

# USER MANUAL

DSL-2520U

VERSION 1.10



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## Package Contents

- DSL-2520U ADSL Router
- Power Adapter
- CD-ROM with User Manual and USB network driver
- One twisted-pair telephone cable used for ADSL connection
- One straight-through Ethernet cable
- One USB cable
- One Quick Installation Guide



**Note:** Using a power supply with a different voltage rating than the one included with the DSL-2520U will cause damage and void the warranty for this product.

## System Requirements

- ADSL Internet service
- Computer with:
  - 200MHz Processor
  - 64MB Memory
  - CD-ROM Drive
  - Ethernet Adapter with TCP/IP Protocol Installed
  - Internet Explorer v6 or later, FireFox v3.0.5 or later
  - Computer with Windows 2000, Windows XP, or Windows Vista
- D-Link Click'n Connect Utility

**Important Warning:** To protect against the latest versions of botnet viruses and malware, D-Link highly recommends changing the Web-based manager access user name and password once you have verified that a connection can be established. The user name and password allow any PC within the same subnet as the Router to access the Web-based manager. A strong password using lower case and upper case letters, special characters, and numbers in a random fashion is recommended.

Below are some examples of "Strong" and "Best" strength passwords using a combination of lower case and upper case letters, numbers, and special characters:

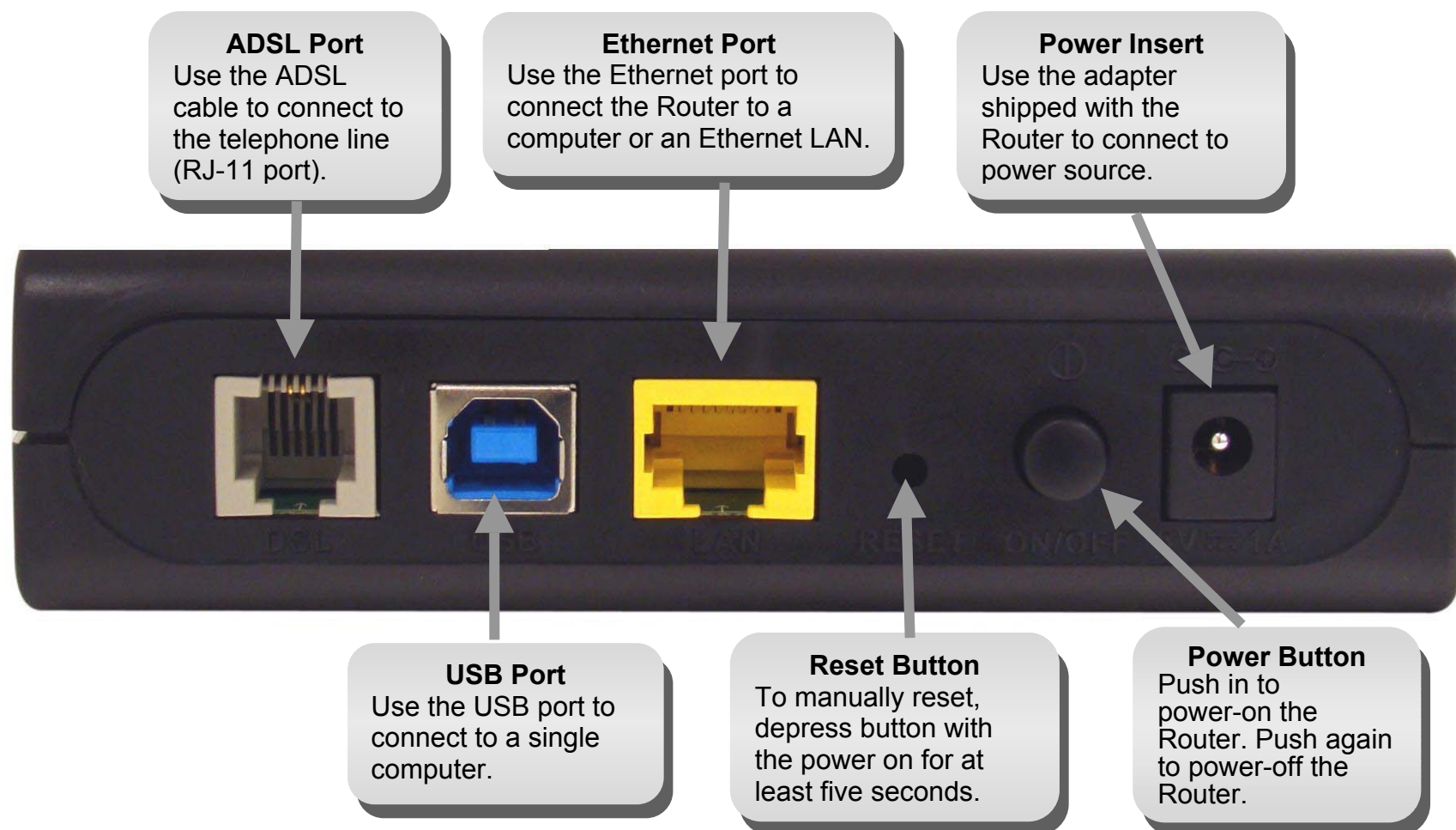
1. Best password with a 15-character length: **abcDE12345!@#\$\$%**
2. Strong password with 12-character length: **abCD1234!@#\$**
3. Strong password with 10-character length: **abCD1234!@**
4. Strong password with 8-character length: **abC123!@**

**Important Note:** Some devices may not be able to input passwords of more than 15 characters in length. Some special characters may not be supported. DO NOT use the following characters: / , \ , ; , , \* , ? , " , | , < , and > . Please DO NOT use the sample passwords listed above.

## Features

- **PPP (Point-to-Point Protocol) Security** – The DSL-2520U ADSL Router supports PAP (Password Authentication Protocol) and CHAP (Challenge Handshake Authentication Protocol) for PPP connections. The Router also supports MSCHAP.
- **DHCP Support** – Dynamic Host Configuration Protocol automatically and dynamically assigns all LAN IP settings to each host on your network. This eliminates the need to reconfigure every host whenever changes in network topology occur.
- **Network Address Translation (NAT)** – For small office environments, the DSL-2520U allows multiple users on the LAN to access the Internet concurrently through a single Internet account. This provides Internet access to everyone in the office for the price of a single user. NAT improves network security in effect by hiding the private network behind one global and visible IP address. NAT address mapping can also be used to link two IP domains via a LAN-to-LAN connection.
- **TCP/IP (Transfer Control Protocol/Internet Protocol)** – The DSL-2520U supports TCP/IP protocol, the language used for the Internet. It is compatible with access servers manufactured by major vendors.
- **RIP-1/RIP-2** – The DSL-2520U supports both RIP-1 and RIP-2 exchanges with other routers. Using both versions lets the Router to communicate with all RIP enabled devices.
- **Static Routing** – This allows you to select a data path to a particular network destination that will remain in the routing table and never “age out”. If you wish to define a specific route that will always be used for data traffic from your LAN to a specific destination within your LAN (for example to another router or a server) or outside your network (to an ISP defined default gateway for instance).
- **Default Routing** – This allows you to choose a default path for incoming data packets for which the destination address is unknown. This is particularly useful when/if the Router functions as the sole connection to the Internet.
- **ATM (Asynchronous Transfer Mode)** – The DSL-2520U supports Bridged Ethernet over ATM (RFC1483), IP over ATM (RFC1577), and PPP over ATM (RFC 2364).
- **Precise ATM Traffic Shaping** – Traffic shaping is a method of controlling the flow rate of ATM data cells. This function helps to establish the Quality of Service for ATM data transfer.
- **G.hs (Auto-handshake)** – This allows the Router to automatically choose either the G.lite or G.dmt ADSL connection standards.
- **High Performance** – Very high rates of data transfer are possible with the Router. Up to 8 Mbps downstream bit rate using the G.dmt standard.
- **Full Network Management** – The DSL-2520U incorporates SNMP (Simple Network Management Protocol) support for Web-based management and text-based network management via an RS-232 or Telnet connection.
- **Telnet Connection** – The Telnet enables a network manager to access the Router’s management software remotely.
- **Easy Installation** – The DSL-2520U uses a Web-based graphical user interface program for convenient management access and easy set up. Any common Web browser software can be used to manage the Router.

## Hardware Overview Connections



## Hardware Overview

### LEDs

#### Power

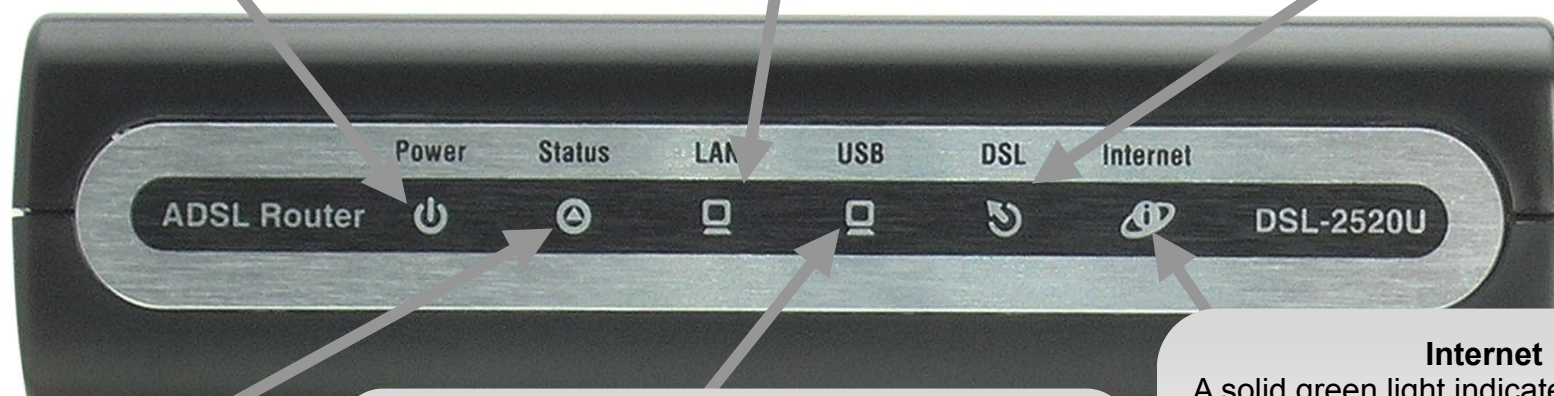
A steady green light indicates the unit is powered on. When the device is powered off, this remains dark. Lights steady red during power on self-test (POST). Once the connection status has been settled, the light will blink green. If the indicator lights steady green after the POST, the system has failed and the device should be rebooted.

#### LAN

A solid green light indicates a valid link on startup. This light will blink when there is activity currently passing through the Ethernet port.

#### DSL

A steady green light indicates a valid ADSL connection. This will light after the ADSL negotiation process has been settled. A blinking green light indicates synchronizing with the wire (ISP) DSL signal.



#### Status

A blinking green light indicates the system is operating normally. System failure is indicated by either a steady green or dark light.

#### USB

Steady green light indicates a valid USB connection. A blinking green light indicates activity on the USB interface. Steady green light indicates a valid USB connection. A blinking green light indicates activity on the USB interface.

#### Internet

A solid green light indicates the WAN IP address from IPCP or DHCP or a static IP address is configured and a PPP negotiation has been successfully completed. A solid red light indicates there is a remote server failure for DHCP, PPPoE or static IP address assignment.

# Installation

This section will walk you through the installation process. Placement of the Router is very important. Do not place the Router in an enclosed area such as a closet, cabinet, or in the attic or garage.

## Before You Begin

Please read and make sure you understand all the prerequisites for proper installation of your new Router. Have all the necessary information and equipment on hand before beginning the installation.

## Installation Notes

In order to establish a connection to the Internet it will be necessary to provide information to the Router that will be stored in its memory. For some users, only their account information (Username and Password) is required. For others, various parameters that control and define the Internet connection will be required. You can print out the two pages below and use the tables to list this information. This way you have a hard copy of all the information needed to setup the Router. If it is necessary to reconfigure the device, all the necessary information can be easily accessed. Be sure to keep this information safe and private.

### Low Pass Filters

Since ADSL and telephone services share the same copper wiring to carry their respective signals, a filtering mechanism may be necessary to avoid mutual interference. A low pass filter device can be installed for each telephone that shares the line with the ADSL line. These filters are easy to install passive devices that connect to the ADSL device and/or telephone using standard telephone cable. Ask your service provider for more information about the use of low pass filters with your installation.

### Operating Systems

The DSL-2520U uses an HTML-based Web interface for setup and management. The Web configuration manager may be accessed using any operating system capable of running Web browser software, including Windows 98 SE, Windows ME, Windows 2000, Windows XP, and Windows Vista.

### Web Browser

Any common Web browser can be used to configure the Router using the Web configuration management software. The program is designed to work best with more recently released browsers such as Microsoft Internet Explorer® version 6.0 or later or FireFox® version 3.0.5 or later. The



Web browser must have JavaScript enabled. JavaScript is enabled by default on many browsers. Make sure JavaScript has not been disabled by other software (such as virus protection or Web user security packages) that may be running on your computer.

### **Ethernet Port (NIC Adapter)**

Any computer that uses the Router must be able to connect to it through the Ethernet port on the Router. This connection is an Ethernet connection and therefore requires that your computer be equipped with an Ethernet port as well. Most notebook computers are now sold with an Ethernet port already installed. Likewise, most fully assembled desktop computers come with an Ethernet NIC adapter as standard equipment. If your computer does not have an Ethernet port, you must install an Ethernet NIC adapter before you can use the Router. If you must install an adapter, follow the installation instructions that come with the Ethernet NIC adapter.

### **USB Port**

The Router is equipped with a USB port that allows a single computer to access the Internet. To use this port the computer must have an available USB port and install the USB driver. The CD-ROM shipped with the Router contains the setup file for the USB network driver.

### **Additional Software**

It may be necessary to install software on your computer that enables the computer to access the Internet. Additional software must be installed if you are using the device a simple bridge. For a bridged connection, the information needed to make and maintain the Internet connection is stored on another computer or gateway device, not in the Router itself.

If your ADSL service is delivered through a PPPoE or PPPoA connection, the information needed to establish and maintain the Internet connection can be stored in the Router. In this case, it is not necessary to install software on your computer. It may however be necessary to change some settings in the device, including account information used to identify and verify the connection.

All connections to the Internet require a unique global IP address. For bridged connections, the global IP settings must reside in a TCP/IP enabled device on the LAN side of the bridge, such as a PC, a server, a gateway device such as a router or similar firewall hardware. The IP address can be assigned in a number of ways. Your network service provider will give you instructions about any additional connection software or NIC configuration that may be required.

## Information you will need from your ADSL service provider

### **Username**

This is the Username used to log on to your ADSL service provider's network. Your ADSL service provider uses this to identify your account.

### **Password**

This is the Password used, in conjunction with the Username above, to log on to your ADSL service provider's network. This is used to verify the identity of your account.

