# D-Link *Air*Xpert™
# DWL-7000AP

**Tri-Mode Dualband 2.4/5GHz
Wireless Access Point**

# Manual

**D-Link**

**Building Networks for People**

# Contents

# Package Contents

## Contents of Package:

■ **D-Link *Air*Xpert DWL-7000AP**
   2.4GHz/5GHz Tri-mode Dualband Wireless Access Point

■ Power Adapter – 5V DC, 2A

■ Manual on CD

■ Quick Installation Guide

■ Ethernet Cable

*Note: Using a power supply with a different voltage rating than the one included with the DWL-7000AP will cause damage and void the warranty for this product.*

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

## System Requirements For Configuration:

■ Computer with Windows, Macintosh, or Linux-based operating system with an installed Ethernet adapter

■ Internet Explorer or Netscape Navigator version 6.0 or above, with JavaScript enabled

■ At least 128 MB of memory and a 500 MHz processor

# Introduction

D-Link, the industry pioneer in wireless networking, introduces another breakthrough in wireless connectivity — the *D-Link AirXpert DWL-7000AP* Wireless Access Point. This tri-mode, dualband Access Point provides the most expanded user bandwidth available in an AP. Wireless clients can connect to this AP using any one of its 11 non-overlapping channels to transfer data at speeds never before achievable in a wireless device. The DWL-7000AP operates seamlessly and simultaneously in both the 2.4GHz and 5GHz frequency spectrums supporting the 802.11b and the newer, faster 802.11a and 802.11g wireless standards. For offices, schools or public hotspots that already use 802.11b devices, the DWL-7000AP is a great way to expand an existing network and enable even more users to communicate with one another, access data and the Internet. Now, you can have an AP that will compliment your existing network and protect the investment you made when you provided the convenience of wireless networking.

The DWL-7000AP offers transfer rates up to 54Mbps in either the 2.4GHz or 5GHz bands, large data packets travel from the router to a remote desktop or roaming laptop PC at up to five times the speed of previous wireless devices. Everyone can work faster and more efficiently or watch a streaming video smoothly. The additional (802.11a) 5GHz band also offers a way to quickly transfer data without the interference produced by other devices operating in the 2.4GHz frequency. Network administrators can partition the usage of the dualband DWL-7000AP by segmenting the users on the wireless network by frequency band. Users who require special networking privileges — access to sensitive information, specific departments or videoconferencing — may use just the 802.11a channels; while other employees may just use the 802.11b and 802.11g channels. This type of user segmentation optimizes the AP s performance and delivers the best network experience to each set of users.

The DWL-7000AP is ideal for network administrators who require additional management, firewall, and other network security features. All of the AP s settings are easily accessible in the operating system independent, Web-based software user interface that also features a step-by-step Setup Wizard to get your router up and running in just a matter of minutes. The DWL-7000AP incorporates the 802.1x standard for wireless user authentication and WPA* (Wi-Fi Protected Access) which dynamically encrypts data as it's being sent.

*WPA features available as a firmware upgrade download in Q3 2003.

# Connections

- **Straight-Through** cable is required when connecting to a router or switch

- **Cross-Over** cable is required when connecting directly to an ethernet adapter on a computer

# Features & Benefits

- **Up to 54 Mbps with 11 Non-overlapping channels** - Means you can transfer large files up to 5 times more quickly than was previously possible without signal interference

- **802.11a, 802.11b and 802.11g Compliant -** Means you can mix devices from different standards without sacrificing connectivity

- **Better Security with 802.1x and WPA\* -** Other 802.11g devices can connect securely using 802.1x authentication and WPA (Wi-Fi Protected Access)

*\* WPA features available as a firmware upgrade download in Q3 2003*

# LEDS

**LED** stands for **L**ight-**E**mitting **D**iode.  The **DWL-7000AP Wireless Access Point** has 5 **Green** LEDs as shown below:

| LED | LED Activity |
|---|---|
| **Power** | A steady light indicates a connection to a power source |
| **LAN (10/100)** | A steady light indicates a connection to the Ethernet port; a blinking light indicates activity |
| **WLAN (802.11a and 802.11b or 802.11g)** | A blinking light indicates activity in the respective wireless mode: 802.11a and/or 802.11b/802.11g |

# Wireless Basics

D-Link *Air* Xpert 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 *Air* Xpert 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 Access Point (AP) is a device used to provide this link.

People use wireless LAN 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.

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# Wireless Basics (continued)

*The DWL-7000AP is compatible with the following wireless products*:

- **D-Link Air*Pro* *DWL-A650*, *D-Link Air*Plus *DWL-650+*, *D-Link Air*Xpert *DWL-A650, D-Link Air*Plus *Xtreme G*™ *DWL-G650*, *D-Link Air*Pro *DWL-AB650*
  Wireless Cardbus Adapters used with laptop computers

- **D-Link Air*Pro* *DWL-A520* *and* **D-Link Air*Plus* *DWL-520+*, *D-Link Air*Plus Xtreme G DWL-G520*, *D-Link AirXpert* DWL-AG520, and D-Link AirPro DWL-AB520**
  Wireless PCI cards used with desktop computers

### Standards-Based Technology

The DWL-7000AP Wireless Access Point utilizes the **802.11a, 802.11b** and draft **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. The **802.11a** standard also increases the data rate up to 54 Mbps, but within the 5GHz band. Both 802.11a and 802.11g utilize **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 DWL-7000AP offers the most advanced network security features available today, including: *WPA and 802.1x*.

In addition to its compatibility with 802.11g and 802.11a devices, the DWL-7000AP is compatible with 802.11b devices. This means that if you have an existing 802.11b network, or a network with a mixture of 802.11g, 802.11a and 802.11b, the devices in that network will be compatible with the DWL-7000AP.

# Wireless Basics *(continued)*

## Installation Considerations

Desktop and laptop computers with wireless network adapters installed can access the D-Link *Air* Xpert™ DWL-7000AP 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-7000AP and other network devices to a minimum - each wall or ceiling can reduce your D-Link 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.

# Getting Started

**Right out of the box, with its default settings, the DWL-7000AP will automatically connect with other D-Link *Air* Xpert products**

## IP ADDRESS

*Note: If you are using a DHCP-capable router in your network setup, such as the DI-604, you will not need to assign a static IP Address.*

If you need to assign 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.**

An **Infrastructure** wireless network contains an Access Point or Router. The **Infrastructure Network** example, shown on the following page, contains the following D-Link network devices:

A wireless Access Point - **D-Link *Air* Xpert DWL-7000AP**
An Ethernet Router - **D-Link DI-604**
A laptop computer with a wireless adapter - **D-Link *Air* Xpert DWL-AG650**
A desktop computer with a wireless adapter - **D-Link *Air* Xpert DWL-AG520**
A Cable modem - **D-Link DCM-201**

# Getting Started (continued)

An Infrastructure wireless network contains an Access Point or Router. The Infrastructure Network example, shown here, contains the following D-Link network devices:
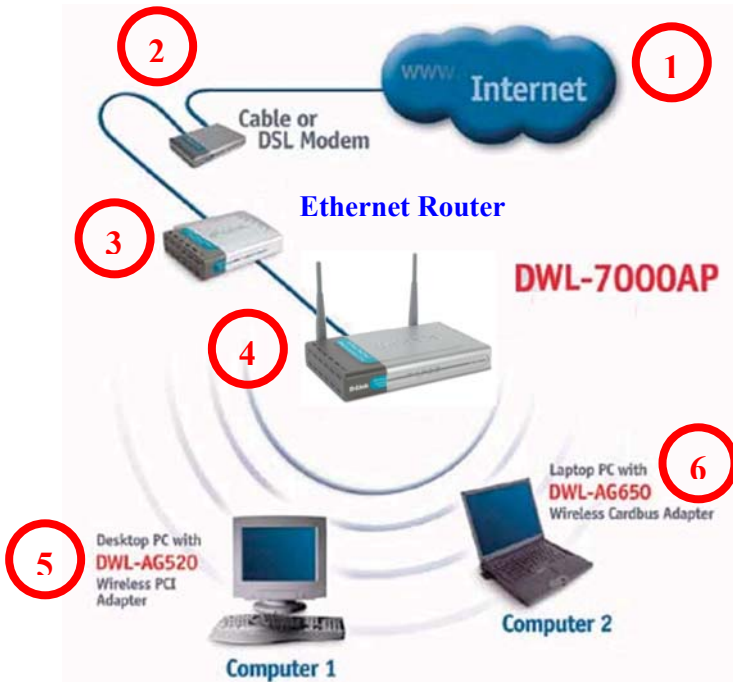


*For a typical wireless setup (as shown above,) please do the following:*
1. You will need a broadband Internet access (Cable/DSL) subscription
2. Consult with your Cable/DSL provider for proper installation of the modem
3. Connect the modem to an Ethernet broadband router such as the DI-604. (See the Quick Installation Guide included with the DI-604.)
4. Connect the router to the D-Link Air Xpert DWL-7000AP. (See the Quick Installation Guide included with the DWL-7000AP.)
5. If you are connecting a desktop computer in your network, you can install the D-Link Air Xpert DWL-AG520 wireless PCI adapter into an available PCI slot. *(See the Quick Installation Guide included with the DWL-AG520.*)
6. Install the drivers for the D-Link Air Xpert DWL-AG650 into the laptop computer. *(See the Quick Installation Guide included with the DWL-A650.)*

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# Using the Configuration Menu

