

IEEE 802.11b  
Wireless LAN PC Card  
User's Guide

Version 5.0

## REGULATORY INFORMATION

### Federal Communications Commission Interference Statement

The 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 instruction, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

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

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

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

### IMPORTANT NOTE:

#### *FCC Radiation Exposure Statement:*

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 2.5 cm between the radiator & your body.

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

## **EUROPEAN COMMUNITY CE NOTICE**

Marking by the symbol CE indicates compliance of this equipment to the R&TTE Directive 1999/5/CE. Such marking is indicative that this equipment meets or exceeds the following technical standards:

- EN 300 328
- EN 301 489 -1, EN 301489-17
- EN 60950

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## **1 Introduction**

Thank you for purchasing Wireless LAN PC Card. You are about to install a networking system that is not only fast and powerful, but also easy to set up and simple to maintain. In a short time you and those in your network will be able to share a local printer and files, access the Internet, and roam about the office wire-freely.

Using radio frequency (RF) technology, WLAN devices transmit and receive data over the air, minimizing the need for wired connections. Thus, WLANs combine data connectivity with user mobility, and, through simplified configuration, enable movable LANs.

This wireless networking solution has been designed for both large and small businesses, and it is scalable so that you can easily add more users and new network features as your business grows.

## 2 Wireless LAN basics

Wireless LAN network defined by IEEE 802.11b standard committee could be configured as:

- **Ad Hoc wireless LAN,**
- or
- **Infrastructure wireless LAN.**

**Ad Hoc** network is a group of notebooks with wireless LAN PC cards, called a BSS (Basic Service Set). These notebooks use their wireless LAN PC cards to communicate with each other directly.

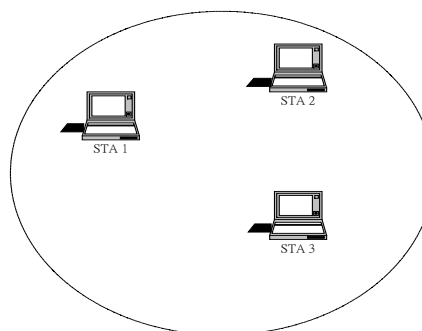


Figure 2-1 Ad Hoc wireless network

The most obvious differentiation between **Infrastructure** wireless network and **Ad Hoc** wireless network is that the notebooks in **Infrastructure** wireless network can make use of the resource in the Internet through **Access Point**.

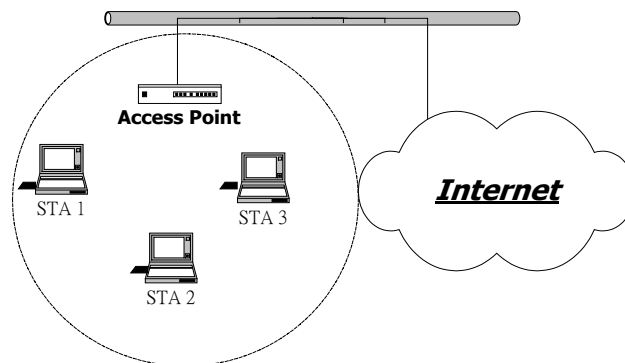


Figure 2-2 Infrastructure wireless network

To set up your notebook's network as the type of "**Ad Hoc**" or "**Infrastructure**" wireless network depends completely on your requirement. Generally, if your network environment has an **Access Point**, it's recommend that you set it as "**Infrastructure**" mode to connect to the **Internet**.

## 3 Installation

This section describes the procedures for installing the Wireless LAN PC Card under

Windows 98SE, ME, 2000, XP and WinCE operating systems.

### **Before You Start**

Before installation, please check your system in advance and ensure it meets the minimum requirements as described below.

- Processor: Intel Celeron / Pentium II / Pentium III / Pentium IV; AMD Duron / Athlon
- Operating System: Microsoft Windows 98SE / ME / 2000 / XP, Linux
- System memory: 32MB at least
- Hard Drive Free Space: 5MB

**Note:** *To prevent potential problems during installation, please use the auto-run installation tool on the CD to finish the driver installation before you plug the WLAN PC Card into the computer.*

To use the WLAN PC Card with a computing device, the device must be equipped with an internal or external PC Card Type II or Type III slot. All drivers and supporting software for the WLAN PC Card must be installed and configured.

Ask your system administrator for the following information, which you may need during driver installation:

- Your Wireless LAN SSID.
- Your computer's unique client name and workgroup name
- For your network account, your user name and password.
- Your IP address, gateway address, and subnet mask, if you're not using a DHCP server.

Every computer on a network is identified by a unique network address. There are two methods to assign network addresses to computers on a TCP/IP network:

- Static IP addressing
- Dynamic IP addressing (DHCP)

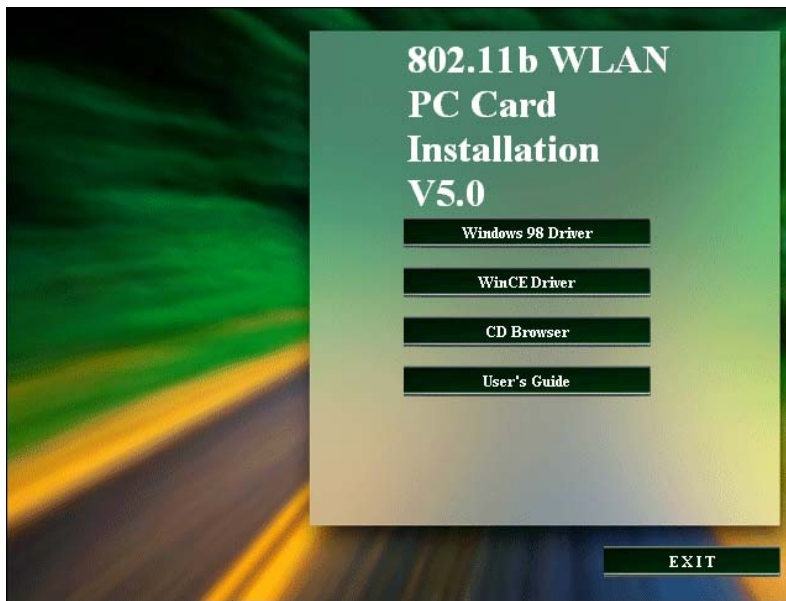
In networks with static IP addressing, the network administrator manually assigns an IP address to each computer. Once a static IP address is assigned, a computer uses the same IP address every time it reboots and logs on to the network. You may manually change the IP address in the **Network Properties dialog box**. Networks using static IP addresses are easy to set up and do not require additional network management software.

In networks with dynamic IP addressing, a DHCP server in the network dynamically assigns IP addresses to all clients every time they log on to the network. Network using dynamic IP addresses require setting up and running a DHCP Server.

### **Installation Menu**

After you insert the **Installation/Documentation CD**, the installation menu will appear.

**Note:** *If the auto-run installation menu window doesn't appear automatically, you can utilize the Windows Explorer to browse CD content and run install.exe manually.*



You can find five buttons in this menu:

1. **Windows XX Driver.** Where the XX can be 98, ME, 2000 or XP, the auto-run installation application will detect the Operating System you are using automatically. Please select this button to install the PC Card when you are using any one of these four Operating Systems.
2. **WinCE Driver.** Please select this button to install the PC Card when you are using the PDA with WinCE Operating Systems.
3. **CD Browser.** Select this button to browse the contents of this **Installation/Documentation CD.**
4. **User's Guide.** To read the user's guide (in pdf format).
5. **Exit.** To exit the auto-run application.

If you'd like to use the Linux operating system, please refer to the readme.txt file in the Linux driver package, which is in the **Linux** sub-folder under the **Driver** folder in the **Installation/Documentation CD.**

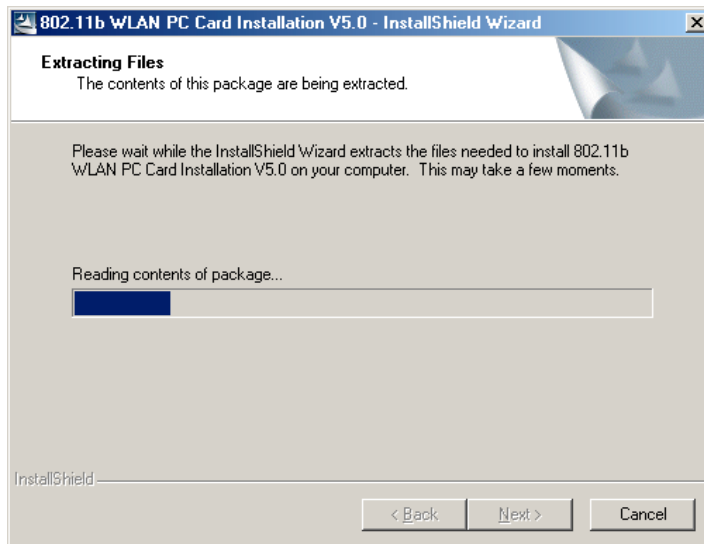


### 3.1 Install Wireless LAN PC Card under Windows 98

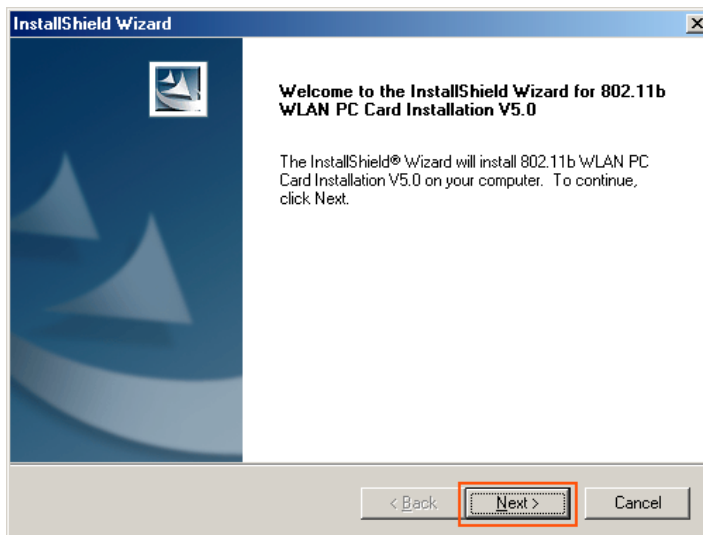
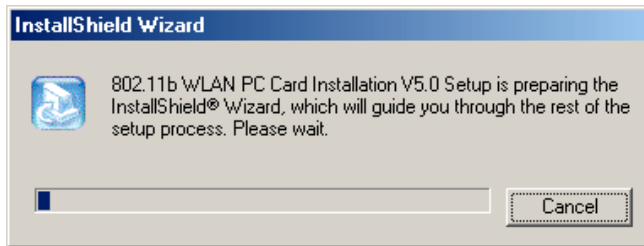
Step 1. Insert the **Installation/Documentation CD**, and the installation menu will appear. If the auto-run installation menu window doesn't appear automatically, you can utilize the Windows Explorer to browse CD content and run **install.exe** manually.



You can choose **Windows 98 Driver** to install the driver. It opens the **InstallShield Wizard** dialog box as shown below. Click **NEXT** to continue.



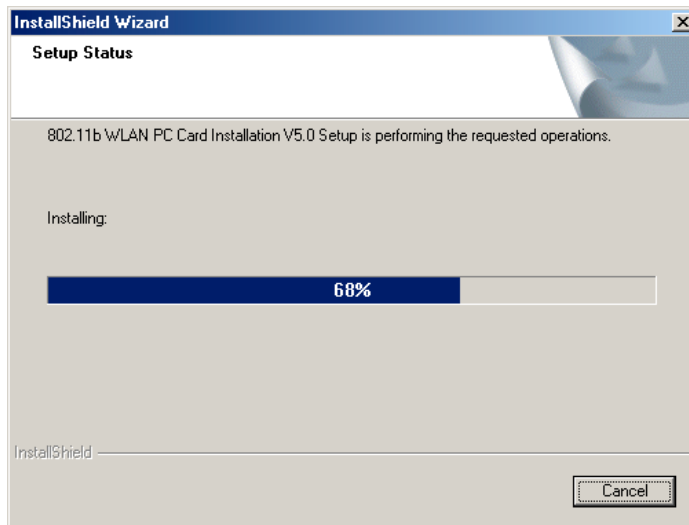
## Wireless LAN PC Card User's Guide



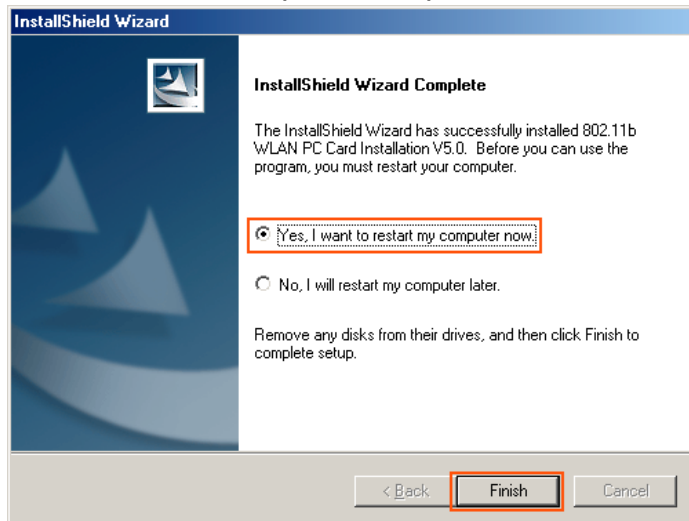
Step 2. Software License Agreement, click **Yes** to accept, then start copying files.



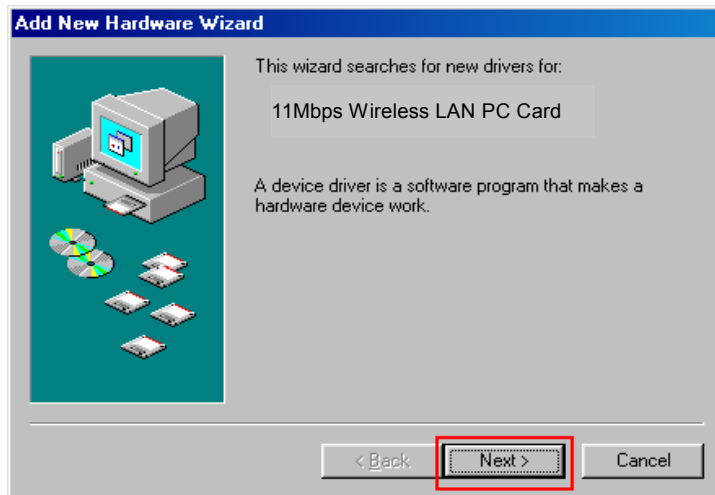
Step 3. Start copying files.



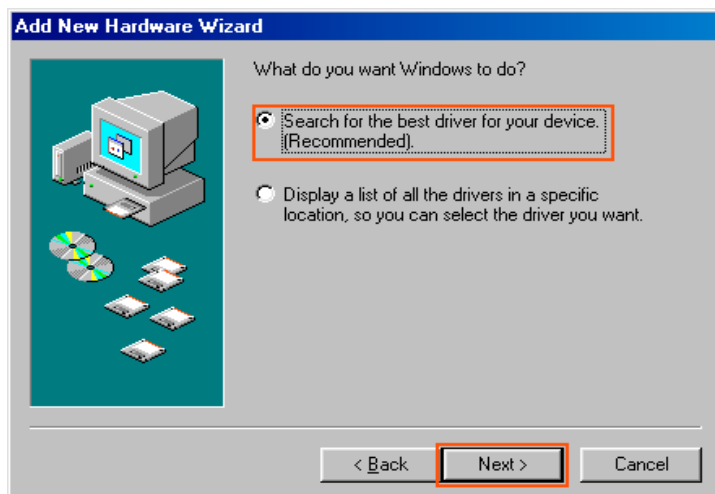
Step 4. Click **Finish** to complete Setup and then the PC will restart.



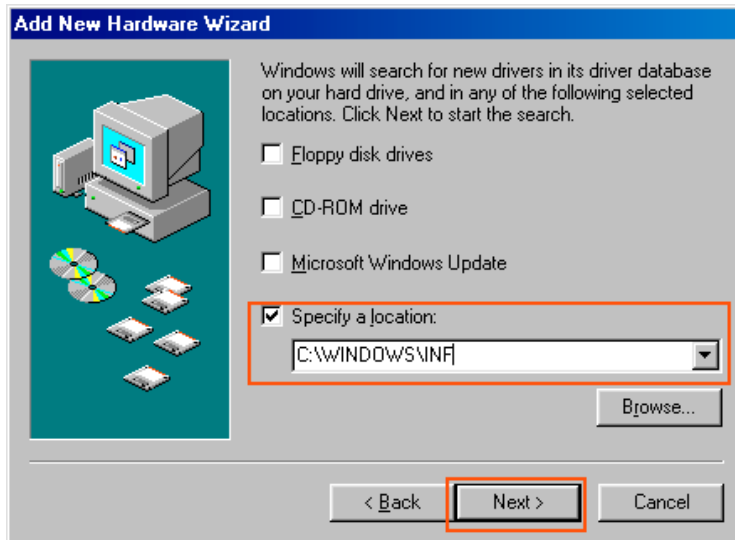
Step 5. After the computer restarts, hold the PC card with the logo facing up, and insert the card into the PC Card slot, applying just enough pressure to make sure it is fully seated. **Windows 98** will automatically detect the PC card, briefly opens a **New Hardware Found** window, and starts collecting information for a driver information database. When **Windows 98** is ready to configure the new hardware, it opens the **Add New Hardware Wizard** dialog box as shown below. Click **Next** to continue.



Step 6. A dialog box appears asking what do you want Windows to do. Select **Search for the best driver for your device (Recommended)** and click **Next**.



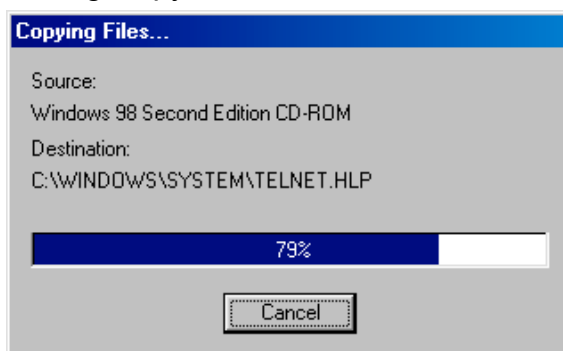
Step 7. Type the “C:\WINDOWS\INF” into the **Specify a Location** box. Then click the **Next** button.



