D-Link *Air* ™
DWL-610
2.4GHz
Wireless Cardbus Adapter

Manual

version 1.02

D-Link

Building Networks for People

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Package Contents

Contents of Package:

- **D-Link *Air* DWL-610**
  2.4 GHz Wireless Cardbus Adapter
- Manual and Drivers on CD
- Quick Installation Guide

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

System Requirements:

- A computer or laptop with an available PC card slot
- Windows XP/2000/Me/98SE
- At least 32 MB of memory and a 300 MHz processor
- An **802.11b** *Access Point (e.g., DWL-900AP+)* for Infrastructure mode, or an **802.11b** wireless adapter for Ad-Hoc mode (e.g., DWL-510.)

This manual applies specifically to the DWL-610 revision M1. Please refer to earlier versions of this manual if you have a previous version of the DWL-610.

Introduction

The D-Link *Air* DWL-610 Wireless Cardbus Adapter is an 802.11b wireless adapter that supports high-speed wireless networking at home, at work or in public places.

The DWL-610 is compatible with existing 802.11b devices such as the D-Link *Air* and *Air*Plus family of products including the DWL-510 and DWL-520+ Wireless PCI Adapters, the DI-614+ Wireless Router, DWL-900AP+ Wireless Access Point and the DWL-122 Wireless USB Adapter.

The DWL-610 is an ideal way to connect your laptop computer to a Wireless Local Area Network (WLAN). After completing the steps outlined in the ***Quick Installation Guide*** (included in the package) you will have the ability to share information and resources, such as files and printers, and enjoy the freedom that wireless networking delivers.

The DWL-610 comes with software drivers for the most popular Microsoft Windows operating systems and can be integrated into a larger network, running Windows XP, Windows 2000, Windows Me, or Windows 98SE in either Ad Hoc mode (without an Access Point or Router) or Infrastructure mode (with an Access Point or Router).

The IEEE 802.11b Ethernet standard allows you to connect computers and 802.11b compatible devices at speeds up to 11Mbps, dependent upon the distance between wireless adapters, the configuration of your working environment, or the capabilities or limitations of your computer systems.

Features & Benefits

- Provides a simple and inexpensive way to connect your laptop computer to a wireless network at home, at the office, or in public places
- Fully compliant with the 802.11b standard and interoperable with all existing 802.11b-compliant devices
- Quick and Easy Installation- The DWL-610 installs quickly and easily into a cardbus slot in a laptop computer. By following the simple steps outlined in the *Quick Installation Guide*, you can connect to an available wireless network in a matter of seconds
- High Performance 32-bit Cardbus - The high capacity Cardbus interface utilized by the DWL-610 ensures optimal performance in transmitting a wireless signal within the laptop computer.
- Provides high-speed wireless connection up to 11Mbps
- Operates in the 2.4GHz frequency range
- Maximum reliability, throughput and connectivity with automatic data rate switching
- Provides a measure of security for the information transmitted over a wireless network with high data encryption at 64 or 128-bit WEP.
- Supports infrastructure networks via an access point and peer-to-peer communication in ad-hoc mode
- User-friendly configuration and diagnostic utilities

LEDS

LED stands for **L**ight-**E**mitting **D**iode.

Link: Solid **green** light indicates connection to the network

ACT: Blinking **amber** light indicates activity on the network

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 Wireless Local Area Network (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.

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.

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.

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

Wireless Basics *(continued)*

The DWL-610 is compatible with 802.11b wireless products, which include:

- **D-Link *Air*Plus DWL-650+**
  2.4GHz Wireless Cardbus Adapter used with laptop computers
- **D-Link *Air* DWL-510, D-Link *Air*Plus DWL-520+**
  2.4GHz Wireless PCI cards used with desktop computers
- **D-Link *Air*Plus DWL-900AP+**
  Enhanced 2.4GHz Wireless Access Point
- **D-Link *Air*Plus DI-614+, DI-714P+**
  Enhanced 2.4GHz Wireless Broadband Routers

Standards-Based Technology

Based on the IEEE **802.11b** standard, the DWL-610 is also interoperable with existing compatible 2.4GHz wireless technology with data transfer speeds of up to 11Mbps.

Installation Considerations

The D-Link *Air* DWL-610 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-610 and other network devices to a minimum - each wall or ceiling can reduce your D-Link *Air* 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 generate RF noise.

Getting Started

With its default settings, the DWL-610, when activated, will connect with other D-Link *Air* products, right out of the box.

There are basically two modes of networking:

- **Infrastructure** – using an Access Point or Router, such as the DI-614+

- **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-610 wireless network adapters.

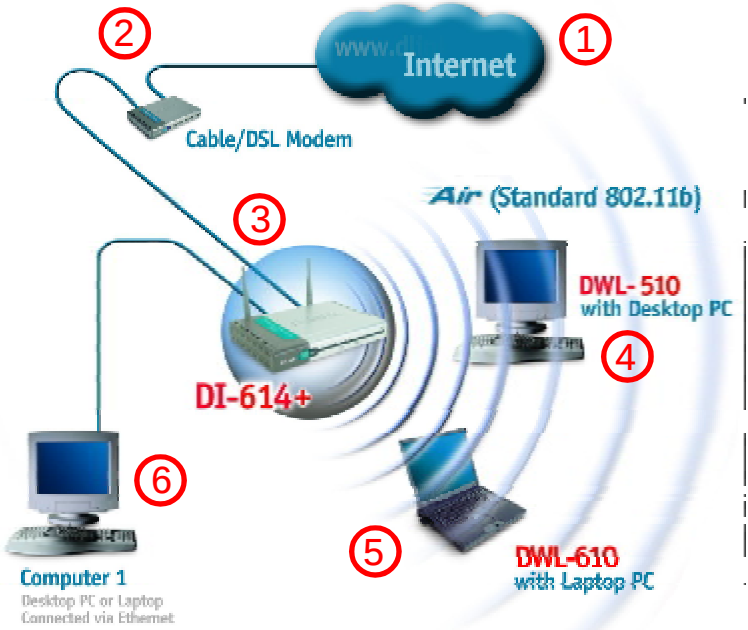
On the following pages we will show you an example of an **Infrastructure Network** and an **Ad-Hoc Network**.

An **Infrastructure** network contains an Access Point or 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 DI-614+**
- A laptop computer with a wireless adapter - **D-Link *Air* DWL-610**
- A desktop computer with a wireless adapter - **D-Link *Air* DWL-510**
- A Cable modem - **D-Link DCM-200**

Getting Started *(continued)*

Setting up a Wireless Infrastructure Network



*Please remember that **D-Link Air** 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. Install the D-Link *Air* DWL-510 wireless PCI adapter into an available PCI slot on your desktop computer.
   *(See the **Quick Installation Guide** included with the DWL-510.)*
5. Install the D-Link *Air* DWL-610 wireless Cardbus adapter into a laptop computer. (*See the **Quick Installation Guide** included with the DWL-610.*)
6. If you wish, you may connect a computer that is equipped with an Ethernet network adapter (such as a DFE-530TX+) to the router also.

1. Install the Wireless PCI adapter(e.g., DWL-510) into the desktop computer. *(See the **Quick Installation Guide** included with the product for installation instructions.)*

2. Install the DWL-610 wireless Cardbus adapter into a laptop computer. *(See the **Quick Installation Guide** included with the product.)*

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

D-Link *Air* DWL-610 uses the **Configuration Utility** as the management software. The utility provides the user an easy interface to change any settings related to the wireless adapter. After you have completed the installation of the DWL-610 (refer to the ***Quick Installation Guide*** that came with your purchase) whenever you start the computer, the **Configuration Utility** starts automatically and the system tray icon is loaded in the toolbar (see illustration below*.) Clicking on the utility icon will start the **Configuration Utility**. Another way to start the **Configuration Utility** is to click on **Start>Programs> D-Link *Air*>D-Link *Air* Utility.**

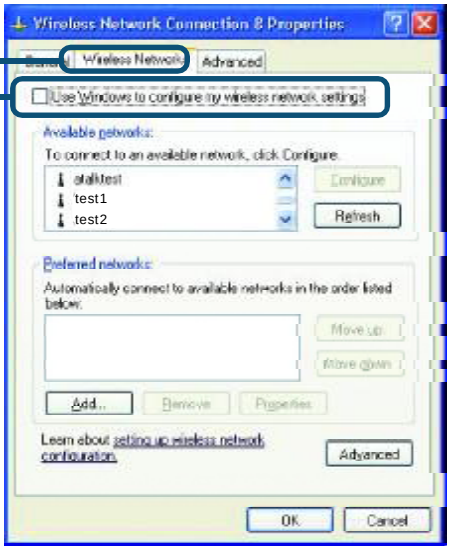
If you are using Windows XP, you can use either the Zero Configuration Utility or the D-Link Configuration Utility.

To use the D-Link Configuration Utility with XP, right-click on the Wireless network icon in the taskbar in the lower right-hand corner of your computer screen.

In the window that appears, select **View Available Wireless Networks** and click the **Advanced** button. The screen at right will appear.

Select the **Wireless Networks** tab.

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 by clicking on the D-Link Configuration Utility icon.

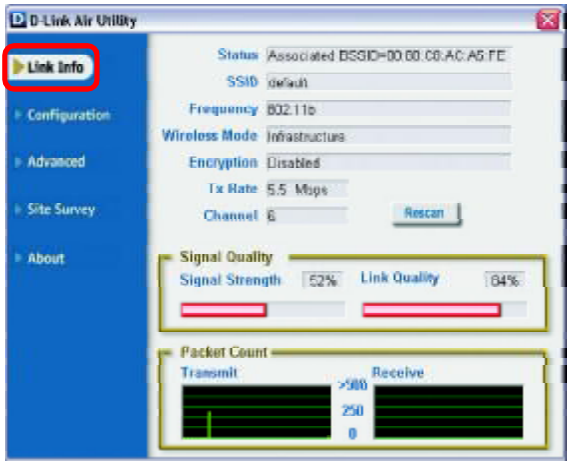
**Config Utility icon in system tray*

If the icon does not display in the taskbar, then click on this icon on your desktop to open.

Using the Configuration Utility *(continued)*

After clicking on the Configuration Utility icon, the **Link Info** screen will display the settings for the DWL-610:

Link Info



Status:

Displays the MAC Address of the Access Point or Router to which the DWL-610 is associated

SSID:

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

Frequency:

802.11b indicates that the DWL-610 is communicating in the 2.4GHz band.

