

Manual

Version 1.00

DWL-G650M

Wireless 108G MIMO Notebook Adapter



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Package Contents



- **D-Link DWL-G650M 108G MIMO**
Wireless Notebook Adapter
- Manual on CD
- Printed Quick Installation Guide

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

Minimum System Requirements

- A computer or laptop with an available 32-bit Cardbus slot
- Windows XP/2000
- At least 64MB of memory and a 500MHz processor
- An 802.11g or 802.11b access point (for Infrastructure mode), or another 802.11g or 802.11b wireless adapter (for Ad-Hoc, Peer-to-Peer networking mode.)

Introduction

The D-Link DWL-G650M 108G MIMO Wireless Notebook Adapter is an 802.11g high-performance, wireless adapter that brings wireless networking to your laptop or desktop PC.

With a maximum wireless signal rate of up to 108Mbps, you can connect to a wireless network at home, at the office or at any wireless hotspot. Now you can stay connected wherever you are and wherever you go.

The DWL-G650M is Wi-Fi compatible, meaning that it can connect and interoperate with other 802.11b and 802.11g Wi-Fi-compliant wireless routers, access points and adapters. The DWL-G650M connects to any available Cardbus slot on a laptop Windows-based computer. A laptop computer with a DWL-G650M can be positioned virtually anywhere at a workstation to achieve the best available wireless signal reception - whether that workstation is in your office, on your deck or patio, by the pool, at the local coffee shop, or in an airport terminal while waiting to board your next flight.

The adapter works with Microsoft Windows XP/2000 operating systems to ensure that you'll be up and running on a wireless network in just a matter of seconds.

The DWL-G650M provides an increased level of security with WPA-PSK. **WPA-Personal** is directed at home users who do not have the server based equipment required for user authentication. The method of authentication is similar to WEP because you define a "Pre-Shared Key" on the wireless router/AP. Once the pre-shared key is confirmed and satisfied on both the client and access point, then access is granted. the encryption method used is referred to as the Temporal Key Integrity Protocol (TKIP), which offers per-packet dynamic hashing. It also includes an integrity checking feature which ensures that the packets were not tampered with during wireless transmission.

*Maximum wireless signal rate derived from IEEE Standard 802.11g specifications. Actual data throughput will vary. Network conditions and environmental factors lower actual data throughput rate.



Features and Benefits

- Provides maximum wireless signal rate of up to 108Mbps*
- Fully 802.11b/802.11g compatible.
- **Better Security with WPA-PSK** - In addition to 64-,128-bit WEP encryption, you can also securely connect to a wireless network using WPA-PSK.
- Utilizes Smart Antenna technology.
- Supports Infrastructure networks via an access point and Peer-to-Peer communication in Ad-Hoc mode.
- User-friendly configuration and diagnostic utilities.

**Maximum wireless signal rate derived from IEEE Standard 802.11g specifications. Actual data throughput will vary. Network conditions and environmental factors lower actual data throughput rate.*

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 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 to 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.

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.

Standards-Based Technology

The DWL-G650M Wireless Cardbus Adapter utilizes the **802.11g** standard.

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

This means that in most environments, within the specified range of this device, you will be able to transfer large files quickly or even watch a movie in MPEG format over your network without noticeable delays. This technology works by transmitting high-speed digital data over a radio wave utilizing **OFDM (Orthogonal Frequency Division Multiplexing)** technology. **OFDM** works by splitting the radio signal into multiple smaller sub-signals that are then transmitted simultaneously at different frequencies to the receiver. **OFDM** reduces the amount of **crosstalk** (interference) in signal transmissions. The D-Link DWL-G650M will automatically sense the best possible connection speed to ensure the greatest speed and range possible.

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

The DWL-G650M is backwards compatible with 802.11b devices. This means that if you have an existing 802.11b network, the devices in that network will be compatible with 802.11g devices at speeds up to 11Mbps in the 2.4GHz range. Also based on the IEEE **802.11b** standard, the DWL-G650M is interoperable with existing compatible 2.4GHz wireless technology with data transfer speeds of up to 11Mbps.

Installation Considerations

The DWL-G650M 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:

- Keep the number of walls and ceilings between the DWL-G650M and other network devices to a minimum - each wall or ceiling can reduce your DWL-G650M's range from 3-90 feet (1-30 meters.) Position your devices so that the number of walls or ceilings is minimized.
- 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.
- 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.
- Keep your product away (at least 3-6 feet or 1-2 meters) from electrical devices or appliances that generate RF noise.



Getting Started

There are basically two modes of networking:

Infrastructure – using an access point or router, such as the DI-624M.

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-G650M 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 108G MIMO DI-624M**
- Laptop computers with a **D-Link 108G MIMO DWL-G650M**
- A cable modem - **D-Link DCM-202**



Setting up a Wireless Infrastructure Network

For a typical wireless setup at home, 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 DWL-G650M 108G MIMO Wireless Notebook Adapter into an available cardbus slot on your laptop computer.
(See the *Quick Installation Guide* included with the DWL-G650M.)
- 5** Install another D-Link DWL-G650M 108G MIMO Wireless Notebook Adapter into an available cardbus slot on your laptop computer.
(See the *Quick Installation Guide* included with the DWL-G650M.)

Setting up a Wireless Ad-Hoc Network



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

- 1** Install the **D-Link DWL-G650M 108G MIMO** Wireless Notebook adapter into the laptop computer. *(See the Quick Installation Guide included with the product.)*
- 2** Install the **D-Link DWL-G650M 108G MIMO** Wireless Notebook adapter into the 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.

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 DWL-G650M 108G MIMO Wireless Notebook adapter 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-G650M (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 Technology > D-Link Wireless 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.

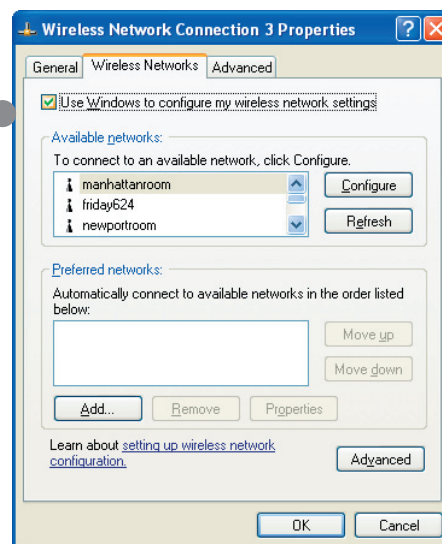
In the window that appears, select **View Available Wireless Networks** and click the **Advanced** button. The screen at right will appear.

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.

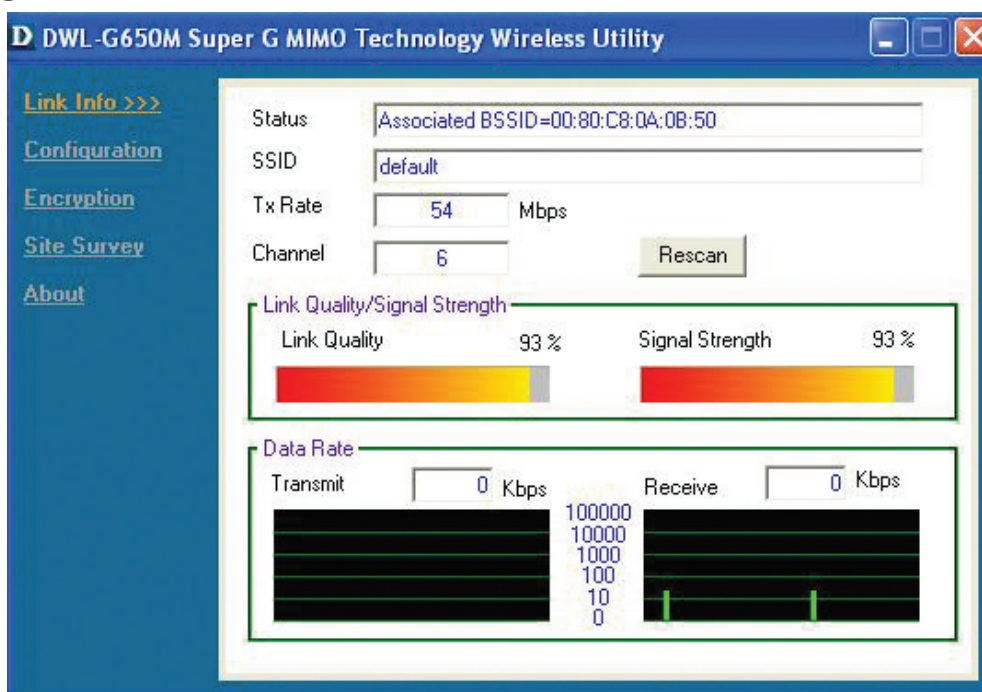
If the icon does not display in the taskbar, then click on this icon on your desktop to open.