Step 8. After the hardware wizard finds the installation files in the windows, it displays the search results:” Windows driver file search for the device: “11Mbps Wireless LAN PC Card”. Click **Next** to copy the required files.



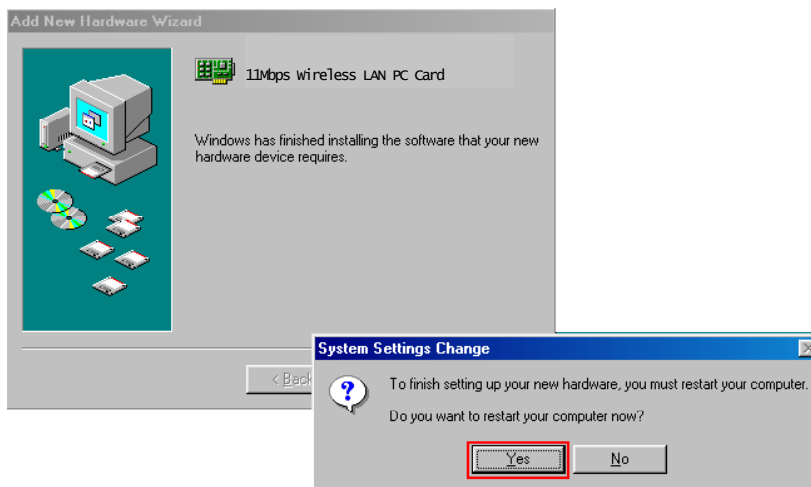
Step 9. Starting Copy.



Step 10. The **Add New Hardware Wizard** window appears stating that Windows has finished installing the software that your new hardware device requires. Click **Finish**.



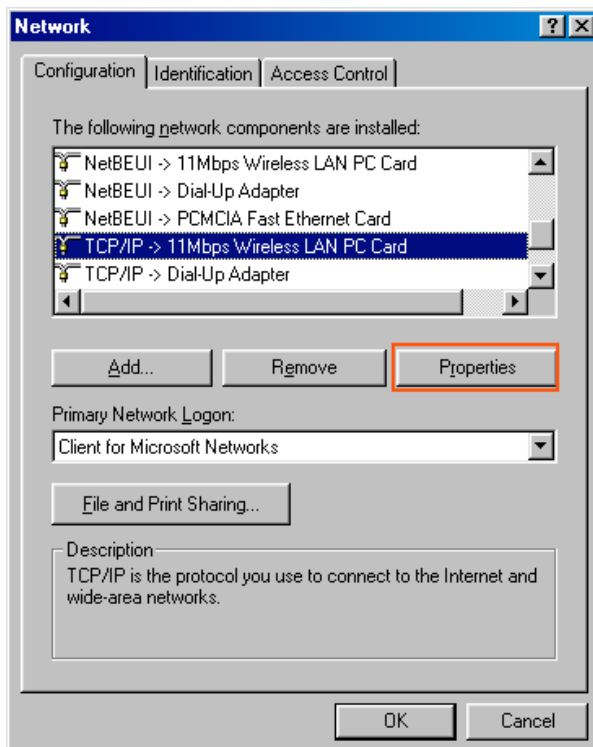
Step 11. The System Settings Change window states:” To finish setting up your new hardware, you must restart your computer. Do you want to restart your computer now?” Remove the software CD and click **Yes** to restart the computer.



Step 12. After the computer restarts, double click the **My Computer** icon on your desktop. In My Computer window, double click the **Control Panel** icon. In Control Panel window, double click the **Network** icon.

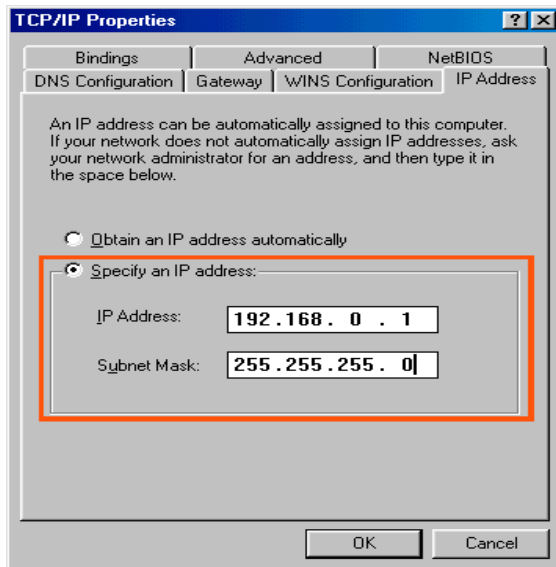


Step 13. Select the **TCP/IP->11Mbps Wireless LAN PC Card** for setting the IP address. Click **Properties**.

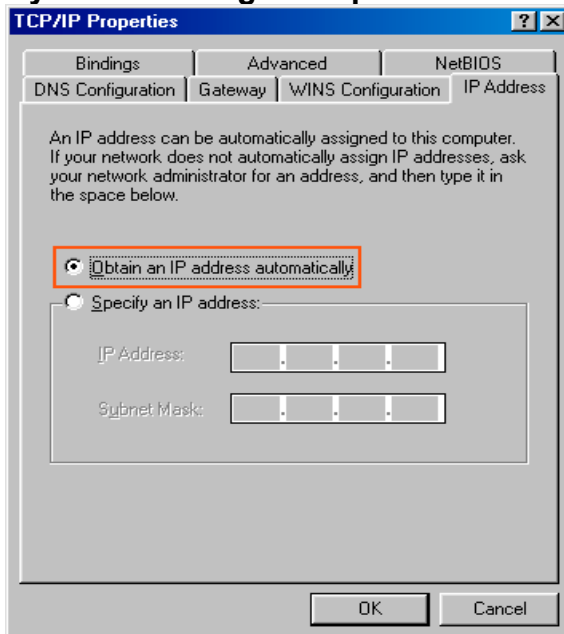


Step 14. Set **IP address** and **Subnet Mask**. You can select either **Static** or **Dynamic** setting. If you use the static IP setup, please enter the IP address and Subnet mask. You should ask your network administrator for an address, and then type it into the blank boxes as below. Then click **OK** to return to Step 13 *Network* dialog box. Then click **OK** button to set the value.

### Static Setting Example



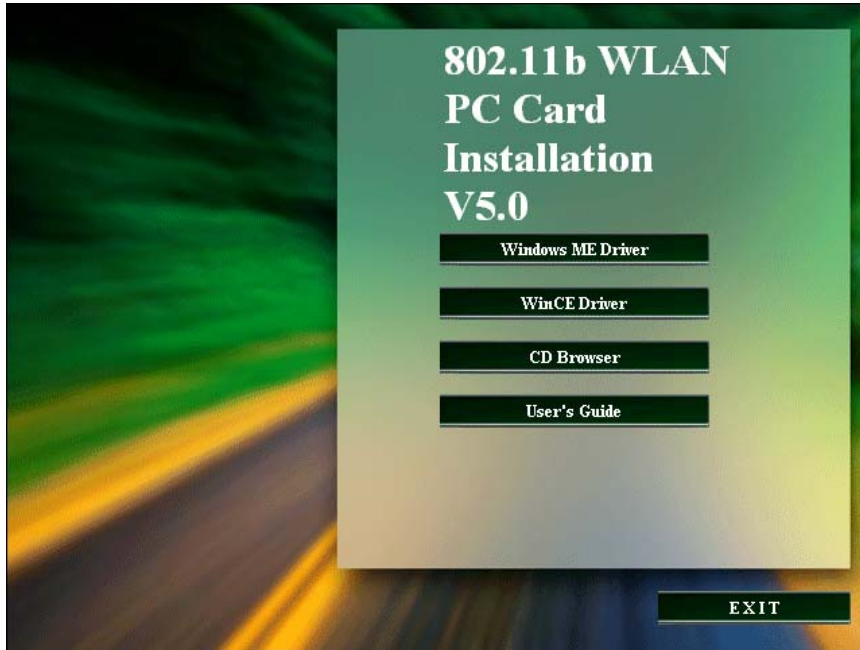
### Dynamic Setting Example



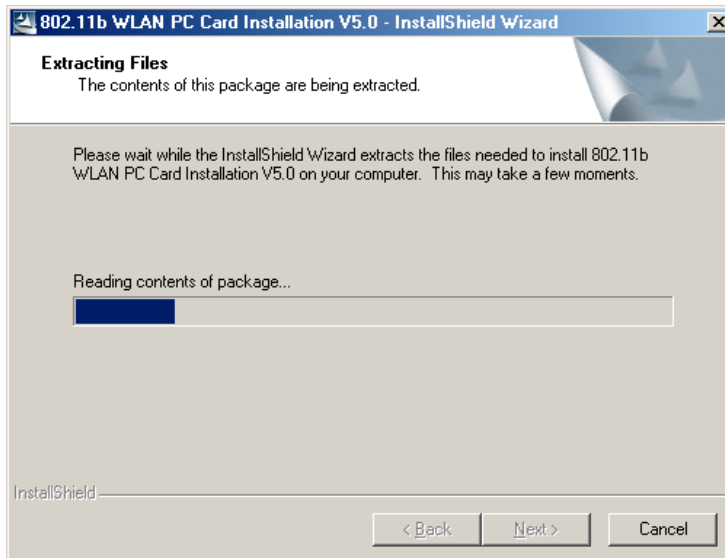


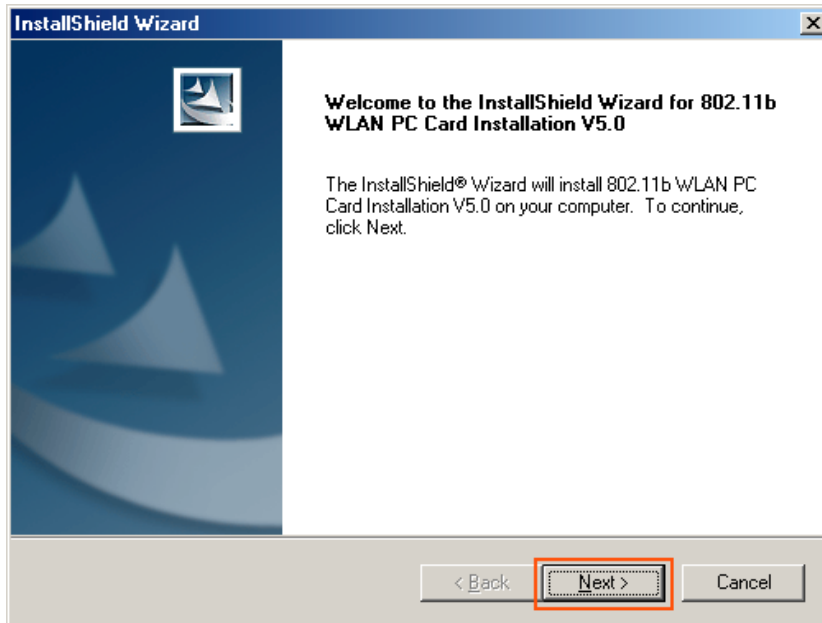
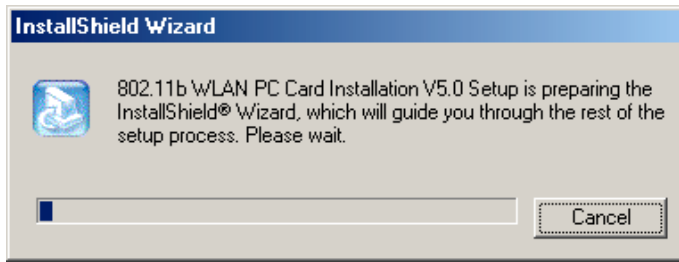
### 3.2 Install Wireless LAN PC Card under Windows ME

Step 1. Insert the **Installation/Documentation CD**, and the installation menu will appear. If the auto-run installation menu window doesn't appear automatically, you can utilize the Windows Explorer to browse CD content and run **install.exe** manually.

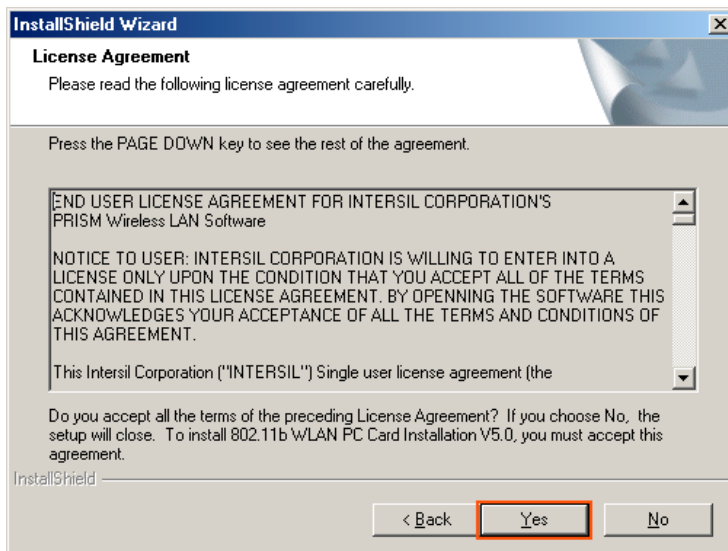


You can choose **Windows ME Driver** to install the driver. It opens the **InstallShield Wizard** dialog box as shown below. Click **NEXT** to continue.

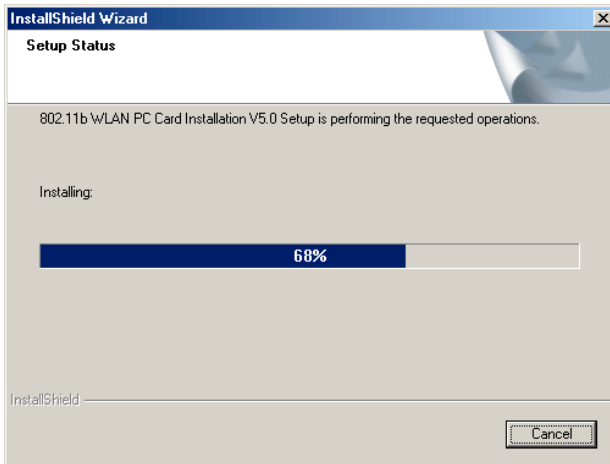




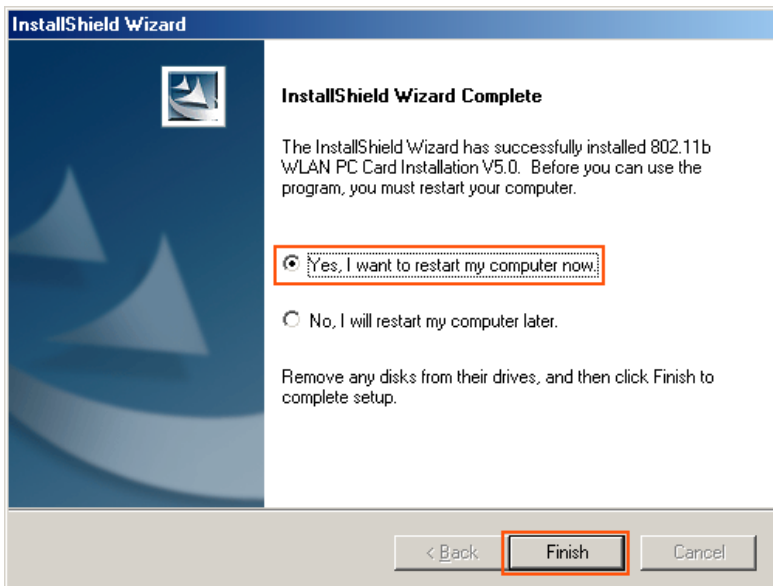
Step 2. Software License Agreement, click **Yes** to accept.



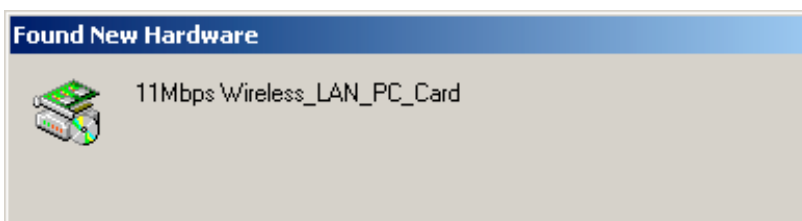
Setup Status window will pop up.



Step 3. Click **Finish** to complete Setup.



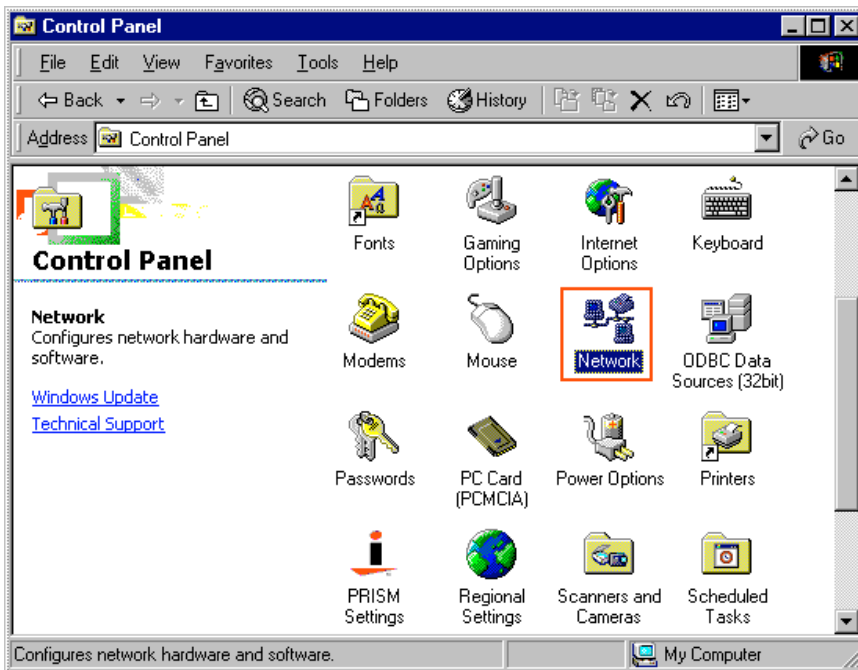
Step 4. After the computer restarts, hold the PC card with the logo facing up, and insert the card into the slot, applying just enough pressure to make sure it is fully seated. **Windows ME** will automatically detect the PC card, and opens a New Hardware Found window.



