OZENDA

CONNECTIONS COUNT

OZENDA 11g Wireless ADSL Firewall Router

Model: AR4505GW

OZENDA 11g Wireless ADSL Firewall Router

TABLE OF CONTENTS

CHAPTER 1
INTRODUCTION

Congratulations on your purchase of the IEEE 802.11g ADSL Router, hereafter referred to as the "ADSL Router". We are proud to provide you with a powerful yet simple communication device for connecting your local area network (LAN) to the Internet. For those who want to surf the Internet in the most secure way, this router provides a convenient and powerful solution.

About the ADSL Router

The ADSL Router provides Internet access to multiple users by sharing a single-user account. Support is provided for both wired and wireless devices. New technology provides wireless security via Wired Equivalent Privacy (WEP) encryption and MAC address filtering. It is simple to configure and can be up and running in minutes.

Features and Benefits

- Internet connection to an ADSL modem via an RJ-11 ADSL port
- Local network connection via four 10/100 Mbps Ethernet ports
- On-board IEEE 802.11g wireless network adapter
- DHCP for dynamic IP configuration, and DNS for domain name mapping

- Firewall with Stateful Packet Inspection, client privileges, intrusion detection, and NAT
- NAT also enables multi-user Internet access via a single user account, and virtual server functionality (providing protected access to Internet services such as web, FTP, email, and Telnet)
- VPN pass-through (IPSec-ESP Tunnel mode, L2TP, PPTP)
- User-definable application sensing tunnel supports applications requiring multiple connections
- Easy setup through a web browser on any operating system that supports TCP/IP
- Compatible with all popular Internet applications

Applications

Many advanced networking features are provided by the ADSL Router:

- **Wireless and Wired LAN**

  The ADSL Router provides connectivity to 10/100 Mbps devices, and wireless IEEE 802.11g compatible devices, making it easy to create a network in small offices or homes.

- **Internet Access**

  This device supports Internet access through an ADSL connection. Since many DSL providers use PPPoE or PPPoA to establish communications with end users, the ADSL Router includes built-in clients for these protocols, eliminating the need to install these services on your computer.

- **Shared IP Address**

  The ADSL Router provides Internet access for up to 253 users via a single shared IP address. Using only one ISP account, multiple users on your network can browse the web at the same time.

- **Virtual Server**

  If you have a fixed IP address, you can set the ADSL Router to act as a virtual host for network address translation. Remote users access various services at your site using a constant IP address. Then, depending on the requested service (or port number), the ADSL Router can route the request to the appropriate server (at another internal IP address). This secures your network from direct attack by hackers, and provides more flexible management by allowing you to change internal IP addresses without affecting outside access to your network.

- **DMZ Host Support**

  Allows a networked computer to be fully exposed to the Internet. This function is used when NAT and firewall security prevent an Internet application from functioning correctly.

- **Security**

  The ADSL Router supports security features that deny Internet access to specified users, or filter all requests for specific services that the administrator does not want to serve. The ADSL Router's firewall also blocks common hacker attacks, including IP Spoofing, Land Attack, Ping of Death, IP with zero length, Smurf Attack, UDP port loopback, Snork Attack, TCP null scan, and TCP SYN flooding. WEP (Wired Equivalent Privacy), SSID, and MAC filtering provide security over the wireless network.

CHAPTER 2
INSTALLATION

Before installing the ADSL Router, verify that you have all the items listed under the Package Contents list. If any of the items are missing or damaged, contact your local distributor. Also be sure that you have all the necessary cabling before installing the ADSL Router. After installing the ADSL Router, refer to "Configuring the ADSL Router" on page 4-1.

Package Contents

After unpacking the ADSL Router, check the contents of the box to be sure you have received the following components:

- Ozenda 11g Wireless ADSL Firewall Router
- Power adapter
- One Category 5 Ethernet cable (RJ-45)
- Telephone patch cable (RJ-11)
- Microfilter/Splitter
- Quick Starter Guide
- Manual CD

Immediately inform your dealer in the event of any incorrect, missing, or damaged parts. If possible, please retain the carton and original packing materials in case there is a need to return the product.

System Requirements

You must meet the following minimum requirements:

- ADSL line installed by your Internet Service Provider.
- A PC using a fixed IP address or dynamic IP address assigned via DHCP, as well as a gateway server address and DNS server address from your service provider.
- A computer equipped with a 10/100 Mbps network adapter, a USB-to-Ethernet converter or an IEEE 802.11g wireless network adapter.
- TCP/IP network protocols installed on each PC that will access the Internet.
- A Java-enabled web browser, such as Microsoft Internet Explorer 5.5 or above, installed on one PC at your site for configuring the ADSL Router.

Hardware Description

The ADSL Router contains an integrated ADSL modem and connects to the Internet or to a remote site using its RJ-11 WAN port. It can be connected directly to your PC or to a local area network using any of the four Fast Ethernet LAN ports.

Data passing between devices connected to your local area network can run at up to 100 Mbps over the Fast Ethernet ports and 54 Mbps over the built-in wireless network adapter.

The ADSL Router includes an LED display on the front panel for system power and port indications that simplifies installation and network troubleshooting. It also provides the following ports on the rear panel:

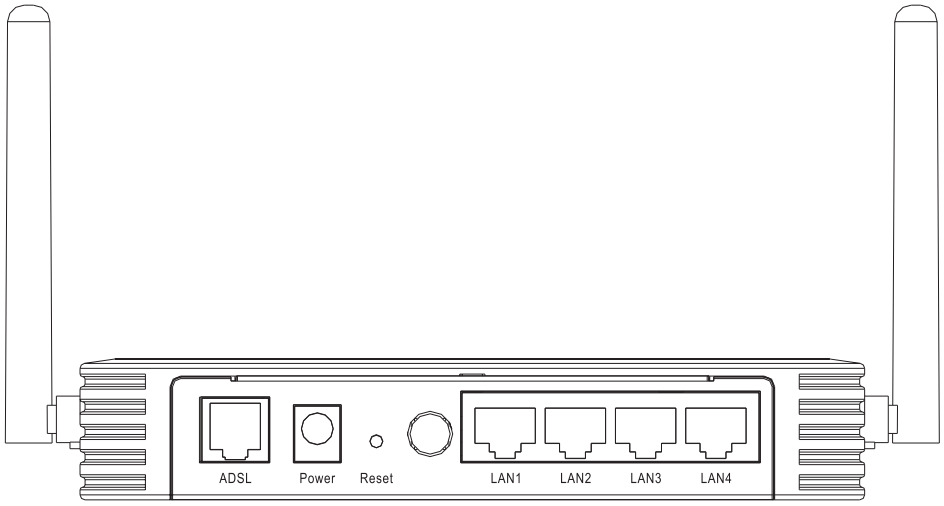


Figure 2-1. Rear Panel

Item	Description
LAN Ports	Fast Ethernet ports (RJ-45). Connect devices on your local area network to these ports (i.e., a PC, hub, or switch).
Power button	Press this button to turn on/turn off the ADSL Router.
Reset Button	Use this button to reset the power and restore the default factory settings. To reset without losing configuration settings, see "Reset" on page 4-58.
Power Inlet	Connect the included power adapter to this inlet. **Warning**: Using the wrong type of power adapter may damage the ADSL Router.
ADSL Port	WAN port (RJ-11). Connect your ADSL line to this port.

LED Indicators

The power and port LED indicators on the front panel are illustrated by the following figure and table.

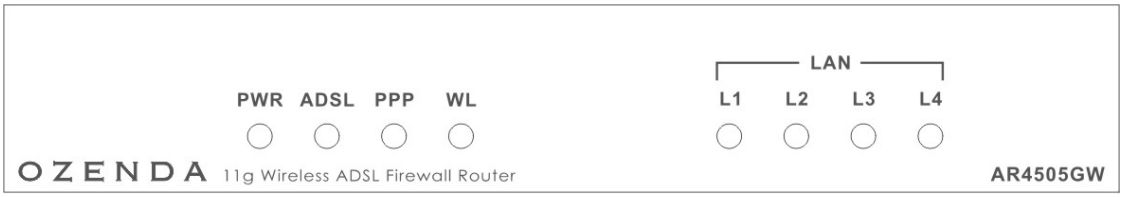


Figure 2-2. Front Panel

LED	Status	Description
PWR	On	The ADSL Router is receiving power. Normal operation.
	Off	Power off or failure.
ADSL	On	ADSL connection is functioning correctly.
	Flashing	The ADSL Router is establishing an ADSL link.
	Off	ADSL connection is not established.
PPP	On	PPP connection is on.
	Off	PPP connection is off.
WL	Flashing	The WLAN port is sending or receiving data.
LAN (4 LEDs)	On	Ethernet connection is established.
	Flashing	The indicated LAN port is sending or receiving data.
	Off	There is no LAN connection on the port.

ISP Settings

Please collect the following information from your ISP before setting up the ADSL Router:

- ISP account user name and password
- Protocol, encapsulation and VPI/VCI circuit numbers
- DNS server address
- IP address, subnet mask and default gateway (for fixed IP users only)

Connect the System

The ADSL Router can be positioned at any convenient location in your office or home. No special wiring or cooling requirements are needed. You should, however, comply with the following guidelines:

- Keep the ADSL Router away from any heating devices.
- Do not place the ADSL Router in a dusty or wet environment.

You should also remember to turn off the power, remove the power cord from the outlet, and keep your hands dry when you install the ADSL Router.

Connect the ADSL Line

Connect the supplied RJ-11 cable from the ADSL Microfilter/Splitter to the ADSL port on your ADSL Router. When inserting an ADSL RJ-11 plug, be sure the tab on the plug clicks into position to ensure that it is properly seated.

Phone Line Configuration

Installing a Full-Rate Connection

If you are using a full-rate (G.dmt) connection, your service provider will attach the outside ADSL line to a data/voice splitter. In this case you can connect your phones and computer directly to the splitter as shown below:

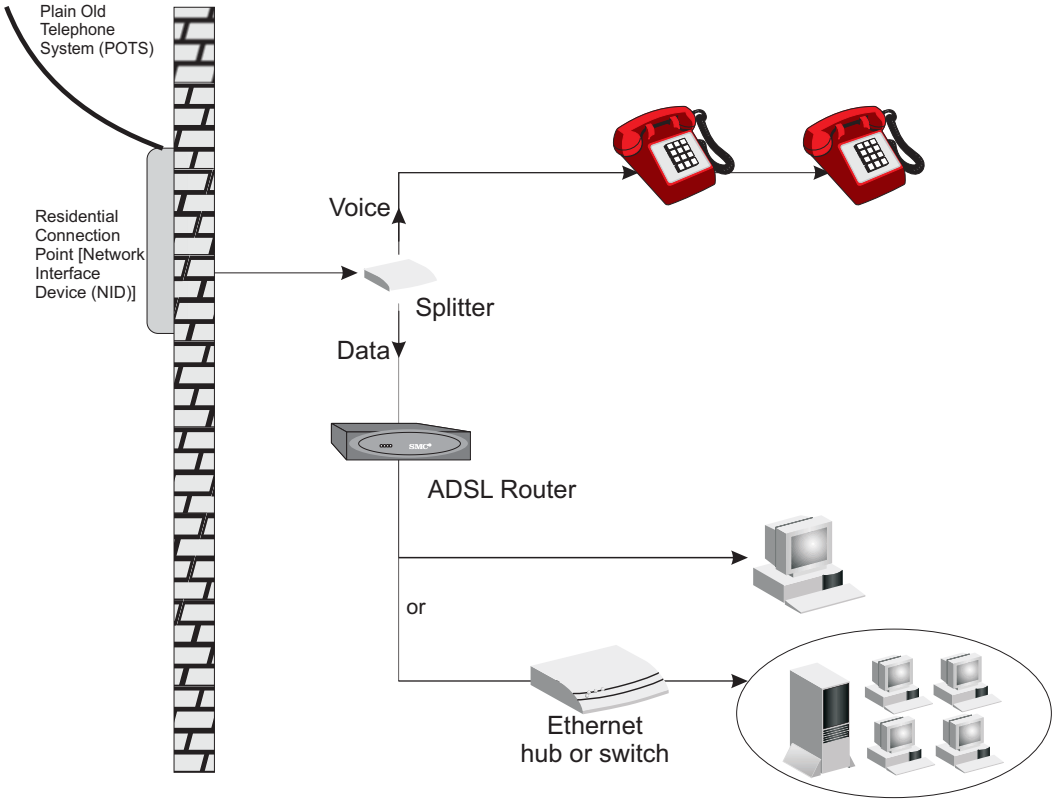


Figure 2-3. Installing with a Splitter

Installing a Splitterless Connection

If you are using a splitterless (G.lite) connection, then your service provider will attach the outside ADSL line directly to your phone system. In this case you can connect your phones and computer directly to the incoming ADSL line, but you will have to add low-pass filters to your phones as shown below:

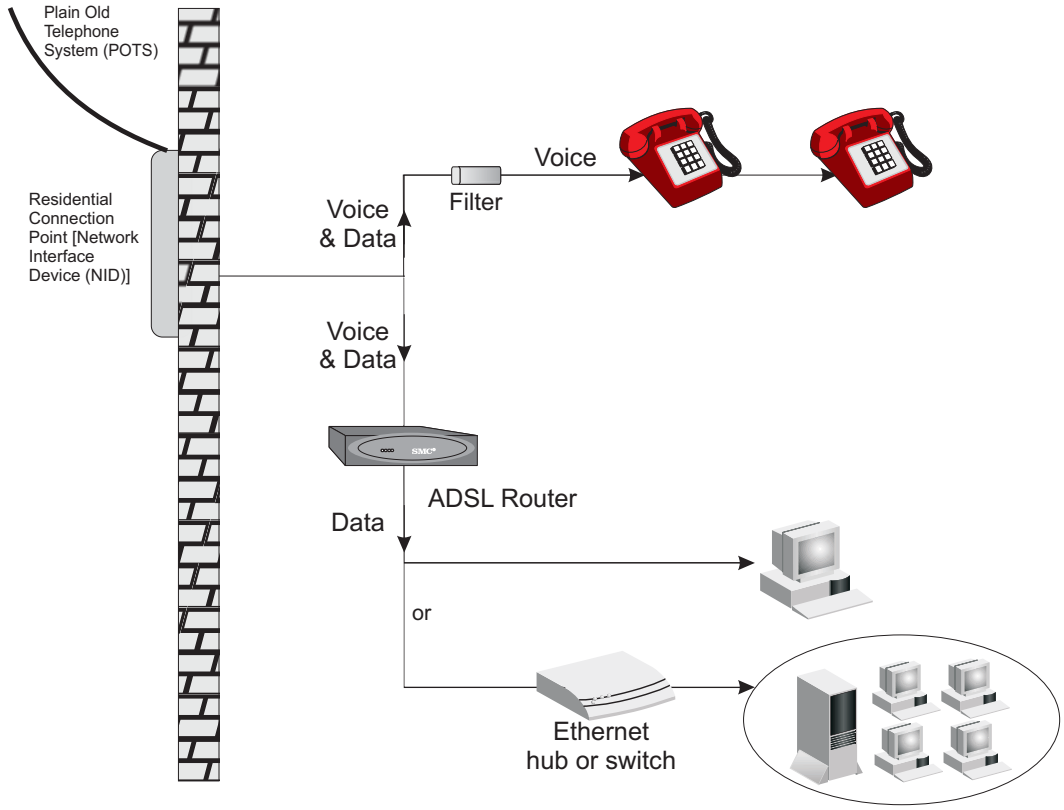


Figure 2-4. Installing without a Splitter

Attach to Your Network Using Ethernet Cabling

The four LAN ports on the ADSL Router auto-negotiate the connection speed to 10 Mbps Ethernet or 100 Mbps Fast Ethernet, as well as the transmission mode to half duplex or full duplex.

Use RJ-45 cables to connect any of the four LAN ports on the ADSL Router to an Ethernet adapter on your PC. Otherwise, cascade any of the LAN ports on the ADSL Router to an Ethernet hub or switch, and then connect your PC or other network equipment to the hub or switch. When inserting an RJ-45 connector, be sure the tab on the connector clicks into position to ensure that it is properly seated.

Warning: Do not plug a phone jack connector into an RJ-45 port. This may damage the ADSL Router.

Notes: **1.** Use 100-ohm shielded or unshielded twisted-pair cable with RJ-45 connectors for all Ethernet ports. Use Category 3, 4, or 5 for connections that operate at 10 Mbps, and Category 5 for connections that operate at 100 Mbps.

2. Make sure each twisted-pair cable length does not exceed 100 meters (328 feet).

Connect the Power Adapter

Plug the power adapter into the power socket on the rear of the ADSL Router, and the other end into a power outlet.

Check the power indicator on the front panel is lit. If the power indicator is not lit, refer to "Troubleshooting" on page A-1.

In case of a power input failure, the ADSL Router will automatically restart and begin to operate once the input power is restored.

CHAPTER 3
CONFIGURING CLIENT PC

After completing hardware setup by connecting all your network devices, you need to configure your computer to connect to the ADSL Router.

See:

"Windows 98/Me" on page 3-3

"Windows NT 4.0" on page 3-8

"Windows 2000" on page 3-12

"Windows XP" on page 3-15

or

"Configuring Your Macintosh Computer" on page 3-17

depending on your operating system.

TCP/IP Configuration

To access the Internet through the ADSL Router, you must configure the network settings of the computers on your LAN to use the same IP subnet as the ADSL Router. The default IP settings for the ADSL Router are:

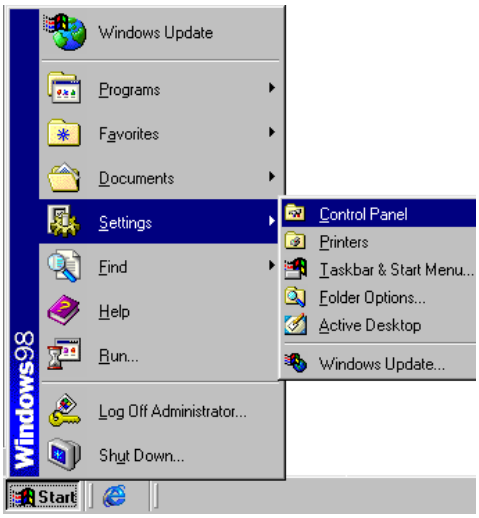
IP Address	192.168.2.1
Subnet Mask	255.255.255.0
DHCP function	Enable
DHCP IP Pool Range	192.168.2.2 to 192.168.2.254

Note: These settings can be changed to fit your network requirements, but you must first configure at least one computer to access the ADSL Router's web configuration interface in order to make the required changes. (See "Configuring the ADSL Router" on page 4-1 for instruction on configuring the ADSL Router.)

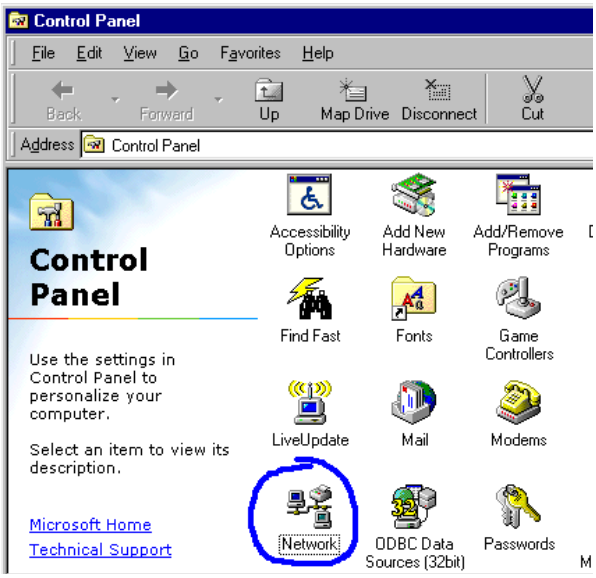
Windows 98/Me

You may find that the instructions in this section do not exactly match your version of Windows. This is because these steps and screen shots were created from Windows 98. Windows Millennium Edition is similar, but not identical, to Windows 98.

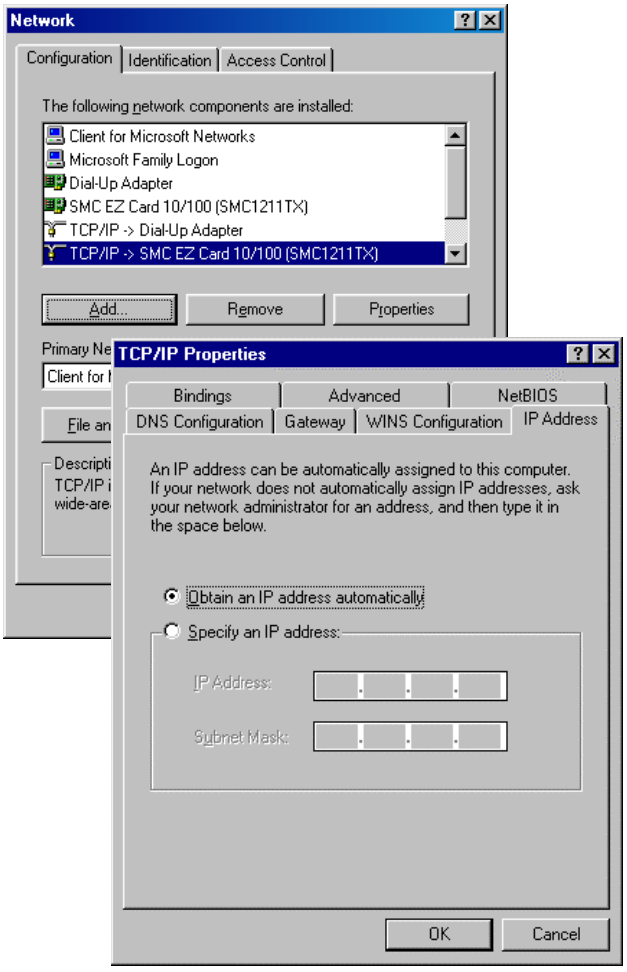
1. On the Windows desktop, click Start/Settings/Control Panel.



2. In Control Panel, double-click the Network icon.

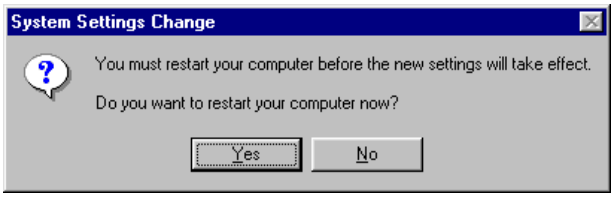


3. In the Network window, under the Configuration tab, double-click the TCP/IP item listed for your network card.



4. In the TCP/IP window, select the IP Address tab. If "Obtain an IP address automatically" is already selected, your computer is already configured for DHCP. If not, select this option.

5. Windows may need your Windows 98/Me CD to copy some files. After it finishes copying, it will prompt you to restart your system. Click Yes and your computer will restart.



TCP/IP Configuration Setting

Primary DNS Server	_____._____._____._____
Secondary DNS Server	_____._____._____._____
Default Gateway	_____._____._____._____
Host Name	_____._____._____._____

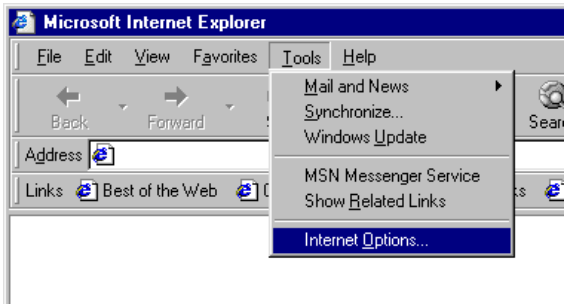
Disable HTTP Proxy

You need to verify that the "HTTP Proxy" feature of your web browser is disabled. This is so that your browser can view the ADSL Router's HTML configuration pages. The following steps are for Internet Explorer.