*Configuration Utility icon in the system tray



Link Info



Status: Displays the MAC address of the access point or router to which the DWL-G650M is associated.

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

Tx Rate: The default setting is **Auto**; Tx Rate settings are automatically determined for a maximum wireless signal rate of up to 54Mbps (108Mbps* in Turbo mode).

Channel: The default setting is **Auto**. The channel selection is automatically determined by the DWL-G650M.

Rescan: Rescans for the strongest signal with the current SSID and associates with that access point or router.

Link Quality: Displays the Link Quality of the DWL-G650M's wireless connection to the access point or router.

Signal Strength: Displays the signal strength and the link quality of the DWL-G650M's wireless connection to the access point or router

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

Configuration

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

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.)

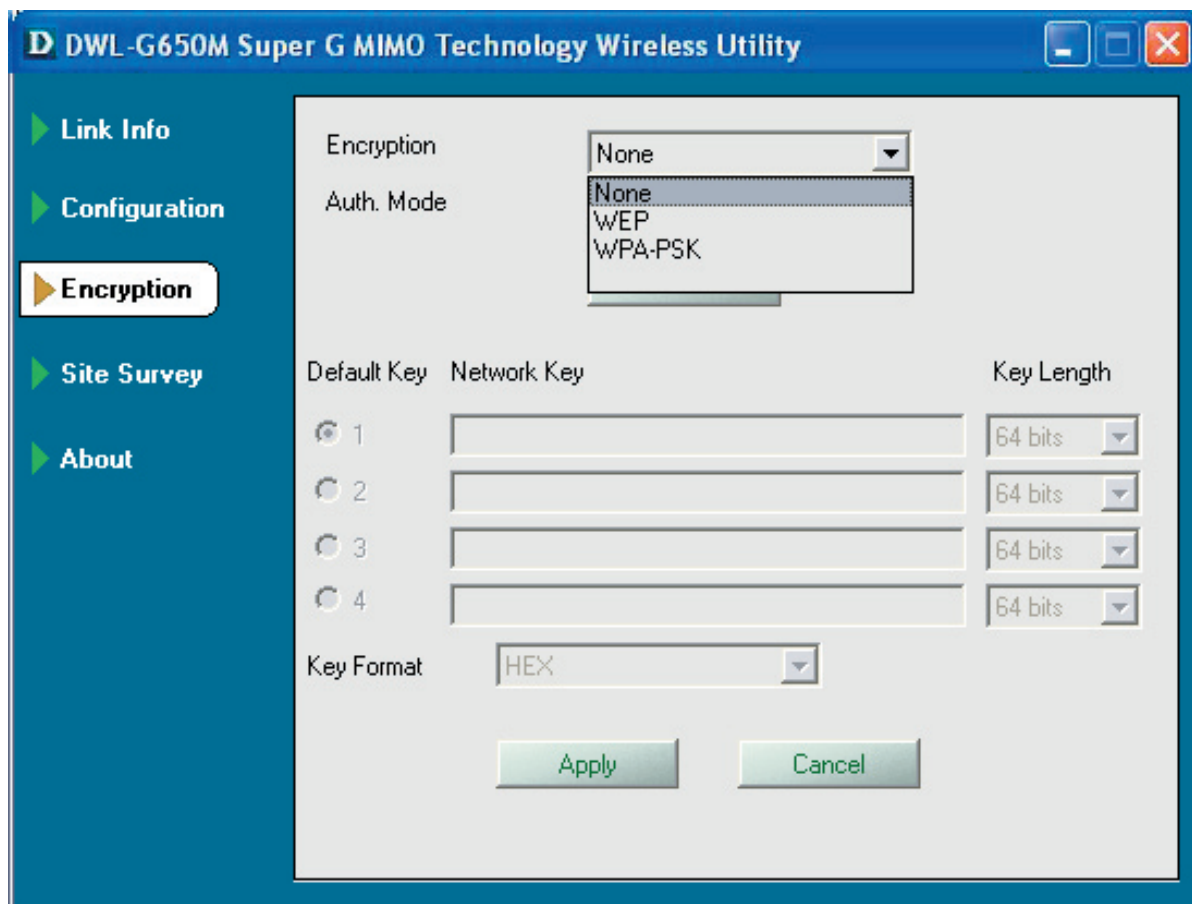
Channel: The channel selection is automatically determined by the DWL-G650M. When in Ad-Hoc mode, you may select a channel manually. The default channel is 6.

Tx Rate: The default setting is Auto. These settings are automatically determined for the maximum wireless signal rate.

Preamble: **Preamble Type** - By default the preamble is set to *Short and Long Preamble*. The preamble defines the length of the CRC block (Cyclic Redundancy Check) used in communication between the access point and the wireless network adapters. CRC is a common technique for detecting data transmission errors. High traffic networks should use the shorter preamble type. The DWL-G650M will automatically determine the best Preamble length.

Power Mode: Continuous Access Mode is the default setting. For best results leave this setting at the default.

Encryption



Encryption: Select the Encryption mode here. The choices are: WEP, WPA-PSK or None. When WPA or WPA-PSK is selected, click **Config** and the pop-up windows, shown on the following pages, will appear on your screen.

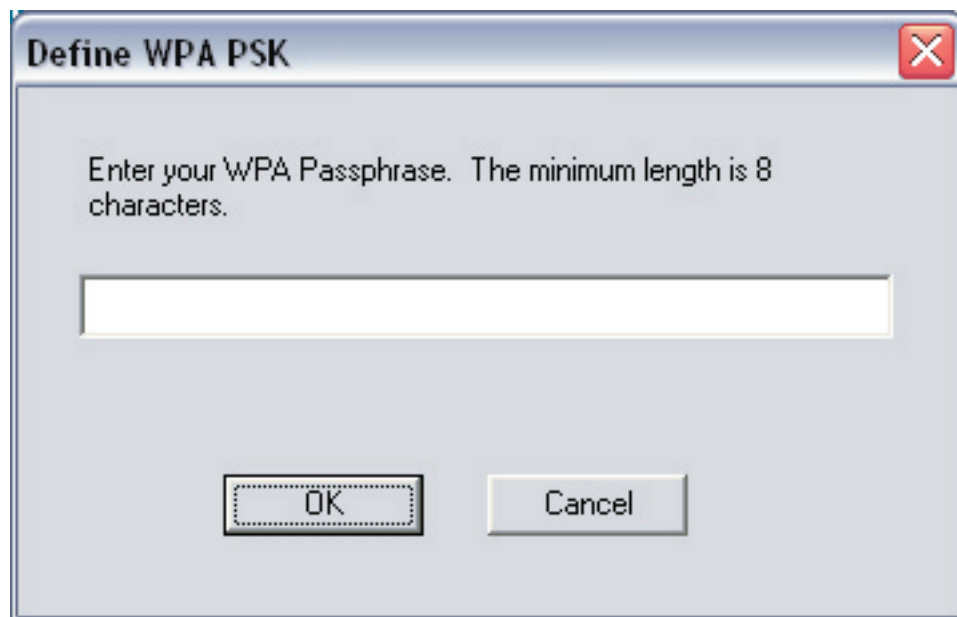
Auth. Mode: Choose one of the following modes:
Open Authentication – the DWL-G650M is visible to all devices on the network.
Shared Authentication – allows communication only with other devices with identical WEP settings.
Auto – the DWL-G650M will automatically select the best Authentication mode for your network.

Config: When you select WPA-PSK in the Auth. Mode pulldown menu, click **Config**. The popup windows shown on the following pages will appear.

Encryption-WPA-PSK

When you select WPA-PSK in the Encryption window, the screen below will appear. Suitable for the home user, WPA-PSK (WPA Pre-Shared Key) is a superior form of security that does not require a RADIUS server in the network.