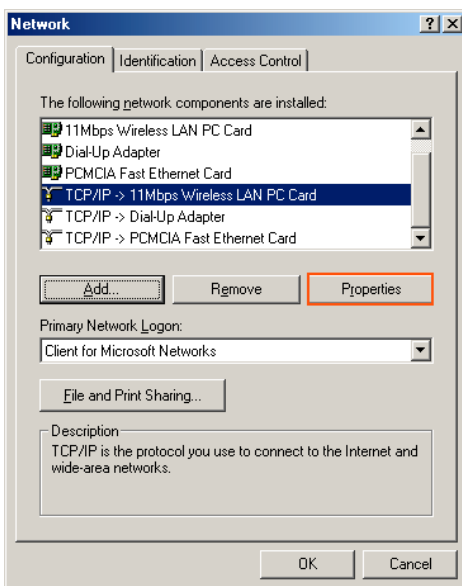
Then click **YES** to restart the computer.



Step 5. After the computer restarts, double click the **My Computer** icon on your desktop. In My Computer window, double click the **Control Panel** icon. In Control Panel window, double click the **Network** icon.

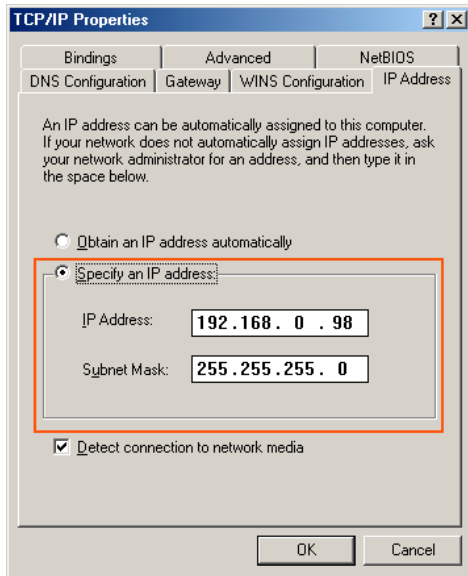


Step 6. Select the **TCP/IP->11Mbps Wireless PC Card** for setting the IP address. Click **Properties**.

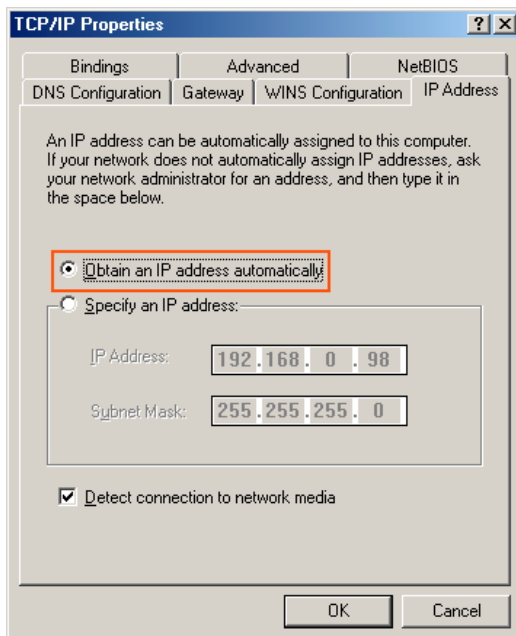


Step 7. Set **IP address** and **Subnet Mask**. You can select either **Static** or **Dynamic** setting. If you use the static IP setup then please enter the IP address and Subnet masking. You should ask your network administrator for an address, and then type it into the blank boxes as below. Then click **OK** to return to Step 6 *Network* dialog box.

### Static Setting Example



### Dynamic Setting Example

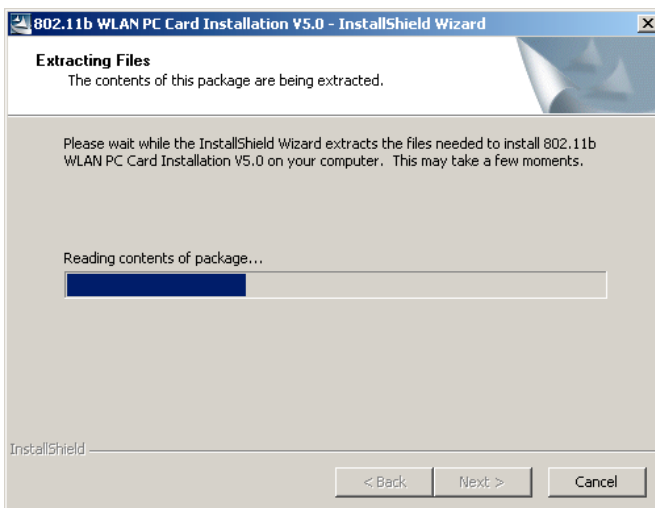


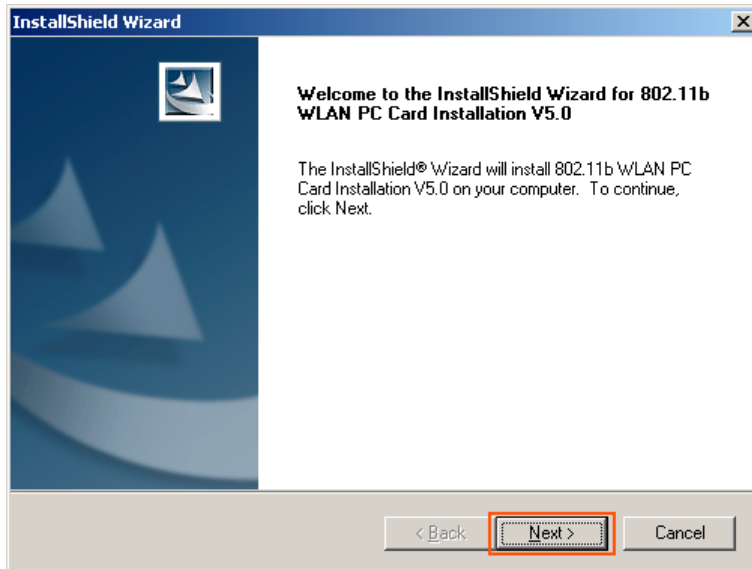
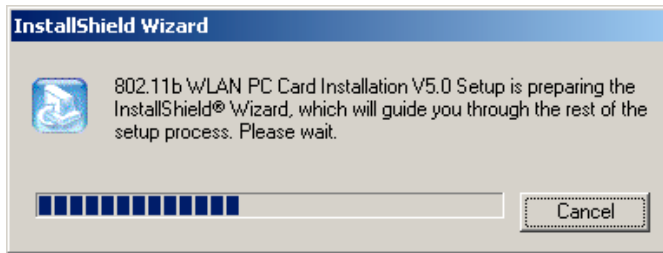
### 3.3 Install Wireless LAN PC Card under Windows 2000

Step 1. Insert the **Installation/Documentation CD**, and the installation menu will appear. If the auto-run installation menu window doesn't appear automatically, you can utilize the Windows Explorer to browse CD content and run **install.exe** manually.

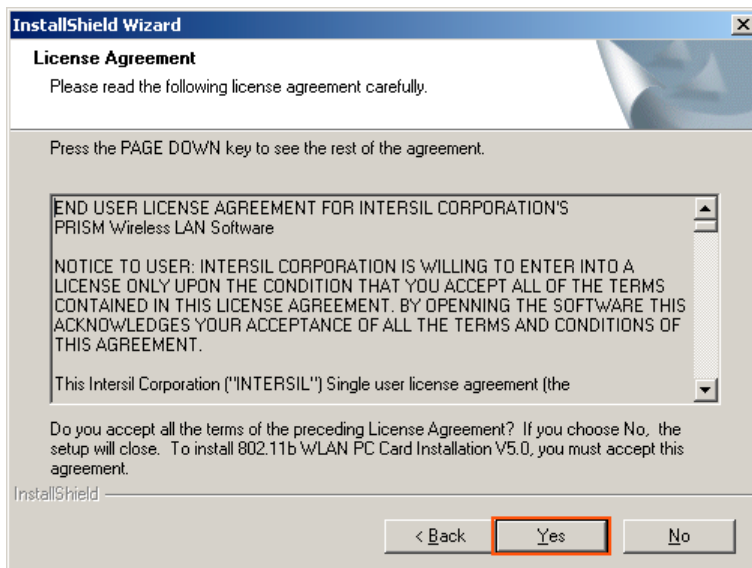


You can choose **Windows 2000 Driver** to install the driver. It opens the **InstallShield Wizard** dialog box as shown below. Click **NEXT** to continue.

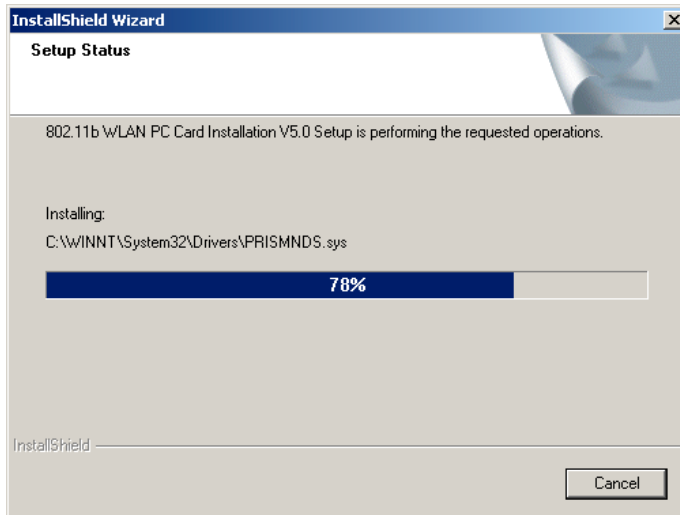




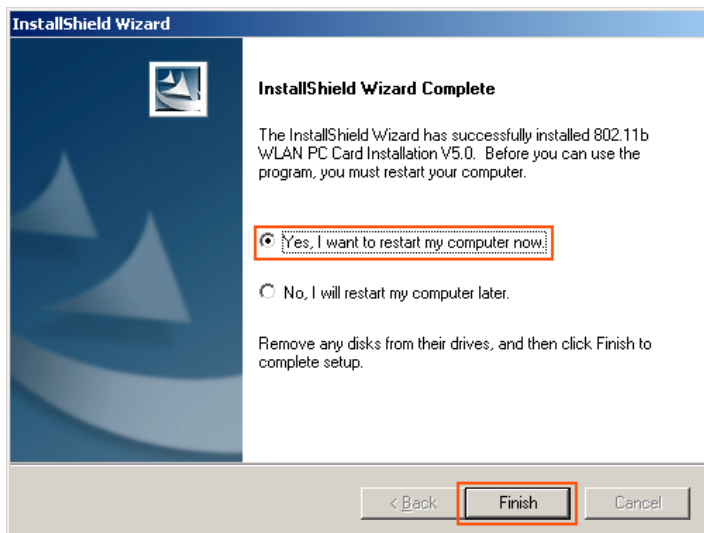
Step 2. Software License Agreement, click **Yes** to accept.



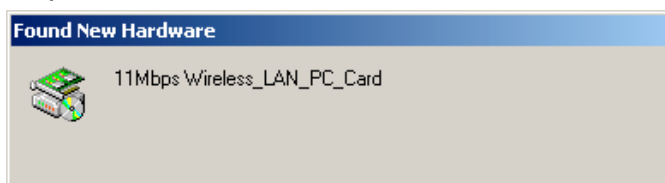
Setup Status window will pop up.



Step 3. Click **Finish** to complete Setup.

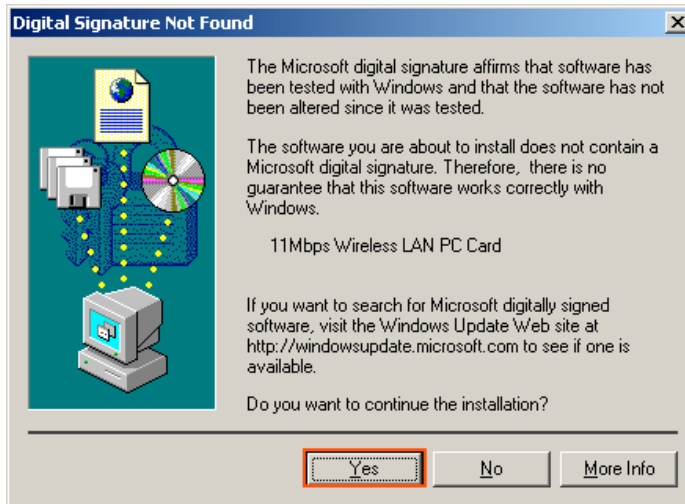


Step 4. After the computer restarts, hold the PC card with the logo facing up, and insert the card into the PC Card slot, applying just enough pressure to make sure it is fully seated. **Windows 2000** will automatically detect the PC Card, opens a New Hardware Found window for a while.

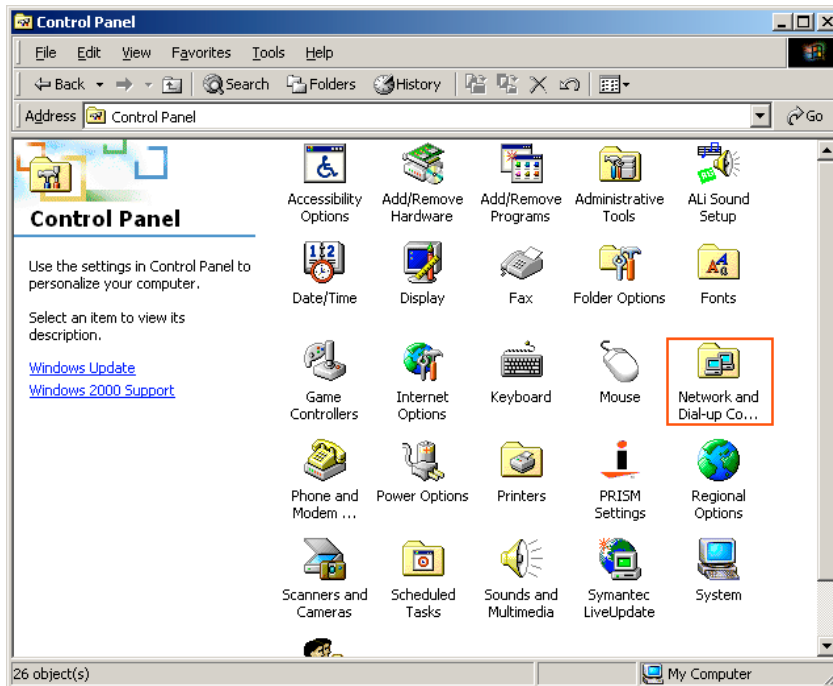




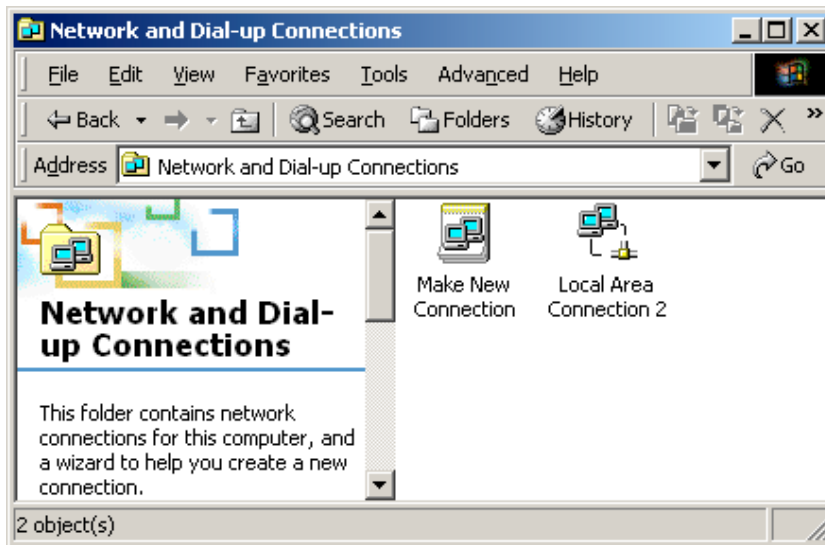
Click **Yes** in the Digital Signature dialog box.



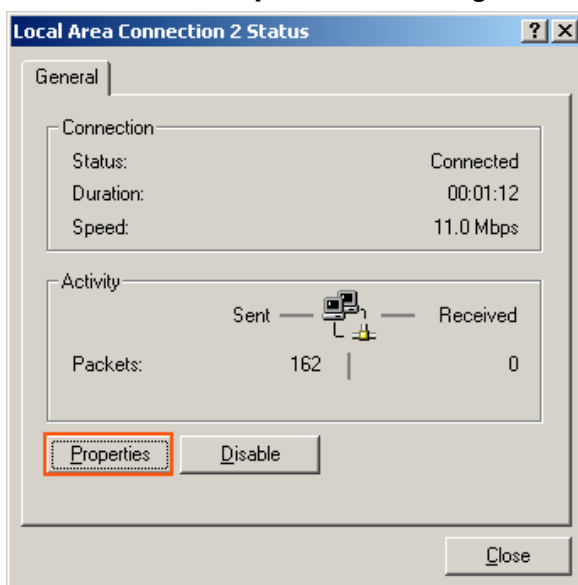
Step 5. Then click **Start** menu and select **Control Panel**. Double click the **Network Connections** icon in the **Control Panel**.



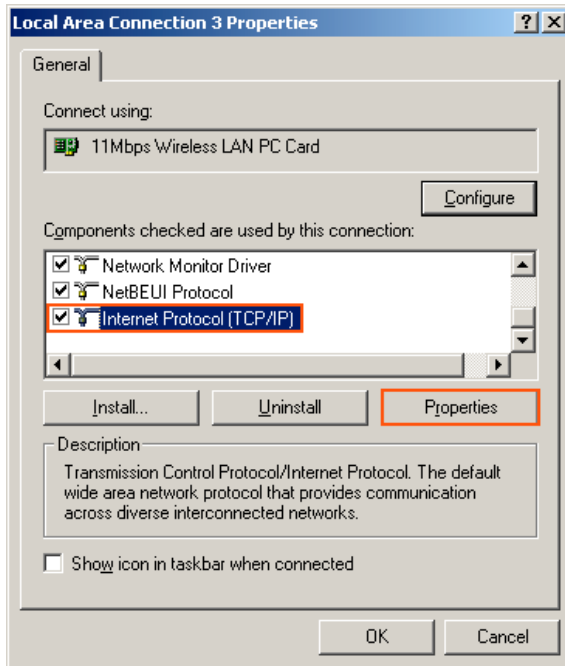
Step 6. Click the local area connection icon.