### **WAN Setting / Connection Type**

These settings describe the method your ADSL service provider uses to transport data between the Internet and your computer. Most users will use the default settings. You may need to specify one of the following WAN Setting and Connection Type configurations (Connection Type settings listed in parenthesis):

- PPPoE/PPoA (PPPoE LLC, PPPoA LLC or PPPoA VC-Mux)
- Bridge Mode (1483 Bridged IP LLC or 1483 Bridged IP VC Mux)
- IPoA/MER (Static IP Address) (Bridged IP LLC, 1483 Bridged IP VC Mux, 1483 Routed IP LLC, 1483 Routed IP VC-Mux or IPoA)
- MER (Dynamic IP Address) (1483 Bridged IP LLC or 1483 Bridged IP VC-Mux)

### **Modulation Type**

ADSL uses various standardized modulation techniques to transmit data over the allotted signal frequencies. Some users may need to change the type of modulation used for their service. The default DSL modulation (ADSL2+ Multi-Mode) used for the Router automatically detects all types of ADSL, ADSL2, and ADSL2+ modulation.

### **Security Protocol**

This is the method your ADSL service provider will use to verify your Username and Password when you log on to their network. Your Router supports the PAP and CHAP protocols.

### **VPI**

Most users will not be required to change this setting. The Virtual Path Identifier (VPI) is used in conjunction with the Virtual Channel Identifier (VCI) to identify the data path between your ADSL service provider's network and your computer. If you are setting up the Router for multiple virtual connections, you will need to configure the VPI and VCI as instructed by your ADSL service provider for the additional connections.

### **VCI**

Most users will not be required to change this setting. The Virtual Channel Identifier (VCI) used in conjunction with the VPI to identify the data path between your ADSL service provider's network and your computer. If you are setting up the Router for multiple virtual connections, you will need to configure the VPI and VCI as instructed by your ADSL service provider for the additional connections.

## Information you will need about DSL-2520U

### **Username**

This is the Username needed access the Router's management interface. When you attempt to connect to the device through a Web browser you will be prompted to enter this Username. The default Username for the Router is "**admin**." The user cannot change this.

### **Password**

This is the Password you will be prompted to enter when you access the Router's management interface. The default Password is "**admin**." The user may change this.

### **LAN IP addresses for the DSL-2520U**

This is the IP address you will enter into the Address field of your Web browser to access the Router's configuration graphical user interface (GUI) using a Web browser. The default IP address is **192.168.1.1**. This may be changed to suit any IP address scheme the user desires. This address will be the base IP address used for DHCP service on the LAN when DHCP is enabled.

### **LAN Subnet Mask for the DSL-2520U**

This is the subnet mask used by the DSL-2520U, and will be used throughout your LAN. The default subnet mask is **255.255.255.0**. This can be changed later.

# Information you will need about your LAN or computer:

## **Ethernet NIC**

If your computer has an Ethernet NIC, you can connect the DSL-2520U to this Ethernet port using an Ethernet cable. You can also use the Ethernet ports on the DSL-2520U to connect to other computer or Ethernet devices.

## **DHCP Client status**

Your DSL-2520U ADSL Router is configured, by default, to be a DHCP server. This means that it can assign an IP address, subnet mask, and a default gateway address to computers on your LAN. The default range of IP addresses the DSL-2520U will assign are from 192.168.1.2 to 192.168.1.254. Your computer (or computers) needs to be configured to obtain an IP address automatically (that is, they need to be configured as DHCP clients.)

It is recommended that you collect and record this information here, or in some other secure place, in case you have to re-configure your ADSL connection in the future.

Once you have the above information, you are ready to set up and configure your DSL-2520U ADSL Router.

## Device Installation

The DSL-2520U connects two separate physical interfaces, an ADSL (WAN) and an Ethernet (LAN) interface. Place the Router in a location where it can be connected to the various devices as well as to a power source. The Router should not be located where it will be exposed to moisture or excessive heat. Make sure the cables and power cord are placed safely out of the way so they do not create a tripping hazard. As with any electrical appliance, observe common sense safety procedures.

The Router can be placed on a shelf or desktop, ideally you should be able to see the LED indicators on the front if you need to view them for troubleshooting.

## Power on Router

The Router must be used with the power adapter included with the device.

1. Insert the AC Power Adapter cord into the power receptacle located on the rear panel of the Router and plug the adapter into a suitable nearby power source.
2. Depress the Power button into the on position. You should see the Power LED indicator light up and remain lit. The Status LED should light solid green and begin to blink after a few seconds.
3. If the Ethernet port is connected to a working device, check the Ethernet Link/Act LED indicators to make sure the connection is valid. The Router will attempt to establish the ADSL connection, if the ADSL line is connected and the Router is properly configured this should light up after several seconds. If this is the first time installing the device, some settings may need to be changed before the Router can establish a connection.

## Factory Reset Button

The Router may be reset to the original factory default settings by using a ballpoint or paperclip to gently push down the reset button in the following sequence:

1. Press and hold the reset button about 5 to 8 seconds while the device is powered off.
2. Turn on the power by following the steps listed in the Power on Router section above.

Remember that this will wipe out any settings stored in flash memory including user account information and LAN IP settings. The device settings will be restored to the factory default IP address **192.168.1.1** and the subnet mask is **255.255.255.0**, the default management Username is **admin** and the default Password is **admin**.

## Network Connections

### **Connect ADSL Line**

Use the ADSL cable included with the Router to connect it to a telephone wall socket or receptacle. Plug one end of the cable into the ADSL port (RJ-11 receptacle) on the rear panel of the Router and insert the other end into the RJ-11 wall socket. If you are using a low pass filter device, follow the instructions included with the device or given to you by your service provider. The ADSL connection represents the WAN interface, the connection to the Internet. It is the physical link to the service provider's network backbone and ultimately to the Internet.

### **Connect Router to Ethernet**

The Router may be connected to a single computer or Ethernet device through the 10BASE-TX Ethernet port on the rear panel. Any connection to an Ethernet concentrating device such as a switch or hub must operate at a speed of 10/100 Mbps only. When connecting the Router to any Ethernet device that is capable of operating at speeds higher than 10Mbps, be sure that the device has auto-negotiation (NWay) enabled for the connecting port. Use standard twisted-pair cable with RJ-45 connectors. The RJ-45 port on the Router is a crossed port (MDI-X). Follow standard Ethernet guidelines when deciding what type of cable to use to make this connection. When connecting the Router directly to a PC or server use a normal straight-through cable. You should use a crossed cable when connecting the Router to a normal (MDI-X) port on a switch or hub. Use a normal straight-through cable when connecting it to an uplink (MDI-II) port on a hub or switch. The rules governing Ethernet cable lengths apply to the LAN to Router connection. Be sure that the cable connecting the LAN to the Router does not exceed 100 meters.

### **Hub or Switch to Router Connection**

Connect the Router to an uplink port (MDI-II) on an Ethernet hub or switch with a straight-through cable. If you wish to reserve the uplink port on the switch or hub for another device, connect to any on the other MDI-X ports (1x, 2x, etc.) with a crossed cable.

### **Computer to Router Connection**

You can connect the Router directly to a 10/100BASE-TX Ethernet adapter card (NIC) installed on a PC using the Ethernet cable provided; or connect a single computer to the USB port.

### **Connect to USB Port**

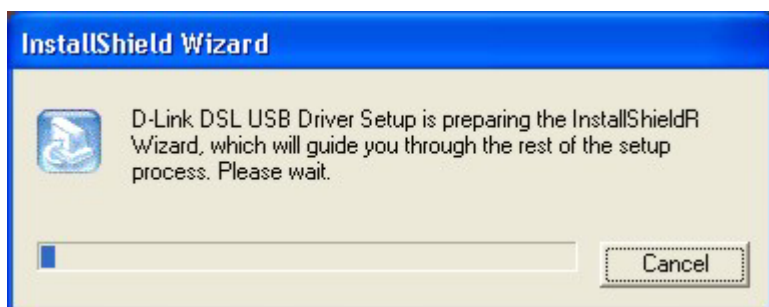
Before using the USB port to connect a computer to the Router, first install the USB network driver on the computer. Follow the instructions below to install the USB driver.

## Installing the USB Driver

**IMPORTANT: Do not connect the USB cable to your PC before completing the below steps.**

The CD-ROM shipped with the Router contains the USB driver software. Insert the DSL-2520U CD-ROM into the CD drive. Within a few seconds you should see a window that offers the following options: Install DSL-2520U, Quick Install Guide, View Manual, Install Acrobat Reader, and Exit. If you do not see this auto-run pop-up window, explore the CD-ROM and double-click the setup application file **autorun.exe** or find the file **Setup.exe** in the folder labeled **USBDRIVER** and double-click it to launch the installation software. The auto-run USB driver setup must be completed before connecting the router to your PC with the USB cable. To install the driver follow these instructions:

1. Click the **Install DSL-2520U** link or **Setup.exe** file in the **USBDRIVER** folder on the **CD-ROM** in to launch the USB driver installation software. The Windows InstallShield Wizard launches automatically and installs the USB driver. A few screens, such as the examples pictured here, will appear briefly during the installation.





2. Click **Finish** to complete the InstallShield Wizard installation process. The Router is now ready to be connected to the USB port of your computer.

When the USB driver has been installed, make sure the Router is powered on and insert one end of the USB cable included with the Router into the DSL-2520U Router's USB port. Insert the other end of the USB cable into a USB port on your PC. Check the USB LED on the front of the Router to confirm that the connections have been made. This should light green when the USB cable is connected.

**To uninstall the USB driver**, from the Windows Start menu, go to **Start → Programs → DSL USB Driver** and click the **Uninstall USB Driver** icon. You will have to confirm that you are uninstalling the USB driver.



# Configuration

This section will show you how to configure your new D-Link Router using the Web-based configuration utility.

## Web-based Configuration Utility

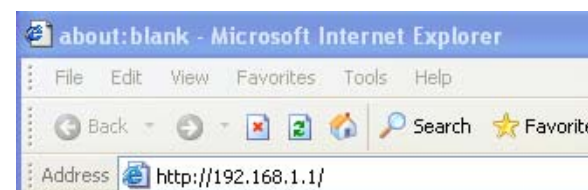
### Connect to the Router

To configure the WAN connection used by the Router it is first necessary to communicate with the Router through its management interface, which is HTML-based and can be accessed using a Web browser. The easiest way to make sure your computer has the correct IP settings is to configure it to use the DHCP server in the Router. The next section describes how to change the IP configuration for a computer running a Windows operating system to be a DHCP client.

**IMPORTANT WARNING:** To protect against the latest versions of botnet viruses and malware, D-Link highly recommends changing the Web-based manager access user name and password once you have verified that a connection can be established. The user name and password allow any PC within the same subnet as the Router to access the Web-based manager. A “strong” or “best” password using lower case and capital letters, special characters, and numbers in a random fashion is recommended. Do not use the following characters: / , \ , ; , \* , ? , " , | , < , and > .

To access the configuration utility, open a Web-browser such as the latest versions of Internet Explorer or FireFox and enter the IP address of the Router (**192.168.1.1**).

Type “**admin**” for the User Name and “**admin**” in the Password field. If you get a “Page Cannot be Displayed” error, please refer to the Troubleshooting section for assistance.



## Quick Setup

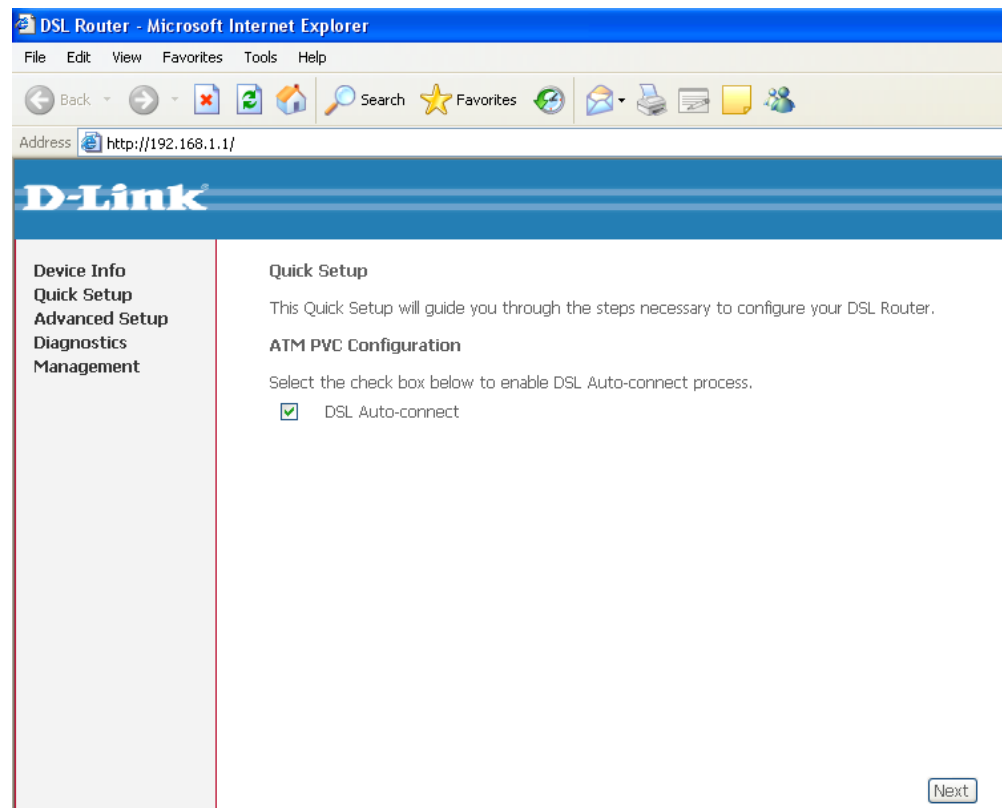
This chapter is concerned with using your computer to configure the WAN connection. The following chapter describes the various windows used to configure and monitor the Router including how to change IP settings and DHCP server setup.

### QUICK SETUP

Click the **Quick Setup** link on the left panel of the opening page to launch a series of setup windows.

Tick the DSL Auto-connect check box and then click the **Next** button.

If the ADSL connection is down, deselect the DSL Auto-connect check box and then click the **Next** button to manually assign VPI and VCI values.



QUICK SETUP

If you chose to manually assign the VPI and VCI values, additional parameters will appear that allow you to set up the ATM PVC configuration. Enter a Port Identifier (PORT), Virtual Path Identifier (VPI), and Virtual Channel Identifier (VCI). The VPI and VCI values should be provided by your ISP. This window also allows you to enable QoS by ticking the **Enable Quality of Service** check box.

Click the **Next** button to continue.

QUICK SETUP – CONNECTION TYPE

This window allows you to select the appropriate connection type. The choices include PPP over ATM (PPPoA), PPP over Ethernet (PPPoE), MAC Encapsulation Routing (MER), IP over ATM (IPoA), and Bridging (default).

This window also allows you to use the drop-down menu to select the desired Encapsulation Mode.

Click the **Next** button to continue.

Quick Setup

This Quick Setup will guide you through the steps necessary to configure your DSL Router.

ATM PVC Configuration

Select the check box below to enable DSL Auto-connect process.

☐ DSL Auto-connect

The Port Identifier (PORT) Virtual Path Identifier (VPI) and Virtual Channel Identifier (VCI) are needed for setting up the ATM PVC. Do not change VPI and VCI numbers unless your ISP instructs you otherwise.

PORT: [0-3]

0

VPI: [0-255]

0

VCI: [32-65535]

35

Enable Quality Of Service

Enabling QoS for a PVC improves performance for selected classes of applications. However, since QoS also consumes system resources, the number of PVCs will be reduced consequently. Use **Advanced Setup/Quality of Service** to assign priorities for the applications.