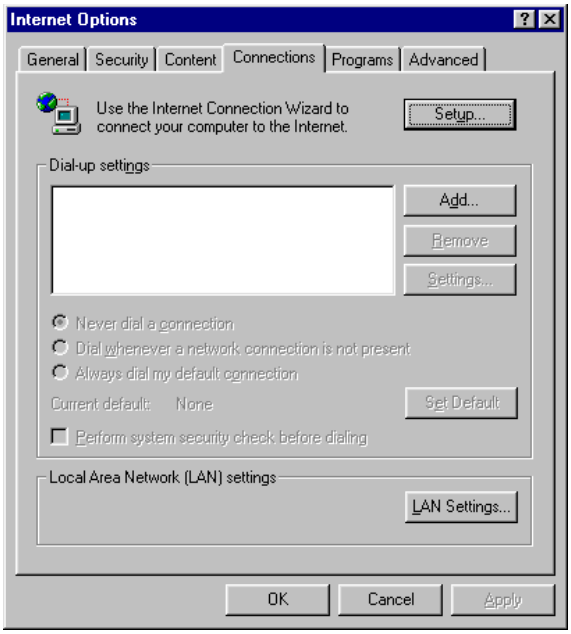
Internet Explorer

1. Open Internet Explorer.

2. Click the Stop button, then click Tools/Internet Options.

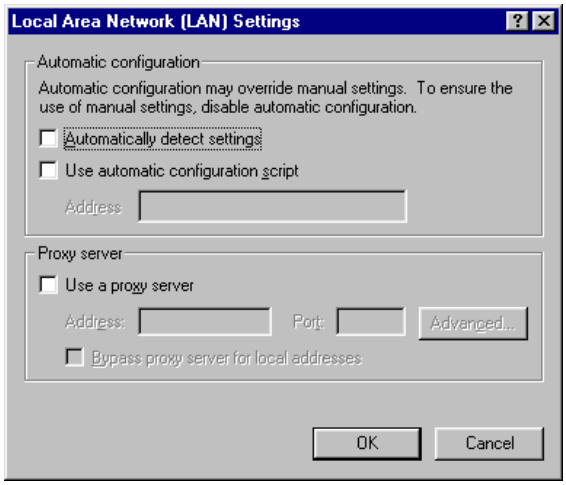


3. In the Internet Options window, click the Connections tab. Next, click the LAN Settings... button.



4. Clear all the check boxes.

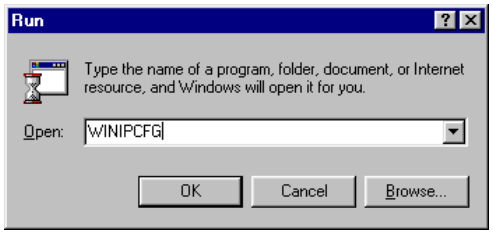
5. Click OK, and then click OK again to close the Internet Options window.



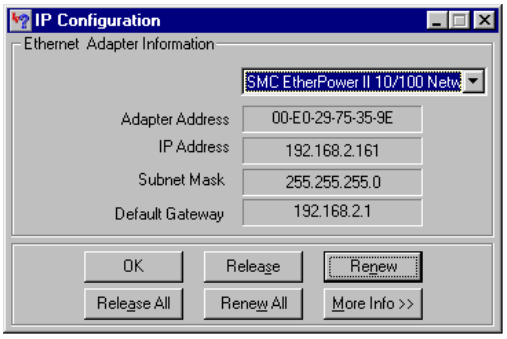
Obtain IP Settings from Your ADSL Router

Now that you have configured your computer to connect to your ADSL Router, it needs to obtain new network settings. By releasing old DHCP IP settings and renewing them with settings from your ADSL Router, you can also verify that you have configured your computer correctly.

1. On the Windows desktop, click Start/Run...



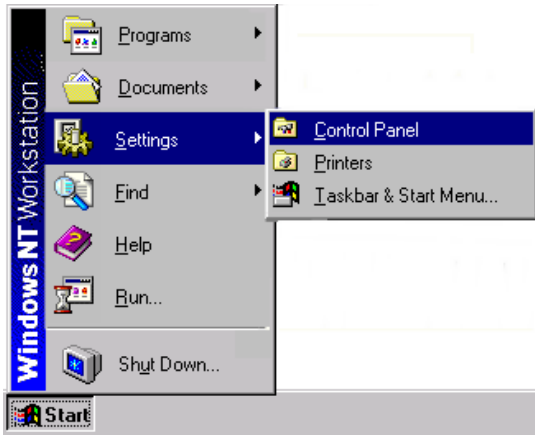
2. Type "WINIPCFG" and click OK. It may take a second or two for the IP Configuration window to appear.



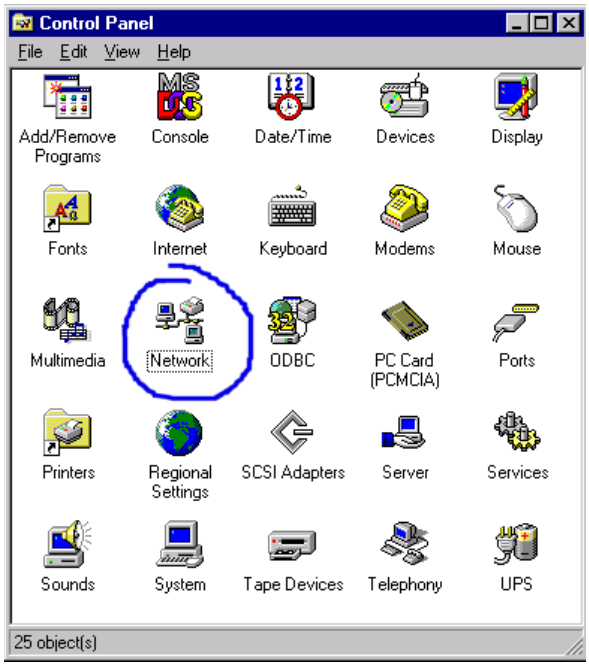
3. In the IP Configuration window, select your network card from the drop-down menu. Click Release and then click Renew. Verify that your IP address is now **192.168.2.xxx**, your Subnet Mask is **255.255.255.0** and your Default Gateway is **192.168.2.1**. These values confirm that your ADSL Router is functioning. Click OK to close the IP Configuration window.

Windows NT 4.0

1. On the Windows desktop, click Start/Settings/Control Panel.



2. Double-click the Network icon.

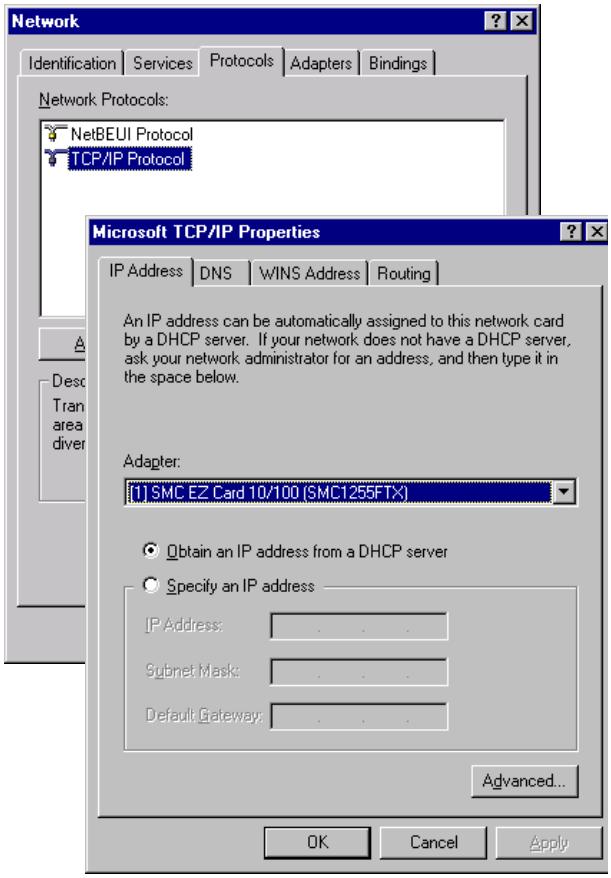


3. In the Network window, Select the Protocols tab. Double-click TCP/IP Protocol.

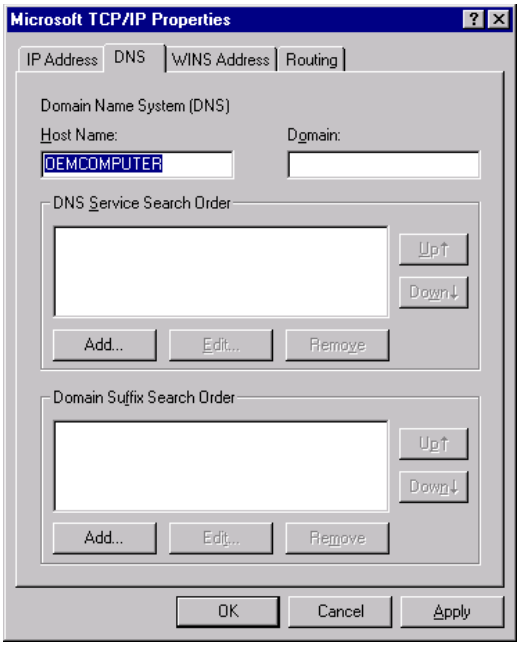
4. When the Microsoft TCP/IP Properties window open, select the IP Address tab.

5. In the Adapter drop-down list, be sure your Ethernet adapter is selected.

6. If "Obtain an IP address automatically" is already selected, your computer is already configured for DHCP. If not, select this option and click "Apply."



7. Click the DNS tab to see the primary and secondary DNS servers. Record these values, and then click "Remove." Click "Apply", and then "OK."



8. Windows may copy some files, and will then prompt you to restart your system. Click Yes and your computer will shut down and restart.

TCP/IP Configuration Setting

Default Gateway	____.____.____.____
Primary DNS Server	____.____.____.____
Secondary DNS Server	____.____.____.____
Host Name	____.____.____.____

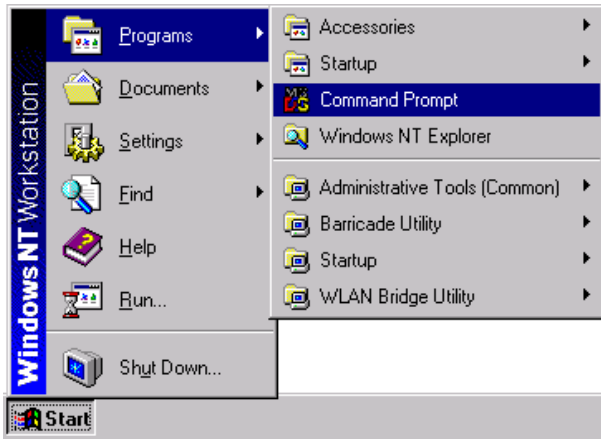
Disable HTTP Proxy

You need to verify that the "HTTP Proxy" feature of your web browser is disabled. This is so that your browser can view the ADSL Router's HTML configuration pages (refer to "Internet Explorer" on page 3-5).

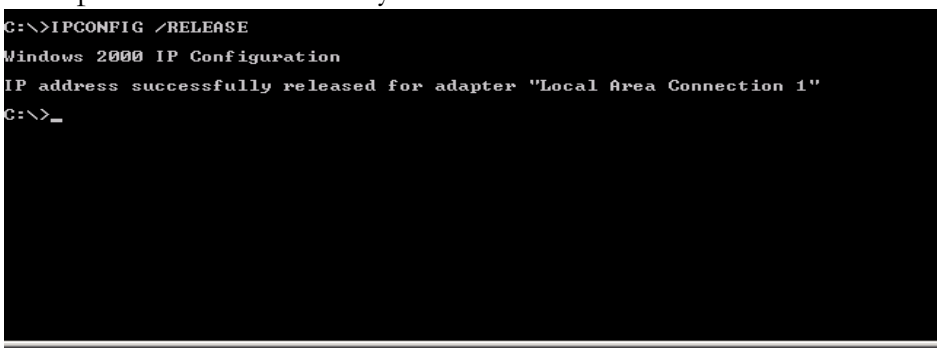
Obtain IP Settings from Your ADSL Router

Now that you have configured your computer to connect to your ADSL Router, it needs to obtain new network settings. By releasing old DHCP IP settings and renewing them with settings from your ADSL Router, you will verify that you have configured your computer correctly.

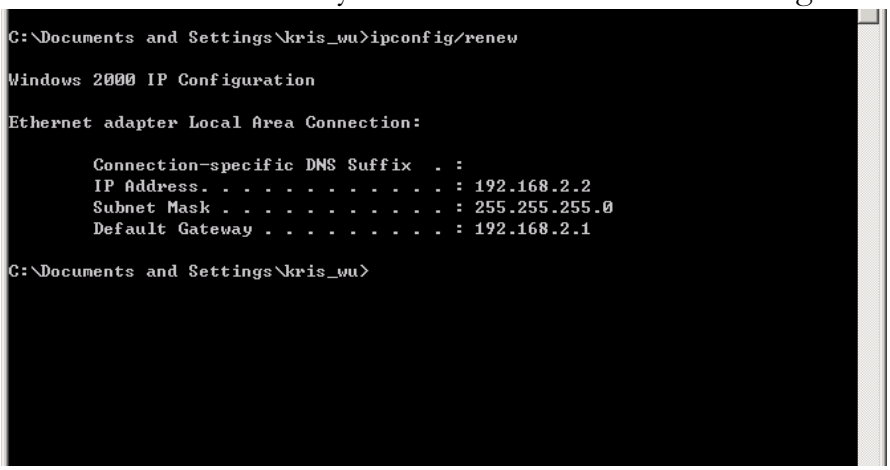
1. On the Windows desktop, click Start/Programs/ Command Prompt.



2. In the Command Prompt window, type "IPCONFIG /RELEASE" and press the ENTER key.



3. Type "IPCONFIG /RENEW" and press the ENTER key. Verify that your IP Address is now **192.168.2.xxx**, your Subnet Mask is **255.255.255.0** and your Default Gateway is **192.168.2.1**. These values confirm that your ADSL Router is functioning.



4. Type "EXIT" and press the ENTER key to close the Command Prompt window.

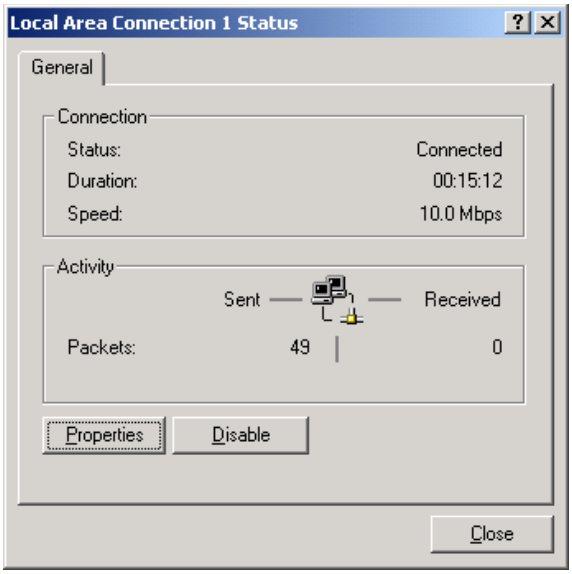
Your computer is now configured to connect to the ADSL Router.

Windows 2000

1. On the Windows desktop, click Start/Settings/Network and Dial-Up Connections.

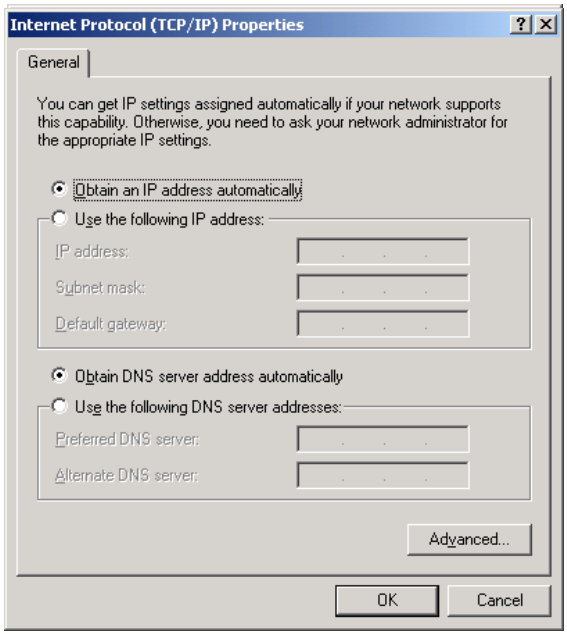
2. Click the icon that corresponds to the connection to your ADSL Router.

3. The connection status screen will open. Click Properties.



4. Double-click Internet Protocol (TCP/IP).

5. If "Obtain an IP address automatically" and "Obtain DNS server address automatically" are already selected, your computer is already configured for DHCP. If not, select this option.



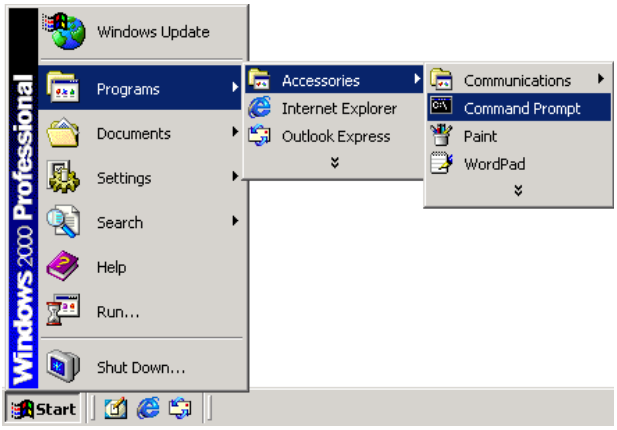
Disable HTTP Proxy

You need to verify that the "HTTP Proxy" feature of your web browser is disabled. This is so that your browser can view the ADSL Router's HTML configuration pages (refer to "Internet Explorer" on page 3-5).

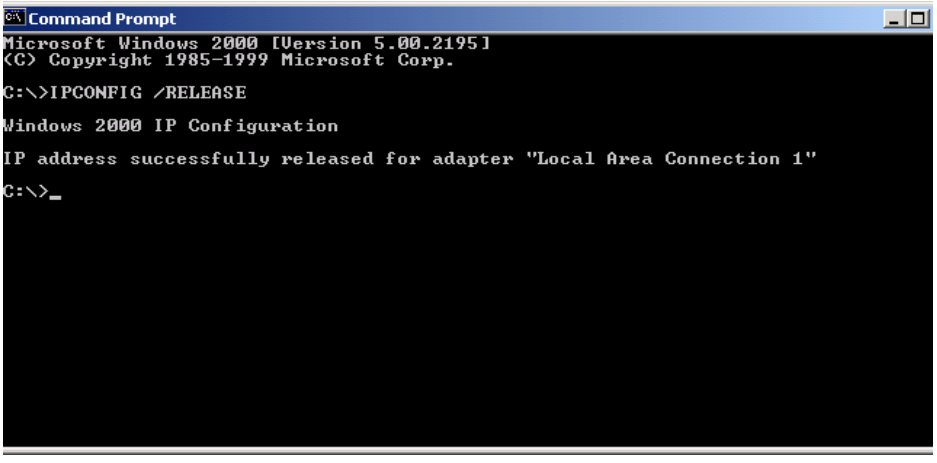
Obtain IP Settings from Your ADSL Router

Now that you have configured your computer to connect to your ADSL Router, it needs to obtain new network settings. By releasing old DHCP IP settings and renewing them with settings from your ADSL Router, you can verify that you have configured your computer correctly.

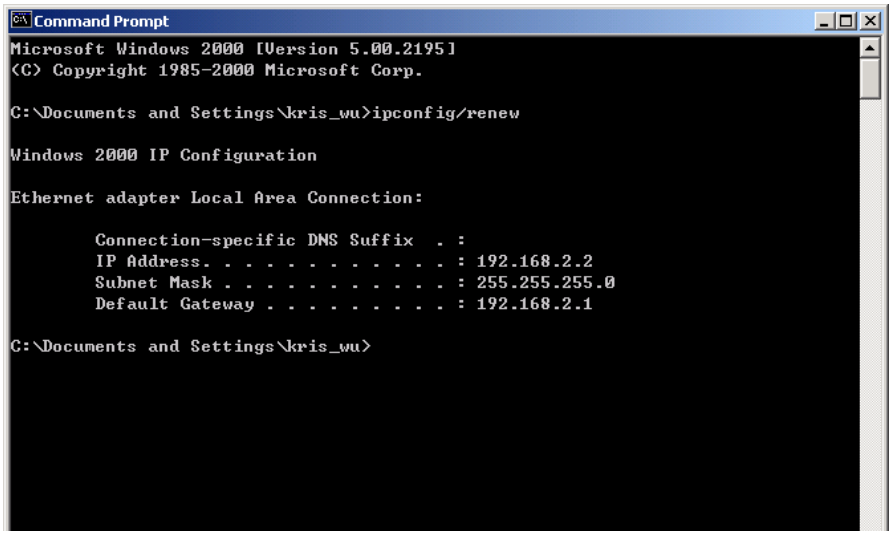
1. On the Windows desktop, click Start/Programs/Accessories/Command Prompt.



2. In the Command Prompt window, type "IPCONFIG/RELEASE" and press the ENTER key.



3. Type "IPCONFIG /RENEW" and press the ENTER key. Verify that your IP Address is now **192.168.2.xxx**, your Subnet Mask is **255.255.255.0** and your Default Gateway is **192.168.2.1**. These values confirm that your ADSL Router is functioning.



4. Type "EXIT" and press the ENTER key to close the Command Prompt window.

Your computer is now configured to connect to the ADSL Router.

Windows XP

1. On the Windows desktop, click Start/Control Panel.
2. In the Control Panel window, click Network and Internet Connections.
3. The Network Connections window will open. Double-click the connection for this device.
4. On the connection status screen, click Properties.
5. Double-click Internet Protocol (TCP/IP).
6. If "Obtain an IP address automatically" and "Obtain DNS server address automatically" are already selected, your computer is already configured for DHCP. If not, select this option.

Disable HTTP Proxy

You need to verify that the "HTTP Proxy" feature of your web browser is disabled. This is so that your browser can view the ADSL Router's HTML configuration pages (refer to "Internet Explorer" on page 3-5).

Obtain IP Settings from Your ADSL Router

Now that you have configured your computer to connect to your ADSL Router, it needs to obtain new network settings. By releasing old DHCP IP settings and renewing them with settings from your ADSL Router, you can verify that you have configured your computer correctly.

1. On the Windows desktop, click Start/Programs/Accessories/ Command Prompt.

2. In the Command Prompt window, type "IPCONFIG/RELEASE" and press the ENTER key.

3. Type "IPCONFIG /RENEW" and press the ENTER key. Verify that your IP Address is now **192.168.2.xxx**, your Subnet Mask is **255.255.255.0** and your Default Gateway is **192.168.2.1**. These values confirm that your ADSL router is functioning.

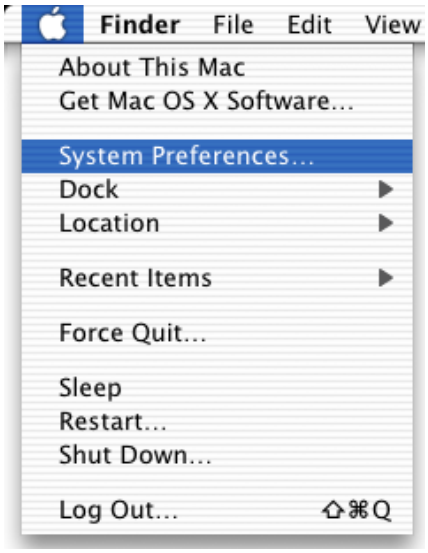
Type "EXIT" and press the ENTER key to close the Command Prompt window.

Your computer is now configured to connect to the ADSL Router.

Configuring Your Macintosh Computer

You may find that the instructions here do not exactly match your operating system. This is because these steps and screen shots were created using Mac OS 10.2. Mac OS 7.x and above are similar, but may not be identical to Mac OS 10.2.

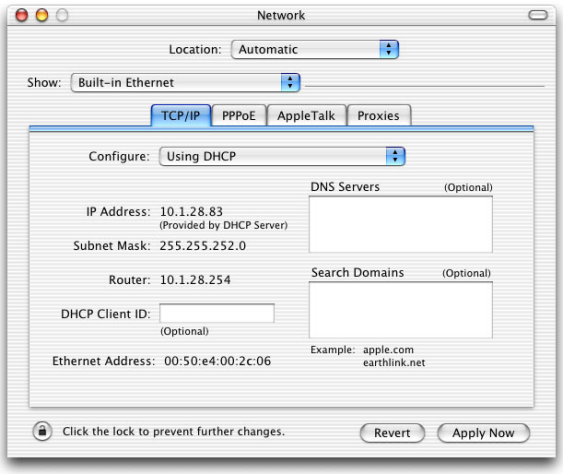
Follow these instructions:



1. Pull down the Apple Menu. Click System Preferences

2. Double-click the Network icon in the Systems Preferences window.

3. If "Using DHCP Server" is already selected in the Configure field, your computer is already configured for DHCP. If not, select this Option.



4. Your new settings are shown on the TCP/IP tab. Verify that your IP Address is now **192.168.2.xxx**, your Subnet Mask is **255.255.255.0** and your Default Gateway is **192.168.2.1**. These values confirm that your ADSL Router is functioning.

5. Close the Network window.

Now your computer is configured to connect to the ADSL Router.

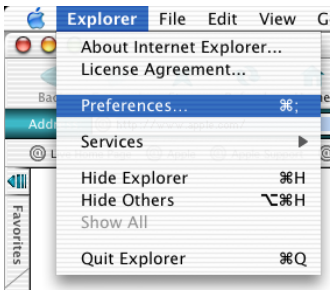
Disable HTTP Proxy

You need to verify that the "HTTP Proxy" feature of your web browser is disabled. This is so that your browser can view the ADSL Router's HTML configuration pages. The following steps are for Internet Explorer.