Step 7. Double click **Properties** to configuration network protocol.

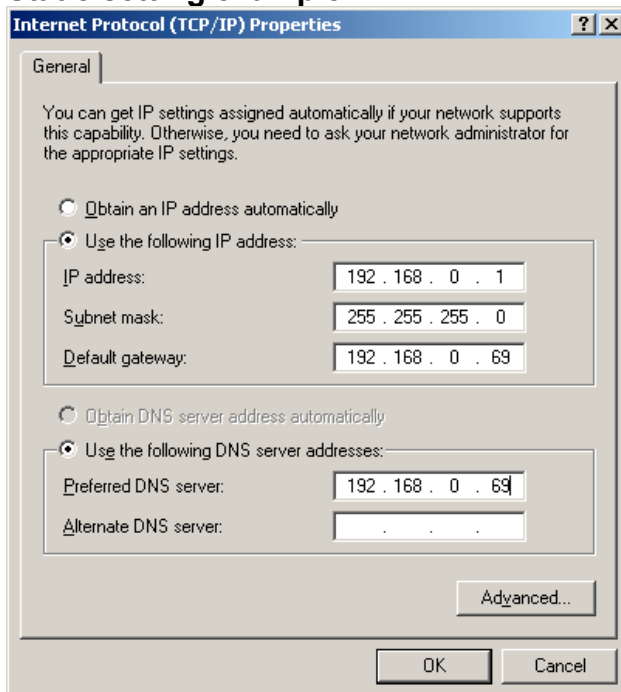


**Step 8. Select Internet Protocol (TCP/IP) and click Properties**

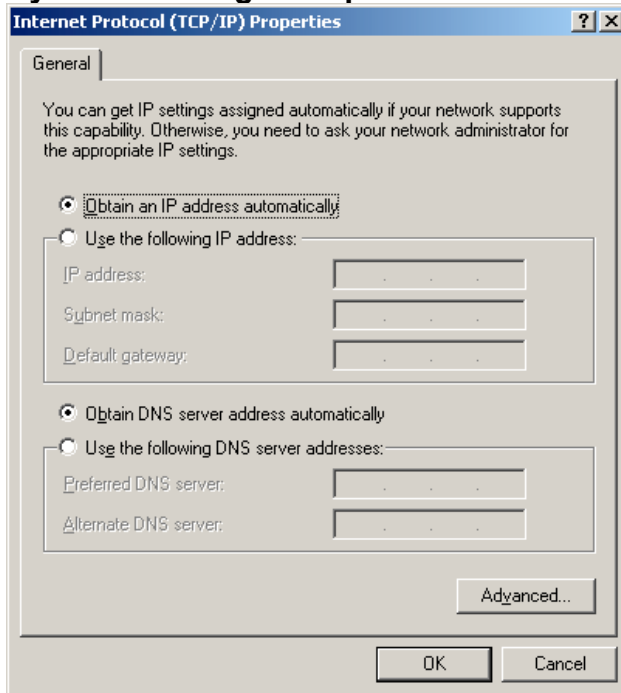


**Step 9. Set IP address and Subnet Mask.** You can select either **Static** or **DHCP** settings. If you use the static IP setup, please enter the IP address and subnet mask. You should ask your network administrator for an address, and then type it into the blank boxes as below. Then click **OK** to return to step 8. **Local Area Connection Properties** dialog box.

**Static setting example**



### Dynamic setting example

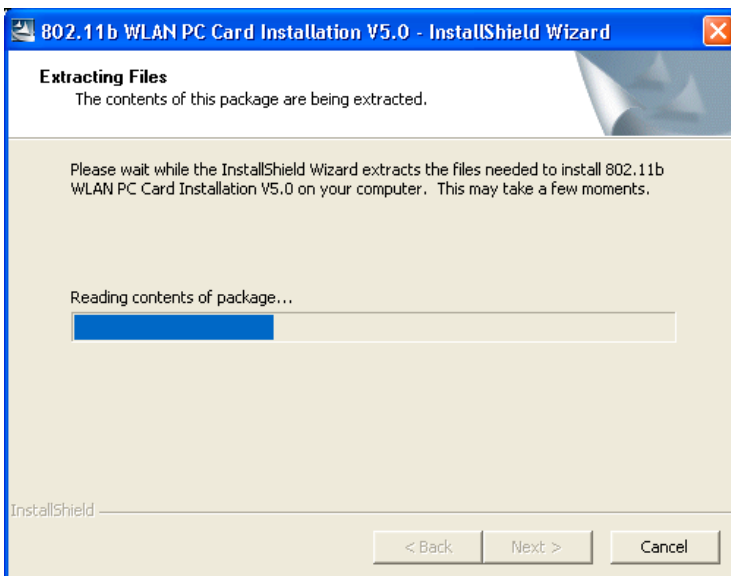


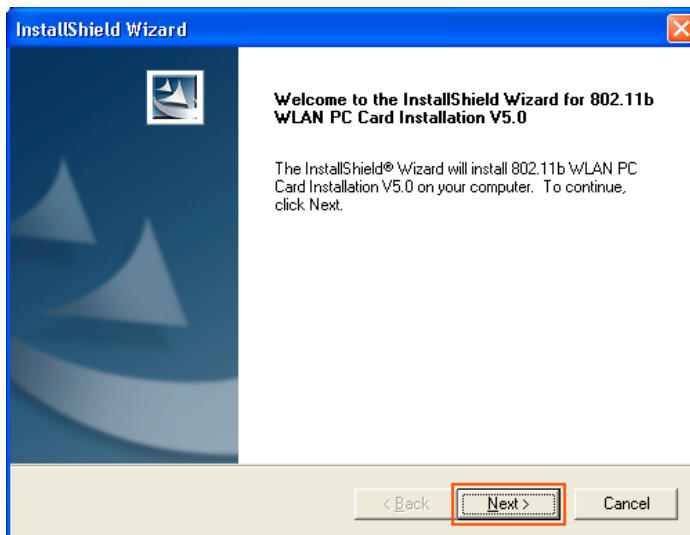
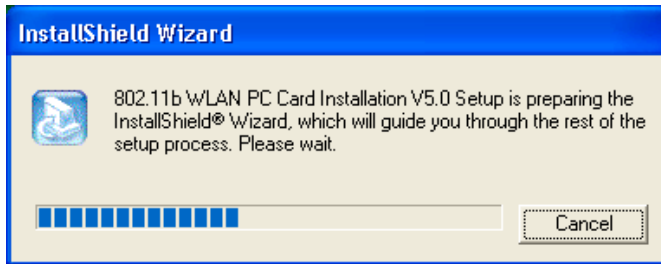
### 3.4 Install Wireless LAN PC Card under Windows XP

Step 1. Insert the **Installation/Documentation CD**, and the installation menu will appear. If the auto-run installation menu window doesn't appear automatically, you can utilize the Windows Explorer to browse CD content and run **install.exe** manually.



You can choose **Windows XP Driver** to install the driver. It opens the **InstallShield Wizard** dialog box as shown below. Click **NEXT** to continue.

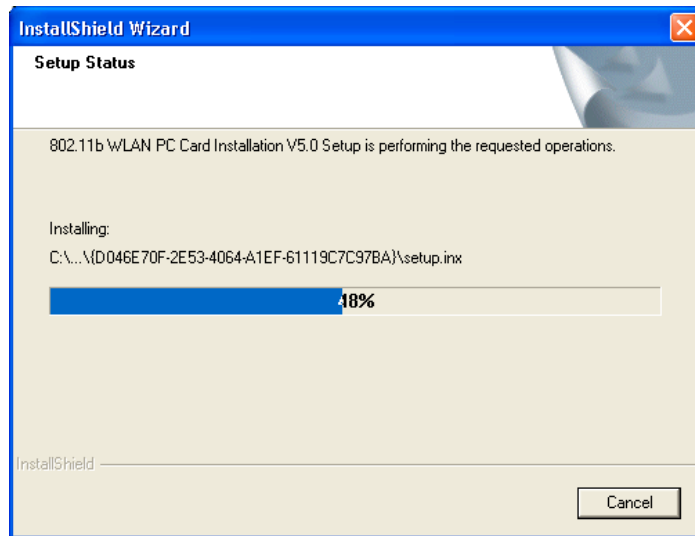




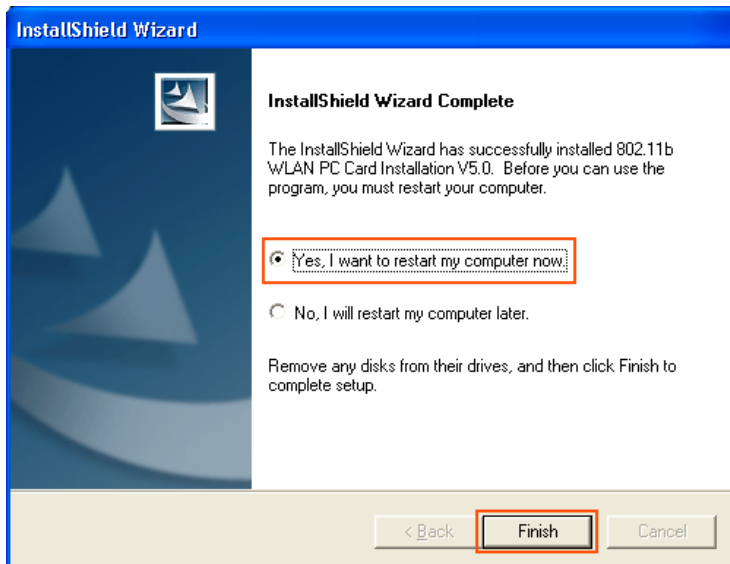
Step 2. Software License Agreement, click **Yes** to accept.



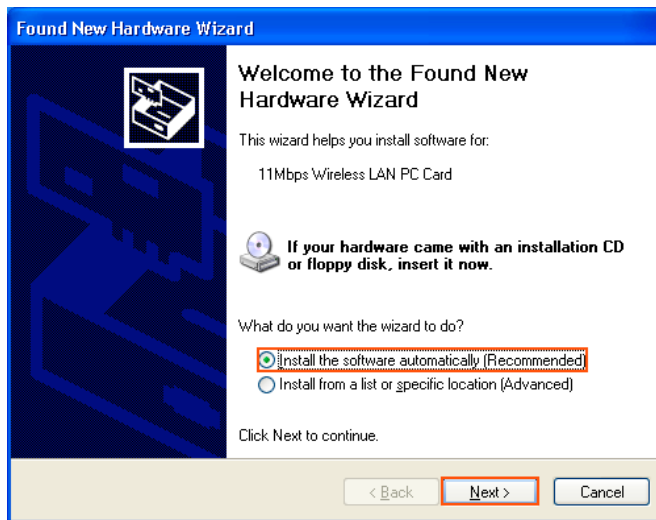
Setup Status window will pop up.



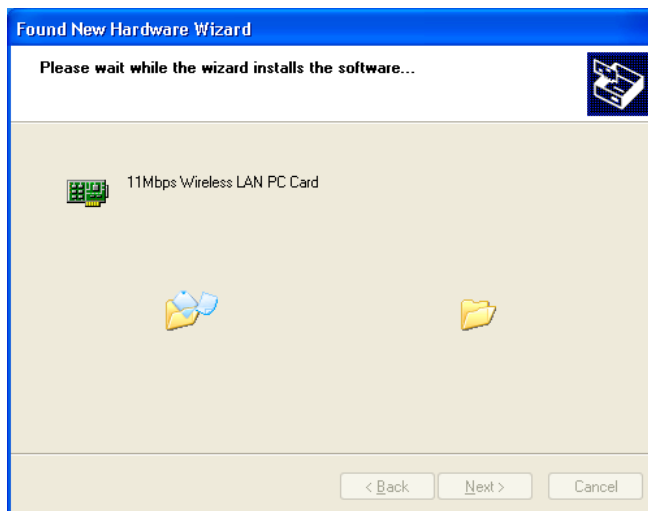
Step 3. Click **Finish** to complete Setup.



Step 4. After restarting the computer, hold the PC card with the logo facing up, and insert the card into the slot, applying just enough pressure to make sure it is fully seated. **Windows XP** will automatically detect the PC card, briefly opens a New Hardware Found window, and starts collecting information for a driver information database. When **Windows XP** is ready to configure the new hardware, it opens the **Found New Hardware Wizard** dialog box asking what do you want Windows to do. Select **Install the software automatically (Recommended)**, and click **Next**.

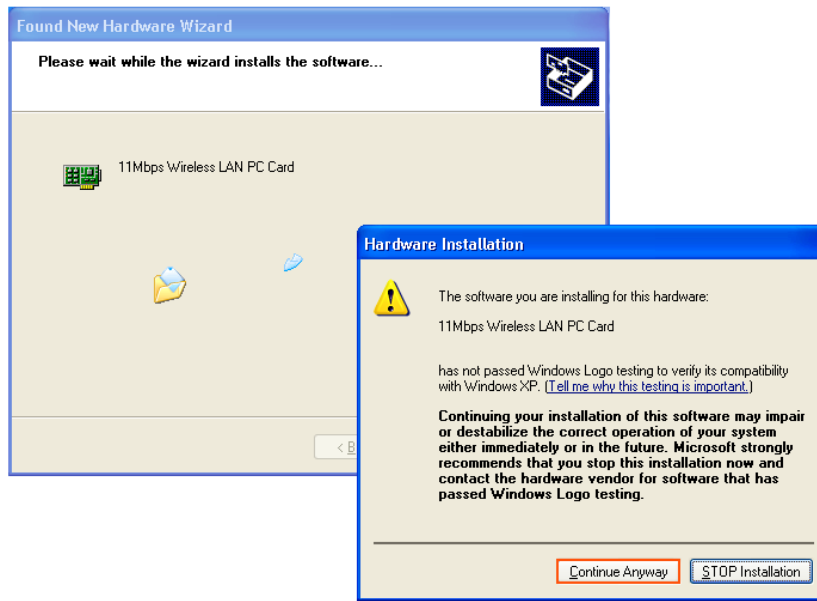


Starting to search the driver automatically.

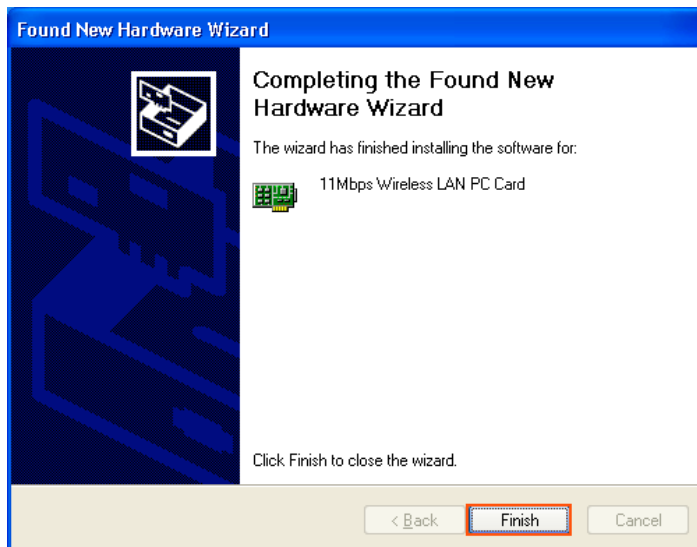




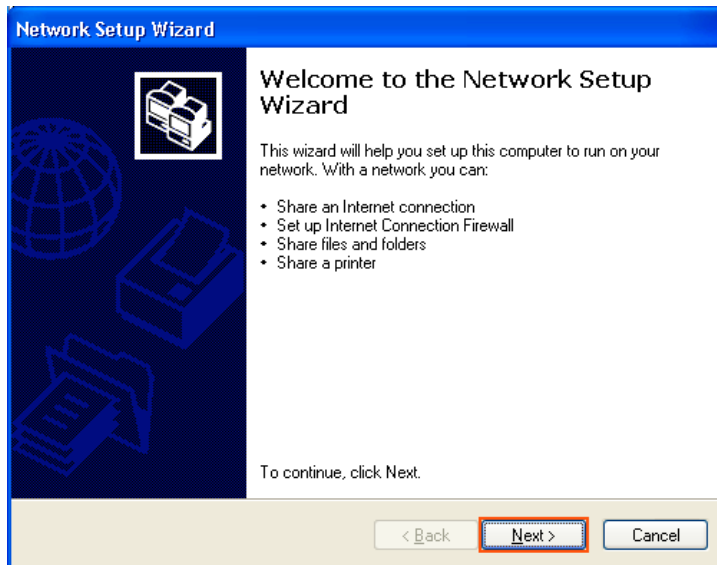
Step 5. Click **Continue Anyway**.



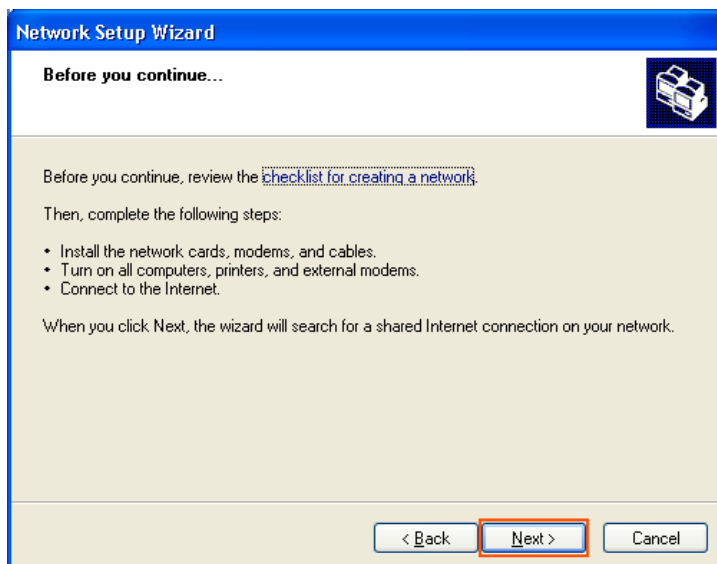
Step 6. The **Found New Hardware Wizard** window appears stating that Windows has finished installing the software that your new hardware device requires. Click **Finish**.