Enable Quality Of Service ☐

Next

Connection Type

Select the type of network protocol for IP over Ethernet as WAN interface

- ☐ PPP over ATM (PPPoA)
- ☐ PPP over Ethernet (PPPoE)
- ☐ MAC Encapsulation Routing (MER)
- ☐ IP over ATM (IPoA)
- ☒ Bridging

Encapsulation Mode

LLC/SNAP-BRIDGING

BackNext

QUICK SETUP – BRIDGING

To enable bridging, tick the **Enable Bridge Service** check box and enter a Service Name.

To disable the Bridge service, unselect the check box.  
Click the **Next** button to continue.

QUICK SETUP – BRIDGING

This window allows you to configure the Router IP Address and Subnet Mask for your LAN. Once you have entered an IP Address and Subnet Mask, click the **Next** button to continue.

QUICK SETUP – BRIDGING

This summary window allows you to confirm the bridging settings you have just made.  
  
Click the **Save/Reboot** button to save your new bridging settings and restart the Router.

Unselect the check box below to disable this WAN service

Enable Bridge Service: ☒

Service Name:

[Back](#) [Next](#)

Device Setup

Configure the DSL Router IP Address and Subnet Mask for your Local Area Network (LAN).

IP Address:

Subnet Mask:

[Back](#) [Next](#)

WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

PORT / VPI / VCI:	0 / 0 / 35
Connection Type:	Bridge
Service Name:	br_0_0_35
Service Category:	UBR
IP Address:	Not Applicable
Service State:	Enabled
NAT:	Enabled
Firewall:	Enabled
IGMP Multicast:	Not Applicable
Quality Of Service:	Disabled

Click "Save/Reboot" to save these settings and reboot router. Click "Back" to make any modifications.  
NOTE: The configuration process takes about 1 minute to complete and your DSL Router will reboot.

[Back](#) [Save/Reboot](#)

### QUICK SETUP – PPPoA

Click the **PPP over ATM (PPPoA)** radio button on this window. This window also allows you to use the drop-down menu to select the desired Encapsulation Mode.

Click the **Next** button to continue.

#### Connection Type

Select the type of network protocol for IP over Ethernet as WAN interface

- ☒ PPP over ATM (PPPoA)
- ☐ PPP over Ethernet (PPPoE)
- ☐ MAC Encapsulation Routing (MER)
- ☐ IP over ATM (IPoA)
- ☐ Bridging

#### Encapsulation Mode

VC/MUX 

[Back](#) [Next](#)

QUICK SETUP – PPPoA

This window allows you to set the Username and the Password for your PPP connection. This information is obtained from your ISP. Additional settings on this window will also depend on your ISP.

Click the **Next** button to continue.

QUICK SETUP – PPPoA

This window allows you to enable or disable Network Address Translation (NAT) and the Firewall function on your Router. In addition, you can enable or disable IGMP Multicasting and the WAN Service.

You can also identify the connection by typing a name into the Service Name field.

Click the **Next** button to continue.

PPP Username and Password

PPP usually requires that you have a user name and password to establish your connection. In the boxes below, enter the user name and password that your ISP has provided to you.

PPP Username:

PPP Password:

Authentication Method: 

AUTO

☒ Obtain default gateway automatically

☐ Use the following default gateway:

☐ Use IP Address:

☐ Use WAN Interface: 

pppoa\_0\_0\_35\_1/ppp\_0\_0\_35\_1

☐ PPP IP extension

☐ Advanced DMZ

Non DMZ IP Address:

Non DMZ Net Mask:

☒ Keep alive PPP connection

☐ Dial on demand (with idle timeout timer)

☐ Use Static IP Address

☒ Retry PPP password on authentication error

PPP Link Setting

MTU

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Network Address Translation Settings

Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN).

Enable NAT ☒

Enable Firewall ☒

Enable IGMP Multicast, and WAN Service

Enable IGMP Multicast ☐

Enable WAN Service ☒

Service Name

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QUICK SETUP – PPPoA

This window allows you to enter an IP address and Subnet Mask for the LAN interface. In addition, you can either Enable or Disable the DHCP Server.

To enable the DHCP Server, enter a Starting IP Address, an Ending IP Address, and a Subnet Mask. You may also choose to change the default value of the Leased Time.

Tick the “Configure the second IP Address and Subnet Mask for LAN interface” check box if you want to enable a second IP Address on the LAN connection. Type the IP Address and Subnet Mask you want to use as the second IP address in the IP Address and Subnet Mask fields that appear below the check box.

Click the **Next** button to continue.

Device Setup

Configure the DSL Router IP Address and Subnet Mask for LAN interface.

IP Address:	<input type="text" value="192.168.1.1"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>

<input type="radio"/> Disable DHCP Server	
<input checked="" type="radio"/> Enable DHCP Server	
Start IP Address:	<input type="text" value="192.168.1.2"/>
End IP Address:	<input type="text" value="192.168.1.254"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Leased Time (hour):	<input type="text" value="24"/>

☐ Configure the second IP Address and Subnet Mask for LAN interface

QUICK SETUP – PPPoA

This summary window allows you to confirm the settings you have just made.

Click the **Save/Reboot** button to save your new PPP over ATM settings and restart the Router.

WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

PORT / VPI / VCI:	0 / 0 / 35
Connection Type:	PPPoA
Service Name:	pppoa_0_0_35_1
Service Category:	UBR
IP Address:	Automatically Assigned
Service State:	Enabled
NAT:	Enabled
Firewall:	Enabled
IGMP Multicast:	Disabled
Quality Of Service:	Disabled
MTU:	1492

Click "Save/Reboot" to save these settings and reboot router. Click "Back" to make any modifications.  
NOTE: The configuration process takes about 1 minute to complete and your DSL Router will reboot.

[Back](#) [Save/Reboot](#)



### QUICK SETUP – PPPoE

Click the PPP over Ethernet (PPPoE) radio button on this window. This window also allows you to use the drop-down menu to select the desired Encapsulation Mode.

Click the **Next** button to continue.

#### Connection Type

Select the type of network protocol for IP over Ethernet as WAN interface

- ☐ PPP over ATM (PPPoA)
- ☒ PPP over Ethernet (PPPoE)
- ☐ MAC Encapsulation Routing (MER)
- ☐ IP over ATM (IPoA)
- ☐ Bridging

#### Encapsulation Mode

LLC/SNAP-BRIDGING ▼

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QUICK SETUP – PPPoE

This window allows you to set the username and the password for your PPP connection. This information is obtained from your ISP. Additional settings on this window will also depend on your ISP.

Click the **Next** button to continue.

QUICK SETUP – PPPoE

This window allows you to enable or disable Network Address Translation (NAT) and the Firewall function on your Router. In addition, you can enable or disable IGMP Multicasting and the WAN Service.

You can also identify the connection by typing a name into the Service Name field.

Click the **Next** button to continue.

PPPoE Username and Password

PPP usually requires that you have a user name and password to establish your connection. In the boxes below, enter the user name and password that your ISP has provided to you.

PPP Username:

PPP Password:

PPPoE Service Name:

Authentication Method:

AUTO

Obtain default gateway automatically

Use the following default gateway:

Use IP Address:

Use WAN Interface:

pppoe\_0\_0\_35\_1/ppp\_0\_0\_35\_1

PPP IP extension

Advanced DMZ

Non DMZ IP Address:

Non DMZ Net Mask:

Keep alive PPP connection

Dial on demand (with idle timeout timer)

Use Static IP Address

Retry PPP password on authentication error

Bridge PPPoE Frames Between WAN and Local Ports

PPP Link Setting

MTU

1492

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Network Address Translation Settings

Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN).

Enable NAT

Enable Firewall

Enable IGMP Multicast, and WAN Service

Enable IGMP Multicast

Enable WAN Service

Service Name

pppoe\_0\_0\_35\_1

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### QUICK SETUP – PPPoE

This window allows you to enter an *IP* address and Subnet Mask for the LAN interface. In addition, you can either Enable or Disable the DHCP Server.

To enable the DHCP Server, enter a Starting IP Address, an Ending IP Address, and a Subnet Mask. You may also choose to change the default value of the Leased Time.

Tick the “Configure the second IP Address and Subnet Mask for LAN interface” check box if you want to enable a second IP Address on the LAN connection. Type the IP Address and Subnet Mask you want to use as the second IP address in the IP Address and Subnet Mask fields that appear below the check box.

Click the **Next** button to continue.

#### Device Setup

Configure the DSL Router IP Address and Subnet Mask for LAN interface.

IP Address:   
Subnet Mask:

☐ Disable DHCP Server

☒ Enable DHCP Server

Start IP Address:

End IP Address:

Subnet Mask:

Leased Time (hour):

☐ Configure the second IP Address and Subnet Mask for LAN interface

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Next

QUICK SETUP – PPPoE

This summary window allows you to confirm the settings you have just made.

Click the **Save/Reboot** button to save your new PPP over Ethernet settings and restart the Router.

WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

PORT / VPI / VCI:	0 / 0 / 35
Connection Type:	PPPoE
Service Name:	pppoe_0_0_35_1
Service Category:	UBR
IP Address:	Automatically Assigned
Service State:	Enabled
NAT:	Enabled
Firewall:	Enabled
IGMP Multicast:	Disabled
Quality Of Service:	Disabled
MTU:	1492

Click "Save/Reboot" to save these settings and reboot router. Click "Back" to make any modifications.  
NOTE: The configuration process takes about 1 minute to complete and your DSL Router will reboot.

[Back](#) [Save/Reboot](#)

QUICK SETUP – MER

Click the MAC Encapsulation Routing (MER) radio button on this window. This window also allows you to use the drop-down menu to select the desired Encapsulation Mode.

Click the **Next** button to continue.

QUICK SETUP – MER

This window allows you to configure the WAN IP settings. This information is obtained from your ISP.

Click the **Next** button to continue.

Connection Type

Select the type of network protocol for IP over Ethernet as WAN interface

- ☐ PPP over ATM (PPPoA)
- ☐ PPP over Ethernet (PPPoE)
- ☒ MAC Encapsulation Routing (MER)
- ☐ IP over ATM (IPoA)
- ☐ Bridging

Encapsulation Mode

LLC/SNAP-BRIDGING ▾

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WAN IP Settings

Enter information provided to you by your ISP to configure the WAN IP settings.  
Notice: DHCP can be enabled for PVC in MER mode or IP over Ethernet as WAN interface if "Obtain an IP address automatically" is chosen.Changing the default gateway or the DNS effects the whole system. Configuring them with static values will disable the automatic assignment from DHCP or other WAN connection.  
If you configure static default gateway over this PVC in MER mode, you must enter the IP address of the remote gateway in the "Use IP address". The "Use WAN interface" is optional.

- ☒ Obtain an IP address automatically
- ☐ Use the following IP address:  
WAN IP Address:   
WAN Subnet Mask:
- ☐ Advanced DMZ

- ☒ Obtain default gateway automatically
- ☐ Use the following default gateway:
  - ☐ Use IP Address:
  - ☐ Use WAN Interface: mer\_0\_0\_35/ ▾

- ☒ Obtain DNS server addresses automatically
- ☐ Use the following DNS server addresses:  
Primary DNS server:   
Secondary DNS server:

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QUICK SETUP – MER

This window allows you to enable or disable Network Address Translation (NAT) and the Firewall function on your Router. In addition, you can enable or disable IGMP Multicasting and the WAN Service.

You can also identify the connection by typing a name into the Service Name field.

Click the **Next** button to continue.

QUICK SETUP – MER

This window allows you to enter an IP address and Subnet Mask for the LAN interface. In addition, you can either Enable or Disable the DHCP Server.

To enable the DHCP Server, enter a Starting IP Address, an Ending IP Address, and a Subnet Mask. You may also choose to change the default value of the Leased Time.

Tick the “Configure the second IP Address and Subnet Mask for LAN interface” check box if you want to enable a second IP Address on the LAN connection. Type the IP Address and Subnet Mask you want to use as the second IP address in the IP Address and Subnet Mask fields that appear below the check box.

Click the **Next** button to continue.

Network Address Translation Settings

Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN).

Enable NAT ☐

Enable Firewall ☐

Enable IGMP Multicast, and WAN Service

Enable IGMP Multicast ☐

Enable WAN Service ☒

Service Name:

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Device Setup

Configure the DSL Router IP Address and Subnet Mask for LAN interface.

IP Address:

Subnet Mask:

☐ Disable DHCP Server

☒ Enable DHCP Server

Start IP Address:

End IP Address:

Subnet Mask:

Leased Time (hour):

☐ Configure the second IP Address and Subnet Mask for LAN interface

### QUICK SETUP – MER

This summary window allows you to confirm the settings you have just made.

Click the **Save/Reboot** button to save your new MAC Encapsulation Routing settings and restart the Router.

#### WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

PORT / VPI / VCI:	0 / 0 / 35
Connection Type:	MER
Service Name:	mer_0_0_35
Service Category:	UBR
IP Address:	Automatically Assigned
Service State:	Enabled
NAT:	Disabled
Firewall:	Disabled
IGMP Multicast:	Disabled
Quality Of Service:	Disabled
MTU:	1492

Click "Save/Reboot" to save these settings and reboot router. Click "Back" to make any modifications.  
NOTE: The configuration process takes about 1 minute to complete and your DSL Router will reboot.

[Back](#) [Save/Reboot](#)

QUICK SETUP – IPoA

Click the IP over ATM (IPoA) radio button on this window. This window also allows you to use the drop-down menu to select the desired Encapsulation Mode.

Click the **Next** button to continue.

QUICK SETUP – IPoA

This window allows you to configure the WAN IP settings. This information is obtained from your ISP.

Click the **Next** button to continue.

Connection Type

Select the type of network protocol for IP over Ethernet as WAN interface

- ☐ PPP over ATM (PPPoA)
- ☐ PPP over Ethernet (PPPoE)
- ☐ MAC Encapsulation Routing (MER)
- ☒ IP over ATM (IPoA)
- ☐ Bridging

Encapsulation Mode

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WAN IP Settings

Enter information provided to you by your ISP to configure the WAN IP settings.

Notice: DHCP is not supported in IPoA mode. Changing the default gateway or the DNS effects the whole system. Configuring them with static values will disable the automatic assignment from other WAN connection.

WAN IP Address:

WAN Subnet Mask:

- ☒ Obtain default gateway automatically
- ☐ Use the following default gateway:
  - ☐ Use IP Address:
  - ☐ Use WAN Interface: ipoa\_0\_0\_35/pe\_0\_0\_35 ▼

☐ Use the following DNS server addresses:

Primary DNS server:

Secondary DNS server:

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**QUICK SETUP – IPoA**

This window allows you to enable or disable Network Address Translation (NAT) and the Firewall function on your Router. In addition, you can enable or disable IGMP Multicasting and the WAN Service.

You can also identify the connection by typing a name into the Service Name field.

Click the **Next** button to continue.

**Network Address Translation Settings**  
Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN).  
Enable NAT ☐  
  
Enable Firewall ☐  
  
**Enable IGMP Multicast, and WAN Service**  
Enable IGMP Multicast ☐  
Enable WAN Service ☒  
Service Name:

### QUICK SETUP – IPoA

This window allows you to enter an IP Address and Subnet Mask for the LAN interface. In addition, you can either Enable or Disable the DHCP Server.

To enable the DHCP Server, enter a Starting IP Address, an Ending IP Address, and a Subnet Mask. You may also choose to change the default value of the Leased Time.

