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## Kit Contents

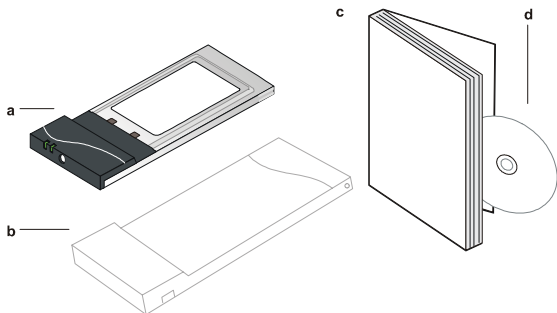
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The PC Card kit includes the items as pictured in Figure 1-1:

- a. One PC Card.
- b. A transparent protective casing for storing your PC Card while not in use.
- c. The Avaya Wireless PC Card Getting Started Guide
- d. One Avaya Wireless LAN CD-ROM.

The Getting Started Guide is an abstract from the electronic User's Guide that is included on the CD-ROM.

**Figure 1-1 Kit Contents**



**NOTE:**

In order to extend the life of the PC Card hardware it is advised to store the card in the protective casing whenever carrying the computer on travel without operating the device.

## Network Options

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The PC Card Kit enables you to:

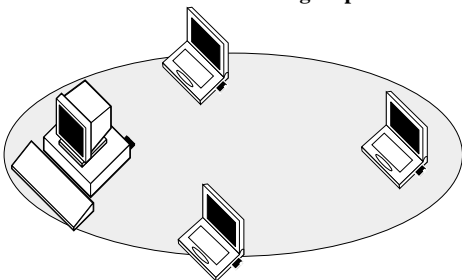
- Connect your computer to a Peer-to-Peer workgroup of wireless computing devices (see Figure 1-2 on page 1-4).
- Connect your computer to a Small Office/Home Office (SOHO) network that includes a Residential Gateway-I (see Figure 1-3 on page 1-5).
- Connect your computer to a Local Area Network (LAN) Infrastructure that includes Avaya access points (see Figure 1-4 on page 1-6 and Figure 1-5 on page 1-7).
- Expand the capabilities of your access points, to support wireless devices that have been equipped with Avaya wireless LAN adapters.

## Peer-to-Peer Workgroup

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The Peer-to-Peer workgroup configuration enables you to quickly set up a small wireless workgroup, where the workgroup participants can exchange files using features like “File and Printer Sharing” as supported by Microsoft Networking.

**Figure 1-2 Peer-to-Peer Wireless Workgroup**



You can use this option to setup a temporary or ad-hoc network in environments where no access points are available (for example in Small Office/Home Office (SOHO) environments).

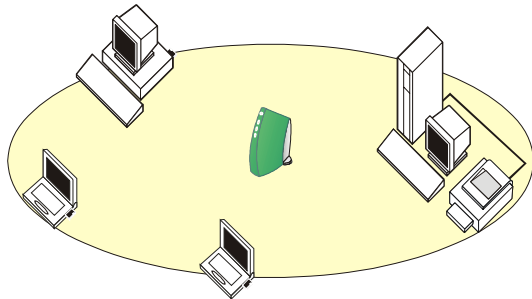
As long as the stations are within range of one another, this is the easiest and least expensive way to set up a wireless network.

## Home Office Networking

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With the Avaya Residential Gateway-I, wireless access to the Internet or other computers is at your fingertips.



**Figure 1-3 Connect to a Residential Gateway (RG)**

All you need to do is connect the wireless computers to the Residential Gateway-I, and you are ready to:

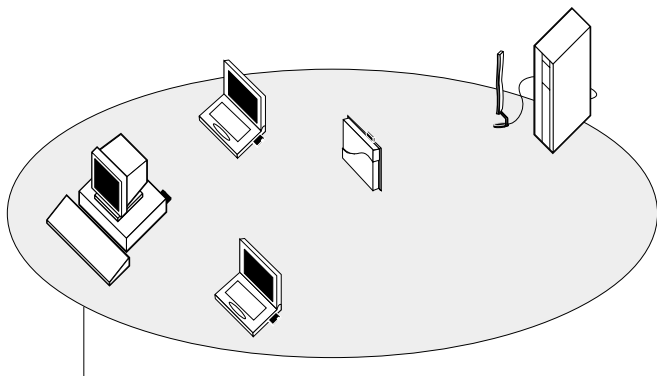
- Share files and printers, and
- Access the Internet via the built-in modem of the Residential Gateway-I.

Optionally the Residential Gateway-I allows you to connect your wireless stations to previously installed wired computers and/or an external cable, an xDSL or a ISDN modem.

## Enterprise Networking

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**Figure 1-4 Stand Alone Wireless LAN**

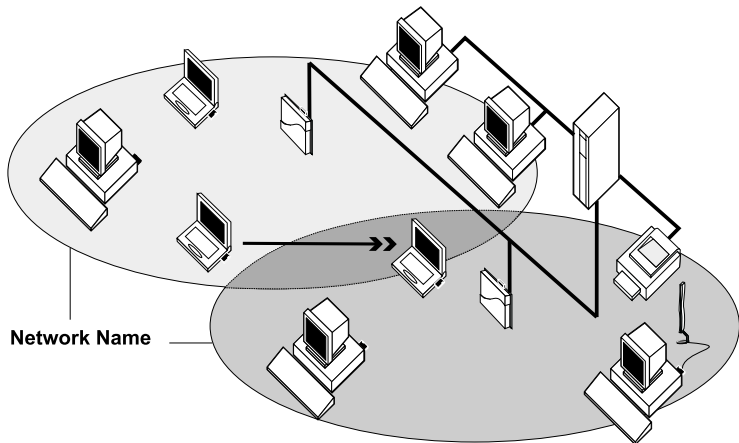


### **Network Name**

With the Access Point-I and/or Access Point-II you can connect to a corporate Local Area Network (LAN) infrastructure to have wireless access to all network facilities.

LAN Infrastructures may either be:

- Stand-alone wireless LANs as pictured in Figure 1-4.
- Wireless network infrastructures connected to an existing Ethernet network as pictured in Figure 1-5 on page 1-7.

**Figure 1-5 LAN Infrastructure**

## It's Easy

The PC Card functions like any standard wired Ethernet card, but Wireless LAN does not need any wires!

