



WESTELL

ULTRALINE® SERIES3 ROUTER

USER GUIDE



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User Guide

UltraLine Series3 Router



1. PRODUCT DESCRIPTION

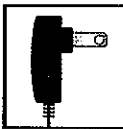
The Westell® UltraLine® Series3 Router is designed to deliver today's most exciting broadband services to and throughout your home. Built around a state-of-the-art, dual-core network processor, this versatile product helps ensure that data and services reach your connected home devices without interruption or delay. The Router allows you to transfer data over your existing in-home coax cables and simultaneously supports both "wired" and "wireless" connection options. This flexibility allows for the connection of a wide range of network enabled devices such as desktop computers, laptop computers, digital media players, and network attached storage (NAS) units.

Hereafter, the Westell® UltraLine® Series3 Router will be referred to as the "Router."

Key Features:

- VDSL2 WAN Interface
- Ethernet WAN Interface
- Optional Multimedia over Coax (MoCA) LAN interface
- 4-Port 10/100 BaseT Ethernet LAN switch
- Integrated 802.11b/g Access Point (802.11n Optional)
- Embedded Stateful Firewall
- IP Quality of Service
- IGMP Proxy Functionality

The Westell® UltraLine® Router is powered by an ENERGY STAR® qualified adapter.



Powered by an
ENERGY STAR®
qualified adapter
for a better
environment

This User Guide is intended to provide installation and configuration information on the Westell® UltraLine® Router and assumes the user of this Router has a medium to advanced understanding of computing, routing and internet networking.

2. SAFETY INSTRUCTIONS

- Never install any telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch non-insulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

⚠ **WARNING** ⚠

Risk of electric shock. Voltages up to 140 Vdc (with reference to ground) may be present on telecommunications circuits.



3. REGULATORY INFORMATION

3.1 FCC Compliance Note

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to a different circuit from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

WARNING: While this device is in operation, a separation distance of at least 20 cm (8 inches) must be maintained between the radiating antenna and users exposed to the transmitter in order to meet the FCC RF exposure guidelines. Making changes to the antenna or the device is not permitted. Doing so may result in the installed system exceeding RF exposure requirements. This device must not be co-located or operated in conjunction with any other antenna or radio transmitter. Installers and end users must follow the installation instructions provided in this guide.

Modifications made to this device, unless expressly approved, could void the users' rights to operate this device.

PART 68 – COMPLIANCE REGISTRATION

This equipment is designated to connect to the telephone network or premises wiring using a compatible modular jack that is Part 68 compliant. An FCC compliant telephone cord and modular plug is provided with the equipment. See the Installation Information section of this User Guide for details.

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. See installation instruction for details.

If this terminal equipment (Model 9000/9050/9100/9150) causes harm to the telephone network, the telephone company may request you to disconnect the equipment until the problem is resolved. The telephone company will notify you in advance if temporary discontinuance of service is required. If advance notification is not practical, the telephone company will notify you as soon as possible. You will be advised of your right to file a complaint with the FCC if you believe such action is necessary. If you experience trouble with this equipment (Model 9000/9050/9100/9150), do not try to repair the equipment yourself. The equipment cannot be repaired in the field. Contact Westell for instructions.

The telephone company may make changes to their facilities, equipment, operations, or procedures that could affect the operation of this equipment. If this happens, the telephone company will provide advance notice in order for you to make the modifications necessary to maintain uninterrupted service.



If your home has specially wired alarm equipment connected to the telephone line, ensure that the installation of this equipment (Model 9000/9050/9100/9150) does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer. This equipment cannot be used on public coin phone service provided by the telephone company. Connection of this equipment to party line service is subject to state tariffs.

3.2 Canada Certification Notice

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operations and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The department does not guarantee the equipment will operate to the user's satisfaction.

This equipment meets the applicable Industry Canada Terminal Equipment Technical Specification. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment. The Ringer Equivalence Number (REN) is 0.0. The Ringer Equivalence Number that is assigned to each piece of terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local Telecommunication Company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations. Connection to a party line service is subject to state tariffs. Contact the state public utility commission, public service commission, or corporation commission for information.

If your home has specially wired alarm equipment connected to the telephone line, ensure that the installation of this equipment (Model 9000/9050/9100/9150) does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

If you experience trouble with this equipment (Model 9000/9050/9100/9150), do not try to repair the equipment yourself. The equipment cannot be repaired in the field and must be returned to the manufacturer. Repairs to certified equipment should be coordinated by a representative, and designated by the supplier. Contact Westell for instructions.

The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five. Users should ensure, for their own protection, that the electrical ground connections of the power utility, telephone lines, and internal, metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.



Users should not attempt to make such connections themselves, but should contact the appropriate electrical inspection authority, or electrician, as appropriate.



4. NETWORKING REQUIREMENTS

The following minimum system specifications are required for optimum performance of your Router.

Requirements for a connected computer:

- Pentium® or equivalent class machines or higher
- Microsoft® Windows® (98 SE or later), Macintosh® OS X, or Linux installed
- 64 MB RAM (128+ MB recommended)
- 10/100 Base-T Network Interface Card (NIC)
- Optional wireless radio (802.11b/g/n)
- Internet Explorer 7+, Netscape Navigator 7+, Firefox 1.0.7+, Chrome 1.0+, Safari 3+

5. HARDWARE FEATURES

5.1 LED Indicators

This section explains the front-panel and rear-panel LED states and descriptions. LEDs are used to verify the unit's operation and status.

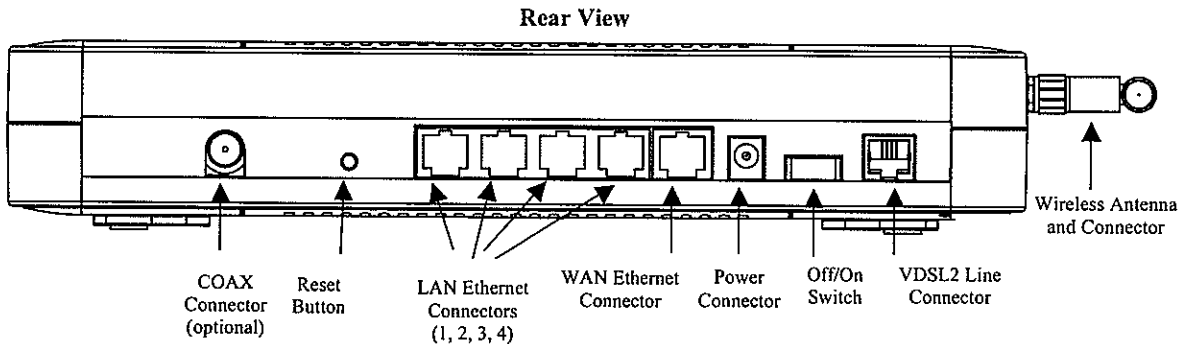
LED States and Descriptions

UltraLine Router Front Panel LEDs		
LED	State	Description
POWER	Solid Green	Power is ON.
	Flashing Green	Router is performing POST.
	Solid Red	Router failed POST (Power On Self Test) or Device Malfunction. Note: The Power LED should be red no longer than two seconds after the power on self test passes.
	OFF	Power is OFF.
BROADBAND	Solid Green	WAN physical link established. (VDSL2 or Ethernet)
	Flashing Green	Router attempting to sync.
	Solid Red	Router failed to sync.
	OFF	Router power is OFF or no WAN signal detected.
INTERNET	Solid Green	Internet link established. VDSL2 link is Up, and the Router has a WAN IP address; or a static IP is configured; or PPP negotiation has successfully completed (if used) and no traffic is detected.
	Flashing Green	IP connection established and IP Traffic is passing through device (in either direction). Note: If the IP or PPP session is dropped due to an idle timeout, the light will remain solid green if a VDSL2 connection is still present. If the session is dropped for any other reason, the light is turned OFF. The light will turn amber when it attempts to reconnect and DHCP or PPP fails).
	Solid Amber	Router has attempted and failed to establish IP connectivity (no DHCP response, no PPP response, PPP authentication failed, no IP address from IPCP, etc.).
	OFF	Router power is OFF; or Router is performing POST; or Router is in Bridge Mode; or Router has not attempted Internet connectivity.
Wi-Fi Protected SETUP	Flashing Green	Router is scanning for WPS enabled clients: WPS pairing procedure should be completed on the client device. (i.e. laptop)
	OFF	Wi-Fi Protected Setup not active.
LAN Ethernet 1,2,3,4	Solid Green	Powered device is connected to the associated port.
	Flashing Green	10/100 Base-T LAN activity is present (traffic in either direction).
	OFF	No cable or no powered device is connected to the associated port.
COAX (optional)	Solid Green	A physical connection has been established.
	Flashing Green	Activity is present on the COAX link.
	OFF	No cable or no powered device is connected to the Coax network.

WIRELESS	Solid Green	Wireless link established or wireless radio is ON.
	Flashing Green	Wireless LAN activity is present.
	OFF	No wireless link established or wireless radio is OFF
Rear Panel LEDs		
LAN/WAN Ethernet Ports (Left LED)	Solid Green	100 Mbps link established.
	Flashing Green	LAN activity at 100 Mbps (traffic in either direction).
	OFF	No 100 Mbps link.
LAN/WAN Ethernet Ports (Right LED)	Solid Green	10 Mbps link established.
	Flashing Green	LAN activity at 10 Mbps (traffic in either direction).
	OFF	No 10 Mbps link.

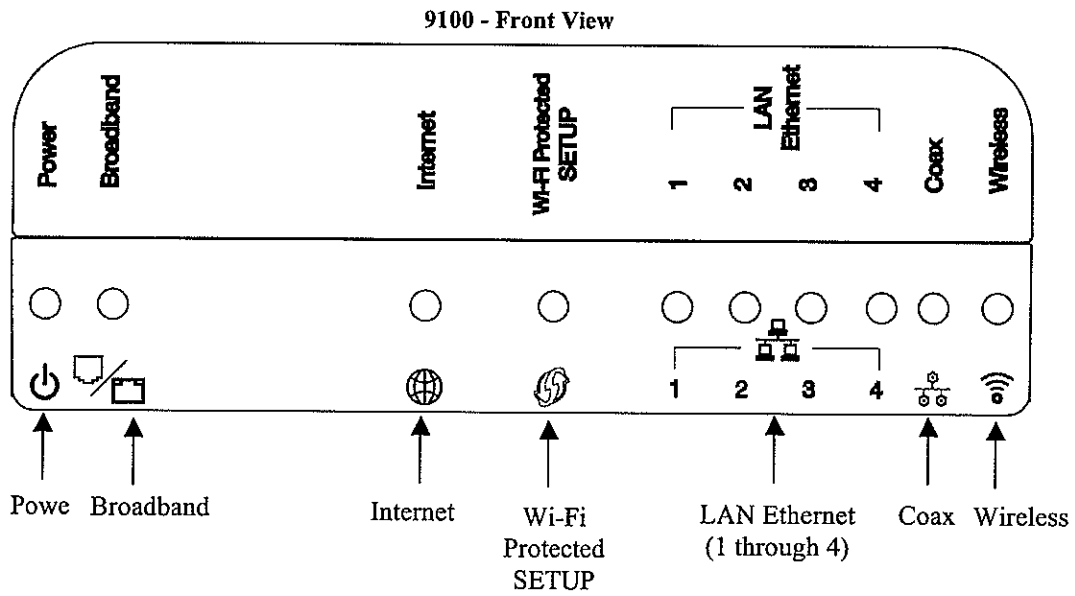
5.2 Cable Connectors and Switch Locations

- Coax connector (optional)
- Reset push button
- Four LAN Ethernet connectors
- WAN Ethernet connector
- Power connector
- OFF/ON power switch
- VDSL2 connector
- Wireless SMA connector and antenna



5.3 Front Panel LEDs

- Power
- Broadband
- Internet
- Wi-Fi Protected SETUP
- LAN Ethernet (1, 2, 3, 4)
- Coax (optional)
- Wireless





5.4 Connector Descriptions

The following chart displays the Router's rear panel connector and switches.

NAME	TYPE	FUNCTION
COAX	F-type COAX connector	Optional Feature - Connects the Router to the in-home coaxial cabling. Compatible with the Multimedia over Coax Alliance (MoCA) standards.
LAN	8-pin (RJ-45) modular jack	Connects the Router's 10/100 Base-T Ethernet switch to a local computer, Hub/Switch, or other Ethernet-enabled device.
WAN	8-pin (RJ-45) modular jack	Connects the Router to a broadband modem or router via 10/100 Base-T Ethernet, enabling access to the Internet or Wide Area Network (WAN).
DC 12V	Barrel connector	Connects the Router's DC 12V power connector to an AC wall jack. Use only the power supply provided with the Router kit.
POWER	Off/On power switch	Allows you to turn on or turn off the Router.
VDSL2	6-pin RJ-11 modular jack	Connects to a wall jack provisioned with VDSL2 service or to the VDSL2 jack of a POTS splitter.
Wireless Antenna and Connector	SMA connector and antenna	Antenna for transmitting and receiving wireless signals for Wi-Fi (802.11b/g/n) connected devices.



6. INSTALLING THE ROUTER

This section explains the hardware installation procedures for connecting your Router to your broadband service as well as to devices in your home, such as computers or media players.

IMPORTANT: Please wait until you have received notification from your ISP that your VDSL2 line has been activated before installing your Router.

6.1 Before you begin

Make sure that your kit contains, at minimum, the following items:

- UltraLine Router
- Power Supply
- Cable Package—Includes an RJ-45 Ethernet cable (straight-through) (yellow) and an RJ-45 Phone cable (beige)
- Wireless antenna (attached to unit)
- Router Stand

Before you install your Router, please read the following notes:

NOTE:

1. It is recommended that you use a surge suppressor to protect equipment attached to the power supply. **Use only the power supply provided with your kit.**
2. If the Ethernet card in your PC does not auto-negotiate, set it to half duplex. Refer to the Ethernet card manufacturer's instructions for installing and configuring your Ethernet card.
3. Additional Ethernet cables may be required depending on the installation method you are using. Ethernet cables can be purchased at your local computer hardware retailer.

6.2 Microfilters

VDSL2 signals must be blocked from reaching each telephone, answering machine, fax machine, computer modem, or any similar conventional device. Failure to do so may degrade telephone voice quality and VDSL2 performance. Install a microfilter if you desire to use the VDSL2-equipped line jack for telephone, answering machine, fax machine, or other telephone device connections. Microfilter installation requires no tools or telephone rewiring. Just unplug the telephone device from the baseboard or wall mount and snap in a microfilter; next, snap in the telephone device. You can purchase microfilters from your local electronics retailer, or contact the original provider of your VDSL2 equipment.

6.3 Hardware Installations

The following instructions explain how to install your Router using VDSL2 or WAN Ethernet connections. Before you begin, please read the following notes:

NOTE:

1. If your Ethernet card does not auto-negotiate, set it to half duplex. Refer to the Ethernet card manufacturer's instructions for installing and configuring your Ethernet card.
2. If you are using Router in conjunction with an Ethernet Hub, Switch, or other VDSL2 device, refer to the manufacturer's instructions for proper installation and configuration.
3. When using a Microfilter, confirm that the VDSL2 RJ-11 phone cable is connected to the VDSL2 port of the DSL/HPN non-filtered jack.
4. It is recommended that you use a surge suppressor to protect equipment attached to the power supply. **Use only the power supply provided with your kit.**



5. Additional Ethernet cables may be required depending on the installation method you are using. Ethernet cables and filters can be purchased at your local computer hardware retailer.
6. The Router supports simultaneous use of 10/100 Base-T Ethernet and Wireless configurations. To use these installation methods, follow the instructions provided in sections 6.6.1, "Connecting Ethernet Devices to Your Router," and 6.6.2, "Connecting Wireless Devices to Your Router," respectively.

The following modes are supported for connecting your Router to your broadband (Internet) service, and are configurable through the Router's Web pages:

- **VDSL2** allows you to use the Router's VDSL2 port for broadband access. In this mode, you should install the Router according to the instructions in section 6.4, "Connecting Your Router to Your Broadband Service Via VDSL2."
- **WAN Ethernet** allows you to use the Router as an Ethernet Gateway (for example, to connect to another network device that establishes broadband access). In this mode, you should install the Router according to the instructions in section 6.5, "Connecting Your Router to Your Broadband Service Via WAN Ethernet."

6.4 Connecting Your Router to Your Broadband Service Via VDSL2

If your home or office has been provisioned with VDSL2 service, this section instructs you on connecting your Router to your broadband network via VDSL2.

To install your Router using a VDSL2 connection, please follow the steps below:

1. Connect the RJ-11 phone cable from the connector marked **VDSL2** on the rear panel of the Router to the jack provisioned with VDSL2 service on the wall.

IMPORTANT: If you use a microfilter, you must plug the RJ-11 phone cable from the Router into the VDSL2 port of the microfilter.
2. Connect the power supply cord to the power connector marked **12 VDC** on the back of the Router. Plug the other end of the power supply into an AC wall socket, and then turn on the Router by pressing the Off/ON switch on the back of the Router.
3. Check to see if the Router's **POWER LED** is solid green. This indicates that the Router is powered on.
4. Check to see if the Router's **BROADBAND LED** is solid Green. This means the WAN VDSL2 connection is functioning properly.
5. After you have logged on to your account and established an Internet connection, as explained later in section 8, "Configuring Your Broadband Connection," check to see if the Router's **INTERNET LED** is solid green. Solid green indicates that an Internet link has been established. (Flashing green indicates the presence of IP traffic.)