Tick the “Configure the second IP Address and Subnet Mask for LAN interface” check box if you want to enable a second IP Address on the LAN connection. Type the IP Address and Subnet Mask you want to use as the second IP address in the IP Address and Subnet Mask fields that appear below the check box.

Click the **Next** button to continue.

#### Device Setup

Configure the DSL Router IP Address and Subnet Mask for LAN interface.

IP Address:   
Subnet Mask:

- ☐ Disable DHCP Server  
☒ Enable DHCP Server

Start IP Address:   
End IP Address:   
Subnet Mask:   
Leased Time (hour):

☐ Configure the second IP Address and Subnet Mask for LAN interface

### QUICK SETUP – IPoA

This summary window allows you to confirm the settings you have just made.

Click the **Save/Reboot** button to save your new IP over ATM settings and restart the Router.

#### WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

PORT / VPI / VCI:	0 / 0 / 35
Connection Type:	IPoA
Service Name:	ipoa_0_0_35
Service Category:	UBR
IP Address:	194.112.11.2
Service State:	Enabled
NAT:	Enabled
Firewall:	Enabled
IGMP Multicast:	Disabled
Quality Of Service:	Disabled

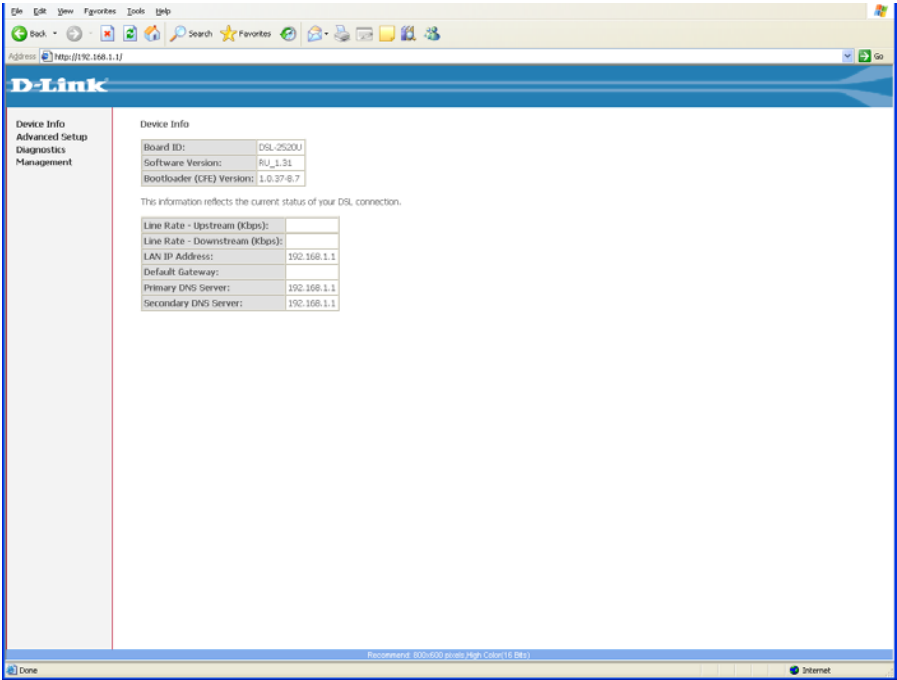
Click "Save/Reboot" to save these settings and reboot router. Click "Back" to make any modifications.

NOTE: The configuration process takes about 1 minute to complete and your DSL Router will reboot.

[Back](#)[Save/Reboot](#)

# Device Info

To access the **Device Info** window, click either the **Device Info** or the **Summary** button in the **Device Info** directory. The following page opens:



# Summary

This window displays the current status of your DSL connection, including the software version, LAN IP address, and DNS server address.

## Device Info

Board ID:	DSL-2520U
Software Version:	RU_1.31
Bootloader (CFE) Version:	1.0.37-8.7

This information reflects the current status of your DSL connection.

Line Rate - Upstream (Kbps):	
Line Rate - Downstream (Kbps):	
LAN IP Address:	192.168.1.1
Default Gateway:	
Primary DNS Server:	192.168.1.1
Secondary DNS Server:	192.168.1.1

# WAN

To access the **WAN Info** window, click the **WAN** button in the **Device Info** directory.

This menu displays the current status of your WAN connection.

WAN Info

Port/VPI/VCI	Con. ID	Category	Service	Interface	Protocol	Igmp	QoS	State	Status	IP Address
0/0/32	1	UBR	pppoe_0_0_32_0	ppp_0_0_32_1	PPPoE	Disabled	Disabled	Enabled	PPP Down	
0/0/35	1	UBR	br_0_0_35	nas_0_0_35	Bridge	N/A	Disabled	Enabled	Up	
0/3/33	1	UBR	br_0_3_33	nas_0_3_33	Bridge	N/A	Disabled	Enabled	Up	

# Statistics

To access the Router’s first **Statistics** window, click the **Statistics** button in the **Device Info** directory.

This window displays the Router’s LAN statistics. Click the **Reset Statistics** button to refresh these statistics.

Statistics -- LAN

Interface	Received				Transmitted			
	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Errs	Drops
Ethernet	52687	487	0	0	329720	467	0	0
USB	0	0	0	0	0	0	0	0

Reset Statistics

This window displays the Router’s WAN statistics. Click the **Reset Statistics** button to refresh these statistics.

Statistics -- WAN

Service	VPI/VCI	Protocol	Interface	Received				Transmitted			
				Bytes	Pkts	Errs	Drops	Bytes	Pkts	Errs	Drops
br_0_0_35	0/0/35	Bridge	nas_0_0_35	0	0	0	0	0	0	0	1278
br_0_8_35	0/8/35	Bridge	nas_0_8_35	0	0	0	0	0	0	0	1276

Reset Statistics

This window displays the Router’s ATM statistics. Click the **Reset** button to refresh these statistics.

ATM Interface Statistics											
In Octets	Out Octets	In Errors	In Unknown	In Hec Errors	In Invalid Vpi Vci Errors	In Port Not Enable Errors	In PTI Errors	In Idle Cells	In Circuit Type Errors	In OAM RM CRC Errors	In GFC Errors
0	0	0	0	0	0	0	0	0	0	0	0

AAL5 Interface Statistics							
In Octets	Out Octets	In Ucast Pkts	Out Ucast Pkts	In Errors	Out Errors	In Discards	Out Discards
0	0	0	0	0	0	0	0

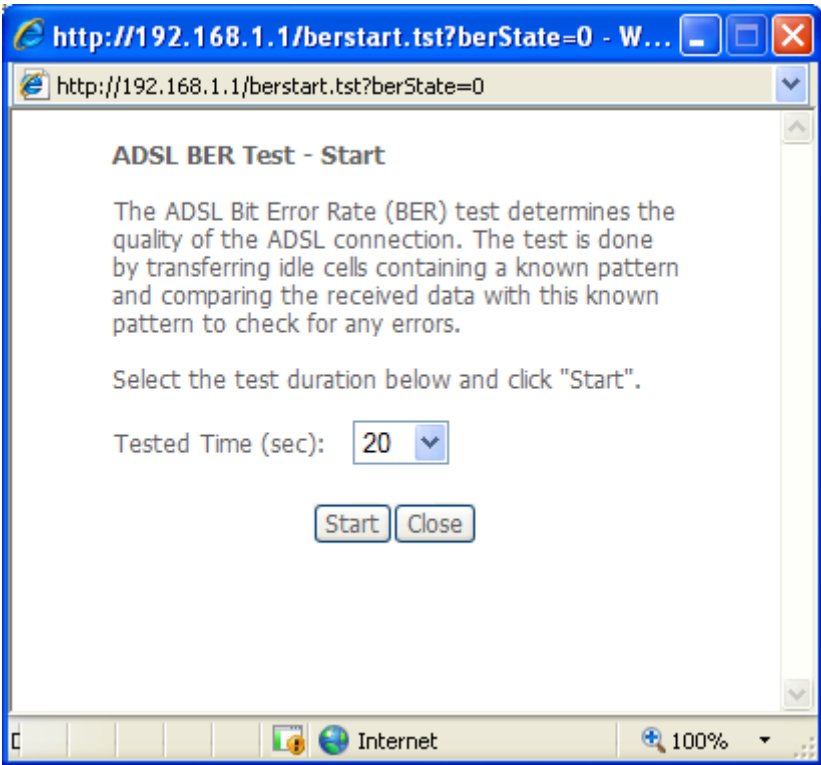
AAL5 VCC Statistics				
VPI/VCI	CRC Errors	SAR Timeouts	Oversized SDUs	Short Packet Errors

Reset

Section 3 – Configuration

This window displays the Router's ADSL statistics. Click the **Reset Statistics** button to refresh these statistics.

Click the **ADSL BER Test** button to test functional ADSL parameters of the physical ADSL connection.



Statistics -- ADSL		
Mode:	G.DMT	
Type:	Interleave	
Line Coding:	Trellis On	
Status:	No Defect	
Link Power State:	LO	
	Downstream	Upstream
SNR Margin (dB):	20.9	6.0
Attenuation (dB):	0.0	3.0
Output Power (dBm):	11.9	7.6
Attainable Rate (Kbps):	11104	1152
Rate (Kbps):	7616	960
K (number of bytes in DMT frame):	239	31
R (number of check bytes in RS code word):	16	12
S (RS code word size in DMT frame):	1	4
D (interleaver depth):	64	16
Delay (msec):	16	16
Super Frames:	1650	1591
Super Frame Errors:	0	0
RS Words:	112266	27047
RS Correctable Errors:	0	1
RS Uncorrectable Errors:	0	N/A
HEC Errors:	0	0
OCD Errors:	0	0
LCD Errors:	0	0
Total Cells:	504754	0
Data Cells:	0	0
Bit Errors:	0	0
Total ES:	0	0
Total SES:	0	0
Total UAS:	76	0
ADSL BER Test      Reset Statistics		



# Route

To access the **Device Info – Route** window, click the **Route** button in the **Device Info** directory.

This read-only window displays routing info.

## Device Info -- Route

Flags: U - up, ! - reject, G - gateway, H - host, R - reinstate  
D - dynamic (redirect), M - modified (redirect).

Destination	Gateway	Subnet Mask	Flag	Metric	Service	Interface
10.0.0.0	0.0.0.0	255.0.0.0	U	0		br0

# ARP

To access the **Device Info – ARP** window, click the **ARP** button in the **Device Info** directory.

This read-only window displays Address Resolution Protocol info.

## Device Info -- ARP

IP address	Flags	HW Address	Device
10.24.22.26	Complete	00:15:F2:09:9C:DE	br0

# DHCP

To access the **Device Info – DHCP Leases** window, click the **DHCP** button in the **Device Info** directory.

This read-only window displays DHCP lease info.

## Device Info -- DHCP Leases

Hostname	MAC Address	IP Address	Expires In
----------	-------------	------------	------------

# Advanced Setup

This chapter include the more advanced features used for network management and security as well as administrative tools to manage the Router, view status and other information used to examine performance and for troubleshooting.

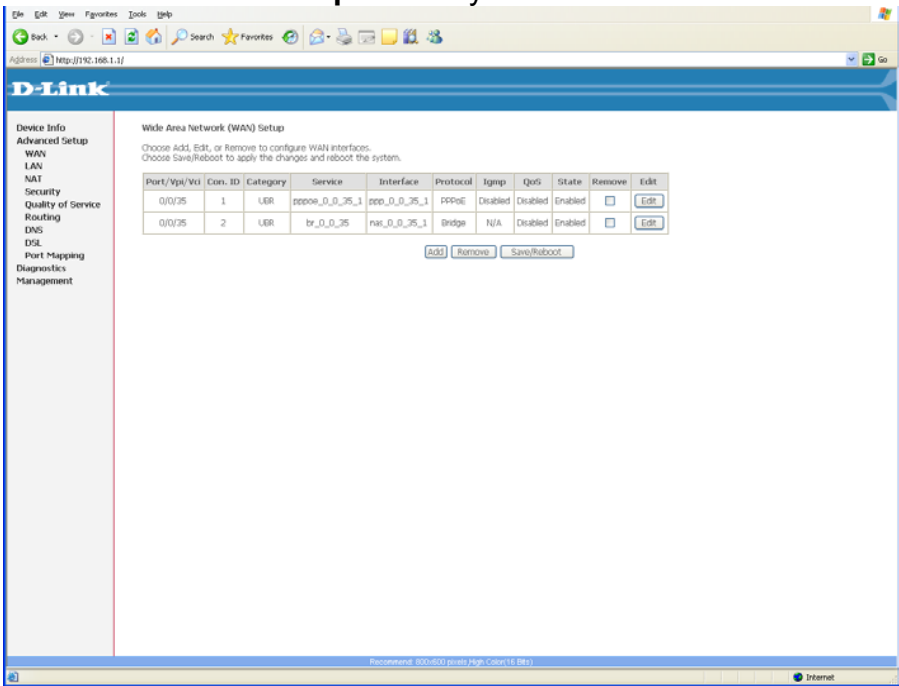
## WAN

To access the **Wide Area Network (WAN) Setup** window, click the **WAN** button in the **Advanced Setup** directory.

This window is used to configure the WAN interface. You can add, delete, and modify WAN interfaces on this window.

Once the desired changes to the WAN interface are complete, click the **Save/Reboot** button.

If you are setting up the WAN interface for the first time, click the **Add** button.



The **ATM PVC** Configuration window allows you to set up ATM PVC configuration. Enter a Port Identifier, Virtual Path Identifier, and Virtual Channel Identifier. The VPI and VCI values should be provided by your ISP. This window also allows you to enable QoS by ticking the Enable Quality of Service check box. Click the **Next** button to continue.

This window allows you to select the appropriate connection type. The choices include PPP over ATM (PPPoA), PPP over Ethernet (PPPoE), MAC Encapsulation Routing (MER), IP over ATM (IPoA), and Bridging (default).

This window also allows you to use the drop-down menu to select the desired Encapsulation Mode. Click the **Next** button to continue.

For further information about each of the five connection types available on the Router, please go to the Quick Setup section earlier in this manual as all of the windows are identical.

ATM PVC Configuration

This screen allows you to configure an ATM PVC Identifier (PORT and VPI and VCI) and select a service category. Otherwise choose an existing interface by selecting the checkbox to enable it.

PORT: [0-3]

0

VPI: [0-255]

0

VCI: [32-65535]

35

Service Category:

UBR Without PCR

Enable Quality Of Service

Enabling packet level QoS for a PVC improves performance for selected classes of applications. QoS cannot be set for CBR and Realtime VBR. QoS consumes system resources; therefore the number of PVCs will be reduced. Use **Advanced Setup/Quality of Service** to assign priorities for the applications.

Enable Quality Of Service

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Connection Type

Select the type of network protocol for IP over Ethernet as WAN interface

PPP over ATM (PPPoA)

PPP over Ethernet (PPPoE)

MAC Encapsulation Routing (MER)

IP over ATM (IPoA)

Bridging

Encapsulation Mode

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## LAN

You can configure the LAN IP address to suit your preference. Many users will find it convenient to use the default settings together with DHCP service to manage the IP settings for their private network. The IP address of the Router is the base address used for DHCP. In order to use the Router for DHCP on your LAN, the IP address pool used for DHCP must be compatible with the IP address of the Router. The IP addresses available in the DHCP IP address pool will change automatically if you change the IP address of the Router.

To access the **Local Area Network (LAN) Setup** window, click the **LAN** link in the **Advanced Setup** directory.