Wireless Mode:

Either **Infrastructure** or **Ad-Hoc** will be displayed here. (Please see the *Getting Started* section in this manual for an explanation of these two modes.)

Encryption:

You can see if WEP (Wired Equivalent Privacy) is **Enabled** or **Disabled** here.

Tx Rate:

The default setting is **Auto**; Tx Rate settings are automatically determined for an optimal speed up to a maximum of 11Mbps.

Channel:

The default setting is **Auto**. The channel selection is automatically determined by the DWL-610.

Signal Strength/Link Quality:

Displays the Link Quality for the DWL-610 wireless connection to the access point. The Signal Strength represents the wireless signal between the access point and the DWL-610. The percentage coincides with the graphical bar

Packet Count:

Displays the statistics of the data packets that are transmitted and received.

Rescan Button:

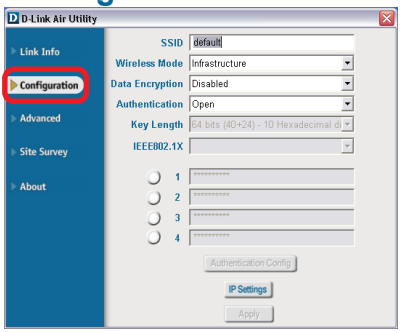
Rescans for the strongest signal in your environment and associates with that Access Point or Router

Using the Configuration Utility *(continued)*

SSID:

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

Configuration



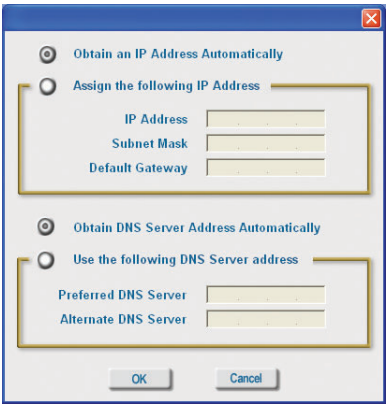
Wireless Mode:

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

Infrastructure - connecting to the WLAN using an Access Point.(This is 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.

IP Settings



Data Encryption:

Select **Enabled** or **Disabled.**

Authentication:

Choose one of the following modes:

Open Authentication – the DWL-650 is visible to all devices on the network

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

WPA – Wi-Fi protected access.

WPA-PSK – Wi-Fi protected access Pre-Shared Key.

IEEE802.1X:.

Enables or disables the use of 802.1X authentication

Key Length:

Select the key length and either ASCII (e.g., a word) or hexadecimal format.

Keys 1-4:

Select the default key

> ***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*

IP Settings:

When you click **IP Settings** in the Configuration window, the pop-up screen above will appear. Configure the IP Settings in this window.

Click **Apply** to save changes.

Using the Configuration Utility *(continued)*

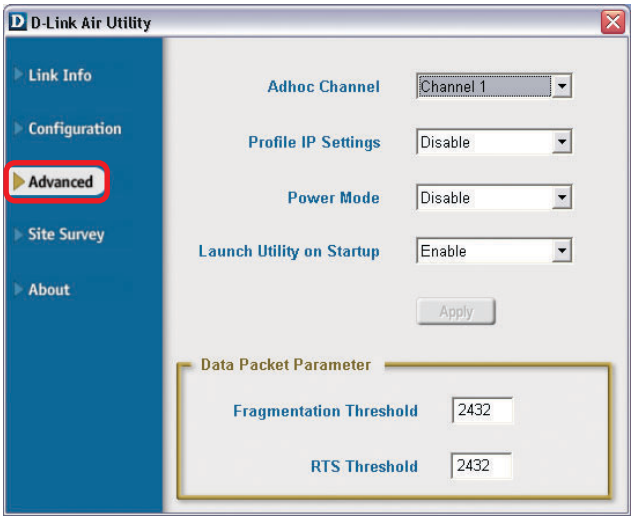
Ad-Hoc Channel:

All devices in the Ad Hoc network must be set to the same channel

Profile IP Settings:

You can **Enable** or **Disable** the *IP Settings* portion of your profile here. If you select **Disable** you will need to configure the IP Address information each time you connect to a network. If you select **Enable** you will maintain the same IP Address information each time you connect to a network.

Advanced



Power Mode:

Disable -this default setting consumes the most power
Enable - this setting consumes the least power

Launch Utility on Startup:

Select **Enable** or **Disable**

Data Packet Parameter:

Select the parameters here

Fragmentation Threshold:

This value should remain at its default setting of 2432. If you experience a high packet error rate, you may slightly increase your Fragmentation Threshold within the value range of 256 to 2432. Setting the Fragmentation Threshold too low may result in poor performance.

RTS Threshold:

This value should remain at its default setting of 2432. If inconsistent data flow is a problem, only a minor modification should be made.

Click **Apply** if you have made any changes

Using the Configuration Utility *(continued)*

Available Network:
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.

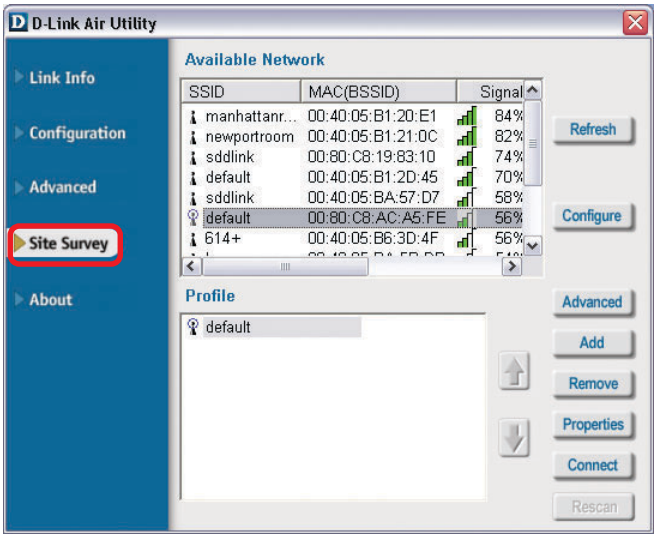
Profile:
In the lower half of the screen, you can manage the profiles that you have created for the wireless network at home, at the office and in public places. Scroll up and down and highlight the profile that you wish to configure. You can **Add** or **Remove** a profile, or configure the **Properties**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

Refresh:
Click on **Refresh** to get the most updated list of available networks.

Configure:
Highlight an existing network and click **Configure**; the configuration window on the next page will appear.

Advanced:
Highlight a network; click **Advanced** and the screen on the next page will appear.

Site Survey



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

Remove:
Highlight a network profile; click **Remove** to remove a network from the profile list.

Properties:
Highlight a network profile; click **Properties** and the screen on the next page will appear.

Connect:
Highlight a network profile; click **Connect** to connect to that network.

Rescan:
Click Rescan to rescan and connect to the strongest signal.

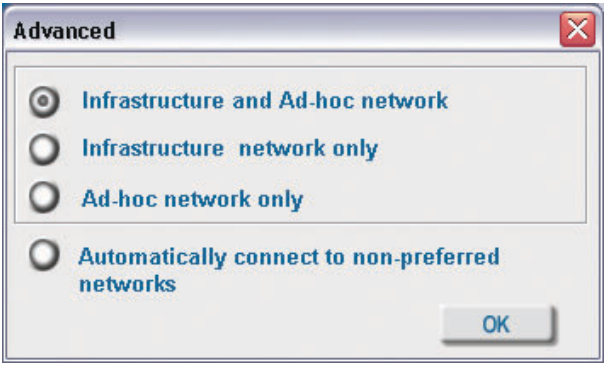
Using the Configuration Utility *(continued)*

Site Survey > Add

Advanced

In this window you can select the type of network connection.

Click **OK** to save the changes.



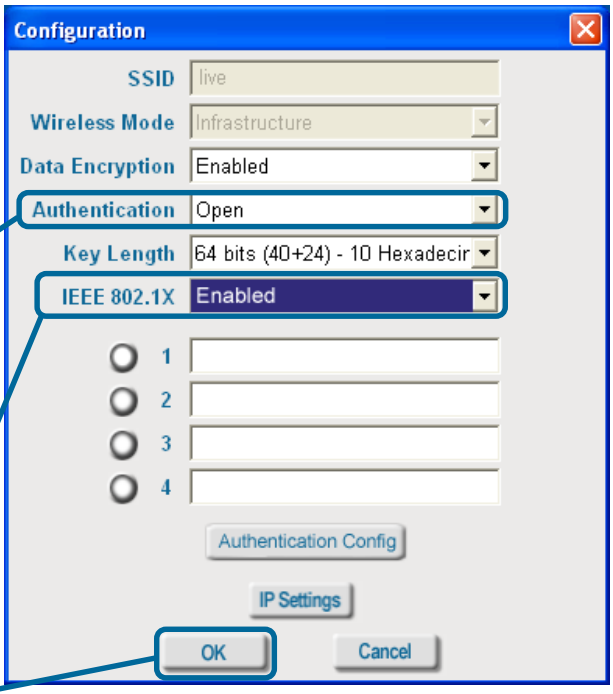
If you clicked on **Add,** you can configure, in this window, all the properties of a profile that you wish to add to the network.

If you clicked on **Configuration** or **Properties** you can configure, in this window, all the properties of a profile that already exists in the network.

If you select **WPA** in the *Authentication* field, please see detailed instructions for configuring WPA on the following pages.

If you choose to use the **IEEE 802.1X f**eature, please see the detailed instructions on the following pages.

Click **OK** to save the changes.



