

# **Wireless LAN PC Card**

## **User's Manual**

Version: 1.0

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## Revision History

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<b>Version</b>	<b>Date</b>	<b>Notes</b>
1.0	November 12, 2003	Initial Version

# 1 Introduction

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This chapter describes the features & benefits, package contents, applications, and network configuration.

## 1.1 Features & Benefits

Features	Benefits
Up to 13 dbm (low), 19dbm (medium), 20dbm (high) transmit power (depends on different countries)	Long Operating Range
IEEE 802.11b compliant	Fully interoperable with IEEE 802.11b compliant products
Automatic data rate scaling at 11, 5.5, 2, and 1 Mbps	Optimized throughput, range, and connectivity
64-bit / 128-bit WEP data encryption and decryption	Powerful data security
Wide coverage range up to 1200 meters in open space	Wireless connectivity for all your computers
Advanced power management	Extended battery life
Plug and Play PC card interface	Easy installation
Significantly improved indoor multi-path distortion	Higher link quality in indoor environment

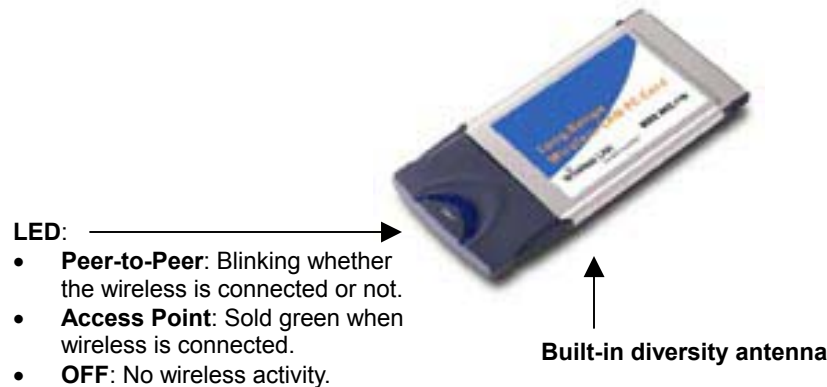
## 1.2 Package Contents

Open the package carefully, and make sure that none of the items listed below are missing. Do not discard the packing materials, in case of return; the unit must be shipped in its original package.

- One PC Card
- One Installation CD
- One Quick Installation Guide

## 1.3 PC Card Description

The PC card is a standard PC card that fits into any PCMCIA card Type II slot. The PC card has a LED indicator and an integrated built-in diversity antenna



## 1.4 System Requirements

The following are the minimum system requirements in order to use the PC card.

- PC/AT compatible computer with a PCMCIA Type II slot.
- Windows 98/ME/ /2000/XP operating system.
- 300 MHz or higher processor
- 32 MB or greater memory

## 1.5 Applications

The wireless LAN products are easy to install and highly efficient. The following list describes some of the many applications made possible through the power and flexibility of wireless LANs:

**a) Difficult-to-wire environments**

There are many situations where wires cannot be laid easily. Historic buildings, older buildings, open areas and across busy streets make the installation of LANs either impossible or very expensive.

**b) Temporary workgroups**

Consider situations in parks, athletic arenas, exhibition centers, disaster-

recovery, temporary offices and construction sites where one wants a temporary WLAN established and removed.

**c) The ability to access real-time information**

Doctors/nurses, point-of-sale employees, and warehouse workers can access real-time information while dealing with patients, serving customers and processing information.

**d) Frequently changed environments**

Show rooms, meeting rooms, retail stores, and manufacturing sites where frequently rearrange the workplace.

**e) Small Office and Home Office (SOHO) networks**

SOHO users need a cost-effective, easy and quick installation of a small network.

**f) Wireless extensions to Ethernet networks**

Network managers in dynamic environments can minimize the overhead caused by moves, extensions to networks, and other changes with wireless LANs.

**g) Wired LAN backup**

Network managers implement wireless LANs to provide backup for mission-critical applications running on wired networks.

**h) Training/Educational facilities**

Training sites at corporations and students at universities use wireless connectivity to ease access to information, information exchanges, and learning.

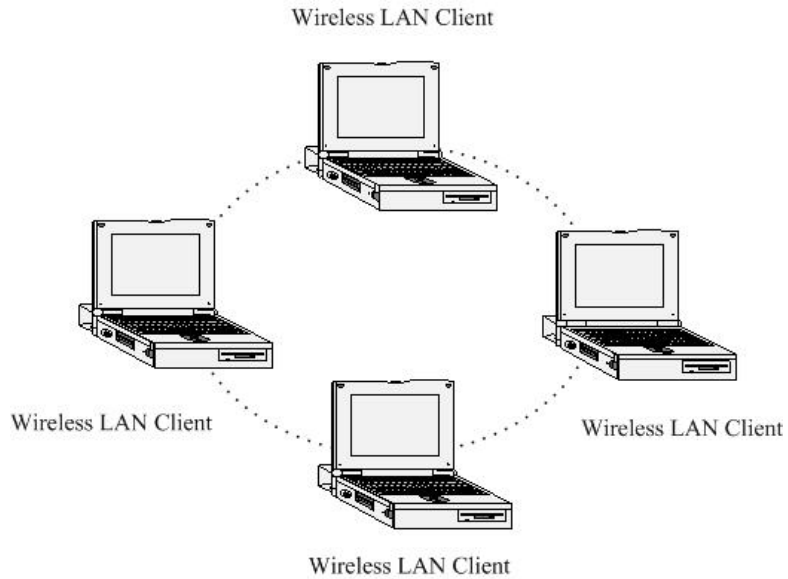
## 1.6 Network Configuration

To better understand how the wireless LAN products work together to create a wireless network, it might be helpful to depict a few of the possible wireless LAN PC card network configurations. The wireless LAN products can be configured as:

- a) Ad-hoc (or peer-to-peer) for departmental or SOHO LANs.
- b) Infrastructure for enterprise LANs.