By using TKIP (Temporal Key Integrity Protocol), the security keys change at set intervals, creating a network that is more secure than one that utilizes WEP encryption

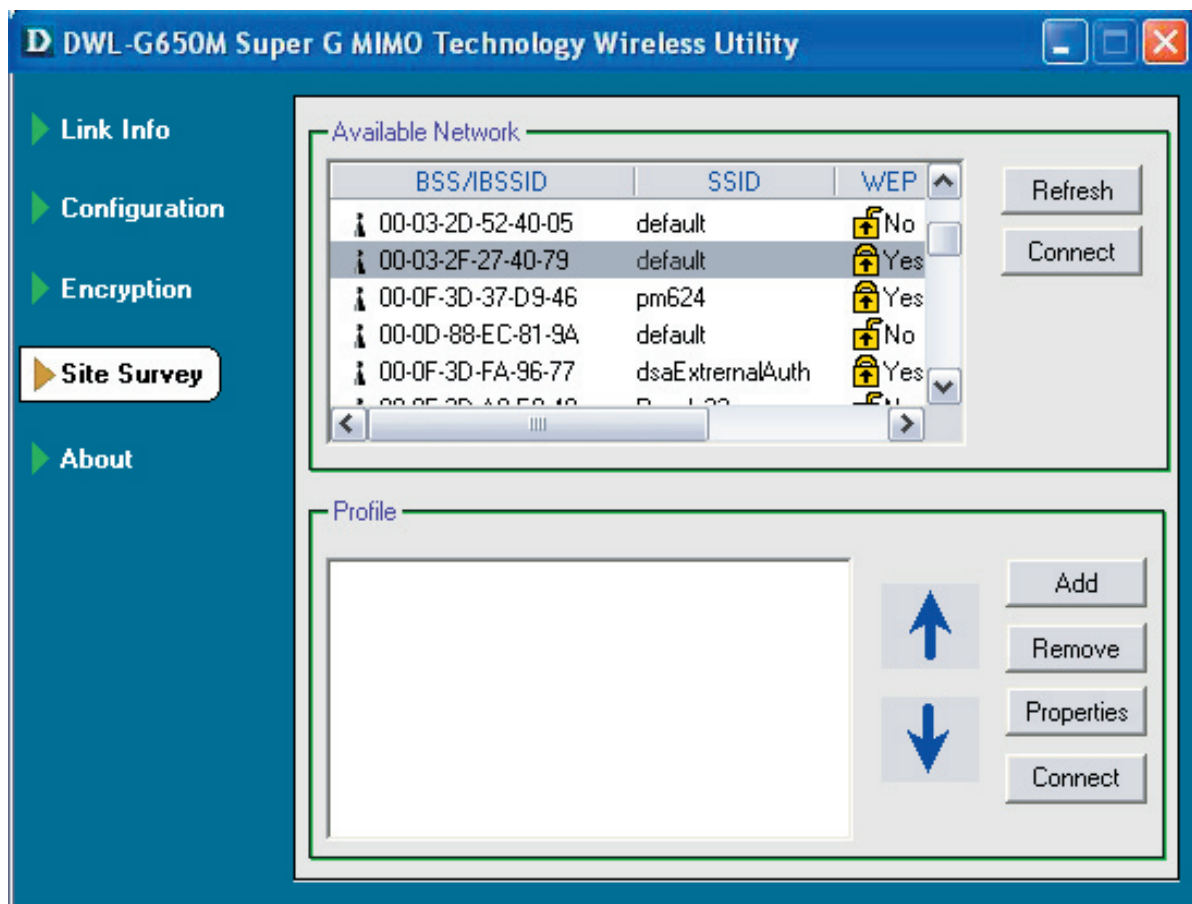


Define WPA PSK: Enter the WPA Passphrase.* All the devices on the network must share this same passphrase in order to communicate on the network.

OK: Click OK to save the passphrase.

*Hint: The longer the key, the more secure your network will be.

Site Survey



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. 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. When you click **Add**, **Properties** or **Connect**, the popup screen on the next page will appear for configuration purposes.

Refresh:

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

Connect:

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

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:

Click to configure properties on the popup screen on the next page.

Connect:

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

Site Survey - Profile Configuration

When you click **Add**, **Properties** or **Connect** in the **Site Survey** or **Encryption** screen, this popup screen appears for configuration purposes.

Profile Name: Enter a name for the network profile here.

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

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.)

Channel: The channel selection is automatically determined by the DWL-G650M.

Tx Rate: The default setting is Auto. These settings are automatically determined for the maximum wireless signal rate.

Power Mode: Continuous Access Mode is the default setting. For best results leave this setting at the default.

Site Survey - Profile Configuration

- Data Encryption:** Select the Encryption mode here. The choices are: WEP, WPA, WPA-PSK. When WPA or WPA-PSK is selected, click **Config** and the pop-up windows, shown on the following pages, will appear on your screen.
- Auth. Mode:** Choose one of the following modes:
Open Authentication – the DWL-G650M is visible to all devices on the network.
Shared Authentication – allows communication only with other devices with identical WEP settings.
Auto – the DWL-G650M will automatically select the best Authentication mode for your network.
- Config:** When you select WPA or WPA-PSK in the Auth. Mode pulldown menu, click **Config**. The popup windows shown on the previous pages will appear.
- Auth. Mode:** Select Open, Shared or Auto.
- Default Key:** Of the four WEP keys entered, select one key as the default key.
- Network Key:** Enter the WEP key here.
- Key Length:** Select the Key length here, either 64-, 128-bits.
- Key Format:** Select Hexadecimal or ASCII format.
- OK:** Click OK to save the settings.

About



About: The About screen displays the MAC address, Utility version and the Driver version of the DWL-G650M.

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**.

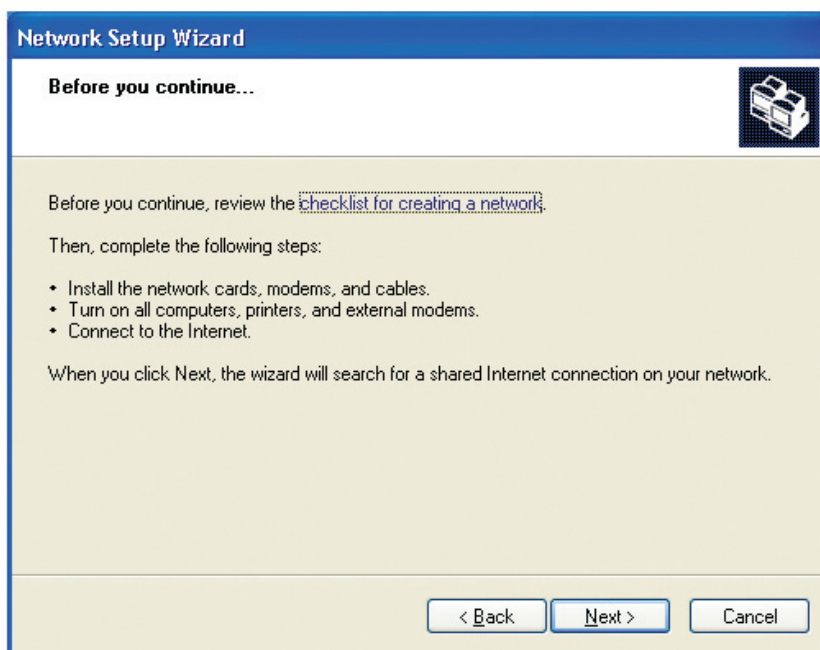
Note: Please refer to websites such as <http://www.homenethelp.com> and <http://www.microsoft.com/windows2000> for information about networking computers using Windows 2000,/Me/98SE.

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



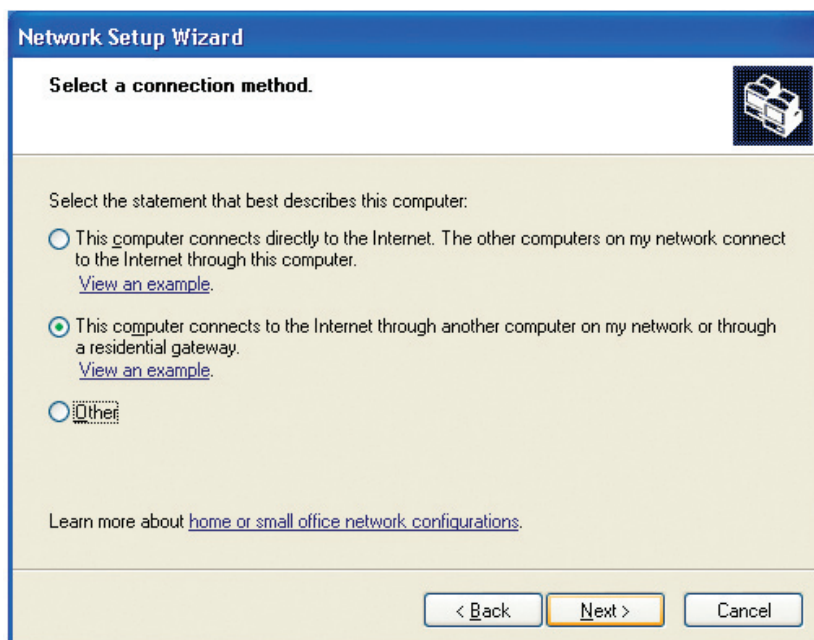
When this screen appears, click **Next**.