Where an Ethernet card requires a cable connection to a hub and/or patch panel, the cable physically ties you down to the location of the wired connection.

Avaya Wireless LAN allows you to connect your computer to a Local Area Network (LAN) system from anywhere within the wireless coverage area. Expanding or re-designing your network is easy: Add or relocate access points, power-up your (new) wireless computers, and you're done!

Unlike Ethernet, wireless connectivity will enable you to roam throughout the network while remaining connected to the LAN.



### **NOTE:**

All Avaya Wireless LAN products, are radio products. Refer to the flyer "Information to the User" for regulatory information that may apply in your country.

## PC Card Features

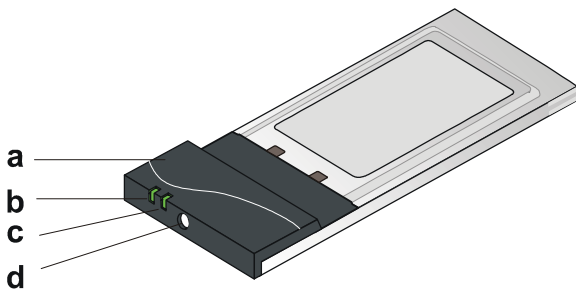
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The PC Card is a wireless network card that fits into any standard PC Card Type II slot.

The PC Card has two LED indicators and two integrated antennas. Optionally you can use the PC Card in combination with an external antenna.

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**Figure 1-6** The PC Card



- a. Integrated Antennas
- b. Radio LED
  - Off - No wireless activity
  - Blinking - Sensing/transmitting wireless data
- c. Power ON/OFF LED

- Solid Green - standard operational mode
  - Blinking Green - Power Management mode
- d. Connector for optional External Antenna.

## PC Card Features

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- Wi-Fi (Wireless Fidelity) certified by the Wireless Ethernet Compatibility Alliance (WECA). This means that your Wireless LAN hardware will communicate with other vendors' IEEE 802.11 compliant wireless LAN products.
- Fully compatible with any other wireless LAN system based on Direct Sequence Spread Spectrum (DSSS) radio technology that complies with the "IEEE 802.11 standard on wireless LANs (Revision B)".



The PC Card supports the following wireless LAN features:

- Automatic Transmit Rate Select mechanism in the transmit range of 11, 5.5, 2 and 1 Mbit/s.
- Automatic Frequency Channel Selection (2.4 GHz) allowing roaming over multiple channels.
- Card Power Management.

## About the CD-ROM

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If you wish to install Wireless LAN drivers and software, turn to 2 “Installation for Windows”.



### NOTE:

Prior to copying or installing the software, you are advised to read the Software License Agreement “**LICENSE.TXT**”, located in the root folder of the CD-ROM. By installing, copying or using the software, you are consenting to be bound by this agreement. If you do not agree to all of the terms of the Software License Agreement, do not download, copy or install the software.

It is the policy of Avaya to improve products as new technology, components, software and firmware become available. Before you proceed with the installation of this product, visit our website at:

**<http://www.avaya.com>** to:

- Verify if newer versions of the software that was shipped with your product are available.
- Download and install the latest software with your purchased product.



## Finding Information

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The Getting Started Guide was designed to give you a brief introduction about the PC Card and the Avaya wireless network system.

In this printed document you will find the most important information to get your wireless network up and running, with a minimum set of parameters for the MS-Windows 95/98, NT, 2000, ME and MS-Windows CE operating systems.

Context-sensitive help for the configuration menus and tools is available when you:

- Click the  button on your screen, or
- Press the  function key on your keyboard.



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## Introduction

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The installation of your PC Card for Windows consists of the following steps:

1. Insert the CD-ROM to install the Client Manager software (see page 2-2).
2. Insert your PC Card (see page 2-3).
3. Install drivers (see page 2-4).
4. Set the wireless LAN properties (see page 2-8).
5. Finish installation (see page 2-14).

To view and/or print this document in Adobe's Acrobat Portable Document File format (\*.pdf) you will need to install the Adobe Acrobat Reader software. You can find a copy of this software on the CD-ROM.



### **NOTE:**

If you intend to use the PC Card in the Access Point-II, please refer to the documentation that was shipped with the device. Alternatively you can download these documents from our website at: **<http://www.avaya.com>**.

### Install the Client Manager

The Client Manager program is a software tool that you can use to check the quality of your network connection.



#### **NOTE:**

It is not mandatory to install the Client Manager program in order to establish a network connection, but it provides you with more options to:

- View/change the settings of your network connection.
- Monitor your network connection.

To install the Client Manager software, proceed as follows:

1. Insert the software CD-ROM that came with your PC Card kit into your computer.
  
2. Follow the instructions on your screen.



#### **NOTE:**

If the CD-ROM does not start automatically:

1. Click the Windows **Start** button
2. Select **Run**
3. Browse to the CD-ROM

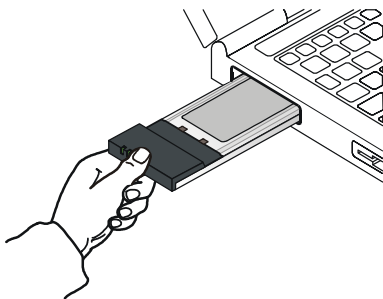
## Insert your PC Card

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1. Unpack your PC Card kit and verify that all items are present, as described in “Kit Contents” on page 1-1.  
If any of the items described appear to be damaged or missing, please contact your supplier.
2. Insert the PC Card into the PC Card slot of your computer as pictured in Figure 2-1.

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**Figure 2-1**     **Inserting the PC Card into Your Computer**



# Install Drivers

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## Before You Start the Installation

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Before you start the installation, you are advised to keep the Windows CD-ROM or software diskettes close at hand. If your computer came with a factory-installed Windows operating system, these files will be stored on your computer's hard disk, in the form of cabinet (\*.cab) files.

## What You Need to Know

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Installing a PC Card requires the same level of expertise that you would need to install a standard Ethernet network adapter card. It is assumed that you have a working knowledge of standard Windows operations and of installing network adapter cards. Refer to the Windows Help when necessary (on the Windows task bar, press the **Start** button and select **Help**).

