass through table are treated as bridge devices, storing and forwarding data between LAN interconnections.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Gateway** link from the top of the screen.
3. Click **Pass Through** from the left side of the screen. The **Pass Through** fields are explained following this screen example.



Advanced Gateway - Pass Through

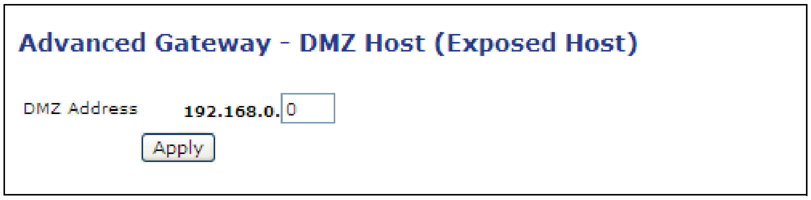
Index	MAC Address	Clear
1.	00 : 00 : 00 : 00 : 00 : 00	□
2.	00 : 00 : 00 : 00 : 00 : 00	□
3.	00 : 00 : 00 : 00 : 00 : 00	□
4.	00 : 00 : 00 : 00 : 00 : 00	□
5.	00 : 00 : 00 : 00 : 00 : 00	□
6.	00 : 00 : 00 : 00 : 00 : 00	□
7.	00 : 00 : 00 : 00 : 00 : 00	□
8.	00 : 00 : 00 : 00 : 00 : 00	□

Label	Description
Index	Index number of the pass through rule.
MAC Address	Input the host’s MAC address.
Clear	Select the box to delete this rule.
Apply	Click to save.

4.2.16 Advanced Gateway Setup - DMZ Host

The **DMZ Host** option allows you to configure a host IP address to be exposed or visible to the WAN (public internet). This may be used when applications do not work with port triggers, or for other networking strategies.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Gateway** link from the top of the screen.
3. Click **DMZ Host** from the left side of the screen. The **DMZ Host** fields are explained following this screen example.



Advanced Gateway - DMZ Host (Exposed Host)

DMZ Address 192.168.0.0

Label	Description
DMZ Address	Enter the DMZ host IP address.
Apply	Click to save.

4.3 Wireless Menu

This chapter contains instructions for all wireless configuration settings.

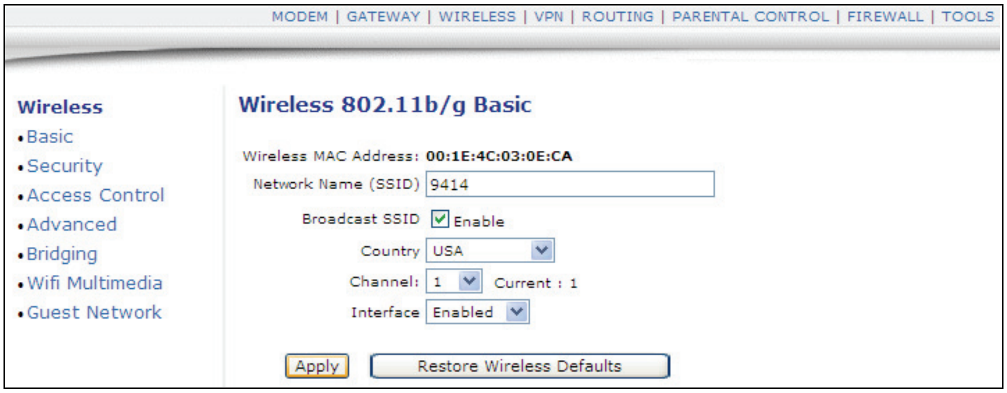
Important: The Wireless menu functions are available on the DDW2600 Wireless Cable Modem/Router only.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Wireless** link from the top of the screen.

4.3.1 Wireless - Basic

The **Basic** option allows you to configure key wireless operations including channel selection, bandwidth control, and the primary broadcast SSID.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Wireless** link from the top of the screen.
3. Click **Basic** from the left side of the screen. The **Basic** fields are explained following this screen example.


MODEM | GATEWAY | WIRELESS | VPN | ROUTING | PARENTAL CONTROL | FIREWALL | TOOLS
Wireless
•Basic
•Security
•Access Control
•Advanced
•Bridging
•Wifi Multimedia
•Guest Network
Apply
Restore Wireless Defaults

Wireless 802.11b/g Basic

Wireless MAC Address: 00:1E:4C:03:0E:CA

Network Name (SSID) 9414

Broadcast SSID ☑ Enable

Country USA

Channel: 1 Current : 1

Interface Enabled

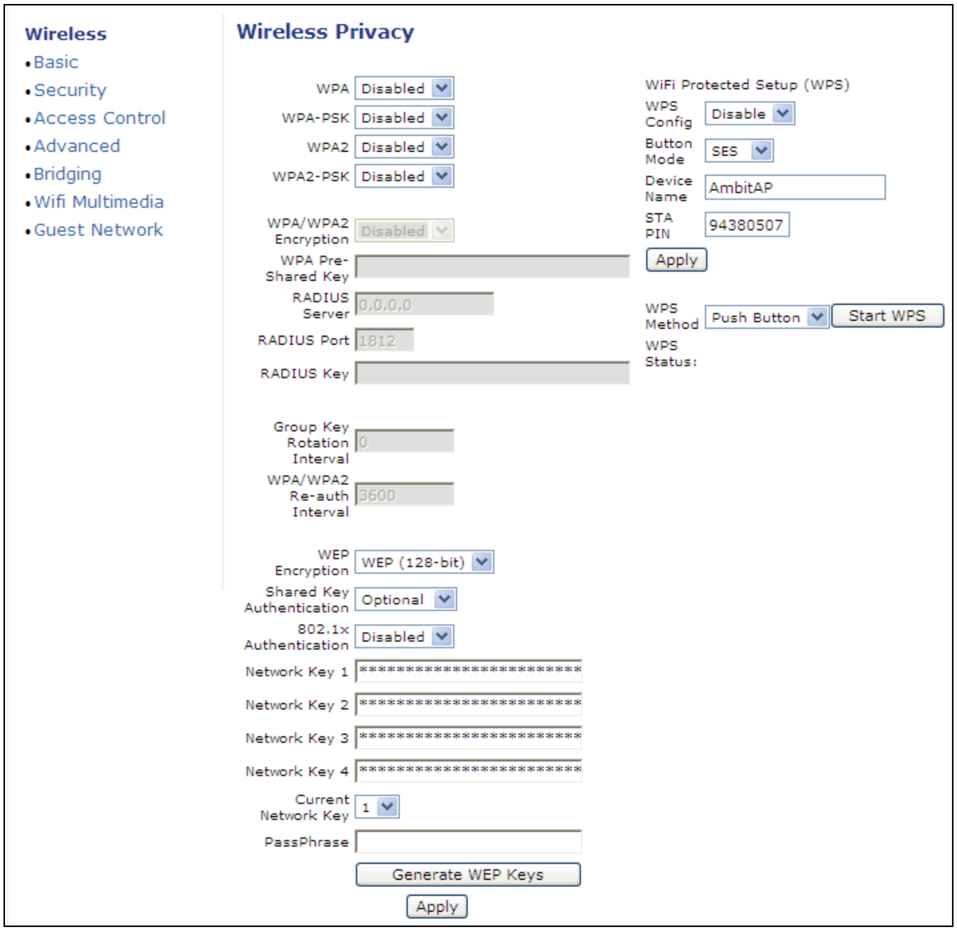
Label	Description
Wireless MAC Address	Displays the MAC address of wireless router's wireless module.
Network Name (SSID)	Use this field to use the existing or enter a new Service Set Identifier (SSID). Wireless clients connecting to the wireless router use this SSID as the address to establish the wireless network connection. Refer to page 7 for more information on the device's default SSID.
Broadcast SSID	Click Enable to allow broadcast of SSID.
Country	When set to USA, channels 1 to 11 is available. If selecting worldwide, 13 channels are available.

Channel	Select a specific channel 1-11 to deploy the wireless network. This allows you to set the operating frequency/channel depending on your particular region.
Interface	Select Enabled/Disabled to turn on or off the wireless radio interface. Off makes the wireless access point unavailable for use.
Apply	Click to save.
Restore Wireless Defaults	Click to restore the factory default settings for wireless configurations.

4.3.2 Wireless - Security

The **Security** option allows you to configure a variety of wireless security settings for the **primary** wireless network. Keep in mind that the device also supports **guest networks** that can have different SSIDs and security settings. Refer to page 57 for more information on guest networks.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Wireless** link from the top of the screen.
3. Click **Security** from the left side of the screen. The **Security** fields are explained following this screen example.



Wireless Privacy

WPA: Disabled
WPA-PSK: Disabled
WPA2: Disabled
WPA2-PSK: Disabled
WPA/WPA2 Encryption: Disabled
WPA Pre-Shared Key:
RADIUS Server: 0.0.0.0
RADIUS Port: 1812
RADIUS Key:
Group Key Rotation Interval: 0
WPA/WPA2 Re-auth Interval: 3600
WEP Encryption: WEP (128-bit)
Shared Key Authentication: Optional
802.1x Authentication: Disabled
Network Key 1: **************************
Network Key 2: **************************
Network Key 3: **************************
Network Key 4: **************************
Current Network Key: 1
PassPhrase:

WiFi Protected Setup (WPS)
WPS Config: Disable
Button Mode: SES
Device Name: AmbitAP
STA PIN: 94380507
WPS Method: Push Button
WPS Status:

Label	Description
WPA	Wi-Fi Protected Access (WPA) is a subset of the IEEE 802.11i standard. Key differences between WPA and WEP are user authentication and improved data encryption. Select to Enable or Disable.