Please follow all the instructions in this window:



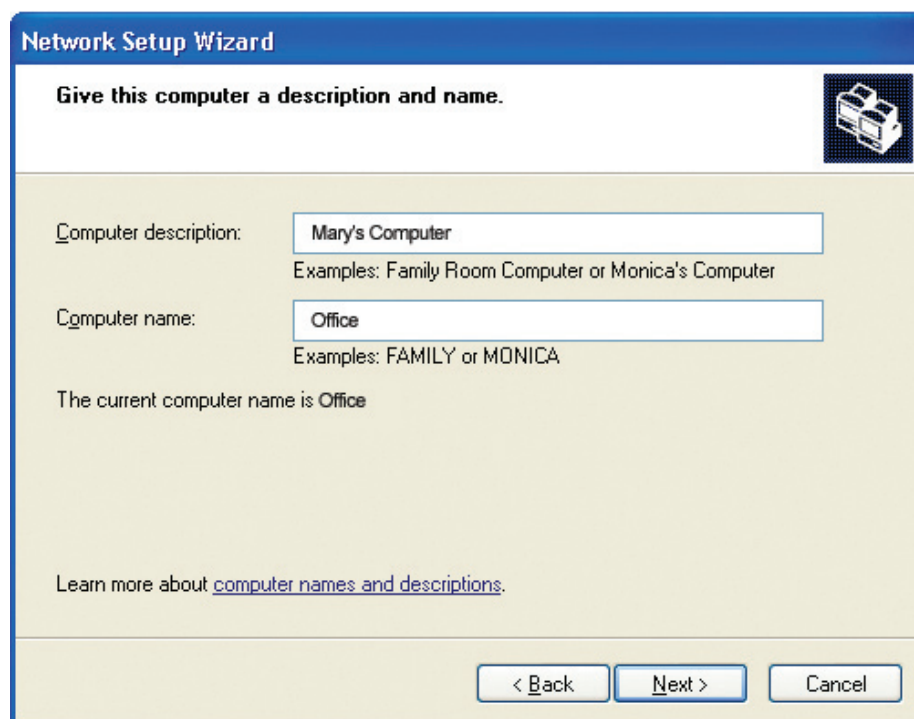
Click **Next**.

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



Click **Next**.

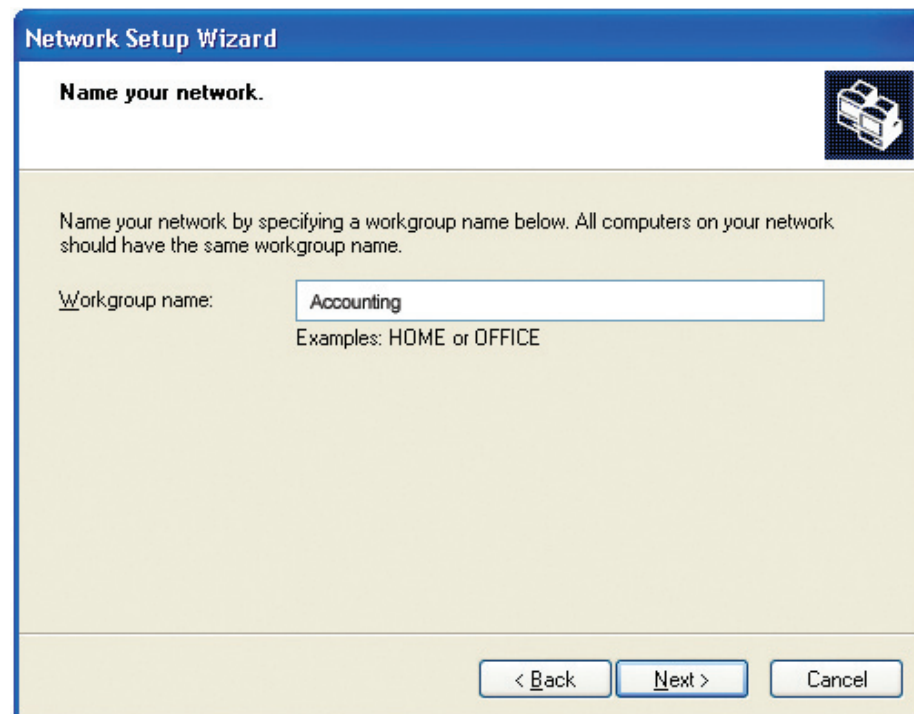
Enter a **Computer description** and a **Computer name** (optional.)



The image shows a screenshot of the 'Network Setup Wizard' dialog box. The title bar is blue with the text 'Network Setup Wizard'. The main area has a light beige background. At the top, it says 'Give this computer a description and name.' with a small icon of a computer. Below this, there are two text input fields. The first is labeled 'Computer description:' and contains the text 'Mary's Computer'. Below it, it says 'Examples: Family Room Computer or Monica's Computer'. The second is labeled 'Computer name:' and contains the text 'Office'. Below it, it says 'Examples: FAMILY or MONICA'. Further down, it says 'The current computer name is Office'. At the bottom, there is a link that says 'Learn more about [computer names and descriptions](#).' and three buttons: '< Back', 'Next >', and 'Cancel'.

Click **Next**.

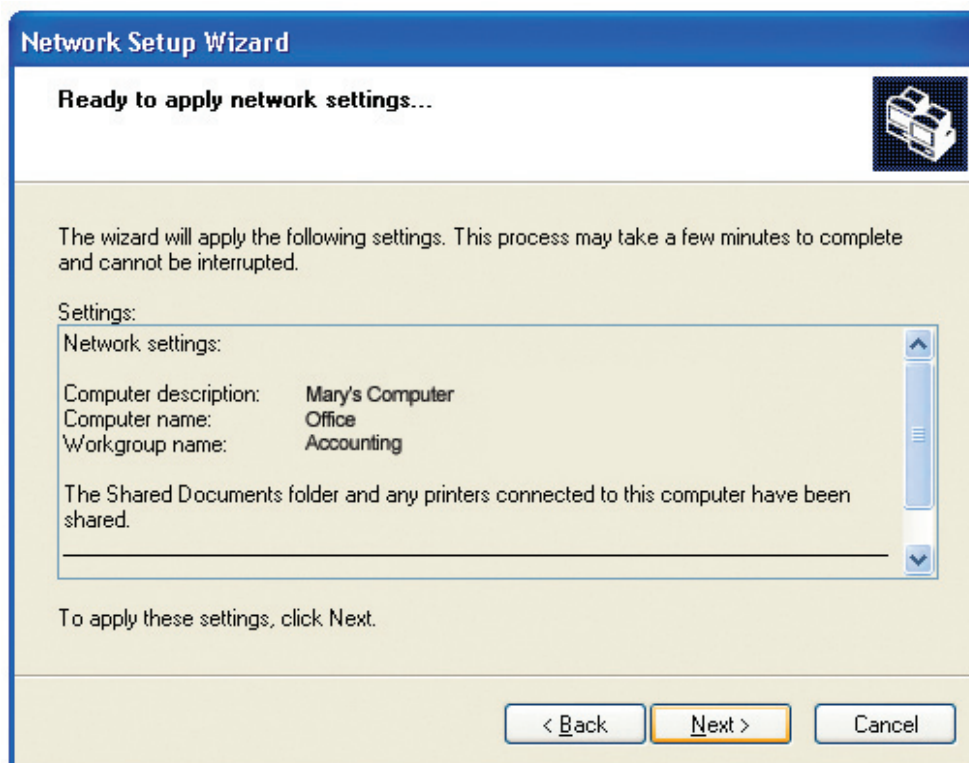
Enter a **Workgroup** name. All computers on your network should have the same **Workgroup name**.



The image shows a screenshot of the 'Network Setup Wizard' dialog box. The title bar is blue with the text 'Network Setup Wizard'. The main area has a light beige background. At the top, it says 'Name your network.' with a small icon of a computer. Below this, it says 'Name your network by specifying a workgroup name below. All computers on your network should have the same workgroup name.' Below this, there is a text input field labeled 'Workgroup name:' which contains the text 'Accounting'. Below it, it says 'Examples: HOME or OFFICE'. At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'.

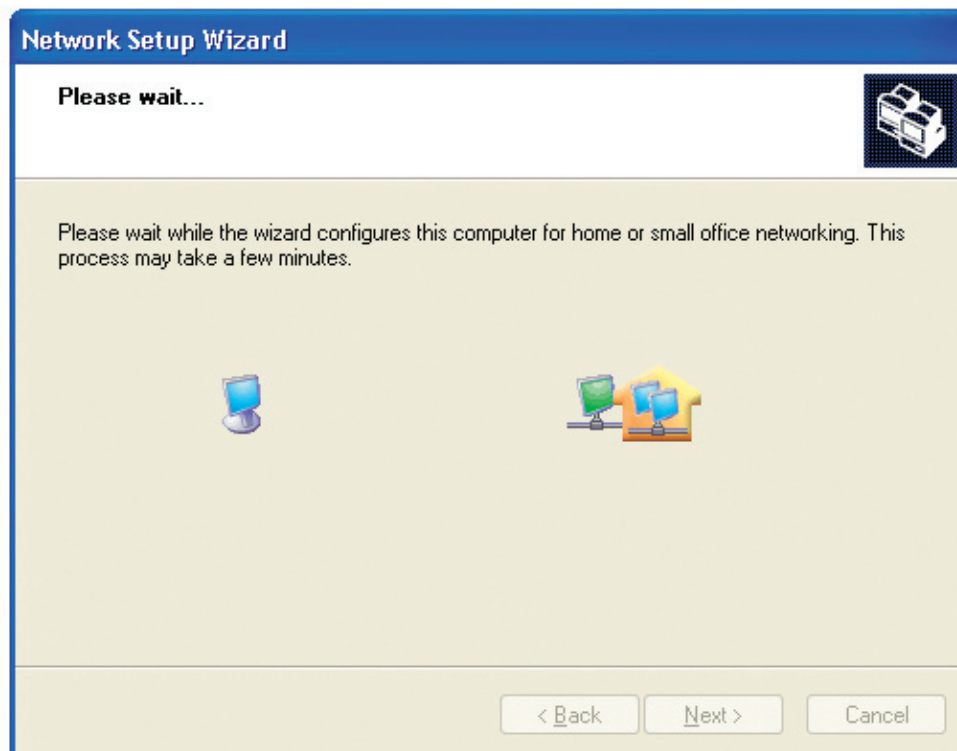
Click **Next**.