## Driver Installation for Windows

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Most Microsoft Windows operating systems support “Plug & Play” for PC Cards. Once you insert the PC Card into your computer, these operating systems will automatically:

- Detect the card, and enable the driver, or

- Start the **Add New Hardware** wizard and prompt you to install the driver, when the operating system cannot find the required driver.  
This would typically occur when inserting the PC Card into your computer for the very first time.

When Windows starts the **Add New Hardware** wizard:

1. Follow the instructions on your screen.
2. When you are prompted to locate the driver installation files, insert the Avaya CD-ROM and navigate to the folder that matches your operating system:
  - Windows 2000:D:\Drivers\Win\_2000
  - Windows ME:D:\Drivers\Win\_ME
  - Windows 98:D:\Drivers\Win\_98
  - Windows 95:D:\Drivers\Win95
  - Windows NT:D:\Drivers\Win\_NT

When finished installing the drivers, Windows automatically opens the **Add/Edit Configuration Profile** window.

3. Continue with “Set Windows Network Properties” on page 2-6.



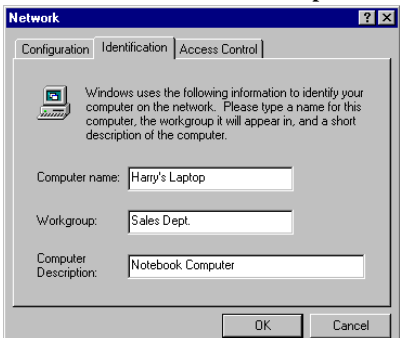
#### **NOTE:**

If your computer does not detect the new hardware you can consult B “Troubleshooting”.

## Set Windows Network Properties

If this is the very first time that Networking support is installed onto your computer, the Windows operating system will prompt you to enter a computer and workgroup name. These names will be used to identify your computer on the Microsoft Network Neighborhood.

Figure 2-2 Windows Network Identification Properties



1. In the **Computer Name** field, enter a unique name for your computer.
2. In the **Workgroup** field, enter the name of your workgroup.
3. (Optional) Provide a description of the computer in the **Computer Description** field.

For more information about setting your Windows Network Properties, consult your Windows documentation or the Windows on-line help information.

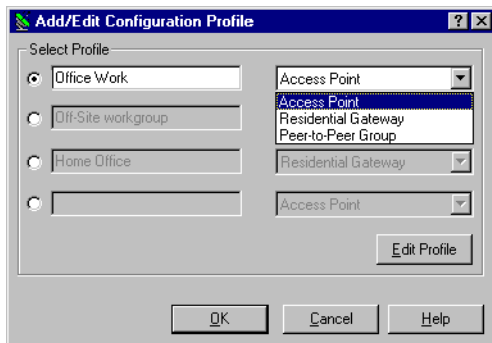
## Wireless LAN Properties

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After installing the drivers, Windows will open the Add/Edit Configuration Profile window for your PC Card as pictured in Figure 2-3.

---

**Figure 2-3** Add/Edit Configuration Profile window



## Configuration Profile

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The Add/Edit Configuration Profile window enables you to specify one or more network connection profiles.

For example you can set up profiles for your office, your home or an ad-hoc



workgroup to share files with your colleagues or friends while being “on the road”.

For more information about the different types of networks, refer to “Network Options” on page 1-3.

To connect your computer to a wireless network you will need to:

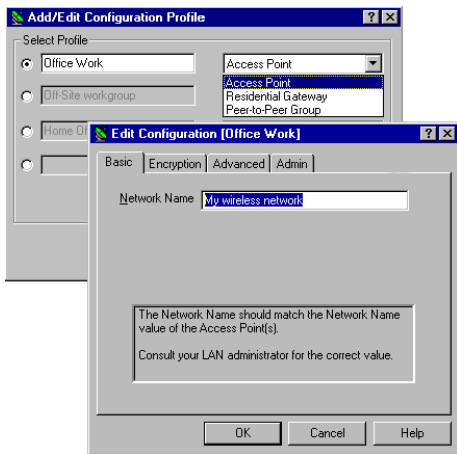
1. Assign a name to the network profile
2. Use the pull-down menu on the right to select how you wish to connect to the wireless network:
  - Via the Access Point-I or Access Point-II to connect to the corporate network
  - An ad-hoc peer-to-peer workgroup of wireless stations without access point.
3. Click the **Edit Profile** button to view/modify the parameters for the selected profile.

For first-time installations, you are advised to setup a single profile using only the Basic Settings.

**NOTE:**

The number and type of parameters you need to specify may differ according to the selected connection type.

For information about the various options press the **(F1)** key or click the **Help** button.

**Figure 2-4** Edit Configuration window

## Basic Settings

To connect to a wireless network, all you need to specify is:

- A valid **Network Name**.
- (Optional) a valid **Encryption key**.

## Network Name

The Network Name is a case-sensitive string of alphanumeric characters in the range of “a” to “z”, “A” to “Z” and “0” to “9”. It connects you to the wireless LAN, like a cable would connect a wired computer to an Ethernet LAN.

Valid values are subject to the type of network to which you wish to connect your computer:

- To connect to a Residential Gateway-I, enter the 6-digit Network Name that is printed on a label at the bottom of the Residential Gateway-I device.
- To connect to a Peer-to-Peer workgroup, enter the name as agreed upon by the workgroup participants.

If you wish to start a workgroup yourself, enter a name with a maximum of 32 alphanumeric characters, and share that value with your workgroup participants.

This value should have a maximum of 32 alphanumeric characters.

Alternatively you may choose to enter the value “ANY” (all character upper-case) to connect to any IEEE 802.11 compliant wireless network in the vicinity of your computer.

Proceed with the Encryption Key settings, or click **OK** to confirm and return to the Add/Edit Configuration Profile window.

## Encryption Key

To enhance the security of your wireless communications, you can also choose to enable wireless data encryption.

The encryption options differ according to the selected configuration profile (page 2-8).



### CAUTION:

*To allow communication, all wireless devices should use identical encryption settings. As the encryption key is case-sensitive, make sure you enter it with care.*

- When you selected to connect to a Residential Gateway-I, you can enter one encryption key. The default Encryption Key matches the last 5 characters of the Network Name.



### CAUTION:

*Do not modify this key unless you have already changed the encryption key of your Residential Gateway-I.*

- When connecting to a Peer-to-Peer workgroup, enter the key as agreed upon by the workgroup participants.
- When connecting to a corporate LAN via the Access Point profile, the encryption tab allows you to enter up to four different keys in either alphanumerical or hexadecimal format.