Label	Description
WPA-PSK	If you don't have an external RADIUS server, you should use WPA-PSK (WPA Pre-Shared Key) that only requires a single (identical) password entered into the wireless gateway and wireless client. As long as the passwords match, a client will be granted access to the wireless LAN. Select to Enable or Disable.
WPA2	Advanced protocol, certified through Wi-Fi Alliance's WPA2 program, implements the mandatory elements of 802.11i. In particular, it introduces a new AES-based algorithm, CCMP, that is considered fully secure. Select to Enable or Disable.
WPA2-PSK	If you don't have an external RADIUS server you should use WPA2-PSK (WPA Pre-Shared Key) that only requires a single (identical) password entered into wireless gateway and wireless client. As long as the passwords match, a client will be granted access to the wireless LAN. Select to Enable or Disable.
WPA/WPA2 Encryption	Switch to enable or disable WPA/WPA2 encryption.
WPA Pre-Shared Key	The encryption mechanisms used for WPA and WPA-PSK are the same. The only difference between the two is that WPA-PSK uses a simple common password, instead of user-specific credentials. If WPA2-PSK is enabled, enter a preshared key. Refer to page 7 for the default value of the shared key. Connecting clients will need to enter this shared key to access the network.
RADIUS Server	Input the IP address of RADIUS server, if used.
RADIUS Port	Enter a RADIUS port number when WPA or 802.1x network authentication is selected.
RADIUS Key	Enter the RADIUS Key when WPA or 802.1x network authentication is selected.
Group Key Rotation Interval	Allows the wireless router to generate the best possible random group key and update all the key-management capable stations periodically.
WPA/WPA2 Re-auth Interval	Wireless router (if using WPA-PSK key management) or RADIUS server (if using WPA key management) sends a new group key out to all clients. The re-keying process is the WPA equivalent of automatically changing the WEP key for a wireless access point and all stations in the WLAN on a periodic basis. Setting of the WPA Group Key Update Timer is also supported in WPA-PSK mode.
WEP Encryption	If you don’t have WPA(2)-aware wireless clients, then use WEP key encrypting. A higher bit key offers better security. WEP encryption scrambles the data transmitted between the wireless stations and the wireless router to keep network communications private. It encrypts unicast and multicast communications in a network. Both the wireless stations and the wireless router must use the same WEP key. Data Encryption can be set to WEP **128-bit, 64-bit,** or **Disable.**

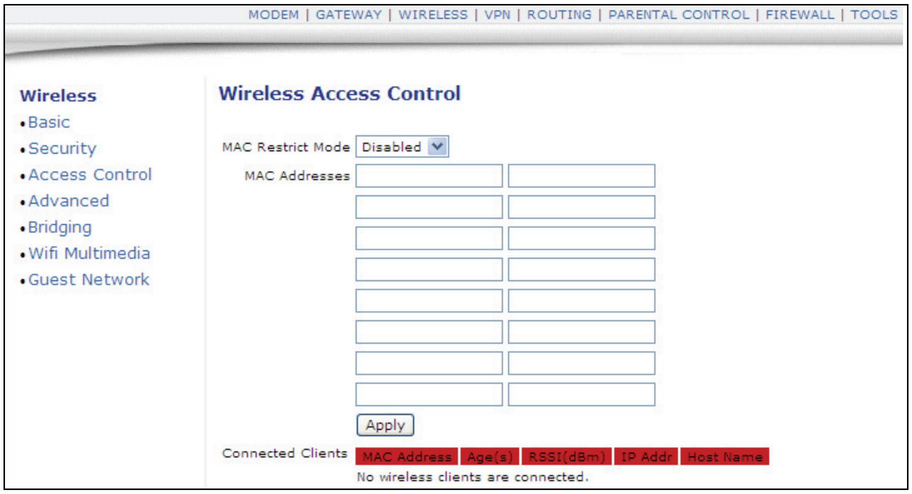
Label	Description
Shared Key Authentication	Shared Key is an authentication method used by wireless LANs, which follow the IEEE 802.11 standard. Wireless devices authenticate each other by using a secret key that is kept by both devices. Select Optional or Required.
802.1x Authentication	Enable to have the wireless router authenticate wireless clients.
Network Key 1-4	You can pre-define up to 4 keys for 64-bit or 128-bit (64-bit keys require 10 hexadecimal digits) (128-bit key require 26 hexadecimal digits).
Current Network Key	You can select one of the four pre-defined keys as the current network key.
Passphrase	You can set WEP encryption key by entering a word or group of printable characters in the Passphrase box and click Generate WEP keys. These characters are case sensitive.
Generate WEP Keys	Force the wireless router to generate 4 WEP keys automatically.
Apply	Click to save all values/changes in this screen.
WiFi Protected Setup	Use this feature to setup WPS (Wifi Protected Setup) for devices connecting to the wireless network. Wifi protected setup is an efficient way to setup authenticated and encrypted communications between wireless clients and the wireless network. Instead of configuring all the security settings, as described above, WPS-enabled clients can connect to the network by entering a PIN or by pressing a WPS button on the device or in software on the device.
WPS Config	Select WPS or Disabled.
Button Mode	SES lets you configure the SSID and encryption keys on both the router and the client with the press of a button. WPS is a protocol to simplify the process of configuring security on wireless networks.
Device Name	Use the default device name or change as needed. This name identifies this wireless router in the WPS network.
STA PIN	Personal Identification Number of your PC or game machine. When a WPS supported device tries to connect to this wireless router, the user has to input the PIN as specified in this STA PIN field.
Apply	Click to save all values/changes for WPS.

Label	Description
WPS Method/Start WPS/WPS Status	Select which method to have connecting wireless clients connect to the wireless network, Push Button or PIN. If PIN is selected, clients are required to enter the PIN in order to access the wireless network. For Push Button, a client pushes a button, either on the device or in software on the device. Within two minutes, access this Web GUI (page 14) and click the Start WPS button on this screen to trigger the negotiation between the wireless client and the wireless router. WPS Status displays the connection status between the device and wireless clients.

4.3.3 Wireless - Access Control

The **Access Control** option allows you to configure what clients can access your wireless network.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Wireless** link from the top of the screen.
3. Click **Access Control** from the left side of the screen. The **Access Control** fields are explained following this screen example.



Wireless Access Control

MAC Restrict Mode: Disabled

MAC Addresses

Connected Clients

MAC Address	Age(s)	RSSI(dBm)	IP Addr	Host Name

No wireless clients are connected.

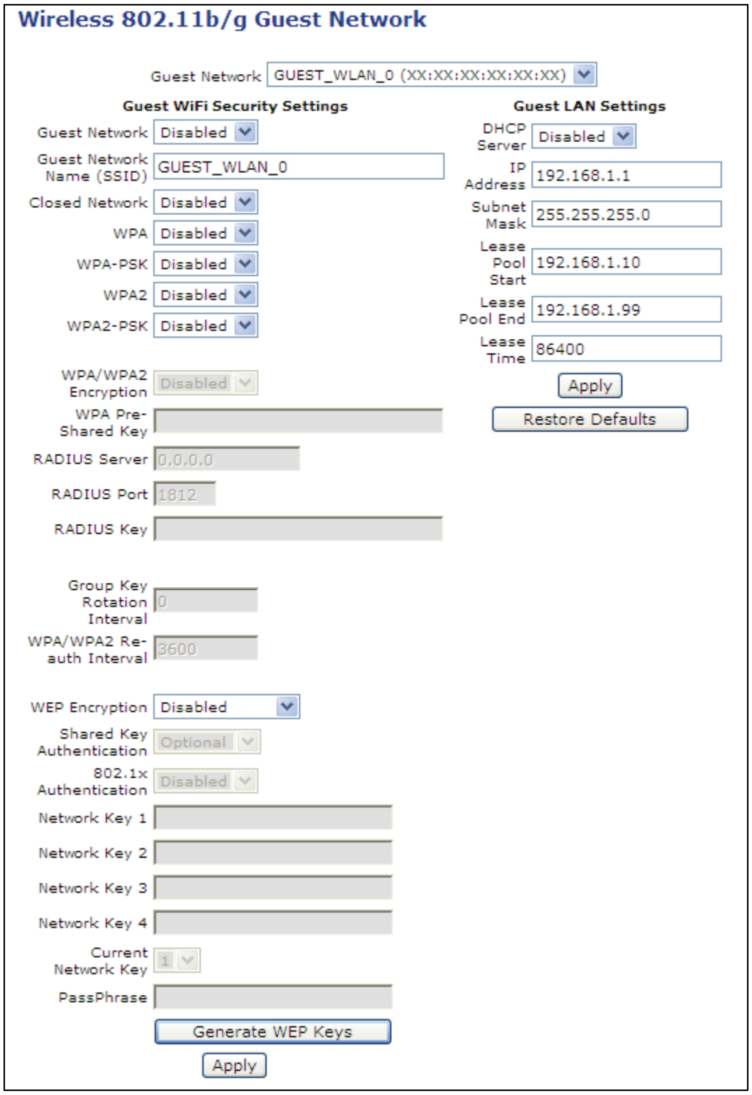
Label	Description
MAC Restrict Mode	Use this feature to control wireless access to your network by MAC address. Select **Disable** to turn off MAC Restrictions and allow any wireless client to connect to this wireless router. Note, however, if you use other security mechanisms for access to the wireless network, clients must still adhere to those restrictions. Select **Allow** to create a list of wireless clients that can connect to the wireless network. Enter the MAC Addresses of these clients in the MAC Addresses fields. All MAC addresses not on the list will not be allowed access to your wireless network. Select **Deny** to create a list of wireless clients that you do not want to have access to your wireless network. Enter the MAC Addresses of these clients in the MAC Addresses fields.
MAC Addresses	Input the MAC addresses. You may consider cutting and pasting MAC addresses from the connected clients list at the bottom of the screen.
Apply	Click to save.

Connected Clients	List of current connected Wireless client listed by MAC address. Fields definitions are: Age(s)—The duration since the wireless client connected to wireless router. RSSI(dBm)—Received signal strength in the wireless environment. IP Addr—The IP address assigned to this wireless client. Host Name—The host name of the wireless client.

4.3.4 Wireless - Guest Network

The wireless cable modem supports Multiple Service Set IDentifiers which allows you to use one access point to advertise multiple networks. These separate networks can have varying levels of security and be used to segregate traffic. A maximum of four SSIDs are allowed on one AP simultaneously. 1 for Admin access, 3 for Guest Networks. **Note**: You must use different WEP keys for different SSIDs, if you use WEP for security.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Wireless** link from the top of the screen.
3. Click **Guest Network** from the left side of the screen. The **Guest Network** fields are explained following this screen example.



Wireless 802.11b/g Guest Network

Guest Network: GUEST_WLAN_0 (XX:XX:XX:XX:XX:XX)

Guest WiFi Security Settings

Guest Network: Disabled
Guest Network Name (SSID): GUEST_WLAN_0
Closed Network: Disabled
WPA: Disabled
WPA-PSK: Disabled
WPA2: Disabled
WPA2-PSK: Disabled
WPA/WPA2 Encryption: Disabled
WPA Pre-Shared Key:
RADIUS Server: 0.0.0.0
RADIUS Port: 1812
RADIUS Key:
Group Key Rotation Interval: 0
WPA/WPA2 Re-auth Interval: 3600
WEP Encryption: Disabled
Shared Key Authentication: Optional
802.1x Authentication: Disabled
Network Key 1:
Network Key 2:
Network Key 3:
Network Key 4:
Current Network Key: 1
PassPhrase:

Guest LAN Settings

DHCP Server: Disabled
IP Address: 192.168.1.1
Subnet Mask: 255.255.255.0
Lease Pool Start: 192.168.1.10
Lease Pool End: 192.168.1.99
Lease Time: 86400

Label	Description
Guest Network (Select)	Select which guest network to configure.
Guest Network (Enable/Disable)	Select to enable or disable the guest network selected.
Guest Network Name	Enter a new guest network name, if desired. This SSID name is broadcast from the device and is used to connect to the wireless network.
Closed Network	If Enable is selected, this will hide the SSID name. When nearby wireless clients try to scan the SSID, it will not discover this hidden SSID name, unless the user manually adds the SSID to the wireless client.
WPA	Wi-Fi Protected Access (WPA) is a subset of the IEEE 802.11i standard. Key differences between WPA and WEP are user authentication and improved data encryption.
WPA-PSK	If you don't have an external RADIUS server you should use WPA-PSK (WPA Pre-Shared Key) that only requires a single (identical) password entered into wireless gateway and wireless client. As long as the passwords match, a client will be granted access to the wireless LAN.
WPA2	Advanced protocol, certified through Wi-Fi Alliance's WPA2 program, implements the mandatory elements of 802.11i. In particular, it introduces a new AES-based algorithm, CCMP, that is considered fully secure.
WPA2-PSK	If you don't have an external RADIUS server you should use WPA2-PSK (WPA Pre-Shared Key) that only requires a single (identical) password entered into wireless gateway and wireless client. As long as the passwords match, a client will be granted access to the wireless LAN.
WPA/WPA2 Encryption	Switch to enable or disable WPA/WPA2 encryption.
WPA Pre-Shared Key	The encryption mechanisms used for WPA and WPA-PSK are the same. The only difference between the two is that WPA-PSK uses a simple common password, instead of user-specific credentials. Refer to page 7 for the default value of the shared key.
RADIUS Server	Input the IP address of RADIUS server, if used.
RADIUS Port	Enter a RADIUS port number when WPA or 802.1x network authentication is selected.
RADIUS Key	Enter the RADIUS Key when WPA or 802.1x network authentication is selected.
Group Key Rotation Interval	Allows the wireless router to generate the best possible random group key and update all the key-management capable stations periodically.