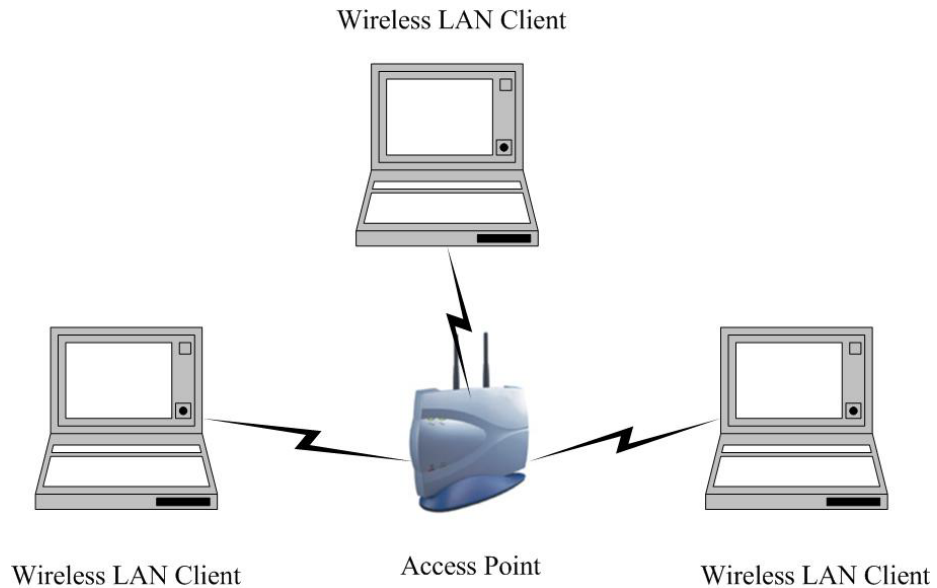
**a) Ad-hoc (peer-to-peer) Mode**

This is the simplest network configuration with several computers equipped with the PC Cards that form a wireless network whenever they are within range of one another. In ad-hoc mode, each client is peer-to-peer, would only have access to the resources of the other client and does not require an access point. This is the easiest and least expensive way for the SOHO to set up a wireless network. The image below depicts a network in ad-hoc mode.



**b) Infrastructure Mode**

The infrastructure mode requires the use of an access point (AP). In this mode, all wireless communication between two computers has to be via the AP. It doesn't matter if the AP is stand-alone or wired to an Ethernet network. If used in stand-alone, the AP can extend the range of independent wireless LANs by acting as a repeater, which effectively doubles the distance between wireless stations. The image below depicts a network in infrastructure mode.

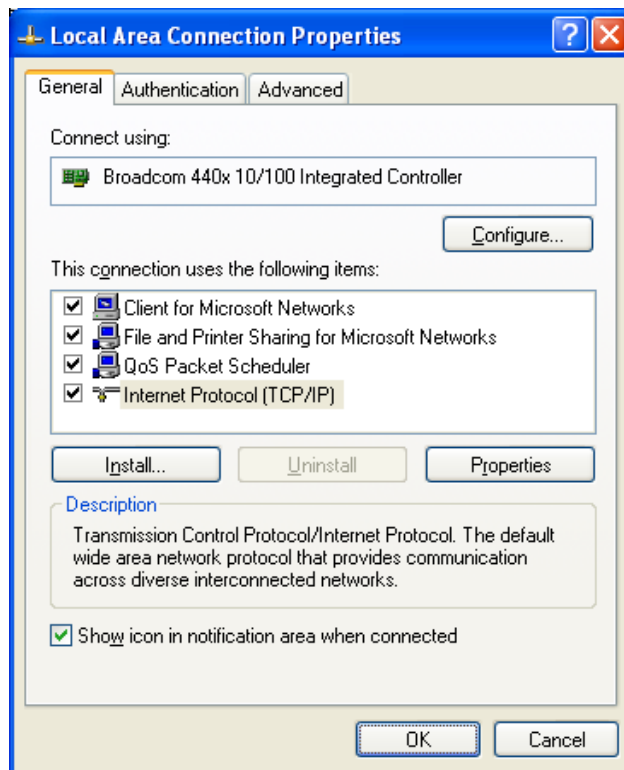


## 2 PC Configuration

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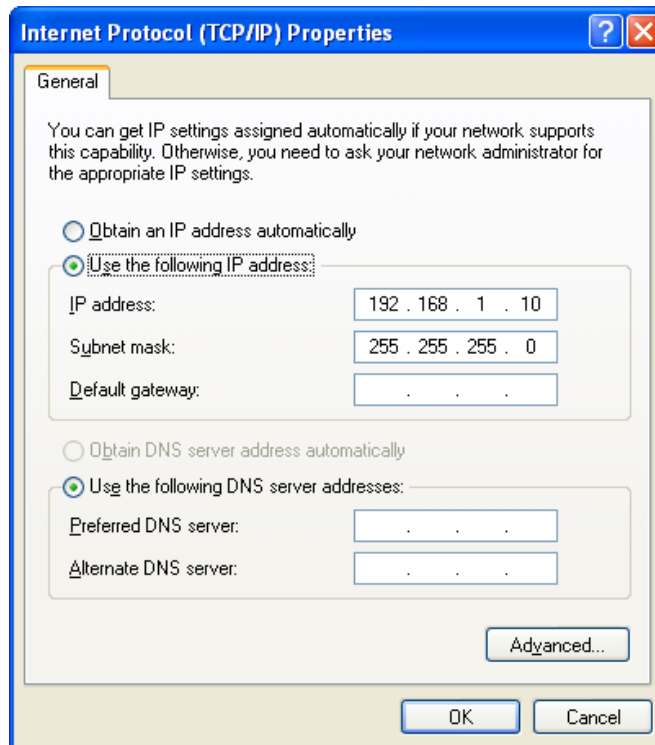
Follow the steps below in order to configure the TCP/IP settings of your PC.

- A. In the Control Panel double click **Network Connections**, and then double click on the connection of your Network Interface Card (NIC). You will then see the following screen.



- B. Select **Internet Protocol (TCP/IP)** and then click on the **Properties** button. This will allow you to configure the IP address of your PC. You will then see the following screen.





- C. Select **Use the following IP address** radio button, and then enter an IP address and subnet mask for your PC. Make sure that the device and your PC is on the same subnet.
- D. Click on the **OK** button, your PC's TCP/IP settings have been configured.

## 3 Install Drivers & Client Utility

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### 3.1 Before You Begin

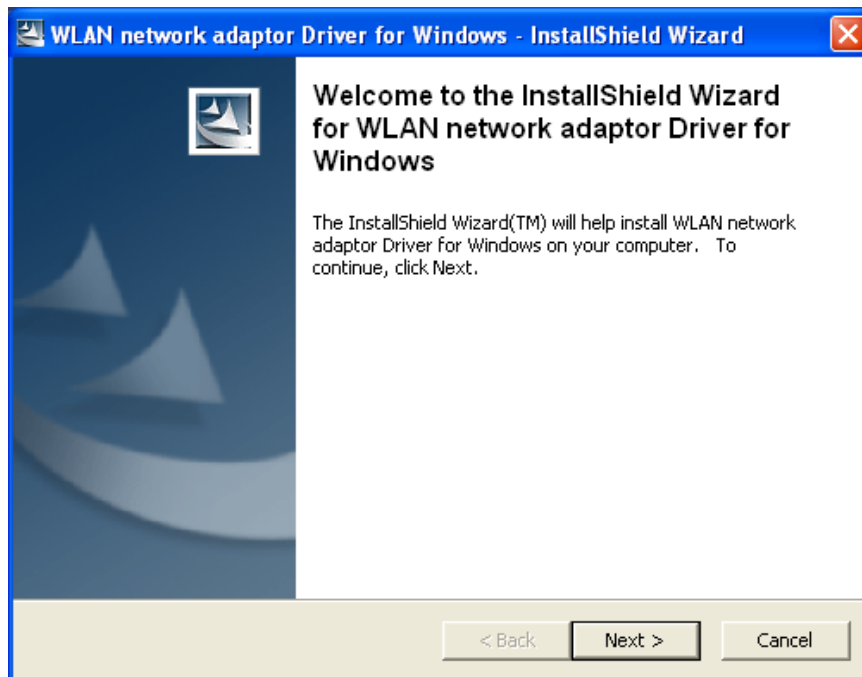
Before installing the new drivers into your PC, you need to remove all of the Wireless LAN PC card drivers that you have installed.

