

**D-Link**<sup>®</sup>

**GAMERLOUNGE**  
NETWORKING EVOLVED

Version 1.3



# User Manual

## DGL-4500

**X**TREME N<sup>™</sup>  
**GAMING ROUTERS**

# Preface

D-Link reserves the right to revise this publication and to make changes in the content hereof without obligation to notify any person or organization of such revisions or changes.

## Manual Revisions

Revision	Date	Description
1.0	August 22, 2007	DGL-4500 Revision A1 with firmware version 1.00
1.1	December 10, 2007	Removed WDS support (firmware 1.02)
1.2	January 17, 2008	Updated OLED screens Removed Big Pond support
1.3	June 18, 2008	Updated the Technical Specifications section

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# Package Contents

D-Link DGL-4500 Gaming Router	
Power Adapter	
Ethernet Cable	
CD-ROM	
Stand	

**Note:** Using a power supply with a different voltage rating than the one included with the DGL-4500 will cause damage and void the warranty for this product.

# System Requirements

<p><b>Network Requirements</b></p>	<ul style="list-style-type: none"> <li>• An Ethernet-based Cable or DSL modem</li> <li>• IEEE 802.11n-draft/g/a wireless clients</li> <li>• 10/100/1000 Ethernet</li> </ul>
<p><b>Web-based Configuration Utility Requirements</b></p>	<p><b>Computer with the following:</b></p> <ul style="list-style-type: none"> <li>• Windows®, Macintosh, or Linux-based operating system</li> <li>• An installed Ethernet adapter</li> </ul> <p><b>Browser Requirements:</b></p> <ul style="list-style-type: none"> <li>• Internet Explorer 6.0 or higher</li> <li>• Mozilla 1.7.12 or higher</li> <li>• Firefox 1.5 or higher</li> <li>• Safari 1.0 or higher (with Java 1.3.1 or higher)</li> <li>• Flock 0.7.14 or higher</li> <li>• Opera 6.0 or higher</li> </ul> <p><b>Windows® Users:</b> Make sure you have the latest version of Java installed. Visit <a href="http://www.java.com">www.java.com</a> to download the latest version.</p>
<p><b>CD Installation Wizard Requirements</b></p>	<p><b>Computer with the following:</b></p> <ul style="list-style-type: none"> <li>• Windows® XP with Service Pack 2 or Vista®</li> <li>• An installed Ethernet adapter</li> <li>• CD-ROM drive</li> </ul>

# Introduction

## **TOTAL PERFORMANCE**

Combines award winning router features and IEEE 802.11a/Draft 802.11n wireless technology to provide the best wireless performance

## **TOTAL SECURITY**

The most complete set of security features including Active Firewall and WPA/WPA2 to protect your network against outside intruders

## **TOTAL COVERAGE**

Provides greater wireless signal rates even at farther distances for best-in-class Whole Home Coverage.

## **ULTIMATE PERFORMANCE**

The D-Link Xtreme N™ Gaming Router (DGL-4500) is a draft 802.11n/802.11a compliant device that delivers real world performance of up to 14x faster than an 802.11g wireless connection (also faster than a 100Mbps wired Ethernet connection). Create a secure wireless network to share photos, files, music, video, printers, and network storage throughout your home. Connect the Xtreme N™ Gaming Router to a cable or DSL modem and share your high-speed Internet access with everyone on the network. In addition, this Router includes GameFuel engine that keeps online gaming smooth and responsive, providing a better Internet experience.

## **EXTENDED WHOLE HOME COVERAGE**

Powered by Xtreme N™ technology, this high performance router provides superior Whole Home Coverage while reducing dead spots. The Xtreme N™ Gaming Router is designed for use in bigger homes and for users who demand higher performance networking. Add a Xtreme N™ notebook or desktop adapter and stay connected to your network from virtually anywhere in your home.

## **TOTAL NETWORK SECURITY**

The Xtreme N™ Gaming Router supports all of the latest wireless security features to prevent unauthorized access, be it from over the wireless network or from the Internet. Support for WPA and WPA2 standards ensure that you'll be able to use the best possible encryption method, regardless of your client devices. In addition, this Xtreme N™ Gaming Router utilizes dual active firewalls (SPI and NAT) to prevent potential attacks from across the Internet.

\* Maximum wireless signal rate derived from IEEE Standard 802.11a, 802.11g and Draft 802.11n specifications. Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate. Environmental conditions will adversely affect wireless signal range.



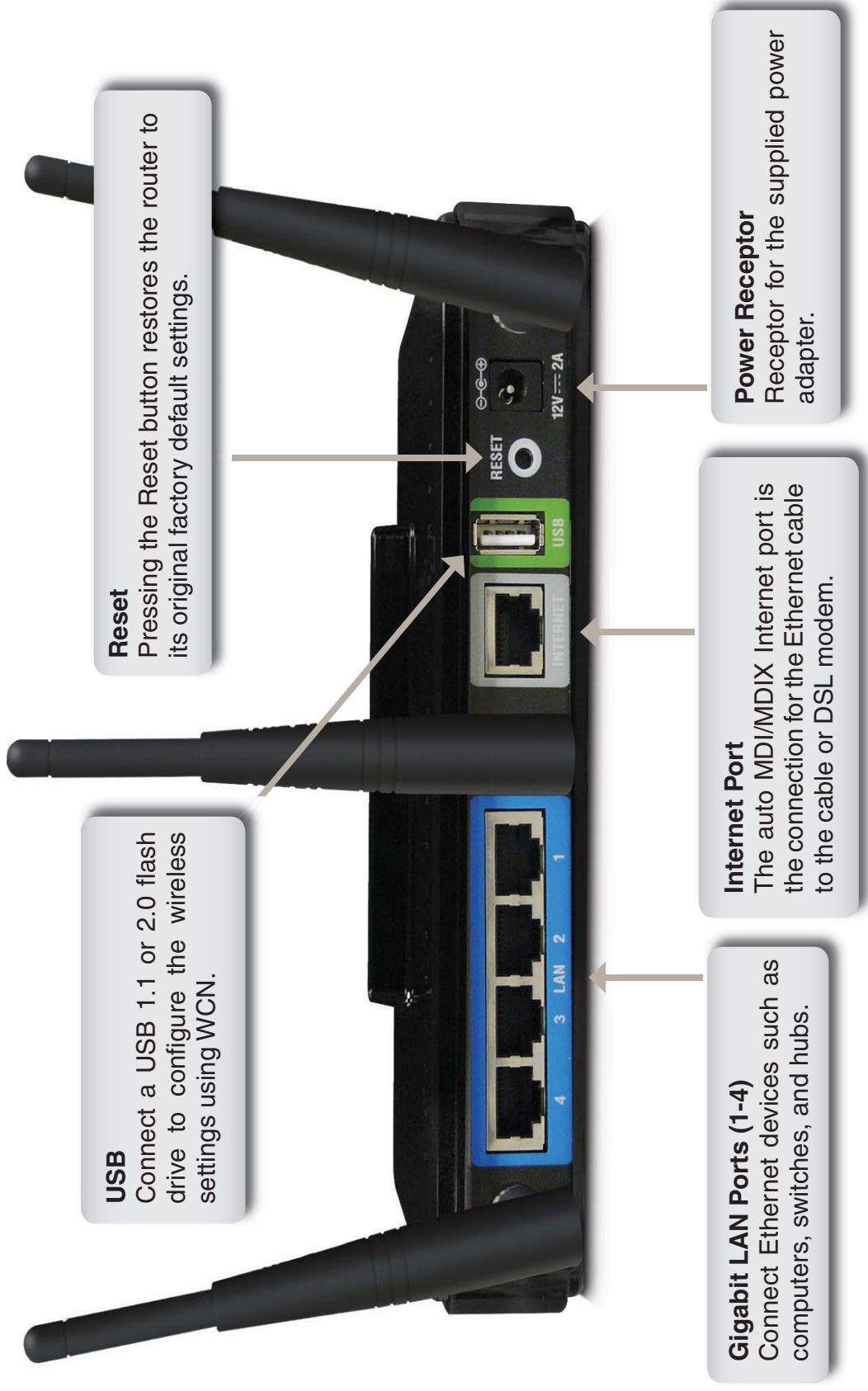
# Features

- **Faster Wireless Networking** - The DGL-4500 provides up to 300Mbps\* wireless connection with other 802.11n wireless clients. This capability allows users to participate in real-time activities online, such as video streaming, online gaming, and real-time audio. The performance of this 802.11n wireless router gives you the freedom of wireless networking at speeds 14x faster than 802.11g.
- **Compatible with 802.11a and 802.11g Devices** - The DGL-4500 is still fully compatible with the IEEE 802.11a/g standard, so it can connect with existing 802.11a/g PCI, USB and Cardbus adapters.
- **OLED Display** - The OLED display screen provides information regarding the router.
- **Advanced Firewall Features** - The Web-based user interface displays a number of advanced network management features including:
  - **Content Filtering** - Easily applied content filtering based on MAC Address, URL, and/or Domain Name.
  - **Filter Scheduling** - These filters can be scheduled to be active on certain days or for a duration of hours or minutes.
  - **Secure Multiple/Concurrent Sessions** - The DGL-4500 can pass through VPN sessions. It supports multiple and concurrent IPsec and PPTP sessions, so users behind the DGL-4500 can securely access corporate networks.
- **User-friendly Setup Wizard** - Through its easy-to-use Web-based user interface, the DGL-4500 lets you control what information is accessible to those on the wireless network, whether from the Internet or from your company's server. Configure your router to your specific settings within minutes.

\* Maximum wireless signal rate derived from IEEE Standard 802.11a, 802.11g, and Draft 802.11n specifications. Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate. Environmental conditions will adversely affect wireless signal range.

# Hardware Overview

## Connections



**USB**

Connect a USB 1.1 or 2.0 flash drive to configure the wireless settings using WCN.

**Reset**

Pressing the Reset button restores the router to its original factory default settings.

**Gigabit LAN Ports (1-4)**

Connect Ethernet devices such as computers, switches, and hubs.

**Internet Port**

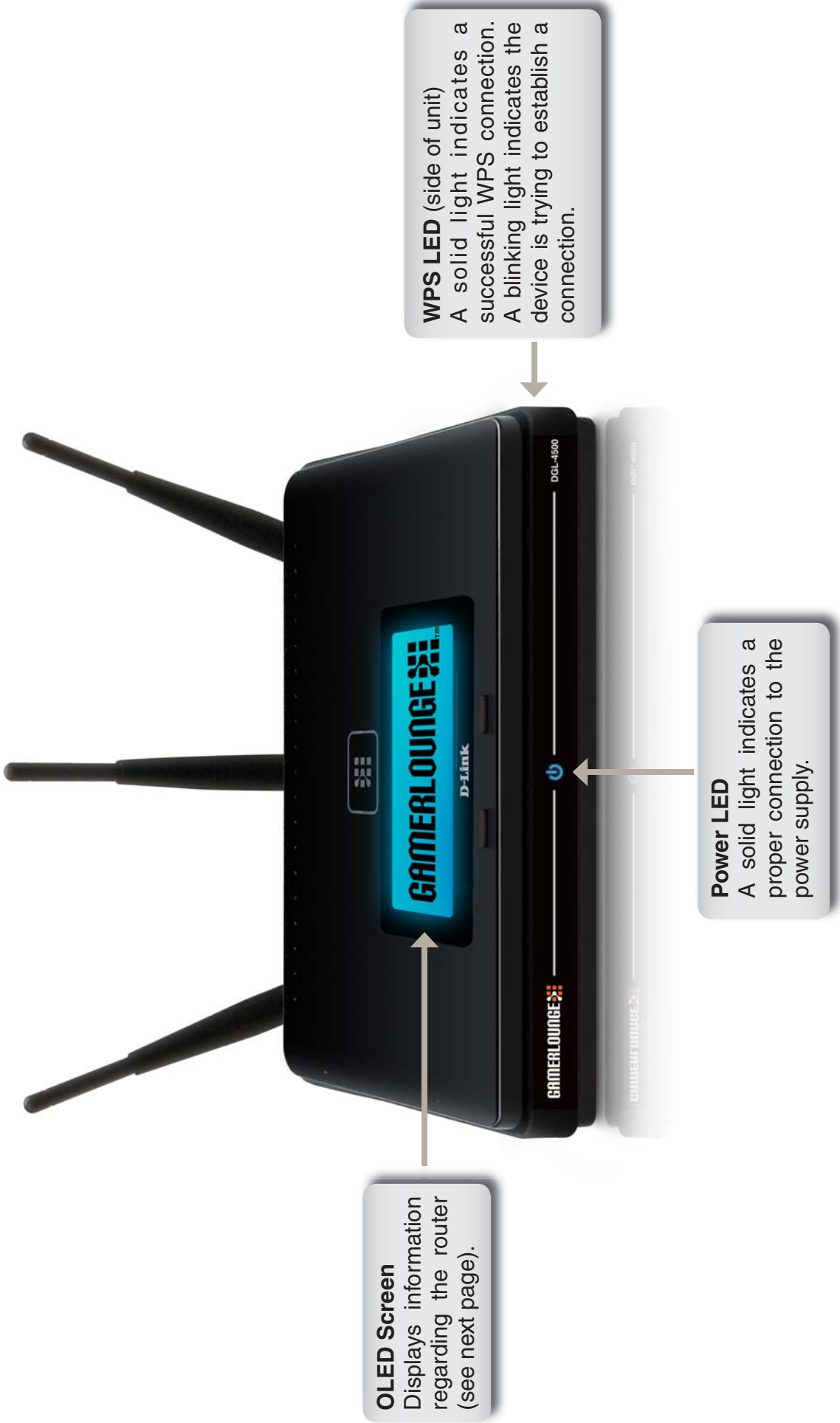
The auto MDI/MDIX Internet port is the connection for the Ethernet cable to the cable or DSL modem.

**Power Receptor**

Receptor for the supplied power adapter.

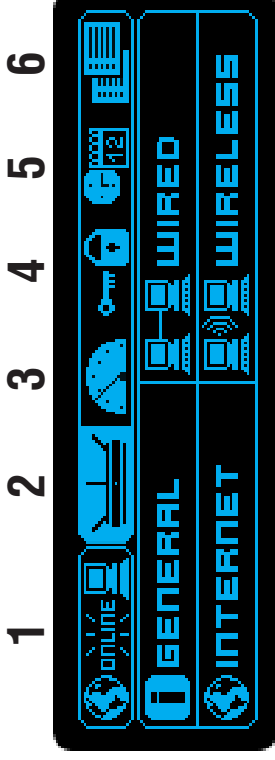
# Hardware Overview

## LEDs



# Hardware Overview

## OLED Screen



OLED Screen

1	WAN	Displays Internet connectivity.
2	Menu	Select to display the OLED main menu.
3	Performance	Select to display the data of the LAN, WAN, and wireless connections.
4	WPS	Displays the WPS status.
5	Date/Time	Displays the routers date and time.
6	Status	Displays the device status.

# Installation

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

## Before you Begin

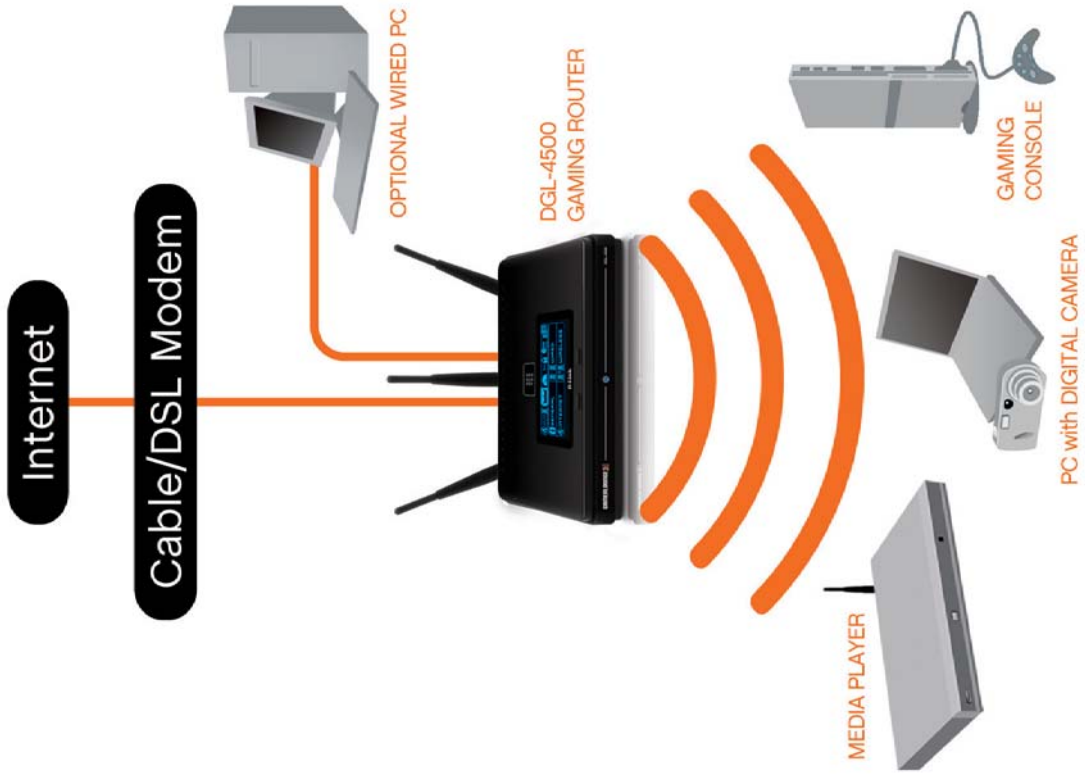
- Please configure the router with the computer that was last connected directly to your modem.
- You can only use the Ethernet port on your modem. If you were using the USB connection before using the router, then you must turn off your modem, disconnect the USB cable and connect an Ethernet cable to the Internet port on the router, and then turn the modem back on. In some cases, you may need to call your ISP to change connection types (USB to Ethernet).
- If you have DSL and are connecting via PPPoE, make sure you disable or uninstall any PPPoE software such as WinPoet, Broadjump, or Enternet 300 from your computer or you will not be able to connect to the Internet.
- When running the Setup Wizard from the D-Link CD, make sure the computer you are running the CD from is connected to the Internet and online or the wizard will not work. If you have disconnected any hardware, re-connect your computer back to the modem and make sure you are online.

# Wireless Installation Considerations

The D-Link wireless router lets you access your network using a wireless connection from virtually anywhere within the operating range of your wireless network. Keep in mind, however, that the number, thickness and location of walls, ceilings, or other objects that the wireless signals must pass through, may limit the range. Typical ranges vary depending on the types of materials and background RF (radio frequency) noise in your home or business. The key to maximizing wireless range is to follow these basic guidelines:

- 1. Keep the number of walls and ceilings between the D-Link router and other network devices to a minimum**
  - each wall or ceiling can reduce your adapter's range from 3-90 feet (1-30 meters.) Position your devices so that the number of walls or ceilings is minimized.
- 2. Be aware of the direct line between network devices.** A wall that is 1.5 feet thick (.5 meters), at a 45-degree angle appears to be almost 3 feet (1 meter) thick. At a 2-degree angle it looks over 42 feet (14 meters) thick! Position devices so that the signal will travel straight through a wall or ceiling (instead of at an angle) for better reception.
- 3. Building Materials make a difference.** A solid metal door or aluminum studs may have a negative effect on range. Try to position access points, wireless routers, and computers so that the signal passes through drywall or open doorways. Materials and objects such as glass, steel, metal, walls with insulation, water (fish tanks), mirrors, file cabinets, brick, and concrete will degrade your wireless signal.
- 4. Keep your product away (at least 3-6 feet or 1-2 meters) from electrical devices or appliances that generate RF noise.**
- 5. If you are using 2.4GHz cordless phones or X-10 (wireless products such as ceiling fans, lights, and home security systems), your wireless connection may degrade dramatically or drop completely. Make sure your 2.4GHz phone base is as far away from your wireless devices as possible. The base transmits a signal even if the phone is not in use.**

# Network Diagram



## **Connect to Cable/DSL/Satellite Modem**

If you are connecting the router to a cable/DSL/satellite modem, please follow the steps below:

1. Place the router in an open and central location. Do not plug the power adapter into the router.
2. Turn the power off on your modem. If there is no on/off switch, then unplug the modem's power adapter. Shut down your computer.
3. Unplug the Ethernet cable (that connects your computer to your modem) from your computer and place it into the Internet port on the router.
4. Plug an Ethernet cable into one of the four LAN ports on the router. Plug the other end into the Ethernet port on your computer.
5. Turn on or plug in your modem. Wait for the modem to boot (about 30 seconds).
6. Plug the power adapter to the router and connect to an outlet or power strip. Wait about 30 seconds for the router to boot.
7. Turn on your computer.
8. Refer to page 14 to configure your router.



