

D-Link AirPro DWL-6000AP

2.4 GHz / 5 GHz Multimode Wireless Access Point

User's Manual



Rev. 101802

D-Link

Building Networks for People

Contents

1. Package Contents	1
2. Introduction	2
3. Wireless Basics	4
4. Getting Started	6
5. Using the Configuration Menu	8
6. Using the Multiple AP Manager	20
7. Troubleshooting	23
8. Networking Basics	27
9. Technical Specifications	61
10. Contacting Technical Support	63
11. Warranty and Registration	64

1. Package Contents



Contents of Package:

- **D-Link AirPro DWL-6000AP** Enhanced 2.4GHz/5GHz Multimode Wireless Access Point
- Power Adapter – 5V DC, 2.5A
- CD including this User's Manual, *AirPro* Multiple Access Point Manager Utility installation software and SNMP management modules for D-view and HP Open-View®.
- Quick Installation Guide
- Ethernet Cable



Using a power supply with a different voltage rating than the one included with the DWL-6000AP will cause damage and void the warranty for this product.

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

System Requirements:

- Computer with Windows, Macintosh, or Linux-based operating system with an installed Ethernet adapter
- Internet Explorer or Netscape Navigator version 4.0 or above, with JavaScript enabled

2. Introduction

D-Link, a leader in wireless technology, introduces the first integrated dual radio 2.4GHz/5GHz wireless access point, as part of the high performance D-Link AirPro series of wireless networking.

The new D-Link AirPro DWL-6000AP Multimode Wireless Access Point is a next generation dual mode access point that simultaneously serves both 802.11a wireless connectivity at 54 Megabits per second (Mbps) and 802.11b wireless connectivity at 11Mbps or 22 Mbps. Featuring a breakthrough all-in-one Multimode design that delivers the ultimate investment protection with the promise of a superior product life cycle and lower total cost of ownership, it is the ideal solution for present and future Wireless Local Area Networks (WLANs).

In addition to identifying and communicating with other 802.11a and 802.11b wireless devices to maintain a connection with transparent bridging and roaming capabilities, the D-Link AirPro DWL-6000AP access point also builds a bridge between wireless and wired network segments with its integrated 10/100 Ethernet port. The multimode access point will automatically obtain an IP address and forward additional IP addresses to multiple clients for a seamless Ethernet network connection and shared Internet access.

At 54Mbps in the 5GHz frequency and up to 22 Mbps in the 2.4GHz frequency range, the D-Link AirPro DWL-6000AP Multimode access point delivers the fastest standards-based wireless technology in the industry. Based on WiFi and WiFi5 technology, and IEEE 802.11a and 802.11b standards compliant, this future-proof Multimode wireless access point provides excellent network interoperability.

Armed with powerful management and security capabilities, the D-Link Air Pro DWL-6000AP has an intuitive and secure web-based interface that is powered by an embedded web server. The included D-Link Device View Software allows for easy monitoring and management of the access point through Simple Network Management Protocol (SNMP) functionality.

After completing the steps outlined in the *Quick Installation Guide* (included in your 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-6000AP is compatible with most popular operating systems, including Macintosh, Linux and Windows, and can be integrated into a large network. This Manual is designed to help you connect the Access Point with the D-Link AirPlus or AirPro 2.4 or 5GHz Wireless Adapters into a network in Infrastructure mode. *Please take a look at the **Getting Started** section in this manual to see an example of an Infrastructure network using the DWL-6000AP.*

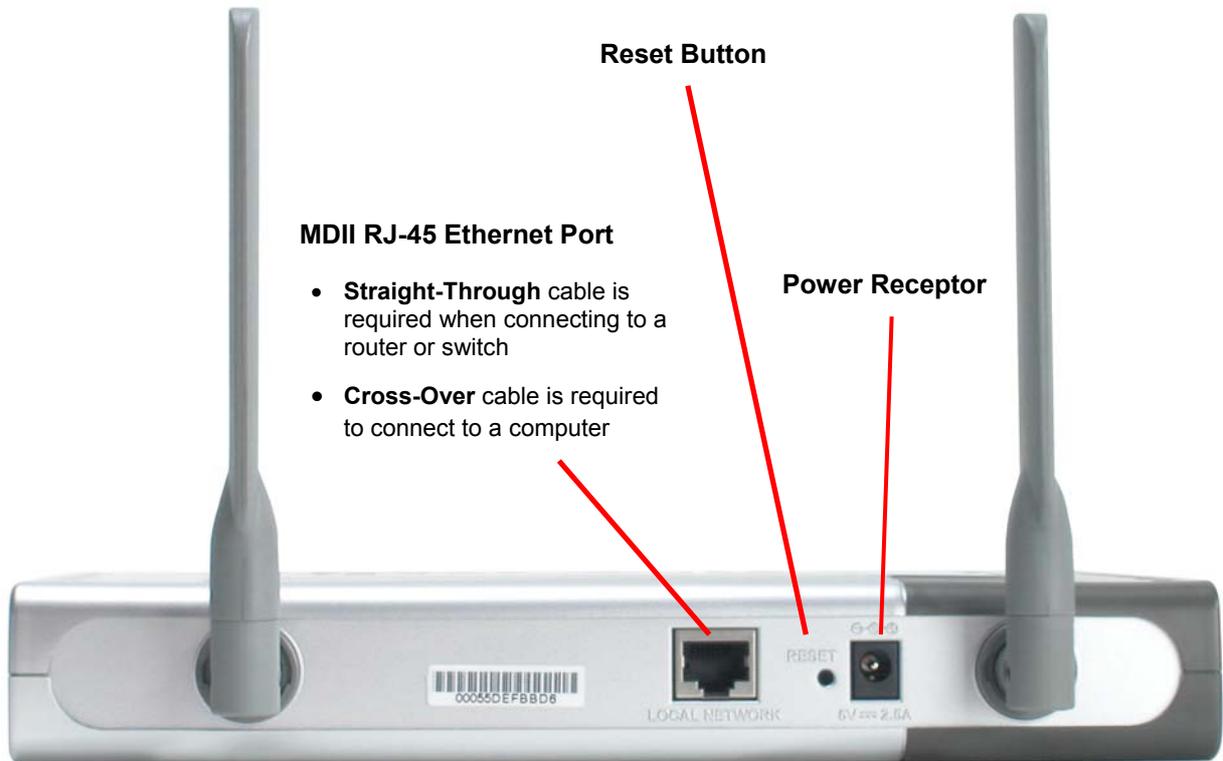
* When used with other D-Link AirPlus products.

Features & Benefits

- Fully 802.11a and 802.11b compatible
- Supports IEEE 802.1x
- Multiple AP Manager
- WLAN Partition
- Transmit Power Adjustable
- Supports Data Transfer Rates of up to 54 Mbps (IEEE 802.11a High Rate) and up to 22 Mbps (IEEE 802.11b DSSS High Rate)
- Dynamic rate scaling and automatic rate switching
- Wireless Range of up to 900 feet (depending on environmental conditions)
- Supports 64/128/152/256-bit Encryption with Enhanced Dynamic Keying
- Operates at both 5GHz and 2.4GHz
- Consistent with regional regulatory frequency requirements
- DSSS (Direct Sequence Spread Spectrum) modulation
- Supports PBCC (Packet Binary Convolutional Code) modulation
- Utilizes OFDM (Orthogonal Division Frequency Multiplexing)
- Easy-to-use Web Based Configuration
- User Level Security

D-Link AirPro DWL-6000AP

Connections



LEDS

LED stands for **L**ight-**E**mitting **D**iode. The **DWL-6000AP Wireless Access Point** has 5 LEDs as shown below:

LED	LED Activity
Power	Steady light indicates a connection to a power source
10M Link/Act	Flashes steadily to indicate connection; intermittent flashes indicate activity at 10Mbps
100M Link/Act	Flashes steadily to indicate connection; intermittent flashes indicate activity at 100Mbps
11a WLAN	Flashes steadily to indicate a wireless 802.11a connection
11b WLAN	Flashes steadily to indicate a wireless 802.11b connection

3. Wireless Basics

D-Link *AirPro* wireless products are based on industry standards to provide easy-to-use and compatible high-speed wireless connectivity within your home, business or public access wireless networks. Strictly adhering to the IEEE standard, the D-Link *AirPro* wireless family of products will allow you to securely access the data you want, when and where you want it. You will be able to enjoy the freedom that wireless networking delivers.

A wireless local area network (WLAN) is a cellular computer network that transmits and receives data with radio signals instead of wires. Wireless LANs are used increasingly in both home and office environments, and public areas such as airports, coffee shops and universities. Innovative ways to utilize WLAN technology are helping people to work and communicate more efficiently. Increased mobility and the absence of cabling and other fixed infrastructure have proven to be beneficial for many users.

Wireless users can use the same applications they use on a wired network. Wireless adapter cards used on laptop and desktop systems, support the same protocols as Ethernet adapter cards.

Under many circumstances, it may be desirable for mobile network devices to link to a conventional Ethernet LAN in order to use servers, printers or an Internet connection supplied through the wired LAN. A Wireless Access Point (AP) is a device used to provide this link.

The advantages of Wireless LAN are many and varied and include:

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 (Wireless Local Area Networks) are easy to set up, manage, change and relocate. Networks that frequently change, both physically and logically, can benefit from WLANs ease of implementation. WLANs can operate in locations where installation of wiring may be impractical.

Installation Speed and Simplicity - Installing a wireless LAN system can be fast and easy and can eliminate the need to pull cable through walls and ceilings.

Network Expansion - Wireless technology allows the network to go where wires cannot go.

Reduced Cost-of-Ownership - While the initial investment required for wireless LAN hardware might be higher than the cost of wired LAN hardware, overall installation expenses and life-cycle costs will be significantly lower. Long-term cost benefits are greatest in dynamic environments requiring frequent moves, adds, and changes.

Scalability – Wireless Local Area Networks (WLANs) can be configured in a variety of topologies 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 full infrastructure networks of thousands of users that allow roaming over a broad area.

*The DWL-6000AP is compatible with the **D-Link AirPro 802.11a** family of products, which include:*

- ◆ 5GHz Wireless Cardbus Adapters used with laptop computers (DWL-A650)
- ◆ 5GHz Wireless PCI Adapters used with desktop computers (DWL-A520)

*The DWL-6000AP is also compatible with the **D-Link AirPlus 802.11b** Wireless Family of LAN products, which include:*

- ◆ Enhanced 2.4GHz Wireless Cardbus Adapters used with laptop computers (DWL-650+)
- ◆ Enhanced 2.4GHz Wireless PCI cards used with desktop computers (DWL-520+)
- ◆ Enhanced 2.4GHz Wireless Broadband Router (DI-614+)

D-Link AirPro DWL-6000AP

Standards - Based Technology

The versatile DWL-6000AP Multimode Wireless Access Point integrates both 802.11a and 802.11b standards.

The IEEE **802.11a** standard designates that devices operate at an optimal data rate of 54 Megabits per second. This means 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. D-Link *AirPro* products will automatically sense the best possible connection speed to ensure the greatest speed and range possible with the technology.

The IEEE **802.11b** standard-based technology assures that the DWL-6000AP is interoperable with existing compatible 2.4GHz wireless technology with data transfer speeds of up to 22Mbps (as in the D-Link *AirPlus* Family of Wireless devices,) as well as standard 802.11b technology (as in the D-Link *Air* Family of Wireless devices), with speeds of up to 11Mbps. D-Link *AirPlus* products will automatically sense the best possible connection speed to ensure the greatest speed and range possible with the technology.

Installation Considerations

Designed to go up to 1,312 feet (400 meters) outdoors and up to 328 feet (100 meters) indoors, D-Link *AirPro* DWL-6000AP lets you access your network, using a wireless connection, from virtually anywhere. 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 to a minimum:**
The signal emitted from Wireless LAN devices can penetrate through ceilings and walls. However, each wall or ceiling can reduce the range Wireless LAN devices from 1 to 30M. Position your Access Points, Residential Gateways, and Computers so that the number of walls or ceilings obstructing the signal path is minimized.
- 2. Consider the direct line between Access Points, Residential Gateways, and Computers:**
A wall that is 0.5 meters thick, at a 45-degree angle appears to be almost 1 meter thick. At a 2-degree angle, it is over 14 meters thick. Be careful to position the Access Point and Adapters so the signal can travel straight through (90° angle) a wall or ceiling for better reception.
- 3. Building Materials make a difference:** Buildings constructed using metal framing or doors can reduce effective range of the device. Whenever possible, position WLAN devices so that their signal can pass through drywall or open doorways, avoid positioning them so that their signal must pass through metallic materials.
- 4. Position the antennas for best reception.** Keep your product away (at least 1-2 meters) from electrical devices: Position WLAN devices away from electrical devices that generate RF noise such as microwave ovens, monitors, electric motors, etc.

If you experience low or no signal strength in areas of your home that you wish to access, consider positioning the Access Point in a location directly between the computers with wireless adapters. Additional Access Points can be connected to provide better coverage in rooms where the signal does not appear as strong as desired.

4. Getting Started

For the price of a single IP Address from your Broadband Internet Service provider you can share the Internet with all the computers on your local network, without sacrificing speed or security, using D-Link Air networking products.

IP ADDRESS

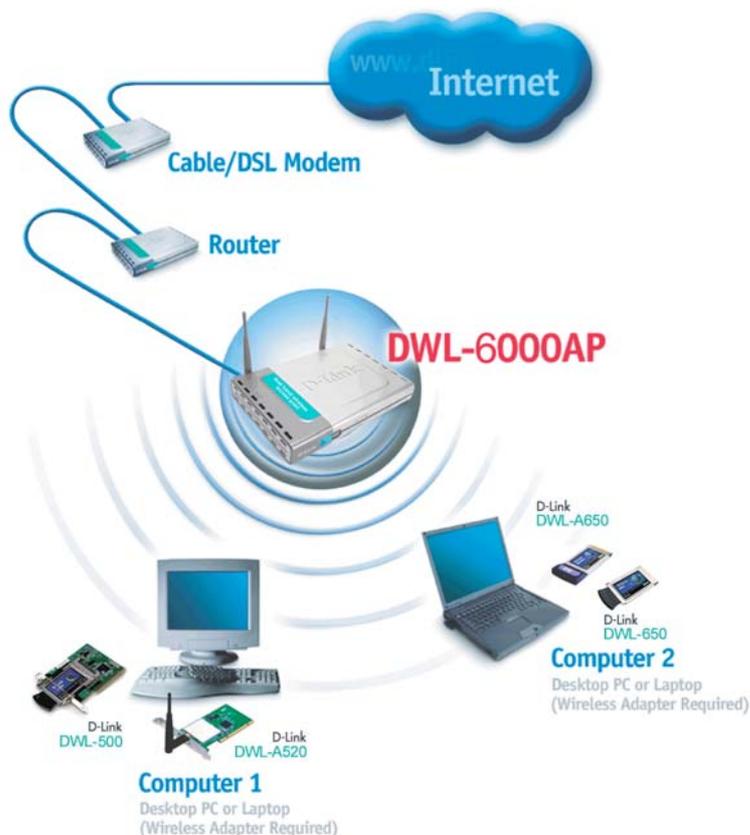
Please note: If you have a DHCP-capable router, such as the D-Link DI-604 or DI-614+, there is no need to assign an IP Address.

If you need to assign IP Addresses to the computers on the network, please remember that the **IP Address for each computer must be in the same IP Address range as all the computers in the network**, and the Subnet mask must be exactly the same for all the computers in the network.

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

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

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



A wireless Access Point - **D-Link AirPro DWL-6000AP**

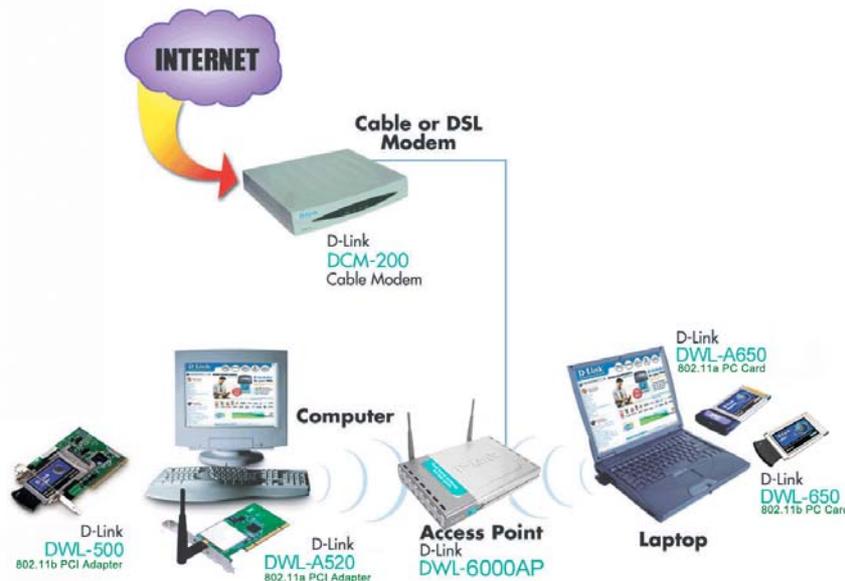
An Ethernet Broadband Router - **D-Link DI-604+**

A laptop computer with a wireless adapter - **D-Link AirPro DWL-AB650**

A desktop computer with a wireless adapter - **D-Link AirPro DWL-AB520**

A Cable modem - **D-Link DCM-200**

D-Link AirPro DWL-6000AP



D-Link AirPro wireless devices are pre-configured to connect together, right out of the box, with the default settings.

- 1** You will need a broadband Internet access (Cable/DSL) subscription.
- 2** Consult with your Cable/DSL provider for proper installation of the modem.
- 3** Connect the modem to an Ethernet Broadband Router (such as the **D-Link DI-604+**) See the **Quick Installation Guide** included with the router.
- 4** Connect the router to the **D-Link AirPro DWL-6000AP**. Refer to the **Quick Installation Guide** for setting up the Access Point.
- 5** If you are connecting a desktop computer in your network, you can install the **D-Link AirPro DWL-A520** wireless PCI adapter into an available PCI slot. See the **Quick Installation Guide** included with the DWL-A520.
- 6** Install the drivers for the wireless cardbus adapter (**D-Link AirPro DWL-A650**) into the laptop computer. See the **Quick Installation Guide** included with the DWL-A650 for installation instructions.

Please refer to the following sections of this manual for additional information about setting up a network:

Networking Basics- Learn how to check your IP Address; share printers and files.

Using the Configuration Utility- Learn the settings you must use on each computer in your network for successful communication.

Troubleshooting- Learn how to check for the proper installation of the network adapters' drivers and other tips for troubleshooting the network.

5. Using the Configuration Menu

The **Configuration Menu** for the DWL-6000AP is web-based. When using the configuration program, please consider the following:

You will need a JavaScript-enabled web-browser such as the Internet Explorer 4.0 or higher, or the Netscape Navigator 4.0 or higher.

The computer that you are using for initial configuration must have an IP Address within the same range as the IP Address of the DWL-6000AP. The DWL-6000AP has a default IP Address of **192.168.0.50** with subnet mask **255.255.255.0**. *The range of compatible computer IP settings is as follows: computer IP Address = 192.168.0.1 – 192.168.0.49 or 192.168.0.51-192.168.0.254 and a subnet mask = 255.255.255.0*

If you **are** using a D-Link router in your network, such as the DI-604, with the factory default settings, you **will not** need to assign a static IP Address to the computer that you are using to configure the Access Point. *(Skip to Fig. 5.1: entering the IP address)*

If you are **not** using a DHCP enabled router to assign IP settings on your network, you **will** need to assign a Static IP Address to the computer that you are using to configure the DWL-6000AP, within the IP Address Range of the DWL-6000AP. (Please see **Networking Basics** in this manual for information on **Assigning a Static IP Address**.) *Please make a note of your initial IP Address, you will need to re-enter it later!*

After you have assigned a Static IP Address to the computer you are using for configuration (if necessary), you need to assign the DWL-6000AP an IP Address within the **IP Address range of your existing network**.

