Wireless CF Card

User Manual

2003/04/14

Rev:01

Federal Communication Commission Interference Statement

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

- 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.

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

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance.

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

Canada (IC):

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

About This User Manual

For brevity, throughout this manual the “Wireless CF Card” will be referred to as “the wireless adapter” or “the card” and following terms or abbreviations are used interchangeably:

- Access Point – AP
- Ad-Hoc – Peer-to-Peer
- Wireless LAN – WLAN
- Ethernet network – LAN – network

This User Manual contains information on how to install and configure your Wireless CF Card. From now on, we will guide you through the correct configuration steps to get your device up and run.

Contents

1 Introduction

1.1 Overview

This Wireless CompactFlash Card is designed for Windows CE–based Pocket PC to easily join an 802.11b wireless network with a range of up to 550 meters. With its CF Type II extended form factor, low power consumption, advanced power management, and rugged design (with antenna on the card), the card is ideally suited for integration into your Pocket PC. It allows your Pocket PC to wirelessly gain access to corporate networks and thereby to share resources on the network, such as file transfers or Internet Access.

This card features acknowledgment protocol and the option to be tuned to another frequency channel to ensure the wireless connectivity in environments with radio interference.

This card transfers data at speeds of up to 11Mbps. Both Peer-to-Peer Group (also referred to as Ad-Hoc mode) and Access Point connection (also referred to as Infrastructure mode) are supported. For network security concern, it also provides 64-bit or 128-bit WEP (Wired Equivalent Privacy) encryption to ensure data security.

1.2 System Requirements

To use this Wireless CF Card, you will need:

- A computer to load driver:
  - Windows® 9x or higher with CD-ROM
  - Microsoft ActiveSynch® 3.0 or higher installed
- Pocket PC with Type II CompactFlash Slot
- Windows CE your Pocket PC

1.3 Unpacking

The Wireless CF Card package contains the following items:

- One Wireless CF Card
- One Software and Utility CD-ROM
- Quick Installation Guide

2 Wireless LAN Basics

This section contains some Wireless LAN basics to help you better understand how the product can be used to create a wireless network.

2.1 Local Area Network (LAN)

Simply put, a LAN is a network that exists in a relatively limited area. A network is two or more computers connected together sharing files and peripheral devices such as printers.

The Wireless LAN Card allows you to interact with other computers without having to run cables normally associated with networks. This lets you move your computer around while staying connected to your network.

There are two ways to use the Wireless LAN Card. One way is to connect directly to one or more Wireless LAN Card equipped computers, forming an Ad-Hoc wireless network. The second way is to connect to an Access Point that gives you access to an existing wired LAN, forming an Infrastructure wireless network.

2.2 Ad-Hoc Mode

Ad-Hoc mode offers peer-to-peer communication between wireless stations within range of each other, eliminating the need for an Access Point. When set to use Ad-Hoc mode, the wireless-enabled Pocket PC can connect to another Ad-Hoc peer, which could be other computer or Pocket PC equipped with 802.11b wireless adapter set in Ad-Hoc mode. A typical Ad-Hoc network may look like Figure 1-1 where all the wireless stations use the same SSID, channel, WEP settings (if enabled). They are in the same subnet and can share files by using TCP/IP and NetBEUI protocol.

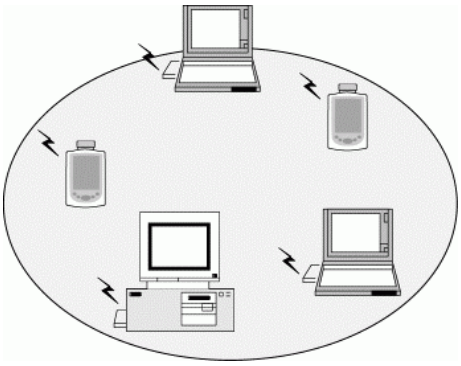


Figure 1-1 Ad-Hoc Mode

2.3 Infrastructure Mode

The Infrastructure network uses an Access Point or several Access Points as a gateway, linking the wireless network to a wired LAN. As a result, portable workstations or desktops on your wireless network have access to all of the features of your wired LAN including e-mail, Internet access, network printers and file server.

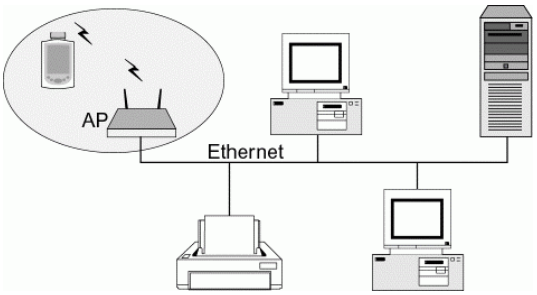


Figure 1-2 Infrastructure Mode

2.4 Roaming

Multiple Access Points can be installed to extend the wireless service coverage area for seamless wireless access. Within an extended service area, all Access Points and wireless clients must have the same Service Set Identity (SSID). Roaming among different Access Points is controlled automatically to maintain the wireless connectivity at all times.