Label	Description
WPA/WPA2 Re-auth Interval	Wireless router (if using WPA-PSK key management) or RADIUS server (if using WPA key management) sends a new group key out to all clients. The re-keying process is the WPA equivalent of automatically changing the WEP key for a wireless access point and all stations in the WLAN on a periodic basis. Setting of the WPA Group Key Update Timer is also supported in WPA-PSK mode.
WEP Encryption	If you don't have WPA(2)-aware wireless clients, then use WEP key encrypting. A higher bit key offers better security. WEP encryption scrambles the data transmitted between the wireless stations and the wireless router to keep network communications private. It encrypts unicast and multicast communications in a network. Both the wireless stations and the wireless router must use the same WEP key. Data Encryption can be set to WEP **128-bit, 64-bit,** or **Disable.**
Shared Key Authentication	Shared Key is an authentication method used by wireless LANs, which follow the IEEE 802.11 standard. Wireless devices authenticate each other by using a secret key that is kept by both devices.
802.1x Authentication	Enable to have the wireless router authenticate wireless clients.
Network Key 1-4	You can pre-define up to 4 keys for 64-bit or 128-bit (64-bit keys require 10 hexadecimal digits) (128-bit key require 26 hexadecimal digits).
Current Network Key	You can select one of the four pre-defined keys as the current network key.
Passphrase	You can set WEP encryption key by entering a word or group of printable characters in the Passphrase box and click Generate WEP keys. These characters are case sensitive.
Generate WEP Keys	Force the wireless router to generate 4 WEP keys automatically.
Apply	Click to save all screen changes.
DHCP Server	Select Enable to allow users to deploy a DHCP server for this guest SSID.
IP Address	This IP address will be the default gateway address for clients connected to this guest network
Subnet Mask	Define the subnet mask value.
Lease Pool Start	Define the start IP address of this DHCP address pool.
Lease Pool End	Define the last IP address of this DHCP address pool.

Label	Description
Lease Time	Define the lease time for DHCP client. Before expiration, DHCP client will resend DHCP request. Max value is 86400 seconds.
Apply	Click Apply to save all DHCP settings.
Restore Defaults	Click to reset to factory default values for the wireless settings only.

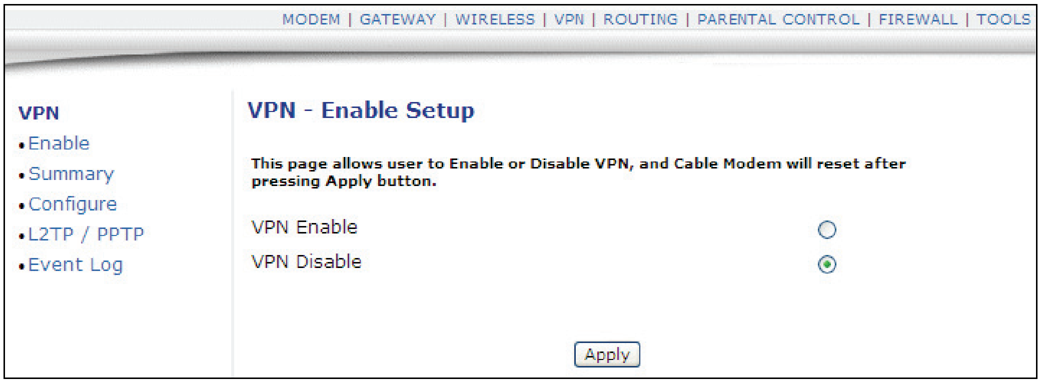
4.4 VPN Menu

This chapter contains instructions for all VPN configuration settings. A **virtual private network (VPN)** is a computer network in which some of the links between nodes are carried by open connections over the internet, or virtual circuits, instead of by physical wires. One common application of VPN is secure communications between trusted nodes using the public Internet. VPNs, for example, can be used to separate the traffic of different user communities over an underlying network with strong security features. For an overview of how VPNs are structured and the security protocols used, refer to page 69.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **VPN** link from the top of the screen.

4.4.1 VPN - Enable

1. Access the web interface. Refer to page 14, if needed.
2. Click the **VPN** link from the top of the screen.
3. Click **Enable** from the left side of the screen.
4. Select the button to either **Enable** or **Disable** VPN. The device must be rebooted for the change to take effect.


MODEM | GATEWAY | WIRELESS | VPN | ROUTING | PARENTAL CONTROL | FIREWALL | TOOLS
VPN
• Enable
• Summary
• Configure
• L2TP / PPTP
• Event Log
Apply

VPN - Enable Setup

This page allows user to Enable or Disable VPN, and Cable Modem will reset after pressing Apply button.

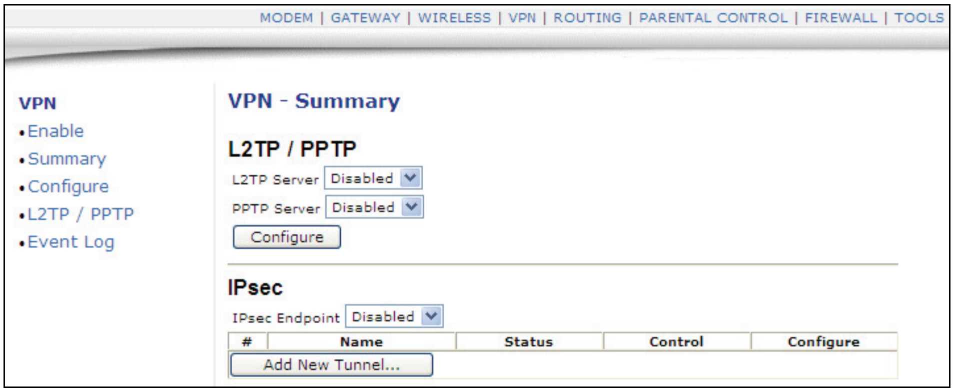
VPN Enable ○

VPN Disable ●

4.4.2 VPN - Summary

The **Summary** option allows you to configure VPN tunnels with a centralized view.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **VPN** link from the top of the screen.
3. Click **Summary** from the left side of the screen. The **Summary** fields are explained following this screen example.


MODEM | GATEWAY | WIRELESS | VPN | ROUTING | PARENTAL CONTROL | FIREWALL | TOOLS
VPN
•Enable
•Summary
•Configure
•L2TP / PPTP
•Event Log
VPN - Summary
L2TP / PPTP
Configure
IPsec
# Name Status Control Configure
Add New Tunnel...

L2TP Server: Disabled

PPTP Server: Disabled

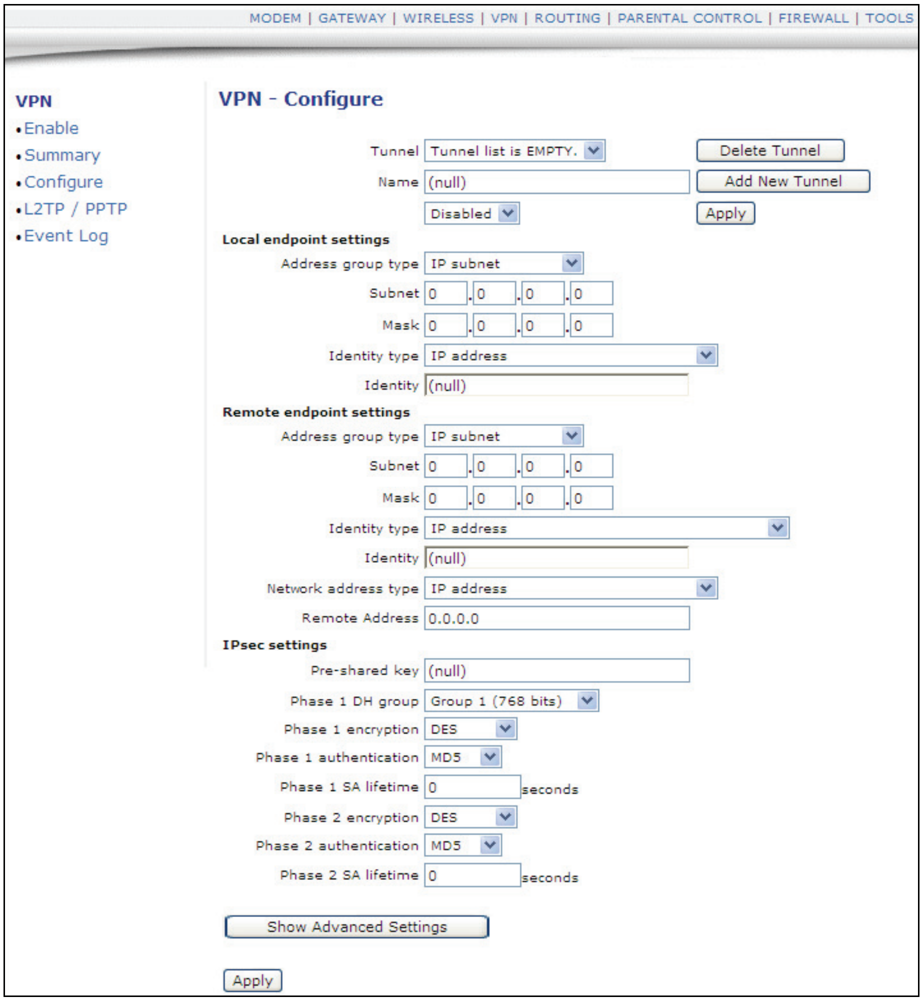
IPsec Endpoint: Disabled

Label	Description
L2TP Server	Select Disabled or Enabled to enable a Layer 2 Tunneling Protocol (L2TP) VPN. Refer to page 68 for more information.
PPTP Server	Select Disabled or Enabled to enable a Point to Point Tunneling Protocol (PPTP) VPN. Refer to page 68 for more information.
Configure	Click Configure to activate the VPN. Refer to page 68 for more information.
IPSec End Point	Select to Enable or Disable the IPSec VPN service.
#	ID of the IPSec VPN tunnel.
Name	Displays the name of IPSec VPN tunnels.
Status	Once an IPSec VPN connects successfully, the Status is Connected. Otherwise, it is Not Connected.
Control	Displays when the user manually triggers an IPSec VPN connection request to the remote VPN gateway.
Configure	Click Edit to modify IPSec VPN parameters of this tunnel; Click Delete to delete this IPSec VPN tunnel.
Add New Tunnel	Click to quickly create a new IPSec VPN tunnel, and then to modify its parameters.