## Connect to Another Router

If you are connecting the D-Link router to another router to use as a wireless access point and/or switch, you will have to do the following before connecting the router to your network:

- Disable UPnP™
- Disable DHCP
- Change the LAN IP address to an available address on your network. The LAN ports on the router cannot accept a DHCP address from your other router.

To connect to another router, please follow the steps below:

1. Plug the power into the router. Connect one of your computers to the router (LAN port) using an Ethernet cable. Make sure your IP address on the computer is 192.168.0.xxx (where xxx is between 2 and 254). Please see the **Networking Basics** section for more information. If you need to change the settings, write down your existing settings before making any changes. In most cases, your computer should be set to receive an IP address automatically in which case you will not have to do anything to your computer.
2. Open a web browser and enter **http://192.168.0.1** and press **Enter**. When the login window appears, set the user name to **Admin** and leave the password box empty. Click **Log In** to continue.
3. Click on **Advanced** and then click **Advanced Network**. Uncheck the **Enable UPnP** checkbox. Click **Save Settings** to continue.
4. Click **Setup** and then click **Network Settings**. Uncheck the **Enable DHCP Server** checkbox. Click **Save Settings** to continue.
5. Under Router Settings, enter an available IP address and the subnet mask of your network. Click **Save Settings** to save your settings. Use this new IP address to access the configuration utility of the router in the future. Close the browser and change your computer's IP settings back to the original values as in Step 1.

6. Disconnect the Ethernet cable from the router and reconnect your computer to your network.
7. Connect an Ethernet cable in one of the LAN ports of the router and connect it to your other router. Do not plug anything into the Internet port of the D-Link router.
8. You may now use the other 3 LAN ports to connect other Ethernet devices and computers. To configure your wireless network, open a web browser and enter the IP address you assigned to the router. Refer to the **Configuration** and **Wireless Security** sections for more information on setting up your wireless network.

## Getting Started

The DGL-4500 includes a Quick Router Setup Wizard CD. Follow the simple steps below to run the Setup Wizard to guide you quickly through the installation process. You may manually configure your router without the wizard. Refer to the next page to manually setup your router.

Insert the **Quick Router Setup Wizard CD** in the CD-ROM drive. The step-by-step instructions that follow are shown in Windows® XP. The steps and screens are similar for the other Windows® operating systems.

If the CD autorun function does not automatically start on your computer, go to **Start > Run**. In the run box type **“D:\DGL4500.exe”** (where **D:** represents the drive letter of your CD-ROM drive).

When the autorun screen appears, click **Install Router** and follow the on-screen instructions.



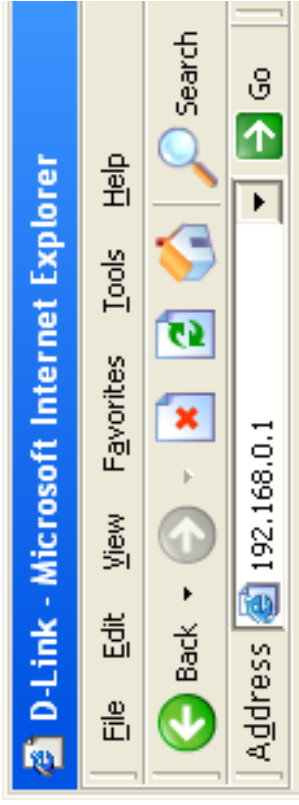
# Configuration

This section will show you how to configure your new D-Link wireless router using the web-based configuration utility.

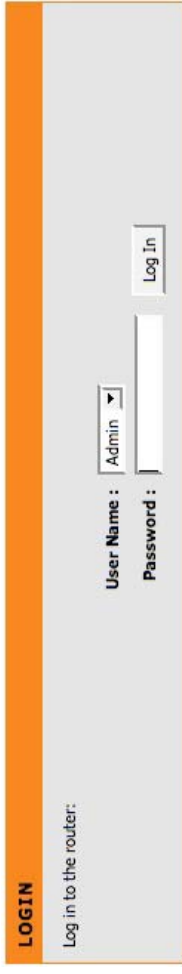
## Web-based Configuration Utility

To access the configuration utility, open a web-browser such as Internet Explorer and enter the IP address of the router (192.168.0.1).

You may also enter the NetBIOS name (“dlinkrouter”) to access the router. Enter **http://dlinkrouter** and press **Enter**.



Select **Admin** from the drop-down menu and then enter your password. Leave the password blank by default.



If you get a **Page Cannot be Displayed** error, please refer to the **Troubleshooting** section for assistance.

## Setup Wizard

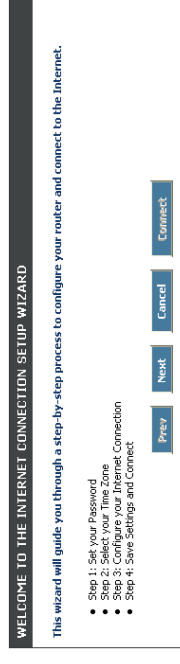
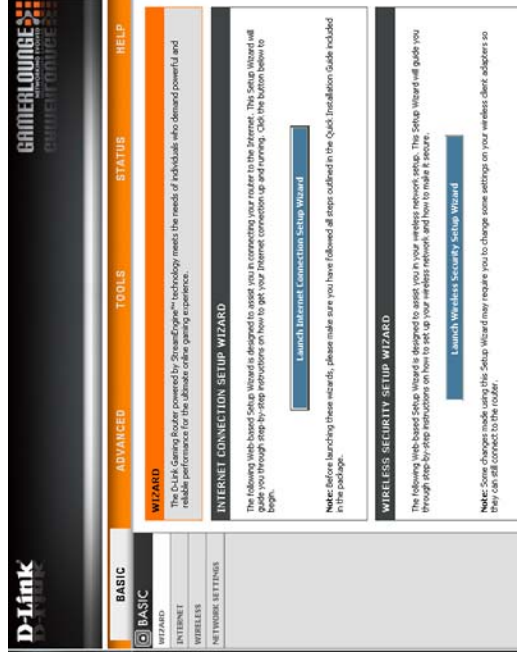
Click **Launch Internet Connection Setup Wizard** to begin.

If you want to configure your wireless settings, click **Launch Wireless Security Setup Wizard** and skip to page 67.

You may click **Setup Wizard** to quickly configure your router.

If you want to enter your settings without running the wizard, click **Manual Configuration** and skip to page 20.

Click **Next** to continue.



Create a new password and then click **Next** to continue.

**STEP 1: SET YOUR PASSWORD**

By default, your router does not have a password configured for administrator access to the Web-based configuration pages. To secure your networking devices, please set and verify a password below.

Password :

Verify Password :

Prev Next Cancel Connect

Select your time zone from the drop-down menu and then click **Next** to continue.

**STEP 2: SELECT YOUR TIME ZONE**

Select the appropriate time zone for your location. This information is required to configure the time-based options for the router.

Time Zone :

Prev Next Cancel Connect

Select the type of Internet connection you use and then click **Next** to continue.

**STEP 3: CONFIGURE YOUR INTERNET CONNECTION**

Your Internet Connection could not be detected, please select your Internet Service Provider (ISP) from the list below. If your ISP is not listed, select the "Not Listed or Don't Know" option to manually configure your connection.

Not Listed or Don't Know ▾

If your Internet Service Provider was not listed or you don't know who it is, please select the Internet connection type below:

- DHCP Connection (Dynamic IP Address)**  
Choose this if your Internet connection automatically provides you with an IP Address. Most Cable Modems use this type of connection.
- Username / Password Connection (PPPoE)**  
Choose this option if your Internet connection requires a username and password to get online. Most DSL modems use this type of connection.
- Username / Password Connection (PPtP)**  
PPtP client.
- Username / Password Connection (L2TP)**  
L2TP client.
- Static IP Address Connection**  
Choose this option if your Internet Setup Provider provided you with IP Address information that has to be manually configured.

Prev Next Cancel Connect

If you selected Dynamic, you may need to enter the MAC address of the computer that was last connected directly to your modem. If you are currently using that computer, click **Clone Your PC's MAC Address** and then click **Next** to continue.

The Host Name is optional but may be required by some ISPs. The default host name is the device name of the Router and may be changed.

If you selected PPPoE, enter your PPPoE username and password. Click **Next** to continue.

Select **Static** if your ISP assigned you the IP address, subnet mask, gateway, and DNS server addresses.

**Note:** Make sure to remove your PPPoE software from your computer. The software is no longer needed and will not work through a router.

If you selected PPTP, enter your PPTP username and password. Click **Next** to continue.

**DHCP CONNECTION (DYNAMIC IP ADDRESS)**

To set up this connection, please make sure that you are connected to the router with the PC that was originally installed on the router. If you are, then click the Clone MAC button to copy your computer's MAC Address to the router.

MAC Address : 00:00:00:00:00:00 (optional)

Host Name :

Notes: You may also need to provide a Host Name. If you do not have or know this information, please contact your ISP.

**SET USERNAME AND PASSWORD CONNECTION (PPPoE)**

To set up this connection you will need to have a Username and Password from your Internet Service Provider. If you do not have this information, please contact your ISP.

Address Mode :  Dynamic IP  Static IP

IP Address : 0.0.0.0

User Name : dhdh@globalnet

Password : ●●●●●●●●

Verify Password : ●●●●●●●● (optional)

Service Name :

Notes: You may also need to provide a Service Name. If you do not have or know this information, please contact your ISP.

**SET USERNAME AND PASSWORD CONNECTION (PPTP)**

To set up this connection you will need to have a Username and Password from your Internet Service Provider. You also need PPTP IP address. If you do not have this information, please contact your ISP.

Address Mode :  Dynamic IP  Static IP

PPTP IP Address : 0.0.0.0

PPTP Subnet Mask : 255.255.255.0

PPTP Gateway IP Address : 0.0.0.0

PPTP Server IP Address (may be same as gateway) : 0.0.0.0

User Name :

Password : ●●●●●●

Verify Password : ●●●●●●

If you selected L2TP, enter your L2TP username and password. Click **Next** to continue.

**SET USERNAME AND PASSWORD CONNECTION (L2TP)**

To set up this connection you will need to have a Username and Password from your Internet Service Provider. You also need L2TP IP address. If you do not have this information, please contact your ISP.

Address Mode:  Dynamic IP  Static IP

L2TP IP Address: 0.0.0.0

L2TP Subnet Mask: 255.255.255.0

L2TP Gateway IP Address: 0.0.0.0

L2TP Server IP Address (may be same as gateway): 0.0.0.0

User Name: \_\_\_\_\_

Password: •••••

Verify Password: •••••

Prev Next Cancel Connect

If you selected Static, enter your network settings supplied by your Internet provider. Click **Next** to continue.

**SET STATIC IP ADDRESS CONNECTION**

To set up this connection you will need to have a complete list of IP information provided by your Internet Service Provider. If you have a Static IP connection and do not have this information, please contact your ISP.

IP Address: 0.0.0.0

Subnet Mask: 255.255.255.0

Gateway Address: 0.0.0.0

Primary DNS Address: 0.0.0.0

Secondary DNS Address: 0.0.0.0

Prev Next Cancel Connect

Click **Connect** to save your settings. Once the router is finished rebooting, click **Continue**. Please allow 1-2 minutes to connect.

Close your browser window and reopen it to test your Internet connection. It may take a few tries to initially connect to the Internet.

**SETUP COMPLETE!**

The Internet Connection Setup Wizard has completed. Click the Connect button to save your settings and reboot the router.

Prev Next Cancel Connect



# Manual Configuration

## Dynamic (Cable)

**My Internet Connection:** Select **Dynamic IP (DHCP)** to obtain IP Address information automatically from your ISP. Select this option if your ISP does not give you any IP numbers to use. This option is commonly used for Cable modem services.

**Host Name:** The Host Name is optional but may be required by some ISPs.

**Use UnICASTing:** Check the box if you are having problems obtaining an IP address from your ISP.

**DNS Addresses:** Enter the Primary DNS server IP address assigned by your ISP.

**MTU:** Maximum Transmission Unit - you may need to change the MTU for optimal performance with your specific ISP. 1500 is the default MTU.

**MAC Address:** The default MAC Address is set to the Internet port's physical interface MAC address on the Broadband Router. It is not recommended that you change the default MAC address unless required by your ISP. You can use the **Clone Your PC's MAC Address** button to replace the Internet port's MAC address with the MAC address of your Ethernet card.

The screenshot shows the D-Link configuration interface for a Dynamic (Cable) connection. The top navigation bar includes 'BASIC', 'ADVANCED', 'TOOLS', 'STATUS', and 'HELP'. The 'BASIC' section is active, showing 'WIZARD', 'INTERNET', 'WIRELESS', and 'NETWORK SETTINGS'. The 'WAN' section is highlighted in orange. The 'Internet Connection' section contains instructions and a 'Don't Save Settings' button. The 'INTERNET CONNECTION TYPE' section shows 'My Internet Connection is: Dynamic IP (DHCP)'. The 'DYNAMIC IP (DHCP) INTERNET CONNECTION TYPE' section includes fields for 'Host Name', 'Use UnICASTing' (checked), 'Primary DNS Server' (0.0.0.0), 'Secondary DNS Server' (0.0.0.0), 'MTU' (1500), and 'MAC Address' (00:00:00:00:00:00). A 'Clone Your PC's MAC Address' button is located at the bottom right of this section.

## Internet Setup PPPoE (DSL)

Choose PPPoE (Point to Point Protocol over Ethernet) if your ISP uses a PPPoE connection. Your ISP will provide you with a username and password. This option is typically used for DSL services. Make sure to remove your PPPoE software from your computer. The software is no longer needed and will not work through a router.

**My Internet Connection:** Select **PPPoE (Username/Password)** from the drop-down menu.

**Address Mode:** Select **Static** if your ISP assigned you the IP address, subnet mask, gateway, and DNS server addresses. In most cases, select **Dynamic**.

**IP Address:** Enter the IP address (Static PPPoE only).

**User Name:** Enter your PPPoE user name.

**Password:** Enter your PPPoE password and then retype the password in the next box.

**Service Name:** Enter the ISP Service Name (optional).

**Reconnection Mode:** Select either **Always-on**, **On-Demand**, or **Manual**.

**Maximum Idle Time:** Enter the Primary and Secondary DNS Server Addresses (Static PPPoE only).

**DNS Addresses:** Enter a maximum idle time during which the Internet connection is maintained during inactivity. To disable this feature, enable Auto-reconnect.

**MTU:** Maximum Transmission Unit - you may need to change the MTU for optimal performance with your specific ISP. 1492 is the default MTU.

**MAC Address:** The default MAC Address is set to the Internet port's physical interface MAC address on the Broadband Router. It is not recommended that you change the default MAC address unless required by your ISP. You can use the **Clone Your PC's MAC Address** button to replace the Internet port's MAC address with the MAC address of your Ethernet card.

The screenshot shows the D-Link router's configuration interface. The top navigation bar includes 'D-link', 'BASIC', 'ADVANCED', 'TOOLS', 'STATUS', and 'HELP'. The 'INTERNET' tab is selected. The 'INTERNET CONNECTION TYPE' dropdown is set to 'PPPoE (Username/Password)'. The 'PPPoE INTERNET CONNECTION TYPE' section contains the following fields:

- Address Mode:** Dynamic IP (selected) / Static IP
- IP Address:** 0.0.0.0
- Username:** dslgig-global.net
- Password:** [masked]
- Verify Password:** [masked]
- Service Name:** [optional]
- Reconnect Mode:** Always on (selected) / On-demand / Manual
- Maximum Idle Time:** 10 (minutes, 0-6000)
- Primary DNS Server:** 0.0.0.0
- Secondary DNS Server:** 0.0.0.0
- MTU:** 1492 (bytes) (MTU default = 1492)
- MAC Address:** 00:00:00:00:00:00

A 'Clone Your PC's MAC Address' button is located at the bottom right of the form.

# Internet Setup

## PPTP

Choose PPTP (Point-to-Point-Tunneling Protocol ) if your ISP uses a PPTP connection. Your ISP will provide you with a username and password. This option is typically used for DSL services.

**Address Mode:** Select **Static** if your ISP assigned you the IP address, subnet mask, gateway, and DNS server addresses. In most cases, select **Dynamic**.

**PPTP IP Address:** Enter the IP address (Static PPTP only).

**PPTP Subnet Mask:** Enter the Primary and Secondary DNS Server Addresses (Static PPTP only).

**PPTP Gateway:** Enter the Gateway IP Address provided by your ISP.

**PPTP Server IP:** Enter the Server IP provided by your ISP (optional).

**Username:** Enter your PPTP username.

**Password:** Enter your PPTP password and then retype the password in the next box.

**Reconnect Mode:** Select either **Always-on, On-Demand, or Manual**.

**Maximum Idle Time:** Enter a maximum idle time during which the Internet connection is maintained during inactivity. To disable this feature, enable Auto-reconnect.

**DNS Servers:** The DNS server information will be supplied by your ISP (Internet Service Provider.)

**Internet Connection**

Use this section to configure your Internet Connection type. There are several connection types to choose from: Static IP, DHCP, PPPoE, PPTP, L2TP, and BigPond. If you are unsure of your connection method, please contact your Internet Service Provider.

Note: If using the PPPoE option, you will need to remove or disable any PPPoE client software on your computers.

Save Settings    Don't Save Settings

**INTERNET CONNECTION TYPE**

Choose the mode to be used by the router to connect to the Internet.

My Internet Connection is: PPTP (Username / Password)

**PPTP INTERNET CONNECTION TYPE :**

Enter the information provided by your Internet Service Provider (ISP).

Address Mode:  Dynamic IP  Static IP

PPTP IP Address: 0.0.0.0

PPTP Subnet Mask: 255.255.255.0

PPTP Gateway IP Address: 0.0.0.0

PPTP Server IP Address: 0.0.0.0

Username: \*\*\*\*\*

Password: \*\*\*\*\*

Verify Password: \*\*\*\*\*

Reconnect Mode:  Always on  On demand  Manual

Maximum Idle Time: 5 (minutes, 0=infinite)

Primary DNS Server: 0.0.0.0

Secondary DNS Server: 0.0.0.0

MTU: 1400 (bytes) MTU default = 1400

MAC Address: 00:00:00:00:00:00

Clone Your PC's MAC Address

**MTU:** Maximum Transmission Unit - you may need to change the MTU for optimal performance with your specific ISP. 1400 is the default MTU.

**MAC Address:** The default MAC Address is set to the Internet port's physical interface MAC address on the Broadband Router. It is not recommended that you change the default MAC address unless required by your ISP. You can use the **Clone Your PC's MAC Address** button to replace the Internet port's MAC address with the MAC address of your Ethernet card.

# Internet Setup

## L2TP

Choose L2TP (Layer 2 Tunneling Protocol) if your ISP uses a L2TP connection. Your ISP will provide you with a username and password. This option is typically used for DSL services.

**Address Mode:** Select **Static** if your ISP assigned you the IP address, subnet mask, gateway, and DNS server addresses. In most cases, select **Dynamic**.

