



DSL-524T
ADSL2+ Router
User's Guide

(January 2006)

6SL524TEU.A1G

FCC Warning

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

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

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

CE Mark Warning

This is a Class B product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

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About This User's Guide

This manual provides instructions on how to install the DSL-524T ADSL Router and use it to connect a computer or Ethernet LAN to the Internet.

Before You Start

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 Overview

The procedure to install the Router can be described in general terms in the following steps:

1. Gather information and equipment needed to install the device. Before you begin the actual installation make sure you have all the necessary information and equipment.
2. Install the hardware, that is, connect the cables (Ethernet and telephone) to the device and connect the power adapter.
3. Check the IP settings on your computer and change them if necessary so the computer can access the web-based software built into the Router.
4. Use the web-based management software to configure the device to suit the requirements of your ADSL account.

Installation Requirements

Information you will need from your ADSL service provider:

Username	This is the Username that is used to log on to your ADSL service provider's network. It is commonly in the form – user@isp.co.uk .	Record your info here.
Password	This is the Password that is used, in conjunction with the Username above, to log on to your ADSL service provider's network.	
Connection Protocol	This is the method that your ADSL service provider uses to send and receive data between the Internet and your computer.	
VPI	This is the Virtual Path Identifier (VPI). It is used in conjunction with the Virtual Channel Identifier (VCI) below, to identify the data path between your ADSL service provider's network and your computer.	
VCI	This is the Virtual Channel Identifier (VCI). It is used in conjunction with the VPI above to identify the data path between your ADSL service provider's network and your computer.	

Information you will need about your DSL-524T ADSL Router:

Username	This is the Username you will be prompted to enter when you access the DSL-524T's configuration windows using a Web browser. The default Username is admin .	Record your info here.
Password	This is the Password you will be prompted to enter when you access the DSL-524T's configuration windows using a Web browser. The default Password is admin .	
LAN IP address for the DSL-524T	This is the IP address you will enter into the Address field of your Web browser to access the DSL-524T's configuration windows using a Web Browser. The default IP address is 192.168.1.1 .	
LAN Subnet Mask for the DSL-524T	This is the subnet mask used by the DSL-524T, and will be used throughout your LAN. The default subnet mask is 255.255.255.0 .	

Information you will need about your LAN or computer:

Ethernet NIC	If your computer has an Ethernet NIC, you can connect the DSL-524T to this Ethernet port using an Ethernet cable. You can also use the Ethernet port on the DSL-524T to connect to other Ethernet devices, such as a Wireless Access Point.	Record your info here.
DHCP Client status	Your DSL-524T 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 range of IP addresses the DSL-524T 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 setup and configure your DSL-524T ADSL Router.

Introduction

This section provides a brief description of the Router, its associated technologies and a list of Router features.

What is ADSL?

Asymmetric Digital Subscriber Line (ADSL) is an access technology that utilizes ordinary copper telephone lines to enable broadband high-speed digital data transmission and interactive multimedia applications for business and residential customers. For ADSL services, it is not necessary to install expensive new cabling or condition the line in any way.

ADSL greatly increases the signal carrying capacity of copper telephone lines without interfering with regular telephone services. For the ADSL user, this means faster downloads and more reliable connectivity. ADSL devices make it possible to enjoy benefits such as high-speed Internet access without experiencing any loss of quality or disruption of voice/fax telephone capabilities.

ADSL2+ provides a dedicated service over a single telephone line operating at speeds of up to 24Mbps downstream and up to 1Mbps upstream, depending on local telephone line conditions. A secure point-to-point connection is established between the user and the central office of the service provider.

D-Link ADSL devices incorporate the recommendations of the ADSL Forum regarding framing, data format, and upper layer protocols.

Router Description and Operation

The DSL-524T ADSL Router is designed to provide a simple, cost-effective and secure ADSL Internet connection for your small- to medium-sized private network. The DSL-524T combines the benefits of high-speed ADSL connection technology and TCP/IP routing with a conventional Ethernet interface in one compact and convenient package. ADSL connection technology enables many interactive multi-media applications such as video conferencing and collaborative computing.

The Router is easy to install and use. The DSL-524T connects to an Ethernet LAN via a standard Ethernet 10BASE-T interface using RJ-45 connectors. The ADSL connection is made using ordinary twisted-pair telephone line with standard RJ-11 connectors. This arrangement means that several PCs can be networked and connected to the Internet using a single WAN interface and IP address.

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. Appendix B provides illustrated examples of how to install two common styles of low pass filters.

Operating Systems

The DSL-524T 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, and Windows XP.

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 Mozilla, Firefox, Opera, Microsoft Internet Explorer® version 6.0, Netscape Navigator® version 6.2.3, or later versions. 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.

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 what is called a “bridged” connection. For a bridged connection, the information needed to make and maintain the Internet connection is stored on your computer, not in the Router. This type of connection is similar to the arrangement used for analog dial-up modems, but the connection speed is much faster. Various terms are used to describe a bridged ADSL connection including the term “RFC 1483 Bridge” which is used in this guide.

About Bridged Ethernet Connections (RFC 1483)

Using this method, the DSL-524T acts as a transparent bridge, and is invisible to other devices on both the WAN and LAN side of the bridge. It is therefore necessary to provide some means of acquiring global IP settings for your account.

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, server or 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.

Account Information (User Name and Password)

Most users will need to supply a user name and password used to access the service provider’s network (and ultimately, the Internet). This information is stored either in the Router’s memory or on your computer depending on the type of ADSL connection you have.

ACCOUNT INFORMATION (PPP Connections Only)
User Name:
Password:

Router Features

The DSL-524T ADSL Router utilizes the latest ADSL enhancements to provide a reliable Internet portal suitable for most small to medium sized offices. DSL-524T advantages include:

- **PPP (Point-to-Point Protocol) Security** – The DSL-524T ADSL Router supports PAP (Password Authentication Protocol) and CHAP (Challenge Handshake Authentication Protocol) for PPP connections.
- **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-524T 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-524T 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-524T 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-524T 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 24Mbps downstream bit rate using the G.dmt standard.(For ADSL2+)
- **Full Network Management** – The DSL-524T 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-524T 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.

Packing List

Open the shipping carton and carefully remove all items. In addition to this User's Guide, ascertain that you have:

- One DSL-524T ADSL Router
- One twisted-pair telephone cable used for ADSL connection
- One CAT-5 Ethernet cable
- One AC power adapter suitable for your electric service
- One Quick Installed Guide
- This Manual on CD-ROM

Front Panel

Place the Router in a location that permits an easy view of the LED indicators on the front panel.



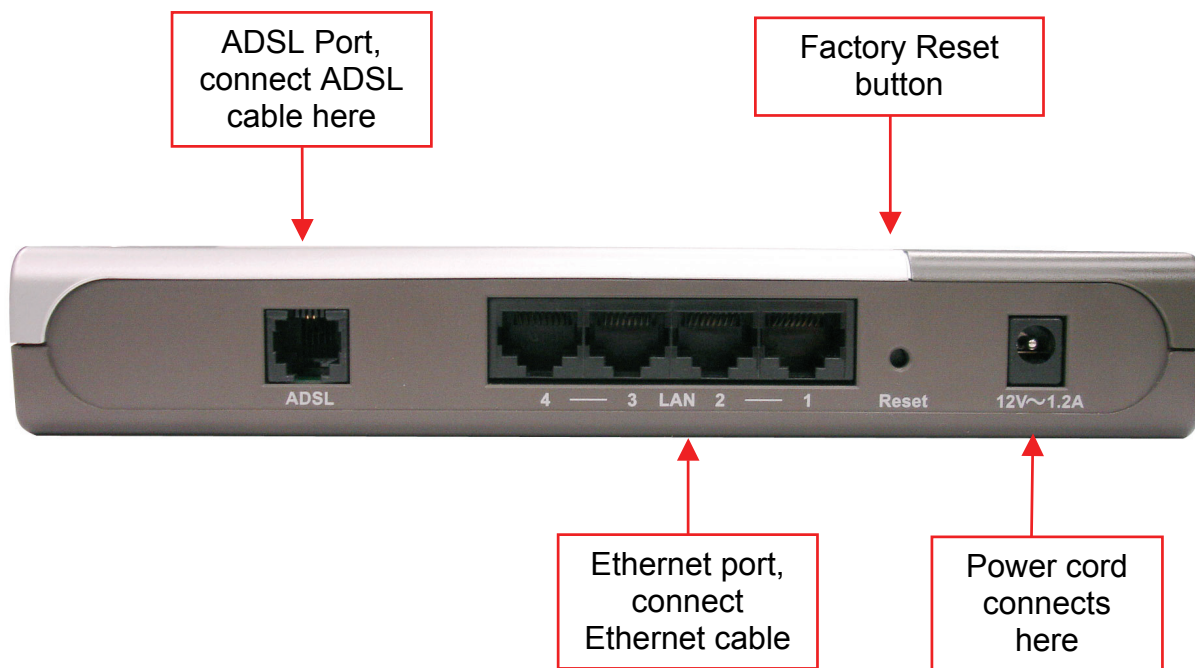
The LED indicators on the front panel include the **Power**, **Status**, **ADSL Link/Act(ivity)** and **LAN Link/Act(ivity)** indicators.

Power	Steady green light indicates the unit is powered on.
Status	Lights steady green during Power on Self-Test (POST). Once the connection status has been settled, the light will blink green. A system failure will be represented by a solid green light or the light going dark.
ADSL: Link/Act	Steady green light indicates a valid ADSL connection. This will light after the ADSL negotiation process has been settled. Blinking green light indicates activity on the WAN interface.
LAN: Link/Act	A solid green light will indicate a valid link on startup. This light will blink when there is activity currently passing through the Ethernet port.

Rear Panel

Connect the AC power adapter cord and network cables on the rear panel. The power switch and reset button are also located on the back of the device. Connect the antennas to the antenna posts.

All cable connections to the Router are made at the rear panel. The power switch and factory reset button is located here as well.



Hardware Installation

The DSL-524T functions on two separate networks, as an Ethernet LAN and as an ADSL WAN. When deciding where to put the Router, the user must take into account the fact that it is connected to these three networks with three types of media. Ethernet cables connect the Router to computers and network devices, and the ADSL line connects it to a wall socket. In addition, the device must be near an AC outlet for power. How to accommodate these wired connections is often not a complicated matter, however, the added dimension of wireless communication does complicate the decision of Router placement.

Location

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

Network Connection

Complete the connection to the network through the ADSL port and the Ethernet port on the back of the Router.

Connect ADSL Line

Use the ADSL cable included with the Router to connect it to a telephone wall socket. 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. It is the physical link to the ISP's network backbone and ultimately to the Internet.

Connect Router to Ethernet

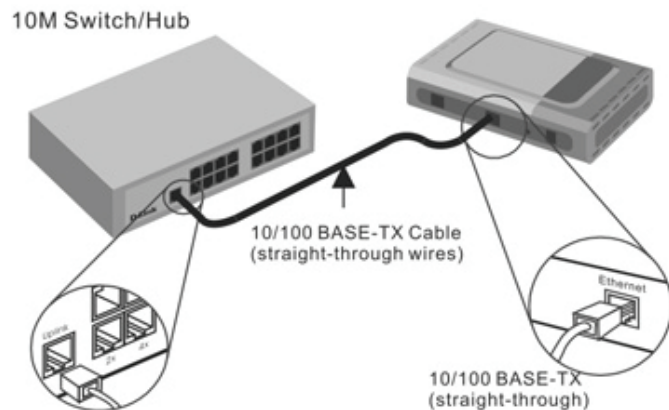
The Router may be connected to any 10/100BASE-TX Ethernet LAN. Any connection to an Ethernet concentrating device such as a switch or hub must operate at a speed of 10/100 Mbps only. When connecting the Router to any Ethernet device that is capable of operating at speeds higher than 10Mbps, be sure that 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

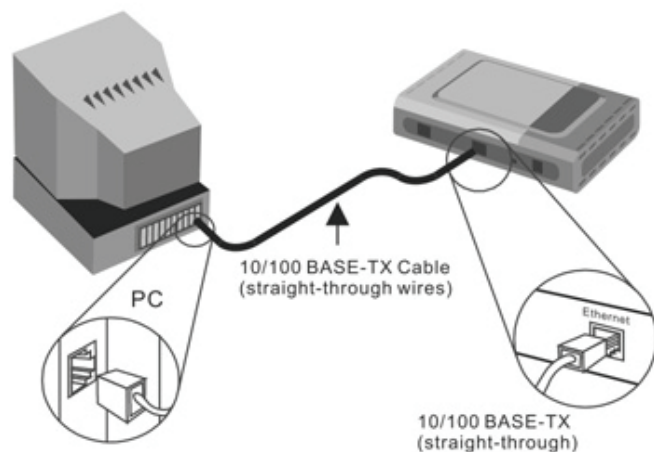
Connect the Router to an uplink port (MDI-II) on an Ethernet hub or switch with a straight-through cable as shown in the diagram below:

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 as shown in this diagram.



Power on Router

To power on the Router:

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. 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 you have the Router connected to your network you can look at the Ethernet Link/Act LED indicators to make sure they have valid connections. The Router will attempt to establish the ADSL connection, if the ADSL line is connected and the connection is properly configured this should light up after several seconds.

Factory Reset Button

The Router may be reset to the original factory default settings by depressing the reset button for a few seconds while the device is powered on. Use a ballpoint or paperclip to push down the reset button. Remember that this will wipe out any settings stored in flash memory including IP settings. The factory default IP address of the Router is 192.168.1.1 and the subnet mask is 255.255.255.0.

Configuring the Router for the First Time

The first time you setup the Router it is recommended that you configure the WAN connection using a single computer making sure that both the computer and the Router are not connected to the LAN. Once the WAN connection is functioning properly you may continue to make changes to the Router configuration including the IP settings. This chapter is concerned with using your computer to configure the WAN connection. The following chapter describes the various menus used to configure and monitor the Router including how to change IP settings. This chapter discusses the steps to first establish the WAN connection. The remaining features, not directly concerned with establishing the initial connection, are explained in Chapter 4, *Web-based Management*.

It is recommended that you install and configure the Router using one non-networked computer. This allows you to verify that the ADSL service is functioning and that you are able to communicate with the device. Once the initial ADSL connection is established, you can proceed to build an Ethernet LAN around the device or incorporate it into an existing LAN.

WAN Configuration Summary

1. **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. To access the management software your computer must be able to “see” the Router. Your computer can see the Router if it is in the same “neighborhood” or subnet as the Router. This is accomplished by making sure your computer has IP settings that place it in the same subnet as the Router. The easiest way to make sure your computer has the correct IP settings is to configure it to use the DHCP server of the computer. The next section describes how to change the IP configuration for a computer running a Windows operating system to be a DHCP client.
2. **Configure the WAN Connection** Once you are able to access the configuration software you can proceed to change the settings required to establish the ADSL connection and connect to the service provider’s network. There are different methods used to establish the connection to the service provider’s network and ultimately to the Internet. You should know what Encapsulation and connection type you are required to use for your ADSL service. It is also possible that you must change the PVC settings used for the ADSL connection. Your service provider should provide all the information you need to configure the WAN connection.

Configuring IP Settings on Your Computer

In order to configure your system to receive IP settings from the Router it must first have the TCP/IP protocol installed. If you have an Ethernet port on your computer, it probably already has TCP/IP protocol installed. If you are using Windows XP the TCP/IP is enabled by default for standard installations. Below is an illustrated example of how to configure a Windows XP system to automatically obtain IP settings from the Router. Following this example is a step-by-step description of the procedures used on the other Windows operating systems to first check if the TCP/IP protocol has been installed; if it is not, instructions are provided for installing it. Once the protocol has been installed you can configure the system to receive IP settings from the Router.

For computers running non-Windows operating systems, follow the instructions for your OS that configure the system to receive an IP address from the Router, that is, configure the system to be a DHCP client.

Configure IP Settings

You must now enable your computer to access the Router's configuration software. To do this you will need to configure the IP settings on your computer. Follow these instructions to configure the IP settings for the operating system installed on your computer.

Windows XP

1. In the Windows task bar, click the **Start** button, and then click **Control Panel**.
2. Double-click the **Network Connections** icon.
3. In the LAN or High-Speed Internet window, right-click on icon corresponding to your network interface card (NIC) and select **Properties**. (This icon may be labeled *Local Area Connection*).
4. The **Local Area Connection** dialog box displays with a list of currently installed network items.
5. Make sure that the check box to the left of the item labeled Internet Protocol TCP/IP is checked, and click **Properties**.
6. In the **Internet Protocol (TCP/IP) Properties** dialog box, click the button labeled **Use the following IP address**:
7. Type in IP settings as follows, IP address: **192.168.1.2** and Subnet mask: **255.255.255.0**.
8. Click **OK** twice to confirm your changes, and close the **Control Panel**.

Windows 2000

First, check for the IP protocol and, if necessary, install it:

1. In the Windows task bar, click the Start button, point to **Settings**, and then click **Control Panel**.
2. Double-click the **Network and Dial-up Connections** icon.
3. In the **Network and Dial-up Connections** window, right-click the **Local Area Connection** icon, and then select **Properties**.
4. The **Local Area Connection Properties** dialog box displays with a list of currently installed network components. If the list includes Internet Protocol (TCP/IP), then the protocol has already been enabled. Skip to step 3.
5. If Internet Protocol (TCP/IP) does not display as an installed component, click **Install**.
6. In the **Select Network Component Type** dialog box, select **Protocol**, and then click **Add**.
7. Select **Internet Protocol (TCP/IP)** in the Network Protocols list, and then click **OK**.
8. You may be prompted to install files from your Windows 2000 installation CD or other media. Follow the instructions to install the files.
9. If prompted, click **OK** to restart your computer with the new settings.

Next, configure IP information:

1. In the **Control Panel**, double-click the **Network and Dial-up Connections** icon.
2. In **Network and Dial-up Connections** window, right-click the **Local Area Connection** icon, and then select **Properties**.
3. In the **Local Area Connection Properties** dialog box, select **Internet Protocol (TCP/IP)**, and then click **Properties**.
4. In the **Internet Protocol (TCP/IP) Properties** dialog box, click the button labeled **Use the following IP address**:
5. Type in IP settings as follows, **IP address: 192.168.1.2** and Subnet mask: **255.255.255.0**.
6. Click **OK** twice to confirm and save your changes, and then close the **Control Panel**.

Windows Me

1. In the Windows task bar, click the **Start** button, point to **Settings**, and then click **Control Panel**.
2. Double-click the **Network and Dial-up Connections** icon.
3. In the **Network and Dial-up Connections** window, right-click on the **Network** icon, then select **Properties**.
4. The **Network Properties** dialog box displays with a list of currently installed network components. If the list includes Internet Protocol (TCP/IP), then the protocol has already been enabled. Skip to step 3.
5. If Internet Protocol (TCP/IP) does not display as an installed component, click **Add**.
6. In the **Select Network Component Type** dialog box, select **Protocol**, and then click **Add**.
7. Select **Microsoft** in the Manufacturers box.
8. Select **Internet Protocol (TCP/IP)** in the Network Protocols list, and then click **OK**.
9. You may be prompted to install files from your Windows Me installation CD or other media. Follow the instructions to install the files.
10. If prompted, click **OK** to restart your computer with the new settings.

Next, configure the IP information:

1. In the **Control Panel**, double-click the **Network and Dial-up Connections** icon.
2. In **Network and Dial-up Connections** window, right-click the **Network** icon, and then select **Properties**.
3. In the **Network Properties** dialog box, select **TCP/IP**, and then click **Properties**.
4. In the **TCP/IP Settings** dialog box, click the **Specify IP address** option.
5. Type in IP settings as follows, **IP address: 192.168.1.2** and **Subnet mask: 255.255.255.0**.
6. Click **OK** twice to confirm and save your changes, and then close the **Control Panel**.

