D-Link *Air*Plus X*TREME G*™
DWL-G520

2.4GHz Wireless PCI Adapter

Manual

Version 1.02

D-Link

Building Networks for People

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Package Contents

Contents of Package:

- **D-Link *Air*Plus Xtreme *G*™DWL-G520**
  2.4 GHz - 54Mbps Wireless PCI Adapter
- Manual, Warranty and Drivers on CD
- Quick Installation Guide

If any of the above items are missing, please contact your reseller.

System Requirements for Configuration:

- A desktop computer with an available 32-bit PCI slot
- Windows XP, Windows 2000, Windows Me, or Windows 98SE
- At least 32 MB of memory and a 300 MHz processor
- An 802.11g or 802.11b Access Point (*for Infrastructure mode*), or another 802.11g or 802.11b wireless adapter (for *Ad-Hoc, peer-to-peer networking mode.*)

Introduction

The D-Link *Air*Plus *X*treme *G*™ DWL-G520 Wireless PCI Adapter is a 802.11g high-performance, wireless adapter that supports high-speed wireless networking at home, at work or in public places.

Unlike most network cards, the DWL-G520 provides data transfers at up to 54 Mbps (compared to the standard 11 Mbps) when used with other D-Link *Air*Plus Xtreme *G* products. The 802.11g standard is backwards compatible with 802.11b products.This means that you do not need to change your entire network to maintain connectivity. You may sacrifice some of 802.11g's speed when you mix 802.11b and 802.11g devices, but you will not lose the ability to communicate when you incorporate the 802.11g standard into your 802.11b network. You may choose to slowly change your network by gradually replacing the 802.11b devices with 802.11g devices .

In addition to offering faster data transfer speeds when used with other 802.11g products, the DWL-G520 has the newest, strongest, most advanced security features available today. When used with other 802.11g WPA (WiFi Protected Access) and 802.1x compatible products in a network with a RADIUS server, the security features include:

WPA*: A new security feature, **Wi-Fi Protected Access** authorizes and identifies users based on a secret key that changes automatically at a regular interval. **WPA** uses **TKIP** (**Temporal Key Integrity Protocol**) to change the temporal key every 10,000 packets (a packet is a kind of message transmitted over a network.) This insures much greater security than the standard WEP security. (By contrast, the older WEP encryption required the keys to be changed manually.)

802.1x: **Authentication** is a first line of defense against intrusion. In the Authentication process the server verifies the identity of the client attempting to connect to the network. Unfamiliar clients would be denied access.

For home users that will not incorporate a RADIUS server in their network, the security for the DWL-G520, used in conjunction with other 802.11g products, will still be much stronger than ever before. Utilizing the **Pre Shared Key mode** of WPA, the DWL-G520 will obtain a new security key every time it connects to the 802.11g network. You only need to input your encryption information once in the configuration menu. No longer will you have to manually input a new WEP key frequently to ensure security, with the DWL-G520, you will automatically receive a new key every time you connect, vastly increasing the safety of your communications.

**WPA will be available Spring 2003 as a free download*

Features

- **Five times faster** - achieve data transfer speeds up to 54 Mbps; up to 5x faster than conventional 802.11b networks, when used with other 802.11g devices
- **Integrates into existing 802.11b wireless networks** - no need to invest in all new devices; the DWL-G520 is interoperable with existing 802.11b devices to provide a wireless data rate of up to 11Mbps
- **Stronger Security than ever before with WPA* -** Wi Fi Protected Access authorizes and identifies users based on a secret key that changes automatically at a regular interval, for example:
  - **TKIP** (Temporal Key Integrity Protocol), in conjunction with a RADIUS server, changes the temporal key every 10,000 packets, ensuring greater security
  - **Pre Shared Key** mode means that the home user, without a RADIUS server, will obtain a new security key every time he or she connects to the network, vastly improving the safety of communications on the network.
- **Extra Protection** - 802.1x **Authentication** in conjunction with the RADIUS server verifies the identity of would be clients
- **User-friendly configuration** and diagnostic utilities allow you to easily discover available wireless networks and create and save detailed connectivity profiles
- Utilizes **OFDM** technology (**O**rthogonal **F**requency **D**ivision **M**ultiplexing)
- Operates in the 2.4GHz frequency range

LEDS

LED stands for **L**ight-**E**mitting **D**iode. The **DWL-G520** has the following LEDs:

LED	LED Activity
Link	A *steady* light indicates a connection to an Access Point. A *flashing* light indicates activity on the network.

**WPA will be available Spring 2003 as a free download*

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. D-Link wireless products will allow you access to the data you want, when and where you want it. You will be able to enjoy the freedom that wireless networking brings.

A WLAN is a cellular computer network that transmits and receives data with radio signals instead of wires. WLANs 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.

Wireless Basics *(continued)*

People use WLAN technology for many different purposes:

Mobility - Productivity increases when people have access to data in any location within the operating range of the WLAN. Management decisions based on real-time information can significantly improve worker efficiency.

Low Implementation Costs – WLANs are easy to set up, manage, change and relocate. Networks that frequently change can benefit from WLANs ease of implementation. WLANs can operate in locations where installation of wiring may be impractical.

Installation and Network Expansion - Installing a WLAN system can be fast and easy and can eliminate the need to pull cable through walls and ceilings. Wireless technology allows the network to go where wires cannot go - even outside the home or office.

Inexpensive Solution – Wireless network devices are as competitively priced as conventional Ethernet network devices.

Scalability – WLANs can be configured in a variety of ways to meet the needs of specific applications and installations. Configurations are easily changed and range from peer-to-peer networks suitable for a small number of users to larger infrastructure networks to accommodate hundreds or thousands of users, depending on the number of wireless devices deployed.

The DWL-G520 is compatible with the following wireless products:

- ***D-Link Air*Plus*Xtreme G DI-624***
  High-Speed 2.4GHz Wireless Router
- ***D-Link Air*Plus *DWL-650+*, *D-Link Air*Plus Xtreme G DWL-G650***
  Wireless Cardbus Adapters used with laptop computers
- ***D-Link Air*Plus *DWL-520+*, *D-Link Air*Plus Xtreme G DWL-G520***
  Wireless PCI cards used with desktop computers
- ***D-Link Air*Plus *DWL-900AP+***
  and D-Link Air*PlusXtreme G *DWL-2000AP
  Wireless Access Points
- ***D-Link Air*Plus *DI-614+***
  Enhanced 2.4GHz Wireless Router

Standards-Based Technology

The DWL-G520 Wireless PCI Adapter utilizes the **802.11g** standard.

The IEEE **802.11g** standard is an extension of the 802.11b standard. It increases the data rate up to 54 Mbps within the 2.4GHz band, utilizing **OFDM technology.**

This means that in most environments, within the specified range of this device, you will be able to transfer large files quickly or even watch a movie in MPEG format over your network without noticeable delays. This technology works by transmitting high-speed digital data over a radio wave utilizing **OFDM** (**O**rthogonal **F**requency **D**ivision **M**ultiplexing) technology. **OFDM** works by splitting the radio signal into multiple smaller sub-signals that are then transmitted simultaneously at different frequencies to the receiver. **OFDM** reduces the amount of **crosstalk** (interference) in signal transmissions. The D-Link DWL-G520 will automatically sense the best possible connection speed to ensure the greatest speed and range possible.

802.11g offers the most advanced network security features available today, including: *WPA*[1]*, 802.1x, TKIP, AES and Pre-Shared Key mode*. These security features are explained in more detail in the *Introduction* and the *Features* section of this manual.

The DWL-G520 is backwards compatible with 802.11b devices. This means that if you have an existing 802.11b network, the devices in that network will be compatible with 802.11g devices at speeds up to 11Mbps in the 2.4GHz range.

1 *WPA will be available Spring 2003 as a free download*

Installation Considerations

The D-Link *Air*Plus Xtreme G DWL-G520 lets you access your network, using a wireless connection, from virtually anywhere within its operating range. 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 DWL-G520 and other network devices to a minimum - each wall or ceiling can reduce your D-Link *Air*Plus Extreme G Wireless product'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 can impede the wireless signal - a solid metal door or aluminum studs may have a negative effect on range. Try to position wireless devices and computers with wireless adapters so that the signal passes through drywall or open doorways and not other materials.
4. Keep your product away (at least 3-6 feet or 1-2 meters) from electrical devices or appliances that may generate extreme RF noise (e.g., wireless telephone; electric shaver; microwave oven; hair dryer etc.)

example, shown here, contains the following D-Link network devices:

A wireless Router - **D-Link *Air*Pro DI-754**
A laptop computer with a wireless adapter - **D-Link *Air*Pro DWL-A650 or *Air*Plus DWL-650+**
A desktop computer with a wireless adapter - **D-Link *Air*Pro DWL-A520 or AirPlus DWL-520+**
A Cable modem - **D-Link DCM-200**

Getting Started

There are basically two modes of networking:

- **Infrastructure** – using an Access Point, or Wireless Router, such as the DI-624.
- **Ad-Hoc** – directly connecting to another computer, for peer-to-peer communication, using wireless network adapters on each computer, such as two or more DWL-G520 wireless network PCI adapters.