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

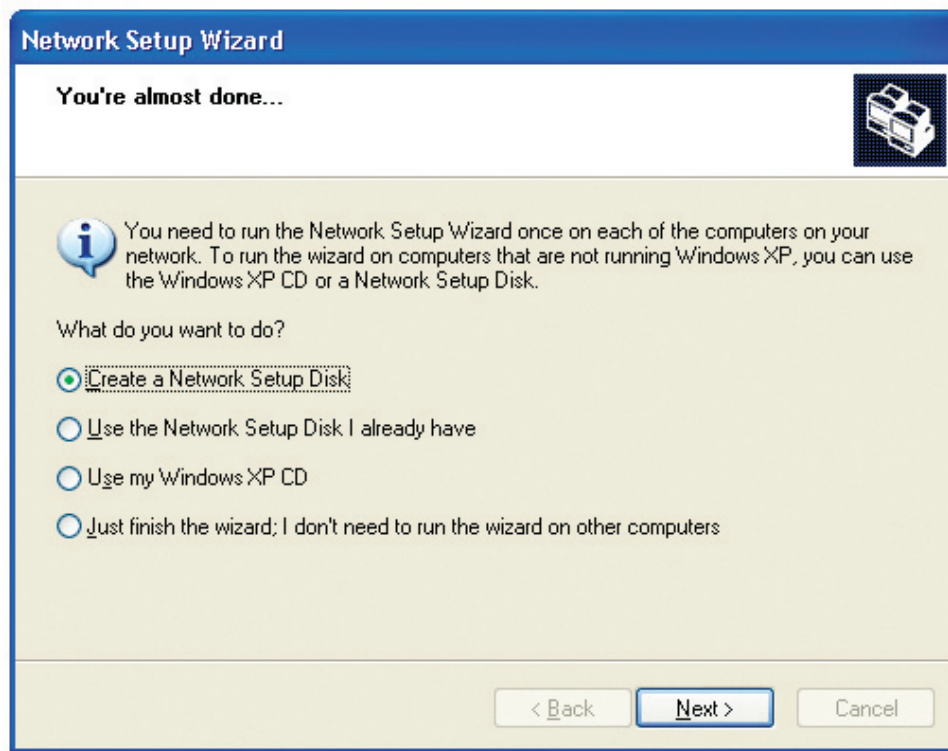


When the changes are complete, click **Next**.

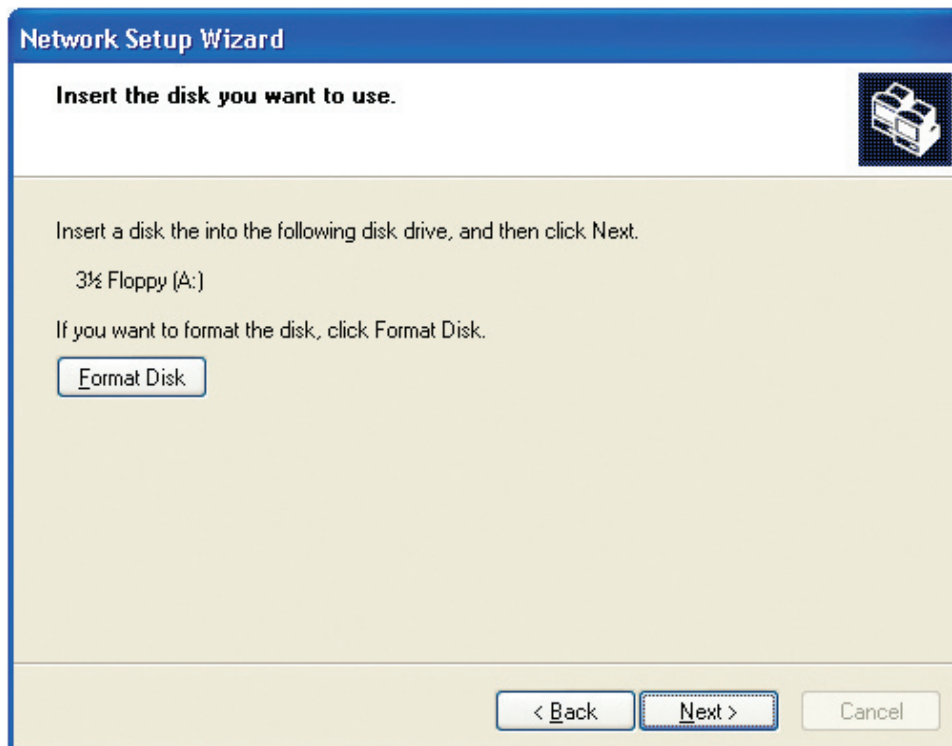
Please wait while the **Network Setup Wizard** configures the computer. This may take a few minutes.



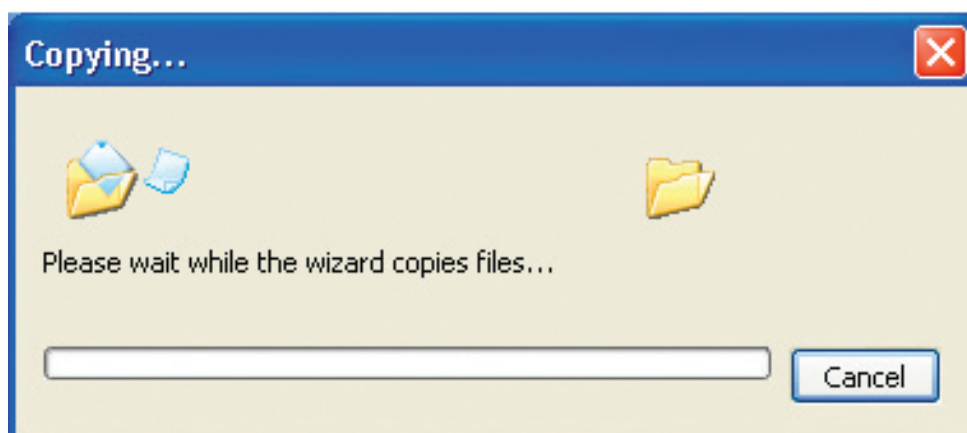
In the window below, select the option that fits your needs. In this example, **Create a Network Setup Disk** has been selected. You will run this disk on each of the computers on your network. Click **Next**.



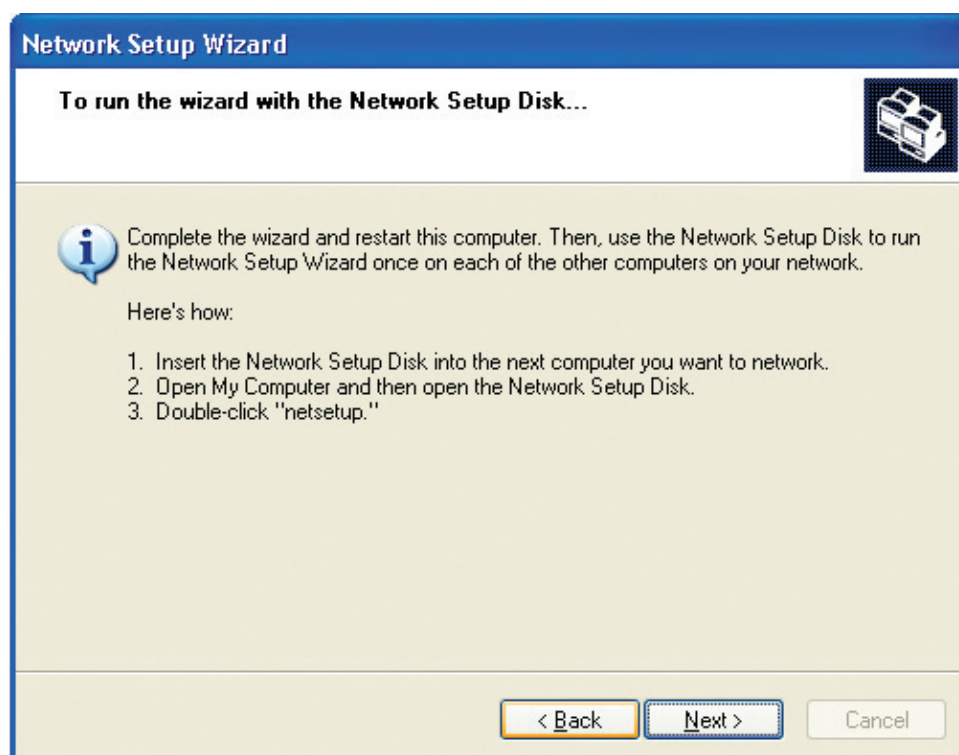
Insert a disk into the Floppy Disk Drive, in this case drive **A**.