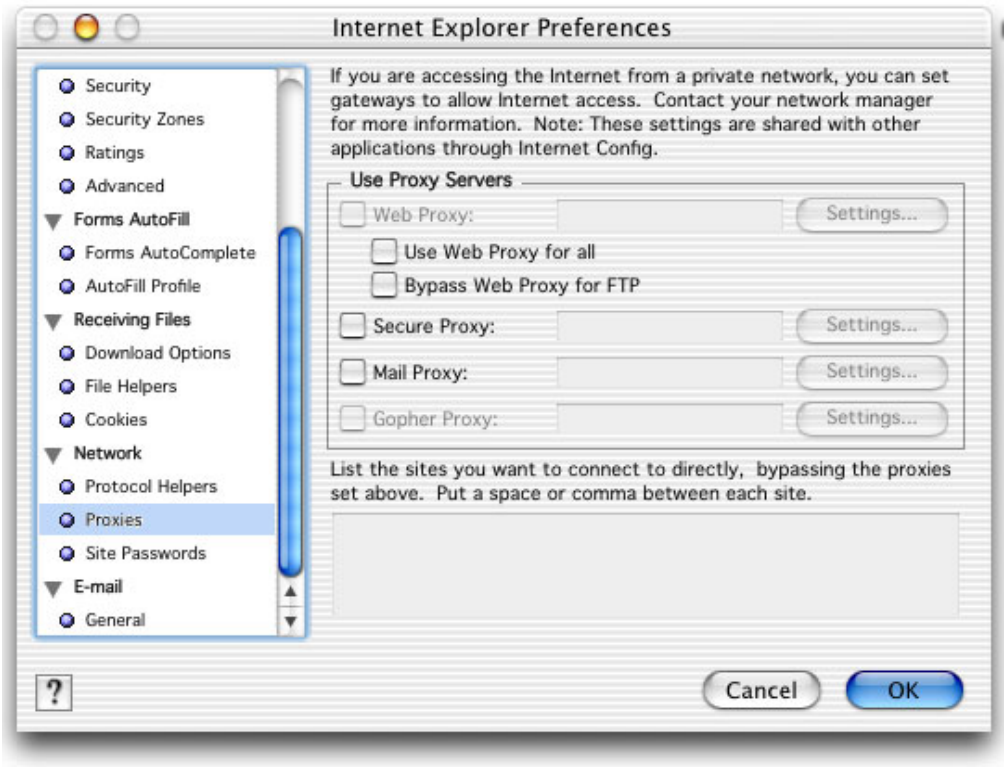
Internet Explorer

1. Open Internet Explorer and click the Stop button. Click Explorer/Preferences.

2. In the Internet Explorer Preferences window, under Network, select Proxies.



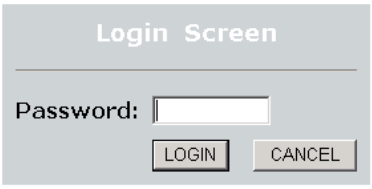
3. Uncheck all check boxes and click OK.



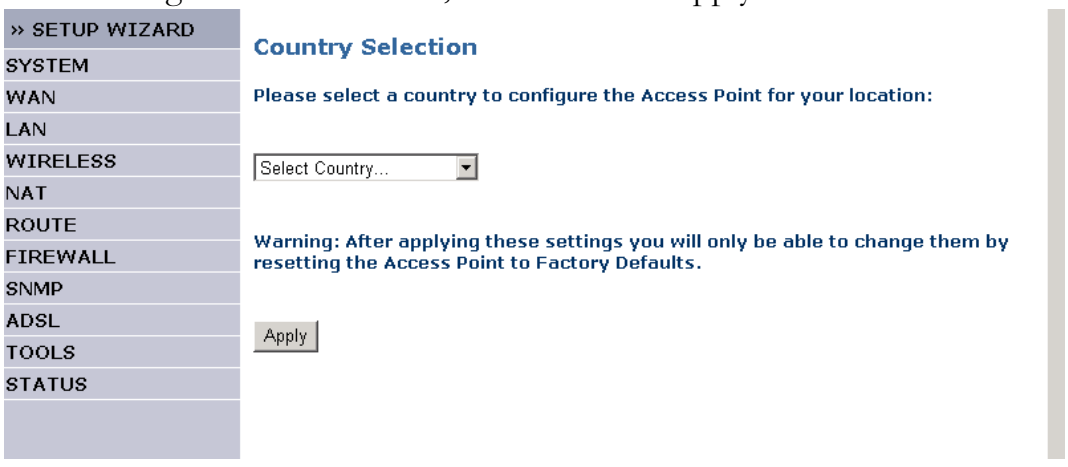
CHAPTER 4
CONFIGURING THE ADSL ROUTER

After you have configured TCP/IP on a client computer, you can configure the ADSL Router using Internet Explorer 5.5 or above.

To access the ADSL Router's management interface, enter the default IP address of the ADSL Router in your web browser: http://192.168.2.1.
By default there is no password, click "LOGIN" to access the user interface.

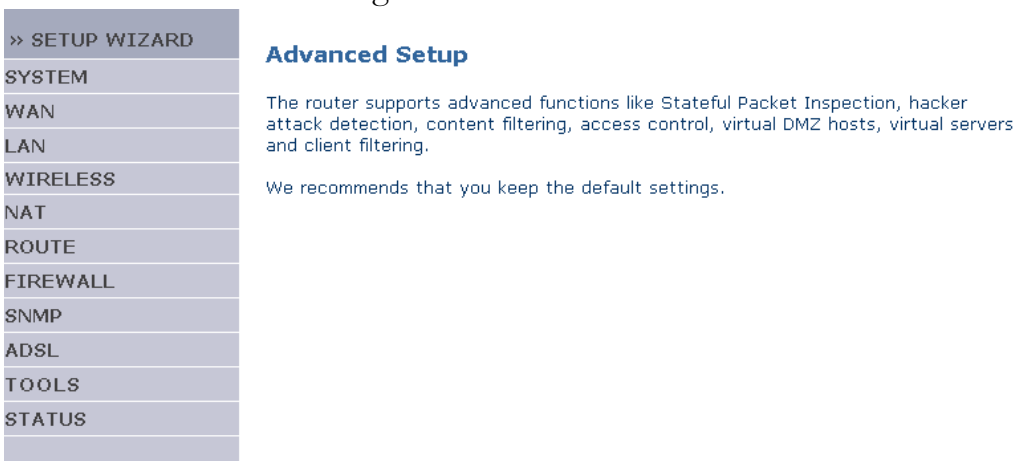


If you are logging in to the management interface for the first time, the country selection page will appear. Please select the country in which you will be using the ADSL Router, and then click Apply.



Navigating the Management Interface

The ADSL Router's management interface consists of 12 main items.



Setup Wizard: Use the Setup Wizard if you want to quickly set up the ADSL Router. Go to "SETUP WIZARD" on page 4-3.

Advanced Setup: Advanced Setup supports more advanced functions like hacker attack detection, IP and MAC address filtering, virtual server setup, virtual DMZ host, as well as other functions. Go to "Advanced Setup" on page 4-13.

Making Configuration Changes

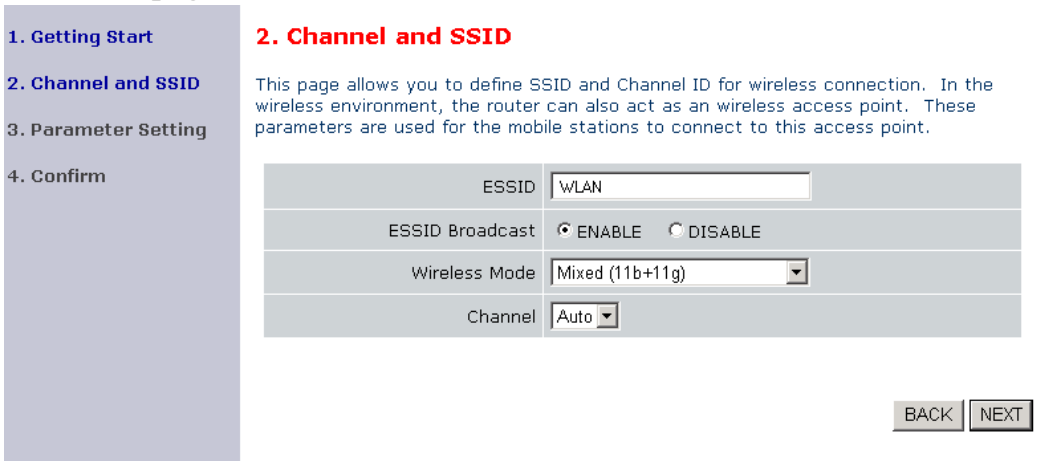
Configurable parameters have a dialog box or a drop-down list. Once a configuration change has been made on a page, click the "SAVE SETTINGS" or "NEXT" button at the bottom of the page to enable the new setting.

Note: To ensure proper screen refresh after a command entry, be sure that Internet Explorer 5.5 is configured as follows: Under the menu Tools/Internet Options/General/Temporary Internet Files/Settings, the setting for "Check for newer versions of stored pages" should be "Every visit to the page."

SETUP WIZARD

Channel and SSID

Click on "SETUP WIZARD" and "NEXT", then you will see the Channel and SSID page.



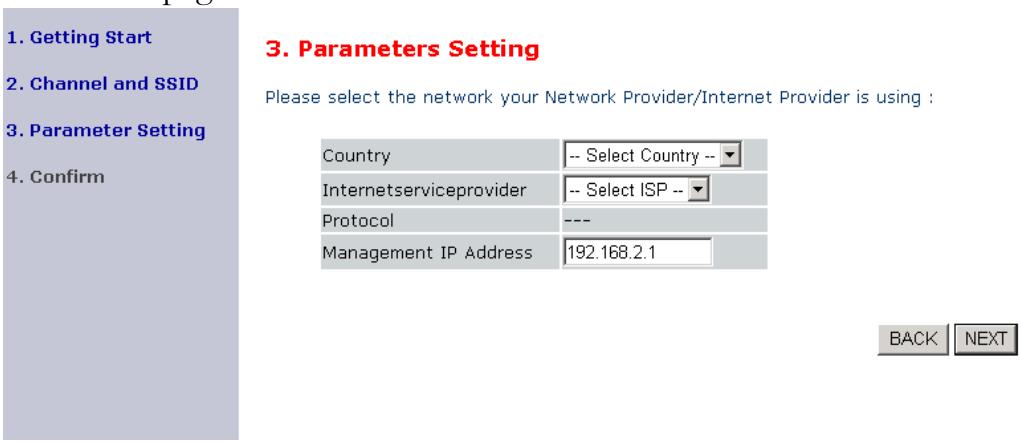
Parameter	Description
ESSID	Extended Service Set ID. The ESSID must be the same on the ADSL Router and all of its wireless clients.
ESSID Broadcast	Enable or disable the broadcasting of the SSID.
Wireless Mode	This device supports both 11g and 11b wireless networks. Make your selection depending on the type of wireless network that you have.
Channel	The radio channel used by the wireless router and its clients to communicate with each other. This channel must be the same on the ADSL Router and all of its wireless clients. The ADSL Router will automatically assign itself a radio channel, or you may select one manually.

Click "NEXT" to continue.

Parameter Setting

Select your Country and Internet Service Provider. This will automatically configure the ADSL Router with the correct Protocol, Encapsulation and VPI/VCI settings for your ISP.

If your Country or Internet Service Provider is not listed you will need to manually enter settings. Go to "Parameter Setting - Country or ISP Not Listed" on page 4-7 in the manual.



If your ISP uses PPPoA or PPPoE, then you will need to enter the username, password and DNS Server address supplied by your ISP.

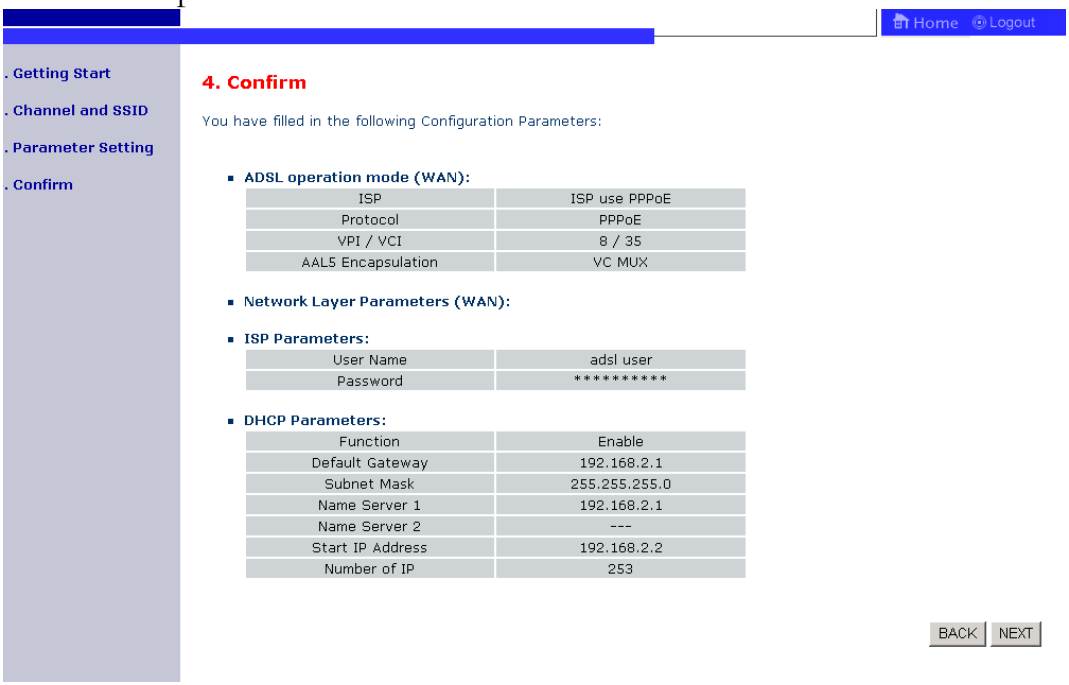
If your ISP uses 1483 Routing, then you will need to enter the IP address, Subnet Mask, Default Gateway and DNS Server address supplied by your ISP.

Note: By default 192.168.2.1 is set for the DNS Server address, this needs to be changed to reflect your ISP's DNS Server address.

Click "NEXT" to continue.

Confirm

The Confirm page shows a summary of the configuration parameters. Check ADSL operation mode (WAN), Network Layer Parameters (WAN) and DHCP parameters are correct.



Parameter	Description
ADSL Operation Mode (WAN)	
ISP	The type of ISP you have selected.
Protocol	Indicates the protocol used.
VPI/VCI	Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI).
AAL5 Encapsulation	Shows the packet encapsulation type. Go to page 4-20 for a detailed description.
Network Layer Parameters (WAN)	
IP Address	WAN IP address.
Subnet Mask	WAN subnet mask.
Default Gateway	WAN gateway.

Parameter	Description
DHCP Parameters	
Function	Shows the DHCP function is enabled or disabled.
Default Gateway	LAN IP address of the ADSL Router.
Subnet Mask	The network subnet mask.
Name Server 1	Primary DNS server IP address.
Name Server 2	Alternate DNS server IP address.
Start IP Address	Start IP address of DHCP assigned IP addresses.
Number of IP	Number of IP addresses available for assignment by the DHCP server.

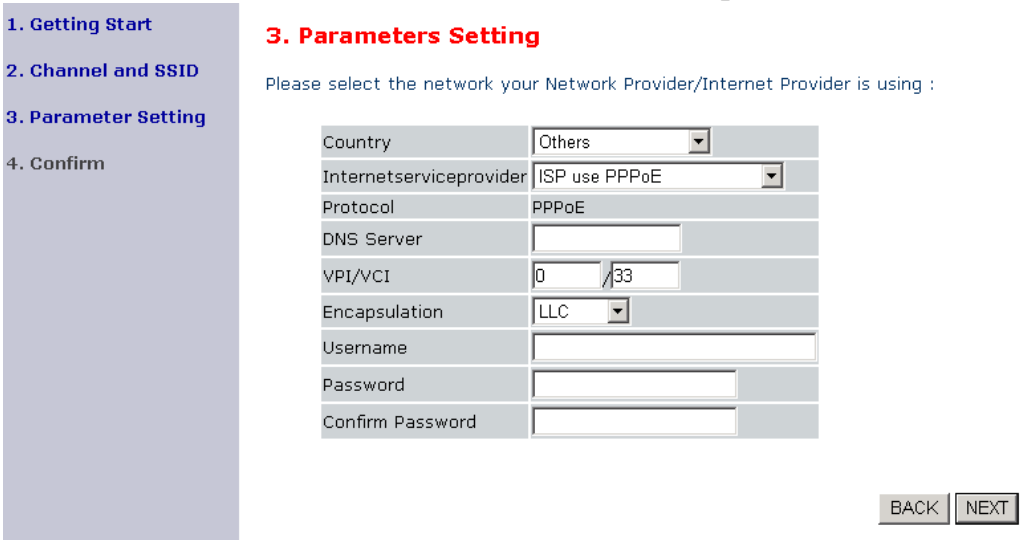
If the parameters are correct, click "NEXT" to save these settings.

Parameter Setting - Country or ISP Not Listed

If your Country or Internet Service Provider is not listed on the drop down menu, select "Others". This will allow you to manually configure your ISP settings.

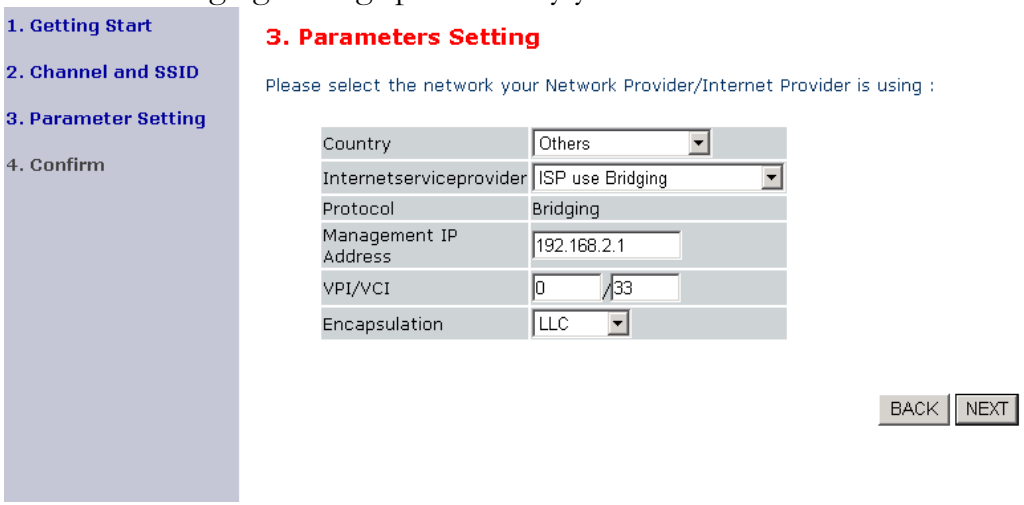
For manual configuration you will need to know the Protocol, DNS Server, Encapsulation and VPI/VCI settings used by your ISP. If you have a Static IP address you will also need to know the IP address, Subnet Mask and Gateway address. Please contact your ISP for these details if you do not already have them.

After selecting "Others" you will be required to select what Protocol your ISP uses from the "Internet Service Provider" drop down list.



ISP use Bridging - Parameter Setting

Enter the Bridging settings provided by your ISP.



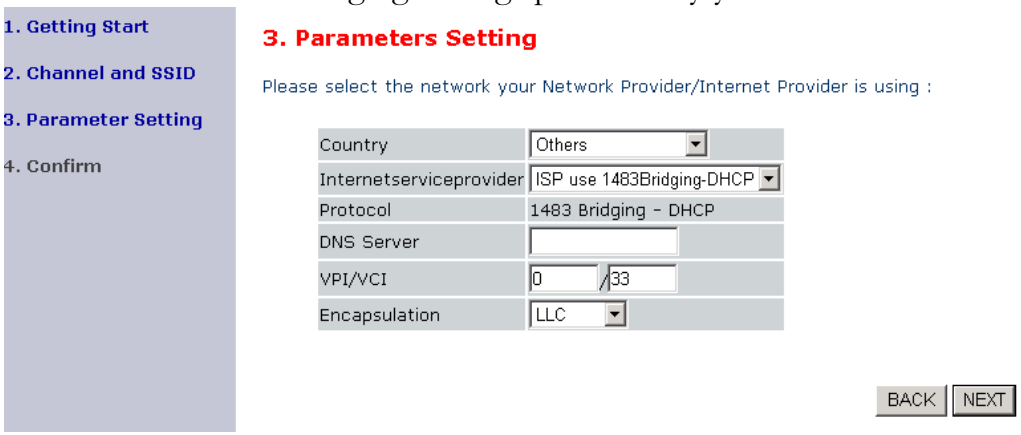
Parameter	Description
Management IP Address	Enter the IP address provided by your ISP. (Default: 192.168.2.1)
VPI/VCI	Enter the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI) supplied by your ISP.
Encapsulation	Select the encapsulation used by ISP from the drop down list.

Click "NEXT" to continue to the "Confirm" settings page.

Go to "Confirm" on page 4-5 in the manual for details about the "Confirm" settings page.

ISP use 1483 Bridging - Parameter Setting

Enter the RFC1483 Bridging settings provided by your ISP.



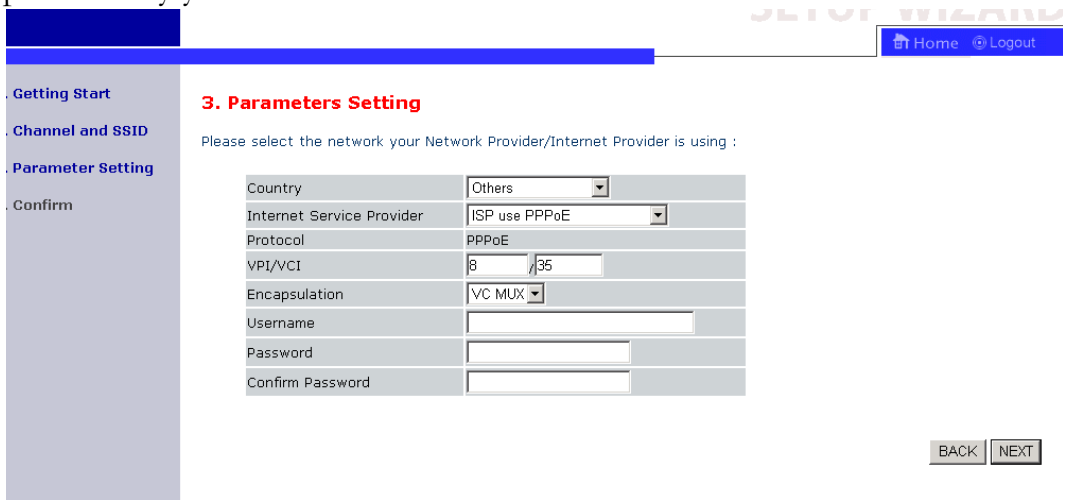
Parameter	Description
DNS Server	Enter the Domain Name Server address.
VPI/VCI	Enter the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI) supplied by your ISP.
Encapsulation	Select the encapsulation used by ISP from the drop down list.

Click "NEXT" to continue to the "Confirm" settings page.

Go to "Confirm" on page 4-5 in the manual for details about the "Confirm" settings page.

ISP use PPPoE - Parameter Setting

Enter the PPPoE (Point-to-Point Protocol over Ethernet) settings provided by your ISP.



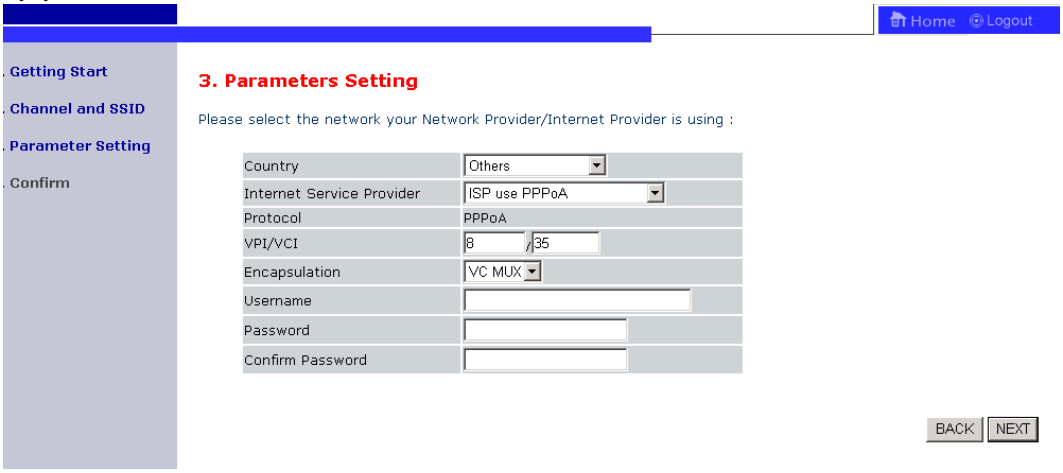
Parameter	Description
DNS Server	Enter the ISP Domain Name Server address.
VPI/VCI	Enter the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI) supplied by your ISP.
Encapsulation	Select the encapsulation used by ISP from the drop down list.
Username	Enter the ISP assigned user name.
Password	Enter your password.
Confirm Password	Confirm your password.