**L2TP IP Address:** Enter the L2TP IP address supplied by your ISP (Static only).

**L2TP Subnet Mask:** Enter the Subnet Mask supplied by your ISP (Static only).

**L2TP Gateway:** Enter the Gateway IP Address provided by your ISP.

**L2TP Server IP:** Enter the Server IP provided by your ISP (optional).

**Username:** Enter your L2TP username.

**Password:** Enter your L2TP password and then retype the password in the next box.

**Reconnect Mode:** Select either **Always-on**, **On-Demand**, or **Manual**.

**Maximum Idle Time:** Enter a maximum idle time during which the Internet connection is maintained during inactivity. To disable this feature, enable Auto-reconnect.

**DNS Servers:** Enter the Primary and Secondary DNS Server Addresses (Static L2TP only).

The screenshot shows the D-Link Internet Setup interface for L2TP configuration. The navigation menu includes BASIC, INTERNET WIZARD, WIRELESS, NETWORK SETTINGS, ADVANCED, TOOLS, STATUS, and HELP. The 'INTERNET CONNECTION' section is active, with a 'WAN' tab selected. Below the navigation, there are instructions for configuring the Internet Connection type, with a note about PPPoE. The 'INTERNET CONNECTION TYPE' dropdown is set to 'L2TP (Username / Password)'. The 'L2TP INTERNET CONNECTION TYPE' section contains the following fields and options:

- Address Mode:** Dynamic IP (selected) / Static IP
- L2TP IP Address:** 0.0.0.0
- L2TP Subnet Mask:** 255.255.255.0
- L2TP Gateway IP Address:** 0.0.0.0
- L2TP Server IP Address:** 0.0.0.0
- Username:** [Empty field]
- Password:** [Masked field]
- Verify Password:** [Masked field]
- Reconnect Mode:** Always on (selected) / On demand / Manual
- Maximum Idle Time:** 5 (minutes, 0=Infinite)
- Primary DNS Server:** 0.0.0.0
- Secondary DNS Server:** 0.0.0.0
- MTU:** 1400 (bytes) (MTU default = 1400)
- MAC Address:** 00:00:00:00:00:00

At the bottom right, there is a 'Clone Your PC's MAC Address' button and a copyright notice: 'Copyright © 2004-2006 D-Link Systems, Inc.'

**MTU:** Maximum Transmission Unit - you may need to change the MTU for optimal performance with your specific ISP. 1400 is the default MTU.

**Clone MAC Address:** The default MAC Address is set to the Internet port's physical interface MAC address on the Broadband Router. It is not recommended that you change the default MAC address unless required by your ISP. You can use the **Clone Your PC's MAC Address** button to replace the Internet port's MAC address with the MAC address of your Ethernet card.

## Internet Setup Static (assigned by ISP)

Select Static IP Address if all the Internet port's IP information is provided to you by your ISP. You will need to enter in the IP address, subnet mask, gateway address, and DNS address(es) provided to you by your ISP. Each IP address entered in the fields must be in the appropriate IP form, which are four octets separated by a dot (x.x.x.x). The Router will not accept the IP address if it is not in this format.

**IP Address:** Enter the IP address assigned by your ISP.

**Subnet Mask:** Enter the Subnet Mask assigned by your ISP.

**Default Gateway:** Enter the Gateway assigned by your ISP.

**DNS Servers:** The DNS server information will be supplied by your ISP (Internet Service Provider.)

**MTU:** Maximum Transmission Unit - you may need to change the MTU for optimal performance with your specific ISP. 1500 is the default MTU.

**MAC Address:** The default MAC Address is set to the Internet port's physical interface MAC address on the Broadband Router. It is not recommended that you change the default MAC address unless required by your ISP. You can use the **Clone Your PC's MAC Address** button to replace the Internet port's MAC address with the MAC address of your Ethernet card.

The screenshot shows the D-Link DGL-4500 Web Management Interface. The top navigation bar includes 'BASIC', 'ADVANCED', 'TOOLS', 'STATUS', and 'HELP'. The left sidebar shows 'BASIC WIZARD', 'INTERNET', 'WIRELESS', and 'NETWORK SETTINGS'. The main content area is titled 'WAN' and 'Internet Connection'. It contains a 'Save Settings' button and a 'Don't Save Settings' button. Below this is the 'INTERNET CONNECTION TYPE' section, where 'Static IP' is selected. The 'STATIC IP ADDRESS INTERNET CONNECTION TYPE' section contains the following fields:

IP Address :	0.0.0.0
Subnet Mask :	255.255.255.0
Default Gateway :	0.0.0.0
Primary DNS Server :	0.0.0.0
Secondary DNS Server :	0.0.0.0
MTU :	1500 (bytes) MTU default = 1500
MAC Address :	00:00:00:00:00:00

# Wireless Settings

**Enable Wireless:** Check the box to enable the wireless function. If you do not want to use wireless, uncheck the box to disable all the wireless functions. Click **Add New** to create your own time schedule to enable the wireless function.

**Wireless Network Name:** Service Set Identifier (SSID) is the name of your wireless network. Create a name using up to 32 characters. The SSID is case-sensitive.

**802.11 Band:** Select **2.4GHz** if you want to use the 2.4GHz band or **5GHz** band if you want to use the 5GHz band.

## 802.11 Mode: 2.4GHz:

Select one of the following:

**802.11g Only** - Select if all of your wireless clients are 802.11g.

**Mixed 802.11g and 802.11b** - Select if you are using both 802.11b and 802.11g wireless clients.

**802.11b Only** - Select if all of your wireless clients are 802.11b.

**802.11n Only** - Select only if all of your wireless clients are 802.11n.

**Mixed 802.11n, 802.11b, and 802.11g** - Select if you are using a mix of 802.11n, 11g, and 11b wireless clients.

**Mixed 802.11n and 802.11g** - Select if you are using a mix of 802.11n and 802.11g wireless clients.

## 5GHz:

Select one of the following:

**802.11a Only** - Select if all of your wireless clients are 802.11a.

**802.11n Only** - Select only if all of your wireless clients are 802.11n.

**802.11n and 802.11a** - Select if you are using both 802.11b and 802.11g wireless clients.

The screenshot shows the D-Link configuration utility for the DGL-4500. The 'WIRELESS' tab is selected. Under 'Wireless Network Settings', the 'Enable Wireless' checkbox is checked. The 'Wireless Network Name' is set to 'dlink'. The '802.11 Band' is set to '2.4GHz' and the '802.11 Mode' is set to 'Mixed 802.11n, 802.11g and 802.11b'. The 'Enable Auto Channel Scan' checkbox is checked. Under 'Wireless Channel Settings', the 'Wireless Channel' is set to '2.437 GHz - CH6', the 'Transmission Rate' is 'Best (automatic)', the 'Channel Width' is '20 MHz', and the 'Visibility Status' is 'Visible'. The 'WIRELESS SECURITY MODE' section is partially visible at the bottom.



**Enable Auto Channel Scan:** The **Auto Channel Scan** setting can be selected to allow the DGL-4500 to choose the channel with the least amount of interference.

**Wireless Channel:** Indicates the channel setting for the DGL-4500. By default the channel is set to 6. The Channel can be changed to fit the channel setting for an existing wireless network or to customize the wireless network. If you enable **Auto Channel Scan**, this option will be greyed out.

**Transmission Rate:** Select the transmit rate. It is strongly suggested to select **Best (Auto)** for best performance.

**Channel Width:** Select the Channel Width:

**Auto 20/40** - Select if you are using both 802.11n and non-802.11n wireless devices.

**20MHz** - Select if you are not using any 802.11n wireless clients. This is the default setting.

**Visibility Status:** Select **Invisible** if you do not want the SSID of your wireless network to be broadcasted by the DGL-4500. If Invisible is selected, the SSID of the DGL-4500 will not be seen by Site Survey utilities so your wireless clients will have to know the SSID of your DGL-4500 in order to connect to it.

**Wireless Security:** Refer to page 66 for more information regarding wireless security.

# Network Settings

This section will allow you to change the local network settings of the router and to configure the DHCP settings.

**IP Address:** Enter the IP address of the router. The default IP address is 192.168.0.1.

If you change the IP address, once you click Apply, you will need to enter the new IP address in your browser to get back into the configuration utility.

**Subnet Mask:** Enter the Subnet Mask. The default subnet mask is 255.255.255.0.

**Local Domain:** Enter the Domain name (Optional).

**Enable DNS Relay:** Uncheck the box to transfer the DNS server information from your ISP to your computers. If checked, your computers will use the router for a DNS server.

**ROUTER SETTINGS**

Use this section to configure the internal network settings of your router. The IP Address that is configured here is the IP Address that you use to access the Web-based management interface. If you change the IP Address here, you may need to adjust your PC's network settings to access the network again.

Router IP Address: 192.168.0.1  
 Subnet Mask: 255.255.255.0  
 Local Domain Name: (optional)  
 Enable DNS Relay:

**DHCP SERVER SETTINGS**

Use this section to configure the built-in DHCP server to assign IP addresses to the computers on your network.

Enable DHCP Server:   
 DHCP IP Address Range: 192.168.0.100 to 192.168.0.199  
 DHCP Lease Time: 1440 (minutes)  
 Always Broadcast:  (compatibility for some DHCP Clients)  
 NetBIOS announcement:   
 Learn NetBIOS from WAN:   
 NetBIOS Scope: (optional)  
 NetBIOS node type:  Broadcast only (use when no WINS servers configured)  
 Peer-to-Peer (no broadcast)  
 Mixed-mode (broadcast then Point-to-Point)  
 Hybrid (Point-to-Point then Broadcast)  
 Primary WINS IP Address: 0.0.0.0  
 Secondary WINS IP Address: 0.0.0.0

**ADD DHCP RESERVATION**

Enable:   
 Computer Name: << Computer Name  
 IP Address:  
 MAC Address:  
 Copy Your PC's MAC Address  
 Save Clear

**DHCP RESERVATIONS LIST**

Enable	Computer Name	MAC Address	IP Address
<b>NUMBER OF DYNAMIC DHCP CLIENTS: 1</b>			
Hardware Address	Assigned IP	Hostname	Logics
00:16:17:46:46:60	192.168.0.199	dlink-5525658a	ZJ Netcat #5 Hosts
			Revolve
			Replay

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## DHCP Server Settings

DHCP stands for Dynamic Host Control Protocol. The router has a built-in DHCP server. The DHCP Server will automatically assign an IP address to the computers on the LAN/private network. Be sure to set your computers to be DHCP clients by setting their TCP/IP settings to “Obtain an IP Address Automatically.” When you turn your computers on, they will automatically load the proper TCP/IP settings provided by the DGL-4500. The DHCP Server will automatically allocate an unused IP address from the IP address pool to the requesting computer. You must specify the starting and ending address of the IP address pool.

**Enable DHCP Server:** Check this box to enable the DHCP server on your router. Uncheck to disable this function.

**DHCP IP Address Range:** Enter the starting and ending IP addresses for the DHCP server’s IP assignment.

**Note:** If you statically (manually) assign IP addresses to your computers or devices, make sure the IP addresses are outside of this range or you may have an IP conflict.

**DHCP Lease Time:** The length of time for the IP address lease. Enter the Lease time in minutes.

**Always Broadcast:** Enable this feature to broadcast your networks DHCP server to LAN/WLAN clients.

**NetBIOS Announcement:** NetBIOS allows LAN hosts to discover all other computers within the network, enable this feature to allow the DHCP Server to offer NetBIOS configuration settings.

**Learn NetBIOS from WAN:** Enable this feature to allow WINS information to be learned from the WAN side, disable to allow manual configuration.

**NetBIOS Scope:** This feature allows the configuration of a NetBIOS ‘domain’ name under which network hosts operates. This setting has no effect if the ‘Learn NetBIOS information from WAN’ is activated.

**NetBIOS Node:** Select the different type of NetBIOS node; **Broadcast only**, **Point-to-Point**, **Mixed-mode**, and **Hybrid**.

**WINS IP Address:** Enter your WINS IP address

The image shows two screenshots of a web interface. The top screenshot is titled "DHCP SERVER SETTINGS" and contains the following fields and options:
 

- Enable DHCP Server:** A checked checkbox.
- DHCP IP Address Range:** Two input fields containing "192.168.0.100" and "192.168.0.199".
- DHCP Lease Time:** An input field containing "1440" with "(minutes)" below it.
- Always broadcast:** A checked checkbox with "(compatibility for some DHCP Clients)" below it.
- NetBIOS announcement:** A checked checkbox.
- Learn NetBIOS from WAN:** An unchecked checkbox.
- NetBIOS Scope:** An input field with "(optional)" below it.
- NetBIOS mode type:** Three radio button options: "Broadcast only (Use when no WINS servers configured)", "Point-to-Point (no Broadcast)", and "Mixed-mode (Broadcast then Point-to-Point)".
- Primary WINS IP Address:** An input field containing "0.0.0.0".
- Secondary WINS IP Address:** An input field containing "0.0.0.0".

 The bottom screenshot is titled "ADD DHCP RESERVATION" and contains:
 

- Enable:** An unchecked checkbox.
- Computer Name:** A dropdown menu showing "<< Computer Name".
- IP Address:** An empty input field.
- MAC Address:** An empty input field.
- Buttons for "Save", "Clear", and "Copy Your PC's MAC Address".

## DHCP Reservation

If you want a computer or device to always have the same IP address assigned, you can create a DHCP reservation. The router will assign the IP address only to that computer or device.

**Note:** This IP address must be within the DHCP IP Address Range.

**Enable:** Check this box to enable the reservation.

**Computer Name:** Enter the computer name or select from the drop-down menu and click <<.

**IP Address:** Enter the IP address you want to assign to the computer or device. This IP Address must be within the DHCP IP Address Range.

**MAC Address:** Enter the MAC address of the computer or device.

**Copy Your PC's** If you want to assign an IP address to the **MAC Address:** computer you are currently on, click this button to populate the fields.

**Save:** Click **Save** to save your entry. You must click **Save Settings** at the top to activate your reservations.

**ADD DHCP RESERVATION**

Enable:

Computer Name:  << Computer Name ▼

IP Address:

MAC Address:

Copy Your PC's MAC Address

DHCP RESERVATIONS LIST			
Enable	Computer Name	MAC Address	IP Address

NUMBER OF DYNAMIC DHCP CLIENTS:1			
Hardware Address	Assigned IP	Hostname	Expires
00:16:17:44:a3:f0	192.168.0.199	dlink-557c6fd9e	23 Hours 45 Minutes
			Revoke   Reserve

## Virtual Server

The DGL-4500 can be configured as a virtual server so that remote users accessing Web or FTP services via the public IP address can be automatically redirected to local servers in the LAN (Local Area Network).

The DGL-4500 firewall feature filters out unrecognized packets to protect your LAN network so all computers networked with the DGL-4500 are invisible to the outside world. If you wish, you can make some of the LAN computers accessible from the Internet by enabling Virtual Server. Depending on the requested service, the DGL-4500 redirects the external service request to the appropriate server within the LAN network.

The DGL-4500 is also capable of port-redirection meaning incoming traffic to a particular port may be redirected to a different port on the server computer.

Each virtual service that is created will be listed at the bottom of the screen in the Virtual Servers List. There are pre-defined virtual services already in the table. You may use them by enabling them and assigning the server IP to use that particular virtual service.

For a list of ports for common applications, please visit [http://support.dlink.com/faq/view.asp?prod\\_id=1191](http://support.dlink.com/faq/view.asp?prod_id=1191).

This will allow you to open a single port. If you would like to open a range of ports, refer to page 35.

**Enable:** Check this box to enable the rule.

**Name:** Enter a name for the rule or select an application from the drop-down menu. Select an application and click << to populate the fields.

**IP Address:** Enter the IP address of the computer on your local network that you want to allow the incoming service to. If your computer is receiving an IP address automatically from the router (DHCP), your computer will be listed in the “Computer Name” drop-down menu. Select your computer and click <<.

**Protocol Type:** Select **TCP**, **UDP**, or **Both** from the drop-down menu.

**Private Port/ Public Port:** Enter the port that you want to open next to **Private Port** and **Public Port**. The private and public ports are usually the same. The public port is the port seen from the Internet side, and the private port is the port being used by the application on the computer within your local network.

**Schedule:** The schedule of time when the Virtual Server Rule will be enabled. The schedule may be set to **Always**, which will allow the particular service to always be enabled. You can create your own times in the **Tools > Schedules** section.

**Inbound Filter:** Select **Allow All** (most common) or a created Inbound filter. You may create your own inbound filters in the **Advanced > Inbound Filter** page.

The screenshot shows the D-Link Virtual Server configuration interface. The top navigation bar includes 'D-Link', 'ADVANCED', 'TOOLS', 'STATUS', and 'HELP'. The main content area is titled 'VIRTUAL SERVER' and contains a description: 'The Virtual Server option allows you to define a single public port on your router for redirection to an internal LAN IP Address and Private LAN port if required. This feature is useful for hosting online services such as FTP or Web Servers.' Below this are 'Save Settings' and 'Don't Save Settings' buttons.

The 'ADD VIRTUAL SERVER RULE' section includes the following fields:

- Enable:**
- Name:** Application Name (dropdown), Computer Name... (dropdown)
- IP Address:** [Text input]
- Protocol:** 6 (dropdown), TCP (dropdown)
- Public port:** [Text input]
- Private port:** [Text input]
- Schedule:** Always (dropdown), Allow All (dropdown)
- Inbound Filter:** [Text input]

Buttons for 'Add' and 'Clear' are located below the 'Inbound Filter' field.

The 'VIRTUAL SERVER LIST' table at the bottom has the following columns: Name, IP Address, Protocol / Ports, Schedule, Inbound Filter, Edit, and Delete.

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## Application Rules

Some applications require multiple connections, such as Internet gaming, video conferencing, Internet telephony and others. These applications have difficulties working through NAT (Network Address Translation). Special Applications makes some of these applications work with the DGL-4500. If you need to run applications that require multiple connections, specify the port normally associated with an application in the "Trigger Port" field, select the protocol type as TCP or UDP, then enter the firewall (public) ports associated with the trigger port to open them for inbound traffic.

The DGL-4500 provides some predefined applications in the table on the bottom of the web page. Select the application you want to use and enable it.

**Enable:** Check this box to enable the rule.

**Name:** Enter a name for the rule. You may select a pre-defined application from the drop-down menu and click <<.

**Trigger:** This is the port used to trigger the application. It can be either a single port or a range of ports.

**Traffic Type:** Select the protocol of the trigger port (TCP, UDP, or Both).

**Firewall:** This is the port number on the Internet side that will be used to access the application. You may define a single port or a range of ports. You can use a comma to add multiple ports or port ranges.

**Traffic Type:** Select the protocol of the firewall port (TCP, UDP, or Both).

**Schedule:** The schedule of time when the Application Rule will be enabled. The schedule may be set to Always, which will allow the particular service to always be enabled. You can create your own times in the **Tools > Schedules** section.

# Gaming

This will allow you to open a single port or a range of ports.

**Enable:** Check this box to enable the rule.

**Name:** Enter a name for the rule or select an application from the drop-down menu. Select an application and click << to populate the fields.

**IP Address:** Enter the IP address of the computer on your local network that you want to allow the incoming service to. If your computer is receiving an IP address automatically from the router (DHCP), your computer will be listed in the “Computer Name” drop-down menu. Select your computer and click <<.

**TCP/UDP:** Enter the TCP and/or UDP port or ports that you want to open. You can enter a single port or a range of ports. Separate ports with a common.

Example: 24, 1009, 3000-4000

**Schedule:** The schedule of time when the Virtual Server Rule will be enabled. The schedule may be set to Always, which will allow the particular service to always be enabled. You can create your own times in the **Tools** > **Schedules** section.

**Inbound Filter:** Select **Allow All** (most common) or a created Inbound filter. You may create your own inbound filters in the **Advanced** > **Inbound Filter** page.



# GameFuel

The GameFuel option helps improve your network gaming performance by prioritizing applications. By default the GameFuel settings are disabled and application priority is not classified automatically.

**Enable GameFuel:** This option is disabled by default. Enable this option for better performance and experience with online games and other interactive applications, such as VoIP.

**Automatic Classification:** This option is enabled by default. This will allow your router to automatically determine the network priority of running programs.