Click **Next**.



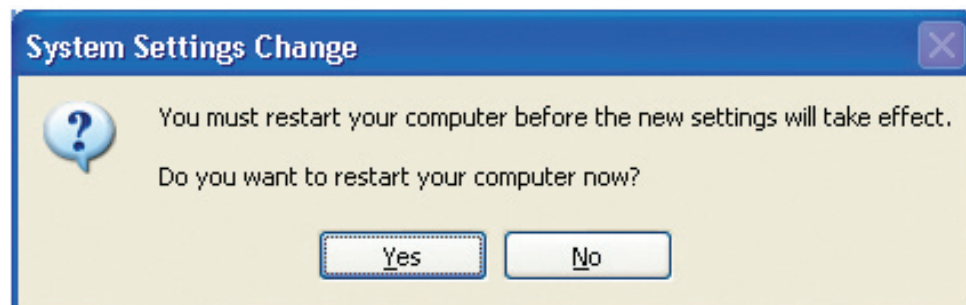
Please read the information under **Here's how** in the screen below. After you complete the **Network Setup Wizard** you will use the **Network Setup Disk** to run the **Network Setup Wizard** once on each of the computers on your network. Click **Next**.



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

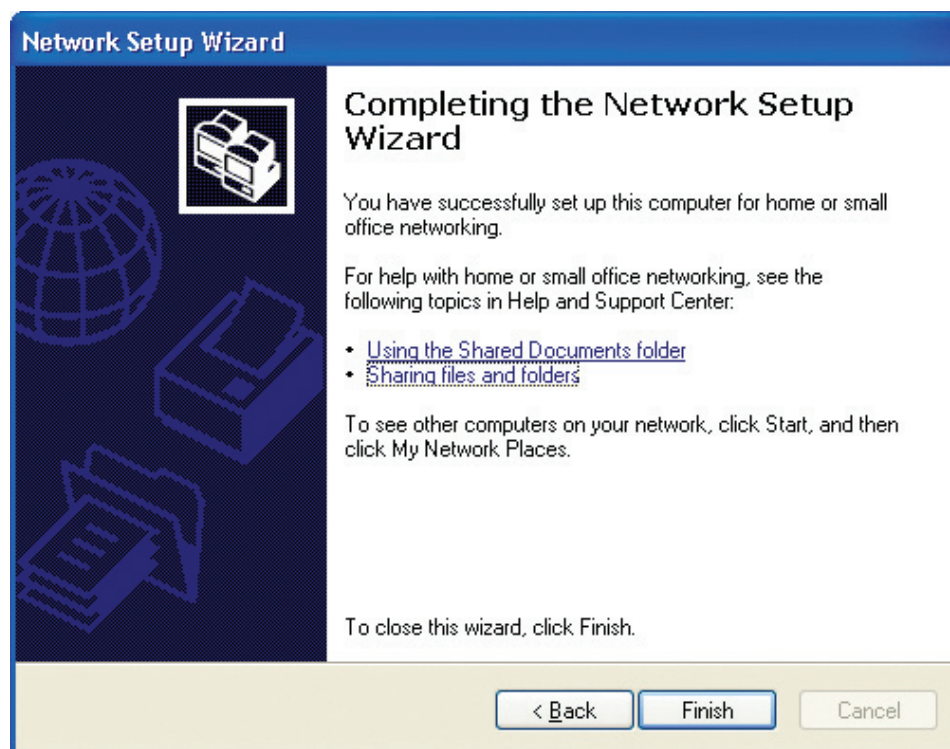


The new settings will take effect when you restart the computer. Click **Yes** to restart the computer.

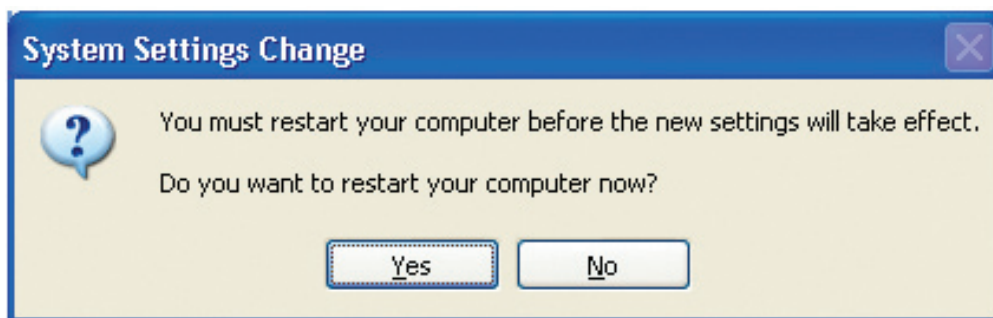


You have completed configuring this computer. Next, you will need to run the **Network Setup Disk** on all the other computers on your network. After running the **Network Setup Disk** on all your computers, your new wireless network will be ready to use.

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.

Naming your Computer

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

Click **Start** (in the lower left corner of the screen).

Right-click on **My Computer**.

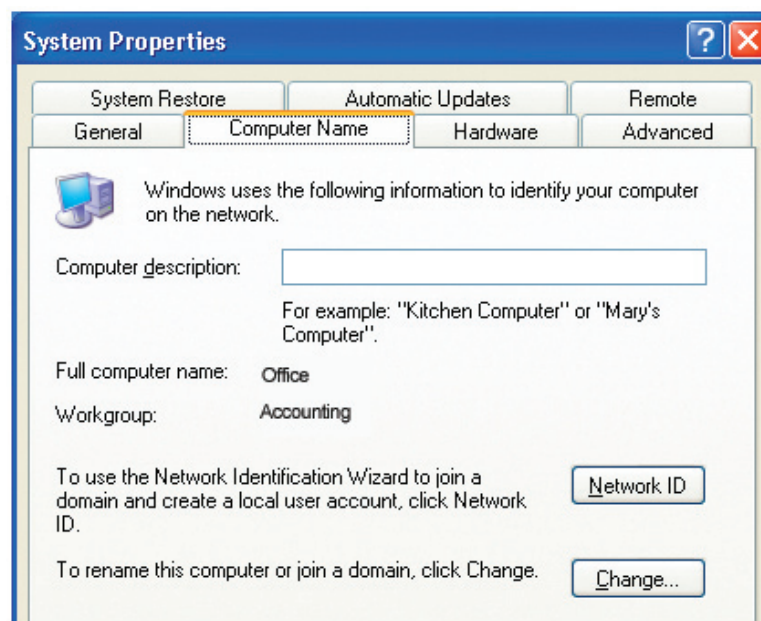
Select **Properties**.



Select the **Computer Name Tab** in the System Properties window.

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

To rename the computer and join a domain, click **Change**.



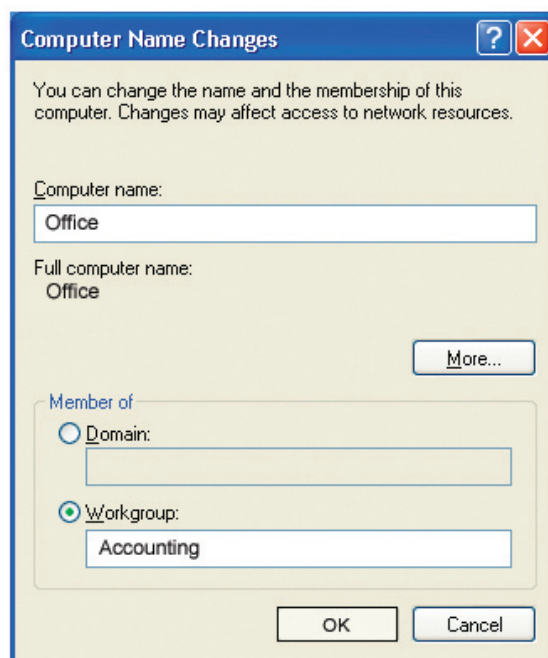
Naming Your Computer

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**.

