

USER MANUAL

DIR-501

VERSION 1.0

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Package Contents

- D-Link DIR-501 Wireless Router
- Power Adapter
- Ethernet Cable

Note: Using a power supply with a different voltage rating than the one included with the DIR-501 will cause damage and void the warranty for this product.

Note: Always attach the power cord plug to the power supply, before inserting the power cord and connected power supply to the wall outlet.



System Requirements

- Ethernet-based Cable or DSL Modem
- Computers with Windows®, Macintosh®, or Linux-based operating systems with an installed Ethernet adapter
- Internet Explorer 6 or Firefox 2.0 or above (for configuration)

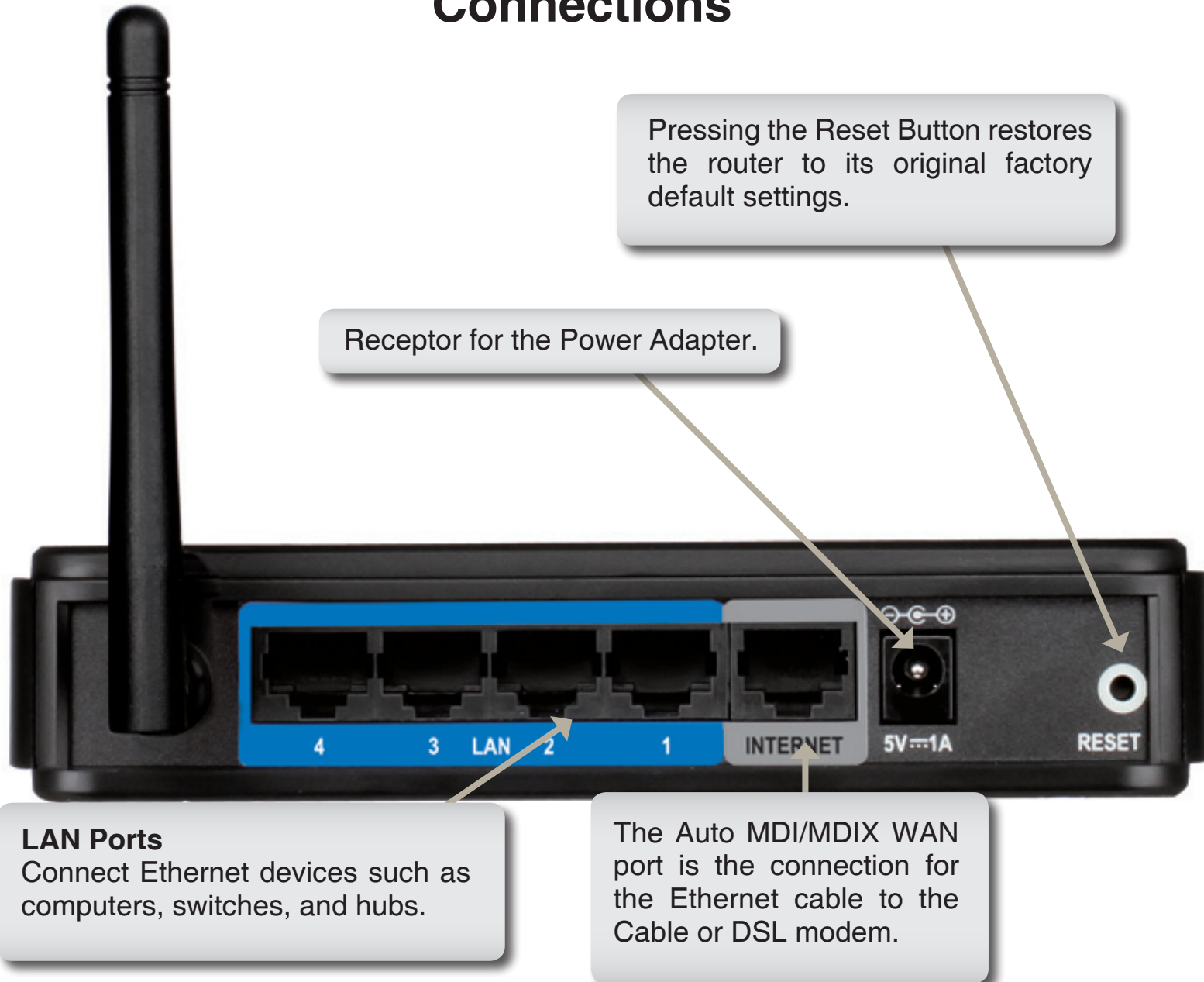
Features

- **Faster Wireless Networking** - The DIR-501 provides up to 150Mbps* 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.
- **Compatible with 802.11b and 802.11g Devices** - The DIR-501 is still fully compatible with the IEEE 802.11b and IEEE 802.11g standard, so it can connect with existing 802.11b and IEEE 802.11g PCI, USB and Cardbus adapters.
- **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 DIR-501 can pass through VPN sessions. It supports multiple and concurrent IPsec and PPTP sessions, so users behind the DIR-501 can securely access corporate networks.
- **User-friendly Setup Wizard** - Through its easy-to-use Web-based user interface, the DIR-501 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 802.11g 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



Hardware Overview

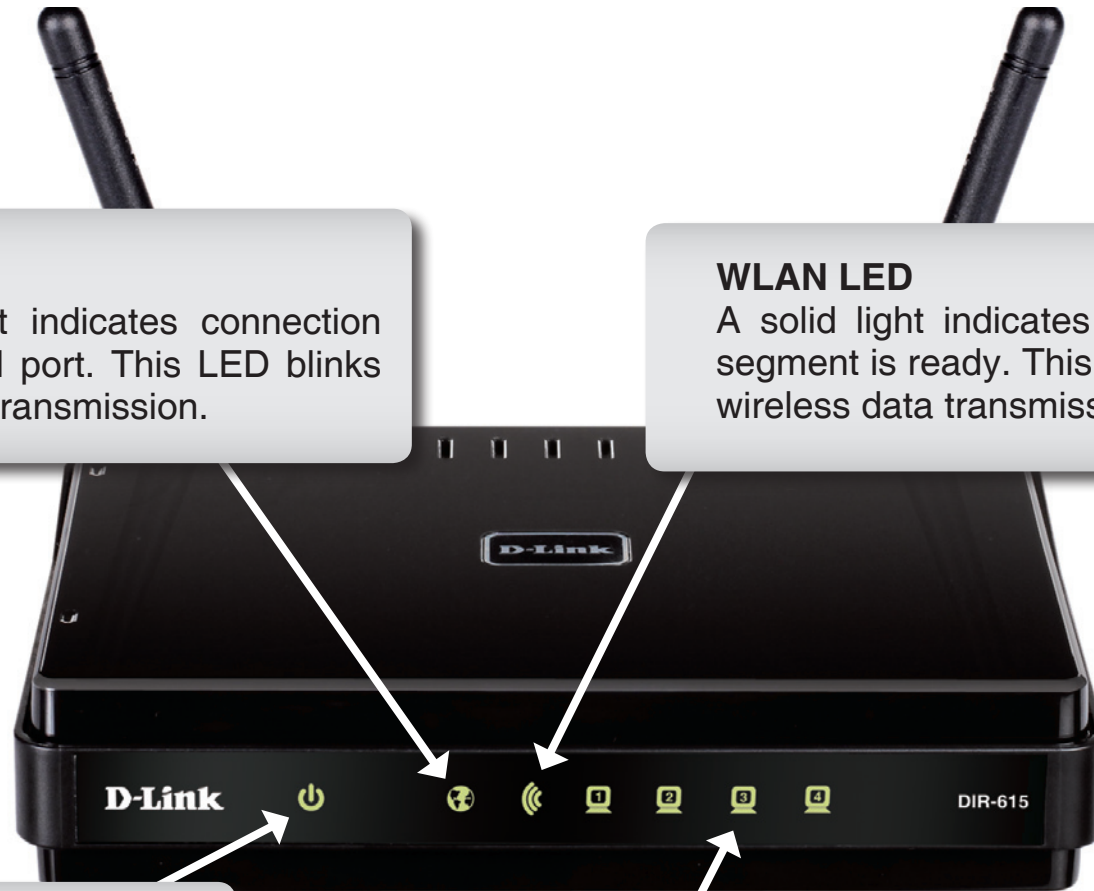
LEDs

INTERNET

A solid light indicates connection on the WAN port. This LED blinks during data transmission.

WLAN LED

A solid light indicates that the wireless segment is ready. This LED blinks during wireless data transmission.



Power LED

A solid light indicates a proper connection to the power supply.

Local Network LEDs

A solid light indicates a connection to an Ethernet-enabled computer on ports 1-4. This LED blinks during data transmission.

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. Also, 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 WAN 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 Ethernet 300 from your computer or you will not be able to connect to the Internet.

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.

Wall Mounting Your Device

You can mount the DIR-501 to a wall or a partition for easy and convenient placement of your device.

To wall mount your device,

- A. Screw the provided screws with the equipment to the wall or partition where the device to be placed.
- B. Place the mounting holes on the bottom of the device over the screws to mount it to the wall or partition.
- C. Connect your cables to the device.



Step A



Step B



Step C

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 WAN 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. Verify the link lights on the router. The power light, WAN light, and the LAN light (the port that your computer is plugged into) should be lit. If not, make sure your computer, modem, and router are powered on and verify the cable connections are correct.
9. Skip to page 16 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 **OK** 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 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.

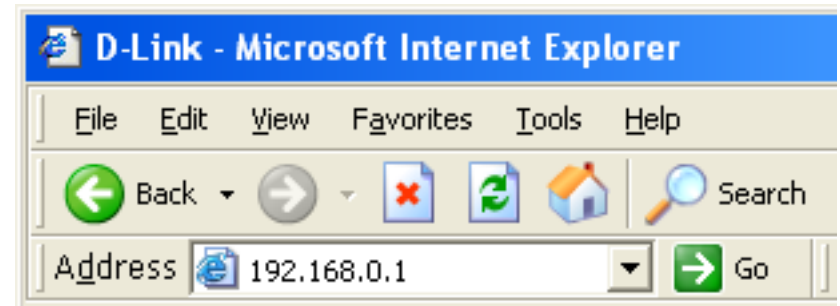
6. Disconnect the Ethernet cable from the router and reconnect your computer to your network.
7. Connect an Ethernet cable in one of the LAN ports of the router and connect it to your other router. Do not plug anything into the WAN port of the D-Link router.
8. You may now use the other three LAN ports 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.

Configuration

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

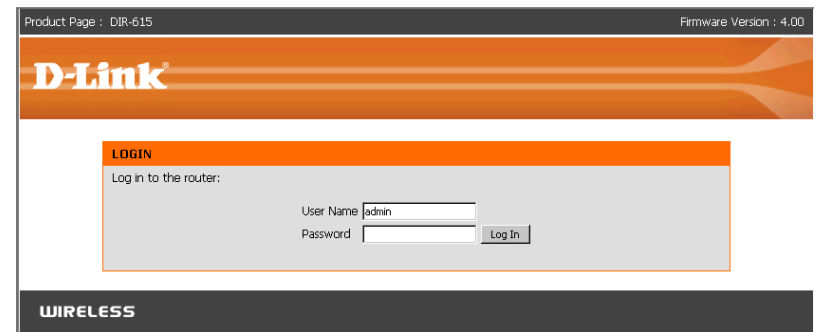
Web-based Configuration Utility

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).



Enter the user name (admin) and 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.



Select the type of Internet connection that Easy Setup Wizard detects, type in necessary information and then click Next to continue.

WELCOME TO THE D-LINK EASY SETUP WIZARD

The router is detecting your Internet connection type. Please wait until the router provides suitable settings for your configuration.... .

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.*

CONFIGURE YOUR INTERNET CONNECTION

Internet Connection: [What is this?](#)

- * User Name: (* is required field)
- * Password:
- * Confirm Password:

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

The screenshot shows the 'CONFIGURE YOUR INTERNET CONNECTION' window with the following settings:

- Internet Connection: PPTP (selected in a dropdown menu)
- Address Mode: Dynamic IP (DHCP) Static IP
- PPTP IP Address: 0.0.0.0 (* is required field)
- PPTP Subnet Mask: 255.255.255.0
- PPTP Gateway IP Address: (empty field)
- PPTP Server IP Address: 0.0.0.0
- User Name: (empty field)
- Password: (masked field)
- Primary DNS Server: 0.0.0.0
- Secondary DNS Server: 0.0.0.0
- MAC Address: 00:00:00:00:00:00
- Buttons: 'Clone Your PC's MAC Address' and 'Connect'

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

The screenshot shows the 'CONFIGURE YOUR INTERNET CONNECTION' window with the following settings:

- Internet Connection: L2TP (selected in a dropdown menu)
- Address Mode: Dynamic IP (DHCP) Static IP
- L2TP IP Address: 0.0.0.0 (* is required field)
- L2TP Subnet Mask: 255.255.255.0
- L2TP Gateway IP Address: (empty field)
- L2TP Server IP Address: 0.0.0.0
- User Name: (empty field)
- Password: (masked field)
- Primary DNS Server: 0.0.0.0
- Secondary DNS Server: 0.0.0.0
- MAC Address: 00:00:00:00:00:00
- Buttons: 'Clone Your PC's MAC Address' and 'Connect'

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

CONFIGURE YOUR INTERNET CONNECTION

Internet Connection: Static IP [What is this?](#)

* IP Address: 0.0.0.0 (* is required field)

* Subnet Mask: 255.255.255.0

* Gateway Address: 0.0.0.0

* Primary DNS Server: 0.0.0.0

Secondary DNS Server: 0.0.0.0

Click **Connect** to save your settings.

EASY SETUP COMPLETE

After clicking the "Save" button, you need to provide your username and password to access the device when logging in next time.

Internet Settings

Internet Connection : Dynamic IP (DHCP) Status : **Connected**

Wireless Settings

Wireless Network Name (SSID) : dlink Status : **Unsecured**

Security : Disabled

Your current wireless security settings are not safe. We recommend you configure wireless settings.

Device Info

User Name : admin

Password :

Save my network settings

Set the password of the device to wireless network key

Please allow 1-2 minutes for rebooting. When the router has finished rebooting, the opening window will be displayed.

REBOOTING...

Saving Changes and Restarting.

If you changed the IP address of the router you will need to change the IP address in your browser before accessing the configuration Web site again.

Internet Setup

Static (assigned by ISP)

Select Static IP Address if all WAN 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.

ISP Gateway: Enter the Gateway assigned by your ISP.

MAC Address: The default MAC Address is set to the WAN'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.

Clone MAC Address: The default MAC address is set to the WAN's physical interface MAC address on the Broadband Router. You can use the **Clone MAC Address** button to copy the MAC address of the Ethernet Card installed by your ISP and replace the WAN MAC address with the MAC address of the router. It is not recommended that you change the default MAC address unless required by your ISP.

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

Secondary DNS Address: This is optional.

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

The screenshot shows the 'INTERNET CONNECTION' section of the router's configuration interface. The 'My Internet Connection is' dropdown is set to 'Static IP'. Below this, the 'STATIC IP ADDRESS INTERNET CONNECTION TYPE' section is active, showing fields for IP Address (0.0.0.0), Subnet Mask (255.255.255.0), Default Gateway (0.0.0.0), MAC Address (00-00-00-00-00-00), Primary DNS Server (0.0.0.0), Secondary DNS Server (0.0.0.0), and MTU (1500 bytes). A 'Copy Your PC's MAC Address' button is visible next to the MAC Address field. The interface includes a sidebar with navigation options like 'Easy Setup', 'Internet Setup', and 'Helpful Hints ...'.

Internet Setup

Dynamic

To manually set up the Internet connection, click the **Manual Internet Connection Setup** button on the Router's opening window.

Access Point Mode: Checking this box disables NAT and turns the Router into an Access Point only.

Dynamic IP Address: Choose Dynamic IP Address 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. The default host name is the device name of the Router and may be changed.

MAC Address: The default MAC Address is set to the WAN'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.

Clone MAC Address: The default MAC address is set to the WAN's physical interface MAC address on the Broadband Router. You can use the "Clone MAC Address" button to copy the MAC address of the Ethernet Card installed by your ISP and replace the WAN MAC address with the MAC address of the router. It is not recommended that you change the default MAC address unless required by your ISP.

DNS Addresses: Enter the DNS (Domain Name Server) 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.

DIR-501	SETUP	ADVANCED	MAINTENANCE	STATUS	HELP
Easy Setup	INTERNET CONNECTION				Helpful Hints...
Internet Setup	Use this section to configure your Internet Connection type. There are several connection types to choose from: Static IP, DHCP, PPPoE, PPTP, and L2TP. If you are unsure of your connection method, please contact your Internet Service Provider.				When configuring the router to access the Internet, be sure to choose the correct Internet Connection Type from the drop down menu. If you are unsure of which option to choose, contact your Internet Service Provider (ISP) .
Wireless Setup	<p>Note: If using the PPPoE option, you will need to remove or disable any PPPoE client software on your computers.</p> <p>Save Settings Don't Save Settings</p>				
LAN Setup	INTERNET CONNECTION TYPE				If you are having trouble accessing the Internet through the router, double check any settings you have entered on this page and verify them with your ISP if needed.
Time and Date	Choose the mode to be used by the router to connect to the Internet.				
Parental Control	My Internet Connection is: <input type="text" value="Dynamic IP (DHCP)"/>				
Logout	DYNAMIC IP (DHCP) INTERNET CONNECTION TYPE				More...
	Use this Internet connection type if your Internet Service Provider (ISP) didn't provide you with IP Address information and/or a username and password.				
	Host Name: <input type="text" value="DIR-501"/> MAC Address: <input type="text" value="00"/> - <input type="text" value="00"/> - <input type="text" value="00"/> - <input type="text" value="00"/> - <input type="text" value="00"/> - <input type="text" value="00"/> (optional) <input type="button" value="Copy Your PC's MAC Address"/> Primary DNS Server: <input type="text" value="0.0.0.0"/> Secondary DNS Server: <input type="text" value="0.0.0.0"/> (optional) MTU: <input type="text" value="1500"/> bytes MTU default 1500				
	Save Settings Don't Save Settings				

Internet Setup

PPPoE

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.