Congratulations! You have installed your Router to your broadband service. Now proceed to section 6.6, "Connecting Other Networking Devices to Your Router," for instructions on connecting other networking devices to your Router.



6.5 Connecting Your Router to Your Broadband Service Via WAN Ethernet

This section instructs you on connecting your Router via WAN Ethernet. The advantage of using the WAN Ethernet feature is that it allows you to connect multiple devices to your LAN beyond the number of physical ports provided by your Router. In this configuration, an Ethernet cable is used to connect the Router to a switch, gateway, or other VDSL2 device. Then, the other device makes the WAN connection to the Internet while still allowing you to use many of the networking features provided in the Router.

To install your Router so that it connects to another VDSL2 device, follow the steps below:

1. Connect the attached VDSL2 device to the jack provisioned with VDSL2 on the wall, using the RJ-11 phone cord that was provided with the kit. If you are using a microfilter at the wall jack, you must connect the RJ-11 VDSL2 phone cable from the VDSL2 port of the VDSL2 device to the VDSL2 port of the microfilter.

NOTE: The VDSL2 device to which you are connecting will function as your WAN interface to the Internet. Be sure you have connected the VDSL2 device appropriately. If needed, refer to the manufacturer's instructions.

2. Connect an Ethernet cable (a yellow Ethernet cable is provided with your kit) from the Ethernet jack marked **WAN** on the rear panel of the Router to the Ethernet port on the attached VDSL2 device, and then turn on the power switch of the attached VDSL2 device (if it is not already on).

NOTE: Later, when in the Router's Web pages, be sure to configure the Router's WAN interface for "Ethernet" via the **WAN VDSL2 Properties** screen. When the Router's WAN interface is configured for "Ethernet," the Router's VDSL2 transceiver is not used to make the WAN connection. Instead the VDSL2 device to which the Router is connected will be your WAN interface to the Internet.

3. Check to see if the Router's **POWER** LED is solid green. This indicates that the Router is powered on.
4. Check to see if the Router's **BROADBAND** LED is solid Green. This means the WAN Ethernet connection is functioning properly.
5. Check to see if the **ETHERNET** LED is solid green. Solid green indicates that the Ethernet connection is functioning properly. Check the **ETHERNET** LED for the Ethernet jack you are using on the Router.
6. After you have logged on to your account and established an Internet connection, as explained later in section 8, "Configuring Your Broadband Connection," check to see if the Router's **INTERNET** LED is solid green. Solid green indicates that an Internet link has been established. (Flashing green indicates the presence of IP traffic.)

Congratulations! You have installed your Router to your broadband service. Now proceed to section 6.6, "Connecting Other Networking Devices to Your Router," for instructions on connecting other networking devices to your Router.

6.6 Connecting Other Networking Devices to Your Router

Now that you have connected your Router to your broadband service and turned on the Router, you can connect Ethernet and Wireless networking devices to your Router, allowing for Internet connection throughout your home without disrupting your cable or satellite television services. Refer to the following sections for instructions on connecting devices to your Router:

- Section 6.6.1, "Connecting Ethernet Devices to Your Router," explains how to connect Ethernet devices to your broadband Router.
- Section 6.6.2, "Connecting Wireless Devices to Your Router," explains how to connection Wireless devices to your broadband Router.



6.6.1 Connecting Ethernet Devices to Your Router

To network your Router to computers in your home or office using an Ethernet installation, follow the steps below:

1. Ensure that you have connected your Router to your broadband service using one of the installation method explained earlier.
2. Connect the yellow Ethernet cable (provided with your kit) from any one of the four Ethernet jacks marked **LAN Ethernet 1, 2, 3, 4** on the rear panel of the Router to the Ethernet port on your computer. Repeat this step to connect up to three additional PCs to the Router.

NOTE: Use any of the four LAN Ethernet jacks on the Router's rear panel; each jack serves as an Ethernet switch.

3. Check to see if the Router's **ETHERNET LED** is solid green. Solid green indicates that the Ethernet connection is functioning properly. Check the **ETHERNET LED** for each Ethernet jack to which you are connected at the rear of the Router.

Now that you have installed your Router to your broadband service and connected devices to your Router, proceed to section 7, "Accessing Your Router," to access the Router's Web pages.

6.6.2 Connecting Wireless Devices to Your Router

IMPORTANT: If you are connecting to the Router via a wireless network adapter, the SSID must be the same for both the Router and your PC's wireless network adapter. The default SSID for the Router is located on a sticker on the bottom of the Router. The SSID is also provided in the Router's Web pages, in the Wireless section. On your PC, locate and run the utility software provided with your PC's wireless network adapter. Then, enter the Router's SSID value (in order to communicate with the Router, the PC's wireless network adapter must be configured with the SSID). Later, for privacy, you can change the SSID by following the procedures outlined in section 12.2, "Wireless Settings."

NOTE: Client PCs can use any Wi-Fi.org certified wireless 802.11b/g/n card to communicate with the Router.

To network your Router to computers in your home or office using a wireless installation, follow the steps below:

1. Ensure that you have connected your Router to your broadband service using one of the installation methods explained earlier.
2. Make sure that each PC on your wireless network has an 802.11b/g/n wireless network adapter installed.
3. Ensure that appropriate drivers for your wireless adapter have been installed on each PC.
4. Make sure the wireless antenna is screwed on to the connector on the rear of the modem and firmly locked into place. Then, orient the antenna to appropriate position.
5. Check to see if the Router's **WIRELESS LED** is solid Green. This means that the Wireless interface is functioning properly.

Now that you have installed your Router to your broadband service and connected devices to your Router, proceed to section 7, "Accessing Your Router," to access the Router's Web pages.



6.6.3 Connecting Your Router to Your Network via Coax

This section instructs you on connecting your Router to your in-home coax network if your Router includes the optional MoCA LAN feature.

To install your Router to the network using a coax connection, please follow the steps below:

1. Make sure all MoCA-connected devices are powered off before beginning. This includes any MoCA Bridge devices or Set-top boxes.
2. Connect the power supply cord to the power connector marked **12 VDC** on the rear panel of the Router. Plug the other end of the power supply into an AC wall socket, and then power up the Router.
3. Connect a COAX cable from the connector marked **COAX** on the rear panel of the Router to a COAX connector on the wall.
4. Check to see if the Router's **POWER LED** is solid green. This indicates that the Router is powered on.
5. Check to see if the Router's **BROADBAND LED** is solid Green. This means the WAN Coax connection is functioning properly
6. Power on your other MoCA-enabled devices and check to see if the Router's **COAX LED** turns green. This means the COAX connection is functioning properly. (Note this will only occur if you have other MoCA devices on your coax network.)

Now that you have installed your Router to your coax network, proceed to section 7, "Accessing Your Router," to access the Router's Web pages.

7. ACCESSING YOUR ROUTER

7.1 Logging on to Your Router

This section explains the logon procedures for your Broadband Router. This procedure should be used any time you want to access or make changes to the Router's configurable settings, such as wireless security and firewall.

IMPORTANT: Your Router is capable of automatically sensing protocol type (DHCP or PPPoE). This process is designed to start after you have connected the Router. To access your Router, your PC must be configured for DHCP. Refer to your operating system help for information on configuring your computer for DHCP.

To log on to the Router, start your Web browser, and then type the following IP address in the browser's address bar:

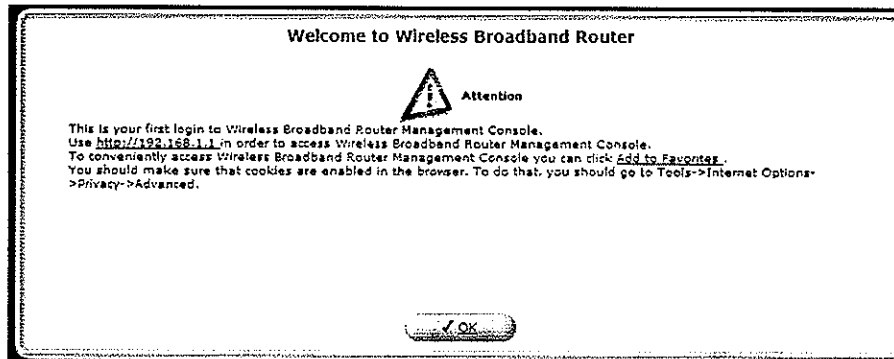
http://192.168.1.1

NOTE: Your ISP may have a different default value. Please verify the correct default value with your service provider.

After you type the IP address, press **Enter** on your keyboard. The following screen will display the message:

This is your first login to the Management Console. Use <http://192.168.1.1> in order to access the Router's Management Console. To conveniently access the Management Console, you can click **Add to Favorites**. You should make sure that cookies are enabled in the browser. To enable cookies, go to **Tools->Internet Options->Privacy->Advanced**.

Click **OK** in the **Welcome** screen.



By default, **admin** appears in the User Name field; however, you can change this to the user name of your choice. Type your password in the **New Password** fields. Your password must be 6 or more characters long and contain at least 1 numeral and 1 letter. As you type your password, asterisks will appear for security purposes.

NOTE: Please write down your user name and password, and save them for future use.

Login Setup

Please configure Wireless Broadband Router's username and password:

User Name:

New Password:

Retype New Password:

Enter your password here.

After you have logged on to your Router, the following screen appears. This is the **Main** screen of your Router's Web pages, also referred to as the "home page." You can access this screen by clicking **Main** in the navigation menu located across the top of the Router's Web pages. Details on this screen will be explained in the following sections.

Main
Wireless
My Network
Firewall Settings
Parental Control
Advanced
System Monitoring

MyRouter

Router Status

Pending! Your gateway is not ready for Internet access.

Broadband Connection

WAN VDSL: Auto Protocol Detect
Waiting DHCP server not connected

ISP Protocol: DHCP
Internet Address: Not Available

Quick Links

- [Change Wireless Settings](#)
- [Change Login User Name & Password](#)
- [Enable Applications \(Games, Webcams, IM & Others\)](#)
- [Westell Help](#)
- [Logout](#)

MyNetwork

Network Status








Name: ITTEMF-XP2
Connection: Ethernet
Status: Online
IP Address: 192.168.1.30

LINKS

Start Surfing



Throughout this User Guide, the following icons are used to indicate clicking actions that you can take with your mouse to configure your Router's settings.

Icon	Description
	Edit Clicking this icon allows you to edit the associated entry/setting.
	Add/New Clicking this icon allows you to add a new entry/setting.
	Delete Clicking this icon deletes the associated entry/setting from your Router.
	View Clicking this icon allows you to view or run a diagnostics test on your Router.
	Move Down Clicking this icon allows you to change the order of your list by moving an entry down in the list.
	Move Up Clicking this icon allows you to change the order of your list by moving an entry up in the list.
	What's This Clicking this icon allows you to learn more about a feature.

8. CONFIGURING YOUR BROADBAND CONNECTION

To browse the Internet using your Router, first confirm your VDSL2 connection, and establish an Internet connection with your ISP. The procedures for configuring your Router's connection settings are explained in this section.

8.1 Confirming Your VDSL2 Connection

IMPORTANT: You must have active broadband service before the Router can synchronize with your ISP's equipment and establish an Internet connection.

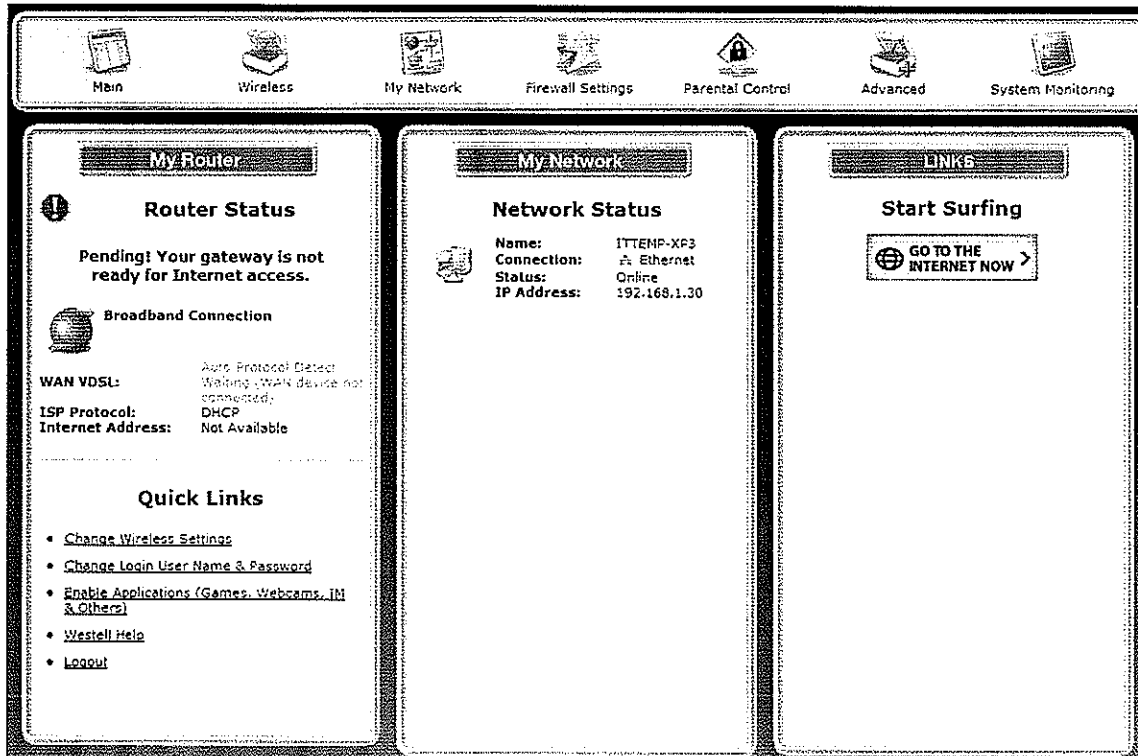
To determine if the Router has established a VDSL2 link, at the Router's front panel, check to see if the Router's **BROADBAND** LED is solid green—this indicates that a VDSL2 connection is established.

After confirming your VDSL2 link, proceed to section 8.2, "Connecting to the Internet," to configure your Router's Internet connection settings.

8.2 Connecting to the Internet

After you have logged on to the Router, the following **Main** screen will appear. Use this screen to determine the Router's Internet connection status. If you do not have an Internet connection, the **Internet Address** field will display "Not Available."

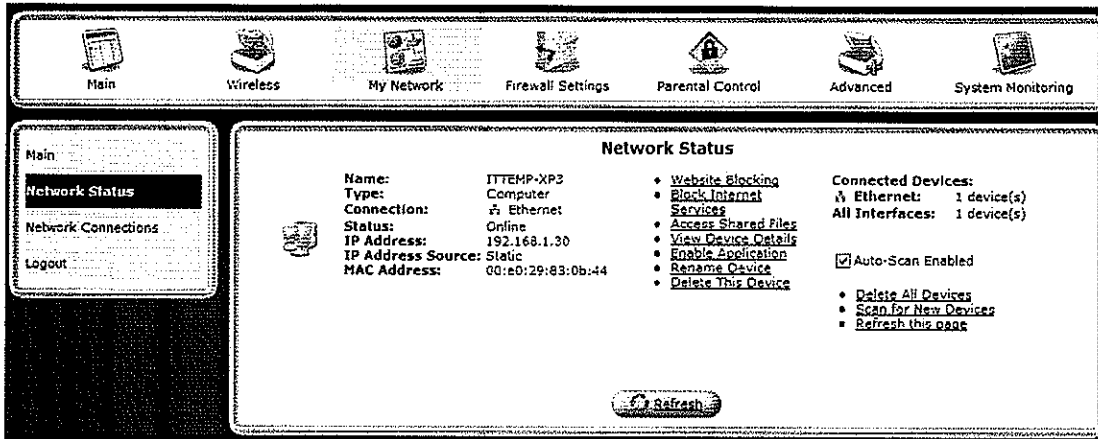
To begin your connection setup, at top navigation menu, click **My Network**.



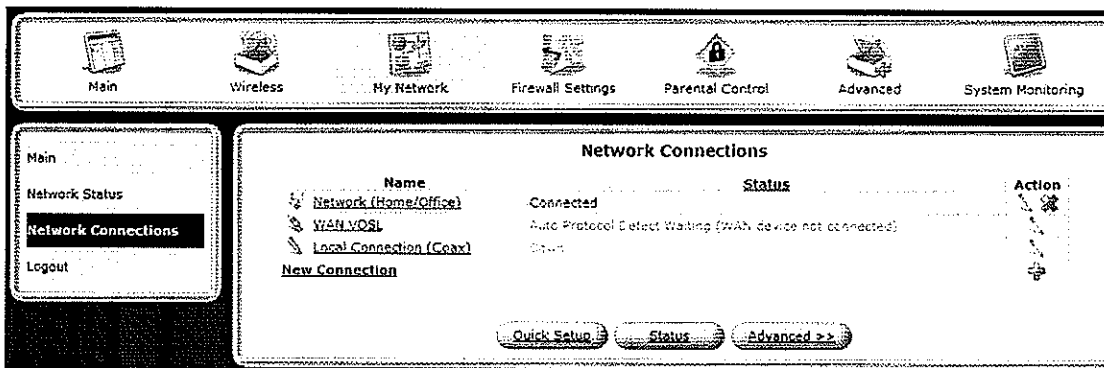
The screenshot displays the router's web interface with the following details:

- Navigation Menu:** Main, Wireless, My Network, Firewall Settings, Parental Control, Advanced, System Monitoring.
- My Router Panel:**
 - Router Status:** Pending! Your gateway is not ready for Internet access.
 - Broadband Connection:**
 - WAN VDSL: Async Protocol Detected, Waiting WAN device not connected.
 - ISP Protocol: DHCP
 - Internet Address: Not Available
 - Quick Links:**
 - Change Wireless Settings
 - Change Login User Name & Password
 - Enable Applications (Games, Webcams, IM & Others)
 - Westell Help
 - Logout
- My Network Panel:**
 - Network Status:**
 - Name: ITTEMP-XP3
 - Connection: Ethernet
 - Status: Online
 - IP Address: 192.168.1.30
- LINKS Panel:**
 - Start Surfing:** GO TO THE INTERNET NOW

The Network Status screen will appear. Next, in the left submenu, click Network Connections.