In order to regain connection to the DWL-6000AP, after changing its IP Address, **revert to the IP address that you had for this computer before you began the configuration**, as follows:

- If this computer had a **static IP address** re-input that same address.

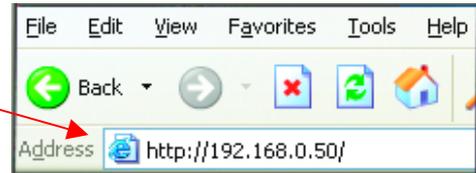
Factory Default Settings for the DWL-6000AP

ESSID	default
Channel	Channel depends on regional settings
WEP	disabled
User Name	admin
Password	(no password, leave field blank)
IP Address	192.168.0.50

D-Link AirPro DWL-6000AP

Whenever you want to configure your network or the DWL-6000AP, you can access the Configuration Utility by opening the web-browser and typing in the IP Address of the DWL-6000AP. The DWL-6000AP default IP Address is shown below:

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



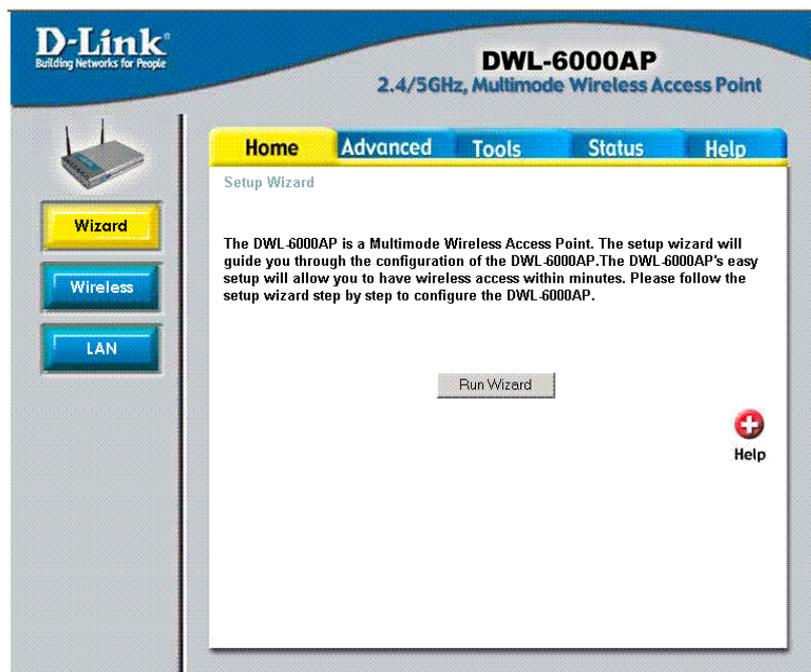
(The IP Address shown in the example above is the default setting. Use this IP address when connecting to a network consisting of other D-Link devices set to their default settings. If you have changed the IP Address of the DWL-6000AP to conform to a network other than one with D-Link devices, at their default setting, then input that IP Address in the web browser, instead of the default IP Address shown.)

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



Home > Wizard

The first page you see displays the Home tab. You may opt to use the Setup Wizard by clicking the Run Wizard button. This will bring up the step-by-step Setup Wizard in a new window. See the **Quick Installation Guide** for an illustrated walk-through of how to use this feature. To configure Wireless settings, click the **Wireless** button.



Home > Wireless

In the **Wireless Settings** window, choose the wireless environment you want to configure from the **Wireless Band** drop-down menu. You can change the **SSID** and **Channel** for the IEEE wireless environment you are configuring.

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

Channel: Available channels depend on the regulations in you are or country. Use the Setup Wizard to select the country or region for your Access Point. *The Setup Wizard is described in the Quick Installation Guide and you can launch it from the Home tab by clicking Wizard.* All devices on the network must be set to the same channel to communicate on the network.

Radio Frequency: This read only display will change according to the channel selected.

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

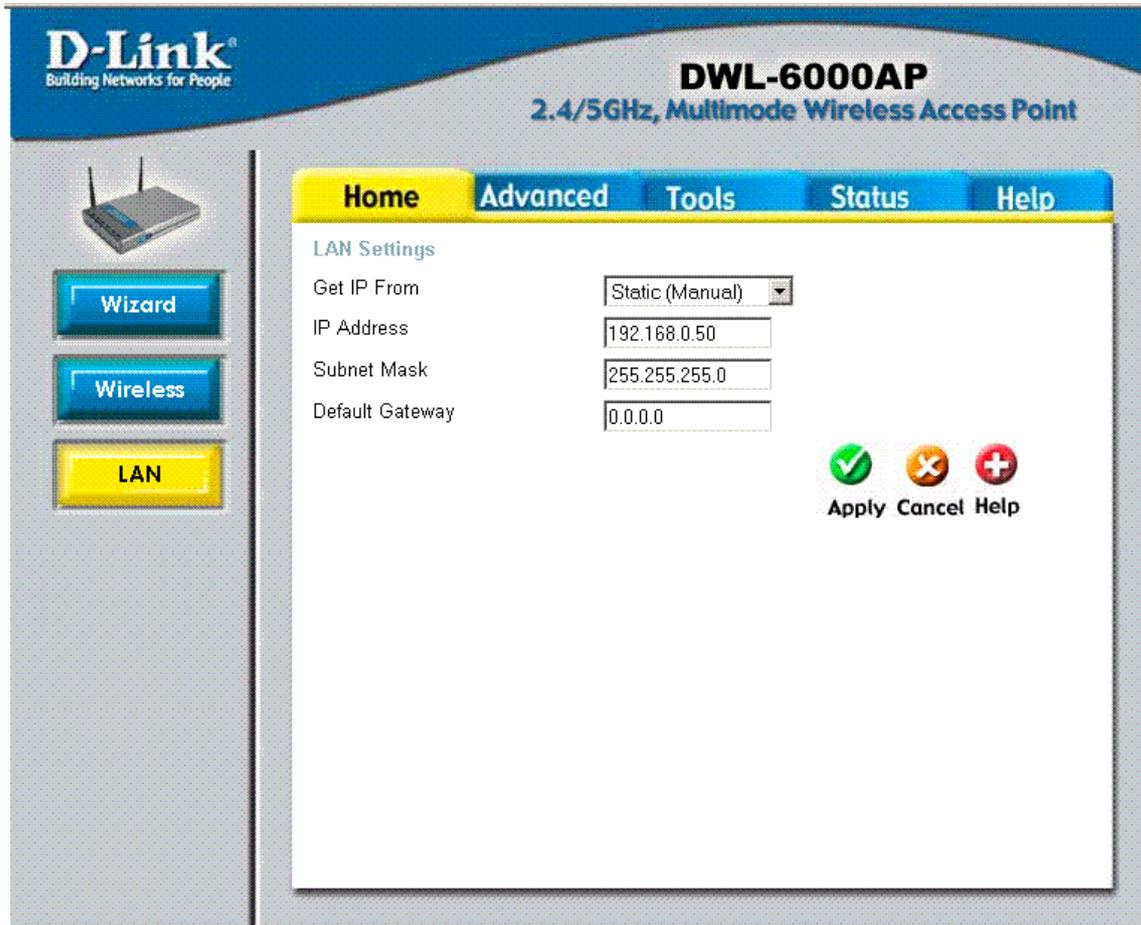
Click **Apply** if you have made any changes or additions.

Note: To configure a “Preferred BSSID” for wireless adapters using the Access Point you need the MAC address of the device. You can find the MAC address of the Access Point listed in the Status – Device Information menu.

D-Link AirPro DWL-6000AP

[Home](#) > LAN

The default settings of the DWL-6000AP are displayed in the example below. The default IP Address is 192.168.0.50



The screenshot shows the web interface for the D-Link DWL-6000AP. The page title is "DWL-6000AP 2.4/5GHz, Multimode Wireless Access Point". The navigation menu includes "Home", "Advanced", "Tools", "Status", and "Help". The "LAN Settings" section is active, showing the following configuration:

Field	Value
Get IP From	Static (Manual)
IP Address	192.168.0.50
Subnet Mask	255.255.255.0
Default Gateway	0.0.0.0

At the bottom right of the settings area, there are three buttons: "Apply" (with a green checkmark icon), "Cancel" (with an orange 'X' icon), and "Help" (with a red plus icon).

Configure LAN IP settings:

Get IP From

If you opt to assign a **Static (Manual)** IP address for the Access Point (recommended), type in an **IP Address** and **Subnet Mask** compatible with your network IP scheme. The **Default Gateway** IP address is a router or other gateway device used to access IP networks that are outside the chosen subnet.

If you select **Dynamic (DHCP)**, you will obtain a dynamic IP Address from a DHCP server on your network. (This is not advisable since it will be difficult to determine the dynamic IP address assigned to the DWL-6000AP.) Using DHCP automatically configures all IP settings upon restart, therefore the IP Address, Subnet Mask and Default Gateway will be read-only displays when the device is configured as a DHCP client.

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

D-Link AirPro DWL-6000AP

Advanced > Performance

Use the Advanced features menu to tweak radio settings and set up security.

The screenshot shows the web interface for the D-Link AirPro DWL-6000AP. The page title is "DWL-6000AP 2.4/5GHz, Multimode Wireless Access Point". The navigation menu includes "Home", "Advanced" (selected), "Tools", "Status", and "Help". On the left sidebar, there are three buttons: "Performance" (highlighted in yellow), "Filters", and "Encryption". The main content area is titled "Advance Wireless Settings" and contains the following configuration options:

Wireless Band	IEEE802.11a
Data Rate	Auto
Beacon Interval (20 - 1000)	100
DTIM (1 - 255)	1
Fragment Length (256 - 2346)	2346
RTS Length (256 - 2346)	2346
Transmit Power	full

At the bottom right of the settings area, there are three buttons: "Apply" (with a green checkmark icon), "Cancel" (with a red X icon), and "Help" (with a red plus icon).

The Performance menu is used to customize wireless performance settings. The default settings will be adequate for most users. Configurable Performance settings are:

Wireless Band: Select the band for configuration 802.11a or 802.11b.

Data Rate: Select the transmission rate for the network.

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

DTIM (1-255): (Delivery Traffic Indication Message) Enter a value between 1 and 255 for the Delivery Traffic Indication Message (DTIM.) A DTIM is a countdown informing clients of the next window for listening to broadcast and multicast messages.

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

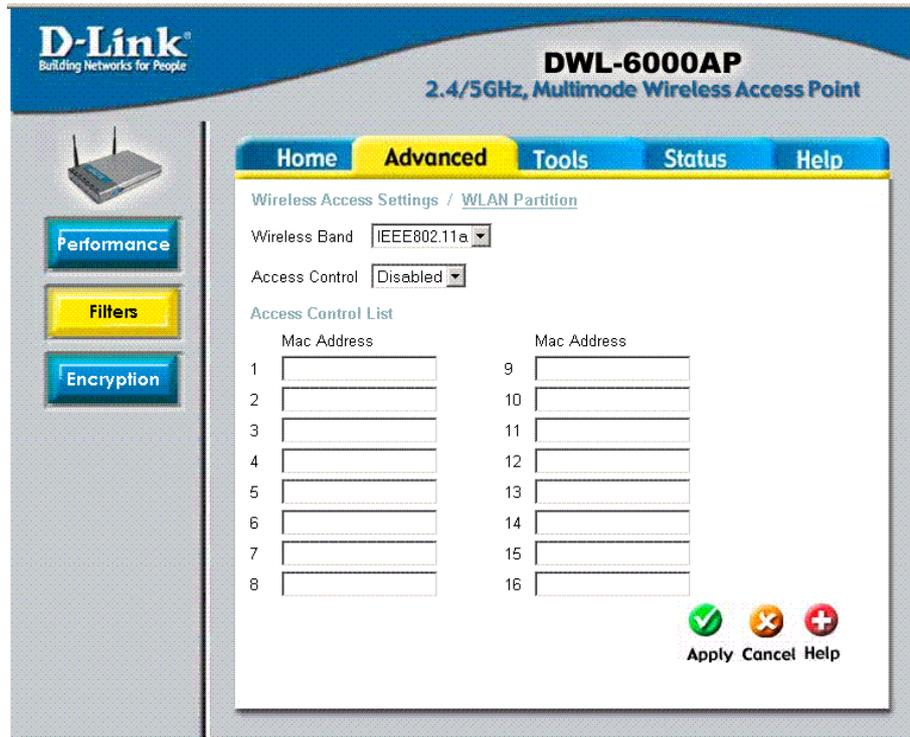
RTS Length (256 – 2346): This value should remain at its default setting of 2346. If you encounter inconsistent data flow, only minor modifications to the value range between 256 and 2346 are recommended.

Transmit Power: Transmitting power can be limited for circumstances where cell overlap is not desired or interference is a concern. The options are full (default), half (-3dB), quarter (-6dB), eighth (-9dB) or min (minimum).

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

Advanced > Filters

Use MAC Filters to allow or deny wireless connection to the DWL-6000AP. WLAN Partition is used to set up barriers between wireless devices or between wired and wireless interfaces.



MAC Address Filtering or Access Control is disabled by default. When this feature is enabled, you can select wireless devices that are allowed access or specify wireless devices that are denied access to the wireless interface through the Access Point. To turn MAC address filtering off, select Disabled for the Access Control drop-down menu.

To use MAC Address Filtering:

1. Select the **Wireless Band** you wish to control from the drop-down menu.
2. Type in the list of MAC addresses you want to specify in the spaces provided.
3. In the **Access Control** drop-down menu, choose the action you want to take for the listed MAC addresses. If you choose to **Accept** the devices, only the devices listed are allowed to associate with the Access Point through the wireless interface. If you choose **Reject**, the listed devices are NOT allowed to associate with the access point.
4. Click **Apply** to save your choices.

MAC Address

(Media Access Control Address)

A unique, hardware-defined address used to identify a device on a network (Ethernet and wireless). It is assigned at the factory and cannot be changed. Usually you will find this address on a sticker on the device or on the packaging.

Advanced > WLAN Partition

Use the WLAN Partition menu to control barriers between networks and wireless devices.



Click on the WLAN Partition hyperlink to access the menu from the Advanced Tab > Filters menu. The default settings do not restrict communication between wireless devices and wired or wireless networks. That is, access from wireless devices to and from the Ethernet, and to and from wireless devices on either 802.11a or 802.11b networks is not restricted. Access between and among all network devices is enabled by default. You can disable access between wireless devices or networks by deselecting the appropriate *Enabled* check box.

To change the WLAN Partition settings, first choose the wireless network you want to configure from the **Wireless Band** drop-down menu. The partitions that can be created are described as follows:

Internal Station Connection: When this is enabled there is no barrier to communication among wireless stations using the Access Point. If this is disabled, wireless stations of the selected band (802.11a or 802.11b) are not allowed to exchange data through the Access Point

Ethernet to WLAN Access: When this is enabled there is no barrier to data flow from the Ethernet to wireless devices using the Access Point. If this is disabled, all data from the Ethernet to associated wireless devices is blocked. Wireless devices can still send data to the Ethernet.

Connection Between 802.11a & 802.11b: When this is enabled, devices on the 802.11a network are able to exchange data with devices on the 802.11b network through the Access Point. If this is disabled, a partition is created between the networks within the Access Point. That is, data from any associated device on the 802.11a network cannot send data to or receive data from another device on the 802.11b network through the Access Point.

To create a WLAN partition, click the Enabled box so the check mark no longer appears in the box and click Apply to make the change.

Advanced > Encryption

WEP Encryption is a standardized system for encrypting data and controlling association for wireless LANs. Read the next page for details about WEP and the settings used to configure encryption.

The screenshot shows the web interface for the D-Link DWL-6000AP. The page title is "DWL-6000AP 2.4/5GHz, Multimode Wireless Access Point". The navigation tabs are "Home", "Advanced", "Tools", "Status", and "Help". The "Advanced" tab is selected. On the left sidebar, there are buttons for "Performance", "Filters", and "Encryption". The main content area is titled "Security Settings" and contains the following fields:

- Wireless Band: IEEE802.11a
- Authentication: Open System Shared Key Open System / Shared key
- 802.1x: 802.1x
- WEP: Disabled Enabled
- Wep Key Type: HEX
- Wep Key Size: 152 Bits
- Valid Key: First

Below these settings is a "Key Table" section with four rows for "First Key", "Second Key", "Third Key", and "Fourth Key", each with a corresponding text input field. At the bottom right of the form are three buttons: "Apply" (with a green checkmark icon), "Cancel" (with an orange 'x' icon), and "Help" (with a red plus icon).

To configure WEP security settings:

1. Select the **Wireless Band** for WEP configuration from the drop-down menu.
2. Choose the **Authentication** system used for WEP. All wireless devices that use the Access Point must use the same type of authentication.
3. Next to **WEP**, choose the Enabled option to enabled encryption.
4. Choose the **WEP Key Type** from the drop-down menu.
5. Choose the **WEP Key Size** from the drop-down menu.
6. Elect the **Valid Key** chosen from the list of keys you must define below. All wireless devices that use the Access Point must use the same valid key. The valid keys that are available may depend on the Authentication chosen above.
7. Type in the keys (First Key, Second Key etc.) in the spaces provided. The number and type of characters used for the keys depends on the key type and key size.

Authentication

You must choose the type of authentication used for WEP. The differences between the choices are explained below.

- **Open System:** Using an open system with WEP enabled means the access point and wireless stations encrypt only the data in each packet. WEP is not used for the purpose of authentication, that is, encryption does not prevent any station from associating with the access point.
- **Shared Key:** With this setting only stations using a shared key encryption identified by the access point are allowed to associate with it. Shared key WEP prohibits non-WEP WLAN stations from associating with the access point. Shared key WEP uses encryption for both data and authentication.
- **Open System/Shared Key:** With this setting both shared and open system are employed. Stations have the option of using either but must still have the correct key to decrypt data.
- **802.1x:** If you use 802.1x you do not need to supply a WEP key. This is an access control system used for Ethernet and wireless networks and a key is generated automatically from a server or switch. In order to use 802.1x you must have the system running on your network. That is, you need a Radius server or computer or switch capable of implementing PAE. After applying the settings and restarting the Access Point, you must choose to use a Radius server or a local server or switch for Authentication. Use the Encryption menu to select where authentication information comes from and what size key to use.

WEP Key Type and Size

WEP keys are defined by the type (HEX or ASCII) of characters entered and size in bits. HEX or Hexadecimal characters are numbers and the letters A – F, upper and lower case are recognized as the same for HEX characters. ASCII characters include all printable characters (including spaces) available on a standard keyboard. ASCII upper and lower cases are recognized as different characters.

The size of the key relates to the level of encryption complexity. Keep in mind however that throughput can be affected by WEP and the higher the level of complexity, the more it will influence throughput. This should not be a problem for most users however, even at the highest levels.