PPPoE: Select **Dynamic** (most common) or **Static**. Select **Static** if your ISP assigned you the IP address, subnet mask, gateway, and DNS server addresses.

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).

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

DNS Addresses: Enter the Primary and Secondary DNS Server Addresses (Static PPPoE only).

Maximum Idle Time: 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.

Connection Mode Select: Select either **Always-on**, **Manual**, or **Connect-on demand**.

DIR-501	SETUP	ADVANCED	MAINTENANCE	STATUS	HELP
Easy Setup	INTERNET CONNECTION				Helpful Hints...
Internet Setup	Use this section to configure your Internet Connection type. There are several connection types to choose from: Static IP, DHCP, PPPoE, PPTP, and L2TP. If you are unsure of your connection method, please contact your Internet Service Provider.				When configuring the router to access the Internet, be sure to choose the correct Internet Connection Type from the drop down menu. If you are unsure of which option to choose, contact your Internet Service Provider (ISP) .
Wireless Setup	<p>Note : If using the PPPoE option, you will need to remove or disable any PPPoE client software on your computers.</p> <p>Save Settings Don't Save Settings</p>				
LAN Setup	INTERNET CONNECTION TYPE				If you are having trouble accessing the Internet through the router, double check any settings you have entered on this page and verify them with your ISP if needed.
Time and Date	Choose the mode to be used by the router to connect to the Internet.				
Parental Control	My Internet Connection is: <input type="text" value="PPPoE(Username / Password)"/>				
Logout	PPPOE				More
	Enter the information provided by your Internet Service Provider (ISP).				
	<input checked="" type="radio"/> Dynamic IP (DHCP) <input type="radio"/> Static IP				
	User Name : <input type="text"/>				
	Password : <input type="password"/>				
	Confirm Password : <input type="password"/>				
	Service Name : <input type="text"/> (optional)				
	IP Address : <input type="text" value="0.0.0.0"/>				
	MAC Address : <input type="text" value="00 - 00 - 00 - 00 - 00 - 00"/> (optional)				
	<input type="button" value="Copy Your PC's MAC Address"/>				
	<input checked="" type="radio"/> Receive DNS from ISP <input type="radio"/> Enter DNS Manually				
	Primary DNS Server : <input type="text" value="0.0.0.0"/>				
	Secondary DNS Server : <input type="text" value="0.0.0.0"/> (optional)				
	Maximum Idle Time : <input type="text" value="5"/> (minutes, 0=infinite)				
	MTU : <input type="text" value="1492"/> bytes MTU default 1492				
	Connection mode select : <input type="radio"/> Always <input type="radio"/> Manual <input checked="" type="radio"/> Connection-on demand				
	<input type="button" value="Add New"/>				
	Save Settings Don't Save Settings				
WIRELESS					

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.

PPTP: Select **Dynamic** (most common) or **Static**. Select **Static** if your ISP assigned you the IP address, subnet mask, gateway, and DNS server addresses.

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

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

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

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

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

PPTP Account: Enter your PPTP account name.

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

Maximum Idle Time: 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.

Connect Mode: Select either Always-on, Manual, or Connect-on demand.

DIR-501	SETUP	ADVANCED	MAINTENANCE	STATUS	HELP
Easy Setup	INTERNET CONNECTION				Helpful Hints... When configuring the router to access the Internet, be sure to choose the correct Internet Connection Type from the drop down menu. If you are unsure of which option to choose, contact your Internet Service Provider (ISP) . If you are having trouble accessing the Internet through the router, double check any settings you have entered on this page and verify them with your ISP if needed. More
Internet Setup	Use this section to configure your Internet Connection type. There are several connection types to choose from: Static IP, DHCP, PPPoE, PPTP, and L2TP. 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. <input type="button" value="Save Settings"/> <input type="button" value="Don't Save Settings"/>				
Wireless Setup	INTERNET CONNECTION TYPE				
LAN Setup	Choose the mode to be used by the router to connect to the Internet. My Internet Connection is : <input type="text" value="PPTP(Username / Password)"/>				
Time and Date	PPTP INTERNET CONNECTION TYPE :				
Parental Control	Enter the information provided by your Internet Service Provider (ISP). <input checked="" type="radio"/> Dynamic IP (DHCP) <input type="radio"/> Static IP PPTP IP Address : <input type="text" value="0.0.0.0"/> PPTP Subnet Mask : <input type="text" value="255.255.255.0"/> PPTP Gateway IP Address : <input type="text"/> Primary DNS Server : <input type="text" value="0.0.0.0"/> MAC Address : <input type="text" value="00 - 00 - 00 - 00 - 00 - 00"/> (optional) <input type="button" value="Copy Your PC's MAC Address"/> PPTP Server IP Address : <input type="text" value="0.0.0.0"/> User Name : <input type="text"/> Password : <input type="password"/> Confirm Password : <input type="password"/> Maximum Idle Time : <input type="text" value="5"/> (minutes, 0=infinite) MTU : <input type="text" value="1400"/> bytes Connection mode select : <input type="radio"/> Always <input type="radio"/> Manual <input checked="" type="radio"/> Connection-on demand <input type="button" value="Add New"/> <input type="button" value="Save Settings"/> <input type="button" value="Don't Save Settings"/>				
Logout	WIRELESS				

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.

L2TP: Select **Dynamic** (most common) or **Static**. Select **Static** if your ISP assigned you the IP address, subnet mask, gateway, and DNS server addresses.

IP Address: Enter the IP address (Static L2TP only).

Subnet Mask: Enter the Primary and Secondary DNS Server Addresses (Static L2TP only).

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

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

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

L2TP Account: Enter your L2TP account name.

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

Maximum Idle Time: 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.

Connect Mode: Select either Always-on, Manual, or Connect-on demand.

The screenshot shows the 'INTERNET CONNECTION' configuration page for a DIR-501 router. The page is divided into several sections:

- INTERNET CONNECTION:** A header section with a note: "Use this section to configure your Internet Connection type. There are several connection types to choose from: Static IP, DHCP, PPPoE, PPTP, and L2TP. If you are unsure of your connection method, please contact your Internet Service Provider." Below this is a "Note" about PPPoE and "Save Settings" / "Don't Save Settings" buttons.
- INTERNET CONNECTION TYPE:** A section titled "Choose the mode to be used by the router to connect to the Internet." with a dropdown menu showing "L2TP(Username / Password)".
- L2TP INTERNET CONNECTION TYPE:** A section titled "Enter the information provided by your Internet Service Provider (ISP)." containing:
 - Radio buttons for "Dynamic IP (DHCP)" (selected) and "Static IP".
 - Fields for "L2TP IP Address" (0.0.0.0), "L2TP Subnet Mask" (255.255.255.0), "L2TP Gateway IP Address", "Primary DNS Server" (0.0.0.0), and "MAC Address" (00 - 00 - 00 - 00 - 00 - 00) with a "Copy Your PC's MAC Address" button.
 - Fields for "L2TP Server IP Address" (0.0.0.0), "User Name", "Password", and "Confirm Password".
 - "Maximum Idle Time" set to 5 minutes.
 - "MTU" set to 1400 bytes.
 - "Connection mode select" with radio buttons for "Always" (selected), "Manual", and "Connection-on demand".

At the bottom of the form are "Save Settings" and "Don't Save Settings" buttons. The page is part of a larger interface with tabs for "SETUP", "ADVANCED", "MAINTENANCE", "STATUS", and "HELP".

Wireless Setup

Wireless settings for the router may be configured manually or by using a wizard. To use the wizard, click the **Wireless Connection Setup Wizard** button and then follow the steps that are described below. To configure the wireless settings manually, click the **Manual Wireless Connection Setup** button. The parameters for this window are described later in this section. The Wireless Security section that directly follows this Configuration section provides additional explanation for how to configure the WEP, WPA, WPA2, and WPA/WPA2 wireless security mode options.

The screenshot shows the router's configuration interface for the DIR-501 model. The 'WIRELESS' section is active, and the 'WIRELESS CONNECTION' tab is selected. It provides two options: using the 'Wireless Connection Setup Wizard' or 'Manual Wireless Connection Setup'. A 'Helpful Hints...' section on the right offers guidance for new users and advanced users.

Click **Next** to continue.

This screen is the welcome page of the wireless security setup wizard. It informs the user that the wizard will guide them through a step-by-step process to set up and secure their wireless network. It lists two steps: 'Step 1: Set your Wireless Network' and 'Step 2: Set your Wireless Security Password'. 'Next' and 'Cancel' buttons are at the bottom.

Enter a **Wireless Network Name** in the textbox, which is also known as the SSID, and then click **Next** to continue.

This screen is the first step of the wizard, titled 'STEP 1: SETUP YOUR WIRELESS NETWORK'. It asks the user to provide a network name (SSID) in a text box, with 'dlink' entered as an example. Below the text box are three radio button options for encryption: 'No Encryption', 'Automatically assign a network key (Recommended)', and 'Manually assign a network key'. There is also a checkbox for 'Use WPA encryption instead of WEP'. 'Prev', 'Next', and 'Cancel' buttons are at the bottom.

Enter a Wireless Security Password in the textbox and then click **Next** to continue.

STEP 2: SET YOUR WIRELESS SECURITY PASSWORD

You have selected your security level - you will need to set a wireless security password. The WEP (Wired Equivalent Privacy) key must meet one of following guidelines:

- Exactly 5 or 13 characters
- Exactly 10 or 26 characters using 0-9 and A-F

A longer WEP key is more secure than a short one

Wireless Security Password :

Note: You will need to enter the same password as keys in this step into your wireless clients in order to enable proper wireless communication.

This window displays a summary of your wireless security settings. Please print this out or record this information in a safe place and then click **Save** to continue.

SETUP COMPLETE!

Below is a detailed summary of your wireless security settings. Please print this page out, or write the information on a piece of paper, so you can configure the correct settings on your wireless client adapters.

Wireless Network Name (SSID) : dlink
Wep Key Length : 64 bits
Default WEP Key to Use : 1
Authentication : Open
Wep Key : 1234567890

Note: In some smart wireless utilities (e.g. DLINK wireless utility or wireless zero configuration), you only select Wireless Network Name and enter Network Key to access Internet.

The Router will save your new settings and reboot. When it is finished after 1-2 minutes, the opening Wireless Setup window is displayed.

REBOOTING...

Saving Changes and Restarting.

Wi-Fi Protected Setup: To implement Wi-Fi protection, or WCN 2.0, tick the Enable checkbox, click either **Generate New PIN** or **Reset PIN to Default**, and then configure the Wi-Fi settings below. Please see the Setting Up Wi-Fi Protection (WCN 2.0 in Windows Vista) section later in this manual for detailed configuration information.

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.

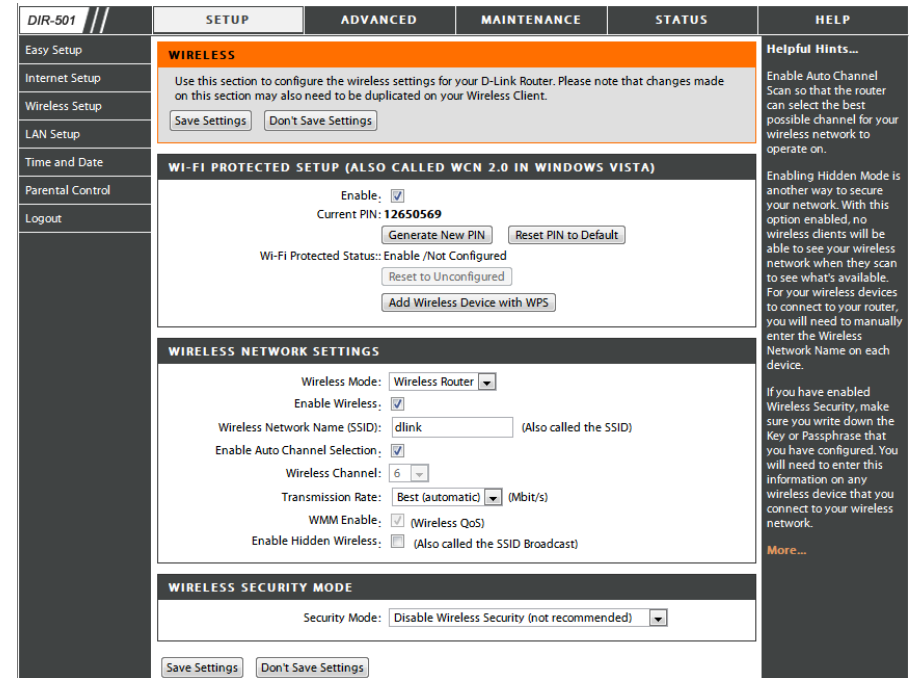
Wireless Network Name: Service Set Identifier (SSID) is the name of your wireless network. Create a name using up to 32 characters. The SSID is case-sensitive.

Enable Wireless Channel: Indicates the channel setting for the DIR-501. 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. The **Auto Channel Selection** setting can be selected to allow the DIR-501 to choose the channel with the least amount of interference.

Transmission Rate: Use the drop-down menu to select the appropriate Transmission Rate in Mbits per second. Many users will want to use the default setting, *Best (automatic)*.

WMM Enable: Enable Wi-Fi Multimedia to enjoy basic quality of service features. WMM prioritizes traffic according to four access categories: voice, video, best effort, and background.

Enable Hidden Wireless: Check this option if you would not like the SSID of your wireless network to be broadcasted by the DIR-501. If this option is checked, the SSID of the DIR-501 will not be seen by Site Survey utilities so your wireless clients will have to know the SSID of your DIR-501 in order to connect to it.



1. To enable wireless security on the Router, use the drop-down menu to select the desired option. To enable WEP, select *Enable WEP Wireless Security (basic)*.
2. Next to **Authentication**, select either *Open* or *Shared Key*. Shared Key provides greater security.
3. Select either *64Bit* or *128Bit* encryption from the drop-down menu next to **WEP Encryption**.
4. Next to **Default Key Type**, select *WEP Key 1* and enter a WEP key that you create. Make sure you enter this key exactly on all your wireless devices. You may enter up to four different keys either using *Hex* or *ASCII*. *Hex* is recommended (letters A-F and numbers 0-9 are valid). In *ASCII* all numbers and letters are valid.
5. 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.

WIRELESS SECURITY MODE

Security Mode:

- Disable Wireless Security (not recommended)
- Enable WEP Wireless Security (basic)
- Enable WPA Only Wireless Security (enhanced)
- Enable WPA2 Only Wireless Security (enhanced)
- Enable WPA/WPA2 Wireless Security (enhanced)

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.

Authentication:

Wep Key Length:

Default WEP Key to Use:

WEPPassword: (5 ASCII or 10 HEX)

NOTE:

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. To enable WPA, WPA2, or WPA/WPA2, select either *Enable WPA Only Wireless Security (enhanced)*, *Enable WPA2 Only Wireless Security (enhanced)*, or *Enable WPA/WPA2 Wireless Security (enhanced)*.
2. Next to **Cipher Type**, select *TKIP*, *AES*, or *Both*.
3. Next to **PSK/EAP**, select *PSK*.
4. Next to **Network Key**, enter a passphrase. The key is an alpha-numeric password between 8 and 63 characters long. The password can include symbols (!?*&_) and spaces. Make sure you enter this key exactly the same on all other wireless clients.
5. 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, WPA2, or WPA/WPA2 (whichever of the three options you have selected above) on your adapter and enter the same network key as you did on the router.

WIRELESS SECURITY MODE

Security Mode :

WPA ONLY

WPA Only requires stations to use high grade encryption and authentication.

Cipher Type :

PSK / EAP :

Network Key : (8~63 ASCII or 64 HEX)

WIRELESS SECURITY MODE

Security Mode :

WPA2 ONLY

WPA2 Only requires stations to use high grade encryption and authentication.

Cipher Type :

PSK / EAP :

Network Key : (8~63 ASCII or 64 HEX)

WIRELESS SECURITY MODE

Security Mode :

WPA/WPA2

WPA/WPA2 requires stations to use high grade encryption and authentication.

Cipher Type :

PSK / EAP :

Network Key : (8~63 ASCII or 64 HEX)

LAN Setup

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

Router 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.

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

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

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

Refer to the next page for DHCP information.

DIR-501	SETUP	ADVANCED	MAINTENANCE	STATUS	HELP							
Easy Setup	LAN SETUP				Helpful Hints... If you already have a DHCP server on your network or are using static IP addresses on all the devices on your network, uncheck Enable DHCP Server to disable this feature. If you have devices on your network that should always have fixed IP addresses, add a DHCP Reservation for each such device. More...							
Internet Setup	Use this section to configure the internal network settings of your router and also to configure the built-in DHCP Server to assign IP addresses to the computers on your network. 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. Please note that this section is optional and you do not need to change any of the settings here to get your network up and running.											
Wireless Setup	Save Settings Don't Save Settings											
LAN Setup	ROUTER SETTINGS											
Time and Date	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.											
Parental Control	Router IP Address: 192.168.0.1 Subnet Mask: 255.255.255.0 Device Name: dlinkrouter Local Domain Name: <input type="text"/> Enable DNS Relay: <input checked="" type="checkbox"/>											
Logout	DHCP SERVER SETTINGS											
	Local Domain Name: <input type="text"/> Enable DNS Relay: <input checked="" type="checkbox"/>											
	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: <input checked="" type="checkbox"/> DHCP IP Address Range: 100 to 199 (address within the LAN subnet) DHCP Lease Time: 1440 (minutes) NetBIOS announcement: <input type="checkbox"/> Learn NetBIOS from WAN: <input type="checkbox"/> NetBIOS Scope: DIR-501 (optional) NetBIOS node type: <input type="radio"/> Broadcast only (use when no WINS servers configured) <input type="radio"/> Point-to-Point (no broadcast) <input checked="" type="radio"/> Mixed-mode (Broadcast then Point-to-Point) <input type="radio"/> Hybrid (Point-to-Point then Broadcast) Primary WINS IP Address: 0.0.0.0 Secondary WINS IP Address: 0.0.0.0											
	DHCP CLIENT LIST											
	<table border="1"> <thead> <tr> <th>Host Name</th> <th>IP Address</th> <th>MAC Address</th> <th>Expired Time</th> </tr> </thead> <tbody> <tr> <td>07018NBWIN7</td> <td>192.168.0.100</td> <td>fddef1:1a:1axd8</td> <td>23 Hours 31 Minutes</td> </tr> </tbody> </table>				Host Name	IP Address	MAC Address	Expired Time	07018NBWIN7	192.168.0.100	fddef1:1a:1axd8	23 Hours 31 Minutes
Host Name	IP Address	MAC Address	Expired Time									
07018NBWIN7	192.168.0.100	fddef1:1a:1axd8	23 Hours 31 Minutes									
	AVOID ARP ATTACK											
	Avoid Arp Attack: <input type="checkbox"/>											
	24--DHCP RESERVATION											
	Remaining number of clients that can be configured: 24											
	<table border="1"> <thead> <tr> <th>Computer Name</th> <th>IP Address</th> <th>MAC Address</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Computer Name	IP Address	MAC Address					
Computer Name	IP Address	MAC Address										

DHCP Server Settings

DHCP stands for Dynamic Host Control Protocol. The DIR-501 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 DIR-501. 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 the 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.