The following screen appears. In the Network Connections screen, click the Quick Setup button.



In the Network Connections screen, click the Quick Setup button.

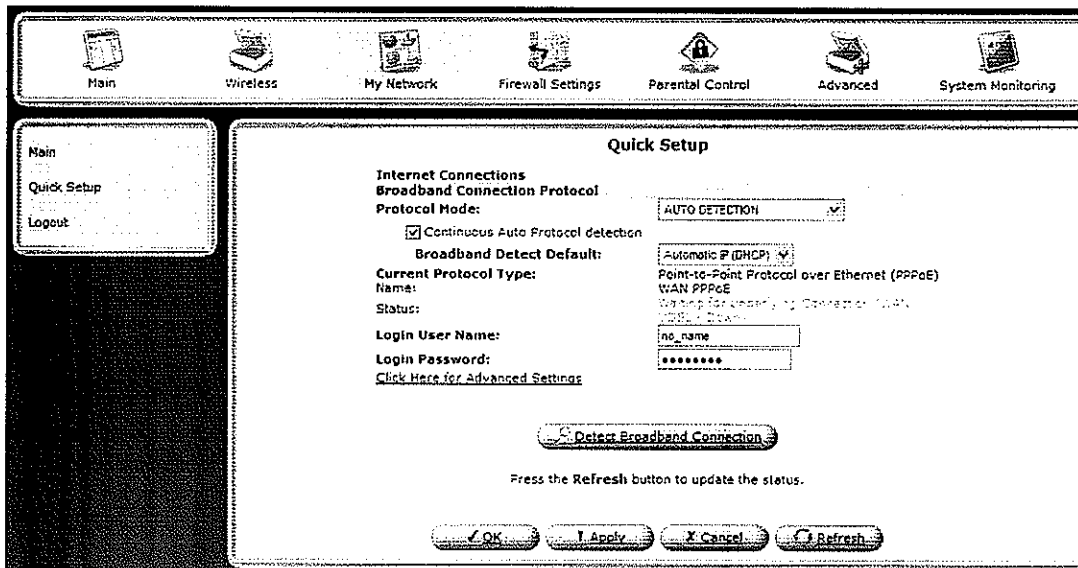
The Quick Setup screen allows you to select the protocol type for your Internet connection, or choose to configure a static IP address. Your ISP will inform you of which protocol to use to establish your Internet connection.

8.2.1 DHCP Protocol Type

IMPORTANT: Do not change the settings in the **Quick Setup** screen unless your ISP instructs you to change the settings. Your Router is designed to automatically detect the correct connection type to the network.

If you are using DHCP protocol to connect to the Internet, at the **Quick Setup** screen, do the following:

1. From the **Broadband Detect Default** drop-down list, select **Automatic IP (DHCP)**. Note: DHCP is the Router's default protocol type. If you use this protocol, you do not need to enter a Login User Name or Login Password.
2. Click **Apply** to save the settings.
3. Click **OK** to continue.



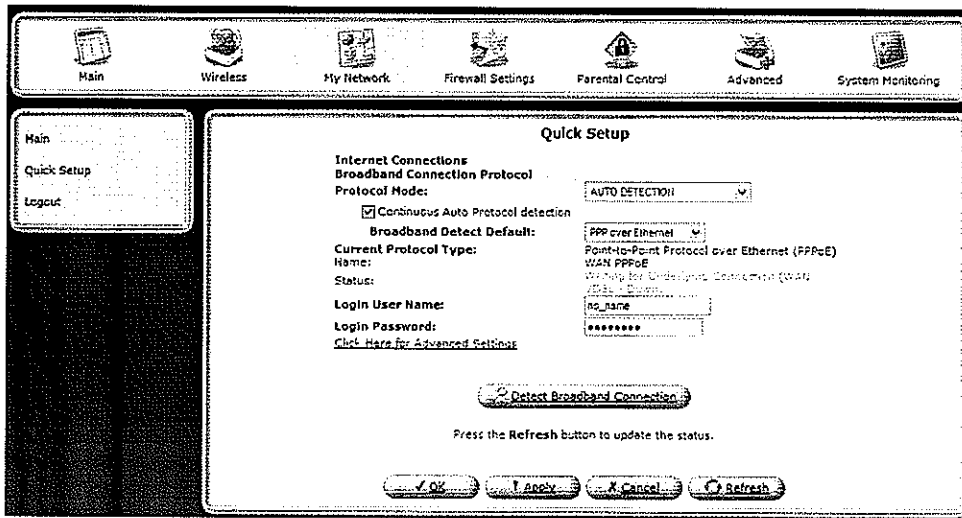
The screenshot shows the 'Quick Setup' screen for Internet Connections. The 'Broadband Connection Protocol' is set to 'AUTO DETECTION'. The 'Broadband Detect Default' is set to 'Automatic IP (DHCP)'. The 'Login User Name' is 'no_name' and the 'Login Password' is masked with asterisks. A 'Detect Broadband Connection' button is visible, along with 'OK', 'Apply', 'Cancel', and 'Refresh' buttons at the bottom.

8.2.2 PPPoE Protocol Type

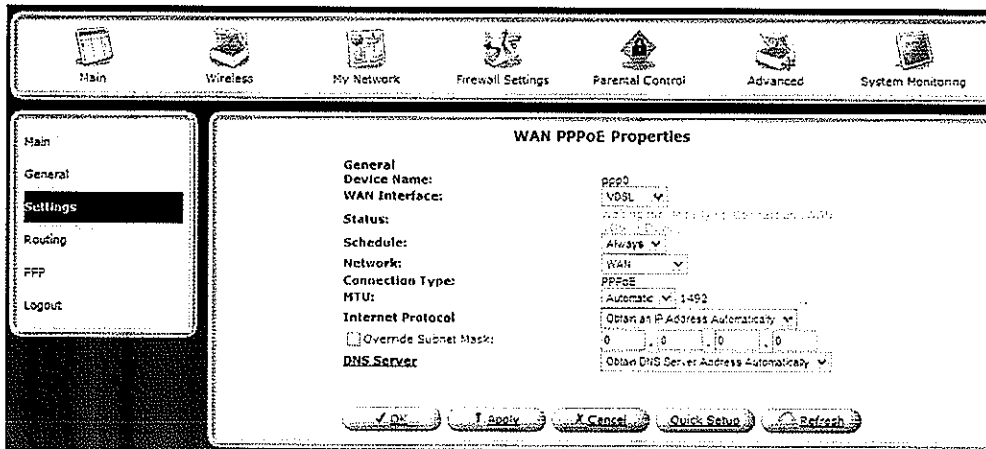
IMPORTANT: Do not change the settings in the **Quick Setup** screen unless your ISP instructs you to change the settings. Your Router is designed to automatically detect the correct connection type to the network.

If you are using PPPoE protocol to connect to the Internet, at the **Quick Setup** screen, do the following:

1. From the **Broadband Detect Default** drop-down list, select **PPP over Ethernet**.
2. Enter your Login User Name and Password (provided by your ISP) in the fields provided.
3. Click **Apply** to save the settings.
4. Click **OK** to continue.

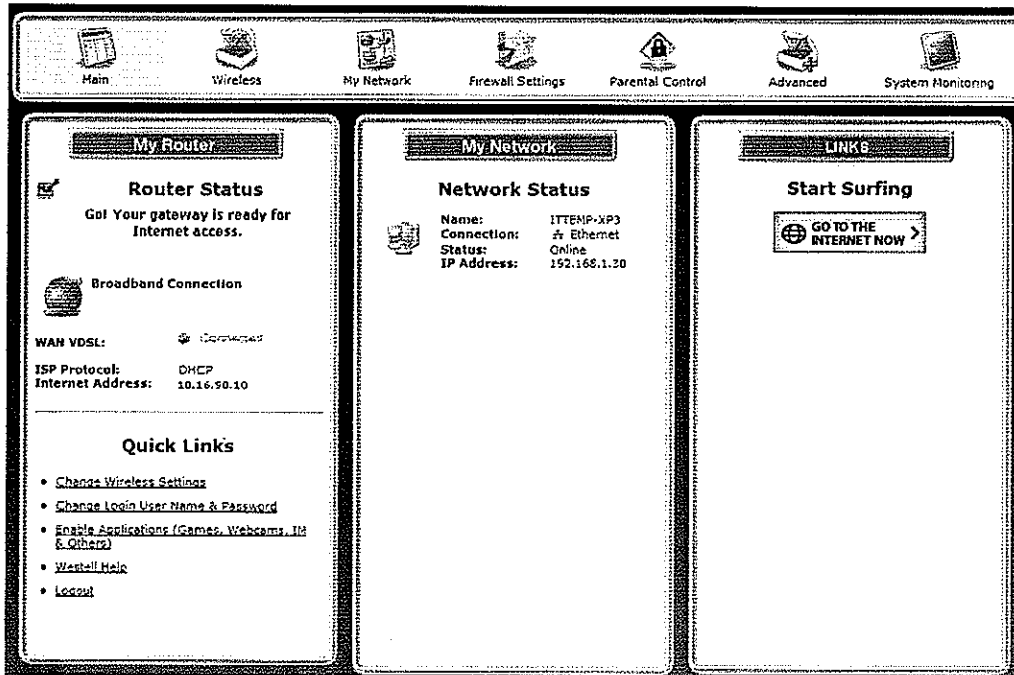


To configure additional PPPoE settings, in **Quick Setup** screen, click the link labeled **Click Here for Advanced Settings**. The following screen appears.



NOTE: To configure additional WAN PPPoE properties, select **Routing** and **PPP** in the left submenu. If you change any settings in these screens, click **Apply** to save the settings.

After you have selected your protocol and clicked **OK** in the preceding screen, click **Main** to return to the home page. In the **My Router** panel, the message **Go! Your gateway is ready for Internet access** should now be displayed. In addition, the **Internet Address** field will display the WAN IP address of your Router. To quickly access your default Web page, in the **Action Zone** panel, click **GO TO THE INTERNET NOW**.



8.3 Logging Out of the Router's Web Pages

When you are ready to log out of the Router's Web pages, click the **Logout** link in the left submenu in any of the Web screens.

NOTE: If you want to close the Router's Web page, simply click the "X" in the upper-right corner of the window. Logging out or closing the window does not affect your Internet connection. However, you will need to log in to the Router again when you are ready to access the Router's Web pages.

9. CONFIGURING YOUR DEVICE TO CONNECT TO YOUR COMPUTER AUTOMATICALLY (DHCP)

In order to communicate with your Router, devices on your LAN (such as PCs, laptops, and other networking equipment using wired or wireless connection) must have an IP address. Your Router's built-in DHCP server can issue IP addresses to devices on your LAN; however, your device must first be configured to automatically receive an IP address from your Router. Typically, networking devices are shipped from the manufacturer already configured for automatic DHCP, but in instances where you need to configure automatic DHCP, the following sections help explain this setup. If needed, please check your device's user manual for details on configuring your device.

9.1 Configuring DHCP in Windows Vista

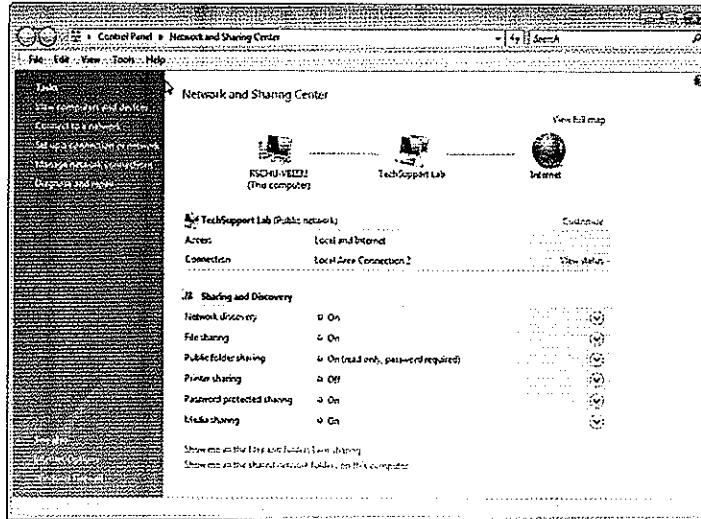
This section provides instructions on how to configure DHCP if you are using Windows Vista operating system.

9.1.1 Accessing Network and Sharing Center

Begin by clicking **Start** in your system tray and then selecting **Connect To**.

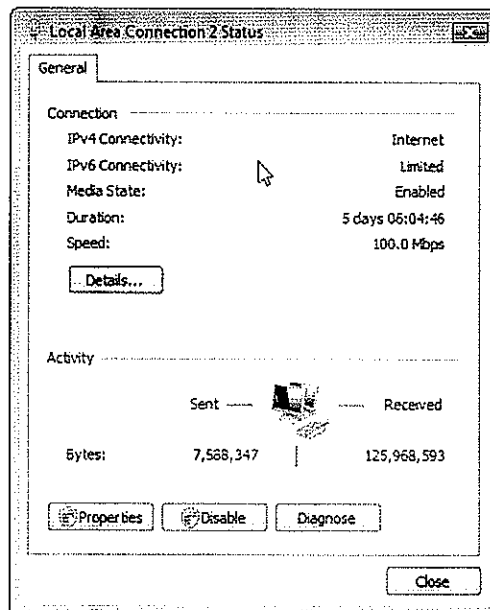


The following Network and Sharing Center window will appear. Click the **View status** link.

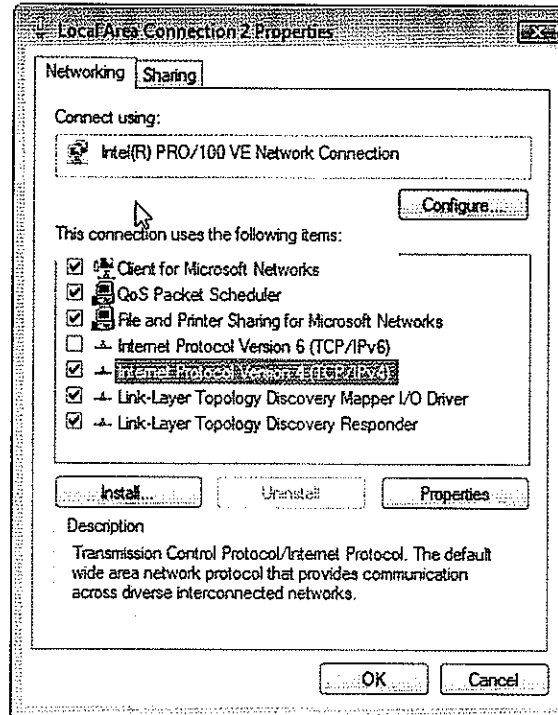


9.1.2 Configuring Network Connection Properties

In the Local Area Connection 2 Status window, click Properties.



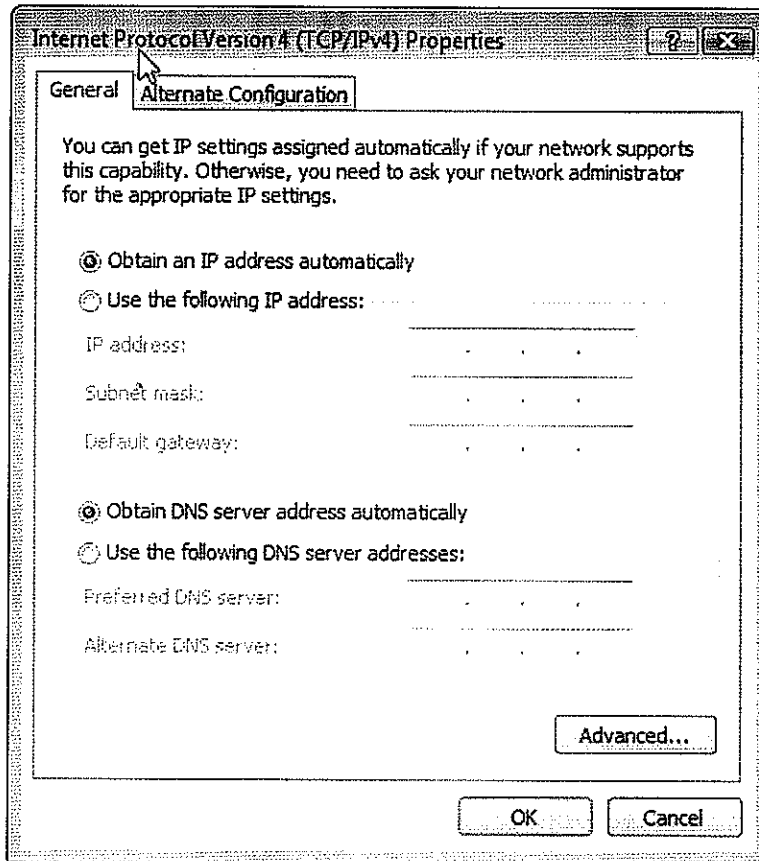
Then, select **Internet Protocol Version 4 (TCP/IPv4)**, and confirm that the box displays a check mark. Click the **Properties** button to continue.