Key Table and the Valid Key

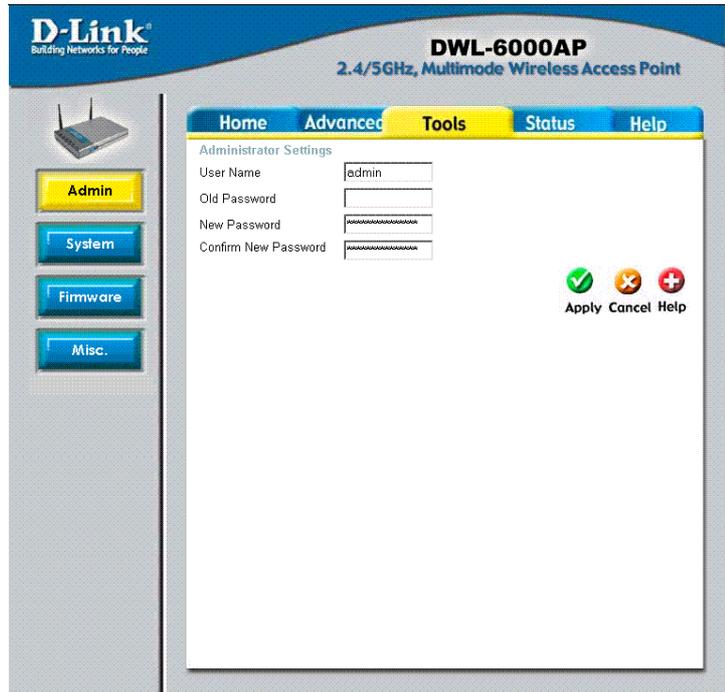
Use the Key Table to define the WEP keys according to the restriction you have selected (key size and type). The Key Table will allow only keys of the correct size and type to be entered. If you should enter a key of an incorrect character type or size an error message informs you when you attempt to apply the changes. The Valid Key determines which Key (Key 1 to Key 4) encrypts and decrypts the transmitting and received by the access point. Make sure you configure your wireless adapters exactly the same way. That is, make sure that Key 1 on the access point is the exactly the same as Key 1 on the adapters, and so on for the other keys in the table.

D-Link AirPro DWL-6000AP

Tools > Admin

Change your password in this window. It can be up to 14 characters in length. Please keep a copy of your password in a safe place. This is the same password used for access by the Multiple AP Manager. Since there is no default password, the Old Password field is blank the first time you access this menu.

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

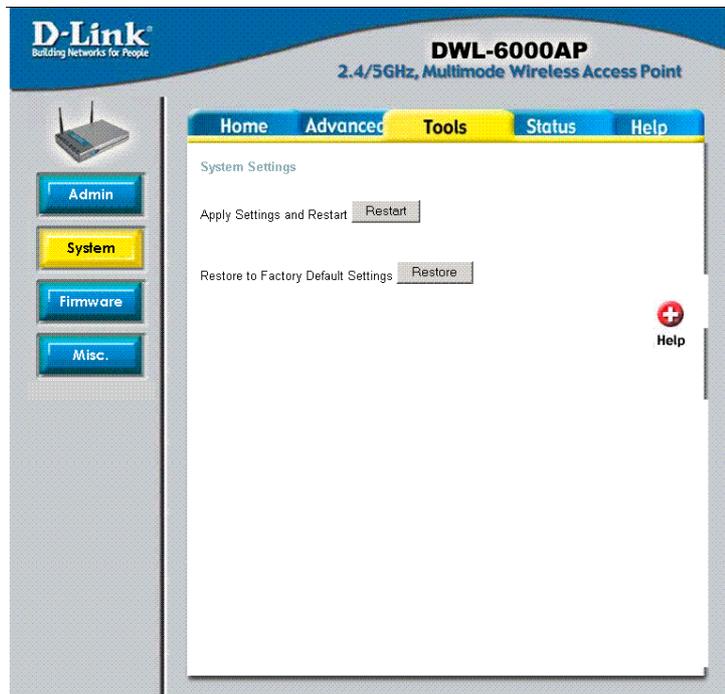


Note: If you intend to use the AirPro Multiple AP Manager you may want to use the same password for all the DWL-6000 Access Points connected to the Ethernet. See **Using the Multiple Access Point Manger** beginning on page 21 for more information.

Tools > System

The current system settings can be saved as a file onto the local hard drive by clicking **Save**. The saved file can be loaded back on the DWL-6000AP by clicking **Browse**. When you have selected the settings file, click **Load**.

Click **Restore** to return to **Factory Default Settings**.



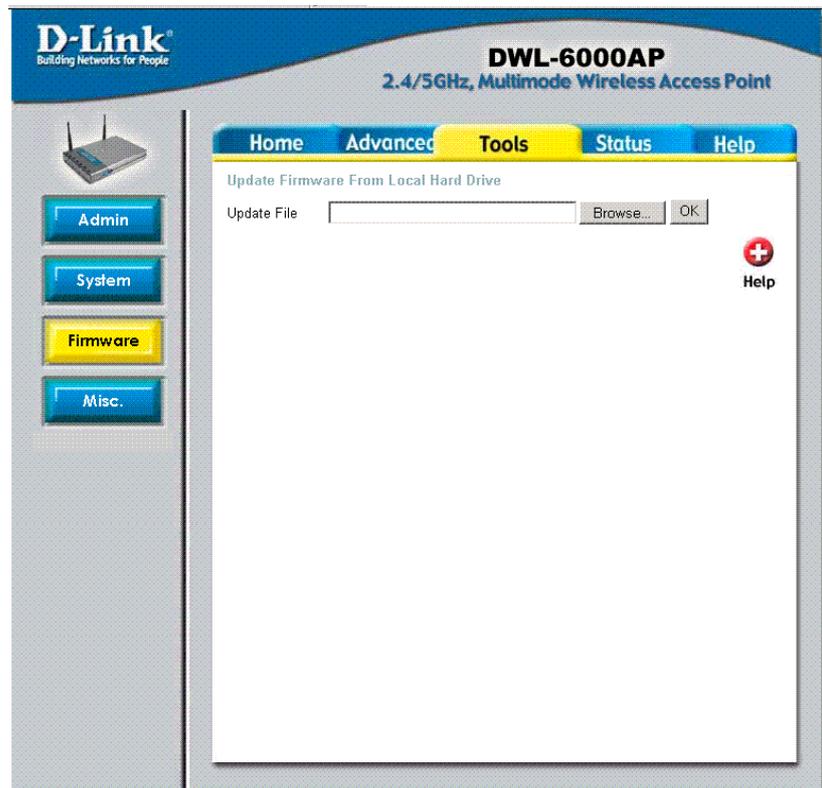
D-Link AirPro DWL-6000AP

Tools > Firmware

Upgrade the firmware for the Access Point. Click on the link to find upgrades to the firmware on the D-Link website at

<http://support.dlink.com>.

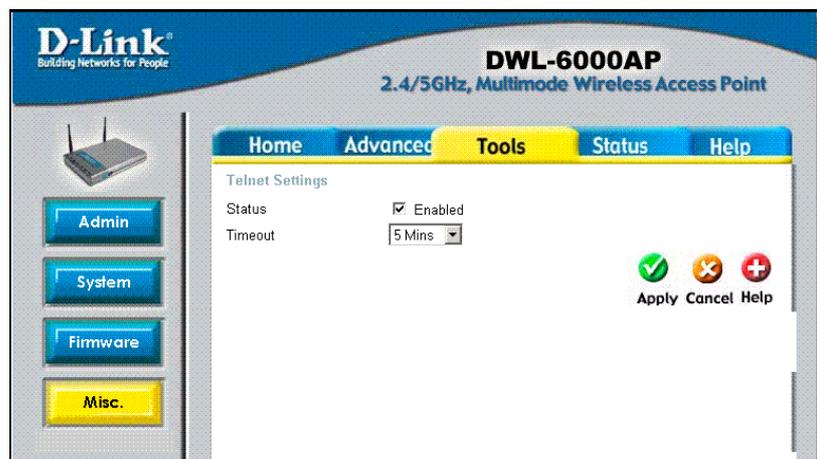
After you have downloaded a firmware upgrade to your local drive, click **Browse**. Select the firmware and click **Apply** to complete the upgrade.



IMPORTANT! The Access Point must be manually reset after every firmware upgrade. After the DWL-6000 has been upgraded and reboots, hold down the reset button on the rear panel for a few seconds. The device will reset and reboot. Upon rebooting after this manual reset, the Access Point is ready to use. See the Troubleshooting section for complete instructions for manually resetting the Access Point

Tools > Misc

The Miscellaneous menu is used to set up Telnet for the Access Point. By default Telnet is enabled. You may disable it by “unchecking” the **Status Enabled** option box. Telnet timeout options are Never, 1, 5, 10 or 15 minutes.



D-Link AirPro DWL-6000AP

Status > Device Info

This page displays the current information including the device MAC address, Ethernet LAN IP information, and Wireless settings information for both 802.11a and 802.11b.

D-Link
Building Networks for People

DWL-6000AP
2.4/5GHz, Multimode Wireless Access Point

Home Advanced Tools **Status** Help

Device Information

Firmware Version: V0.05-B00
MAC Address: 00:05:5d:6e:54:5c
Country: Norway

Ethernet

Get IP From: Manual
IP Address: 192.168.0.50
Subnet Mask: 255.255.255.0
Gateway: 0.0.0.0

Wireless (802.11a)

SSID: default
Channel: 36
Rate: Auto
Security Level: Shared Key / WEP Disabled

Wireless (802.11b)

SSID: default
Channel: 1
Rate: Auto
Security Level: Open System / WEP Disabled

Hel

Status > Stats

Network traffic statistics for both received and transmitted communications through the Ethernet port and wireless connections associated with the Access Point are displayed here.

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DWL-6000AP
2.4/5GHz, Multimode Wireless Access Point

Home Advanced Tools **Status** Help

Traffic Statistics

ThroughPut

Transmit Success Rate	100 %
Transmit Retry Rate	0 %
Receive Success Rate	19 %
Receive Duplicate Rate	0 %
RTS Success Count	0
RTS Failure Count	0

Transmitted Frame Count

Transmitted Frame Count	19336
Multicast Transmitted Frame Count	19187
Transmitted Error Count	0
Transmitted Total Retry Count	7
Transmitted Multiple Retry Count	0

Received Frame Count

Received Frame Count	138
Multicast Received Frame Count	0
Received Frame FCS Error Count	590
Received Frame Duplicate Count	0
Ack Rcv failure Count	16

Wep Frame Error Count

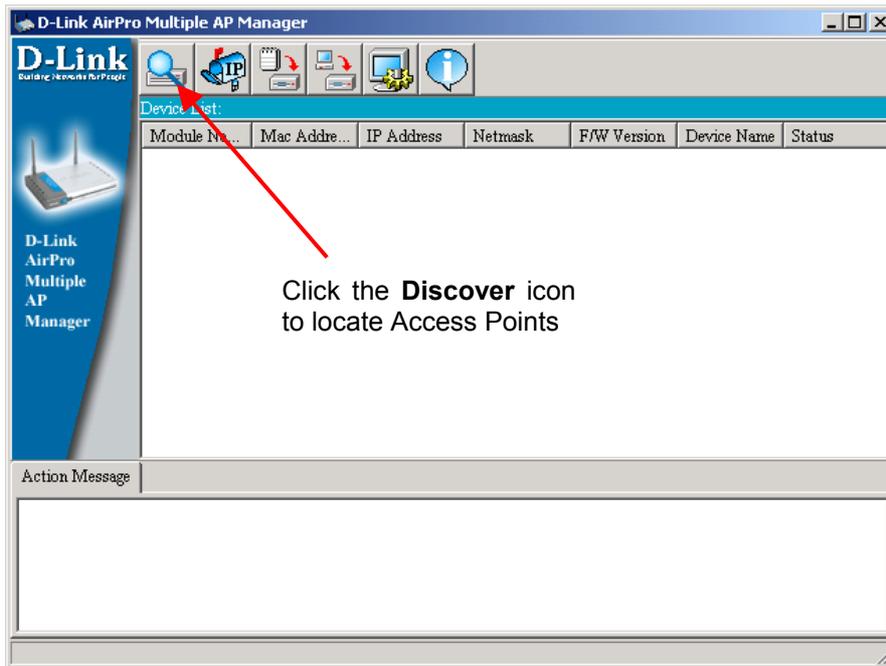
WEP Excluded Frame Count	0
WEP ICV Error Count	0

Refresh Help

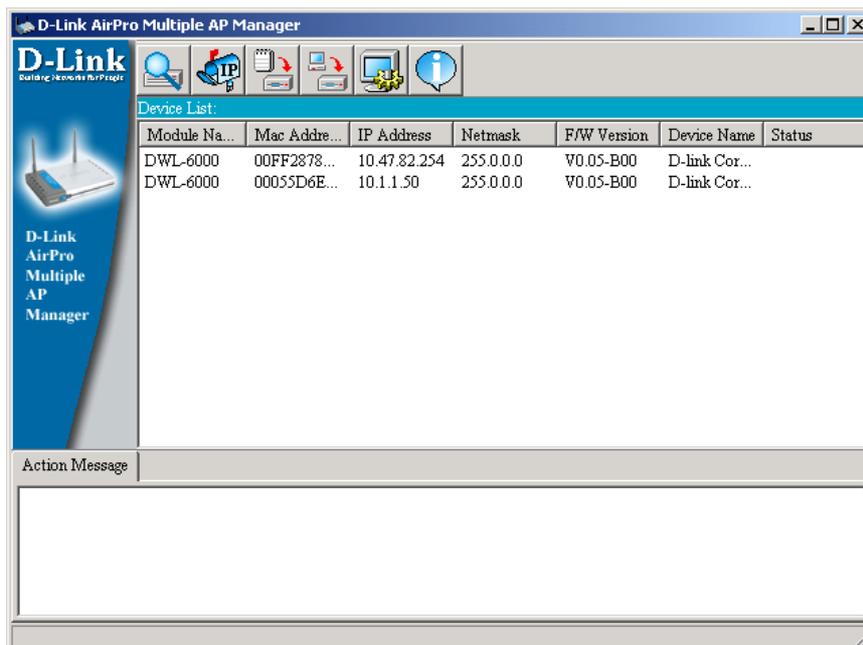
6. Using the Multiple AP Manager

The D-Link AirPro Multiple AP Manager is included with your DWL-6000AP. The self-executing installation software can be found on the CD (along with this user's manual). Launch the Setup file for the Multiple AP Manager and follow the instructions to install the software. The software should be installed a system connected to the Ethernet and running a Windows OS (Windows XP, 2000, NT 4.0 Me or 98).

Once the Multiple AP Manager is installed, it can be launched from the Start menu: **Start>Programs>D-Link AirPro Multiple AP Manager>AirPro Multiple AP Manager**. The AP Manager window appears.



Click on the Discover icon to locate other DWL-6000 Access Points on the network. All DWL-6000 Access Points connected to the Ethernet will appear in the Device List below.



D-Link AirPro DWL-6000AP

Use the Device List to view a summary of basic information for AirPro Access Points on your network.

To configure an Access Point, highlight to select the device and click on the icon representing the action you wish perform. The icons for device configuration are used to perform the following tasks:

- Set device IP settings
- Configure device settings
- Upgrade device firmware
- Configure system settings

Configure Access Points

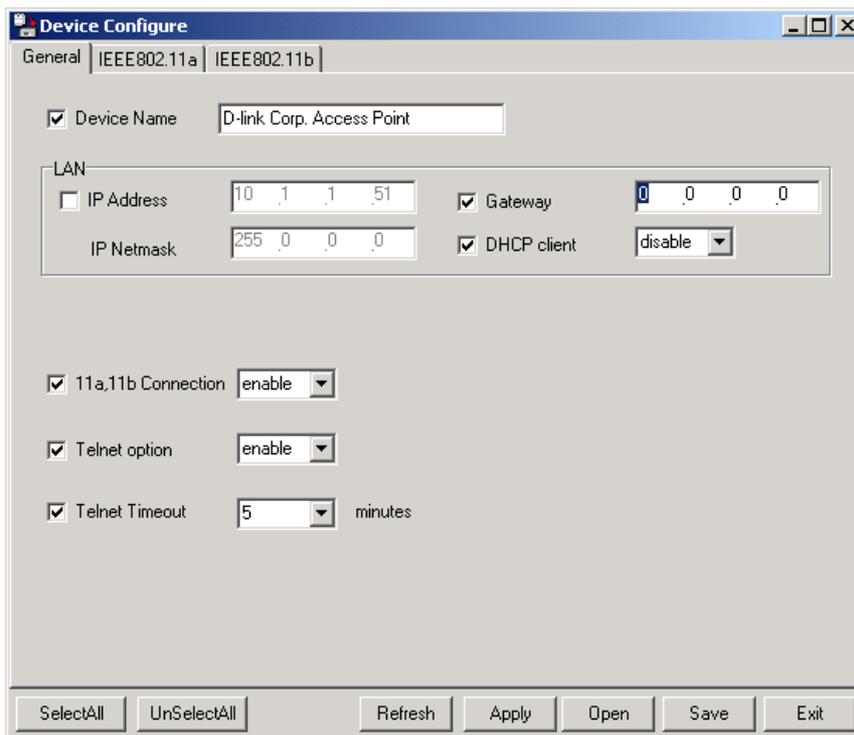
To configure password-enabled DWL-6000 Access Points with the Multiple Access Point Manager you must first provide the password in the System Settings menu (see below). Click on a single device on the list or hold the left button down and pull down to select more than a single device. The selected devices will appear highlighted.



To change the IP settings, click the  icon. This lets you change the IP address and subnet mask of the device. If you are configuring IP settings for multiple devices, the IP settings are configured for each device in the order they appear in the Device List.



To change device settings click the  icon. A new windows appears:



The screenshot shows a window titled "Device Configure" with three tabs: "General", "IEEE802.11a", and "IEEE802.11b". The "General" tab is active. The window contains the following settings:

- Device Name: D-link Corp. Access Point
- LAN**
 - IP Address: 10 . 1 . 1 . 51
 - Gateway: 0 . 0 . 0 . 0
 - IP Netmask: 255 . 0 . 0 . 0
 - DHCP client: disable
- 11a,11b Connection: enable
- Telnet option: enable
- Telnet Timeout: 5 minutes

At the bottom of the window are buttons: SelectAll, UnSelectAll, Refresh, Apply, Open, Save, and Exit.

Use the Device Configuration menu to configure the same basic and advanced settings available for configuration in the web manager, including LAN IP settings. The device settings are presented in three tabs in the Configuration menu for General, IEEE 802.11a and IEEE 802.11b settings.

The buttons along the bottom of the Configuration menu appear with all three tabs. These allow you to select or unselect all options, apply the settings, open a previously saved device configuration file, or save the current device settings to a configuration file.

D-Link AirPro DWL-6000AP

The wireless settings include the same settings that are available in the web manager except for some of the WLAN partition settings. You can disable connection between the 802.11a and 802.11b networks with the **11a, 11b Connection** option in the General tab (See page14, WLAN Partition).

System Settings

In order to configure an Access Point that is password protected, the correct password must be configured so the Multiple AP Manager can gain access to the device configuration software.

The Multiple AP Manager uses a single Access Password. For this reason, it may be easier to set the same password for each Access Point. Passwords for Access Points are set using the Tools>Admin menu in the Web Manager.

The **Access Password** used by the Multiple AP Manager functions like a community string used with SNMP manager software. The AP Manager uses this password to configure any single device or multiple access points that have been given the same password. This way you can configure settings such as SSID and WEP so that the Access Points are configured simultaneously. Since many wireless functions require that the settings be entered exactly the same way for all devices, you can reduce the likelihood of problems caused by settings entry error.

Enter the Access Password used for device configuration and click the **OK** button.

If you attempt to change configuration settings for a device that is not using the same password, an error message will appear in the Action Message field at the bottom of the Configuration menu.