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

DHCP SERVER SETTINGS

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

Enable DHCP Server :

DHCP IP Address Range : to (addresses within the LAN subnet)

DHCP Lease Time : (minutes)

DHCP CLIENT LIST

Host Name	IP Address	MAC Address	Expired Time
10 - DHCP RESERVATION			
Remaining number of clients that can be configured : 10			
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<< Computer Name ▾
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<< Computer Name ▾
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<< Computer Name ▾
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<< Computer Name ▾
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<< Computer Name ▾
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<< Computer Name ▾
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<< Computer Name ▾
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<< Computer Name ▾
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<< Computer Name ▾
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<< Computer Name ▾

Time and Date

This section will allow you to configure, update, and maintain the correct time on the internal system clock.

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

Enable Daylight Saving: Ticking this checkbox enables Daylight Saving time. Click **Sync. your computer's time settings** to copy your PC's time settings.

NTP Server Used: Tick the "Automatically synchronize with D-Link's Internet time server" checkbox and then use the drop-down menu to select an NTP Server. NTP is short for Network Time Protocol. NTP synchronizes computer clock times in a network of computers.

Manual: To manually input the time, enter the values in these fields for the Year, Month, Day, Hour, Minute, and Second. Click **Save Settings**.

The screenshot shows the 'TIME AND DATE' configuration page for a DIR-501 device. The page is organized into several sections:

- TIME AND DATE:** Contains an introductory text about time configuration and two buttons: 'Save Settings' and 'Don't Save Settings'.
- TIME AND DATE CONFIGURATION:** Shows the current time as '2011Year3Month25Day(s)Fri 3:41:56'. The 'Time Zone' is set to '(GMT+08:00) Beijing, Chongqing, Hong Kong, Urumqi'. The 'Enable Daylight Saving' checkbox is unchecked, and the 'Sync. your computer's time settings' button is present.
- AUTOMATIC TIME AND DATE CONFIGURATION:** Features an unchecked checkbox for 'Automatically synchronize with D-Link's Internet time server'. The 'NTP Server Used' is set to 'ntp1.dlink.com', with an 'Update Now' button next to it.
- SET THE DATE AND TIME MANUALLY:** Provides fields for manual time entry: Year (2011), Month (Mar), Day(s) (25), Hour (03), Minute (41), and Second (50). 'Save Settings' and 'Don't Save Settings' buttons are at the bottom.

The interface also includes a left sidebar with navigation options like 'Easy Setup', 'Internet Setup', 'Wireless Setup', 'LAN Setup', 'Time and Date', 'Parental Control', and 'Logout'. A right sidebar contains 'Helpful Hints...' and 'More...'. The 'WIRELESS' logo is visible at the bottom left of the main content area.

Parental Control

This feature allows you to create a list of websites that you want to either allow or deny users access.

Configure Parental Control: Select Turn Parental Control OFF, Turn Parental Control ON and ALLOW computers access to ONLY these sites, or Turn Parental Control ON and DENY computers access to ONLY these sites.

Website URL: Enter the keywords or URLs that you want to block (or allow). Any URL with the keyword in it will be blocked.

Schedule: The schedule of time when the parental control filter 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 **Maintenance > Schedules** section.

Website URL	Schedule
<input type="checkbox"/>	Always Add New
<input type="checkbox"/>	Always Add New
<input type="checkbox"/>	Always Add New
<input type="checkbox"/>	Always Add New
<input type="checkbox"/>	Always Add New
<input type="checkbox"/>	Always Add New
<input type="checkbox"/>	Always Add New
<input type="checkbox"/>	Always Add New
<input type="checkbox"/>	Always Add New
<input type="checkbox"/>	Always Add New
<input type="checkbox"/>	Always Add New

Port Forwarding

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

Rule: Check the box to enabled the rule.

Name: Enter a name for the rule.

IP Address: Enter the IP address of the computer on your local network that you want to allow the incoming service to.

Start Port/End Port: Enter the port or ports that you want to open. If you want to open one port, enter the same port in both boxes.

Traffic Type: Select TCP, UDP, or Any

DIR-501	SETUP	ADVANCED	MAINTENANCE	STATUS	HELP																																								
Port Forwarding	PORT FORWARDING				Helpful Hints...																																								
Application Rules	The Advanced Port Forwarding 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 service such as FTP or Web Servers.				Check the Application Name drop down menu for a list of predefined server types. If you select one of the predefined server types, click the arrow button next to the drop down menu to fill out the corresponding field. More...																																								
MAC Filtering	<input type="button" value="Save Settings"/> <input type="button" value="Don't Save Settings"/>																																												
Traffic Control	24--ADVANCED PORT FORWARDING RULES																																												
Firewall & DMZ	Remaining number of rules that can be created : 24																																												
Advanced Wireless Settings	<table border="1"> <thead> <tr> <th></th> <th></th> <th>Port</th> <th>Traffic Type</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td>Name <input type="text"/></td> <td><< Application Name >></td> <td>Public Port <input type="text"/> ~ <input type="text"/></td> </tr> <tr> <td></td> <td>IP Address <input type="text"/></td> <td><< Computer Name >></td> <td>Private Port <input type="text"/> ~ <input type="text"/></td> </tr> <tr> <td></td> <td></td> <td></td> <td>Any <input type="button" value="v"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td>Name <input type="text"/></td> <td><< Application Name >></td> <td>Public Port <input type="text"/> ~ <input type="text"/></td> </tr> <tr> <td></td> <td>IP Address <input type="text"/></td> <td><< Computer Name >></td> <td>Private Port <input type="text"/> ~ <input type="text"/></td> </tr> <tr> <td></td> <td></td> <td></td> <td>Any <input type="button" value="v"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td>Name <input type="text"/></td> <td><< Application Name >></td> <td>Public Port <input type="text"/> ~ <input type="text"/></td> </tr> <tr> <td></td> <td>IP Address <input type="text"/></td> <td><< Computer Name >></td> <td>Private Port <input type="text"/> ~ <input type="text"/></td> </tr> <tr> <td></td> <td></td> <td></td> <td>Any <input type="button" value="v"/></td> </tr> </tbody> </table>						Port	Traffic Type	<input type="checkbox"/>	Name <input type="text"/>	<< Application Name >>	Public Port <input type="text"/> ~ <input type="text"/>		IP Address <input type="text"/>	<< Computer Name >>	Private Port <input type="text"/> ~ <input type="text"/>				Any <input type="button" value="v"/>	<input type="checkbox"/>	Name <input type="text"/>	<< Application Name >>	Public Port <input type="text"/> ~ <input type="text"/>		IP Address <input type="text"/>	<< Computer Name >>	Private Port <input type="text"/> ~ <input type="text"/>				Any <input type="button" value="v"/>	<input type="checkbox"/>	Name <input type="text"/>	<< Application Name >>	Public Port <input type="text"/> ~ <input type="text"/>		IP Address <input type="text"/>	<< Computer Name >>	Private Port <input type="text"/> ~ <input type="text"/>				Any <input type="button" value="v"/>	
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			Any <input type="button" value="v"/>																																										
Advanced Network Settings																																													
Routing																																													
Logout																																													

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 DIR-501.

Rule: Check the box to enable the rule.

Name: Enter a name for the rule.

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

Firewall Port: This is the port number on the WAN 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.

Select TCP, UDP, or Any.

Traffic Type:

The screenshot shows the 'APPLICATION RULES' configuration page in the DIR-501 web interface. The page is divided into several sections:

- Navigation Sidebar:** Includes options like Port Forwarding, Application Rules (selected), MAC Filtering, Traffic Control, Firewall & DMZ, Advanced Wireless Settings, Advanced Network Settings, Routing, and Logout.
- Page Header:** Shows 'DIR-501' and tabs for 'SETUP', 'ADVANCED', 'MAINTENANCE', 'STATUS', and 'HELP'.
- Application Rules Section:** Contains a title 'APPLICATION RULES', a descriptive paragraph, and two buttons: 'Save Settings' and 'Don't Save Settings'.
- 24--APPLICATION RULES Section:** Displays a table for managing application rules. The table has columns for 'Name', 'Application', 'Port' (with sub-columns for 'Trigger' and 'Firewall'), and 'Traffic Type'. There are three rows, each with a checkbox in the 'Name' column and a dropdown menu in the 'Application' column. The 'Port' and 'Traffic Type' columns contain input fields and dropdown menus respectively.
- Helpful Hints... Section:** Provides instructions on how to use the 'Application Name' dropdown menu, mentioning predefined applications and the 'More...' link.

Access Control

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 Filter: Select Turn MAC Filtering OFF, Turn MAC Filtering ON and ALLOW computers listed to access the network, or Turn MAC Filtering ON and DENY computers listed to access the network.

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 List: Select a DHCP client from the drop-down menu and click the arrow to copy that MAC Address.

Schedule: The schedule of time when the network filter 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 **Maintenance > Schedules** section.

The screenshot shows the 'MAC FILTERING' configuration page in the DIR-501 web interface. The page is divided into several sections:

- Navigation:** SETUP, ADVANCED, MAINTENANCE, STATUS, HELP.
- MAC FILTERING:** A section with a description: "The MAC (Media Access Controller) Address filter option is used to control network access based on the MAC Address of the network adapter. A MAC address is a unique ID assigned by the manufacturer of the network adapter. This feature can be configured to ALLOW or DENY network/Internet access." Below this are buttons for "Save Settings" and "Don't Save Settings".
- 24 -- MAC FILTERING RULES:** A section with a dropdown menu for "Configure MAC Filtering below:" set to "Turn MAC Filtering OFF". Below this is a message: "Remaining number of rules that can be created : 24".
- Table:** A table with columns for "MAC Address", "DHCP Client List", and "Schedule". There are four rows, each with a checkbox, a text input for the MAC address, a dropdown for the DHCP client name, a dropdown for the schedule (set to "Always"), and an "Add New" button.
- Helpful Hints:** A sidebar on the right with the text: "Create a list of MAC addresses that you would either like to allow or deny access to your network. Computers that have obtained an IP address from the router's DHCP server will be in the DHCP Client List. Select a device from the drop down menu, then click the arrow to add that device's MAC address to the list. More..."

Traffic Control

Traffic control can be used to distribute download bandwidth automatically according to the requirements of the users, and the users also can setup manually.

Enable Traffic Control: Select this function to control the access bandwidth of computer in LAN.

Enable Traffic Control: Select this function to control the access bandwidth of computer in LAN.

Automatic Distribute Bandwidth: All the computers in LAN will be distributed the bandwidth equally.

key in bandwidth manually: Key in the value to setup the bandwidth manually.

Taffic Control Rules: When the option Automatic Distribute Bandwidth is unchecked, you can control the access bandwidth of the specific IP address.

DIR-501	SETUP	ADVANCED	MAINTENANCE	STATUS	HELP
Port Forwarding	TRAFFIC CONTROL				Helpful Hints...
Application Rules	Traffic Control can distribute download bandwidth equally to the LAN/Wireless client. User also can setup the traffic control rules manually.				More...
MAC Filtering	<input type="button" value="Save Settings"/> <input type="button" value="Don't Save Settings"/>				
Traffic Control					
Firewall & DMZ	TRAFFIC CONTROL SETTING				
Advanced Wireless Settings	Enable Traffic Control: <input checked="" type="checkbox"/>				
Advanced Network Settings	Automatic Distribute Bandwidth: <input type="checkbox"/>				
Routing	Key in bandwidth manually: <input type="text" value="2000"/> kbps				
Logout	5-TRAFFIC CONTROL RULES				
	IP Range	Mode	Bandwidth(kbps)	Schedule	
	IP Address Address	IP ~	Guaranteed minimum bandwidth	Always	New Scheduler
	<input type="text"/>	~	<input type="text"/>	<input type="text"/>	<input type="button" value="New Scheduler"/>
	IP Address Address	IP ~	Guaranteed minimum bandwidth	Always	New Scheduler
	<input type="text"/>	~	<input type="text"/>	<input type="text"/>	<input type="button" value="New Scheduler"/>

Setup Wizard

You may run the setup wizard from the opening quick setup window to quickly set up your router. You will be directed to the first window of the wizard automatically.

The screenshot displays the D-Link DIR-615 web interface. At the top, it shows 'Product Page : DIR-615' and 'Firmware Version : 4.00'. The D-Link logo is prominently displayed. Below the logo, there are navigation tabs: 'DIR-615 //', 'SETUP', 'ADVANCED', 'MAINTENANCE', 'STATUS', and 'HELP'. The 'SETUP' tab is selected, and the 'INTERNET CONNECTION' sub-tab is active. The main content area is titled 'INTERNET CONNECTION' and contains the following text:

If you are configuring the device for the first time, we recommend that you click on the Internet Connection Setup Wizard, and follow the instructions on the screen. If you wish to modify or configure the device settings manually, click the Manual Internet Connection Setup.

INTERNET CONNECTION SETUP WIZARD

If you would like to utilize our easy to use Web-based Wizard to assist you in connecting your new D-Link Systems Router to the Internet, click on the button below.

[Internet Connection Setup Wizard](#)

Note: Before launching the wizard, please make sure you have followed all steps outlined in the Quick Installation Guide included in the package.

MANUAL INTERNET CONNECTION OPTIONS

If you would like to configure the Internet settings of your new D-Link Router manually, then click on the button below.

[Manual Internet Connection Setup](#)

On the right side, there is a 'Helpful Hints...' section with two bullet points:

- If you are new to networking and have never configured a router before, click on **Internet Connection Setup Wizard** and the router will guide you through a few simple steps to get your network up and running.
- If you consider yourself an advanced user and have configured a router before, click **Manual Internet Connection Setup** to input all the settings manually.

On the left side, there is a sidebar menu with the following items: Internet Setup, Wireless Setup, LAN Setup, Time and Date, Parental Control, Logout, Internet Offline, and a Reboot button.

Firewall & DMZ

This section will allow you to set up a DMZ host and to set up firewall rules.

If you have a client PC that cannot run Internet applications properly from behind the DIR-501, then you can set the client up for unrestricted Internet access. It allows a computer to be exposed to the Internet. This feature is useful for gaming purposes. Enter the IP address of the internal computer that will be the DMZ host. Adding a client to the DMZ (Demilitarized Zone) may expose your local network to a variety of security risks, so only use this option as a last resort.

Enable SPI: Check this to enable SPI.

Enable DMZ Check this box to enable DMZ.

Host:

DMZ IP Address: Enter the IP address of the computer you would like to open all ports to.

Name: Choose a name for the firewall rule.

Action: Select to *Allow* or *Deny* transport of the data packets according to the criteria defined in the rule.

Source/Dest: The Source/Destination is the TCP/UDP port on either the LAN or WAN side.

Schedule: Click **Add New** to access the Schedules window. See **Maintenance>Schedules** for more information.

IP Address: Enter a beginning and ending IP address.

Protocol: Select the transport protocol that will be used for the filter rule.

Port Range: Enter the desired port range for the filter rule.

The screenshot shows the configuration interface for the DIR-501 router. The main navigation menu on the left includes: Port Forwarding, Application Rules, MAC Filtering, Traffic Control, Firewall & DMZ (selected), Advanced Wireless Settings, Advanced Network Settings, Routing, and Logout. The main content area is titled 'FIREWALL & DMZ' and contains the following sections:

- FIREWALL & DMZ:** A header section with a description of firewall rules and DMZ, and buttons for 'Save Settings' and 'Don't Save Settings'.
- ANTI-SPOOF CHECKING:** A section with a checkbox for 'Enable Anti-Spoof checking'.
- FIREWALL SETTINGS:** A section with a checkbox for 'Enable SPI'.
- DMZ HOST:** A section with a description of the DMZ feature, a checkbox for 'Enable DMZ', and a field for 'DMZ IP Address' (0.0.0.0) with a 'Computer Name' dropdown menu.
- APPLICATION LEVEL GATEWAY (ALG) CONFIGURATION:** A section with a checkbox for 'RTSP'.
- 50 - FIREWALL RULES:** A section showing 'Remaining number of rules that can be created : 50' and a table for adding new rules. The table has columns for Name, Interface, IP Address, Protocol, and Schedule. The 'Action' dropdown is set to 'Allow'. There is an 'Add New' button.

On the right side, there is a 'Helpful Hints...' section with text: 'Enable the DMZ option only as a last resort. If you are having trouble using an application from a computer behind the router, first try opening ports associated with the application in the Port Forwarding sections.' and a 'More...' link.

Advanced Wireless

This window allows you to change the behavior of the 802.11g wireless radio from the standard settings. Please be aware that any changes to the factory default settings may adversely affect the behavior of your network.

Transmit Power: Set the transmit power of the antennas.

Beacon interval: 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: 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) *1* is the default setting. A DTIM is a countdown informing clients of the next window for listening to broadcast and multicast messages.

Preamble Type: Select Short or Long Preamble. The Preamble defines the length of the CRC block (Cyclic Redundancy Check is a common technique for detecting data transmission errors) for communication between the wireless router and the roaming wireless network adapters. Auto is the default setting. Note: High network traffic areas should use the shorter preamble type.