Windows 95, Windows 98, and Windows 98SE

1. First, check for the IP protocol and, if necessary, install it:
2. In the Windows task bar, click the **Start** button, point to **Settings**, and then click **Control Panel**.
3. Double-click the **Network** icon.
4. The **Network** dialog box displays with a list of currently installed network components. If the list includes TCP/IP, and then the protocol has already been enabled. Skip to step 2.
5. If TCP/IP does not display as an installed component, click **Add**.
6. The **Select Network Component Type** dialog box displays.
7. Select **Protocol**, and then click **Add**.
8. The **Select Network Protocol** dialog box displays.
9. Click on **Microsoft** in the Manufacturers list box, and then click **TCP/IP** in the Network Protocols list box.
10. Click **OK** to return to the **Network** dialog box, and then click **OK** again.
11. You may be prompted to install files from your Windows 95/98 installation CD. Follow the instructions to install the files.
12. Click **OK** to restart the PC and complete the TCP/IP installation.

Next, configure the IP information:

1. Open the **Control Panel** window, and then click the **Network** icon.
2. Select the network component labeled TCP/IP, and then click **Properties**.
3. If you have multiple TCP/IP listings, select the listing associated with your network card or adapter.
4. In the **TCP/IP Properties** dialog box, click the **IP Address** tab.
5. Click the **Specify an IP address** option.
6. Type in IP settings as follows, **IP address: 192.168.1.2** and Subnet mask: **255.255.255.0**.
7. Click **OK** twice to confirm and save your changes.

8. You will be prompted to restart Windows.
9. Click **Yes**.

Windows NT 4.0

1. First, check for the IP protocol and, if necessary, install it:
2. In the Windows NT task bar, click the **Start** button, point to **Settings**, and then click **Control Panel**.
3. In the **Control Panel** window, double-click the **Network** icon.
4. In the **Network** dialog box, click the **Protocols** tab.
5. The **Protocols** tab displays a list of currently installed network protocols. If the list includes TCP/IP, then the protocol has already been enabled. Skip to step 3.
6. If TCP/IP does not display as an installed component, click **Add**.
7. In the **Select Network Protocol** dialog box, select **TCP/IP**, and then click **OK**.
8. You may be prompted to install files from your Windows NT installation CD or other media. Follow the instructions to install the files.
9. After all files are installed, a window displays to inform you that a TCP/IP service called DHCP can be set up to dynamically assign IP information.
10. Click **Yes** to continue, and then click **OK** if prompted to restart your computer.

Next, configure the IP information:

1. Open the **Control Panel** window, and then double-click the **Network** icon.
2. In the **Network** dialog box, click the **Protocols** tab.
3. In the **Protocols** tab, select **TCP/IP**, and then click **Properties**.
4. In the Microsoft **TCP/IP Properties** dialog box, click the **Specify an IP address** option.
5. Type in IP settings as follows, **IP address: 192.168.1.2** and Subnet mask: **255.255.255.0**. Click **OK** twice to confirm and save your changes, and then close the **Control Panel**.

Accessing the Configuration Manager

Now that your computer's IP settings allow it to communicate with the Router, you can access the configuration software.

Note: Be sure that the web browser on your computer is not configured to use a proxy server in the Internet settings. In Windows Internet Explorer, you can check if a proxy server is enabled using the following procedure:

1. In Windows, click on the **Start** button, go to **Settings** and choose **Control Panel**.
2. In the **Control Panel** window, double-click on the **Internet Options** icon.
3. Click the **Connections** tab and click on the **LAN Settings** button.
4. Verify that the "Use proxy server" option is NOT checked. If it is checked, click in the checked box to deselect the option and click OK.

Alternatively you can access this **Internet Options** menu using the **Tools** pull-down menu in Internet Explorer.

To use the web-based management software, launch a suitable web browser and direct it to the IP address of the Router. Type in **http://** followed by the default IP address, **192.168.1.1** in the address bar of the browser. The URL in the address bar should read: **http://192.168.1.1**. Once entered, the user will be prompted to enter the username and password to access the Configuration Manager, as show below. A new window will appear and you will be prompted for a user name and password to access the web-based manager. Use the default user name "admin" and password "admin" for first time setup. You should change the web-based manager access user name and password once you have verified

that a connection can be established. The user name and password allows any PC within the same subnet as the Router to access the web-based manager.



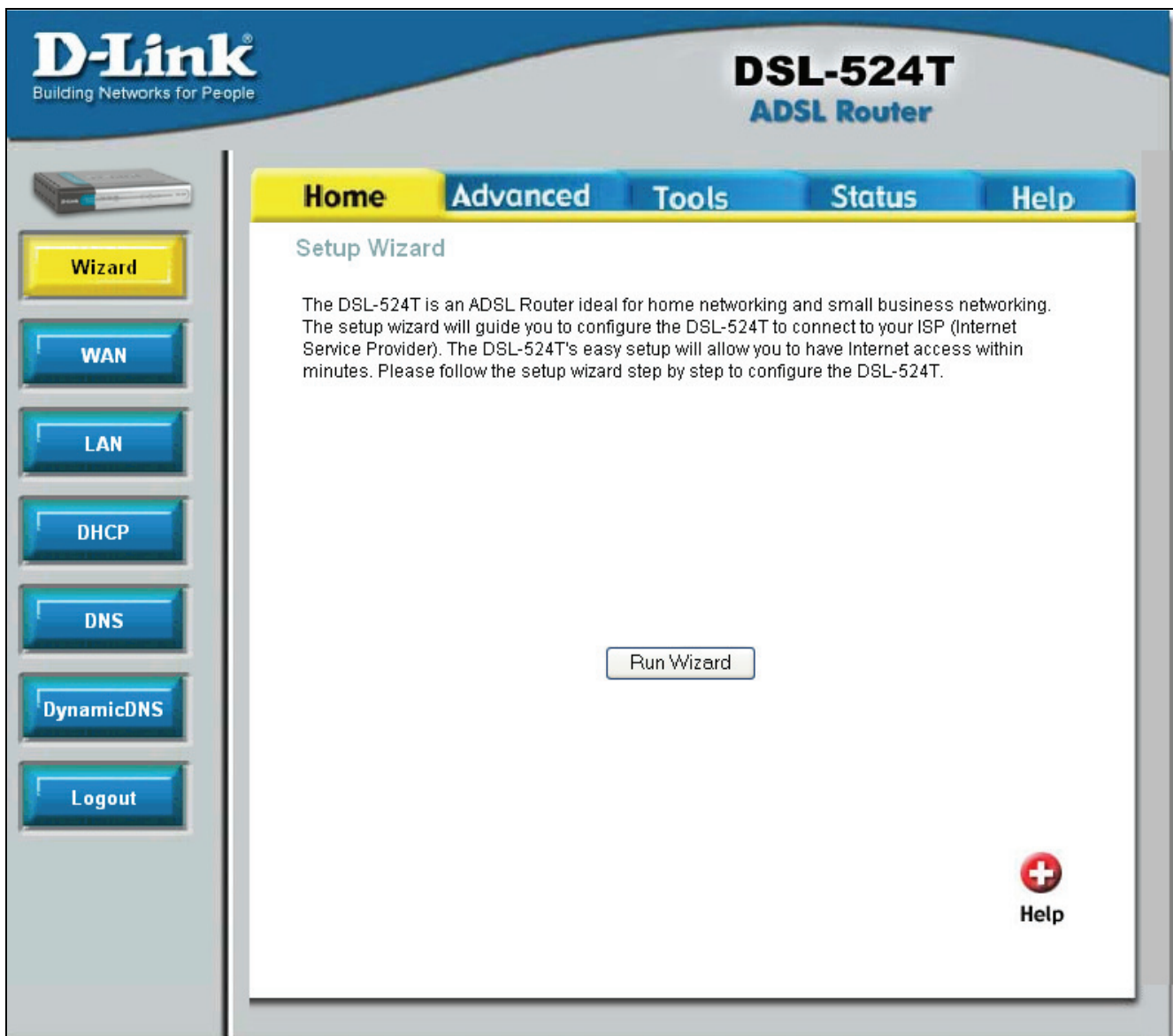
NOTE: Do not confuse the user name and password used to access the web-based manager with the ADSL account user name and password needed for PPP connections to access the service provider's network.



Enter Network Password dialog box

Configure the Router with the Configuration Wizard

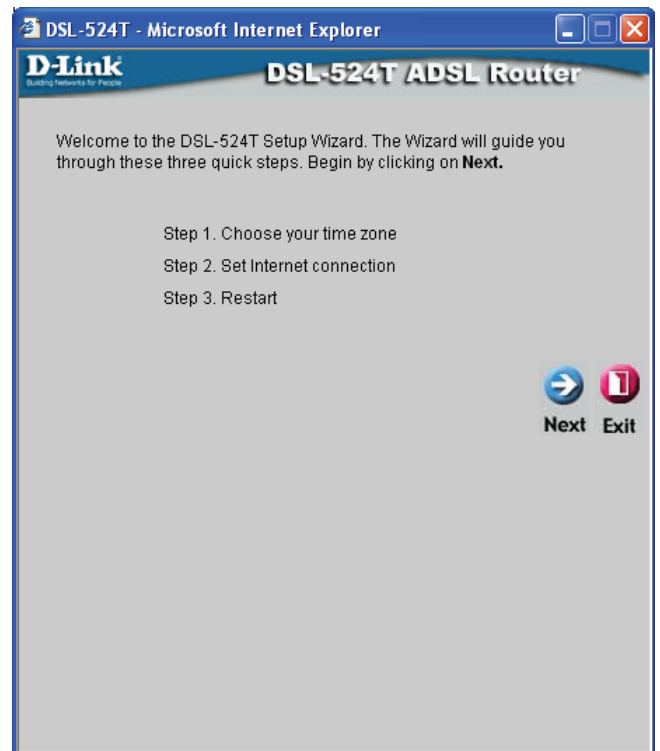
The first page that appears after you successfully login displays information about the Router's Setup Wizard. Tabs across the top of the window show other available windows: **Home**, **Advanced**, **Tools**, **Status**, and **Help**.



Home tab

When the Router is used to provide Internet access it actually must first access your service provider's network, that is, it must communicate with computers and other modems owned by your service provider. These computers and modems then provide access to the Internet. The Router must be configured to communicate with the systems that give it access to the larger network. The quickest way for you to connect to the Internet is by using the **Setup Wizard**. Click the **Run Wizard** button the following window will appear:

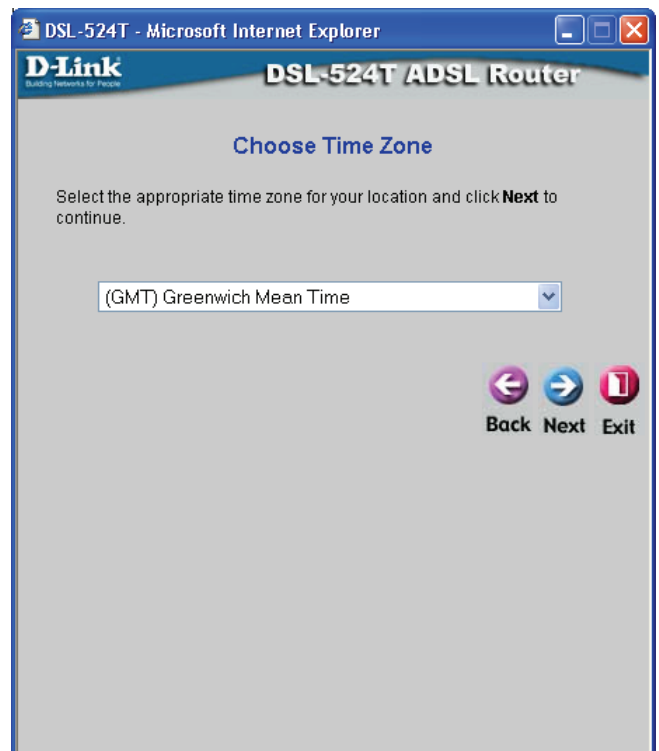
The **Setup** window has four options listed, which will run through in the order given. Each step will be explained in detail. Click **Next** to access Step 1. You may click **Back** during the Setup procedure to return to the previous screen in the Setup Wizard, or **Exit** to exit the Setup Wizard at any time during the procedure.



Opening Setup window

Step 1: Choose Your Time Zone

In Step1, you must choose the time zone that best corresponds to the area you are living in by using the pull-down menu. Choose the appropriate setting and click **Next** to go on to Step 2.



Choose Time Zone window

Step 2: Setting the ADSL Connection

Step 2 involves choosing the correct connection type mode for your Router. There are different methods or protocols used to make this communication possible, and both ends of the communication (you and your ISP) must agree on what method to use and how to set up the connection. This is what you want to configure the Router to do, to agree with the service provider's equipment and negotiate the terms of the connection using a language or protocol that both sides understand. This window offers six connection types for the user to choose from. The choice will depend on information provided to you by your ISP. Options available on the DSL-524T are **PPPoE/PPPoA**, **Dynamic IP Address**, **Static IP Address**, and **Bridge Mode**. Simply click the corresponding radio button and click **Next** to go on to the configuration window for that choice.



Set Internet Connection Type window

Step 2:1 PPPoE/PPPoA

PPP or Point-to-Point protocol is a standard method of establishing a network connection/session between networked devices. Different forms of PPP include PPPoA and PPPoE, and they involve an authentication process that requires a username and password to gain access to the network. PPPoE (Point to Point Protocol over Ethernet), as described in RFC 2516, is a method of using PPP through the Ethernet network. PPPoA (Point to Point Protocol over ATM) configuration requires the same basic information as the previously discussed PPPoE and both configuration windows are identical. Notice the VPI and VCI values are included.

To configure the connection for PPPoE/PPPoA, perform the steps listed below. Some of the settings do not need to be changed the first time the device is set up, but can be changed later if you choose. After setting the values listed, click the **Next** button to go to Step 3 of the Configuration Wizard.

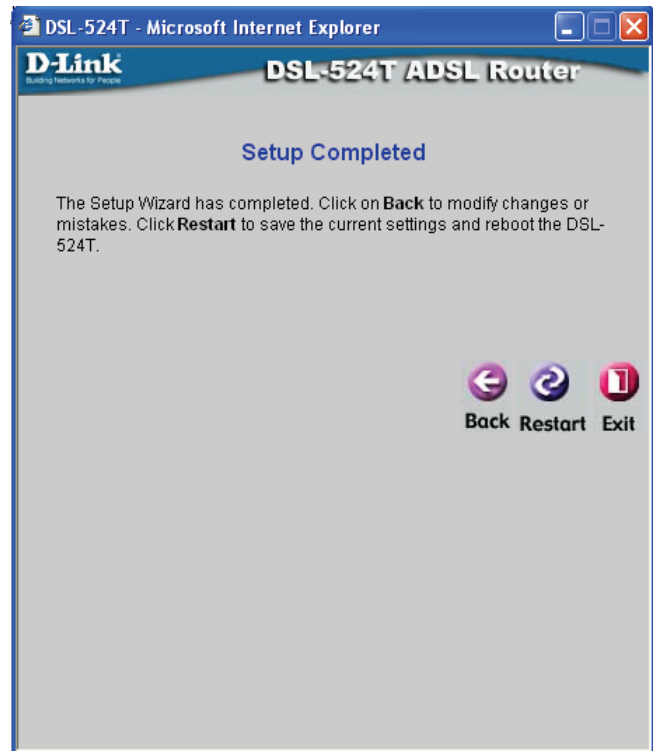


Set PPPoE/PPPoA window

VPI/VCI	If you are told to change the VPI or VCI values, type in the values given to you by your service provider. Many users will be able to use the default settings.
Username & Password	Type the Username and Password used to verify the identity of your account. Typically, the Username is an account number assigned by your ISP. See your ISP for further information.
Connection Type	Choose between <i>PPPoE LLC</i> , <i>PPPoA LLC</i> or <i>PPPoE VC-Mux</i> depending on the instructions of your ISP.

Step 3: Restart

In the following window, the user must restart the system to save the settings implemented or go back to choose another option to configure.



Step 2.2 Dynamic IP Address

Choosing the third option and clicking **Next** will lead you to the following window to configure the Router for. Users choosing this option should have software located on their computer or other networking device to establish a connection between you and your ISP. DHCP allows the user to set the Router so it will automatically set IP addresses for other devices on the LAN. For this option, you may change the PVC (Permanent Virtual Channel) settings, which are defined by two numbers, the **VPI** (Virtual Path Indicator) and the **VCI** (Virtual Channel Indicator). These two values should be provided to you by your ISP. In most cases, the default settings are correct and need not be altered. The second setting is the **Connection Type** by using the pull-down menu. The two choices available to the user here are *1483 Bridged IP LLC* and *1483 Bridged IP VC-Mux*, and this correct choice should also be provided to you by your ISP. The **Cloned MAC Address** field is used to copy the MAC Address of your Ethernet Adapter to the router. Simply enter the **MAC Address** into the space provided and click the **Clone Mac Address** button. After setting the values listed, click the **Next** button to go to Step 3 of the Configuration Wizard.

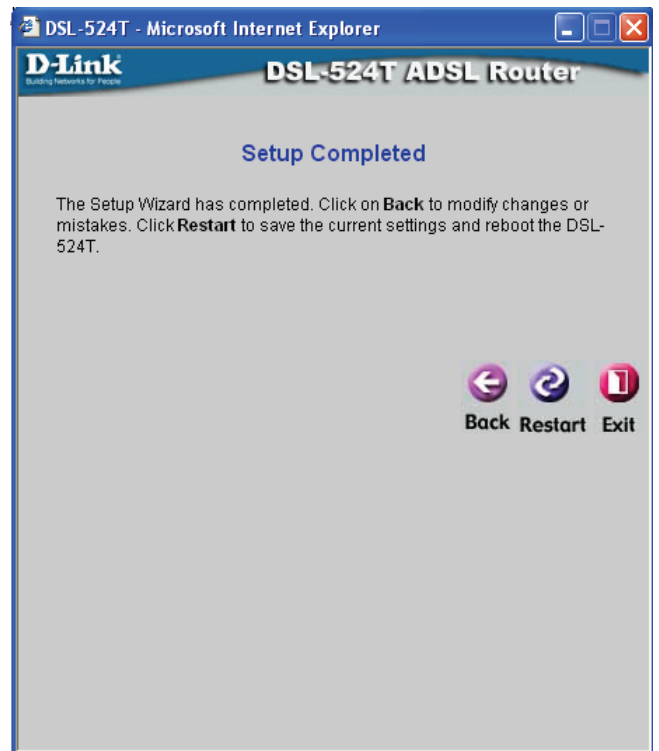
The screenshot shows a web browser window titled "DSL-524T - Microsoft Internet Explorer" displaying the "DSL-524T ADSL Router" configuration page. The page has a blue header with the D-Link logo and the title "DSL-524T ADSL Router". Below the header, the section "Set Dynamic IP Address" is displayed. A text box explains: "The Clone MAC Address is used to copy the MAC address of your Ethernet adapter to the DSL-524T. Click Next to continue." The form contains the following fields and controls:

- VPI**: A text box containing the value "8".
- VCI**: A text box containing the value "35".
- Connection Type**: A pull-down menu showing "1483 Bridged IP LLC".
- Cloned MAC Address**: A text box that is currently empty.
- Clone MAC Address**: A button located below the Cloned MAC Address text box.
- Navigation buttons**: Three buttons at the bottom right: "Back" (with a left arrow), "Next" (with a right arrow), and "Exit" (with a red square icon).

Set Dynamic IP Address

Step 3: Restart

In the following window, the user must restart the system to save the settings implemented or go back to choose another option to configure.