In the **Internet Protocol Version 4 (TCP/IPv4) Properties** window, complete the following steps:

1. Click the radio button labeled **Obtain an IP address automatically**.
2. Click the radio button labeled **Obtain DNS server address automatically**.
3. Click the **OK** button to save the changes.
4. Click **Close**, and then click **Close** again to close the screens.

This completes the procedure for configuring DHCP in the Vista operating system. You are now ready to proceed to section 7.1, "Logging on to Your Router."

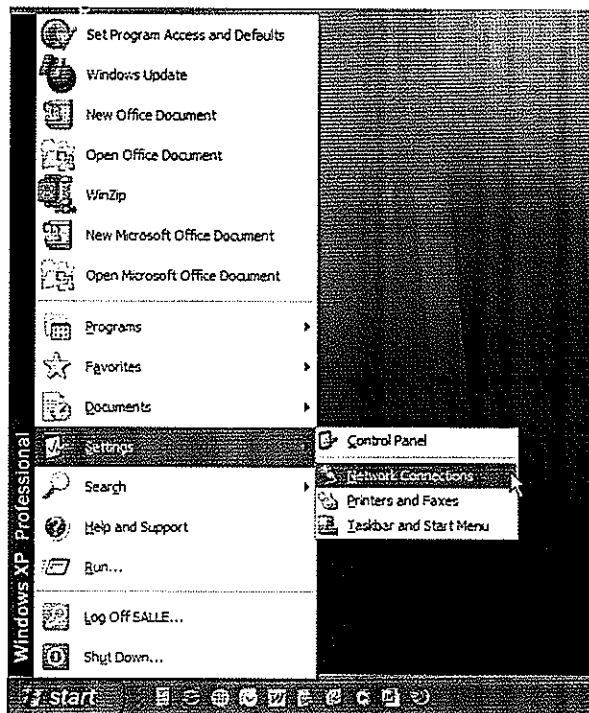


9.2 Configuring DHCP in Windows XP

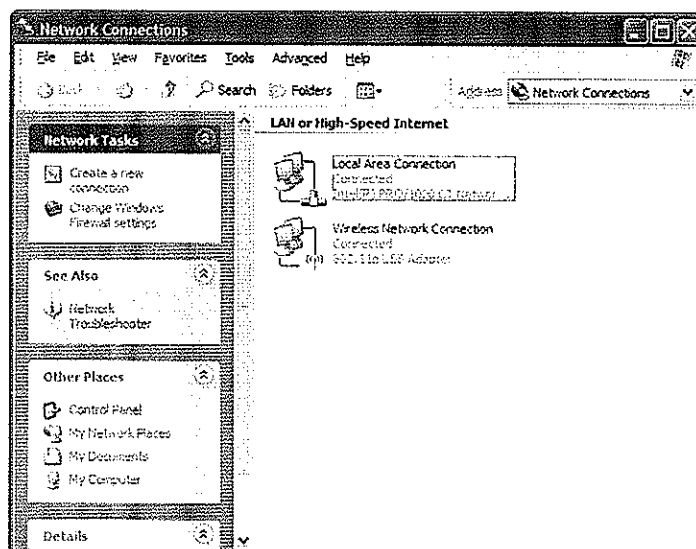
This section provides instructions on how to configure DHCP if you are using Windows XP operating system.

9.2.1 Accessing Network Connections

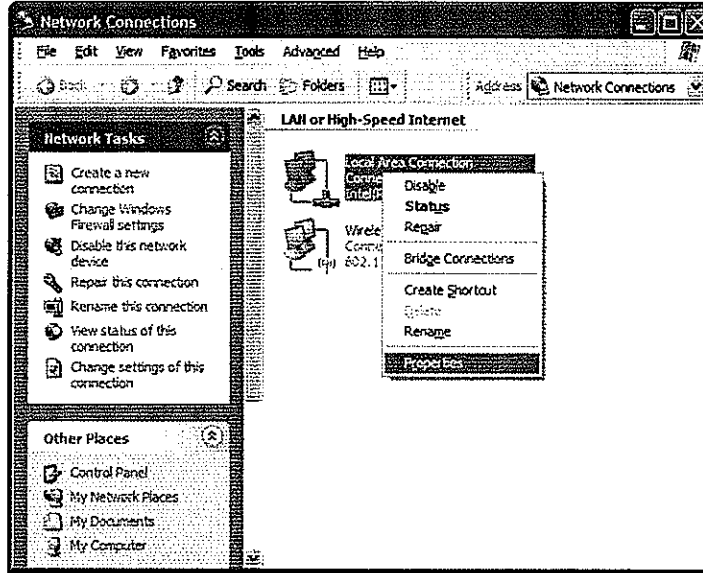
Begin by clicking Start in your system tray and then selecting Settings, Network Connections.



The following Network Connections window will appear.

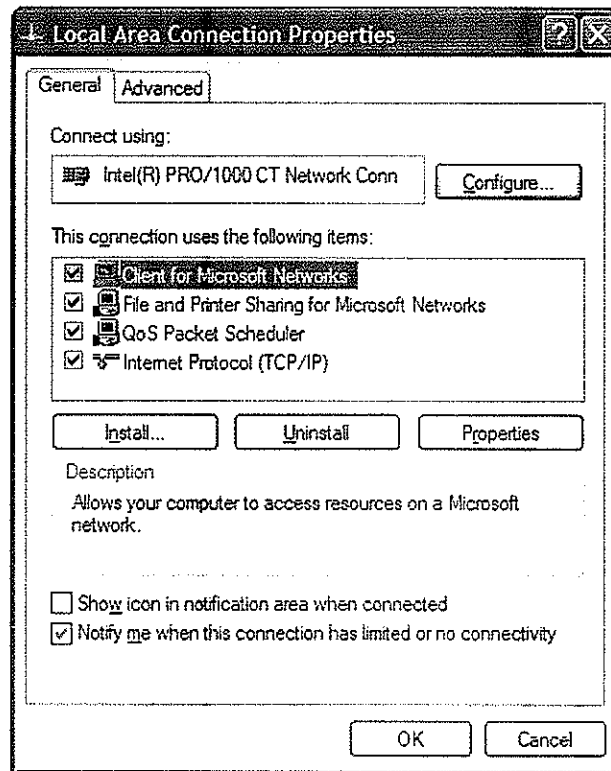


Right-click on **Local Area Connection**, and then select **Properties**.

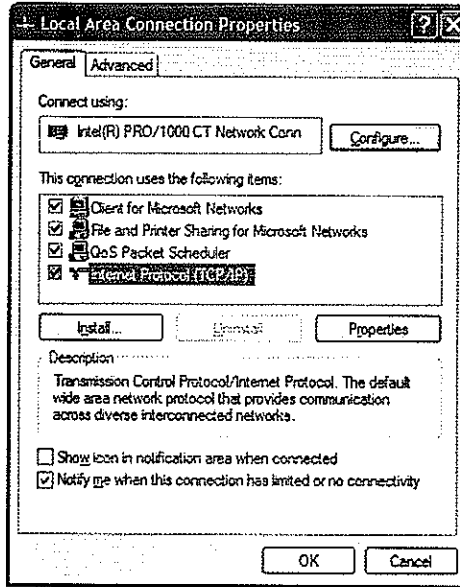


9.2.2 Configuring Network Connection Properties

The following properties window will appear. Click the **General** tab.



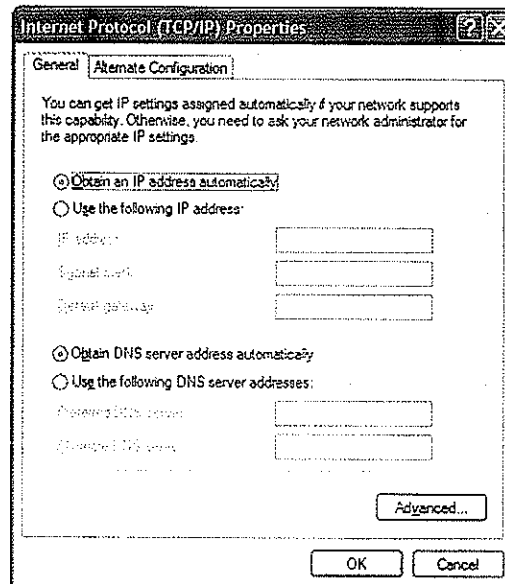
Then, select **Internet Protocol (TCP/IP)**, and confirm that the box displays a check mark. Click the **Properties** button to continue.



In the **Internet Protocol (TCP/IP) Properties** window, complete the following steps:

1. Click the radio button labeled **Obtain an IP address automatically.**
2. Click the radio button labeled **Obtain DNS server address automatically.**
3. Click the **OK** button to save the changes.
4. Click **Close** and then click **Close** again to close the screens.

This completes the procedure for configuring DHCP in the Windows XP operating system. You are now ready to proceed to section 7.1, "Logging on to Your Router."



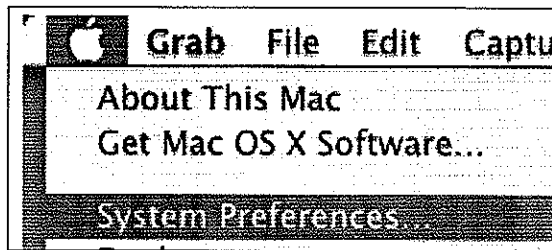
9.3 Configuring DHCP in Macintosh OS X

This section provides instructions on how to configure DHCP if you are using Macintosh Operating System 10.

NOTE: Macintosh computers must use the Router's Ethernet installation. Refer to section 6, "Installing the Router," for details.

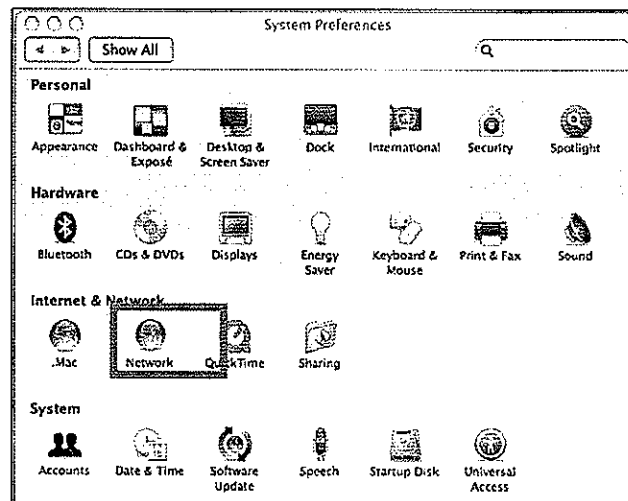
9.3.1 Accessing the System Preferences Window

After you have connected the Router to the Ethernet port of your Macintosh, the screen below will appear. Click the "Apple" icon in the upper-left corner of the screen and select **System Preferences**.



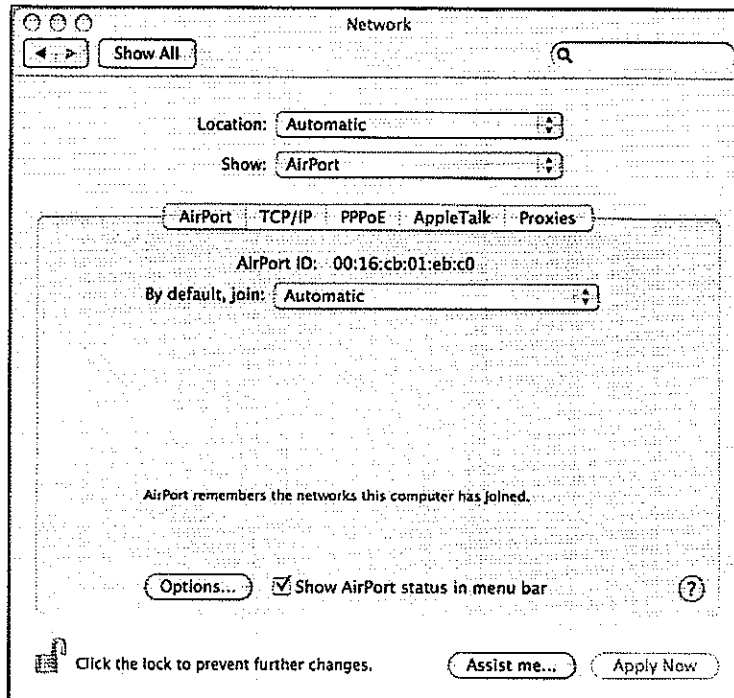
9.3.2 Selecting Network Preferences

After selecting **System Preferences** from the previous screen, the following screen will appear. Click the **Network** icon.

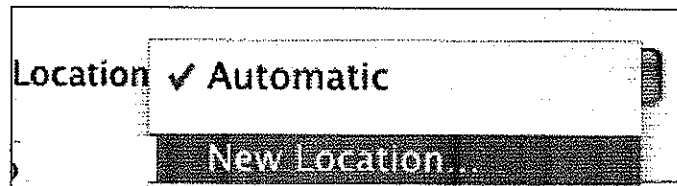


9.3.3 Creating a New Location

After clicking the Network icon, the Network screen will appear.

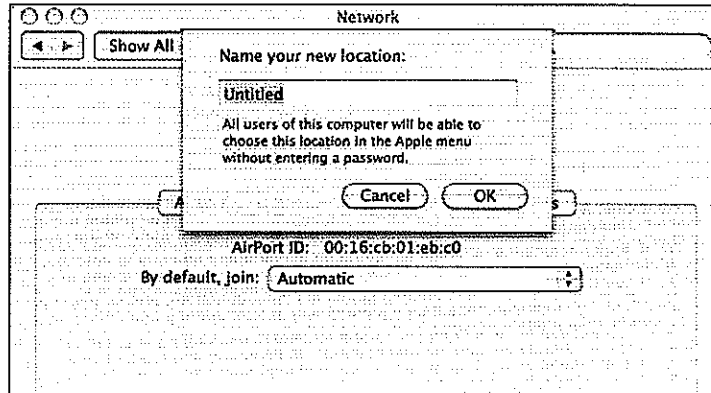


Select **New Location** from the **Location** pull-down list.

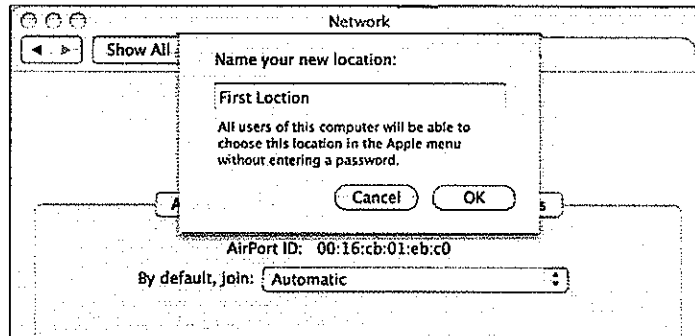


9.3.4 Naming the New Location

After you have selected **New Location** in the **Network** screen, the following screen will appear. In the field labeled **Name your new location**, enter a location name.



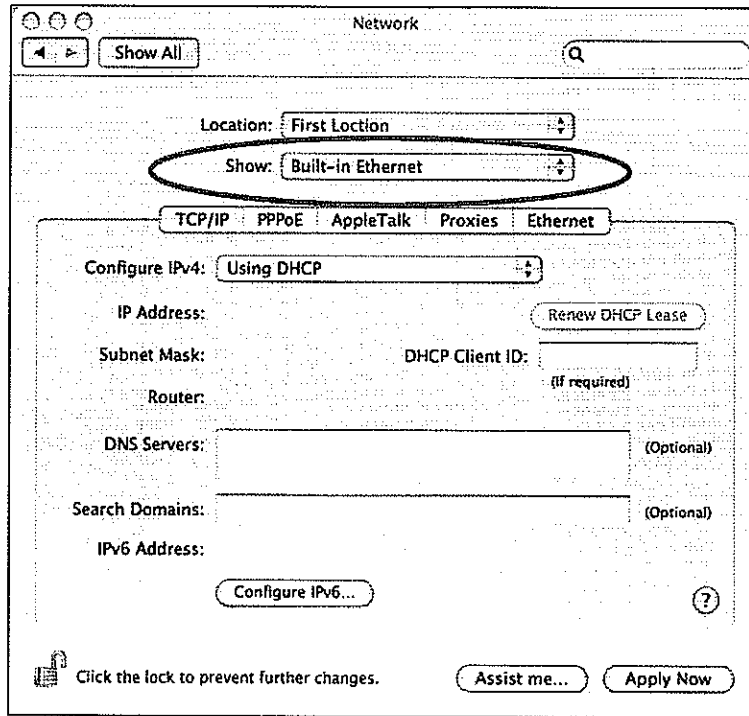
After you have named your new location, click **OK** to continue.



9.3.5 Selecting the Ethernet Configuration

After clicking **OK** in the preceding screen, the **Network** screen will appear. The **Network** screen shows the settings for the newly created location. From the **Show** pull-down list, select **Built-in Ethernet**. In the field labeled **Configure IPv4**, make sure **Using DHCP** is selected. Click **Apply Now** to save the settings.