Whenever you want to configure your network or the DWL-7000AP, you can access the Configuration Menu by opening the web-browser and typing in the IP Address of the DWL-7000AP. The DWL-7000AP default IP Address is shown below:

- Open the web browser
- Type in the **IP Address** of the Access Point
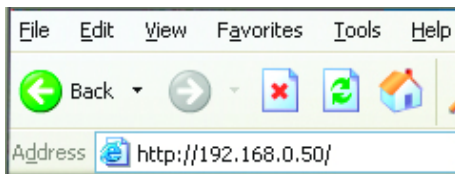


*Note:  if you have changed the default IP Address assigned to the DWL-7000AP, make sure to enter the correct IP Address.*

- Type **admin** in the **User  Name** field
- Leave the **Password** blank
- Click **Next**



## Home > Wizard

The **Home>Wizard** screen will appear.  Please refer to the *Quick Installation Guide* for more information regarding the Setup Wizard.
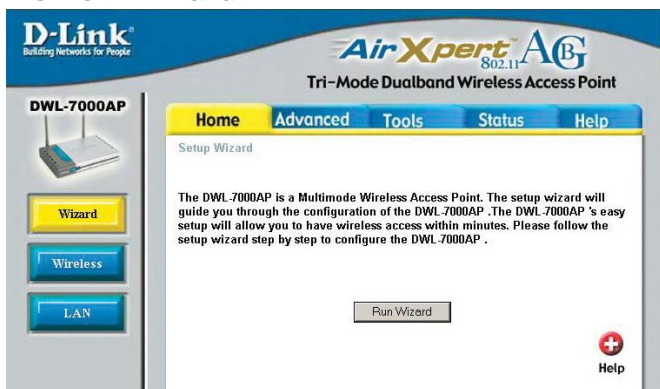
# Using the Configuration Menu (continued)

## Home > Wireless



> ⚠ Note: In the Configuration screens that follow, you will be able to configure settings for 802.11a and 802.11g devices in your network. Settings that you input for 802.11g devices will also apply to 802.11b devices in your network.

**Wireless Band:** Choose 802.11a or 802.11g.

**SSID:** (**Service Set Identifier**) **"default" is the default setting for both 802.11a and 802.11g.** The SSID is a unique name that identifies a network. All devices on a network must share the same SSID name in order to communicate on the network. If you choose to change the SSID from the default setting, input your new SSID name in this field. The SSID can be up to 32 characters in length.

**Channel: Channel 52 is the default channel for 802.11a. Channel 6 is the default channel for 802.11b**. Select a different channel if you want to change the default setting. All devices on the network must be set to the same channel to communicate on the network. *(Current wireless network adapters will automatically scan for the channel to establish connection with the access point.)*
Click **Help** at any time for more information.
Click **Apply** if you have made any changes or additions.

# Using the Configuration Menu (continued)

## Home > LAN



This window displays the default settings of the DWL-7000AP.

**Get IP From:** Choose **Static** or **Dynamic**. If you select **Static** you will manually input the IP Address. If you select **Dynamic** the DHCP server on your network will automatically assign an IP Address.

**IP Address:** The default IP Address is 192.168.0.50. *(Note: you will need to use the AP Manager to determine the IP Address dynamically assigned to the Access Point.)*

**Subnet Mask:** The **Subnet Mask** is 255.255.255.0

**Default Gateway:** Input the IP Address of the Default Gateway (the router in the network).

Click **Help** at any time for more information.

Click **Apply** if you have made any changes or additions.

# Using the Configuration Menu (continued)

## Advanced > Mode

**Choose 802.11a or 802.11g Wireless Band; then select from the following options:**



**Access Point:** Select this mode to create a WLAN (Wireless Local Area Network.)

**PtP Bridge (Point to Point Bridge):** This mode enables you to connect two WLANS

**Remote AP MAC Address:** Input the remote AP MAC Address of the AP with which the DWL-7000AP will associate

**PtMP Bridge (Point to Multi-Point Bridge):** This mode enables you to connect multiple WLANs

**Remote AP MAC Address:** Input the remote AP MAC Addresses of the APs with which the DWL-7000AP will associate

**AP Repeater:** To extend the range of the wireless network select this option and enter the MAC address of the remote AP within your network that will have its range extended.

**Static Key:** Select this option when the AP to be repeated has WEP enabled.

**Dynamic Key:** Select this option when the AP to be repeated has 802.1x enabled.

**Root AP MAC Address:** Enter the MAC address of the remote AP within your network that will have its range extended.
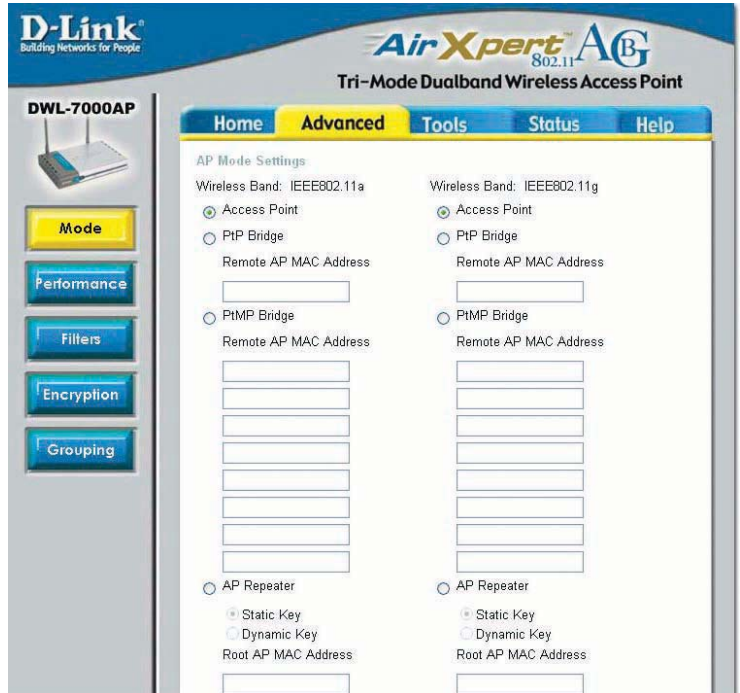
# Using the Configuration Menu (continued)

## Advanced > Performance



**Wireless Band:**
Select **802.11a** (up to 72 Mbps speed in turbo mode in the 5GHz range) or **802.11g** (up to 54 Mbps speed with AirPlus adapters.)

*The **default** Performance settings are shown in the illustration above.*

**Turbo Setting:** Select **Enabled** or **Disabled.** The **default** setting is **Disabled**.

**Frequency:** The frequency range will be displayed.

**Channel:** The default channel for 802.11a is **52.**
The default channel for 802.11g is **6.**

**Data Rate:** Select the transmission rate for the network

**Beacon Interval:** Beacons are packets sent by an Access Point to synchronize a wireless network. Specify a Beacon interval value (20-1000.) Default (100) is recommended.

**DTIM:** (**D**elivery **T**raffic **I**ndication **M**essage) Enter a value between 1 and 255 for the Delivery Traffic Indication Message (DTIM.) A DTIM is a countdown informing clients of the next window for listening to broadcast and multicast messages.

**Fragment Length:** This value should remain at its default setting of 2346. If you experience a high packet error rate, you may slightly increase your Fragmentation Threshold within the value range of 256 to 2346. Setting the Fragmentation Threshold too low may result in poor performance.

**RTS Length:** This value should remain at its default setting of 2346. If you encounter inconsistent data flow, only minor modifications to the value range between 256 and 2346 are recommended.

**Transmit Power:** Adjust the transmission range here. This tool can be helpful for security purposes if you wish to limit the transmission range.

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## Advanced > Filters



**Access Control:**

| | |
|---|---|
| **Disabled -** | **Disable** the Access Control feature |
| **Accept -** | **Accept** the MAC Addresses in the list into the network |
| **Reject -** | **Reject** the MAC Addresses in the list from participating in the network |

**Access Control List:** Input the MAC Addresses into the list

**MAC Address** (**M**edia **A**ccess **C**ontrol Address)
A unique hardware address that identifies a device on a network. It is assigned at the factory and cannot be changed. Usually you will find this address on a sticker on the device or on the packaging. *(Please use the following format when entering the MAC address- xx:xx:xx:xx:xx:xx)*

# Using the Configuration Menu (continued)

## Advanced > Encryption



**802.1x -** is the first line of defense against network intrusion. In the authentication process the Radius Server verifies the identity of the client attempting to connect to the network. Unfamiliar clients will be denied access. **EAP** (Extensible Authentication Protocol) is available through the Windows XP Operating System. You will need to use the same type of EAP protocol on all the devices in your network when using the 802.1x feature.

**Authentication:** Select from one of the following:

- **Open System:** the DWL-6000AP will be visible to all devices on the network. **Open System** is the **default** setting.

- **Shared Key:** in order to access the DWL-6000AP on the network, the device must be listed in the **Access Control List**

- **Shared Key/Open System:** click here to select both options

- **802.1x:** click here to select 802.1x authentication

**WEP:** Select **Enabled** or **Disabled** (the **default** setting is **Disabled**)

**WEP Key Type:** Select **HEX** (Hexadecimal) or **ASCII**

*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*

**WEP Key Size:** Select **64, 128 or 256 bit for 802.11b; 64, 128, 152 bit for 802.11a**

**Valid Key:** Select the key that you will use from one of the four keys in the Key Table.

**Key Table:** Input up to 4 keys using the format that you have selected in *Wep Key Type.*

## Advanced > Grouping



**Load Balance:** Select Enabled or Disabled.

When you **Enable Load Balance** you allow several DWL-7000APs to balance wireless network traffic and wireless clients among the DWL-7000APs with the same group name. After selecting this option, you will be prompted to enter a **Group Name**. All the APs that share Load Balancing must have the same **Group Name** and the same **SSID.** Assign each Access Point a different **non-overlapping channel** (e.g., 1, 6, 11).