Click "NEXT" to continue to the "Confirm" settings page.

Go to "Confirm" on page 4-5 in the manual for details about the "Confirm" settings page.

ISP use PPPoA - Parameter Setting

Enter the PPPoA (Point-to-Point Protocol over ATM) settings provided by your ISP.



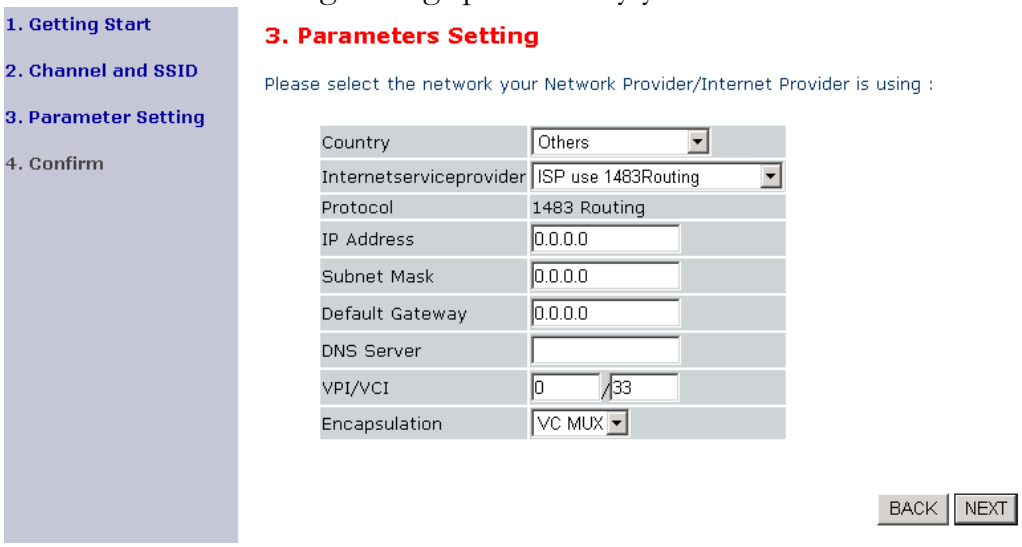
Parameter	Description
DNS Server	Enter the ISP Domain Name Server address.
VPI/VCI	Enter the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI) supplied by your ISP.
Encapsulation	Select the encapsulation used by ISP from the drop down list.
Username	Enter the ISP assigned user name.
Password	Enter your password.
Confirm Password	Confirm your password.

Click “NEXT” to continue to the “Confirm” settings page.

Go to “Confirm” on page 4-5 in the manual for details about the “Confirm” settings page.

ISP use 1483 Routing - Parameter Setting

Enter the 1483 Routing settings provided by your ISP.



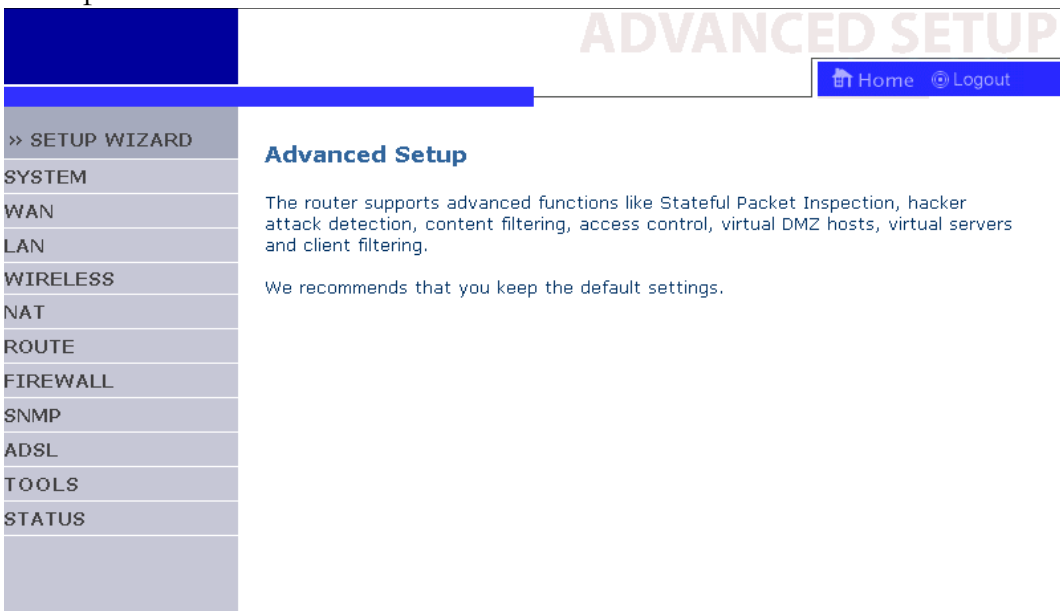
Parameter	Description
IP Address	Enter the IP address provided by your ISP.
Subnet Mask	Enter the subnet mask address provided by your ISP.
Default Gateway	Enter the gateway address provided by your ISP.
DNS Server	Enter the Domain Name Server address.
VPI/VCI	Enter the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI) supplied by your ISP.
Encapsulation	Select the encapsulation used by ISP from the drop down list.

Click "NEXT" to continue to the "Confirm" settings page.

Go to "Confirm" on page 4-5 in the manual for details about the "Confirm" settings page.

Advanced Setup

Click on Home which is located on the upper right-hand corner. The left-hand side displays the main menu and the right-hand side shows descriptive information.



The advanced management interface contains 11 main menu items as described in the following table.

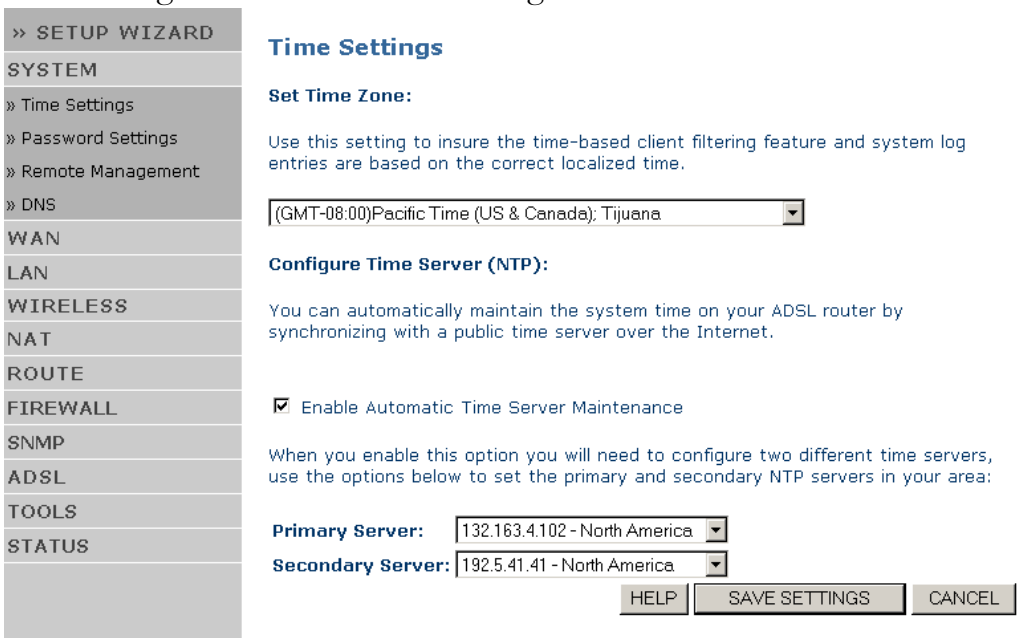
Menu	Description
SYSTEM	Sets the local time zone, the password for administrator access, and the IP address of a PC or notebook that will be allowed to manage the ADSL Router remotely.
WAN	Specifies the Internet connection settings.
LAN	Sets the TCP/IP configuration for the ADSL Router LAN interface and DHCP clients.
WIRELESS	Configures the radio frequency, SSID, and security for wireless communications.
NAT	Configures Address Mapping, virtual server and special applications.
ROUTE	Sets the routing parameters and displays the current routing table.
FIREWALL	Configures a variety of security and specialized functions including: Access Control, URL blocking, Internet access control scheduling, intruder detection, and DMZ.
SNMP	Community string and trap server settings.

Menu	Description
ADSL	Sets the ADSL operation type and shows the ADSL status.
TOOLS	Contains options to backup & restore the current configuration, restore all configuration settings to the factory defaults, update system firmware, or reset the system.
STATUS	Provides WAN connection type and status, firmware and hardware version numbers, system IP settings, as well as DHCP, NAT, and firewall information. Displays the number of attached clients, the firmware versions, the physical MAC address for each media interface, and the hardware version and serial number. Shows the security and DHCP client log.

SYSTEM

Time Settings

Select your local time zone from the drop down list. This information is used for log entries and client filtering.

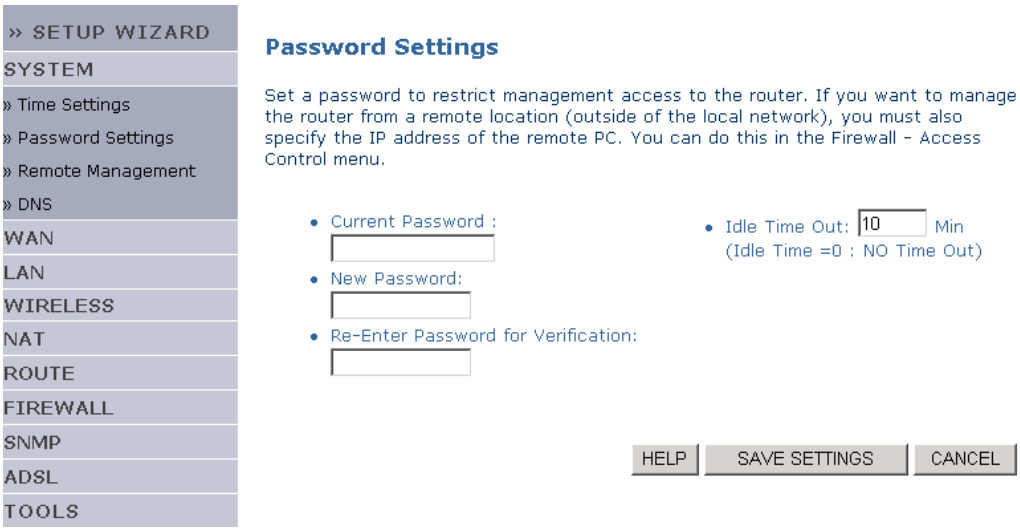


For accurate timing of log entries and system events, you need to set the time zone. Select your time zone from the drop down list.

If you want to automatically synchronize the ADSL router with a public time server, check the box to Enable Automatic Time Server Maintenance. Select the desired servers from the drop down menu.

Password Settings

Use this page to change the password for accessing the management interface of the ADSL Router.



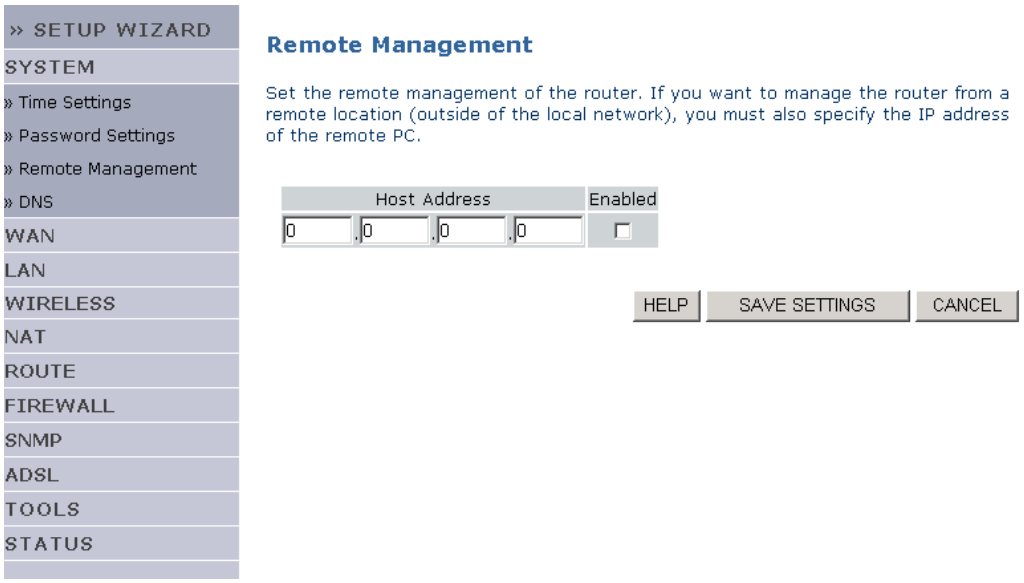
Passwords can contain from 3~12 alphanumeric characters and are case sensitive.

Note: If you lost the password, or you cannot gain access to the user interface, press the blue reset button on the rear panel, holding it down for at least five seconds to restore the factory defaults. By default, there is no password to login to the user interface.

Enter a maximum Idle Time Out (in minutes) to define a maximum period of time for which the login session is maintained during inactivity. If the connection is inactive for longer than the maximum idle time, it will perform system logout, and you have to log in again to access the management interface. (Default: 10 minutes)

Remote Management

By default, management access is only available to users on your local network. However, you can also manage the ADSL Router from a remote host by entering the IP address of a remote computer on this screen. Check the Enabled check box, and enter the IP address of the Host Address and click "SAVE SETTINGS".

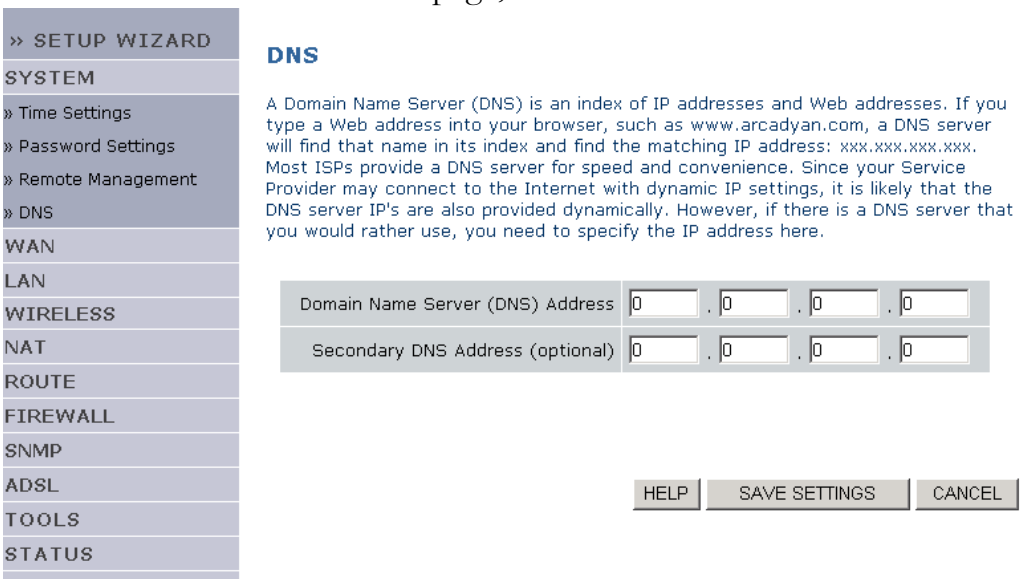


Note: If you check Enable and specify an IP address of 0.0.0.0, any remote host can manage the ADSL Router.

For remote management via WAN IP address you need to connect using port 8080. Simply enter WAN IP address followed by :8080, for example, 212.120.68.20:8080.

DNS

Domain Name Servers (DNS) are used to map a domain name (e.g., www.smc.com) with the IP address (e.g., 64.147.25.20). Your ISP should provide the IP address of one or more Domain Name Servers. Enter those addresses on this page, and click "SAVE SETTINGS".

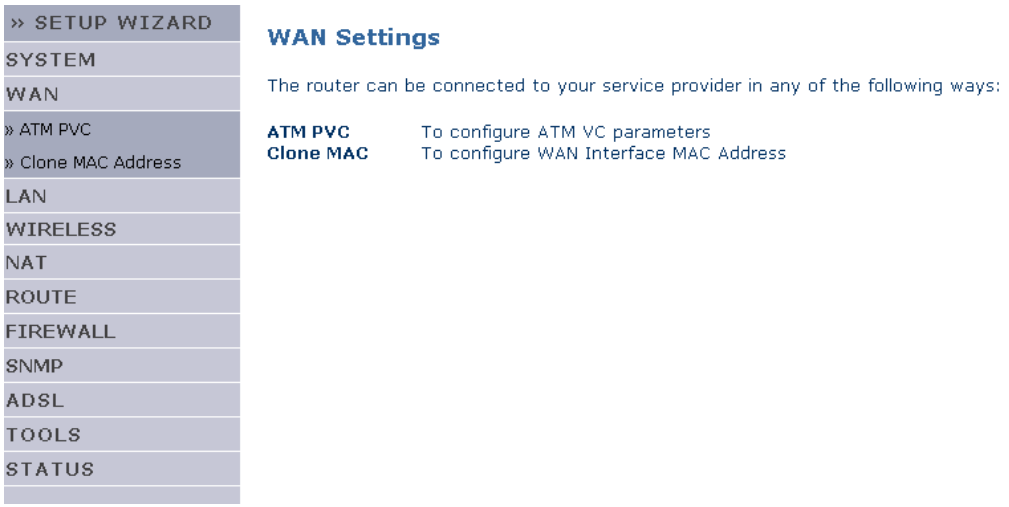


WAN

Specify the WAN connection parameters provided by your Internet Service Provider (ISP).

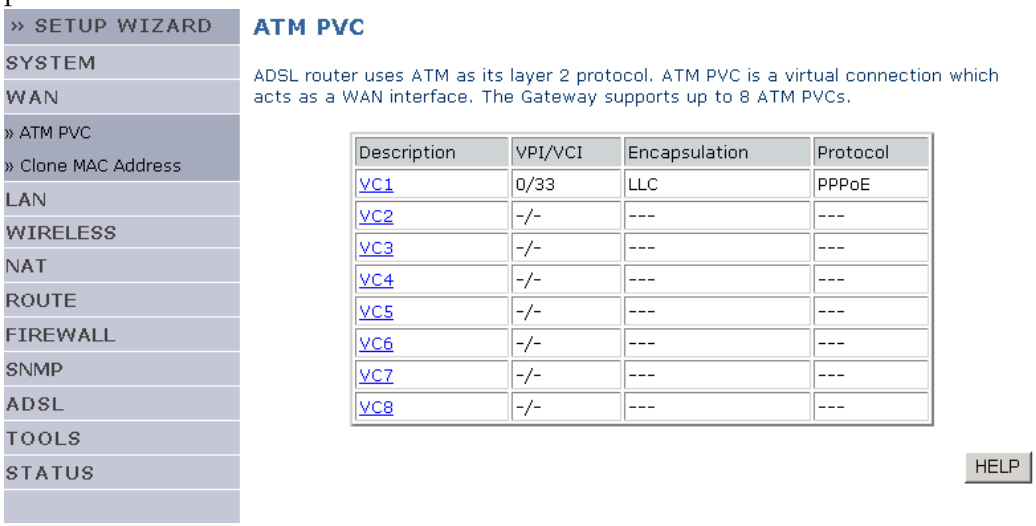
The ADSL Router can be connected to your ISP in one of the following ways:

- ATM PVC
- Clone MAC



ATM PVC

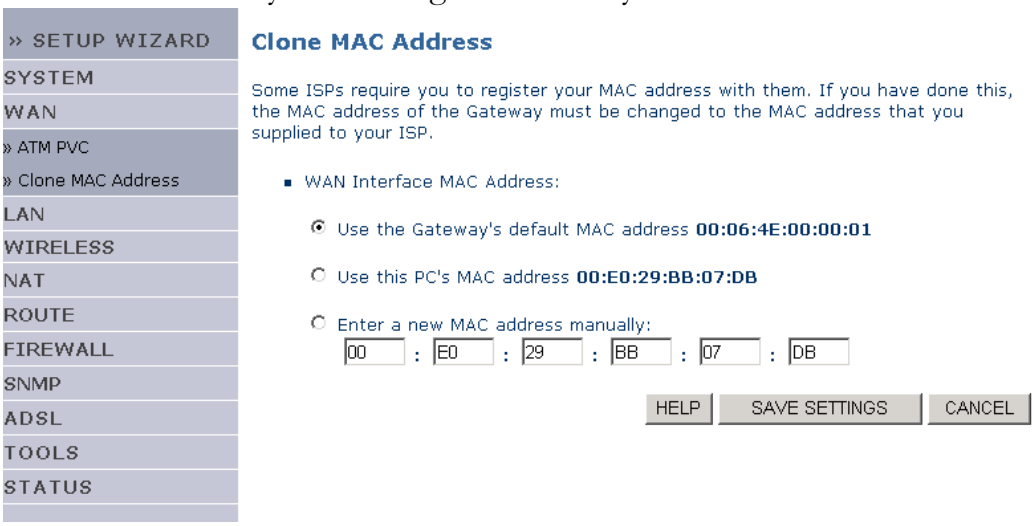
Enter the ATM (Asynchronous Transfer Mode) virtual connection parameters here.



Parameter	Description
Description	Click on the VC to set the values for the connection.
VPI/VCI	Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI).
Encapsulation	Specifies how to handle multiple protocols at the ATM transport layer. • VC-MUX: Point-to-Point Protocol over ATM Virtual Circuit Multiplexer (null encapsulation) allows only one protocol running per virtual circuit with less overhead. • LLC: Point-to-Point Protocol over ATM Logical Link Control (LLC) allows multiple protocols running over one virtual circuit (using slightly more overhead).
Protocol	Protocal used for the connection.

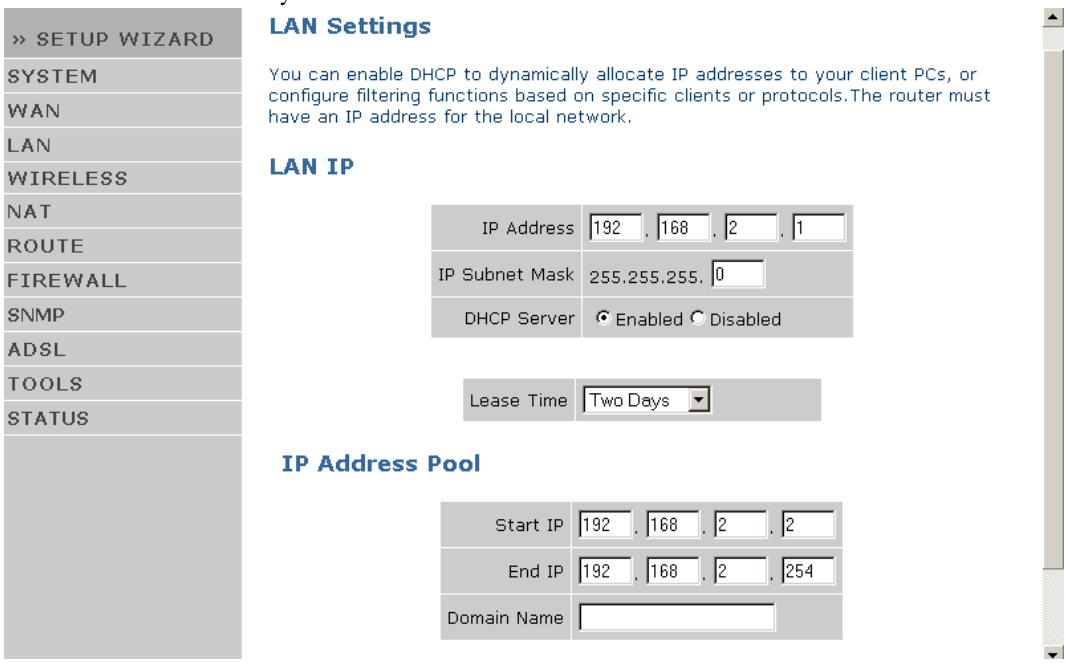
Clone MAC Address

Some ISPs require you to register your MAC address with them. If this is the case, the MAC address of the ADSL Router must be changed to the MAC address that you have registered with your ISP.



LAN

Use the LAN menu to configure the LAN IP address and to enable the DHCP server for dynamic client address allocation.