4.4.3 VPN - Configure

The **Configure** option allows you to configure a complete VPN.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **VPN** link from the top of the screen.
3. Click **Configure** from the left side of the screen. The **Configure** fields are explained following this screen example.
4. For an overview of how VPNs are structured and the security protocols used refer to page 69.



VPN - Configure

Tunnel: Tunnel list is EMPTY.
Name: (null)
Disabled

Local endpoint settings
Address group type: IP subnet
Subnet: 0 .0 .0 .0
Mask: 0 .0 .0 .0
Identity type: IP address
Identity: (null)

Remote endpoint settings
Address group type: IP subnet
Subnet: 0 .0 .0 .0
Mask: 0 .0 .0 .0
Identity type: IP address
Identity: (null)
Network address type: IP address
Remote Address: 0.0.0.0

IPsec settings
Pre-shared key: (null)
Phase 1 DH group: Group 1 (768 bits)
Phase 1 encryption: DES
Phase 1 authentication: MD5
Phase 1 SA lifetime: 0 seconds
Phase 2 encryption: DES
Phase 2 authentication: MD5
Phase 2 SA lifetime: 0 seconds

Label	Description
Tunnel	Select the specific VPN tunnel to configure/edit, unless there are no tunnels in the system.
Name	Enter/edit the name for the tunnel.
Delete Tunnel	Click this button to delete the selected VPN tunnel.

Add New Tunnel	Once a tunnel Name is entered, click this button to add the tunnel.
Apply	Select to either Enable or Disable the tunnel. Click Apply to save your changes.
Address Group Type	Configure the local network that will be protected by the IPSec VPN located in your cable modem/router's LAN side. Choose the local address type: ♦ IP Subnet, to protect the whole subnet. ♦ Single IP address, to protect a single PC. ♦ IP address range, to protect several PCs.
Subnet	Enter the subnet.
Mask	Enter the subnet mask.
Identity Type	Select the identity type to identify this cable modem by: ♦ WAN IP (remote endpoint) address ♦ IP address ♦ FQDN ♦ Email address In Aggressive mode, the VPN concentrator identifies incoming SAs by ID type and content, since this identifying information is not encrypted, to distinguish between multiple rules for SAs that connect from remote IPSec routers that have dynamic WAN IP addresses. In Main mode, the ID type and content are encrypted to provide identity protection. In this case VPN concentrator can only distinguish between up to 30 different incoming SAs that connect from remote IPSec routers that have dynamic WAN IP addresses. Because you can select between five encryption algorithms (DES, 3DES, AES-128, AES-192 and AES-256), two authentication algorithms (MD5 and SHA1) and three key groups (DH1 and DH2, DH5) when you configure a VPN rule. The ID type and content act as an extra level of identification for incoming SAs.
Identity	Enter the value corresponding to the selected Identity type.
Address Group Type	Select the address group type: ♦ IP Subnet, to protect the whole subnet. ♦ Single IP address, to protect a single PC. ♦ IP address range, to protect several PCs.
Subnet	Enter the subnet.
Mask	Enter the subnet mask.
Identity Type	Select the identity type to identify this cable modem by: ♦ WAN IP (remote end point) address ♦ IP address ♦ FQDN ♦ Email address
Identity	Enter the value corresponding to the selected Identity Type.

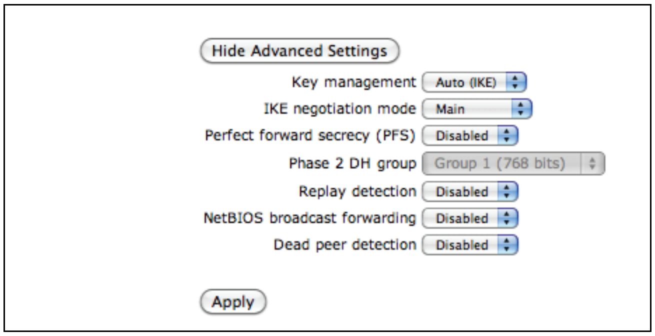
Network Address Type	Enter the network address type: ♦ IP address, usually suitable for static public IP address. ♦ Fully Qualified Domain Name (FQDN), usually suitable for dynamic public IP address.
Remote address	Input the IP address value when choosing an IP address in Network Address Type. Input the FQDN if FQDN is selected. This field is used to identify the specific remote IPSec VPN gateway to which your cable modem will initiate IPSec VPN connection.
IPSec Settings	Configure the IPSec protocol related parameters in the following fields.
Pre-shared Key	Enter your pre-shared key in this field. A pre-shared key identifies a communicating party during a phase 1 IKE negotiation. It is called "pre-shared" because you have to share it with another party before you can communicate with them over a secure connection.
Phase 1 DH Group	Select which Diffie-Hellman key group (DH*x*) you want to use for encryption keys: ♦ **DH1** - use a 768-bit random number ♦ **DH2** - use a 1024-bit random number ♦ **DH5** - user a 1536-bit random number
Phase 1 Encryption	Select which key size and encryption algorithm to use for data communications: ♦ **DES** - a 56-bit key with the DES encryption algorithm ♦ **3DES** - a 168-bit key with the DES encryption algorithm. The DDW2600 Wireless & DDC2700 Commercial Cable Modem/Router and the remote IPSec router must use the same algorithms and key, which can be used to encrypt and decrypt the messages or to generate and verify a message authentication code. Longer keys require more processing power, resulting in increased latency and decreased throughput. ♦ **AES** - Advanced Encryption Standard is a newer method of data encryption that also uses a secret key. This implementation of AES applies a 128-bit key to 128-bit blocks of data. AES is faster than 3DES. Here you have the choice **AES-128, AES-192, AES-256**
Phase 1 Authentication	Select which hash algorithm to use to authenticate packet data in the IKE SA. Choices are **SHA1** and **MD5**. **SHA1** is generally considered stronger than **MD5**, but it is also slower. ♦ MD5 (Message Digest 5) produces a 128-bit digest to authenticate packet data. ♦ SHA1 (Secure Hash Algorithm) produces a 160-bit digest to authenticate packet data.
Phase 1 SA Lifetime	Define the length of time before an IKE SA automatically renegotiates a key. It may range from 120 to 86400 seconds. A short SA lifetime increases security by forcing the two VPN gateways to update the encryption and authentication keys. However, every time the VPN tunnel renegotiates the keys, all users accessing remote resources are temporarily disconnected.

Phase 2 Encryption	Select which key size and encryption algorithm to use for data communications. Choices are: ♦ **Null –** No data encryption in IPSec SA. Not suggested. ♦ **DES** - a 56-bit key with the DES encryption algorithm. ♦ **3DES** - a 168-bit key with the DES encryption algorithm, the cable modem and the remote IPSec router must use the same algorithms and key, which can be used to encrypt and decrypt the message or to generate and verify a message authentication code. Longer keys require more processing power, resulting in increased latency and decreased throughput. ♦ **AES** - Advanced Encryption Standard is a newer method of data encryption that also uses a secret key. This implementation of AES applies a 128-bit key to 128-bit blocks of data. AES is faster than 3DES. Here you can have the choice **AES-128, AES-192, AES-256.**
Phase 2 Authentication	Select which hash algorithm to use to authenticate packet data in the IKE SA. Choices are **Null, SHA1** and **MD5**. **SHA1** is generally considered stronger than **MD5**, but it is also slower.
Phase 2 SA Lifetime	Define the length of time before an IPSec SA automatically renegotiates keys. It may range from 120 to 86400 seconds.
Show Advanced Settings	Click this button to specify advanced parameters for the VPN. The defaults are typically acceptable. Refer to page 67 for a screen example.
Apply	Click to save all changes.
Key Management	Select Auto (IKE) or select Manual key configuration in order to set up a VPN.
IKE Negotiation Mode	Determines how the Security Association (SA) will be established for each connection through IKE negotiations. The choices are: ♦ Main Mode, which ensures the highest level of security when the communicating parties are negotiating authentication (phase 1). ♦ Aggressive Mode, which is quicker than Main Mode because it eliminates several steps when the communicating parties are negotiating authentication (phase 1).
Perfect Forward Secrecy (PFS)	Perfect Forward Secret (PFS) is Disabled by default in phase 2 IPSec SA setup. This allows faster IPSec setup, but is not so secure. Select DH1, DH2 or DH5 to enable PFS.
Phase 2 DH Group	After enabling PFS, you must select a DH Group.
Replay Detection	Select Enabled or Disabled for replay detection. As VPN setup is processing intensive, the system can be vulnerable to Denial of Service (DOS) attacks. The IPSec receiver can detect and reject old or duplicate packets to protect against replay attacks.

NetBIOS Broadcast Forwarding	Select Enabled or Disabled for sending NetBIOS packets through the VPN connection. NetBIOS (Network Basic Input/Output System) are TCP or UDP packets that enable a computer to find other computers. It may sometimes be necessary to allow NetBIOS packets to pass through VPN tunnels in order to allow local computers to find computers on the remote network and vice versa.
Dead Peer Detection	Select Enabled or Disabled to force the cable modem (if enabled is selected) to periodically detect if the remote IPSec gateway is available or not.
Apply	Click to save all changes.

4.4.4 VPN Configure - Advanced Settings

The following screen is displayed when the Show Advanced Settings button is clicked from the VPN Configure screen (previous section).