**Dynamic Fragmentation:** This option should be enabled when you have a slow Internet uplink. It helps to reduce the impact that large low priority network packets can have on more urgent ones.

**Automatic Uplink Speed:** This option is enabled by default when the GameFuel option is enabled. This option will allow your router to automatically determine the uplink speed of your Internet connection.

**Measured Uplink Speed:** This displays the detected uplink speed.

**Manual Uplink Speed:** The speed at which data can be transferred from the router to your ISP. This is determined by your ISP. ISP's often speed as a download/upload pair. For example, 1.5Mbps/284Kbits. Using this example, you would enter 284. Alternatively you can test your uplink speed with a service such as [www.dsireports.com](http://www.dsireports.com).

**Connection Type:** By default, the router automatically determines whether the underlying connection is an xDSL/Frame-relay network or some other connection type (such as cable modem or Ethernet), and it displays the result as Detected xDSL or Frame Relay Network.

The screenshot shows the D-Link GameFuel configuration page. The top navigation bar includes 'BASIC', 'ADVANCED', 'TOOLS', 'STATUS', and 'HELP'. The 'ADVANCED' section is expanded to show 'GAMEFUEL'. The 'GAMEFUEL SETUP' section contains the following options:

- Enable GameFuel:**
- Automatic Classification:**
- Dynamic Fragmentation:**
- Automatic Uplink Speed:**
- Measured Uplink Speed:** Max Estimated: 128 kbps << 128 kbps
- Manual Uplink Speed:** 128 kbps << 128 kbps
- Connection Type:** Auto-detect
- Detected xDSL or other Frame Relay Network:** No

The 'ADD GAMEFUEL RULE' section includes fields for:

- Enable:**
- Name:** [Empty]
- Priority:** [Empty] (1..255, 255 is the lowest priority)
- Protocol:** 255 << Any
- Local IP Range:** [Empty] to [Empty]
- Local Port Range:** [Empty] to [Empty]
- Remote IP Range:** [Empty] to [Empty]
- Remote Port Range:** [Empty] to [Empty]

Buttons for 'Add' and 'Clear' are present. Below is the 'GAMEFUEL RULES LIST' table with columns: Name, Priority, Local IP Range, Remote IP Range, Protocol / Ports.

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If you have an unusual network connection in which you are actually connected via xDSL but for which you configure either “Static” or “DHCP” in the Internet settings, setting this option to xDSL or Other Frame Relay Network ensures that the router will recognize that it needs to shape traffic slightly differently in order to give the best performance. Choosing xDSL or Other Frame Relay Network causes the measured uplink speed to be reported slightly lower than before on such connections, but gives much better results.

**Detected xDSL:** When Connection Type is set to automatic, the automatically detected connection type is displayed here.

# Routing

Use the routing option to define fixed routes to specific destinations.

**Enable:** Check this box to enable the rule.

**Name:** Enter a name for the rule.

**Destination IP:** Enter the destination IP address or network address.

**Netmask:** Enter the destination subnet mask.

**Gateway:** Enter the destination's gateway IP address.

**Metric:** Enter the route's priority. The higher the number the lower the priority.

**Interface:** Select LAN or WAN from the drop-down menu.

The screenshot shows the 'GAMERLOUNGE NETWORKING FRONT END' interface. The 'ADVANCED' tab is selected, and the 'ROUTING' sub-tab is active. The 'ADD ROUTE' section contains the following fields:

- Enable:**
- Name:** [Text Input]
- Destination IP:** [Text Input]
- Netmask:** [Text Input]
- Gateway:** [Text Input]
- Metric:** [Text Input]
- Interface:** [WAN] (Dropdown Menu)

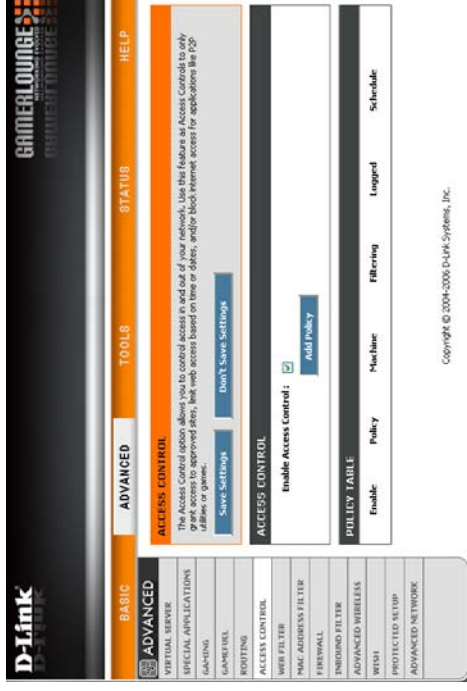
Below the form is a table titled 'ROUTES LIST' with the following columns: Name, Destination IP, Netmask, Gateway, Metric, and Interface. The table is currently empty.

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## Access Control

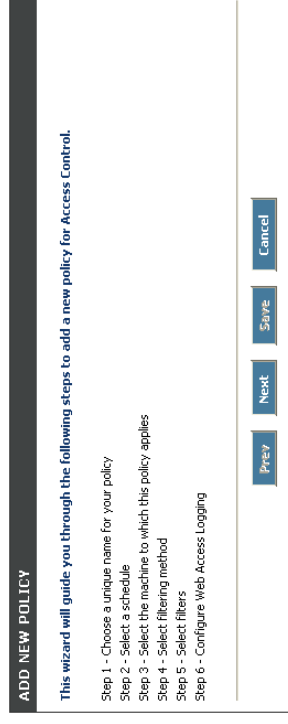
The Access Control section allows you to control access in and out of your network. Use this feature as Parental Controls to only grant access to approved sites, limit web access based on time or dates, and/or block access from applications like P2P utilities or games.

**Add Policy:** Click the **Add Policy** button to start the Access Control Wizard.



## Access Control Wizard

Click **Next** to continue with the wizard.



## Access Control Wizard (continued)

Enter a name for the policy and then click **Next** to continue.

**STEP 1: CHOOSE POLICY NAME**  
Choose a unique name for your policy.

Policy Name:

Select a schedule (I.E. Always) from the drop-down menu and then click **Next** to continue.

**STEP 2: SELECT SCHEDULE**  
Choose a schedule to apply to the policy.

Details:

Enter the following information and then click **Next** to continue.

- Address Type - Select IP address, MAC address, or Other Machines.
- IP Address - Enter the IP address of the computer you want to apply the rule to.

**STEP 3: SELECT MACHINE**  
Select the machine to which this policy applies.  
Specify a machine with its IP or MAC address, or select "Other Machines" for machines that do not have a policy.

Address Type:  IP  MAC  Other Machines

IP Address:

Machine Address:

## Access Control Wizard (continued)

Select the filtering method and then click **Next** to continue.

Enter the rule:

- Enable** - Check to enable the rule.
- Name** - Enter a name for your rule.
- Dest IP Start** - Enter the starting IP address.
- Dest IP End** - Enter the ending IP address.
- Protocol** - Select the protocol.
- Dest Port Start** - Enter the starting port number.
- Dest Port End** - Enter the ending port number.

Enable	Name	Dest IP Start	Dest IP End	Protocol	Dest Port Start	Dest Port End
<input checked="" type="checkbox"/>		0.0.0.0	255.255.255.255	Any	0	65535
<input checked="" type="checkbox"/>		0.0.0.0	255.255.255.255	Any	0	65535
<input checked="" type="checkbox"/>		0.0.0.0	255.255.255.255	Any	0	65535
<input checked="" type="checkbox"/>		0.0.0.0	255.255.255.255	Any	0	65535
<input checked="" type="checkbox"/>		0.0.0.0	255.255.255.255	Any	0	65535
<input checked="" type="checkbox"/>		0.0.0.0	255.255.255.255	Any	0	65535
<input checked="" type="checkbox"/>		0.0.0.0	255.255.255.255	Any	0	65535

To enable web logging, click **Enable**.

Click **Save** to save the access control rule.

## Website Filters

Website Filters are used to allow you to set up a list of allowed Web sites that can be used by multiple users through the network. To use this feature select to **Allow** or **Deny**, enter the domain or website and click **Add**, and then click **Save Settings**. You must also select **Apply Web Filter** under the Access Control section (page 39).

**Add Website** Select **Allow** or **Deny**.  
**Filtering Rule:**

**Website Filtering** Enter the keywords or URLs that you want to  
**List:** allow or deny and then click **Add**.

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 NETWORKING EVOLVED

BASIC ADVANCED TOOLS STATUS HELP

**ADVANCED**

VIRTUAL SERVER  
 SPECIAL APPLICATIONS  
 GAMING  
 GAMEFUEL  
 ROUTING  
 ACCESS CONTROL  
 WEB FILTER  
 MAC ADDRESS FILTER  
 FIREWALL  
 INBOUND FILTER  
 ADVANCED WIRELESS  
 WISH  
 WI-FI PROTECTED SETUP  
 ADVANCED NETWORK

**WEBSITE FILTER**  
 The Web Filter option allows you to set up a list of allowed Web sites that can be used by multiple users. When Web Filter is enabled, all Web sites not listed on this page will be blocked. To use this feature, you must also select the "Apply Web Filter" checkbox in the Access Control section.  
 Save Settings Don't Save Settings

**ADD WEB FILTERING RULE**  
 ALLOW  DENY

**WEBSITE FILTERING LIST**

Website URL/Domain	URL	Delete
<input type="text"/>	<input type="text"/>	<input type="button" value="Add"/>

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## MAC Address Filters

Use MAC (Media Access Control) Filters to allow or deny LAN (Local Area Network) computers by their MAC addresses from accessing the Network. You can either manually add a MAC address or select the MAC address from the list of clients that are currently connected to the Broadband Router.

**Configure MAC Filtering:** Select Turn MAC Filtering Off, allow MAC addresses listed below, or deny MAC addresses listed below from the drop-down menu.

**MAC Address:** Enter the MAC address you would like to filter. To find the MAC address on a computer, please refer to the Networking Basics section in this manual.

**DHCP Client:** Select a DHCP client from the drop-down menu and click << to copy that MAC Address.

**Add:** Click to add the rule.

The screenshot shows the D-Link Web Management Interface for the DGL-4500. The top navigation bar includes 'BASIC', 'ADVANCED', 'TOOLS', 'STATUS', and 'HELP'. The 'ADVANCED' section is expanded to show 'MAC ADDRESS FILTER'. Below this, there is a 'MAC ADDRESS FILTER' section with a description and 'Save Settings' and 'Don't Save Settings' buttons. The 'MAC FILTERING SETUP' section includes a checkbox for 'Turn MAC Filtering ON and DENY computers listed to access the network.' Below this is the 'ADD MAC FILTERING RULE' section, which has a 'MAC address' input field, a '<<' button, and a 'Computer Name' dropdown menu. An 'Add' button is located below these fields. At the bottom, there is a table titled 'MAC FILTERING RULES' with columns for 'MAC Address', 'Name', and 'Delete'. The footer contains the copyright notice: 'Copyright © 2004-2006 D-Link Systems, Inc.'



## Firewall Settings

A firewall protects your network from the outside world. The D-Link DGL-4500 offers a firewall type functionality.

**Enable SPI:** SPI (Stateful Packet Inspection, also known as dynamic packet filtering) helps to prevent cyber attacks by tracking more state per session. It validates that the traffic passing through the session conforms to the protocol.

**NAT Endpoint** Select one of the following for TCP and UDP ports:

**Filtering:** **Endpoint Independent** - Any incoming traffic sent to an open port will be forwarded to the application that opened the port. The port will close if idle for 5 minutes.

**Address Restricted** - Incoming traffic must match the IP address of the outgoing connection.

**Address and Port Restriction** - Incoming traffic must match the IP address and port of the outgoing connection.

**Anti-Spoofing:** Click to enable Anti-Spoofing protection.

**Enable DMZ Host:** If an application has trouble working from behind the router, you can expose one computer to the Internet and run the application on that computer. **Note:** Placing a computer in the DMZ may expose that computer to a variety of security risks. Use of this option is only recommended as a last resort.

**IP Address:** Specify the IP address of the computer on the LAN that you want to have unrestricted Internet communication. If this computer obtains its IP address automatically using DHCP, be sure to make a static reservation on the **Basic > DHCP** page so that the IP address of the DMZ machine does not change.

**Non-UDP/TCP/ICMP LAN Sessions:** Enable this feature to allow the router' NAT to track application that uses protocols other than UDP, TCP or ICMP.

**D-Link** **GAMERLOUNGE** **POWERFORGE**

BASIC ADVANCED TOOLS STATUS HELP

**FIREWALL SETTINGS**  
The Firewall Settings allow you to set a single computer on your network outside of the router.  
Save Settings Don't Save Settings

**FIREWALL SETTINGS**  
Enable SPI:

**NAT ENDPOINT FILTERING**  
UDP Endpoint Filtering:  Endpoint Independent  Address Restricted  Port And Address Restricted  
TCP Endpoint Filtering:  Endpoint Independent  Address Restricted  Port And Address Restricted

**ANTI-SPOOF CHECKING**  
Enable anti-spoof checking:

**DMZ HOST**  
Enable DMZ:   
DMZ IP Address: 0.0.0.0 Computer Name: [dropdown]

The DMZ (Demilitarized Zone) option lets you set a single computer on your network outside of the router. If you have a computer on your network that you want to expose to the Internet, you can place the computer in the DMZ for unrestricted Internet access.  
Note: Putting a computer in the DMZ may expose that computer to a variety of security risks. Use of this option is only recommended as a last resort.

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## Inbound Filters

The Inbound Filter option is an advanced method of controlling data received from the Internet. With this feature you can configure inbound data filtering rules that control data based on an IP address range. Inbound Filters can be used with Virtual Server, Port Forwarding, or Remote Administration features.

**Name:** Enter a name for the inbound filter rule.

**Action:** Select **Allow** or **Deny**.

**Enable:** Check to enable rule.

**Source IP Start:** Enter the starting IP address. Enter 0.0.0.0 if you do not want to specify an IP range.

**Source IP End:** Enter the ending IP address. Enter 255.255.255.255 if you do not want to specify and IP range.

**Add:** Click the **Add** button to apply your settings. You must click **Save Settings** at the top to save the settings.

**Inbound Filter Rules List:** This section will list any rules that are created. You may click the **Edit** icon to change the settings or enable/disable the rule, or click the **Delete** icon to remove the rule.

The screenshot shows the D-Link Web Management Interface for the DGL-4500. The top navigation bar includes 'BASIC', 'ADVANCED', 'TOOLS', 'STATUS', and 'HELP'. The 'ADVANCED' section is active, with a sub-menu on the left listing various features like 'VIRTUAL SERVER', 'SPECIAL APPLICATIONS', 'GAMING', 'GAMEFUEL', 'ROUTING', 'ACCESS CONTROL', 'WEB FILTER', 'MAC ADDRESS FILTER', 'FIREWALL', 'INBOUND FILTER', 'ADVANCED WIRELESS', 'WISH', 'PROTECTED SETUP', and 'ADVANCED NETWORK'. The 'INBOUND FILTER' option is selected.

The main content area is titled 'Inbound Filter Rules' and contains the following text: 'The Inbound Filter option is an advanced method of controlling data received from the Internet. With this feature you can configure inbound data filtering rules that control data based on an IP address range. Inbound Filters can be used for limiting access to a server on your network to a system or group of systems. Filter rules can be used with Virtual Server, Port Forwarding, or Remote Administration features.'

Below this text is the 'ADD INBOUND FILTER RULE' section, which includes:
 

- Name:** A text input field.
- Action:** A dropdown menu currently set to 'Deny'.
- Source IP Range:** A section with two columns of input fields:
  - Source IP Start:** Six input fields, each containing '0.0.0.0'.
  - Source IP End:** Six input fields, each containing '255.255.255.255'.
- Enable:** A checkbox that is currently unchecked.
- Buttons:** 'Add' and 'Clear' buttons.

At the bottom is the 'INBOUND FILTER RULES LIST' table, which has two columns: 'Name' and 'Action'. The table is currently empty.

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## Advanced Wireless Settings

**Transmit Power:** Set the transmit power of the antennas.

**Beacon Period:** Beacons are packets sent by an Access Point to synchronize a wireless network. Specify a value. 100 is the default setting and is recommended.

**RTS Threshold:** This value should remain at its default setting of 2346. If inconsistent data flow is a problem, only a minor modification should be made.

**Fragmentation Threshold:** The fragmentation threshold, which is specified in bytes, determines whether packets will be fragmented. Packets exceeding the 2346 byte setting will be fragmented before transmission. 2346 is the default setting.

**DTIM Interval:** (Delivery Traffic Indication Message) 3 is the default setting. A DTIM is a countdown informing clients of the next window for listening to broadcast and multicast messages.

**WMM Function:** WMM is QoS for your wireless network. This will improve the quality of video and voice applications for your wireless clients.

**Short GI:** Check this box to reduce the guard interval time therefore increasing the data capacity. However, it's less reliable and may create higher data loss.

Product Page: DGL-4500 Hardware Version: A2 Firmware Version: 1.10

**D-Link**

**SETUP** **ADVANCED** **TOOLS** **STATUS** **SUPPORT**

**ADVANCED WIRELESS**

If you are not familiar with these Advanced Wireless settings, please read the help section before attempting to modify these settings.

Save Settings Don't Save Settings

**ADVANCED WIRELESS SETTINGS**

Transmit Power : High

Beacon Period : 100 (20..1000)

RTS Threshold : 2346 (0..2347)

Fragmentation Threshold : 2346 (256..2346)

DTIM Interval : 1 (1..255)

WLAN Partition :

WMM Enable :

Short GI :

Extra Wireless Protection :

**Helpful Hints...**

It is recommended that you leave these parameters at their default values. Adjusting them could limit the performance of your wireless network.

Enabling WMM can help control latency and jitter when transmitting multimedia content over a wireless connection.

[More...](#)

**WIRELESS**

VIRTUAL SERVER  
PORT FORWARDING  
APPLICATION RULES  
QoS ENGINE  
NETWORK FILTER  
ACCESS CONTROL  
WEBSITE FILTER  
INBOUND FILTER  
FIREWALL SETTINGS  
ROUTING  
ADVANCED WIRELESS  
WIFI PROTECTED SETUP  
ADVANCED NETWORK

## WISH Settings

WISH is short for Wireless Intelligent Stream Handling, a technology developed to enhance your experience of using a wireless network by prioritizing the traffic of different applications.

**Enable WISH:** Enable this option if you want to allow WISH to prioritize your traffic.

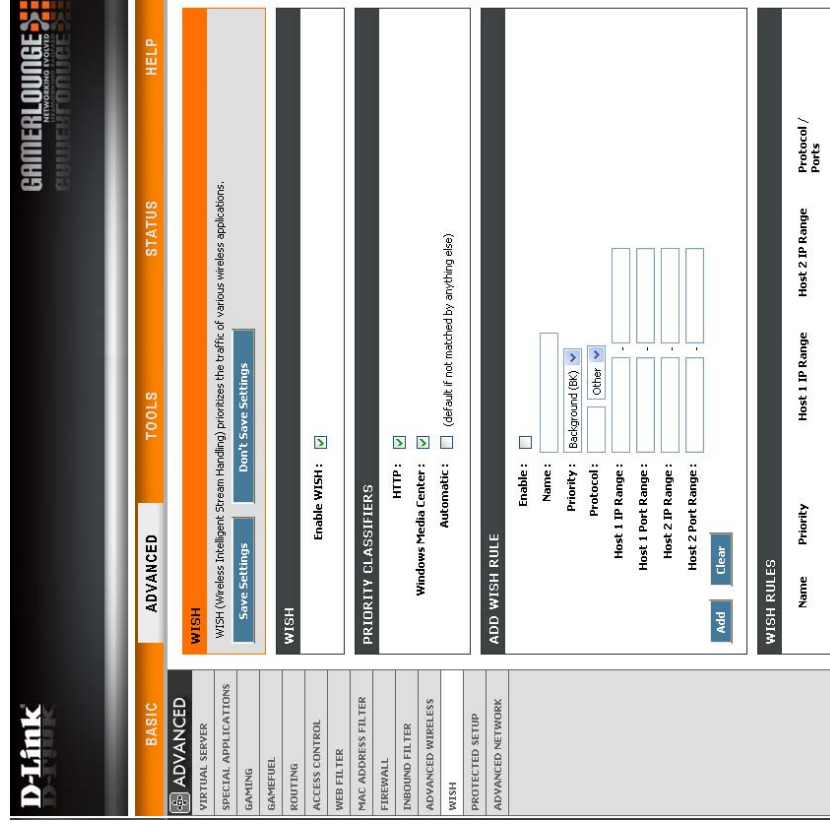
**HTTP:** Allows the router to recognize HTTP transfers for many common audio and video streams and prioritize them above other traffic. Such streams are frequently used by digital media players.