During the installation, Windows 98/ME/2000/XP may need to copy systems files from its installation CD. Therefore, you may need a copy of the Windows installation CD at hand before installing the drivers. On many systems, instead of a CD, the necessary installation files are archived on the hard disk in C:\WINDOWS\OPTIONS\CABS directory.

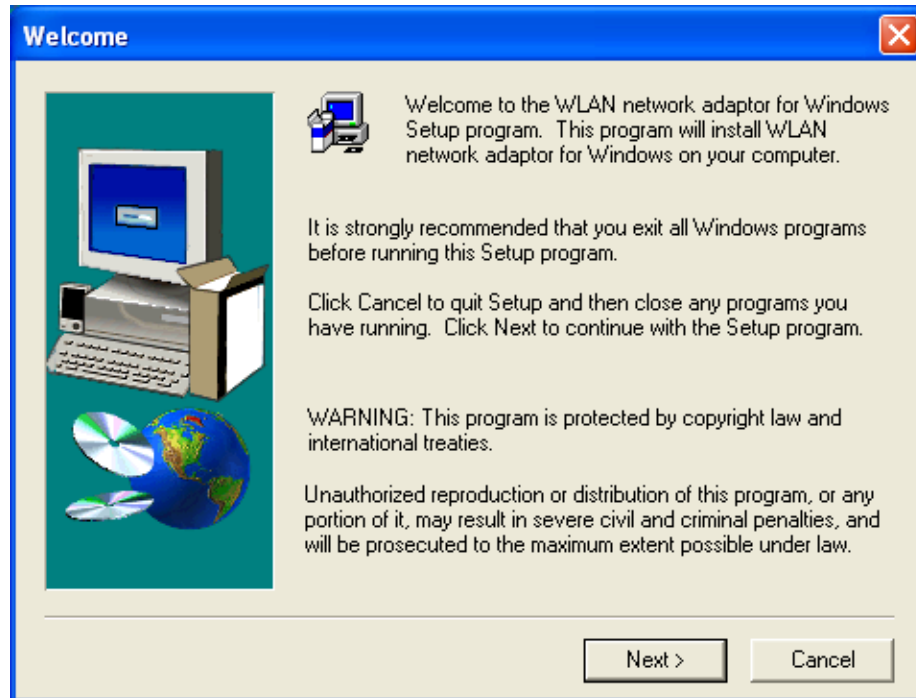
### 3.2 Installing the Drivers

Follow the steps below in order to install the PC card drivers:

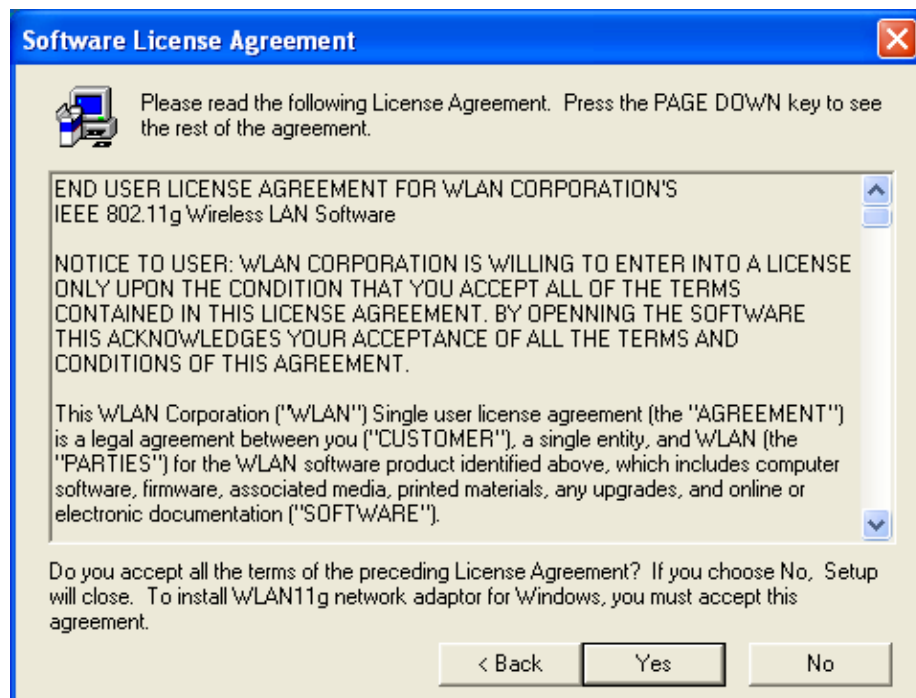
1. Insert the CD-ROM that was provided to you in this package. The setup should run automatically. If the setup does not run automatically, then you must manually select the **DriverSetup.exe** file from the CD-ROM drive.
2. Once the setup begins you will see the **Install Shield Wizard**, as the image depicts below.



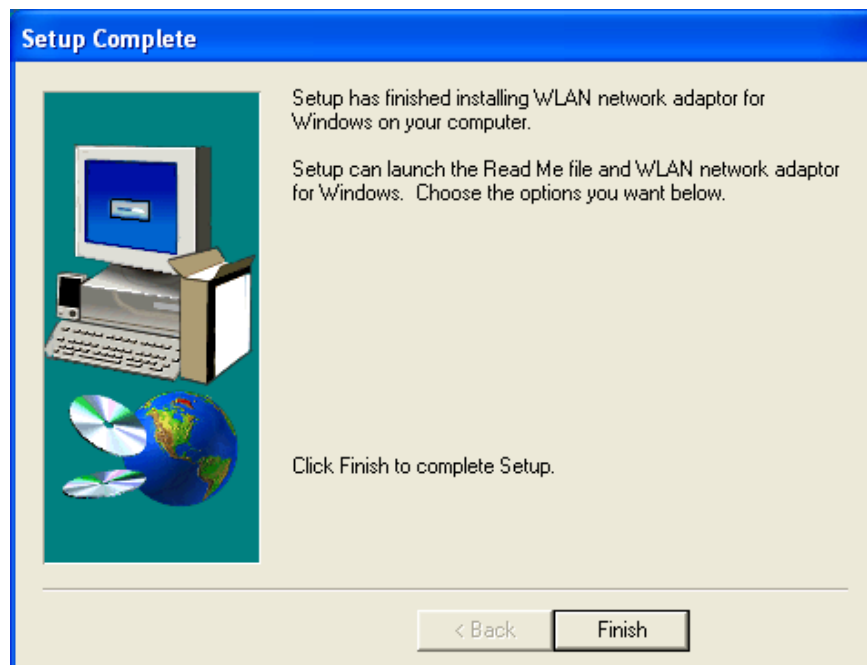
3. Click on the **Next** button to continue. The Install Wizard will then copy a few files that are necessary to install the PC card. You will then see the **Welcome** screen, as the image depicts below.