Setting	Value
Access Password	
Setting Timeout (s)	5
Reboot Time (s)	15
Configuration Upload Time (s)	10
Configuration Download Time (s)	10
Configuration Flash Update Time (s)	30
Factory Reset Time (s)	30
F/W Download Time (s)	10
F/W Flash Update Time (s)	30
Timing Tolerance (s)	5

Configuring Multiple Access Points

If you use a common password for all DWL-6000 Access Points on your network, you may configure them all at once. This is especially convenient when you are setting up WEP encryption or upgrading firmware. To configure more than one Access Point, select the devices you want to configure from the Device List and click on the icon to perform the desired function. Then simply enter the settings as you would for a single device.

Note: Hold the **Ctrl** key down and click on individual Access Points from the Device List to add them to the selected group for configuration. To select Access Points listed consecutively, hold the **Shift** key while selecting them.

7. Troubleshooting

This chapter provides solutions to problems that can occur during the installation and operation of the DWL-6000AP Wireless Access Point. We cover various aspects of the network setup, including the network adapters. Please read the following if you are having problems.

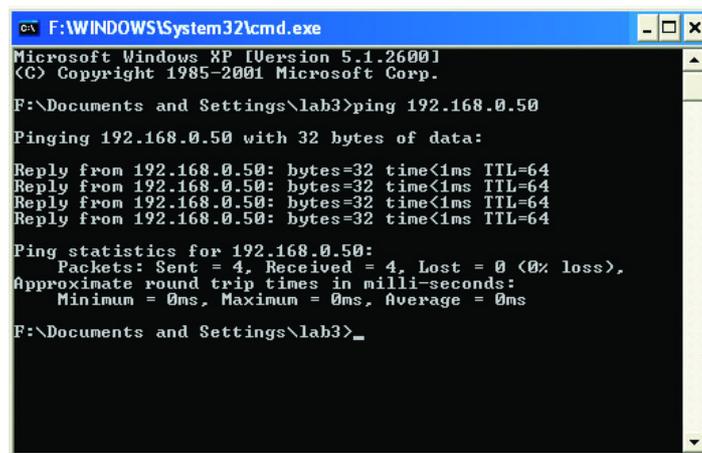
Note: It is recommended that you use an Ethernet connection to configure the DWL-6000AP Access Point.

1. The computer used to configure the DWL-6000AP cannot access the Configuration menu.

- Check that the **Ethernet LED** on the DWL-6000AP is **ON**. If the **LED** is not **ON**, check that the cable for the Ethernet connection is securely inserted.
- Check that the Ethernet Adapter is working properly. Please see item 6 (**Check that the drivers for the network adapters are installed properly**) in this **Troubleshooting** section to check that the drivers are loaded properly.
- Check that the **IP Address** is in the same range and subnet as the DWL-6000AP. Please see **Checking the IP Address in Windows XP** in the **Networking Basics** section of this manual.

Note: The IP Address of the DWL-6000AP is 192.168.0.50. All the computers on the network must have a unique IP Address in the same range, e.g., 192.168.0.x. Any computers that have identical IP Addresses will not be visible on the network. They must all have the same subnet mask, e.g., 255.255.255.0

- Do a **Ping test** to make sure that the DWL-6000AP is responding. Go to **Start>Run>Type Command>Type ping 192.168.0.50**. A successful ping will show four replies.



```
F:\WINDOWS\System32\cmd.exe
Microsoft Windows XP [Version 5.1.2600.1
(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:

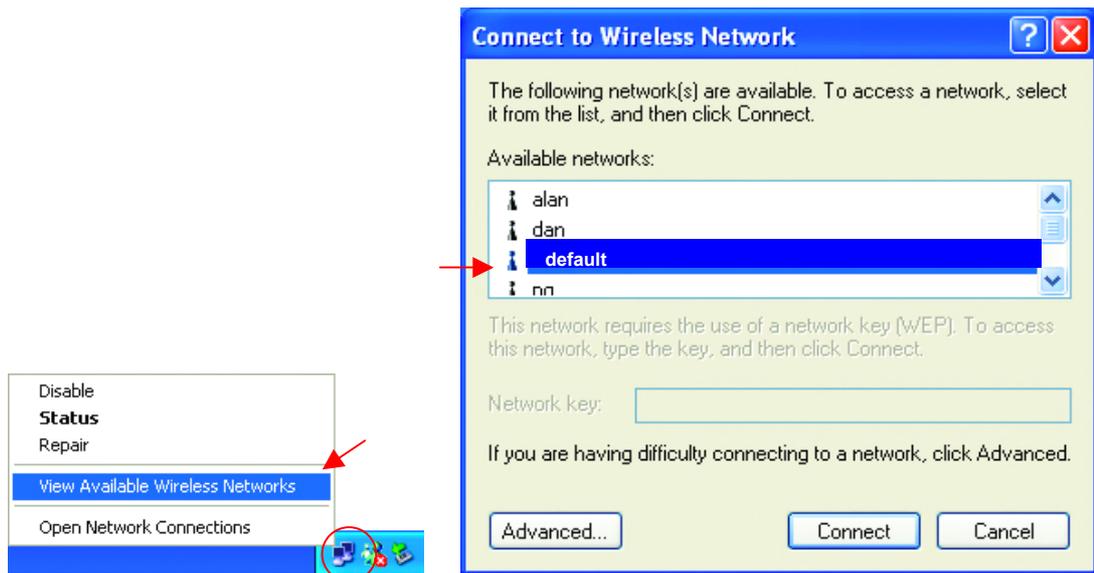
Reply from 192.168.0.50: bytes=32 time<1ms TTL=64

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>_
```

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

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

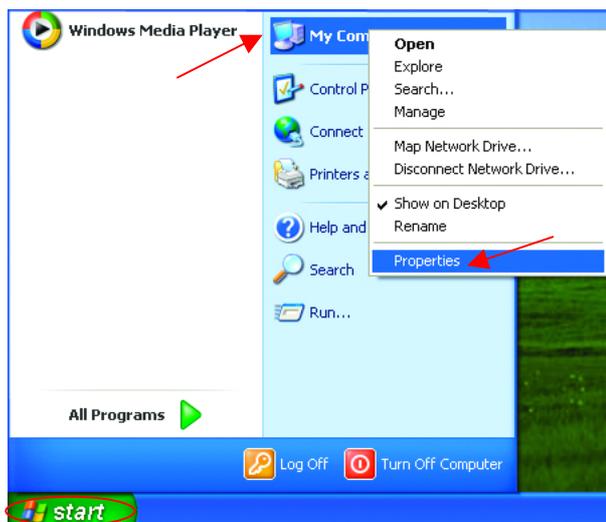


- Check that the **IP Address** assigned to the wireless adapter is within the same **IP Address range** as the access point and gateway. *Since the DWL-6000AP has an IP Address of 192.168.0.50, wireless adapters must have an IP Address in the same range, e.g., 192.168.0.x. Each device must have a unique IP Address; no two devices may have the same IP Address. The subnet mask must be the same for all the computers on the network.)* To check the **IP Address** assigned to the wireless adapter, **double-click** on the **Local Area Connection icon** in the taskbar > select the **Support tab** and the **IP Address** will be displayed. (Please refer to **Checking the IP Address** in the **Networking Basics** section of this manual.)
- If it is necessary to assign a **Static IP Address** to the wireless adapter, please refer to the appropriate section in **Networking Basics**. If you are entering a **DNS Server address** you must also enter the **Default Gateway Address**. (Remember that if you have a **DHCP-capable router**, you will not need to assign a **Static IP Address**. See **Networking Basics: Assigning a Static IP Address**.)

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

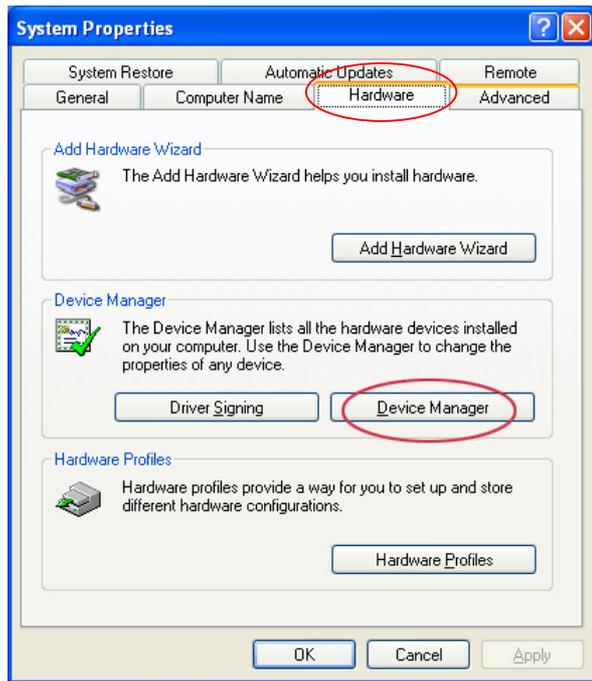
You may be using different network adapters than those illustrated here, but this procedure will remain the same, regardless of the type of network adapters you are using.

- Go to **Start**
- **Right-click** on **My Computer**
- Click **Properties**

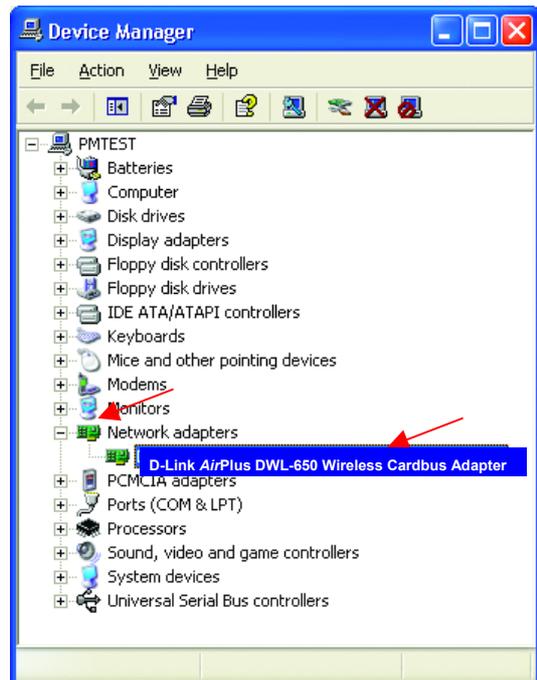


D-Link AirPro DWL-6000AP

- Select the **Hardware Tab**
- Click **Device Manager**

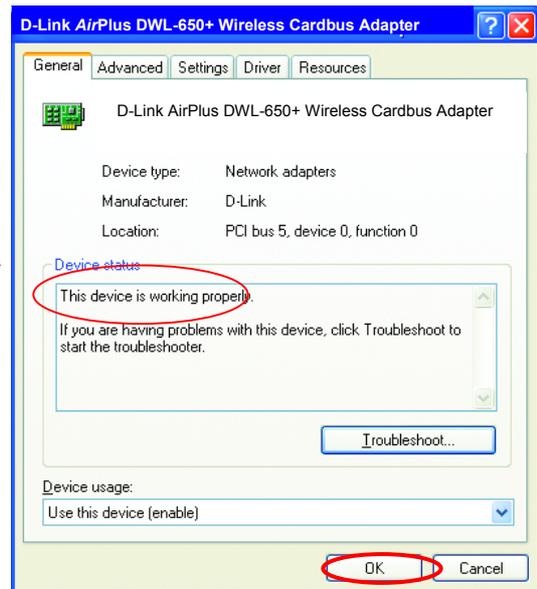


- Double-click on **Network Adapters**
- Right-click on **D-Link AirPlus DWL-650+ Wireless Cardbus Adapter**
- Select **Properties** to check that the drivers are installed properly



D-Link AirPro DWL-6000AP

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



4. Resetting the DWL-6000AP to Factory Default Settings

After you have tried other methods for troubleshooting your network, you may choose to **Reset** the DWL-6000AP to the factory default settings. Remember that D-Link AirPro products network together, out of the box, at the factory default settings.



To hard-reset the D-Link AirPro DWL-6000AP to Factory Default Settings, please do the following:

- Locate the **Reset** button on the back of the DWL-6000AP
- Use a paper clip to press the **Reset** button.
- Hold for about 5 seconds and then release
- After the DWL-6000AP reboots (this may take a few minutes) it will be reset to the factory **Default** settings.

8. Networking Basics

Using the Network Setup Wizard in Windows XP

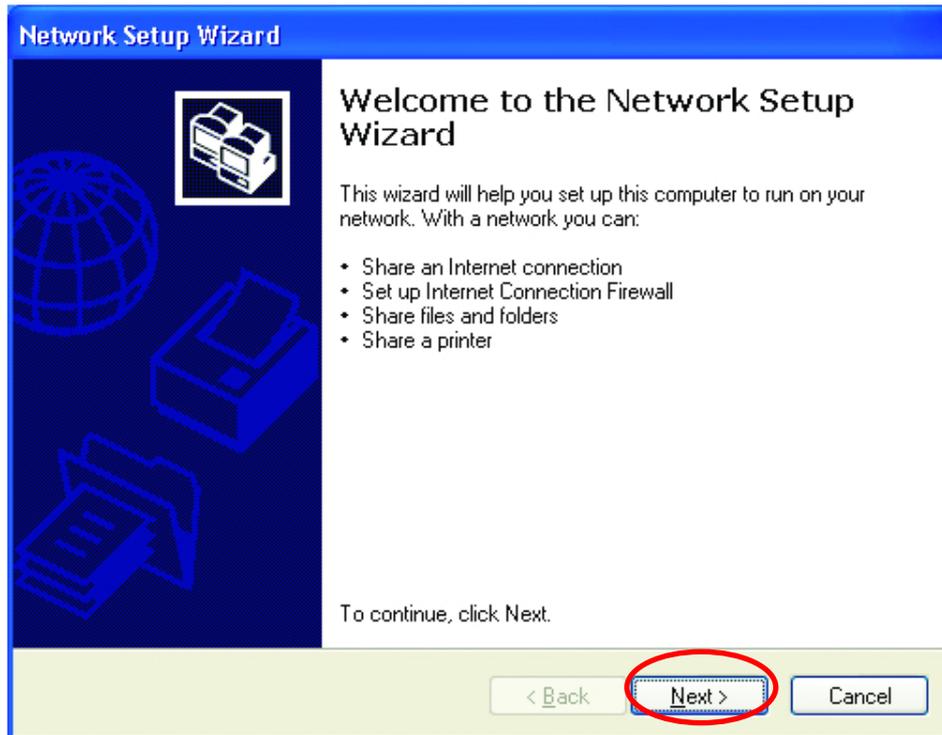
In this section you will learn how to establish a network at home or work, using **Microsoft Windows XP**.

Note: Please refer to websites such as <http://www.homenethelp.com>

and <http://www.microsoft.com/windows2000> for information about networking computers using Windows 2000, ME or 98.

Go to **Start>Control Panel>Network Connections**

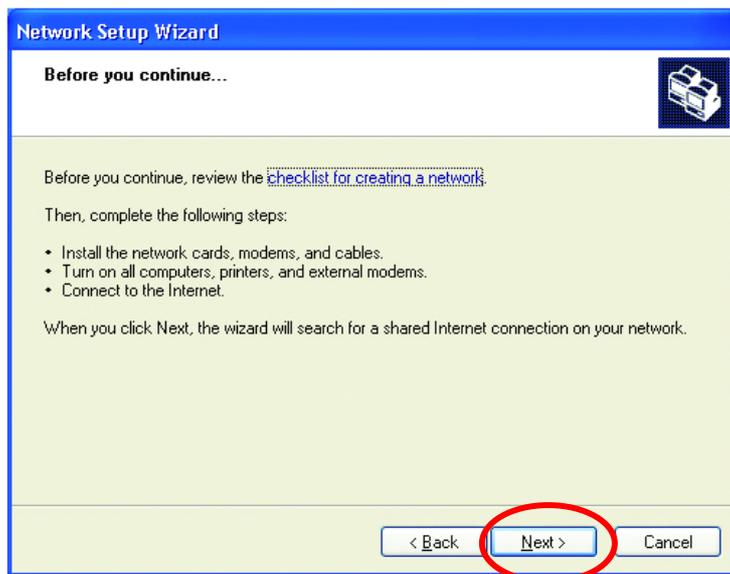
Select **Set up a home or small office network**



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

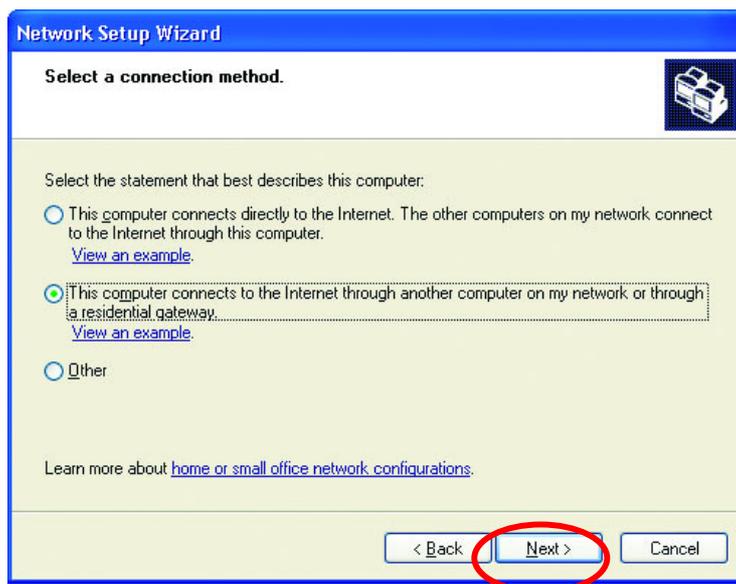
D-Link AirPro DWL-6000AP

Please follow all the instructions in this window:



Click **Next**

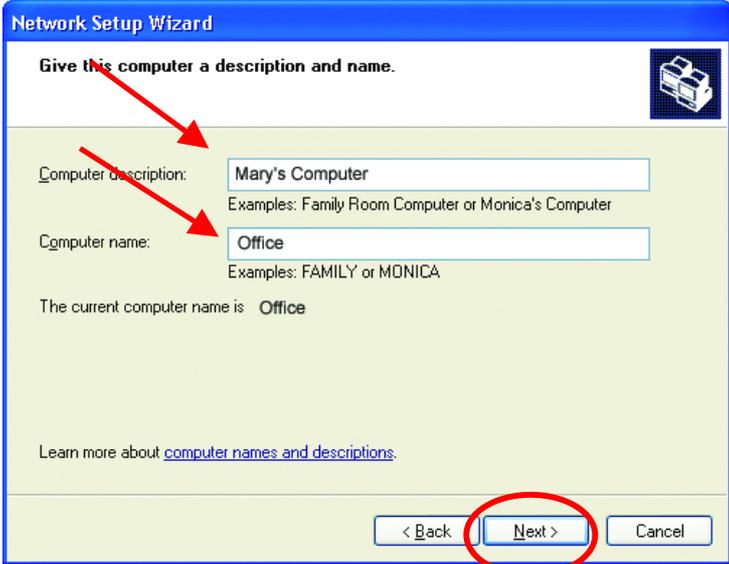
In the following window, select the best description of your computer. If your computer connects to the internet through a gateway/router, select the second option as shown.