**Windows Media Center:** Enables the router to recognize certain audio and video streams generated by a Windows® Media Center PC and to prioritize these above other traffic. Such streams are used by systems known as Windows® Media Extenders, such as the Xbox 360.

**Automatic:** When enabled, this option causes the router to automatically attempt to prioritize traffic streams that it doesn't otherwise recognize, based on the behavior that the streams exhibit. This acts to deprioritize streams that exhibit bulk transfer characteristics, such as file transfers, while leaving interactive traffic, such as gaming or VoIP, running at a normal priority.

**WISH Rules:** A WISH Rule identifies a specific message flow and assigns a priority to that flow. For most applications, the priority classifiers ensure the right priorities and specific WISH Rules are not required.

WISH supports overlaps between rules. If more than one rule matches for a specific message flow, the rule with the highest priority will be used.



**Name:** Create a name for the rule that is meaningful to you.

**Priority:** The priority of the message flow is entered here. The four priorities are defined as:

**BK:** Background (least urgent)

**BE:** Best Effort.

**VI:** Video

**VO:** Voice (most urgent)

**Protocol:** The protocol used by the messages.

**Host IP Range:** The rule applies to a flow of messages for which one computer's IP address falls within the range set here.

**Host Port Range:** The rule applies to a flow of messages for which host's port number is within the range set here.

**Add:** Click to add the rule.

## Wi-Fi Protected Setup (WPS)

Wi-Fi Protected Setup (WPS) System is a simplified method for securing your wireless network during the “Initial setup” as well as the “Add New Device” processes. The Wi-Fi Alliance (WFA) has certified it across different products as well as manufacturers. The process is just as easy, as depressing a button for the Push-Button Method or correctly entering the 8-digit code for the Pin-Code Method. The time reduction in setup and ease of use are quite beneficial, while the highest wireless Security setting of WPA2 is automatically used.

**Enable:** Enable the Wi-Fi Protected Setup feature.

**Lock Wireless Security Settings:** Locking the wireless security settings prevents the settings from being changed by the Wi-Fi Protected Setup feature of the router. Devices can still be added to the network using Wi-Fi Protected Setup. However, the settings of the network will not change once this option is checked.

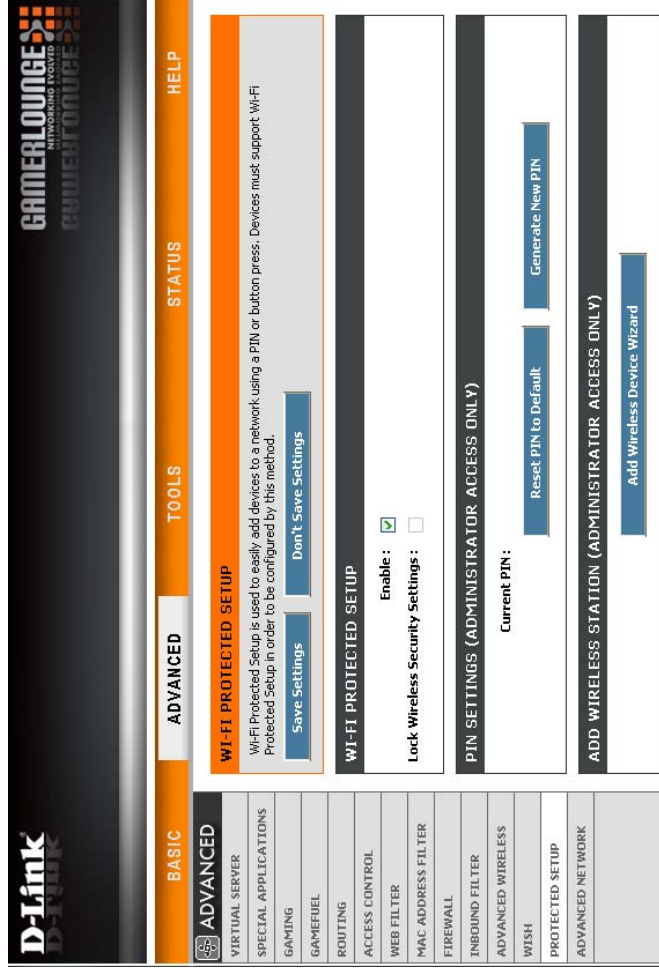
**PIN Settings:** A PIN is a unique number that can be used to add the router to an existing network or to create a new network. The default PIN may be printed on the bottom of the router. For extra security, a new PIN can be generated. You can restore the default PIN at any time. Only the Administrator (“admin” account) can change or reset the PIN.

**Current PIN:** Shows the current value of the router’s PIN.

**Reset PIN to Default:**

Restore the default PIN of the router.

**Generate New PIN:** Create a random number that is a valid PIN. This becomes the router’s PIN. You can then copy this PIN to the user interface of the registrar.



**Add Wireless Station:** This Wizard helps you add wireless devices to the wireless network.

The wizard will either display the wireless network settings to guide you through manual configuration, prompt you to enter the PIN for the device, or ask you to press the configuration button on the device. If the device supports Wi-Fi Protected Setup and has a configuration button, you can add it to the network by pressing the configuration button on the device and then the on the router within 60 seconds. The status LED on the router will flash three times if the device has been successfully added to the network.

There are several ways to add a wireless device to your network. A “registrar” controls access to the wireless network. A registrar only allows devices onto the wireless network if you have entered the PIN, or pressed a special Wi-Fi Protected Setup button on the device. The router acts as a registrar for the network, although other devices may act as a registrar as well.

**Add Wireless Device Wizard:** Start the wizard.

# Advanced Network Settings

**UPnP Settings:** To use the Universal Plug and Play (UPnP™) feature click on **Enabled**. UPnP provides compatibility with networking equipment, software and peripherals.

**WAN Ping:** Unchecking the box will not allow the DGL-4500 to respond to pings. Blocking the Ping may provide some extra security from hackers. Check the box to allow the Internet port to be “pinged”.

**WAN Port Speed:** You may set the port speed of the Internet port to 10Mbps, 100Mbps, or auto. Some older cable or DSL modems may require you to set the port speed to 10Mbps.

**Multicast streams:** Check the box to allow multicast traffic to pass through the router from the Internet.

**D-Link** **GAMERLOUNGE**  
ADVANCED NETWORK SETTINGS  
GUIDE/FOUNDE

BASIC ADVANCED TOOLS STATUS HELP

**ADVANCED NETWORK**

If you are not familiar with these Advanced Network settings, please read the help section before attempting to modify these settings.

Save Settings Don't Save Settings

**UPnP**

Universal Plug and Play (UPnP) supports peer-to-peer Plug and Play functionality for network devices.

Enable UPnP :

Allow Users to disable Internet Access :

Allow Users to modify Virtual Server Mappings :

**WAN PING**

If you enable this feature, the WAN port of your router will respond to ping requests from the Internet that are sent to the WAN IP Address.

Enable WAN Ping Respond :

WAN Ping Inbound Filter :

Details :

**WAN PORT SPEED**

WAN Port Speed :

**MULTICAST STREAMS**

Enable Multicast Streams :

**PPPoE PASS THROUGH**

Enable PPPoE Pass Through :

VIRTUAL SERVER  
SPECIAL APPLICATIONS  
GAMING  
GAMEFUEL  
ROUTING  
ACCESS CONTROL  
WEB FILTER  
MAC ADDRESS FILTER  
FIREWALL  
INBOUND FILTER  
ADVANCED WIRELESS  
WISH  
PROTECTED SETUP  
ADVANCED NETWORK



# Administrator Settings

This page will allow you to change the Administrator and User passwords. You can also enable Remote Management. There are two accounts that can access the management interface through the web browser. The accounts are admin and user. **Admin** has read/write access while **User** has read-only access. User can only view the settings but cannot make any changes. Only the admin account has the ability to change both admin and user account passwords.

**Admin Password:** Enter a new password for the Administrator Login Name. The administrator can make changes to the settings.

**User Password:** Enter the new password for the User login. If you login as the User, you can only see the settings, but cannot change them.

**Gateway Name:** Enter a name for the DGL-4500 router.

**Enable HTTPS Server:** Check this option to enable HTTPS server through remote Server: management.

**Remote Management:** Remote management allows the DGL-4500 to be configured from the Internet by a web browser. A username and password is still required to access the Web-Management interface. In general, only a member of your network can browse the built-in web pages to perform Administrator tasks. This feature enables you to perform Administrator tasks from the remote (Internet) host.

**Remote Admin Port:** The port number used to access the DGL-4500.

Example: `http://x.x.x.x:8080` whereas `x.x.x.x` is the Internet IP address of the DGL-4500 and 8080 is the port used for the Web Management interface.

**Inbound Filter:** This section will list any rules that are created. You may click the **Edit** icon to change the settings or enable/disable the rule, or click the **Delete** icon to remove the rule.

The screenshot shows the D-Link DGL-4500 web management interface. At the top, there's a navigation bar with 'BASIC', 'ADVANCED', 'TOOLS', 'STATUS', and 'HELP' tabs. Below this is a sidebar menu with options like 'ADMIN', 'TIME', 'SYSLOG', 'EMAIL SETTINGS', 'SYSTEM', 'FIRMWARE', 'DYNAMIC DNS', 'SYSTEM CHECK', and 'SCHEDULES'. The main content area is titled 'ADMINISTRATOR SETTINGS' and contains several sections:
 

- ADMINISTRATOR SETTINGS:** A text box explaining that 'admin' and 'user' accounts can access the management interface. Below it are 'Save Settings' and 'Don't Save Settings' buttons.
- ADMIN PASSWORD:** Two input fields for 'Password' and 'Verify Password' with a note: 'Please enter the same password into both boxes, for confirmation.'
- USER PASSWORD:** Two input fields for 'Password' and 'Verify Password' with a note: 'Please enter the same password into both boxes, for confirmation.'
- SYSTEM NAME:** A text field for 'Gateway Name' with the value 'DLink Systems DGL-4500'.
- ADMINISTRATION:** A section with checkboxes for 'Enable HTTPS Server', 'Enable Remote Management', and 'Remote Admin Port'. Below these is a dropdown menu for 'Remote Admin Inbound Filter' set to 'Allow All'.

# Time Settings

The Time Configuration option allows you to configure, update, and maintain the correct time on the internal system clock. From this section you can set the time zone that you are in and set the Time Server. Daylight Saving can also be configured to automatically adjust the time when needed.

**Time Zone:** Select the Time Zone from the drop-down menu.

**Daylight Saving:** To select Daylight Saving time manually, select enabled or disabled, and enter a start date and an end date for daylight saving time.

**Enable NTP** NTP is short for Network Time Protocol. NTP **Server:** synchronizes computer clock times in a network of computers. Check this box to use a NTP server. This will only connect to a server on the Internet, not a local server.

**NTP Server Used:** Enter the NTP server or select one from the drop-down menu.

**Manual:** To manually input the time, enter the values in these fields for the Year, Month, Day, Hour, Minute, and Second and then click **Set Time**. You can also click **Copy Your Computer's Time Settings**.

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ADMIN TOOLS ADVANCED TOOLS STATUS HELP

**TIME**

**Time Configuration**

This Time Configuration option allows you to configure, update, and maintain the correct time on the internal system clock. From this section you can set the time zone that you are in and set the NTP (Network Time Protocol) Server. Daylight Saving can also be configured to automatically adjust the time when needed.

Save Settings Don't Save Settings

**TIME CONFIGURATION**

Current Router Time : Saturday, January 31, 2004 2:06:41 PM

Time Zone : (GMT-08:00) Pacific Time (US/Canada), Tijuana

Enable Daylight Saving :

Daylight Saving Offset : +1:00

Daylight Saving Dates :

Month : Apr Oct Week : 1st 5th Day of Week : Sun Sun Time : 2 am 2 am

DST Start : DST End :

**AUTOMATIC TIME CONFIGURATION**

Enable NTP Server :

NTP Server Used : << Select NTP Server >>

**SET THE DATE AND TIME MANUALLY**

Date And Time :

Year : 2004 Month : Jan Day : 31

Hour : 02 Minute : 06 Second : 22 PM

Copy Your Computer's Time Settings

# SysLog

The Broadband Router keeps a running log of events and activities occurring on the Router. You may send these logs to a SysLog server on your network.

**Enable Logging to SysLog Server:** Check this box to send the router logs to a SysLog Server.

**SysLog Server IP Address:** The address of the SysLog server that will be used to send the logs. You may also select your computer from the drop-down menu (only if receiving an IP address from the router via DHCP).



## Email Settings

The Email feature can be used to send the system log files, router alert messages, and firmware update notification to your email address.

**Enable Email Notification:** When this option is enabled, router activity logs are e-mailed to a designated email address.

**From Email Address:** This email address will appear as the sender when you receive a log file or firmware upgrade notification via email.

**To Email Address:** Enter the email address where you want the email sent.

**SMTP Server Address:** Enter the SMTP server address for sending email. If your SMTP server requires authentication, select this option.

**Enable Authentication:** Check this box if your SMTP server requires authentication.

**Account Name:** Enter your account for sending email.

**Password:** Enter the password associated with the account. Re-type the password associated with the account.

**On Log Full:** When this option is selected, logs will be sent via email when the log is full.

**On Schedule:** Selecting this option will send the logs via email according to schedule.

**Schedule:** This option is enabled when On Schedule is selected. You can select a schedule from the list of defined schedules. To create a schedule, go to **Tools > Schedules**.

The screenshot shows the 'Email Settings' page in the D-Link DGL-4500 web interface. The top navigation bar includes 'ADMIN', 'TOOLS', 'ADVANCED', 'STATUS', and 'HELP'. The left sidebar lists 'ADMIN', 'TIME', 'SYSLOG', 'EMAIL SETTINGS', 'SYSTEM', 'FIRMWARE', 'DYNAMIC DNS', 'SYSTEM CHECK', and 'SCHEDULES'. The main content area is titled 'EMAIL SETTINGS' and contains the following sections:

- Email Settings:** A text box for 'From Email Address', a text box for 'To Email Address', a text box for 'SMTP Server Address', a checkbox for 'Enable Authentication', a text box for 'Account Name', a text box for 'Password', and a text box for 'Verify Password'. Below these are buttons for 'Save Settings' and 'Don't Save Settings'. A note states: 'The Email feature can be used to send the system log files, router alert messages, and firmware update notification to your email address.'
- ENABLE:** A checkbox labeled 'Enable Email Notification'.
- EMAIL LOG WHEN FULL OR ON SCHEDULE:** Two checkboxes for 'On Log Full' and 'On Schedule', a dropdown menu for 'Schedule' (currently set to 'Never'), and a text box for 'Details'.

# System Settings

**Save Settings to Local Hard Drive:** Use this option to save the current router configuration settings to a file on the hard disk of the computer you are using. First, click the Save button. You will then see a file dialog, where you can select a location and file name for the settings.

**Load Settings from Local Hard Drive:** Use this option to load previously saved router configuration settings. First, use the Drive: dropdown to find a previously saved file of configuration settings. Then, click the Load button to transfer those settings to the router.

**Restore to Factory Default Settings:** This option will restore all configuration settings back to the settings that were in effect at the time the router was shipped from the factory. Any settings that have not been saved will be lost, including any rules that you have created. If you want to save the current router configuration settings, use the Save button above.

**Reboot Device:** Click to reboot the router.

**SYSTEM SETTINGS**

The System Settings section allows you to reboot the device, or restore the router to the factory default settings. Restoring the unit to the Factory default settings will erase all settings, including any rules that you have created. The current system settings can be saved as a file onto the local hard drive. The saved file or any other saved setting file created by device can be uploaded into the unit.

**SYSTEM SETTINGS**

**Save To Local Hard Drive :** [Save Configuration](#)

**Load From Local Hard Drive :**  [Browse...](#)

**Restore To Factory Default :** [Restore Configuration from File](#)

[Restore Factory Defaults](#)  
Restore all settings to the factory defaults.

**Reboot The Device :** [Reboot the Device](#)

**TOOLS**

- ADMIN
- TIME
- SYSLDG
- EMAIL SETTINGS
- SYSTEM
- FIRMWARE
- DYNAMIC DNS
- SYSTEM CHECK
- SCHEDULES

## Update Firmware

You can upgrade the firmware of the Router here. Make sure the firmware you want to use is on the local hard drive of the computer. Click on **Browse** to locate the firmware file to be used for the update. Please check the D-Link support site for firmware updates at <http://support.dlink.com>. You can download firmware upgrades to your hard drive from the D-Link support site.

**Firmware** Click on **Check Online Now for Latest Firmware Upgrade: Version** to find out if there is an updated firmware; if so, download the new firmware to your hard drive.

**Browse:** After you have downloaded the new firmware, click **Browse** to locate the firmware update on your hard drive. Click **Upload** to complete the firmware upgrade.

**Notifications** Check **Automatically Check Online for Latest Firmware Version** to have the router check automatically to see if there is a new firmware upgrade.

Check **Email Notification of Newer Firmware Version** to have the router send an email when there is a new firmware available.

The screenshot shows the D-Link DGL-4500 router's web interface. The top navigation bar includes 'D-Link', 'ADMIN', 'TIME', 'SYSLOG', 'EMAIL SETTINGS', 'SYSTEM', 'FIRMWARE', 'DYNAMIC DNS', 'SYSTEM CHECK', 'SCHEDULES', 'BASIC', 'ADVANCED', 'TOOLS', 'STATUS', and 'HELP'. The 'FIRMWARE' section is active, displaying the following information:

- FIRMWARE INFORMATION:**
  - Current Firmware Version : 1.00
  - Current Firmware Date : 2007/08/16
  - Latest Firmware Version : 1.00
- FIRMWARE UPGRADE:**
  - Newer firmware version is available. Click here to download it.
- FIRMWARE UPGRADE NOTIFICATION OPTIONS:**
  - Automatically Check Online for Latest Firmware Version :
  - Email Notification of Newer Firmware Version :

The 'FIRMWARE UPGRADE' section also includes a note: "Note: Some firmware upgrades reset the configuration options to the factory defaults. Before performing an upgrade, be sure to save the current configuration from the Tools -> Admin screen." and instructions: "To upgrade the firmware, your PC must have a wired connection to the router. Enter the name of the firmware upgrade file, and click on the Upload button." There is an 'Upload' button and a 'Browse...' button for selecting the firmware file.

## Dynamic DNS

The DDNS feature allows you to host a server (Web, FTP, Game Server, etc...) using a domain name that you have purchased (www.whateveryournameis.com) with your dynamically assigned IP address. Most broadband Internet Service Providers assign dynamic (changing) IP addresses. Using a DDNS service provider, your friends can enter in your domain name to connect to your server no matter what your IP address is.

**DDNS:** Dynamic Domain Name System is a method of keeping a domain name linked to a changing IP Address. Check the box to enable DDNS.

**Server Address:** Choose your DDNS provider from the drop down menu.

**Host Name:** Enter the Host Name that you registered with your DDNS service provider.

**Username or Key:** Enter the Username for your DDNS account.

**Password or Key:** Enter the Password for your DDNS account.

**Timeout:** Enter a time (in hours).

**Status:** Displays the current status.

**DYNAMIC DNS**

**Dynamic DNS (DDNS)**

The DDNS Feature allows you to host a server (Web, FTP, Game Server, etc...) using a domain name that you have purchased (www.whateveryournameis.com) with your dynamically assigned IP address. Most broadband Internet Service Providers assign dynamic (changing) IP addresses. Using a DDNS service provider, your friends can enter your host name to connect to your game server no matter what your IP address is.