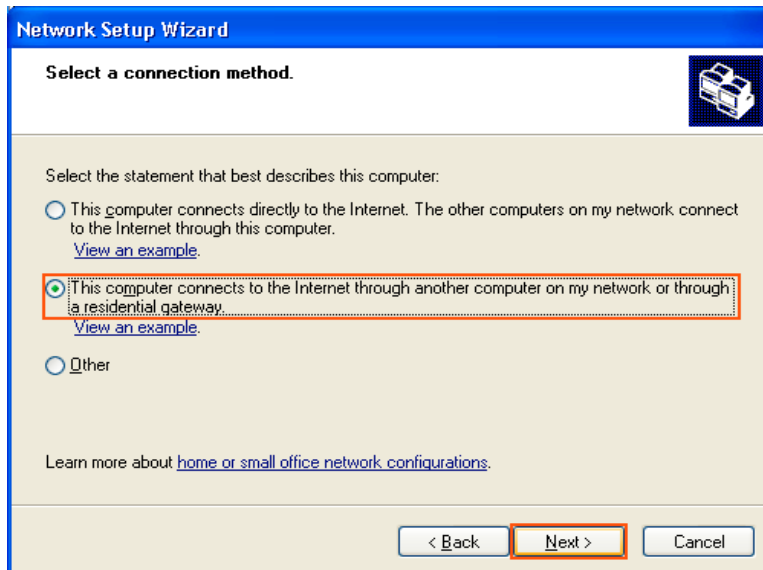
Step 7. After the computer restarts, the **Network Setup Wizard** appears. Click **Next**.



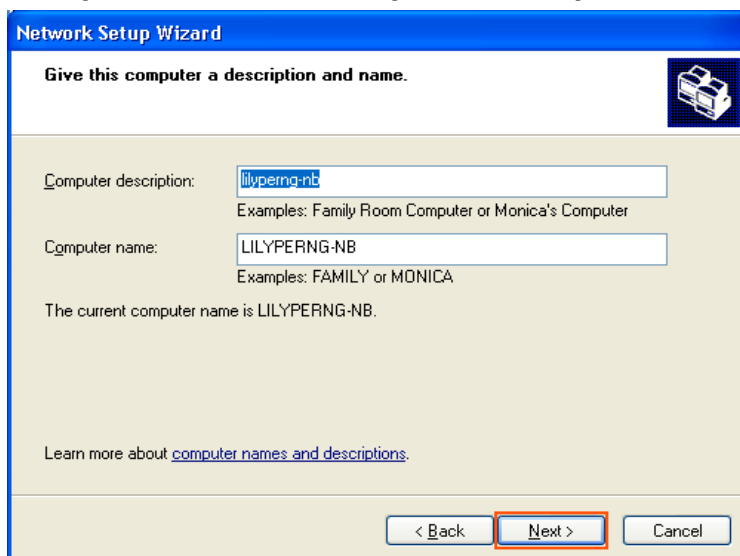
Step 8. Make sure that your computer connects to the internet, then click **Next**.



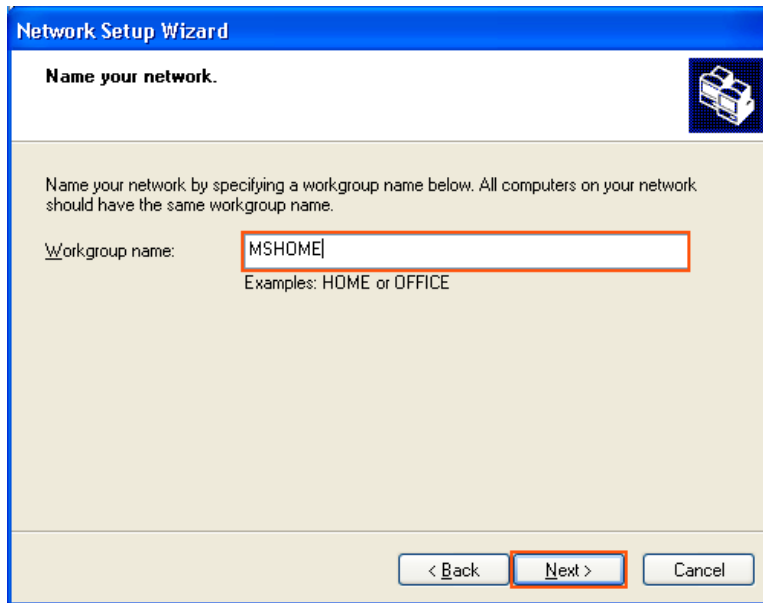
Step 9. If communication to and from the Internet to all the computers on your network is sent through this computer, you can choose **This computer connects directly to the Internet**. If this computer is part of a home or small office network that connects to the Internet through another computer on the network or using a residential gateway, you can choose **This computer connects to the Internet through another computer on my network or through a residential gateway** or other. In this case, choose **This computer connects to the Internet through another computer on my network or through a residential gateway**.



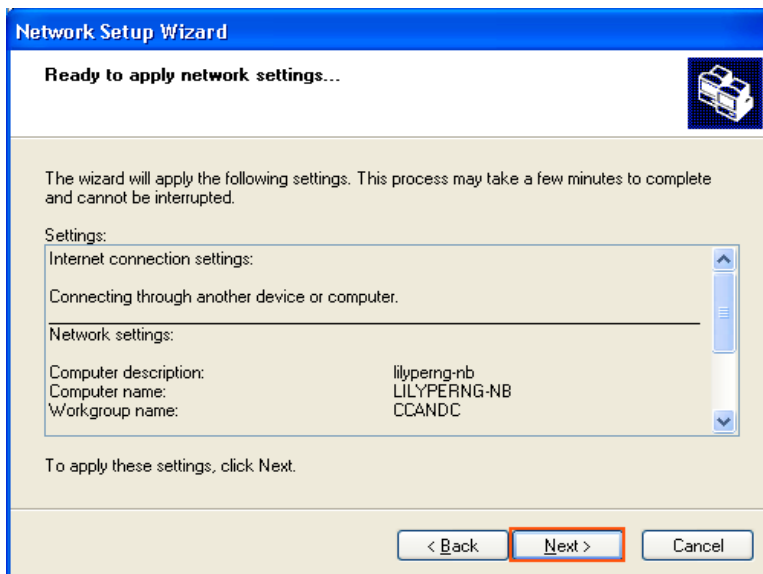
Step 10. A **computer name** identifies your computer on the network. Some Internet service providers(ISPs) require that you use a specific computer name. Check with your ISP to see if they require a specific computer name. The **computer description** is a short explanation of the computer. Type the **computer name** and **computer description** then click **Next**.



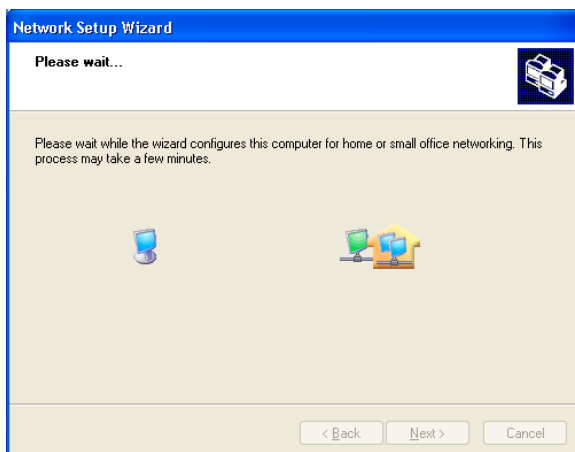
Step 11. Type the **Workgroup name** then click **Next**.



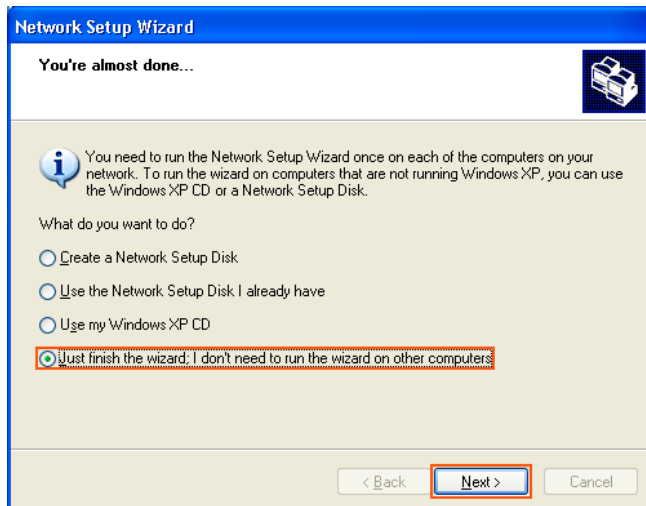
Step 12. Click **Next**.



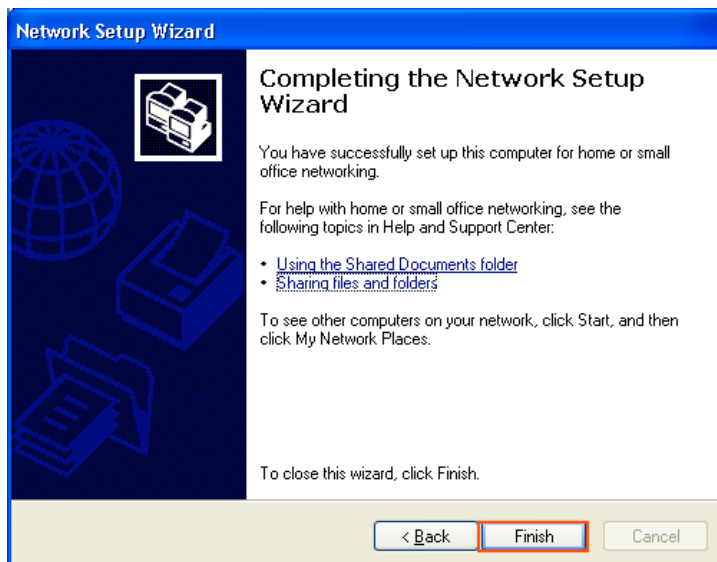
Then wait a few minutes.



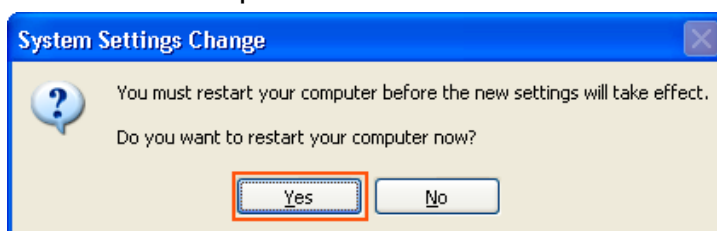
Step 13. Select the **Just finish the wizard** and click **Next**.



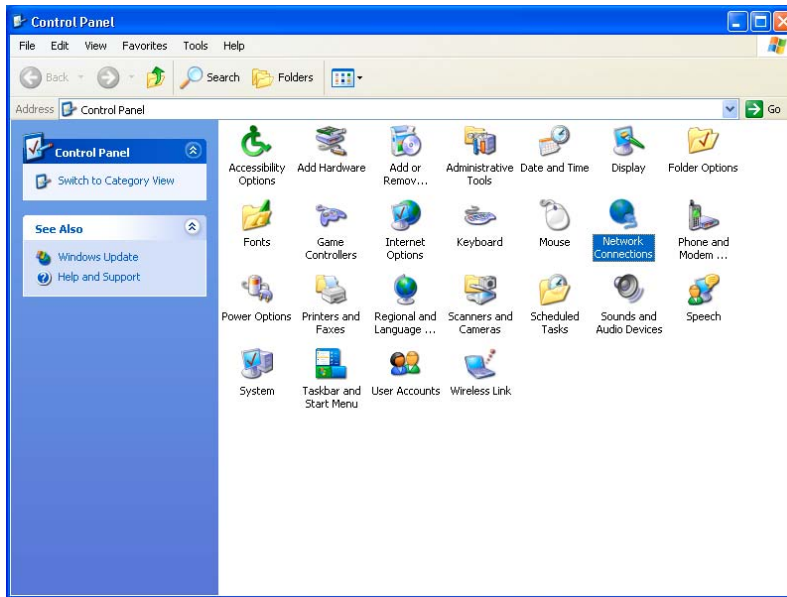
Step 14. Click **Finish**.



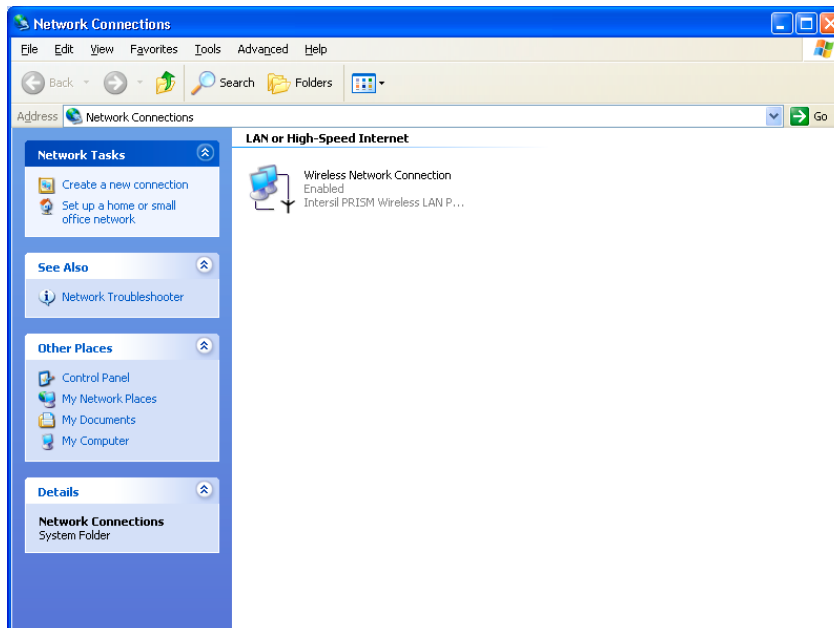
Step 15. Restart the computer.



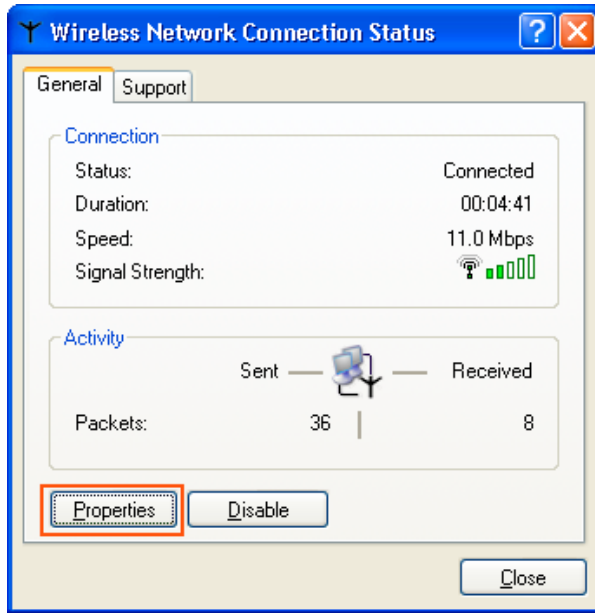
Step 16. After the computer restarts, click **Start** menu and select **Control Panel**. Double click the **Network Connections** icon in the **Control Panel**.



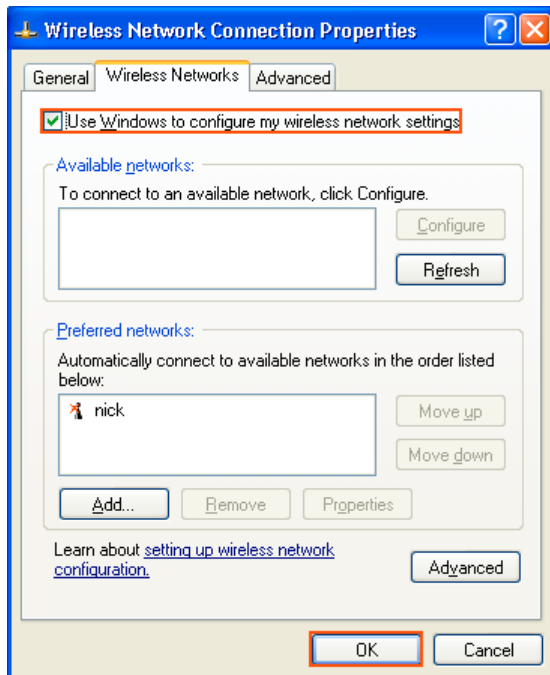
Step 17. Double click the **11Mbps Wireless LAN PC Card** local area connection icon.



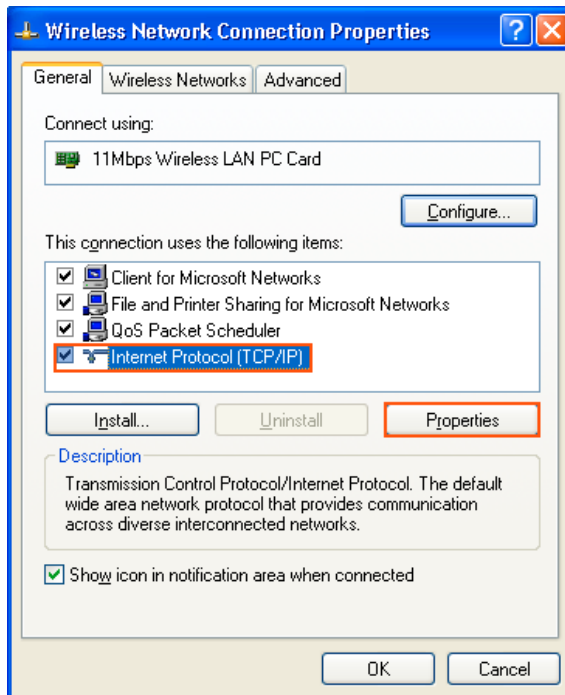
Step 18. Double click **Properties** to configuration network protocol.



Step 19. Select **Wireless Networks** and cancel **Use Windows to configure my Wireless network settings**. Then press the **OK** button. Otherwise, there will be only two function tabs (instead of four) in your utility.