4. Click on the **Next** button to continue. The setup will then bring you to the **Software License Agreement** screen, as the image depicts below.



5. After reading the license agreement click on the **Yes** button to continue. The setup will then copy the drivers into your PC. You will then see the **Setup Complete** screen, as the image depicts below.



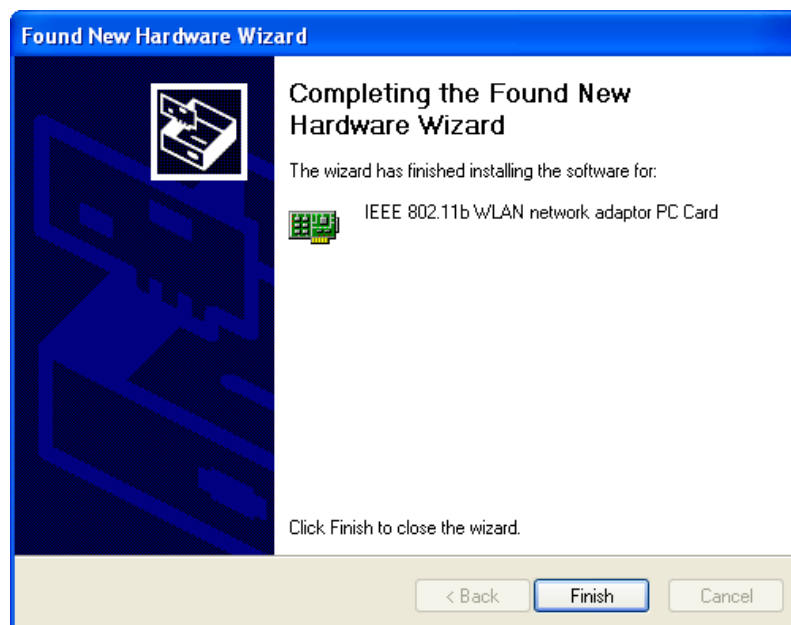
6. Click on the **Finish** button. The first part of the installation is complete.
7. Gently insert the PC card into the PCMCIA slot of your PC. Windows will automatically detect the PC card and display the **Found New Hardware Wizard**, as the image depicts below.



8. Select the **Install the software automatically (Recommended)** radio button, and then click on the **Next** button to continue. If you are using Windows XP, you will see a message regarding Windows Logo Testing, click on the **Continue Anyway** button to continue.



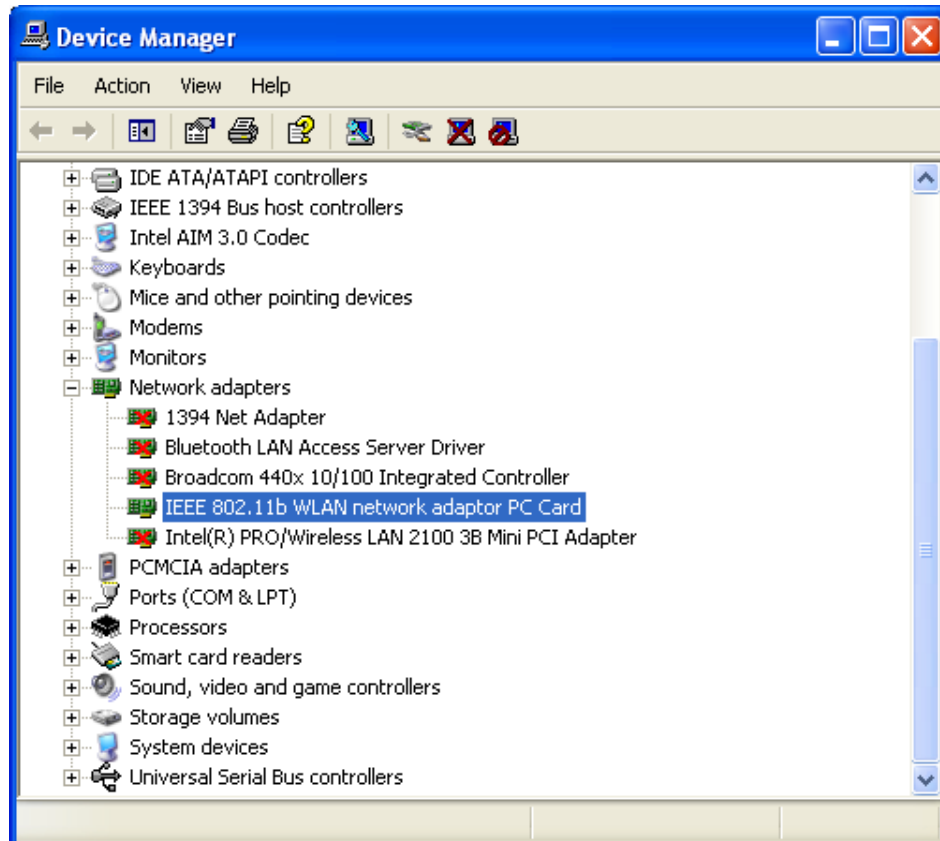
9. The installation of the PC card is now complete. Click on the **Finish** button.



### 3.3 Verify the Installation

Follow the steps below in order to verify that the PC card has been installed and is functioning properly:

1. Click on **Start > Settings > Control Panel**.
2. Double click on the **System** icon.
3. Click on the **Hardware** tab, and then click on the **Device Manger** button.
4. Select **Network adapters** to view a list of network adapters on your PC. You will then see a window similar to the image below.

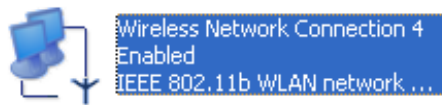


5. Make sure that you do not see a yellow (?) or a red (X) next to the PC Card adapter (*IEEE 802.1b WLAN 11 network adaptor PC card*). If you see a (?) or (X) you would need to uninstall the drivers, and reinstall them again. In order to uninstall the drivers refer to **Chapter 5**.