Click **Next**

D-Link AirPro DWL-6000AP

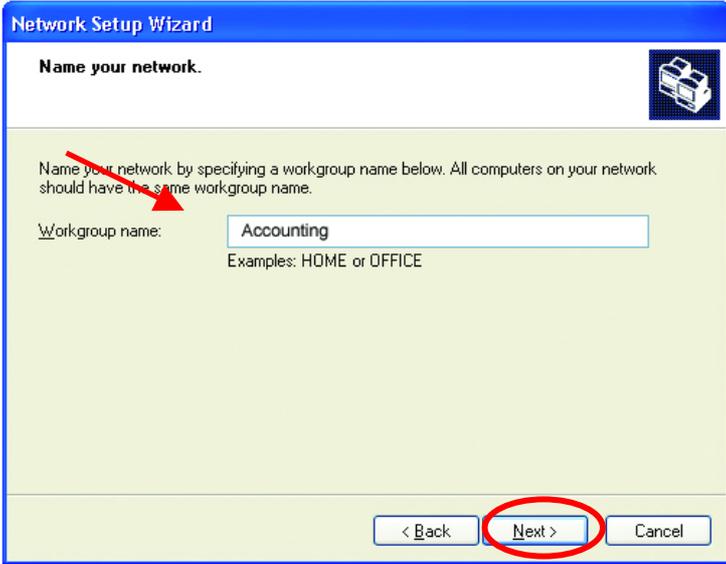
Enter a **Computer description** and a **Computer name** (optional.)



The screenshot shows the 'Network Setup Wizard' window with the title 'Give this computer a description and name.' It features two text input fields: 'Computer description' containing 'Mary's Computer' and 'Computer name' containing 'Office'. Below the 'Computer name' field, it states 'The current computer name is Office'. At the bottom, the 'Next >' button is circled in red, and two red arrows point to the input fields. A link for 'Learn more about computer names and descriptions.' is also visible.

Click **Next**

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

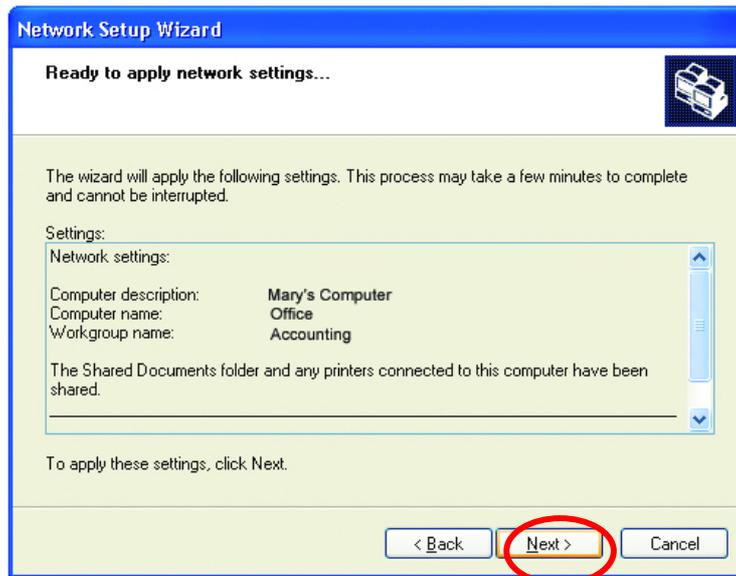


The screenshot shows the 'Network Setup Wizard' window with the title 'Name your network.' It features a text input field for 'Workgroup name' containing 'Accounting'. Below the field, it states 'Examples: HOME or OFFICE'. At the bottom, the 'Next >' button is circled in red, and a red arrow points to the input field.

Click **Next**

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

D-Link AirPro DWL-6000AP



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

Please wait while the **Network Setup Wizard** configures the computer.

This may take a few minutes.



D-Link AirPro DWL-6000AP

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



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



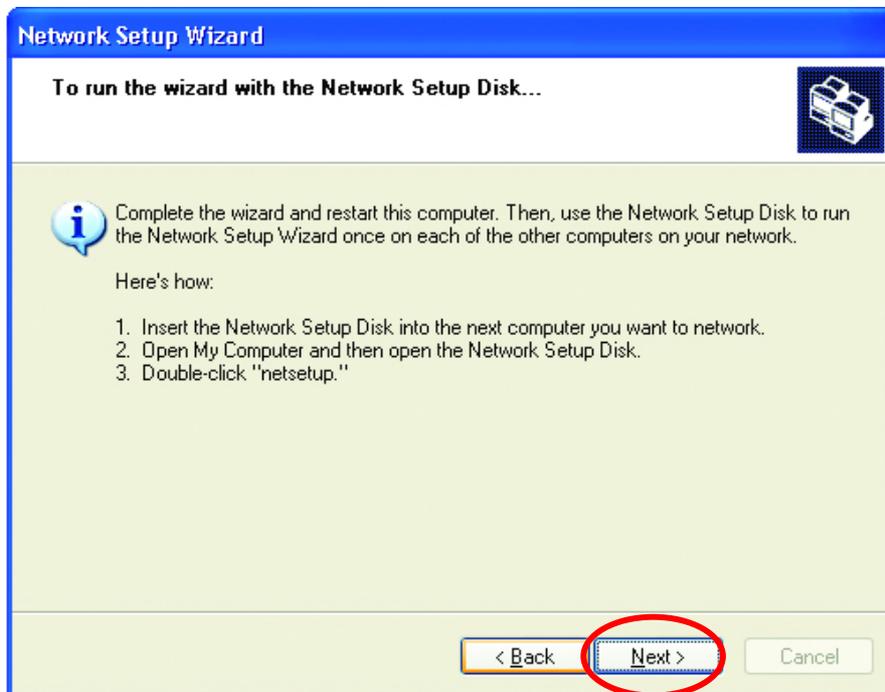
Format the disk if you wish, and click **Next**.

Please wait while the **Network Setup Wizard** copies the files.

D-Link AirPro DWL-6000AP

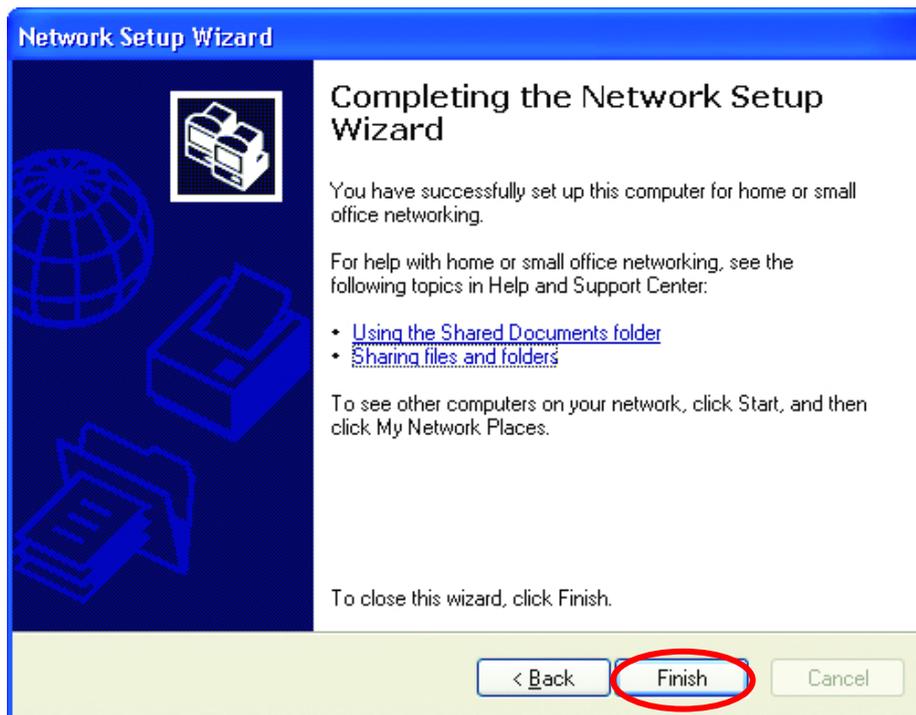


Please read the information under **Here's how** in the screen below. After you complete the **Network Setup Wizard** you will use the **Network Setup Disk** to run the **Network Setup Wizard** once on each of the computers on your network. To continue click **Next**.

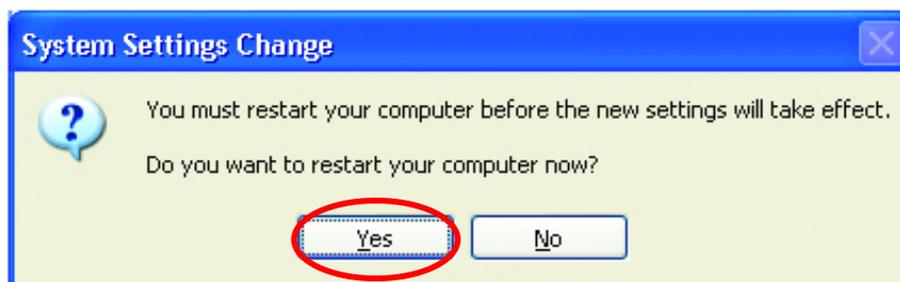


D-Link AirPro DWL-6000AP

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.



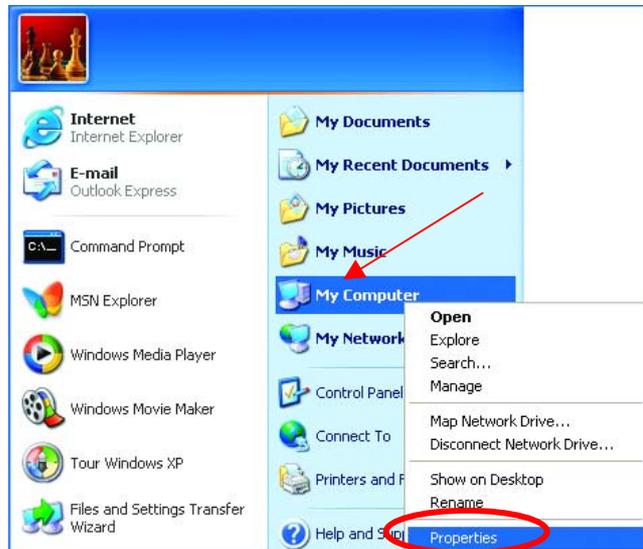
You have completed configuring this computer. Next, you will need to run the **Network Setup Disk** on all the other computers on your network. After running the **Network Setup Disk** on all your computers, your new wireless network will be ready to use.

Naming your Computer

To name your computer, 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

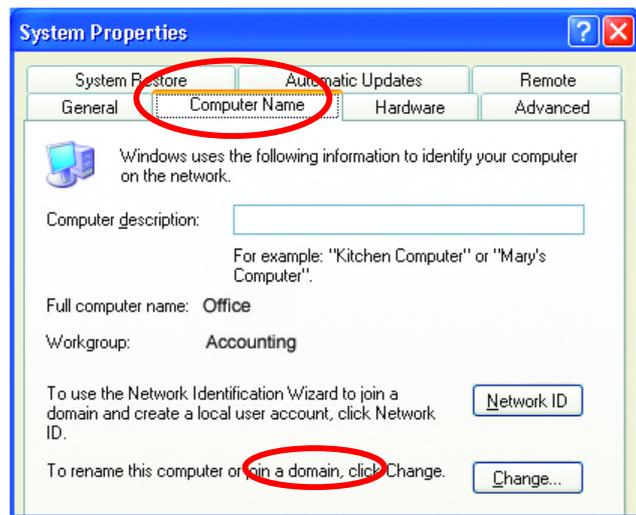


- Select the **Computer Name Tab** in the **System Properties** window.

*You may enter a **Computer description** if you wish, this field is optional.*

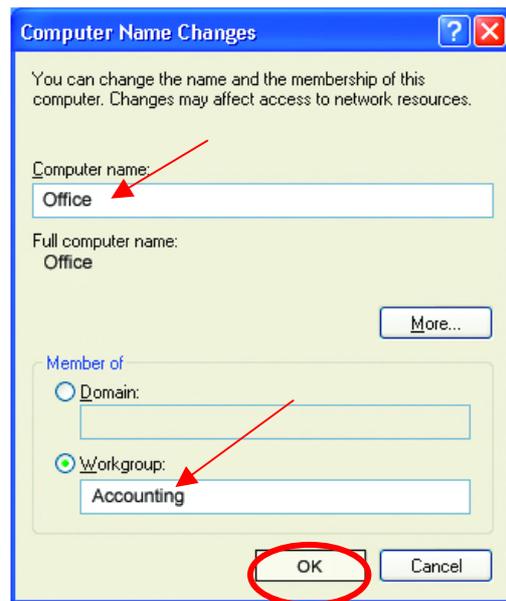
To rename the computer and join a domain,

- 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**



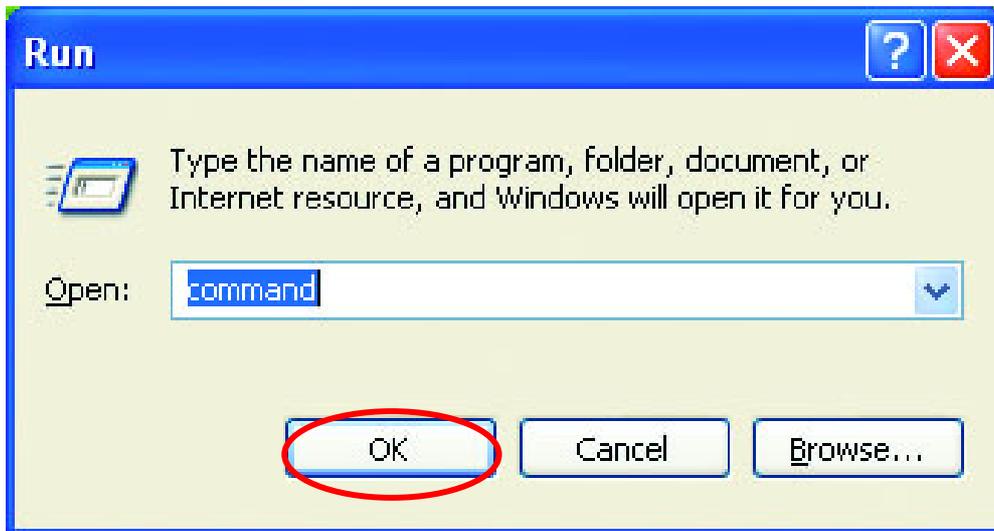
Checking the IP Address in Windows XP/2000

Go to **Start > All Programs > Accessories > Command Prompt**



Checking the IP Address in Windows XP/2000

Type **Command**



Click **OK**

Checking the IP Address in Windows XP/2000

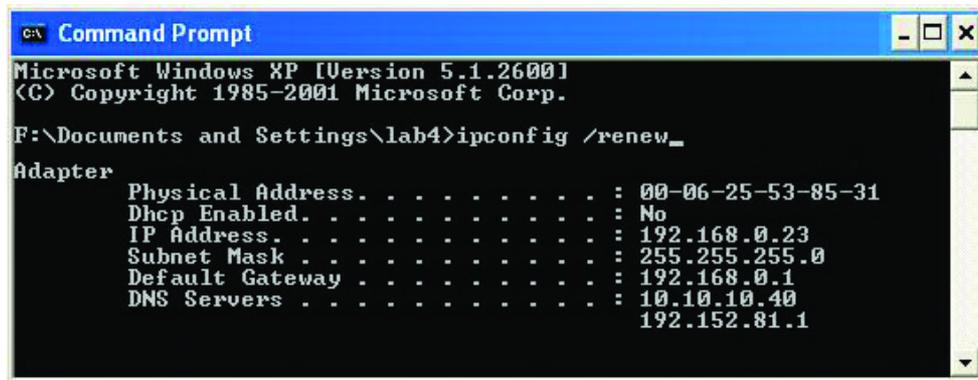
Type **ipconfig /all** at the prompt. Press **Enter**. All the configuration settings are displayed as shown below.



D-Link AirPro DWL-6000AP

Checking the IP Address in Windows XP/2000

Type `ipconfig /renew` at the prompt to get a new IP Address. Press **Enter**. The new IP Address is shown below.