**IP Address** Type the IP Address you want to configure for the LAN Interface.

**Subnet Mask** Type the Subnet Mask you want to configure for the LAN Interface.

**Enable UPnP**  
*(This setting is only available when the WAN connection has been configured to operate in PPPoA, PPPoE, MER or IPoA mode)*

Tick the checkbox to enable UPnP. UPnP is a feature that supports zero-configuration networking and automatic discovery for many types of networked devices. When enabled, it allows other devices that support UPnP to dynamically join a network, obtain an IP address, convey its capabilities, and learn about the presence and capabilities of other devices.

**Local Area Network (LAN) Setup**

Configure the DSL Router IP Address and Subnet Mask for LAN interface. Save button only saves the LAN configuration data. Save/Reboot button saves the LAN configuration data and reboots the router to make the new configuration effective.

IP Address:

Subnet Mask:

☐ Enable IGMP Snooping

☒ Standard Mode

☐ Blocking Mode

☐ Disable DHCP Server

☒ Enable DHCP Server

Start IP Address:

End IP Address:

Subnet Mask:

Leased Time (hour):

Static IP Lease List: Please click on Save/Reboot button to make the new configuration effective. (A maximum 32 entries can be configured)

MAC Address	IP Address	Remove
<input type="button" value="Add Entries"/> <input type="button" value="Remove Entries"/>		

☐ Enable DHCP Server Relay

DHCP Server IP Address:

☐ Configure the second IP Address and Subnet Mask for LAN interface

**Enable IGMP Snooping**

Tick the check box to enable IGMP Snooping on the Router.

If the Router has been configured to work in Bridge Mode, click the Standard Mode radio button to specify that IGMP traffic from the WAN connection will be flooded to each LAN port, even if the user hasn't joined the IGMP group. Click the Blocking Mode radio button to specify that IGMP traffic will be blocked, unless a LAN user requests to join an IGMP group, e.g. to view an IPTV program, in which case the IGMP traffic will only flow to the user who joined the IGMP group.

If the Router has been configured to work in one of the Routing Modes, the Router will only ever forward traffic to the requesting client and not flood the other LAN ports.

**DHCP Server** Click the Enable DHCP Server radio button to enable the DHCP Server function on the Router.

- Type the first IP address that you want to include in the DHCP range in the Start IP Address field.
- Type the last IP address that you want to include in the DHCP range in the End IP Address field.
- Type the Subnet Mask that you want DHCP hosts to use in the Subnet Mask field.
- Type the amount of time that DHCP leases should last (in hours) in the Leased Time field.

**Static IP Lease List** This section allows you to view, create and delete Static IP Lease entries. (See the following page to find out how to use the Static IP Lease list).

**Enable DHCP Server Relay** Tick the check box to enable DHCP Server Relay. This setting is only available if the Router has been configured to work in Bridge Mode. To use this feature, enter the IP address of the remote DHCP server you want to use. This is useful if there isn't a DHCP server on your network or the DHCP server on your network is not working properly.

**Configure the second IP Address and Subnet Mask for LAN interface** Tick the check box if you want to enable a second IP Address on the LAN connection. Type the IP Address and Subnet Mask you want to use as the second IP address in the IP Address and Subnet Mask fields that appear below the checkbox.

When you have finished configuring the LAN settings, click either the **Save** or **Save/Reboot** button.

# DHCPD Static IP Lease

Use the Static IP Lease list section to view, add or delete Static IP Leases.

**Adding a New Lease**  
Click the **Add Entries** button.

Static IP Lease List: Please click on Save/Reboot button to make the new configuration effective. (A maximum 32 entries can be configured)

MAC Address	IP Address	Remove
<div>Add Entries Remove Entries</div>		

The following window appears:

- Type the MAC Address of the device that you want to create the Static IP Lease for in the MAC Address field. (The MAC address should be in the following format: xx:xx:xx:xx:xx:xx, where x equals the hexadecimal numbers of the MAC Address.)
- Type the IP Address you want to issue the device in the IP Address field.

## Dhcpd Static IP Lease

Enter the Mac address and desired IP address then click "Save/Apply" .

MAC Address:

IP Address:

Save/Apply

- Click the **Save/Apply** button when you have finished creating the Static IP Lease.

## Deleting a Lease

- Tick the check boxes of the Static Leases you want to delete.
- Click the **Remove Entries** button to delete the selected Static Leases from the list.

# NAT

To access the **Network Address Translation (NAT) Setup** window, click the **NAT** button in the **Advanced Setup** directory. The **NAT** button appears when configuring WAN interface in PPPoA, PPPoE, MER or IPoA.

## Virtual Servers

This window is used to configure virtual server. You can add, delete, and modify virtual server on this window.

If you are setting up the virtual server, click the **Add** button.

You can configure the service settings on this window by clicking the **Select a Service** radio button and then using the drop-down list to choose an existing service, or by clicking the **Custom Server** radio button and entering your own Application Rule in the field provided.

Click **Save/Apply** when you are finished with the virtual server configuration.

NAT -- Virtual Servers Setup

Virtual Server allows you to direct incoming traffic from WAN side (identified by Protocol and External port) to the Internal server with private IP address on the LAN side. The Internal port is required only if the external port needs to be converted to a different port number used by the server on the LAN side. A maximum 32 entries can be configured.

AddRemove

Server Name	External Port Start	External Port End	Protocol	Internal Port Start	Internal Port End	Server IP Address	Remove
-------------	---------------------	-------------------	----------	---------------------	-------------------	-------------------	--------

NAT -- Virtual Servers

Select the service name, and enter the server IP address and click "Save/Apply" to forward IP packets for this service to the specified server. NOTE: The "Internal Port End" cannot be changed. It is the same as "External Port End" normally and will be the same as the "Internal Port Start" or "External Port End" if either one is modified. Remaining number of entries that can be configured:32

Server Name:

Select a Service:Select One

Custom Server:

Server IP Address:192.168.1.

Save/Apply

External Port Start	External Port End	Protocol	Internal Port Start	Internal Port End
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		

Save/Apply

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# Port Triggering

Some applications require that the remote parties open specific ports in the Router’s firewall for access. Port Trigger dynamically opens the Open Ports in the firewall when an application on the LAN initiates a TCP/UDP connection to a remote party using Trigger Ports. The Router allows the remote party from the WAN side to establish new connections back to the application on the LAN side using the Open Ports.

Applications such as games, video conferencing, and other remote access applications require that specific ports in the Router’s firewall be opened for access by applications.

Click the **Add** button to configure port triggering.

You can configure the port settings on this window by clicking the Select an application radio button and then using the drop-down list to choose an existing application, or by clicking the Custom application radio button and entering your own Application Rule in the field provided.

Click **Save/Apply** when you are finished with the port setting configuration. The new Application Rule will appear in the Port Triggering table.

NAT -- Port Triggering Setup

Some applications require that specific ports in the Router’s firewall be opened for access by the remote parties. Port Trigger dynamically opens up the ‘Open Ports’ in the firewall when an application on the LAN initiates a TCP/UDP connection to a remote party using the ‘Triggering Ports’. The Router allows the remote party from the WAN side to establish new connections back to the application on the LAN side using the ‘Open Ports’. A maximum 32 entries can be configured.

AddRemove

Application		Trigger		Open		Remove
Name	Protocol	Port Range		Protocol	Port Range	
		Start	End		Start	End

NAT -- Port Triggering

Some applications such as games, video conferencing, remote access applications and others require that specific ports in the Router’s firewall be opened for access by the applications. You can configure the port settings from this screen by selecting an existing application or creating your own (Custom application) and click “Save/Apply” to add it.  
Remaining number of entries that can be configured:32

Application Name:  

Select an application:

Select One

Custom application:

Save/Apply

Trigger Port	Start	Trigger Port	End	Trigger Protocol	Open Port	Start	Open Port	End	Open Protocol
				TCP					TCP
				TCP					TCP
				TCP					TCP
				TCP					TCP
				TCP					TCP
				TCP					TCP
				TCP					TCP
				TCP					TCP
				TCP					TCP

Save/Apply

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# DMZ Host

Since some applications are not compatible with NAT, the Router supports use of a DMZ IP address for a single host on the LAN. This IP address is not protected by NAT and will therefore be visible to agents on the Internet with the right type of software. Keep in mind that any client PC in the DMZ will be exposed to various types of security risks. If you use the DMZ, take measures (such as client-based virus protection) to protect the remaining client PCs on your LAN from possible contamination through the DMZ.

To designate a DMZ IP address, type in the IP Address of the server or device on your LAN, and click the **Save/Apply** button.

## NAT -- DMZ Host

The DSL router will forward IP packets from the WAN that do not belong to any of the applications configured in the Virtual Servers table to the DMZ host computer.

Enter the computer's IP address and click "Apply" to activate the DMZ host.

Clear the IP address field and click "Apply" to deactivate the DMZ host.

DMZ Host IP Address:

Save/Apply

# ALG

Tick the check box to enable the Session Initiation Protocol (SIP) Application Level Gateway (ALG) function on the Router. This function can be enabled if you plan to use your Internet connection to make VoIP or video calls.

## ALG

Select the ALG below.

☐ SIP ALG Enabled

Save/Apply

# Security

To access the **Security** window, click the **Security** button in the **Advanced Setup** directory. The **Security** button appears after configuring the WAN interface.

## IP Filtering

The **IP Filtering** button appears when configuring WAN interface in PPPoA, PPPoE, MER or IPoA.

### IP Filtering - Outgoing

This window allows you to create a filter rule to allow or block outgoing IP traffic by specifying a filter name and at least one condition on this window. All of the specified conditions in this filter rule must be satisfied for the rule to take effect. Filters are used to allow or deny LAN or WAN users from accessing the Internet or your internal network.

If you are setting up the outgoing IP filtering, click the **Add** button.

Enter the information in the section. Explanations of parameters are described below. Click the **Save/Apply** button to add the entry in the Active Outbound IP Filtering table.

Outgoing IP Filtering Setup

By default, all outgoing IP traffic from LAN is allowed, but some IP traffic can be **BLOCK** by setting up filters.

Change Policy

Choose Add or Remove to configure outgoing IP filters.

Filter Name	Protocol	Source Address / Mask	Source Port	Dest. Address / Mask	Dest. Port	URL	DNS	Remove
-------------	----------	-----------------------	-------------	----------------------	------------	-----	-----	--------

Add

Remove

Add IP Filter -- Outgoing

The screen allows you to create a filter rule to identify outgoing IP traffic by specifying a new filter name and at least one condition below. All of the specified conditions in this filter rule must be satisfied for the rule to take effect. Click 'Save/Apply' to save and activate the filter.

When **POLICY** is **ACCEPT**, the **URL** and **DNS** filter are not supported.

Filter Name:

Protocol:

Any

Select IP Range by:

Source Port (port or port:port):

Select IP Range by:

Destination Port (port or port:port):

URL String:

DNS String:

Save/Apply

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Filters Parameter	Description	
Filter Name	Enter a name for the new filter.	
Protocol	Select the transport protocol ( <i>Any</i> , <i>TCP/UDP</i> , <i>TCP</i> , <i>UDP</i> or <i>ICMP</i> ) that will be used for the filter rule.	
Select IP Range by	Select either <i>IP address</i> or <i>Netmask</i> to show different items.	
	Source IP Address	Enter the start and end IP address for the range of IP addresses which you are creating the filter rule.
	Source IP Address & Source Subnet Mask	This is the IP address and their associated subnets for which you are creating the filter rule.
Source Port	The Source Port is the TCP/UDP port on either the LAN or WAN depending on if you are configuring an Outbound or Inbound Filter rule.	
Destination Port	The Destination Port is the TCP/UDP port on either the LAN or WAN depending on if you are configuring an Outbound or Inbound Filter rule.	
URL String	Enter the URL string you are filtering. When the Policy is Accept, the URL string is not supported.	
DNS String	Enter the DNS string you are filtering. When the Policy is Accept, the DNS string is not supported.	

### IP Filtering – Incoming

The Inbound Filter allows you to create a filter rule to allow incoming IP traffic by specifying a filter name and at least one condition on this window. All of the specified conditions in this filter rule must be satisfied for the rule to take effect. By default, all incoming IP traffic from the Internet is allowed when the firewall is enabled.

If you are setting up the incoming IP filtering, click the **Add** button.

#### Incoming IP Filtering Setup

By default, all incoming IP traffic from WAN is denied, but some IP traffic can be **ACCEPT** by setting up filters.

[Change Policy](#)

Choose Add or Remove to configure incoming IP filters.

Filter Name	VPI/VCI	Protocol	Source Address / Mask	Source Port	Dest. Address / Mask	Dest. Port	Remove
<div> <a href="#">Add</a> <a href="#">Remove</a> </div>							

Enter the information in the section. Explanations of parameters are described below. Click the **Save/Apply** button to add the entry in the Active Inbound IP Filtering table.

Add IP Filter -- Incoming

The screen allows you to create a filter rule to identify incoming IP traffic by specifying a new filter name and at least one condition below. All of the specified conditions in this filter rule must be satisfied for the rule to take effect. Click 'Save/Apply' to save and activate the filter.

Filter Name:

Protocol:

Any

Select IP Range by:

Source Port (port or port:port):

Select IP Range by:

Destination Port (port or port:port):

WAN Interfaces (Configured in Routing mode and with firewall enabled only)

Select at least one or multiple WAN interfaces displayed below to apply this rule.

☒ Select All

☒ pppoe\_0\_0\_35\_1/ppp\_0\_0\_35\_1

Save/Apply

Filters Parameter	Description	
Filter Name	Enter a name for the new filter.	
Protocol	Select the transport protocol ( <i>Any, TCP/UDP, TCP, UDP or ICMP</i> ) that will be used for the filter rule.	
Select IP Range by	Select either <i>IP address</i> or <i>Netmask</i> to show different items.	
	Source IP Address	Enter the start and end IP address for the range of IP addresses which you are creating the filter rule.
	Source IP Address & Source Subnet Mask	This is the IP address and their associated subnets for which you are creating the filter rule.
Source Port	The Source Port is the TCP/UDP port on either the LAN or WAN depending on if you are configuring an Outbound or Inbound Filter rule.	
Destination Port	The Destination Port is the TCP/UDP port on either the LAN or WAN depending on if you are configuring an Outbound or Inbound Filter rule.	
Select all	Tick this check box (or multiple WAN interfaces if also displayed) to apply this rule. At least one WAN interface must be selected.	

# MAC Filtering

The **MAC Filtering** button appears when configuring WAN interface in Bridging.

MAC filtering is used to block or allow various types of packets through the WAN/LAN interface. This may be done for security or to improve network efficiency. The rules are configured for individual devices based on MAC address. Filter rules can be set up for source, destination or both. You can set up filter rules and disable the entire set of rules without losing the rules that have been configured.

Click **Change Policy** to configure the global policy as **Forwarded** or **Blocked**.

If you are setting up the MAC filtering, click the **Add** button.

Select a protocol (*All, PPPoE, IPv4, IPv6, Apple Talk, IPX, NetBEUI or IGMP*) in the Protocol Type list, type in a Destination MAC, a Source MAC or both in the entry fields. Select a direction (LAN=>WAN, WAN=>LAN, or LAN<=>WAN) in the Frame Direction list. Tick the Select All check box (or multiple WAN interfaces if also displayed) to apply this rule. At least one WAN interface must be selected Click the **Save/Apply** button to add the entry in the Active Bridge Filters table.