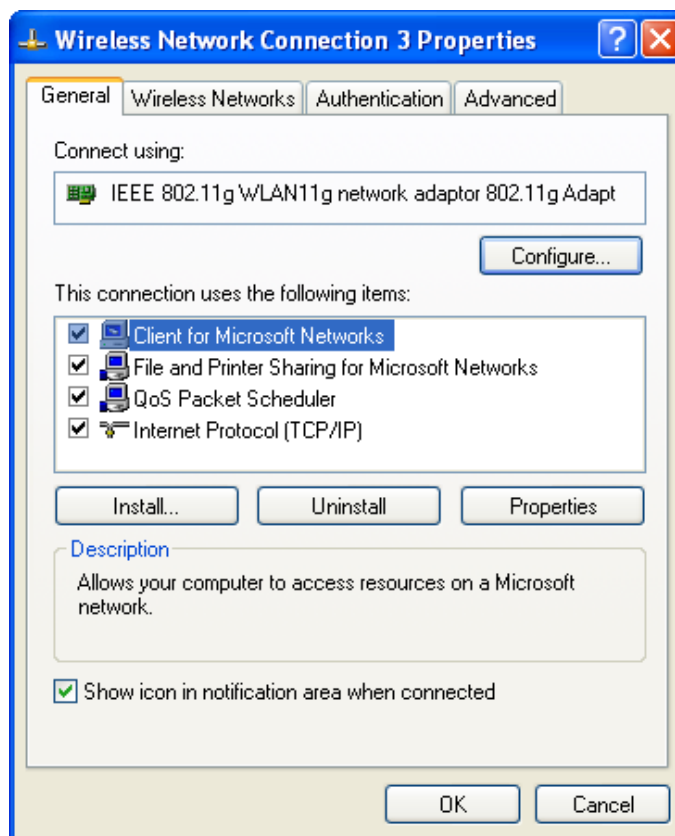
### 3.4 Disable Windows WEP/SSID Configuration

In order to configure **SSID** and **WEP** settings from the Client Utility, you must first disable the Windows based SSID and WEP configuration from the Network Configuration in the Control Panel. Follow the steps below in order to disable the SSID and WEP on Windows.

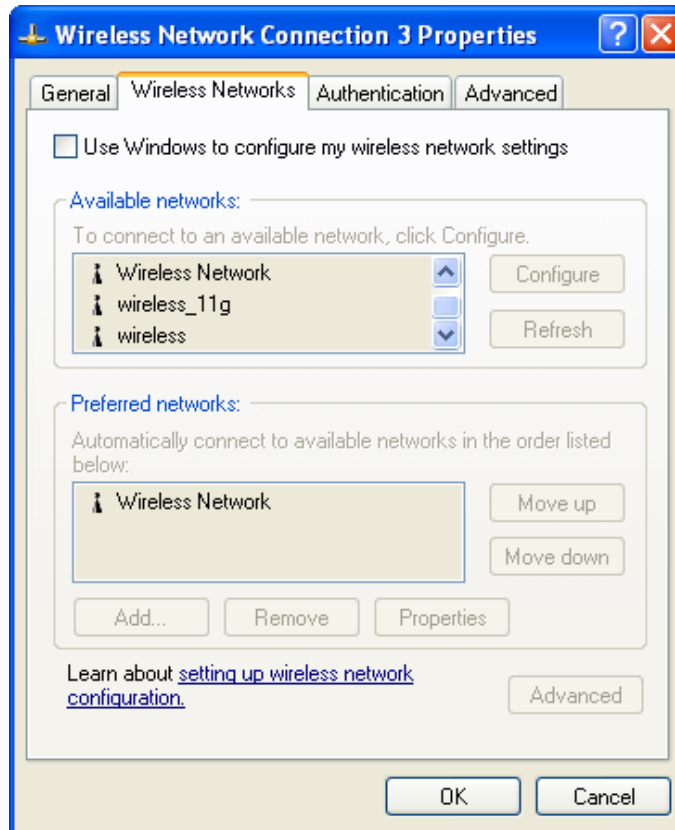
1. Click on **Start > Settings > Control Panel**.
2. Double click on the **Network Connections** icon.
3. Right-click on the wireless network connection for the PC card, and then select **Properties**. The icon may look similar to the image below.



After you click on **Properties**, the **Wireless Network Connection Properties** window will appear, as the image depicts below:



4. Click on the **Wireless Networks** tab, you will then see the following screen.



5. Make sure that there isn't any check placed in the **Use Windows to configure my wireless network settings** check box.
6. Click on the **OK** button.



## 4 Using the Client Utility

After a successful installation you will see the PC card **Client Utility radio** icon in the system tray.



PC Card Client Utility radio



Green indicates good or excellent link status.

Yellow indicates fair link status.

Red indicates poor or no link status.

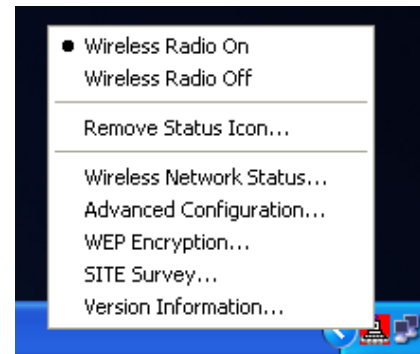
The client utility will automatically be executed and display a small green **radio** icon at the bottom right corner of your screen in the system tray whenever the PC card is inserted into the PCMCIA slot of your computer. Right-click the radio icon to view the list of options available. Each item is described below.

### 4.1 Wireless Radio On/Off

The first two items in the icon menu are used to turn on/off the wireless radio (image right). When the wireless radio is turned off, a red cross is placed over the radio icon in the system tray as shown below. When the wireless radio is turned on, the icon will vary in colors depending on the link quality.



Wireless Radio Off



#### Link Quality



Green indicates good or excellent link status.

Yellow indicates fair link status.

Red indicates poor or no link status.

### 4.2 Remove Status Icon

This item allows you to set the system tray radio icon to appear or disappear. Once you choose this item, the system will display the dialog box to confirm if you want to remove the system tray icon as shown below.



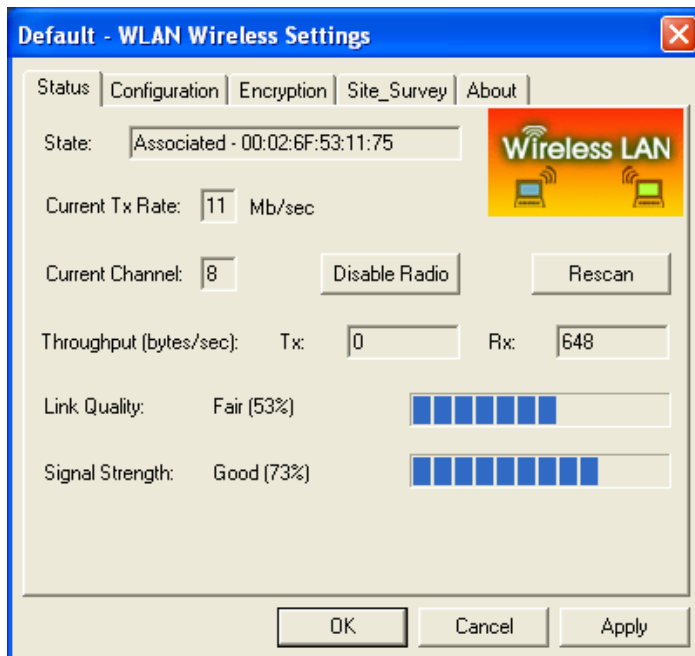
You can also set the system tray radio icon to disappear permanently by placing a check in the box **Remove Status Icon Permanently** as shown above. When the computer is restarted, the system tray radio icon will reappear unless the **Remove Status Icon Permanently** box was checked.