**User Limit:** Set the User Limit in this field (0-64)

**Link Integrity:** Select Enabled or Disabled

When **Link Integrity** is Enabled, whenever the Ethernet connection between the LAN and the AP is disconnected - then the Wireless segment associated with the AP will also be disconnected from the AP.

**Ethernet Link Status:** This field displays the Ethernet Link Status. **Link Up** indicates that there is an Ethernet LAN connection to the AP.

# Using the Configuration Menu (continued)

## Tools > Admin



**User Name:** The default User Name is admin

**Old Password:** To change your password, first enter the old password

**New Password:** Enter the new password

**Confirm New Password:** Re-enter the new password

**Apply:** To save changes, click **Apply**

## Tools > System
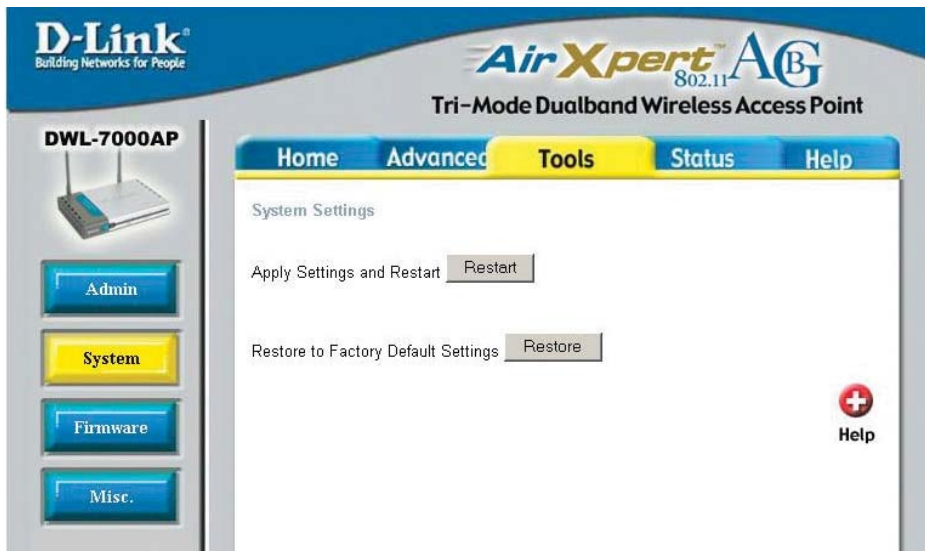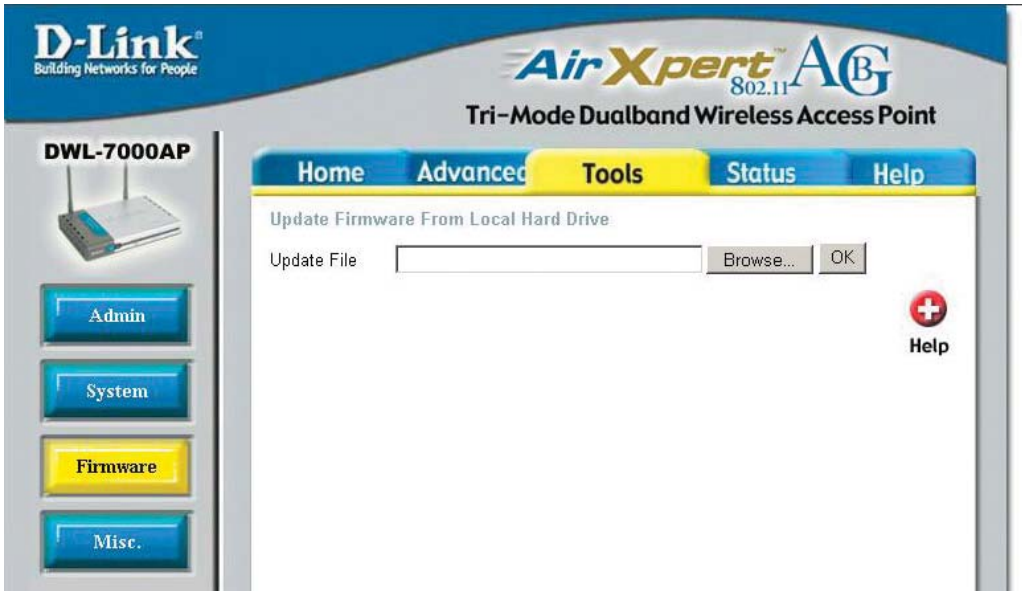


**Apply Settings and Restart:** If you have made any changes to the configuration settings, click **Restart** to apply the changes

**Restore to Factory Default Settings:** To return the DWL-7000AP to the factory default settings, click **Restore**

# Using the Configuration Menu (continued)

## Tools> Firmware
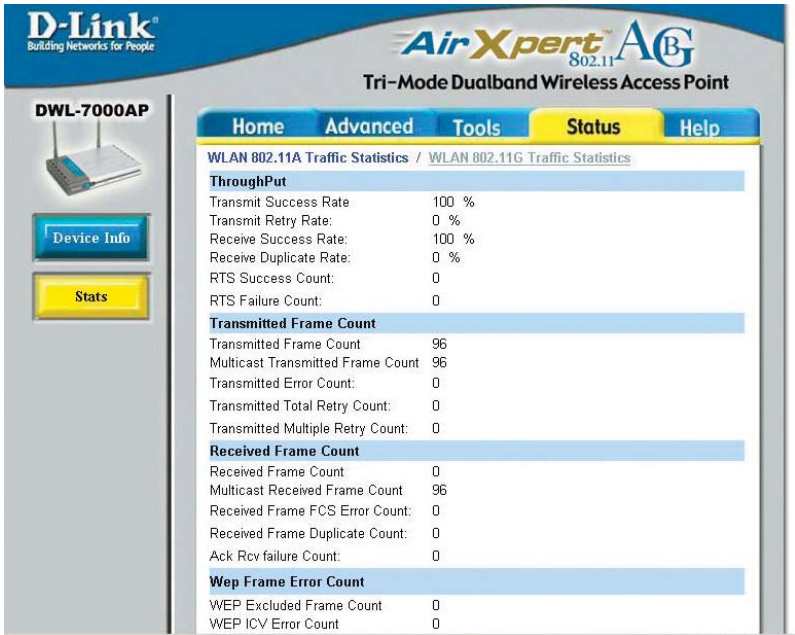


**Update File:** Click on **Browse** to find the updated firmware file on your hard drive. (Before you Browse your hard drive you will need to download the updated firmware from the D-Link Support website: http://support.dlink.com)

After you find the updated firmware file on your hard drive, click **OK**.

# Using the Configuration Menu (continued)

## Status > Stats

Displays the network traffic statistics for both received and transmitted communications through the Ethernet port and wireless connections associated with the Access Point.



## Help

The **Help** menu is displayed here. You can also click on **Help** in any window for additional information.
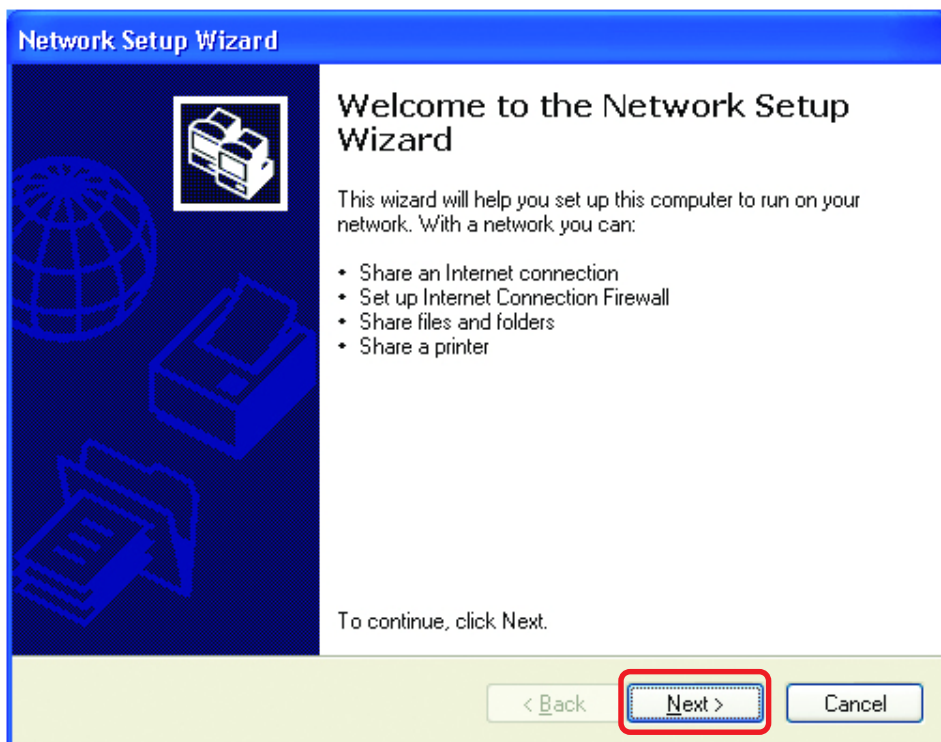
# Networking Basics