NOTE: Default settings for the Built-in Ethernet configuration are sufficient to operate the Router.



9.3.6 Checking the IP Connection

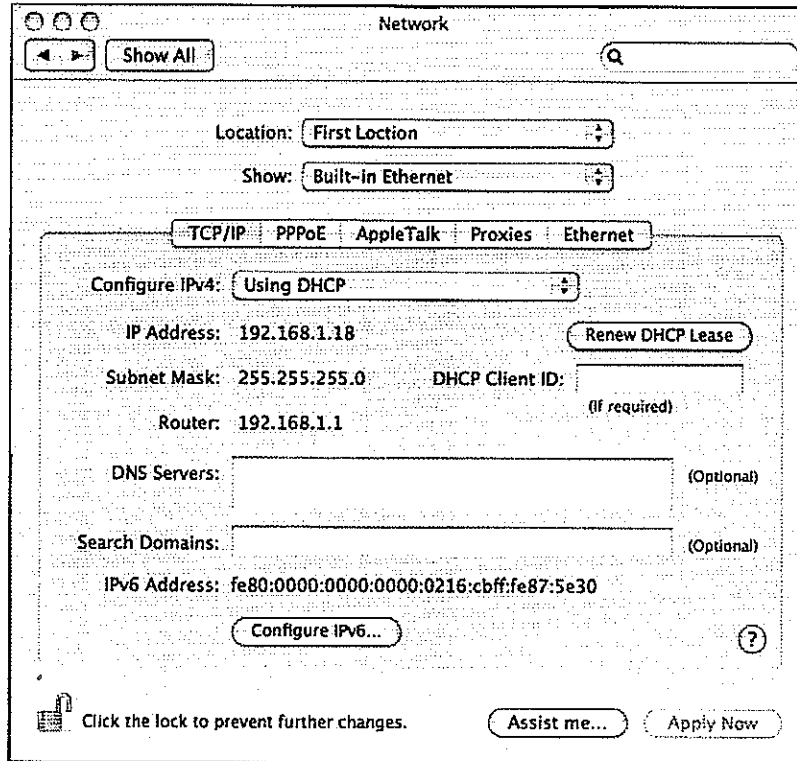
After connecting a computer to your Router, you can confirm that the computer is communicating with the Router by checking to see that the computer has an IP address.

NOTE: The Router’s DHCP server provides this IP address. If this IP address is not displayed, check the Router’s wiring connection to the PC. If necessary, refer to section 6, “Installing the Router,” for installation instructions.

To confirm that the connected computer has received an IP address from the Router:

1. Go to the “**Apple**” icon in the upper-left corner of the screen and select **System Preferences**.
2. In the **System Preferences** screen, click the **Network** icon. The **Network** screen will appear.
3. In the **Show** field in the **Network** screen, select **Built-in Ethernet**.
4. View the **IP address** field. An IP address that begins with **192.168.1** should appear.

This completes the procedure for configuring DHCP in the Macintosh operating system. You are now ready to proceed to section 7.1, "Logging on to Your Router."





10. BASIC CONFIGURATION

IMPORTANT: The following sections assume that you have active broadband Internet service.

The Router allows you to make changes to the configurable features such as connection settings, routing configurations, and firewall settings. The following sections explain each feature and show you how to make changes to the Router's settings. The navigation menu displayed at the top of each screen allows you to navigate to the various configuration screens of your Router. Whenever you change the settings in your Router, you must click **Apply** to allow the changes to take effect in the Router.

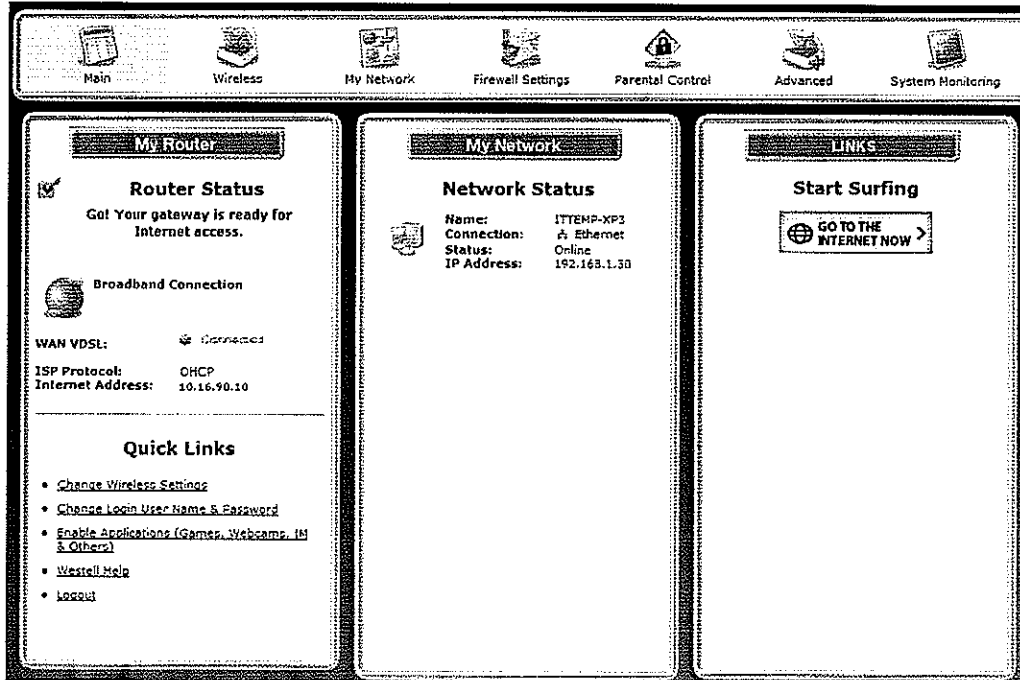
NOTE:

1. If you need help, go to the **Quick Links** section in the **Main** screen, and then click the **Westell Help** link. Clicking this link takes you to Westell's Online Help site where you can find additional information about your Router.
2. If you click **OK** or **Apply** in a screen and then experience a delay, you may need to refresh the screen; press the **Refresh** button (where applicable) or press **F5** on your keyboard.
3. If you want to log out of the Router's Web page, click the **logout** link in the **Main** screen. Clicking this link does not affect your Internet connection; it only closes the Router's Web page. To log in, you will need to enter your username and password in the **Login** screen.

To configure the basic settings in your Router, follow the instructions provided in sections 11 through 15.

11. MAIN (HOME PAGE)

After you have logged on to your Router and established an Internet connection with your ISP, click **Main** in the top navigation menu. The following screen will appear. The **Main** screen allows you to view connection information reported by your Router and quickly access Internet services provided by your ISP. The following sections discuss each panel in the **Main** screen. The **Main** screen is also referred to as the “home page.”



11.1 Router Status

In the **Main** screen, the **Router Status** pane allows you to view the status of your Router’s Internet connection. Whenever you have an Internet connection, a green check mark is displayed. This signals you to Go! You can now browse the Internet. In addition, the Router’s connection type and WAN IP address will also be displayed.

11.2 Quick Links

The **Quick Links** pane allows access to your broadband connection settings, and provides a link to Help information related to your Router. The following links are displayed in the **Quick Links** panel.

Quick Links	
Change Wireless Settings	Click this link to access the Router’s wireless settings screens.
Change Login User Name & Password	Click this link to changea permissions needed to manage network connections, or to set up privileges for new users and groups on your network.
Enable Applications (Games, Webcams, IM & Others)	Click this link to open a tunnel between remote (Internet) computers and a specific device port inside your local area network (LAN).
Westell Help	Click this link to access Westell’s Online Help site.
Logout	Click this link to log out of the Router’s Web pages.



11.3 Network Status

In the **Main** screen, the **Network Status** pane allows you to view information about devices that are connected to your network. If your network provides access to shared files, you can access the files by clicking the **Access Shared Files** link. The following details are displayed in the **Network Connections** panel.

Network Status	
Name	The ASCII (text) name or MAC address of the device connected to the network.
Connection	The physical or wireless connection used to interface with your Router.
Status	The Internet status of the connected device: Offline or Online.
IP Address	The IP address assigned to a device on your network.

11.4 Start Surfing

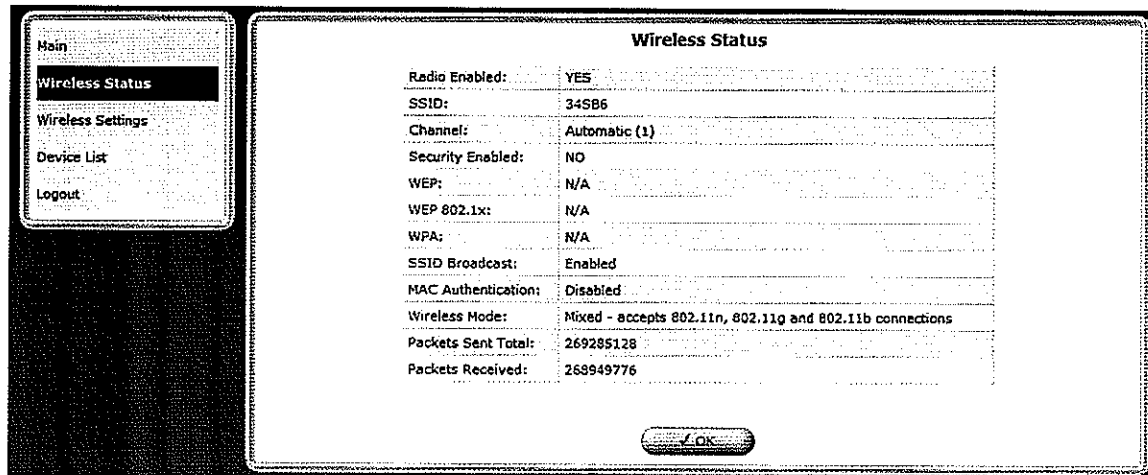
In the **Main** screen, the **Start Surfing** pane allows quick access to Internet services provided by your ISP. Click **GO TO THE INTERNET NOW** to go to your PC's default Web page.

12. WIRELESS

12.1 Wireless Status

If you click **Wireless** in the top navigation menu, the following screen will appear. This screen allows you to view details about your wireless connection.

NOTE: If you change the Router's wireless settings, wireless access to the Router may be interrupted, and wireless stations may require reconfiguration.



12.2 Wireless Settings

If you select **Wireless** from the top navigation menu and then select **Wireless Settings** in the left submenu, the following screen will appear.

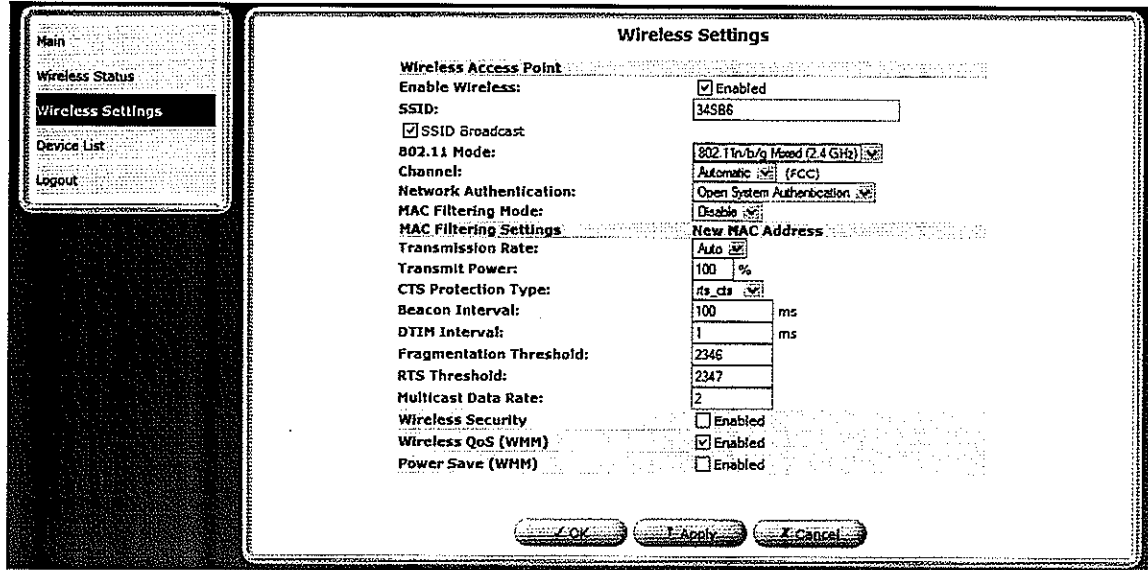
To configure your wireless settings, enter the appropriate values in the fields provided. Then, click **Apply** to allow the settings to take effect. The following table explains the details of this screen.

IMPORTANT:

1. If you are connecting to the Router via a wireless network adapter, the computer's wireless network adapter must be configured with the Router's Service Set ID (SSID); that is, the SSID used in the wireless network adapter must be identical to the Router's SSID. The default SSID and WEP key for the Router are both located on the label on the bottom of the unit.

Locate and run the utility software provided with your computers wireless network adapter, and then enter the identical SSID and WEP encryption security settings displayed in the Router into the wireless adapter. For privacy, you can change the SSID and security settings to your desired values. SSIDs are case sensitive and can contain up to 32 alphanumeric characters, including spaces.

2. In order for every computer on your network to connect to your Router wirelessly, confirm that each computer's wireless adapter is using the same security settings that you have configured in the Router's **Wireless Settings** screen. After you have configured all the settings in this screen, please record the settings for future reference.



Advanced Security Settings	
Enable Wireless	By default, the wireless feature is enabled. To disable this feature, clear the check box.
SSID	The SSID is the name of your wireless network. This string is case-sensitive and must be 30 characters or less. To connect to the Router, the SSID on a computer's wireless card must be identical the SSID on the Router. The Router comes pre-configured with the SSID; however, you can change the SSID to any name or code you want.
SSID Broadcast	Select this check box to enable SSID broadcast. When this box is cleared, the Router will not broadcast its SSID. When SSID Broadcast is enabled, your wireless network name will be advertised to wireless clients looking for wireless networks.
802.11 Mode	Allows you to limit access to your Router based on technology type. 802.11 n/b/g Mixed (2.4 GHz): Allow 802.11b, 802.11g, or 802.11n devices to connect. 802.11 b/g Mixed: Allow 802.11b or 802.11g devices to connect. 802.11n only: Only allow 802.11n clients to connect. 802.11g only: Only allow 802.11g clients to connect. 802.11b only: Only allow 802.11b clients to connect.
Channel	This is the channel of the frequency band at which the Router communicates. In the United States, use wireless routers use channels 1 through 11. Default is to automatically select the cleanest channel.
Network Authentication	Open System Authentication: If Open System authentication is selected, this will allow any station to associate with the wireless network, but only stations with a valid security key can send or receive data from the Router. Shared Key Authentication: If Shared Key Authentication is selected, a station must authenticate with the Router (using the security key) before it can connect to the Router's wireless network. Both: If "Both" is selected, the Router will allow both Open System and Shared Key Authentication to be used.
MAC Filtering Mode	Disable: If Disable is selected, MAC Filtering Mode will be deactivated. Allow: If Allow is selected, the Router will allow only the devices that are configured in the MAC filter table.



	Deny: If Deny is selected, the Router will deny all devices that are configured in the MAC filter table.
MAC Filtering Settings	Click this link to add a MAC address to the MAC filtering list. Details on this feature are discussed later in this section.
Transmission Rate	Selecting a transmission rate allows you to adjust the bit rate of the Router's wireless transmissions. Select a transmission rate from the drop-down list, or select Auto to allow the Router to automatically select the best transmission rate. (Recommended to remain on Auto.)
CTS Protection Mode	Clear to Send (CTS) protection is a technology that is designed to reduce frame collisions. This allows to router to inform clients that it okay for them to send their data at a particular time. Setting this to Automatic will allow clients that support this feature to communicate with the router. Auto: Select Auto to activate CTS. None: Select None to deactivate CTS. Always: Select Always to allow CTS to always be activated.
CTS Protection Type	CTS (Clear to Send) protection has a secondary option of RTS (Request to Send). RTS is a client technology that lets a wireless client request a time to send its data to the router. The Router will then respond with a CTS command. You have the option to disable RTS acknowledgements. cts_only will not acknowledge RTS from clients cts_rts will support RTS beacons from client devices
Beacon Interval (in milliseconds)	Enter the beacon interval value. The beacon interval is the time between beacon frame transmissions. Beacons are transmitted by the Router to help identify wireless networks. Beacons contain rate and capability information. Beacons received by stations can be used to identify the wireless access points in the area. (You should not need to change this value.)
DTIM Interval (in milliseconds)	Enter the DTIM (Delivery Traffic Indication Message) interval value. A DTIM is a countdown mechanism for the Router. It informs wireless network clients of the next window for listening to broadcast and multicast messages. (You should not need to change this value.)
Fragmentation Threshold	Setting the fragmentation threshold can increase the reliability of frame transmissions on the wireless network. Any MAC Service Data Unit (MSDU) or MAC Protocol Data Unit (MPDU) larger than this value will be fragmented into an MPDU of the specified size. (You should not need to change this value.)
RTS Threshold	Enter the RTS (Request to Send) threshold. This setting controls what size data packet the low level RF protocol issues to an RTS packet. RTS/CTS handshaking will be performed for any data containing a number of bytes greater than the threshold. If this value is larger than the MSDU size (typically set by the fragmentation threshold), no handshaking will be performed. A value of zero will enable handshaking for all MPDUs. (You should not need to change this value.)
Maximum Multicast Data Rate	The maximum rate (in kb/s) at which multicast packets are transmitted over your network.
Wireless Security	When this feature is enabled (the box contains a check mark), wireless security is activated, and the security type can be configured. When the box is clear, wireless security is deactivated.
Stations Security Type	Set the type of security for the Router's wireless network. Choose from the following options: WPA, WPA2, WPA and WPA2, 802.1x WEP, Non-802.1x WEP, Authentication Only. Details on these options are discussed later in this section.
Authentication Method	This is the authentication method used with the security type.
Wireless QoS (WMM)	Wi-Fi Multimedia (WMM) is a Wi-Fi Alliance certification, based on the IEEE 802.11e draft standard. It provides basic Quality of Service (QoS) features to IEEE 802.11 networks. If your wireless card supports WMM, enable this feature by checking its "Enabled" check box.
Power Save (WMM)	WMM® Power Save is a set of features for Wi-Fi networks that help conserve battery

power in small devices such as phones, PDAs, and audio players.