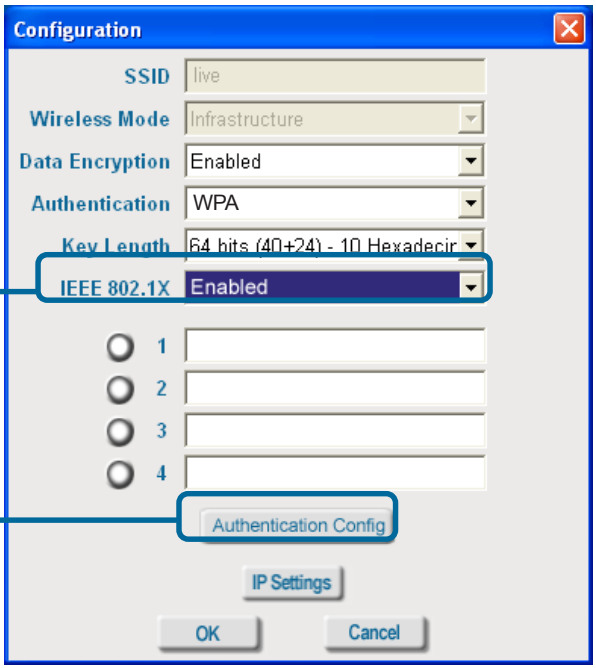
Using the Configuration Utility *(continued)*

Site Survey > Configuration > 802.1X

To use 802.1x and to configure its settings, please do the following:

IEEE 802.1X - Select **Enabled**.

Click **Authentication Config**



Advanced Security Settings

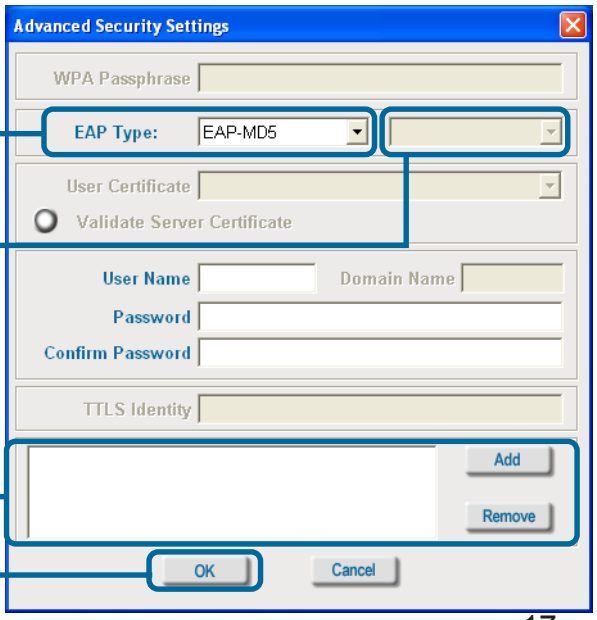
Select the **EAP Type** you want to use. Configure the information needed for authenticating.

Inner Authentication Protocol.

For an explanation of the terms shown in this window please see the following pages.

Trusted CA List.

Click **OK**.



Using the Configuration Utility *(continued)*

802.1x > Advanced Security Settings > EAP Types

EAP Type	Inner Authentication Protocol	Information needed for Authenticating
EAP-TLS		Certificate User Name
EAP-MSCHAPv2		User Name Password Domain Name
LEAP		User Name Password
EAP-TTLS	PAP	TTLS Identity User Name Password
	CHAP	TTLS Identity User Name Password
	MSCHAP	TTLS Identity User Name Password Domain Name
	MSCHAPv2	TTLS Identity User Name Password Domain Name

802.1x > Advanced Security Settings > EAP Types (continued)

EAP Type	Inner Authentication Protocol	Information needed for Authenticating
EAP-TTLS	EAP-MD5	TTLS Identity User Name Password
	EAP- Generic Token Card	TTLS Identity User Name Password
	EAP-MSCHAPv2	TTLS Identity User Name Password Domain Name
PEAP	EAP-MD5	User Name Password
	EAP-MSCHAPv2	User Name Password Domain Name
	EAP- Generic Token Card	User Name Password

802.1x > Advanced Security Settings > Definitions of Terms

Validate Server Certificate:

Check **Validate Server Certificate** to verify the identity of the authentication server based on its certificate when using EAP-TTLS, PEAP, and EAP-TLS. (This is checked by default.)

Certain protocols, such as EAP-TTLS, PEAP, and EAP-TLS, allow you to verify the identity of the authentication server as the server verifies your identity. This is called mutual authentication.

You can select trusted authentication server certificates using the **Add** button at the **Trusted CA List** (at the bottom of the **Advanced Security Settings** page).

Using the Configuration Utility *(continued)*

802.1x > Advanced Security Settings > Definitions of Terms (continued)

Domain Name:

Each server has a domain name that uniquely identifies it. That domain name is normally contained in the ***Subject CN*** field of the server certificate. A server domain name ends with the name of a larger administrative domain, to which the server belongs.

TTLS Identity:

EAP-TTLS has a unique feature that other protocols do not offer. Because it sets up an encrypted tunnel for your credentials, it is also able to pass your login name through that tunnel. That means that not only are your credentials secure from eavesdropping, but your identity is protected as well. Thus, with EAP-TTLS you have two identities: an inner one and an outer one. The inner identity is your actual user name. Your outer identity can be completely anonymous. Set your outer identity in the ***TTLS Identity*** field.

Trusted CA List:

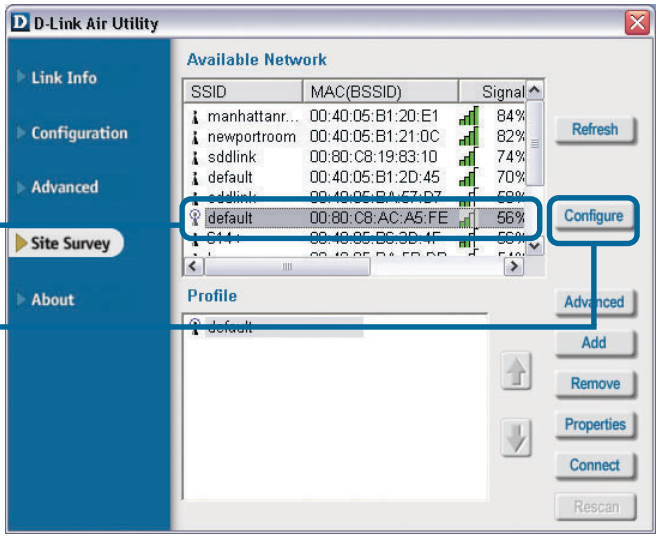
The **Trusted CA List** allows you to configure which authentication servers you trust for the purpose of logging you into the network.
Click **Add** at the **Trusted CA List** at the bottom of the *Advanced Security Settings* page. Select the **Trusted CA** that you want to add and click **OK**.

Using the Configuration Utility *(continued)*

Authentication > WPA

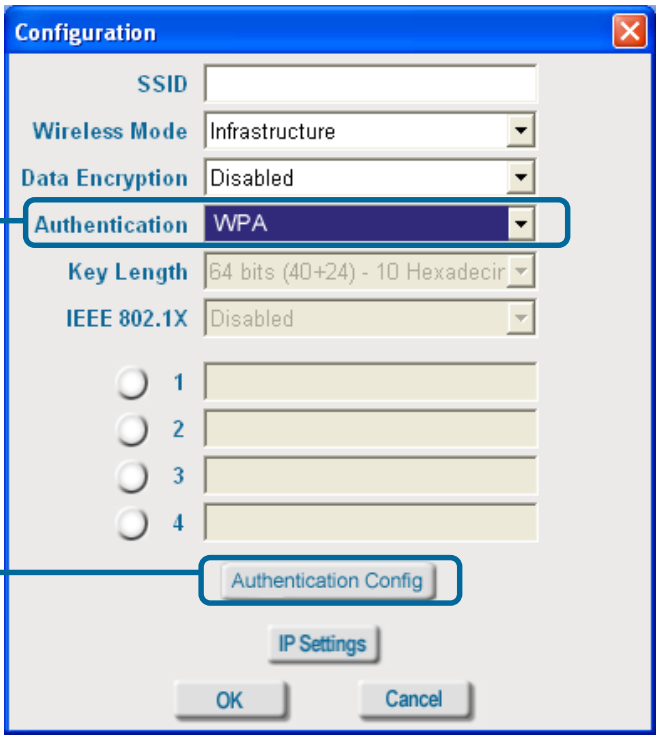
Select the available network to which you want to connect.

Click **Configure**.



Select **WPA** in the *Authentication* field.

Click **Authentication Config**



After you click **Authentication Config**, the *Advanced Security Settings* screen will appear. Complete the *Advanced Security Settings* configuration. Please see pages 17-20 of this manual to find out more about the *Advanced Security Settings*.

Using the Configuration Utility *(continued)*

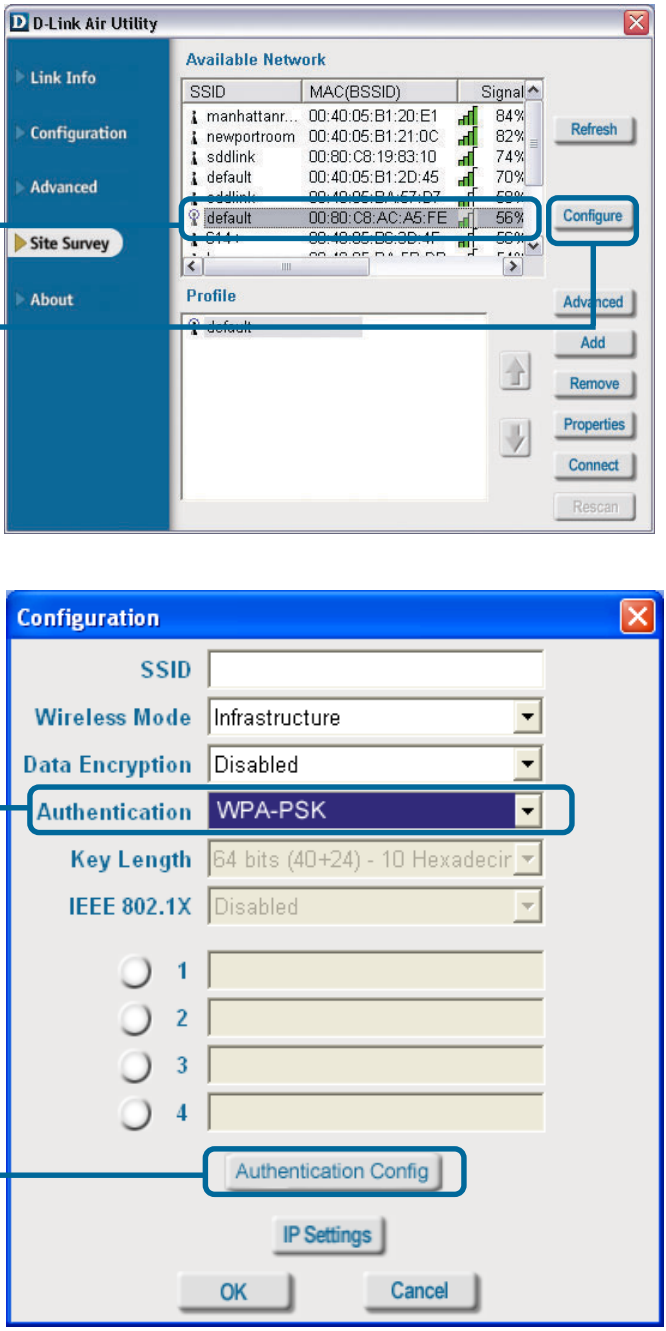
Select the available network to which you want to connect.