**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 98.*
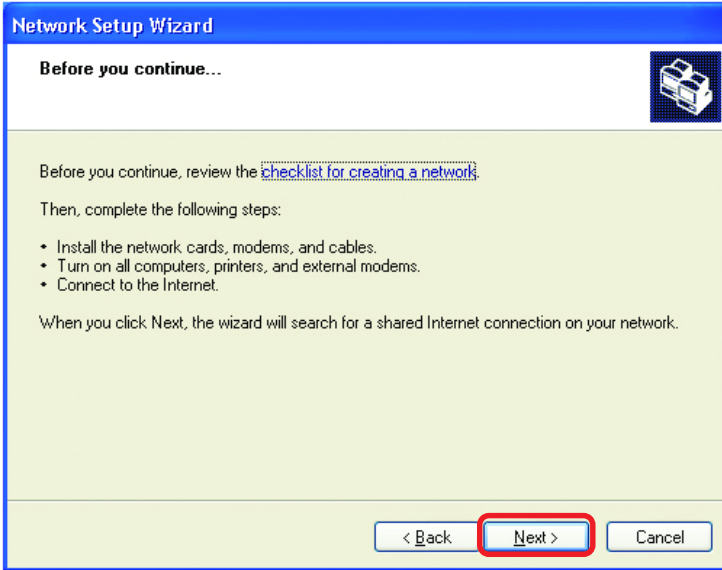
Go to **Start>Control Panel>Network Connections**
Select **Set up a home or small office network**
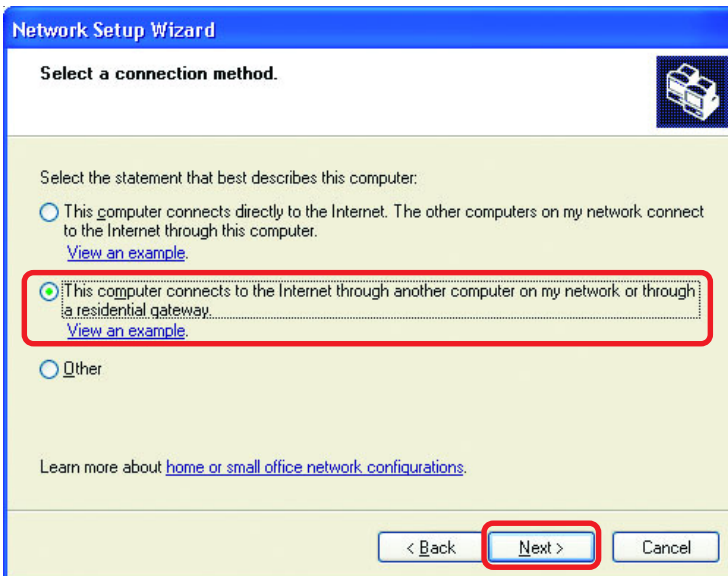


When this screen appears, **Click Next.**

# Networking Basics (continued)

Please follow all the instructions in this window:

**Network Setup Wizard**

**Before you continue...**

Before you continue, review the checklist for creating a network.

Then, complete the following steps:

- Install the network cards, modems, and cables.
- Turn on all computers, printers, and external modems.
- Connect to the Internet.

When you click Next, the wizard will search for a shared Internet connection on your network.

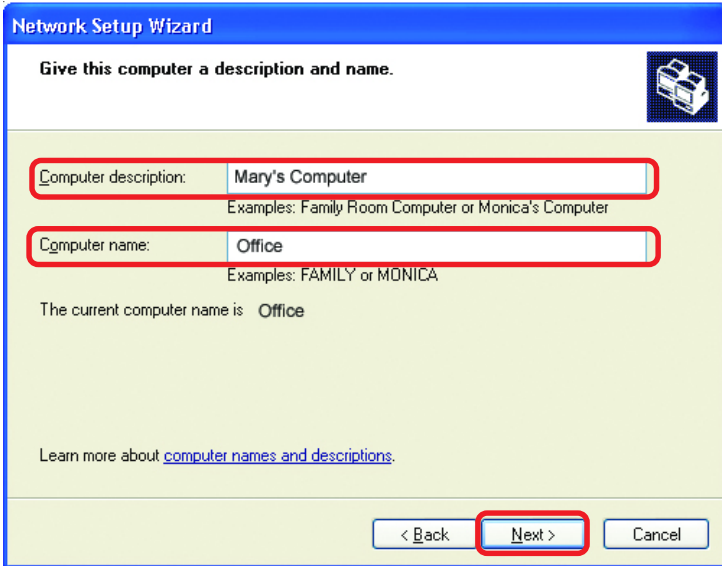[< Back]  [Next >]  [Cancel]

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.
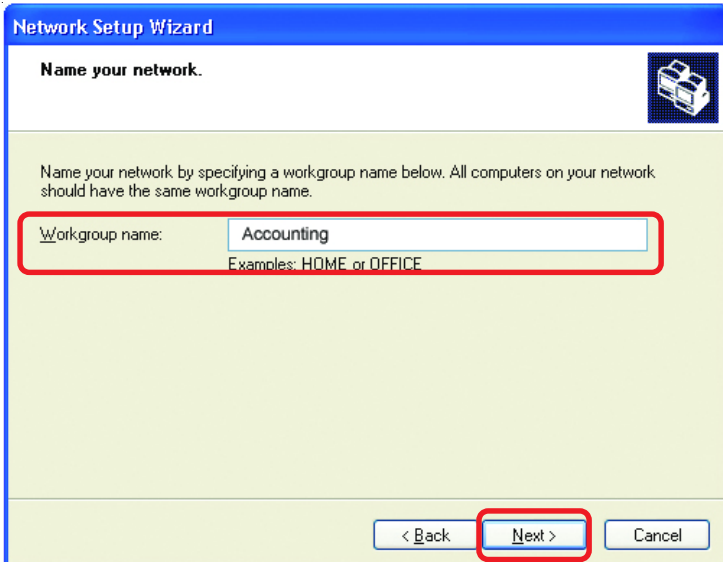
**Network Setup Wizard**

**Select a connection method.**

Select the statement that best describes this computer:

○ This computer connects directly to the Internet. The other computers on my network connect to the Internet through this computer.
   View an example.

◉ This computer connects to the Internet through another computer on my network or through a residential gateway.
   View an example.

○ Other

Learn more about home or small office network configurations.

[< Back]  [Next >]  [Cancel]

Click **Next**

# Networking Basics (continued)

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

Click **Next**

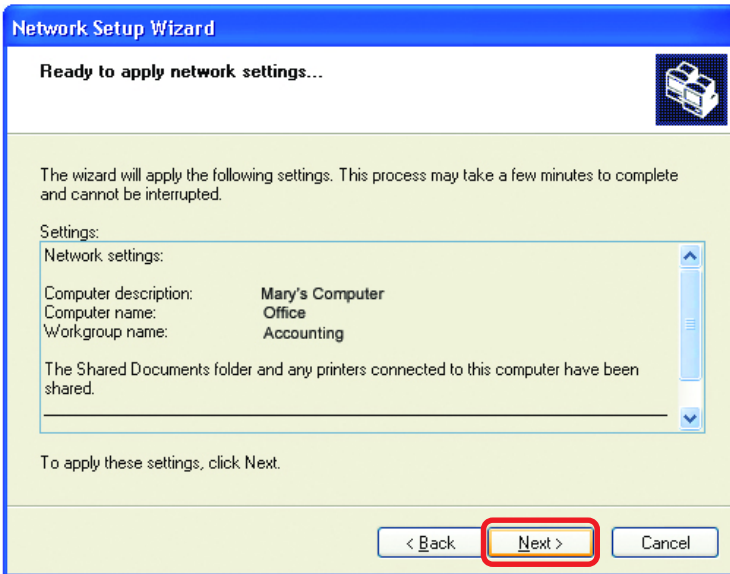Enter a **Workgroup** name. All computers on your network should have the same **Workgroup name.**

Click **Next**

# Networking Basics (continued)

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

**Network Setup Wizard**

**Ready to apply network settings...**

The wizard will apply the following settings. This process may take a few minutes to complete and cannot be interrupted.

Settings:

Network settings:

Computer description:    Mary's Computer
Computer name:          Office
Workgroup name:         Accounting

The Shared Documents folder and any printers connected to this computer have been shared.

To apply these settings, click Next.

< Back    Next >    Cancel

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

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

**Network Setup Wizard**

**Please wait...**

Please wait while the wizard configures this computer for home or small office networking. This process may take a few minutes.