Enter the values as defined by your LAN Administrator.

**NOTE:**

The keys should be entered in exactly the same order as in the access point.

## Advanced Parameters

The Edit Configuration window also provides access to the advanced parameters in the Advanced and Admin tab.

You are advised to leave these parameters to their default settings, unless special situations require a change of these parameters. For a description of these parameters, consult the on-line help file or the “User’s Guide” on the CD-ROM.

## Finish the Installation

---

When you have finished the “Wireless LAN Properties”, click the **OK** button to close the Add/Edit Configuration window and to proceed with the installation process. Windows will finish building the driver configuration database and copy some files to your computer’s hard disk.

- If the Windows operating system prompts you to identify the location of the Windows files, specify the drive and directory of the Windows Installation CD-ROM or diskettes.

When you had a PC Card installed on your computer before, most of these files are already available on your hard disk drive. If you do not have the Windows CD-ROM available, you may try replacing the proposed path in the Copy Files From dialog box with:

“**C:\Windows\System**” or “**C:\Windows**”

- If the Windows operating system prompts you to identify the location of driver files (typically file names starting with the characters w\*.\*) specify the drive and directory of the CD-ROM:
  - Windows 2000:D:\Drivers\Win\_2000
  - Windows ME:D:\Drivers\Win\_ME
  - Windows 98:D:\Drivers\Win\_98
  - Windows 95:D:\Drivers\Win95
  - Windows NT:D:\Drivers\Win\_NT

If you downloaded the files from the Internet, point to the disk drive or directory where you saved files.

When Windows has finished copying files, it will prompt you to restart your computer. Click **OK** button to complete the installation.

## After Restarting Your Computer

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After you have restarted your computer, the Windows operating system will:

1. Detect the PC Card (you can hear the two-tone sound of the PC Card Socket Controller).
2. Load the driver
3. Display a dialog box requesting you to enter a Windows user name and password.

The password you enter here will be the one used to login to the Windows Network Neighborhood.

Write down this password and keep it in a safe place.

## Verifying installation

To verify if the installation of the drivers was completed successfully:

- Check if the Windows task bar displays the PC Card icon as pictured in Figure 2-5.
- Check the LEDs on your PC Card.
  - A steady green Power LED indicates the PC Card is active.
  - A flickering green Radio LED indicates wireless activity.

For other LED behavior see B.

- (Optional) To check the quality of the network connection, start the Client Manager program as described in 3 “Working with Wireless LAN and Windows”.

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**Figure 2-5** PC Card icon on the Windows task bar





# Working with Wireless LAN and Windows

# 3

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## Introduction

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This chapter provides general information on how to:

- Use your PC Card
- View Other Computers
- View Wireless Link Quality
- View/Modify PC Card Settings

## Use your PC Card

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### Radio Antennae

---

The built-in radio and antennae of your PC Card perform best in an open environment with as few obstacles as possible.

- To achieve the maximum range for wireless communications do not cover the card with objects such as books or thick stacks of paper.
- If you are using the card inside a desktop computer you may consider the purchase of the optional Range Extender Antenna.

### Remove the PC Card

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If you do not need the wireless connectivity of your PC Card, you can remove the card from its slot as pictured in Figure 3-1.



#### **CAUTION:**

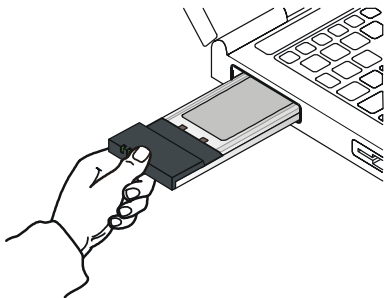
*When removing the PC Card you will lose your connection to the network. Prior to removing the PC Card, make sure you have closed all files and network applications (such as e-mail).*

You are advised to always disable the PC Card **prior** to removing the card from the PC Card slot. This will allow the Windows operating system to:

- Log off from the network server

- Disable the driver
- Disconnect power to the PC Card slot (which will extend battery life for mobile computers).

**Figure 3-1 Remove the PC Card**



To stop using the PC Card:

1. Click once on the PC Card icon on the right side of the Windows task bar.
2. Select the option **Stop Avaya Wireless PC Card**.
3. Wait a few seconds until the operating systems displays a pop-up message to indicate you can safely remove the PC Card.

Alternatively, you can disable the PC Card via the PC Card icon on the Control Panel.

## Maintenance of your PC Card

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If you are not using the Wireless LAN PC Card for wireless communications, extend its life by storing it inside the transparent plastic casing that was shipped with the product.

To clean the PC Card, gently wipe it with a soft (damp) cloth.



### **CAUTION:**

*To avoid damage to the PC Card do not use abrasive materials, or rinse the card with liquids.*

## View Other Computers

---


When multiple Wireless LAN stations are up-and-running in your wireless network, you can use the procedure described below to display the other computers:

1. Start Windows Explorer.
2. Scroll down the list of files and folders to look for the item **Network Neighborhood**.
3. Double-click the **Network Neighborhood** item to display all stations in your Microsoft Networking Group.
4. To display other workgroups in the network environment, double-click the **Entire Network** icon.

If you cannot find other (Wireless LAN) networked computers, verify whether the other Wireless LAN computers are:

- Powered up and logged on to the network.
- Configured to operate with identical Microsoft Network settings concerning:
  - Networking Protocol.
  - Wireless Network Name
  - Workgroup Name

To view or modify the **Station Name** or **Workgroup** of your computer, proceed as follows:

1. Click the  button from the Windows task bar.

2. Click on **Settings**, and then on **Control Panel**.
3. In the Control Panel window, double-click the **Network** icon.
4. In the Network Settings window, select the **Identification** tab.

You can verify and change the **Station Name** or **Workgroup** parameters.



### **NOTE:**

You have to restart your computer before changes to the Network Settings will be effected.

To verify the radio connection with other stations refer to “View Wireless Link Quality” on page 3-7.

## Using the Client Manager

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If you installed the Wireless LAN Client Manager as described in “Install the Client Manager” on page 2-2, you can use the Client Manager to:

- Verify the quality of your wireless connection to the network.
- View/Modify the configuration settings of your wireless PC Card.

The Client Manager will start automatically every time you power up your computer.