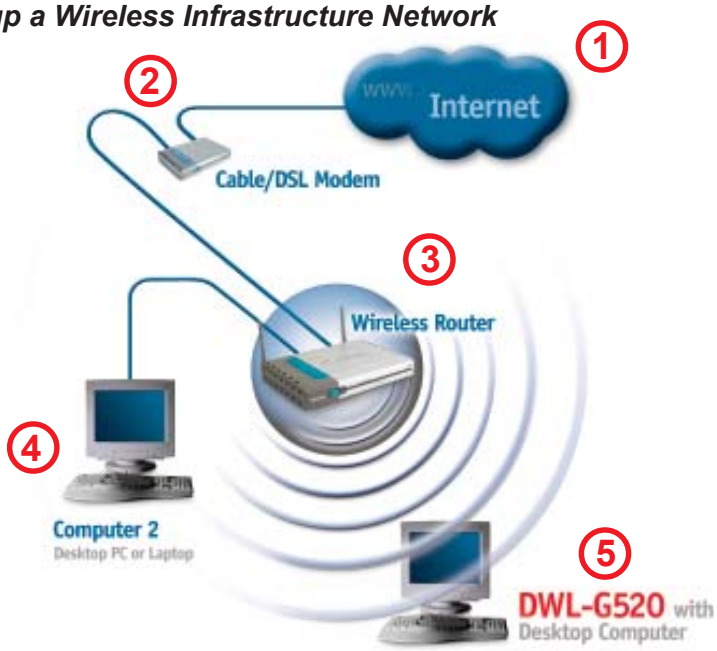
On the following pages we will show you an example of an **Infrastructure Network** and an **Ad-Hoc Network**.

An **Infrastructure** network contains an Access Point or a Wireless Router. The **Infrastructure Network** example shown on the following page contains the following D-Link network devices (your existing network may be comprised of other devices):

- A wireless Router - **D-Link *Air*Plus Xtreme G DI-624**
- A desktop computer with a wireless adapter - **D-Link *Air*Plus *Xtreme G* DWL-G520, D-Link Air DWL-520,** or **D-Link AirPlus DWL-520+**
  (**D-Link *Air*** devices have speeds up to 11Mbps)
- A Cable modem - **D-Link DCM-201**

Getting Started

Setting up a Wireless Infrastructure Network



Please remember that **D-Link *Air*Plus Xtreme G** *wireless devices are pre-configured to connect together, right out of the box, with their default settings.*

For a typical wireless setup at home (as shown above), please do the following:

1. You will need broadband Internet access (a Cable or DSL-subscriber line into your home or office)

2. Consult with your Cable or DSL provider for proper installation of the modem

3. Connect the Cable or DSL modem to your broadband router (*see the Quick Installation Guide included with your router.*)

4. If you are connecting a desktop computer to your network, you can connect the D-Link DFE-530TX+ Fast Ethernet PCI Adapter to the Ethernet port on the DI-624 wireless broadband router using an Ethernet cable.
   (See the Quick Installation Guide included with the network adapter for complete installation instructions.)

5. Install the drivers for the D-Link DWL-G520 wireless PCI adapter into a desktop computer.
   (*See the Quick Installation Guide included with the DWL-G520.*)

Getting Started

Setting up a Wireless Ad Hoc Network

1. Install the **D-Link DWL-G520** Wireless PCI adapter into the desktop computer. *(See the **Quick Installation Guide** included with the product for installation instructions.)*

2. Install the **DWL-G650** into a laptop computer. *(See the **Quick Installation Guide** included with the product for installation instructions.)*

3. Set the wireless configuration for the adapters to Ad-Hoc mode, set the adapters to the same channel, and assign an IP Address to each computer on the Ad-Hoc network. *(See Box below)*

IP Address

When assigning IP Addresses to the computers on the network, please remember that the **IP Address for each computer must be in the same IP Address range as all the computers in the network**, and the subnet mask must be exactly the same for all the computers in the network.

For example: If the first computer is assigned an IP Address of 192.168.0.2 with a Subnet Mask of 255.255.255.0, then the second computer can be assigned an IP Address of 192.168.0.3 with a Subnet Mask of 255.255.255.0, etc.

IMPORTANT: If computers or other devices are assigned the same IP Address, one or more of the devices may not be visible on the network.

Using the Configuration Utility

If you wish to change the default settings or optimize the performance of the DWL-G520, D-Link has included a configuration utility for this purpose. However, in Windows XP, you must use either the zero configuration utility or you can disable it so that you can use the D-Link Configuration utility.

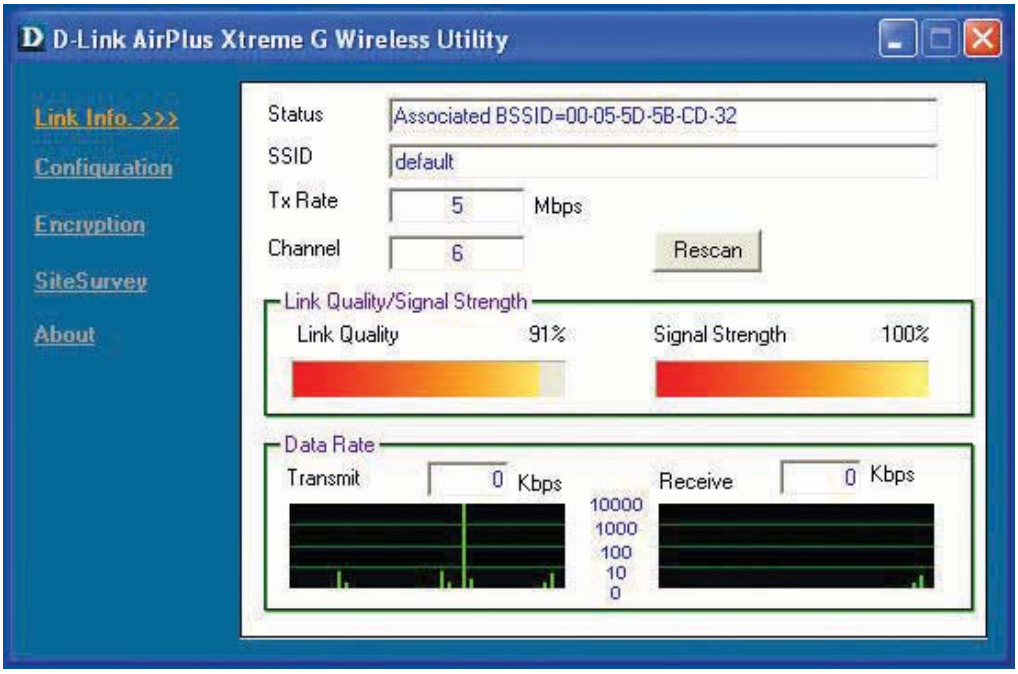
To use the D-Link configuration utility with XP, click on the zero configuration utility icon in the taskbar in the lower corner of your computer screen and **uncheck** the box in the properties window that enables windows configuration. After you have done this, you can then use the D-Link Configuration utility with XP.

Before you use the configuration utility for the DWL-G520, you must install the drivers and the configuration utility from the CD-ROM that came with the DWL-G520. (Please see the *Quick Installation Guide* that came with the product.) After you have completed this installation and restarted your computer, you can access the *Configuration Utility* at any time by clicking on this icon that will appear on your desktop.

After double-clicking on the icon on the desktop (shown at right), the Link Info window shown on the next page will appear:

Configuration Utility

Link Info



Status: Displays the MAC Address of the Access Point that is associated with the DWL-G520.

SSID: The Service Set Identifier is the name assigned to the wireless network. The factory SSID setting is set to **default**.

TxRate: The default setting is **Auto**; TxRate settings are automatically determined by the DWL-G520 depending on the distance from the access point at this default setting.

Channel: Displays the channel information. By default, the channel is set to **6** and selection is automatically adjusted by the DWL-G520, depending on the access point being used.

Link Quality / Signal Strength: Displays the Link Quality for the DWL-G520 wireless connection to the access point. The Signal Strength represents the wireless signal between the access point and the DWL-G520. The percentage coincides with the graphical bar.

Data Rate: Displays the statistics of data transmitted and received.

Configuration Utility

Configuration

This configuration screen displays the default settings for the DWL-G520

To communicate on the network all devices must have the same settings for the following properties:

SSID - (Service Set Identifier) is a name that identifies a wireless network. Access Points and wireless clients attempting to connect to a specific WLAN (Wireless Local Area Network) must use the same SSID. The default setting is **default**.

Wireless Mode - Click on the pull-down menu; select from the following options:

Infrastructure - connecting the WLAN using an Access Point. (The **default** setting.)

Ad-Hoc – wireless mode used when connecting directly to a computer equipped with a wireless adapter in a peer-to-peer environment.

Channel – The **default** channel setting is channel **6**. However, the DWL-G520 will automatically select the channel to match the channel setting for the selected Access Point. In Ad Hoc mode, the channel must be manually set to the same channel for each wireless adapter.

TX Rate - Select the transmission rate on the network. **Auto** is the **default** setting. TX rates are automatically determined by the DWL-G520 depending on the distance from the access point.