< Back    Next >    Cancel
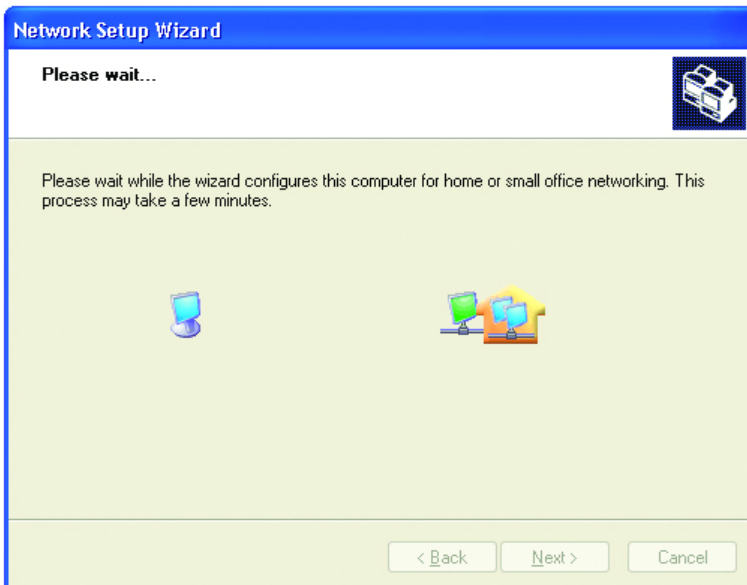
## Networking Basics (continued)

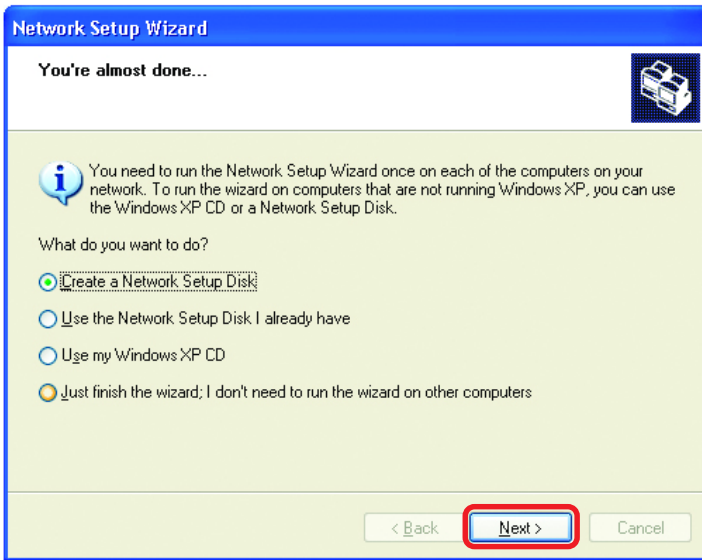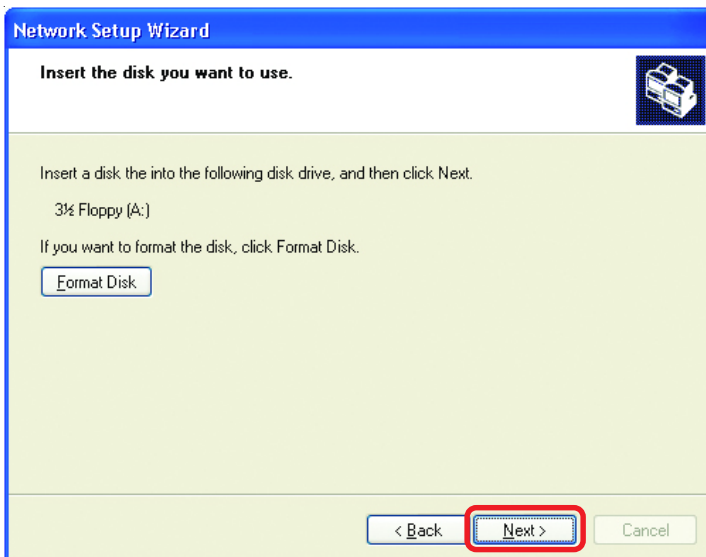In the window below, select the option that fits your needs. In this example, **Create a Network Setup Disk** has been selected. You will run this disk on each of the computers on your network. Click **Next**.



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



Format the disk if you wish, and click **Next.**

# Networking Basics (continued)



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.**
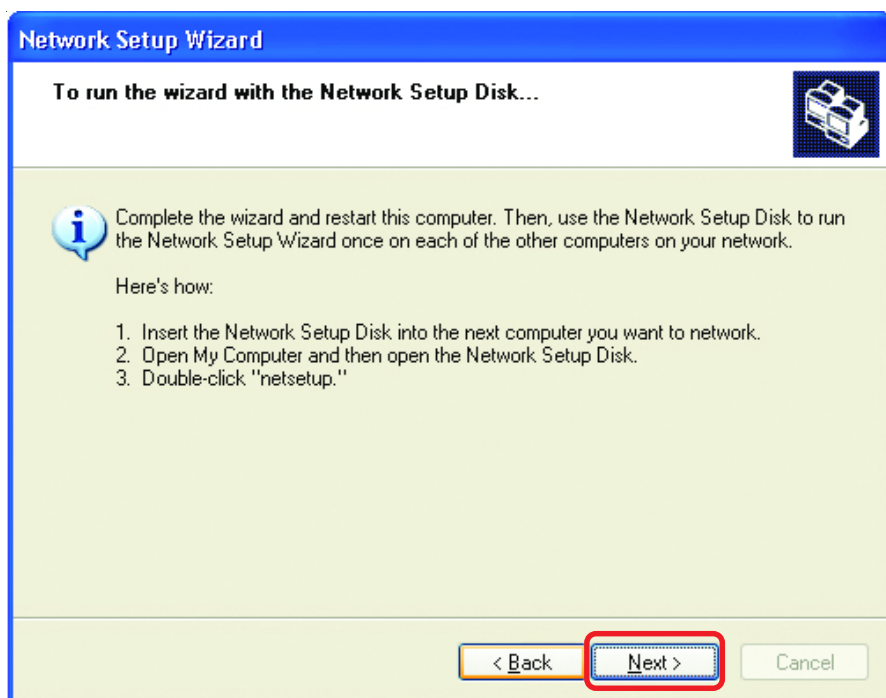
## Networking Basics (continued)

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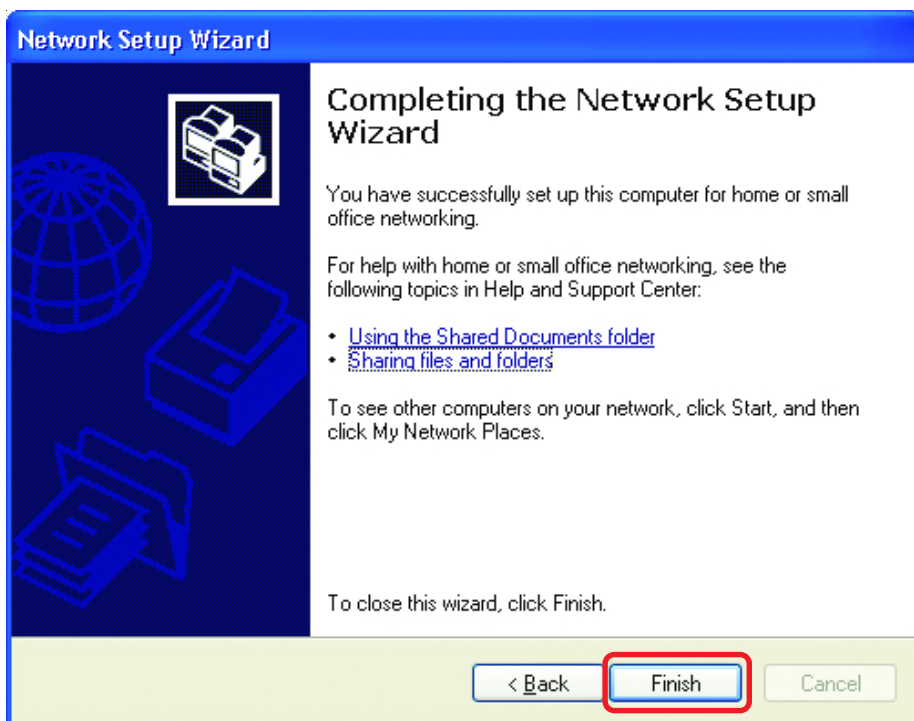


The new settings will take effect when you restart the computer. Click **Yes** to restart the computer.
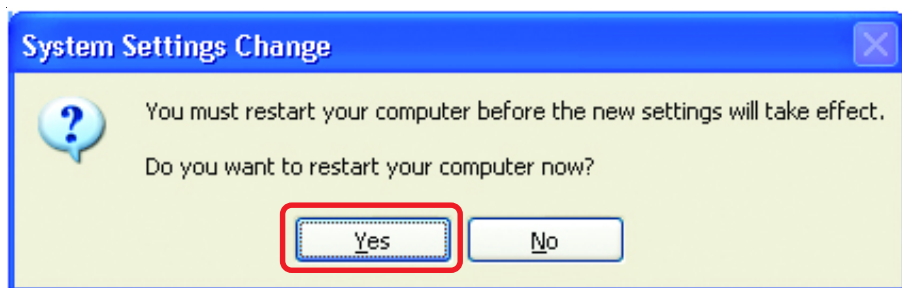


You have completed configuring this computer. Next, you will need to run the **Network Setup Disk** on all the other computers on your network. After running the **Network Setup Disk** on all your computers, your new wireless network will be ready to use.