Step 2.3: Static IP Address

The following window is used to set the Static IP mode for the Router. A Static IP address is used whenever a known static IP is assigned. The accompanying information such as the Subnet mask, ISP Gateway Address and DNS servers should also be specified in order to be able to connect. These are the servers would enable you to have access to other web servers. Valid IP addresses range from 1.0.0.1 to 255.255.255.255.

To configure the connection for Static, perform the steps listed below. Some of the settings do not need to be changed the first time the device is set up, but can be changed later if you choose. After setting the values listed, click the **Next** button to go to Step 3 of the Configuration Wizard.

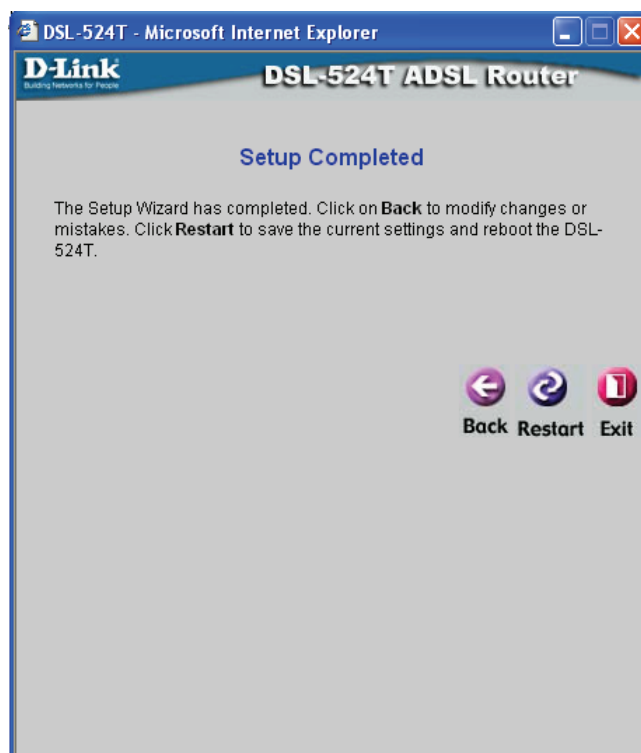
Set RFC2684 Bridged Static IP window

VPI/VCI	If you are told to change the VPI or VCI values, type in the values given to you by your service provider. Many users will be able to use the default settings.
IP Address	Enter the IP address based on the information provided to you by your ISP.
Subnet Mask	Enter the Subnet Mask based on the information provided to you by your ISP.
ISP Gateway Address	Enter the Default Gateway based on the information provided to you by your ISP.
ARP Server Address	For IPoA (Classic IP over ATM) connections you may need to type in an additional IP address for an ARP Server Address . If you are using an IPoA connection, ask your ISP if it is necessary to use an ARP (Address Resolution Protocol) server.
Primary DNS Address	This entry is for the IP address of your primary domain name server, which should also be provided to you by your ISP. The router will first try the Primary DNS Address to resolve a website's URL IP address. If this IP address fails, the router will then try the Secondary DNS Address .
Secondary DNS Address	The IP address of the secondary domain name server will be used to resolve a website's URL IP address if the Primary DNS Address fails. The information in this field should also be provided by your ISP.

Connection Type	There are four Connection Types set in the router to be chosen by using the pull-down menu and they are <i>1483 Bridged IP LLC</i> , <i>1483 Bridged IP VC-Mux</i> , <i>1483 Routed IP LLC</i> , <i>1483 Routed IP VC-Mux</i> and <i>IPoA</i> . The correct choice should be told to you by your ISP.
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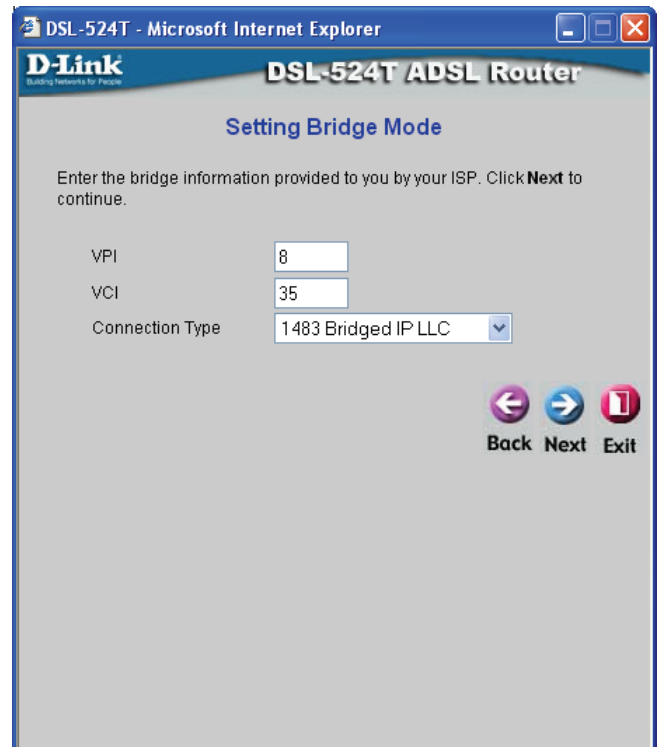
Step 3: Restart

In the following window, the user must restart the system to save the settings implemented, or go back to choose another option to configure.



Step 2.4: Bridge Mode

Bridge Mode is for users who have software on their computer or other network device to accept the connection from your ISP. You may change the PVC (Permanent Virtual Channel) settings, which are defined by two numbers, the **VPI** (Virtual Path Indicator) and the **VCI** (Virtual Channel Indicator). These two values should be provided to you by your ISP. In most cases, the default settings are correct and need not be altered. The second setting is the **Connection Type**, selected by using the pull-down menu. The two choices available to the user here are *1483 Bridged IP LLC* and *1483 Bridged IP VC-Mux*, and this correct choice should also be provided to you by your ISP. After setting the values listed, click the **Next** button to go to Step 3 of the Configuration Wizard.

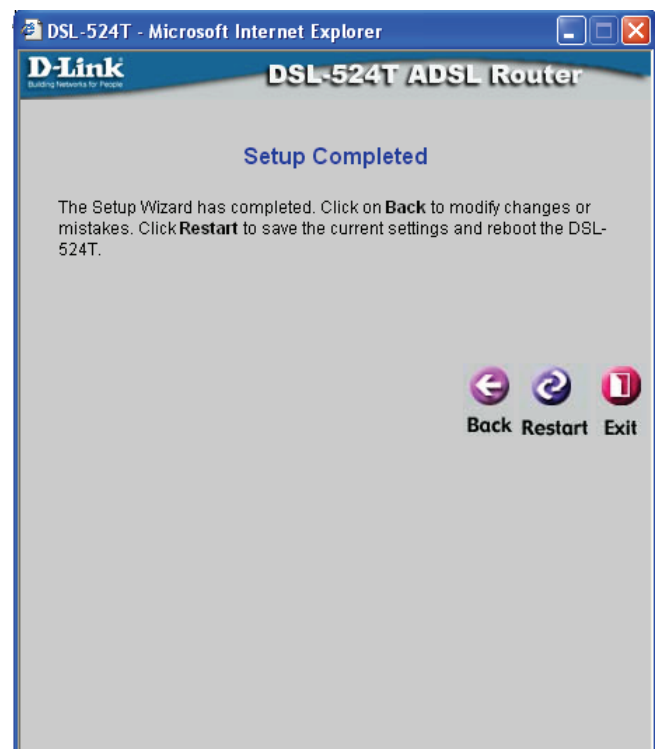


The screenshot shows the 'Setting Bridge Mode' page in a Microsoft Internet Explorer window titled 'DSL-524T - Microsoft Internet Explorer'. The page header includes the D-Link logo and 'DSL-524T ADSL Router'. The main heading is 'Setting Bridge Mode'. Below it, a message says: 'Enter the bridge information provided to you by your ISP. Click **Next** to continue.' There are three input fields: 'VPI' with the value '8', 'VCI' with the value '35', and 'Connection Type' with a dropdown menu showing '1483 Bridged IP LLC'. At the bottom right, there are three buttons: 'Back' (left arrow), 'Next' (right arrow), and 'Exit' (stop sign).

Set 1483 Bridged IP LLC

Step 3: Restart

In the following window, the user must restart the system to save the settings implemented, or go back to choose another option to configure.




The screenshot shows the 'Setup Completed' page in a Microsoft Internet Explorer window titled 'DSL-524T - Microsoft Internet Explorer'. The page header includes the D-Link logo and 'DSL-524T ADSL Router'. The main heading is 'Setup Completed'. Below it, a message says: 'The Setup Wizard has completed. Click on **Back** to modify changes or mistakes. Click **Restart** to save the current settings and reboot the DSL-524T.' At the bottom right, there are three buttons: 'Back' (left arrow), 'Restart' (circular arrow), and 'Exit' (stop sign).


Home

This tab in the Web Manager will allow the user to set up various configurations in order to connect your Router to the Internet. Much of the information necessary in these windows must be supplied to you by your ISP. Remember to use the key words in bold when asking your ISP for information. This will make your ISP's job easier and therefore your configuration of the modem, much simpler and quicker. Windows to configure under the **Home** tab include **WAN**, **LAN**, **DHCP**, **DNS**, and **Dynamic DNS**.

WAN Configuration

WAN is short for Wide Area Network. The WAN settings can be referred to as the Public settings. All IP information in the WAN settings is public IP addresses, which is accessible on the Internet. There are eight PVCs pre-configured on this Router and upon initial connection, the appropriate settings should automatically be set for you. Altering any of these fields should only be done if specified by your ISP, who should have all the configuration settings necessary for your connection.

**DSL-524T**
ADSL Router


Wizard
WAN
LAN
DHCP
DNS
Dynamic DNS
Logout




Home **Advanced** **Tools** **Status** **Help**

ATM VC Setting
PVC
VPI
VCI
Virtual Circuit
WAN Setting

PPPoE/PPPoA
User Name
Password
Connection Type
MTU bytes
MRU bytes
Default Route
NAT
Firewall
IP Control
Static IP

Connection Setting
☒ Always ON
☐ Connection On Demand
☐ Manual
Recommended
Connection will close if idle for minutes
Use Connect/Disconnect button in Status/Device Info page only

ATM
Service Category
PCR kbps
SCR kbps
CDVT uSeconds
MBS Cells

  
Apply Cancel Help

Home – WAN window for PPPoE/PPPoA

ATM VC Setting

The first section of the WAN configuration pages offers fields to set general values for any Virtual Channel chosen for connection to your ISP. This section holds the following fields to configure.

PVC: Leave this set at the default value 1 the first time the Router is set up. The Router has been pre-configured for seven PVCs. The PVC for you should be enabled when you have made your first connection to the Internet. The configured settings for this can be viewed under the **Status** tab, under **Device Info**.

VPI: If instructed to change this, type in the VPI value for the initial connection.

VCI: If instructed to change this, type in the VCI value for the initial connection.

Virtual Circuit: This enables the PVC connection on your Router. Select *Enabled* from the pull-down menu to enable the selected PVC.

WAN Settings

The WAN Settings section of this window will allow users to select the type of connection to be used by the router to establish a connection between you and your ISP. Choosing a WAN type will change the window and new settings will appear for the user to configure. The proper selection should be given to you by your ISP.

PPPoE/PPPoA

Selecting this option in the WAN Settings will change your window to look like the one seen below. PPP or Point-to-Point protocol is a standard method of establishing a network connection/session between networked devices. Different forms of PPP include PPPoA and PPPoE, and they involve an authentication process that requires a username and password to gain access to the network. PPPoE (PPP over Ethernet), as described in RFC 2516, is a method of using PPP through the Ethernet network. PPPoA (PPP over ATM) configuration is over ATM and requires the same basic information as the previously discussed PPPoE. Both configuration windows are identical.




To configure the connection for PPPoE/PPPoA, perform the steps listed below. Some of the settings do not need to be changed the first time the device is set up, but can be changed later if you choose.

Username & Password	Type the Username and Password used to verify the identity of your account. Typically, the Username is an account number assigned by your ISP. See your ISP for further information.
Connection Type	Choose among <i>PPPoE LLC</i> , <i>PPPoA LLC</i> or <i>PPPoE VC-Mux</i> , depending on the instructions of your ISP.
MTU	The Maximum Transmission Unit (MTU) is a link layer restriction on the maximum number of bytes of data that can be sent in a single transmission. The default size is <i>1400</i> bytes per packet.
MRU	The Maximum Receive Unit (MRU) field indicates the maximum number of bytes that can be received by the Router. This MRU's default size is <i>1492</i> bytes per packet. Upon initial negotiation with your ISP, the Router will tell the ISP that the amount entered here is the largest packet allowed to be accepted by the Router.
Default Route	Click the corresponding radio button if you wish to enable or disable the Default Route. The Default Route is used for outgoing packets, which have an unresolved IP address. If the Router is unable to match the destination address on a received packet with a destination address in the routing table, the Router uses the default route.
NAT	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. Use the pull-down menu to enable or disable NAT on the Router.
Firewall	The Firewall allows the Router to enforce policies to protect against certain kinds of attacks. To enable the firewall on the Router, use the pull-down menu and select <i>Enabled</i> .
IP Control	This field allows the user to control the WAN IP address of the router. There are three choices for the user: <i>Dynamic IP</i> – Select this option if you wish to have an IP address automatically assigned to the router. <i>Unnumbered IP</i> – Select this option if your ISP has assigned a block of IP addresses for use. <i>Static IP</i> – Select this option if you know the IP address assigned to the router. After selecting this option, the user must enter the known Static IP address in the following field. A Static IP address is used whenever a known static IP is assigned.
Static IP	This field states the Static IP Address of the Router and can only be configured when Static IP is chosen in the previous field.
Connection Setting	This field has three options for the connection setting of the PPP protocol. <ul style="list-style-type: none"> • Always On – Clicking this radio button will set the connection to always be connected. • Connection on Demand – Clicking this radio button will set the Router to connect to the Internet only when requested to by your computer. • Manual – Clicking this radio button will set the router to only connect when the user clicks the connect button in the previous field.

Click **Apply** to implement the PPPoE settings for the DSL-524T.

Dynamic IP Address

Selecting this option in the WAN Settings will change your screen to look like the one seen below. Users choosing this option should have software located on their computer or other networking device to establish a connection between you and your ISP. The Connection Type is chosen by using the pull-down menu. The two choices available to the user here are *1483 Bridged IP LLC* and *1483 Bridged IP VC-Mux*, and this correct choice should also be provided to you by your ISP. The **Cloned MAC Address** field is used to copy the MAC Address of your Ethernet Adapter to the router. Simply enter the **MAC Address** into the space provided and click the **Clone Mac Address** button. The Maximum Transmission Unit (**MTU**) is a link layer restriction on the maximum number of bytes of data in a single transmission. The default size is *1400* bytes per packet. 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. To enable NAT on the Router, use the pull-down menu and select *Enabled*. The **Firewall** allows the Router to enforce policies to protect against certain kinds of attacks. To enable the firewall on the Router, use the pull-down menu and select *Enabled*.

Home	Advanced	Tools	Status	Help
ATM VC Setting				
PVC	Pvc0 ▾			
VPI	8			
VCI	35			
Virtual Circuit	Enabled ▾			
WAN Setting	Dynamic IP Address ▾			
Dynamic IP				
Connection Type	1483 Bridged IP LLC ▾			
Cloned MAC Address	00:50:BA:F4:A9:74			
Cloned MAC Address	<input type="button" value="Clone MAC Address"/>			
MTU	1400 bytes			
NAT	Enabled ▾			
Firewall	Enabled ▾			
ATM				
Service Category	UBR ▾			
PCR	<input type="text"/> kbps			
SCR	<input type="text"/> kbps			
CDVT	<input type="text"/> uSeconds			
MBS	<input type="text"/> Cells			
<div> Apply  Cancel  Help</div>				

WAN Settings window for Dynamic IP Address

Click **Apply** to set the Dynamic IP settings for your DSL-524T.

Static IP Address

Selecting this option in the WAN Settings will change your window to look like the one seen below. A Static IP address is used whenever a known static IP is assigned. The accompanying information such as the Subnet mask, ISP Gateway Address and DNS servers should also be specified in order to be able to connect. These are the servers would enable you to have access to other web servers. Valid IP addresses range from 1.0.0.1 to 255.255.255.255. All information to be entered in this window must be provided to you by your ISP.

The screenshot shows the WAN Settings window for Static IP Address configuration. The window has a navigation bar at the top with tabs: Home, Advanced, Tools, Status, and Help. The 'Advanced' tab is selected. The main content area is divided into three sections: ATM VC Setting, Static IP, and ATM.

ATM VC Setting

- PVC: Pvc0 (dropdown)
- VPI: 8 (text input)
- VCI: 35 (text input)
- Virtual Circuit: Enabled (dropdown)
- WAN Setting: Static IP Address (dropdown)

Static IP

- Connection Type: 1483 Routed IP LLC (dropdown)
- IP Address: 0.0.0.0 (text input)
- Subnet Mask: (text input)
- Gateway Address: (text input)
- ARP Server Address: 0.0.0.0 (text input)
- Primary DNS Address: 168.95.1.1 (text input)
- Secondary DNS Address: (text input)
- MTU: 1400 bytes (text input)
- NAT: Enabled (dropdown)
- Firewall: Enabled (dropdown)

ATM

- Service Category: UBR (dropdown)
- PCR: (text input) kbps
- SCR: (text input) kbps
- CDVT: (text input) uSeconds
- MBS: (text input) Cells

At the bottom right, there are three buttons: Apply (green checkmark icon), Cancel (orange X icon), and Help (red plus icon).

WAN Settings window for Static IP Address

This window holds the following fields for the user to configure.

Connection Type	This field allows the user to choose the connection type used to connect your router to your ISP. The user may choose among <i>1483 Bridged IP LLC</i> , <i>1483 Bridged IP VC-Mux</i> , <i>1483 Routed IP LLC</i> and <i>1483 Routed IP VC-Mux</i> . The correct choice should be told to you by your ISP.
IP Address	Enter the IP address based on the information provided to you by your ISP.
Subnet Mask	Enter the Subnet Mask based on the information provided to you by your ISP.
Gateway Address	Enter the Default Gateway based on the information provided to you by your ISP.
Primary DNS Address	This entry is for the IP address of your primary domain name server, which should also be provided to you by your ISP. The router will first try the Primary DNS Address to resolve a website's URL IP address. If this IP address fails, the router will then try the Secondary DNS Address .
Secondary DNS Address	The IP address of the secondary domain name server will be used to resolve a website's URL IP address if the Primary DNS Address fails. The information in this field should also be provided by your ISP.
MTU	The Maximum Transmission Unit (MTU) is a link layer restriction on the maximum number of bytes of data in a single transmission. The default size is <i>1400</i> bytes per packet.
NAT	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. Use the pull-down menu to enable or disable NAT on the Router.
Firewall	The Firewall allows the Router to enforce policies to protect against certain kinds of attacks. To enable the firewall on the Router, use the pull-down menu and select <i>Enabled</i> .

Click **Apply** to set the Static IP address for the DSL-524T.

Bridge Mode

Selecting this option in the WAN Settings will change your window to look like the one seen below. **Bridge Mode** is for users who have software on their computer or other network device to accept the connection from your ISP. The **Connection Type** setting is selected by using the pull-down menu. The two choices available to the user here are *1483 Bridged IP LLC* and *1483 Bridged IP VC-Mux*, and this correct choice should be provided to you by your ISP.