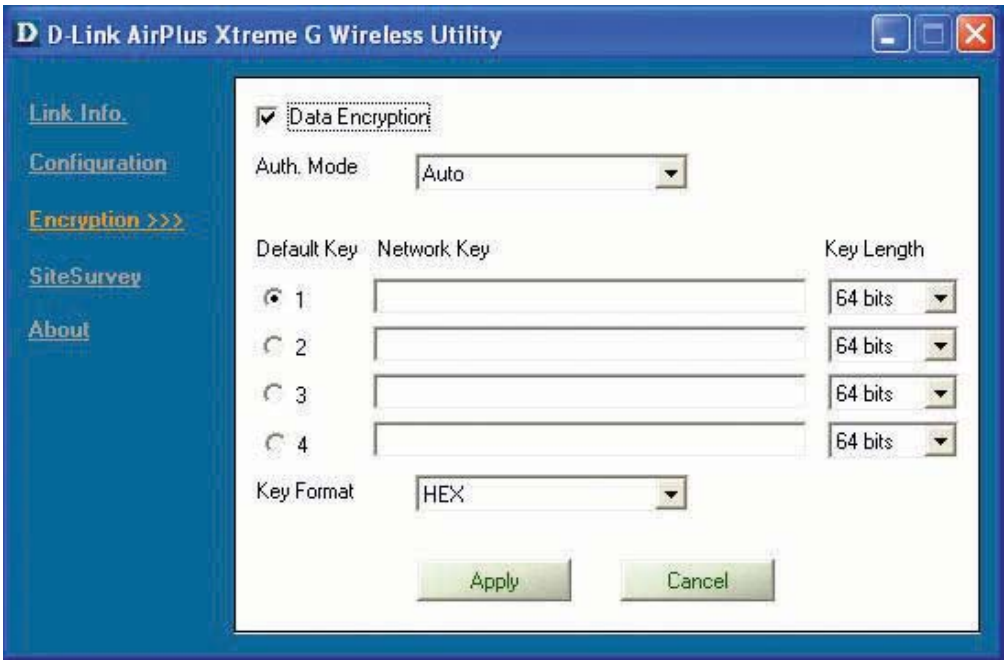
Preamble - **Auto** is the default setting. The Preamble defines the length of the CRC block (Cyclic Redundancy Check is a common technique for detecting data transmission errors) for communication between the Access Point and the wireless Network adapters. *Note: High network traffic areas should use the shorter preamble type.*

Power Mode – Select from three modes:

Continuous Access Mode-this **default** setting consumes the most power
Maximum Power Save-this setting consumes the least power
Power Save- this setting consumes a moderate amount of power
If any changes are made to the configuration of the wireless adapter, click **Apply** to save the changes.

Configuration Utility

Encryption



Data Encryption – enable Encryption by clicking on the box. Encryption is disabled as the default setting.

Authorization mode – choose one of the following modes:

Open Authentication – communicates the key across the network

Shared Authentication – allows communication only with other devices with identical WEP settings

Auto – will automatically adjust to the Authentication mode of the wireless client

Network Key – enter a key in either ASCII (e.g., a word) or hexadecimal format

> ***Hexadecimal*** *digits consist of the numbers 0-9 and the letters A-F*
>
> ***ASCII*** *(American Standard Code for Information Interchange) is a code for representing English letters as numbers from 0-127*

Key Format - ASCII or Hexadecimal

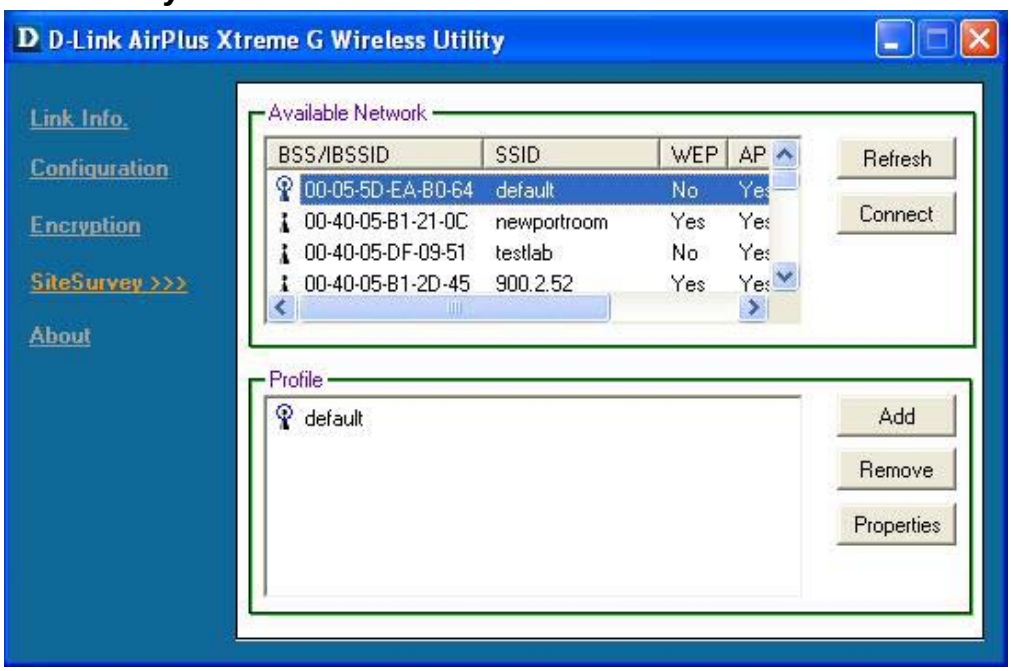
Key type - select the key length, either 64 or 128 bits

Key Index – You can create up to 4 different security keys

Click **Apply** to save the changes.

Configuration Utility

Site Survey



Available Networks

The top section of the window displays the **Available Networks.** Scroll up and down the list and highlight the network to which you wish to connect. Click on the **Connect** button.

Profiles

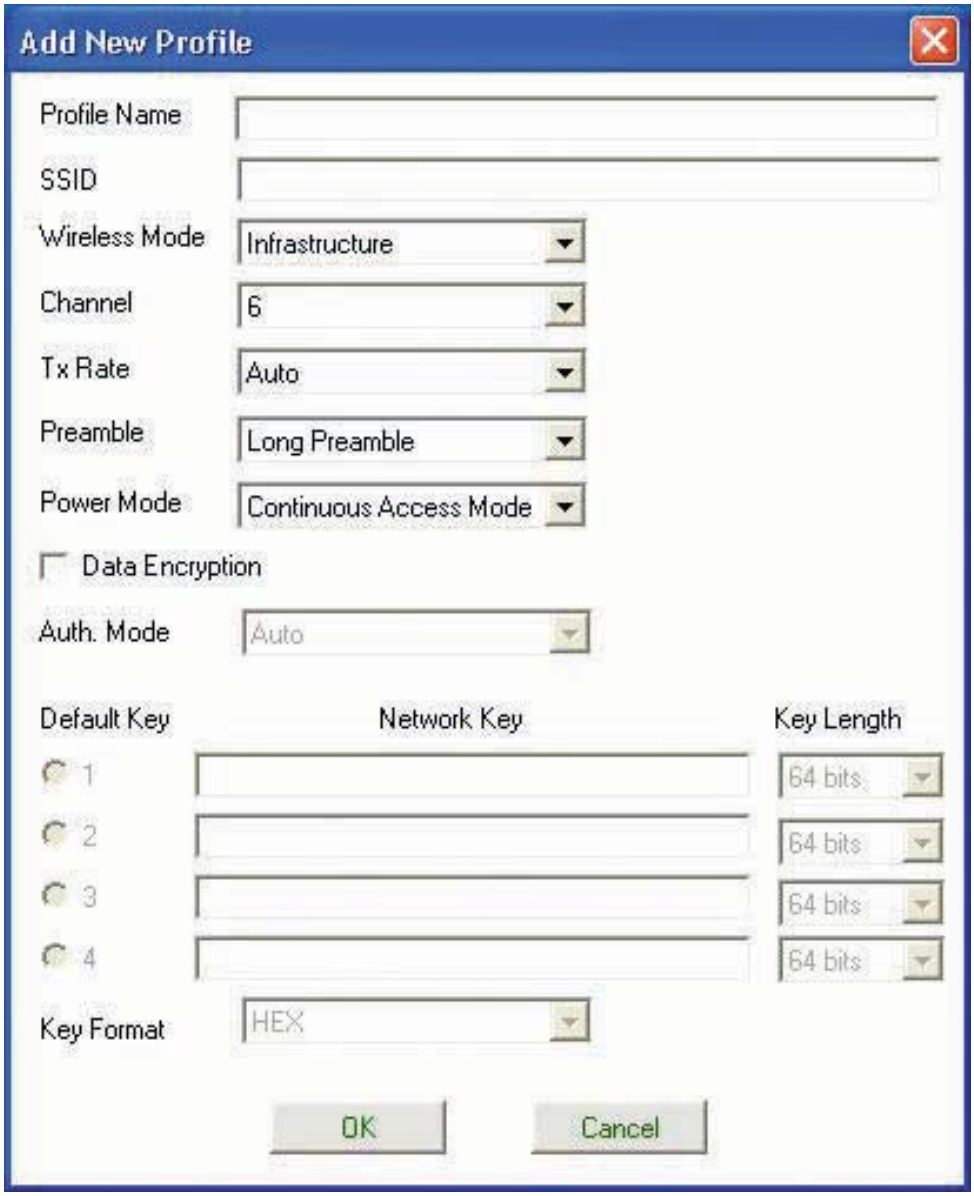
In the lower half of the screen, you can manage the profiles that you have created for the wireless network at home, at the office and in public places. Scroll up and down and highlight the profile that you wish to configure. You can **ADD** or **REMOVE** a profile, or configure the **Properties** of the profile in order to connect to an available network.

Add

Click on **Add** and the screen on the next page will appear.