CTS Mode: CTS (Clear To Send) is a function used to minimize collisions among wireless devices on a wireless local area network (LAN). CTS will make sure the wireless network is clear before a wireless client attempts to send wireless data. Enabling CTS will add overhead and may lower wireless through put. **None:** CTS is typically used in a pure 802.11g environment. If CTS is set to "None" in a mixed mode environment populated by 802.11b clients, wireless collisions may occur frequently. **Always:** CTS will always be used to make sure the wireless LAN is clear before sending data. **Auto:** CTS will monitor the wireless network and automatically decide whether to implement CTS based on the amount of traffic and collisions that occurs on the wireless network.

Select one of the following:
802.11 Mode: **Mixed 802.11g and 802.11b** - Select if you are using both 802.11b and 802.11g wireless clients.
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.

Select the Channel Width:
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.

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.

The screenshot shows the 'ADVANCED WIRELESS SETTINGS' page. The left sidebar contains navigation tabs: SETUP, ADVANCED (selected), MAINTENANCE, STATUS, and HELP. Below these are menu items: Port Forwarding, Application Rules, MAC Filtering, Traffic Control, Firewall & DMZ, Advanced Wireless Settings (selected), Advanced Network Settings, Routing, and Logout. The main content area is titled 'ADVANCED WIRELESS SETTINGS' and contains the following settings:

- Transmit Power: 100%
- Beacon Period: 100 (msec, range:20-1000, default:100)
- RTS Threshold: 2346 (range: 256-2346, default:2346)
- Fragmentation: 2346 (range: 1500-2346, default:2346, even number only)
- DTIM Interval: 1 (range: 1-255, default:1)
- Preamble Type: Short Preamble Long Preamble
- CTS Mode: None Always Auto
- Wireless Mode: 802.11Mixed(n/g/b)
- Band Width: 20MHz
- STBC: Enable Disabled
- 20/40MHz Coexist: Enable Disabled
- Short Guard Interval:

On the right side, there is a 'Helpful Hints...' section with the text: 'It is recommended that you leave these parameters at their default values. Adjusting them could limit the performance of your wireless network.' Below this is a 'More...' link.

Advanced Network

This window allows you to change the LAN settings. Please be aware that any changes to the factory default settings may affect the behavior of your network.

Enable UPnP: To use the Universal Plug and Play (UPnP™) feature tick this checkbox. UPnP provides compatibility with networking equipment, software and peripherals.

Enable WAN Ping Respond: Unchecking the box will not allow the DIR-501 to respond to Pings. Blocking the Ping may provide some extra security from hackers. Tick this checkbox to allow the WAN port to be “Pinged”.

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

DIR-501	SETUP	ADVANCED	MAINTENANCE	STATUS	HELP
Port Forwarding	ADVANCED NETWORK SETTINGS				Helpful Hints... UPnP helps other UPnP LAN hosts interoperate with the router. Leave the UPnP option enabled as long as the LAN has other UPnP applications. For added security, it is recommended that you disable the WAN Ping Respond option. Ping is often used by malicious Internet users to locate active networks or PCs. The WAN speed is usually detected automatically. If you are having problems connecting to the WAN, try selecting the speed manually. If you are having trouble receiving multicast streams from the Internet, make sure the Multicast Streams option is enabled. More...
Application Rules	These options are for users that wish to change the LAN settings. We do not recommend changing these settings from factory default. Changing these settings may affect the behavior of your network. <input type="button" value="Save Settings"/> <input type="button" value="Don't Save Settings"/>				
MAC Filtering					
Traffic Control					
Firewall & DMZ	UPNP				
Advanced Wireless Settings	Universal Plug and Play (UPnP) supports peer-to-peer Plug and Play functionality for network devices. Enable UPnP : <input checked="" type="checkbox"/>				
Advanced Network Settings	WAN PING				
Routing	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 : <input type="checkbox"/>				
Logout	WAN PORT SPEED				
	<input type="text" value="10/100Mbps Auto"/>				
	MULTICAST STREAMS				
	Enable Multicast Streams : <input type="checkbox"/> Wireless enhance mode : <input type="checkbox"/>				

Routing

This option allows you to define fixed routes to defined destinations.

Enable: Tick this checkbox to enable or disable fixed routes to defined destinations.

Interface: Use the drop-down menu to choose the *WAN* or *WAN (Physical Port)* Interface the IP packet must use to transit out of the Router.

Destination: The IP address of the packets that will take this route.

Subnet Mask: The subnet of the IP address of the packets that will take this route.

Gateway: Specifies the next hop to be taken if this route is used.

	Interface	Destination	Subnet Mask	Gateway
<input type="checkbox"/>	WAN			
<input type="checkbox"/>	WAN			
<input type="checkbox"/>	WAN			
<input type="checkbox"/>	WAN			
<input type="checkbox"/>	WAN			
<input type="checkbox"/>	WAN			

Remaining number of rules that can be created : 32

Helpful Hints...
 Each route has a check box next to it, check this box if you want the route to be enabled.
 The destination IP address is the address of the host or network you wish to reach.
 The Subnet mask field identifies the portion of the destination IP in use.
 The gateway IP address is the IP address of the router, if any, used to reach the specified destination.
 More...

Device Administration

This window will allow you to change the Administrator password. You can also enable Remote Management.

Administrator Login Name: Enter a new Login Name for the Administrator account.

Administrator Password: Enter a new password for the Administrator Login Name and then retype the new password in the Confirm Password textbox. The administrator can make changes to the settings.

Enable Remote Management: Remote management allows the DIR-501 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.

IP Allowed to Access: The Internet IP address of the computer that has access to the Broadband Router. If you input an asterisk (*) into this field, then any computer will be able to access the Router. Putting an asterisk (*) into this field would present a security risk and is not recommended.

Port: The port number used to access the DIR-501. For example: `http://x.x.x.x:8080` whereas `x.x.x.x` is the WAN IP address of the DIR-501 and `8080` is the port used for the Web-Management interface.

The screenshot shows the web management interface for a DIR-501 router. The top navigation bar includes tabs for SETUP, ADVANCED, MAINTENANCE, STATUS, and HELP. The left sidebar lists various settings categories: Administrator Settings, Save and Restore Settings, Firmware Update, Dynamic DNS, System Check, Schedule, Log Settings, and Logout. The main content area is titled 'ADMINISTRATOR SETTINGS' and contains the following sections:

- ADMINISTRATOR SETTINGS:** A message states, "There is no password for this router by default. To help secure your network, we recommend that you should choose a new password." Below this message are two buttons: "Save Settings" and "Don't Save Settings".
- ADMINISTRATOR (The default login name is 'admin'):** This section contains three input fields: "Login Name" (with the value "admin"), "Password" (masked with asterisks), and "Confirm Password" (masked with asterisks).
- REMOTE MANAGEMENT:** This section includes three checkboxes: "Enable Graphical Authentication" (unchecked), "Enable Remote Management" (unchecked), and "IP Allowed to Access" (set to "0.0.0.0"). Below these is a "Port" dropdown menu currently set to "8080".

On the right side of the interface, there is a "Helpful Hints..." section with the following text: "For security reasons, it is recommended that you change the password for the Admin and User accounts. Be sure to write down the new and passwords to avoid having to reset the router in case they are forgotten." Below this, it says: "When enabling Remote Management, you can specify the IP address of the computer on the Internet that you want to have access to your router, or leave it blank to allow access to any computer on the Internet." A "More..." link is also present.

Save and Restore

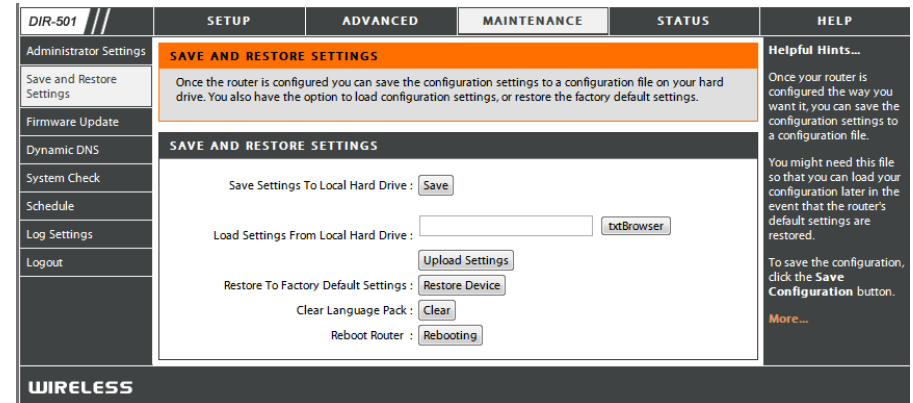
This window allows you to save your configuration file to a hard drive, load configuration settings from a hard drive, and restore the Router's factory default settings.

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 **Browse** control to find a previously save file of configuration settings. Then, click the **Upload Settings** 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.

Reboots: Click the **Reboots** button on the left side of the window to restart the Router.



Firmware Update

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 Upgrade: Click the **Check Now** button (or the link at the top of the window) 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** in this window to locate the firmware update on your hard drive. Click **Save Settings** to complete the firmware upgrade.

The screenshot displays the web interface for a D-Link DIR-501 router. The top navigation bar includes tabs for SETUP, ADVANCED, MAINTENANCE, STATUS, and HELP. The left sidebar lists various settings categories: Administrator Settings, Save and Restore Settings, Firmware Update, Dynamic DNS, System Check, Schedule, Log Settings, and Logout. The main content area is titled 'FIRMWARE UPDATE' and contains the following sections:

- FIRMWARE UPDATE:** A notification box stating, "There may be new firmware for your DIR-501 to improve functionality and performance. [Click here to check for an upgrade on our support site.](#)" Below this, instructions are provided for upgrading the firmware and the language pack.
- FIRMWARE INFORMATION:** Displays the current firmware version as 1.03 and the date as Fri 25 Mar 2011. A 'Check Now' button is available to check for updates.
- FIRMWARE UPGRADE:** A note in red text states, "Some firmware upgrades reset the configuration options to the factory defaults. Before performing an upgrade, be sure to save the current configuration." Instructions specify that a wired connection is required and that the user should enter the filename of the upgrade file. An 'Upload' button is accompanied by a 'txtBrowser' button for file selection.
- LANGUAGE PACK UPGRADE:** Similar to the firmware upgrade section, it includes an 'Upload' button and a 'txtBrowser' button for selecting a language pack file.

On the right side of the interface, there is a 'Helpful Hints...' section with additional information and a 'More...' link.

DDNS Setting

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

Enable DDNS: Tick the Enable DDNS checkbox to enable support for DDNS.

Server Address: Select one of the DDNS registration organizations from those listed in the pull-down menu. Available servers include *dlinkddns.com(Free)*, *DynDns.org(Custom)*, *Dyn.Dns.org(free)*, and *Dyn.Dns.org(Static)*.

Host Name: Enter the host name of the DDNS server.

Username: Enter the username given to you by your DDNS server.

Password: Enter the password or key given to you by your DDNS server.

The screenshot shows the DDNS configuration interface on a D-Link router. The page is titled "DYNAMIC DNS" and features a sidebar with navigation options: Administrator Settings, Save and Restore Settings, Firmware Update, Dynamic DNS, System Check, Schedule, Log Settings, and Logout. The main content area has a header with tabs for SETUP, ADVANCED, MAINTENANCE, STATUS, and HELP. Below the header, there is an introductory text about DDNS, a link to sign up for D-Link's Free DDNS service at www.Dlinkddns.com, and two buttons: "Save Settings" and "Don't Save Settings". The "DYNAMIC DNS SETTINGS" section contains a checkbox for "Enable DDNS" (checked), a dropdown menu for "Server Address" (set to dlinkddns.com), and input fields for "Host Name", "Username", and "Password" (masked with asterisks). There is also a "DDNS Account Testing" button and a "Status" field.

System Check

This tool is used to verify the physical connectivity on both the LAN and the WAN interfaces. The Ping Test can be used to test the status of the Internet.

Virtual Cable Tester (VCT) VCT is an advanced feature that integrates a LAN cable tester on every Ethernet port on the router. Through the graphical user interface (GUI), VCT can be used to remotely diagnose and report cable faults such as opens, shorts, swaps, and impedance mismatch. This feature significantly reduces service calls and returns by allowing users to easily troubleshoot their cable connections.

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**.

Port	Link Status		
Internet		100Mbps FULL Duplex	More Info
LAN1		Disconnected	More Info
LAN2		Disconnected	More Info
LAN3		100Mbps FULL Duplex	More Info
LAN4		Disconnected	More Info

PING TEST

Ping Test is used to send 'Ping' packets to test if a computer is on the Internet.

Host Name or IP Address :

PING RESULT

Schedules

The Router allows the user the ability to manage schedule rules for various firewall and parental control features on this window. Once you have finished configuring the new schedule rule, click the **Save Settings** button at the top of the window.

Name: Enter a name for the new schedule rule.

Day(s): Choose the desired day(s), either All Week or Select Days. If the latter is selected, please use the checkboxes directly below to specify the individual days.

All Day - 24 hrs: Tick this check box if the new schedule rule applies to the full 24-hour period.

Start Time/ End Time: If the new schedule rule does not apply to the full 24-hour period, untick the previous checkbox and then enter a specific beginning and ending time.

The screenshot shows the configuration interface for a DIR-501 router. The top navigation bar includes tabs for SETUP, ADVANCED, MAINTENANCE, STATUS, and HELP. The left sidebar lists various settings categories: Administrator Settings, Save and Restore Settings, Firmware Update, Dynamic DNS, System Check, Schedule, Log Settings, and Logout. The main content area is titled 'SCHEDULE' and contains the following elements:

- A description: 'The Schedule configuration option is used to manage schedule rules for various firewall and parental control features.'
- Buttons: 'Save Settings' and 'Don't Save Settings'.
- A section titled '33 - ADD SCHEDULE RULE' containing:
 - Name: [Text Input Field]
 - Day(s): All Week Select Day(s)
 - Day selection checkboxes: Sun Mon Tue Wed Thu Fri Sat
 - All Day - 24 hrs:
 - Start Time: [0] : [0] (hour:minute, 24 hour time)
 - End Time: [0] : [0] (hour:minute, 24 hour time)
- A section titled 'SCHEDULE RULES LIST' with a table header:

Name	Day(s)	Time Frame

The right sidebar contains 'Helpful Hints...' with text explaining that schedules are used with other features to define when they are in effect, and a 'More ...' link.

Log Settings

The system log displays chronological event log data specified by the router user. You may also save a simple text file containing the log to your computer. Click the **Save** button and follow the prompts to save the file.

Save Log File: Click on the **Save** button link on this window to save the log file to your local hard drive.

Syslog Server: click the checkbox to save the log in the log server in the LAN side.

Log Type & Level: Click the checkbox(es) of the type of log information requested: **“System, Firewall & Security, Router Status, Critical, Warning and Information”**

Send by Mail: Enter the your SMTP server name(or IP address) and enter your mail address before sending your system log by mail.

DIR-501	SETUP	ADVANCED	MAINTENANCE	STATUS	HELP
Administrator Settings	LOG SETTINGS				Helpful Hints... You may want to make the email settings similar to those of your email client program. More...
Save and Restore Settings	Logs can be saved by sending it to an admin email address.				
Firmware Update	<input type="button" value="Save Settings"/> <input type="button" value="Don't Save Settings"/>				
Dynamic DNS	SAVE LOG FILE				
System Check	Save Log File To Local Hard Drive <input type="button" value="Save"/>				
Schedule	SYSLOG SETTINGS				
Log Settings	Enable Logging To Syslog Server: <input type="checkbox"/> Syslog Server IP Address: 0.0.0.0 << Computer Name				
Logout	LOG TYPE & LEVEL				
	Log Type: <input checked="" type="checkbox"/> System <input checked="" type="checkbox"/> Firewall & Security <input checked="" type="checkbox"/> Router Status Log Level: <input type="checkbox"/> Critical <input type="checkbox"/> Warning <input type="checkbox"/> Information				
	SEND BY MAIL				
	Email Address: <input type="text"/> Email Subject: <input type="text"/> Sender Email Address: <input type="text"/> SMTP Server/IP Address: <input type="text"/> User Name: <input type="text"/> Password: <input type="password"/> Confirm Password: <input type="password"/> <input type="button" value="Send Mail Now"/>				

Device Info

This window displays the current information for the DIR-501. It will display the LAN, WAN, and Wireless information.

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

If your WAN 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.

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

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

Wireless 802.11N: Displays the wireless MAC address and your wireless settings such as SSID, Channel, and Encryption status.

DIR-501	SETUP	ADVANCED	MAINTENANCE	STATUS	HELP
Device Info	DEVICE INFORMATION				Helpful Hints...
View Log	All of your Internet and network connection details are displayed on this page. The firmware version is also displayed here.				All of your WAN and LAN connection details are displayed here.
Traffic Statistics	Firmware Version :1.03, Fri 25 Mar 2011				More...
Active Sessions	LAN				
Wireless	MAC Address :F07D6882858E IP Address :192.168.0.1 Subnet Mask :255.255.255.0 DHCP Server :Enabled				
Logout	INTERNET				
	MAC Address :F07D688285BF DHCP Client Connected Connection : <input type="button" value="DHCP Renew"/> <input type="button" value="DHCP Release"/> IP Address :172.17.5.7 Subnet Mask :255.255.255.0 Default Gateway :172.17.5.254 DNS :192.168.168.250, 192.168.168.201				
	WIRELESS 802.11N				
	SSID :dlink Channel :11 Encryption :Disabled				

Log

This window allows you to view a log of activities on the Router. This is especially helpful detecting unauthorized network usage.

First Page: View the first page of the log.

Last Page: View the last page of the log.

Previous: View the previous page.

Next: View the next page.

Clear: Clear the log.

Link to Log Settings: Click this button to go directly to the Log Settings window (**Maintenance > Log Settings**).

Traffic Statistics

The window below displays the Traffic Statistics. Here you can view the amount of packets that pass through the DIR-501 on both the WAN and the LAN ports. The traffic counter will reset if the device is rebooted.

DIR-501	SETUP	ADVANCED	MAINTENANCE	STATUS	HELP
Device Info	TRAFFIC STATISTICS				Helpful Hints... This is a summary of the number of packets that have passed between the WAN and the LAN since the router was last initialized. More...
View Log	Traffic Statistics display Receive and Transmit packets passing through your router.				
Traffic Statistics					
Active Sessions					
Wireless	<input type="button" value="Refresh"/> <input type="button" value="Reset"/>				
Logout					
		Received		Transmit	
	Internet	0 Packets		0 Packets	
	LAN	5 Packets		5 Packets	
	WIRELESS 11n	0 Packets		0 Packets	

Active Session

The NAPT Active Session table displays a list of all active conversations between WAN computers and LAN computers.