12.2.1 Configuring the Stations Security Type

To configure the Router's wireless security in the **Wireless Settings** screen, select an option from the **Stations Security Type** drop-down list. The following sections describe each security type.

Wireless Settings

Wireless Access Point

Enable Wireless: Enabled

SSID:

SSID Broadcast

802.11 Mode:

Channel:

Network Authentication:

MAC Filtering Mode:

MAC Filtering Settings:

Transmission Rate:

CTS Protection Mode:

CTS Protection Type:

Beacon Interval: ms

DTIM Interval: ms

Fragmentation Threshold:

RTS Threshold:

Maximum Multicast Data Rate:

Wireless Security: Enabled

Stations Security Type:

Authentication Method:

Pre-Shared Key:

Encryption Algorithm:

Group Key Update Interval:

Wireless QoS (WMM):

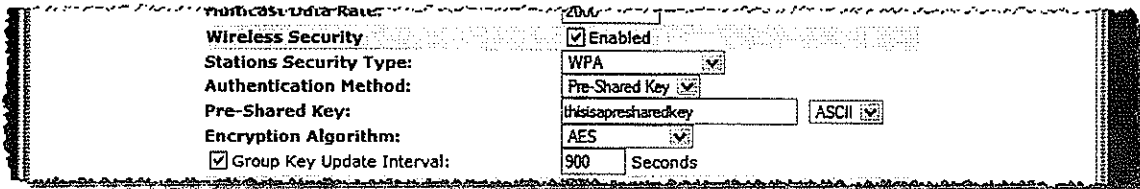
Power Save (WMM):

Enabled

Enabled

12.2.1.1 WPA (Wi-Fi Protected Access)

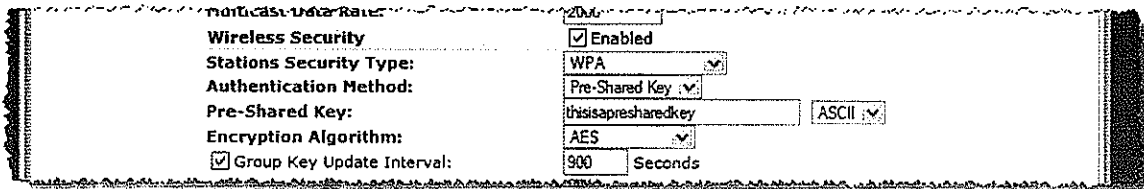
If you select **WPA** in the **Stations Security Type** drop-down list, the screen will reconfigure to allow setup of the security keys/passphrase. WPA allows you to enable a pre-shared key for your network. This option allows stations that support WPA to connect to the Router.



WPA Wireless Security	
Authentication Method	<p>Factory Default = Personal (Pre-Shared Key)</p> <p>Pre-Shared Key – WPA stations share a pre-shared key with the Router. This is the most common Home scenario.</p> <p>802.1x – Stations will authenticate with a RADIUS server over 802.1x, a standard for passing security settings.</p>
WPA Pre-Shared Key	<p>The WPA key can be either 8 to 63 text (ASCII) characters or 64 hexadecimal (Hex) characters. The only allowable hexadecimal characters are: A-F and 0-9.</p>
Encryption Algorithm	<p>Factory Default = TKIP</p> <p>Select the encryption algorithm you want to use (TKIP, AES, or TKIP and AES).</p> <p>TKIP: Select this option to enable the Temporal Key Integrity Protocol for data encryption.</p> <p>AES: Select this option to enable the Advanced Encryption Standard for data encryption.</p> <p>TKIP and AES: Select this option to enable the Router to accept TKIP and AES encryption.</p>
Group Key Update Interval (in seconds)	<p>The number of seconds between rekeying the WPA group key. A value of zero means that rekeying is disabled.</p>

12.2.1.1.1 Authentication Method—Pre-Shared Key

If you select **Pre-Shared key** as the authentication method for WPA, the following screen will appear. Configuring Pre-Shared Key in the Router allows devices that know the pre-shared key to connect to the Router.



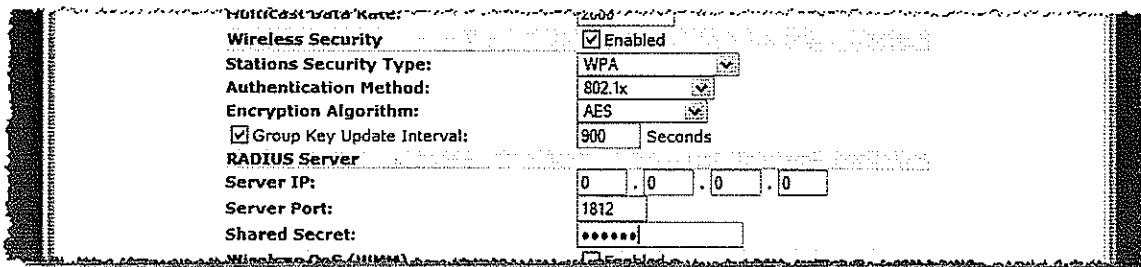
NOTE: A WPA pre-shared key is treated as either a string of text (ASCII) characters or a set of hexadecimal (Hex) characters. The key can be either 8 to 63 text (ASCII) characters or 64 hexadecimal (Hex) characters. The only allowable hexadecimal characters are: 0-9 and A-F.

To configure the WPA Pre-Shared Key, do the following:

1. Select the string type (ASCII or HEX) in the **Pre-Shared Key** drop-down list.
2. Enter the desired pre-shared key values in the field provided.
3. Select the desired option from the **Encryptoin Algorithm** drop-down list.
 - TKIP: Select this option to enable the Temporal Key Integrity Protocol for data encryption.
 - AES: Select this option to enable the Advanced Encryption Standard for data encryption.
 - TKIP and AES: Select this option to enable the Router to accept TKIP and AES encryption.
4. Enter the desired Group Key Update Interval, and confirm that the adjacent box contains a check mark. (By factory default, Group Key Interval is enabled for 900 seconds.)
5. Click **OK** to save the wireless settings in the Router.

12.2.1.1.2 Authentication Method—802.1x

If you select **802.1x** as the authentication method , the following screen will appear. Configuring 802.1x allows use of a RADIUS server for authentication of clients.



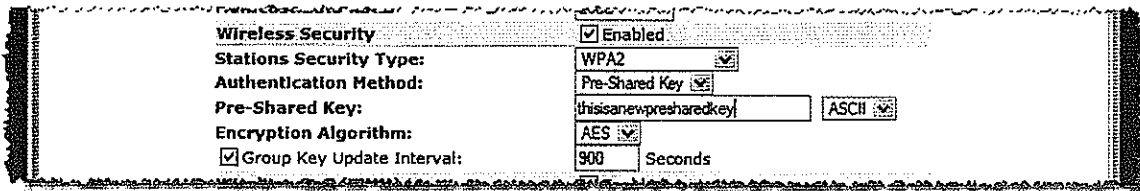
To configure 802.1x Authentication, do the following:

1. Select the desired option from the **Encryptoin Algorithm** drop-down list.
 - a. TKIP: Select this option to enable the Temporal Key Integrity Protocol for data encryption.
 - b. AES: Select this option to enable the Advanced Encryption Standard for data encryption.
 - c. TKIP and AES: Select this option to enable the Router to accept either TKIP or AES encryption.
2. Enter the desired Group Key Update Interval, and confirm that the box contains a check mark. (By factory default, Group Key Interval is enabled for 900 seconds.)
3. Configure the Radius Server:
 - a. Enter the Radius Server IP address in the fields provided.
 - b. Enter the desired Server Port value.
 - c. Enter the Shared Secret.
4. Click **OK** to save the wireless settings in the Router.

12.2.1.2 WPA2 (Wi-Fi Protected Access)

If you select WPA2 in the Stations Security Type drop-down list, the screen will reconfigure to allow setup of the security keys/passphrase. Like WPA, WPA2 allows you to enable a pre-shared key for your network, but does so using stronger security standards.

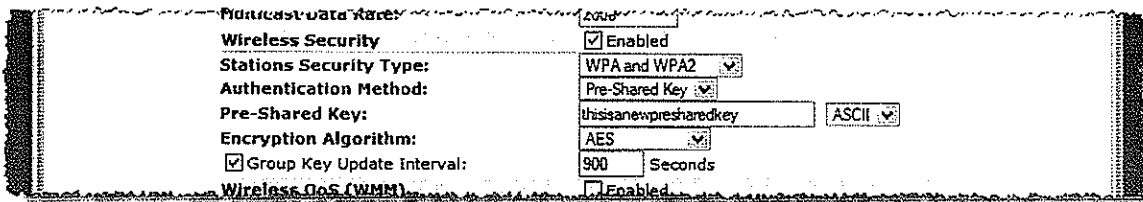
Setup of the WPA2 Pre-Shared Key is the same as WPA. WPA2 requires AES Encryption, and that is the only option allowed.



12.2.1.3 WPA and WPA2

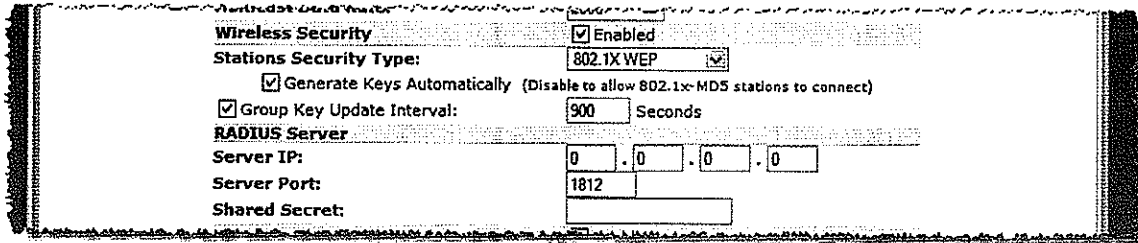
If you select WPA and WPA2 in the Stations Security Type drop-down list, the screen will reconfigure to allow setup of the security keys/passphrase. This allows for a backward compatible setting that enables devices that do not support WPA2 to also connect to the router at the same time WPA2 devices are connecting.

Setup of the WPA2 Pre-Shared Key is the same as WPA. The option to support both TKIP and AES Encryption is allowed in this mode.



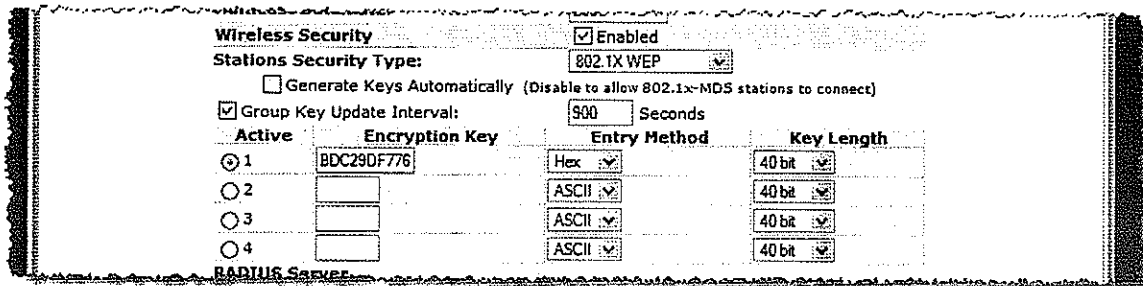
12.2.1.4 802.1x WEP

If you select **802.1x WEP** as the authentication method, the following screen will appear. Configuring 802.1x allows use of a RADIUS server for authentication of clients.



To configure 802.1x Authentication, do the following:

1. Choose to either automatically generate keys or use a static entry.
 - This limits the connection of devices to those that only support the latest encryption code algorithms.
 - If you choose to statically assign keys, this screen is shown:

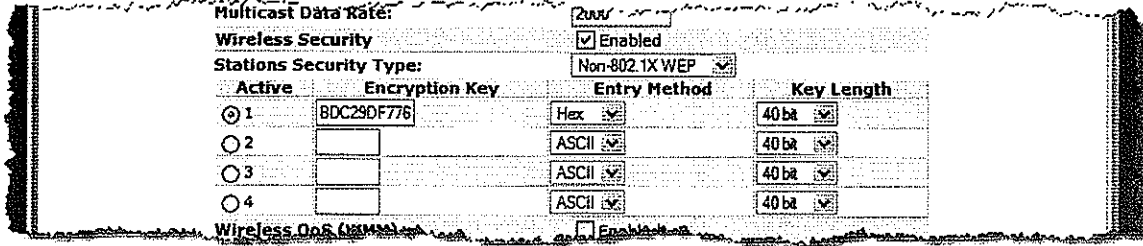


Active	Encryption Key	Entry Method	Key Length
<input checked="" type="radio"/>	BDC29DF776	Hex	40 bit
<input type="radio"/>		ASCII	40 bit
<input type="radio"/>		ASCII	40 bit
<input type="radio"/>		ASCII	40 bit

- a. Select a key (1 through 4) that you want to activate.
 - b. Select the Entry Method (ASCII or Hex) from the drop-down list.
 - c. Select the Key Length (40 bit or 104 bit) from the drop-down list.
2. Enter the desired Group Key Update Interval (Factory default Group Key Interval is 900 seconds.)
 3. Configure the Radius Server:
 - a. Enter the Radius Server IP address in the fields provided.
 - b. Enter the desired Server Port value.
 - c. Enter the Shared Secret.
 4. Click **OK** to save the wireless settings in the Router.

12.2.1.5 Non-802.1x WEP

If you select **Non-802.1x WEP** in the **Stations Security Type** drop-down list, the following screen will appear. The Non-802.1x WEP feature allows you to enable a WEP key for wireless security without using a RADIUS server.



To configure the Router for Non-802.1x WEP, do the following:

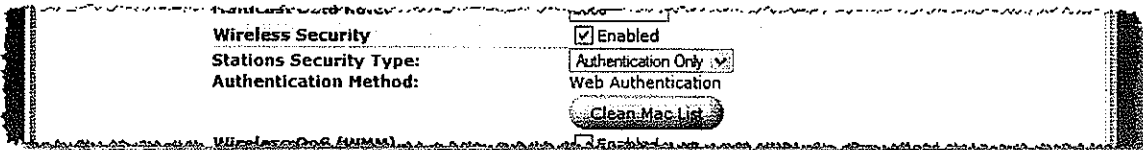
1. At the Key Encryption table, select a key (1 through 4) that you want to activate.
2. Enter the desired encryption key.

NOTE: A WEP encryption key is treated as either a string of text (ASCII) characters or a set of hexadecimal (Hex) characters. The number of text characters must be either 5 (for 40-bit encryption) or 13 (for 104-bit encryption). The number of Hex characters must be either 10 (for 40-bit encryption) or 26 (for 104-bit encryption). The only allowable hexadecimal characters are: A-F and 0-9.

3. Select the Entry Method (ASCII or Hex) from the drop-down list.
4. Select the Key Length (40 bit or 104 bit) from the drop-down list.
5. Click OK to save the wireless settings in the Router.

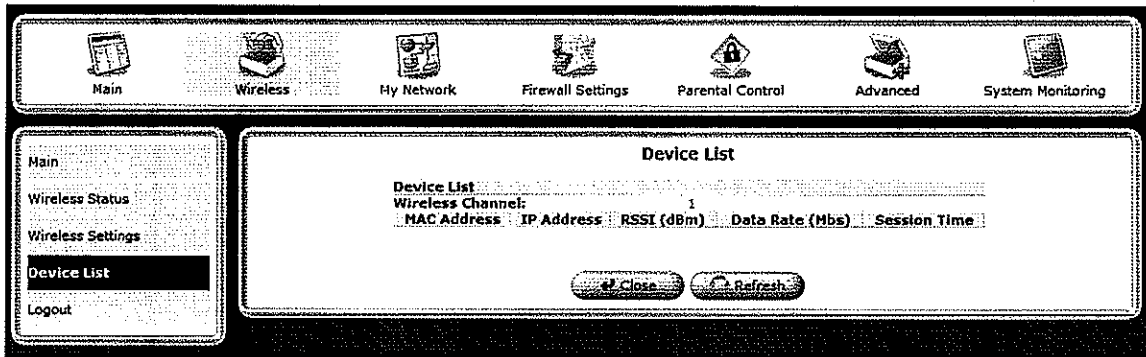
12.2.1.6 Authentication Only

If you select **Authentication Only** in the **Stations Security Type** drop-down list, the following screen will appear. This feature allows you to enable wireless security in your Router without using encryption keys or a RADIUS server. However, a station's SSID must match the Router's SSID in order to connect to the Router.