Click **Configure**.

WPA-PSK does not require a RADIUS Server in the network.

Select **WPA-PSK** in the *Authentication* field.

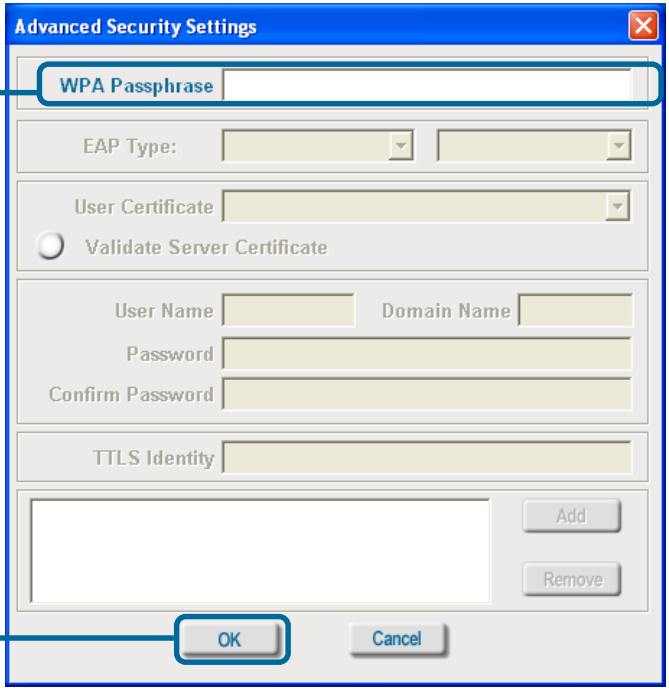
Click **Authentication Config**



Using the Configuration Utility *(continued)*

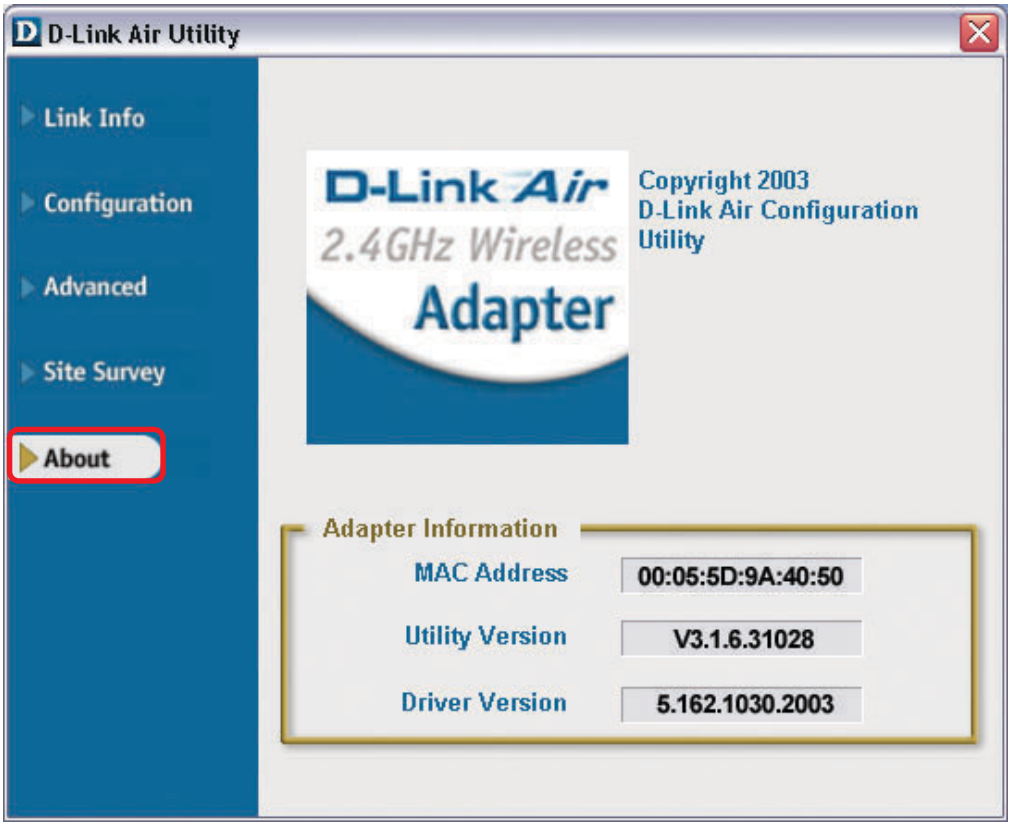
Enter the **WPA Passphrase**.

Click **OK**.
The configuration is done.



Using the Configuration Utility *(continued)*

About



The **ABOUT** screen gives you the MAC Address, Utility Version and the Driver Version of the DWL-610.

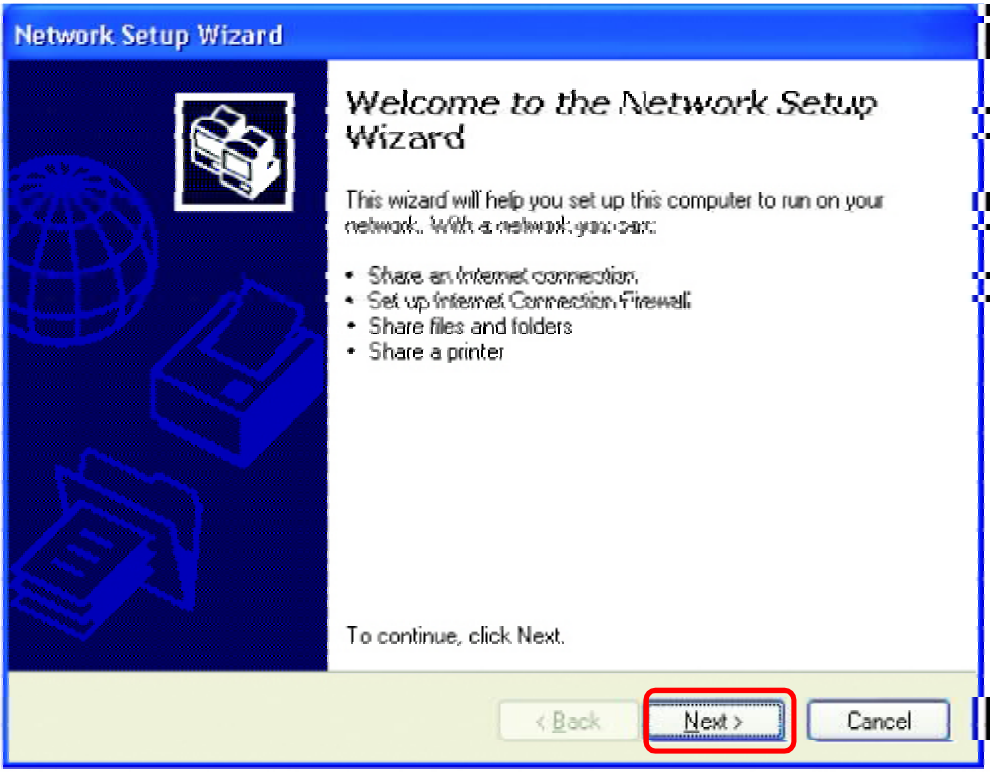
Networking Basics

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.**

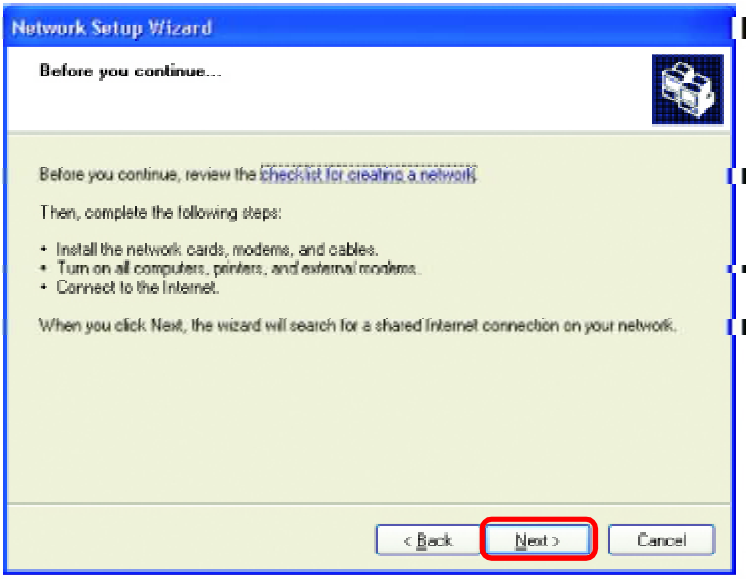
Note: Please refer to websites such as http://www.homenethelp.com and http://www.microsoft.com/windows2000 for information about networking computers using Windows 2000, ME or 98SE.