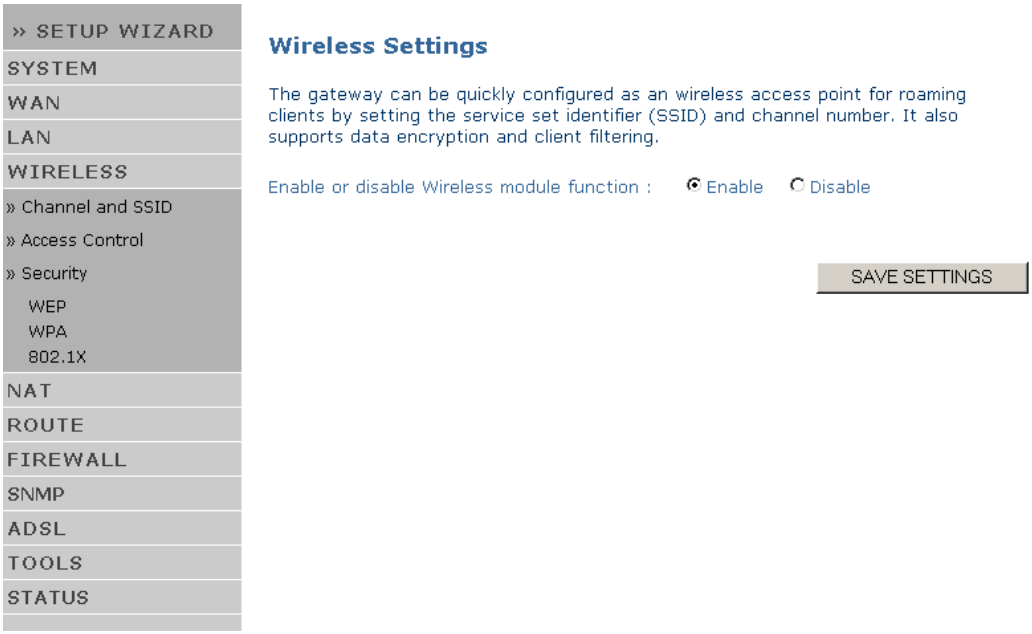


Parameter	Description
IP Address	The IP address of the ADSL Router.
IP Subnet Mask	The subnet mask of the network.
DHCP Server	The ADSL Router comes with the DHCP function. Enable this function to dynamically assign an IP address to client PCs.
Lease Time	Set the IP lease time. For home networks this may be set to Forever, which means there is no time limit on the IP address lease.
Start IP Address	Specify the start IP address of the DHCP pool. Do not include the gateway address of the ADSL Router in the client address pool. If you change the pool range, make sure the first three octets match the gateway's IP address, i.e., 192.168.2.xxx.
End IP Address	Specify the end IP address of the DHCP pool.
Domain Name	If your network uses a domain name, enter it here. Otherwise, leave this field blank.

Note: Remember to configure your client PCs for dynamic address allocation. (See page 3-2 for details.)

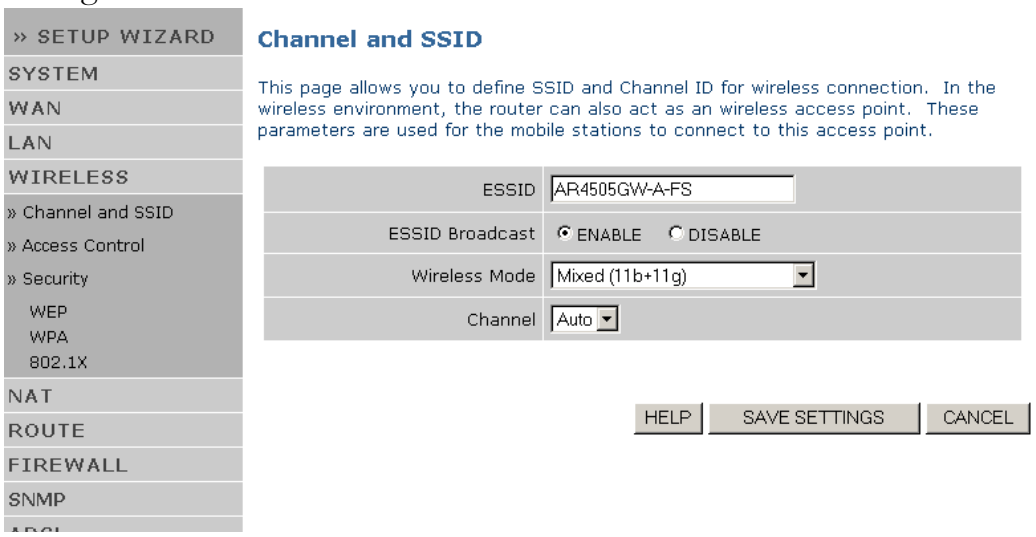
Wireless

The ADSL Router also operates as a wireless access point, allowing wireless computers to communicate with each other. To configure this function, you need to enable the wireless function, define the radio channel, the domain identifier, and the security options. Check Enable and click "SAVE SETTINGS".



Channel and SSID

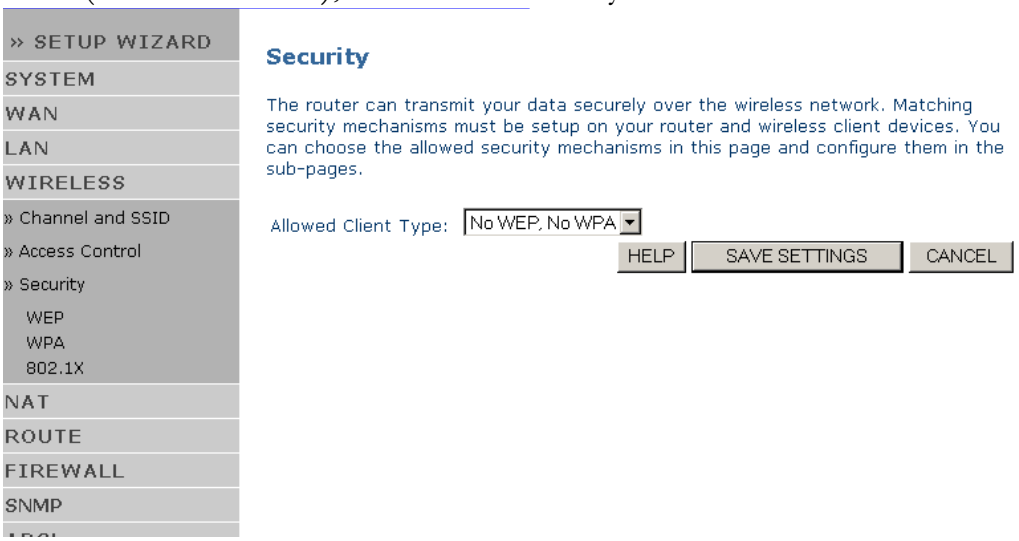
You must specify a common radio channel and SSID (Service Set ID) to be used by the ADSL Router and all of its wireless clients. Be sure you configure all of its clients to the same values.



Parameter	Description
ESSID	Extended Service Set ID. The ESSID must be the same on the ADSL Router and all of its wireless clients.
ESSID Broadcast	Enable or disable the broadcasting of the SSID.
Wireless Mode	This device supports both 11g and 11b wireless networks. Make your selection depending on the type of wireless network that you have.
Channel	The radio channel used by the wireless router and its clients to communicate with each other. This channel must be the same on the ADSL Router and all of its wireless clients. The ADSL Router will automatically assign itself a radio channel, or you may select one manually.

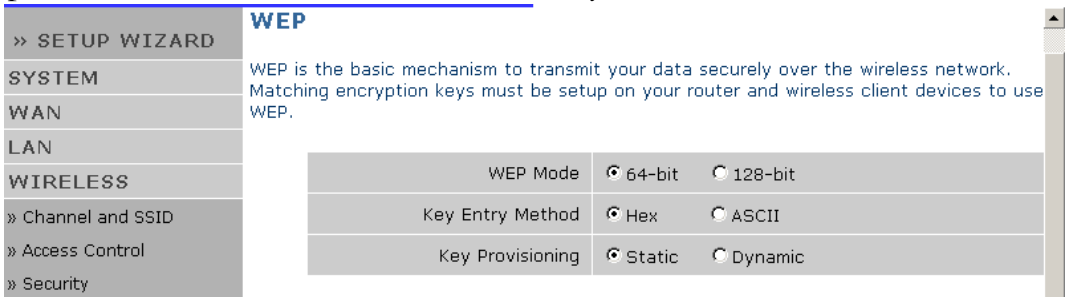
Security

To make your wireless network safe, you should turn on the security function. The ADSL Router supports WEP (Wired Equivalent Privacy), WPA (Wi-Fi Protected), and 802.1x security mechanisms.

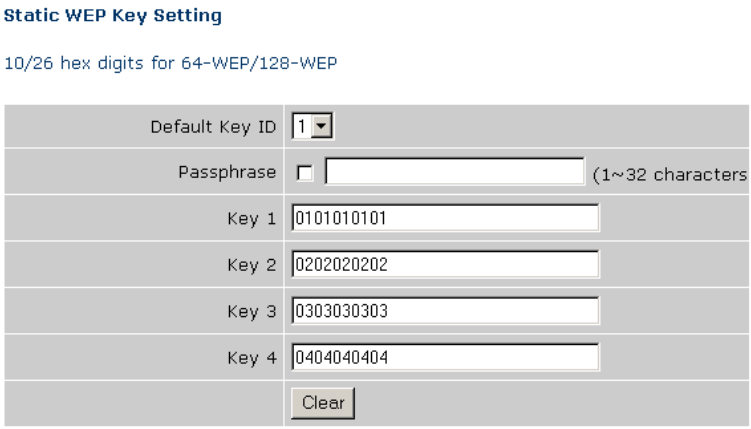


WEP

If you use WEP to protect your wireless network, you need to set the same parameters for the ADSL Router and all your wireless clients.



Parameter	Description
WEP Mode	Select 64 bit or 128 bit key to use for encryption.
Key Entry Method	Select Hex or ASCII code for encryption key generation.
Key Provisioning	Select Static if there is only one fixed key for encryption. If you want to select Dynamic, you would need to enable 802.1x function first.



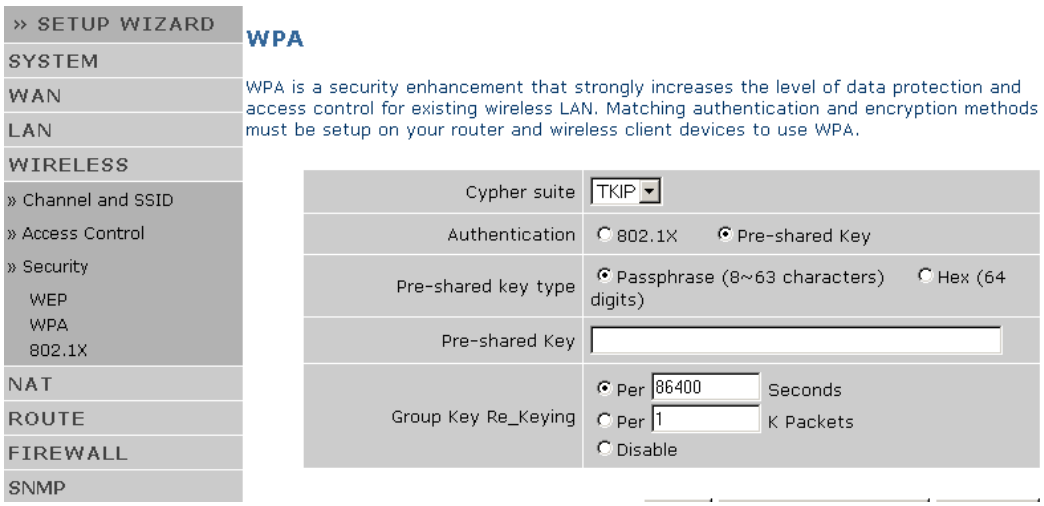
You may automatically generate encryption keys or manually enter the keys. To generate the key automatically with passphrase, check the Passphrase box, enter a string of characters. Select the default key from the drop down menu. Click "SAVE SETTINGS".

Note: The passphrase can consist of up to 32 alphanumeric characters.

To manually configure the encryption key, enter five hexadecimal pairs of digits for each 64-bit key, or enter 13 pairs for the single 128-bit key. (A hexadecimal digit is a number or letter in the range 0-9 or A-F.) Note that WEP protects data transmitted between wireless nodes, but does not protect any transmissions over your wired network or over the Internet.

WPA

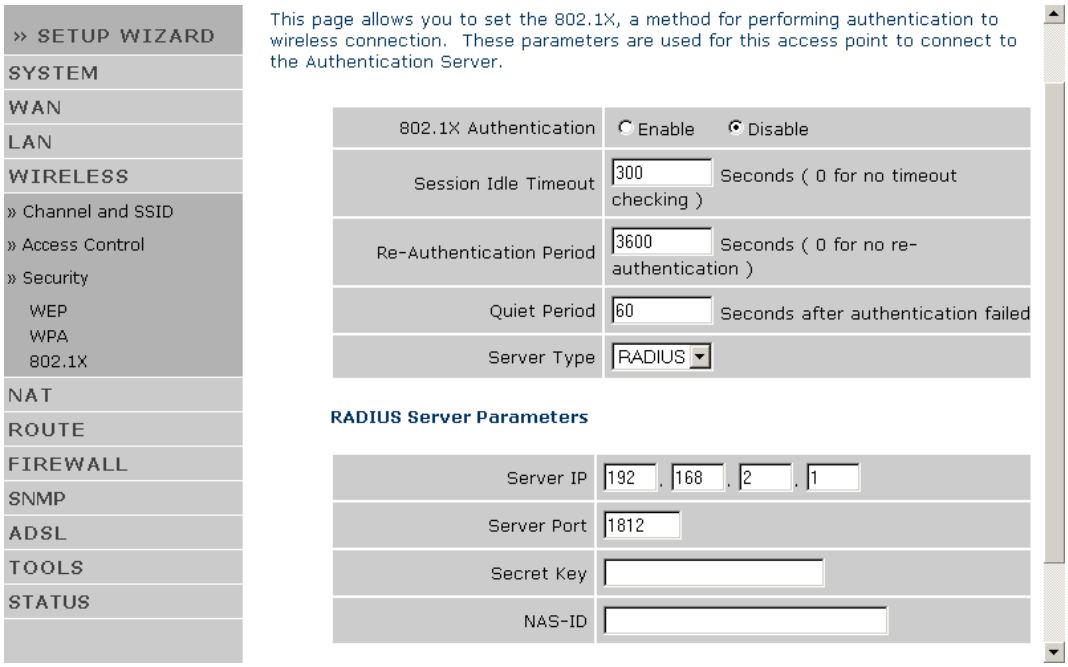
Wi-Fi Protected Access (WPA) combines temporal key integrity protocol (TKIP) and 802.1x mechanisms. It provides dynamic key encryption and 802.1x authentication service.



Parameter	Description
Cypher suite	The security mechanism used in WPA for encryption.
Authentication	Choose 802.1X or Pre-shared Key to use as the authentication method. •802.1X: for the enterprise network with a RADIUS server. •Pre-shared key: for the SOHO network environment without an authentication server.
Pre-shared key type	Select the key type to be used in the Pre-shared Key.
Pre-shared Key	Type in the key here.
Group Key Re-Keying	The period of renewing broadcast/multicast key.

802.1X

If 802.1x is used in your network, then you should enable this function for the ADSL Router. These parameters are used for the ADSL Router to connect to the authentication server.

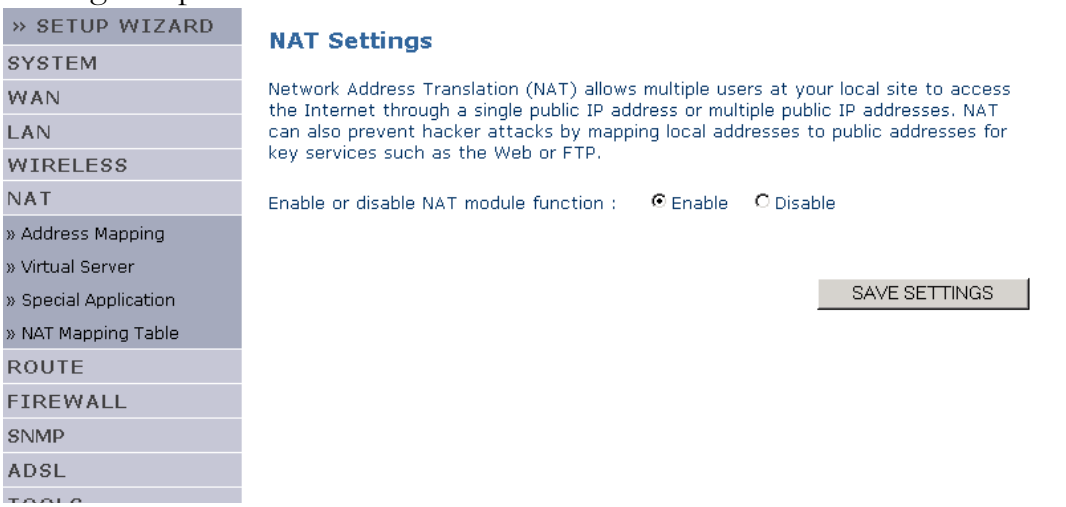


Parameter	Description
802.1X Authentication	Enable or disable this authentication function.
Session Idle timeout	Defines a maximum period of time for which the connection is maintained during inactivity.
Re-Authentication Period	Defines a maximum period of time for which the authentication server will dynamically re-assign a session key to a connected client.
Quiet Period	Defines a maximum period of time for which the ADSL Router will wait between failed authentications.
Server Type	RADIUS authentication server.
RADIUS Server Parameters	
Server IP	The IP address of your authentication server.
Server Port	The port used for the authentication service.

Parameter	Description
Secret Key	The secret key shared between the authentication server and its clients.
NAS-ID	Defines the request identifier of the Network Access Server.

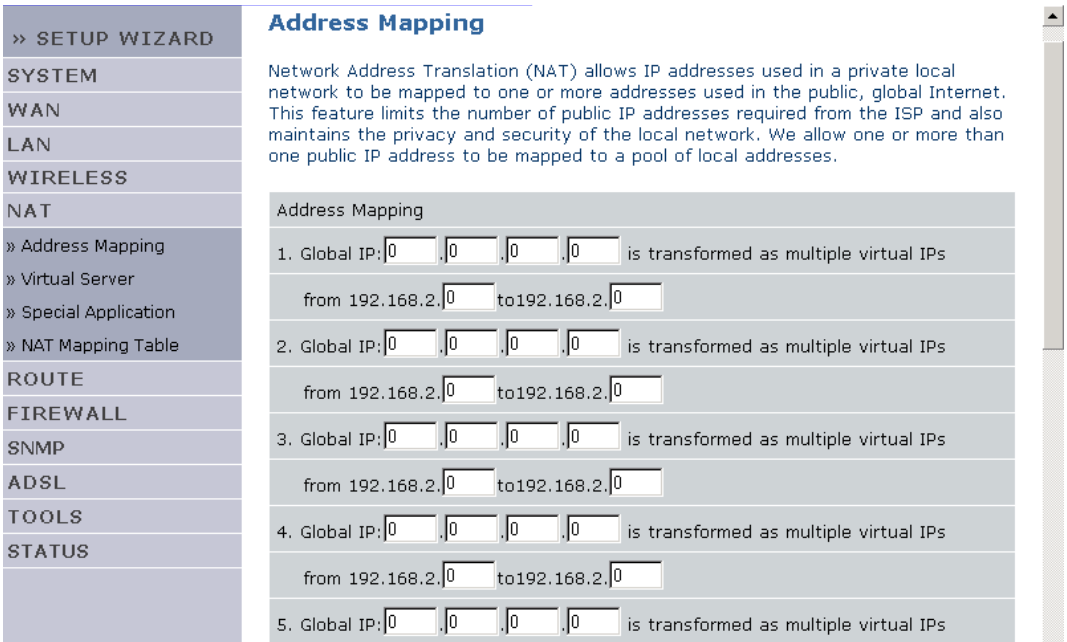
NAT

Network Address Translation allows multiple users to access the Internet sharing one public IP.



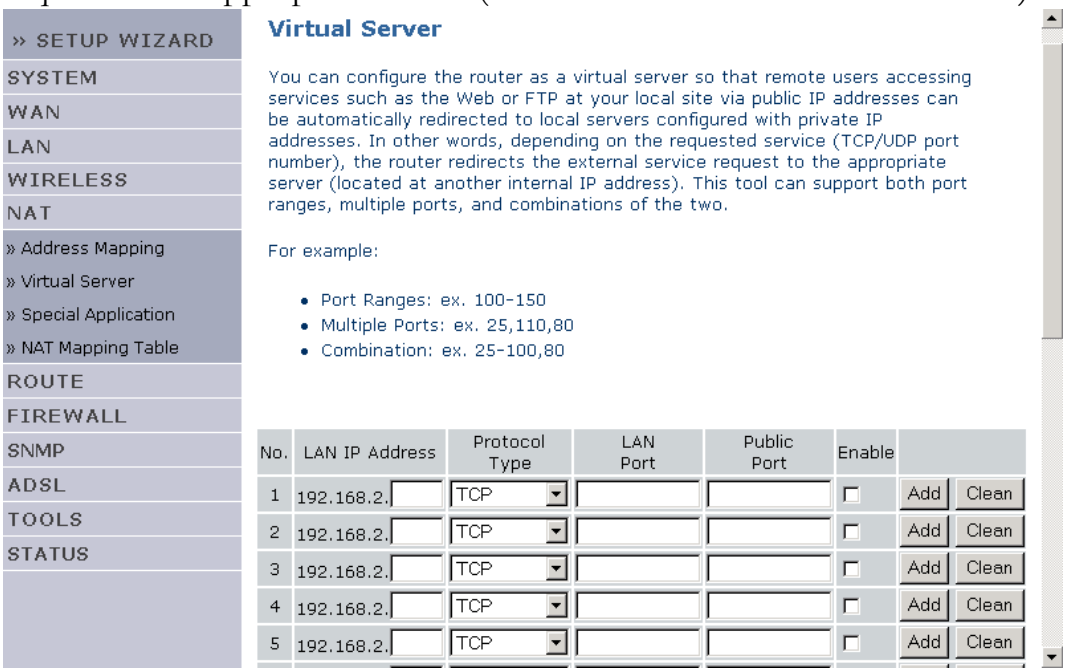
Address Mapping

Allows one or more public IP addresses to be shared by multiple internal users. This also hides the internal network for increased privacy and security. Enter the Public IP address you wish to share into the Global IP field. Enter a range of internal IPs that will share the global IP into the "from" field.



Virtual Server

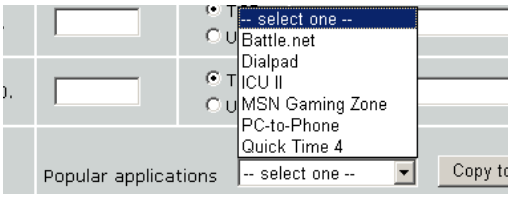
If you configure the ADSL Router as a virtual server, remote users accessing services such as web or FTP at your local site via public IP addresses can be automatically redirected to local servers configured with private IP addresses. In other words, depending on the requested service (TCP/UDP port number), the ADSL Router redirects the external service request to the appropriate server (located at another internal IP address).



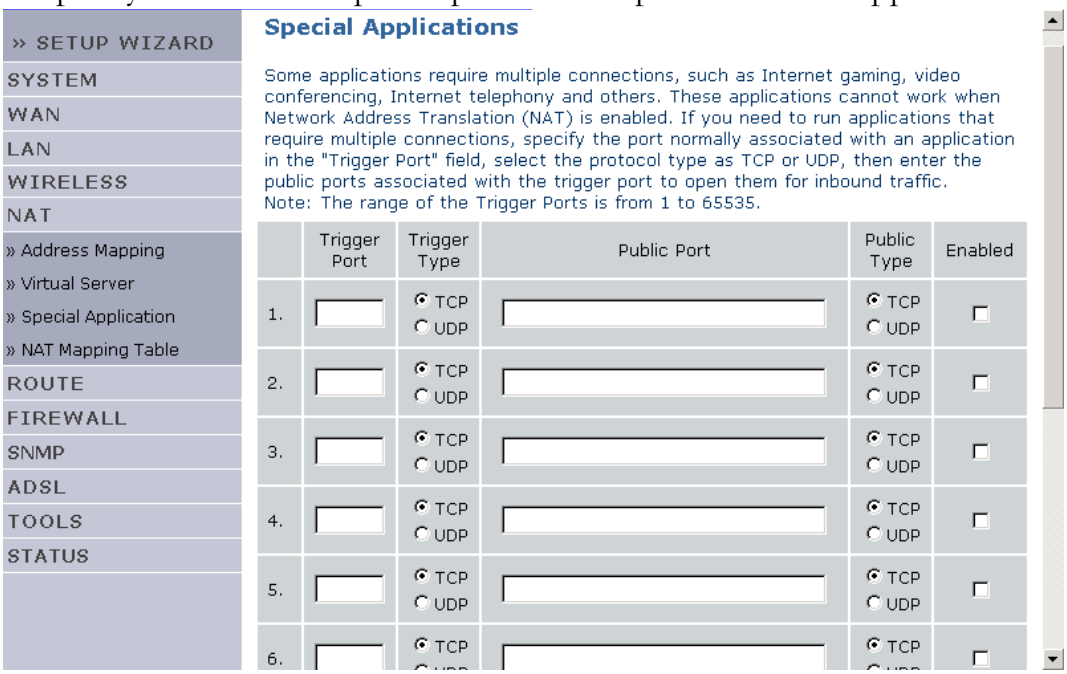
For example, if you set Type/Public Port to TCP/80 (HTTP or web) and the Private IP/Port to 192.168.2.2/80, then all HTTP requests from outside users will be transferred to 192.168.2.2 on port 80. Therefore, by just entering the IP address provided by the ISP, Internet users can access the service they need at the local address to which you redirect them.