Home	Advanced	Tools	Status	Help
ATM VC Setting				
PVC	Pvc0 ▾			
VPI	8			
VCI	35			
Virtual Circuit	Enabled ▾			
WAN Setting	Bridge Mode ▾			
Bridge Mode				
Connection Type	1483 Bridged IP LLC ▾			
ATM				
Service Category	UBR ▾			
PCR	<input type="text"/> kbps			
SCR	<input type="text"/> kbps			
CDVT	<input type="text"/> uSeconds			
MBS	<input type="text"/> Cells			
<div>Apply Cancel Help</div>				

WAN Settings window for Bridge Mode

Click **Apply** to implement the Bridge Mode settings for the DSL-524T.

ATM

This section of the WAN window allows the user to adjust ATM Quality of Service (QoS) or traffic parameters to suit specific traffic requirements. For applications or circumstances where packet loss or packet delay are a concern, ATM QoS can be adjusted to minimize problems. For most accounts, it will not be necessary to change these settings. Altering QoS settings can adversely affect performance of some commonly used Internet applications.

If you plan to change QoS or traffic parameters, contact your ISP or network services provider for information on what types of adjustment are available or possible for your account. Your ISP may not support the class of service you want to use.

ATM settings for the WAN interface

Service Category: This field represents the QoS (Quality of Service) feature for the Router. The choices available from the pull-down menu include UBR (Unspecified Bit Rate), CBR (Constant Bit Rate) and VBR (Variable Bit Rate). These values should already be set for you and should not be changed unless specified by your ISP.

- **UBR** – Unspecified Bit Rate, this is the default category used for general-purpose Internet traffic where normal levels of packet loss and delay are acceptable. For some applications or for multiple connection accounts, it may be desirable to specify the PCR.
- **CBR** – Constant Bit Rate, usually used in circumstances where very low packet loss and very low Cell Delay Variable (CDV) are desirable.
- **VBR** – Variable Bit Rate, usually used when network traffic is characterized by bursts of packets at variable intervals, and some moderate packet loss and delay is acceptable. This category is typically used for audio and video applications such as teleconferencing. The network must support QoS Class 2 to use VBR.

PCR: Peak Cell Rate refers to the Bandwidth control on your Router. This field allows you to enter a value representing the maximum bps (bits per second) the Router can receive. This field is limited by the stream coming from your ISP.

SCR: Sustained Cell Rate refers to the Bandwidth control on your Router. This field allows you to enter a value representing the minimum bps (bits per second) the Router can receive.

CDVT: Cell Delay Variation Tolerance is a measure of the cell clumping phenomenon by which cells are delayed in the network and are negotiated.

Increasing the CDVT creates greater bucket depth.

MBS: Maximum Burst Size is the maximum number of bytes that can be sent continuously from the source to the destination dropping any packets. Some ATM providers set the MBS and CDVT very low and adjust up if problems occur.

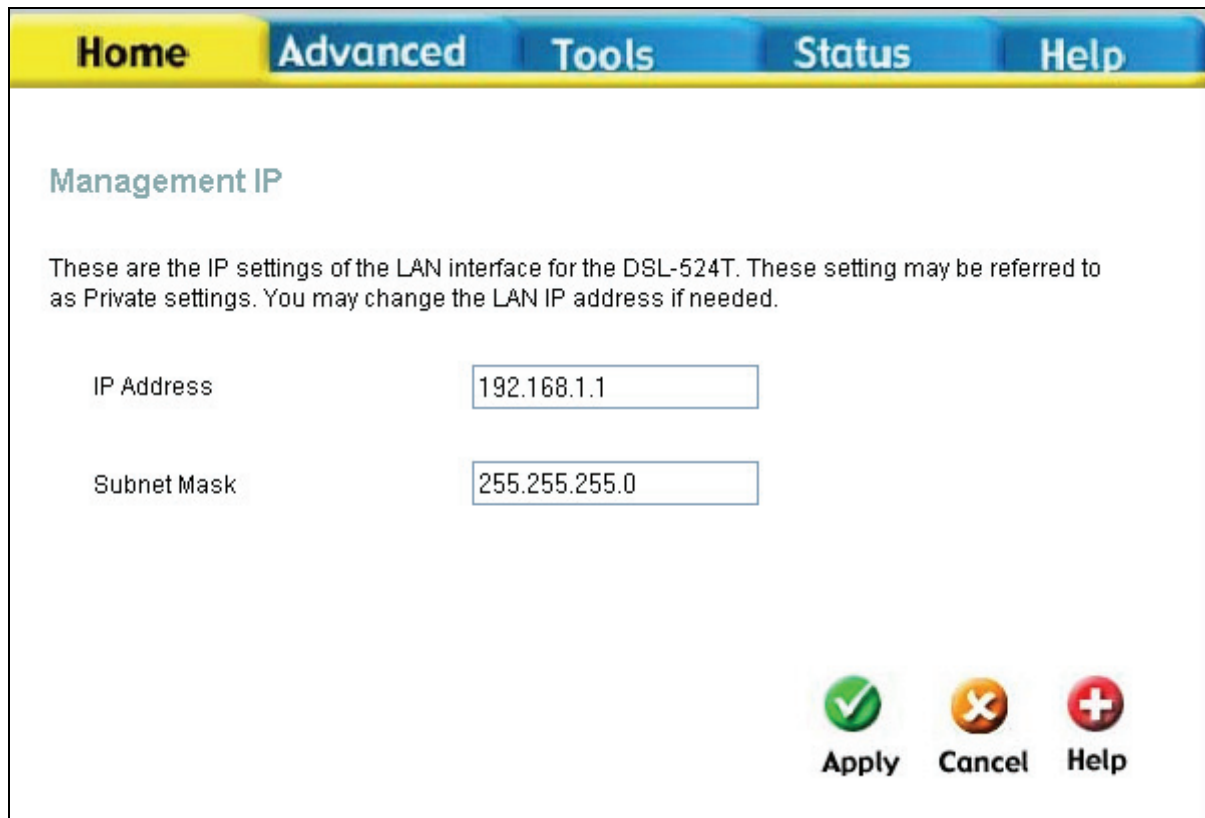
After making the changes to this window, click **Apply** to let your changes take effect.

LAN Configuration

LAN is short for Local Area Network. This is considered your internal network. These are the IP settings of the LAN interface for the DSL-524T and may be referred to as Private settings. You may change the LAN IP address if needed. The LAN IP address is private to your internal network and cannot be seen on the Internet.

IP Address: The IP address of the LAN interface. The default IP address is 192.168.1.1.

Subnet Mask: The subnet mask of the LAN interface. The default subnet mask is 255.255.255.0.



The screenshot shows the 'Management IP' configuration window. At the top is a navigation bar with tabs: 'Home' (yellow), 'Advanced' (blue), 'Tools' (blue), 'Status' (blue), and 'Help' (blue). Below the tabs, the title 'Management IP' is displayed in blue. A paragraph explains that these are the IP settings of the LAN interface, referred to as Private settings, and that the IP address can be changed. Below this, there are two input fields: 'IP Address' with the value '192.168.1.1' and 'Subnet Mask' with the value '255.255.255.0'. At the bottom right, there are three buttons: 'Apply' (green checkmark icon), 'Cancel' (orange 'X' icon), and 'Help' (red plus icon).

Management IP window

Click **Apply** to implement changes made to this window.

DHCP

Dynamic Host Configuration Protocol (DHCP) allows the gateway to automatically obtain the IP address from a DHCP server on the service provider's network. The service provider assigns a global IP address from a pool of addresses available to the service provider. Typically the IP address assigned has a long lease time, so it will likely be the same address each time the Router requests an IP address. If DHCP is not enabled on the Router, it is necessary for the user to assign a static IP address at each computer on your LAN.

Home **Advanced** **Tools** **Status** **Help**

DHCP Settings

The device can be setup as a DHCP Server to distribute IP addresses to the LAN network.

☐ No DHCP Choose this option. The IP address must be manually assigned at each device connected to DSL-524T.

☒ DHCP Server Choose this option to setup as a DHCP server to distribute IP addresses to the LAN network.

DHCP Server

Starting IP Address: 192.168.1.2

Ending IP Address: 192.168.1.254

Lease Time: 3600 seconds

DNS Mode: ☒ Auto ☐ Manual

Primary DNS: 192.168.1.1

Secondary DNS:

Static IP Assignment

	MAC address	IP address
Static IP1:		
Static IP2:		
Static IP3:		
Static IP4:		
Static IP5:		

Enter MAC address format as xx-xx-xx-xx-xx-xx, i.e: 00-0C-6E-D5-11-22, and IP address format as yy.yy.yy.yy, i.e: 192.168.1.2

Apply
 Cancel
 Help

DHCP Clients List

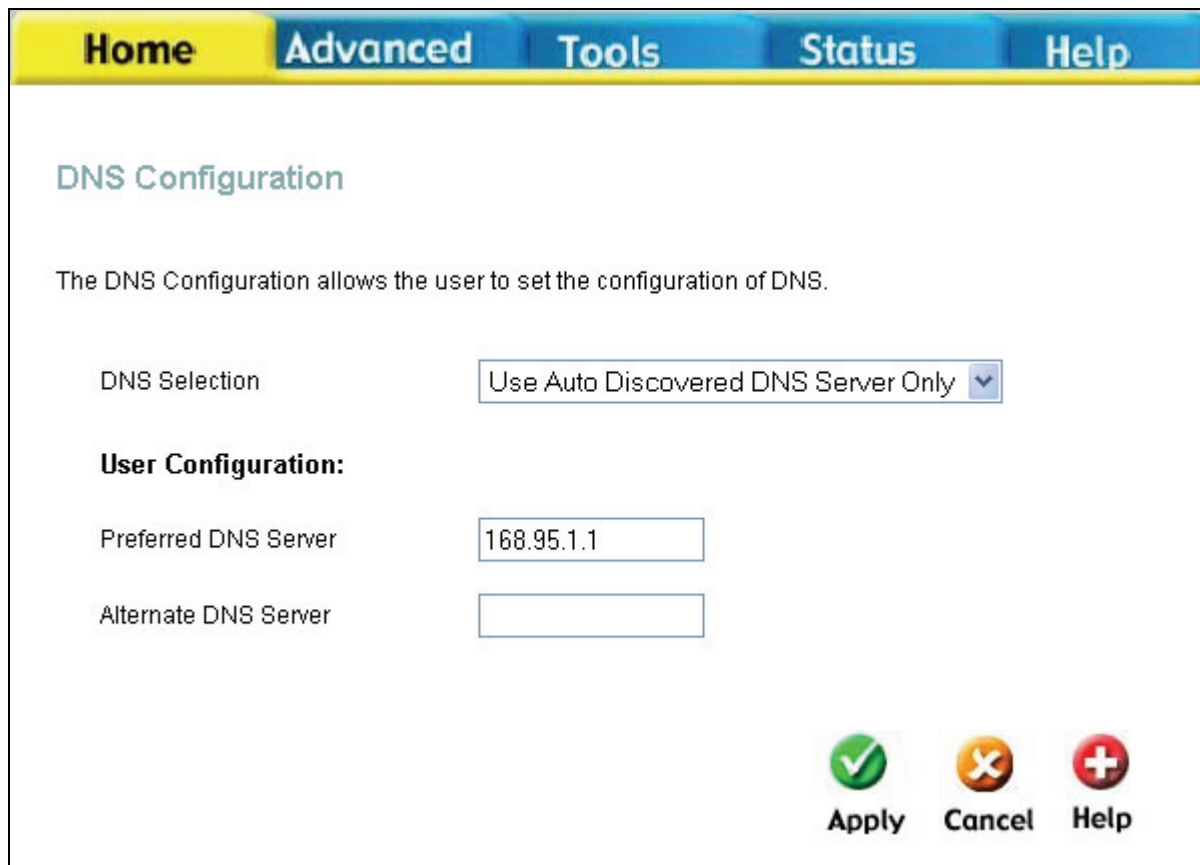
No DHCP Clients Available

DHCP Settings window

To setup DHCP for your LAN, first enable the Router as a DHCP server by clicking the corresponding **DHCP Server** radio button in the window above and enter the **Starting IP Address** and **Ending IP address** to create a pool of IP addresses to be assigned to other end nodes (computers, routers, etc.) on the LAN. The **Lease Time** field is the time the Server will set for devices using DHCP to re-request an IP Address. When using the Router in DHCP mode you may also configure **DNS** settings for the LAN. Click the **DNS Mode** radio button to auto to allow the Router to automatically relay DNS settings to properly configured DHCP clients. Click Manual to manually enter the Primary and Secondary DNS IP addresses. When the Router has been enabled as DHCP Server the administrator of the server can assign a **Static IP** address to each computer on the LAN from the workstation where the DHCP server has been enabled. To assign a Static IP address to a computer on the LAN, enter the IP and MAC address in the Static IP Assignment field. Click **Apply** to implement information set in this table.

DNS

DNS or Domain Name Server is a system that translates Domain Names into IP addresses. Setting up a DNS will allow the router to contact the DNS to ask it to translate and find a web site you have entered. The following window allows you to set two DNS servers by their IP addresses and these IP addresses should be supplied to you by your ISP.



DNS Configuration window

To configure the DNS for the Router, use the DNS Relay Selection pull down menu to select the DNS configuration for the router. There are three choices:

- **Disable DNS** – Selecting this option will disable the DNS function of your router.
- **Use Auto Discovered DNS Server Only** – This choice will enable the router to automatically find the DNS Server for your setup.
- **Use User Discovered DNS Server Only** – This choice will enable the DNS Servers entered in the Preferred DNS Server and Alternate DNS Server fields. These two IP addresses must be stated to you by your ISP.

The router will first try the **Preferred DNS Server** to resolve a website's URL IP address. If that IP address fails to resolve the URL, the Router will then try the **Alternate DNS Server**. Your ISP must provide this information to you. Click **Apply** to set the DNS configurations into the memory of the Router.

Dynamic DNS

The Router supports DDNS, a service that maps Internet domain names to IP addresses. DDNS serves a similar purpose to DNS in that DDNS allows anyone hosting a Web or FTP server to advertise a public name to prospective users. Unlike DNS that only works with static IP addresses, DDNS works with dynamic IP addresses, such as those assigned by an ISP or other DHCP server. DDNS is popular with home networkers, who typically receive dynamic, frequently-changing IP addresses from their service provider. To use DDNS, one simply signs up with a provider and installs network software on their host to monitor its IP address. Please see your ISP for further information.

The screenshot shows the 'Dynamic DNS Configuration' window. At the top is a navigation bar with tabs: 'Home' (yellow), 'Advanced' (blue), 'Tools' (blue), 'Status' (blue), and 'Help' (blue). Below the tabs, the title 'Dynamic DNS Configuration' is displayed in blue. A descriptive text states: 'The DDNS Configuration allows the user to set the configuration of DDNS.' The configuration area includes a 'DDNS Server' dropdown menu currently set to 'Disable DDNS Server'. Below this is a section titled 'User Configuration:' with three input fields: 'UserName' (containing 'UserName'), 'PassWord' (containing ten dots), and 'HostName' (containing 'HostName'). At the bottom right are three buttons: 'Apply' (green checkmark icon), 'Cancel' (orange 'X' icon), and 'Help' (red plus icon).

Dynamic DNS Configuration window

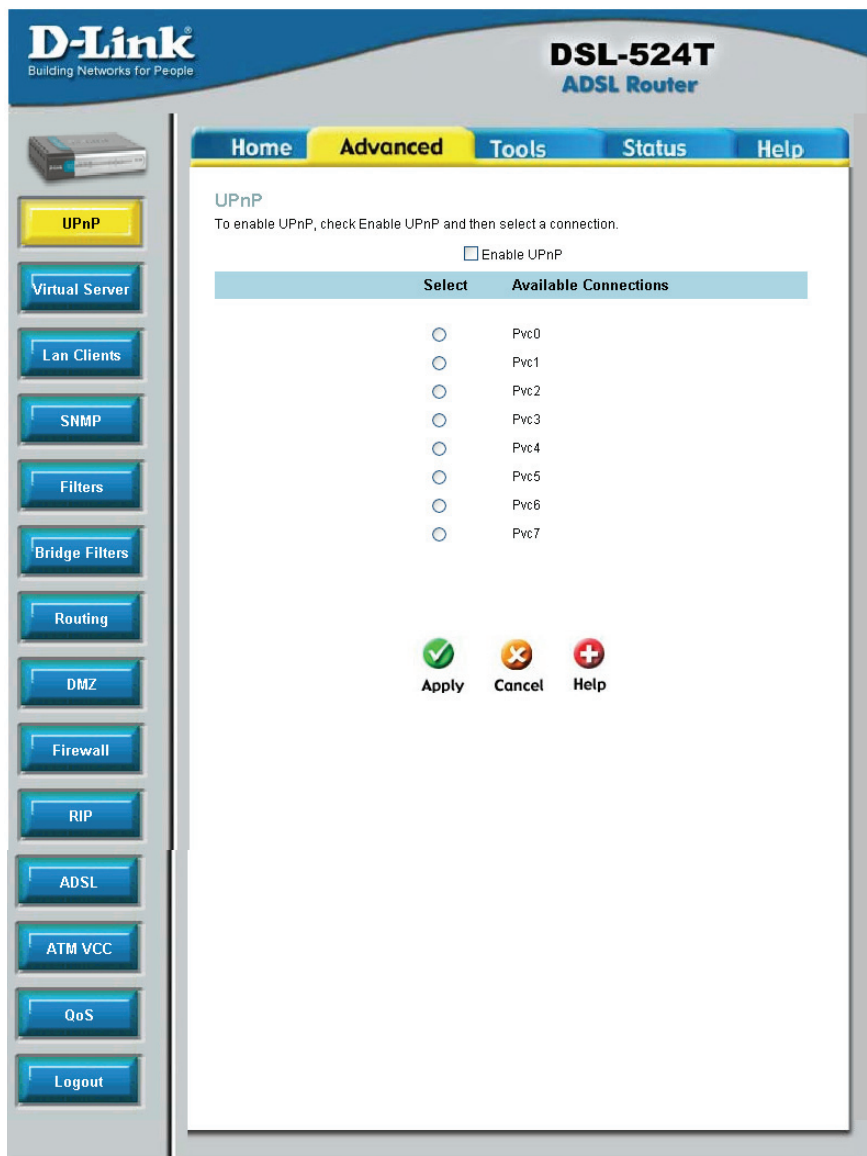
Advanced Configuration

The **Advanced** tab has thirteen windows for you to view and configure. The window buttons are **UPnP**, **Virtual Server**, **LAN Clients**, **SNMP**, **Filters**, **Bridge Filters**, **Routing**, **DMZ**, **Firewall**, **RIP**, **ADSL**, **ATM VCC**, and **QoS**.

UPnP

UPnP 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. DHCP and DNS service can also be used if available on the network. UPnP also allows supported devices to leave a network automatically without adverse effects to the device or other devices on the network.

UPnP can be supported by diverse networking media including Ethernet, Firewall, phone line, and power line networking.



UPnP window

To enable UPnP for any available connection, click to check the **Enable UPnP** selection box, select the connection or connections on which you will enable UPnP listed under **Available Connections** and click the **Apply** button.

Virtual Server

To view the following window, click on the **Advanced** tab at the top of the window and then click the **Virtual Server** button to the left. The **Virtual Server** will allow remote users access to various services outside of their LAN through a public IP address, such as FTP (File Transfer Protocol) or HTTPS (Secure Web). Select a connection type and enter an IP address for the virtual server. After configuring the Router for these features, the Router will redirect these external services to an appropriate server on the users' LAN. To choose a particular service click a radio button from the category list and highlight the service from the Available Rules list. Click **Add**, and then reboot to apply the rule.