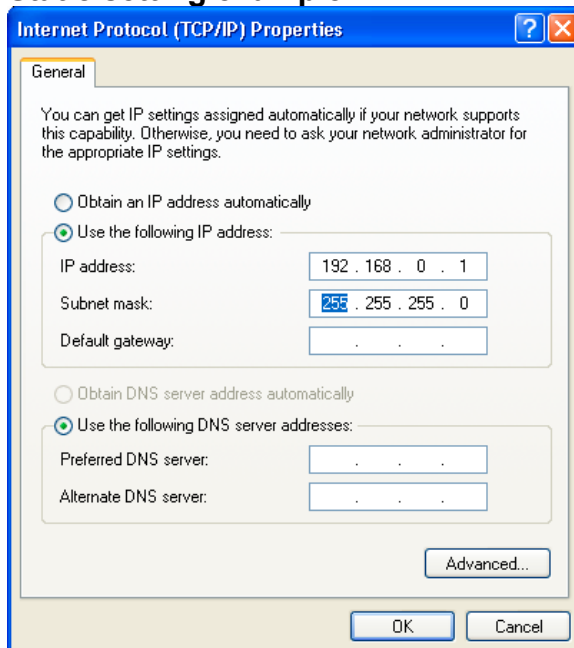


Step 20. Select **Internet Protocol (TCP/IP)** and click **Properties**.



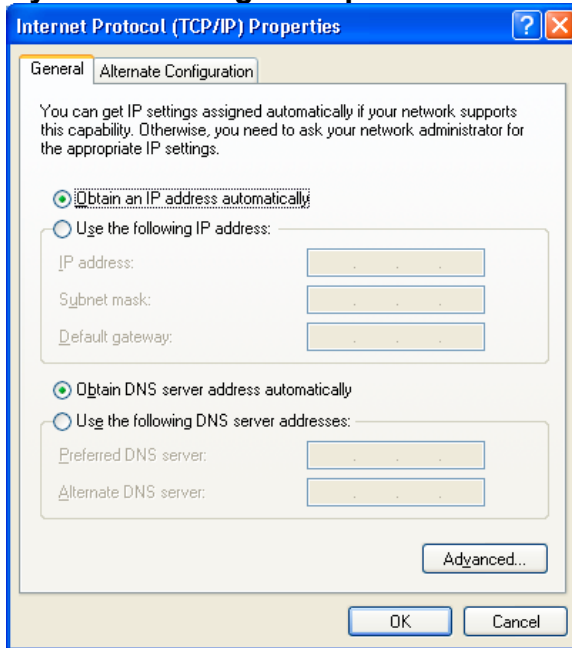
Step 21. Set **IP address** and **Subnet Mask**. You can select either **Static** or **DHCP** setting. If you use the static IP setup then please enter the IP address and Subnet masking. You should ask your network administrator for an address, and then type it into the blank boxes as below. Then click **OK** to return to Step 20.

### Static setting example





### Dynamic setting example

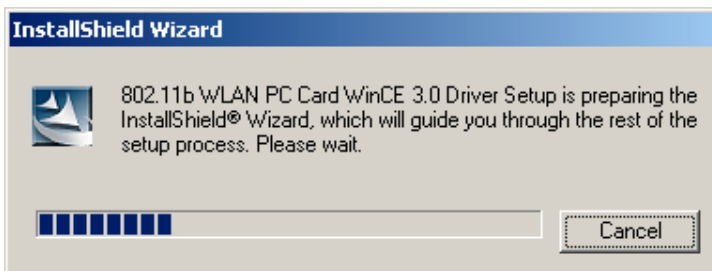


### 3.5 Install Wireless LAN PC Card under WinCE

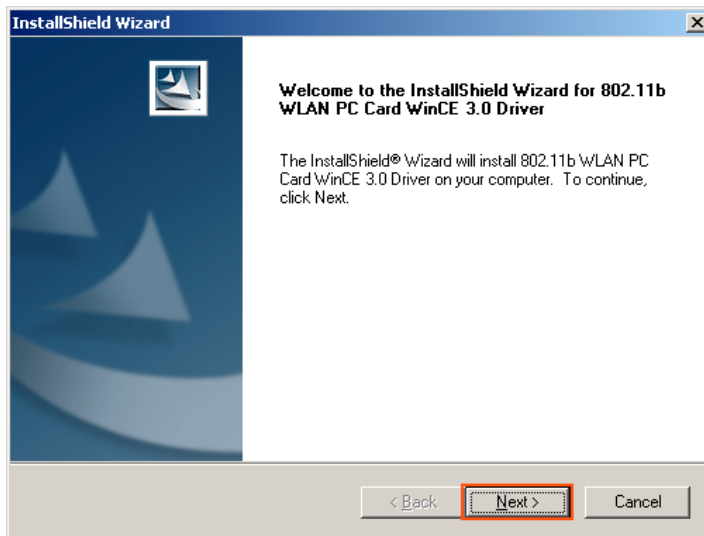
Step 1. Before you install the driver, please make sure that ActiveSync application has been installed in your computer and your PDA is connected to your computer. Insert the **Installation/Documentation CD**, and the installation menu will appear. If the auto-run installation menu window doesn't appear automatically, you can utilize the Windows Explorer to browse CD content and run **install.exe** manually.



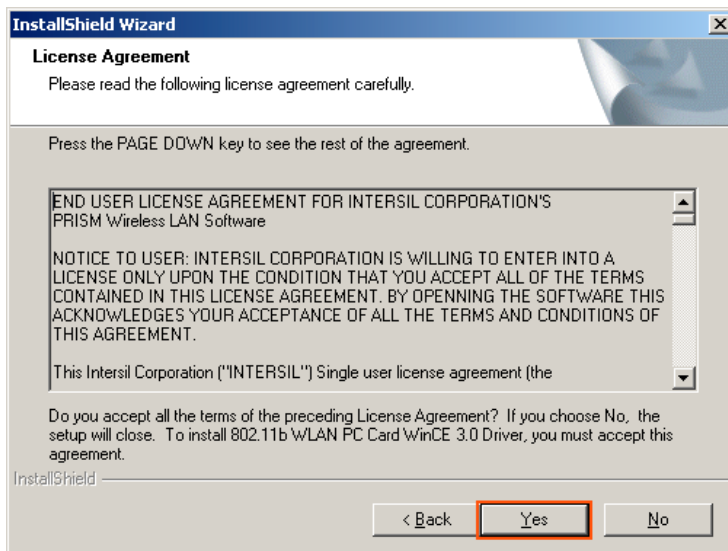
Choose **WinCE Driver** and it will open the **InstallShield Wizard** dialog box as shown below.



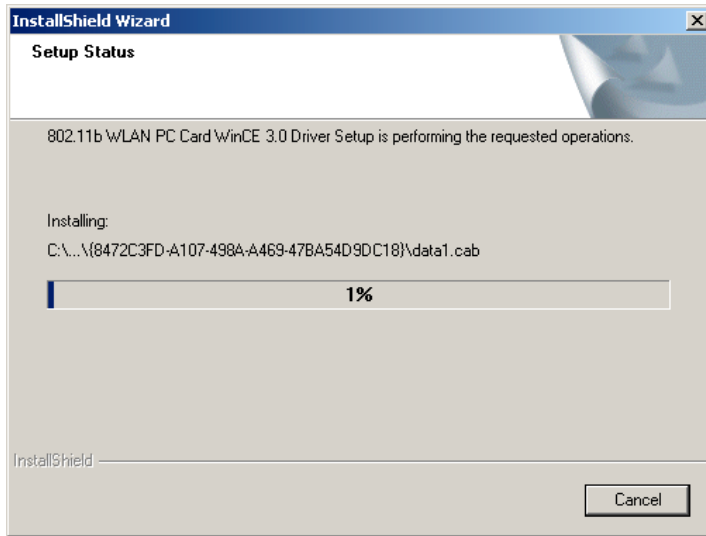
Then click **Next** to continue.



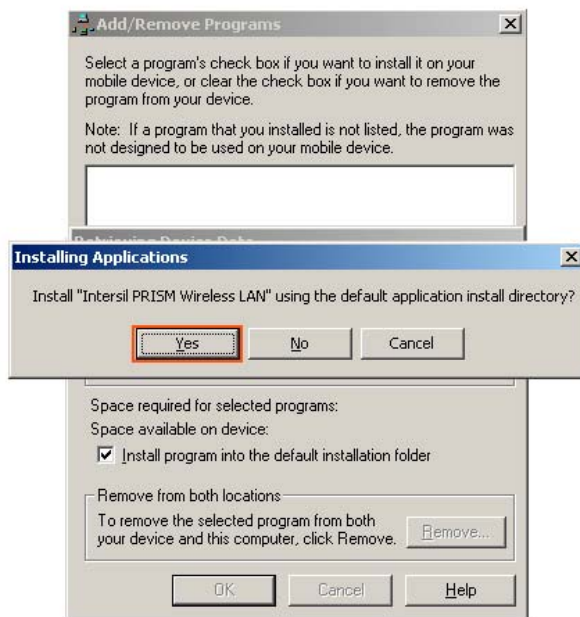
Step 2. Click **Yes** to accept the Software License Agreement.



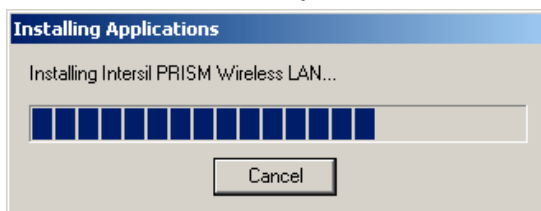
Setup is starting.



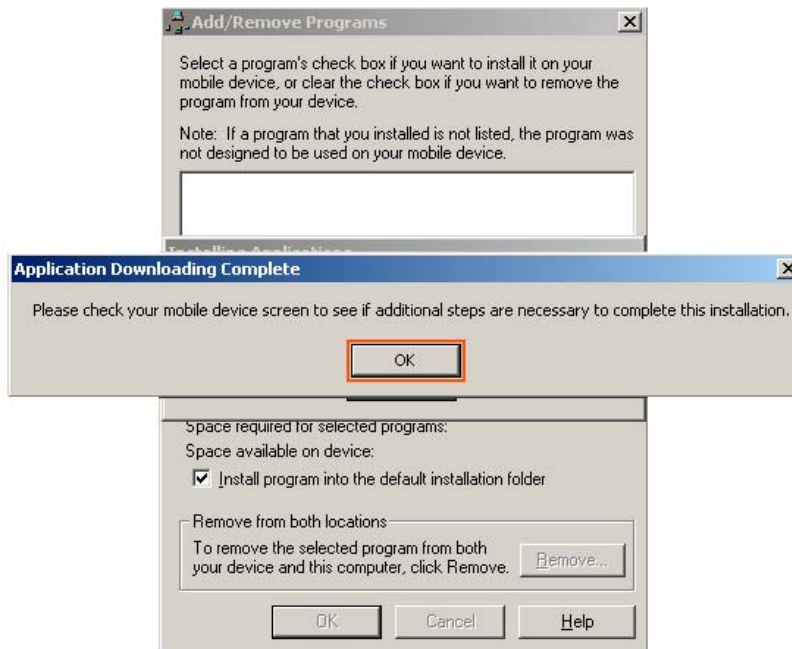
Step 3. The Application installation process will load the data to the default directory. Please click **OK** .



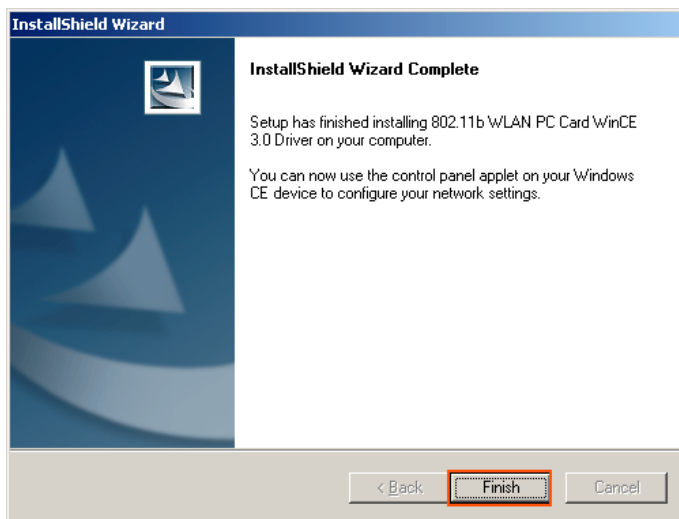
Please wait until the process is finished.



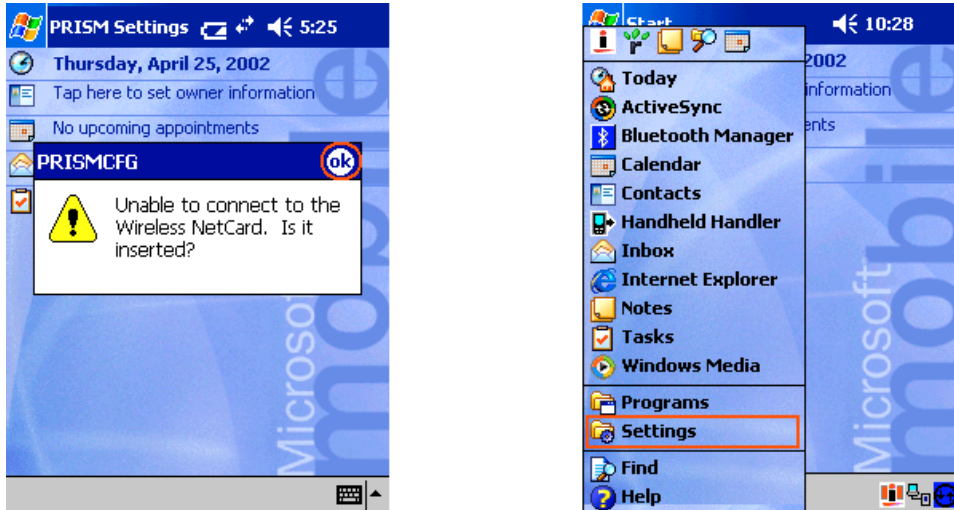
Step 4. Check your PDA and then click **OK**.



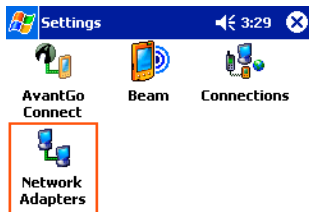
Step 5. Click **Finish** to complete Setup.



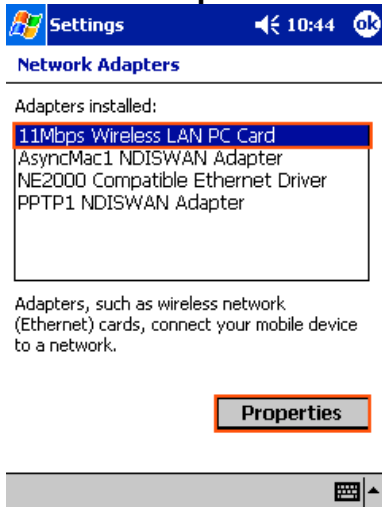
Step 6. Hold the PC card with the logo facing up, and insert the card into the slot. Apply just enough pressure to make sure it is fully seated. If the PDA shows the dialog message: "Unable to connect to the Wireless NetCard. Is it inserted?" then press the **OK** button and reset the PDA. After the PDA restarts, click the **Start** menu and select **Settings** on your PDA.



Step 7. Then choose **Connections** and double click the **Network Adapters**.

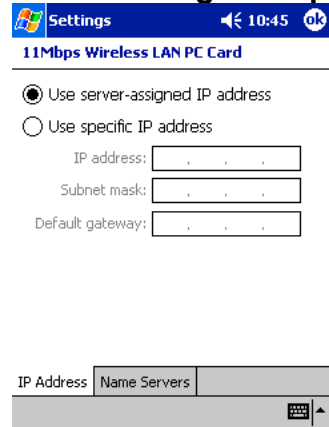


Step 8. Select **11Mbps Wireless LAN PC Card** and click **Properties**.



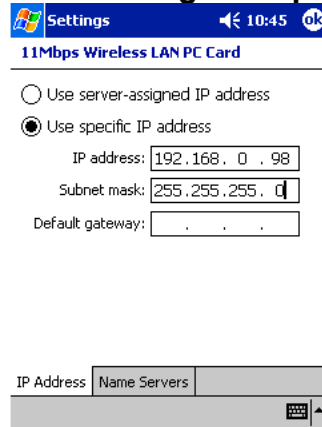
Step 9. Set **IP address** and **Subnet Mask**. You can select either **Static** or **DHCP** setting. If you choose to use DHCP, the DHCP server will assign an IP address to your PDA. If you use the static IP setup, please enter the IP address and subnet mask. You should ask your network administrator for an address, and then type it into the blank boxes as below. When this process is finished, click **OK**. Then the new settings will take effect immediately.

### DHCP Setting Example



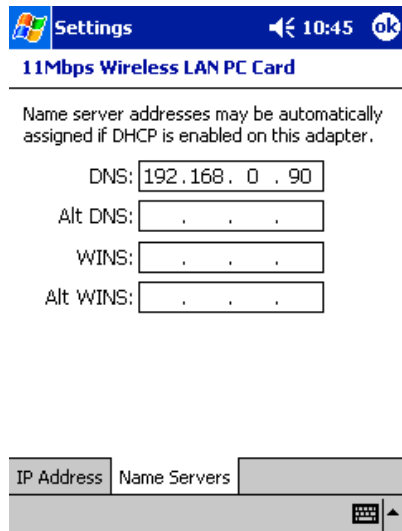
The screenshot shows the 'Settings' window for the '11Mbps Wireless LAN PC Card'. The 'Use server-assigned IP address' option is selected. Below it are three empty input fields for 'IP address', 'Subnet mask', and 'Default gateway'. At the bottom, there are tabs for 'IP Address' and 'Name Servers', with a keyboard icon and an arrow on the right.

### Static Setting Example



The screenshot shows the 'Settings' window for the '11Mbps Wireless LAN PC Card'. The 'Use specific IP address' option is selected. The 'IP address' field contains '192.168.0.98', the 'Subnet mask' field contains '255.255.255.0', and the 'Default gateway' field is empty. At the bottom, there are tabs for 'IP Address' and 'Name Servers', with a keyboard icon and an arrow on the right.