A list of ports is maintained at the following link: http://www.iana.org/assignments/port-numbers.

Special Applications

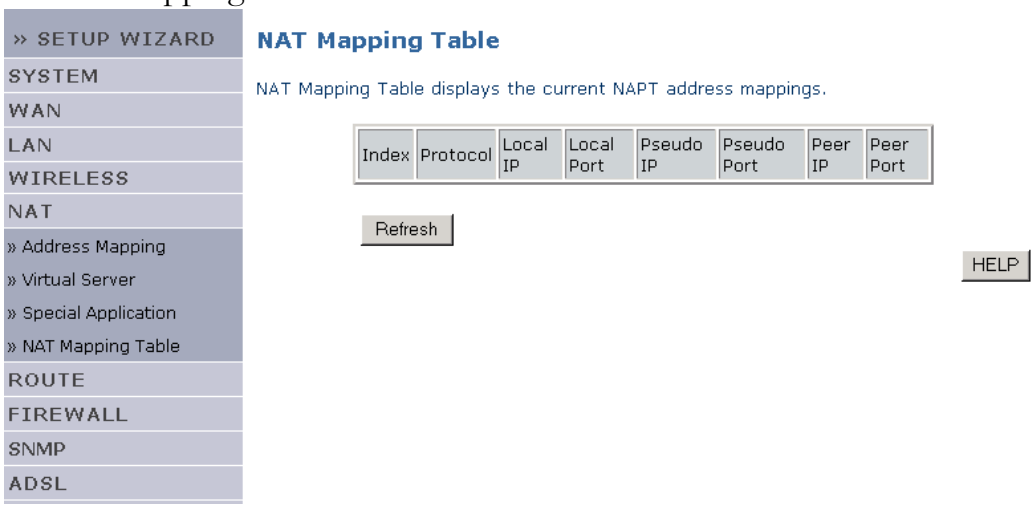


Some applications require multiple connections, such as Internet gaming, video-conferencing, and Internet telephony. These applications may not work when Network Address Translation (NAT) is enabled. If you need to run applications that require multiple connections, use these pages to specify the additional public ports to be opened for each application.



NAT Mapping Table

This page displays the current NAPT (Network Address Port Translation) address mappings.

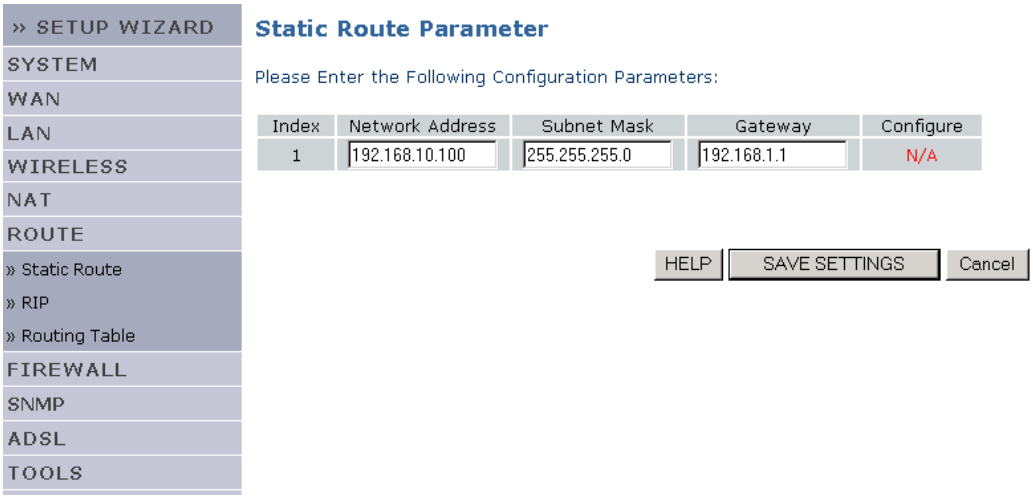


Route

These pages define routing related parameters, including static routes and RIP (Routing Information Protocol) parameters.

Static Route

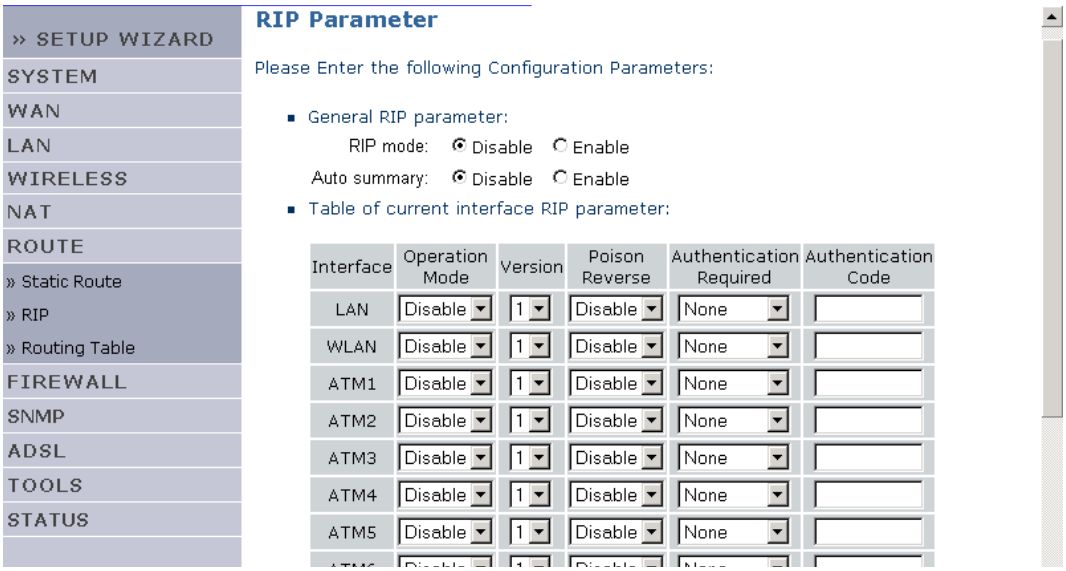
Click "Add" to add a new static route to the list.



Parameter	Description
Network Address	Enter the IP address of the remote computer for which to set a static route.
Subnet Mask	Enter the subnet mask of the remote network for which to set a static route.
Gateway	Enter the WAN IP address of the gateway to the remote network.

Click "Save Settings" to save the configuration.

RIP

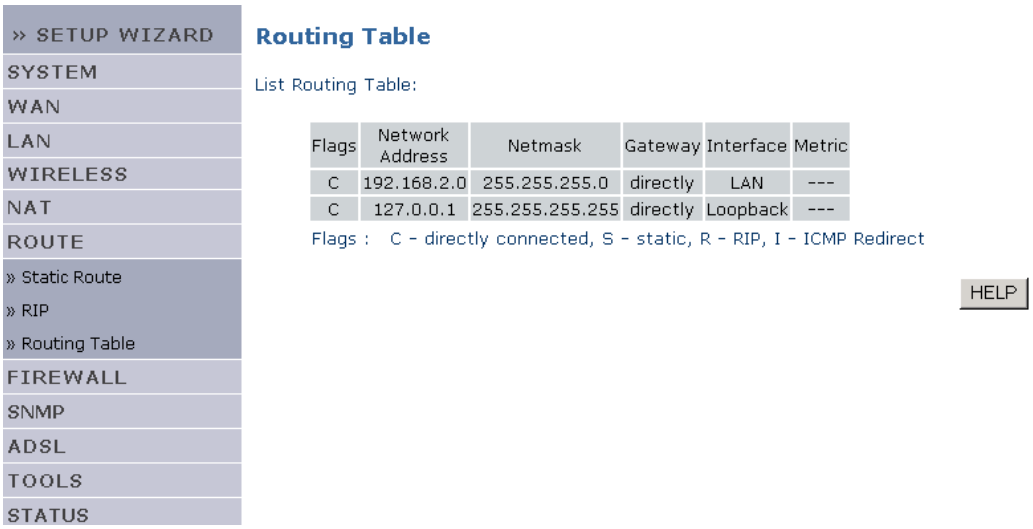


Parameter	Description
General RIP Parameters	
RIP mode	Globally enables or disables RIP.
Auto summary	If Auto summary is disabled, then RIP packets will include sub-network information from all sub-networks connected to the router. If enabled, this sub-network information will be summarized to one piece of information covering all sub-networks.
Table of current Interface RIP parameter	
Interface	The WAN interface to be configured.
Operation Mode	Disable: RIP disabled on this interface. Enable: RIP enabled on this interface. Silent: Listens for route broadcasts and updates its route table. It does not participate in sending route broadcasts.
Version	Sets the RIP (Routing Information Protocol) version to use on this interface.
Poison Reverse	A method for preventing loops that would cause endless retransmission of data traffic.

Parameter	Description
Authentication Required	• None: No authentication. • Password: A password authentication key is included in the packet. If this does not match what is expected, the packet will be discarded. This method provides very little security as it is possible to learn the authentication key by watching RIP packets.
Authentication Code	Password Authentication key.

RIP sends routing-update messages at regular intervals and when the network topology changes. When a router receives a routing update that includes changes to an entry, it updates its routing table to reflect the new route. RIP routers maintain only the best route to a destination. After updating its routing table, the router immediately begins transmitting routing updates to inform other network routers of the change.

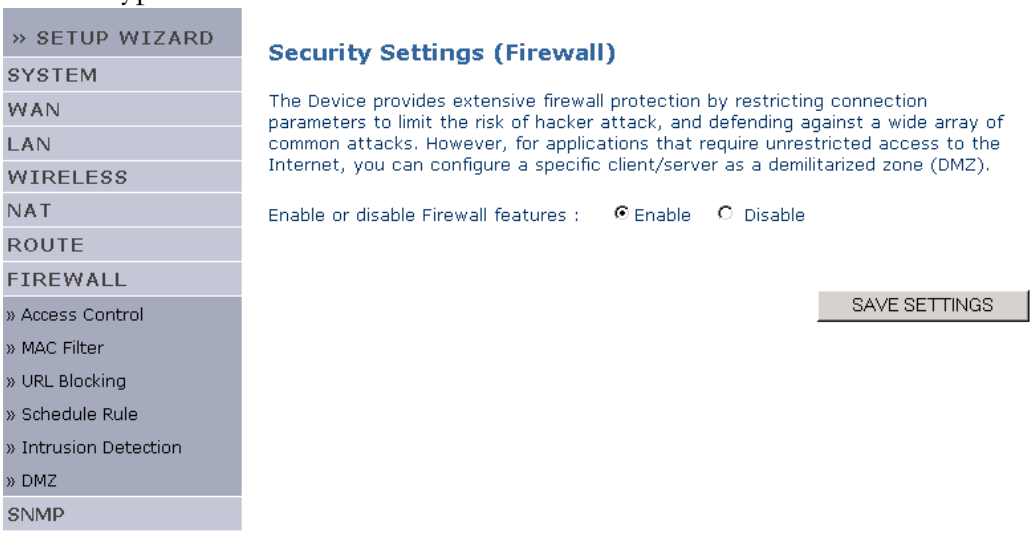
Routing Table



Parameter	Description
Flags	Indicates the route status: C = Direct connection on the same subnet. S = Static route. R = RIP (Routing Information Protocol) assigned route. I = ICMP (Internet Control Message Protocol) Redirect route.
Network Address	Destination IP address.
Netmask	The subnetwork associated with the destination. This is a template that identifies the address bits in the destination address used for routing to specific subnets. Each bit that corresponds to a "1" is part of the subnet mask number; each bit that corresponds to "0" is part of the host number.
Gateway	The IP address of the router at the next hop to which frames are forwarded.
Interface	The local interface through which the next hop of this route is reached.
Metric	When a router receives a routing update that contains a new or changed destination network entry, the router adds 1 to the metric value indicated in the update and enters the network in the routing table.

Firewall

The ADSL Router's firewall inspects packets at the application layer, maintains TCP and UDP session information including time-outs and the number of active sessions, and provides the ability to detect and prevent certain types of network attacks.



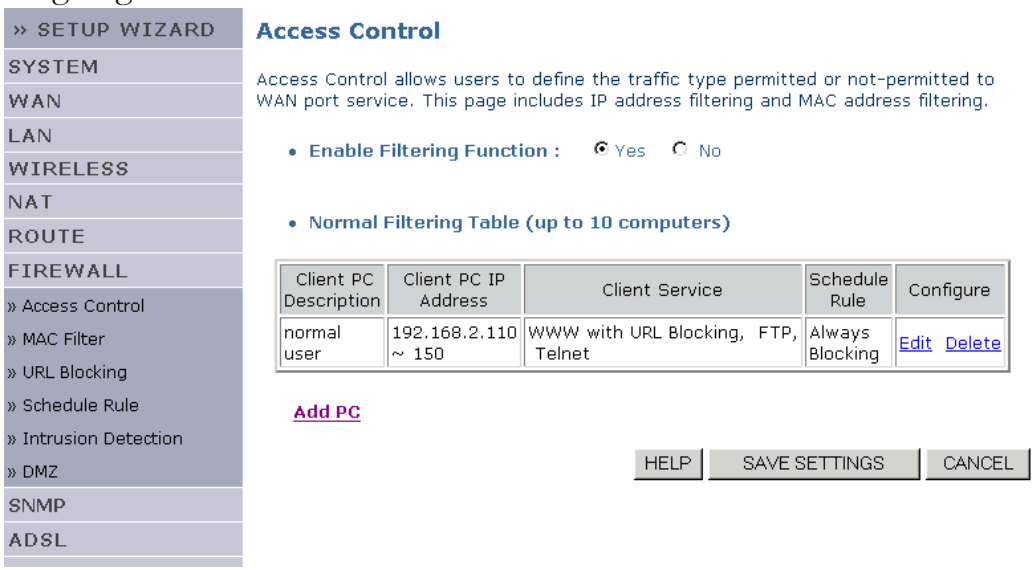
Network attacks that deny access to a network device are called Denial-of-Service (DoS) attacks. DoS attacks are aimed at devices and networks with a connection to the Internet. Their goal is not to steal information, but to disable a device or network so users no longer have access to network resources.

The ADSL Router firewall function protects against the following DoS attacks: IP Spoofing, Land Attack, Ping of Death, IP with zero length, Smurf Attack, UDP port loopback, Snork Attack, TCP null scan, and TCP SYN flooding. (See page 4-45 for details.)

The firewall does not significantly affect system performance, so we advise leaving it enabled to protect your network. Select Enable and click the "SAVE SETTINGS" button to open the Firewall submenus.

Access Control

Access Control allows users to define the outgoing traffic permitted or not-permitted through the WAN interface. The default is to permit all outgoing traffic.



The following items are on the Access Control screen:

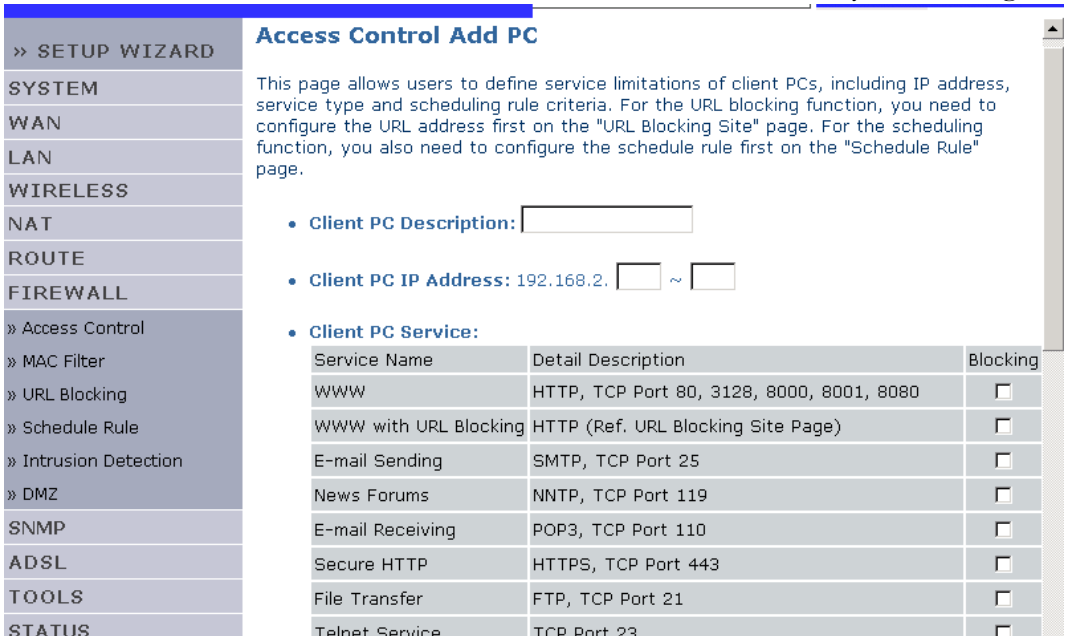
Parameter	Description
Enable Filtering Function	Click Yes to turn on the filtering function.
Normal Filtering Table	Displays the IP address (or an IP address range) filtering table.

To add the PC to the filtering table:

1. Click "Add PC" on the Access Control screen.

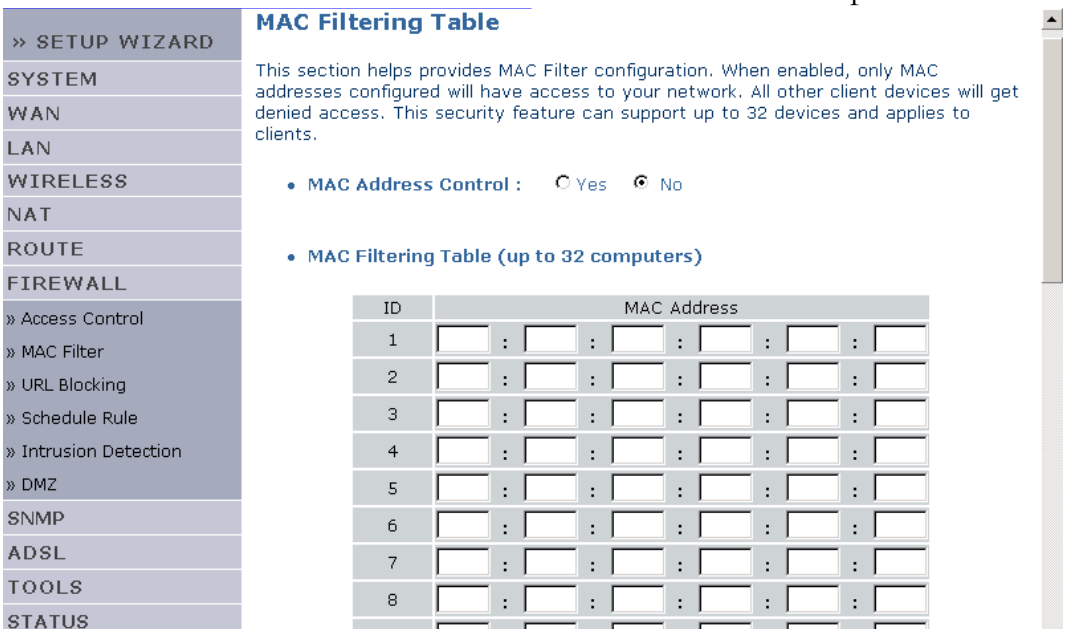
2. Define the appropriate settings for client PC services.

3. Click "OK" and then click "SAVE SETTINGS" to save your settings.



MAC Filter

The ADSL Router can also limit the network access based on the MAC address. The MAC Filtering Table allows the ADSL Router to enter up to 32 MAC addresses that are not allowed access to the WAN port.

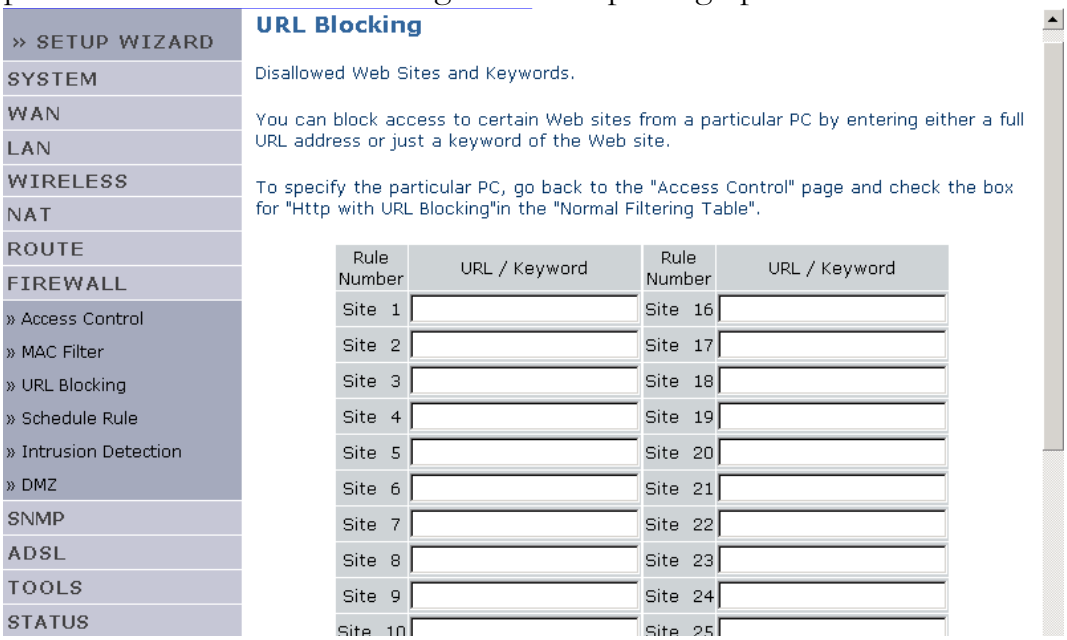


Click Yes to enable, or No to disable this function.

Enter the MAC address in the space provided.

URL Blocking

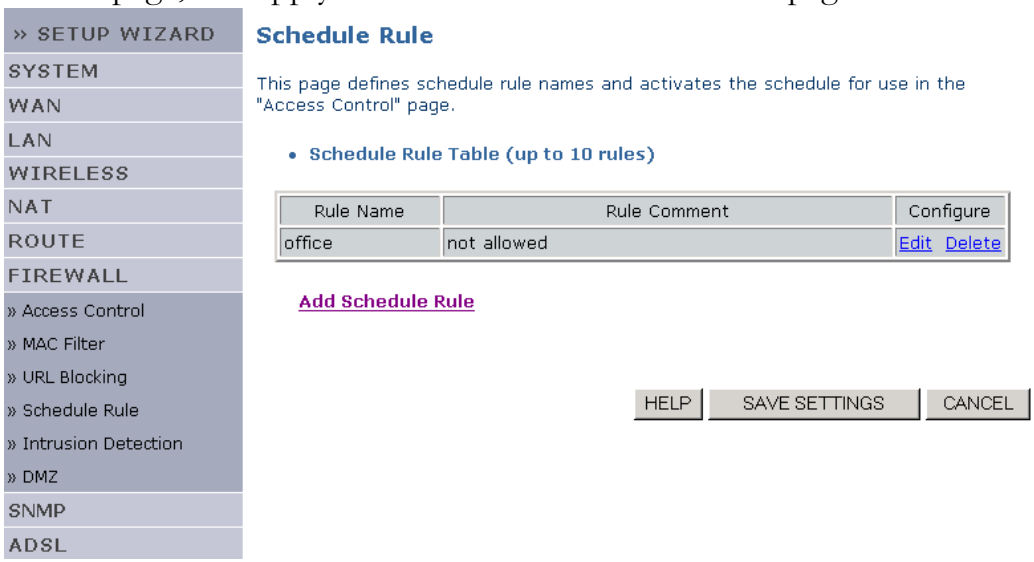
The ADSL Router allows the user to block access to web sites by entering either a full URL address or just a keyword. This feature can be used to protect children from accessing violent or pornographic web sites.



You can define up to 30 sites here.

Schedule Rule

You may filter Internet access for local clients based on rules. Each access control rule may be activated at a scheduled time. Define the time schedule on this page, and apply the rule on the Access Control page.