MAC Filtering Setup

MAC Filtering Global Policy: **FORWARDED**

Change Policy

MAC Filtering is only effective on ATM PVCs configured in Bridge mode. **FORWARDED** means that all MAC layer frames will be **FORWARDED** except those matching with any of the specified rules in the following table. **BLOCKED** means that all MAC layer frames will be **BLOCKED** except those matching with any of the specified rules in the following table.

Choose Add or Remove to configure MAC filtering rules.

VPI/VCI	Protocol	Destination MAC	Source MAC	Frame Direction	Remove
					Add Remove

Add MAC Filter

Create a filter to identify the MAC layer frames by specifying at least one condition below. If multiple conditions are specified, all of them take effect. Click "Apply" to save and activate the filter.

Protocol Type: All

Destination MAC Address:

Source MAC Address:

Frame Direction: LAN<=>WAN

WAN Interfaces (Configured in Bridge mode only)

☒ Select All

☒ br\_0\_0\_35/nas\_0\_0\_35\_1

Save/Apply

# Quality of Service

QoS or Quality of Service allows your Router to help prioritize the data packet flow in your Router and network. This is very important for time sensitive applications such as VoIP where it may help prevent dropped calls. Large amounts of non-critical data can be scaled so as not to affect these prioritized sensitive real-time programs.

To access the **QoS – Queue Management Configuration** window, click the **Quality of Service** button in the **Advanced Setup** directory. This window allows you to set up QoS on the Router. When you are finished, click on the **Save/Apply** button.

QoS -- Queue Management Configuration

If Enable QoS checkbox is selected, choose a default DSCP mark to automatically mark incoming traffic without reference to a particular classifier. Click 'Save/Apply' button to save it.

Note: If Enable QoS checkbox is not selected, all QoS will be disabled for all interfaces.

Note: The default DSCP mark is used to mark all egress packets that do not match any classification rules.

☒ Enable QoS

Select Default DSCP Mark No Change(-1)

Save/Apply

## Queue Config

Choose **Add** or **Remove** to configure the QoS Queue.

QoS Queue Configuration -- A maximum 16 entries can be configured.

Interfacename	Description	Precedence	Queue Key	Enable	Remove
---------------	-------------	------------	-----------	--------	--------

Add Remove Save/Reboot

### Adding a QoS Queue

Click the **Add** button to add a QoS Queue Configuration table entry.

This window allows you to configure a QoS queue entry and assign it a specific network interface.

Click the **Save/Apply** button to save and activate the filter.

QoS Queue Configuration

The screen allows you to configure a QoS queue entry and assign it to a specific network interface. Each interface with QoS enabled will be allocated three queues by default. Each of the queues can be configured for a specific precedence. The queue entry configured here will be used by the classifier to place ingress packets appropriately. **Note: Lower integer values for precedence imply higher priority for this queue relative to others** Click 'Save/Apply' to save and activate the filter.

Queue Configuration Status:

Queue:

Queue Precedence:

Save/Apply

### Deleting a QoS Queue

Tick the Remove checkbox next to the QoS queue entry you want to delete and click the **Remove** button.

# QoS Classification

Choose **Add** or **Remove** to configure network traffic classes.

Use this window to create a traffic class rule to classify the upstream traffic, assign a queue that defines the precedence and the interface, and optionally overwrite the IP header DSCP byte. A rule consists of a class name and at least one condition. Please remember that all of the specified conditions on this window must be met for the rule to take effect.

Click the **Save/Apply** button to save and activate this rule.

Quality of Service Setup

Choose Add or Remove to configure network traffic classes.

MARK			TRAFFIC CLASSIFICATION RULES														
Class Name	DSCP Mark	Queue ID	802.1P Mark	Lan Port	Protocol	DSCP	Source Addr./Mask	Source Port	Dest. Addr./Mask	Dest. Port	Source MAC Addr./Mask	Destination MAC Addr./Mask	802.1P	Order	Enable/Disable	Remove	Edit

Add

Save/Apply

Add Network Traffic Class Rule

The screen creates a traffic class rule to classify the upstream traffic, assign queue which defines the precedence and the interface and optionally overwrite the IP header DSCP byte. A rule consists of a class name and at least one condition below. All of the specified conditions in this classification rule must be satisfied for the rule to take effect. Click 'Save/Apply' to save and activate the rule.

Traffic Class Name:

Rule Order:

Rule Status:

Assign ATM Priority and/or DSCP Mark for the class

If non-blank value is selected for 'Assign Differentiated Services Code Point (DSCP) Mark', the corresponding DSCP byte in the IP header of the upstream packet is overwritten by the selected value.

Assign Classification Queue:

Assign Differentiated Services Code Point (DSCP) Mark:

Mark 802.1p if 802.1q is enabled:

Specify Traffic Classification Rules

Enter the following conditions either for IP level, SET-1, or for IEEE 802.1p, SET-2.

SET-1

Protocol:

Differentiated Services Code Point (DSCP) Check:

IP Address

Source Subnet Mask:

UDP/TCP Source Port (port or port:port):

Destination IP Address:

Destination Subnet Mask:

UDP/TCP Destination Port (port or port:port):

Source MAC Address:

Source MAC Mask:

Destination MAC Address:

Destination MAC Mask:

(The MAC address format is xx:xx:xx:xx:xx:xx)

(The MAC address format is xx:xx:xx:xx:xx:xx)

SET-2

802.1p Priority:

Save/Apply



# Routing

To access the **Routing** windows, click the **Routing** button in the **Advanced Setup** directory.

If the Enable Automatic Assigned Default Gateway checkbox is ticked, the Router will accept the first default gateway assignment received from one of the enabled PPPoA, PPPoE, or MER/DHCP enabled PVC(s).

If this checkbox is not ticked, enter the static default gateway and/or a WAN interface. Click the **Save/Apply** button when you are finished.

Click the **Add** button on the **Routing – Static Route** window to access the following window displayed on the next page.

Enter the static routing information for an entry to the routing table.

Click the **Save/Apply** button when you are finished.

To activate RIP for the router, click the Enabled button for Global RIP Mode. To configure an individual interface, select the desired RIP version (1, 2 or *Both*) and Operation (*Active* or *Passive*). Next, tick the corresponding Enabled check box. Click the **Save/Apply** button to save the configuration. This will start or stop RIP based on the chosen Global RIP mode.

Routing -- Default Gateway

If Enable Automatic Assigned Default Gateway checkbox is selected, this router will accept the first received default gateway assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s). If the checkbox is not selected, enter the static default gateway AND/OR a WAN interface. Click 'Save/Apply' button to save it.

NOTE: If changing the Automatic Assigned Default Gateway from unselected to selected, You must reboot the router to get the automatic assigned default gateway.

☒ Enable Automatic Assigned Default Gateway

Save/Apply

Routing -- Static Route (A maximum 32 entries can be configured)

Destination	Subnet Mask	Gateway	Interface	Remove
-------------	-------------	---------	-----------	--------

Add Remove

Routing -- Static Route Add

Enter the destination network address, subnet mask, gateway AND/OR available WAN interface then click "Save/Apply" to add the entry to the routing table.

Destination Network Address:

Subnet Mask:

☐ Use Gateway IP Address

☒ Use Interface

Save/Apply

Routing -- RIP Configuration

To activate RIP for the device, select the 'Enabled' radio button for Global RIP Mode. To configure an individual interface, select the desired RIP version and operation, followed by placing a check in the 'Enabled' checkbox for the interface. Click the 'Save/Apply' button to save the configuration, and to start or stop RIP based on the Global RIP mode selected.

Global RIP Mode ☒ Disabled ☐ Enabled

Interface	VPI/VCI	Version	Operation	Enabled
br0	(LAN)	2	Active	<input type="checkbox"/>
ppp_0_0_35_1	0/0/35	2	Passive	<input type="checkbox"/>

Save/Apply

# DNS

To access the **DNS** windows, click the **DNS** button in the **Advanced Setup** directory. The **DNS** link only appears when the WAN interface has been configured to operate in PPPoA, PPPoE, MER or IPoA mode.

## DNS Server

If you have not been given specific DNS server IP addresses or if the Router is not pre-configured with DNS server information, tick the Enable Automatic Assigned DNS check box. Auto discovery DNS instructs the Router to automatically obtain the DNS IP address from the ISP through DHCP. If your WAN connection uses a Static IP address, auto discovery for DNS cannot be used.

If you have DNS IP addresses provided by your ISP, deselect the Enable Automatic Assigned DNS check box and enter these IP addresses in the available entry fields for the Primary DNS Server and the Secondary DNS Server. Click the **Save** button when you are finished.

DNS Server Configuration

If 'Enable Automatic Assigned DNS' checkbox is selected, this router will accept the first received DNS assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s) during the connection establishment. If the checkbox is not selected, enter the primary and optional secondary DNS server IP addresses. Click 'Save' button to save the new configuration. You must reboot the router to make the new configuration effective.

☒ Enable Automatic Assigned DNS

Save

## Dynamic DNS

The Router supports Dynamic DNS (Dynamic Domain Name Service). The Dynamic DNS service allows a dynamic public IP address to be associated with a static host name in any of the many domains, allowing access to a specified host from various locations on the Internet. This is enabled to allow remote access to a host by clicking a hyperlinked URL in the form [hostname.dyndns.org](http://hostname.dyndns.org), Many ISPs assign public IP addresses using DHCP, this can make it difficult to locate a specific host on the LAN using standard DNS. If for example you are running a public Web server or VPN server on your LAN, this ensures that the host can be located from the Internet if the public IP address changes. DDNS requires that an account be setup with one of the supported DDNS providers.

Click **Add** to see the Add DDNS Settings section.

Dynamic DNS

The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname in any of the many domains, allowing your DSL router to be more easily accessed from various locations on the Internet.

Choose Add or Remove to configure Dynamic DNS.

Hostname	Username	Service	Interface	Remove
<div>Add Remove</div>				

Enter the required DDNS information. Click the **Save/Apply** button to save the information.



**Note**

*DDNS requires that an account be setup with one of the supported DDNS servers prior to engaging it on the Router. This function will not work without an accepted account with a DDNS server.*

Dynamic DNS

The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname in any of the many domains, allowing your DSL router to be more easily accessed from various locations on the Internet.

Choose Add or Remove to configure Dynamic DNS.

Hostname	Username	Service	Interface	Remove
<div>Add Remove</div>				

# DSL

To access the **DSL Settings** window, click the **DSL Setup** button in the **Advanced Setup** directory.

This window allows you to select the desired modulation, phone line pair, and capability. Click the **Save/Apply** button when you are finished.

Click the **Advanced Settings** button to select a DSL test mode.

**DSL Settings**

Select the modulation below.

- ☒ G.Dmt Enabled
- ☒ G.lite Enabled
- ☒ T1.413 Enabled
- ☒ ADSL2 Enabled
- ☒ AnnexL Enabled
- ☒ ADSL2+ Enabled
- ☐ AnnexM Enabled

Select the phone line pair below.

- ☒ Inner pair
- ☐ Outer pair

Capability

- ☒ Bitswap Enable
- ☐ SRA Enable

Save/Apply

Advanced Settings

Select the desired DSL test mode and then click the **Apply** button.

Click the **Tone Selection** button to modify the upstream and downstream tones.

Select the appropriate upstream and downstream tones for your ADSL connection. Click the **Apply** button to let your settings take effect.

DSL Advanced Settings

Select the test mode below.

- ☒ Normal
- ☐ Reverb
- ☐ Medley
- ☐ No retrain
- ☐ L3

Apply

Tone Selection

ADSL Tone Settings

Upstream Tones																															
<input checked="" type="checkbox"/> 0	<input checked="" type="checkbox"/> 1	<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 3	<input checked="" type="checkbox"/> 4	<input checked="" type="checkbox"/> 5	<input checked="" type="checkbox"/> 6	<input checked="" type="checkbox"/> 7	<input checked="" type="checkbox"/> 8	<input checked="" type="checkbox"/> 9	<input checked="" type="checkbox"/> 10	<input checked="" type="checkbox"/> 11	<input checked="" type="checkbox"/> 12	<input checked="" type="checkbox"/> 13	<input checked="" type="checkbox"/> 14	<input checked="" type="checkbox"/> 15	<input checked="" type="checkbox"/> 16	<input checked="" type="checkbox"/> 17	<input checked="" type="checkbox"/> 18	<input checked="" type="checkbox"/> 19	<input checked="" type="checkbox"/> 20	<input checked="" type="checkbox"/> 21	<input checked="" type="checkbox"/> 22	<input checked="" type="checkbox"/> 23	<input checked="" type="checkbox"/> 24	<input checked="" type="checkbox"/> 25	<input checked="" type="checkbox"/> 26	<input checked="" type="checkbox"/> 27	<input checked="" type="checkbox"/> 28	<input checked="" type="checkbox"/> 29	<input checked="" type="checkbox"/> 30	<input checked="" type="checkbox"/> 31