The Client Manager icon is displayed in the “System Tray” of your Windows task bar at the right-side on the bottom of your screen, indicating that the Client Manager program is running.



- Click the icon once with your **left** mouse button to retrieve a more detailed status overview.
- Click the icon once with your **right** mouse button to display a menu with more options.







## View Wireless Link Quality

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You can use the Client Manager icon on the Windows task bar to verify the link quality of your network connection.

An overview of all possible icons is given in Table 3-2. When the Client Manager icon is not indicating excellent or good radio connection, act as described in Table 3-2.

Table 3-2 Client Manager Icon


Icon	Description	Color
	Excellent radio connection	Green
	Good radio connection	Green
	Marginal radio connection: The radio signal is weak. Move closer to the: <ul style="list-style-type: none"> <li>■ Wireless LAN access point, or</li> <li>■ Wireless LAN Base Station</li> </ul>	Yellow
	Poor radio connection: The radio signal is very weak. Save your files and move closer to the: <ul style="list-style-type: none"> <li>■ Wireless LAN access point, or</li> <li>■ Wireless LAN Base Station</li> </ul>	Red
	No radio connection because: <ul style="list-style-type: none"> <li>■ Looking for initial connection, or</li> <li>■ You have moved out of range of the network.</li> </ul>	Red
	Peer-to-Peer network connection	Blank

## View/Modify PC Card Settings

If you would like to view or modify Wireless LAN parameters, for example

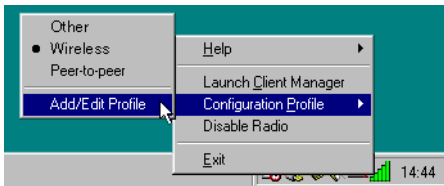


because you would like to connect to another network or type of network, proceed as follows:


1. Right-click on the Client Manager  icon on the Windows task bar.
2. From the menu, select **Configuration Profile** (see Figure 3-3) and select:
  - **Add/Edit Profile** to add a new profile or to modify an existing profile.
  - **One of the existing profiles** (if present) to select a profile without viewing or modifying the settings.

After selecting and another profile, the PC Card will use the selected profile to connect to the wireless network.


**Figure 3-3** Edit Wireless Configuration Settings



If your Client Manager icon is not visible, you have to start the Client Manager program again:

1. Click the  button from the Windows task bar.
2. Next select **Client Manager** to start the Client Manager program.

Alternatively you can to change the PC Card configuration via the Control Panel:

1. Click the  button from the Windows task bar.
2. Click on **Settings**, and then on **Control Panel**.
3. In the Control Panel window, double-click the **Wireless Network** icon.
4. (Optional) Change the parameters you would like to modify, and click
  - the **OK** button to confirm your changes, or
  - the **Cancel** button to ignore your modifications.

# Advanced Settings

# 4

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## Introduction

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Although your PC Card will work fine in most network environment with the basic settings as described on 2 “Installation for Windows”, you may wish to explore the advanced parameters options as displayed on the Configuration window for your adapter.

Advanced parameters are available only in the configuration profiles that connect to an access point.

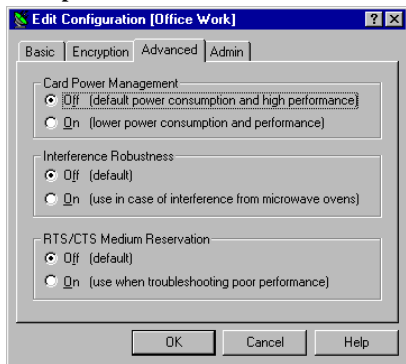
Consult your LAN Administrator for information about whether these parameters apply to your situation.

For more information consult your LAN Administrator. You can also refer to the help file and the “Wireless LAN Manager Suite User’s guide”.

## Advanced Parameters Tab

This tab of the Edit Configuration window allows you to adjust a number of parameters related to the performance of your wireless adapter.

**Figure 4-1 Setup Advanced Parameters**



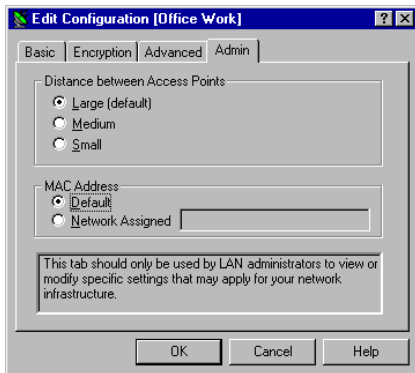
- Card Power Management allows you to extend the battery life of (mobile) wireless devices.
- Interference Robustness allows you to remedy slow performance related to in-band interference from devices like microwave ovens.
- RTS/CTS Medium Reservation controls the deferral behavior of wireless devices. Enabling this option may improve reliability of the network when:

- many wireless stations operate in an environment with relatively few access points, and
- network performance is poor network due to excessive frame collisions at the access points.

## Admin Parameters Tab

The Admin parameters tab allows LAN Administrators to ensure that your adapter settings match specific settings that apply to the entire network.

**Figure 4-2** Setup Admin Parameters



- Distance between Access Points allows you to control network performance in relation to the number of access points in your network.
- MAC Address allows you to assign a local MAC address to your adapter in case your network operating system requires local addressing.

# Card Specifications



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## Physical Specifications

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<b>Form Factor</b>	PC Card Type-II Extended	
<b>Dimensions</b>	(LxWxH)	117.8 x 53.95 x 8.7 mm
<b>Weight</b>	45 gram (PC Card)	
<b>Temperature &amp; Humidity (non condensing)</b>		
<b>Operation</b>	0° to 55° C	maximum humidity 95%
<b>Transit</b>	-20° to 70° C	humidity 15 to 95%
<b>Storage</b>	-10° to 60° C	humidity 10 to 90%

Although the PC Card may still operate in the range of -20° to 70°C, operation outside the range of 0° to 55° C may no longer be according to specifications

## Electrical Characteristics

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<b>Doze Mode</b>	10 mA
<b>Receive Mode</b>	180 mA
<b>Transmit Mode</b>	280 mA
<b>Power Supply</b>	5 V



## Networking Characteristics

<b>Compatibility</b>	<ul style="list-style-type: none"> <li>■ IEEE 802.11 Standard for Wireless LANS (DSSS)</li> <li>■ Wi-Fi (Wireless Fidelity) certified by the Wireless Ethernet Compatibility Alliance (WECA).</li> </ul>	
<b>Host Operating System</b>	Microsoft Windows® 95:	
	<ul style="list-style-type: none"> <li>■ NDIS3 Miniport Driver</li> </ul>	
	Microsoft Windows® NT v4.0:	
<b>Media Access Protocol</b>	CSMA/CA (Collision Avoidance) with Acknowledgment (ACK)	
	<b>Data Rate</b>	<ul style="list-style-type: none"> <li>■ High</li> </ul>
<ul style="list-style-type: none"> <li>■ Medium</li> </ul>		5.5 Mb/s
<ul style="list-style-type: none"> <li>■ Standard</li> </ul>		2 Mb/s
<ul style="list-style-type: none"> <li>■ Low</li> </ul>		1 Mb/s
The cards use an automatic Transmit Rate Select mechanism.		