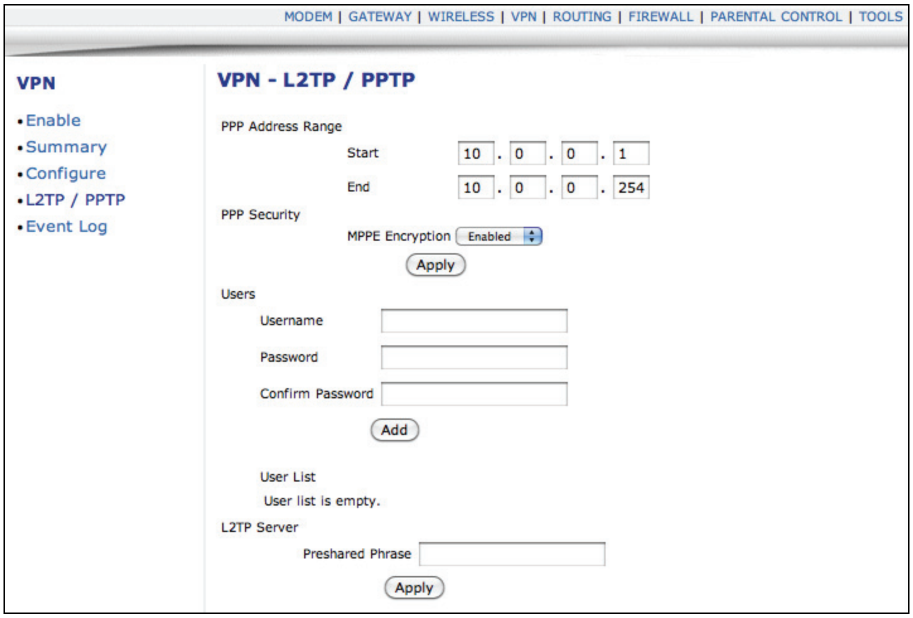


Key management: Auto (IKE)
IKE negotiation mode: Main
Perfect forward secrecy (PFS): Disabled
Phase 2 DH group: Group 1 (768 bits)
Replay detection: Disabled
NetBIOS broadcast forwarding: Disabled
Dead peer detection: Disabled

4.4.5 VPN - L2TP / PPTP

The **L2TP / PPTP** option allows you to configure the **L2TP / PPTP** parameters if this VPN mode is enabled. Layer 2 Tunneling Protocol (L2TP) is a tunneling protocol used to support virtual private networks (VPNs). PPTP (Point-to-Point Tunneling Protocol) is a Microsoft proprietary protocol to tunnel PPP frames, which is very similar to L2TP.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **VPN** link from the top of the screen.
3. Click **L2TP / PPTP** from the left side of the screen. The **L2TP / PPTP** fields are explained following this screen example.


MODEM | GATEWAY | WIRELESS | VPN | ROUTING | FIREWALL | PARENTAL CONTROL | TOOLS
VPN
•Enable
•Summary
•Configure
•L2TP / PPTP
•Event Log
Apply
Add
Apply

VPN - L2TP / PPTP

PPP Address Range

Start 10 . 0 . 0 . 1

End 10 . 0 . 0 . 254

PPP Security

MPPE Encryption Enabled

Users

Username

Password

Confirm Password

User List

User list is empty.

L2TP Server

Preshared Phrase

Label	Description
PPP Address Range Start / End	Select the specific IP range to be used for the VPN tunnels.
MPPE Encryption	Select Disabled or Enabled to enable MPPE Encryption. MPPE uses the RSA RC4 encryption algorithm.
Apply	Click to save the above configuration.
Username / Password / Confirm	Enter a Username and a Password required by that user to access the VPN. Reenter the password in the Confirm Password field.
User List	All added users are displayed.
L2TP Preshared Phrase	Enter a Preshared Phrase.
Apply	Click to save the configuration.

4.4.6 Additional information - VPN Overview

Internet protocol Security (IPSec) is a standard based VPN that offers flexible solutions for secure data communications across a public network like the Internet. IPSec is built around a number of standardized cryptographic techniques to provide confidentiality, data integrity, and authentication at the IP layer. A VPN tunnel is usually established in two phases. Each phase establishes a security association (SA), a contract indicating what security parameters the cable modem and the remote IPSec router will use.

- ❑ The first phase establishes an Internet Key Exchange (IKE) SA between the cable modem and the remote IPSec router.
- ❑ The second phase uses the IKE SA to securely establish an IPSec SA through which the cable modem and the remote IPSec router can send data between computers on the local and remote network.

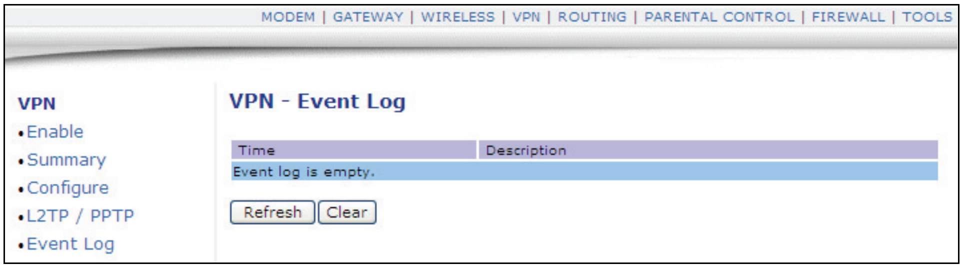
Before IPSec VPN configuration, you may need to understand the following terms:

- ❑ **IPSec Algorithms**—The **ESP** and **AH** protocols are necessary to create a Security Association (SA), the foundation of an IPSec VPN. An SA is built from the authentication provided by the **AH** and **ESP** protocols. The primary function of key management is to establish and maintain the SA between systems. Once the SA is established, the transport of data may commence.
- ❑ **AH (Authentication Header) Protocol—AH** protocol (RFC 2402) was designed for integrity, authentication, sequence integrity (replay resistance), and non-repudiation but not for confidentiality, for which the **ESP** was designed. In applications where confidentiality is not required or not sanctioned by government encryption restrictions, an **AH** can be employed to ensure integrity. This type of implementation does not protect the information from dissemination but will allow for verification of the integrity of the information and authentication of the originator.
- ❑ **ESP (Encapsulating Security Payload) Protocol**—The **ESP** protocol (RFC 2406) provides encryption as well as the services offered by **AH**. **ESP** authenticating properties are limited compared to the **AH** due to the non-inclusion of the IP header information during the authentication process. However, **ESP** is sufficient if only the upper layer protocols need to be authenticated. An added feature of the **ESP** is payload padding, which further protects communications by concealing the size of the packet being transmitted.

4.4.7 VPN - Event Log

The **Event Log** option allows you to view the VPN Event Log.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **VPN** link from the top of the screen.
3. Click **Event Log** from the left side of the screen. The **Event Log** fields are explained following this screen example.


MODEM | GATEWAY | WIRELESS | VPN | ROUTING | PARENTAL CONTROL | FIREWALL | TOOLS
VPN
•Enable
•Summary
•Configure
•L2TP / PPTP
•Event Log
VPN - Event Log
Refresh
Clear

Time	Description
Event log is empty.	

Label	Description
Time	Displays the local time of a certain log event.
Description	Displays detailed information of a log.
Refresh	Click to refresh the current page to view new log events.
Clear	Click to clear all of the logs.

4.5 Parental Control Menu

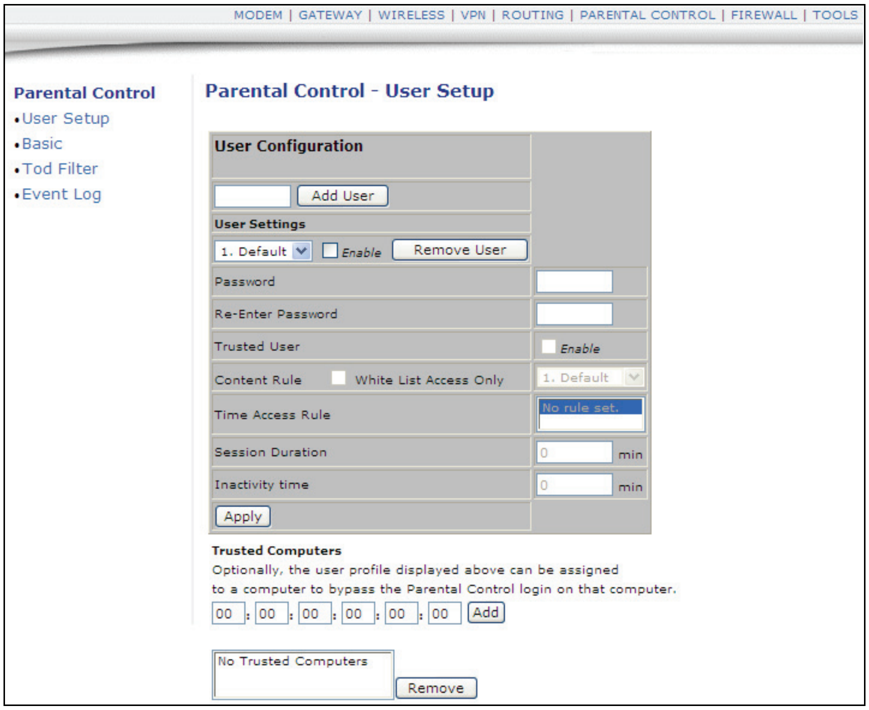
This chapter provides instructions for controlling the internet access of users on the DDW2600 Wireless & DDC2700 Commercial Cable Modem/Router network. These parental control features include defining user/password access, defining the what times users are allowed to access the internet, blocking certain web sites, and blocking certain sites by keywords.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Parental Control** link from the top of the screen.

4.5.1 Parental Control - User Setup

The **User Setup** option allows the configuration of user accounts that can or cannot connect to your wireless or wired network, and the parameters of the connection.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Parental Control** link from the top of the screen.
3. Click **User Setup** from the left side of the screen. The **User Setup** fields are explained following this screen example. Note: To enable Parental Control, refer to page 73.



Parental Control - User Setup

User Configuration

User Settings

1. Default ☐ Enable

Password	
Re-Enter Password	
Trusted User	☐ Enable
Content Rule ☐ White List Access Only	1. Default
Time Access Rule	No rule set.
Session Duration	0 min
Inactivity time	0 min

Trusted Computers
Optionally, the user profile displayed above can be assigned to a computer to bypass the Parental Control login on that computer.