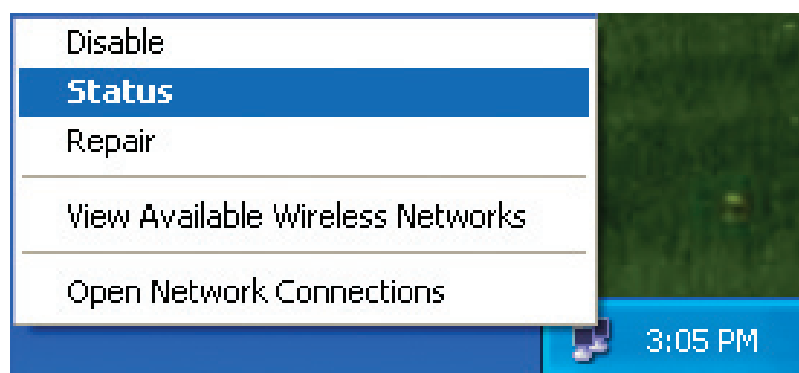


Checking the IP Address in Windows XP

All 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 an 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

Click the **Support** tab.



Click **Close**.

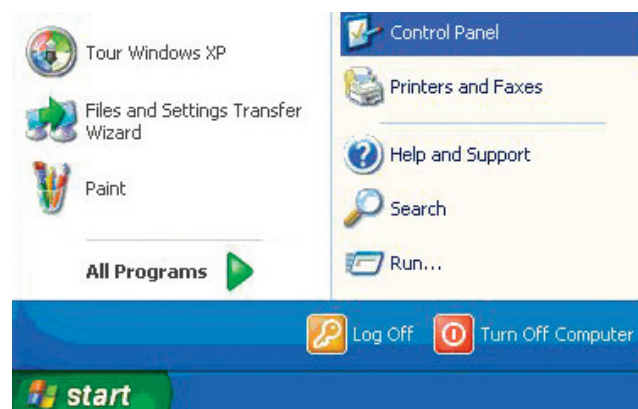
Assigning a Static IP Address in Windows XP/2000

Note: Many 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 router you will not need to assign static IP addresses.

If you are not using a DHCP capable router, or you need to assign a static IP address, please follow these instructions:

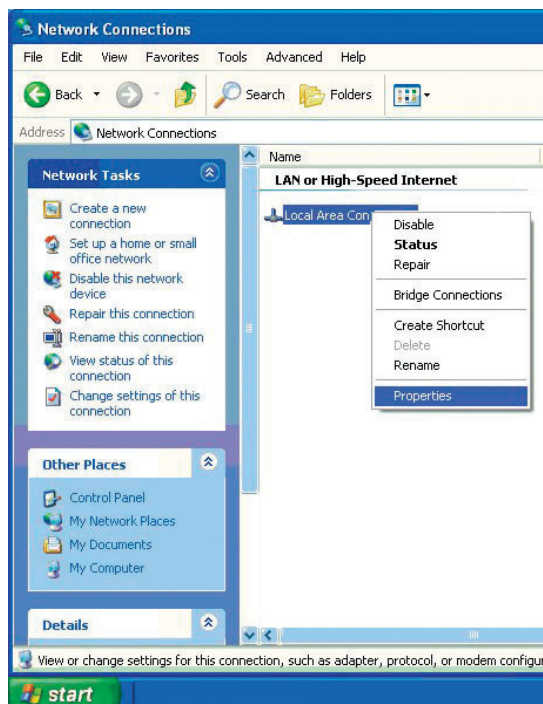
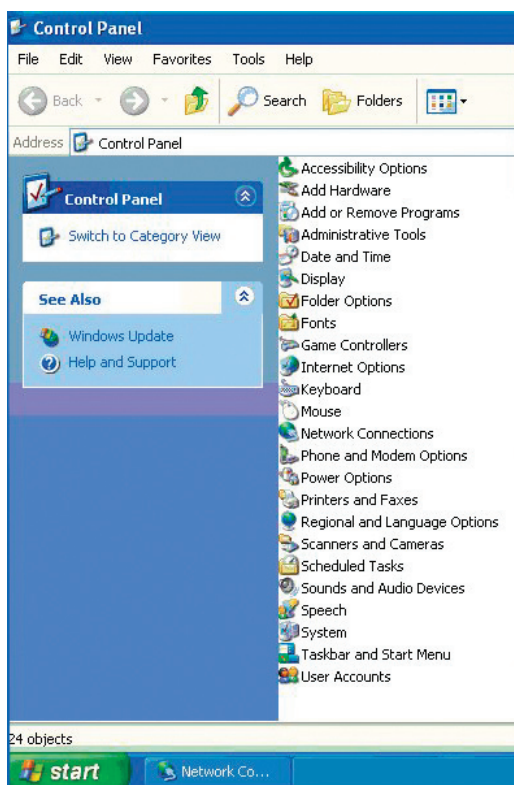
Go to **Start**.

Click on **Control Panel**.



Assigning a Static IP Address in Windows XP/2000

Double-click on **Network Connections**.



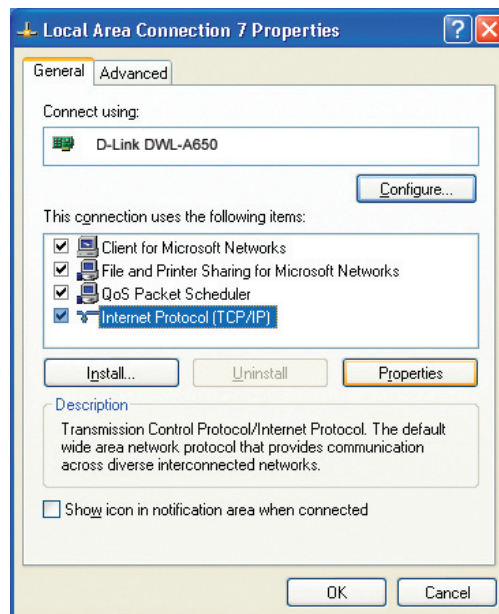
Right-click on **Local Area Connections**.

Click on **Properties**.

Assigning a Static IP Address in Windows XP/2000

Click on **Internet Protocol (TCP/IP)**.

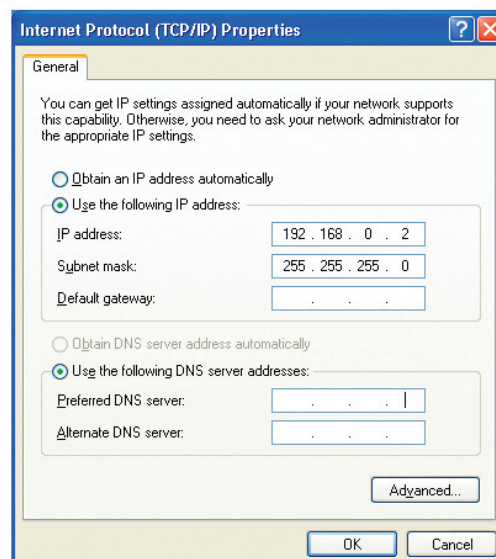
Click **Properties**.



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.)

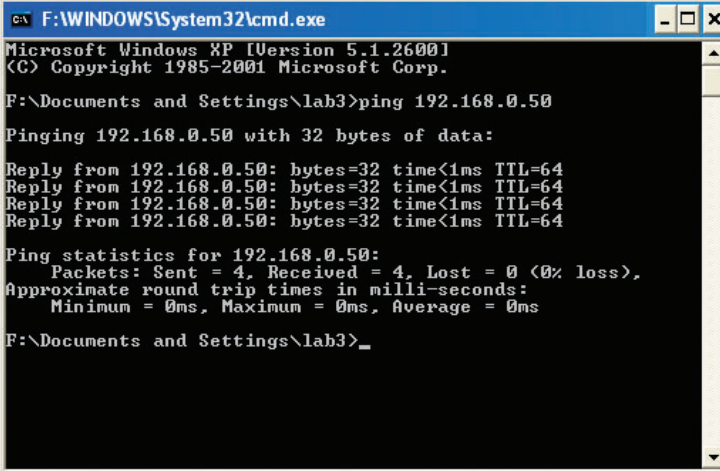
Input your DNS server addresses. (Note: If you are entering a DNS server, you must enter the IP address of the Default Gateway.)

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



Click **OK**.