# Networking Basics (continued)
## *Naming your Computer*

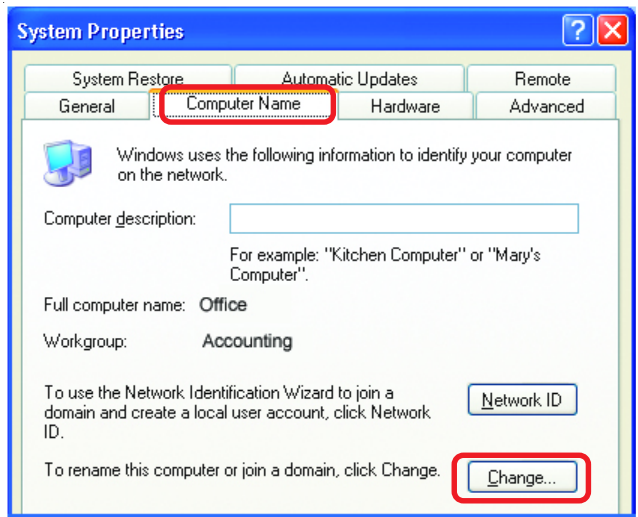To name your computer, please follow these directions:In **Windows XP**:

- ■ 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.
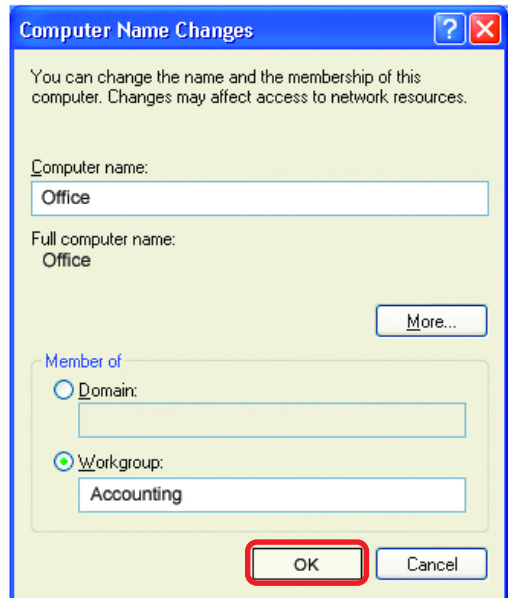
- ■ To rename the computer and join a domain, Click **Change**.

*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**

**Computer Name Changes**  ? ✕

You can change the name and the membership of this computer. Changes may affect access to network resources.

Computer name:

Office

Full computer name:
Office

More...

Member of

○ Domain:

⦿ Workgroup:

Accounting

OK    Cancel

---

## *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**

Disable

**Status**

Repair

View Available Wireless Networks

Open Network Connections

3:05 PM

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*Checking the IP Address in Windows XP*

This window will appear.

■  Click the
   **Support tab**

■  Click **Close**
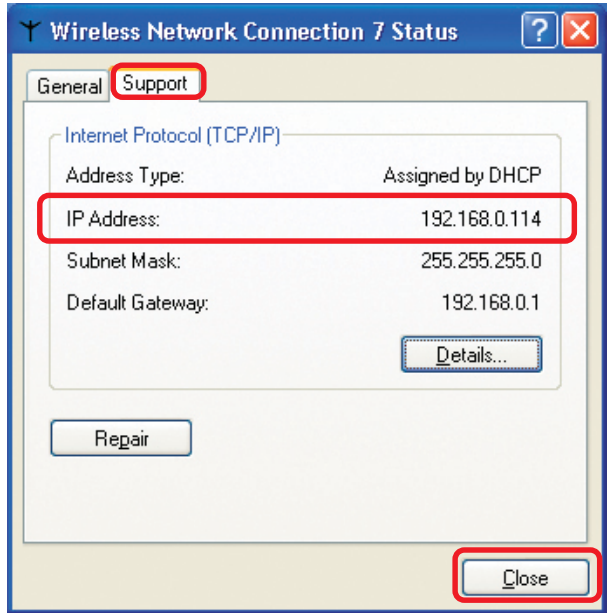
*Assigning a Static IP Address in Windows XP/2000*

***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**
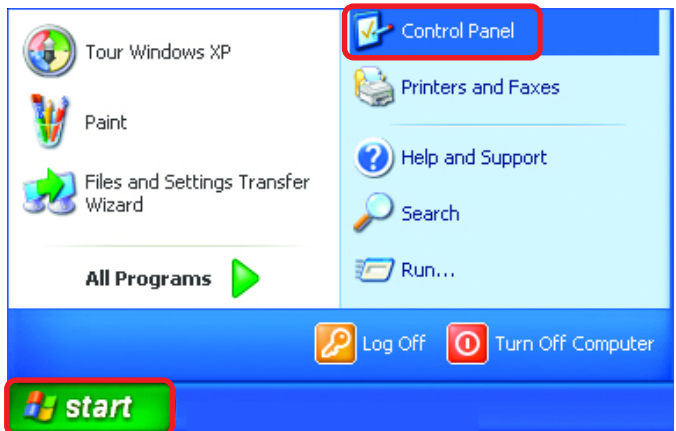
# Networking Basics (continued)
## *Assigning a Static IP Address in Windows XP/2000*

■ Double-click on **Network Connections**



■ Right-click on **Local Area Connections**

■ Double-click on **Properties**

## Networking Basics (continued)
### *Assigning a Static IP Address in Windows XP/2000*
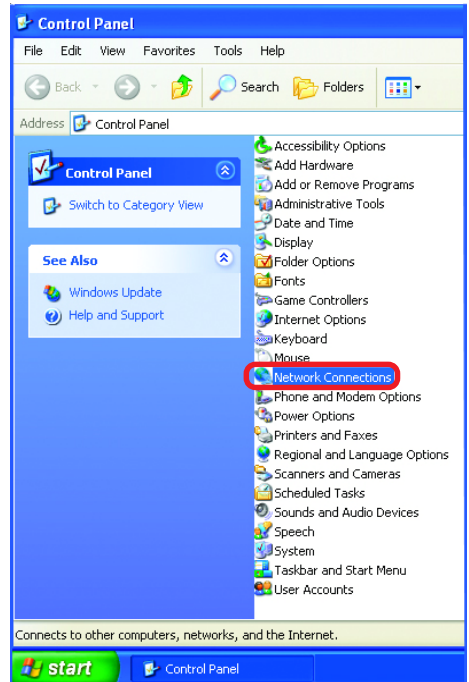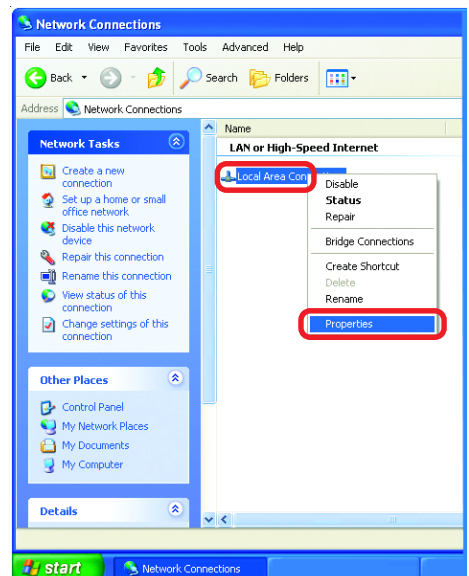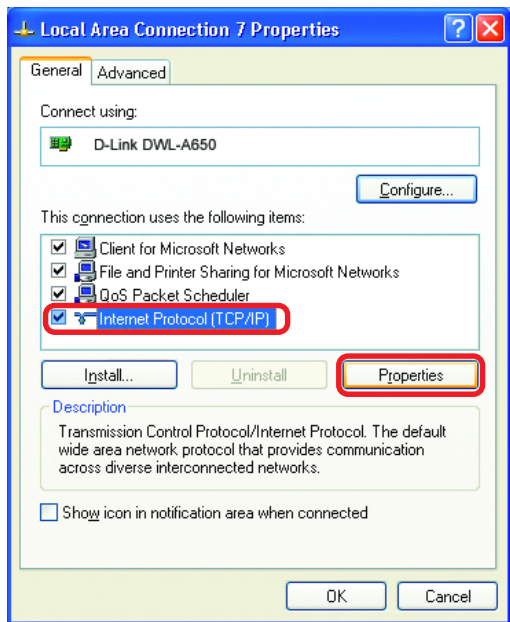
■ Click on **Internet Protocol (TCP/IP)**

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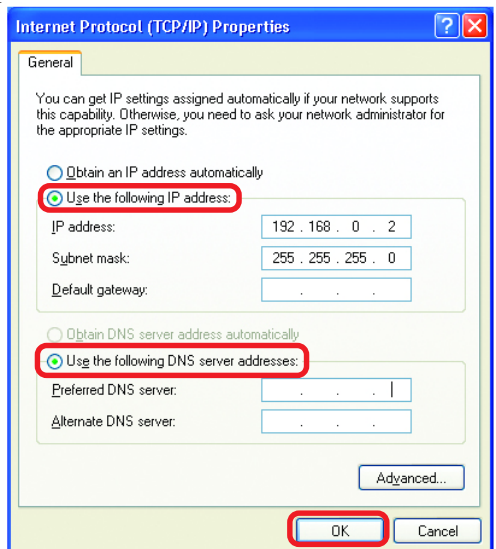
*You have completed the assignment of a Static IP Address. (You do not need to assign a Static IP Address if you have a DHCP-capable Gateway/Router).*

■ Go to the **Apple Menu** and select **System Preferences**
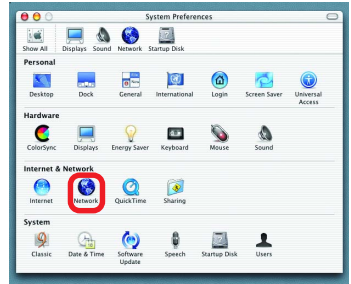
■ Click on **Network**

■ Select **Built-in Ethernet** in the **Show** pull-down menu
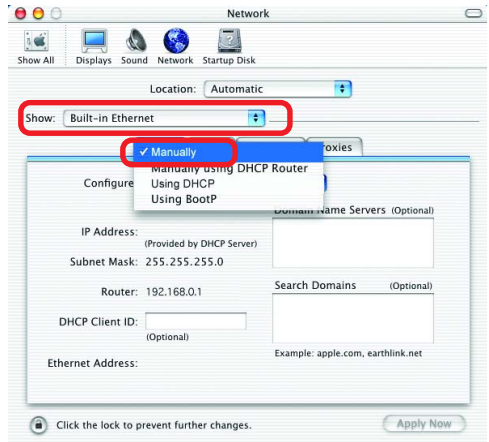
■ Select **Manually** in the **Configure** pull-down menu