00 : 00 : 00 : 00 : 00 : 00

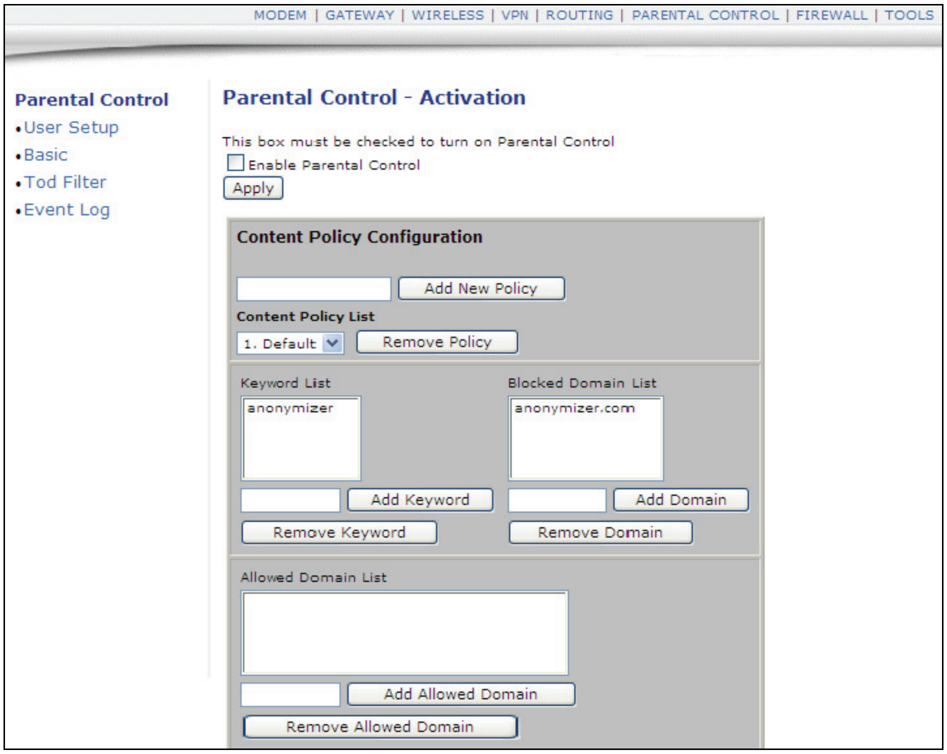
No Trusted Computers

Label	Description
User Configuration/Add User/Remove User/Enable	Select an existing user account to edit from the User Settings pop-up menu. Or, enter a new user name and click the Add button. To activate the user, click the Enable button. To remove a user, select a user from the pop-up menu and click the Remove button.
Password	Enter the password for this user. It is required when this user tries to access the Internet via the cable modem.
Re-Enter Password	Re-enter the password as required.
Trusted User	Click the Enable checkbox to allow the selected user to be trusted user. That means the user is now limited to timing and content when visiting Internet, as defined in the following fields.
Content Rule	Select from the pop-up menu an existing content rule that defines what kind of websites the user can visit or not.
White List Access Only	If you have created a content rule which defines a black list and white list, then you can select the White List Access Only checkbox to force the cable modem to execute the policy for the selected user
Time Access Rule	Select a defined time access rule to apply to the selected user.
Session Duration	Enter a time in minutes for the user's session expiration. Upon expiration, the user can log back in for the same session duration.
Inactivity Time	Enter the time out value when a user has no activity on the Internet. When the time expires, the user interface to the internet cancelled.
Apply	Click to save all changes.
Trusted Computers	Define the trusted hosts that will bypass the Parental Control Process.
Add	Enter the trusted host's MAC address and click the Add button to save.
Remove	To remove a trusted computer, highlight it from the list and click the Remove button.

4.5.2 Parental Control - Basic Settings

The **Basic** option allows basic selection of rules which block certain Internet content and certain Web sites. When you change your Parental Control settings, you must click on the appropriate "Apply," "Add," or "Remove" button for your new settings to take effect. Refresh your browser's display to see the currently active settings.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Parental Control** link from the top of the screen.
3. Click **Basic** from the left side of the screen. The **Basic** fields are explained following this screen example.



Parental Control - Activation

This box must be checked to turn on Parental Control

□ Enable Parental Control

Content Policy List: 1. Default

Keyword List: anonymizer

Blocked Domain List: anonymizer.com

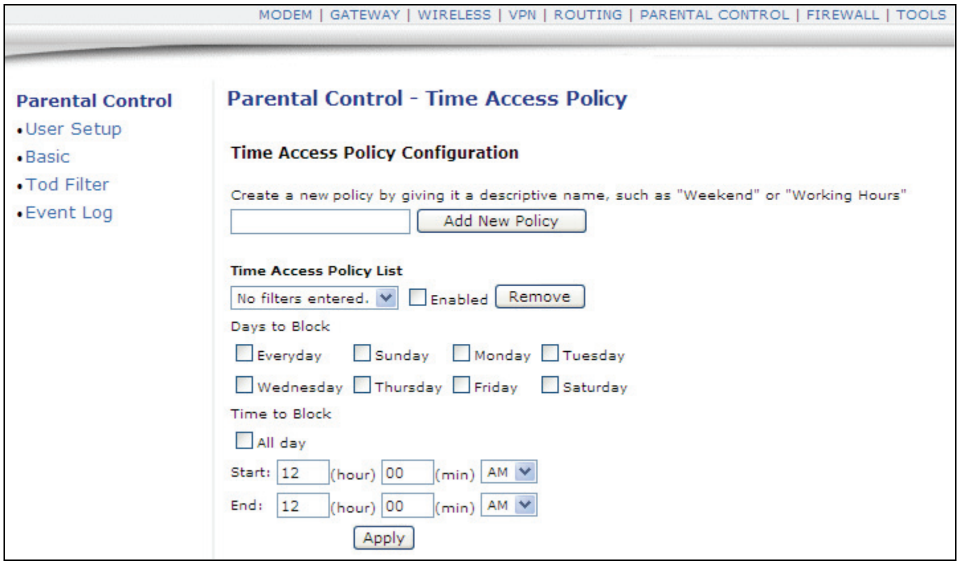
Label	Description
Enable Parental Control	Click the Enable checkbox to activate the Parental Control feature.
Apply	Click to save all changes in the screen and activate Parental Control, if enabled.
Content Policy Configuration	This part of the screen allows you to configure the internet content access policy.
Add New Policy	Enter a policy name and click Add New Policy to create a new policy.
Content Policy List/Remove Policy	Select from the list an existing policy to edit or remove. If removing a policy, select it from the list and click the Remove Policy button.

Keyword List/ Add Keyword/ Remove Keyword	Enter keywords to use in order to filter out web site addresses (URLs) containing those words. Enter a keyword and click the Add Keyword button. To remove a keyword, select it from the list and click Remove Keyword.
Blocked Domain List/ Add Domain/ Remove Domain	Enter web domains (for example, unwanted.com) to use in order to filter out access to those domains. Enter a domain and click the Add Domain button. To remove a domain, select it from the list and click Remove Domain.
Allowed Domain List	This list allows users to visit specific sites. This list restricts users to these sites only.
Add Allowed Domain	Enter a domain name and click Add Allowed Domain.
Remove Allowed Domain	To remove a domain, highlight it from the list and click Remove Allowed Domain.

4.5.3 Parental Control - Tod Filter

The **Tod Filter** option allows the configuration of time-based access policies to block all internet traffic at specified times.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Parental Control** link from the top of the screen.
3. Click **Tod Filter** from the left side of the screen. The **Tod Filter** fields are explained following this screen example.


MODEM | GATEWAY | WIRELESS | VPN | ROUTING | PARENTAL CONTROL | FIREWALL | TOOLS
Parental Control
•User Setup
•Basic
•Tod Filter
•Event Log
Add New Policy
Remove
Apply

Parental Control - Time Access Policy

Time Access Policy Configuration

Create a new policy by giving it a descriptive name, such as "Weekend" or "Working Hours"

Time Access Policy List

No filters entered. ☐ Enabled

Days to Block

☐ Everyday ☐ Sunday ☐ Monday ☐ Tuesday

☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday

Time to Block

☐ All day

Start: 12 (hour) 00 (min) AM

End: 12 (hour) 00 (min) AM

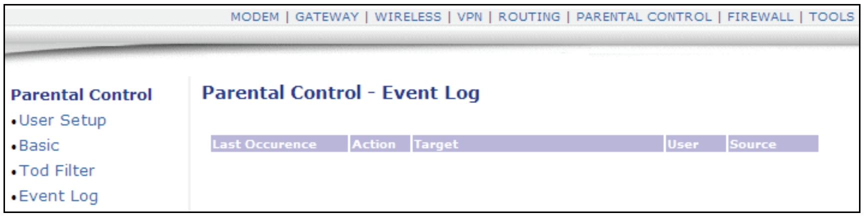
Label	Description
Add New Policy	Enter a policy name and click the Add New Policy button.
Time Access Policy List	Select a policy to edit from the drop-down list.

Enable/Remove	Select the Enabled checkbox to activate this policy. If the checkbox is unselected, the policy is not active. To remove a policy, select the policy from the drop-down list and click the Remove button.
Days to Block	Select the days to block Internet access. The internet access times for the days selected to block are defined in the following fields.
Time to Block	
All Day	Select All Day to eliminate all access during the days selected to block. Or, enter a specific time range in the Start and End fields.
Apply	Click to save all changes.

4.5.4 Parental Control - Event Log

The **Event Log** option displays Parental Control event log reporting.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Parental Control** link from the top of the screen.
3. Click **Event Log** from the left side of the screen. The **Event Log** fields are explained following this screen example.


MODEM | GATEWAY | WIRELESS | VPN | ROUTING | PARENTAL CONTROL | FIREWALL | TOOLS
Parental Control
•User Setup
•Basic
•Tod Filter
•Event Log

Parental Control - Event Log

Last Occurence	Action	Target	User	Source

Label	Description
Last Occurrence	Displays the time when the last event occurred.
Action	Displays what is done by parental control, including dropping or permitting access requests.
Target	Displays the destination IP address of a certain access request.
User	Displays the user who triggered this event log.
Source	Displays the source IP address of this event.
Refresh/Clear Log	Click Refresh to update the log with the most currently recorded events. Click Clear to empty the displayed log entries.

4.6 Firewall Menu

This chapter provides instructions for configuring the DDW2600 Wireless & DDC2700 Commercial Cable Modem/Router firewall to control what types of traffic are allowed on your network. The firewall can block certain Web-oriented cookies, java scripts, and pop-up windows. It is highly recommended that the Firewall is left enabled at all times for protection against Denial of Service attacks. Refer to Parental Control Menu, on page 71 to block internet access to specific sites.

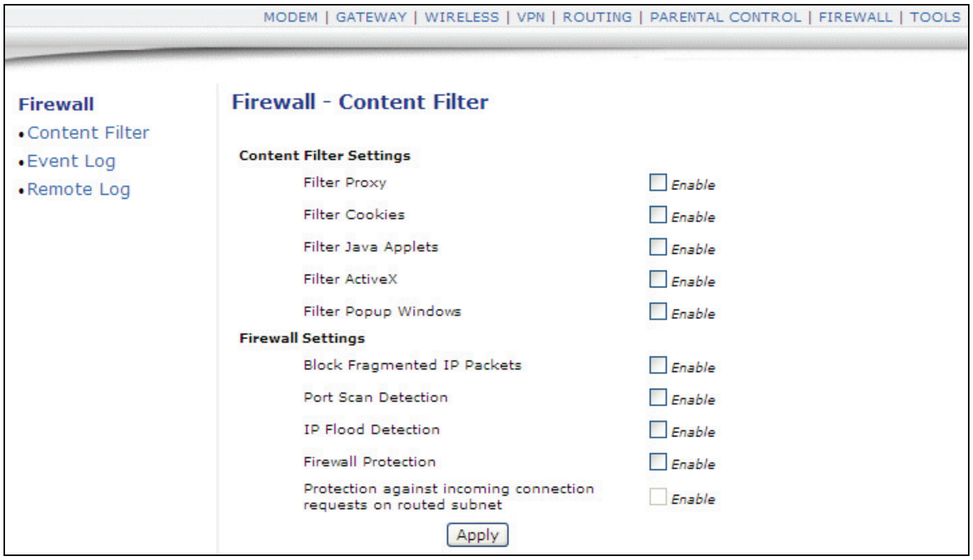
Note: Firewall menu options are not available when the device is in Bridge mode. Firewall options are available only when the device is in NAT, NATRoute, or Route modes.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Firewall** link from the top of the screen.