## 4.3 Wireless Network Status

This item allows you to view the status, configure IBSS, Rates, Domain, and view information about the client utility.

### 4.3.1 Status

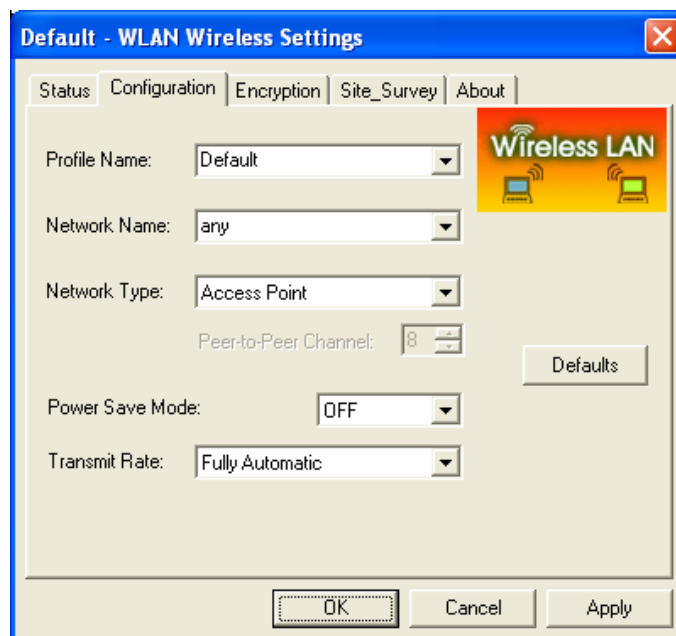
The **Status** tab displays the current status of the wireless radio. The following information is included in this tab, as the image depicts below.



- **State:** this indicates the state of the client. There are three options:
  - **Associated:** indicates that the wireless client is connected to an Access Point (AP). The BSSID is shown in the form of six HEX digits, which is the MAC address of the AP.
  - **Scanning:** indicates that the wireless client is searching for an AP in the area.
  - **Disconnected:** indicates that there are no APs or clients in the area.
- **Channel:** the operating frequency channel that the client is using (infrastructure mode).
- **Current Tx Rate:** the current rate at which the client is transmitting.
- **Throughput (bytes/sec):** displays the Tx (transmit) and Rx (receive) bytes per second.
- **Link Quality:** In infrastructure mode, this bar displays the transmission quality between an AP and a client. In Ad-hoc mode, this bar displays the transmission quality between one client, and another.
- **Signal Strength:** this bar displays the strength of the signal received from an AP or client.
- **Enable/Disable Radio:** click on this button to switch on/off the wireless radio.
- **Rescan:** click on this button to rescan the environment for a better signal/frequency.
- Click on the **Apply** or **OK** button if you have made any changes.

### 4.3.2 Configuration

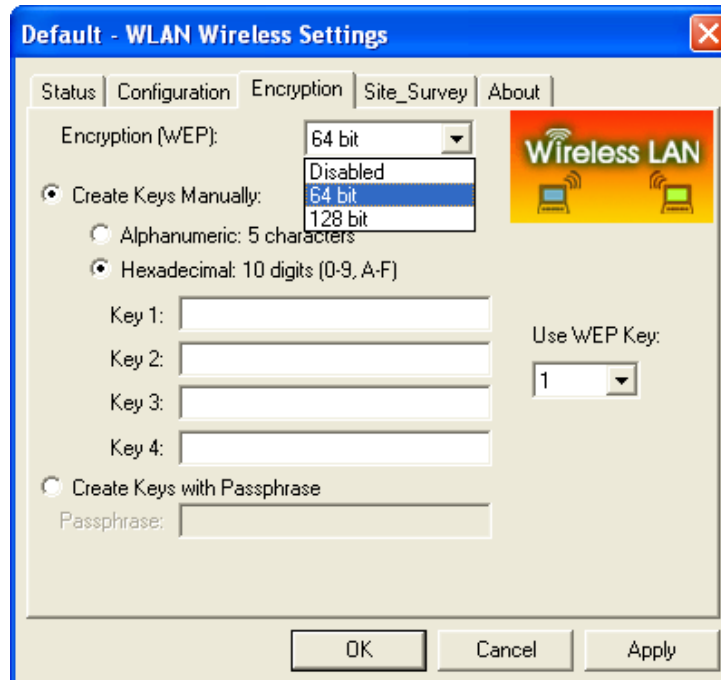
The **Configuration** tab displays settings such as profile name, network name, network type, and transmit rate. The following information is included in this tab, as the image depicts below.



- **Profile Name:** enter a name for this profile; this can be any name that you may associate with your network. This feature comes in handy when you need to work at several locations where there are different network settings. Using this you can configure a different profile for each of your networks.
- **Network Name:** enter the SSID of the network. The SSID is a unique name shared among all points in your wireless network. The SSID must be identical for all points in the network, and is case-sensitive.
- **Network Type:** select Peer-to-Peer or Access Point from the drop-down list.
  - **Peer-to-Peer:** if two or more stations exchange data directly without an AP.
  - **Access Point:** if the stations exchange data through an AP.
- **Peer-to-Peer Channel:** This option is just for Peer-to-Peer (Ad-Hoc) mode. You need to specify a channel on which the communications are established. Each station in a Peer-to-Peer (Ad-Hoc) network must specify the same channel and network type (SSID).
- **Power Save Mode:** this option is used to conserve energy. Select **ON**, **OFF**, or **Auto**. If you select Auto, the client will decide whether to switch this mode ON or OFF.
- **Transmit Rate:** select a data rate from the drop-down list. By default, **fully automatic** is selected; this indicates that the client will select the fastest available rate.
- **Defaults:** this button will set all configurations back to the default settings.
- Click on the **Apply** button to save the changes.