Downstream Tones																															
<input checked="" type="checkbox"/> 32	<input checked="" type="checkbox"/> 33	<input checked="" type="checkbox"/> 34	<input checked="" type="checkbox"/> 35	<input checked="" type="checkbox"/> 36	<input checked="" type="checkbox"/> 37	<input checked="" type="checkbox"/> 38	<input checked="" type="checkbox"/> 39	<input checked="" type="checkbox"/> 40	<input checked="" type="checkbox"/> 41	<input checked="" type="checkbox"/> 42	<input checked="" type="checkbox"/> 43	<input checked="" type="checkbox"/> 44	<input checked="" type="checkbox"/> 45	<input checked="" type="checkbox"/> 46	<input checked="" type="checkbox"/> 47	<input checked="" type="checkbox"/> 48	<input checked="" type="checkbox"/> 49	<input checked="" type="checkbox"/> 50	<input checked="" type="checkbox"/> 51	<input checked="" type="checkbox"/> 52	<input checked="" type="checkbox"/> 53	<input checked="" type="checkbox"/> 54	<input checked="" type="checkbox"/> 55	<input checked="" type="checkbox"/> 56	<input checked="" type="checkbox"/> 57	<input checked="" type="checkbox"/> 58	<input checked="" type="checkbox"/> 59	<input checked="" type="checkbox"/> 60	<input checked="" type="checkbox"/> 61	<input checked="" type="checkbox"/> 62	<input checked="" type="checkbox"/> 63
<input checked="" type="checkbox"/> 64	<input checked="" type="checkbox"/> 65	<input checked="" type="checkbox"/> 66	<input checked="" type="checkbox"/> 67	<input checked="" type="checkbox"/> 68	<input checked="" type="checkbox"/> 69	<input checked="" type="checkbox"/> 70	<input checked="" type="checkbox"/> 71	<input checked="" type="checkbox"/> 72	<input checked="" type="checkbox"/> 73	<input checked="" type="checkbox"/> 74	<input checked="" type="checkbox"/> 75	<input checked="" type="checkbox"/> 76	<input checked="" type="checkbox"/> 77	<input checked="" type="checkbox"/> 78	<input checked="" type="checkbox"/> 79	<input checked="" type="checkbox"/> 80	<input checked="" type="checkbox"/> 81	<input checked="" type="checkbox"/> 82	<input checked="" type="checkbox"/> 83	<input checked="" type="checkbox"/> 84	<input checked="" type="checkbox"/> 85	<input checked="" type="checkbox"/> 86	<input checked="" type="checkbox"/> 87	<input checked="" type="checkbox"/> 88	<input checked="" type="checkbox"/> 89	<input checked="" type="checkbox"/> 90	<input checked="" type="checkbox"/> 91	<input checked="" type="checkbox"/> 92	<input checked="" type="checkbox"/> 93	<input checked="" type="checkbox"/> 94	<input checked="" type="checkbox"/> 95
<input checked="" type="checkbox"/> 96	<input checked="" type="checkbox"/> 97	<input checked="" type="checkbox"/> 98	<input checked="" type="checkbox"/> 99	<input checked="" type="checkbox"/> 100	<input checked="" type="checkbox"/> 101	<input checked="" type="checkbox"/> 102	<input checked="" type="checkbox"/> 103	<input checked="" type="checkbox"/> 104	<input checked="" type="checkbox"/> 105	<input checked="" type="checkbox"/> 106	<input checked="" type="checkbox"/> 107	<input checked="" type="checkbox"/> 108	<input checked="" type="checkbox"/> 109	<input checked="" type="checkbox"/> 110	<input checked="" type="checkbox"/> 111	<input checked="" type="checkbox"/> 112	<input checked="" type="checkbox"/> 113	<input checked="" type="checkbox"/> 114	<input checked="" type="checkbox"/> 115	<input checked="" type="checkbox"/> 116	<input checked="" type="checkbox"/> 117	<input checked="" type="checkbox"/> 118	<input checked="" type="checkbox"/> 119	<input checked="" type="checkbox"/> 120	<input checked="" type="checkbox"/> 121	<input checked="" type="checkbox"/> 122	<input checked="" type="checkbox"/> 123	<input checked="" type="checkbox"/> 124	<input checked="" type="checkbox"/> 125	<input checked="" type="checkbox"/> 126	<input checked="" type="checkbox"/> 127
<input checked="" type="checkbox"/> 128	<input checked="" type="checkbox"/> 129	<input checked="" type="checkbox"/> 130	<input checked="" type="checkbox"/> 131	<input checked="" type="checkbox"/> 132	<input checked="" type="checkbox"/> 133	<input checked="" type="checkbox"/> 134	<input checked="" type="checkbox"/> 135	<input checked="" type="checkbox"/> 136	<input checked="" type="checkbox"/> 137	<input checked="" type="checkbox"/> 138	<input checked="" type="checkbox"/> 139	<input checked="" type="checkbox"/> 140	<input checked="" type="checkbox"/> 141	<input checked="" type="checkbox"/> 142	<input checked="" type="checkbox"/> 143	<input checked="" type="checkbox"/> 144	<input checked="" type="checkbox"/> 145	<input checked="" type="checkbox"/> 146	<input checked="" type="checkbox"/> 147	<input checked="" type="checkbox"/> 148	<input checked="" type="checkbox"/> 149	<input checked="" type="checkbox"/> 150	<input checked="" type="checkbox"/> 151	<input checked="" type="checkbox"/> 152	<input checked="" type="checkbox"/> 153	<input checked="" type="checkbox"/> 154	<input checked="" type="checkbox"/> 155	<input checked="" type="checkbox"/> 156	<input checked="" type="checkbox"/> 157	<input checked="" type="checkbox"/> 158	<input checked="" type="checkbox"/> 159
<input checked="" type="checkbox"/> 160	<input checked="" type="checkbox"/> 161	<input checked="" type="checkbox"/> 162	<input checked="" type="checkbox"/> 163	<input checked="" type="checkbox"/> 164	<input checked="" type="checkbox"/> 165	<input checked="" type="checkbox"/> 166	<input checked="" type="checkbox"/> 167	<input checked="" type="checkbox"/> 168	<input checked="" type="checkbox"/> 169	<input checked="" type="checkbox"/> 170	<input checked="" type="checkbox"/> 171	<input checked="" type="checkbox"/> 172	<input checked="" type="checkbox"/> 173	<input checked="" type="checkbox"/> 174	<input checked="" type="checkbox"/> 175	<input checked="" type="checkbox"/> 176	<input checked="" type="checkbox"/> 177	<input checked="" type="checkbox"/> 178	<input checked="" type="checkbox"/> 179	<input checked="" type="checkbox"/> 180	<input checked="" type="checkbox"/> 181	<input checked="" type="checkbox"/> 182	<input checked="" type="checkbox"/> 183	<input checked="" type="checkbox"/> 184	<input checked="" type="checkbox"/> 185	<input checked="" type="checkbox"/> 186	<input checked="" type="checkbox"/> 187	<input checked="" type="checkbox"/> 188	<input checked="" type="checkbox"/> 189	<input checked="" type="checkbox"/> 190	<input checked="" type="checkbox"/> 191
<input checked="" type="checkbox"/> 192	<input checked="" type="checkbox"/> 193	<input checked="" type="checkbox"/> 194	<input checked="" type="checkbox"/> 195	<input checked="" type="checkbox"/> 196	<input checked="" type="checkbox"/> 197	<input checked="" type="checkbox"/> 198	<input checked="" type="checkbox"/> 199	<input checked="" type="checkbox"/> 200	<input checked="" type="checkbox"/> 201	<input checked="" type="checkbox"/> 202	<input checked="" type="checkbox"/> 203	<input checked="" type="checkbox"/> 204	<input checked="" type="checkbox"/> 205	<input checked="" type="checkbox"/> 206	<input checked="" type="checkbox"/> 207	<input checked="" type="checkbox"/> 208	<input checked="" type="checkbox"/> 209	<input checked="" type="checkbox"/> 210	<input checked="" type="checkbox"/> 211	<input checked="" type="checkbox"/> 212	<input checked="" type="checkbox"/> 213	<input checked="" type="checkbox"/> 214	<input checked="" type="checkbox"/> 215	<input checked="" type="checkbox"/> 216	<input checked="" type="checkbox"/> 217	<input checked="" type="checkbox"/> 218	<input checked="" type="checkbox"/> 219	<input checked="" type="checkbox"/> 220	<input checked="" type="checkbox"/> 221	<input checked="" type="checkbox"/> 222	<input checked="" type="checkbox"/> 223
<input checked="" type="checkbox"/> 224	<input checked="" type="checkbox"/> 225	<input checked="" type="checkbox"/> 226	<input checked="" type="checkbox"/> 227	<input checked="" type="checkbox"/> 228	<input checked="" type="checkbox"/> 229	<input checked="" type="checkbox"/> 230	<input checked="" type="checkbox"/> 231	<input checked="" type="checkbox"/> 232	<input checked="" type="checkbox"/> 233	<input checked="" type="checkbox"/> 234	<input checked="" type="checkbox"/> 235	<input checked="" type="checkbox"/> 236	<input checked="" type="checkbox"/> 237	<input checked="" type="checkbox"/> 238	<input checked="" type="checkbox"/> 239	<input checked="" type="checkbox"/> 240	<input checked="" type="checkbox"/> 241	<input checked="" type="checkbox"/> 242	<input checked="" type="checkbox"/> 243	<input checked="" type="checkbox"/> 244	<input checked="" type="checkbox"/> 245	<input checked="" type="checkbox"/> 246	<input checked="" type="checkbox"/> 247	<input checked="" type="checkbox"/> 248	<input checked="" type="checkbox"/> 249	<input checked="" type="checkbox"/> 250	<input checked="" type="checkbox"/> 251	<input checked="" type="checkbox"/> 252	<input checked="" type="checkbox"/> 253	<input checked="" type="checkbox"/> 254	<input checked="" type="checkbox"/> 255

Check All Clear All Apply Close

# Port Mapping

To access the **Port Mapping** window, click the **Port Mapping** button in the **Advanced Setup** directory.

To set up port mapping, tick the Enable check box, enter the appropriate information in the fields offered, and then click the **Save/Apply** button when you are finished.

**PPTP Setting**

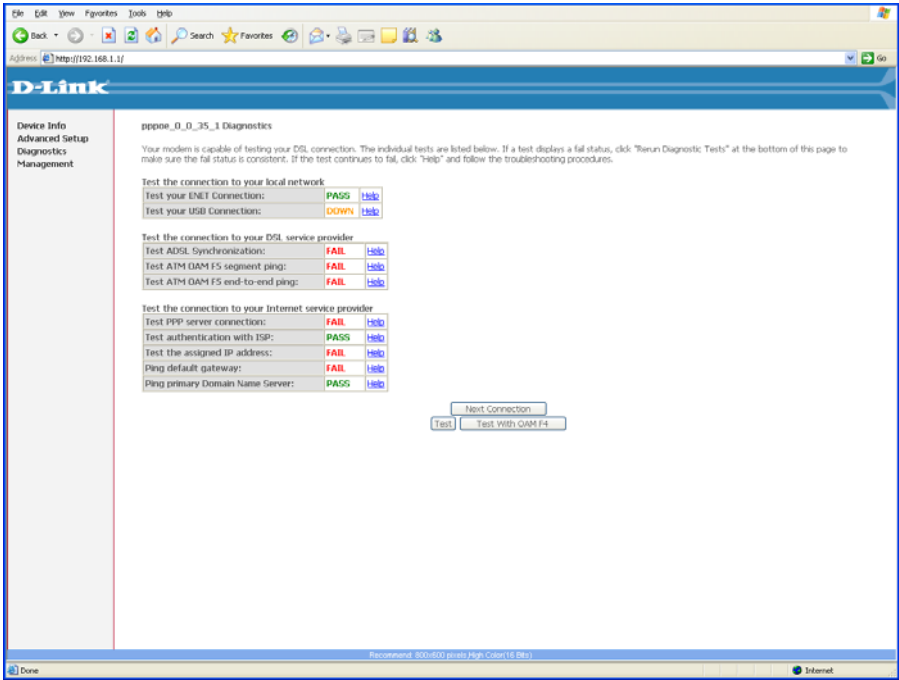
Set Point to Point Tunnel Protocol (VPN)

Enable	<input type="checkbox"/>
Tunnel Name	<input type="text"/>
PPTP Server IP Address	<input type="text"/>
User Name	<input type="text"/>
Password	<input type="password"/>
Peer IP Address	<input type="text"/>
Peer Subnet Mask	<input type="text"/>

Save/Apply

# Diagnostics

To access the **Diagnostics** window, click the **Diagnostics** button in the **Diagnostics** directory.  
This window is used to test connectivity of the Router.



# Management

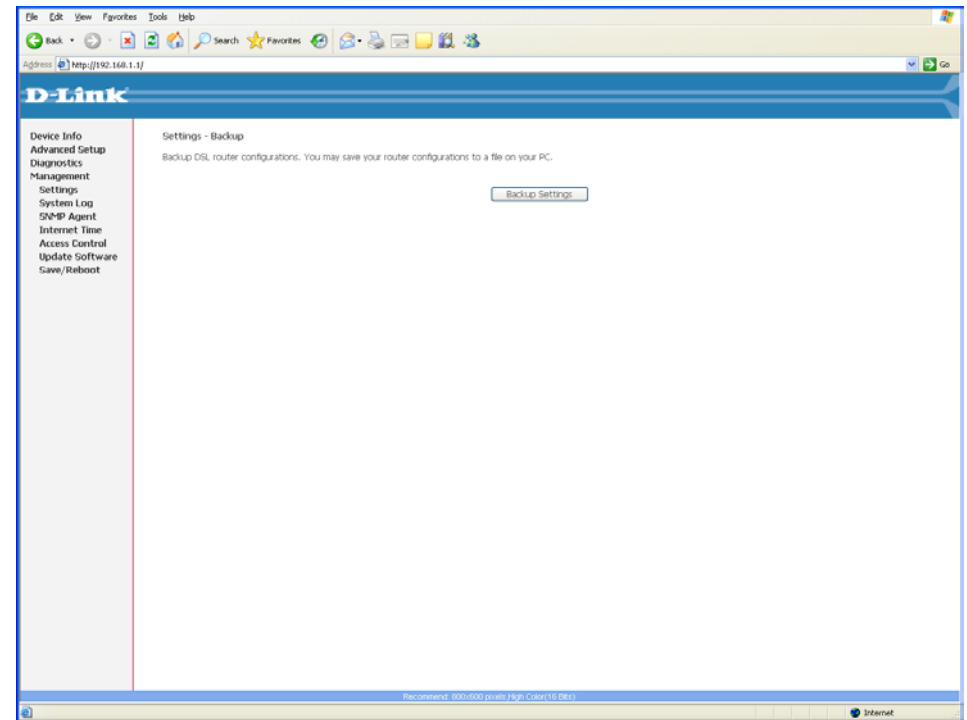
The Management directory features an array of options designed to help you get the most out of your Router.

## Settings

To access the **Settings - Backup** window, click the **Settings** button in the **Management** directory.

This window allows you to backup your DSL Router configurations.

Click the **Backup Settings** button to save your Router configurations to a file on your computer.





## Section 3 – Configuration

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To access the **Settings - Update** window, click the **Settings > Update** link in the **Management** directory.

This window can be used to restore or update the Router using a previously created configuration file.

Click the **Browse...** button to locate the file you want to use for the restoration/update.

When you have located the file, click the **Update Settings** button to start the restoration/update.

To access the **Settings – Restore Default** window, click the **Settings > Restore Default** link in the **Management** directory.

This window allows you to restore the Router back to Factory Default settings.

Click the **Restore Default Settings** button to restore the Router to Factory Default Settings.

### Tools -- Update Settings

Update DSL router settings. You may update your router settings using your saved files.

Settings File Name:

### Tools -- Restore Default Settings

Restore DSL router settings to the factory defaults.

# System Log

These windows allow you to view the System Log and configure the System Log options. To access the **System Log** window, click the **System Log** button in the **Management** directory.

Click the **View System Log** button to view the System Log.  
Click the **Configure System Log** button to configure the System Log options.

**System Log**  
The System Log dialog allows you to view the System Log and configure the System Log options.  
Click "View System Log" to view the System Log.  
Click "Configure System Log" to configure the System Log options.

View System Log

Configure System Log

Click on the **Refresh** button to refresh the system log settings.

**System Log**

Date/Time	Facility	Severity	Message
-----------	----------	----------	---------

Refresh

Close

## System Log – Configuration

The system log displays chronological event log data. The event log can be read from local host or sent to a System Log server. The available event severity levels are: *Emergency*, *Alert*, *Critical*, *Error*, *Warning*, *Notice*, *Informational*, and *Debugging*.

This window allows you to log selected events. When you are finished, click the **Save/Apply** button.

**System Log -- Configuration**  
If the log mode is enabled, the system will begin to log all the selected events. For the Log Level, all events above or equal to the selected level will be logged. For the Display Level, all logged events above or equal to the selected level will be displayed. If the selected mode is 'Remote' or 'Both,' events will be sent to the specified IP address and UDP port of the remote syslog server. If the selected mode is 'Local' or 'Both,' events will be recorded in the local memory.  
Select the desired values and click 'Save/Apply' to configure the system log options.

Log: ☒ Disable ☐ Enable

Log Level: 

Debugging

Display Level: 

Error

Mode: 

Local

Save/Apply

# SNMP Agent

To access the **SNMP – Configuration** window, click the **SNMP Agent** button in the **Management** directory.

Simple Network Management Protocol allows a management application to retrieve statistics and status from the SNMP agent in the Router. When you are finished, click the **Save/Apply** button.

SNMP - Configuration

Simple Network Management Protocol (SNMP) allows a management application to retrieve statistics and status from the SNMP agent in this device.