12.2.2 Device List

Clicking on **Device list** in the left-hand navigation window will bring up a list of connected wireless devices. This screen shows the operating channel as well as relative signal strength (RSSI in dBm) for each connected device. Also included is the IP address of each device, the connected data rate, and session time.



The screenshot shows the router's web interface. At the top is a navigation bar with icons and labels for: Main, Wireless, My Network, Firewall Settings, Parental Control, Advanced, and System Monitoring. On the left is a vertical navigation menu with: Main, Wireless Status, Wireless Settings, **Device List** (highlighted), and Logout. The main content area is titled "Device List" and displays the following information:

Device List: 1
Wireless Channel: 1
MAC Address : IP Address : RSSI (dBm) : Data Rate (Mbs) : Session Time

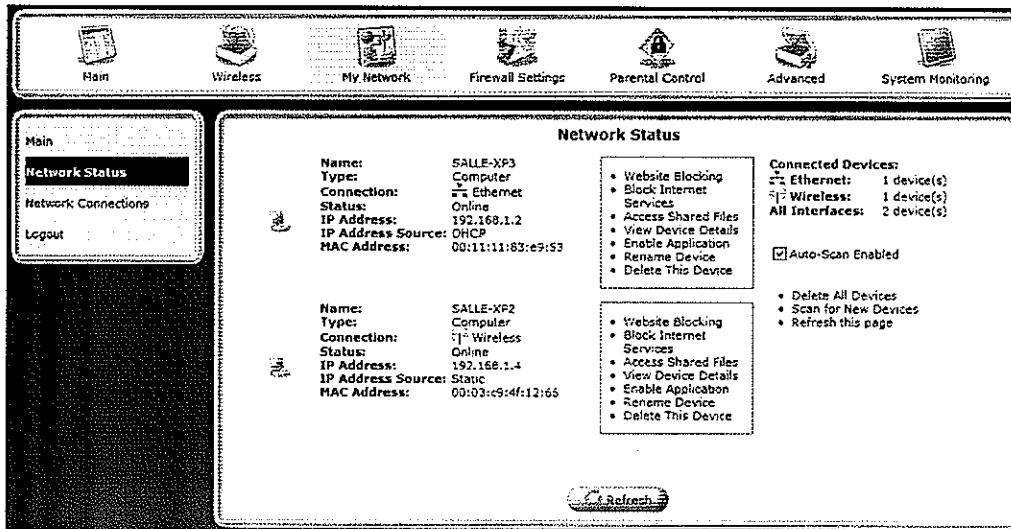
At the bottom of the main content area are two buttons: "Close" and "Refresh".

13. MY NETWORK

This section provides details on your Router's network connections.

13.1 Network Status

To view your Router's network settings, from the top navigation menu, select **Network Status**. The following screen appears. This screen displays information about the devices connected to your local area network (LAN). Click **Refresh** to update this screen and display the most current information about devices on your network.



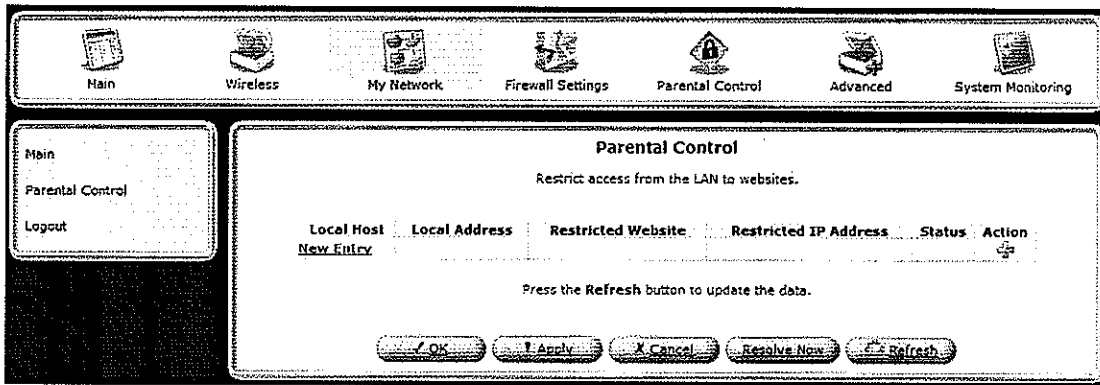
Network Status	
Name	The name of the device.
Type	The type of device connected to the network.
Connection	The interface used to connect to the Router. Ethernet: Displays the number of devices that are connected to the Router via Ethernet 10/100 BaseT connection. Wireless: Displays the number of devices that are connected to the Router wirelessly. Note: If you have computers on your network that are not being displayed, check the firewall setting on the PCs to ensure that the firewall is disabled.
Status	The status of the Internet connection.
IP Address	The IP address assigned to the computer.
IP Address Source	The method by which the computer receives its IP address.
MAC Address	The Media Access Controller; the hardware address assigned to the device by the manufacturer.
Connected Devices	The interface used to connect the device to the Router, and the devices connected. Ethernet: Displays the number of devices that are connected to the Router via Ethernet 10/100 BaseT connection. Wireless: Displays the number of devices that are connected to the Router wirelessly. All Interfaces: Displays the total number of devices that are connected to the Router. Note: If you have computers on your network that are not being displayed, check the firewall setting on the PCs to ensure that the firewall is disabled.
Auto-Scan Enabled	When this box is checked, the Router will automatically scan for devices that are connected to the network.
Delete All Devices	Click this link to delete all devices from your network.

Scan for New Devices	Click this link to allow the Router to scan the network for new devices that may have recently connected to the network.
Refresh this page	Click this link to update this screen and display the most current data.

13.1.1 Website Blocking

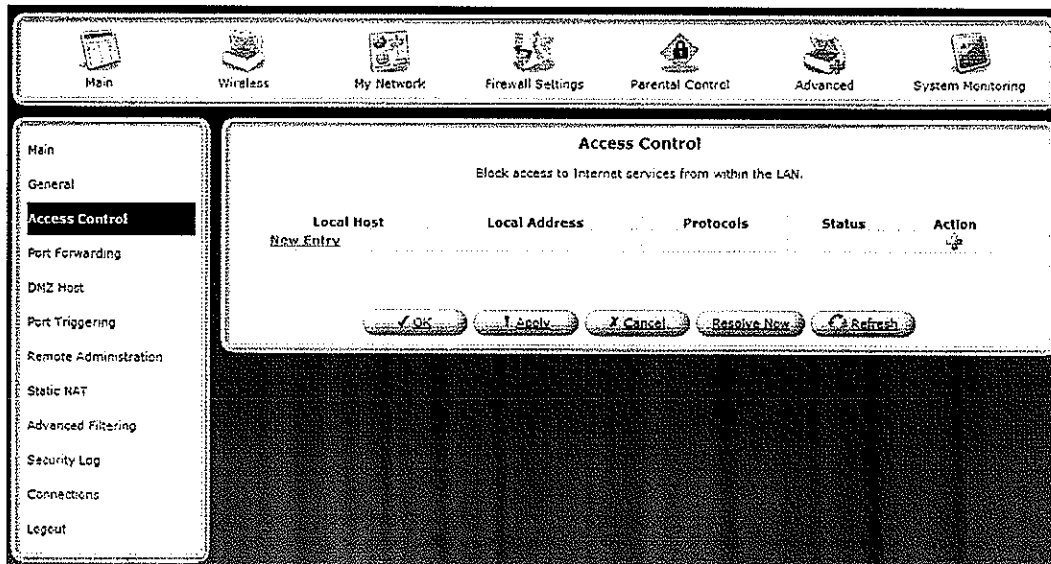
You can configure your Router to restrict access to certain Web sites for computers on your network. On the **Network Status** screen, when you click the **Website Blocking** link, it will take you to the **Parental Control** section.

Please go to section 15, "Parental Controls," for information on setting up Web site blocking rules.



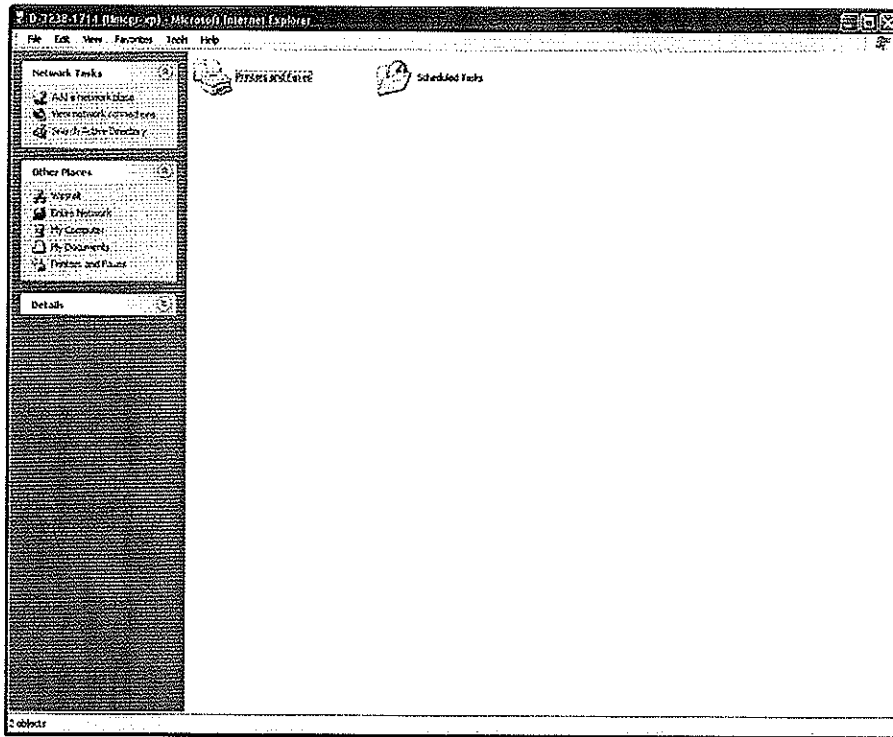
13.1.2 Block Internet Services

In the **Network Status** screen, click the **Block Internet Services** link. Then, click **Access Control** in the left submenu; the following screen appears. This feature allows you to block specific computers within the local network (or even your entire network) from accessing certain services on the Internet. For example, one computer can be prohibited from surfing the Internet; another computer from transferring files using FTP; and the whole network from receiving incoming email. To configure the settings in this screen, please follow the instructions provided in section 14.2, "A."



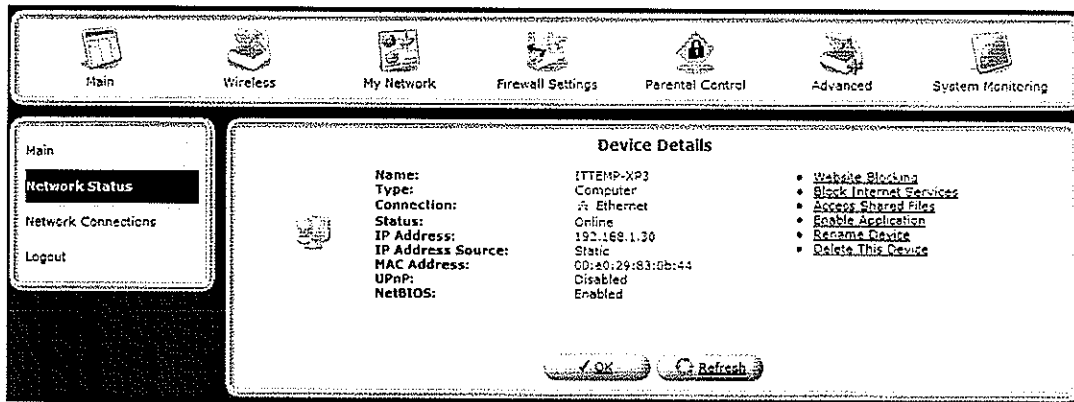
13.1.3 Access Shared Files

In the **Network Status** screen, click the **Access Shared Files** link to access files from a device on your local network. (The device from which you will access files must have file sharing enabled.) If the device has a firewall turned on, you will not be able to access shared files from the device.



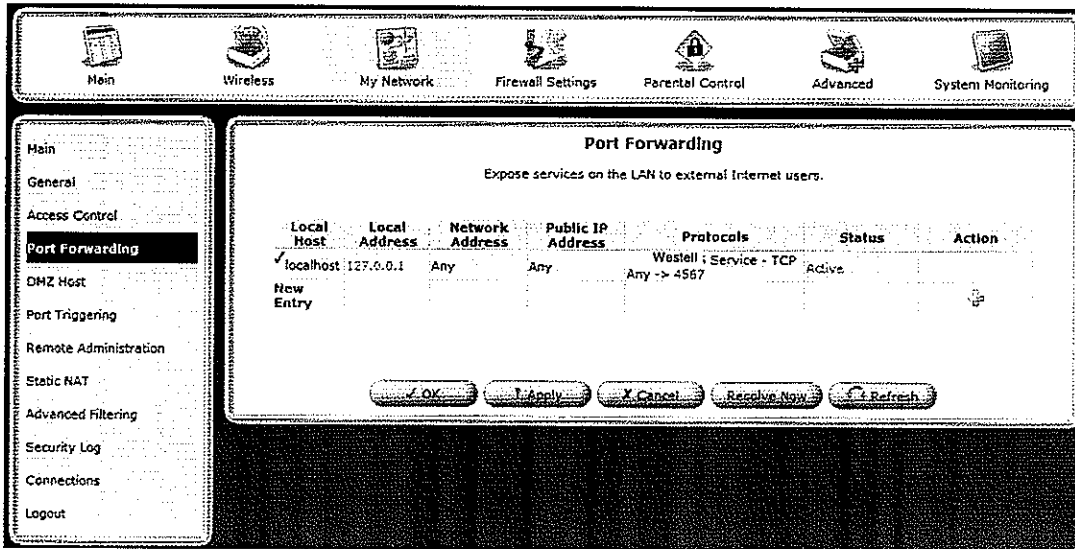
13.1.4 View Device Details

In the **Network Status** screen, click the **View Device Details** link. The following screen appears. Click **Refresh** to refresh the details in this screen. After you have finished viewing this screen, click **OK** to return to the **Network Status** screen.



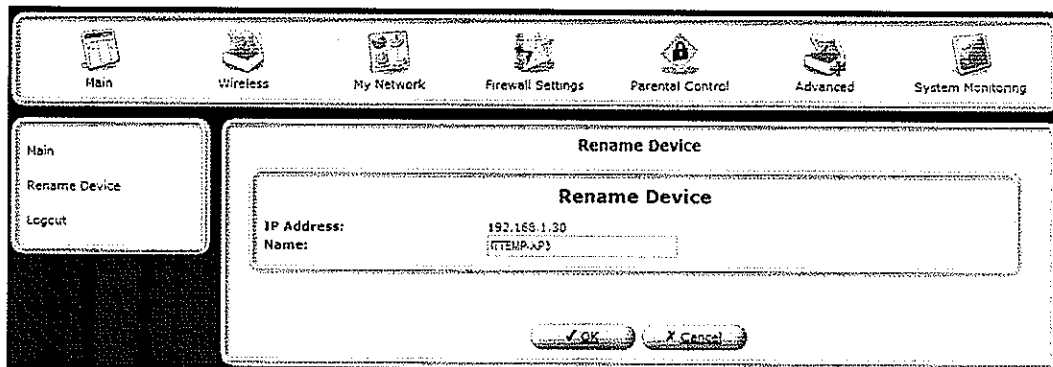
13.1.5 Enable Application

In the **Network Status** screen, click the **Enable Application** link to set up applications for your service profile, such as port forwarding services. This feature enables applications (Games, Webcams, IM & Others) by opening a tunnel between remote (Internet) computers and a specific device port inside your local area network (LAN). Details on this screen are discussed in section 14.3, "Port Forwarding."



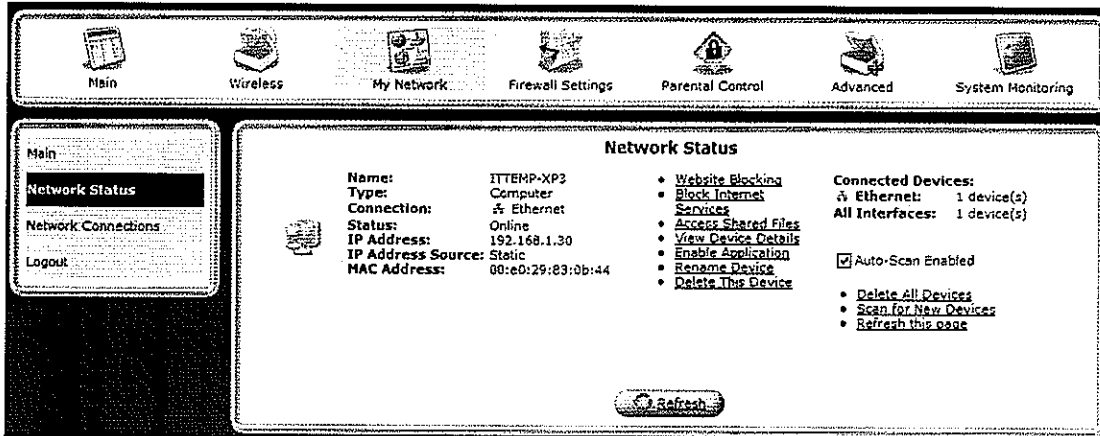
13.1.6 Rename Device

In the **Network Status** screen, click the **Rename Device** link. This screen allows you to rename a device on your network. In the following screen, type the desired name in the Name field. Next, click **OK** to allow the changes to take effect. Click **Cancel** to return to the **Network Status** screen.