The screenshot shows the 'Virtual Server' configuration window. At the top, there are tabs: 'Home', 'Advanced' (selected), 'Tools', 'Status', and 'Help'. Below the tabs, the title 'Virtual Server' is displayed. The configuration area includes a 'Connection' dropdown menu set to 'Pvc0' and a 'LAN IP' dropdown menu set to '192.168.1.3', with a 'New IP' button next to it. Below these are two main sections: 'Category' and 'Available Rules'. The 'Category' section has radio buttons for 'Games' (selected), 'VPN', 'Audio/Video', 'Apps', 'Servers', and 'User'. The 'Available Rules' section is a list box containing the following items: 'Alien vs Predator', 'Asheron's Call', 'Dark Rein 2', 'Delta Force', 'Doom', 'Dune 2000', 'DirectX (7,8) Games', 'EliteForce', 'EverQuest', and 'Fighter Ace II'. There are 'Add >' and '< Remove' buttons between the 'Available Rules' and 'Applied Rules' sections. The 'Applied Rules' section is an empty list box. At the bottom left, a message states: 'You must save settings and reboot to take effect.' At the bottom right, there are three buttons: 'Apply' (with a green checkmark icon), 'Cancel' (with an orange X icon), and 'Help' (with a red plus icon).

Virtual Server window

LAN Clients

The **LAN Clients** window is used when establishing port forwarding rules in the **Virtual Server** and **Filters** windows. This window can be accessed directly by clicking on the **LAN Clients** button in the **Advanced** tab. In order to use these advanced features it is necessary to have IP addresses available for configuration. If there are no IP addresses listed in the **LAN Clients** window, you will not be able to access the **Virtual Server** window.

Use the **LAN Clients** window to add or delete static IP addresses for the advanced functions mentioned above, or to Reserve a Dynamically assigned IP address for an advanced function. Dynamically assigned IP addresses will only be listed if DHCP is enabled on the Router.

The screenshot shows the 'LAN Clients' window within the router's configuration interface. At the top, there is a navigation bar with tabs: 'Home', 'Advanced' (which is highlighted in yellow), 'Tools', 'Status', and 'Help'. Below the navigation bar, the 'LAN Clients' section is titled. It contains two input fields: 'IP Address' and 'Host Name', each followed by a text box. Below these fields is a blue 'Add' button. Further down, it displays the 'Valid IP Range: 192.168.1.2 - 192.168.1.254'. There are two sections below: 'Static Addresses' and 'Dynamic Addresses'. Each section has a table with four columns: 'Delete', 'IP Address', 'Host Names', and 'Type'. The 'Static Addresses' table is currently empty. The 'Dynamic Addresses' table is also empty. At the bottom of the window, there are three icons: a green checkmark, an orange 'X', and a red plus sign. Below these icons are the labels 'Apply', 'Cancel', and 'Help' respectively.

LAN Clients window

To add a static IP address to the list of available IP addresses, type an IP address that falls within the range of available IP addresses and click on the **Add** button. Any addresses added will appear in the list of **Static Addresses** available for advanced configuration. To delete an IP address from the list of Static Addresses, click the **Delete** box for the address or addresses you want to eliminate and click on the **Apply** button.

Dynamically assigned IP addresses may be reserved so that the LAN IP address for the device does not expire. This will create a permanent entry for the device in the ARP table and in effect, it becomes a static IP address. Click to check the **Reserve** box for the address or addresses you want to reserve and click the **Apply** button. These reserved addresses will no longer be available for DHCP assignment and will be listed in the Static IP Addresses table.

SNMP

This window can be accessed directly by clicking on the **SNMP** button or hyperlink in the **Advanced** tab. Simple Network Management Protocol (SNMP) is an OSI Layer 7 Application designed specifically for managing and monitoring network devices. SNMP enables network management stations to read and modify the settings of gateways, routers, switches, and other network devices. Use SNMP to configure system features for proper operation, performance monitoring, and detection of potential problems in the Router or network.

Home	Advanced	Tools	Status	Help
------	----------	-------	--------	------

SNMP Management

☐ **Enable SNMP Agent**
☐ **Enable SNMP Traps**

Name:
 Location:
 Contact:




Vendor OID: 1.3.6.1.4.1.294

Community

Name	Access Right
<input type="text" value="public"/>	<input type="text" value="ReadOnly"/> ▼
<input type="text"/>	<input type="text"/> ▼
<input type="text"/>	<input type="text"/> ▼

Traps

Destination IP	Trap Community	Trap Version
<input type="text"/>	<input type="text"/>	<input type="text"/> ▼
<input type="text"/>	<input type="text"/>	<input type="text"/> ▼
<input type="text"/>	<input type="text"/>	<input type="text"/> ▼

 **Apply**
 **Cancel**
 **Help**

SNMP Management window

Under **SNMP Management**, enable or disable **SNMP Agent** or **SNMP Traps** by using the check boxes. An SNMP Agent is software that runs locally on the device. A defined set of variables (managed objects) is maintained by the SNMP agent and used to manage the device. Traps are messages that alert network personnel of events that occur on the Switch. The events can be as serious as a reboot (someone accidentally turned OFF the Switch), or less serious like a port status change. The Router generates traps and sends them to the trap recipient (or network manager). Typical traps include trap messages for Authentication Failure, Topology Change and Broadcast/Multicast Storms. In the **Name**, **Location** and **Contact** fields, enter the appropriate information of the Network Administrator. Under **Community**, enter the name of an SNMP community string that defines the relationship between the SNMP manager and an agent. The community string acts like a password to permit or deny access to an agent on the Router. The defining characteristic associated with the

community string is the **Access Right**. The agent's access right can be set as either read/write or read-only. Under **Traps** enter the **Destination IP address** and **Trap Community Name** so that the agent sends traps to the management server. The **Trap Version** can also be set to either *SNMP V1* (to specify that SNMP version 1 will be used) or *SNMPv2c*, which supports both centralized and distributed network management strategies. *SNMP V2c* includes improvements in the Structure of Management Information (SMI) and adds some security features.

Filters

The following window will aid the router's administrator in configuring filters for IP addresses. There are two types of filters that the administrator can configure. **Outbound Filters** are for administrators who wish to deny clients on their LAN from accessing certain virtual ports or IP addresses on the Internet. **Inbound Filters** are for administrators who wish to deny IP addresses or virtual ports from outside the router (on the Internet) from accessing the Internal LAN of the router. Click the corresponding radio button to configure Outbound or Inbound Filters. Both windows are identical in configuration.

Filters

Filters are used to allow or deny LAN or WAN users from accessing the internet or internal Network.

☒ Outbound Filter ☐ Inbound Filter

IP Outbound Filter

Filters are used to allow or deny LAN users from accessing the internet.

Source IP ~ Any IP

Destination IP ~ Any IP

Source Port ~ Any Port

Destination Port ~ Any Port

Protocol

Action

Apply Cancel Help

ID	Category	Source IP	Destination IP	Prot.	Act.	Enable
----	----------	-----------	----------------	-------	------	--------

Filters window

To configure filters for the router, configure the following fields and click **Apply**.

Source IP	Enter an IP address or range of addresses from which to block or allow packets. This field may also be used to block a set of subnet masks by using the corresponding pull- down menu.
Destination IP	Enter an IP address or range of addresses to which to block or allow packets from being sent. This field may also be used to block a set of subnet masks by using the corresponding pull-down menu.

Source Port	Enter a port or range of ports from which to block or allow packets. This field can only be configured if TCP or UDP is selected in the Protocol field. The Safe Range option in the pull-down menu is for ports that have a higher value than 1024.
Destination Port	Enter a port or range of ports to which to block or allow packets from being sent. This field can only be configured if TCP or UDP is selected in the Protocol field. The Safe Range option in the pull-down menu is for ports that have a higher value than 1024.
Protocol	Use the pull down menu to select the protocol type to be used for this filter. The user may choose between <i>TCP</i> , <i>UDP</i> or <i>TCP, UDP</i> .
Action	This field states allows the user to choose the course of action for this filter to take. The user may choose <i>Allow</i> to allow packets to be forwarded to end nodes configured in the previous fields. The user may choose <i>Deny</i> to block packets from being forwarded to end nodes configured in the previous fields.

Properly configured filters for the router will appear in the table in the bottom half of the filters window. Click **Apply** to set the filters configured for this router.

Bridge Filters

Bridge filters are used to block or allow various types of packets through the WAN 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.

Bridge Filters

☒ Enable Bridge Filters

Src MAC	Src Port	Dest MAC	Dest Port	Protocol	Mode
00-00-00-00-00-0	ANY	00-00-00-00-00-0	ANY	PPPoE Session	Deny

Src MAC	Src Port	Dest MAC	Dest Port	Protocol	Mode	Delete
---------	----------	----------	-----------	----------	------	--------

Bridge Filters window

To add a bridge filter rule, check **Enable Bridge Filters**, type in a Source MAC, a Destination MAC or both in the entry fields. Select *Any* to apply the rule to any protocol that the router receives. The user may also specify a protocol to be filtered by using the pull-down menu, and then choose either *Allow*, to allow the specified protocol to pass through the router, or *Deny* to filter the protocol from the router. The protocols that may be specifically allowed or denied to pass through the WAN interface are *IPv4*, *IPv6*, *RARP*, *PPPoE Discovery* and *PPPoE Session*. Click the **Add** button. The rule will appear in the entry field below as it is currently configured. To edit an existing rule, select the rule by clicking the corresponding **Edit** radio button. Make the desired changes and click the **Add** button. To remove a bridge filter from the table in the bottom half of the window, click to select the corresponding **Delete** box, and then click **Apply**. Remember to save the configuration changes.

Routing

Clicking the **Routing** tab will lead you to this window, which is used to manually enter a routing entry for the Router. Routing entries are used when known gateways and hops on the network are known to the user. Unless instructed by your ISP or if you have a greater knowledge of networking, this window should not be necessary to configure as the LAN IP settings should be sufficient for your connection.

Routing Table




IP Routes are used to define gateways and hops used to route data traffic. Most users will not need to use this feature as the previous gateway and LAN IP settings on your host computers should be sufficient.

Destination

Netmask

☒ Gateway

☐ Connection

Apply Cancel Help

ID	Destination	Netmask	Gateway	Interface
----	-------------	---------	---------	-----------

Routing Table window

The user may configure the following fields for Static routing on the router:

Destination	Enter the host IP address or the remote network that will be used for static routing on the router.
Netmask	Enter the Subnet Mask to be used for static routing.
Gateway	Enter the gateway device's IP address. This is an IP address of a device that will allow the user to contact the remote network or Host IP address. This field cannot be configured or used if the following field, Connection , has been selected.
Connection	Choose a PVC from the corresponding pull-down menu to be used for static routing. This field cannot be configured or used if the previous field, Gateway , has been selected.

Click **Apply** to set the routing information configured.

DMZ

Firewalls may conflict with certain interactive applications such as video conferencing or playing Internet video games. For these applications, a firewall bypass can be set up using a DMZ IP address. The DMZ IP address is a “visible” address and does not benefit from the full protection of the firewall function. Therefore it is advisable that other security precautions be enabled to protect the other computers and devices on the LAN. It may be wise to use isolate the device with the DMZ IP address from the rest of the LAN. For example, if you want to use video conferencing and still use a firewall, you can use the DMZ IP address function. In this case, you must have a PC or server through which video conferencing will take place. The IP address of this PC or server will then be the DMZ IP address. You can designate the server’s IP address as the DMZ by typing in the IP address in the **IP Address** space provided and then enabling its status by clicking the **Status Enabled** radio button and then click **Apply**. For the system that uses the DMZ IP address, you may want to manually assign an IP address to it and adjust your DHCP server addresses so that the DMZ IP address is not included in the DHCP server range. This way you avoid possible IP address problems if you reboot the DMZ system. To configure the Router’s DMZ IP address, click the **Advanced** tab at the top of the window and then the **DMZ** tab to the left.

The screenshot shows the DMZ configuration window. At the top, there is a navigation bar with tabs: Home, Advanced (highlighted in yellow), Tools, Status, and Help. Below the navigation bar, the title 'DMZ' is displayed. A descriptive text states: 'DMZ (Demilitarized Zone) is used to allow a single computer on the LAN to be exposed to the Internet.' Below this text, there are two radio buttons: 'Enabled' (unselected) and 'Disabled' (selected). Underneath the radio buttons, there is a label 'IP Address:' followed by a text input field containing '0.0.0.0'. At the bottom right of the window, there are three buttons: 'Apply' (with a green checkmark icon), 'Cancel' (with an orange 'X' icon), and 'Help' (with a red plus icon).

DMZ window

Click **Apply** when your configuration is complete.

Firewall

The DSL-524T ADSL Router comes equipped with a firewall. The **Firewall** configuration window allows the Router to enforce specific predefined policies intended to protect against certain common types of attacks. To configure the Router's firewall, click the **Advanced** tab at the top of the window and then the **Firewall** tab to the left.

Home **Advanced** **Tools** **Status** **Help**

Firewall Configuration

DoS Protection

DoS attacks can be checked based on your specific need.

State: ☐ Enabled ☒ Disabled

☐ SYN Flooding checking

☐ ICMP Redirection checking

Port Scan Protection

Port Scan attacks can be checked based on your specific need.

State: ☐ Enabled ☒ Disabled

☐ FIN/URG/PSH attack

☐ Xmas Tree attack

☐ Null Scan attack

☐ SYN/RST attack

☐ SYN/FIN attack

Service Filtering

The following services can be blocked based on your specific need.

☒ Ping from External Network

☒ Telnet from External Network

☒ FTP from External Network

☒ DNS from External Network

☒ IKE from External Network

☒ RIP from External Network

☒ DHCP from External Network

☐ ICMP from LAN

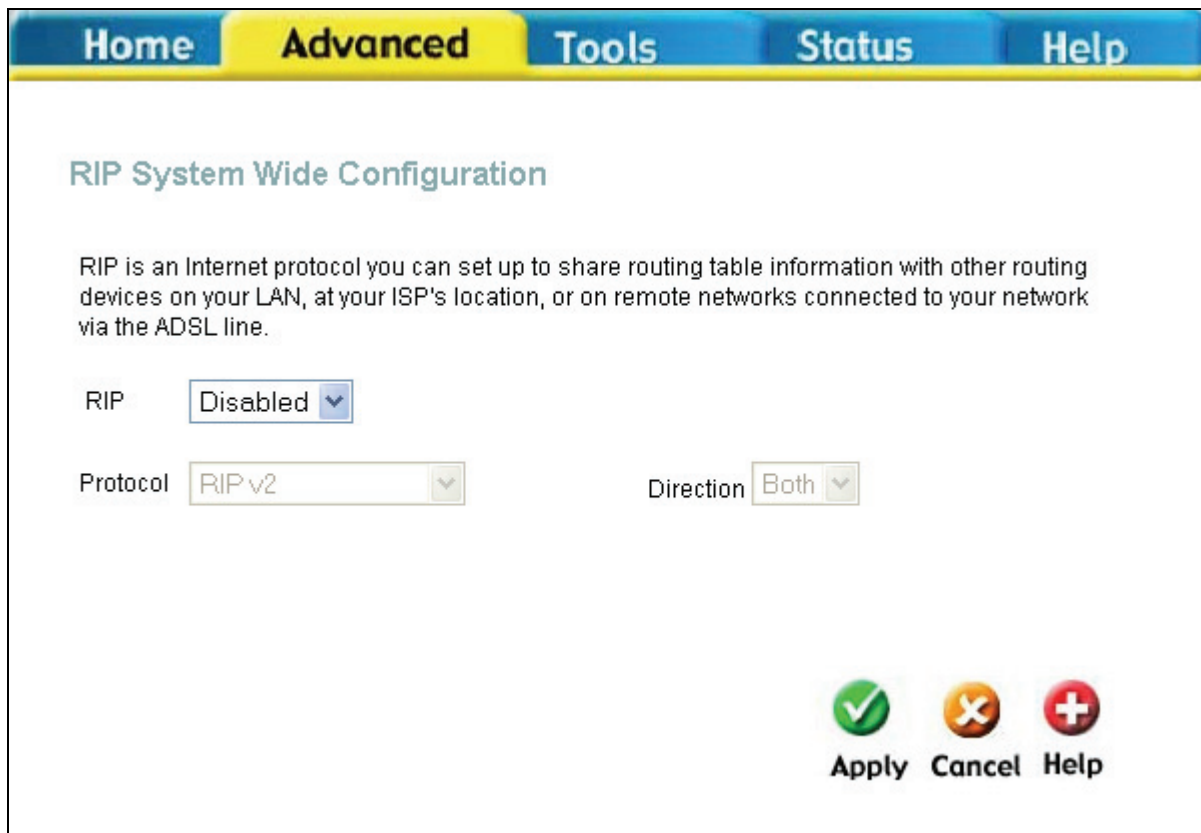
Apply **Cancel** **Help**

Firewall Configuration window

This window has three filtering options for you to choose, **DoS (Denial of Service) Protection**, **Port Scan Protection** and **Service Filtering**. **DoS Protection** and **Port Scan Protection** may be globally enabled on the Router and then may be modified to the users preference by checking the boxes in these sections. For **Service Filtering**, the user must choose which services to be filtered by the router using the corresponding check boxes. The user may choose any combination of these to use for firewalling. Click **Apply** to set these firewall rules to the routers memory.

RIP

The DSL-524T supports RIP v1 and RIP v2 used to share routing tables with other Layer 3 routing devices on the LAN, at your ISP's location or remote networks connected to your network through the ADSL line. The user may enable or disable RIP v1 (received and sent) or RIP v2. This will enable the router to send and receive RIP packets. Disabling the RIP function will disable the routing function of this device.



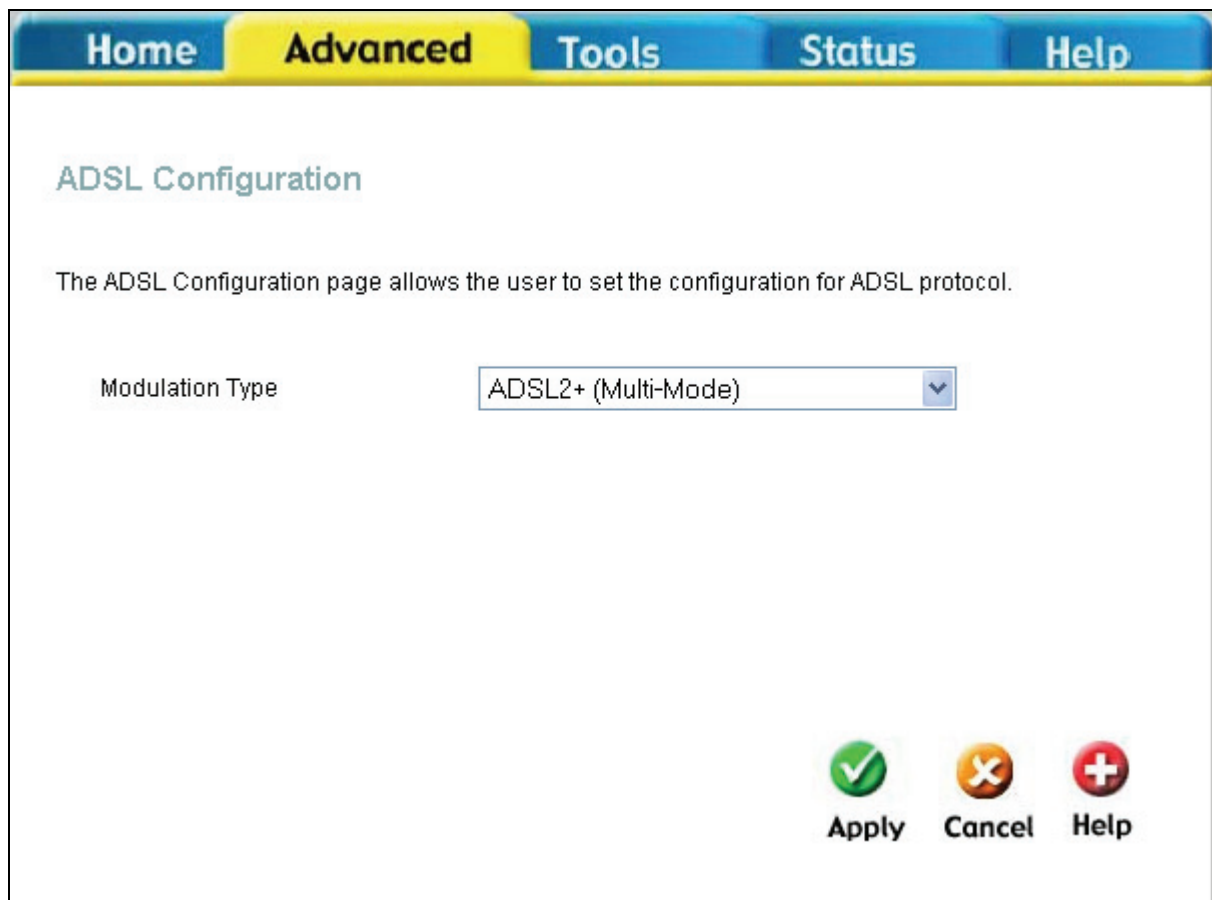
The screenshot shows a web interface with a navigation bar at the top containing five tabs: "Home", "Advanced", "Tools", "Status", and "Help". The "Advanced" tab is highlighted in yellow. Below the navigation bar, the main content area is titled "RIP System Wide Configuration". A descriptive text block states: "RIP is an Internet protocol you can set up to share routing table information with other routing devices on your LAN, at your ISP's location, or on remote networks connected to your network via the ADSL line." Below this text are three configuration fields: a "RIP" status dropdown menu set to "Disabled", a "Protocol" dropdown menu set to "RIP v2", and a "Direction" dropdown menu set to "Both". At the bottom right of the configuration area are three buttons: "Apply" (with a green checkmark icon), "Cancel" (with an orange 'X' icon), and "Help" (with a red plus icon).