DIR-501	SETUP	ADVANCED	MAINTENANCE	STATUS	HELP
Device Info	ACTIVE SESSIONS				Helpful Hints... This is a list of all active conversations between WAN computers and LAN computers. More...
View Log	This page displays the full details of active internet sessions to your router.				
Traffic Statistics	<input type="button" value="Refresh"/>				
Active Sessions					
Wireless	NAPT SESSION				
Logout	TCP Session: 11 UDP Session: 1 Total: 12				
	NAPT SESSION				
	IP Address	TCP Session		UDP Session	
	192.168.0.100	11		0	
	192.168.0.1	0		1	

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 client.

DIR-501 //	SETUP	ADVANCED	MAINTENANCE	STATUS	HELP									
Device Info	WIRELESS				Helpful Hints... This is a list of all wireless clients that are currently connected to your wireless router. More...									
View Log	Use this option to view the wireless clients that are connected to your wireless router.													
Traffic Statistics														
Active Sessions	NUMBER OF WIRELESS CLIENTS : 0													
Wireless	<table border="1"> <thead> <tr> <th>MAC Address</th> <th>IP Address</th> <th>Mode</th> <th>Rate</th> <th>Signal (%)</th> </tr> </thead> <tbody> <tr> <td colspan="5"> </td> </tr> </tbody> </table>					MAC Address	IP Address	Mode	Rate	Signal (%)				
MAC Address	IP Address	Mode	Rate	Signal (%)										
Logout														

Help

Click the desired hyperlink to get more information about how to use the Router.

DIR-501	SETUP	ADVANCED	MAINTENANCE	STATUS	HELP
Menu	HELP MENU				Helpful Hints...
Logout	<p>Setup</p> <ul style="list-style-type: none">Internet SetupWireless SetupLan SetupTime and DateParental Control <p>Advanced</p> <ul style="list-style-type: none">Port ForwardingApplication RulesAccess ControlTraffic ControlFirewall & DMZAdvanced WirelessAdvanced NetworkRouting <p>Maintenance</p> <ul style="list-style-type: none">Device AdministrationSave and RestoreFirmware UpdateDDNS SettingSystem CheckSchedulesLog Setting <p>Status</p> <ul style="list-style-type: none">Device InfoView LogTraffic StatisticsActive SessionsWireless				

Wireless Security

This section will show you the different levels of security you can use to protect your data from intruders. The DIR-501 offers the following types of security:

- WPA2 (Wi-Fi Protected Access 2)
- WPA (Wi-Fi Protected Access)
- WEP (Wired Equivalent Privacy)
- WPA2-PSK (Pre-Shared Key)
- WPA-PSK (Pre-Shared Key)

What is WEP?

WEP stands for Wired Equivalent Privacy. It is based on the IEEE 802.11 standard and uses the RC4 encryption algorithm. WEP provides security by encrypting data over your wireless network so that it is protected as it is transmitted from one wireless device to another.

To gain access to a WEP network, you must know the key. The key is a string of characters that you create. When using WEP, you must determine the level of encryption. The type of encryption determines the key length. 128-bit encryption requires a longer key than 64-bit encryption. Keys are defined by entering in a string in HEX (hexadecimal - using characters 0-9, A-F) or ASCII (American Standard Code for Information Interchange – alphanumeric characters) format. ASCII format is provided so you can enter a string that is easier to remember. The ASCII string is converted to HEX for use over the network. Four keys can be defined so that you can change keys easily.

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 **Wireless Setup** on the left side.
2. Next to **Security Mode**, select *Enable WEP Wireless Security (basic)*.
3. Next to **Authentication**, select either *Shared Key* or *Open*. *Shared Key* is recommended as it provides greater security when WEP is enabled.
4. Select either *64Bit* or *128Bit* encryption from the drop-down menu next to **WEP Encryption**.
5. Next to **Default Key Type**, select *WEP Key 1* and enter a WEP key that you create. Make sure you enter this key exactly on all your wireless devices. You may enter up to four different keys either using *Hex* or *ASCII*. *Hex* is recommended (letters A-F and numbers 0-9 are valid). In *ASCII* all numbers and letters are valid.
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.

WIRELESS SECURITY MODE

Security Mode : Enable WEP Wireless Security (basic) ▼

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.

Authentication : Open ▼
 WEP Encryption : 64Bit ▼
 Default WEP Key : WEP Key 1 ▼
 WEP Key : (5 ASCII or 10 HEX)

Save Settings
Don't Save Settings

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 two 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.

Configure WPA-PSK and WPA2-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 **Wireless Setup** on the left side.
2. Next to **Security Mode**, select *Enable WPA Only Wireless Security (enhanced)* or *Enable WPA2 Only Wireless Security (enhanced)*.
3. Next to **Cipher Mode**, select *TKIP*, *AES*, or *Both*.
4. Next to **PSK/EAP**, select *PSK*.
5. Next to **Network Key**, enter a key (passphrase). The key is an alpha-numeric password between 8 and 63 characters long. The password can include symbols (!?*&_) and spaces. Make sure you enter this key exactly the same on all other wireless clients.
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 WPA-PSK or WPA2-PSK on your adapter and enter the same passphrase as you did on the Router.

The screenshot shows the 'WIRELESS SECURITY MODE' section of a router's configuration page. The 'Security Mode' dropdown is set to 'Enable WPA Only Wireless Security (enhanced)'. Below this, the 'WPA ONLY' section contains the text 'WPA Only requires stations to use high grade encryption and authentication.' The 'Cipher Type' dropdown is set to 'TKIP', and the 'PSK / EAP' dropdown is set to 'PSK'. A 'Network Key' input field is present, followed by the text '(8~63 ASCII or 64 HEX)'. At the bottom, there are two buttons: 'Save Settings' and 'Don't Save Settings'.

The screenshot shows the 'WIRELESS SECURITY MODE' section of a router's configuration page. The 'Security Mode' dropdown is set to 'Enable WPA2 Only Wireless Security (enhanced)'. Below this, the 'WPA2 ONLY' section contains the text 'WPA2 Only requires stations to use high grade encryption and authentication.' The 'Cipher Type' dropdown is set to 'TKIP', and the 'PSK / EAP' dropdown is set to 'PSK'. A 'Network Key' input field is present, followed by the text '(8~63 ASCII or 64 HEX)'. At the bottom, there are two buttons: 'Save Settings' and 'Don't Save Settings'.

Configure WPA/WPA2-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 **Wireless Setup** on the left side.
2. Next to **Security Mode**, select *Enable WPA/WPA2 Wireless Security (enhanced)*.
3. Next to **Cipher Mode**, select *TKIP*, *AES*, or *Both*.
4. Next to **PSK/EAP**, select *PSK*.
5. Next to **Network Key**, enter a key (passphrase). The key is an alpha-numeric password between 8 and 63 characters long. The password can include symbols (!?*&_) and spaces. Make sure you enter this key exactly the same on all other wireless clients.
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 WPA/WPA2-PSK on your adapter and enter the same passphrase as you did on the Router.

The screenshot shows the 'WIRELESS SECURITY MODE' section of a router's web interface. The 'Security Mode' dropdown is set to 'Enable WPA/WPA2 Wireless Security (enhanced)'. Below this is the 'WPA/WPA2' section, which includes a note: 'WPA/WPA2 requires stations to use high grade encryption and authentication.' The 'Cipher Type' dropdown is set to 'TKIP', and the 'PSK / EAP' dropdown is set to 'PSK'. The 'Network Key' field is empty, with a note '(8~63 ASCII or 64 HEX)' to its right. At the bottom of the form are two buttons: 'Save Settings' and 'Don't Save Settings'.

Configure WPA, WPA2, and WPA/WPA2 (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 **Wireless Settings** on the left side.
2. Next to **Security Mode**, select *Enable WPA Only Wireless Security (enhanced)*, *Enable WPA2 Only Wireless Security (enhanced)*, or *Enable WPA/WPA2 Wireless Security (enhanced)*.
3. Next to **Cipher Type**, select *TKIP*, *AES*, or *Auto*.
4. Next to **PSK/EAP**, select *EAP*.
5. Next to **RADIUS Server 1** enter the **IP Address** of your RADIUS server.
6. Next to **Port**, enter the port you are using with your RADIUS server. *1812* is the default port.
7. Next to **Shared Secret**, enter the security key.
8. If you have a secondary RADIUS server, enter its IP address, port, and secret key.
9. Click **Save Settings** to save your settings.

WIRELESS SECURITY MODE

Security Mode : Enable WPA Only Wireless Security (enhanced) ▼

WPA ONLY

WPA Only requires stations to use high grade encryption and authentication.

Cipher Type : TKIP ▼

PSK / EAP : EAP ▼

802.1X

RADIUS Server 1 IP Address :

Port :

Shared Secret :

RADIUS Server 2 IP Address :

Port :

Shared Secret :

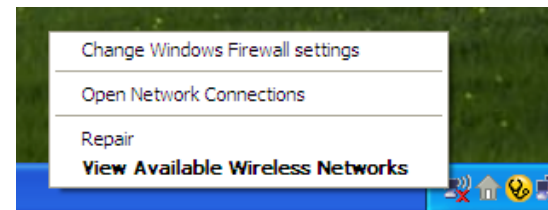
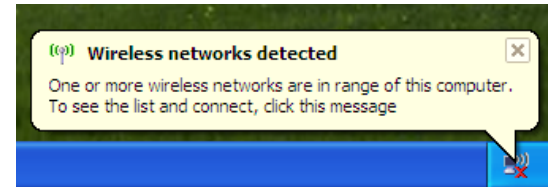
Connect to a Wireless Network Using Windows® XP

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.

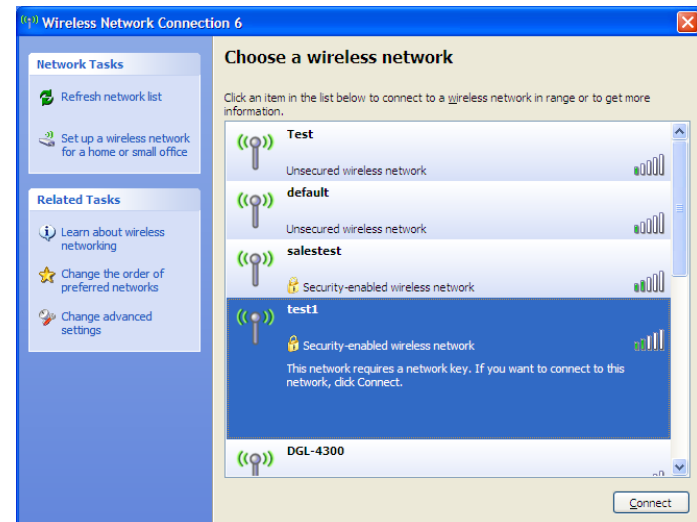
or

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.

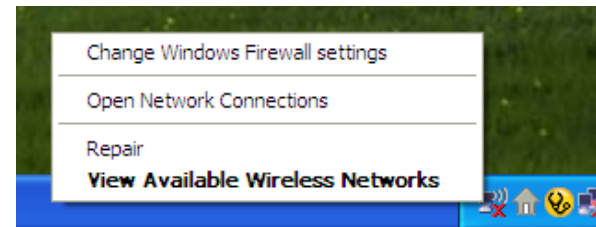
If you get a good signal but cannot access the Internet, check you TCP/IP settings for your wireless adapter. Refer to the **Networking Basics** section in this manual for more information.



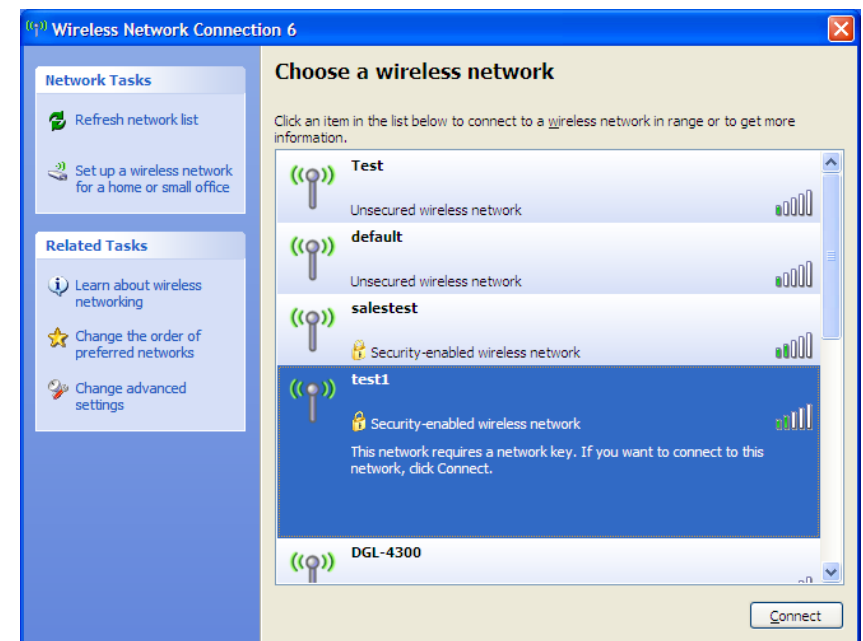
Configure WEP

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**.

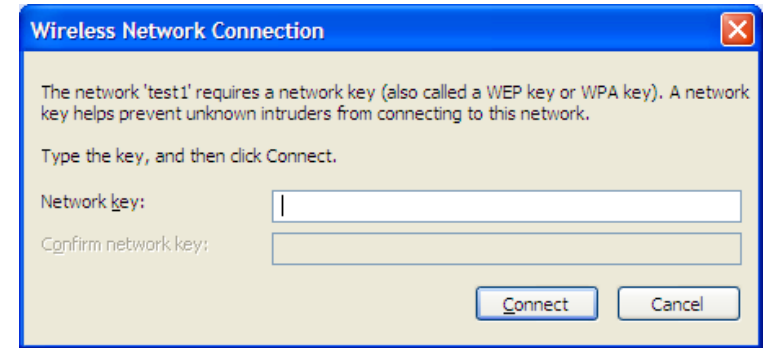


2. Highlight the wireless network (SSID) you would like to connect to and click **Connect**.



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

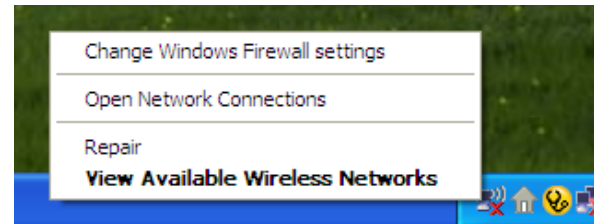
It may take 20-30 seconds to connect to the wireless network. If the connection fails, please verify that the WEP settings are correct. The WEP key must be exactly the same as on the wireless router.



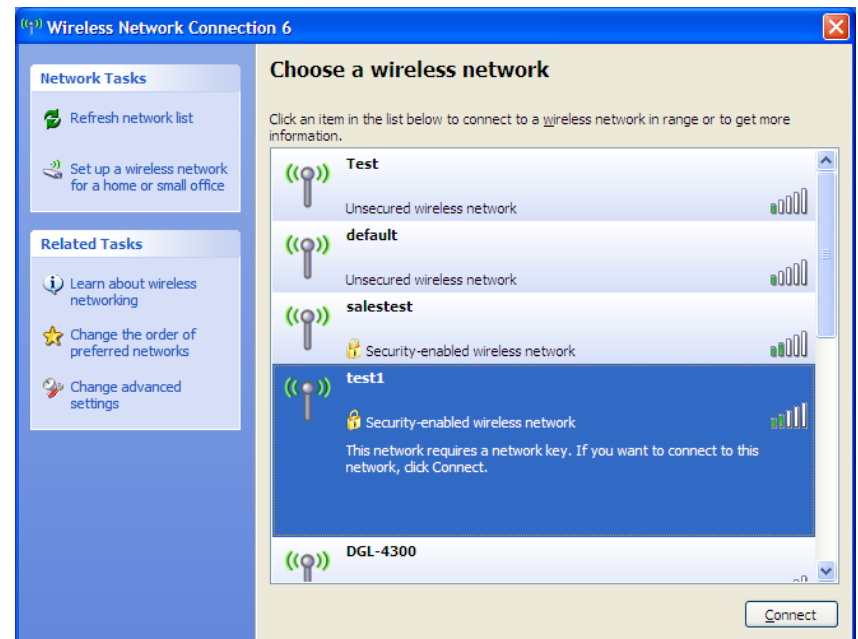
Configure WPA-PSK

It is recommended to enable 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**.

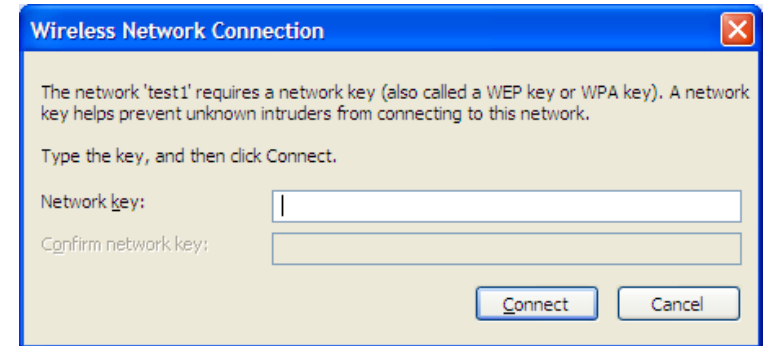


2. Highlight the wireless network (SSID) you would like to connect to and click **Connect**.



3. The **Wireless Network Connection** box will appear. Enter the 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.



Setting Up Wi-Fi Protection (WCN 2.0 in Windows Vista)

The DIR-501 supports Wi-Fi protection, referred to as WCN 2.0 in Windows Vista. The instructions for setting this up depend on whether you are using Windows Vista to configure the Router or third party software.

Initial Router Configuration for Wi-Fi Protection

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 use the traditional Ethernet approach.