Sign up for D-Link's Free DDNS service at [www.DLinkDDNS.com](http://www.DLinkDDNS.com)

[Save Settings](#) [Don't Save Settings](#)

---

**DYNAMIC DNS**

Enable Dynamic DNS :

Server Address : << Select Dynamic DNS Server >>

Host Name :

Username or Key :

Password or Key :

Verify Password or Key :

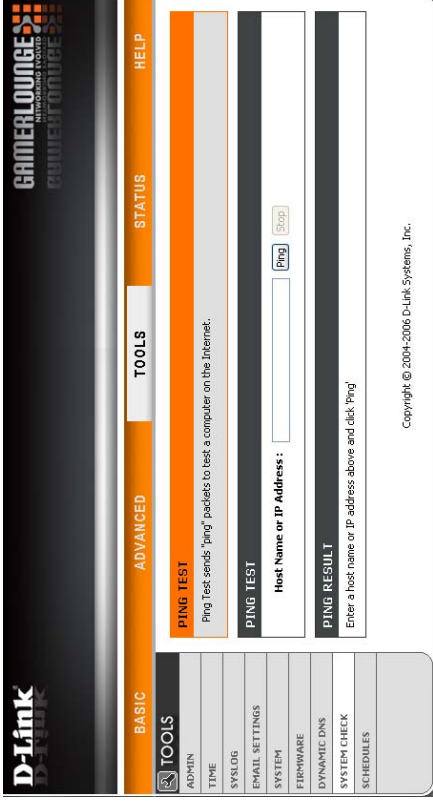
Timeout :  (hours)

Status : Disconnect

# System Check

**Ping Test:** The Ping Test is used to send Ping packets to test if a computer is on the Internet. Enter the IP Address that you wish to Ping, and click **Ping**.

**Ping Results:** The results of your ping attempts will be displayed here.





# Schedules

**Name:** Enter a name for your new schedule.

**Days:** Select a day, a range of days, or All Week to include every day.

**Time:** Check **All Day - 24hrs** or enter a start and end time for your schedule.

**Add:** Click **Add** to save your schedule. You must click Save Settings at the top for your schedules to go into effect.

**Schedule Rules List** The list of schedules will be listed here. Click the **Edit** icon to make changes or click the **Delete** icon to remove the schedule.

The screenshot displays the 'SCHEDULES' configuration page in the D-Link Gamer Lounge Network Products interface. The page is divided into several sections:

- Navigation Menu:** Located on the left, it includes links for ADMIN, TIME, SYSLOG, EMAIL SETTINGS, SYSTEM, FIRMWARE, DYNAMIC DNS, SYSTEM CHECK, and SCHEDULES.
- SCHEDULES Section:** Contains a sub-section 'ADD SCHEDULE RULE' with the following fields:
  - Name:** A text input field.
  - Day(s):** Radio buttons for 'All Week' (selected), and checkboxes for 'Sun', 'Mon', 'Tue', 'Wed', 'Thu', 'Fri', and 'Sat'.
  - All Day - 24 hrs:** A checkbox.
  - Start Time:** Two dropdown menus for hours (12) and minutes (0), with 'AM' selected.
  - End Time:** Two dropdown menus for hours (12) and minutes (0), with 'AM' selected.
  - Buttons:** 'Add' and 'Clear' buttons.
- SCHEDULE RULES LIST:** A table with columns for 'Name', 'Day(s)', and 'Time Frame'.
- Footer:** Copyright © 2004-2006 D-Link Systems, Inc.

## Device Information

This page displays the current information for the DGL-4500. It will display the LAN, WAN (Internet), and Wireless information.

If your Internet connection is set up for a Dynamic IP address then a **Release** button and a **Renew** button will be displayed. Use **Release** to disconnect from your ISP and use **Renew** to connect to your ISP.

If your Internet connection is set up for PPPoE, a **Connect** button and a **Disconnect** button will be displayed. Use **Disconnect** to drop the PPPoE connection and use **Connect** to establish the PPPoE connection.

**General:** Displays the router's time and firmware version.

**WAN:** Displays the MAC address and the public IP settings for the router.

**LAN:** Displays the MAC address and the private (local) IP settings for the router.

**Wireless LAN:** Displays the wireless MAC address and your wireless settings such as SSID and Channel.

**LAN Computers:** Displays computers and devices that are connected to the router via Ethernet and that are receiving an IP address assigned by the router (DHCP).

**IGMP Multicast Memberships:** Displays the Multicast Group IP Address.

The screenshot shows the 'Device Information' page of a D-Link router. The navigation menu includes Basic, Status, Advanced, Tools, and Help. The 'Status' section is active, showing 'Device Information'. A note states: 'All of your Internet and network connection details are displayed on this page. The firmware version is also displayed here.'

**GENERAL**

Time: Saturday, January 31, 2009 2:12:56 PM  
Firmware Version: LAN\_2007/06/16

**WAN**

Connection Type: DHCP Client  
StreamStatus: Active  
Cable Status: Disconnected  
Network Status: Disconnected  
Connection Up Time: N/A

MAC Address: 00:05:54:00:01:23  
IP Address: 0.0.0.0  
Subnet Mask: 0.0.0.0  
Default Gateway: 0.0.0.0  
Primary DNS Server: 0.0.0.0  
Secondary DNS Server: 0.0.0.0

**LAN**

MAC Address: 00:05:54:00:01:24  
IP Address: 192.168.0.1  
Subnet Mask: 255.255.255.0  
DHCP Server: Enabled

**WIRELESS LAN**

Wireless Radio: 1st (2nd)  
WPA: Auto  
WPA2: Auto  
MAC Address: [Blank]  
Network Name (SSID): [Blank]  
Channel: [Blank]  
Security Mode: [Blank]  
Preferred Setup: [Blank]

**LAN COMPUTERS**

IP Address	Name (if any)	MAC
192.168.0.199	dlm-252726296	00:16:17:44:14:80

**IGMP MULTICAST MEMBERSHIPS**

Multicast Group Address
[Blank]

## Wireless

The wireless client table displays a list of current connected wireless clients. This table also displays the connection time and MAC address of the connected wireless clients.

## Routing

The Routing page displays the routing table.

## Logs

The router automatically logs (records) events of possible interest in its internal memory. If there isn't enough internal memory for all events, logs of older events are deleted but logs of the latest events are retained. The Logs option allows you to view the router logs. You can define what types of events you want to view and the level of the events to view. This router also has external Syslog Server support so you can send the log files to a computer on your network that is running a Syslog utility.

**What to View:** You can select the types of messages that you want to display from the log. Firewall & Security, System, and Router Status messages can be selected.

**View Levels:** There are three levels of message importance: Informational, Warning, and Critical. Select the levels that you want displayed in the log.

**Apply Log Settings:** Will filter the log results so that only the selected options appear.

**Refresh:** Updates the log details on the screen so it displays any recent activity.

**Clear:** Clears all of the log contents.

**Email Now:** This option will send a copy of the router log to the email address configured in the **Tools > Email** screen.

**Save Log:** This option will save the router to a log file on your computer.

**D-Link GAMERLOUNGE**

**LOGS**

**System Logs**

Use this option to view the router logs. You can define what types of events you want to view and the event levels to view. This router also has external Syslog server support so you can send the log files to a computer on your network that is running a Syslog utility.

**LOG OPTIONS**

**What to View:**  Firewall & Security  System  Router Status

**View Levels:**  Critical  Warning  Informational

Apply Log settings Now

**LOG DETAILS**

[INFO] Sat Jan 31 14:17:26 2004 Log viewed by IP address 192.168.0.199

[INFO] Sat Jan 31 14:14:31 2004 Above message repeated 1 times

[INFO] Sat Jan 31 12:30:04 2004 Allowed configuration authentication by IP address 192.168.0.199

[INFO] Sat Jan 31 12:30:04 2004 Allowed configuration authentication by IP address 192.168.0.199

[INFO] Sat Jan 31 12:12:57 2004 Allowed configuration authentication by IP address 192.168.0.199

[INFO] Sat Jan 31 12:12:20 2004 Above message repeated 1 times

[INFO] Sat Jan 31 12:12:20 2004 Allowed configuration authentication by IP address 192.168.0.199

[INFO] Sat Jan 31 12:12:00 2004 LAN Ethernet Card Detected

[INFO] Sat Jan 31 12:11:59 2004 Starting DHCP server

[INFO] Sat Jan 31 12:11:57 2004 Device initialized

[INFO] Sat Jan 31 12:11:47 2004 Policy started. Internet access for IP address 192.168.0.199 set to: Allowed, Web Sites - None Blocked, Ports - Restricted

[INFO] Sat Jan 31 12:11:47 2004 Policy started. Internet access for IP address 192.168.0.199 set to: Allowed, Web Sites - None Blocked, Ports - Restricted

[INFO] Sat Jan 31 12:11:47 2004 One or more Internet access policies are in effect. Internet access will be restricted according to these policies.

[INFO] Wed Dec 31 16:00:00 1993 Loaded configuration from non-volatile memory


# Statistics


The screen below displays the Traffic Statistics. Here you can view the amount of packets that pass through the DGL-4500 on both the Internet and the LAN ports. The traffic counter will reset if the device is rebooted.

# Internet Sessions

Local	NAT	Internet	Protocol	State	Dir	Priority	Time Out
192.168.0.199:3732	3732	72.51.37.237:8699	TCP	SS	Out	128	238
192.168.0.199:3730	3730	219.239.90.172:28221	TCP	SS	Out	128	237
192.168.0.199:3728	3728	66.199.250.170:8911	TCP	SS	Out	128	236
192.168.69.109:39475	39475	210.242.32.129:80	TCP	EST	Out	128	7787
192.168.69.109:4097	4097	67.130.140.2153	UDP	-	Out	128	286
192.168.69.109:68	68	*.*.*.*	UDP	-	-	128	-


# Help





---

BASIC
ADVANCED
TOOLS
STATUS
HELP

 **HELP**

MENU

BASIC

ADVANCED

TOOLS

STATUS

GLOSSARY

**SUPPORT MENU**

- Setup
- Advanced
- Tools
- Status
- Glossary

**SETUP HELP**

- Internet Connection
- WAN
- Wireless
- Network Settings

**ADVANCED HELP**

- Virtual Server
- Port Forwarding
- Application Rules
- Speed Engine
- Routing
- Access Control
- Website Filter
- Network Filter
- Firewall Settings
- Inbound Filter
- Advanced Wireless
- WISH
- Wi-Fi Protected Setup
- Advanced Network

**TOOLS HELP**

- Admin
- Time
- Syslog
- Email Settings
- System
- Firmware
- System DMS
- System Check
- Schedules

**STATUS HELP**

- Device Info
- Wireless
- Logs
- Statistics
- Internet Sessions
- WISH Sessions

# Wireless Security

This section will show you the different levels of security you can use to protect your data from intruders. The DGL-4500 offers the following types of security:

- WPA2 (Wi-Fi Protected Access 2)
- WPA (Wi-Fi Protected Access)
- WPA2-PSK (Pre-Shared Key)
- WPA-PSK (Pre-Shared Key)

## What is WPA?

WPA, or Wi-Fi Protected Access, is a Wi-Fi standard that was designed to improve the security features of WEP (Wired Equivalent Privacy).

The 2 major improvements over WEP:

- Improved data encryption through the Temporal Key Integrity Protocol (TKIP). TKIP scrambles the keys using a hashing algorithm and, by adding an integrity-checking feature, ensures that the keys haven't been tampered with. WPA2 is based on 802.11i and uses Advanced Encryption Standard (AES) instead of TKIP.
- User authentication, which is generally missing in WEP, through the extensible authentication protocol (EAP). WEP regulates access to a wireless network based on a computer's hardware-specific MAC address, which is relatively simple to be sniffed out and stolen. EAP is built on a more secure public-key encryption system to ensure that only authorized network users can access the network.

WPA-PSK/WPA2-PSK uses a passphrase or key to authenticate your wireless connection. The key is an alpha-numeric password between 8 and 63 characters long. The password can include symbols (!?\*&\_) and spaces. This key must be the exact same key entered on your wireless router or access point.

WPA/WPA2 incorporates user authentication through the Extensible Authentication Protocol (EAP). EAP is built on a more secure public key encryption system to ensure that only authorized network users can access the network.

# Wireless Security Setup Wizard

To run the security wizard, click on Setup at the top and then click **Launch Wireless Security Setup Wizard**.

Type your desired wireless network name (SSID).

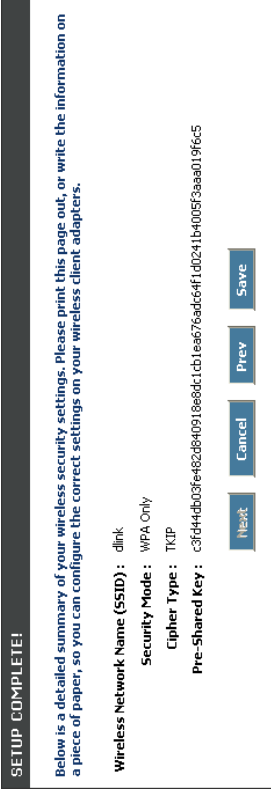
**Automatically:** Select this option to automatically generate the router’s network key and click **Next**.

**Manually:** Select this option to manually enter your network key and click **Next**.

Check the “**Use WPA encryption...**” box to use WPA instead of WEP (strongly recommended).



If you selected **Automatically**, the summary window will display your settings. Write down the security key and enter this on your wireless clients. Click **Save** to save your settings.



If you selected **Manually**, the following screen will appear.

Enter your security key. If you checked the WPA box on the previous page, make sure your key is between 8-64 characters. If you are using WEP (WPA box is unchecked), you must enter exactly 64 characters (only 0-9 and A-F are valid). Click **Save** to save your settings.



## Add Wireless Device with WPS Wizard

From the **Basic** > **Wizard** screen, click **Add Wireless Device with WPS**.



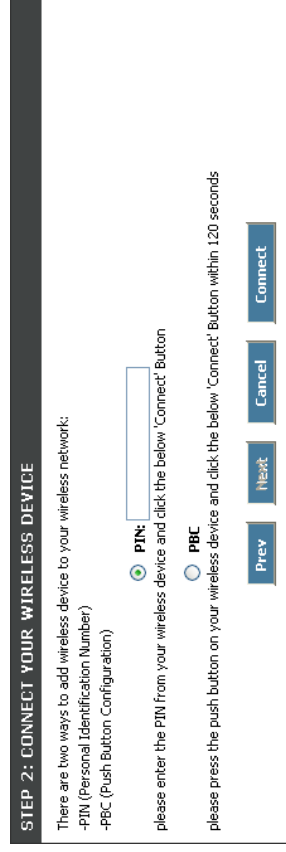
Select **Auto** to add a wireless client using WPS (Wi-Fi Protected Setup). Once you select **Auto** and click **Connect**, you will have a 120 second time limit to apply the settings to your wireless client(s) and successfully establish a connection.

If you select **Manual**, a settings summary screen will appear. Write down the security key and enter this on your wireless clients.



**PIN:** Select this option to use PIN method. In order to use this method you must know the wireless client's 8 digit PIN and click **Connect**.

**PBC:** Select this option to use PBC (Push Button) method to add a wireless client. Click **Connect**.



# Configure WEP

It is recommended to enable encryption on your wireless router before your wireless network adapters. Please establish wireless connectivity before enabling encryption. Your wireless signal may degrade when enabling encryption due to the added overhead.

1. Log into the web-based configuration by opening a web browser and entering the IP address of the router (192.168.0.1). Click on **Setup** and then click **Wireless Settings** on the left side.
2. Next to **Security Mode**, select **WEP**.
3. Next to **WEP Key Length**, select the level of encryption (64 or 128-bit).  
**Hex** - (recommended) Letters A-F and numbers 0-9 are valid.

**WIRELESS SECURITY MODE**

To protect your privacy you can configure wireless security features. This device supports two wireless security modes including: WPA-Personal, and WPA-Enterprise. WPA provides a higher level of security. WPA-Personal does not require an authentication server. The WPA-Enterprise option requires an external RADIUS server.

Security Mode: WEP

**WEP**

WEP is the wireless encryption standard. To use it you must enter the same key(s) into the router and the wireless stations. For 64 bit keys you must enter 10 hex digits into each key box. For 128 bit keys you must enter 26 hex digits into each key box. A hex digit is either a number from 0 to 9 or a letter from A to F. For the most secure use of WEP set the authentication type to "Shared Key" when WEP is enabled.

You may also enter any text string into a WEP key box, in which case it will be converted into a hexadecimal key using the ASCII values of the characters. A maximum of 5 text characters can be entered for 64 bit keys, and a maximum of 13 characters for 128 bit keys.

If you choose the WEP security option this device will **ONLY** operate in **Legacy Wireless mode (802.11B/G)**. This means you will **NOT** get 11N performance due to the fact that WEP is not supported by Draft 11N specification.

WEP Key Length: 64 bit (10 hex digits) (length applies to all keys)

WEP Key 1: ●●●●●●●●

WEP Key 2: ●●●●●●●●

WEP Key 3: ●●●●●●●●

WEP Key 4: ●●●●●●●●

Default WEP Key: WEP Key 1

Authentication: Open

4. Next to **WEP Key 1**, enter a WEP key that you create. Make sure you enter this key exactly on all your wireless devices. You may enter up to 4 different keys.
5. Next to **Authentication**, select **Shared Key**.
6. Click **Save Settings** to save your settings. If you are configuring the router with a wireless adapter, you will lose connectivity until you enable WEP on your adapter and enter the same WEP key as you did on the router.

# Configure WPA-Personal (PSK)

It is recommended to enable encryption on your wireless router before your wireless network adapters. Please establish wireless connectivity before enabling encryption. Your wireless signal may degrade when enabling encryption due to the added overhead.

1. Log into the web-based configuration by opening a web browser and entering the IP address of the router (192.168.0.1). Click on **Setup** and then click **Wireless Settings** on the left side.
2. Next to **Security Mode**, select **WPA-Personal**.
3. Next to **WPA Mode**, select **Auto**, **WPA2 Only**, or **WPA Only**. Use **Auto** if you have wireless clients using both WPA and WPA2.
4. Next to **Cypher Type**, select **TKIP and AES**, **TKIP**, or **AES**.
5. Next to **Group Key Update Interval**, enter the amount of time before the group key used for broadcast and multicast data is changed (3600 is default).

**WIRELESS SECURITY MODE**

To protect your privacy you can configure wireless security features. This device supports two wireless security modes including: WPA-Personal, and WPA-Enterprise. WPA provides a higher level of security. WPA-Personal does not require an authentication server. The WPA-Enterprise option requires an external RADIUS server.

Security Mode:

---

**WPA**

WPA requires stations to use high grade encryption and authentication. For legacy compatibility, use **WPA** or **WPA2** mode. This mode uses WPA for legacy clients while maintaining higher security with stations that are WPA2 capable. The strongest cipher that the client supports will be used. For best security, use **WPA2 Only** mode. In this mode, legacy stations are not allowed access with WPA security. The AES cipher will be used across the wireless network to ensure best security.

WPA Mode:

Cipher Type:

Group Key Update Interval:  (seconds)

---

**PRE-SHARED KEY**

Pre-Shared Key:

6. Next to **Pre-Shared Key**, enter a key (passphrase). The key is entered as a pass-phrase in ASCII format at both ends of the wireless connection. The pass-phrase must be between 8-63 characters.
7. Click **Save Settings** to save your settings. If you are configuring the router with a wireless adapter, you will lose connectivity until you enable WPA-PSK on your adapter and enter the same passphrase as you did on the router.

# Configure WPA-Enterprise (RADIUS)

It is recommended to enable encryption on your wireless router before your wireless network adapters. Please establish wireless connectivity before enabling encryption. Your wireless signal may degrade when enabling encryption due to the added overhead.