■ Input the **Static IP Address**, the **Subnet Mask** and the **Router IP Address** in the appropriate fields
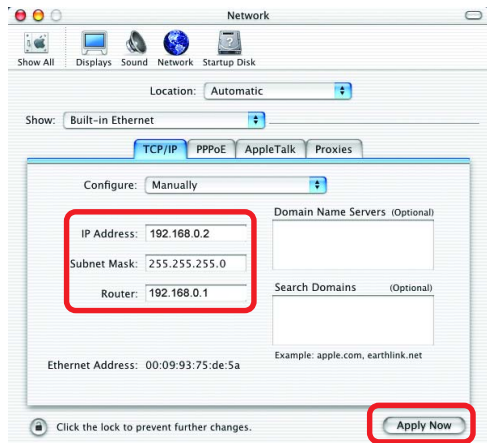
■ Click **Apply Now**

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■  Go to the **Apple Menu** and select **System Preferences**

■  Click on **Network**
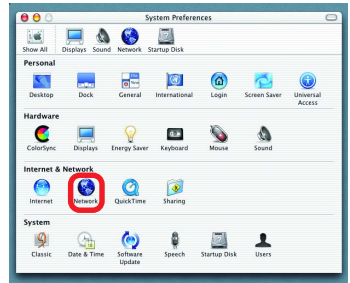


■  Select **Built-in Ethernet** in the **Show** pull-down menu

■  Select **Using DHCP** in the **Configure** pull-down menu



■  Click **Apply Now**
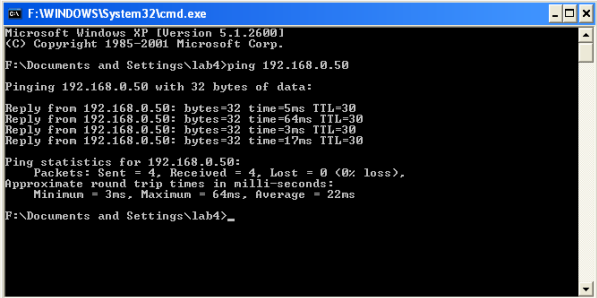
■  The **IP Address, Subnet mask**, and the **Router's IP Address** will appear in a few seconds

# Networking Basics (continued)

## *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 Acess Point, as shown.
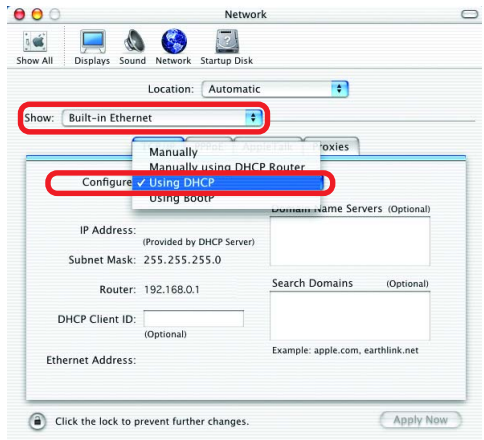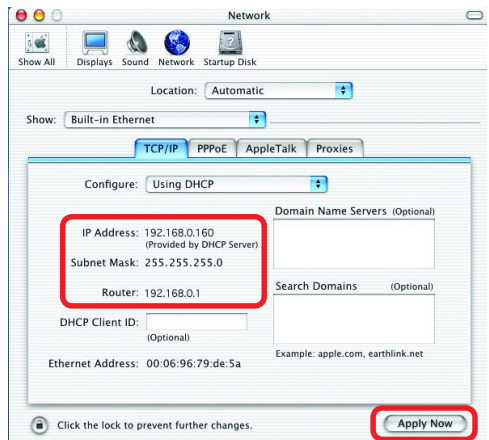
```
F:\WINDOWS\System32\cmd.exe

Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

F:\Documents and Settings\lab4>ping 192.168.0.50

Pinging 192.168.0.50 with 32 bytes of data:

Reply from 192.168.0.50: bytes=32 time=5ms TTL=30
Reply from 192.168.0.50: bytes=32 time=64ms TTL=30
Reply from 192.168.0.50: bytes=32 time=3ms TTL=30
Reply from 192.168.0.50: bytes=32 time=17ms TTL=30

Ping statistics for 192.168.0.50:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 3ms, Maximum = 64ms, Average = 22ms

F:\Documents and Settings\lab4>_
```

## *Checking the Wireless Connection by Pinging in Windows Me and 98*

■ 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.

```
MS-DOS Prompt

C:\WINDOWS\Desktop>ping 192.168.0.50

Pinging 192.168.0.50 with 32 bytes of data:

Reply from 192.168.0.50: bytes=32 time<10ms TTL=30
Reply from 192.168.0.50: bytes=32 time<10ms TTL=30
Reply from 192.168.0.50: bytes=32 time<10ms TTL=30
Reply from 192.168.0.50: bytes=32 time<10ms TTL=30

Ping statistics for 192.168.0.50:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum =  0ms, Average =  0ms

C:\WINDOWS\Desktop>_
```

# Troubleshooting

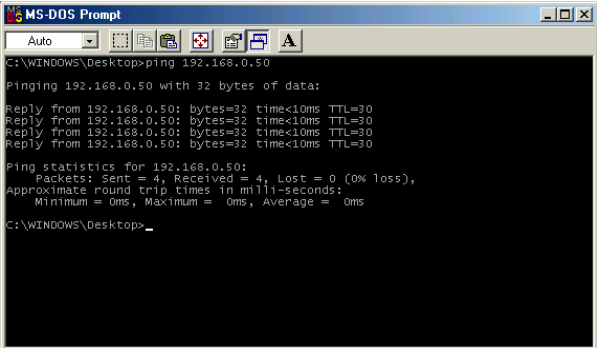This Chapter provides solutions to problems that can occur during the installation and operation of the DWL-7000AP Wireless Access Point. We cover various aspects of the network setup, including the network adapters. Please read the following if you are having problems.
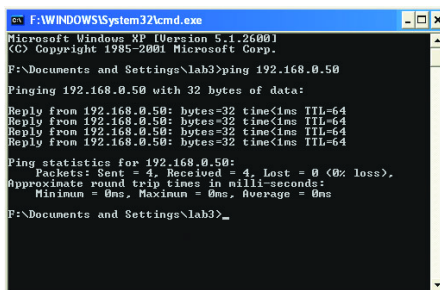
> *Note: It is recommended that you use an Ethernet connection to configure the DWL-7000AP Access Point.*

## 1. The computer used to configure the DWL-7000AP cannot access the Configuration menu.

- Check that the **Ethernet LED** on the DWL-7000AP is **ON**. If the **LED** is not **ON**, check that the cable for the Ethernet connection is securely inserted.

- Check that the Ethernet Adapter is working properly. Please see item 3 (**Check that the drivers for the network adapters are installed properly**) in this **Troubleshooting** section to check that the drivers are loaded properly.

- Check that the **IP Address** is in the same range and subnet as the DWL-7000AP. Please see **Checking the IP Address in Windows XP** in the **Networking Basics** section of this manual.

*Note: The IP Address of the DWL-7000AP is 192.168.0.50. All the computers on the network must have a unique IP Address in the same range, e.g., 192.168.0.x. Any computers that have identical IP Addresses will not be visible on the network. They must all have the same subnet mask, e.g., 255.255.255.0*

- Do a **Ping test** to make sure that the DWL-7000AP is responding. Go to **Start**>**Run**>Type **Command**>Type **ping 192.168.0.50.** A successful ping will show four replies.



*Note: If you have changed the default IP Address, make sure to ping the correct IP Address assigned to the DWL-7000AP.*

# Troubleshooting (continued)

## 2. The wireless client cannot access the Internet in the Infrastructure mode.

Make sure the wireless client is associated and joined with the correct Access Point. To check this connection: **Right-click** on the **Local Area Connection icon** in the taskbar> select **View Available Wireless Networks**. The **Connect to Wireless Network** screen will appear. Please make sure you have selected the correct available network, as shown in the illustrations below.
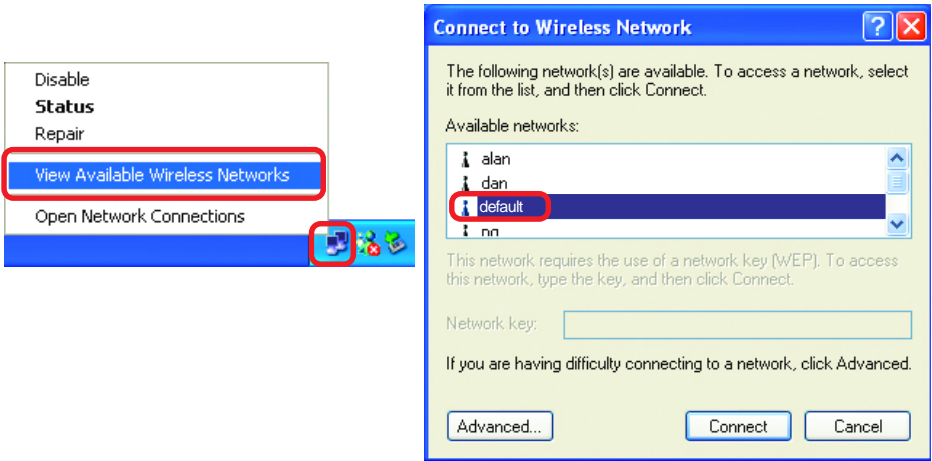