If you are running Windows Vista, tick the Enable checkbox on the **Wireless Network** window. Use the Current PIN that is displayed on the **Wireless Network** window or choose to click the **Generate New PIN** button or **Reset PIN to Default** button.



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.

Setting Up a Configured Router

Once the Router has been configured, you can use the push button on the Router or third party software to invite a newcomer to join your Wi-Fi protected network. For maximum security, the software method is recommended. However, the push button method is ideal if there is no access to a GUI.

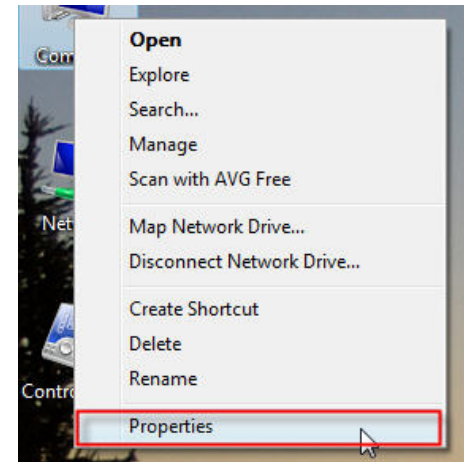
If you are using the Router's Wi-Fi Security push button option, simultaneously depress the push button located on the side of the Router and the button on the client (or virtual button on the client's GUI). Next click **Finish**. The Client's software will then allow a newcomer to join your secure, Wi-Fi protected network.

If you are using third party software, run the appropriate Wi-Fi Protected System utility. You will be asked to either use the push button method or to manually enter the PIN. Follow the on-screen instructions.

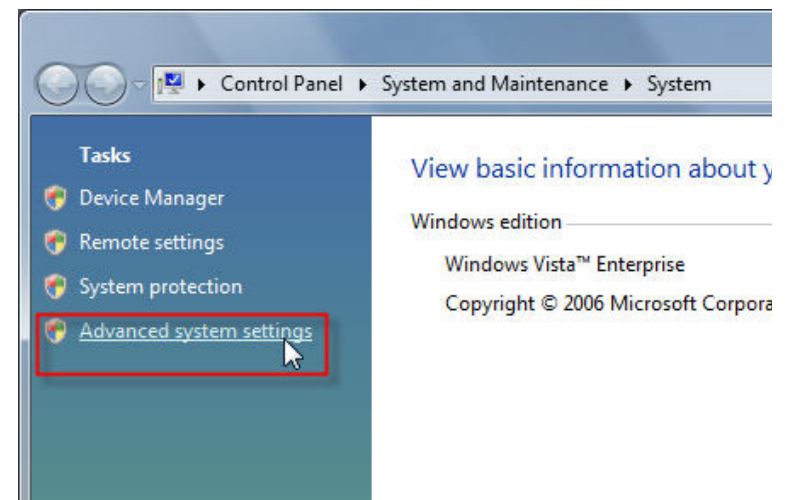
Changing the Computer Name and Joining a Workgroup

The following are step-by-step directions to change the computer name and join a workgroup.

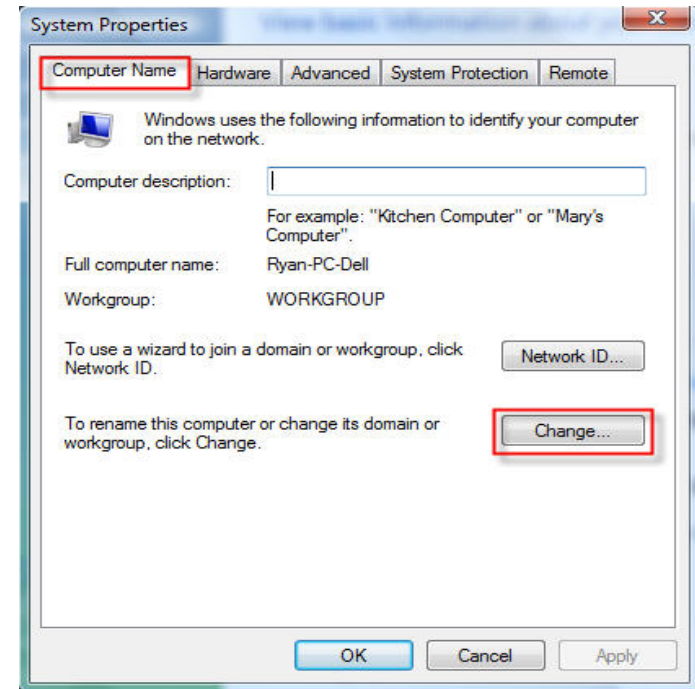
1. Click on **Properties**.



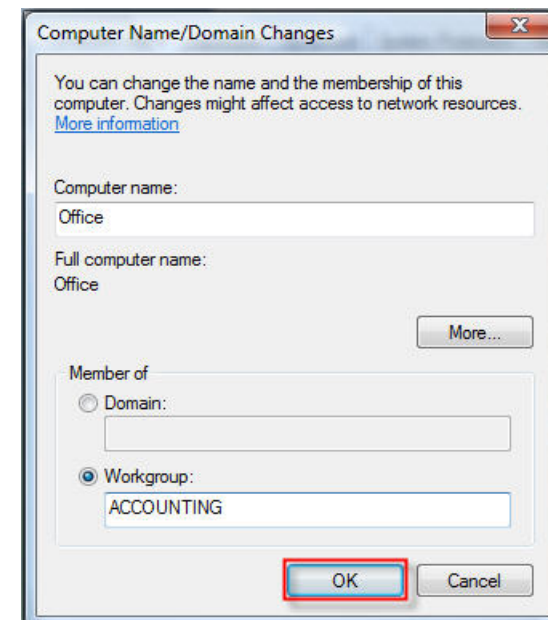
2. Click on the **Advanced system settings** link.



3. Click the **Computer Name** tab in the **System Properties** window and enter a description of your computer in the textbox. When you are finished, click the **Change** button.



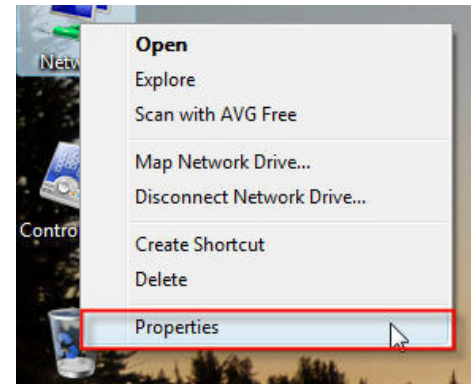
4. Go to the **Computer Name/Domain Changes** window and click the radio button next to the Workgroup you want to join. When you are finished, click the **OK** button.



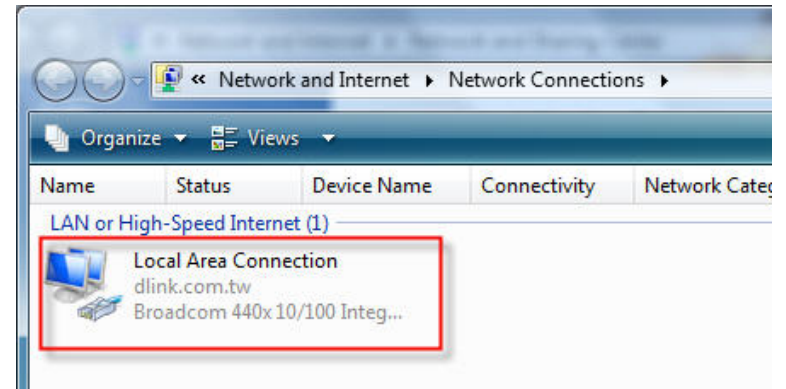
Configuring the IP Address in Vista

The following are step-by-step directions to configure the IP address in Windows Vista.

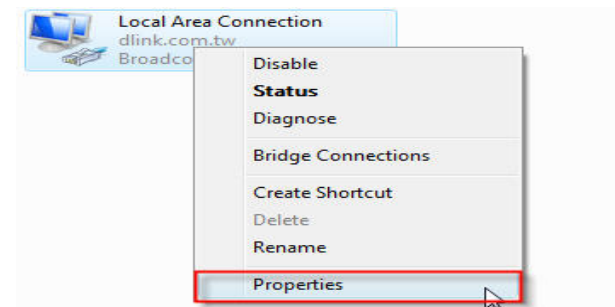
1. Click on **Properties**.



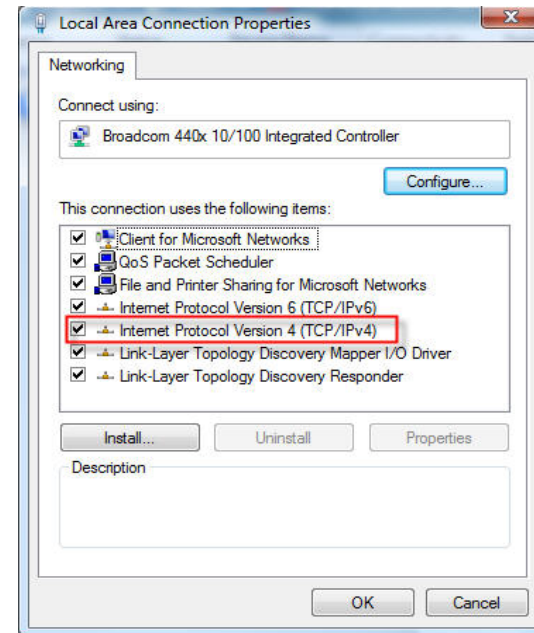
2. Go to the **Network and Internet** window and click the appropriate **Local Area Connection** icon.



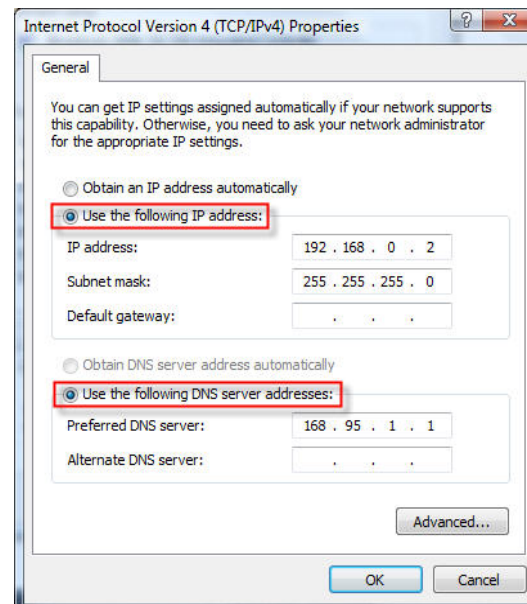
3. Right-click the **Local Area Connection** icon and then select **Properties** from the drop-down menu.



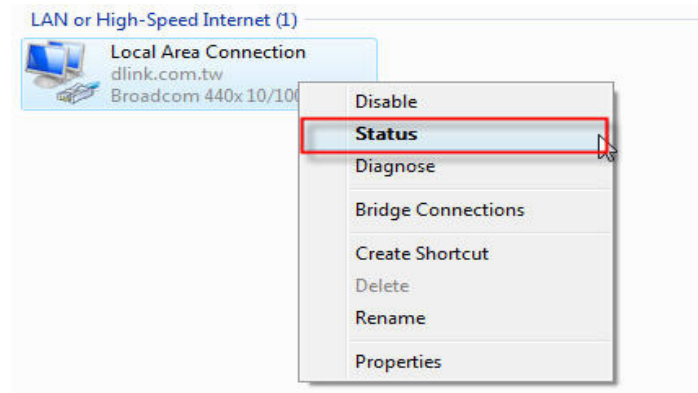
4. Tick the **Internet Protocol Version 4 (TCP/IPv4)** checkbox in the **Networking** tab in the **Local Area Connection Properties** window.



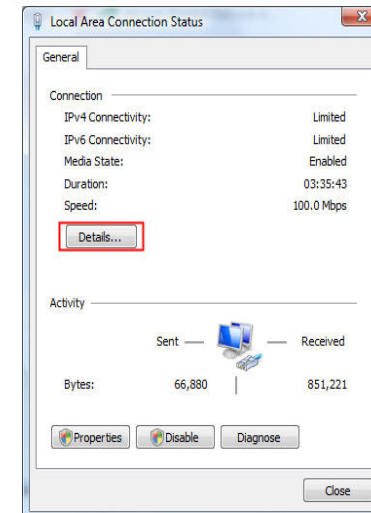
5. Click the “Use the following IP address” option in the **General** tab in the **Local Area Connections Properties** window and enter the desired IP address in the space offered. Then click the “Use the following DNS server addresses” option on the same tab and enter the desired DNS server information.



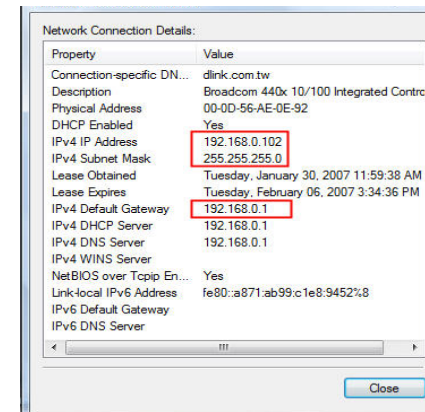
6. Right-click the **Local Area Connection** icon and then select **Status** from the drop-down menu.



7. Go to the **Local Area Connection Status** window and click the **Details** button.



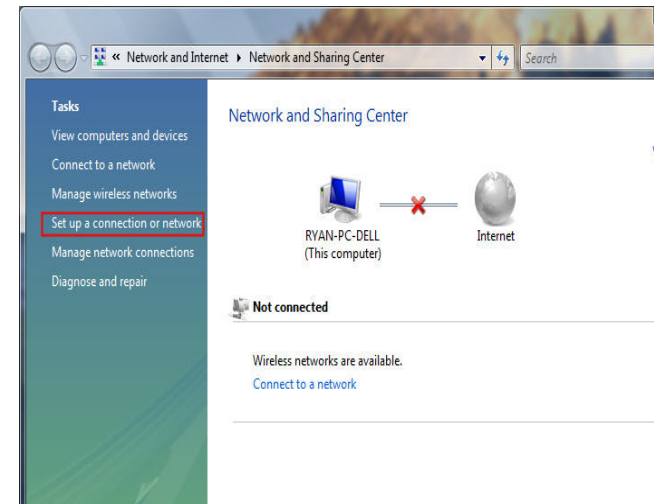
8. Confirm your new settings on the **Network Connection Status** window. When you are finished, click the **Done** button.



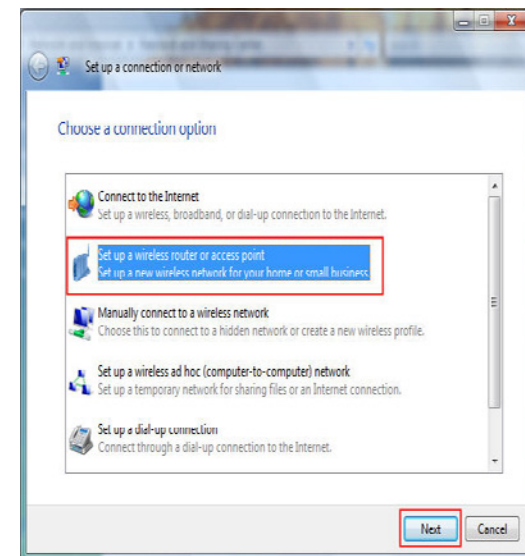
Setting Up a Connection or Network Wirelessly

The following are step-by-step directions to set up a wireless connection.

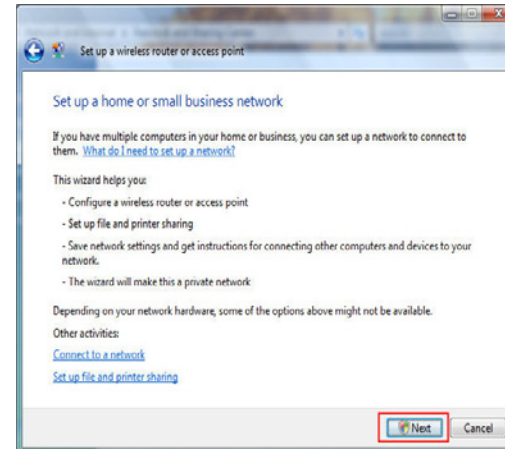
1. Click on **Set up a connection or network** in the **Network and Sharing Center** section.



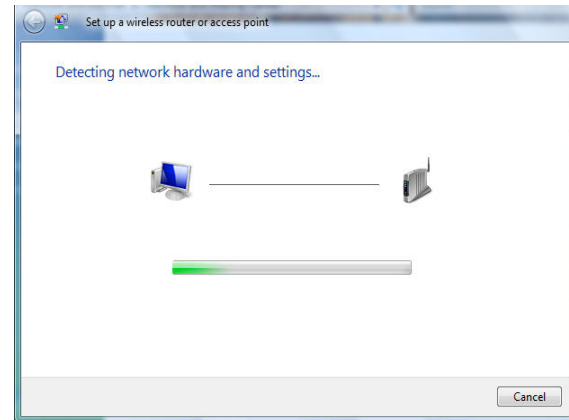
2. Go to the **Set up a connection or network** window and choose the **Set up a wireless router or access point** **Set up a new wireless network for your home or business** option. Click the **Next** button.



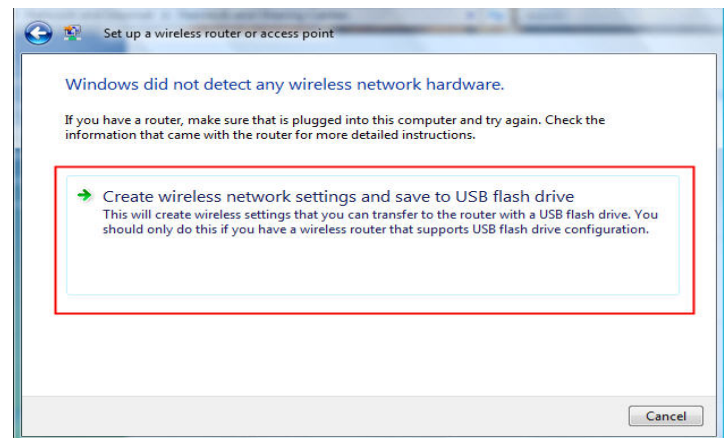
3. Click the **Next** button on the **Set up a wireless router or access point** window.