Configuration Utility

Add New Profile

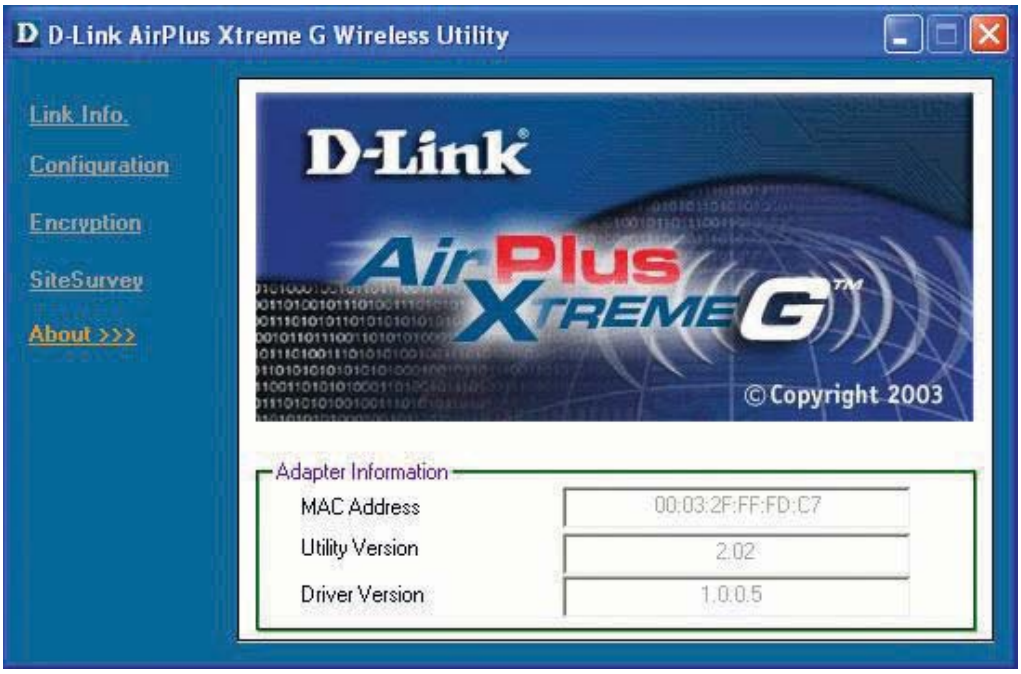


In this window you can configure all the properties of a profile in order to connect with a network of your choice.

After you have entered your changes in this window, click **OK** to save the changes.

Configuration Utility

About



The **ABOUT** screen gives you information about the F**irmware** and **Utility Versions** of the DWL-G520.

Networking Basics

Using the Network Setup Wizard in Windows XP

In this section you will learn how to establish a network at home or work, using **Microsoft Windows XP.**

Note: Please refer to websites such as http://www.homenethelp.com and http://www.microsoft.com/windows2000 for information about networking computers using Windows 2000, ME or 98SE.

Go to **Start>Control Panel>Network Connections**
Select **Set up a home or small office network**

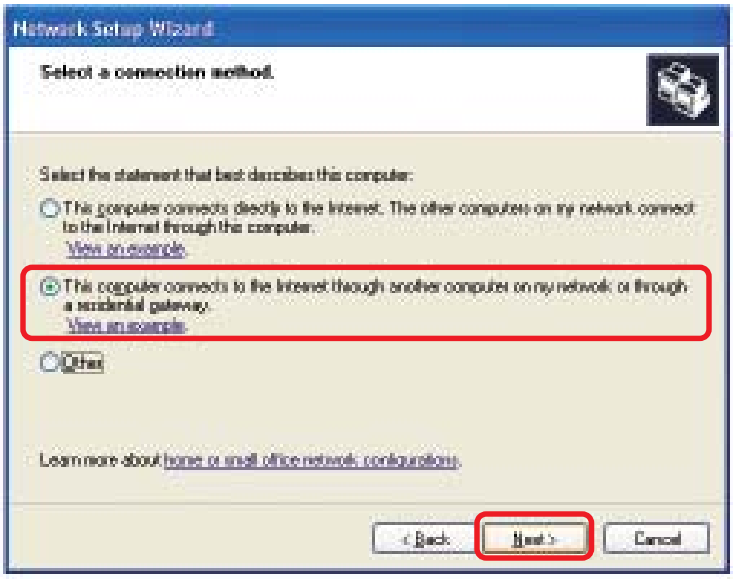
When this screen appears, click **Next.**

Networking Basics

Please follow all the instructions in this window:

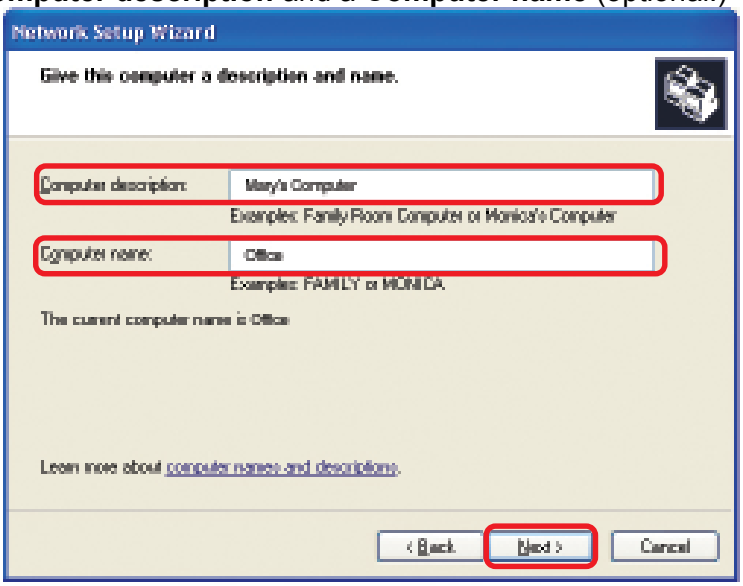
Click **Next**

In the following window, select the best description of your computer. If your computer connects to the internet through a gateway/router, select the second option as shown.



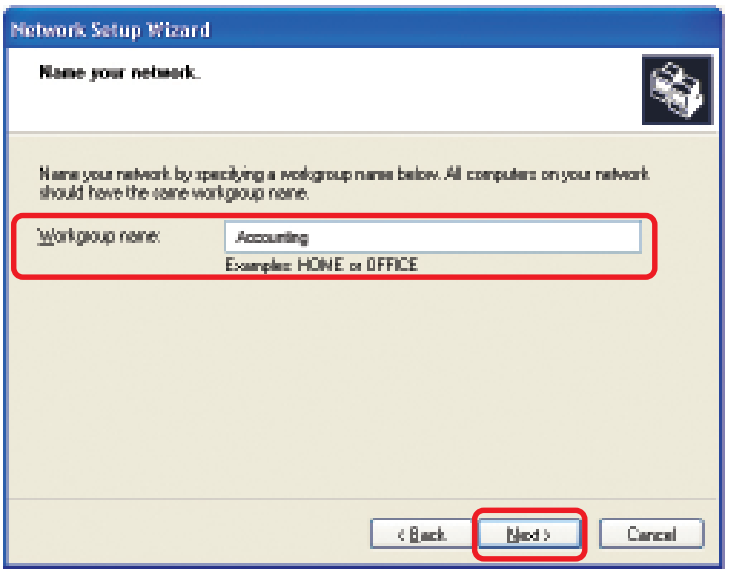
Click **Next**

Enter a **Computer description** and a **Computer name** (optional.)



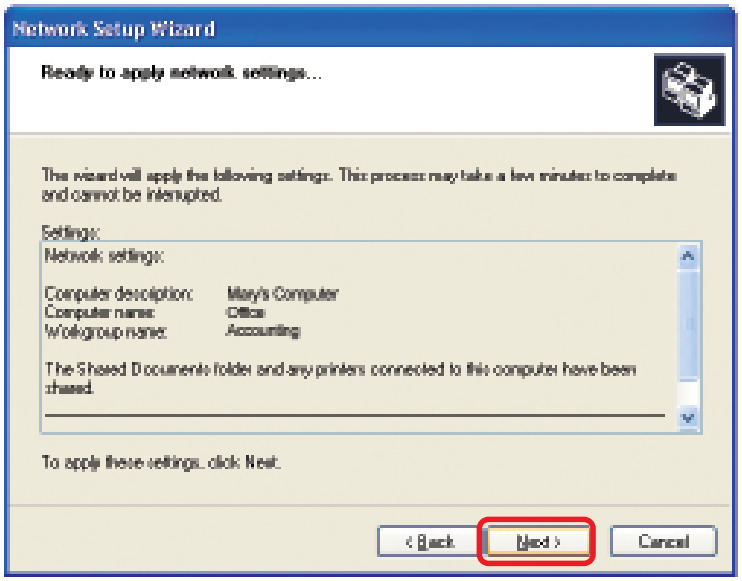
Click **Next**

Enter a **Workgroup** name. All computers on your network should have the same **Workgroup name.**



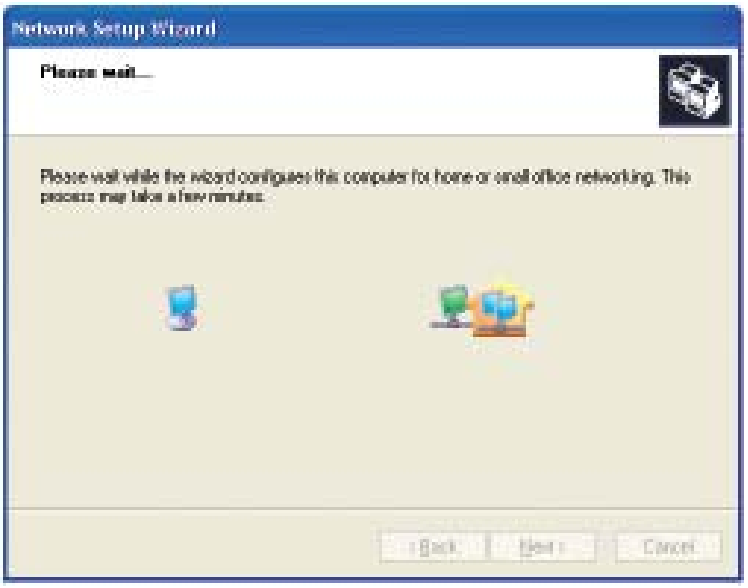
Click **Next**

Please wait while the **Network Setup Wizard** applies the changes.



When the changes are complete, click **Next**.

Please wait while the **Network Setup Wizard** configures the computer. This may take a few minutes.