RIP System Wide Configuration window

To configure RIP, first use the RIP pull-down menu to enable RIP on the Router. Then select the protocol to be used by using the pull-down menu. The choices are *RIP v1*, *RIPv1 Compatible* and *RIP v2*. Then the user must choose the direction by selecting *In*, *Out* or *Both*. After making the configuration choices for RIP, click the **Apply** button to set the configurations in the memory of the Router.

ADSL

This window will allow you to set the ADSL configuration protocol for the Router. You may choose the modulation type from the pull-down window. For most users, the default setting, *ADSL2+ (Multi-Mode)*, should be fine. Your ISP must provide this information to you. Click **Apply** after you have made the proper selection.






Home **Advanced** **Tools** **Status** **Help**

ADSL Configuration

The ADSL Configuration page allows the user to set the configuration for ADSL protocol.

Modulation Type

 **Apply**  **Cancel**  **Help**

ADSL Configuration window

ATM VCC

The **ATM VC Setting** window shows you the current WAN settings implemented on your Router under the heading ATM VCs List at the bottom of the window. Selecting a Connection Type will change the window for the values for the Connection setting selected. These values have already been described in the **WAN Configuration** section of the **Home** setup. Click **Apply** to set changes into the Router's memory.

The screenshot shows the 'ATM VC Setting' window with the 'Advanced' tab selected. The window is divided into two main sections: 'ATM VC Setting' and 'ATM VCs List'.

ATM VC Setting

PVC: PVC0

VPI: 8

VCI: 35

Virtual Circuit: Enabled

WAN Setting: PPPoE/PPPoA

PPPoE/PPPoA

User Name: username

Password: ••••

Connection Type: PPPoE LLC

MTU: 1400 bytes

MRU: 1492 bytes

Default Route: Enabled

NAT: Enabled

Firewall: Enabled

IP Control: Dynamic IP

Static IP: 0.0.0.0

Buttons: Apply (green checkmark), Cancel (orange X), Help (red plus)

ATM VCs List

ID	PVC	VPI	VCI	Connection Type	Virtual Circuit
1	PVC0	8	35	PPPoE	Enabled

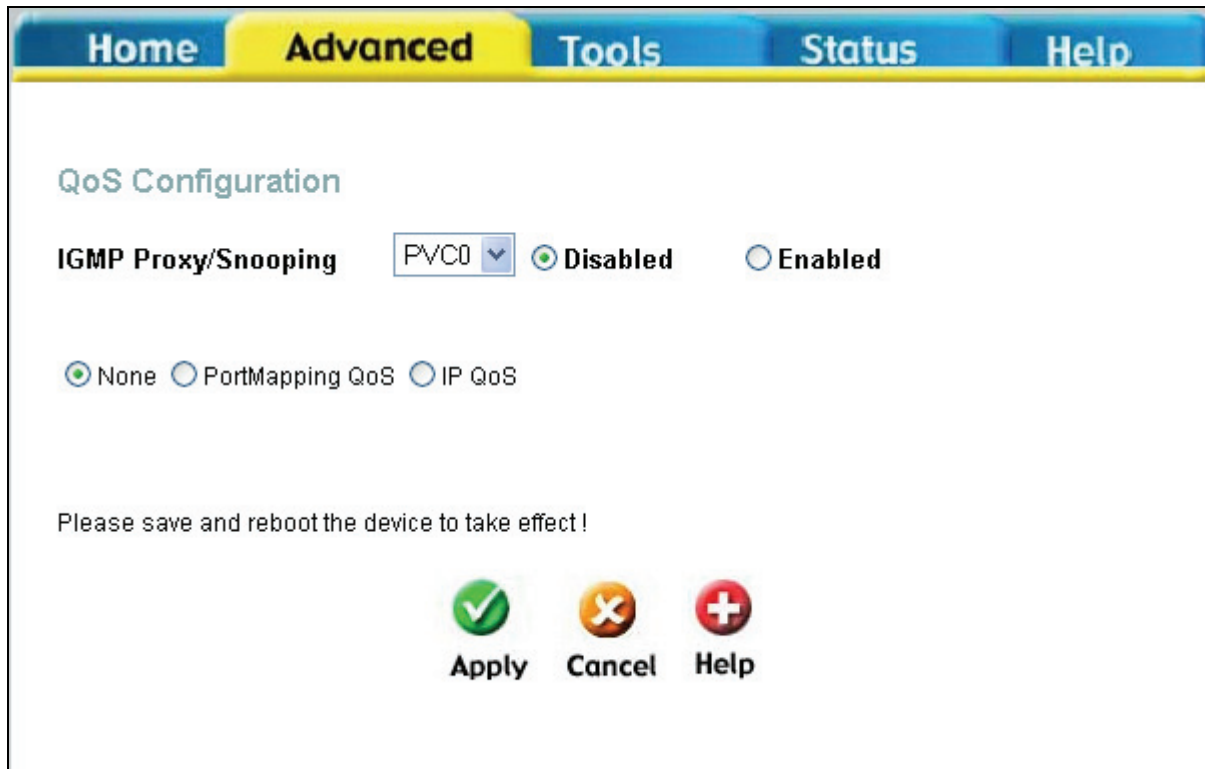
ATM VCC window

QoS

QoS or Quality of Service is used to allot priority from the Router. This is done by allotting a priority from a port to a PVC. There are four priorities for each QoS configuration. "1" denotes the highest priority while "4" is the lowest.

The **IGMP Proxy/Snooping** is disabled by default. This setting will not allow IGMP (Internet Group Management Protocol) packets to be forwarded to the LAN. IGMP is used to manage multicasting on TCP/IP networks, most users will not need to enable this. Some ISPs use

IGMP to perform remote configuration for client devices, such as the Router. If you are unsure, check with your ISP. To enable IGMP service to the LAN interface, select Enabled and click the **Apply** button



The screenshot shows a web-based configuration interface for QoS. At the top is a navigation bar with tabs: Home, Advanced (highlighted in yellow), Tools, Status, and Help. Below the navigation bar, the title 'QoS Configuration' is displayed. The main configuration area includes a section for 'IGMP Proxy/Snooping' with a dropdown menu set to 'PVC0' and two radio buttons: 'Disabled' (selected) and 'Enabled'. Below this, there are three radio buttons for QoS type: 'None' (selected), 'PortMapping QoS', and 'IP QoS'. A message states 'Please save and reboot the device to take effect!'. At the bottom, there are three buttons: 'Apply' (with a green checkmark icon), 'Cancel' (with an orange 'X' icon), and 'Help' (with a red plus icon).

QoS Configuration window

To set QoS for the router, first click the **PortMapping QoS** check box in the middle of the window. This will open the following window. Then select the PVC to associate with the corresponding port and choose a priority for this combination. The user may also enable IGMP Proxy/Snooping for each PVC at the top of the screen by choosing the PVC from the pull-down menu and clicking the **Enabled** radio button and set a maximum *bandwidth* in kbps from *unlimited* to *64* using the drop-down menu. Click **Apply** to set the configuration.

Home

Advanced

Tools

Status

Help

QoS Configuration

IGMP Proxy/Snooping

PVC0

☒ Disabled
 ☐ Enabled

☐ None
 ☒ PortMapping QoS
 ☐ IP QoS

Please set configuration for Ethernet Port based Qos.

LAN	Port Mapping PVC	Priority	Bandwidth
Port1	<div>PVC0</div>	<div>1</div>	<div>unlimited</div> kbps
Port2	<div>PVC0</div>	<div>1</div>	<div>unlimited</div> kbps
Port3	<div>PVC0</div>	<div>1</div>	<div>unlimited</div> kbps
Port4	<div>PVC0</div>	<div>1</div>	<div>unlimited</div> kbps

Please set configuration for Wireless port based Qos.

Wireless

PVC0

Please save and reboot the device to take effect !

Apply

Cancel

Help

QoS Configuration window for Port Mapping QoS

The Router can also be configured to use the QoS information contained in the header of IP packets. This will open the following window. To set IP QoS for the router, first click the **IP QoS** check box in the middle of the window. Then select the PVC to associate with the corresponding action and choose a maximum bandwidth and classification for this combination. Then select the classification type using the **Classified by** pull-down menu. The choices are *Disable*, *ToS*, *Application*, and *User Define*. Each choice will open the corresponding windows, shown following. The user may also enable IGMP Proxy/Snooping for each PVC at the top of the window by choosing the PVC from the pull-down menu and clicking the **Enabled** radio button and set a maximum **Bandwidth** in kbps from *unlimited* to 64 using the drop-down menu. Click **Apply** to set the configuration.

Home
Advanced
Tools
Status
Help

QoS Configuration

IGMP Proxy/Snooping
PVC0
☒ Disabled
☐ Enabled

☐ None
☐ PortMapping QoS
☒ IP QoS

Please set configuration for IP based Qos.

PVC
PVC0

Bandwidth
unlimited kbps

Classified by
Disable

Please save and reboot the device to take effect !

QoS Configuration window IP QoS

If you select *Disable* in the **Classified by** drop-down menu, you can assign a maximum allowed bandwidth of between *64 kbps* and *unlimited* to each of the PVCs configured on the router.

Additional options become available when you select either *ToS*, *Application*, or *User Define* from the **Classified by** drop-down menu. Selecting *ToS* will display the following window.

Home
Advanced
Tools
Status
Help

QoS Configuration

IGMP Proxy/Snooping
PVC0
☒ Disabled
☐ Enabled

☐ None
☐ PortMapping QoS
☒ IP QoS

Please set configuration for IP based Qos.



PVC
PVC0

Bandwidth
unlimited kbps

Classified by
ToS

Enable	Priority	Weight	Range (0~7)
<input checked="" type="checkbox"/>	1	0 %	0 ~ 0
<input checked="" type="checkbox"/>	2	0 %	0 ~ 0
<input checked="" type="checkbox"/>	3	0 %	0 ~ 0
<input checked="" type="checkbox"/>	4	0 %	0 ~ 0

Please save and reboot the device to take effect !


Apply
Cancel
Help

QoS Configuration window IP QoS for ToS

From this window you can input a Weight in percentage and a priority range that will determine the mechanism by which the four priority levels are “mapped”. For example, if you assign 100% and a range of 0 to 7 to priority level 1, then the remaining priority levels (2 to 4) will only forward packets when priority level 1 is empty (when there are no packets to forward). Some experimentation may be necessary to achieve the optimum results with your particular ISP’s connection.

If you select *Application* from the **Classified by** drop-down menu, the following window appears.

HomeAdvancedToolsStatusHelp

QoS Configuration

IGMP Proxy/Snooping

PVC0

☒ Disabled
☐ Enabled

☐ None
☐ PortMapping QoS
☒ IP QoS

Please set configuration for IP based QoS.

PVC

PVC0

Bandwidth

unlimited

kbps

Classified by

Application

Enable	Priority	Weight	Application Type
<input checked="" type="checkbox"/>	1	0 %	Voice
<input checked="" type="checkbox"/>	2	0 %	Video
<input checked="" type="checkbox"/>	3	0 %	IGMP
<input checked="" type="checkbox"/>	4	0 %	Data

RTP Voice Data Port

0 ~ 0

RTP Video Data Port

0 ~ 0

Please save and reboot the device to take effect !

☒ Apply
☐ Cancel
☐ Help

QoS Configuration window IP QoS for Application

On this window, you can select the mechanism by which the four priority queues are emptied by assigning a weight, in percentage terms, to each priority queue, and then assigning a packet type that can be associated with an application type. For example, if you assign a weight of 100% to Priority 1, with an application type of Voice, then the other three priority queues (2 to 4) will not be allowed to forward packets until all of the Voice packets have been sent from the priority 1 queue.

If you select *User Define* in the **Classified by** drop-down menu, the following window appears.

Home
Advanced
Tools
Status
Help

QoS Configuration

IGMP Proxy/Snooping PVC0 ☒ Disabled ☐ Enabled

☐ None ☐ PortMapping QoS ☒ IP QoS

Please set configuration for IP based Qos.

PVC PVC0

Bandwidth unlimited kbps

Classified by User Define

Enable	Priority	Weight	IP Header Offset	Value	Mask
<input checked="" type="checkbox"/>	1	<input type="text"/> %	<input type="text"/>	<input type="text"/> 0x0000000C	<input type="text"/> 0xFFFFFFF
<input checked="" type="checkbox"/>	2	<input type="text"/> %	<input type="text"/>	<input type="text"/> 0x0000000C	<input type="text"/> 0xFFFFFFF
<input checked="" type="checkbox"/>	3	<input type="text"/> %	<input type="text"/>	<input type="text"/> 0x0000000C	<input type="text"/> 0xFFFFFFF
<input checked="" type="checkbox"/>	4	<input type="text"/> %	<input type="text"/>	<input type="text"/> 0x0000000C	<input type="text"/> 0xFFFFFFF

Please save and reboot the device to take effect !

QoS Configuration window IP QoS for User Define

On this window, you can assign a weight, on a percentage basis, to each of the four priority queues. In addition, you can specify the number of bytes from the beginning of a given packet's IP header to set a pointer. From this pointer, you can then specify a Value (in hexadecimal) and a Mask (in hexadecimal) for the router to match when examining packets crossing the specified priority queue. It is recommended that you not enter a QoS scheme of this type unless you fully understand Offsets, pointers, masks, and IP headers or you are instructed to do so by your ISP.

Tools

The Tools tab allows you to set up basic maintenance features on the Router. The window tabs available include **Admin**, **Time**, **Remote Log**, **System**, **Firmware**, **Miscellaneous**, and **Test**.

The screenshot shows the D-Link DSL-524T ADSL Router web management interface. The top navigation bar includes tabs for Home, Advanced, Tools (selected), Status, and Help. On the left, a sidebar contains buttons for Admin, Time, Remote Log, System, Firmware, Miscellaneous, Test, and Logout. The main content area is titled "Administrator Settings" and contains the following sections:

- Administrator Settings:** A message states, "There is only one account that can access the DSL-524T's Web-Management interface." Below this, there are input fields for "New Password" and "Confirm Password", and a "WebPort" field set to "80" with a note "(Change the port number of login web)".
- Remote Web Management:** This section includes a "State" field with radio buttons for "Enabled" and "Disabled" (selected). Below are input fields for "IP Address" (0.0.0.0) and "Netmask" (255.255.255.255).
- Remote Telnet Management:** This section also includes a "State" field with radio buttons for "Enabled" and "Disabled" (selected). Below are input fields for "IP Address" (0.0.0.0) and "Netmask" (255.255.255.255).

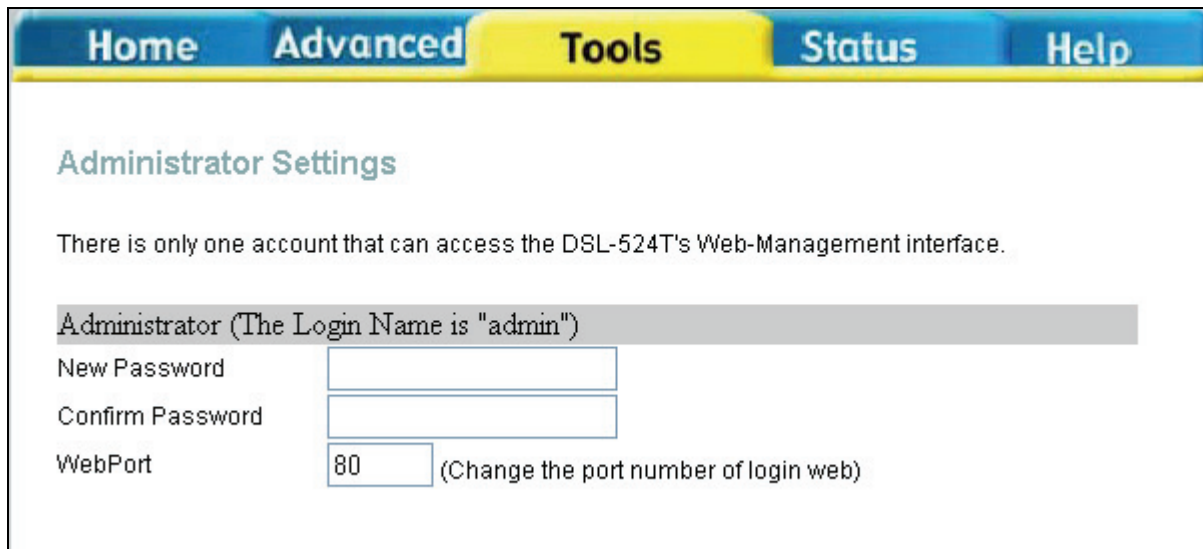
At the bottom right of the interface, there are three icons: a green checkmark for "Apply", an orange 'X' for "Cancel", and a red plus sign for "Help".

Tools tab

Admin

The **Administrator Settings** window allows you to configure a new password for the Router. There is only one administrator account that can access the DSL-524T's web management interface. To change the password, first enter the **Old Password** in its respective field, then enter the password into the **New Password** field and repeat the password in the **Confirm Password** field. Click **Apply** to set your new password.

This window will also allow the user to enable remote management of the device from a remote computer, either through the web management or through Telnet. To configure this function, click the **Enabled** radio button under the **Remote Management** heading, enter the **IP Address** of the computer you wish to allow to remotely configure the Router, along with the corresponding Subnet Mask (**Netmask**). Click **Apply** to set these configurations into the memory of the Router.



The screenshot shows a web management interface with a navigation bar at the top containing five tabs: "Home", "Advanced", "Tools", "Status", and "Help". The "Tools" tab is currently selected and highlighted in yellow. Below the navigation bar, the page title is "Administrator Settings". A message states: "There is only one account that can access the DSL-524T's Web-Management interface." Below this message is a section header "Administrator (The Login Name is 'admin')". Under this header, there are three input fields: "New Password", "Confirm Password", and "WebPort". The "WebPort" field contains the value "80" and has a tooltip that says "(Change the port number of login web)".