4.6.1 Firewall - Content Filter

The **Content Filter** option allows you to configure the blocking of certain Web-oriented cookies, java scripts, and pop-up windows. It also has options that protect against network attacks, questionable data, and undesired connections.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Firewall** link from the top of the screen.
3. Click **Content Filter** from the left side of the screen. The **Content Filter** fields are explained following this screen example.


MODEM | GATEWAY | WIRELESS | VPN | ROUTING | PARENTAL CONTROL | FIREWALL | TOOLS
Firewall
• Content Filter
• Event Log
• Remote Log
Apply

Firewall - Content Filter

Content Filter Settings

Filter Proxy	□ Enable
Filter Cookies	□ Enable
Filter Java Applets	□ Enable
Filter ActiveX	□ Enable
Filter Popup Windows	□ Enable

Firewall Settings

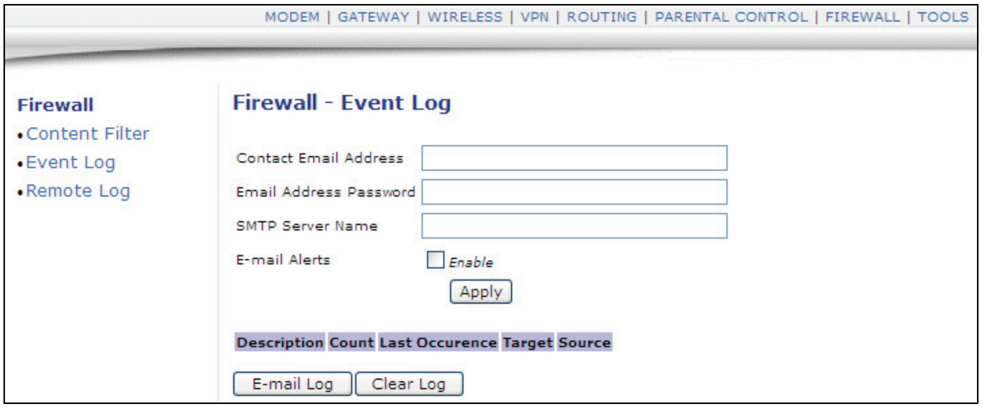
Block Fragmented IP Packets	□ Enable
Port Scan Detection	□ Enable
IP Flood Detection	□ Enable
Firewall Protection	□ Enable
Protection against incoming connection requests on routed subnet	□ Enable

Label	Description
Content Filter Settings	Click the **Enable** button to enable a filter. Deselecting a checkbox disables the feature.
Filter Proxy	An enabled filter proxy server acts as an intermediary between a user and the Internet to provide security, administrative control, and caching service. When a proxy server is located on the WAN, it is possible for LAN users to circumvent content filtering by pointing to this proxy server.
Filter Cookies	Enable this filter to stop Cookies from being stored on a connected computer's hard drive. Some web servers use them to track usage and provide service based on an ID found in the Cookies.
Filter Java Applets	Enable this filter to stop Java applets from being launched on connected computers. Java is a programming language and development environment for building downloadable Web components or Internet and intranet business applications.
Filter ActiveX	Enable this filter to stop ActiveX applications from being launched on connected computers. ActiveX is a tool for building dynamic and active web pages and distributed object applications. When you visit an ActiveX web site, ActiveX controls are downloaded to your browser, where they remain in case you visit the site again.
Filter Popup Windows	Enable this filter to stop popup windows when visiting some websites.
Firewall Settings	Click the **Enable** button to enable a firewall setting. Deselecting a checkbox disables the feature.
Block Fragmented IP Packets	Enable this feature to have the firewall detect fragmented IP packets and block them.
Port Scan Detection	Enable this feature to have the firewall detect port scan attacks.
IP Flood Detection	Enable this feature to have the firewall to detect IP flood attacks.
Firewall Protection	Enable this feature to activate the firewall function.
Protection against incoming connection requests on routed subnet	Enable this feature to have the firewall to protect all of the routed subnets connected to the cable modem.
Apply	Click to save the configuration.

4.6.2 Firewall - Event Log

The **Event Log** option allows you to configure firewall event log reporting via email alerts and report on possible attacks on the system.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Firewall** link from the top of the screen.
3. Click **Event Log** from the left side of the screen. The **Event Log** fields are explained following this screen example.


MODEM | GATEWAY | WIRELESS | VPN | ROUTING | PARENTAL CONTROL | FIREWALL | TOOLS
Firewall
•Content Filter
•Event Log
•Remote Log
Apply
E-mail Log
Clear Log

Firewall - Event Log

Contact Email Address

Email Address Password

SMTP Server Name

E-mail Alerts □ *Enable*

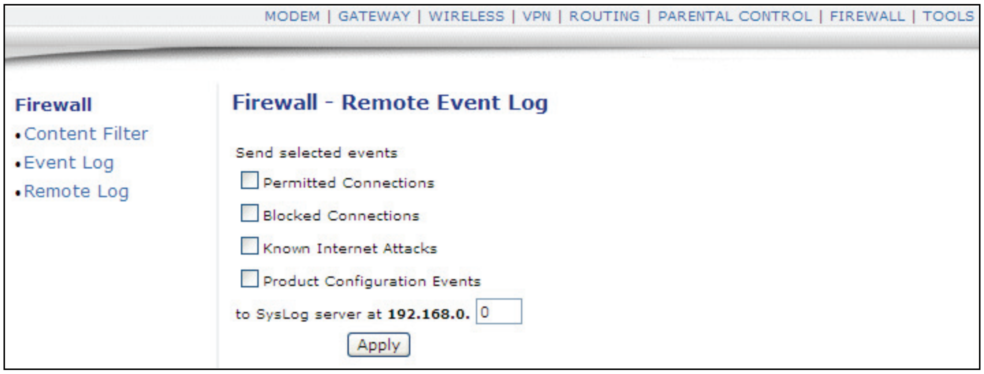
Description	Count	Last Occurence	Target	Source

4. Enter the appropriate email address and password information, enter the SMTP server, then click the **Enable** button. Click **Apply** to complete the setup. The entered email address will begin to receive firewall events.

4.6.3 Firewall - Remote Log

The **Remote Log** option allows you to configure events to be sent to a local SysLog server.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Firewall** link from the top of the screen.
3. Click **Remote Log** from the left side of the screen. The **Remote Log** fields are explained following this screen example.


MODEM | GATEWAY | WIRELESS | VPN | ROUTING | PARENTAL CONTROL | FIREWALL | TOOLS
Firewall
•Content Filter
•Event Log
•Remote Log
Apply

Firewall - Remote Event Log

Send selected events

□ Permitted Connections

□ Blocked Connections

□ Known Internet Attacks

□ Product Configuration Events

to SysLog server at **192.168.0.** 0

Label	Description
Permitted Connections	Select to log all access attempts that are allowed by firewall.
Blocked Connections	Select to log all access attempts that are blocked by firewall.
Known Internet Attacks	Select to log all known attacks from Internet.
Product Configuration Events	Select to log whenever the DDW2600 Wireless & DDC2700 Commercial Cable Modem/Router is configured/modified by a user or admin.
SysLog server	Enter the IP address of the Syslog server.
Apply	Click to save the remote log configuration.

4.7 Tools Menu

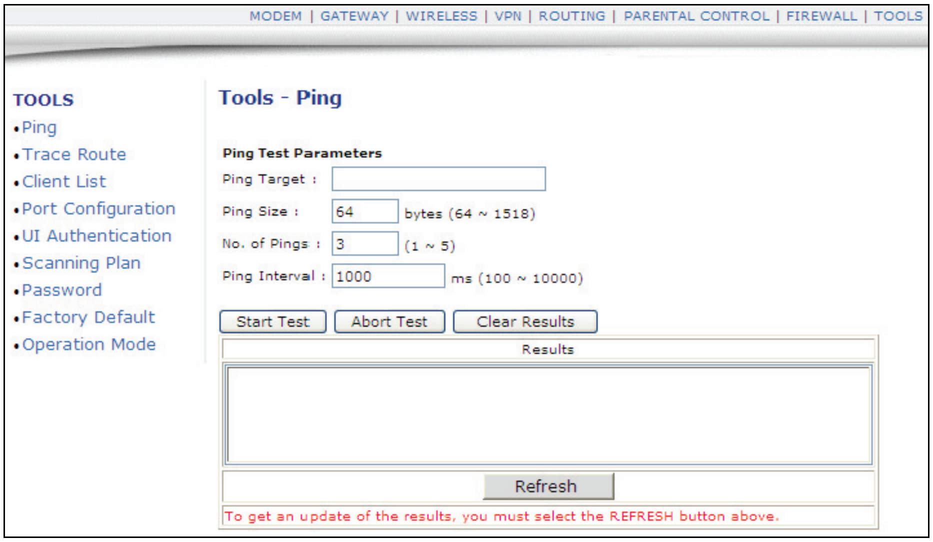
This chapter contains instructions for using a variety of tools to evaluate, diagnose, and configure the operation of DDW2600 Wireless & DDC2700 Commercial Cable Modem/Router.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Tools** link from the top of the screen.

4.7.1 Tools - Ping

The **Ping** option is a utility to test connectivity to a specific device by its IP address.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Tools** link from the top of the screen.
3. Click **Ping** from the left side of the screen. The **Ping** fields are explained following this screen example.



Tools - Ping

Ping Test Parameters

Ping Target :

Ping Size : 64 bytes (64 ~ 1518)

No. of Pings : 3 (1 ~ 5)

Ping Interval : 1000 ms (100 ~ 10000)

To get an update of the results, you must select the REFRESH button above.