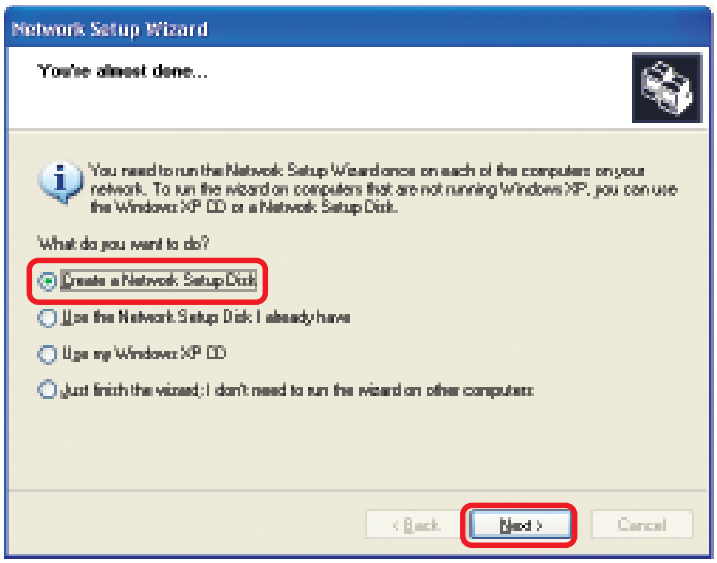


Form

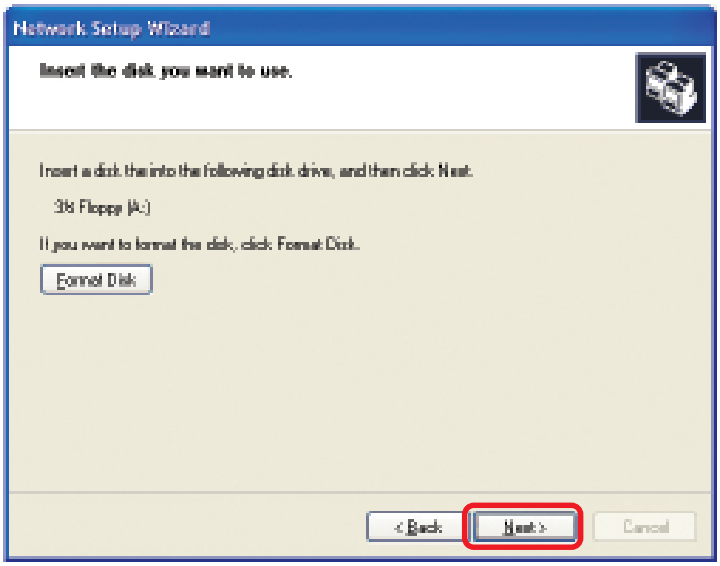
Networking Basics

In the window below, select the option that fits your needs. In this example, **Create a Network Setup Disk** has been selected. You will run this disk on each of the computers on your network. Click **Next**.

Please wait while

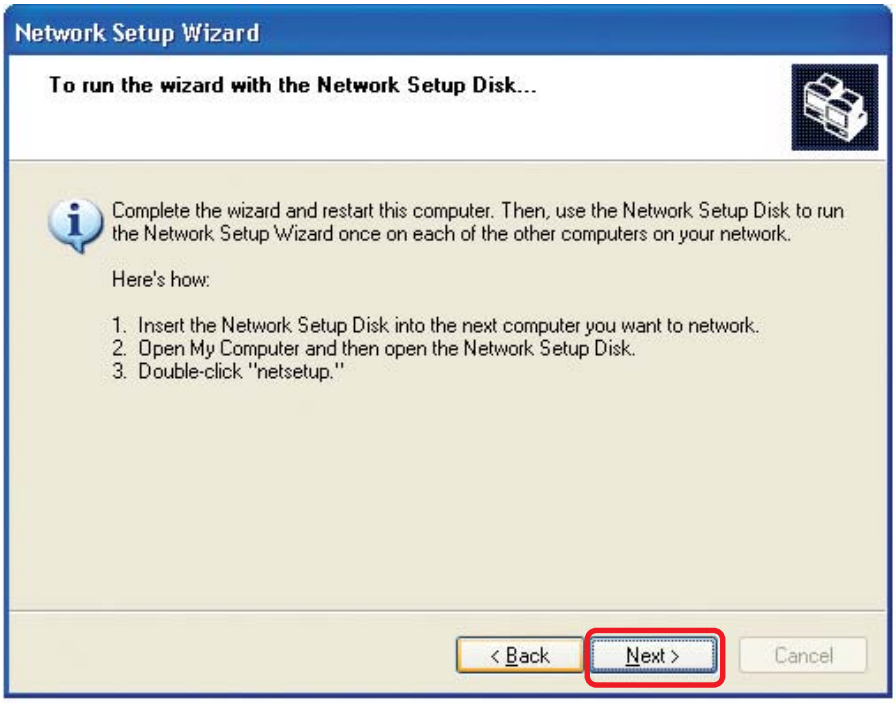


Insert a disk into the Floppy Disk Drive, in this case drive **A.**



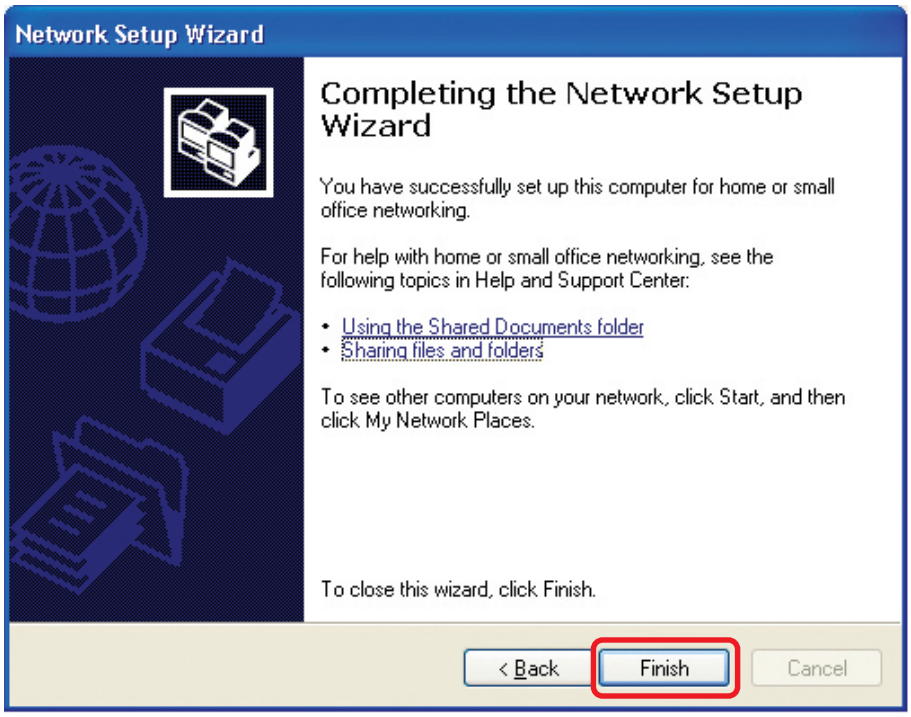
Click **Next**

Please read the information under **Here's how** in the screen below. After you complete the **Network Setup Wizard** you will use the **Network Setup Disk** to run the **Network Setup Wizard** once on each of the computers on your network. To continue click **Next.**

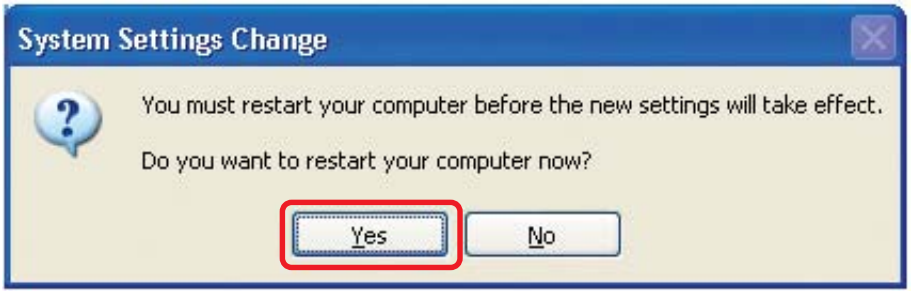


Networking Basics

Please read the information on this screen, then click **Finish** to complete the **Network Setup Wizard**.



The new settings will take effect when you restart the computer. Click **Yes** to restart the computer.



You have completed configuring this computer. Next, you will need to run the **Network Setup Disk** on all the other computers on your network. After running the **Network Setup Disk** on all your computers, your new wireless network will be ready to use.

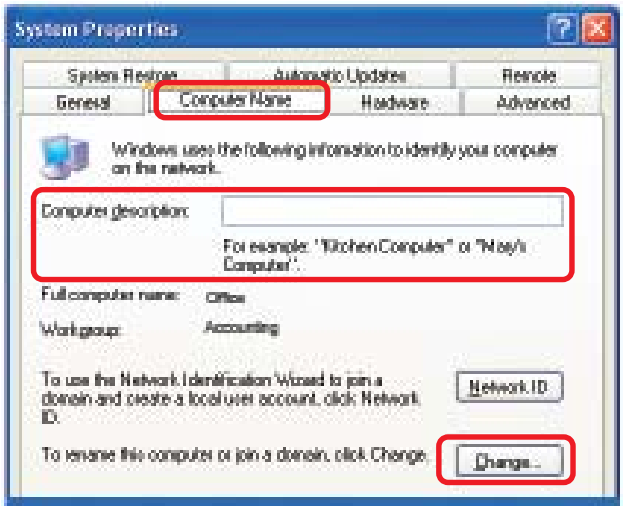
Networking Basics

Naming your Computer

To name your computer, please follow these directions:In **Windows XP**:

- Click **Start** (in the lower left corner of the screen)
- **Right-click** on **My Computer**
- Select **Properties** and click

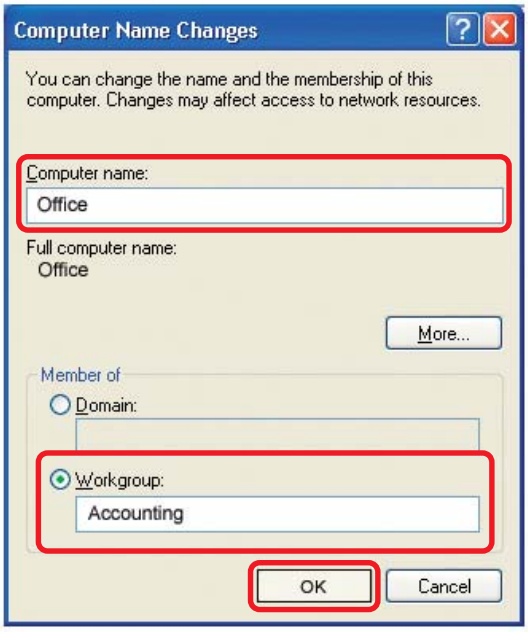
- Select the **Computer Name Tab** in the System Properties window.
- You may enter a **Computer Description** if you wish; this field is optional.
- To rename the computer and join a domain, Click **Change**.