13.1.7 Delete This Device

In the **Network Status** screen, click the **Delete This Device** link to remove a device from your network.



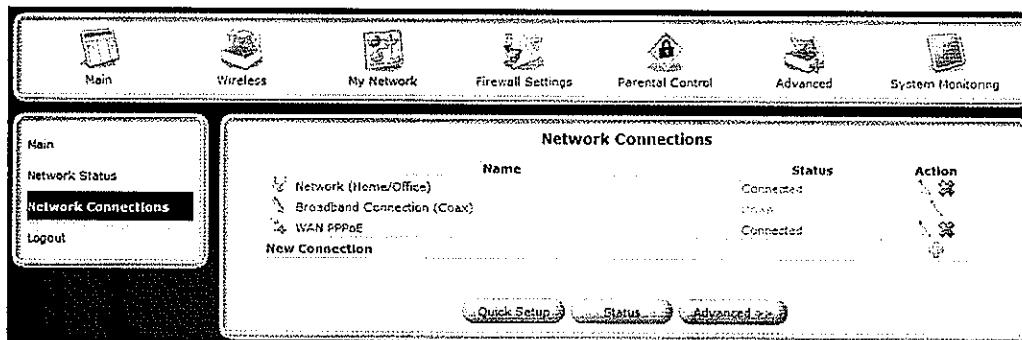
13.2 Network Connections

Your Router supports various local area network (LAN) and wide area network (WAN, on Internet) connections via Ethernet or coaxial cables. The **Network Connections** screen is used to configure the various parameters of the Router's network and Internet connections and to create new connections.

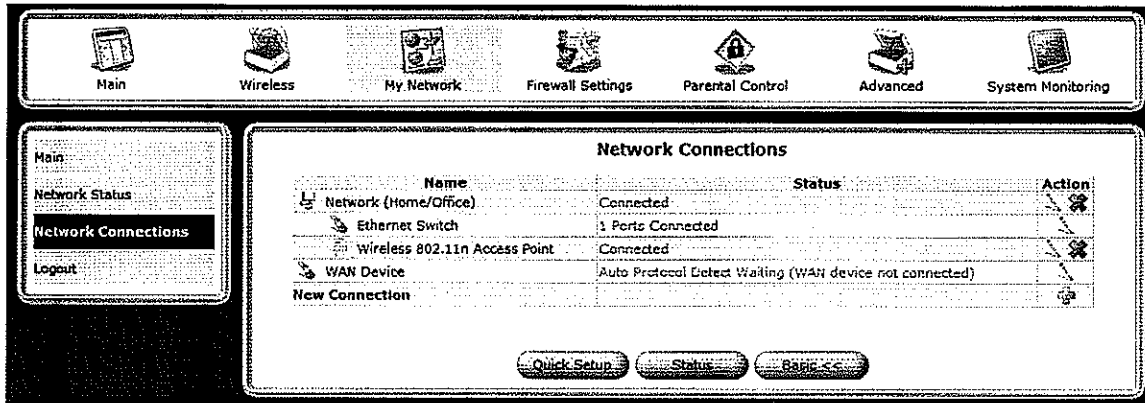
To edit your connection settings, from the top navigation menu, select **My Network**. Next, select **Network Connections** in the left submenu. The following screen appears.

Determine which screen you are viewing by looking at the buttons on the bottom of the screen. If the third button from the left displays **Advanced**, as shown below, this means you are viewing the basic Network Connections screen. Conversely, if the third button from the left displays **Basic**, this means you are viewing the advanced Network Connections screen. To go to the basic screen, click the **Basic** button.

For example, to go to the advanced Network Connections screen, click the **Advanced** button.



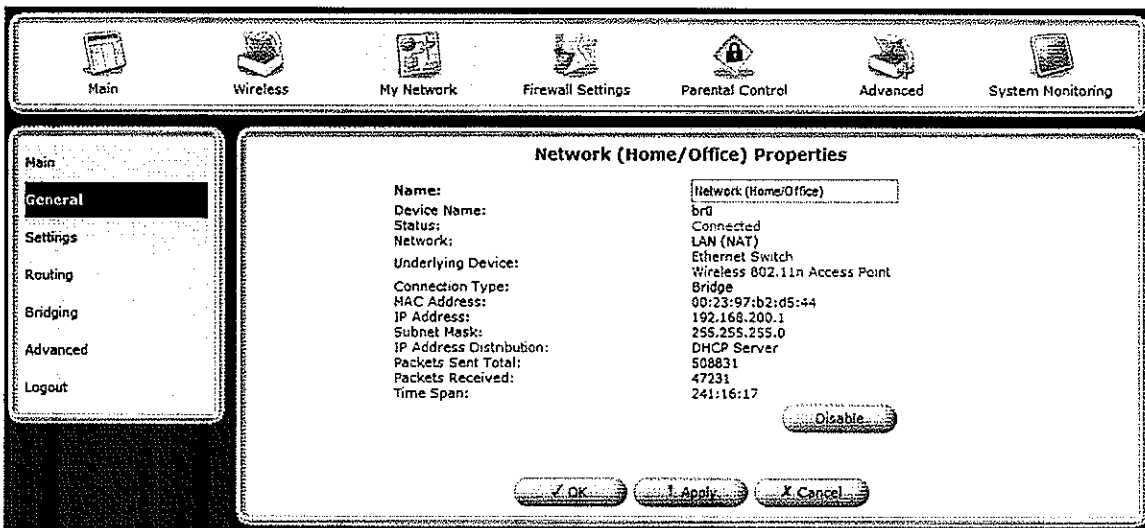
The advanced **Network Connections** screen displays additional links that allow you to access various connection settings in your Router. The following sections describe the different network connections available in the Router, as well as the connection types that can be created.



13.2.1 Network (Home/Office) Properties

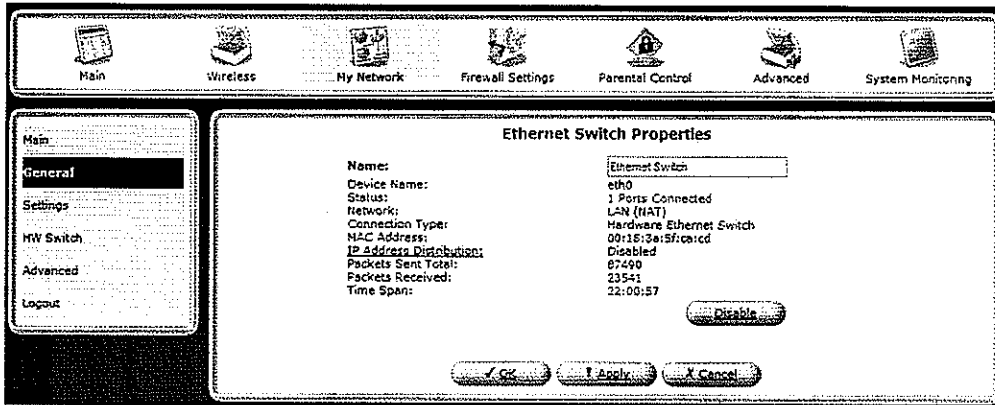
In the **Network Connections** screen, click the **Network (Home/Office)** link to access the Router's local network properties. The Network (Home/Office) connection is a bridge that is used to combine several network devices under one single "virtual network." For example, a home/office network can be created that includes your Ethernet Switch as well as your Wireless computers. Network (Home/Office) is the Router's default setting.

- At this screen, you may click on any of the named connections/bridges to edit their properties.



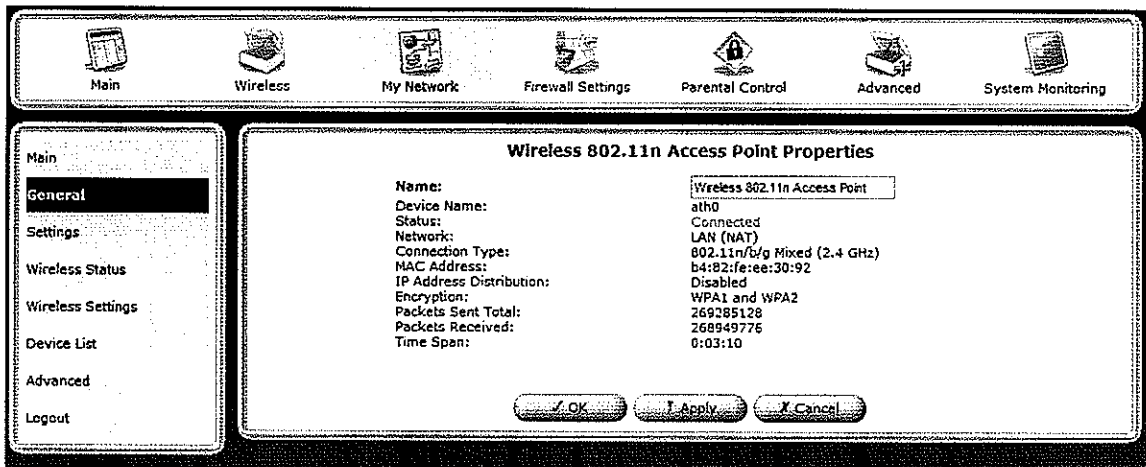
13.2.1.1 Ethernet Switch Properties

For example, if you click the **Ethernet Switch** link in the **Network (Home/Office) Properties** screen, the following screen appears. View the properties in this screen. If you change the connection name, click **Apply** to save the changes. Then, click **OK** to return to the **Network Connections** screen.



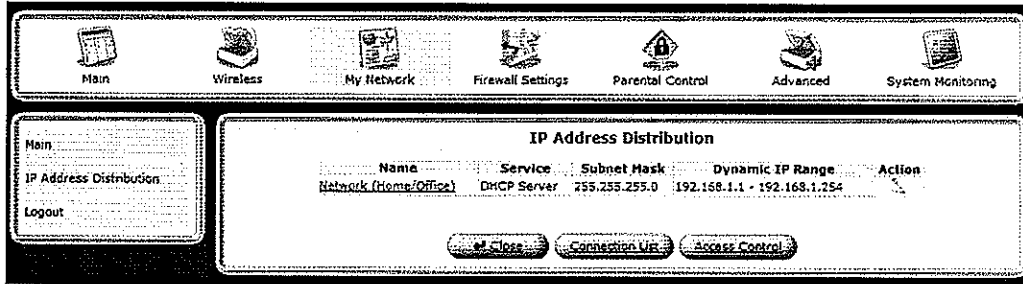
13.2.1.2 Wireless 802.11n Access Point

To view the wireless access properties, in the **Network (Home/Office) Properties** screen, click the link to the wireless subsystem (802.11g or 802.11n). The following screen appears. View the wireless properties in this screen. If you change the connection name, click **Apply** to save the changes. Click **OK** to return to the **Network Connections** screen.



13.2.1.3 IP Address Distribution

If you click the **IP Address Distribution** link in the **Network (Home/Office) Properties** screen, the following screen appears. This screen allows you to access your Router's DHCP settings. See section 16.23, "IP Address Distribution," for details on DHCP settings.



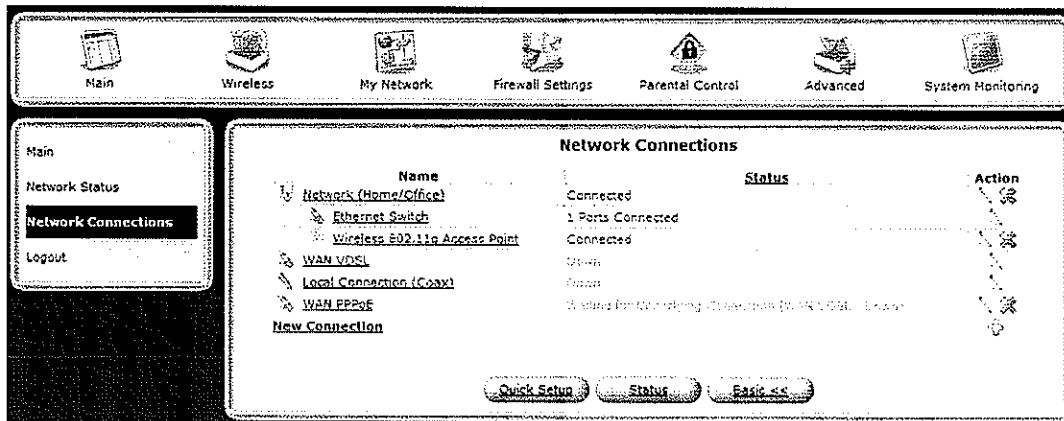
13.2.2 WAN VDSL

The Router's Broadband Connection types describe the interface used to connect your Router to your broadband network. Broadband Connection (Ethernet) means that Ethernet is the hardware used to connect the Router to the Internet. By factory default, Broadband Connection (Ethernet) is Disabled in the Router. However, you can Enable this connection type. To Enable Broadband Connection (Ethernet), you must (1) connect your Router to your existing network device using an Ethernet cable, as described in section 6.4, "Connecting Your Router to Your Broadband Service Via VDSL2," and (2) configure your Router's network connection settings for the physical connection type.

NOTE: After you have installed the Router to your network and turned on the Router, it will automatically detect which connection protocol type is being used.

In this example, the Router is connected to the broadband network using the Router's WAN port. Remember, when you use the Router's WAN port, you must also configure the Router's network connection settings.

To configure the Router's network connection settings, click the **My Network** icon in the top navigation menu, and then click **Network Connections** in the left submenu. In the **Network Connections** screen, click the **WAN VDSL** link.



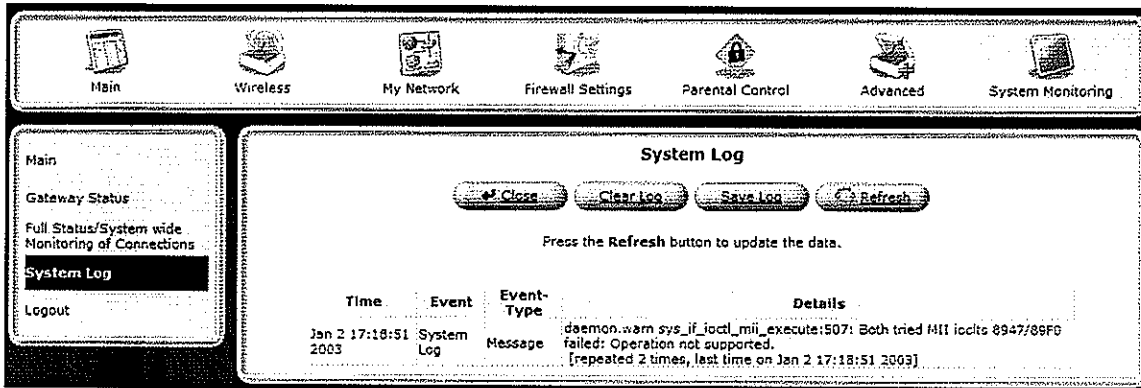
17.3 System Log

If you click **System Monitoring** in the top navigation menu and then click **System Log** in the left submenu, the following screen will appear. This screen displays the details of your system's logged events. To save the system log, click **Save Log**, and then follow the instructions to save the log to the desired location.

NOTE: Only the advanced technical user should enter this section.

At this screen, you can do any of the following:

- Click **Close** to return to the **Advanced Status** screen.
- Click **Clear Log** to remove all logs from the list.
- Click **Save Log**, and then follow the instructions to save the system log to the desired location.
- Click the **Refresh** button to manually update this screen to display the most current details.





18. TECHNICAL SUPPORT INFORMATION

Contact your Internet service provider for technical support.

19. PRODUCT SPECIFICATIONS

System Requirements

- Pentium® or equivalent class machines or higher
- Microsoft® Windows® (98 SE or later), Macintosh® OS X, or Linux installed
- 64 MB RAM (128+ MB recommended)
- 10/100 Base-T Network Interface Card (NIC)
- Optional wireless radio (802.11b/g/n)
- Internet Explorer 7+, Netscape Navigator 7+, Firefox 1.0.7+, Chrome 1.0+, Safari 3+

LEDs

- Power
- Broadband
- Internet
- Wireless Setup
- Ethernet 1, Ethernet 2, Ethernet 3, Ethernet 4
- MoCA (Optional)
- Wireless

Connectors

- COAX (Optional)
- VDSL2: RJ-11, 6-pin modular jack-VDSL2
- Ethernet: Four 8-pin RJ-45 modular jacks

- WAN: 8-pin RJ-45 modular jack
- Power: Barrel connector

Power

- Power Supply: 120 VAC to 12 VDC wall-mount power supply

Dimensions

- Height: 1.9 in. (4.8 cm)
- Width: 10.8 in. (27.4 cm)
- Depth: 5.75 in. (14.6 cm)

Weight

- Approx. 1.32 lb (0.60 kg)

Environmental

- Relative Humidity: 5 to 95%, non-condensing
- Storage Temperature: -20 °C to 85 °C (-4 °F to 185 °F)
- Ambient Temperature: 23 °C (73 °F)

EMC/Safety/Regulatory Certifications

- FCC Part 15, Class B
- FCC Part 68
- ANSI/UL Standard 60950-1
- CAN/CSA C22.2 No. 6090-1



20. SOFTWARE LICENSE AGREEMENT

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21. PUBLICATION INFORMATION

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