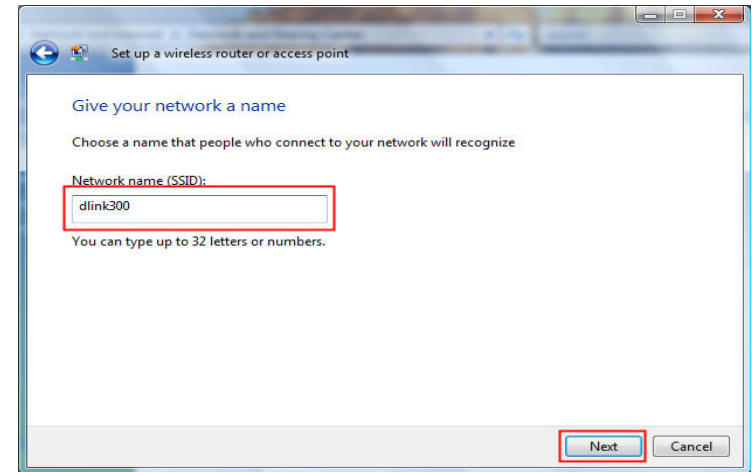
4. The following window displays the system progress.



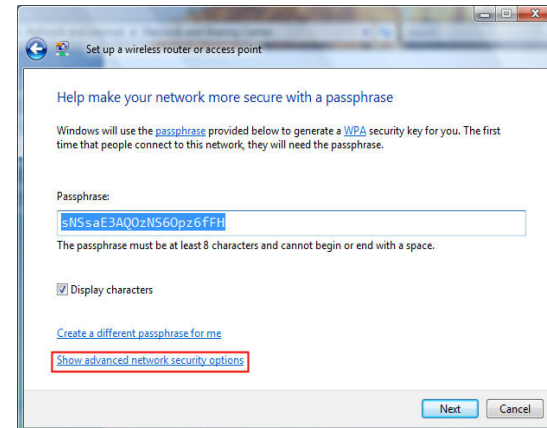
5. This window confirms that you want to create wireless network settings that are savable to a USB flash drive.



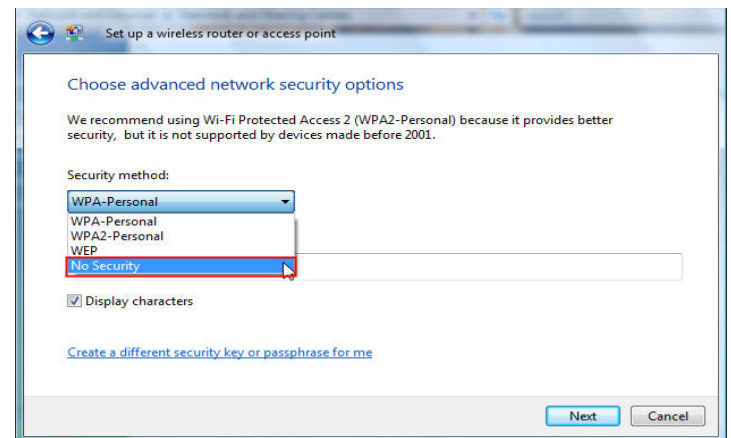
6. Enter a network name on the **Give your network a name** window in the **Set up a wireless router or access point** wizard. Click the **Next** button.



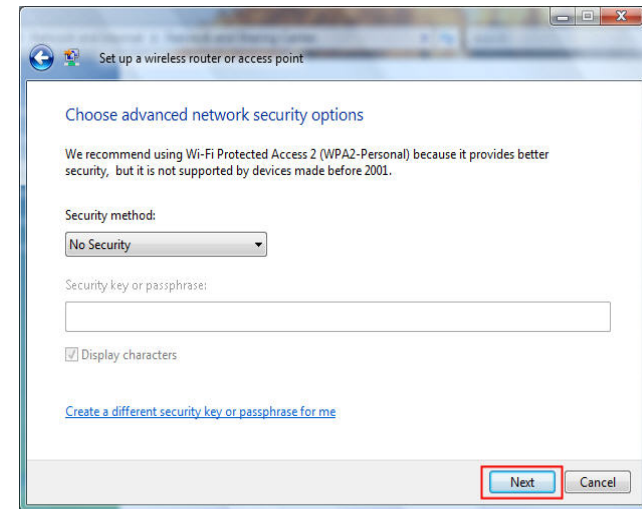
7. Enter a passphrase on the **Help make your network more secure with a passphrase** window in the **Set up a wireless router or access point** wizard. Click the **Show advanced network security options** link.



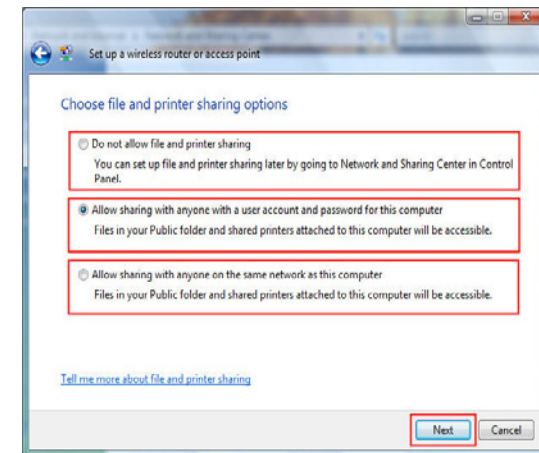
8. Select security method on the **Choose advanced network security options** window in the **Set up a wireless router or access point** wizard. Click the **Next** button.



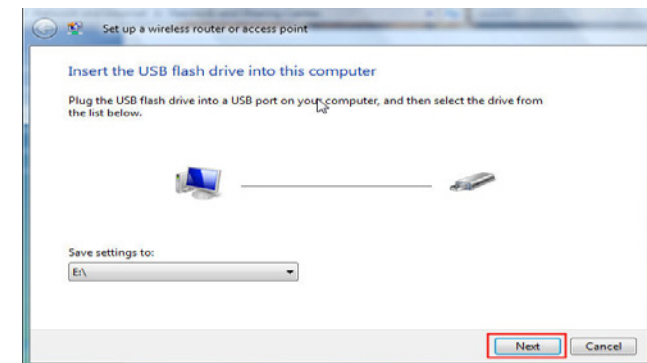
9. Once you have selected the desired security method on the **Choose advanced network security options** window in the **Set up a wireless router or access point** wizard, click the **Next** button.



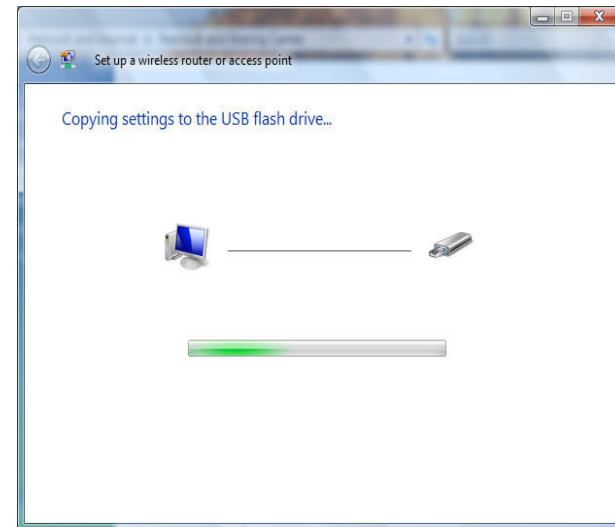
10. Select the desired file and printer sharing option on the **Choose file and printer sharing options** window in the **Set up a wireless router or access point** wizard. Click the **Next** button.



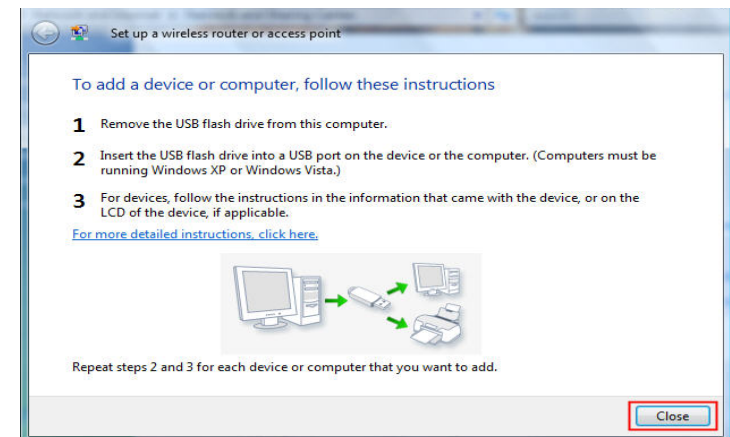
11. Once you have saved your network settings to USB, use the pull-down menu on the **Insert the USB flash drive into this computer** window in the **Set up a wireless router or access point** wizard to select a destination for your network settings. Click the **Next** button.



12. Once you have saved your network settings to USB, the **Copying settings to the USB drive** window in the **Set up a wireless router or access point wizard** opens to indicate the system progress.



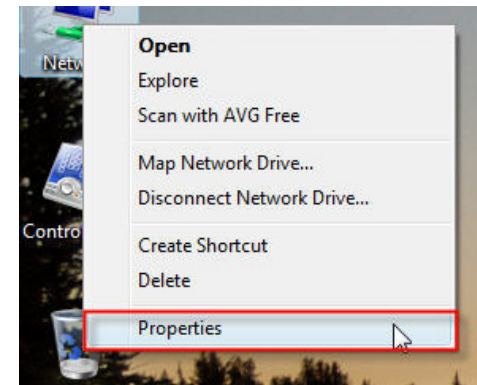
13. Once you are finished, the **To add a device or computer, follow these instructions** window in the **Set up a wireless router or access point wizard** opens. When you are finished, click the **Close** button.



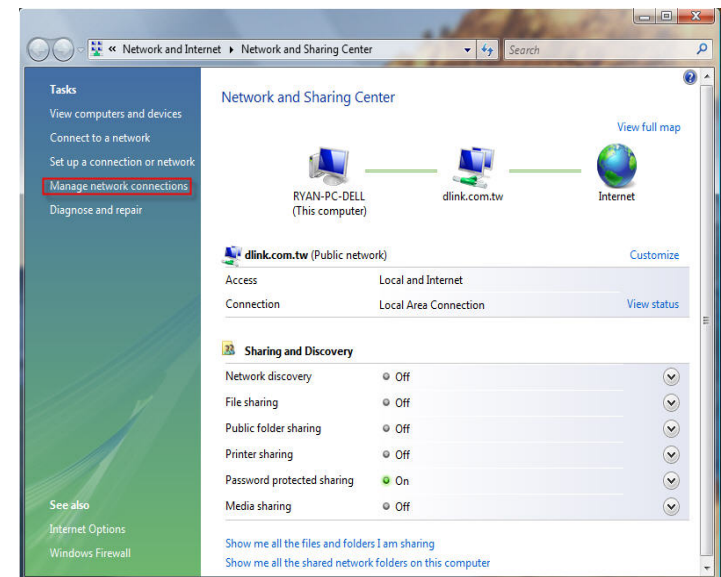
Connecting to a Secured Wireless Network (WEP, WPA-PSK & WPA2-PSK)

The following are step-by-step directions to set up a wireless connection.

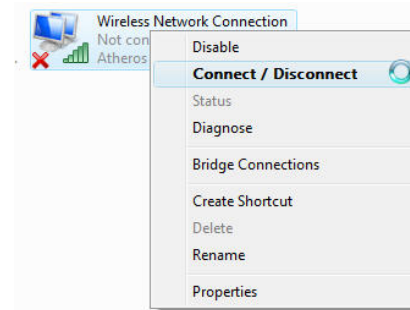
1. Click on **Properties**.



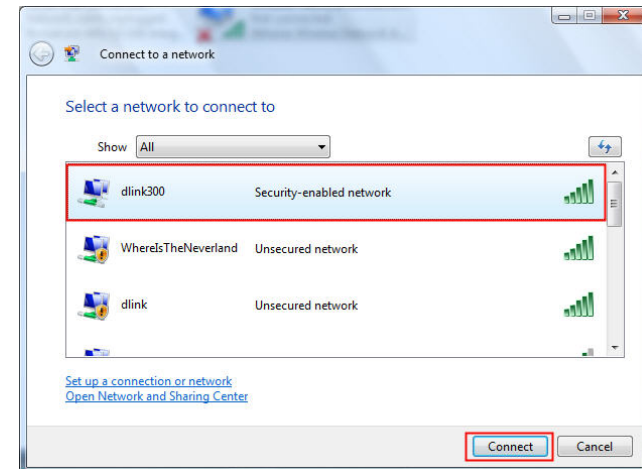
2. Click the **Manage network connections** link in the **Network and Sharing Center** window.



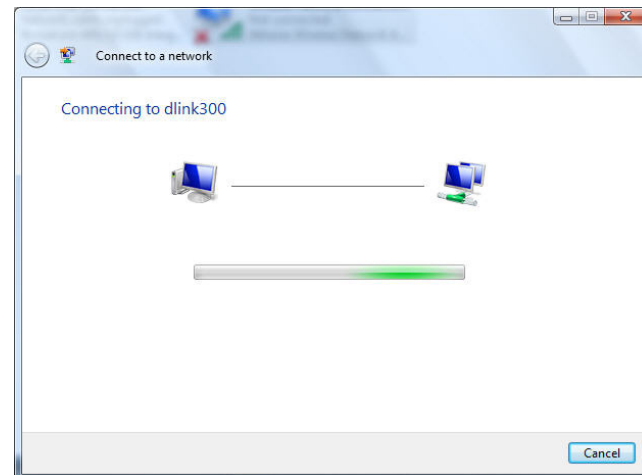
3. Right-click the **Wireless Network Connection** entry and then select **Connect/Disconnect** from the drop-down menu.



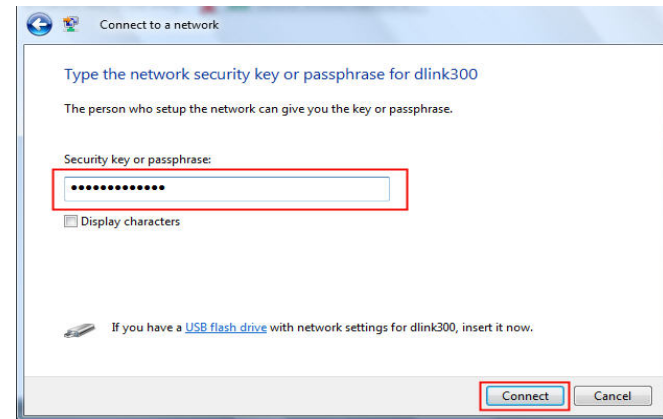
4. Select a network to connect to in the **Select a network to connect to** window in the **Connect to a network** wizard and then click the **Connect** button.



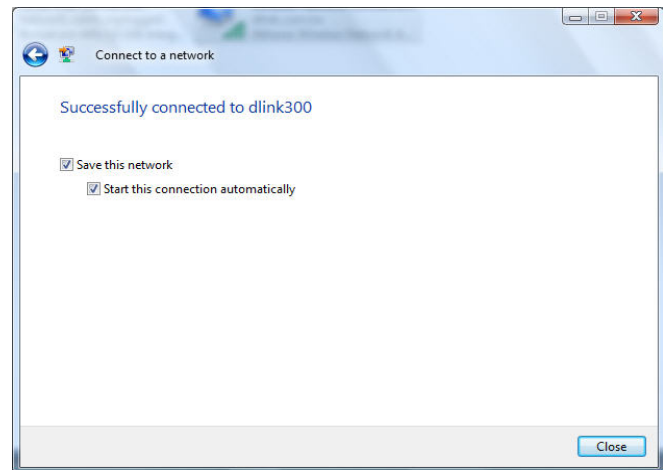
5. The following **Connect to a network** wizard window displays the system progress.



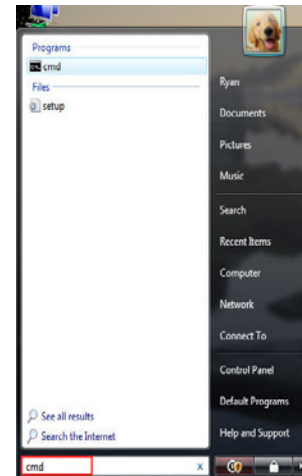
6. Enter the network security key or passphrase for the Router in the textbox provided in the **Type the network security key or passphrase for dlink300** window in the **Connect a network wizard**. When you are finished, click the **Connect** button.



7. The following **Successfully connected to dlink300** window in the **Connect to a network** wizard is displayed. Choose to save to the network and/or start the new connection automatically. When you are finished, click the **Close** button.