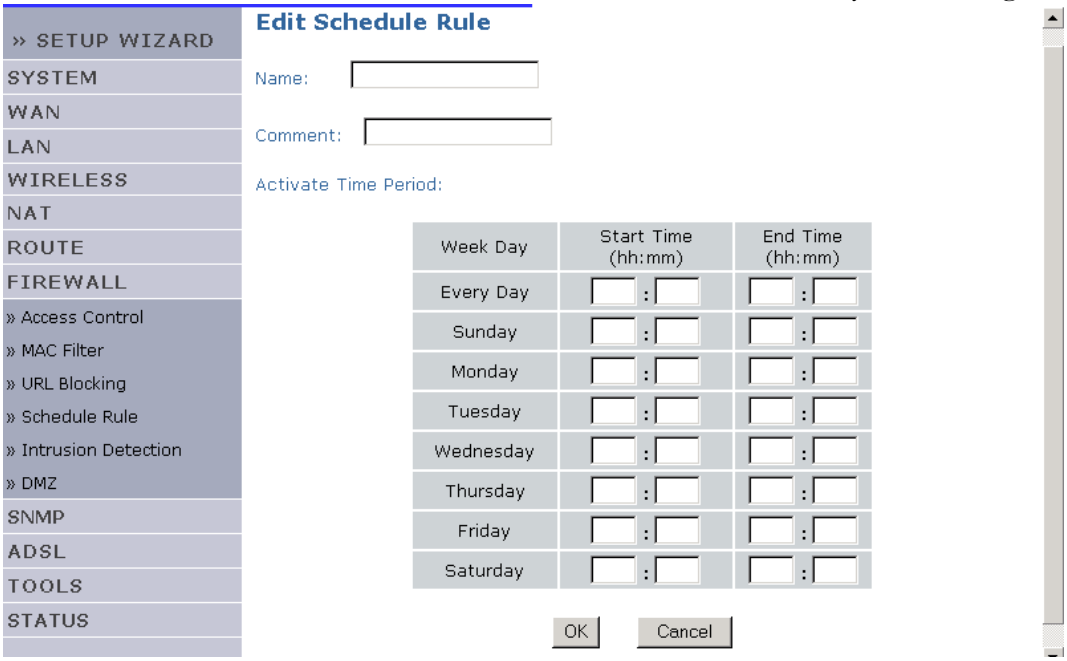


Follow these steps to add a schedule rule:

1. Click "Add Schedule Rule".

2. Define the appropriate settings for a schedule rule (as shown in this example).

3. Click "OK" and then click "SAVE SETTINGS" to save your settings.



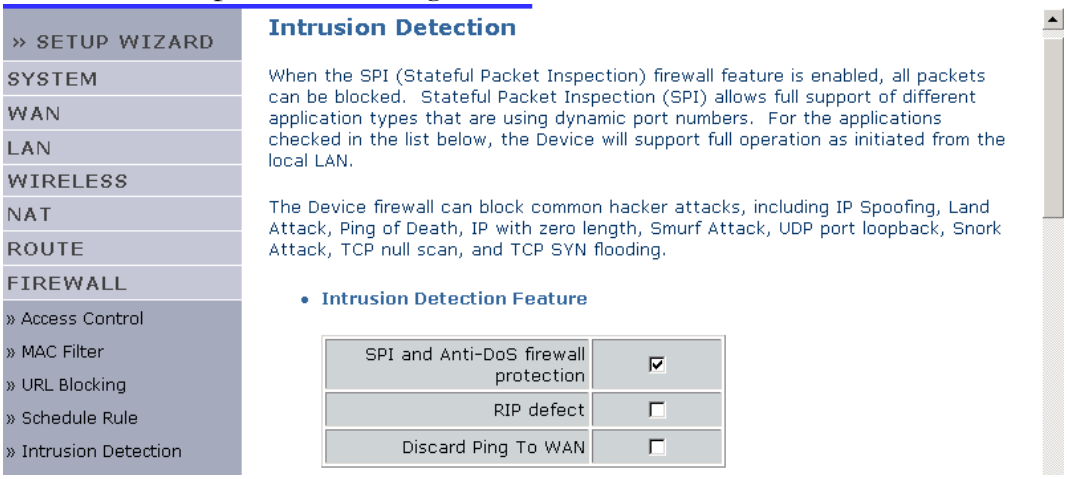
Intrusion Detection

- **Intrusion Detection Feature**

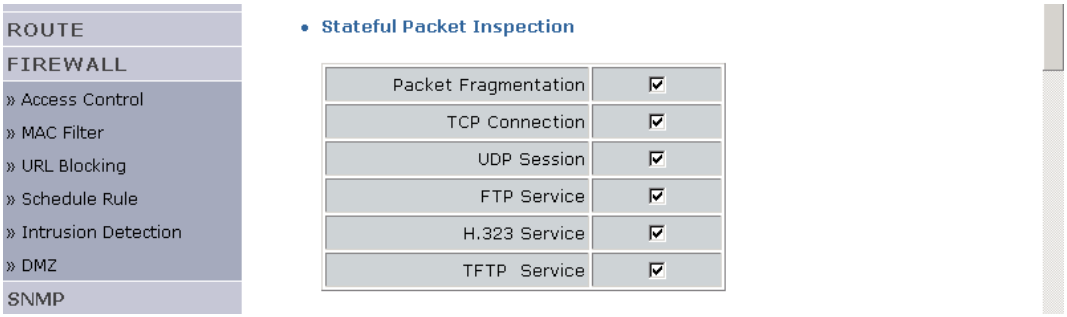
Stateful Packet Inspection (SPI) and Anti-DoS firewall protection (Default: Enabled) — The Intrusion Detection Feature of the ADSL Router limits access for incoming traffic at the WAN port. When the SPI feature is turned on, all incoming packets will be blocked except for those types marked in the Stateful Packet Inspection section.

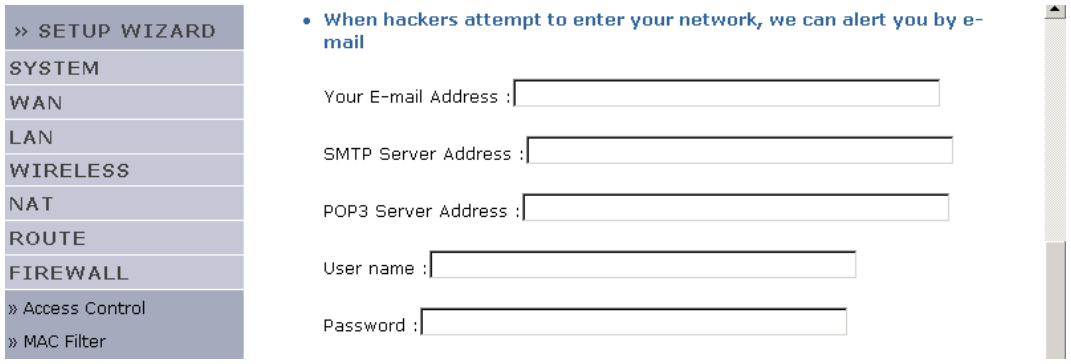
RIP Defect (Default: Disabled) — If an RIP request packet is not acknowledged to by the router, it will stay in the input queue and not be released. Accumulated packets could cause the input queue to fill, causing severe problems for all protocols. Enabling this feature prevents the packets from accumulating.

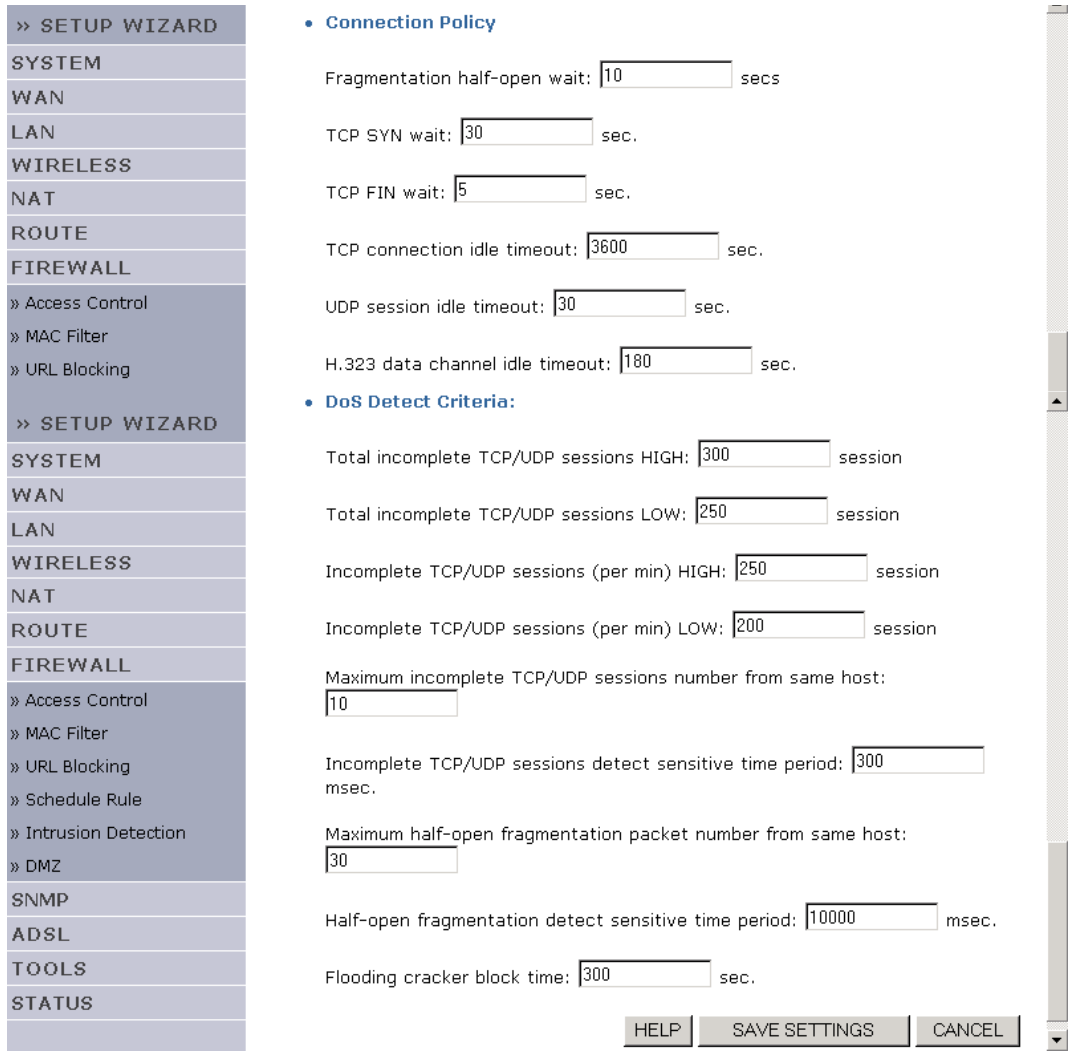
Discard Ping to WAN (Default: Disabled) — Prevent a ping on the ADSL Router's WAN port from being routed to the network.



Scroll down to view more information.







- **Stateful Packet Inspection**

This is called a "stateful" packet inspection because it examines the contents of the packet to determine the state of the communications; i.e., it ensures that the stated destination computer has previously requested the current communication. This is a way of ensuring that all communications are initiated by the recipient computer and are taking place only with sources that are known and trusted from previous interactions. In addition to being more rigorous in their inspection of packets, stateful inspection firewalls also close off ports until connection to the specific port is requested.

When particular types of traffic are checked, only the particular type of traffic initiated from the internal LAN will be allowed. For example, if the user only checks "FTP Service" in the Stateful Packet Inspection section, all incoming traffic will be blocked except for FTP connections initiated from the local LAN.

Stateful Packet Inspection allows you to select different application types that are using dynamic port numbers. If you wish to use the Stateful Packet Inspection (SPI) to block packets, click on the Yes radio button in the "Enable SPI and Anti-DoS firewall protection" field and then check the inspection type that you need, such as Packet Fragmentation, TCP Connection, UDP Session, FTP Service, H.323 Service, or TFTP Service.

- **When hackers attempt to enter your network, we can alert you by e-mail**

If the mail server needs to authenticate your identification before sending out any e-mail, please fill related information in POP3 server, username and password fields. Otherwise leave the three fields blank.

- **Connection Policy**

Enter the appropriate values for TCP/UDP sessions as described in the following table.

Parameter	Defaults	Description
Fragmentation half-open wait	10 sec	Configures the number of seconds that a packet state structure remains active. When the timeout value expires, the router drops the unassembled packet, freeing that structure for use by another packet.
TCP SYN wait	30 sec	Defines how long the software will wait for a TCP session to synchronize before dropping the session.
TCP FIN wait	5 sec	Specifies how long a TCP session will be maintained after the firewall detects a FIN packet.
TCP connection idle timeout	3600 sec (1 hour)	The length of time for which a TCP session will be managed if there is no activity.
UDP session idle timeout	30 sec	The length of time for which a UDP session will be managed if there is no activity.
H.323 data channel idle timeout	180 sec	The length of time for which an H.323 session will be managed if there is no activity.

- **DoS Criteria and Port Scan Criteria**

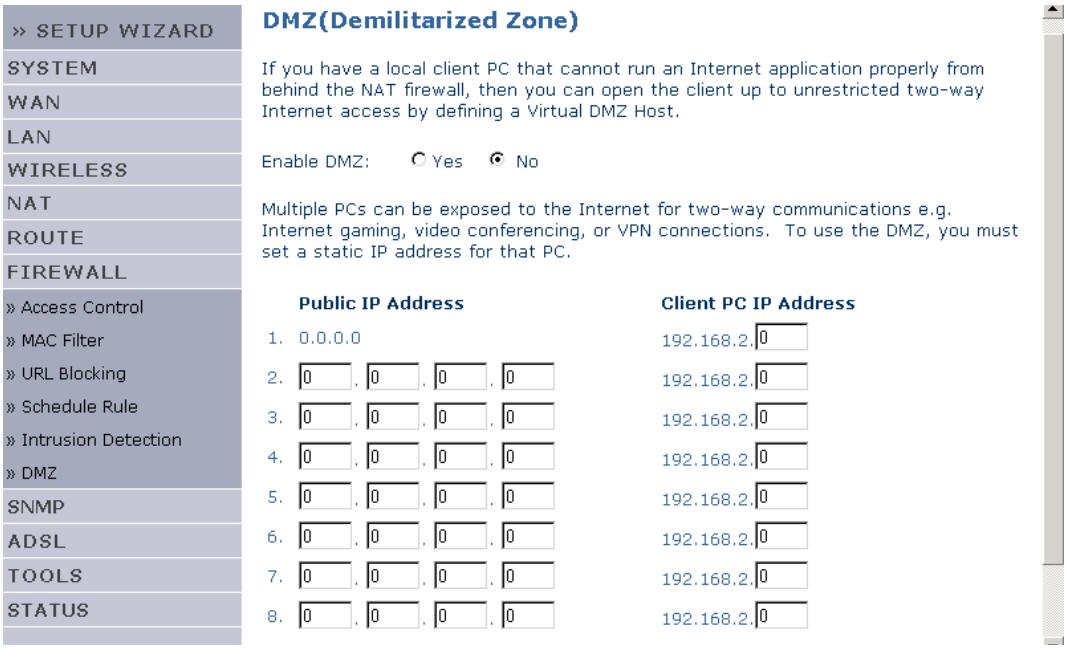
Set up DoS and port scan criteria in the spaces provided (as shown below).

Parameter	Defaults	Description
Total incomplete TCP/UDP sessions HIGH	300 sessions	Defines the rate of new unestablished sessions that will cause the software to *start* deleting half-open sessions.
Total incomplete TCP/UDP sessions LOW	250 sessions	Defines the rate of new unestablished sessions that will cause the software to *stop* deleting half-open sessions.
Incomplete TCP/UDP sessions (per min) HIGH	250 sessions	Maximum number of allowed incomplete TCP/UDP sessions per minute.
Incomplete TCP/UDP sessions (per min) LOW	200 sessions	Minimum number of allowed incomplete TCP/UDP sessions per minute.
Maximum incomplete TCP/UDP sessions number from same host	10	Maximum number of incomplete TCP/UDP sessions from the same host.
Incomplete TCP/UDP sessions detect sensitive time period	300 msec	Length of time before an incomplete TCP/UDP session is detected as incomplete.
Maximum half-open fragmentation packet number from same host	30	Maximum number of half-open fragmentation packets from the same host.
Half-open fragmentation detect sensitive time period	10000 msec	Length of time before a half-open fragmentation session is detected as half-open.
Flooding cracker block time	300 sec	Length of time from detecting a flood attack to blocking the attack.

Note: The firewall does not significantly affect system performance, so we advise enabling the prevention features to protect your network.

DMZ

If you have a client PC that cannot run an Internet application properly from behind the firewall, you can open the client up to unrestricted two-way Internet access. Enter the IP address of a DMZ (Demilitarized Zone) host on this screen. Adding a client to the DMZ may expose your local network to a variety of security risks, so only use this option as a last resort.

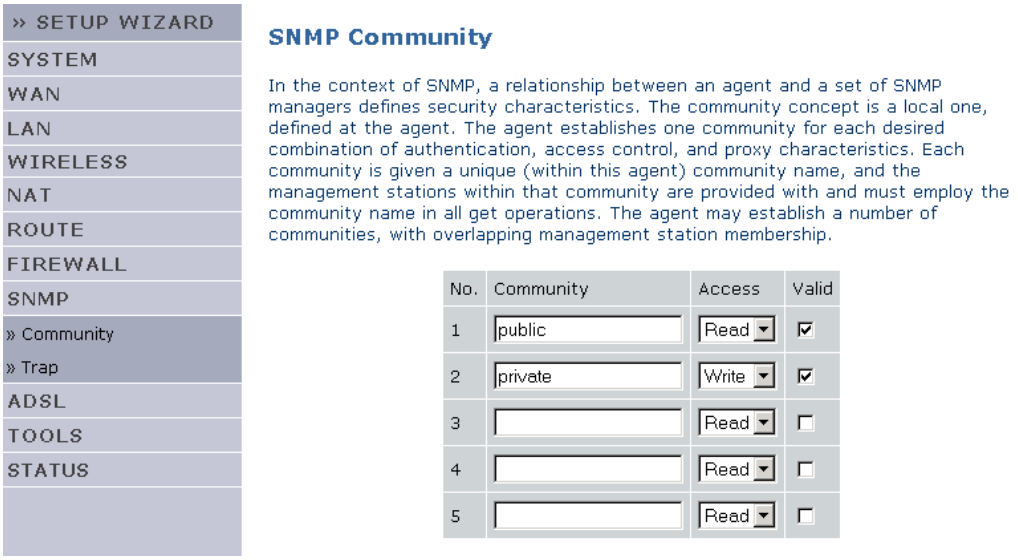


SNMP

Use the SNMP configuration screen to display and modify parameters for the Simple Network Management Protocol (SNMP).

Community

A computer attached to the network, called a Network Management Station (NMS), can be used to access this information. Access rights to the agent are controlled by community strings. To communicate with the ADSL Router, the NMS must first submit a valid community string for authentication.

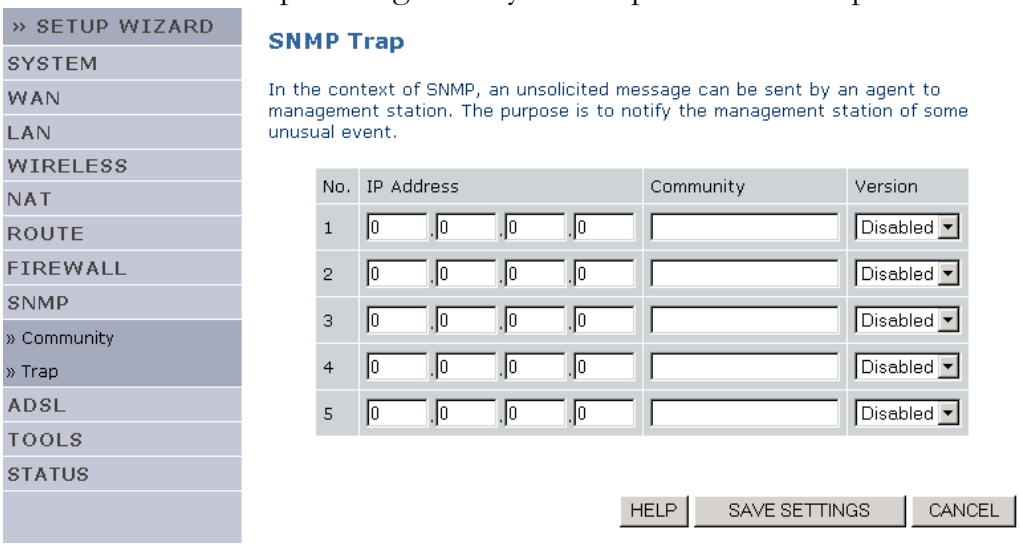


Parameter	Description
Community	A community name authorized for management access.
Access	Management access is restricted to Read Only (Read) or Read/Write (Write).
Valid	Enables/disables the entry.

Note: Up to five community names may be entered.

Trap

Specify the IP address of the NMS to notify when a significant event is detected by the agent. When a trap condition occurs, the SNMP agent sends an SNMP trap message to any NMS specified as a trap receiver.

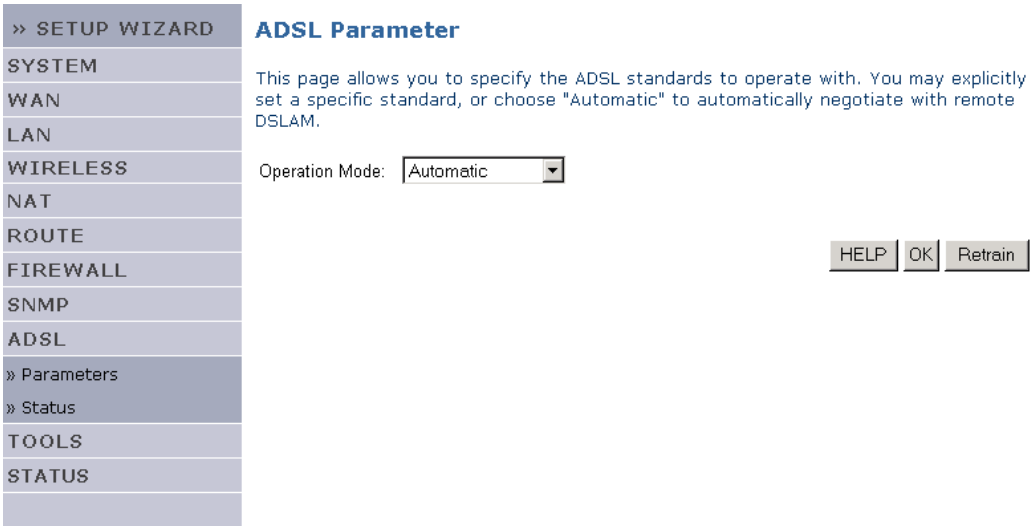


Parameter	Description
IP Address	Traps are sent to this address when errors or specific events occur on the network.
Community	A community string (password) specified for trap management. Enter a word, something other than public or private, to prevent unauthorized individuals from accessing information on your system.
Version	Sets the trap status to disabled, or enabled with V1 or V2c. The v2c protocol was proposed in late 1995 and includes enhancements to v1 that are universally accepted. These include a get-bulk command to reduce network management traffic when retrieving a sequence of MIB variables, and a more elaborate set of error codes for improved reporting to a Network Management Station.

ADSL

ADSL (Asymmetric Digital Subscriber Line) is designed to deliver more bandwidth downstream (from the central office to the customer site) than upstream. This section is used to configure the ADSL operation type and shows the ADSL status.