## Regulatory Information

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Wireless communication is often subject to local radio regulations. Although wireless networking products have been designed for operation in the license-free 2.4 GHz band, local radio regulations may impose a number of limitations to the use of wireless communication equipment.



**NOTE:**

Refer to the flyer “Information to the User” for more regulatory information that may apply in your country.

## Radio Characteristics

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<b>R-F Frequency Band</b>	<b>2.4 GHz (2400-2500 MHz)</b>
Supported sub-channels	1            2412
	2            2417
	3            2422
	4            2427
	5            2432
	6            2437
	7            2442
	8            2447
	9            2452
	10          2457 (default)
	11          2462
Modulation Technique	Direct Sequence Spread Spectrum CCK 11 & 5.5 Mb/s, DQPSK for 2 Mb/s and DBPSK for 1 Mb/s
Spreading	11-chip Barker Sequence
Bit Error Rate (BER)	Better than $10^{-5}$
Nominal Output Power	15 dBm
Encryption	64-bit Wired Equivalent Privacy (WEP) - Silver 128-bit (RC4) - Gold

<b>Range/Transmit Rate</b>	<b>11 Mb/s</b>	<b>5.5 Mb/s</b>	<b>2 Mb/s</b>	<b>1 Mb/s</b>
Open Office	160 m (525 ft.)	270 m (885 ft.)	400 m (1300 ft.)	550 m (1750 ft.)
Semi-Open Office	50 m (165 ft.)	70 m (230 ft.)	90 m (300 ft.)	115 m (375 ft.)
Closed Office	25 m (80 ft.)	35 m (115 ft.)	40 m (130 ft.)	50 m (165 ft.)
Receiver Sensitivity	-83 dBm	-87 dBm	-91 dBm	-94 dBm
Delay Spread (FER of <1%)	65 ns	225 ns	400 ns	500 ns

The range of the wireless signal is related to the Transmit Rate of the wireless communication. Communications at lower Transmit range will travel larger distances.


**NOTE:**

The range values listed above are typical distances as measured at the Avaya Wireless LAN laboratories. These values may provide a rule of thumb and may vary according to the actual radio conditions at the location where the Wireless LAN product will be installed.

The range of your wireless devices can be affected when the antennas are placed near metal surfaces and solid high-density materials.

Range is also impacted due to “obstacles” in the signal path of the radio that may either absorb or reflect the radio signal.

The listed ranges are typical values when used indoors in “office environments” that can be described as follows:

- In Open Office environments, antennas can “see” each other, i.e. there are no physical obstructions between them.
- In Semi-open Office environments, work space is divided by shoulder-height, hollow wall elements; antennas are at desktop level.
- In Closed Office environments, work space is separated by floor-to-ceiling brick walls.

### Auto Channel Selection

When installing PC Cards the channel configuration is managed as follows:

- For wireless clients that operate in an Wireless LAN Infrastructure, the PC Card will automatically start operation at the channel identified by the access points. When roaming between different access points the station can dynamically switch to another channel if required.
- For PC Cards installed into wireless clients that operate in an “Peer-to-Peer” mode, the PC Card will default use channel 10.
- When inserted into the Access Point-II, the PC Card will use the factory-set default channel (printed in bold), unless the LAN Administrator selected a different channel when configuring the access point device.

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## LED Activity

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If you encounter difficulty using and/or installing your Wireless LAN product, the error may be related to various causes:

- Out-of range situation, which prevents the PC Card from establishing a wireless connection with the network.
- Configuration mismatch, which prevents the PC Card from establishing a wireless connection with the (correct) network.
- Absence of, or conflict of the Wireless LAN Driver.
- A problem or conflict with the PC Card slot which prevents the PC Card from powering on.
- A conflict of the hardware with another device.

The starting point to troubleshoot problems with your wireless network is looking at the LED activity of the PC Card.

Table B-1 provides an overview of the various modes of operation and the associated LED activity. It also includes a number of troubleshooting hints, that may help you solve the problem.

**Table B-1 LED Activity**

<b>Power LED</b>	<b>Radio LED</b>	<b>Description/Action</b>
Continuous Green	Blinking	Standard operational mode. <ul style="list-style-type: none"> <li>■ Card is powered on.</li> <li>■ Sensing/transmitting wireless data.</li> </ul>
	Off	<ul style="list-style-type: none"> <li>■ Card is powered on.</li> <li>■ No wireless activity.</li> </ul> No action is required.
Flicker	Flicker	Power Management mode: <ul style="list-style-type: none"> <li>■ Card is powered on, but set to power saving mode, to conserve battery life.</li> <li>■ Flashes indicates that the card wakes up at regular intervals to verify if there is wireless data addressed to your computer.</li> </ul>



Power LED	Radio LED	Description/Action
Both LEDs blink once every 10 seconds		<p>The PC Card works fine, but did not yet succeed establishing a wireless connection with the wireless Infrastructure.</p> <p>Actions:</p> <ul style="list-style-type: none"><li>■ Contact the LAN Administrator to verify the Network Name assigned to the wireless infrastructure.</li><li>■ Contact the LAN Administrator to verify the correct value(s) of the encryption keys.</li><li>■ Contact the LAN Administrator to verify whether the network infrastructure has been set to deny "ANY" as valid Network Name (Closed Network).</li><li>■ Change the configuration of your PC Card to enter the correct Network Name</li><li>■ If there are no access point devices available, change the configuration of your PC Card to run in "Peer-to-Peer" mode.</li></ul>