- Check that the **IP Address** assigned to the wireless adapter is within the same **IP Address range** as the access point and gateway. *(Since the DWL-7000AP has an IP Address of 192.168.0.50, wireless adapters must have an IP Address in the same range, e.g., 192.168.0.x. Each device must have a unique IP Address; no two devices may have the same IP Address. The subnet mask must be the same for all the computers on the network.)* To check the **IP Address** assigned to the wireless adapter, **double-click** on the **Local Area Connection icon** in the taskbar > select the **Support tab** and the **IP Address** will be displayed. *(Please refer to **Checking the IP Address** in the **Networking Basics** section of this manual.)*

- If it is necessary to assign a **Static IP Address** to the wireless adapter, please refer to the appropriate section in **Networking Basics**. If you are entering a **DNS Server address** you must also enter the **Default Gateway Address.** *(Remember that if you have a DHCP-capable router, you will not need to assign a Static IP Address. See **Networking Basics: Assigning a Static IP Address.**)*

# Troubleshooting (continued)

## 3. Check that the drivers for the network adapters are installed properly.

*You may be using different network adapters than those illustrated here, but this procedure will remain the same, regardless of the type of network adapters you are using.*

■ Go to **Start**

■ Right-click on **My Computer**

    Click
■ **Properties**
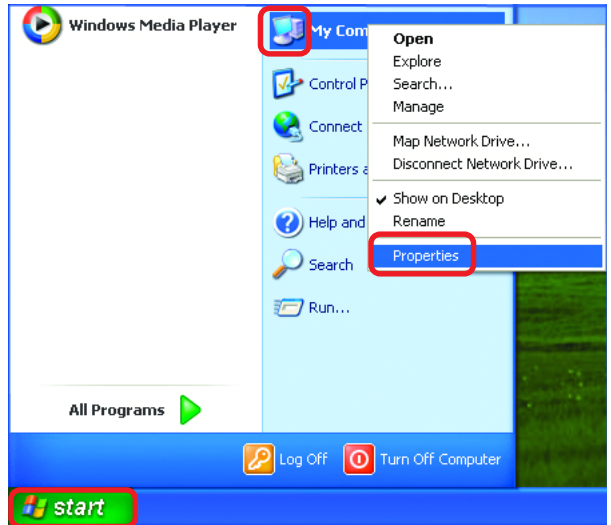


■ **Select** the **Hardware Tab**

■ Click **Device Manager**
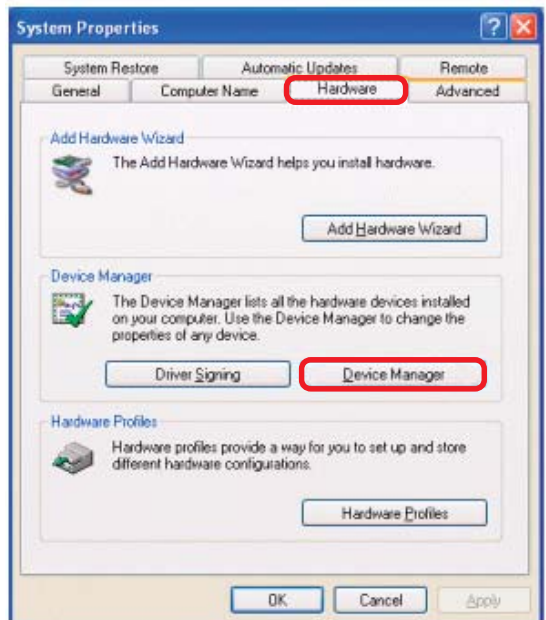
# Troubleshooting (continued)

- Double-click on **Network Adapters**

- Right-click on **D-Link DWL-AG650 Wireless Cardbus 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**
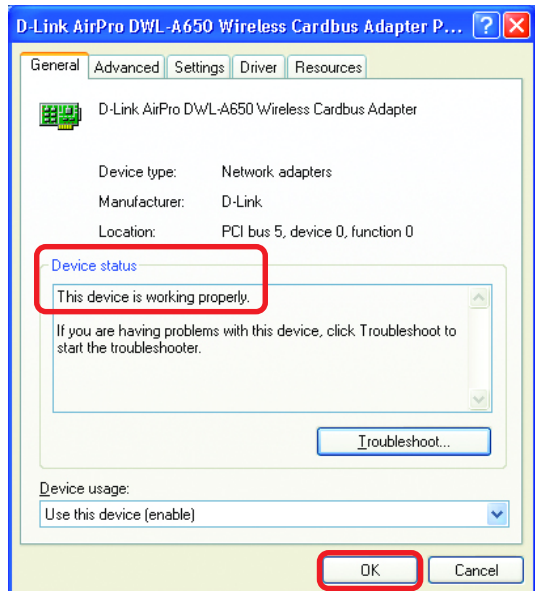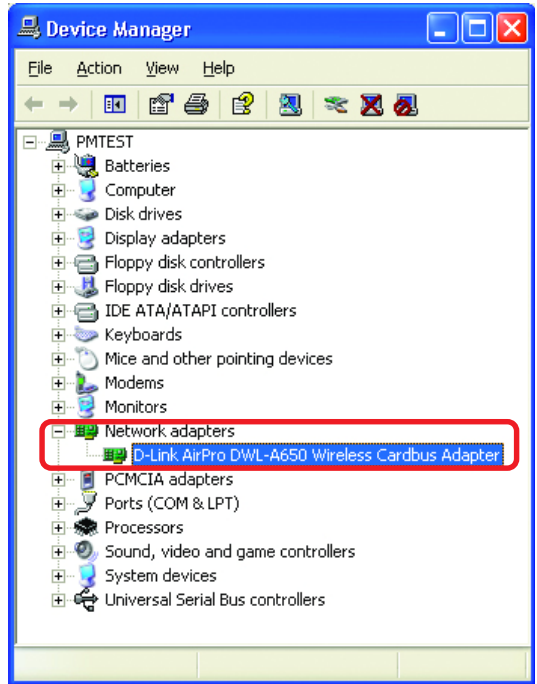
# Troubleshooting (continued)

## 4. What variables may cause my wireless products to lose reception?

D-Link products let you access your network from virtually anywhere you want. However, the positioning of the products within your environment will affect the wireless range. Please refer to **Installation Considerations** in the **Wireless Basics** section of this manual for further information about the most advantageous placement of your D-Link wireless products.

## 5. Why does my wireless connection keep dropping?

■ Antenna Orientation- Try different antenna orientations for the DWL-7000AP. Try to keep the antenna at least 6 inches away from the wall or other objects.

■ If you are using 2.4GHz cordless phones, X-10 equipment or other home security systems, ceiling fans, and lights, your wireless connection will degrade dramatically or drop altogether. Try changing the Channel on your Access Point and Wireless adapter to a different Channel to avoid interference.

■ Keep your product away (at least 3-6 feet) from electrical devices that generate RF noise, like microwaves, Monitors, electric motors, etc.

## 6. Why can't I get a wireless connection?

To establish a wireless connection, while enabling Encryption on the DWL-7000AP, you must also enable encryption on the wireless client.

■ For 802.11a, the Encryption settings are: 64, 128 or 152 bit. Make sure that the encryption bit level is the same on the Access Point and the Wireless Client.

■ For 802.11b, the Encryption settings are: 64, 128, or 256 bit. Make sure that the encryption bit level is the same on the Access Point and the Wireless Client.

Make sure that the SSID on the Access Point and the Wireless Client are exactly the same. If they are not, wireless connection will not be established. Please note that there are two separate SSIDs for 802.11a and 802.11b. The default SSID for both 802.11a and 802.11b is **default**.

# Troubleshooting (continued)

## 7. Resetting the DWL-7000AP to Factory Default Settings

After you have tried other methods for troubleshooting your network, you may choose to **Reset** the DWL-7000AP to the factory default settings. Remember that D-Link *Air*Pro products network together, out of the box, at the factory default settings.
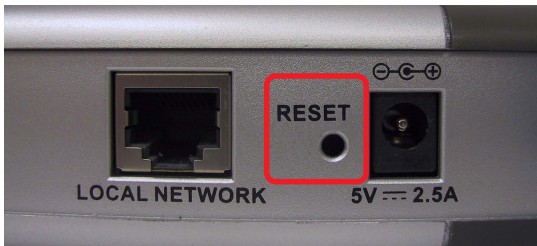


To hard-reset the D-Link *Air*Pro DWL-7000AP to Factory Default Settings, please do the following:

- ■ Locate the **Reset** button on the back of the DWL-7000AP

- ■ Use a paper clip to press the **Reset** button

- ■ Hold for about 10 seconds and then release

- ■ After the DWL-7000AP reboots (this may take a few minutes) it will be reset to the factory Default settings

# 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

# Warranty and Registration
## (USA only)

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. 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.

- Return Merchandise Ship-To Address
**USA:** 53 Discovery Drive, Irvine, CA 92618
**Canada:** 2180 Winston Park Drive, Oakville, ON, L6H 5W1 (Visit http://www.dlink.ca for detailed warranty information within Canada)

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.

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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.

## For detailed warranty outside the United States, please contact corresponding local D-Link office.
**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.

(1) The devices are restricted to indoor operations within the 5.15 to 5.25GHz range. (2) For this device to operate in the 5.15 to 5.25GHz range, the devices must use integral antennas.

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 device and its antenna must not be co-located or operating in conjunction with any other

antenna or transmitter.