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



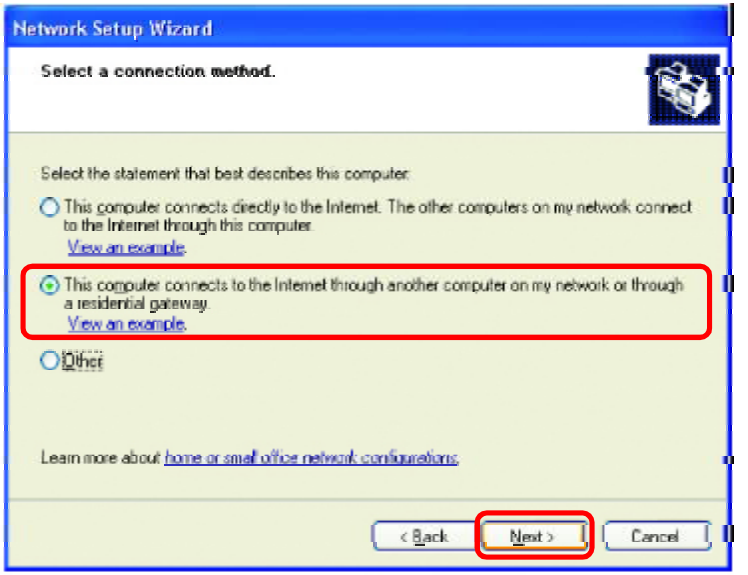
When this screen appears, click **Next.**

Please follow all the instructions in this window:



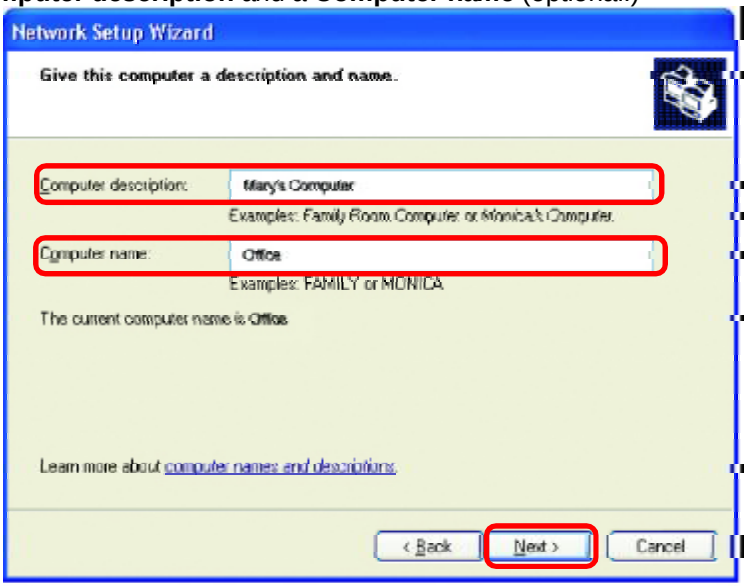
Click **Next**

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.



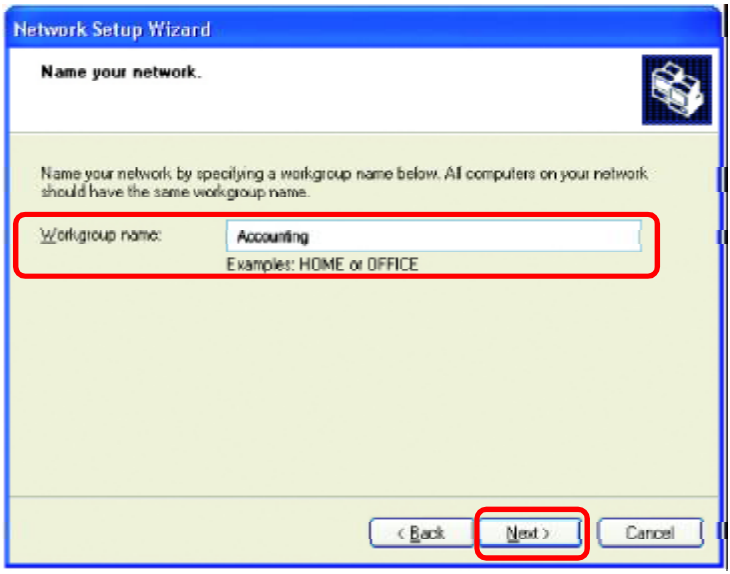
Click **Next**

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



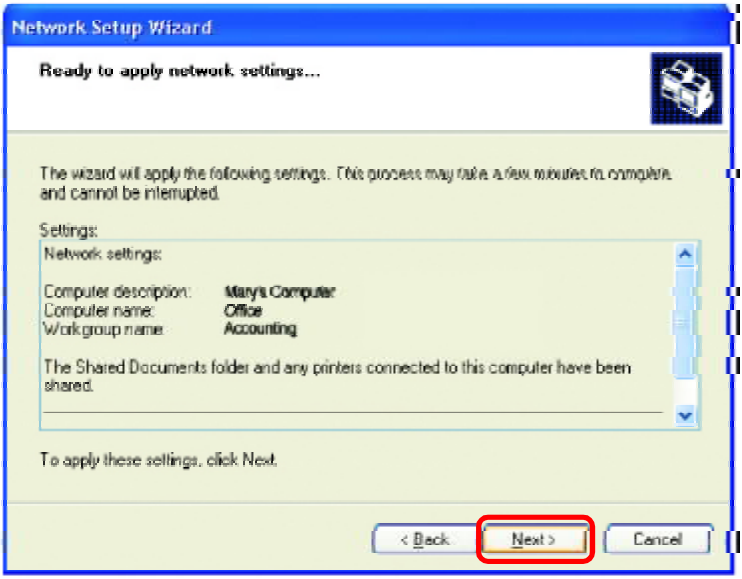
Click **Next**

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



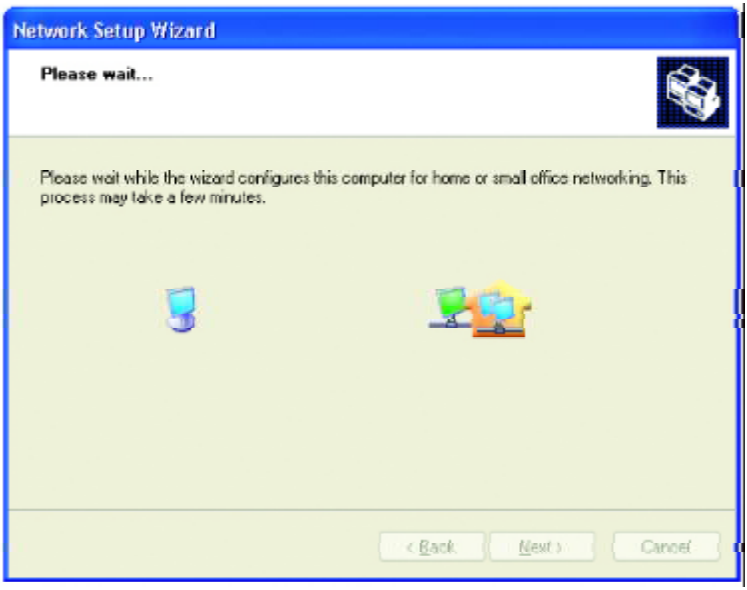
Click **Next**

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



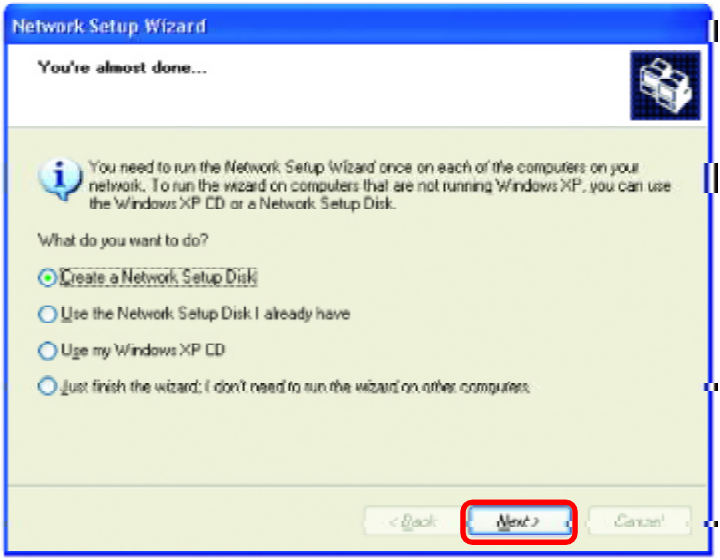
When the changes are complete, click **Next**.

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



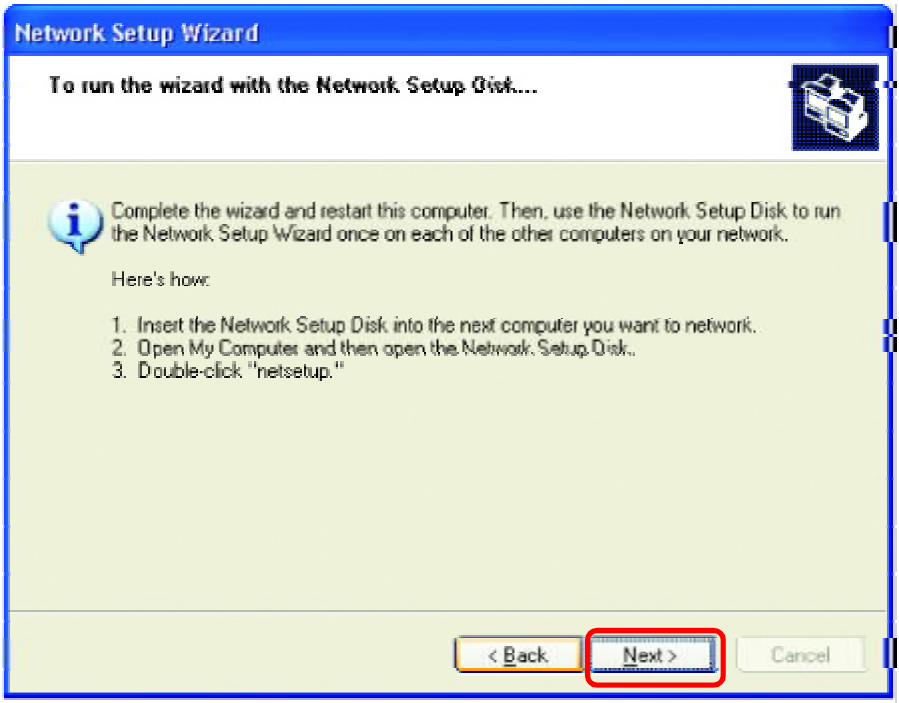
Networking Basics *(continued)*

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**.