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

F:\Documents and Settings\lab4>ipconfig /renew_

Adapter
Physical Address. . . . . : 00-06-25-53-85-31
Dhcp Enabled. . . . . : No
IP Address. . . . . : 192.168.0.23
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.0.1
DNS Servers . . . . . : 10.10.10.40
                       192.152.81.1
```

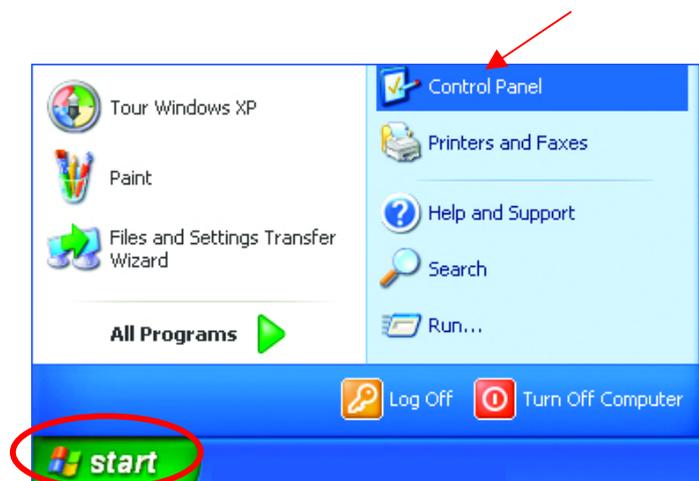
(Windows 98/ME users: go to **Start > Run**. Type **Command**. Type `winipcfg` at the prompt. The Windows IP Configuration menu will come up. Click **Release**, then **Renew** to obtain a new IP Address.)

Assigning a Static IP Address

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.

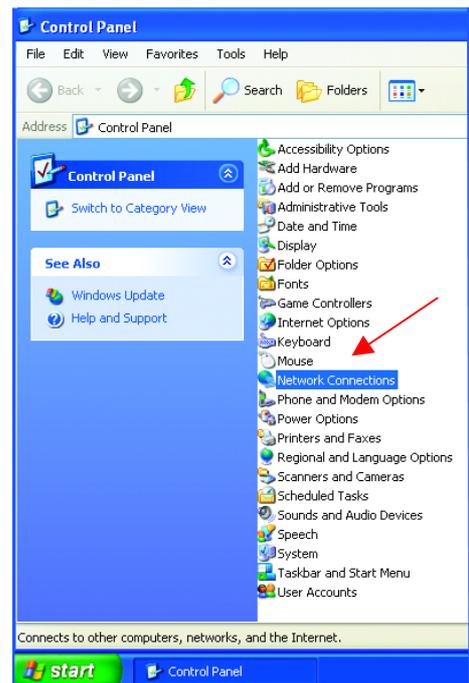
If you are not using a DHCP capable Gateway/Router, or you need to assign a Static IP Address, please follow these instructions:

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

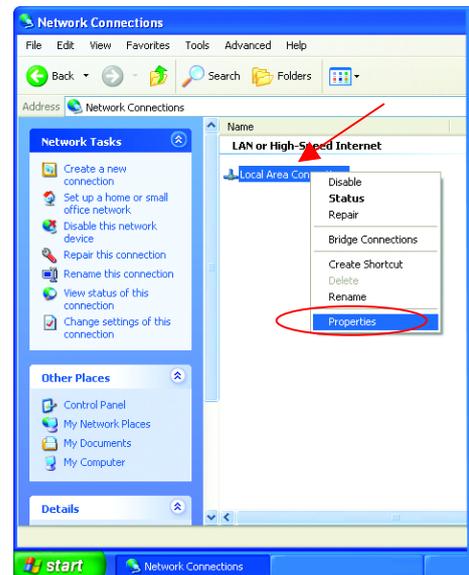


Assigning a Static IP Address

- **Double-click on Network Connections**



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



Assigning a Static IP Address

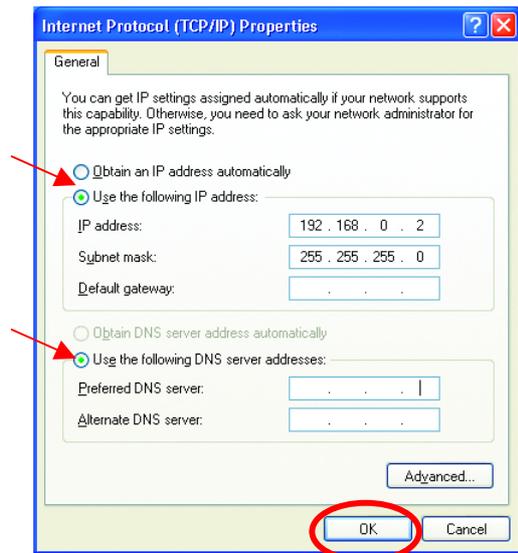
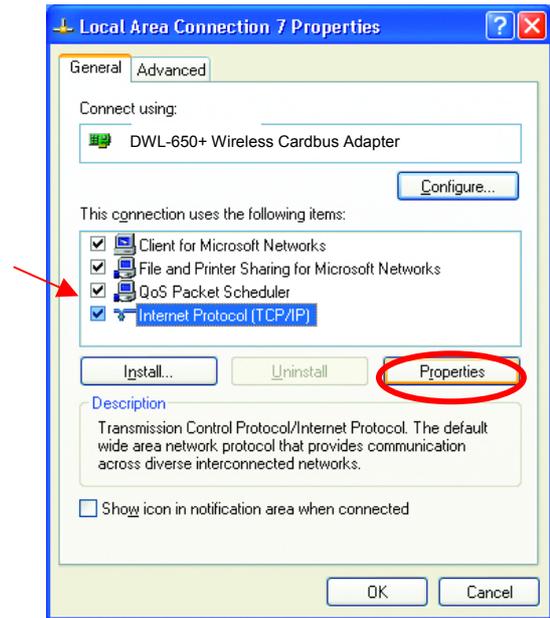
- Click on **Internet Protocol (TCP/IP)**
- Click **Properties**

- **Select Use the following IP address**

in the **Internet Protocol (TCP/IP) Properties** window,

- 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 provided by your ISP



- Click **OK**

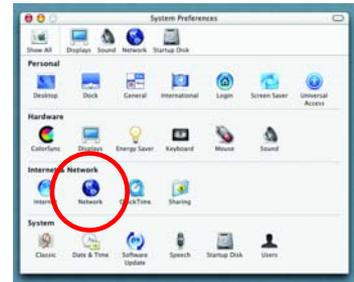
You have completed the assignment of a Static IP Address. (You do not need to assign a Static IP Address if you have a DHCP-capable Gateway/Router.)

D-Link AirPro DWL-6000AP

Assigning a Static IP Address with **Macintosh OS X**

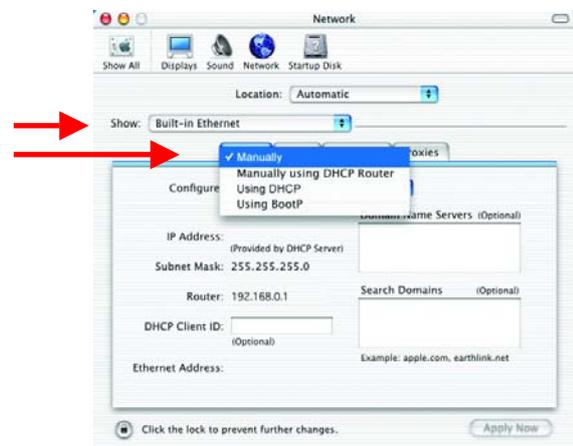
Go to the **Apple Menu** and select **System Preferences**.

Click on **Network**

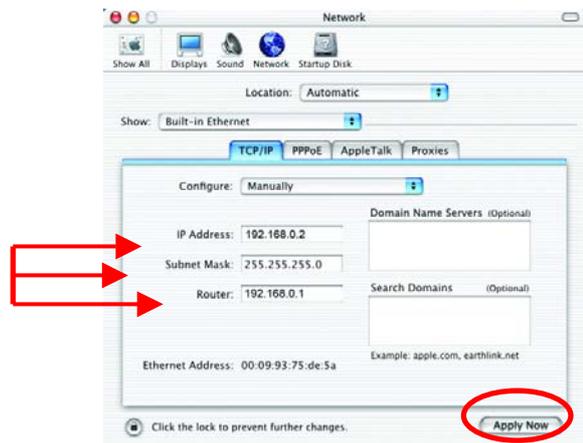


Select **Built-in Ethernet** in the **Show** pull-down menu.

Select **Manually** in the **Configure** pull-down menu.



Input the **Static IP Address**, the **Subnet Mask** and the **Router IP Address** in the appropriate fields.



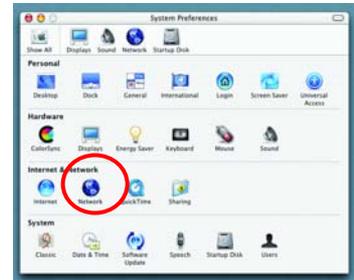
Click **Apply Now**

D-Link AirPro DWL-6000AP

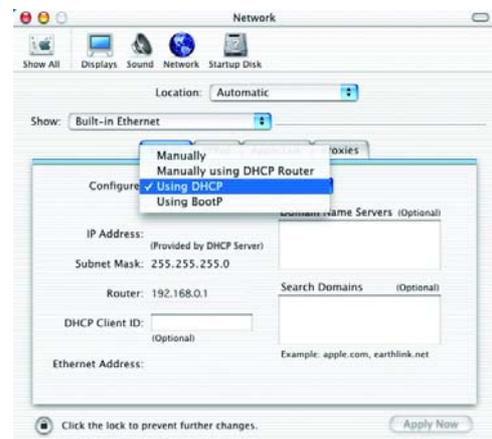
Selecting a Dynamic IP Address with *Macintosh OS X*

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

Click on **Network**



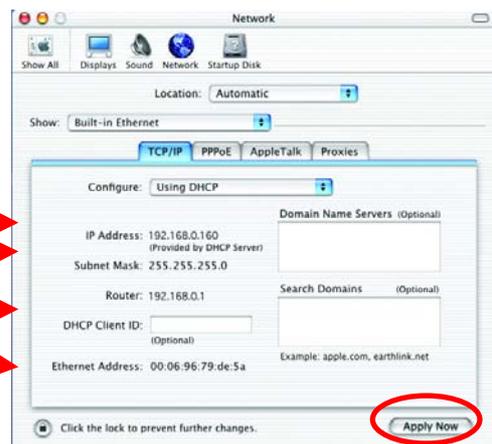
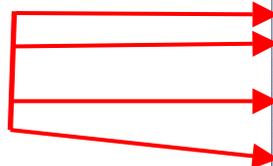
Select **Built-in Ethernet** in the **Show** pull-down menu.



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

Click **Apply Now**

The **IP Address**, **Subnet mask**, and the **Router's IP Address** will appear in a few seconds.

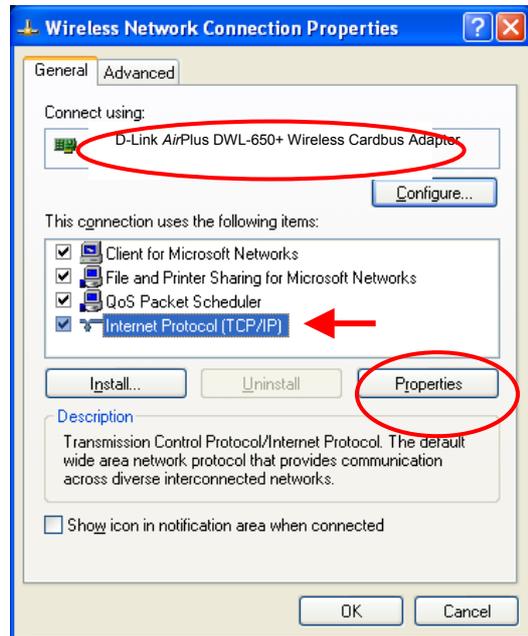


D-Link AirPro DWL-6000AP

Connecting to a Wireless Network in Windows XP

To be able to connect to a wireless network, make sure the proper network settings are configured for DWL-650+.

Go to **Start** > right-click on **My Network Places** > select **Properties** > double-click on the **Wireless Network Connection** associated with the DWL-650+ > select **Properties** > select **Internet Protocol (TCP/IP)** > click **Properties**

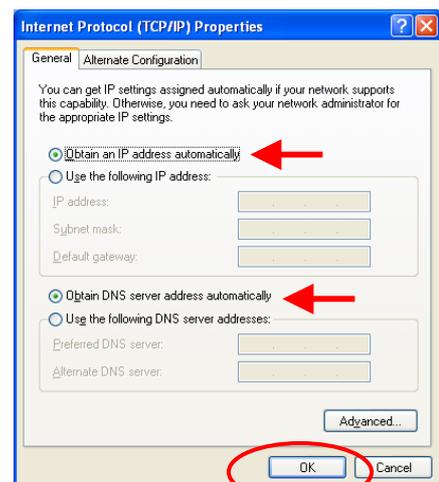


Connecting to a Wireless Network with a Wireless Router or an Access Point using a DHCP server in Windows XP.

Select **Obtain an IP address automatically** - if the Wireless Router or Access Point has DHCP server enabled

Select **Obtain DNS server address automatically**.

Click **OK**



Connecting to a Wireless Network

Connecting to a Wireless Network with a Wireless Router or an Access Point using a static IP address in Windows XP.

Select **Use the following IP address** - if the Wireless Router or Access Point **does not** have a DHCP server enabled.

Input a static IP address within the same range as the Wireless Router or Access Point.

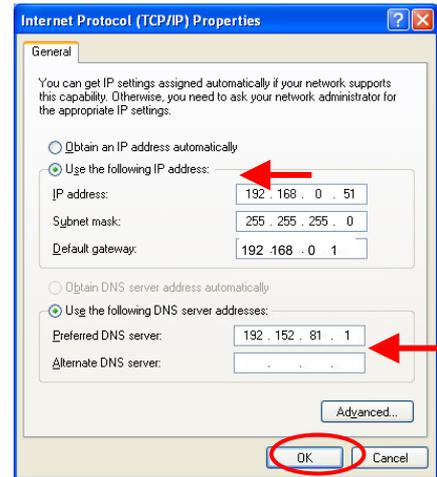
IP address: 192.168.0.51

Subnet mask: 255.255.255.0

Default Gateway: Enter the LAN IP address of the Wireless Router

Select **Use the following DNS server address**. Enter the LAN IP address of the Wireless Router.

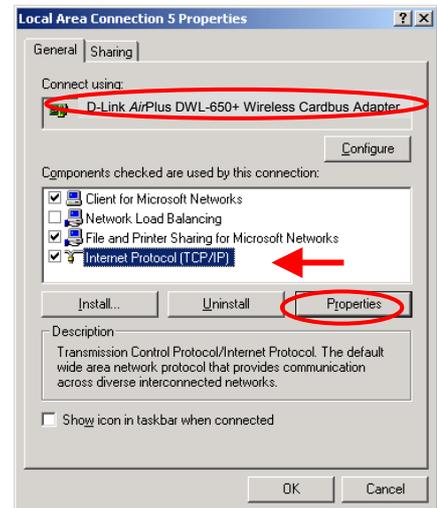
Click **OK**



Connecting to a Wireless Network in Windows 2000

Go to **Start > Settings > Network and Dial-up Connections >** Double click on the **Local Area Connection** associated with the DWL-650+ > select **Properties >**

select **Internet Protocol (TCP/IP) >** click **Properties**



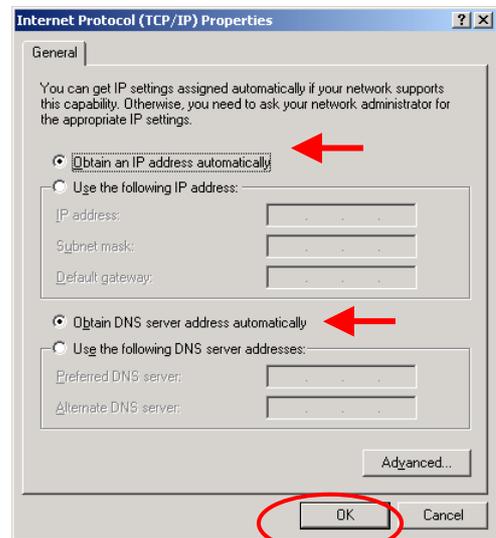
Connecting to a Wireless Network

Connecting to a Wireless Network with a Wireless Router or an Access Point using a DHCP server in Windows 2000.

Select **Obtain an IP address automatically.**

Select **Obtain DNS server address automatically.**

Click **OK**



Connecting to a Wireless Network with a Wireless Router or an Access Point using a static IP address in Windows 2000.

Select **Use the following IP address**

Input a static IP Address within the same IP Address range as the wireless router or the access point.

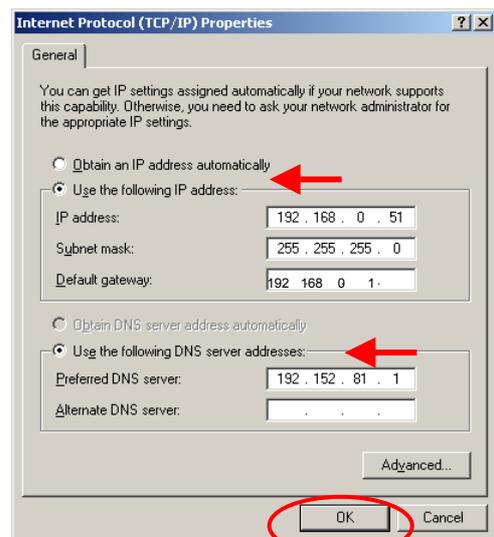
IP address: 192.168.0.51

Subnet mask: 255.255.255.0

Default Gateway: 192.168.0.1

Select **Use the following DNS server address.** Leave this section blank.

Click **OK**

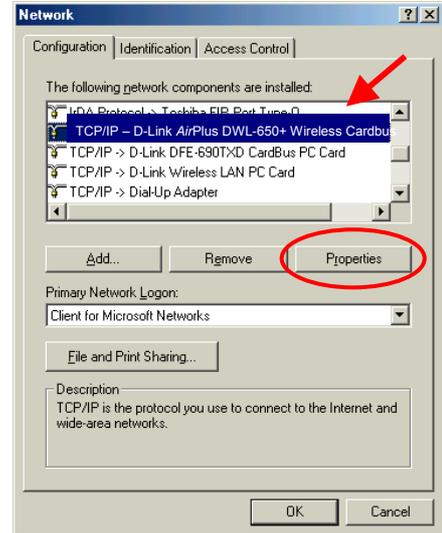


D-Link AirPro DWL-6000AP

Connecting to a Wireless Network

Connecting to a Wireless Network in Windows Me and 98

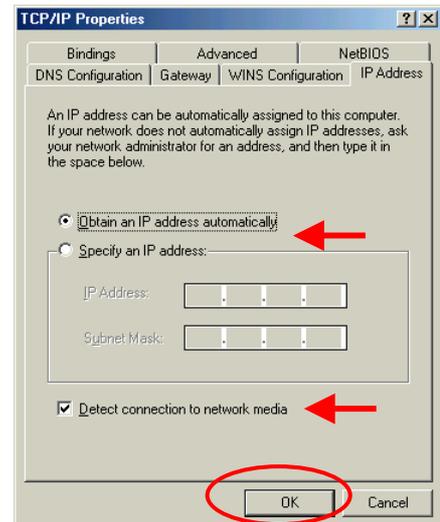
Go to **Start > Settings > Control Panel > Double-click on the Network** associated with the DWL-650+ > click **Properties** > select **Internet Protocol (TCP/IP)** > click **Properties**



Connecting to a Wireless Network with a Wireless Router or an Access Point using a DHCP server in Windows Me and 98.

Select the **IP Address** tab. Then, select **Obtain an IP address automatically**.

Select **Detect connection to network media**.



Click **OK**

Connecting to a Wireless Network

Connecting to a Wireless Network with a Wireless Router or Access Point using a static IP address in Windows Me or Windows 98.

Select **Use the following IP address**.

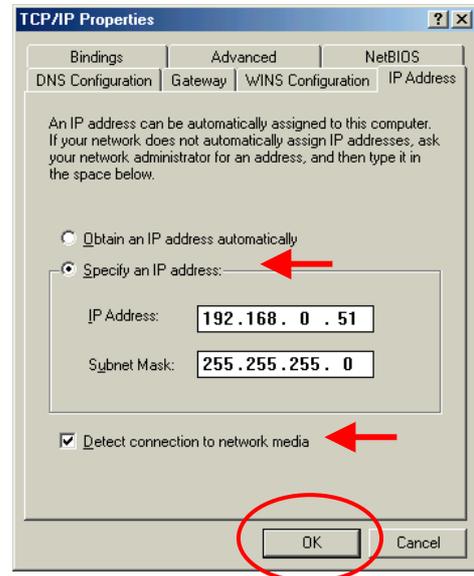
Input a static IP address within the same IP Address range as the wireless router or access point.

IP address: 192.168.0.51

Subnet mask: 255.255.255.0

Select **Detect connection to network media**.

Click **OK**.

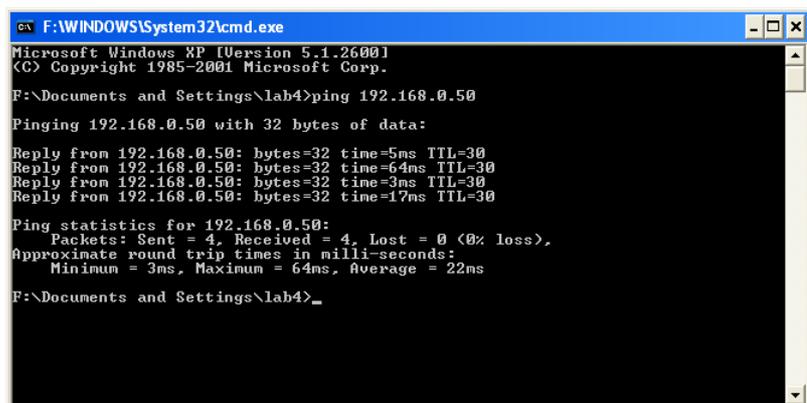


Checking the Wireless Connection by Ping

For Windows XP and 2000:

Go to **Start > Run > type cmd**. A window similar to Fig. 9.25 will appear. Type **ping xxx.xxx.xxx.xxx**, where **xxx** is the **IP address** of the Wireless Router or Access Point.

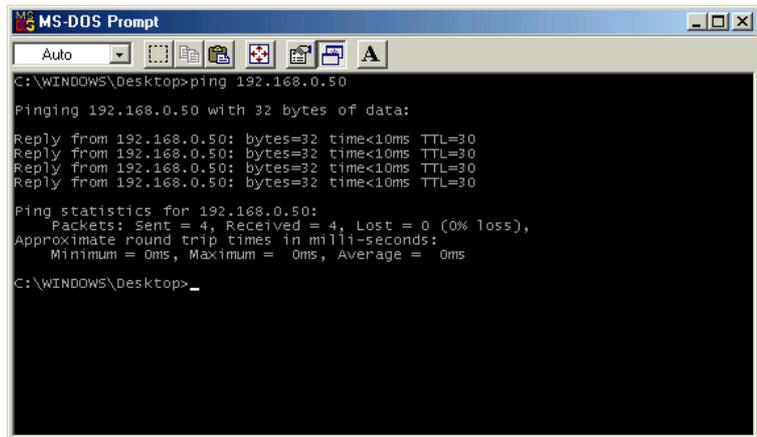
A good wireless connection will show four replies from the wireless router or access point, as shown.



Checking the Wireless Connection by Pinging

For Windows Me and 98:

Go to **Start > Run >** type **command**. A window similar to *Fig. 9.26* will appear. Type **ping xxx.xxx.xxx.xxx**, where **xxx** is the **IP address** of the Wireless Router or Access Point. A good wireless connection will show four replies from the wireless router or access point, as shown.