Checking the Wireless Connection by Pinging in Windows XP and 2000



```
F:\WINDOWS\System32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

F:\Documents and Settings\lab3>ping 192.168.0.50

Pinging 192.168.0.50 with 32 bytes of data:

Reply from 192.168.0.50: bytes=32 time<1ms TTL=64
Reply from 192.168.0.50: bytes=32 time<1ms TTL=64
Reply from 192.168.0.50: bytes=32 time<1ms TTL=64
Reply from 192.168.0.50: bytes=32 time<1ms TTL=64

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

F:\Documents and Settings\lab3>_
```

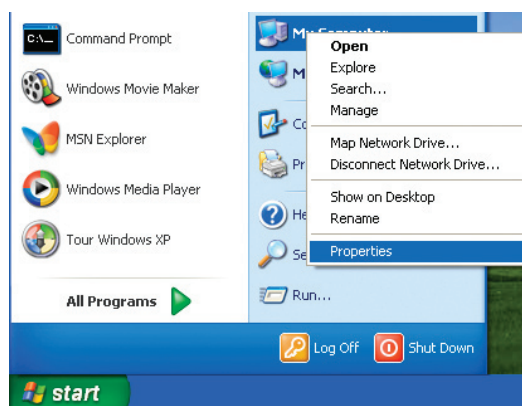
Go to **Start > Run >** type **cmd**. A window similar to this one will appear. Type **ping xxx.xxx.xxx.xxx**, where **xxx** is the **IP address** of the wireless router or access point. A good wireless connection will show four replies from the wireless router or access point, as shown.

Troubleshooting

This chapter provides solutions to problems that can occur during the installation and operation of the DWL-G650M. 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.)

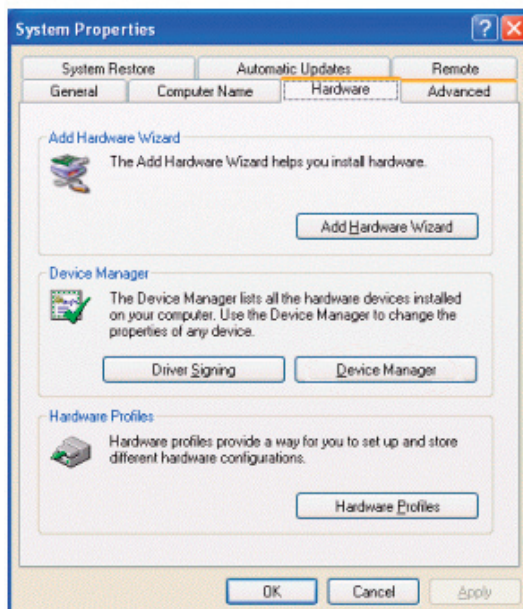
1. How do I check to see that the drivers for the DWL-G650M are installed properly?

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



Select the **Hardware Tab**.

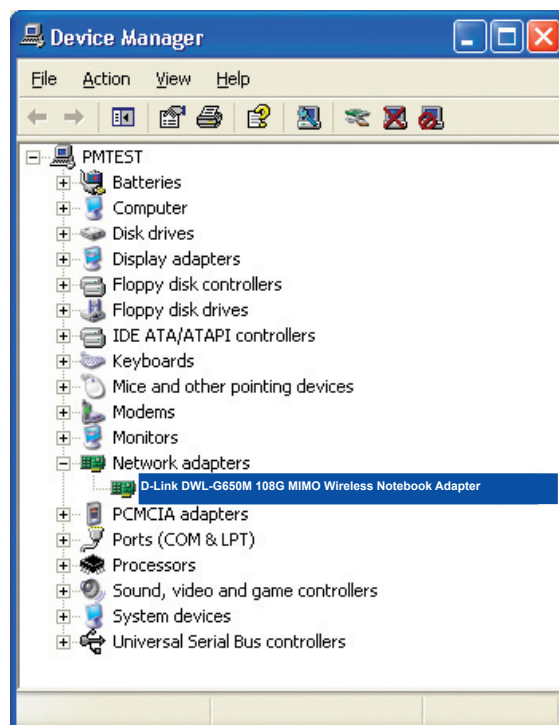
Click **Device Manager**.



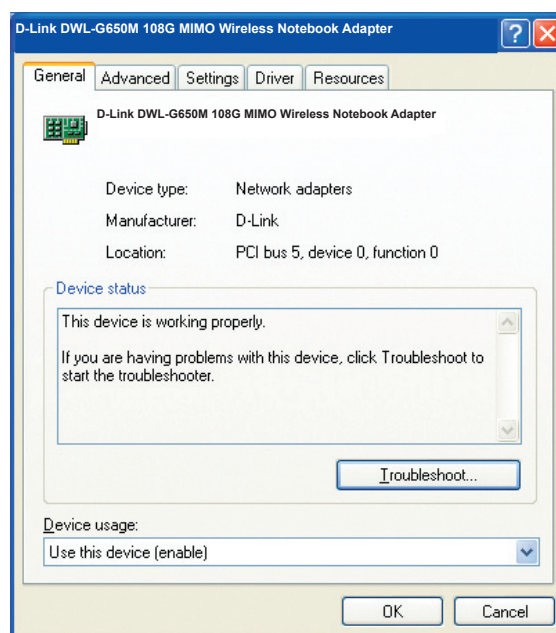
Double-click on **Network Adapters**.

Right-click on **D-Link DWL-G650M 108G MIMO Wireless Notebook 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**.

2. 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.

3. Why does my wireless connection keep dropping?

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 router, 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.

4. Why can't I get a wireless connection?

If you have enabled encryption on the DWL-G650M, you must also enable encryption on all wireless devices in the network in order to establish a wireless connection.


The encryption settings are: 64-, 128- bit. Make sure that the encryption bit level is the same on the router and the DWL-G650M.

Make sure that the SSID on the wireless router (if you have one in your network) and the DWL-G650M are exactly the same. If they are not, wireless connection will not be established. The default SSID is **default**.

Technical Specifications

Standards	IEEE 802.11g IEEE 802.11b IEEE 802.11
Diagnostic LEDs	Power Activity
Temperature	Operating: 0°C to 55°C (32°F to 131°F)
Humidity	95% maximum, non-condensing
Internal Antenna Type	Diversity
Bus Type	32-bit Cardbus
Security	64-, 128-bit WEP WPA-PSK
Data Rates	54, 48, 36, 24, 18, 11, 9, 6 5.5, 2, 1Mbps (with Automatic Fallback)
Range¹	Indoors: Up to 328 feet (100 meters) Outdoors: Up to 1,312 feet (400 meters)
Media Access Control	CSMA/CA with ACK

¹ - Environmental factors may adversely affect wireless signal range

	Receiver Sensitivity	54Mbps OFDM 48Mbps OFDM 36Mbps OFDM 24Mbps OFDM 18Mbps OFDM 12Mbps OFDM 11Mbps OFDM 9Mbps OFDM 6Mbps OFDM 5.5Mbps CCK 2Mbps QPSK 1Mbps BPSK
	Transmitter Output Power	14dBm ± 2dB
	Physical Dimensions	L = 4.64 inches W = 2.13 inches H = 0.34 inches
	Weight	0.12 lb. (4.4g)
	Warranty	1 year



Contacting 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 web site, or by phone.

Tech Support for customers within the United States:

D-Link Technical Support over the Telephone:

(877) 453-5465

Monday through Friday 8:00am to 5:00pm (PST).

D-Link Technical Support over the Internet:

<http://support.dlink.com>

[email:support@dlink.com](mailto:support@dlink.com)

Tech Support for customers within Canada:

D-Link Technical Support over the Telephone:

(800) 361-5265

Monday to Friday 7:30am to 12:00am EST

D-Link Technical Support over the Internet:

<http://support.dlink.ca>

[email:support@dlink.ca](mailto:support@dlink.ca)

When contacting technical support, please provide the following information:

- *Serial number of the unit*
- *Model number or product name*

Warranty

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.

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

- Hardware (excluding power supplies and fans) One (1) Year
- 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 of 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: 17595 Mt. Herrmann, Fountain Valley, CA 92708
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.

Disclaimer of Other Warranties: EXCEPT FOR THE LIMITED WARRANTY SPECIFIED HEREIN, THE PRODUCT IS PROVIDED "AS-IS" WITHOUT ANY WARRANTY OF ANY KIND WHATSOEVER INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. IF ANY IMPLIED WARRANTY CANNOT BE DISCLAIMED IN ANY TERRITORY WHERE A PRODUCT IS SOLD, THE DURATION OF SUCH IMPLIED

WARRANTY SHALL BE LIMITED TO NINETY (90) DAYS. EXCEPT AS EXPRESSLY COVERED UNDER THE LIMITED WARRANTY PROVIDED HEREIN, THE ENTIRE RISK AS TO THE QUALITY, SELECTION AND PERFORMANCE OF THE PRODUCT IS WITH THE PURCHASER OF THE PRODUCT.

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

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

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

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

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

FCC Caution:

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. End users must follow the specific operating instructions for satisfying RF exposure compliance. To maintain compliance with FCC RF exposure compliance requirements, please avoid direct contact to the transmitting antenna during transmitting. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

D-Link declares that the DWL-G650M (FCC ID: KA2DWLG650MB1) is limited in CH1~CH11 by specified firmware controlled in the USA.

Highest SAR test value: 0.222W/kg

Registration



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

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