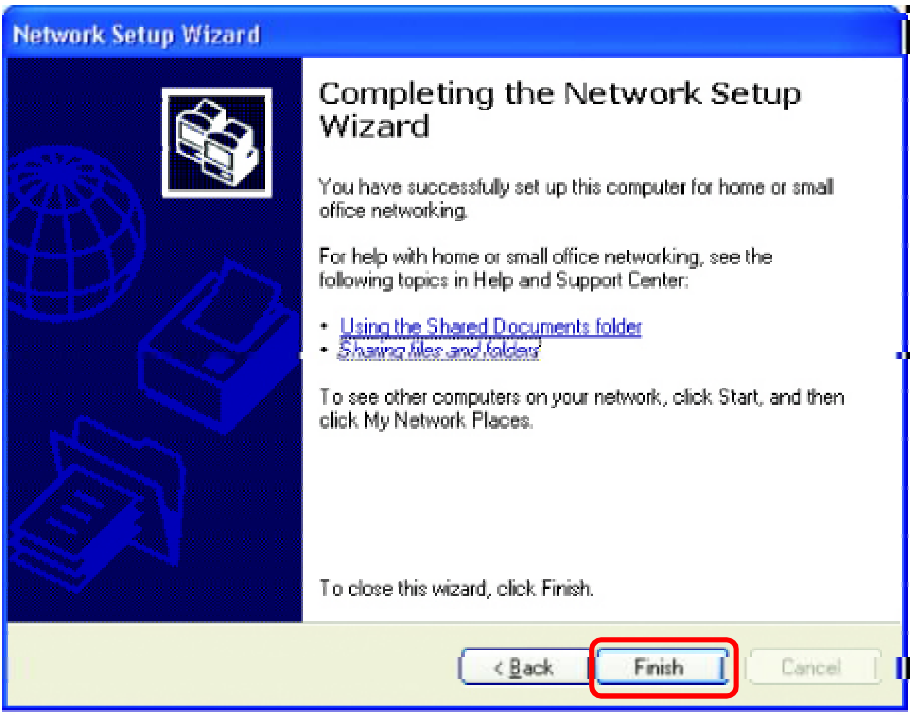
Insert a disk into the Floppy Disk Drive, in this case drive **A.**

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.**

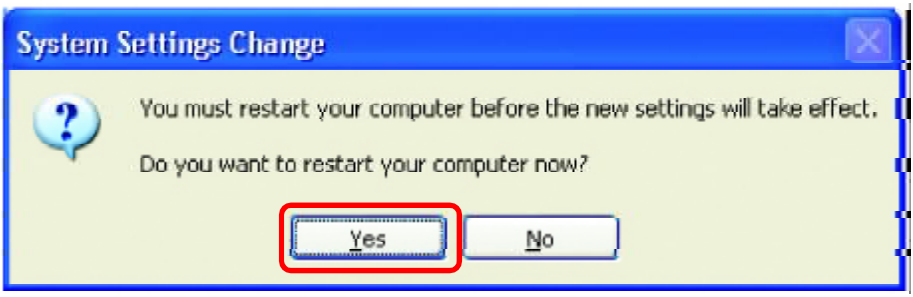


Networking Basics *(continued)*

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

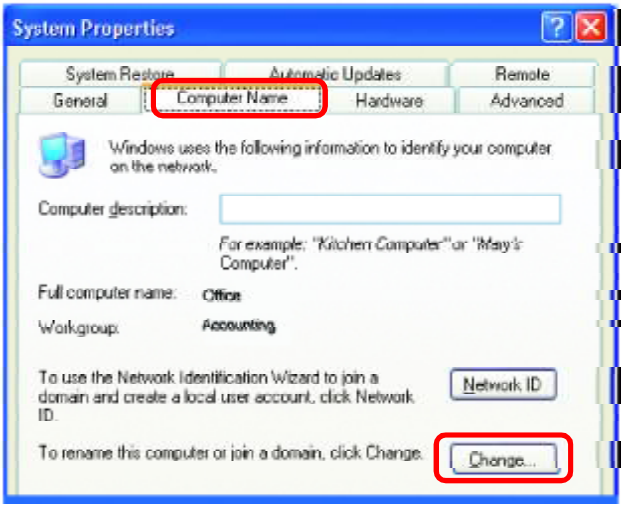
To name your computer, please follow these directions:In **Windows XP**:

- 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.

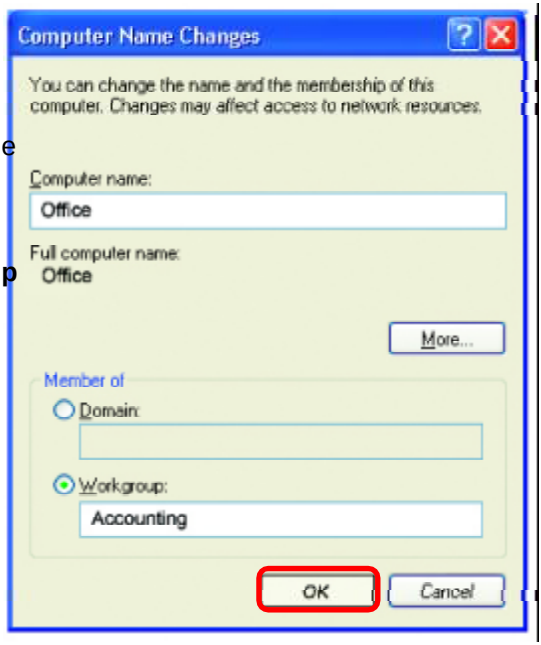
- You may enter a **Computer Description** if you wish; this field is optional.

- 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**



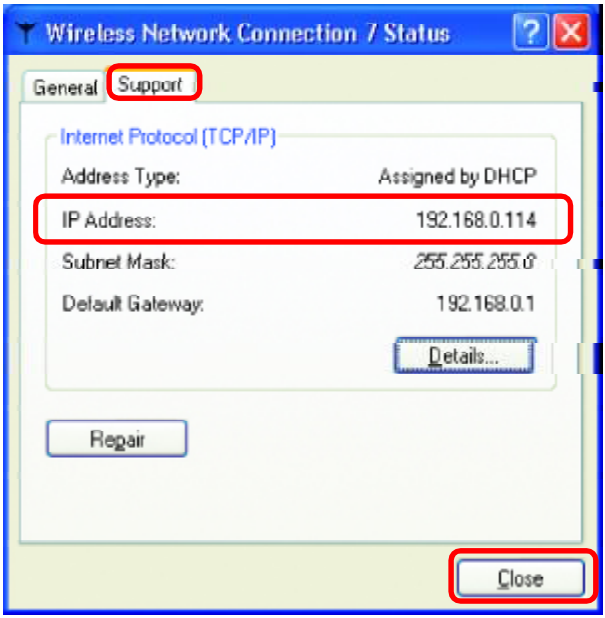
Checking the IP Address in Windows XP

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**

Checking the IP Address in Windows XP

This window will appear.



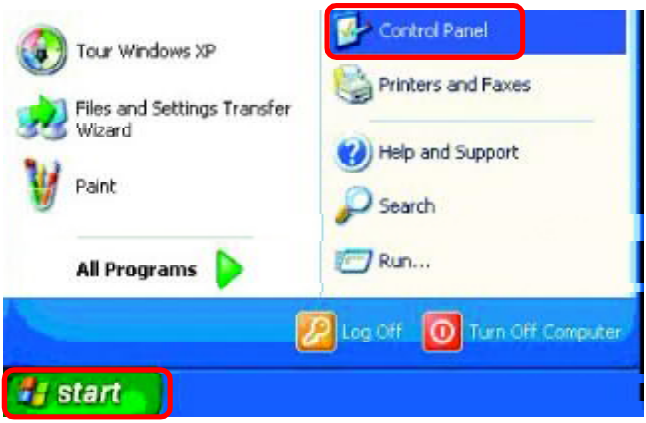
- Click the **Support tab**
- Click **Close**

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:

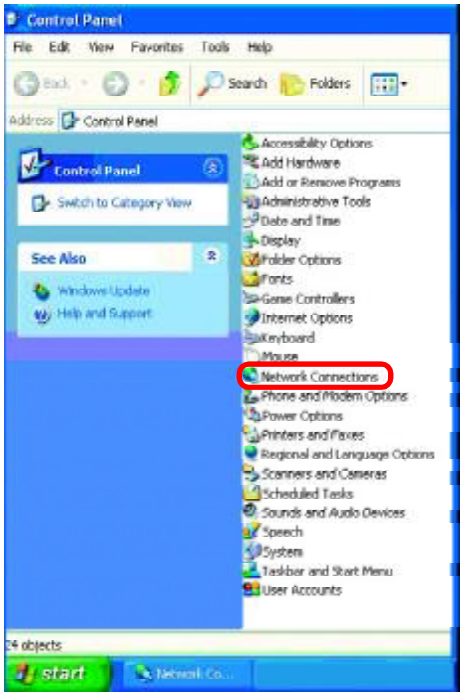
- Go to **Start**
- Double-click on **Control Panel**



Networking Basics *(continued)*

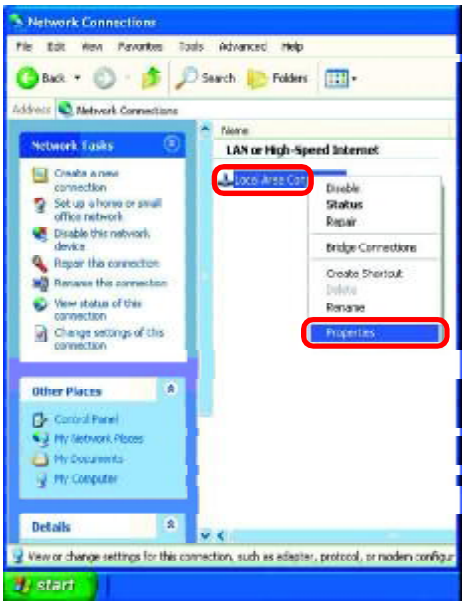
Assigning a Static IP Address in Windows XP/2000