```
MS-DOS Prompt
Auto
C:\WINDOWS\Desktop>ping 192.168.0.50
Pinging 192.168.0.50 with 32 bytes of data:
Reply from 192.168.0.50: bytes=32 time<10ms TTL=30
Ping statistics for 192.168.0.50:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\WINDOWS\Desktop>_
```

Adding and Sharing Printers in Windows XP

After you have run the **Network Setup Wizard** on all the computers in your network (please see the **Network Setup Wizard** section at the beginning of **Networking Basics**.) you can use the **Add Printer Wizard** to add or share a printer on your network.

Whether you want to add a **local printer** (a printer connected directly to one computer,) share an **LPR printer** (a printer connected to a print server) or share a **network printer** (a printer connected to your network through a Gateway/Router,) use the **Add Printer Wizard**. Please follow the directions below:

First, make sure that you have run the Network Setup Wizard on all of the computers on your network.

We will show you 3 ways to use the **Add Printer Wizard**

1. Adding a local printer
2. Sharing an network printer
3. Sharing an LPR printer

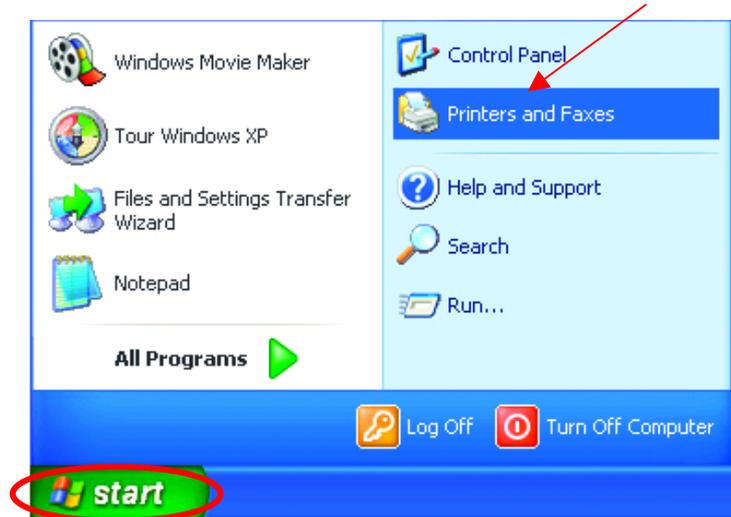
D-Link AirPro DWL-6000AP

Adding a local printer

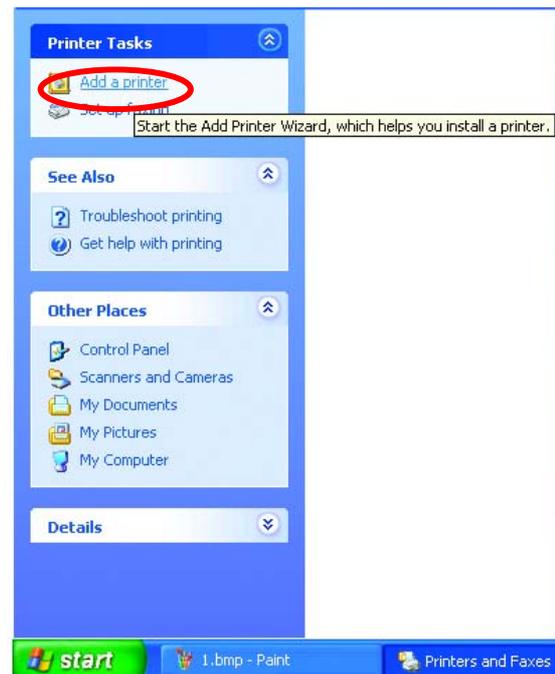
(A printer connected directly to a computer)

A printer that is not shared on the network and is connected directly to one computer is called a **local printer**. If you do not need to share your printer on a network, follow these directions to add the printer to one computer.

- Go to **Start> Printers and Faxes**

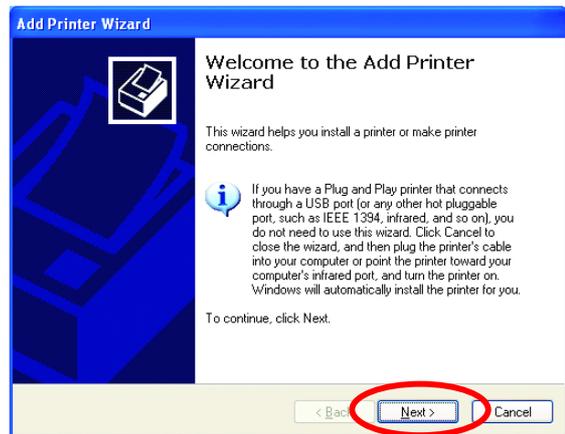


- Click on **Add a printer**

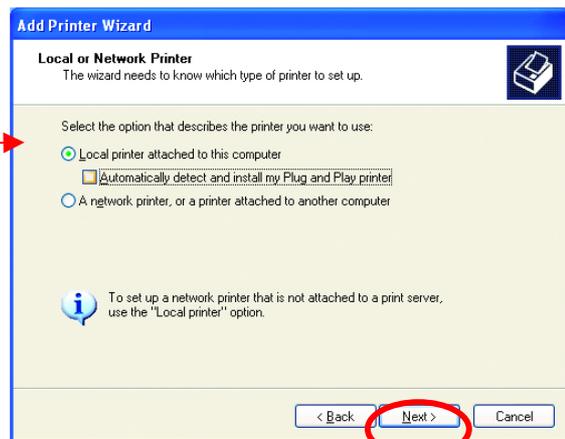


Adding a local printer

- Click **Next**



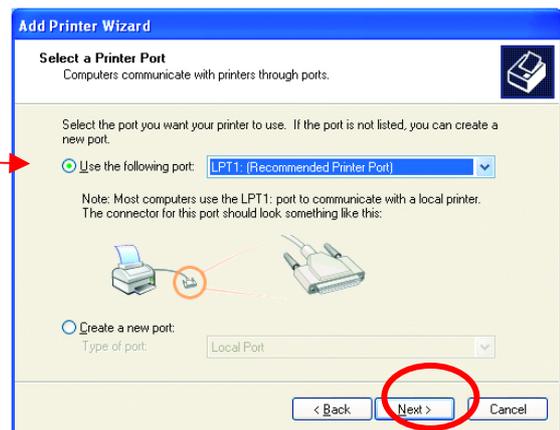
- Select **Local printer attached to this computer**
- *(Deselect **Automatically detect and install my Plug and Play printer** if it has been selected.)*



- Click **Next**

- Select **Use the following port:**
- From the pull-down menu **select the correct port** for your printer

*(Most computers use the **LPT1: port**, as shown in the illustration.)*



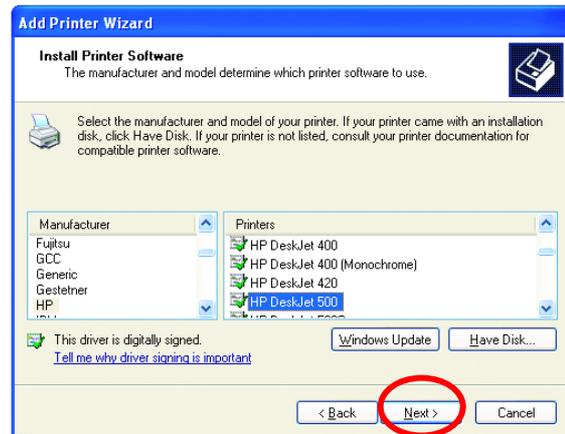
- Click **Next**

Adding a local printer

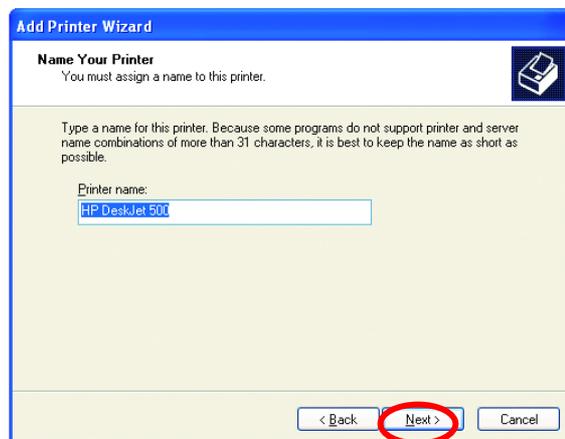
- Select and highlight the **correct driver** for your printer.

- Click **Next**

*(If the correct driver is not displayed, insert the CD or floppy disk that came with your printer and click **Have Disk.**)*



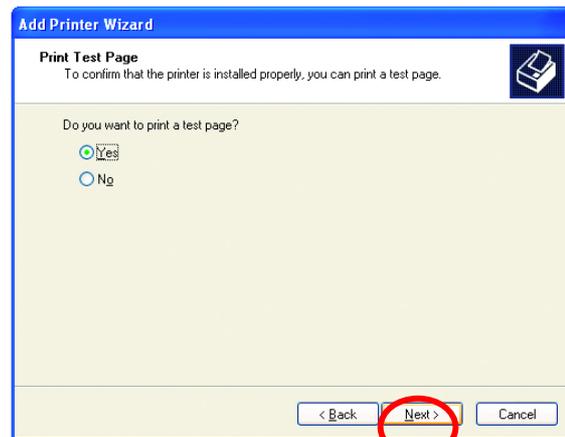
- At this screen, you can change the name of the printer (optional.)



- Click **Next**

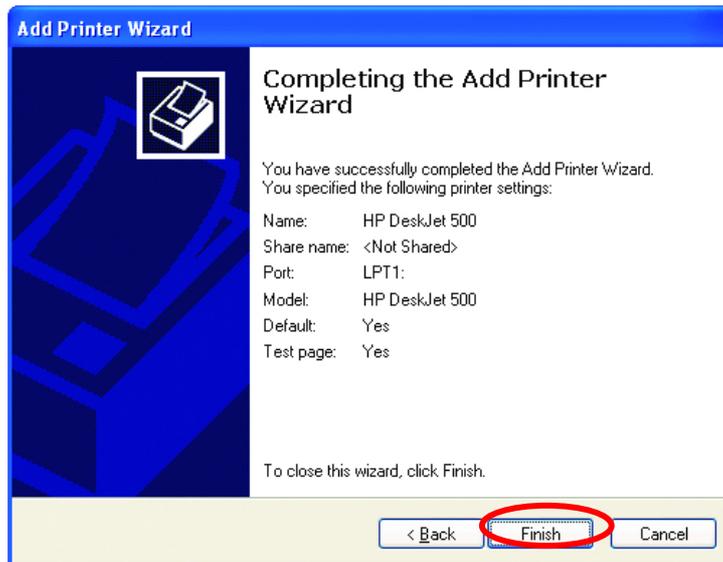
- Select **Yes**, to print a test page. A successful printing will confirm that you have chosen the correct driver.

- Click **Next**



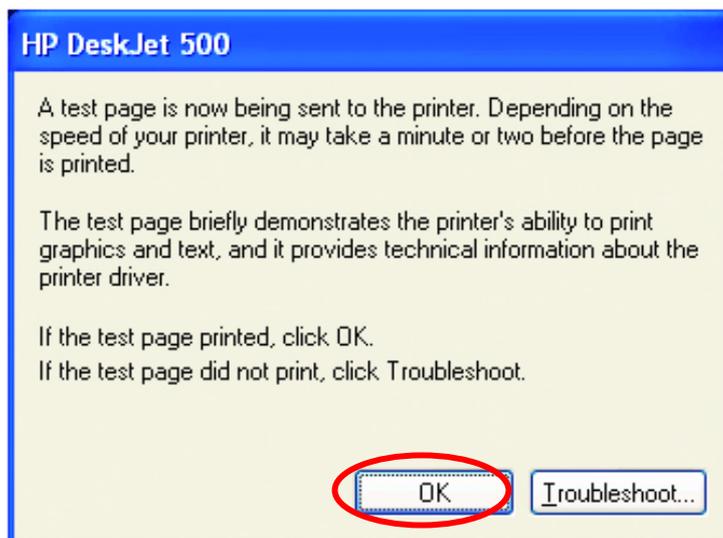
Adding a local printer

This screen gives you information about your printer.



Click **Finish**

When the test page has printed,



Click **OK**

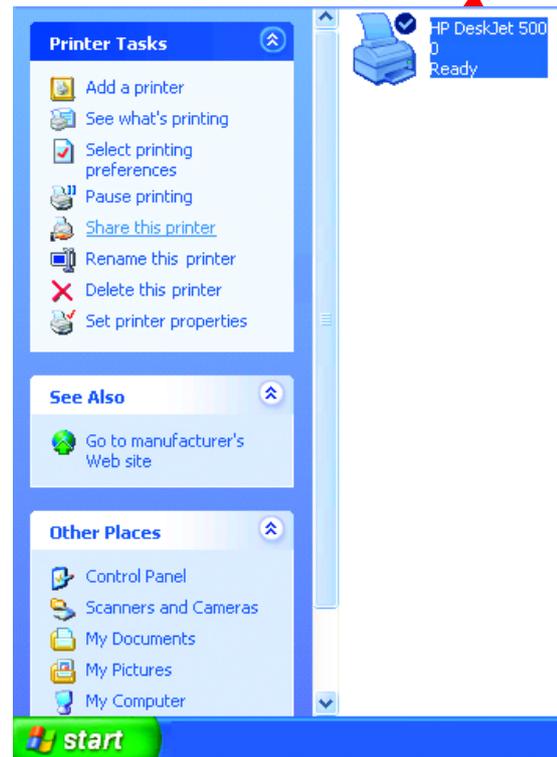
D-Link AirPro DWL-6000AP

Adding a local printer

- Go to **Start > Printers and Faxes**

A successful installation will display the printer icon as shown at right.

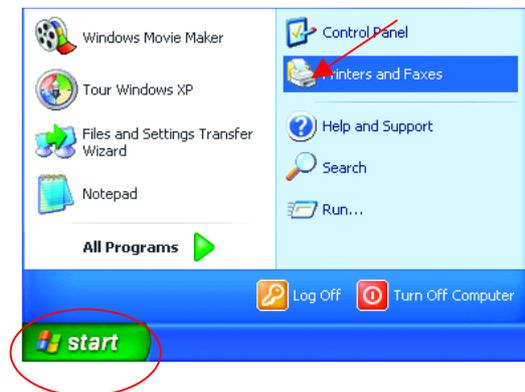
You have successfully added a local printer.



Sharing a network printer

After you have run the **Network Setup Wizard** on all the computers on your network, you can run the **Add Printer Wizard** on all the computers on your network. Please follow these directions to use the **Add Printer Wizard** to share a printer on your network:

- Go to **Start > Printers and Faxes**



Sharing a network printer

- Click on **Add a Printer**

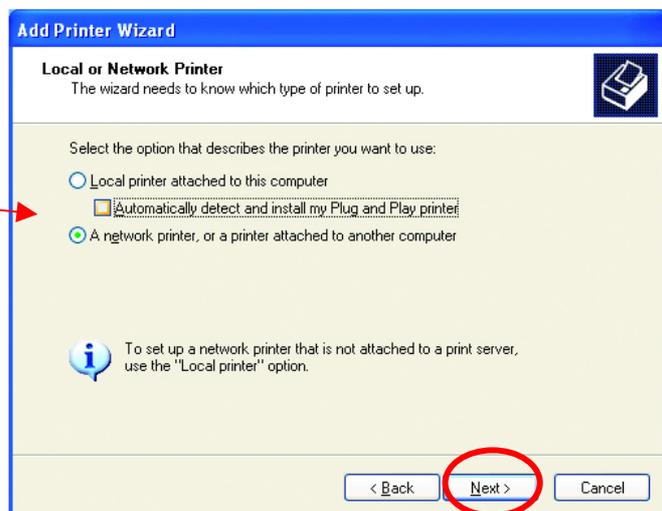


- Click **Next**



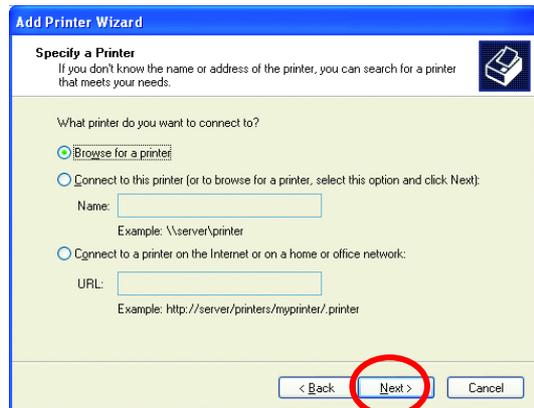
- Select **Network Printer**

- Click **Next**

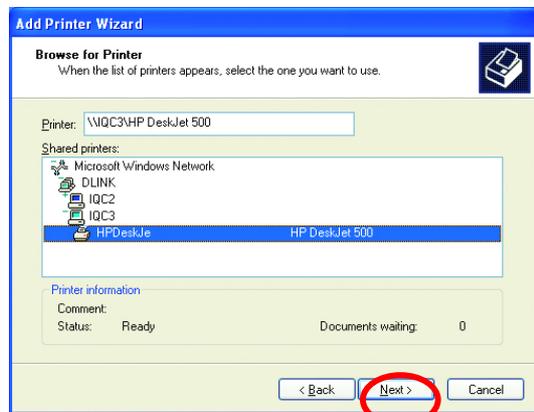


Sharing a network printer

- Select **Browse for a printer**



- Click **Next**
- Select the **printer** you would like to share.



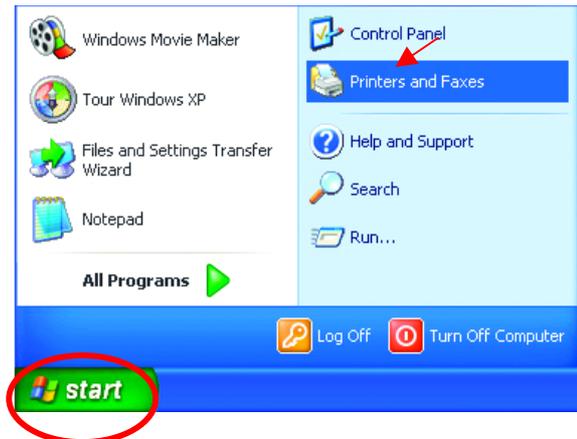
- Click **Finish**



Sharing a network printer

To check for proper installation:

- Go to **Start**>
Printers and Faxes



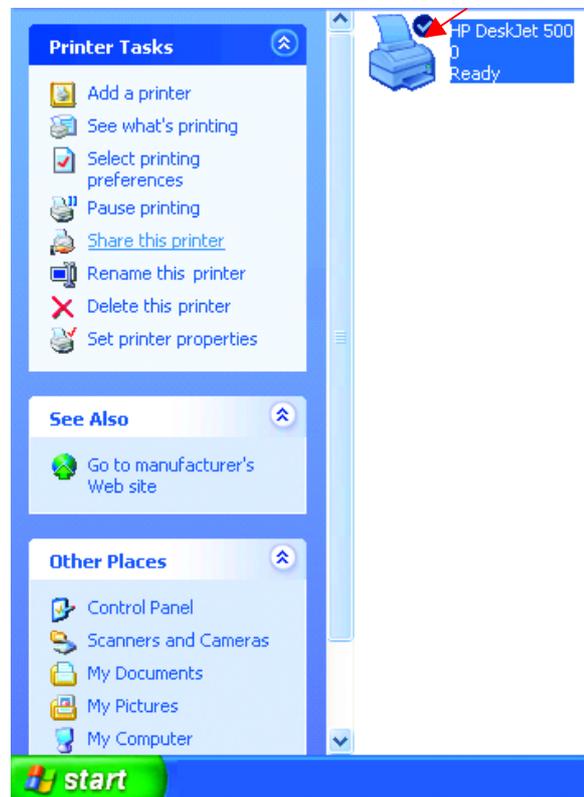
The printer icon will appear at right, indicating proper installation.

You have completed adding the printer.

To share this printer on your network:

- Remember the **printer name**
- Run the **Add Printer Wizard** on all the computers on your network.
- Make sure you have already run the **Network Setup Wizard** on all the network computers.

After you run the **Add Printer Wizard** on all the computers in the network, you can share the printer.



Sharing an LPR printer

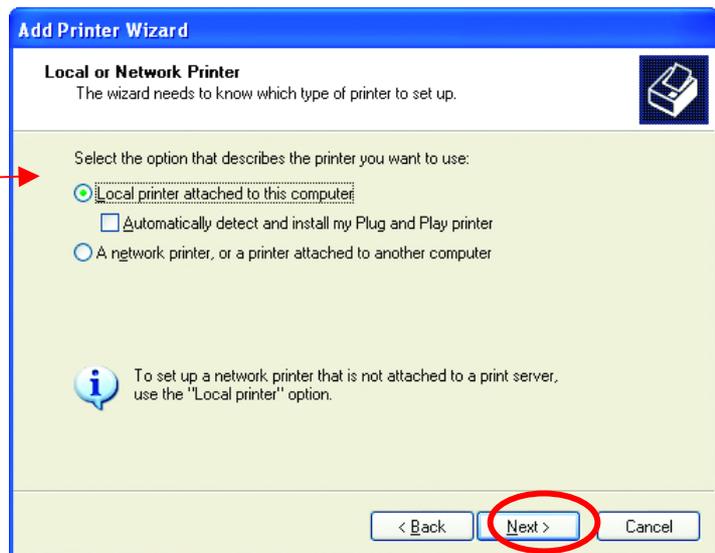
To share an **LPR printer** (using a print server,) you will need a Print Server such as the **DP-101P+**. Please make sure that you have run the **Network Setup Wizard** on all the computers on your network. To share an **LPR printer**, please follow these directions:

- Go to **Start**>
Printers
and Faxes
- Click on
Add a Printer

The screen to the right will display.



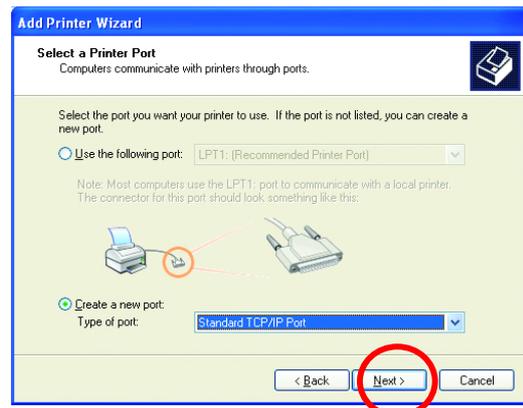
- Select
Local printer...



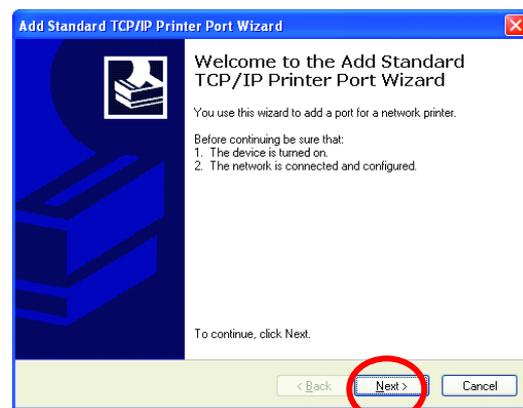
- Click **Next**

Sharing an LPR printer

- Select **Create a new port**
- From the pull-down menu, select **Standard TCP/IP Port**, as shown.

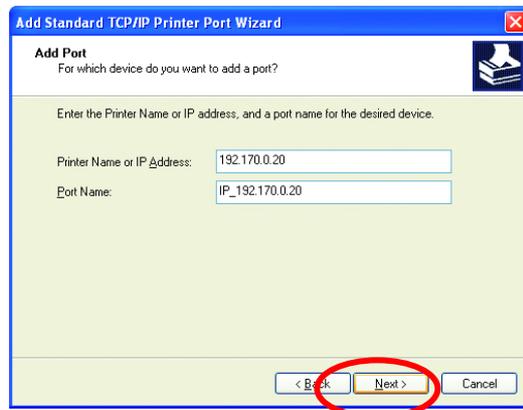


- Please read the instructions on this screen.



- Enter the **Printer IP Address** and the **Port Name**, as shown.

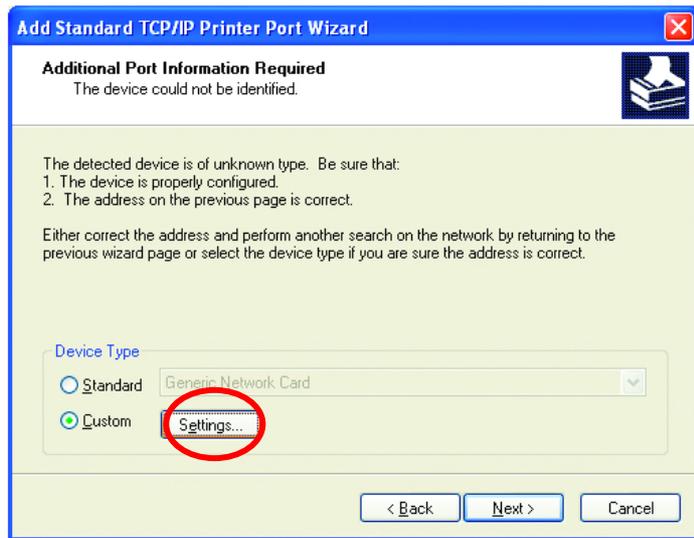
- Click **Next**



Sharing an LPR printer

- In this screen, select **Custom**.

- Click **Settings**

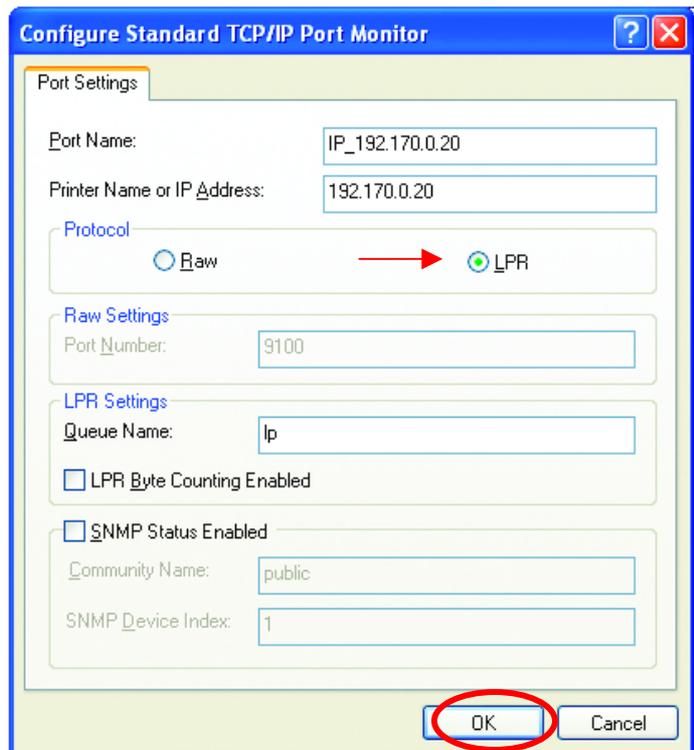


- Enter the **Port Name** and the **Printer Name or IP Address**.

- Select **LPR**

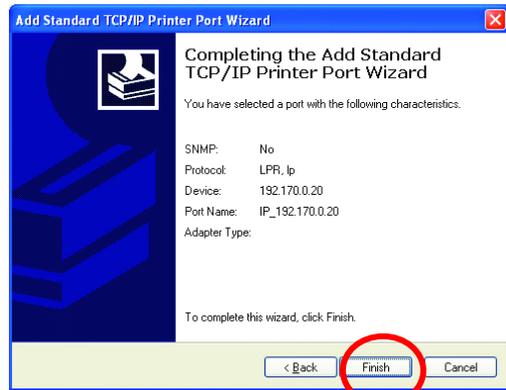
- Enter a **Queue Name** (if your Print-Server/ Gateway has more than one port, you will need a **Queue name**.)

- Click **OK**

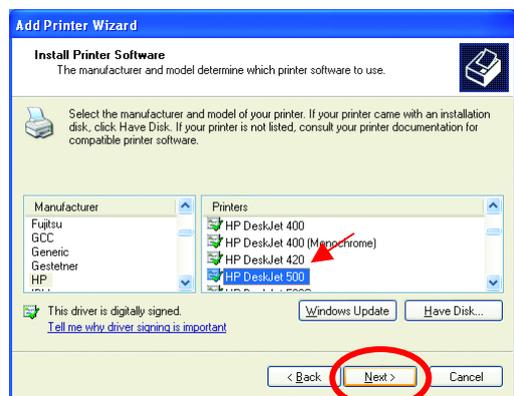


Sharing an LPR printer

- This screen will show you information about your printer.
- Click **Finish**

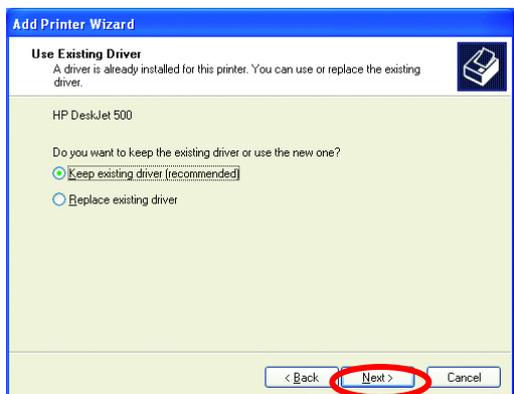


- Select the **printer** you are adding from the list of **Printers**.
- Insert the printer driver disk that came with your printer.
- Click **Have Disk**



If the printer driver is already installed,

- Select **Keep existing driver**
- Click **Next**

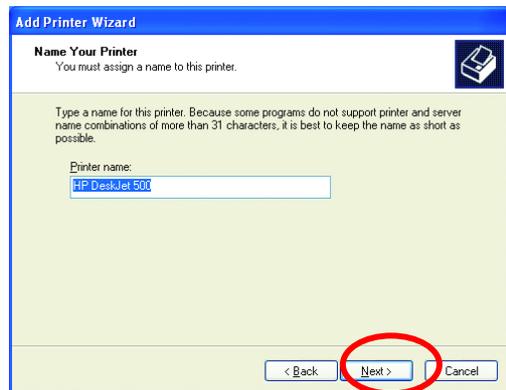


Sharing an LPR printer

- You can rename your printer if you choose. It is optional.

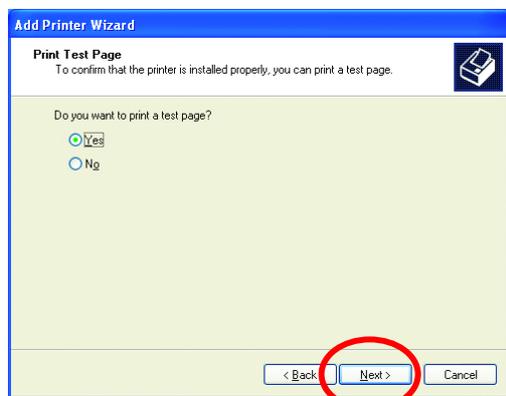
*Please remember the name of your printer. You will need this information when you use the **Add Printer Wizard** on the other computers on your network.*

- Click **Next**



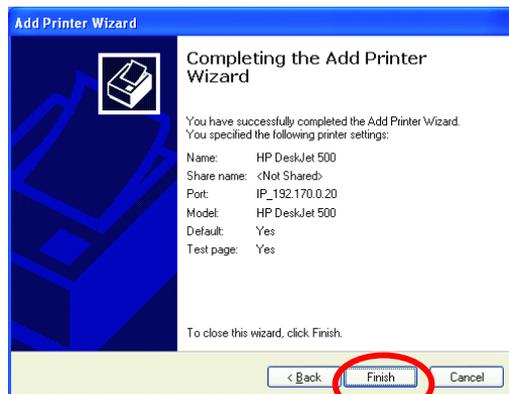
- Select **Yes**, to print a test page.

- Click **Next**



This screen will display information about your printer.

- Click **Finish** to complete the addition of the printer.
- Please run the **Add Printer Wizard** on all the computers on your network in order to share the printer.



*Note: You must run the **Network Setup Wizard** on all the computers on your network before you run the **Add Printer Wizard**.*

Other Tasks