Power LED	Radio LED	Description/Action
Off	Off	<p>Card is not powered on, so it can not transmit/receive data.</p> <p>The cause may either be:</p> <ul style="list-style-type: none"> <li>■ No Driver loaded/installed</li> <li>■ Card - Driver mismatch which prevented the driver from loading</li> <li>■ Device conflict which prevented the driver from loading</li> </ul> <p>Actions:</p> <ul style="list-style-type: none"> <li>■ Verify if a driver has been installed, if not install the driver.</li> <li>■ View/Modify the device settings of the PC Card to determine/resolve the occurrence of a conflict with another device</li> <li>■ Verify the versions of the driver, and the embedded software in the PC Card (also referred to as Station firmware).</li> <li>■ Check our website at: <a href="http://www.avaya.com">http://www.avaya.com</a> to download and install the latest embedded software and driver.</li> </ul>

## Can Not Connect To The Network

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If your PC Card seems to be working fine, but you are not able to connect to the network, this error might be due to a configuration mismatch.

For example if both LEDs of your PC Card blink once every ten seconds, the problem is likely to be caused by a configuration mismatch of:

- Network Name
- Encryption Key

The Wireless LAN Network Name is case-sensitive.

## LEDs Work But Can't Connect to Network

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If you can not connect to the network while the LEDs indicate that the network is working properly (Power LED is on, Radio LED blinks) your problems might be caused by:

- Incorrect TCP/IP settings for your wireless network adapter (“Changing TCP/IP Settings” on page B-5).
- Your Windows operating system requires an update with a Microsoft Service Pack “Install Windows 2000 Service Pack” on page B-10).



### **NOTE:**

Some older versions of the Windows 95 operating system will not automatically install the necessary TCP/IP network protocol.

## Changing TCP/IP Settings

Consult your LAN Administrator for the values of your TCP/IP settings.

To change the TCP/IP Settings:

1. On the Windows task bar click the **Start** button
2. Select **Settings** and then select **Control Panel**.
3. On the Control Panel window, double click on the **Network** icon to view the **Network Properties**.
  - If this protocol is not yet installed, click the **Add** button and select the **TCP/IP** protocol from the list. Refer to the Windows Help for more information.
  - If this protocol is installed, select this protocol and click the **Properties** button. Check if the parameters resemble the settings provided by your LAN Administrator. Make Changes if necessary, and click **OK** when you're done.
4. When prompted, restart your computer.

## Static IP Addressing for Peer-to-Peer networks

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, unless you 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.

A Peer-to-Peer network environment is best suited for **Static IP addressing**, because of its simplicity.

Peer-to-Peer networks are also not likely to have a DHCP server already set up on the network.

### Configure TCP/IP Settings for Static IP Addressing



#### NOTE:

This IP configuration should only be applied to wireless networks that do not have a DHCP server installed.

1. Right-click **Network Neighborhood** on your desktop.
2. Select **Properties** from the pop-up menu to display the **Network Properties** dialog box.
3. Select the **Configuration** tab, and click **TCP/IP Avaya Wireless PC Card**.
4. Click **Properties** to display the **TCP/IP Properties** dialog box.  
Make sure the **Specify an IP address** option is selected.

**NOTE:**

In accordance with private IP addressing you can use IP addresses from **192.168.0.1** to **192.168.0.254** with the Subnet Mask of **255.255.255.0**.

- Each computer on the network must have a unique IP address. It is best to assign the value **192.168.0.1** to the first computer, **192.168.0.2** to the next computer and so on.
- All computers on the network must use the same Subnet Mask value **255.255.255.0**.

5. Click **OK** to return to the **Network Properties** dialog box.
6. Select the **Identification** tab.
  - a. In the **Computer Name** field, create a unique name to identify the computer.

Each computer on the network must have a unique computer name.
  - b. In the **Workgroup** field, create a workgroup name.

This name is the same for all computers on the wireless network.
  - c. In the **Computer Description** field, you can enter a detailed description for the computer.
7. Click **OK** when completed. Click **Yes** to restart the computer with the new network settings.

# Installation for Windows CE



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## Introduction

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The MS-Windows CE operating system is most commonly used on hand-held computing devices such as the Pocket PC and Personal Digital Assistants (PDA).


These devices come with different processors and versions of the CE operating system.

You can use the Avaya Wireless LAN PC Card on any device that matches the requirements listed in the table on the following page.

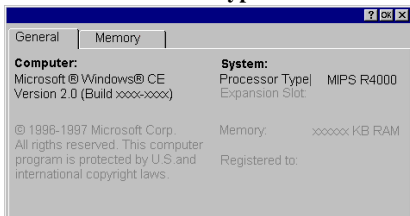
The Avaya Wireless LAN CD-ROM includes different installation programs for each of the listed platforms.

Device Type	Device Name	CE version	Processor
iPAQ	Pocket PC	3.0	ARM,MIPS, SH3
H/PC PRO	HPC 2000	3.0	ARM,MIPS, SH3, SH4
	H/PC 3.0 HPC PRO	2.11	ARM,MIPS, SH3, SH4
Generic	WinCE300	3.0	SH3, SH4 R3000, R4100
	WinCE212	2.12	SA1100 i486,i586

To determine whether you can use the PC Card on your Windows CE device proceed as follows:

1. Click the  **Start** button on the Windows Taskbar.
2. Click on **Settings**, then **Control Panel**.
3. On the Control Panel, double-click the **System** icon to display the window pictured in Figure C-1.

**Figure C-1 Windows CE CPU Type**





## Installing the Wireless LAN Driver

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### What you Need

Windows CE devices are typically used in combination with desktop computers running 'Windows CE Services' to transfer data between the desktop computer and the handheld device. To install the PC Card in your CE device, you will need to:

1. Run an installation program to copy the driver and configuration files to the Windows CE "synchronization folder" on your desktop computer, and
2. Use the Windows CE Services to transfer files to your CE device.

The default location of the synchronization folder is: **C:\Program Files\Windows CE Services\**

Please refer to the Microsoft Handheld PC Companion booklet and the user documentation of your CE device for more information about installing the Windows CE Services.

### Running the Installation Program

1. Insert the CD-ROM that came with your PC Card into your computer. Your operating system will automatically start the CD.
2. When finished, use the serial cable and/or docking station to connect your Windows CE device to your computer.