1. Log into the web-based configuration by opening a web browser and entering the IP address of the router (192.168.0.1). Click on **Setup** and then click **Wireless Settings** on the left side.
2. Next to **Security Mode**, select **WPA-Enterprise**.
3. Next to **WPA Mode**, select **Auto**, **WPA2 Only**, or **WPA Only**. Use **Auto** if you have wireless clients using both WPA and WPA2.
4. Next to **Cypher Type**, select **TKIP and AES**, **TKIP**, or **AES**.
5. Next to **Group Key Update Interval**, enter the amount of time before the group key used for broadcast and multicast data is changed (3600 is default).
6. Next to **Authentication Timeout**, enter the amount of time before a client is required to re-authenticate (60 minutes is default).
7. Next to **RADIUS Server IP Address** enter the IP Address of your RADIUS server.

WIRELESS SECURITY MODE

To protect your privacy you can configure wireless security features. This device supports two wireless security modes including: WPA-Personal and WPA-Enterprise. WPA provides a higher level of security. WPA-Personal does not require an authentication server. The WPA-Enterprise option requires an external RADIUS server.

**Security Mode :** WPA-Enterprise

---

WPA

WPA requires stations to use high grade encryption and authentication. For legacy compatibility, use **WPA** or **WPA2** mode. This mode uses WPA for legacy clients while maintaining higher security with stations that are WPA2 capable. The strongest cipher that the client supports will be used. For best security, use **WPA2 Only** mode. In this mode, legacy stations are not allowed access with WPA security. The AES cipher will be used across the wireless network to ensure best security.

**WPA Mode :** Auto (WPA or WPA2)

**Cipher Type :** TKIP and AES

**Group Key Update Interval :** 3600 (seconds)

---

EAP (802.1X)

When WPA Enterprise is enabled, the router uses EAP (802.1X) to authenticate clients via a remote RADIUS server.

**Authentication Timeout :** 60 (minutes)

**RADIUS server IP Address :** 0.0.0.0

**RADIUS server Port :** 1812

**RADIUS server Shared Secret :** radius\_shared

**MAC Address Authentication :**

[Advanced >>](#)

8. Next to *RADIUS Server Port*, enter the port you are using with your RADIUS server. 1812 is the default port.
9. Next to *RADIUS Server Shared Secret*, enter the security key.
10. If the *MAC Address Authentication* box is selected then the user will need to connect from the same computer whenever logging into the wireless network.
11. Click **Advanced** to enter settings for a secondary RADIUS Server.
12. Click **Apply Settings** to save your settings.

**EAP (802.1X)**

When WPA enterprise is enabled, the router uses EAP (802.1x) to authenticate clients via a remote RADIUS server.

Authentication Timeout :	60 (minutes)
RADIUS server IP Address :	0.0.0.0
RADIUS server Port :	1812
RADIUS server Shared Secret :	radius_shared
MAC Address Authentication :	<input checked="" type="checkbox"/>

<< **Advanced**

Optional backup RADIUS server :

Second RADIUS server IP Address :	0.0.0.0
Second RADIUS server Port :	1812
Second RADIUS server Shared Secret :	radius_shared
Second MAC Address Authentication :	<input checked="" type="checkbox"/>

# Connect to a Wireless Network

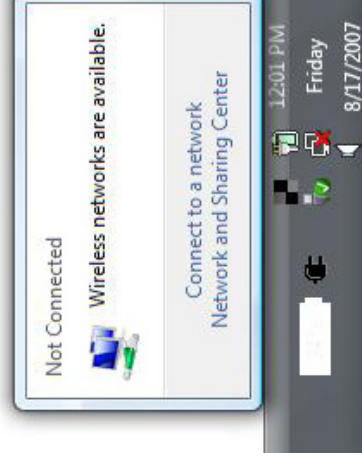
## Using Windows Vista®

Windows Vista® users may use the built-in wireless utility. If you are using another company's utility or Windows® 2000, please refer to the user manual of your wireless adapter for help with connecting to a wireless network. Most utilities will have a "site survey" option similar to the Windows Vista® utility as seen below.

If you receive the **Wireless Networks Detected** bubble, click on the center of the bubble to access the utility.

or

Right-click on the wireless computer icon in your system tray (lower-right corner next to the time). Select **Connect to a network**.



The utility will display any available wireless networks in your area. Click on a network (displayed using the SSID) and click the **Connect** button.

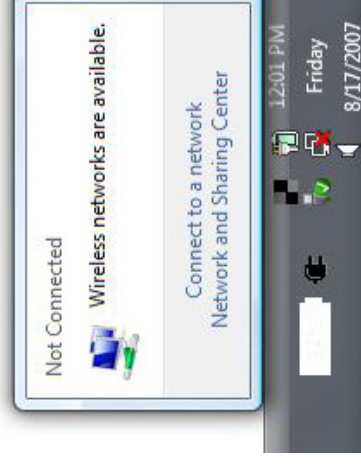
If you get a good signal but cannot access the Internet, check you TCP/IP settings for your wireless adapter. Refer to the **Networking Basics** section in this manual for more information.



# Configure Wireless Security

It is recommended to enable wireless security (WPA/WPA2) on your wireless router or access point before configuring your wireless adapter. If you are joining an existing network, you will need to know the security key or passphrase being used.

1. Open the Windows Vista® Wireless Utility by right-clicking on the wireless computer icon in your system tray (lower right corner of screen). Select **Connect to a network**.



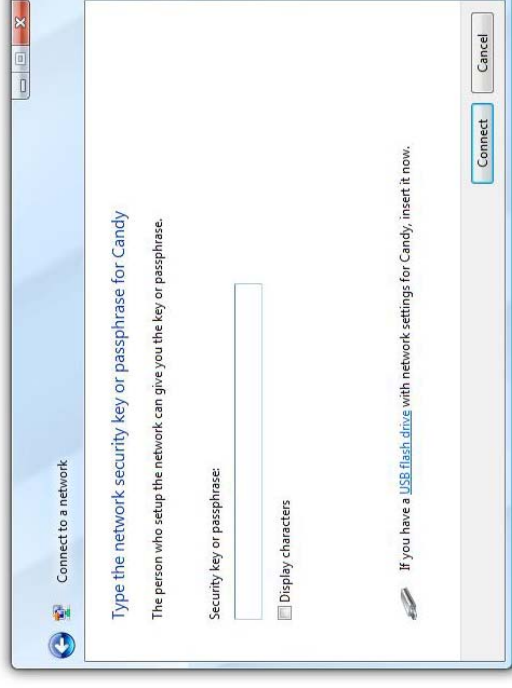
2. Highlight the wireless network (SSID) you would like to connect to and click **Connect**.





**3. Enter the same security key or passphrase that is on your router and click **Connect**.**

It may take 20-30 seconds to connect to the wireless network. If the connection fails, please verify that the security settings are correct. The key or passphrase must be exactly the same as on the wireless router.



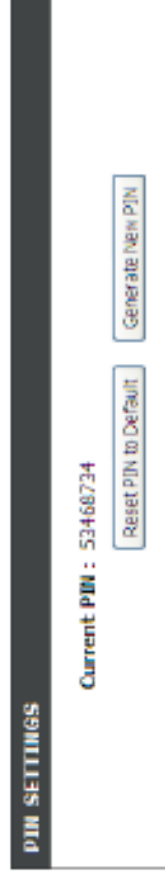
## Connect Using WCN 2.0 in Windows Vista®

The router supports Wi-Fi protection, referred to as WCN 2.0 in Windows Vista®. The following instructions for setting this up depends on whether you are using Windows Vista® to configure the router or third party software.

When you first set up the router, Wi-Fi protection is disabled and unconfigured. To enjoy the benefits of Wi-Fi protection, the router must be both enabled and configured. There are three basic methods to accomplish this: use Windows Vista's built-in support for WCN 2.0, use software provided by a third party, or manually configure.

If you are running Windows Vista®, log into the router and click the **Enable** checkbox in the **Basic** > **Wireless** section. Use the Current PIN that is displayed on the **Advanced** > **Wi-Fi Protected Setup** section or choose to click the **Generate New PIN** button or **Reset PIN to Default** button.

For additional information, please refer to page 47.



If you are using third party software to set up Wi-Fi Protection, carefully follow the directions. When you are finished, proceed to the next section to set up the newly-configured router.

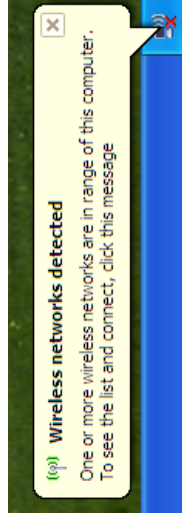
# Connect to a Wireless Network Using Windows® XP

Windows® XP users may use the built-in wireless utility (Zero Configuration Utility). The following instructions are for Service Pack 2 users. If you are using another company's utility or Windows® 2000, please refer to the user manual of your wireless adapter for help with connecting to a wireless network. Most utilities will have a "site survey" option similar to the Windows® XP utility as seen below.

If you receive the **Wireless Networks Detected** bubble, click on the center of the bubble to access the utility.

or

Right-click on the wireless computer icon in your system tray (lower-right corner next to the time). Select **View Available Wireless Networks**.



The utility will display any available wireless networks in your area. Click on a network (displayed using the SSID) and click the **Connect** button.

If you get a good signal but cannot access the Internet, check you TCP/IP settings for your wireless adapter. Refer to the **Networking Basics** section in this manual for more information.

# Configure WEP

It is recommended to enable WEP on your wireless router or access point before configuring your wireless adapter. If you are joining an existing network, you will need to know the WEP key being used.

1. Open the Windows® XP Wireless Utility by right-clicking on the wireless computer icon in your system tray (lower-right corner of screen). Select **View Available Wireless Networks**.

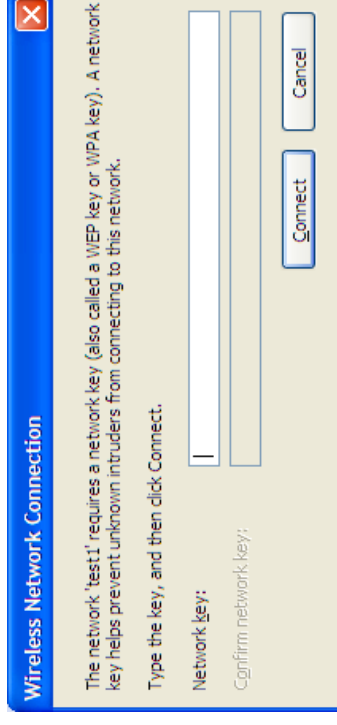


2. Highlight the wireless network (SSID) you would like to connect to and click **Connect**.



3. The **Wireless Network Connection** box will appear. Enter the same WEP key that is on your router and click **Connect**.

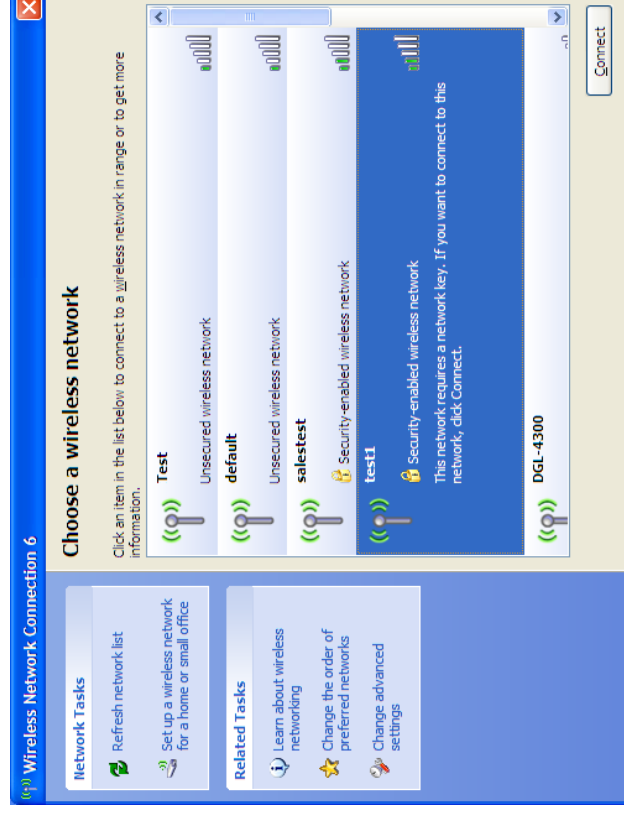
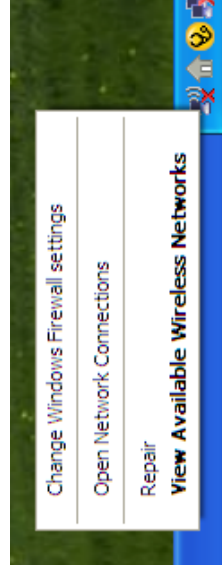
It may take 20-30 seconds to connect to the wireless network. If the connection fails, please verify that the WEP settings are correct. The WEP key must be exactly the same as on the wireless router.



# Configure WPA-PSK

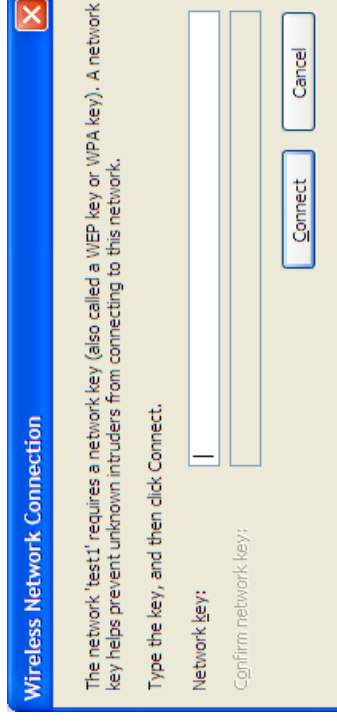
It is recommended to enable WPA on your wireless router or access point before configuring your wireless adapter. If you are joining an existing network, you will need to know the WPA key being used.

1. Open the Windows® XP Wireless Utility by right-clicking on the wireless computer icon in your system tray (lower-right corner of screen). Select **View Available Wireless Networks**.
2. Highlight the wireless network (SSID) you would like to connect to and click **Connect**.



3. The **Wireless Network Connection** box will appear. Enter the WPA-PSK passphrase and click **Connect**.

It may take 20-30 seconds to connect to the wireless network. If the connection fails, please verify that the WPA-PSK settings are correct. The WPA-PSK passphrase must be exactly the same as on the wireless router.



# Troubleshooting

This chapter provides solutions to problems that can occur during the installation and operation of the DGL-4500. Read the following descriptions if you are having problems. (The examples below are illustrated in Windows® XP. If you have a different operating system, the screenshots on your computer will look similar to the following examples.)

## 1. Why can't I access the web-based configuration utility?

When entering the IP address of the D-Link router (192.168.0.1 for example), you are not connecting to a website on the Internet or have to be connected to the Internet. The device has the utility built-in to a ROM chip in the device itself. Your computer must be on the same IP subnet to connect to the web-based utility.

• Make sure you have an updated Java-enabled web browser. We recommend the following:

- Internet Explorer 6.0 or higher
- Netscape 8 or higher
- Mozilla 1.7.12 (5.0) or higher
- Opera 8.5 or higher
- Safari 1.2 or higher (with Java 1.3.1 or higher)
- Firefox 1.5 or higher

• Verify physical connectivity by checking for solid link lights on the device. If you do not get a solid link light, try using a different cable or connect to a different port on the device if possible. If the computer is turned off, the link light may not be on.

• Disable any internet security software running on the computer. Software firewalls such as Zone Alarm, Black Ice, Sygate, Norton Personal Firewall, and Windows® XP firewall may block access to the configuration pages. Check the help files included with your firewall software for more information on disabling or configuring it.



• Configure your Internet settings:

- Go to **Start > Settings > Control Panel**. Double-click the **Internet Options** icon. From the **Security** tab, click the button to restore the settings to their defaults.
- Click the **Connection** tab and set the dial-up option to **Never Dial a Connection**. Click the LAN Settings button. Make sure nothing is checked. Click **OK**.
- Go to the **Advanced** tab and click the button to restore these settings to their defaults. Click **OK** three times.
- Close your web browser (if open) and open it.
- Access the web management. Open your web browser and enter the IP address of your D-Link router in the address bar. This should open the login page for your the web management.
- If you still cannot access the configuration, unplug the power to the router for 10 seconds and plug back in. Wait about 30 seconds and try accessing the configuration. If you have multiple computers, try connecting using a different computer.

## 2. What can I do if I forgot my password?

If you forgot your password, you must reset your router. Unfortunately this process will change all your settings back to the factory defaults.

To reset the router, locate the reset button (hole) on the rear panel of the unit. With the router powered on, use a paperclip to hold the button down for 10 seconds. Release the button and the router will go through its reboot process. Wait about 30 seconds to access the router. The default IP address is 192.168.0.1. When logging in, the username is **admin** and leave the password box empty.

### 3. Why can't I connect to certain sites or send and receive emails when connecting through my router?

If you are having a problem sending or receiving email, or connecting to secure sites such as eBay, banking sites, and Hotmail, we suggest lowering the MTU in increments of ten (Ex. 1492, 1482, 1472, etc).

**Note: AOL DSL+ users must use MTU of 1400.**

To find the proper MTU Size, you'll have to do a special ping of the destination you're trying to go to. A destination could be another computer, or a URL.

- Click on **Start** and then click **Run**.
- Windows® 95, 98, and Me users type in **command** (Windows® NT, 2000, XP, and Vista® users type in **cmd**) and press **Enter** (or click **OK**).
- Once the window opens, you'll need to do a special ping. Use the following syntax:

**ping [url] [-f] [-l] [MTU value]**

**Example: ping yahoo.com -f -l 1472**

```
C:\>ping yahoo.com -f -l 1482
Pinging yahoo.com [66.94.234.13] with 1482 bytes of data:
Packet needs to be fragmented but DF set.
Packet needs to be fragmented but DF set.
Packet needs to be fragmented but DF set.
Ping statistics for 66.94.234.13:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping yahoo.com -f -l 1472
Pinging yahoo.com [66.94.234.13] with 1472 bytes of data:
Reply from 66.94.234.13: bytes=1472 time=93ms TTL=52
Reply from 66.94.234.13: bytes=1472 time=109ms TTL=52
Reply from 66.94.234.13: bytes=1472 time=125ms TTL=52
Reply from 66.94.234.13: bytes=1472 time=203ms TTL=52
Ping statistics for 66.94.234.13:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 93ms, Maximum = 203ms, Average = 132ms
C:\>
```

You should start at 1472 and work your way down by 10 each time. Once you get a reply, go up by 2 until you get a fragmented packet. Take that value and add 28 to the value to account for the various TCP/IP headers. For example, lets say that 1452 was the proper value, the actual MTU size would be 1480, which is the optimum for the network we're working with ( $1452+28=1480$ ).

Once you find your MTU, you can now configure your router with the proper MTU size.

To change the MTU rate on your router follow the steps below:

- Open your browser, enter the IP address of your router (192.168.0.1) and click **OK**.
- Enter your username (admin) and password (blank by default). Click **OK** to enter the web configuration page for the device.
- Click on **Setup** and then click **Manual Configure**.
- To change the MTU enter the number in the MTU field and click **Save Settings** to save your settings.
- Test your email. If changing the MTU does not resolve the problem, continue changing the MTU in increments of ten.

# Wireless Basics

D-Link wireless products are based on industry standards to provide easy-to-use and compatible high-speed wireless connectivity within your home, business or public access wireless networks. Strictly adhering to the IEEE standard, the D-Link wireless family of products will allow you to securely access the data you want, when and where you want it. You will be able to enjoy the freedom that wireless networking delivers.

A wireless local area network (WLAN) is a cellular computer network that transmits and receives data with radio signals instead of wires. Wireless LANs are used increasingly in both home and office environments, and public areas such as airports, coffee shops and universities. Innovative ways to utilize WLAN technology are helping people to work and communicate more efficiently. Increased mobility and the absence of cabling and other fixed infrastructure have proven to be beneficial for many users.