Step 10. If you have a specific server address, please type it into the **DNS** blank. And then click **OK**.



The screenshot shows the 'Settings' window for the '11Mbps Wireless LAN PC Card'. A message states: 'Name server addresses may be automatically assigned if DHCP is enabled on this adapter.' Below this are four input fields: 'DNS' (containing '192.168.0.90'), 'Alt DNS', 'WINS', and 'Alt WINS'. At the bottom, there are tabs for 'IP Address' and 'Name Servers', with a keyboard icon and an arrow on the right.

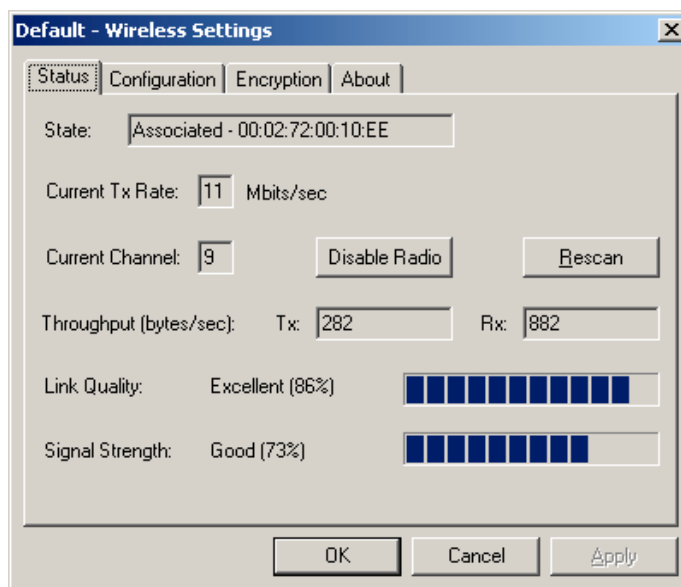
## 4 Configuration Utility

### 4.1 Configuration Utility under Windows 98SE / ME / 2000 / XP

WLAN PC Card uses its own management software. All functions controlled by users are provided by this application. When you insert the WLAN PC Card into the PC Card



slot, a new icon, , should appear in the Windows System Tray automatically. If the icon is in red, it means that WLAN PC Card configuration is invalid or incomplete. Double click that icon and the configuration window will pop up as shown below.



User can navigate through “tabs” by clicking or tapping them with a stylus.

#### Status Tab

##### **State**

The field shows the association state to available Access Point with BSSID--MAC address of the Access Point. When the state is “Associated”, it means normal operation in infrastructure mode and the PC Card is connected to the Access Point.

##### **Disable Radio**

The PC Card’s RF radio function can be disabled by clicking this Disable Radio button.



***Rescan***

When the Rescan button is clicked, the PC Card will restart the process of finding an Access point.

***Tx / Rx Rate Information***

This displays the instantaneous wireless Receive and Transmit throughput in bytes per second. These values are updated every two seconds.

***Link Quality / Signal Strength***

The Link Quality and Signal Strength bar graph is only active when the node is in Infrastructure Mode. The bar graph displays the quality and strength of the link between the node and its Access Point. A label summarizes the quality of the Link over the bar graph, which can take on one of the following values:

“Not Applicable”

“Poor”

“Fair”

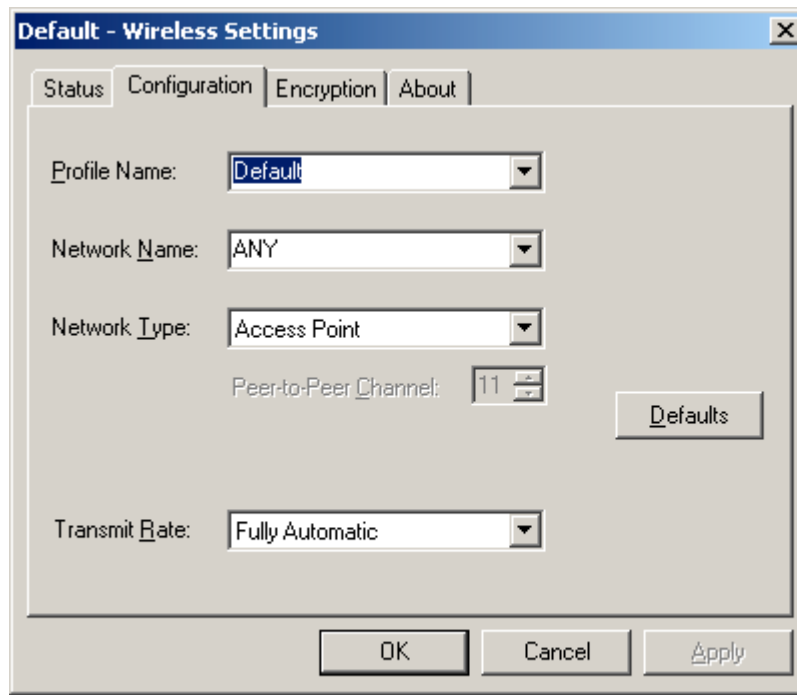
“Good”

“Excellent”

The driver will start looking for a better Access Point if the Link Quality becomes “Poor”. Link Quality is a measurement of receiving and transmitting errors over the radio.

## Configuration Tab

The Configuration Tab contains several fields where operating parameters of the driver can be viewed or changed. Changes to any of the parameters in this panel can be applied to the driver without a need to restart the computer.



### **Profile Name**

Each Profile represents specific settings of the PC Card. You can set the settings for each profile. Next time when you want to change the PC Card settings, you can just select the profile you want to use.

### **Network Name**

Network Name is the group name (or SSID) that will be shared by every member of your wireless network. You will only be able to connect with an WLAN device that has the same Network Name.

### **Network Type**

This field allows you to select from a list of supported Network Types. The types displayed have two values: "Access Point" and "Peer-to-Peer".

**Access Point** -The infrastructure mode of operation requires the presence of an 802.11b Access Point. All communication is done via the Access Point, which relays packets to other wireless clients in the BSS as well as to nodes on a wired network such as Ethernet.

Peer to Peer -This is the 802.11b Ad Hoc mode of operation. All communication is done from Client to Client without the use of an Access Point. 802.11 Ad Hoc network uses the same SSID for establishing the wireless connection. In this mode you have to set the Channel number you want to use.

***Peer-to-Peer Channel***

When you choose Peer-to-Peer as the Network Type, you have to set the channel number you want to use.

***Transmit Rate***

The transmission rate at which client of AP transmits the data packets. You can set this to Auto 1 or 2Mb, 5.5Mb, 11Mb or Fully Automatic.

***“OK”*** button

This button becomes active only when one of the fields has been modified. Pressing this button applies the changed values to the driver and saves them to the registry and is used the next time the computer boots up

## Encryption Tab

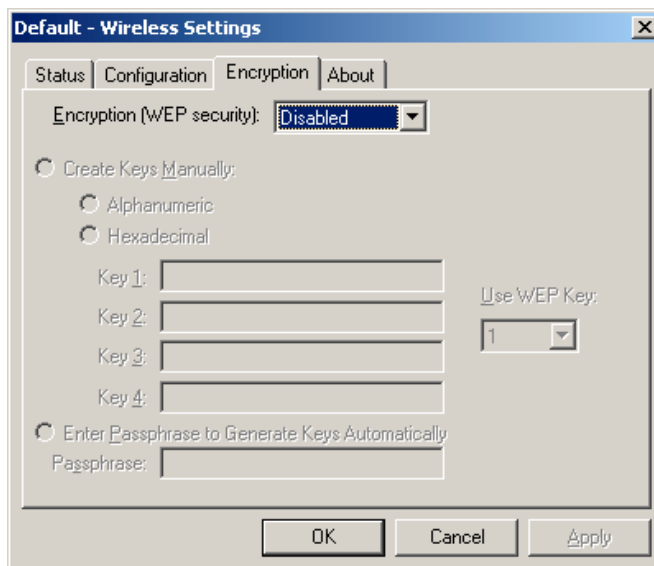
You may want an additional measure of security on your wireless network, which can be achieved by using WEP (Wired Equivalent Privacy) encryption. WEP encrypts each frame transmitted from the radio using one of the Keys entered in this panel.

When an encrypted frame is received it will only be accepted if it decrypts correctly. This will only happen if the receiver has the same WEP Key used by the transmitter.

To be written to the driver and registry, each key must consist of hex digits, which means that only digit 0-9 and letter A-F are valid entries.

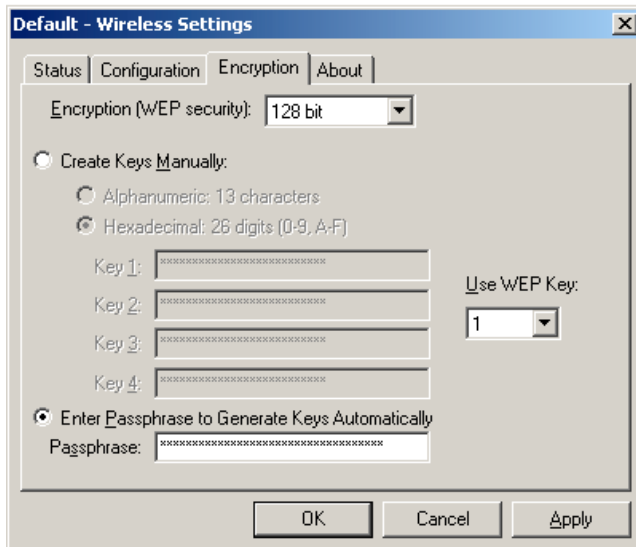
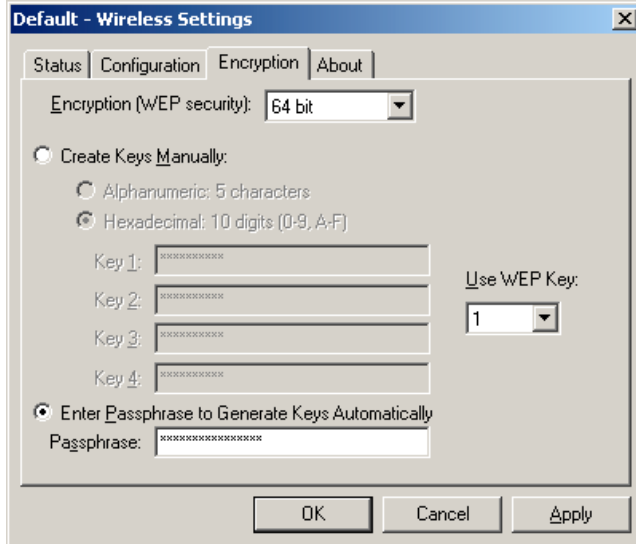
You can set this to disable, 64 bits or 128 bits.

### ***Encryption WEP - disable***



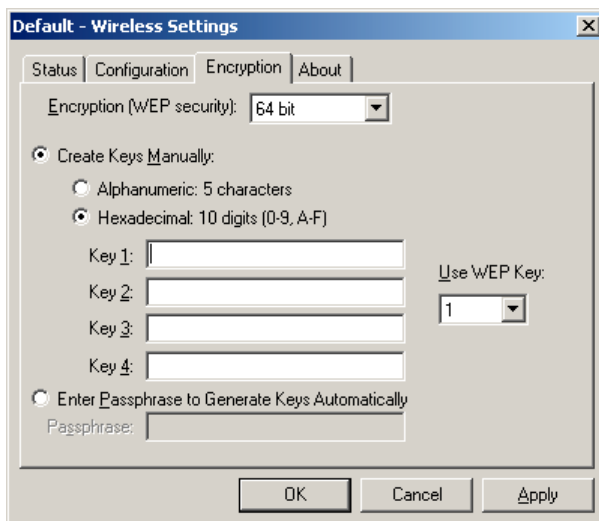
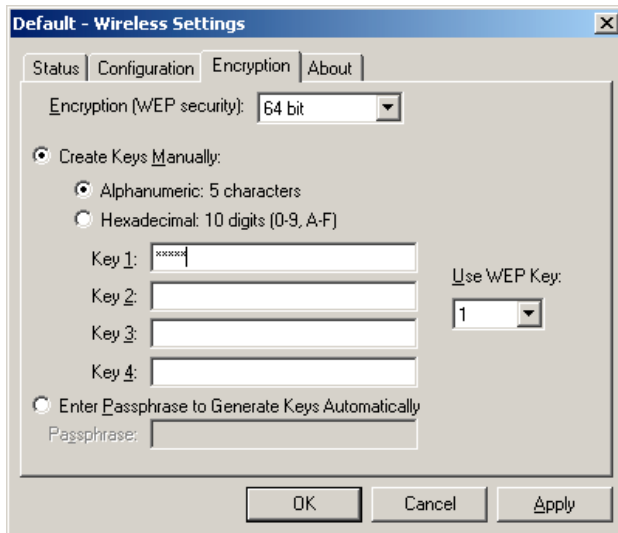
### ***Enter Passphrase to Generate Keys Automatically– 64 bit/128bit***

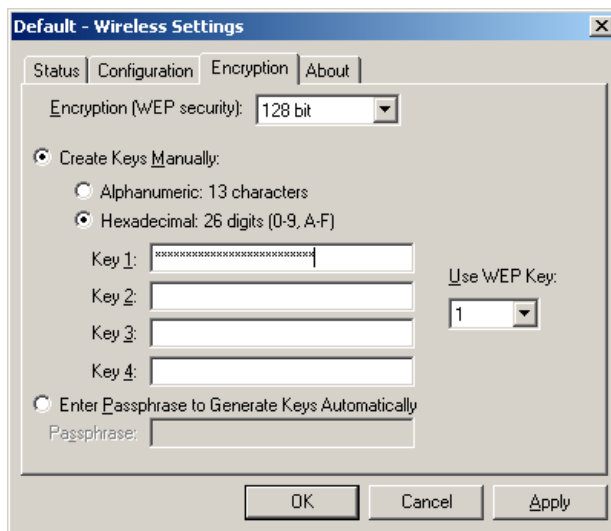
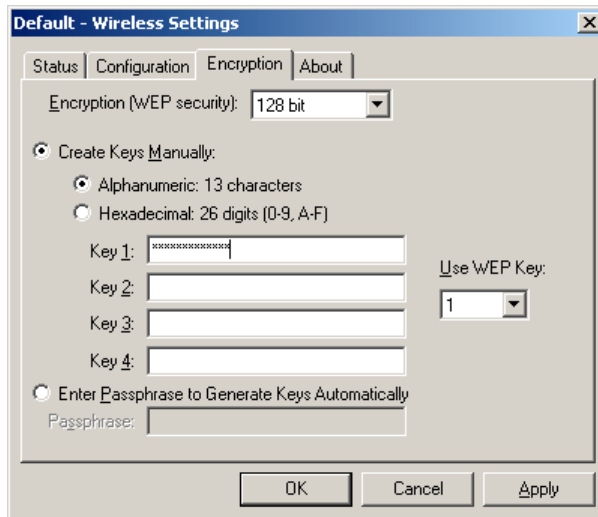
You can type a string that you can remember easily in the blank and the WEP Keys will be generated automatically. There are two options: 64 bit and 128 bit. You can choose any WEP Key from Key 1 to Key 4.



### **Create Keys Manually – 64bit / 128bit**

When you want to entering Keys Manually, there are four fields can be used and user can choose to use **Alphanumeric** or **Hexadecimal**. In Alphanumeric, you can type the keys between A-Z and numbers arbitrarily. But in the Hexadecimal, you must type the Hexadecimal symbols. In 64 bit, the Alphanumeric has 5 characters and the Hexadecimal has 10 digits. And in the 128 bit, the Alphanumeric has 13 characters and the Hexadecimal has 26 digits. You can choose any WEP Key from Key 1 to Key 4.



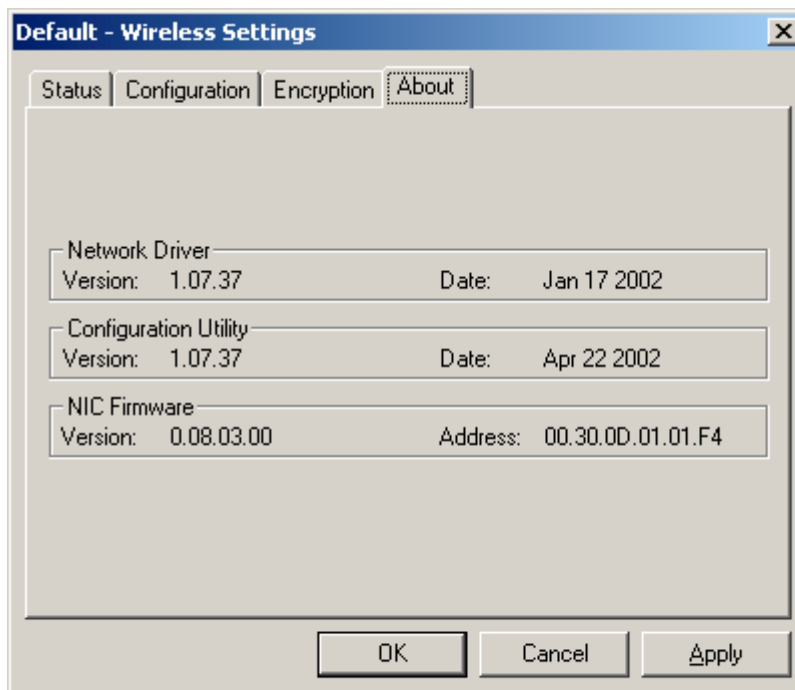


***Apply***

This button updates the driver with the four keys displayed in Key field. The keys are also written to the registry for permanent storage.

## About Tab

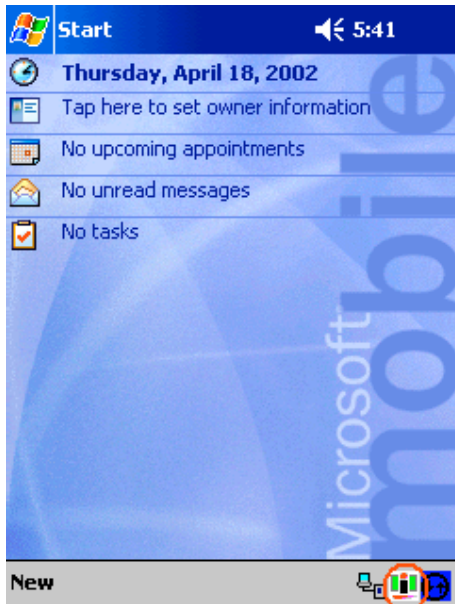
About Tab shows the product version including the detail of Driver, Configuration Utility, and NIC firmware version. Users must use this version number when reporting their problems for technical support.