- Double-click on **Network Connections**

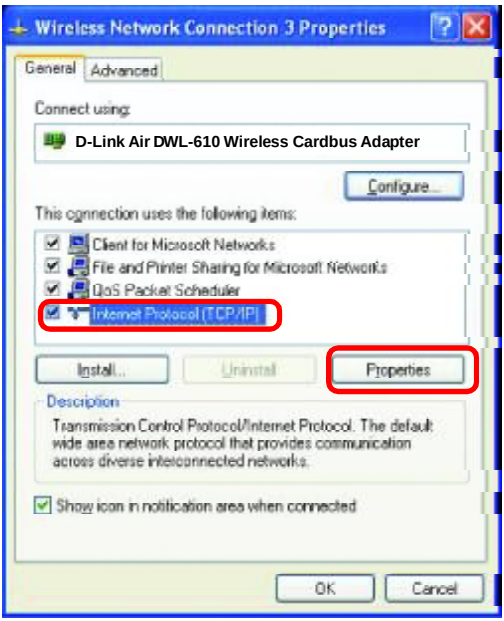


- Right-click on **Local Area Connections**

- Double-click on **Properties**



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



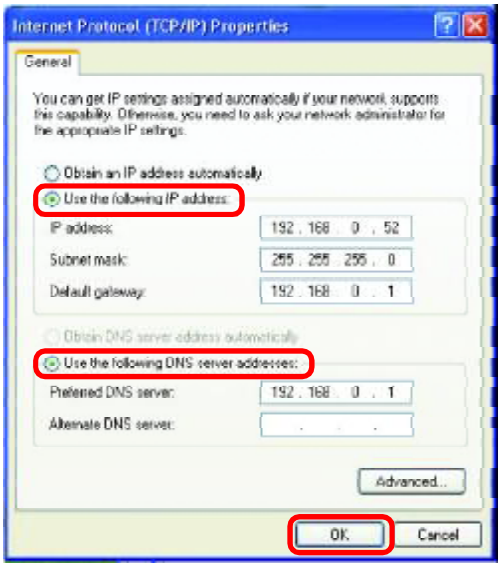
- Click on **Internet Protocol (TCP/IP)**
- Click **Properties**

- 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)



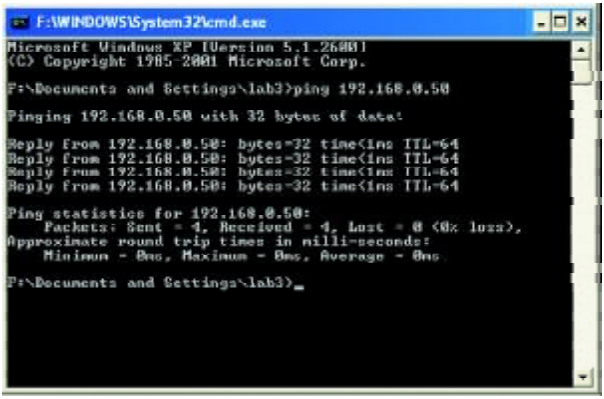
- Select **Use the following DNS server address**. Enter the LAN IP address of the Wireless Router. (D-Link wireless routers have a LAN IP address of 192.168.0.1)
- Click **OK**

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.)

Networking Basics *(continued)*

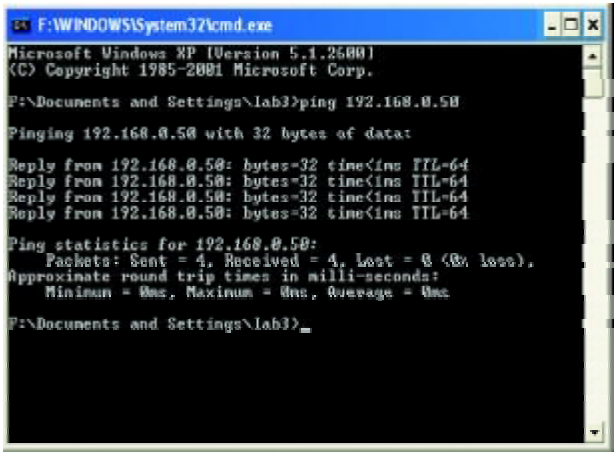
*Checking the Wireless Connection by Pinging in Windows XP and 2000**

- 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.



*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.



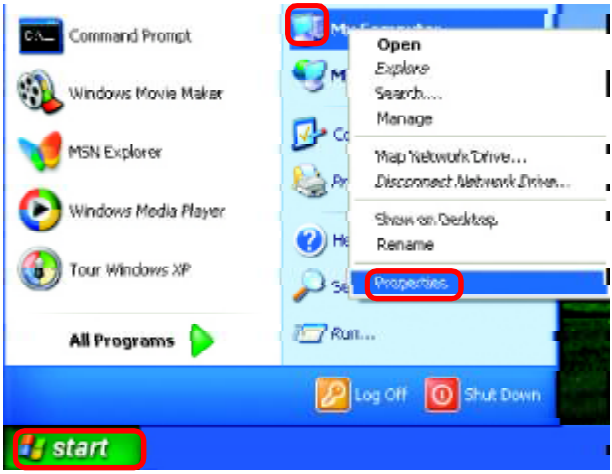
**You may be pinging different IP Addresses than the ones pictured here, however the procedure for pinging remains the same.)*

Troubleshooting

This chapter provides solutions to problems that can occur during the installation and operation of the DWL-610. Read the following descriptions if you are having problems. (The examples below are illustrated in Windows XP. If you have another operating system, these solutions will still apply although the appearance on your computer screen may differ.)

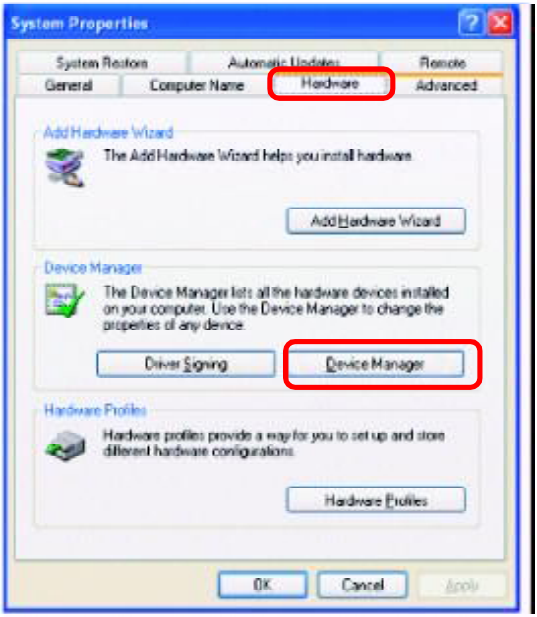
1. Check that the drivers for the DWL-610 are installed properly.

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



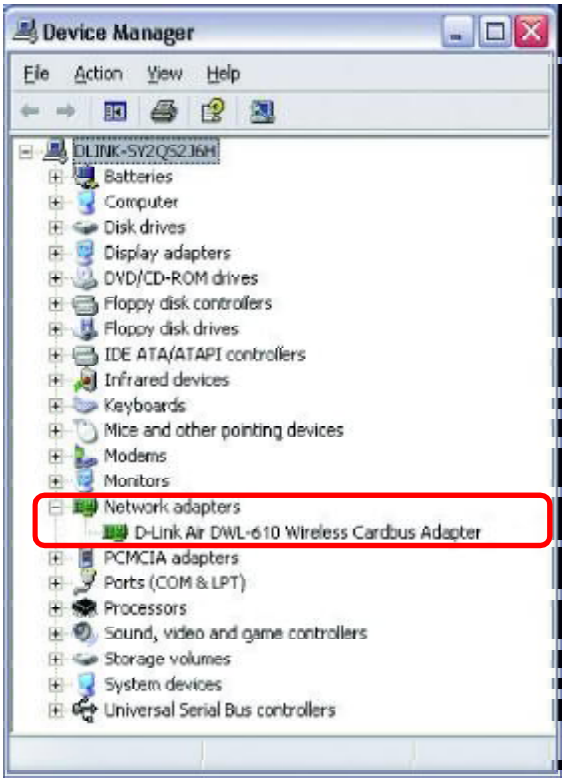
- Select the **Hardware Tab**

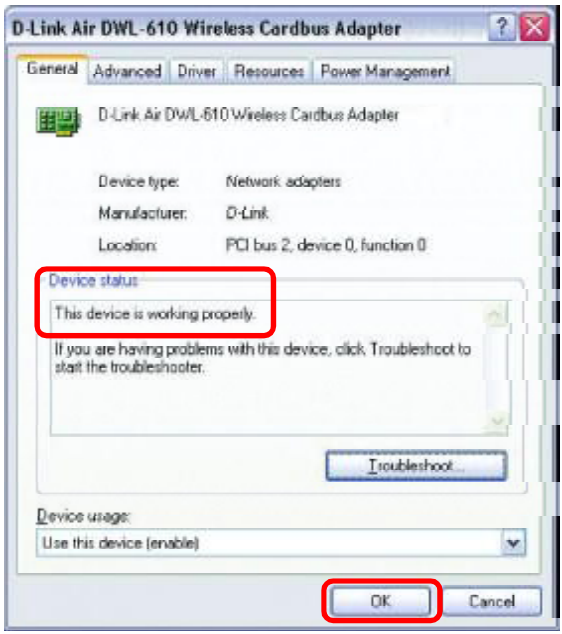
- Click **Device Manager**



Troubleshooting *(continued)*

- Double-click on **Network Adapters**
- Right-click on **D-Link *Air* DWL-610 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)*

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

- Make sure that the SSID on the DWL-610 Cardbus adapter is exactly the same as the SSID on the Access Point or wireless router.
- Move the DWL-610 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-610. Turn on the Access Point, and then turn on the computer with the DWL-610.
- Refresh the DWL-610 Utility

3. The DWL-610 Power and Link lights are not on.

- Check to see if the DWL-610 Cardbus adapter is firmly inserted into the Cardbus slot of your laptop.

4. I forgot my Encryption key.

- Reset the Access Point to its factory default settings and restore the DWL-610 Wireless Cardbus 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-610 Cardbus Adapter.

- Make sure that the DWL-610 Wireless Cardbus Adapter is properly seated in the laptop's Cardbus 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 the files **DWL650.INF** and **DWL650.SYS**. 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-610 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 and Air*Plus 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.

- 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-610 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-610.