Networking Basics

Naming your Computer

- In this window, enter the **Computer name**
- Select **Workgroup** and enter the name of the **Workgroup**
- All computers on your network must have the same **Workgroup** name.
- Click **OK**



Checking the IP Address in Windows XP

The wireless adapter-equipped computers in your network must be in the same IP Address range (see Getting Started in this manual for a definition of IP Address Range.) To check on the IP Address of the adapter, please do the following:

- Right-click on the ***Local Area Connection icon*** in the task bar
- Click on **Status**

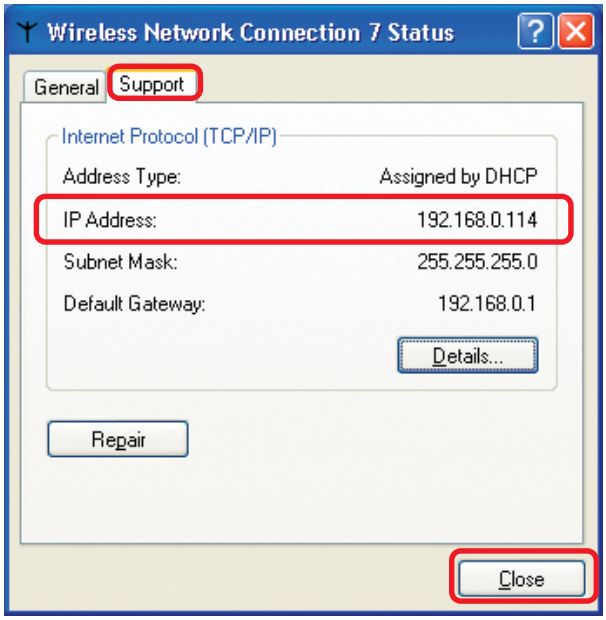
Networking Basics

Checking the IP Address in Windows XP

This window will appear.

- Click the **Support tab**

- Click **Close**



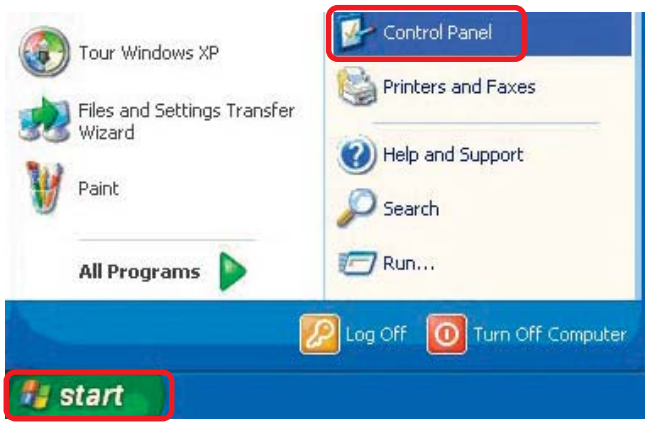
Assigning a Static IP Address in Windows XP/2000

Note: Residential Gateways/Broadband Routers will automatically assign IP Addresses to the computers on the network, using DHCP (Dynamic Host Configuration Protocol) technology. If you are using a DHCP-capable Gateway/Router you will not need to assign Static IP Addresses.

If you are not using a DHCP capable Gateway/Router, or you need to assign a Static IP Address, please follow these instructions:

- Go to **Start**

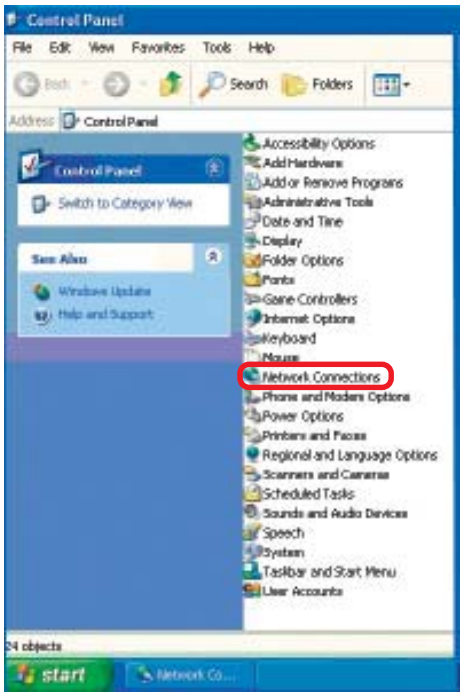
- Double-click on **Control Panel**



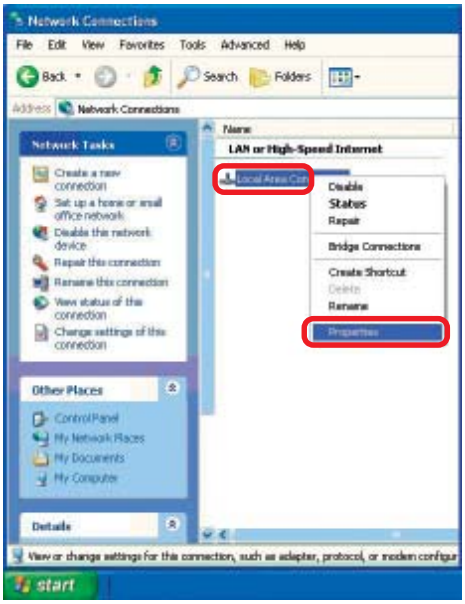
Networking Basics

Assigning a Static IP Address in Windows XP/2000

- Double-click on **Network Connections**



- Right-click on **Local Area Connections**
- Double-click on **Properties**



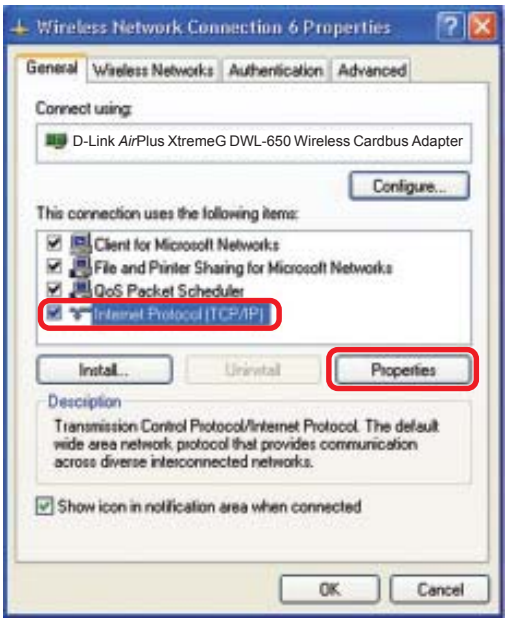
Click
(TCI

Click

Select Use
address in
Protocol (T
window *(sho*

Networking Basics

Assigning a Static IP Address in Windows XP/2000

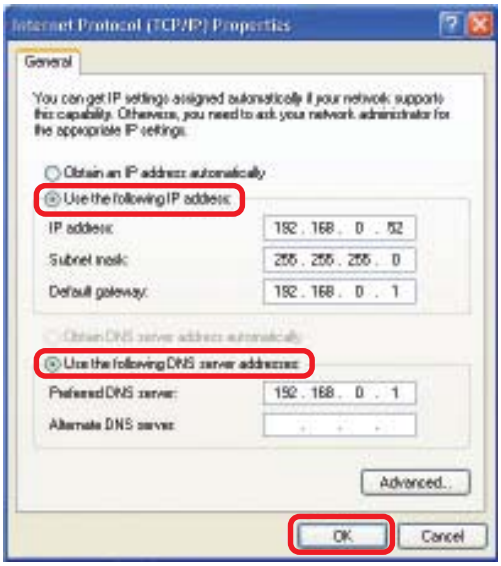


- Click on **Internet Protocol (TCP/IP)**
- Click **Properties**
- In the window below, select **Use the following IP Address**. Input your **IP Address and subnet mask.** (The IP Addresses on your network must be within the same range. For example, if one computer has an IP Address of 192.168.0.2, the other computers should have IP Addresses that are sequential, like 192.168.0.3 and 192.168.0.4. The subnet mask must be the same for all the computers on the network.)