Once the computers have been connected, the Windows CE services will automatically copy the files and drivers from your desktop computer to the Windows CE device.



### NOTE:

If the CD-ROM does not start automatically:

1. Click the Windows **Start** button.
2. Select **Run**.
3. Browse to the CD-ROM
4. Double-click the file "**Run\_CD.exe**"

If you encounter difficulty copying the driver files to your Windows CE device, please refer to the Microsoft Handheld PC Companion booklet and the user documentation of your H/PC device for more information about installing and/or troubleshooting the Windows CE Services.

If you encounter difficulty establishing a network connection after you installed the Wireless LAN drivers successfully, consult the **readme.txt** of the Wireless LAN driver files for Windows CE for troubleshooting hints.

## Using Wireless LAN with Windows CE

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When you insert the PC Card card into your Windows CE device, it will start operation with the following factory-set defaults:

- Connect to a Network Infrastructure

- Use the Network Name “ANY” to connect to the first access point that provides a communications quality that is acceptable or better.

On the Control Panel of your Windows CE device, you will also find a Wireless Network icon, to view or modify the setting of your PC Card.

## Monitoring Wireless Performance

To monitor wireless communications between your Windows CE device and other computers, you can use either the Client Manager or AP Manager tool (running on a computer Windows 95, 98, ME or Windows NT).

- For Peer-to-Peer workgroup environments, start the Client Manager program on a standard computer.  
The Link Test mode of this utility enables you to analyze the communications quality between the “Initiator” station and your Windows CE device (identified as the “Remote Station”).
- In Infrastructure Networks, consult the LAN Administrator to run the AP MANAGER tool. The “Remote Link Test” of this utility enables the LAN Administrator to analyze the communications quality between the access point (identified as the “Initiator” station) and your Windows CE device (identified as the “Remote Station”).

## Modifying Configuration Parameters

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To view or modify the settings of your PC Card, open the Control Panel on your Windows CE device and double-click the Wireless Network icon.

For more information about these parameters, please consult:

- The on-line help system for your Windows CE drivers by clicking the “?” help icon, or
- The chapters about other Windows operating systems described earlier in this document.

# Installation for Windows NT

# D

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## Introduction

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Unlike Windows 95/98/2000 and ME, Windows NT 4.0 does not support “Plug & Play” and “Hot Swapping” of PC Cards:

- In order to start the driver installation for your PC Card, you will need to “introduce” the card to the operating system.
- To insert or remove PC Cards, Windows NT machines typically require you to restart the computer in order to recognize the card and load the drivers.

The Windows NT operating system also identifies user profiles (accounts) that are associated with dedicated levels of authority (privileges) like the ones listed below:

- Users - are allowed to change the visual appearance of the Windows NT desktop and user-defined preferences.
- Power Users - can create “User Accounts” or “User Groups”.
- Administrators - can manage and control the overall configuration of the workstation.



### **NOTE:**

To install (or uninstall) the PC Card in a Windows NT environment, you will need to login as the “Administrator”, or ensure that your login profile provides the same level of privileges. The privilege settings for each user (account) are set in the Microsoft Windows NT “User Manager” program. Please consult the documentation that was shipped with your Microsoft Windows NT operating system or station for more information.

# Installing the Wireless LAN Driver

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## Overview

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1. Start Installation (page D-3)
2. Enable PCMCIA Services (page D-4)
3. Enable Network Support (page D-5) for the workstation.

## Start Installation

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To install the PC Card on a computer running Windows NT 4.0, proceed as follows:

1. Insert the PC Card into your computer.
2. Power up your computer.
3. Continue with Enabling PCMCIA Services.



### **NOTE:**

To be able to perform the steps as described on the following pages, you will need:

- Windows NT Service Pack v4.0 or higher
- The privileges of the Windows NT station administrator.

To verify these settings:

- During start-up, check the blue start-up screen to verify which NT Service Pack is installed on the computer.
- From the Start menu, use the option **Shut Down, Log Off xxxxx to close all windows** and log on as **Administrator**.

If the computer is running with Service Pack v3.0 or lower, download and install Service Pack v6a from the Microsoft website (<http://www.microsoft.com>) prior to installing the PC Card.

### Enable PCMCIA Services

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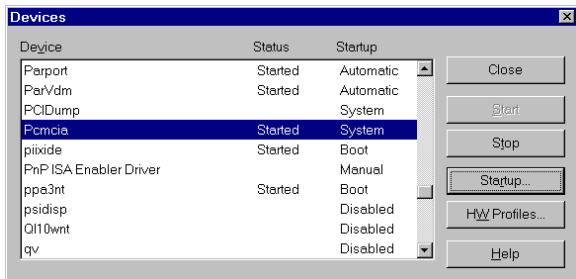
To allow the Windows NT operating system to detect PC Cards in the computer's PC Card slot, you must enable the PC Card Socket controller, identified as the PCMCIA device.

1. Click the **Start** button, then select **Settings** and then click **Control Panel**.
2. Double-click the **Devices** icon.
3. Scroll down the list of devices and select the item **PCMCIA**.



Devices



**Figure D-1 Enable the PCMCIA service for Windows NT**

4. Click the button **Startup** on the right side of the **Devices** window, and set the Startup type for the item PCMCIA to **Boot**.
5. Click **OK** to confirm and return to the Devices window.
6. Click **Close** to return to the Control Panel.

## Enable Network Support

To introduce your Wireless LAN network adapter card to the Windows NT operating system, you will need to enable Network support for your Wireless LAN wireless station.

1. From the Windows NT Taskbar, click the  **Start** button.
2. Click on **Settings**, then **Control Panel**.

- In the Control Panel window, double-click the **Network** icon to open the Network Settings window.



Network

- If no network has been installed yet, you will be prompted to install it now.

Click **Yes** to install Windows NT Networking, and follow the instructions as they appear on your screen.

- If networking support was already installed, you will see a window with multiple tabs.

- Select the tab **Adapters**, and click the **Add** button.
- When prompted to select a driver, select “Driver from disk provided by hardware manufacturer” and enter the following path: **d:\drivers\win\_nt**, where **d:\** represents the drive letter of your CD-ROM
- Follow the instructions on your screen and restart your computer when prompted to do so.
- Configure your PC Card as described in 2 “Installation for Windows”.