8. The successful connection is displayed at the bottom of the Windows start up menu.



9. Confirm your new settings by calling up the command prompt and then entering the ipconfig command.

```
Microsoft Windows [Version 6.0.6000]
Copyright (c) 2006 Microsoft Corporation. All rights reserved.

C:\Users\Ryan>ipconfig

Windows IP Configuration

Wireless LAN adapter Wireless Network Connection:

    Connection-specific DNS Suffix . . . : dlink.com.tw
    Link-local IPv6 Address . . . . . : fe80::ad12:c78:90
    IPv4 Address. . . . . : 192.168.0.103
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.0.1

Ethernet adapter Local Area Connection:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . . : dlink.com.tw

Tunnel adapter Local Area Connection* 6:

    Connection-specific DNS Suffix . . :
    IPv6 Address. . . . . : 2001:0:4136:e38a:
```

10. To test the new IP address, use the Ping feature of the command prompt.

```
C:\Windows\system32\cmd.exe - ping 192.168.0.1 -t

C:\Users\Ryan>ping 192.168.0.1 -t

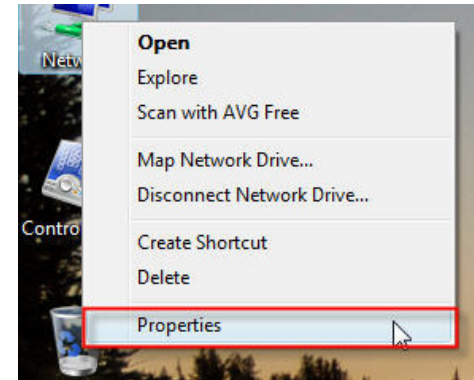
Pinging 192.168.0.1 with 32 bytes of data:

Reply from 192.168.0.1: bytes=32 time=3ms TTL=64
Reply from 192.168.0.1: bytes=32 time=2ms TTL=64
Reply from 192.168.0.1: bytes=32 time=2ms TTL=64
Reply from 192.168.0.1: bytes=32 time=1ms TTL=64
Reply from 192.168.0.1: bytes=32 time=5ms TTL=64
```

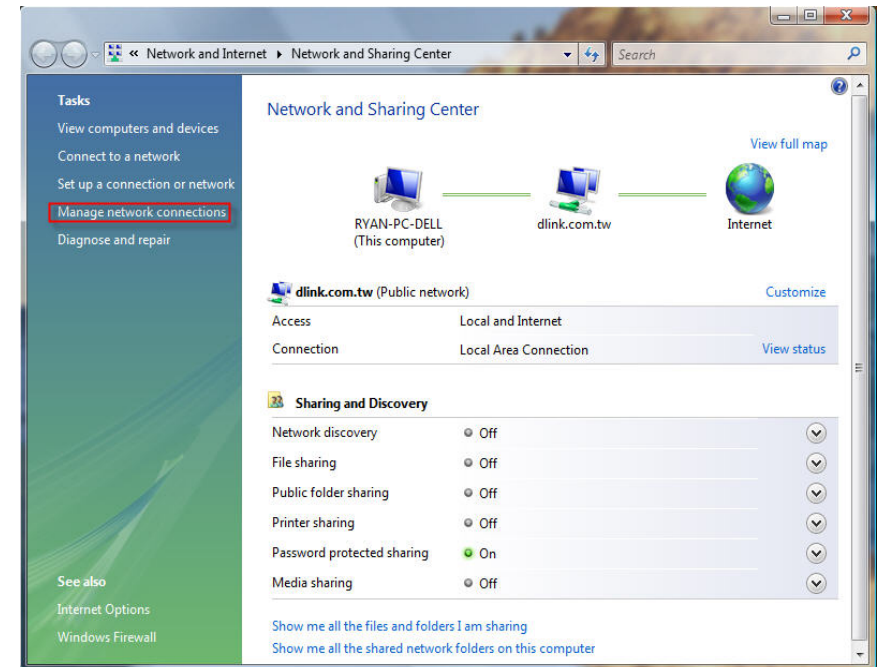
Connecting to an Unsecured Wireless Network

The following are step-by-step directions to set up an unsecured wireless connection.

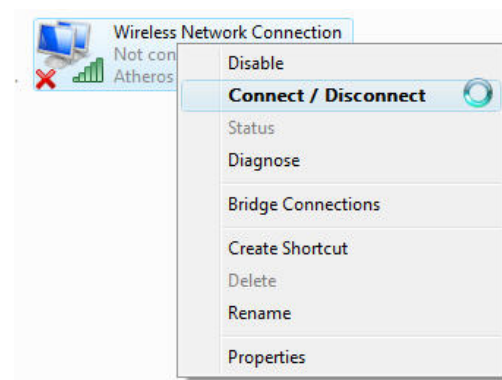
1. Click on **Properties**.



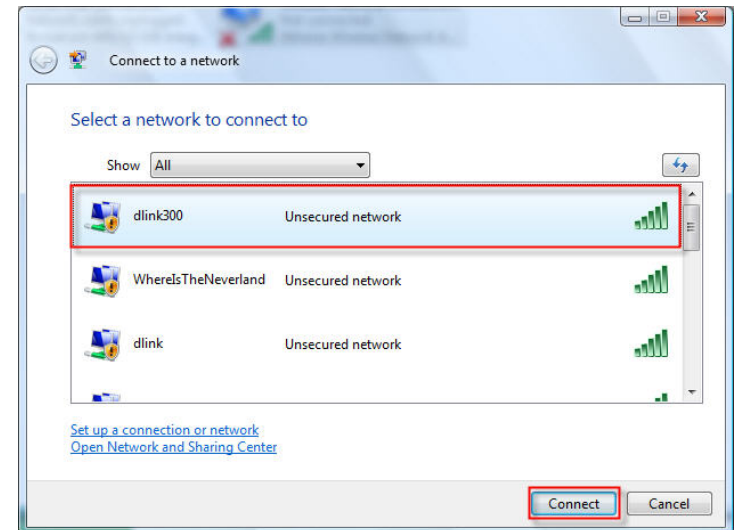
2. Go to the **Network and Sharing Center** window and click the **Manage Network Connections** link.



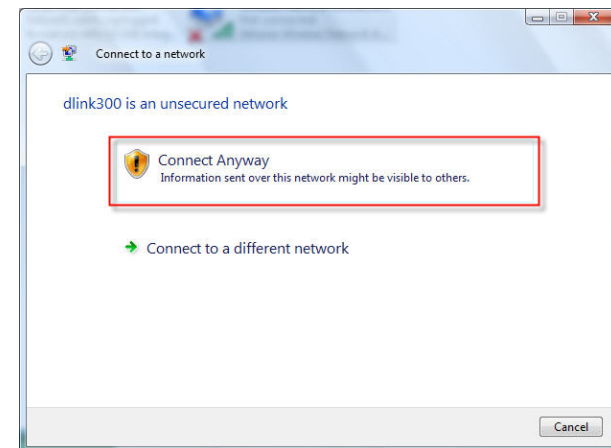
3. Right-click the **Wireless Network Connection** entry and then select **Connect/Disconnect** from the drop-down menu.



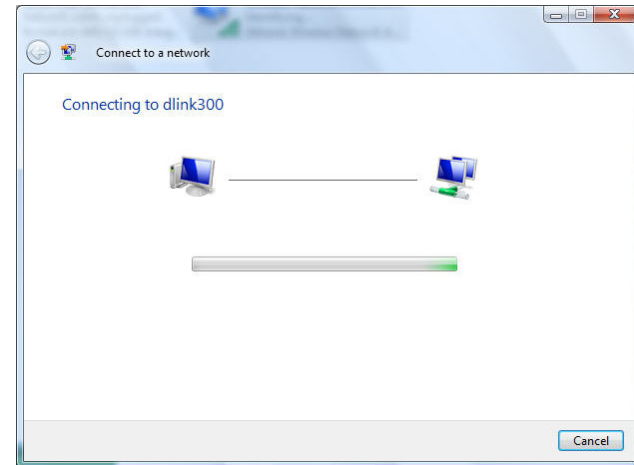
4. Select a network to connect to in the **Select a network to connect to** window in the **Connect to a network** wizard and then click the **Connect** button.



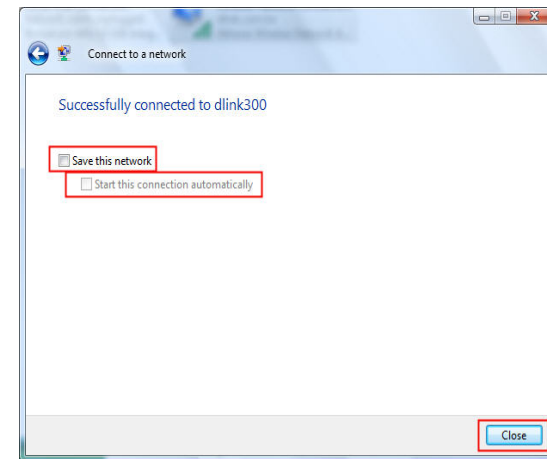
5. Confirm your desire to connect anyway on the following **Network Connection Status** window.



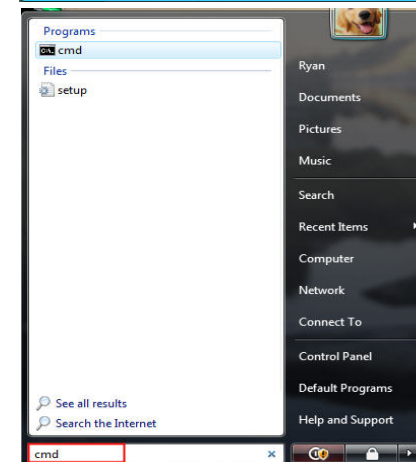
6. The following **Connect to a network** wizard window displays the system progress.



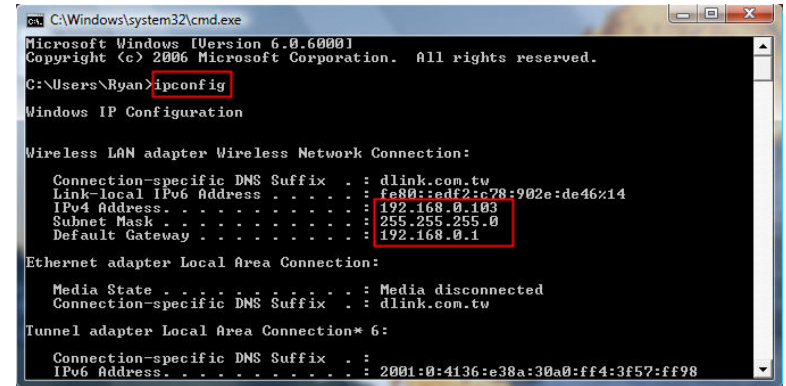
7. The following **Successfully connected to dlink300** window in the **Connect to a network** wizard is displayed. Choose to save to the network and/or start the new connection automatically. When you are finished, click the **Close** button.



8. The successful connection is displayed at the bottom of the Windows start up menu.



9. Confirm your new settings by calling up the command prompt and then entering the ipconfig command.



```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.0.6000]
Copyright (c) 2006 Microsoft Corporation. All rights reserved.

C:\Users\Ryan>ipconfig

Windows IP Configuration

Wireless LAN adapter Wireless Network Connection:

    Connection-specific DNS Suffix . . . : dlink.com.tw
    Link-local IPv6 Address . . . . . : fe80::edf2:c78:902e:de46%14
    IPv4 Address. . . . . : 192.168.0.103
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.0.1

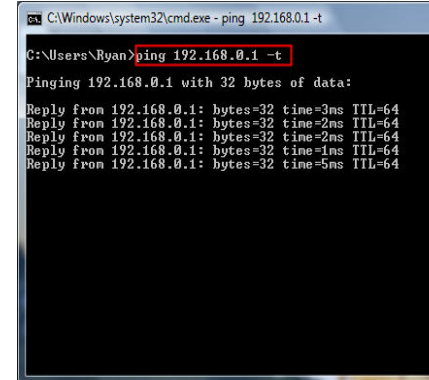
Ethernet adapter Local Area Connection:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . . : dlink.com.tw

Tunnel adapter Local Area Connection* 6:

    Connection-specific DNS Suffix . . :
    IPv6 Address. . . . . : 2001:0:4136:e38a:30a0:ff4:3f57:ff98
```

10. To test the new IP address, use the Ping feature of the command prompt.



```
C:\Windows\system32\cmd.exe - ping 192.168.0.1 -t

C:\Users\Ryan>ping 192.168.0.1 -t

Pinging 192.168.0.1 with 32 bytes of data:

Reply from 192.168.0.1: bytes=32 time=3ms TTL=64
Reply from 192.168.0.1: bytes=32 time=2ms TTL=64
Reply from 192.168.0.1: bytes=32 time=2ms TTL=64
Reply from 192.168.0.1: bytes=32 time=1ms TTL=64
Reply from 192.168.0.1: bytes=32 time=5ms TTL=64
```

Troubleshooting

This chapter provides solutions to problems that can occur during the installation and operation of the DIR-501. 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)
 - Camino 0.8.4 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, and XP 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.
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 the **Save Settings** button 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.

For the wireless repeater, there are two types of repeater in D-Link for user to select:

- Universal repeater: It acts as an AP and a wireless STA at the same time. It can support all AP and wireless STA if they work in the same wireless channel.
- AP-repeater (AP with WDS): only repeat same model or limited models which base on the same proprietary protocol.

Please choose a universal repeater to boost the signal to extend the range.

Wireless Modes

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.

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 WNA-2330 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.

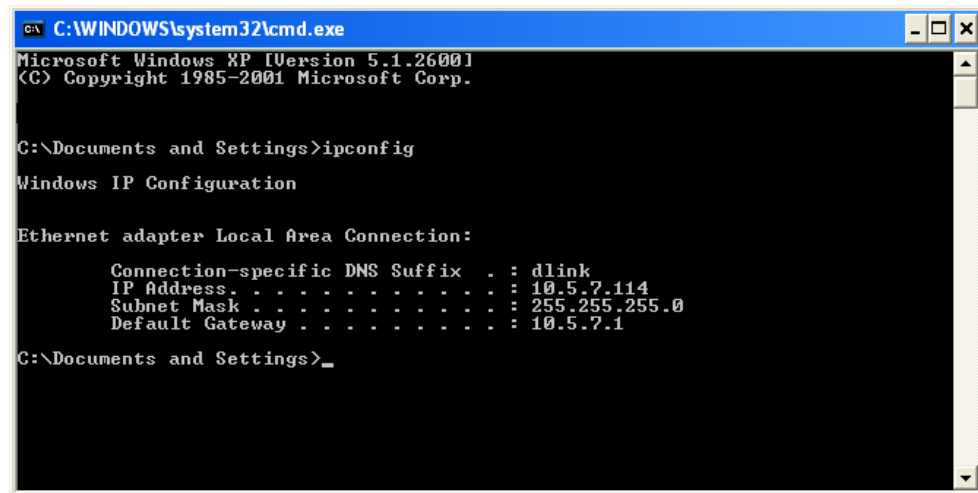
Click on **Start > Run**. In the run box type *cmd* and click **OK**.

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

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

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

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



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

C:\Documents and Settings>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

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

C:\Documents and Settings>_
```

Statically Assign an IP address

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

Step 1

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

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

Step 2

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

Step 3

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

Step 4

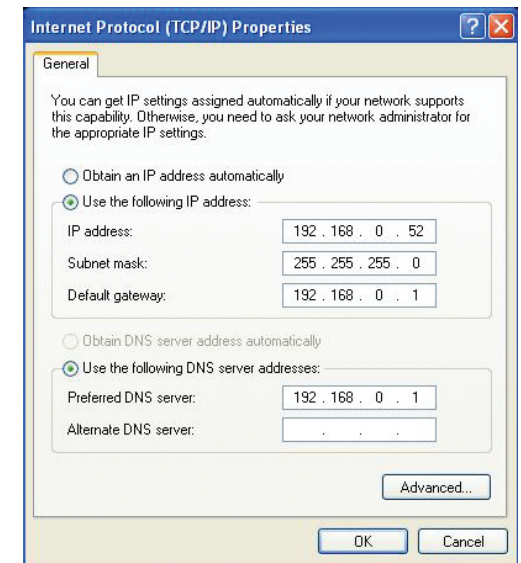
Click **Use the following IP address** and enter an IP address that is on the same subnet as your network or the LAN IP address on your router.

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 802.11g
- IEEE 802.11b
- IEEE 802.11n
- IEEE 802.3
- IEEE 802.3u
- IEEE 802.3x

Wireless Signal Rates*

- 150Mbps
- 48Mbps
- 24Mbps
- 12Mbps
- 9Mbps
- 5.5Mbps
- 1Mbps
- 54Mbps
- 36Mbps
- 18Mbps
- 11Mbps
- 6Mbps
- 2Mbps

Security

- WPA - Wi-Fi Protected Access (TKIP, MIC, IV Expansion, Shared Key Authentication)
- 802.1x
- 64/128-bit WEP

Modulation Technology

- 802.11 b : DSSS / DBPSK / DQPSK / CCK
- 802.11 g : 16QAM / 64QAM / BPSK / QPSK with OFDM
- 802.11 n : 16QAM / 64QAM / BPSK / QPSK with OFDM

Receiver Sensitivity

802.11n

HT20

- 75Mbps OFDM, 10% PER, -68dBm

HT40

- 150N OFDM, 10% PER, -64dBm

802.11b and 802.11g

- 54Mbps OFDM, 10% PER, -70dBm
- 48Mbps OFDM, 10% PER, -72dBm
- 36Mbps OFDM, 10% PER, -76dBm
- 24Mbps OFDM, 10% PER, -78dBm
- 18Mbps OFDM, 10% PER, -80dBm
- 12Mbps OFDM, 10% PER, -83dBm
- 11Mbps CCK, 8% PER, -85dBm
- 9Mbps OFDM, 10% PER, -85dBm
- 6Mbps OFDM, 10% PER, -88dBm
- 5.5Mbps CCK, 8% PER, -87dBm
- 2Mbps DQPSK, 8% PER, -89dBm
- 1Mbps DBPSK, 8% PER, -90dBm

VPN Pass Through/ Multi-Sessions

- PPTP
- IPSec

Device Management

- Web-based Internet Explorer v6 or later; Netscape Navigator v6 or later; or other Java-enabled browsers
- DHCP Server and Client

Wireless Frequency Range

2.4GHz to 2.497GHz (802.11b)
2.4GHz to 2.4835GHZ (802.11g and 802.11n)

Wireless Operating Range²

- Indoors - up to 328 ft. (100 meters)
- Outdoors- up to 1312 ft. (400 meters)

Wireless Transmit Power (AVG Power)

11b:17dBm(Max) 11g:16dBm(Max) 11n:13dBm(Max)

External Antenna Type

Two fixed reverse SMA external antenna

Advanced Firewall Features

- NAT with VPN Pass-through (Network Address Translation)
- MAC Filtering
- IP Filtering
- URL Filtering
- Scheduling

Operating Temperature

32°F to 129 °F (0°C to 40°C)

Humidity

95% maximum (non-condensing)

Safety and Emissions

FCC Part 15B/ 15C/ MPE
CE

LEDs

- Power
- Status
- Internet
- WLAN (Wireless Connection)
- LAN (10/100)

Dimensions

- L = 135mm
- W = 99.8mm
- H = 31.5mm

Weight

0.246kg

* Maximum wireless signal rate derived from IEEE Standard 802.11b, 802.11g and 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.

CE Mark Warning:

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

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.

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 20 cm 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 ~ 5.25 GHz 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.

ICC Notice:

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:

IC 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 (2 dBi) 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.

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