IP Address:
e.g., 192.168.0.2

Subnet Mask:
255.255.255.0

Default Gateway:
Enter the LAN IP Address of the wireless router. (D-Link wireless routers have a LAN IP Address of 192.168.0.1)

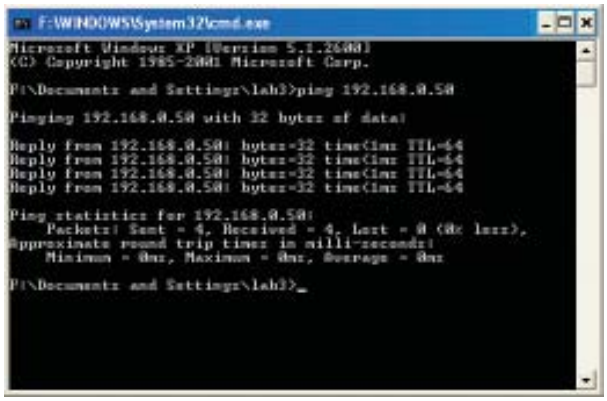


- Select **Use the following DNS server address**. Enter the LAN IP Address of the Wireless Router. (D-Link wireless routers have a LAN IP Address of 192.168.0.1)
- Click **OK**

You have completed the assignment of a Static IP Address. (You do not need to assign a Static IP Address if you have a DHCP-capable Gateway/Router.)

Checking the Wireless Connection by Pinging in Windows XP and 2000

- Go to **Start** > **Run** > type **cmd**. A window similar to this one will appear. Type **ping xxx.xxx.xxx.xxx**, where **xxx** is the **IP Address** of the Wireless Router or Access Point. A good wireless connection will show four replies from the Wireless Router or access point, as shown.



Checking the Wireless Connection by Pinging in Windows ME and 98SE

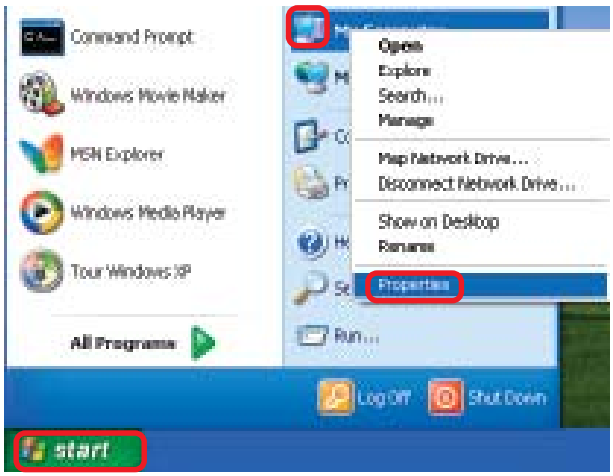
- Go to **Start** > **Run** > type **command**. A window similar to this will appear. Type **ping xxx.xxx.xxx.xxx** where **xxx** is the **IP Address** of the Wireless Router or Access Point. A good wireless connection will show four replies from the wireless router or access point, as shown.

Troubleshooting

This chapter provides solutions to problems that can occur during the installation and operation of the DWL-G520. 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.)

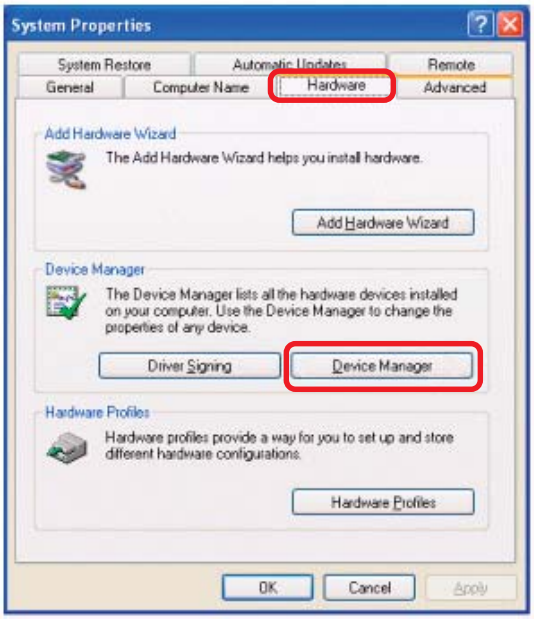
1. Check that the drivers for the DWL-G520 are installed properly.

- Go to **Start** > **My Computer** > **Properties**



- Select the **Hardware Tab**

- Click **Device Manager**

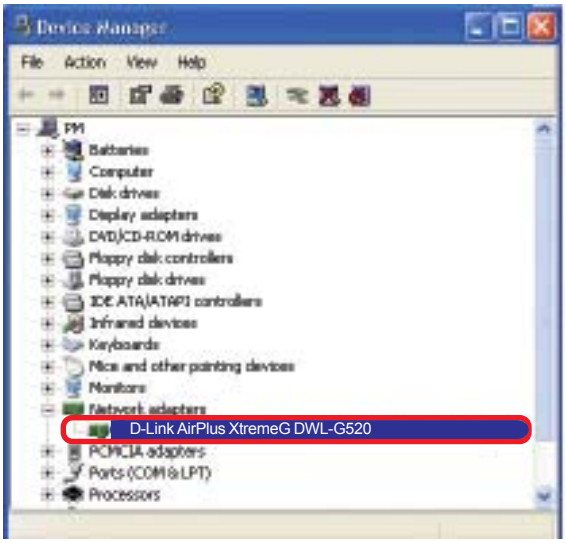


- Double
  Adapt
- **Right-**
  ***Air*Pro**
  Wirele
  Adapt
- Select
  check
  installe

Troubleshooting

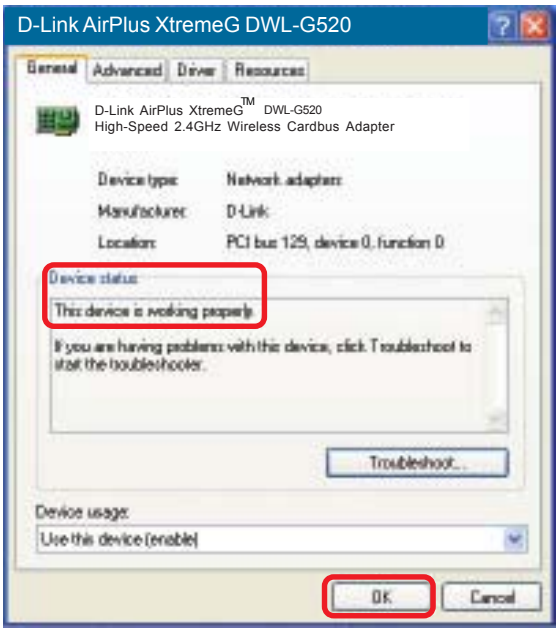
- Double-click on **Network Adapters**

- Right-click on **D-Link DWL-G520 Wireless PCI Adapter**



- Select **Properties** to check that the drivers are installed properly

- Look under **Device Status** to check that the device is working properly



- Click **OK**

Troubleshooting

2. I cannot connect to the access point or the wireless router.

- Make sure that the SSID on the DWL-G520 PCI adapter is exactly the same as the SSID on the Access Point or wireless router.
- Move the DWL-G520 and Access Point or Wireless router into the same room and then test the wireless connection.
- Disable all security settings. (WEP, MAC Address Control, AES)
- Make sure that the Radio is not locked down to a different frequency
- Turn off your Access Point and the computer with the DWL-G520. Turn on the Access Point, and then turn on the computer with the DWL-G520.
- Refresh the DWL-G520 Utility

3. The DWL-G520 Power and Link lights are not on.

- Check to see if the DWL-G520 PCI adapter is firmly inserted into the PCI slot of your laptop computer.

4. I forgot my Encryption key.

- Reset the Access Point to its factory default settings and restore the DWL-G520 Wireless PCI Adapter to the factory default settings. (The default settings are listed in the **Using the Configuration Utility** section in this manual.)

5. The computer does not recognize the DWL-G520 Wireless Adapter.

- Make sure that the DWL-G520 Wireless Adapter is properly seated in the computer's PCI slot.
- If Windows does not detect the hardware upon insertion of the adapter, make sure to completely remove drivers that were previously loaded. To remove the drivers, do the following:

A. Under **Tools**> select **Folder Options**…> select **View** > under **Hidden files and folders** > select **Show hidden files and folders**

B. Uncheck **Hide extension for known file types** > click on **Apply**

C. Search for previously loaded driver files. Remove these files from the **INF** and **SYSTEM32** (DRIVERS) folders in the Windows directory. Note: Windows XP and Windows 2000 will rename **.inf** files that have not received WHQL certification into **oem.inf** files (e.g., **oem1.inf.)**

6. The computer with the DWL-G520 installed is unable to connect to the wireless network and/or the Internet.

- Check that the LED indicators for the broadband modem are indicating normal activity. If not, there may be a problem with the broadband connection.
- Check that the LED indicators on the wireless router are functioning properly. If not, check that the AC power and Ethernet cables are firmly connected.
- Check that the IP Address, subnet mask, gateway, and DNS settings are correctly entered for the network
- In **Infrastructure** mode, make sure the same **Service Set Identifier (SSID)** is specified on the settings for the wireless clients and access points. The **SSID** factory default setting for the D-Link *Air, Air*Plus *and Air*Pro products is **default.** (Double-click on the WLAN icon in the taskbar. The **Link Info** screen will display the SSID setting.)
- In **Ad-Hoc** mode, both wireless clients will need to have the same **SSID**. Please note that it might be necessary to set up one client to establish a **BSS (Basic Service Set)** and wait briefly before setting up other clients. This prevents several clients from trying to establish a **BSS** at the same time, which can result in multiple singular **BSSs** being established, rather than a single **BSS** with multiple clients associated to it.

Troubleshooting

- Check that the **Network Connection** for the wireless client is configured properly. Select **AP (Infrastructure)** when connecting to an access point and select **Ad-Hoc mode** when connecting without an access point. Double-click on the **WLAN icon** in the taskbar > click on **Configuration** to change the settings for the wireless adapter.

- If **Security** is enabled, make sure that the correct encryption keys are entered on both the DWL-G520 and the access point. Double-click on the **WLAN** icon in the taskbar > click **Encryption**. Check to see that the key selected is set to the same key as other devices on the network.