### 4.3.3 Encryption

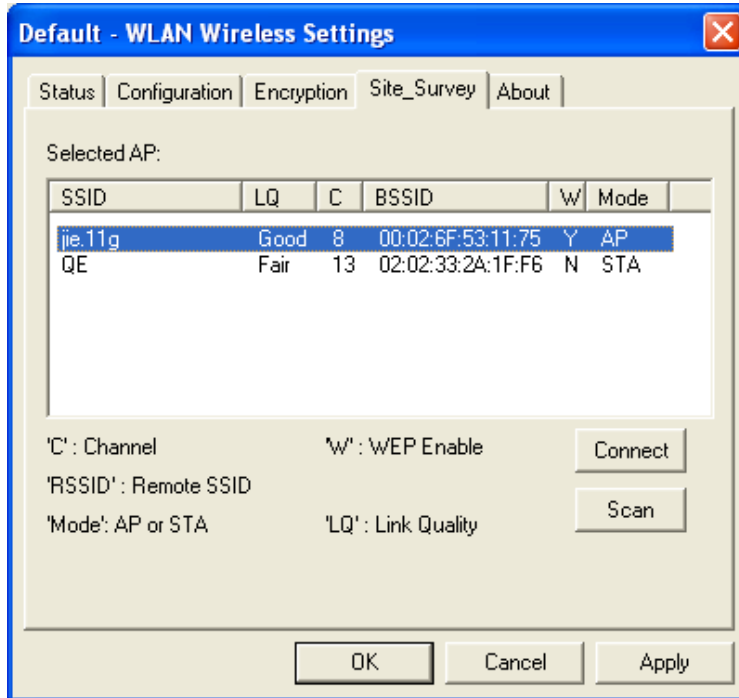
The **Encryption** tab displays the WEP settings. Encryption is designed to make the data transmission more secure. You may select 64 or 128-bit WEP (Wired Equivalent Privacy) key to encrypt data (Default setting is Disable). WEP encrypts each frame transmitted from the radio using one of the Keys from a panel. When you use WEP to communicate with the other wireless clients, all the wireless devices in this network must have the same encryption key or pass phrase. The following information is included in this tab, as the image depicts below.



- **Encryption (WEP):** select one of the encryption keys (64-bit, 128-bit, or disable) from the drop-down list. Click either on **Create Keys Manually** radio button or on **Create Keys with Passphrase** radio button. There are two ways, Alphanumeric and Hexadecimal, to set the different characters
- **Create Keys with Pass phrase:** type a character string into the field. For 64-bit enter 5 alphanumeric or 10 hexadecimal characters. For 128-bit enter 13 alphanumeric or 26 hexadecimal characters.
- **Create Keys Manually:** if you select this radio button, you must then select a Alphanumeric or Hexadecimal radio button below it. Then enter the WEP key.
- Click on the **Apply** button to save the changes.

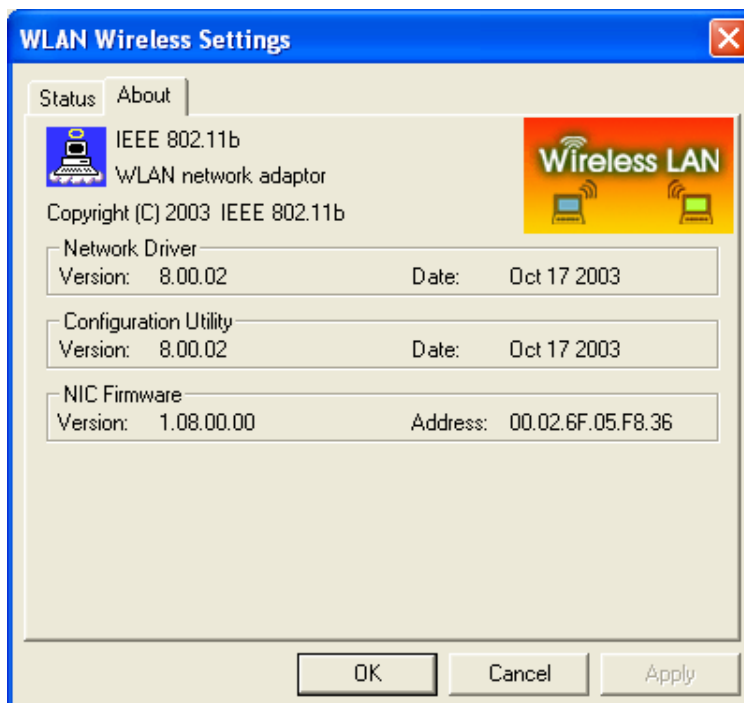
#### 4.3.4 Site Survey

The **Site Survey** tab displays a list of available Access Points and stations in the area. Click on the **Scan** button to re-scan the area, or click on the **Connect** button to associate with one of the Access Points.



#### 4.3.5 About

The **About** tab displays information about the PC card. This includes the network driver version and date, configuration utility version and date, and the NIC (Network Interface Card) firmware version and date.