For help with other tasks in home or small office networking, see **Using the Shared Documents** folder and **Sharing files and folders** in the **Help and Support Center** in Microsoft Windows XP.

9. Technical Specifications

Standards	IEEE 802.11b IEEE 802.11a IEEE 802.3 and IEEE 802.3u
Ports	(1) 10/100Base-T Ethernet, RJ-45 (UTP) (1) Power – 5.0V DC, 2.5A
Network Management	Web-Based Interface SNMP Management
Network Architecture	Supports Infrastructure Mode (Communications to wired networks via Access Points with Roaming)
Diagnostic LED	Power 100M Link/Act 10M Link/Act 11a WLAN 11b WLAN
Range	Indoors – up to 328 feet (100 meters) Outdoors – up to 1,312 feet (400 meters)
Temperature	Operating: 0°C to 40°C (32°F to 104°F) Storing: -25°C to 65°C (-77°F to 140°F)
Humidity	5%-95%, non-condensing
EMI/Safety	IEEE 802.11a - EMC: EN 301 489-1 and -17, EN 60950 DFS/TPC : 301 893 Draft IEEE 802.11b – EMC: EN 300 328, EN 300 826, EN 60950
Operating Voltage	3.3V± -10%
Physical Dimensions:	L = 23.5 cm W = 15.9 cm H = 3.8 cm

D-Link AirPro DWL-6000AP

802.11a Specifications	
Data Rates	6, 9, 12, 18, 24, 36, 48, 54 Mbps
Data Security	64, 128, 154-bit WEP (Wired Equivalent Privacy) Encryption Access Control List based on MAC Address
Antenna Type	5dBi dipole antenna with diversity
Available Channels	Subject to local regulatory restrictions
Frequency Range	5.150 – 5.825 GHz
Modulation Technology	Orthogonal Frequency Division Multiplexing (OFDM)
Modulation Techniques	BPSK QPSK 16 QAM 64 QAM
802.11b Specifications	
Data Rates	1, 2, 5.5, 11, 22Mbps
Data Security	64, 128, 256-bit WEP (Wired Equivalent Privacy) Encryption
Antenna Type	2dBi antenna with diversity
Available Channels	Subject to local regulatory restrictions
Frequency Range	2.4 – 2.4835 GHz
Modulation Technology	Direct Sequence Spread Spectrum (DSSS)
Modulation Techniques	CCK DQPSK DBSK

10. Contacting Technical Support

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

D-Link Technical Support over the Internet:

<http://support.dlink.com>

When contacting technical support, please provide the following information:

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

11. Warranty and Registration

Wichtige Sicherheitshinweise

1. Bitte lesen Sie sich diese Hinweise sorgfältig durch.
2. Heben Sie diese Anleitung für den spätem Gebrauch auf.
3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie keine Flüssig- oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.
4. Um eine Beschädigung des Gerätes zu vermeiden sollten Sie nur Zubehörteile verwenden, die vom Hersteller zugelassen sind.
5. Das Gerät ist vor Feuchtigkeit zu schützen.
6. Bei der Aufstellung des Gerätes ist auf stabilem Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen. Verwenden Sie nur sichere Standorte und beachten Sie die Aufstellhinweise des Herstellers.
7. Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor Überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden.
8. Beachten Sie beim Anschluß an das Stromnetz die Anschlußwerte.
9. Die Netzanschlußsteckdose muß aus Gründen der elektrischen Sicherheit einen Schutzleiterkontakt haben.
10. Verlegen Sie die Netzanschlußleitung so, daß niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.
11. Alle Hinweise und Warnungen die sich an den Geräten befinden sind zu beachten.
12. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.
13. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. Elektrischen Schlag auslösen.
14. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von autorisiertem Servicepersonal geöffnet werden.
15. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:
 - a – Netzkabel oder Netzstecker sind beschädigt.
 - b – Flüssigkeit ist in das Gerät eingedrungen.
 - c – Das Gerät war Feuchtigkeit ausgesetzt.
 - d – Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
 - e – Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
 - f – Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.
16. Bei Reparaturen dürfen nur Originalersatzteile bzw. den Originalteilen entsprechende Teile verwendet werden. Der Einsatz von ungeeigneten Ersatzteilen kann eine weitere Beschädigung hervorrufen.
17. Wenden Sie sich mit allen Fragen die Service und Reparatur betreffen an Ihren Servicepartner. Somit stellen Sie die Betriebssicherheit des Gerätes 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:

<u>Product Type</u>	<u>Warranty Period</u>
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, NEGLIGENCE, 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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FCC Warning

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this user's guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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.

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 Funkstörungen verursachen. In diesem Fall kann vom Benutzer verlangt werden, angemessene Massnahmen zu ergreifen.

Precaución!

Este es un producto de Clase A. En un entorno doméstico, puede causar interferencias de radio, en cuyo caso, 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 interférences radio, auquel cas l'utilisateur devrait prendre les mesures adéquates.

Attenzione!

Il presente prodotto appartiene alla classe A. Se utilizzato in ambiente domestico il prodotto può causare interferenze radio, nel cui caso è 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。

AVERTISSEMENT AUX UTILISATEURS

La décision N° 01-480 en date du 23 mai 2001 prise par l'Autorité de Régulation des Télécommunications (ART) autorise l'utilisation d'une partie de la bande de fréquences 2400-2483,5 MHz pour les réseaux locaux radioélectriques (RLAN)

Au niveau national, seule la bande 2446,5-2483,5 MHz est autorisée pour des produits ayant une puissance limitée à 100 mW

Cette bande de fréquences correspond aux canaux 10,11,12 et 13.

En installant et utilisant les produits réseaux sans fils de la gamme proposée par D-Link, vous vous engagez donc à respecter cette réglementation et à n'utiliser que ces 4 canaux.

WARNING

The Decision N° 01-480 taken by ART (Autorité de Régulation de Télécommunications) on May 23, 2001 authorizes the utilisation of a part of the 2400-2483.5MHz band for Radio Local Area Network (RLAN) in France.

Only the 2446.5-2483.5MHz band is authorized for RLAN with products with a limited power to 100mW.

This band concerns the channels 10, 11, 12 and 13.

Using and installing D-Link Wireless solutions for RLAN, you commit to respect this regulation et to use only these four channels.



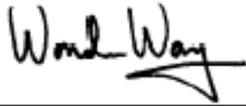
Declaration of Conformity

Hereby, D-Link Corporation, declares that this DWL-6000AP is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

The following importer/manufacturer is responsible for this declaration:

Company Name : D-Link Corporation
Company Address : No.8, Li-shing Road VII, Science-based Industrial Park, Hsinchu, Taiwan, R.O.C.
Telephone : +886-3-563-6666 Facsimile: +886-3-578-1861

Person is responsible for marking this declaration:

<u>Wonder Wang</u> Name (Full Name)	<u>President</u> Position/ Title
<u>October 21, 2002</u> Date	<u></u> Legal Signature

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