Wireless users can use the same applications they use on a wired network. Wireless adapter cards used on laptop and desktop systems support the same protocols as Ethernet adapter cards.

Under many circumstances, it may be desirable for mobile network devices to link to a conventional Ethernet LAN in order to use servers, printers or an Internet connection supplied through the wired LAN. A Wireless Router is a device used to provide this link.

## **What is Wireless?**

Wireless or Wi-Fi technology is another way of connecting your computer to the network without using wires. Wi-Fi uses radio frequency to connect wirelessly, so you have the freedom to connect computers anywhere in your home or office network.

## **Why D-Link Wireless?**

D-Link is the worldwide leader and award winning designer, developer, and manufacturer of networking products. D-Link delivers the performance you need at a price you can afford. D-Link has all the products you need to build your network.

## **How does wireless work?**

Wireless works similar to how cordless phone work, through radio signals to transmit data from one point A to point B. But wireless technology has restrictions as to how you can access the network. You must be within the wireless network range area to be able to connect your computer. There are two different types of wireless networks Wireless Local Area Network (WLAN), and Wireless Personal Area Network (WPAN).

## **Wireless Local Area Network (WLAN)**

In a wireless local area network, a device called an Access Point (AP) connects computers to the network. The access point has a small antenna attached to it, which allows it to transmit data back and forth over radio signals. With an indoor access point as seen in the picture, the signal can travel up to 300 feet. With an outdoor access point the signal can reach out up to 30 miles to serve places like manufacturing plants, industrial locations, college and high school campuses, airports, golf courses, and many other outdoor venues.

## **Wireless Personal Area Network (WPAN)**

Bluetooth is the industry standard wireless technology used for WPAN. Bluetooth devices in WPAN operate in a range up to 30 feet away.

Compared to WLAN the speed and wireless operation range are both less than WLAN, but in return it doesn't use nearly as much power which makes it ideal for personal devices, such as mobile phones, PDAs, headphones, laptops, speakers, and other devices that operate on batteries.

## **Who uses wireless?**

Wireless technology has become so popular in recent years that almost everyone is using it, whether it's for home, office, business, D-Link has a wireless solution for it.

### **Home**

- Gives everyone at home broadband access
- Surf the web, check email, instant message, and etc
- Gets rid of the cables around the house
- Simple and easy to use

### **Small Office and Home Office**

- Stay on top of everything at home as you would at office
- Remotely access your office network from home
- Share Internet connection and printer with multiple computers
- No need to dedicate office space

## **Where is wireless used?**

Wireless technology is expanding everywhere not just at home or office. People like the freedom of mobility and it's becoming so popular that more and more public facilities now provide wireless access to attract people. The wireless connection in public places is usually called "hotspots".

Using a D-Link Cardbus Adapter with your laptop, you can access the hotspot to connect to Internet from remote locations like: Airports, Hotels, Coffee Shops, Libraries, Restaurants, and Convention Centers.

Wireless network is easy to setup, but if you're installing it for the first time it could be quite a task not knowing where to start. That's why we've put together a few setup steps and tips to help you through the process of setting up a wireless network.

## **Tips**

Here are a few things to keep in mind, when you install a wireless network.

### **Centralize your router or Access Point**

Make sure you place the router/access point in a centralized location within your network for the best performance. Try to place the router/access point as high as possible in the room, so the signal gets dispersed throughout your home. If you have a two-story home, you may need a repeater to boost the signal to extend the range.

### **Eliminate Interference**

Place home appliances such as cordless telephones, microwaves, and televisions as far away as possible from the router/access point. This would significantly reduce any interference that the appliances might cause since they operate on same frequency.

## Security

Don't let you next-door neighbors or intruders connect to your wireless network. Secure your wireless network by turning on the WPA or WEP security feature on the router. Refer to product manual for detail information on how to set it up.

## Wireless Modes

There are basically two modes of networking:

- **Infrastructure** – All wireless clients will connect to an access point or wireless router.
- **Ad-Hoc** – Directly connecting to another computer, for peer-to-peer communication, using wireless network adapters on each computer, such as two or more DGL-4500 wireless network Cardbus adapters.

An Infrastructure network contains an Access Point or wireless router. All the wireless devices, or clients, will connect to the wireless router or access point.

An Ad-Hoc network contains only clients, such as laptops with wireless Cardbus adapters. All the adapters must be in Ad-Hoc mode to communicate.



# Networking Basics

## Check your IP address

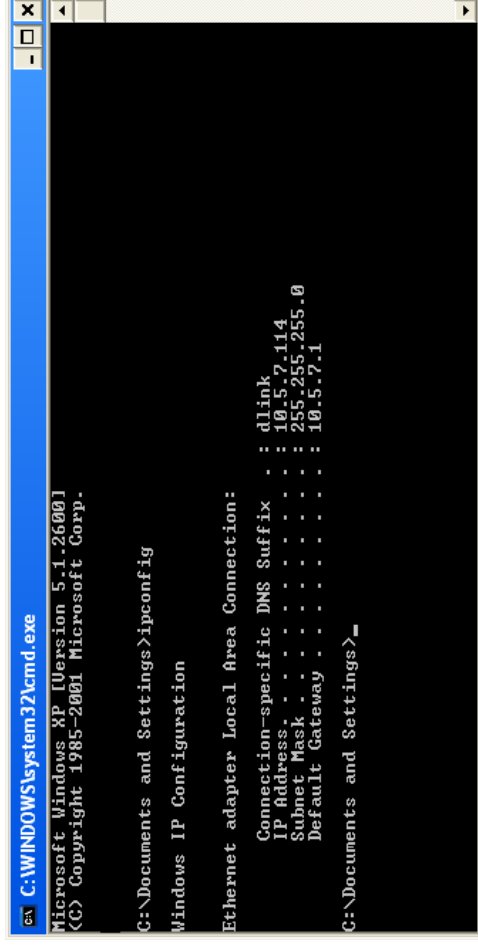
After you install your new D-Link adapter, by default, the TCP/IP settings should be set to obtain an IP address from a DHCP server (i.e. wireless router) automatically. To verify your IP address, please follow the steps below.

Click on **Start > Run**. In the run box type **cmd** and click **OK**. (Windows Vista® users type **cmd** in the **Start Search** box.)

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

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

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



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

C:\Documents and Settings>ipconfig
Windows IP Configuration

Ethernet adapter Local Area Connection:

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

C:\Documents and Settings>
```

## Statically Assign an IP address

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

### Step 1

Windows Vista® - Click on **Start > Control Panel > Network and Internet > Network and Sharing Center > Manage Network Connections**.

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

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

### Step 2

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

### Step 3

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

### Step 4

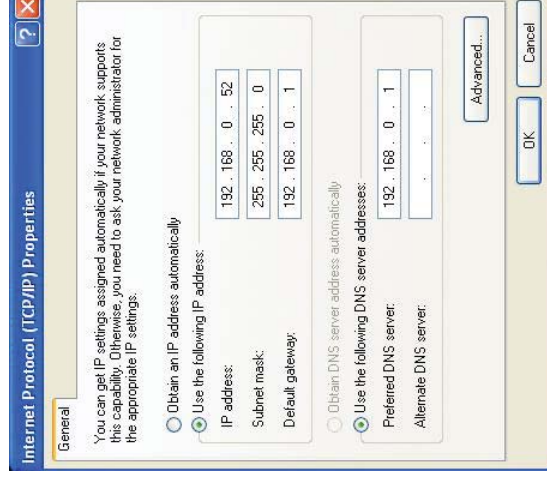
Click **Use the following IP address** and enter an IP address that is on the same subnet as your network or the LAN IP address on your router.

Example: If the router's LAN IP address is 192.168.0.1, make your IP address 192.168.0.X where X is a number between 2 and 99. Make sure that the number you choose is not in use on the network. Set Default Gateway the same as the LAN IP address of your router (192.168.0.1).

Set Primary DNS the same as the LAN IP address of your router (192.168.0.1). The Secondary DNS is not needed or you may enter a DNS server from your ISP.

### Step 5

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



# Technical Specifications

## Standards

- IEEE 802.11n (draft 2.0)
- IEEE 802.11g
- IEEE 802.11a
- IEEE 802.3
- IEEE 802.3u
- IEEE 802.3ab

## Frequency Range<sup>2</sup> (North America)

- 2.412GHz to 2.462GHz (802.11g/n)
- 5.15GHz~5.25GHz、5.725GHz~5.825GHz (802.11a/n)

## External Antenna Type

- Three (3) detachable dual-band dipole antennas with reverse SMA connectors

## Wireless Signal Rates<sup>1</sup>

- IEEE 802.11N Draft 2.0 (HT20/40):**
- 144.4Mbps (300)
  - 117Mbps (243)
  - 78Mbps (162)
  - 58.5Mbps (121.5)
  - 39Mbps (81)
  - 19.5Mbps (40.5)
  - 6.5Mbps (13.5)
- 130Mbps (270)
  - 104Mbps (216)
  - 66Mbps (135)
  - 52Mbps (108)
  - 26Mbps (54)
  - 12Mbps (27)

## IEEE 802.11a:

- 54Mbps
- 24Mbps
- 11Mbps
- 48Mbps
- 18Mbps
- 9Mbps
- 36Mbps
- 12Mbps
- 6Mbps

## IEEE 802.11g:

- 54Mbps
- 24Mbps
- 11Mbps
- 5.5Mbps
- 48Mbps
- 18Mbps
- 9Mbps
- 2Mbps
- 36Mbps
- 12Mbps
- 6Mbps
- 1Mbps

## Security

- WPA™ - Personal/Enterprise
- WPA2™ - Personal/Enterprise

## Operating Temperature

- 32°F to 104°F ( 0°C to 40°C)

## Maximum Power Consumption

- 1435mA

## Maximum Operating Voltage

- 12V

## Humidity

- 95% maximum (non-condensing)

## Safety & Emissions

- FCC
- IC

## Dimensions

- L = 7.6 inches
- W = 4.6 inches
- H = 1.2inches

## Warranty

- 1 Year limited

<sup>1</sup> Maximum wireless signal rate derived from IEEE Standard 802.11a, 802.11g, and Draft 802.11n specifications. Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate. Environmental factors will adversely affect wireless signal range.

<sup>2</sup> Frequency Range varies depending on country's regulation

<sup>3</sup> The DGL-4500 does not include 5.25-5.35GHz & 5.47-5.725GHz in some regions.

# Contacting Technical Support

U.S. and Canadian customers can contact D-Link technical support through our web site or by phone.

Before you contact technical support, please have the following ready:

- Model number of the product (e.g. DGL-4500)
- Hardware Revision (located on the label on the bottom of the router (e.g. rev A1))
- Serial Number (s/n number located on the label on the bottom of the router).

You can find software updates and user documentation on the D-Link website as well as frequently asked questions and answers to technical issues.

## For customers within the United States:

**Phone Support:**  
(877) 453-5465

**Internet Support:**  
<http://support.dlink.com>

## For customers within Canada:

**Phone Support:**  
(800) 361-5265

**Internet Support:**  
<http://support.dlink.com>

# Warranty

Subject to the terms and conditions set forth herein, D-Link Systems, Inc. (“D-Link”) provides this Limited Warranty:

- Only to the person or entity that originally purchased the product from D-Link or its authorized reseller or distributor, and
- Only for products purchased and delivered within the fifty states of the United States, the District of Columbia, U.S. Possessions or Protectorates, U.S. Military Installations, or addresses with an APO or FPO.

## Limited Warranty:

D-Link warrants that the hardware portion of the D-Link product described below (“Hardware”) will be free from material defects in workmanship and materials under normal use from the date of original retail purchase of the product, for the period set forth below (“Warranty Period”), except as otherwise stated herein.

- Hardware (excluding power supplies and fans): One (1) year limited
- Power supplies and fans: One (1) year
- Spare parts and spare kits: Ninety (90) days

The customer’s sole and exclusive remedy and the entire liability of D-Link and its suppliers under this Limited Warranty will be, at D-Link’s option, to repair or replace the defective Hardware during the Warranty Period at no charge to the original owner or to refund the actual purchase price paid. Any repair or replacement will be rendered by D-Link at an Authorized D-Link Service Office. The replacement hardware need not be new or have an identical make, model or part. D-Link may, at its option, replace the defective Hardware or any part thereof with any reconditioned product that D-Link reasonably determines is substantially equivalent (or superior) in all material respects to the defective Hardware. Repaired or replacement hardware will be warranted for the remainder of the original Warranty Period or ninety (90) days, whichever is longer, and is subject to the same limitations and exclusions. If a material defect is incapable of correction, or if D-Link determines that it is not practical to repair or replace the defective Hardware, the actual price paid by the original purchaser for the defective Hardware will be refunded by D-Link upon return to D-Link of the defective Hardware. All Hardware or part thereof that is replaced by D-Link, or for which the purchase price is refunded, shall become the property of D-Link upon replacement or refund.

### **Limited Software Warranty:**

D-Link warrants that the software portion of the product ("Software") will substantially conform to D-Link's then current functional specifications for the Software, as set forth in the applicable documentation, from the date of original retail purchase of the Software for a period of ninety (90) days ("Software Warranty Period"), provided that the Software is properly installed on approved hardware and operated as contemplated in its documentation. D-Link further warrants that, during the Software Warranty Period, the magnetic media on which D-Link delivers the Software will be free of physical defects. The customer's sole and exclusive remedy and the entire liability of D-Link and its suppliers under this Limited Warranty will be, at D-Link's option, to replace the non-conforming Software (or defective media) with software that substantially conforms to D-Link's functional specifications for the Software or to refund the portion of the actual purchase price paid that is attributable to the Software. Except as otherwise agreed by D-Link in writing, the replacement Software is provided only to the original licensee, and is subject to the terms and conditions of the license granted by D-Link for the Software. Replacement Software will be warranted for the remainder of the original Warranty Period and is subject to the same limitations and exclusions. If a material non-conformance is incapable of correction, or if D-Link determines in its sole discretion that it is not practical to replace the non-conforming Software, the price paid by the original licensee for the non-conforming Software will be refunded by D-Link; provided that the non-conforming Software (and all copies thereof) is first returned to D-Link. The license granted respecting any Software for which a refund is given automatically terminates.

### **Non-Applicability of Warranty:**

The Limited Warranty provided hereunder for Hardware and Software portions of D-Link's products will not be applied to and does not cover any refurbished product and any product purchased through the inventory clearance or liquidation sale or other sales in which D-Link, the sellers, or the liquidators expressly disclaim their warranty obligation pertaining to the product and in that case, the product is being sold "As-Is" without any warranty whatsoever including, without limitation, the Limited Warranty as described herein, notwithstanding anything stated herein to the contrary.

### **Submitting A Claim:**

The customer shall return the product to the original purchase point based on its return policy. In case the return policy period has expired and the product is within warranty, the customer shall submit a claim to D-Link as outlined below:

- The customer must submit with the product as part of the claim a written description of the Hardware defect or Software nonconformance in sufficient detail to allow D-Link to confirm the same, along with proof of purchase of the product (such as a copy of the dated purchase invoice for the product) if the product is not registered.
- The customer must obtain a Case ID Number from D-Link Technical Support at 1-877-453-5465, who will attempt to assist the customer in resolving any suspected defects with the product. If the product is considered defective, the customer must obtain a Return Material Authorization ("RMA") number by completing the RMA form and entering the assigned Case ID Number at <https://rma.dlink.com/>.

- After an RMA number is issued, the defective product must be packaged securely in the original or other suitable shipping package to ensure that it will not be damaged in transit, and the RMA number must be prominently marked on the outside of the package. Do not include any manuals or accessories in the shipping package. D-Link will only replace the defective portion of the product and will not ship back any accessories.
- The customer is responsible for all in-bound shipping charges to D-Link. No Cash on Delivery (“COD”) is allowed. Products sent COD will either be rejected by D-Link or become the property of D-Link. Products shall be fully insured by the customer and shipped to D-Link Systems, Inc., 17595 Mt. Herrmann, Fountain Valley, CA 92708. D-Link will not be held responsible for any packages that are lost in transit to D-Link. The repaired or replaced packages will be shipped to the customer via UPS Ground or any common carrier selected by D-Link. Return shipping charges shall be prepaid by D-Link if you use an address in the United States, otherwise we will ship the product to you freight collect. Expedited shipping is available upon request and provided shipping charges are prepaid by the customer. D-Link may reject or return any product that is not packaged and shipped in strict compliance with the foregoing requirements, or for which an RMA number is not visible from the outside of the package. The product owner agrees to pay D-Link’s reasonable handling and return shipping charges for any product that is not packaged and shipped in accordance with the foregoing requirements, or that is determined by D-Link not to be defective or non-conforming.

### **What Is Not Covered:**

The Limited Warranty provided herein by D-Link does not cover: Products that, in D-Link’s judgment, have been subjected to abuse, accident, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, repair or service in any way that is not contemplated in the documentation for the product, or if the model or serial number has been altered, tampered with, defaced or removed; Initial installation, installation and removal of the product for repair, and shipping costs; Operational adjustments covered in the operating manual for the product, and normal maintenance; Damage that occurs in shipment, due to act of God, failures due to power surge, and cosmetic damage; Any hardware, software, firmware or other products or services provided by anyone other than D-Link; and Products that have been purchased from inventory clearance or liquidation sales or other sales in which D-Link, the sellers, or the liquidators expressly disclaim their warranty obligation pertaining to the product.

While necessary maintenance or repairs on your Product can be performed by any company, we recommend that you use only an Authorized D-Link Service Office. Improper or incorrectly performed maintenance or repair voids this Limited Warranty.

### **Disclaimer of Other Warranties:**

EXCEPT FOR THE LIMITED WARRANTY SPECIFIED HEREIN, THE PRODUCT IS PROVIDED “AS-IS” WITHOUT ANY WARRANTY OF ANY KIND WHATSOEVER INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT.

IF ANY IMPLIED WARRANTY CANNOT BE DISCLAIMED IN ANY TERRITORY WHERE A PRODUCT IS SOLD, THE DURATION OF SUCH IMPLIED WARRANTY SHALL BE LIMITED TO THE DURATION OF THE APPLICABLE WARRANTY PERIOD SET FORTH ABOVE. EXCEPT AS EXPRESSLY COVERED UNDER THE LIMITED WARRANTY PROVIDED HEREIN, THE ENTIRE RISK AS TO THE QUALITY, SELECTION AND PERFORMANCE OF THE PRODUCT IS WITH THE PURCHASER OF THE PRODUCT.

**Limitation of Liability:**

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**Governing Law:**

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### **FCC Statement:**

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 the equipment off and on, the user is encouraged to try to correct the interference by one 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.

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.

### **FCC Caution:**

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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.

### **IMPORTANT NOTICE:**

#### **FCC Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. To maintain compliance with FCC RF exposure compliance requirements, please avoid direct contact to the transmitting antenna during transmitting.

If this device is going to be operated in 5.15 ~ 5.25GHz frequency range, then it is restricted in indoor environment only.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.

**IC statement:**

Operation is subject to the following two conditions:

- 1) This device may not cause interference and
- 2) This device must accept any interference, including interference that may cause undesired operation of the device.

**IMPORTANT NOTE:**

**Radiation Exposure Statement:**

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

- (i) the device for the band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co-channel mobile satellite systems;
- (ii) the maximum antenna gain (2dBi) permitted (for devices in the band 5725-5825 MHz) to comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate, as stated in section A9.2(3).

In addition, users should also be cautioned to take note that high-power radars are allocated as primary users (meaning they have priority) of the bands 5250-5350 MHz and 5650-5850 MHz and these radars could cause interference and/or damage to LE-LAN devices.

**Règlement d'Industry Canada**

Les conditions de fonctionnement sont sujettes à deux conditions:

- 1) Ce périphérique ne doit pas causer d'interférence et.
- 2) Ce périphérique doit accepter toute interférence, y compris les interférences pouvant perturber le bon fonctionnement de ce périphérique.

# Registration



Product registration is entirely voluntary and failure to complete or return this form will not diminish your warranty rights.

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