Parameters

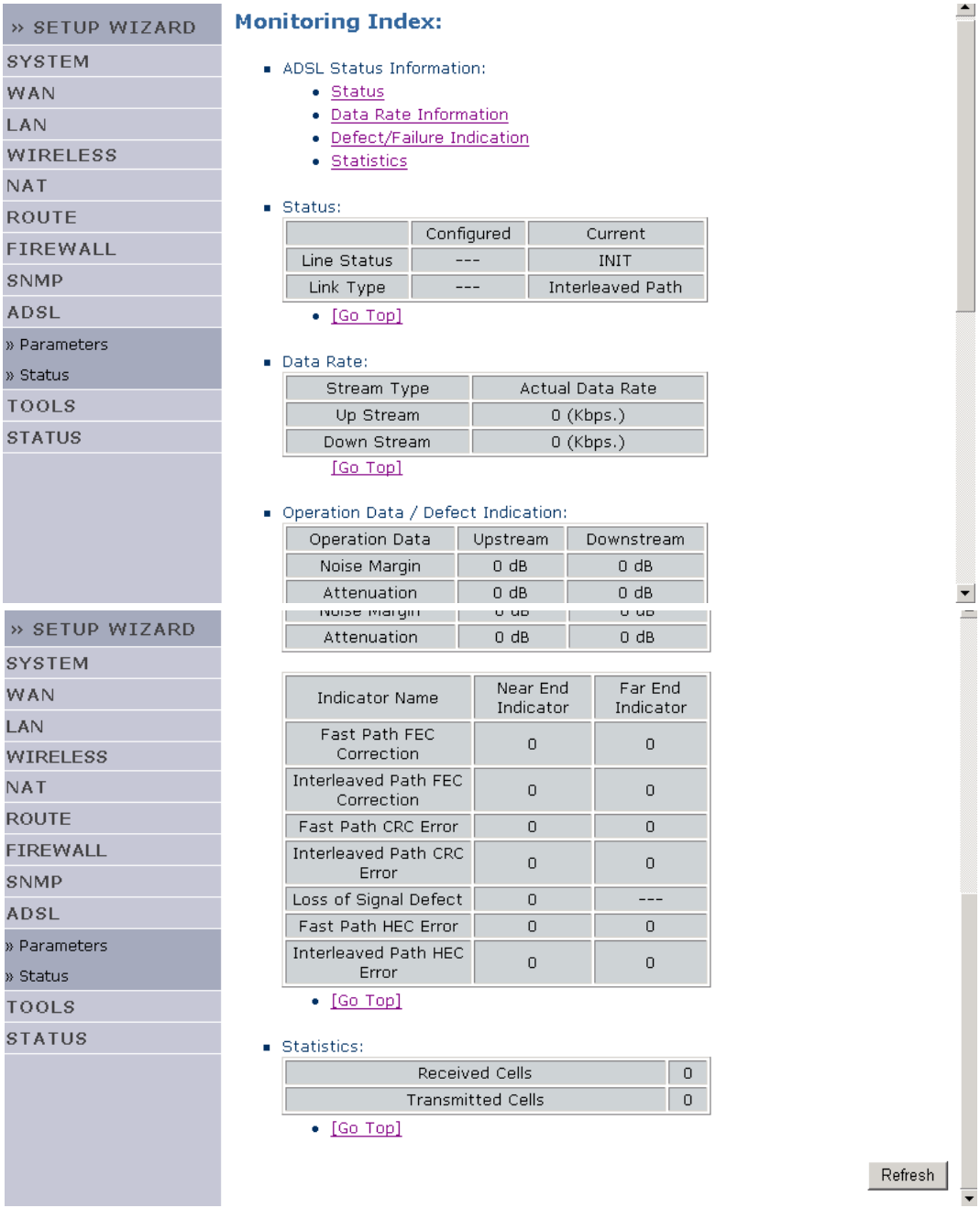


Parameter	Description
Operation Mode	• Automatic • T1.413 issue 2 • G.992.1 • G.992.2

This page is designed for the engineer to test the ADSL loop condition. Therefore, it is advised that users should not change the settings here at all.

Status

The Status screen displays information on connection line status, data rate, operation data and defect indication, and statistics.



The following items are included on the ADSL status page:

Parameter	Description
Status	
Line Status	Shows the current status of the ADSL line connection.
Link Type	Two types of link: Fast path and Interleaved path.
Data Rate	
Upstream	Maximum upstream data rate.
Downstream	Maximum downstream data rate.
Operation Data/Defect Indication	
Noise Margin	Maximum upstream and downstream noise margin.
Attenuation	Maximum reduction in the strength of the upstream and downstream signal.
Fast Path FEC Correction	There are two latency paths that may be used: fast and interleaved. For either path, a forward error correction (FEC) scheme is employed to ensure higher data integrity. For maximum noise immunity, an interleaver may be used to supplement FEC.
Interleaved Path FEC Correction	An interleaver is basically a buffer used to introduce a delay, allowing for additional error correction techniques to handle noise. Interleaving slows the data flow and may not be optimal for real-time signals such as video transmission.
Fast Path CRC Error	The number of Fast Path Cyclic Redundancy Check errors.
Interleaved Path CRC Error	The number of Interleaved Path Cyclic Redundancy Check errors.
Loss of Signal Defect	Momentary signal discontinuities.
Fast Path HEC Error	Fast Path Header Error Concealment errors.
Interleaved Path HEC Error	Interleaved Path Header Error Concealment errors.

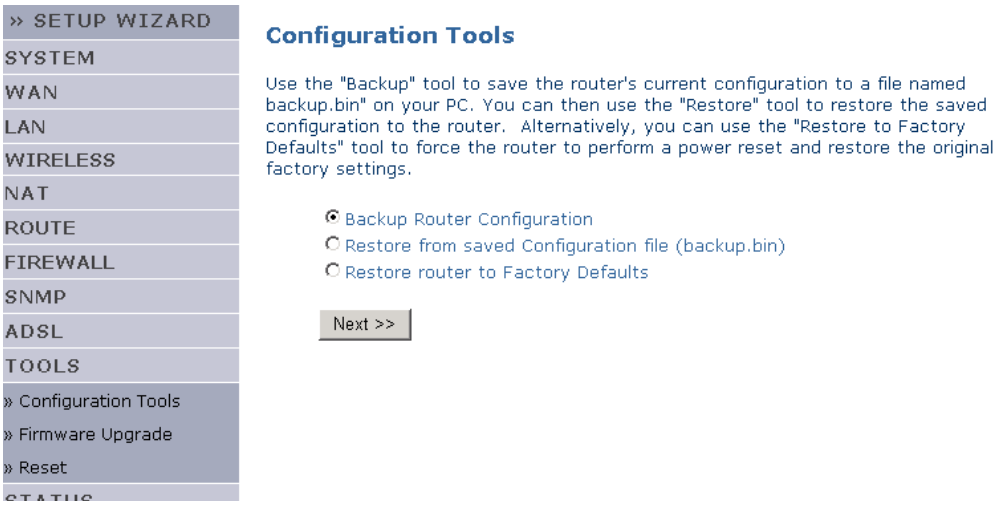
Parameter	Description
Statistics	(Superframes represent the highest level of data presentation. Each superframe contains regular ADSL frames, one of which is used to provide superframe synchronization, identifying the start of a superframe. Some of the remaining frames are also used for special functions.)
Received cells	Number of cells received.
Transmitted cells	Number of cells transmitted.

Tools

Use the Tools menu to backup the current configuration, restore a previously saved configuration, restore factory settings, update firmware, and reset the ADSL Router.

Configuration Tools

Choose a function and click Next.



Backup allows you to save the ADSL Router's configuration to a file. Restore can be used to restore the saved backup configuration file. Restore to Factory Defaults resets the ADSL Router to the original settings.

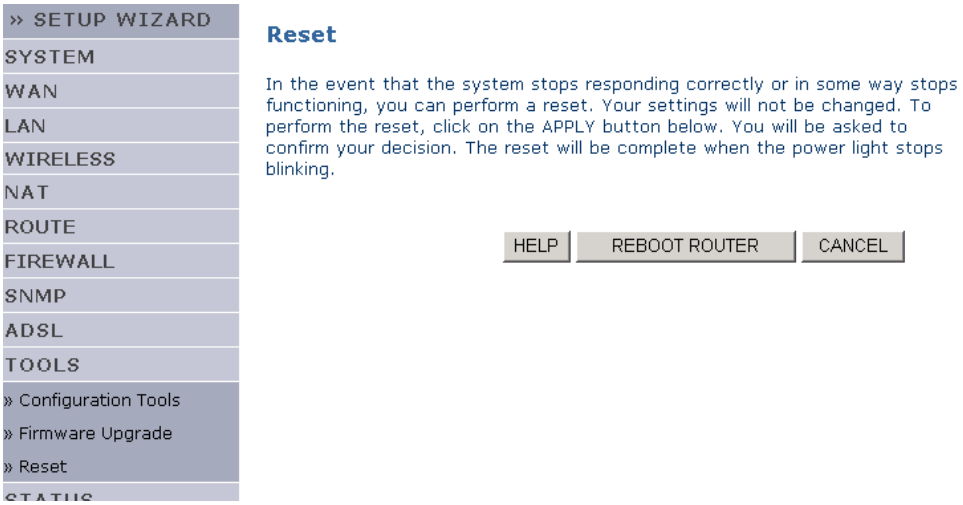
You will be asked to confirm your decision.

Firmware Upgrade

Use the Firmware Upgrade screen to update the firmware or user interface to the latest versions. Download the upgrade file, and save it to your hard drive. Then click "Browse..." to look for the downloaded file. Click "BEGIN UPGRADE". Check the Status page Information section to confirm that the upgrade process was successful.

Reset

Click "REBOOT ROUTER" to reset the ADSL Router.

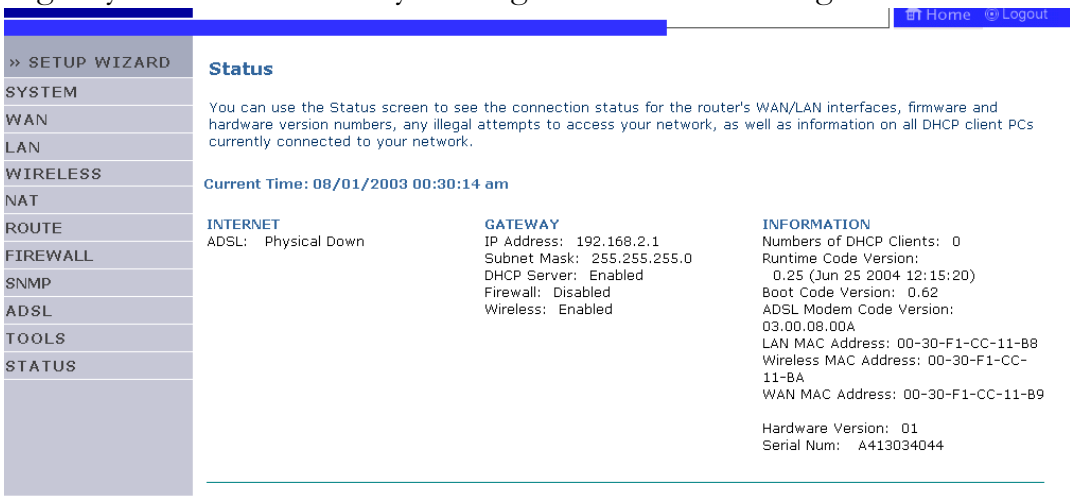


If you perform a reset from this page, the configurations will not be changed back to the factory default settings.

Note: If you use the Reset button on the rear panel, the ADSL Router performs a power reset. Press the button for over five seconds, and the factory default settings will be restored.

Status

The Status page displays WAN/LAN connection status, firmware, and hardware version numbers, illegal attempts to access your network, as well as information on DHCP clients connected to your network. The security log may be saved to a file by clicking "Save" and choosing a location.



The following items are included on the Status page:

Item	Description
INTERNET	Displays WAN connection type and status. Click the Connect button to connect to your ISP.
GATEWAY	Displays system IP settings, as well as DHCP Server and Firewall status.
INFORMATION	Displays the number of attached clients, the firmware versions, the physical MAC address for each media interface, and for the ADSL Router, as well as the hardware version and serial number.
Security Log	Displays illegal attempts to access your network.
Save	Click on this button to save the security log file.
Clear	Click on this button to delete the access log.
Refresh	Click on this button to refresh the screen.
DHCP Client Log	Displays information on DHCP clients on your network.

Finding the MAC address of a Network Card

Windows 98/ME

Click Start/Run. Type "winipcfg" and press "ENTER".

The MAC address is in the "Adapter Address" section.

Windows NT4/2000/XP

Click Start/Programs/Command Prompt. Type "ipconfig /all" and press "ENTER".

The MAC address is listed as the "Physical Address."

Macintosh

Click System Preferences/Network.

The MAC address is listed as the "Ethernet Address" on the TCP/IP tab.

Linux

Run the command "/sbin/ifconfig."

The MAC address is the value after the word "HWaddr."

APPENDIX A
TROUBLESHOOTING

This section describes common problems you may encounter and possible solutions to them. The ADSL Router can be easily monitored through panel indicators to identify problems.

Troubleshooting Chart	
Symptom	**Action**
LED Indicators	
Power LED is Off	• Check connections between the ADSL Router, the external power supply, and the wall outlet. • If the power indicator does not turn on when the power cord is plugged in, you may have a problem with the power outlet, power cord, or external power supply. However, if the unit powers off after running for a while, check for loose power connections, power losses, or surges at the power outlet. If you still cannot isolate the problem, then the external power supply may be defective. In this case, contact Technical Support for assistance.

Troubleshooting Chart	
Symptom	**Action**
LED Indicators	
Link LED is Off	• Verify that the ADSL Router and attached device are powered on. • Be sure the cable is plugged into both the ADSL Router and the corresponding device. • Verify that the proper cable type is used and that its length does not exceed the specified limits. • Be sure that the network interface on the attached device is configured for the proper communication speed and duplex mode. • Check the adapter on the attached device and cable connections for possible defects. Replace any defective adapter or cable if necessary.
Network Connection Problems	
Cannot ping the ADSL Router from the attached LAN	• Verify that the IP addresses are properly configured. For most applications, you should use the ADSL Router's DHCP function to dynamically assign IP addresses to hosts on the attached LAN. However, if you manually configure IP addresses on the LAN, verify that the same network address (network component of the IP address) and subnet mask are used for both the ADSL Router and any attached LAN devices. • Be sure the device you want to ping (or from which you are pinging) has been configured for TCP/IP.

Troubleshooting Chart	
Symptom	**Action**
Management Problems	
Cannot connect using the web browser	• Be sure to have configured the ADSL Router with a valid IP address, subnet mask, and default gateway. • Check that you have a valid network connection to the ADSL Router and that the port you are using has not been disabled. • Check the network cabling between the management station and the ADSL Router.
Forgot or lost the password	• Press the Reset button on the rear panel (holding it down for at least five seconds) to restore the factory defaults.

Troubleshooting Chart	
Symptom	**Action**
Wireless Problems	
A wireless PC cannot associate with the ADSL Router.	• Make sure the wireless PC has the same SSID settings as the ADSL Router. See "Channel and SSID" on page 4-24. • You need to have the same security settings on the clients and the ADSL Router. See "Security" on page 4-25.
The wireless network is often interrupted.	• Move your wireless PC closer to the ADSL Router to find a better signal. If the signal is still weak, change the angle of the antenna. • There may be interference, possibly caused by a microwave ovens or wireless phones. Change the location of the interference sources or of the ADSL Router. • Change the wireless channel on the ADSL Router. See "Channel and SSID" on page 4-24. • Check that the antenna, connectors, and cabling are firmly connected.
The ADSL Router cannot be detected by a wireless client.	• The distance between the ADSL Router and wireless PC is too great. • Make sure the wireless PC has the same SSID and security settings as the ADSL Router. See ADSL Router. See "Channel and SSID" on page 4-24 and "Security" on page 4-25.

APPENDIX B
CABLES

Ethernet Cable

Caution: DO NOT plug a phone jack connector into any RJ-45 port. Use only twisted-pair cables with RJ-45 connectors that conform with FCC standards.

Specifications

Cable Types and Specifications			
Cable	**Type**	**Max. Length**	**Connector**
10BASE-T	Cat. 3, 4, 5 100-ohm UTP	100 m (328 ft)	RJ-45
100BASE-TX	Cat. 5 100-ohm UTP	100 m (328 ft)	RJ-45

Wiring Conventions

For Ethernet connections, a twisted-pair cable must have two pairs of wires. Each wire pair is identified by two different colors. For example, one wire might be red and the other, red with white stripes. Also, an RJ-45 connector must be attached to both ends of the cable.

Each wire pair must be attached to the RJ-45 connectors in a specific orientation. The following figure illustrates how the pins on an Ethernet RJ-45 connector are numbered. Be sure to hold the connectors in the same orientation when attaching the wires to the pins.

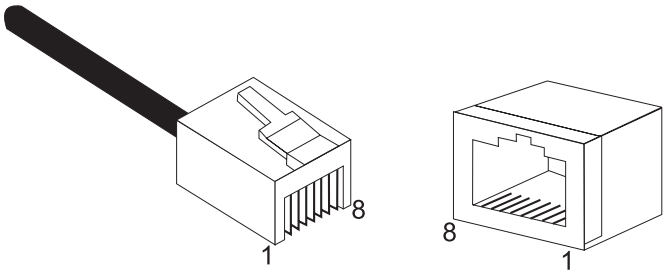


Figure B-1. RJ-45 Ethernet Connector Pin Numbers

RJ-45 Port Connection

Use the straight-through CAT-5 Ethernet cable provided in the package to connect the ADSL Router to your PC. When connecting to other network devices such as an Ethernet switch, use the cable type shown in the following table.

AttachedDevicePortType	Connecting Cable Type
MDI-X	Straight-through
MDI	Crossover

Pin Assignments

With 100BASE-TX/10BASE-T cable, pins 1 and 2 are used for transmitting data, and pins 3 and 6 for receiving data.

RJ-45 Pin Assignments	
Pin Number	Assignment[1]
1	Tx+
2	Tx-
3	Rx+
6	Rx-

1: The "+" and "-" signs represent the polarity of the wires that make up each wire pair.

Straight-Through Wiring

If the port on the attached device has internal crossover wiring (MDI-X), then use straight-through cable.

Straight-Through Cable Pin Assignments	
End 1	End 2
1 (Tx+)	1 (Tx+)
2 (Tx-)	2 (Tx-)
3 (Rx+)	3 (Rx+)
6 (Rx-)	6 (Rx-)

Crossover Wiring

If the port on the attached device has straight-through wiring (MDI), use crossover cable.

Crossover Cable Pin Assignments	
End 1	End 2
1 (Tx+)	3 (Rx+)
2 (Tx-)	6 (Rx-)
3 (Rx+)	1 (Tx+)
6 (Rx-)	2 (Tx-)

ADSL Cable

Use standard telephone cable to connect the RJ-11 telephone wall outlet to the RJ-11 ADSL port on the ADSL Router.

Caution: Do not plug a phone jack connector into an RJ-45 port.

Specifications

Cable Types and Specifications		
Cable	**Type**	**Connector**
ADSL Line	Standard Telephone Cable	RJ-11

Wiring Conventions

For ADSL connections, a cable requires one pair of wires. Each wire is identified by different colors. For example, one wire might be red and the other, red with white stripes. Also, an RJ-11 connector must be attached to both ends of the cable.

Each wire pair must be attached to the RJ-11 connectors in a specific orientation. The following figure illustrates how the pins on the RJ-11 connector are numbered. Be sure to hold the connectors in the same orientation when attaching the wires to the pins.

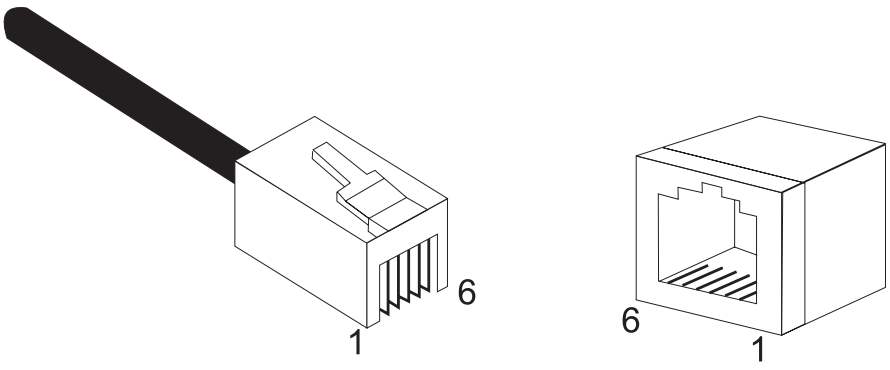


Figure B-2. RJ-11 Connector Pin Numbers

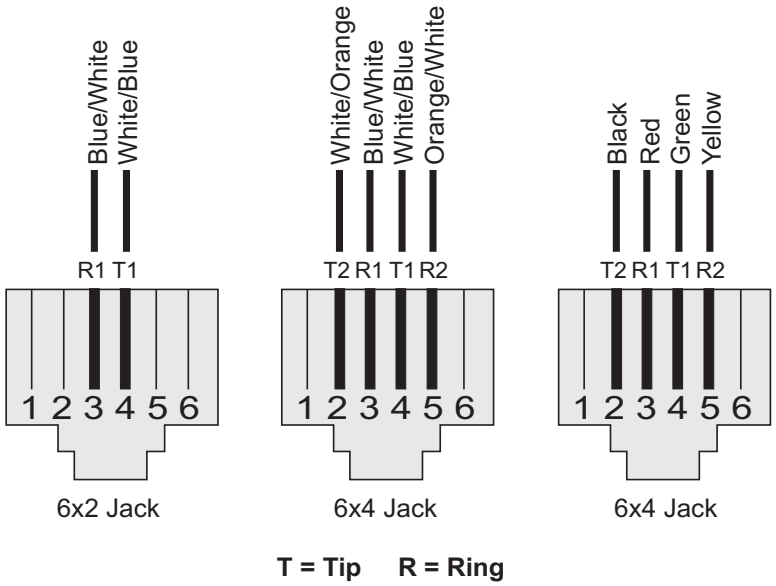


Figure B-3. RJ-11 Pinouts

Pin	Signal Name	Wire Color
1	Not used	
2	Line 2 Tip	Black or White/Orange
3	Line 1 Ring	Red or Blue/White
4	Line 1 Tip	Green or White/Blue
5	Line 2 Ring	Yellow or Orange/White
6	Not used	

APPENDIX C
SPECIFICATIONS

Physical Characteristics

Ports

Four 10/100Mbps RJ-45 Ports
One ADSL RJ-11

ADSL Features

Supports DMT line modulation
Supports Annex A Full-Rate ADSL: up to 8 Mbps downstream, up to 1 Mbps upstream (G.992.1 &T1.413, Issue 2)
Supports G.Lite ADSL: up to 1.5 Mbps downstream, up to 512 Kbps upstream
Dying GASP support

ATM Features

RFC1483 Encapsulation (IP, Bridging and encapsulated routing)
PPP over ATM (LLC &VC multiplexing) (RFC2364)
Classical IP (RFC1577)
Traffic shaping (UBR, CBR)
OAM F4/F5 support
PPP over Ethernet Client

Management Features

Firmware upgrade via web based management
Web based management (configuration)
Power indicators
Event and history logging
Network ping

Security Features

Password protected configuration access
User authentication (PAP/CHAP) with PPP
Firewall NAT NAPT
VPN pass through (IPSec-ESP Tunnel mode,L2TP, PPTP)

LAN Features

IEEE 802.1d (self-learning transparent Bridging)
DHCP Server
DNS Proxy
Static Routing, RIPv1 and RIP

Applications

Netmeeting, ICQ, Real Player, QuickTime, DialPad, PC Anywhere, Telnet, SNTP, NNTP

Radio Features

Wireless RF module Frequency Band

802.11g Radio: 2.4GHz
802.11b Radio: 2.4GHz
Europe - ETSI
2412~2472MHz (Ch1~Ch13)
France
2457~2472MHz (Ch10~Ch13)

Modulation Type

OFDM, CCK

Operating Channels IEEE 802.11b compliant:

13 channels (ETSI)
4 Channels (France)

Operating Channels IEEE 802.11g compliant:

13 channels (Europe)

RF Output Power Modulation Rate-Output Power (dBm)

802.11b - 1Mbps (16 dBm)
802.11b - 2Mbps (16 dBm)
802.11b - 5.5Mbps (16 dBm)
802.11b - 11Mbps (16 dBm)

Modulation Rate-Output Power (dBm)

802.11g - 6Mbps (15 dBm)
802.11g - 9Mbps (15 dBm)
802.11g - 12Mbps (15 dBm)
802.11g - 18Mbps (15 dBm)
802.11g- 24Mbps (15 dBm)
802.11g - 36Mbps (15 dBm)
802.11g- 48Mbps (15 dBm)
802.11g - 54Mbps (15 dBm)

SensitivityModulationRate-Receiver2.412~2.484HGzSensitivity (dBm)

802.11b - 1Mbps - (90 dBm)
802.11b - 2Mbps - (88 dBm)
802.11b - 5.5Mbps - (85 dBm)
802.11b- 11Mbps - (84 dBm)

Modulation Rate-Receiver Sensitivity Typical (dBm)

802.11g - 6Mbps - (88 dBm)
802.11g - 9Mbps - (87 dBm)
802.11g - 12Mbps - (84 dBm)
802.11g - 18Mbps - (82 dBm)
802.11g - 24Mbps - (79 dBm)
802.11g - 36Mbps - (75 dBm)
802.11g - 48Mbps - (68 dBm)
802.11g - 54Mbps - (68 dBm)

Environmental

Complies with the following standards:

Temperature: IEC 68-2-14

0 to 50 degrees C (Standard Operating)
-40 to 70 degree C (Non-operation)

Humidity

10% to 90% (Non-condensing)

Vibration

IEC 68-2-36, IEC 68-2-6

Shock

IEC 68-2-29

Drop

IEC 68-2-32

Dimensions

220 x 132 x 30 (mm)

Weight

550 g

Input Power

12 V 1 A

IEEE Standards

IEEE 802.3, 802.3u, 802.11g, 802.1d
ITU G.dmt
ITU G.Handshake
ITU T.413 issue 2 - ADSL full rate

Standards Conformance Electromagnetic Compatibility

CE, ETSI, R&TTE, ETS 300 328, ETS 300 826

Safety

EN60950

Internet Standards

RFC 826 ARP
RFC 791 IP
RFC 792 ICMP
RFC 768 UDP
RFC 793 TCP
RFC 783 TFTP
RFC 1483 AAL5 Encapsulation
RFC 1661 PPP
RFC 1866 HTML
RFC 2068 HTTP
RFC 2364 PPP over ATM

June 2004
Revision: R01 F0.25