7. How can I troubleshoot distance issues using the DWL-G520.

- Move the DWL-G520 and Access Point or Wireless router into the same room and then test the wireless connection.

- Change the channel of the Access Point.

- Move devices within the line of sight

Technical Specifications

Standards

- IEEE 802.11g
- IEEE 802.11
- IEEE 802.11b

Bus Type:

- PCI 2.2

Data Rates:

With Automatic Fallback

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

Security:

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

Media Access Control:

- CSMA/CA with ACK

Frequency Range:

- 2.4GHz to 2.462GHz

Range:

- Indoors: Up to 328 feet (100 meters)
- Outdoors: Up to 1,312 feet (400 meters)

Power Consumption:

- PowerSave mode = 28mA
- Standby mode = 4.66mA
- Transmit mode = 248mA

Modulation Technology:

- Orthogonal Frequency Division Multiplexing (OFDM)

**WPA will be available Spring 2003 as a download*

Technical Specifications

Receiver Sensitivity:

- 54Mbps OFDM, 10% PER,-68dBm
- 48Mbps OFDM, 10% PER,-68dBm
- 36Mbps OFDM, 10% PER,-75dBm
- 24Mbps OFDM, 10% PER,-79dBm
- 18Mbps OFDM, 10% PER,-82dBm
- 12Mbps OFDM, 10% PER,-84dBm
- 11Mbps CCK, 8% PER, -82dBm
- 9Mbps OFDM, 10% PER,-87dBm
- 6Mbps OFDM, 10% PER,-88dBm
- 5.5Mbps CCK, 8% PER,-85dBm
- 2Mbps QPSK, 8% PER,-86dBm
- 1Mbps BPSK, 8% PER,-89dBm

Transmitter Output Power:

- 15dBm ± 2dB

Internal Antenna Type:

- Dipole with detachable reverse SMA connector

Temperature

- Operating: 0ºC to 55ºC (32ºF to 149ºF)

Humidity:

- 95% maximum, non-condensing

Physical Dimensions:

- L = 4.64 inches (114.3mm)
- W = 2.13 inches (54mm)
- H = 0.34 inches (8.7mm)

Weight:

- 0.12 lb. (55 grams)

Certifications:

- FCC part 15b

Warranty:

- 3 years

Technical Support

You can find software updates and user documentation on the D-Link website.

D-Link provides free technical support for customers within the United States and within Canada for the duration of the warranty period on this product.

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

Tech Support for customers within the United States:

D-Link Technical Support over the Telephone:
(877) 453-5465
24 hours a day, seven days a week.

D-Link Technical Support over the Internet:
http://support.dlink.com
email:support@dlink.com

Tech Support for customers within Canada:

D-Link Technical Support over the Telephone:
(800) 361-5265
Monday to Friday 8:30am to 9:00pm EST

D-Link Technical Support over the Internet:
http://support.dlink.ca
email:support@dlink.ca

When contacting technical support, please provide the following information:

- *Serial number of the unit*
- *Model number or product name*
- *Software type and version number*

Warranty and Registration

Subject to the terms and conditions set forth herein, D-Link Systems, Inc. ("D-Link") provides this Limited warranty for its product only to the person or entity that originally purchased the product from:

- D-Link or its authorized reseller or distributor and
- Products purchased and delivered within the fifty states of the United States, the District of Columbia, U.S. Possessions or Protectorates, U.S. Military Installations, addresses with an APO or FPO.

Limited Warranty: D-Link warrants that the hardware portion of the D-Link products described below will be free from material defects in workmanship and materials from the date of original retail purchase of the product, for the period set forth below applicable to the product type ("Warranty Period"), except as otherwise stated herein.

3-Year Limited Warranty for the Product(s) is defined as follows:

- Hardware (excluding power supplies and fans) Three (3) Years
- Power Supplies and Fans One (1) Year
- Spare parts and spare kits Ninety (90) days

D-Link's sole obligation shall be to repair or replace the defective Hardware during the Warranty Period at no charge to the original owner or to refund at D-Link's sole discretion. Such repair or replacement will be rendered by D-Link at an Authorized D-Link Service Office. The replacement Hardware need not be new or have an identical make, model or part. D-Link may in its sole discretion replace the defective Hardware (or any part thereof) with any reconditioned product that D-Link reasonably determines is substantially equivalent (or superior) in all material respects to the defective Hardware. Repaired or replacement Hardware will be warranted for the remainder of the original Warranty Period from the date of original retail purchase. If a material defect is incapable of correction, or if D-Link determines in its sole discretion that it is not practical to repair or replace the defective Hardware, the price paid by the original purchaser for the defective Hardware will be refunded by D-Link upon return to D-Link of the defective Hardware. All Hardware (or part thereof) that is replaced by D-Link, or for which the purchase price is refunded, shall become the property of D-Link upon replacement or refund.

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

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

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

- The customer must submit with the product as part of the claim a written description of the Hardware defect or Software nonconformance in sufficient detail to allow D-Link to confirm the same.

- The original product owner must obtain a Return Material Authorization ("RMA") number from the Authorized D-Link Service Office and, if requested, provide written proof of purchase of the product (such as a copy of the dated purchase invoice for the product) before the warranty service is provided.

- After an RMA number is issued, the defective product must be packaged securely in the original or other suitable shipping package to ensure that it will not be damaged in transit, and the RMA number must be prominently marked on the outside of the package. Do not include any manuals or accessories in the shipping package. D-Link will only replace the defective portion of the Product and will not ship back any accessories.

- The customer is responsible for all in-bound shipping charges to D-Link. No Cash on Delivery ("COD") is allowed. Products sent COD will either be rejected by D-Link or become the property of D-Link. Products shall be fully insured by the customer and shipped to **D-Link Systems, Inc., 53 Discovery Drive, Irvine, CA 92618**. D-Link will not be held responsible for any packages that are lost in transit to D-Link. The repaired or replaced packages will be shipped to the customer via UPS Ground or any common carrier selected by D-Link, with shipping charges prepaid. Expedited shipping is available if shipping charges are prepaid by the customer and upon request.

D-Link may reject or return any product that is not packaged and shipped in strict compliance with the foregoing requirements, or for which an RMA number is not visible from the outside of the package. The product owner agrees to pay D-Link's reasonable handling and return shipping charges for any product that is not packaged and shipped in accordance with the foregoing requirements, or that is determined by D-Link not to be defective or non-conforming.

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

Disclaimer of Other Warranties: EXCEPT FOR THE LIMITED WARRANTY SPECIFIED HEREIN, THE PRODUCT IS PROVIDED "AS-IS" WITHOUT ANY WARRANTY OF ANY KIND WHATSOEVER INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. IF ANY IMPLIED WARRANTY CANNOT BE DISCLAIMED IN ANY TERRITORY WHERE A PRODUCT IS SOLD, THE DURATION OF SUCH IMPLIED WARRANTY SHALL BE LIMITED TO NINETY (90) DAYS. EXCEPT AS EXPRESSLY COVERED UNDER THE LIMITED WARRANTY PROVIDED HEREIN, THE ENTIRE RISK AS TO THE QUALITY, SELECTION AND PERFORMANCE OF THE PRODUCT IS WITH THE PURCHASER OF THE PRODUCT.

Limitation of Liability: TO THE MAXIMUM EXTENT PERMITTED BY LAW, D-LINK IS NOT LIABLE UNDER ANY CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHER LEGAL OR EQUITABLE THEORY FOR ANY LOSS OF USE OF THE PRODUCT, INCONVENIENCE OR DAMAGES OF ANY CHARACTER, WHETHER DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF GOODWILL, LOSS OF REVENUE OR PROFIT, WORK STOPPAGE, COMPUTER FAILURE OR MALFUNCTION, FAILURE OF OTHER EQUIPMENT OR COMPUTER PROGRAMS TO WHICH D-LINK'S PRODUCT IS CONNECTED WITH, LOSS OF INFORMATION OR DATA CONTAINED IN, STORED ON, OR INTEGRATED WITH ANY PRODUCT RETURNED TO D-LINK FOR WARRANTY SERVICE) RESULTING FROM THE USE OF THE PRODUCT, RELATING TO WARRANTY SERVICE, OR ARISING OUT OF ANY BREACH OF THIS LIMITED WARRANTY, EVEN IF D-LINK HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE SOLE REMEDY FOR A BREACH OF THE FOREGOING LIMITED WARRANTY IS REPAIR, REPLACEMENT OR REFUND OF THE DEFECTIVE OR NON-CONFORMING PRODUCT. THE MAXIMUM LIABILITY OF D-LINK UNDER THIS WARRANTY IS LIMITED TO THE PURCHASE PRICE OF THE PRODUCT COVERED BY THE WARRANTY. THE FOREGOING EXPRESS WRITTEN WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ANY OTHER WARRANTIES OR REMEDIES, EXPRESS, IMPLIED OR STATUTORY.

Governing Law: This Limited Warranty shall be governed by the laws of the State of California. Some states do not allow exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the foregoing limitations and exclusions may not apply. This limited warranty provides specific legal rights and the product owner may also have other rights which vary from state to state.

Trademarks: D-Link is a registered trademark of D-Link Systems, Inc. Other trademarks or registered trademarks are the property of their respective manufacturers or owners.

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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 communication. 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 or more of the following measures**:**

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

FCC Caution:

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment; such modifications could void the user's authority to operate the equipment.

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

IMPORTANT NOTE:
FCC Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. The antenna(s) used for this equipment must be installed to provide a separation distance of at least eight inches (20 cm) from all persons.

This equipment must not be operated in conjunction with any other antenna.

Register your D-Link product online at http://support.dlink.com/register/