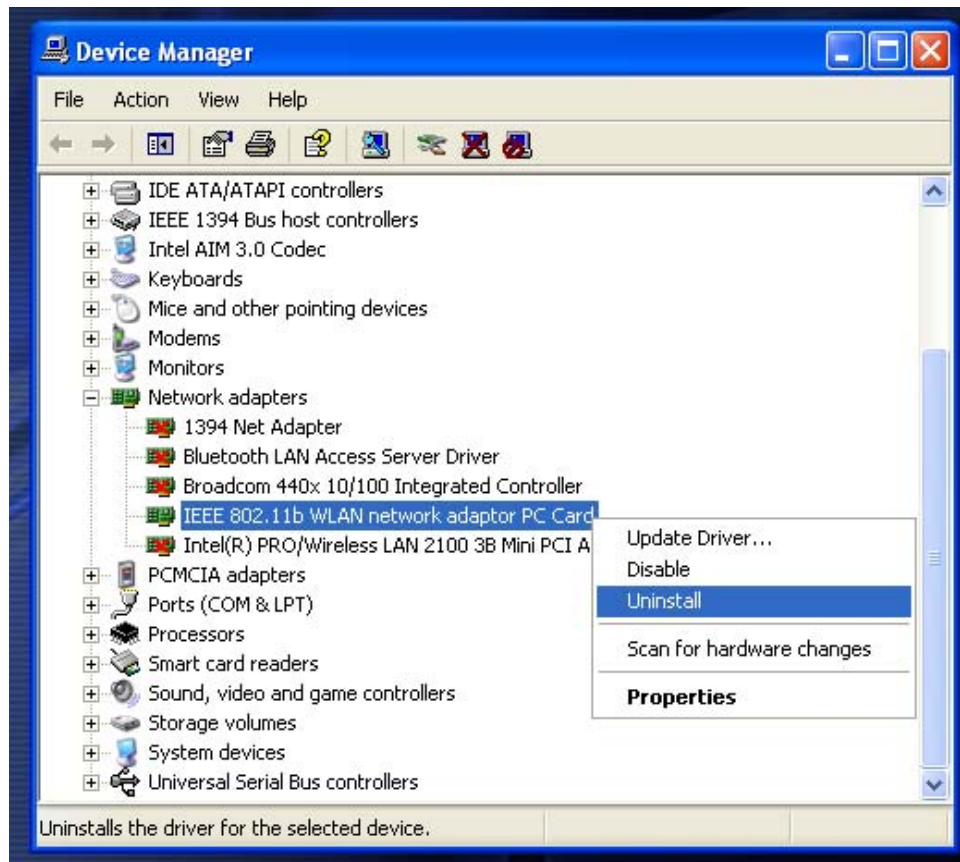


## 5 Uninstall the Drivers & Client Utility

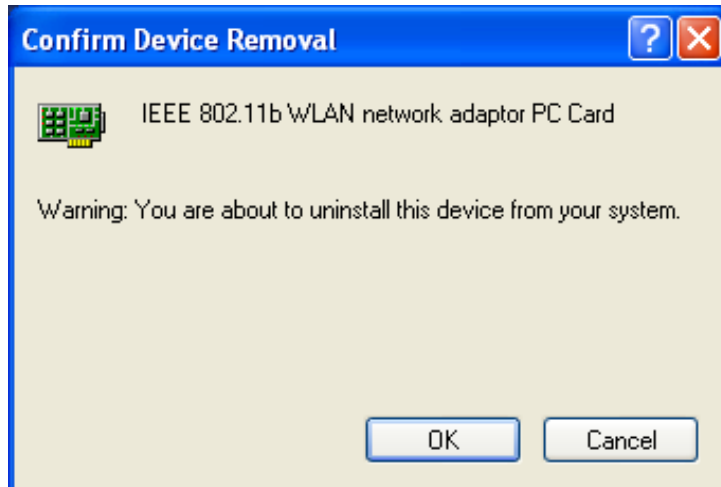
If the PC card installation is unsuccessful for any reason, the best way to solve the problem may be to completely uninstall the PC card and its utility and repeat the installation procedure again.

Follow the steps below in order to uninstall the Drivers/Client Utility:

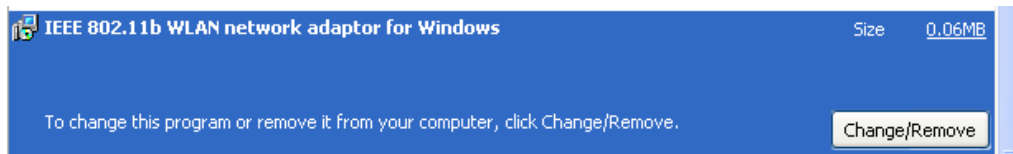
1. Click on **Start > Settings > Control Panel**.
2. Double click on the **System** icon.
3. Click on the **Hardware** tab, and then click on the **Device Manger** button.
4. Select **Network adapters** to view a list of network adapters on your PC.
5. Right-click on the **IEEE 802.11b WLAN network adaptor PC Card**, you will then see a window similar to the image below.



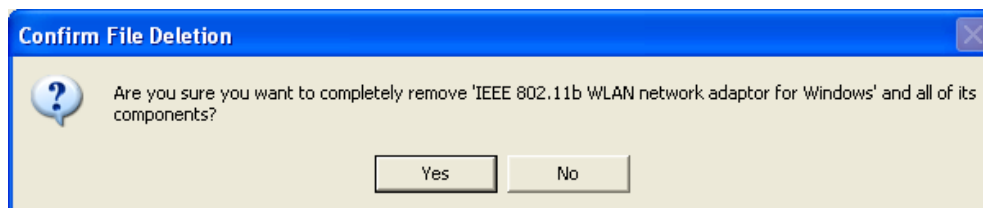
6. Select **Uninstall**. You will then see the following message asking you to confirm the device removal.



7. Click on the **OK** button.
8. Click on **Start > Settings > Control Panel**, and then click on the **Add or Remove Programs** icon. A window will then appear listing all the programs on your PC. From the list click on the 802.11b adapter item, as the image depicts below.



9. Click on the **Change/Remove** button. You will then be asked to confirm the file deletion, as the image depicts below.



10. Click on the **Yes** button. The Uninstallation process will then complete.



## Appendix A – Specifications

<b>General</b>	
Radio Data Rate	11, 5.5, 2 and 1 Mbps, Auto Fall-Back
Range (open environment)	11 Mbps –300m/450m (13, 19, 20 dBm output power) 5.5 Mbps –400m/600m (13, 19, 20 dBm output power) 2 Mbps – 500m/750m (13, 19, 20 dBm output power) 1 Mbps –800m/1200m (13, 19, 20 dBm output power)
Operating Voltage	3.3V / 5V
EMC Certifications	FCC Part 15/UL, ETSI 300/328/CE
Compatibility	Fully interoperable with IEEE802.11b compliant products
LED Indicator	RF Link activity
<b>Network Information</b>	
Network Architecture	Support ad-hoc, peer-to-peer networks and infrastructure communications to wired Ethernet networks via Access Point
Drivers	Windows 98/ME/2000/XP
Access Protocol	CSMA/CA
Roaming	IEEE802.11b compliant
Security	64/128-bit WEP data encryption
<b>Radio</b>	
Frequency Band	2.4 – 2.484 GHz
Radio Type	Direct Sequence Spread Spectrum (DSSS)
Modulation	CCK (11, 5.5Mbps), DQPSK (2Mbps), DBPSK (1Mbps)
Operation Channels	11 for North America, 14 for Japan, 13 for Europe, 2 for Spain, 4 for France
RF Output Power	13dBm (50mW) – FCC, 13dBm (50mW) – CE (low) 19dBm (100mW) – FCC, 19dBm (100mW) – CE (medium) 20dBm (200mW) – FCC, 20dBm (100mW) – CE (high)
Antenna	Integrated with built in diversity (low) Two antenna connectors (MMCX) (medium) Integrated with built in diversity (high)
Sensitivity @FER=0.08	11 Mbps @ 83dBm (low), 86dBm (medium), 87dbm (high) 5.5 Mbps @ 85dBm (low), 88dBm (medium), 99dbm (high) 2 Mbps @ 87dBm (low), 90dBm (medium), 91dbm (high) 1 Mbps @ 89dBm (low), 92dBm (medium), 93dbm (high)
<b>Environmental</b>	
Temperature Range	Operating: -10 to 55C (low), -10 to 55C (medium), 0 to 55C (high) Storage: -20 to 80C (low), -20 to 80C (medium), -40 to 70C (high)
Humidity (non-condensing)	5% to 95% typical
<b>Physical Specifications</b>	
Form Factor	PCMCIA Type II PC Card
Dimensions	118(L) mm x 54(W) mm x 7.5(H) mm
Weight	40 g

# Appendix B – Regulatory Compliance Information

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## Radio Frequency Interference Requirements

This device complies with Part 15 of FCC Rules and Canada RSS-210. Operation is subject to the following conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.
3. To comply with RF safety requirements, you must maintain a distance of 20 cm from the antenna when operating the device.
4. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

## Interference Statement

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

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

**FCC Caution:** To assure continued compliance, (example – use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.