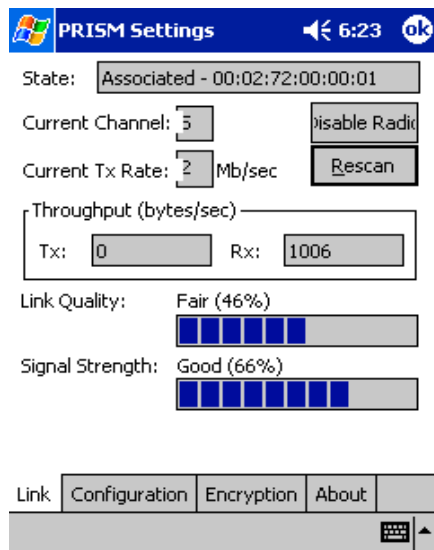
## 4.2 Configuration Utility under WinCE

WLAN PC Card uses its own management software. All functions controlled by user are provided by this application. Double click the icon in the System Tray as shown below, then the configuration window will appear. If the icon is in red, it means that WLAN PC Card configuration is invalid or incomplete.



User can navigate through “tabs” by clicking or tapping them with a stylus.

## Link Tab



### **State**

The field shows the association state to available Access Point with BSSID--MAC address of the Access Point. When the state is “Associated” , it means normal operation in infrastructure mode and the PC Card is connected to the Access Point.

### **Disable Radio**

The PC Card’s RF radio function can be disabled by clicking this Disable Radio button.

### **Rescan**

When the Rescan button is clicked, the PC Card will restart the process of finding an Access point.

### **Tx / Rx Rate Information**

This displays the instantaneous wireless Receive and Transmit throughput in bytes per second. These values are updated every two seconds.

### **Link Quality / Signal Strength**

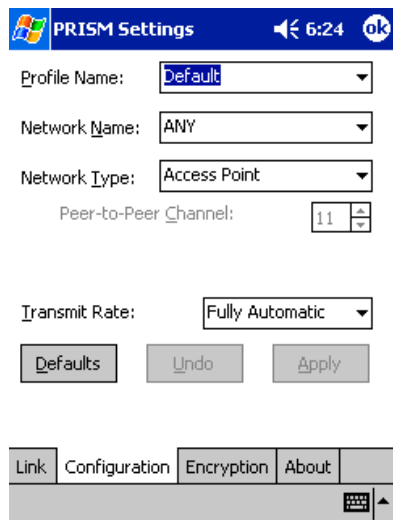
The Link Quality and Signal Strength bar graph is only active when the node is in Infrastructure Mode. The bar graph displays the quality and strength of the link between the node and its Access Point. A label summarizes the quality of the Link over the bar graph, which can take on one of the following values:

- “Not Applicable”
- “Poor”
- “Fair”
- “Good”
- “Excellent”

The driver will start looking for a better Access Point if the Link Quality becomes "Poor". Link Quality is a measurement of receiving and transmitting errors over the radio.

## Configuration Tab

The Configuration Tab contains several fields where operating parameters of the driver can be viewed or changed. Changes to any of the parameters in this panel can be applied to the driver without a need to restart the PDA.



### **Profile Name**

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***Peer-to-Peer Channel***

When you choose Peer-to-Peer as the Network Type, you have to set the channel number you want to use.

***Transmit Rate***

The transmission rate at which client of AP transmits the data packets. You can set this to Auto 1 or 2Mb, 5.5Mb, 11Mb or Fully Automatic.

## Encryption Tab

You may want an additional measure of security on your wireless network, which can be achieved by using WEP (Wired Equivalent Privacy) encryption. WEP encrypts each frame transmitted from the radio using one of the Keys entered in this panel.

When an encrypted frame is received it will only be accepted if it decrypts correctly. This will only happen if the receiver has the same WEP Key used by the transmitter.

To be written to the driver and registry, each key must consist of hex digits, which means that only digit 0-9 and letter A-F are valid entries.

You can set this to disable, 64 bits or 128 bits.

### ***Encryption WEP - disable***

The screenshot shows the 'PRISM Settings' window with the 'Encryption (WEP)' dropdown menu set to 'Disabled'. Below this, there are two radio button options: 'Enter Passphrase to Generate Keys Automatic' and 'Create Keys Manually'. Under 'Create Keys Manually', there are two sub-options: 'Alphanumeric' and 'Hexadecimal'. There are four text input fields labeled 'Key 1', 'Key 2', 'Key 3', and 'Key 4'. At the bottom, there is a 'Use WEP Key:' dropdown menu set to '1' and an 'Apply' button. The window has a standard Windows XP-style title bar with a volume icon and a clock showing 6:24. At the bottom of the window, there are tabs for 'Link', 'Configuration', 'Encryption', and 'About', with 'Encryption' currently selected. A keyboard icon is visible in the bottom right corner of the window.

### ***Enter Passphrase to Generate Keys Automatically– 64 bit/128bit***

You can type a string that you can remember easily in the blank and the WEP Keys will be generated automatically. There are two options: 64 bit and 128 bit. You can choose any WEP Key from Key 1 to Key 4.

The screenshot shows the PRISM Settings window for 64-bit WEP encryption. The title bar includes the Windows logo, 'PRISM Settings', a volume icon, '4:17', and an 'ok' button. The 'Encryption (WEP):' dropdown is set to '64 bit'. The 'Enter Passphrase to Generate Keys Automatic' radio button is selected, with a 'Passphrase:' field containing '12345'. The 'Create Keys Manually:' radio button is unselected. Under 'Create Keys Manually:', the 'Alphanumeric: 5 characters' radio button is selected, and the 'Hexadecimal: 10 digits (0-9, A-F)' radio button is unselected. Four 'Key' fields are visible: Key 1: E235485511, Key 2: 292BB51BCC, Key 3: 3DCD220BC8, and Key 4: 97C74DA650. An 'Apply' button is at the bottom right. At the bottom, a navigation bar contains 'Link', 'Configuration', 'Encryption', and 'About' tabs, with 'Encryption' selected. A keyboard icon and an upward arrow are on the far right.

The screenshot shows the PRISM Settings window for 128-bit WEP encryption. The title bar includes the Windows logo, 'PRISM Settings', a volume icon, '4:18', and an 'ok' button. The 'Encryption (WEP):' dropdown is set to '128 bit'. The 'Enter Passphrase to Generate Keys Automatic' radio button is selected, with a 'Passphrase:' field containing '1234567'. The 'Create Keys Manually:' radio button is unselected. Under 'Create Keys Manually:', the 'Alphanumeric: 13 characters' radio button is unselected, and the 'Hexadecimal: 26 digits (0-9, A-F)' radio button is selected. Four 'Key' fields are visible, all containing the same hexadecimal string: BA3A402CC4DCC7A2CE4059C3A. An 'Apply' button is at the bottom right. At the bottom, a navigation bar contains 'Link', 'Configuration', 'Encryption', and 'About' tabs, with 'Encryption' selected. A keyboard icon and an upward arrow are on the far right.

### Create Keys Manually–64bit/128bit

When you want to entering Keys Manually, there are four fields can be used and user can choose to use **Alphanumeric** or **Hexadecimal**. In Alphanumeric, you can type the keys between A-Z and numbers arbitrarily. But in the Hexadecimal, you must type the Hexadecimal symbols. In 64 bit, the Alphanumeric has 5 characters and the Hexadecimal has 10 digits. And in the 128 bit, the Alphanumeric has 13 characters and the Hexadecimal has 26 digits. You can choose any WEP Key from Key 1 to Key 4.

PRISM Settings 4:19 ok

Encryption (WEP): 64 bit

Enter Passphrase to Generate Keys Automatic  
Passphrase: \_\_\_\_\_

Create Keys Manually:

- Alphanumeric: 5 characters
- Hexadecimal: 10 digits (0-9, A-F)

Key 1: 12345

Key 2: \_\_\_\_\_

Key 3: \_\_\_\_\_

Key 4: \_\_\_\_\_

Use WEP Key: 1 Apply

Link Configuration Encryption About

PRISM Settings 4:19 ok

Encryption (WEP): 64 bit

Enter Passphrase to Generate Keys Automatic  
Passphrase: \_\_\_\_\_

Create Keys Manually:

- Alphanumeric: 5 characters
- Hexadecimal: 10 digits (0-9, A-F)

Key 1: 1234567890

Key 2: \_\_\_\_\_

Key 3: \_\_\_\_\_

Key 4: \_\_\_\_\_

Use WEP Key: 1 Apply

Link Configuration Encryption About

PRISM Settings 4:20 ok

Encryption (WEP): 128 bit

Enter Passphrase to Generate Keys Automatic  
Passphrase: \_\_\_\_\_

Create Keys Manually:

- Alphanumeric: 13 characters
- Hexadecimal: 26 digits (0-9, A-F)

Key 1: 1234567890123

Key 2: \_\_\_\_\_

Key 3: \_\_\_\_\_

Key 4: \_\_\_\_\_

Use WEP Key: 1 Apply

Link Configuration Encryption About

PRISM Settings 4:21 ok

Encryption (WEP): 128 bit

Enter Passphrase to Generate Keys Automatic  
Passphrase: \_\_\_\_\_

Create Keys Manually:

- Alphanumeric: 13 characters
- Hexadecimal: 26 digits (0-9, A-F)

Key 1: 1234567890eadc34567899123

Key 2: \_\_\_\_\_

Key 3: \_\_\_\_\_

Key 4: \_\_\_\_\_

Use WEP Key: 1 Apply

Link Configuration Encryption About

## About Tab

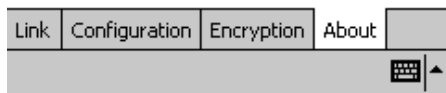
About Tab shows the product version including the detail of Driver, Configuration Utility, and NIC firmware version. Users must use this version number when reporting their problems for technical support.



Network Driver
Version: 1.07.18
Date: Sep 29 2001

Configuration Utility
Version: 1.07.29
Date: Oct 20 2001

NIC Firmware
Version: 1.03.06.1 00.09.40.39.48.09





## 5 Technical Specifications of WLAN PC Card

Product Name	WLAN PC Card
Standard	IEEE802.11b
Frequency Band	2.400GHz ~ 2.4835GHz unlicensed ISM band
Spread Spectrum	DSSS (Direct Sequence Spread Spectrum)
Modulation method	DQPSK/DBPSK/CCK
Data Rate	1Mbps, 2Mbps, 5.5Mbps, 11Mbps
Operation mode	Ad hoc Infrastructure (need Access Points)
RF Output Power	14 to 16 dBm
Receive Sensitivity	Operating at 11Mbps: Better than $10^{-5}$ BER @ -80dBm
Operating Range	Up to 300 m, depending on surrounding environment
Antenna	Two integrated antennas (printed type)
Security	64-bit or 128-bit WEP (Wired Equivalent Privacy)
Operating system supported	Windows 98SE, Windows ME, Windows 2000, Windows XP, Linux
Management	Windows-based utility for configuration and status monitoring
Regulation	FCC CE
I/O Interface	PC Card, type II
LED	ACTIVE
Dimension	119(L) x 54(W) x 5(H) mm
Weight	43 g (approximate)
Input Power	3.3 or 5V DC
Operating Temperature	0 ~ 50°C (operation)
Storage Temperature	-20 ~ 70°C
Humidity	5 ~ 90% (non-condensing)

## 6 Troubleshooting

**Symptom:**

The LED is off.

**Possible Remedy:**

Make sure the PC Card is inserted properly. Otherwise contact your vendor.

**Symptom:**

The LED is always on not blinking.

**Possible Remedy:**

Make sure that you have installed the driver from attached CD. Otherwise contact your vendor.

**Symptom:**

The LED is blinking but the PC Card icon does not appear in your icon tray.

**Possible Remedy:**

Make sure that you have installed the Utility from attached CD.

**Symptom:**

The PC Card icon is red.

**Possible Remedy:**

It means there is no wireless link.

1. Make sure there is any 802.11b device in the servicing area.
2. Double click the icon to pop up the configuration window
  - a. Make sure they are sharing the same SSID and channel. If the SSID is same, you could press the **Status** tab → **Re-Scan** to scan the channel to link.
  - b. Make sure they are operating under same authentication type. WEP function has to be enabled, if Shared Key Authentication is the selection, and the secret Keys have to be same in the communicating group.
3. Make sure there is no metal objects, electron devices or cordless phone in the vicinity.

**Symptom:**

The PC Card icon is green, but can't access wired-LAN

**Possible Remedy:**

1. Make sure there is any 802.11b AP in your LAN.
2. Make sure the PC Card is configured as infrastructure mode.
3. Make sure the Network setting is proper. You could check and modify through **My Computer → Control Panel → Network → TCP/IP / NetBEUI → PRISM2 IEEE 802.11 PC Card Adaptor → Content.**

**Symptom:**

The PC Card icon is green, but can't share files with others.

**Possible Remedy:**

Make sure the **file and printer sharing** function is enabled. You could enable the function by checking the icon of **My Computer → Control Panel → Network → file and printer sharing → I want to be able to give others to access to my files.**

**Symptom:**

Slow or erratic performance

**Possible Remedy:**

Try change the channel of the communicating group or move your device closer to the communicating device.

## 7 Glossary

### **IEEE 802.11 Standard**

The IEEE 802.11 Wireless LAN standards subcommittee, which is formulating a standard for the industry.

### **Access Point**

An internetworking device that seamlessly connects wired and wireless networks together.

### **Ad Hoc**

An Ad Hoc wireless LAN is a group of computers, each with a WLAN adapter, connected as an independent wireless LAN. Ad Hoc wireless LAN is applicable at a departmental scale for a branch or SOHO operation.

### **BSSID**

A specific Ad Hoc LAN is called a Basic Service Set (BSS). Computers in a BSS must be configured with the same BSSID.

### **DHCP**

Dynamic Host Configuration Protocol - a method in which IP addresses are assigned by server dynamically to clients on the network. DHCP is used for Dynamic IP Addressing and requires a dedicated DHCP server on the network.

### **Direct Sequence Spread Spectrum**

This is the method the wireless cards use to transmit data over the frequency spectrum. The other method is frequency hopping. Direct sequence spreads the data over one frequency range (channel) while frequency hopping jumps from one narrow frequency band to another many times per second.

### **ESSID**

An Infrastructure configuration could also support roaming capability for mobile workers. More than one BSS can be configured as an Extended Service Set (ESS). Users within an ESS could roam freely between BSSs while served as a continuous connection to the network wireless stations and Access Points within an ESS must be configured with the same ESSID and the same radio channel.

### **Ethernet**

Ethernet is a 10/100Mbps network that runs over dedicated home/office wiring. Users must be wired to the network at all times to gain access.

### **Gateway**

A gateway is a hardware and software device that connects two dissimilar systems, such as a LAN and a mainframe. In Internet terminology, a gateway is another name for a router. Generally a gateway is used as a funnel for all traffic to the Internet.

## **IEEE**

Institute of Electrical and Electronics Engineers

## **Infrastructure**

An integrated wireless and wired LAN is called an Infrastructure configuration. Infrastructure is applicable to enterprise scale for wireless access to central database, or wireless application for mobile workers.

## **ISM Band**

The FCC and their counterparts outside of the U.S. have set aside bandwidth for unlicensed use in the so-called ISM (Industrial, Scientific and Medical) band. Spectrum in the vicinity of 2.4 GHz, in particular, is being made available worldwide. This presents a truly revolutionary opportunity to place convenient high-speed wireless capabilities in the hands of users around the globe.

## **Local Area Network (LAN)**

A LAN is a group of computers, each equipped with the appropriate network adapter card connected by cable/air, that share applications, data, and peripherals. All connections are made via cable or wireless media, but a LAN does not use telephone services. It typically spans a single building or campus.

## **Network**

A network is a system of computers that is connected. Data, files, and messages can be transmitted over this network. Networks may be local or wide area networks.

## **PCMCIA**

Personal Computer Memory Card International Association. Also a PCMCIA card is also referred to PC Card.

## **Protocol**

A protocol is a standardized set of rules that specify how a conversation is to take place, including the format, timing, sequencing and/ or error checking.

## **Roaming**

In an infrastructure network, this is when a wireless PC moves out of range of the previously connected access point and connects to a newly connected access point. Throughout the network environment where access point are deployed, PCs can always be connected regardless of where they are located or roam.

## **SSID**

A Network ID unique to a network. Only clients and Access Points that share the same SSID are able to communicate with each other. This string is case-sensitive.

### **Simple Network Management Protocol (SNMP)**

Simple Network Management Protocol is the network management protocol of TCP/IP. In SNMP, agents-which can be hardware as well as software-monitor the activity in the various devices on the network and report to the network console workstation. Control information about each device is maintained in a structure known as a management information block.

### **Static IP Addressing**

A method of assigning IP addresses to clients on the network. In networks with Static IP address, the network administrator manually assigns an IP address to each computer. Once a Static IP address is assigned, a computer uses the same IP address every time it reboots and logs on to the network, unless it is manually changed.

### **Transmission Control Protocol / Internet Protocol (TCP/IP)**

TCP/IP is the protocol suite developed by the Advanced Research Projects Agency (ARPA). It is widely used in corporate Internet works, because of its superior design for WANs. TCP governs how packet is sequenced for transmission the network. The term "TCP/IP" is often used generically to refer to the entire suite of related protocols.

### **Transmit / Receive**

The wireless throughput in Bytes per second averaged over two seconds.

### **Wide Area Network (WAN)**

A WAN consists of multiple LANs that are tied together via telephone services and / or fiber optic cabling. WANs may span a city, a state, a country, or even the world.

### **Wireless LAN (WLAN)**

A wireless LAN does not use cable to transmit signals, but rather uses radio or infrared to transmit packets through the air. Radio Frequency (RF) and infrared are the commonly used types of wireless transmission. Most wireless LANs use spread spectrum technology. It offers limited bandwidth, usually under 11Mbps, and users share the bandwidth with other devices in the spectrum; however, users can operate a spread spectrum device without licensing from the Federal Communications Commission (FCC)