Administrator Settings	
There is only one account that can access the DSL-524T's Web-Management interface.	
Administrator (The Login Name is "admin")	
New Password	<input type="text"/>
Confirm Password	<input type="text"/>
WebPort	<input type="text" value="80"/> (Change the port number of login web)

top of Administrator Settings window

Time

The system time is the time used by the DSL-524T for scheduling services. You can manually set the time, connect to a NTP (Network Time Protocol) server or synchronize the time on the router with your PC. If an NTP server is set, you will only need to set the time zone (in the set up wizard). You may also set the time from the clock on your computer by checking the corresponding radio button. To manually set the time, you will need to input the value into the fields provided. Click **Apply** to set the changes made.

Home **Advanced** **Tools** **Status** **Help**

Time

Set the DSL-524T system time.

Local Time 01/12/2006 16:54:07

Synchronize the ADSL Router's clock with:




☐ Automatic (Simple Network Time Protocol)

☒ Your computer's clock

☐ Manual (Enter your own settings)

Date: Jan 12 2006

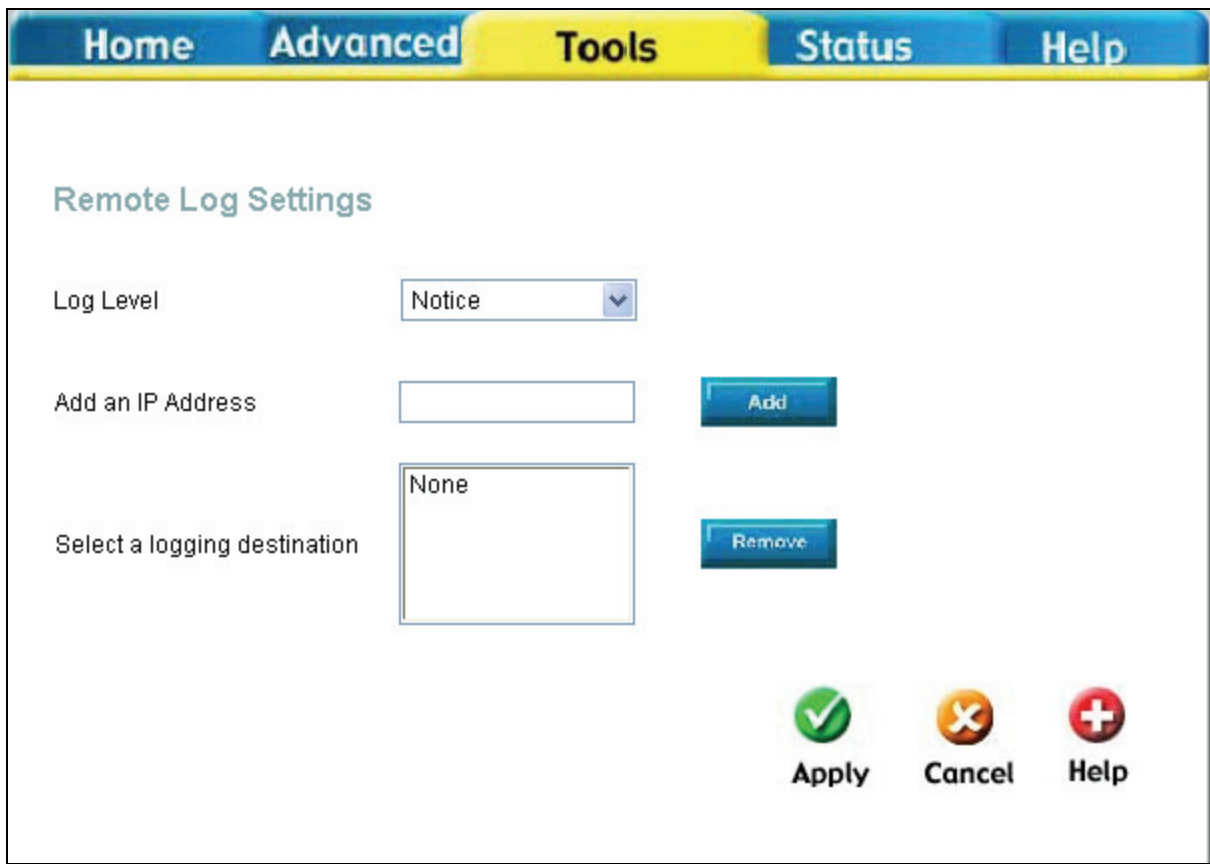
Time: 16 : 54 : 07

  
Apply **Cancel** **Help**

Time window

Remote Log

Use the **Remote Log Settings** window to set up logging to servers or computers that are located outside the LAN or subnet of the Router.



Home Advanced **Tools** Status Help

Remote Log Settings

Log Level Notice ▼

Add an IP Address **Add**

Select a logging destination

None

Remove

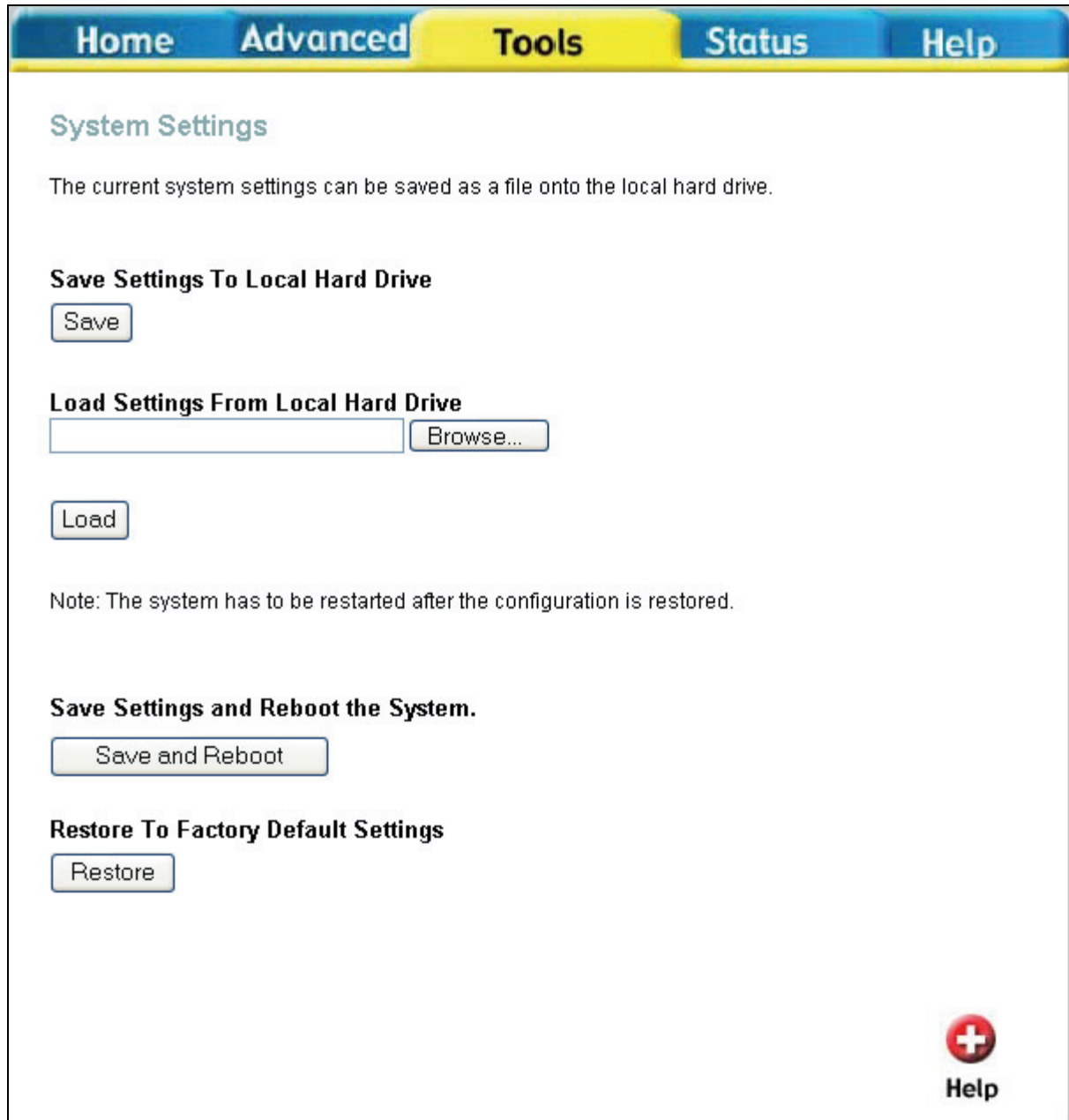
Apply **Cancel** **Help**

Remote Log Settings window

Select the **Log Level** from the pull-down menu. The levels available are: *Alert, Critical, Debug, Error, Info, Notice, Panic* and *Warning*. Type in the IP address of a receiver for the log message in the **Add an IP Address** field and click on the **Add** button. Log message receivers that are added appear listed in the **Select a logging destination** pull-down menu. These may be used at any time for other types of log messages. To remove a log message receiver from the list, select it and click on the **Remove** button. Click the **Apply** button when you have configured the log message receivers. Remember to save the settings to non-volatile memory.

System

This window offers four settings for the user to configure. The user may save the settings configured on the router by clicking the Save button. A file Download dialog box will appear questioning the user where to save the files on your computer. Files will be saved as XML documents. The user may also upload save settings by using the **Load Settings From Local Hard Drive** field by entering the path of the file on your computer into the box. If you are not sure of the path, click **Browse** to find the file on your computer. Click **Load** to initiate the file transfer. Next, click save and reboot. You may reset the ADSL Router back to factory settings by clicking on **Restore**.



The screenshot shows a web interface with a navigation bar at the top containing five tabs: 'Home', 'Advanced', 'Tools' (which is highlighted in yellow), 'Status', and 'Help'. Below the navigation bar, the page title is 'System Settings'. A paragraph of text states: 'The current system settings can be saved as a file onto the local hard drive.' There are four main sections of controls: 1. 'Save Settings To Local Hard Drive' with a 'Save' button. 2. 'Load Settings From Local Hard Drive' with a text input field and a 'Browse...' button, followed by a 'Load' button. 3. 'Save Settings and Reboot the System.' with a 'Save and Reboot' button. 4. 'Restore To Factory Default Settings' with a 'Restore' button. A note below the load section says: 'Note: The system has to be restarted after the configuration is restored.' In the bottom right corner, there is a red circular icon with a white plus sign and the word 'Help' below it.

Home Advanced **Tools** Status Help

System Settings

The current system settings can be saved as a file onto the local hard drive.

Save Settings To Local Hard Drive

Save

Load Settings From Local Hard Drive

Browse...

Load


Note: The system has to be restarted after the configuration is restored.

Save Settings and Reboot the System.

Save and Reboot

Restore To Factory Default Settings

Restore


Help

System Settings window

Firmware

You can upgrade the firmware of the ADSL Router at this page. Make sure the firmware you want to use is on the local hard drive of the computer. Click on **Browse** to browse the local hard driver and locate the firmware to be used for the update. Once found, click **Apply** to initiate the transfer. Please check the D-Link support site for firmware updates at D-Link Technical support website of your country. Remember to restart the Router after uploading new firmware.

[Home](#) [Advanced](#) [Tools](#) [Status](#) [Help](#)

Firmware Upgrade

There may be new firmware for your DSL-524T to improve functionality and performance. To upgrade the firmware, locate the upgrade file on the local hard drive with the Browse button. Once you have found the file to be used, click the Apply button below to start the firmware upgrade.

Current Firmware Version : V3.00B01T02.EU-A.20060111

Note: The system has to be restarted after the firmware upgrade.

Firmware Upgrade window

Miscellaneous

This window allows you to ping any IP address from the Router to test connectivity to the address. To Ping a device, enter the IP address of the device that you wish to ping into the **Ping IP Address** field and click **Ping** to start the Ping mechanism. The results of the ping will be shown under the **Ping Result** heading. Click **Apply** to set changes made in this page.

Home

Advanced

Tools

Status

Help

Miscellaneous Configuration

There are additional tools and features of the DSL-524T


Ping Test


Ping IP Address


192.168.1.1

Ping

Ping Result :







ApplyCancelHelp

Miscellaneous Configuration window

Test

The **Diagnostic Test** window allows users to test the functionality of the router by executing a series of tests. This window will aid the user in troubleshooting various problems that may occur with the functionality of the router. This window will appear differently depending on connection type chosen. The following picture shows the window that includes all possible connection tests associated with this Router.

Diagnostic Test


The diagnostics feature executes a series of test of your system software and hardware connections. Use the feature when working with your ISP to troubleshoot problems.

Virtual Circuits :

OAM Type :

This Page is used for performing diagnostics on the system.

Testing Connectivity to modem	
Testing Ethernet LAN connection	PASS
Testing ADSL Connection	
Testing ADSL Synchronization	FAIL
Testing Network Connection	
Testing ATM OAM segment ping	SKIPPED
Testing ATM OAM end to end ping	SKIPPED
Testing Internet Connectivity	
Ping Primary Domain Names Server	SKIPPED

 Help

Diagnostic Test window

To perform the following tests, choose the **PVC** (Private Virtual Connection) that you wish to test and click **Apply**. Test results will either be displayed as Pass or Fail. The following tasks will be performed:

Testing Ethernet LAN Connection	This test will check the Ethernet connection of your Router.
Testing ADSL Synchronization	This test will check the ADSL line connected to your Router.
Testing ATM OAM segment ping	This test will check the PVC connectivitiy by sending out an OAM (Operation Administration Management) packet. If the remote device on this segment returns the ping packet, the PVC has passed the test and a Pass result will appear.
Testing ATM	This test will check the PVC connectivitiy by sending out an

OAM end to end ping	OAM (Operation Administration Management) packet. If the remote device returns the ping packet, the PVC has passed the test and a Pass result will appear.
Ping Primary Domain Name Server	This test will check to see if the Primary DNS is accessible from the Router.

Status

The **Status** tab will allow users to check information about the Router. The window buttons include **Device Info**, **DHCP Clients**, **Log**, **Statistics**, and the **ADSL** line.

Device Info

The device info window, located under the **Status** tab will allow users to view information regarding the settings of the Router, both on the LAN side and WAN side of the connection.

The screenshot shows the D-Link DSL-524T ADSL Router web interface. The top navigation bar includes tabs for Home, Advanced, Tools, Status (selected), and Help. On the left sidebar, there are buttons for Device Info (selected), DHCP Clients, Log, Statistics, ADSL, and Logout. The main content area is titled 'Device Information' and shows the Firmware Version as V3.00B01T02.EU-A.20060111. It is divided into two sections: LAN and WAN. The LAN section displays MAC Address (00:0f:3d:bb:83:7d), IP Address (192.168.1.1), Subnet Mask (255.255.255.0), DHCP Server (Enabled), and NAT (Enabled). The WAN section displays Virtual Circuit (Pvc0), Status (Not Connected), Connection Type (pppoe), IP Address (N/A), Subnet Mask (N/A), Default Gateway (N/A), and DNS Server (N/A). A 'Connect' button is located next to the Status field in the WAN section. A red plus icon with the word 'Help' is in the bottom right corner.

Device Information	
Firmware Version : V3.00B01T02.EU-A.20060111	
LAN	
MAC Address	00:0f:3d:bb:83:7d
IP Address	192.168.1.1
Subnet Mask	255.255.255.0
DHCP Server	Enabled
NAT	Enabled
WAN	
Virtual Circuit	Pvc0
Status	Not Connected
Connection Type	pppoe
IP Address	N/A
Subnet Mask	N/A
Default Gateway	N/A
DNS Server	N/A

Device Information window


Select the desired Virtual Circuit from the drop-down menu and then click the **Connect** button.

The following information is what is displayed in the **Device Information** window:

LAN	
MAC Address	Displays the MAC Address of the Router.
IP Address	Displays the current IP address of the Device.
Subnet Mask	Displays the Subnet Mask of the device.
DHCP Server	Displays the DHCP status implemented on the Router.
NAT	Displays the current NAT status implemented on the Router.
WAN Channel	
Virtual Circuit	Displays the number of the Private Virtual Channel located on the Router.
Status	Displays the connection status of the selected Virtual Channel.
Connection Type	Displays the connection type employed on this Virtual Circuit.
IP Address	Displays the IP address of the corresponding Virtual Circuit.
Subnet Mask	Displays the Subnet mask of the corresponding Virtual Circuit.
Default Gateway	Displays the Default gateway of the corresponding Virtual Circuit.
DNS Server	Displays the DNS Server currently employed on this Virtual Circuit.

DHCP Clients

The **DHCP Clients** window, located under the **Status** tab will allow users to view information regarding the DHCP Clients on the Router.

Home Advanced Tools Status Help		
DHCP Clients		
MAC Address	IP Address	Host Name
	192.168.1.3	Julian Stranger
 Help		

DHCP Clients window

Log

The **View Log** window allows users to view events occurring within the Router by time and date. To clear the log events, click **Clear Log**. To save the log, click **Save Log** and a pop-up window will appear to find a folder on your computer to save the log files to.



View Log window

Statistics

The **Traffic Statistics** window will allow users to view transmitted and received packets occurring on the Router, both for the Ethernet connection and for the ADSL connection. To choose a interface to view statistics for, click the corresponding radio button for either **ADSL** or **Ethernet**, which will change the window, as shown below. To refresh the stats in this window, click **Refresh**.

Home **Advanced** **Tools** **Status** **Help**

Traffic Statistics


Traffic Statistics display Receive and Transmit packets passing through the DSL-524T.

Choose an interface to view your network status:

☒ Ethernet Display Receive and Transmit packages through Ethernet

☐ ADSL Display Receive and Transmit packages through ADSL

[Refresh](#)

 **Help**

Transmit	
Good Tx Frames	2358
Good Tx Broadcast Frames	0
Good Tx Multicast Frames	0
Tx Total Bytes	1722993
Collisions	0
Error Frames	0
Carrier Sense Errors	0

Receive	
Good Rx Frames	1640
Good Rx Broadcast Frames	17
Good Tx Multicast Frames	0
Rx Total Bytes	173518
CRC Errors	0
Undersized Frames	0
Overruns	0

Traffic Statistics window for Ethernet

Traffic Statistics

Traffic Statistics display Receive and Transmit packets passing through the DSL-524T.

Choose an interface to view your network status:

☐ Ethernet

Display Receive and Transmit packages through Ethernet

☒ ADSL

Display Receive and Transmit packages through ADSL

Refresh



Transmit

Tx PDU's	0
Tx Total Bytes	0
Tx Total Error Counts	0

Receive

Rx PDU's	0
Rx Total Bytes	0
Rx Total Error Counts	0

Traffic Statistics window for ADSL

ADSL

The **ADSL Status** window, located under the **Status** tab, will allow users to monitor the speed of the upstream and downstream packet flow of the Router.

Home **Advanced** **Tools** **Status** **Help**

ADSL Status

ADSL status shows the ADSL physical layer status.

ADSL Firmware Version: 5.00.04.00 - 5.00.03.00 - 5.00.03.00 Annex A - 01.07.2b - 0.52

ADSL Software Version: V3.00B01T02.EU-A.20060111


Line State: Disconnected

Modulation: NO_MODE

Annex Mode: ANNEX_A

Max Tx Power: -38 dBm/Hz

Item	Downstream	Upstream	Unit
SNR Margin	0	0	dB
Line Attenuation	0	0	dB
Data Rate	0	0	kbps


Help

ADSL Status window

The following information is displayed:

ADSL Firmware Version	The current Firmware version currently set in the Router.
ADSL Software Version	The current Software version currently set in the Router.
Line State	Displays the current line state of the ADSL connection, either being Up or Down.
Modulation	Displays the modulation type currently set on the router for the ADSL connection.
Annex Mode	This field displays the ADSL annex modes for Annex A or Annex B.
Max Tx Power	This field displays the transmit output power level of the CPE.
SNR Margin	Amount of increased noise that can be tolerated while maintaining the designed BER (bit error rate). The SNR Margin is set by the Central Office DSLAM. If the SNR Margin is increased, bit error rate performance will improve, but the data rate will decrease. Conversely, if the SNR Margin is decreased, bit error rate performance will decrease, but the data rate will increase.