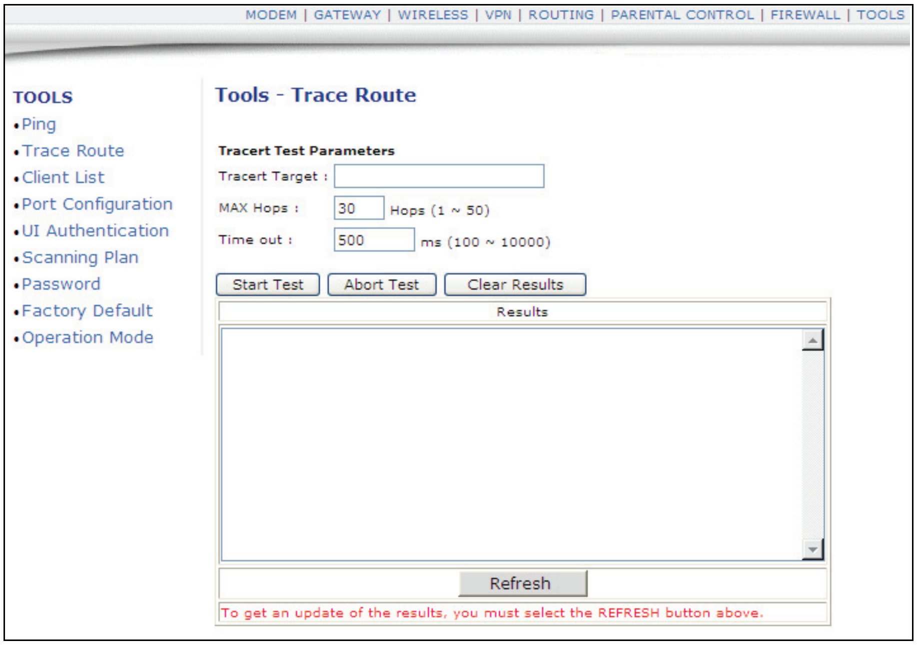
Label	Description
Ping Target	Enter the IP address to which you want to send a ping. A ping tests the network connectivity between devices by sending a test message to a specific device. You can also confirm the size of data sent is the same as received.
Ping Size	Enter the packet size to send for the ping operation.
No. of Pings	Enter the number of ping commands to send to the ping target.

Ping Interval	Define the interval between ping operations in milliseconds.
Start Test/Abort Test/Clear Results	Click Start to start the ping test. Click Abort Test to cancel the ping test. Click Clear Results to clear the displayed ping results.
Results/Refresh	The Results area of the screen displays the ping results. Click Refresh to update the screen with on-going ping tests.

4.7.2 Tools - Trace Route

The **Trace Route** option is a utility to test the route that data is taking to and from the DDW2600 Wireless & DDC2700 Commercial Cable Modem/Router.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Tools** link from the top of the screen.
3. Click **Trace Route** from the left side of the screen. The **Trace Route** fields are explained following this screen example.



Tools - Trace Route

Tracert Test Parameters

Tracert Target :

MAX Hops : 30 Hops (1 ~ 50)

Time out : 500 ms (100 ~ 10000)

To get an update of the results, you must select the REFRESH button above.

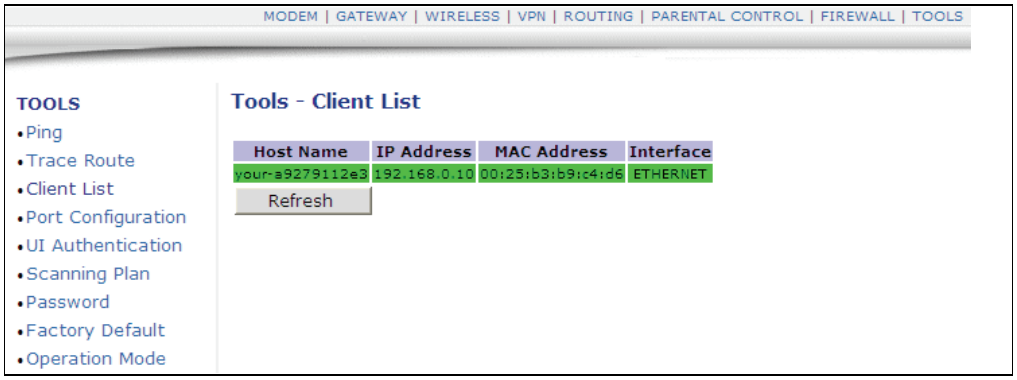
Label	Description
Tracert Target	Enter the specific IP address or domain (e.g. yahoo.com) to which you want to trace a route.
MAX Hops	Define the MAX hops. Hops is the number routers that the trace route traverses.

Time Out	Enter the expiration time for this trace route operation.
Start Test/Abort Test/Clear Results	Click Start to start the trace route test. Click Abort Test to cancel the test. Click Clear Results to clear the displayed trace route results.
Results/Refresh	This Results area of the screen displays the trace route results. Click Refresh to update the screen with on-going trace route tests.

4.7.3 Tools - Client List

The **Client List** option displays connected computers to the DDW2600 Wireless & DDC2700 Commercial Cable Modem/Router.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Tools** link from the top of the screen.
3. Click **Client List** from the left side of the screen. The **Client List** fields are explained following this screen example.



Tools - Client List

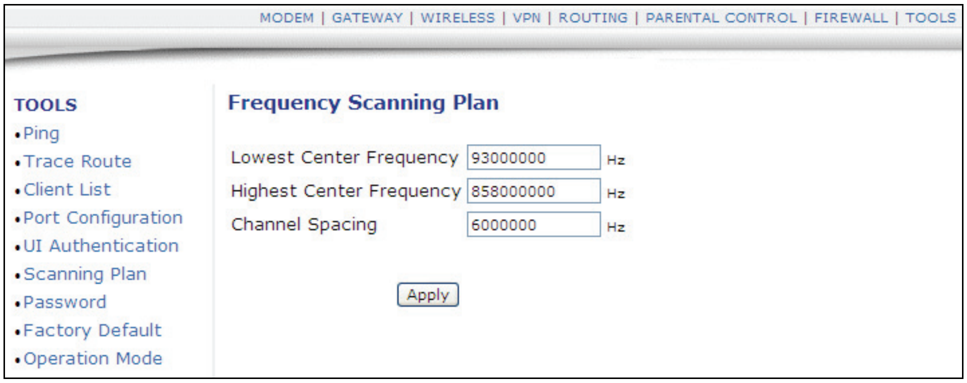
Host Name	IP Address	MAC Address	Interface
your-a9279112e3	192.168.0.10	00:25:b3:b9:c4:d6	ETHERNET

Label	Description
Hostname/IP Address/ MAC Address	DHCP Clients currently connected to the DDW2600 Wireless & DDC2700 Commercial Cable Modem/Router are displayed in this list and are identified by the hostname, IP address, and MAC address of the connected devices.
Interface	The method that clients are connected to the device is displayed (for example, Ethernet (LAN), Wireless).
Refresh	Click to refresh the client list. This may be useful when testing network connectivity between connecting clients and the DDW2600 Wireless & DDC2700 Commercial Cable Modem/Router.

4.7.4 Tools - Scanning Plan

The **Scanning Plan** option allows you to define a specific range of frequency for the cable modem to scan and use.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Tools** link from the top of the screen.
3. Click **Scanning Plan** from the left side of the screen. The **Scanning Plan** fields are explained following this screen example.



Frequency Scanning Plan

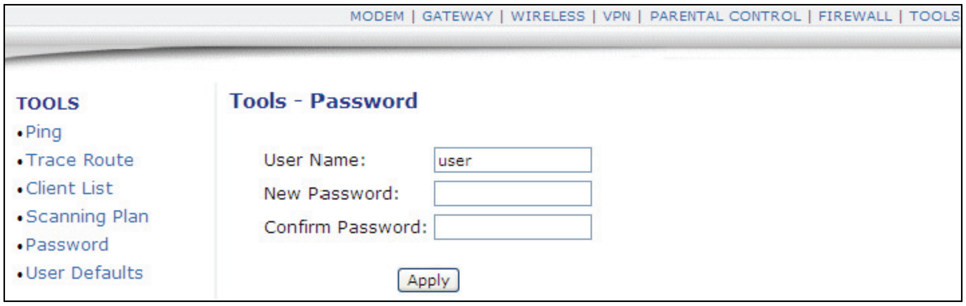
Lowest Center Frequency 93000000 Hz
Highest Center Frequency 858000000 Hz
Channel Spacing 6000000 Hz

Label	Description
Lowest Center Frequency	Lowest and Highest Center Frequency are used to define a scope for the frequencies used by the cable modem. Enter the low end of the frequency range.
Highest Center Frequency	Enter the high end of the frequency range.
Channel Spacing	Channel spacing is set for the width of the frequency spectrum to scan whenever the cable modem scans. If it is 6000000, for example, when scanning from 9300000, the cable modem will scan from 93000000 to 99000000, then from 99000000 to 105000000, and so on until the Highest Center Frequency is reached.

4.7.5 Tools - Password (Subscriber)

The **Password** option allows you to change the subscriber-level password for the logins on the DDW2600 Wireless & DDC2700 Commercial Cable Modem/Router. This login is used to access this web interface. For information on default logins, refer to page 7.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Tools** link from the top of the screen.
3. Click **Password** from the left side of the screen. The **Password** fields are explained following this screen example.



Tools - Password

User Name: user

New Password:

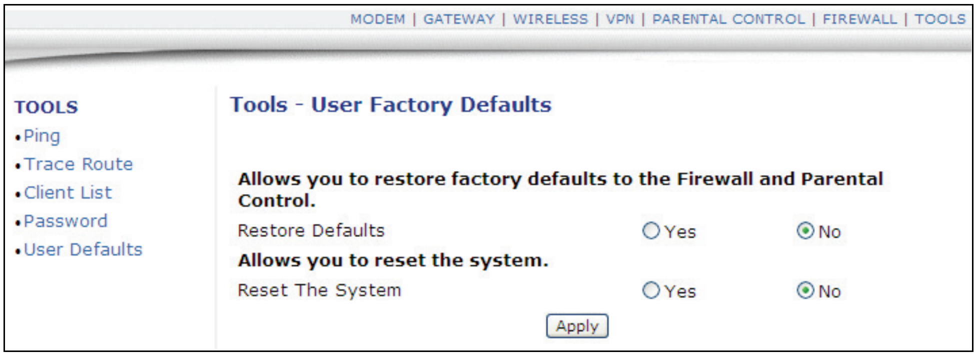
Confirm Password:

Label	Description
User Name/New Password/Confirm Password	To change the user name, enter a new name in User Name field. Otherwise, leave as is. To change the password, enter the new password, and re-enter the new password in the Confirm password field. Click Apply.

4.7.6 Tools - User Defaults

The **User Defaults** option allows you to restore some factory defaults to the system, including Firewall and Parental Control settings.

1. Access the web interface. Refer to page 14, if needed.
2. Click the **Tools** link from the top of the screen.
3. Click **User Default** from the left side of the screen. The **User Default** options are explained following this screen example.


MODEM | GATEWAY | WIRELESS | VPN | PARENTAL CONTROL | FIREWALL | TOOLS
TOOLS
•Ping
•Trace Route
•Client List
•Password
•User Defaults
Apply

Tools - User Factory Defaults

Allows you to restore factory defaults to the Firewall and Parental Control.

Restore Defaults ○ Yes ◉ No

Allows you to reset the system.

Reset The System ○ Yes ◉ No

Label	Description
Restore Defaults	Select Yes to restore the device to default settings for the Firewall and Parental Control settings. This operation does not require a reset of the system.
Reset The system	Select Yes to power cycle and reset the device.
Apply	Click Apply to complete the options selected in this screen.