- Move the DWL-610 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 802.11b

Temperature

- Operating: 32ºF to 131ºF (0ºC to 55ºC)
- Storing: -4ºF to 167ºF (-20ºC to 75ºC)

Humidity:

- Operating: 10% - 90%, non-condensing
- Storage: 5% - 95%, non-condensing

Antenna Type:

- Integrated Microstrip Antennas

Emissions:

- FCC part 15b

Physical Dimensions:

- L = 4.50 inches (114mm)
- W = 2.25 inches (54mm)
- H = .25 inches (6mm)

Weight:

- .095 lbs. (43g)

Adapter Type:

- PC Cardbus slot

Warranty:

- 1 Year

System Requirements:

- Laptop with Cardbus Controller
- Windows XP/2000/Me/98SE
- At least 32MB of memory and a 300 MHz processor
- An 802.11b Access Point (e.g., DWL-900AP+) for Infrastructure mode; or an 802.11b wireless adapter (e.g., DWL-510) for Ad-Hoc mode

Technical Specifications *(continued)*

Data Rates:

- 1, 2, 5.5, 11Mbps (with Automatic Fallback)

Operating Channels:

- 1-11 United States (FCC)

Encryption:

- Supports 64-bit or 128-bit WEP encryption

Frequency Range:

- 2.4 – 2.4835 GHz, Direct Sequence Spread Spectrum

Media Access Control:

- CSMA/CA with ACK

Transmit Output Power:

- 16dBm (40mW)

Receiver Sensitivity: Nominal Temp Range

- -83dBm for 11Mbps @ 8% PER (Packet Error Rate)
- -90dBm for 2Mbps @ 8% PER (Packet Error Rate)

Modulation Techniques

- CCK (11Mbps)
- CCK (5.5Mbps)
- DQPSK (2Mbps)
- DBSK (1Mbps)

Modulation:

- Direct Sequence Spread Spectrum

Range:

- Indoors - up to 328 feet (100 meters)*

Warranty and Registration

Wichtige Sicherheitshinweise

1. Bitte lesen Sie sich diese Hinweise sorgfaltig durch.
2. Heben Sie diese Anleitung fur den spatern Gebrauch auf.
3. Vor jedem Reinigen ist das Gerat vom Stromnetz zu trennen. Vervenden Sie keine Flussig- oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.
4. Um eine Beschadigung des Gerates zu vermeiden sollten Sie nur Zubehorteile verwenden, die vom Hersteller zugelassen sind.
5. Das Gerat is vor Feuchtigkeit zu schutzen.
6. Bei der Aufstellung des Gerates ist auf sichern Stand zu achten. Ein Kippen oder Fallen konnte Verletzungen hervorrufen. Verwenden Sie nur sichere Standorte und beachten Sie die Aufstellhinweise des Herstellers.
7. Die Beluftungsoffnungen dienen zur Luftzirkulation die das Gerat vor Uberhitzung schutzt. Sorgen Sie dafur, das diese Offnungen nicht abgedeckt werden.
8. Beachten Sie beim Anschlus an das Stromnetz die Anschlus werte.
9. Die Netzanschlus steckdose mus aus Grunden der elektrischen Sicherheit einen Schutzleiterkontakt haben.
10. Verlegen Sie die Netzanschlus leitung so, das niemand daruber fallen kann. Es sollete auch nichts auf der Leitung abgestellt werden.
11. Alle Hinweise und Warnungen die sich am Geraten befinden sind zu beachten.
12. Wird das Gerat uber einen langeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Uberspannung eine Beschadigung vermieden.
13. Durch die Luftungsoffnungen durfen niemals Gegenstande oder Flussigkeiten in das Gerat gelangen. Dies konnte einen Brand bzw. Elektrischen Schlag auslosen.
14. Offnen Sie niemals das Gerat. Das Gerat darf aus Grunden der elektrischen Sicherheit nur von authorisiertem Servicepersonal geoffnet werden.
15. Wenn folgende Situationen auftreten ist das Gerat vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu uberprufen:
    a Netzkabel oder Netzstecker sint beschadigt.
    b Flussigkeit ist in das Gerat eingedrungen.
    c Das Gerat war Feuchtigkeit ausgesetzt.
    d Wenn das Gerat nicht der Bedienungsanleitung ensprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
    e Das Gerat ist gefallen und/oder das Gehause ist beschadigt.
    f Wenn das Gerat deutliche Anzeichen eines Defektes aufweist.
16. Bei Reparaturen durfen nur Orginalersatzteile bzw. den Orginalteilen entsprechende Teile verwendet werden. Der Einsatz von ungeeigneten Ersatzteilen kann eine weitere Beschadigung hervorrufen.
17. Wenden Sie sich mit allen Fragen die Service und Repartur betreffen an Ihren Servicepartner. Somit stellen Sie die Betriebssicherheit des Gerates sicher.

Limited Warranty

Hardware:

D-Link warrants its hardware products to be free from defects in workmanship and materials, under normal use and service, for the following periods measured from date of purchase from D-Link or its Authorized Reseller:

Product Type	Warranty Period
Complete products	One year
Spare parts and spare kits	90 days

The one-year period of warranty on complete products applies on condition that the product's Registration Card is filled out and returned to a D-Link office within ninety (90) days of purchase. A list of D-Link offices is provided at the back of this manual, together with a copy of the Registration Card. Failing such timely registration of purchase, the warranty period shall be limited to 90 days.

If the product proves defective within the applicable warranty period, D-Link will provide repair or replacement of the product. D-Link shall have the sole discretion whether to repair or replace, and replacement product may be new or reconditioned. Replacement product shall be of equivalent or better specifications, relative to the defective product, but need not be identical. Any product or part repaired by D-Link pursuant to this warranty shall have a warranty period of not less than 90 days, from date of such repair, irrespective of any earlier expiration of original warranty period. When D-Link provides replacement, then the defective product becomes the property of D-Link.

Warranty service may be obtained by contacting a D-Link office within the applicable warranty period, and requesting a Return Material Authorization (RMA) number. If a Registration Card for the product in question has not been returned to D-Link, then a proof of purchase (such as a copy of the dated purchase invoice) must be provided. If Purchaser's circumstances require special handling of warranty correction, then at the time of requesting RMA number, Purchaser may also propose special procedure as may be suitable to the case.

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. The package must be mailed or otherwise shipped to D-Link with all costs of mailing/shipping/insurance prepaid; D-Link will ordinarily reimburse Purchaser for mailing/shipping/insurance expenses incurred for return of defective product in accordance with this warranty. D-Link shall never be responsible for any software, firmware, information, or memory data of Purchaser contained in, stored on, or integrated with any product returned to D-Link pursuant to this warranty.

Any package returned to D-Link without an RMA number will be rejected and shipped back to Purchaser at Purchaser's expense, and D-Link reserves the right in such a case to levy a reasonable handling charge in addition mailing or shipping costs.

Software:

Warranty service for software products may be obtained by contacting a D-Link office within the applicable warranty period. A list of D-Link offices is provided at the back of this manual, together with a copy of the Registration Card. If a Registration Card for the product in question has not been returned to a D-Link office, then a proof of purchase (such as a copy of the dated purchase invoice) must be provided when requesting warranty service. The term "purchase" in this software warranty refers to the purchase transaction and resulting licence to use such software.

D-Link warrants that its software products will perform in substantial conformance with the applicable product documentation provided by D-Link with such software product, for a period of ninety (90) days from the date of purchase from D-Link or its Authorized Reseller. D-Link warrants the magnetic media, on which D-Link provides its software product, against failure during the same warranty period. This warranty applies to purchased software, and to replacement software provided by D-Link pursuant to this warranty, but shall not apply to any update or replacement which may be provided for download via the Internet, or to any update which may otherwise be provided free of charge.

D-Link's sole obligation under this software warranty shall be to replace any defective software product with product which substantially conforms to D-Link's applicable product documentation. Purchaser assumes responsibility for the selection of appropriate application and system/platform software and associated reference materials. D-Link makes no warranty that its software products will work in combination with any hardware, or any application or system/platform software product provided by any third party, excepting only such products as are expressly represented, in D-Link's applicable product documentation as being compatible. D-Link's obligation under this warranty shall be a reasonable effort to provide compatibility, but D-Link shall have no obligation to provide compatibility when there is fault in the third-party hardware or software. D-Link makes no warranty that operation of its software products will be uninterrupted or absolutely error-free, and no warranty that all defects in the software product, within or without the scope of D-Link's applicable product documentation, will be corrected.

LIMITATION OF WARRANTIES

IF THE D-LINK PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, THE CUSTOMER'S SOLE REMEDY SHALL BE, AT D-LINK'S OPTION, REPAIR OR REPLACEMENT. THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. D-LINK NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION MAINTENANCE OR USE OF D-LINK'S PRODUCTS.

D-LINK SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY THE CUSTOMER'S OR ANY THIRD PERSON'S MISUSE, NEGLECT, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO REPAIR, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING OR OTHER HAZARD.

LIMITATION OF LIABILITY

IN NO EVENT WILL D-LINK BE LIABLE FOR ANY DAMAGES, INCLUDING LOSS OF DATA, LOSS OF PROFITS, COST OF COVER OR OTHER INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES ARISING OUT THE INSTALLATION, MAINTENANCE, USE,

PERFORMANCE, FAILURE OR INTERRUPTION OF A D- LINK PRODUCT, HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY. THIS LIMITATION WILL APPLY EVEN IF D-LINK HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

IF YOU PURCHASED A D-LINK PRODUCT IN THE UNITED STATES, SOME STATES DO NOT ALLOW THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

D-Link Offices for Registration and Warranty Service

The product's Registration Card, provided at the back of this manual, must be sent to a D-Link office. To obtain an RMA number for warranty service as to a hardware product, or to obtain warranty service as to a software product, contact the D-Link office nearest you. An addresses/telephone/fax list of D-Link offices is provided in the back of this manual.

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Federal Communication Commission Interference Statement

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

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

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

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

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

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

CE Mark Warning

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

Warnung!

Dies ist ein Produkt der Klasse A. Im Wohnbereich kann dieses Produkt Funkstoerungen verursachen. In diesem Fall kann vom Benutzer verlangt werden, angemessene Massnahmen zu ergreifen.

Precaucion!

Este es un producto de Clase A. En un entorno domestico, puede causar interferencias de radio, en cuyo case, puede requerirse al usuario para que adopte las medidas adecuadas.

Attention!

Ceci est un produit de classe A. Dans un environnement domestique, ce produit pourrait causer des interferences radio, auquel cas l'utilisateur devrait prendre les mesures adequates.

Attenzione!

Il presente prodotto appartiene alla classe A. Se utilizzato in ambiente domestico il prodotto puo causare interferenze radio, nel cui caso e possibile che l'utente debba assumere provvedimenti adeguati.

BSMI Warning

警 告 使 用 者

這是甲類的資訊產品,在居住的環境中使用時,可能會造成射頻干擾,在這種情況下使用者會被要求採取某些適當的對策.

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