Line Attenuation	Attenuation is the decrease in magnitude of the ADSL line signal between the transmitter (Central Office DSLAM) and the receiver (Client ADSL Router), measured in dB. It is measured by calculating the difference in dB between the signal power level received at the Client ADSL Router and the reference signal power level transmitted from the Central Office DSLAM.
Data Rate	This field displays the ADSL data rate.

Help

The **Help** tab will give basic information referring to various windows located in the Router. To view a specific section, click on its hyperlinked name. A new window of information will appear.



Technical Specifications

General	
Standards:	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) ADSL2 Standards ITU G.992.3 (G.dmt.bis) Annex A ITU G.992.4 (G.lite.bis) Annex A ADSL Standards: ITU G.992.5 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 RFC1483/2684 Multiprotocol Encapsulation over ATM Adaptation Layer 5 RFC1577 Classical IP over ATM 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 G.dmt full rate upstream: up to 1 Mbps G.lite: ADSL downstream up to 1.5 Mbps G.lite: ADSL upstream up to 512 Kbps G.dmt.bis full rate downstream: up to 12 Mbps G.dmt.bis full rate upstream: up to 12 Mbps ADSL full rate downstream: up to 24 Mbps ADSL full rate upstream: up to 1 Mbps

General	
Media Interface:	ADSL interface: RJ-11 connector for connection to 26 AWG twisted pair telephone line LAN interface: RJ-45 port for 10/100BASE-T Ethernet connection

Physical and Environmental	
DC Inputs: Power Adapter:	Input: 120V AC 60Hz Output: 12V AC, 1.2A
Power Consumption :	9 Watts (max)
Operating Temperature:	0° to 40°C
Storage Temperature	-20° to 70°C
Humidity:	5% to 95% (non-condensing)
Dimensions:	109 mm x 142.8 mm x 32.1 mm
Weight:	200 gm
EMI:	CE Class B, FCC Class B (Part 15)
Safety:	CSA 950, UL 1950, IEC 60950, EN 60950
Reliability:	Mean Time Between Failure (MTBF) min. 4 years

IP Address Setup

The DSL-524T is designed to provide network administrators maximum flexibility for IP addressing on the Ethernet LAN. The easiest IP setup choice in most cases is to let the Router do it using DHCP, which is enabled by default. This appendix briefly describes various options including DHCP, used for IP setup on a LAN. If you are new to IP networking, the next appendix provides some background information on basic IP concepts.

Assigning Network IP Addresses

The IP address settings, which include the IP address, subnet mask and gateway IP address are the first and most important internal network settings that need to be configured. The Router is assigned a default LAN IP address and subnet mask. If you do not have a preexisting IP network and are setting one up now, using the factory default IP address settings can greatly ease the setup process. If you already have a preexisting IP network, you can adjust the IP settings for the Router to fit within your existing scheme.

Using the Default IP Address

The Router is shipped with a preset default IP address setting of 192.168.1.1 for the LAN port. There are two ways to use this default IP address, you can manually assign an IP address and subnet mask for each PC on the LAN or you can instruct the Router to automatically assign them using DHCP. The simplest method is to use DHCP. The DHCP function is active by default.

Manual IP Address Assignment

Manually configuring IP settings for the LAN means you must manually set an IP address, subnet mask and IP address of the default gateway (the Router's IP address) on each networked computer. The example listed below describes IP configuration for computers running Windows 95 or Windows 98. Regardless of what operating system is used on each workstation, the three network IP settings must be defined so the network interface used by each workstation can be identified by the Router, and vice versa. For detailed information about configuring your workstations IP settings, consult the user's guide included with the operating system or the network interface card (NIC).

1. In Windows 95/98, click on the **Start** button, go to **Settings** and choose **Control Panel**.
2. In the window that opens, double-click on the **Network** icon.
3. Under the Configuration tab, select the **TCP/IP** component and click *Properties*.
4. Choose the *Specify an IP address* option and edit the address settings accordingly. Consult the table below for IP settings on a Class C network.

IP Setup - Example #1

Using Default IP without DHCP			
Host	IP Address	Subnet Mask	Gateway IP
Router	192.168.1.1	255.255.255.0	
Computer #1	192.168.1.2	255.255.255.0	192.168.1.1
Computer #2	192.168.1.3	255.255.255.0	192.168.1.1

Computer #3	192.168.1.4	255.255.255.0	192.168.1.1
--------------------	-------------	---------------	-------------

Please note that when using the default IP address as in the above example, the first three numbers in the IP address must always be the same with only the fourth number changing. The first three numbers define the network IP address (all machines must belong to the same IP network), while the last number denotes the host IP address (each computer must have a unique address to distinguish it on the network). The IP address scheme used in Example #1 can be used for any LAN that requires up to 253 separate IP addresses (excluding the Router). Notice that the subnet mask is the same for all machines and the default gateway address is the LAN IP address of the Router.

It is a good idea to make a note of each device's IP address for reference during troubleshooting or when adding new stations or devices.

Using DHCP

The second way to use the default settings is to allow the Router to automatically assign IP settings for workstation using DHCP. To do this, simply make sure your computers' IP addresses are set to 0.0.0.0 (under Windows, choose the option Obtain an IP address automatically in the TCP/IP network component described above). When the computers are restarted, their IP settings will automatically be assigned by the Router. The Router is set by default to use DHCP. See the discussion in Chapter 5 for information on how to use configure the Router for DHCP.

Changing the IP Address of the Router

When planning your LAN IP address setup, you may use any scheme allowed by rules that govern IP assignment. It may be more convenient or easier to remember an IP scheme that use a different address for the Router. Or you may be installing the Router on a network that has already established the IP settings. Changing the IP address is a simple matter and can be done using the web manager (see *LAN IP Address* in Chapter 5). If you are incorporating the Router into a LAN with an existing IP structure, be sure to disable the DHCP function. Also, consider the effects of the NAT function which is enable by default.

An IP addressing scheme commonly used for Ethernet LANs establishes 10.0.0.1 as the base address for the network. Using Example #2 below, the Router is assigned the base address 10.0.0.1 and the remaining addresses are assigned manually or using DHCP.

IP Setup - Example #2

Alternative IP Assignment			
Host	IP Address	Subnet Mask	Gateway IP
Router	10.0.0.1	255.255.255.0	
Computer #1	10.0.0.2	255.255.255.0	10.0.0.1
Computer #2	10.0.0.3	255.255.255.0	10.0.0.1
Computer #3	10.0.0.4	255.255.255.0	10.0.0.1

These two examples are only examples you can use to help you get started. If you are interested in more advanced information on how to use IP addressing on a LAN there are numerous resources freely available on the Internet. There are also many books and chapters of books on the subject of IP address assignment, IP networking and the TCP/IP protocol suite.



IP Concepts

This appendix describes some basic IP concepts, the TCP/IP addressing scheme and show how to assign IP Addresses.

When setting up the Router, you must make sure it has a valid IP address. Even if you will not use the WAN port (ADSL port), you should, at the very least, make sure the Ethernet LAN port is assigned a valid IP address. This is required for telnet, in-band SNMP management, and related functions such as “trap” handling and TFTP firmware download.

IP Addresses

The Internet Protocol (IP) was designed for routing data between network sites all over the world, and was later adapted for routing data between networks within any site (often referred to as “subnetworks” or “subnets”). IP includes a system by which a unique number can be assigned to each of the millions of networks and each of the computers on those networks. Such a number is called an IP address.

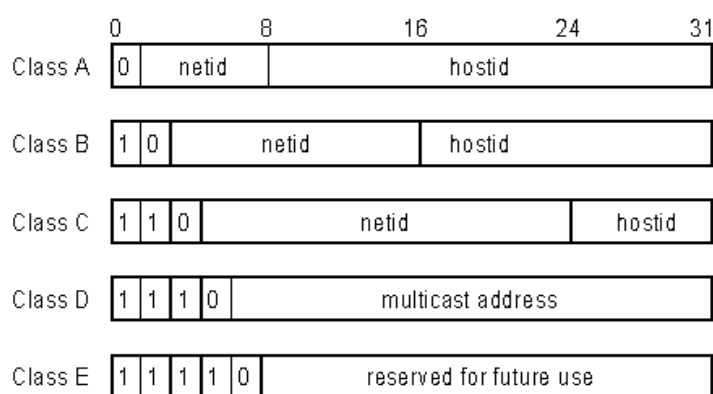
To make IP addresses easy to understand, the originators of IP adopted a system of representation called “dotted decimal” or “dotted quad” notation. Below are examples of IP addresses written in this format:

201.202.203.204 189.21.241.56 125.87.0.1

Each of the four values in an IP address is the ordinary decimal (base 10) representation of a value that a computer can handle using eight “bits” (binary digits — 1s and 0s). The dots are simply convenient visual separators.

Zeros are often used as placeholders in dotted decimal notation; 189.21.241.56 can therefore also appear as 189.021.241.056.

IP networks are divided into three classes on the basis of size. A full IP address contains a network portion and a “host” (device) portion. The network and host portions of the address are different lengths for different classes of networks, as shown in the table below.



Networks attached to the Internet are assigned class types that determine the maximum number of possible hosts per network. The previous figure illustrates how the net and host portions of the IP address differ among the three classes. Class A is assigned to networks that have more than 65,535 hosts; Class B is for networks that have 256 to 65534 hosts; Class C is for networks with less than 256 hosts.

Class	Maximum Number of Networks in Class	Network Addresses (Host Portion in Parenthesis)	Maximum Number of Hosts per Network
A	126	1(.0.0.0) to 126(.0.0.0)	16,777,214
B	16,382	128.1(.0.0) to 191.254(.0.0)	65,534
C	2,097,150	192.0.1(.0) to 223.255.254(.0)	254

Note: All network addresses outside of these ranges (Class D and E) are either reserved or set aside for experimental networks or multicasting.

When an IP address's host portion contains only zero(s), the address identifies a network and not a host. No physical device may be given such an address.

The network portion must start with a value from 1 to 126 or from 128 to 223. Any other value(s) in the network portion may be from 0 to 255, except that in class B the network addresses 128.0.0.0 and 191.255.0.0 are reserved, and in class C the network addresses 192.0.0.0 and 223.255.255.0 are reserved.

The value(s) in the host portion of a physical device's IP address can be in the range of 0 through 255 as long as this portion is not all-0 or all-255. Values outside the range of 0 to 255 can never appear in an IP address (0 to 255 is the full range of integer values that can be expressed with eight bits).

The network portion must be the same for all the IP devices on a discrete physical network (a single Ethernet LAN, for example, or a WAN link). The host portion must be different for each IP device — or, to be more precise, each IP-capable port or interface — connected directly to that network.

The network portion of an IP address will be referred to in this manual as a **network number**; the host portion will be referred to as a **host number**.

To connect to the Internet or to any private IP network that uses an Internet-assigned network number, you must obtain a registered IP network number from an Internet-authorized network information center. In many countries you must apply through a government agency, however they can usually be obtained from your Internet Service Provider (ISP).

If your organization's networks are, and will always remain, a closed system with no connection to the Internet or to any other IP network, you can choose your own network numbers as long as they conform to the above rules.

If your networks are isolated from the Internet, e.g. only between your two branch offices, you can assign any IP Addresses to hosts without problems. However, the Internet Assigned Numbers Authority (IANA) has reserved the following three blocks of IP Addresses specifically for private (stub) networks:

Class	Beginning Address	Ending Address
A	10.0.0.0	10.255.255.255
B	172.16.0.0	172.31.255.255
C	192.168.0.0	192.168.255.255

It is recommended that you choose private network IP Addresses from the above list. For more information on address assignment, refer to RFC 1597, *Address Allocation for Private Internets* and RFC 1466, *Guidelines for Management of IP Address Space*.

Subnet Mask

In the absence of subnetworks, standard TCP/IP addressing may be used by specifying subnet masks as shown below.

IP Class	Subnet Mask
Class A	255.0.0.0
Class B	255.255.0.0
Class C	255.255.255.0

Subnet mask settings other than those listed above add significance to the interpretation of bits in the IP address. The bits of the subnet mask correspond directly to the bits of the IP address. Any bit and a subnet mask that is to correspond to a net ID bit in the IP address must be set to 1.

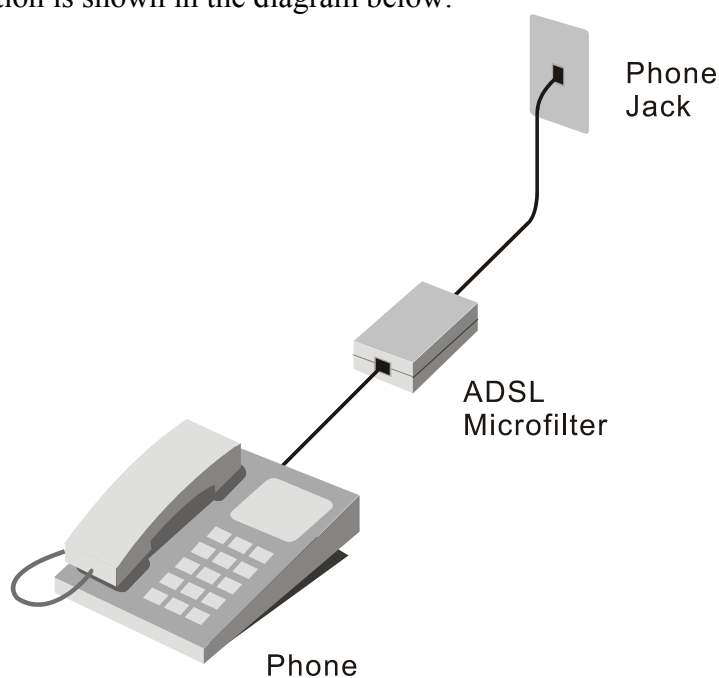
Microfilters and Splitters

Most ADSL clients will be required to install a simple device that prevents the ADSL line from interfering with regular telephone services. These devices are commonly referred to as microfilters or sometimes called (inaccurately) line splitters. They are easy to install and use standard telephone connectors and cable.

Some ADSL service providers will send a telecommunications technician to modify the telephone line, usually at the point where the telephone line enters the building. If a technician has divided or split your telephone line into two separate lines - one for regular telephone service and the other for ADSL – then you do not need to use any type of filter device. Follow the instructions given to you by your ADSL service provider about where and how you should connect the Router to the ADSL line.

Microfilters

Unless you are instructed to use a “line splitter” (see below), it will be necessary to install a microfilter (low pass filter) device for each telephone or telephone device (answering machines, Faxes etc.) that share the line with the ADSL service. Microfilters are easy-to-install, in-line devices, which attach to the telephone cable between the telephone and wall jack. Microfilters that install behind the wall plate are also available. A typical in-line microfilter installation is shown in the diagram below.



Microfilter Installation

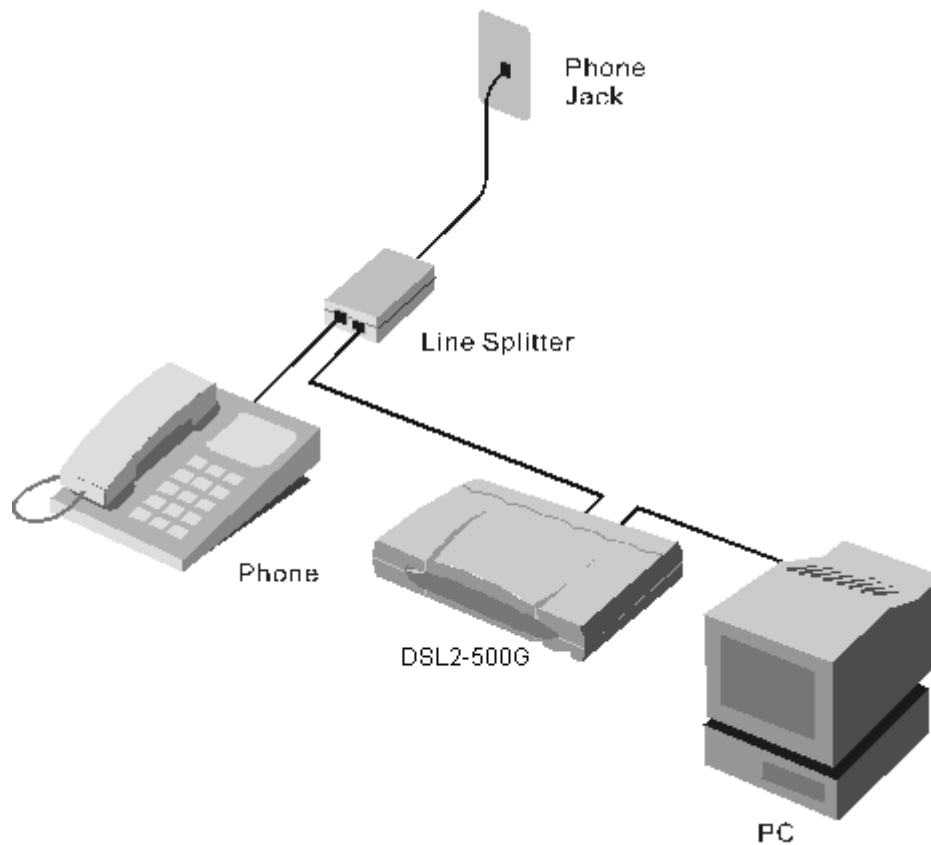
Important: Do not install the microfilter between the Router and the telephone jack. Microfilters are only intended for use with regular telephones, Fax machines and other regular telephone devices.

Line Splitter

If you are instructed to use a “line splitter”, you must install the device between the Router and the phone jack. Use standard telephone cable with standard RJ-11 connectors. The splitter has three RJ-11 ports used to connect to the wall jack, the Router and if desired, a telephone or telephone device. The connection ports are typically labeled as follows:

- **Line** - This port connects to the wall jack.
- **ADSL** – This port connects to the Router.
- **Phone** – This port connects to a telephone or other telephone device.

The diagram below illustrates the proper use of the splitter.



Line Splitter Installation

International Offices

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17595 Mt. Herrmann Street
Fountain Valley, CA 92708
TEL: 1-800-326-1688
URL: www.dlink.com

Canada

2180 Winston Park Drive
Oakville, Ontario, L6H 5W1
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TEL: 1-905-8295033
FAX: 1-905-8295223
URL: www.dlink.ca

Europe (U. K.)

4th Floor, Merit House
Edgware Road, Colindale
London NW9 5AB
U.K.
TEL: 44-20-8731-5555
FAX: 44-20-8731-5511
URL: www.dlink.co.uk

Germany

Schwalbacher Strasse 74
D-65760 Eschborn
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TEL: 49-6196-77990
FAX: 49-6196-7799300
URL: www.dlink.de

France

No.2 all'ée de la Fresnerie
78330 Fontenay le Fleury
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FAX: +36 (0) 1 461 30 09
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URL: www.dlink.com.au

India

D-Link House, Kurla Bandra Complex Road
Off CST Road, Santacruz (East)
Mumbai - 400098
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FAX: 91-022-26528914
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FAX: 56-2-232-0923
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FAX: (55 11) 21859322
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129626 Russia
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FAX: 7-095-744-0099 #350
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