Select the desired values and click "Apply" to configure the SNMP options.

SNMP Agent ☐ Disable ☒ Enable

Read Community:

Set Community:

System Name:

System Location:

System Contact:

Trap Manager IP:

public

private

DSL-2520U

D-Link

ADSL

0.0.0.0

Save/Apply

# Internet Time

To access the **Time settings** window, click the **Internet Time** button in the **Management** directory.

This window allows you to set the Router's time configuration. When you are finished, click the **Save/Apply** button.

Time settings

This page allows you to the modem's time configuration.

☐ Automatically synchronize with Internet time servers

Save/Apply

# Access Control

To access the **Access Control** windows, click the **Access Control** button in the **Management** directory.

## Access Control – Services

Enable or disable the desired LAN and WAN services. When you are finished, click the **Save/Apply** button.

### Access Control -- Services

A Service Control List ("SCL") enables or disables services from being used.

Services	LAN	WAN
HTTP	<input checked="" type="checkbox"/> Enable	<input type="checkbox"/> Enable
ICMP	Enable	<input type="checkbox"/> Enable
SNMP	<input checked="" type="checkbox"/> Enable	<input type="checkbox"/> Enable
TELNET	<input checked="" type="checkbox"/> Enable	<input type="checkbox"/> Enable

Save/Apply

## Access Control – IP Address

This window allows you to enable or disable Access Control Mode. To add an IP address management station, click the **Add** button.

### Access Control -- IP Address

The IP Address Access Control mode, if enabled, permits access to local management services from IP addresses contained in the Access Control List. If the Access Control mode is disabled, the system will not validate IP addresses for incoming packets. The services are the system applications listed in the Service Control List

Access Control Mode: ☒ Disable ☐ Enable

IP Address Remove

Add Remove

### Access Control

Enter the IP address of the management station permitted to access the local management services, and click 'Save/Apply.'

IP Address:

Save/Apply

**Access Control – Passwords**

This window allows you to change the password on the Router. When you are finished, click the **Save/Apply** button.

**Access Control -- Passwords**

Access to your DSL router is controlled through three user accounts: admin, support, and user.

The user name "admin" has unrestricted access to change and view configuration of your DSL Router.

The user name "support" is used to allow an ISP technician to access your DSL Router for maintenance and to run diagnostics.

The user name "user" can access the DSL Router, view configuration settings and statistics, as well as, update the router's software.

Use the fields below to enter up to 16 characters and click "Apply" to change or create passwords. Note: Password cannot contain a space.

Username:

Old Password:

New Password:

Confirm Password:

(Note: The length of password can not be greater than 16.)

# Update Software

To access the **Tools - Update Software** window, click the **Update Software** button in the **Management** directory. This window allows you to update the Router's software.

**Tools -- Update Software**

**Step 1:** Obtain an updated software image file from your ISP.

**Step 2:** Enter the path to the image file location in the box below or click the "Browse" button to locate the image file.

**Step 3:** Click the "Update Software" button once to upload the new image file.

NOTE: The update process takes about 2 minutes to complete, and your DSL Router will reboot.

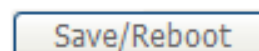
Software File Name:

## Save/Reboot

To access this window, click the **Save/Reboot** button in the **Management** directory.

To save your settings and reboot the system, click the **Save/Reboot** button.

Click the button below to save and reboot the router.

A rectangular button with a light gray background and a thin blue border. The text "Save/Reboot" is centered on the button in a dark gray font.

# Troubleshooting

This chapter provides solutions to problems that might occur during the installation and operation of the DSL-2520U. Read the following descriptions if you are having problems. (The examples below are illustrated in Windows® XP. If you have a different operating system, the screenshots on your computer will look similar to the following examples.)

## 1. How do I configure my DSL-2520U Router without the CD-ROM?

- Connect your PC to the Router using an Ethernet cable.
- Open a Web browser and enter the address `http://192.168.1.1`
- The default username is 'admin' and the default password is 'admin'.
- If you have changed the password and cannot remember it, you will need to reset the Router to the factory default setting (see question 2), which will set the password back to 'admin'.

**Note:** Please refer to next section **Network Basics** to check your PC's IP configuration if you can't see the login window.

## 2. How do I reset my Router to the factory default settings?

- Ensure the Router is powered on.
- Press and hold the reset button on the back of the device for at least 5 seconds.
- This process will take about 1~2 minutes to complete.

**Note:** Resetting the Router to the factory default settings will erase the current configuration settings. To reconfigure your settings, log into the Router as outlined in question 1 and then run the Quick Setup wizard.

## 3. What can I do if my Router is not working correctly?

There are a few quick steps you can take to try and resolve any issues:

- Follow the directions in question 2 to reset the Router.
- Check that all the cables are firmly connected at both ends.
- Check the LEDs on the front of the Router. The Power indicator should be on, the Status indicator should flash, and the DSL and LAN indicators should be on as well.

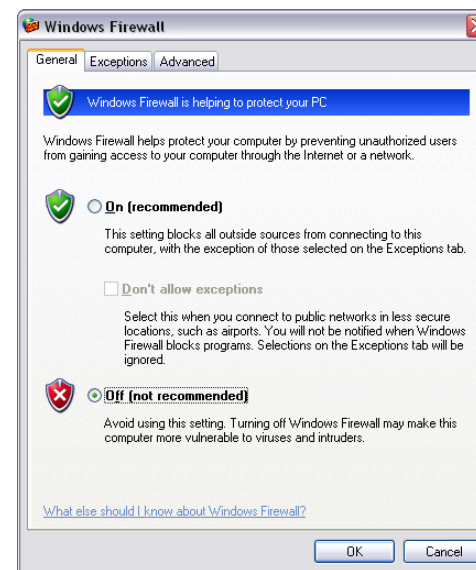
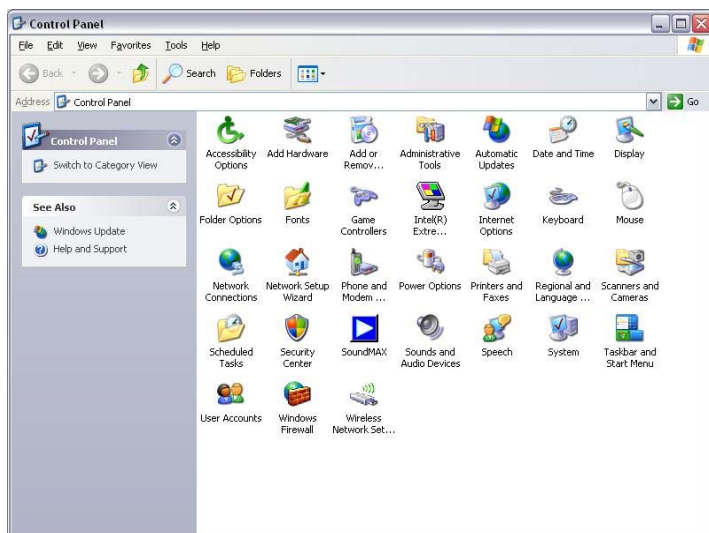
- Please ensure that the settings in the Web-based configuration manager, e.g. ISP username and password etc., are the same as the settings provided by your ISP.

### 4. Why can't I get an Internet connection?

For ADSL subscribers, please contact your ISP to make sure the ADSL service has been enabled by your ISP, and your ISP username and password are correct.

### 5. What can I do if my Router can't be detected by running installation CD?

- Ensure the Router is powered on.
- Check that all the cables are firmly connected at both ends and all LEDs work correctly.
- Ensure only one network interface card on your PC is activated.
- Click on **Start > Control Panel > Security Center** to disable the setting of **Firewall**.



**Note:** There might be a potential security issue if you disable the setting of Firewall on your PC. Please remember to turn it back on once you have finished the whole installation procedure and can surf on Internet without any problem.



**6. How can I detect if my Router is infected with a virus?**

- Because some malware adds a firewall rule to block Telnet connections, if there is a Telnet daemon running on your Router and you cannot reach it, this could be one indicator of a virus.
- If either port 22 (SSH), port 23 (Telnet), and/or port 80 (HTTP) is blocked, this is another indication that the Router may be infected with a virus.
- In fact, it can be very difficult to determine if your Router has been infected with a virus.

**7. What do I do if my Router is infected with a virus or if I suspect my Router may be infected with a virus?**

- Use a wired network to your Router/Internet gateway.
- Fetch the latest firmware version available from a different network.
- Initiate a hard reset on the Router by depressing the Reset Button for at least 5 seconds (see question 2).
- Pull out the power plug and then reinsert the plug again.
- Change the default password to a strong and safe one using small and capital letters, special characters, and numbers in a random fashion.
- Upgrade the firmware to the most recent version.
- When this is finished, you can start configuring your Router/Internet gateway again.

# Networking Basics

## Check Your IP Address

After you install your new D-Link adapter, by default, the TCP/IP settings should be set to obtain an IP address from a DHCP server (i.e. wireless router) automatically. To verify your IP address, please follow the steps below.

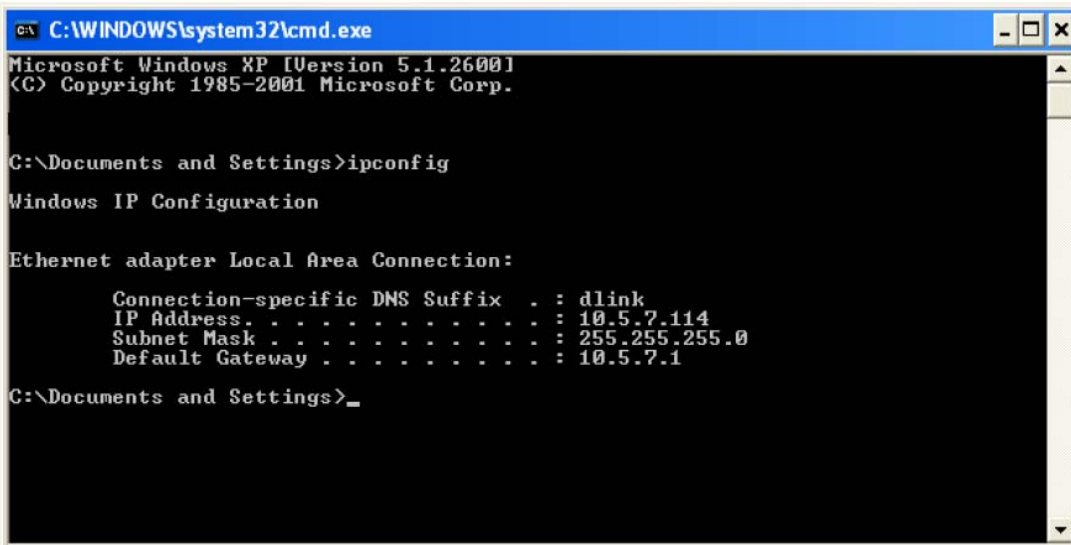
Click on **Start > Run**. In the run box type **cmd** and click on the **OK**.

At the prompt, type **ipconfig** and press **Enter**.

This will display the IP address, subnet mask, and the default gateway of your adapter.

If the address is 0.0.0.0, check your adapter installation, security settings, and the settings on your router. Some firewall software programs may block a DHCP request on newly installed adapters.

If you are connecting to a wireless network at a hotspot (e.g. hotel, coffee shop, airport), please contact an employee or administrator to verify their wireless network settings.



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : dlink
    IP Address. . . . . : 10.5.7.114
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 10.5.7.1

C:\Documents and Settings>
```

## Statically Assign an IP Address

If you are not using a DHCP capable gateway/router, or you need to assign a static IP address, please follow the steps below:

### Step 1

Windows® XP - Click on **Start > Control Panel > Network Connections**.

Windows® 2000 - From the desktop, right-click on the **My Network Places > Properties**.

### Step 2

Right-click on the **Local Area Connection** which represents your D-Link network adapter and select **Properties**.

### Step 3

Highlight **Internet Protocol (TCP/IP)** and click on the **Properties**.

### Step 4

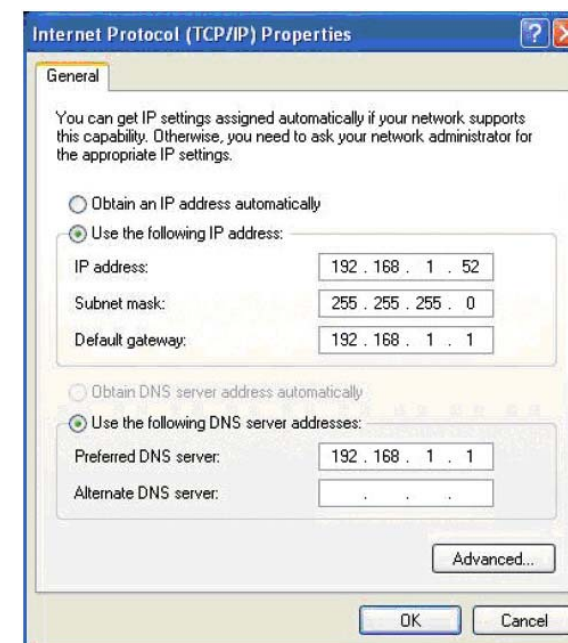
Click “Use the following IP address” and enter an IP address that is on the same subnet as your network or the LAN IP address on your router.

Example: If the router’s LAN IP address is 192.168.1.1, make your IP address 192.168.1.X where X is a number between 2 and 99. Make sure that the number you choose is not in use on the network. Set Default Gateway the same as the LAN IP address of your router (192.168.1.1).

Set Primary DNS the same as the LAN IP address of your router (192.168.1.1). The Secondary DNS is not needed or you may enter a DNS server from your ISP.

### Step 5

Click on the **OK** twice to save your settings.



# Technical Specifications

## ADSL Standards

- ANSI T1.413 Issue 2
- ITU G.992.1 (G.dmt) AnnexA
- ITU G.992.2 (G.lite) Annex A
- ITU G.994.1 (G.hs)
- ITU G.992.5 Annex A

## ADSL2 Standards

- ITU G.992.3 (G.dmt.bis) Annex A
- ITU G.992.4 (G.lite.bis) Annex A

## Protocols

- IEEE 802.1d Spanning Tree
- TCP/UDP
- ARP
- RARP
- ICMP
- RFC1058 RIP v1
- RFC1213 SNMP v1 & v2c
- RFC1334 PAP
- RFC1389 RIP v2
- RFC1577 Classical IP over ATM
- RFC1483/2684 Multiprotocol Encapsulation over ATM Adaptation Layer 5 (AAL5)
- RFC1661 Point to Point Protocol
- RFC1994 CHAP
- RFC2131 DHCP Client / DHCP Server
- RFC2364 PPP over ATM
- RFC2516 PPP over Ethernet

## Data Transfer Rate

- G.dmt full rate downstream: up to 8 Mbps / upstream: up to 1 Mbps
- G.lite: ADSL downstream up to 1.5 Mbps / upstream up to 512 Kbps
- G.dmt.bis full rate downstream: up to 12 Mbps / upstream: up to 12 Mbps
- ADSL full rate downstream: up to 24 Mbps / upstream: up to 1 Mbps

## Media Interface

- ADSL interface: RJ-11 connector for connection to 24/26 AWG twisted pair telephone line
- LAN interface: RJ-45 port for 10/100BASE-T Ethernet connection
- USB interface: USB port Type B connector, USB 1.1 Specification