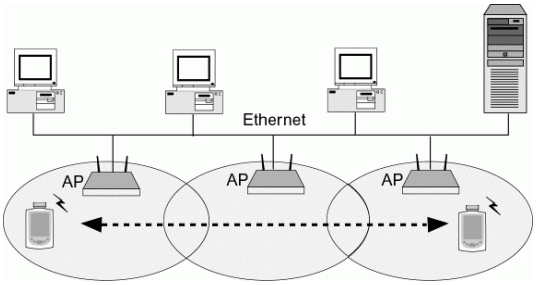


Figure 1-3 Roaming Across Multiple Access Points

3 Installing the Driver and CF Card

The software provided with the Wireless CF Card supports Windows CE 2.11, 2.12, 3.0 and 4.0. Most Windows CE devices use a host computer with Microsoft ActiveSynch® software to synchronize data. Therefore you should synchronize your Pocket PC and a host computer before installing the driver and utility. The Wireless CF Card is to be inserted into your Pocket PC at the last stage.

Follow the steps described in this chapter to complete the installation.

Caution: DO NOT insert the Wireless CF Card into your Pocket PC before you install the driver.

Step 1: Install Microsoft ActiveSynch.

Please have Microsoft ActiveSynch® 3.0 or higher installed on your host computer and hooked up to your Pocket PC.

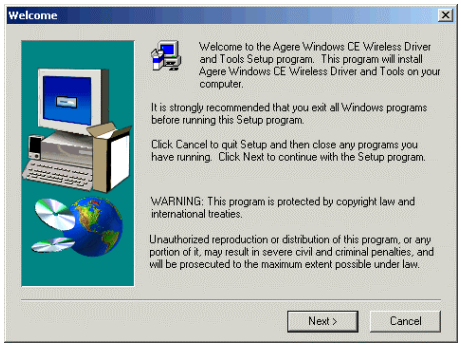
Most Windows CE devices came with ActiveSynch in the supplied CD-ROM. You can also download the latest version of ActiveSynch from Microsoft website.

Step 2: Install the driver.

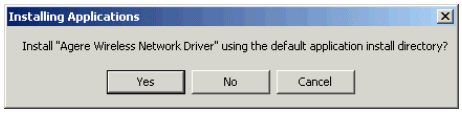
Make sure your Pocket PC is **connected** to your host computer before proceeding.

1. Insert the provided Software Utility CD into the CD-ROM of the host computer.
2. Locate and run **Setup.exe** from **D**:**Utility&Driver** of the Software Utility CD where **D** is the drive letter.

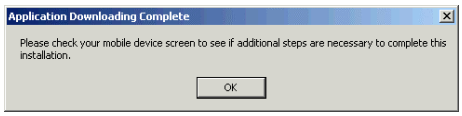
3. When the Welcome screen pops up, click **Next**.



4. Click **Yes** to install the driver into the default directory. To change the directory, click **No** to locate desired directory and then click **Yes** to proceed.

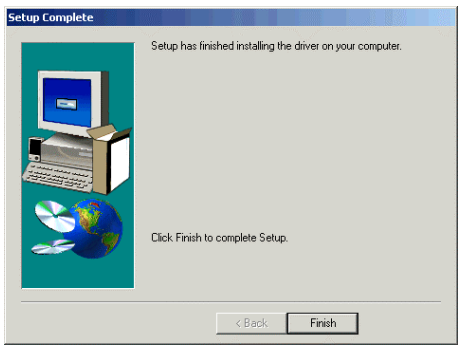


5. If no additional steps are required on your Pocket PC as shown in the example figure below, just click **OK**. Otherwise you should follow the instructions on your Pocket PC before you click **OK** on the host PC.



The screen on Pocket PC indicates the installation is complete.

6. Click **Finish** to complete the installation.

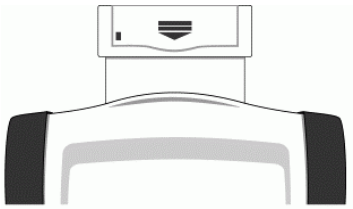


Step 3: Disconnect the Pocket PC from the host computer.

Since the synchronization between the host computer and the Pocket PC has been completed, you may now disconnect your Pocket PC from the host computer.

Step 4: Insert the Wireless CF Card.

At the last stage, insert the Wireless CF Card into the Type II CompactFlash slot in your Pocket PC with the printed label facing up. If the card is securely inserted, the red LED should blink to indicate the wireless connection.



Then you should be able to find the wireless icon in the system tray:

Now you are done with the installation procedure. Proceed to next chapter to configure or fine-tune your Wireless CF Card settings.

Note: If you need to set up the TCP/IP of your Wireless CF Card, refer to “Setting Up TCP/IP” for details.

4 Using Client Manger

Your Wireless CF Card program comes with a utility, Client Manager, which allows you to configure the device. This utility also includes a number of tools to display current statistics and status information pertaining to your Wireless CF Card and to perform link test. See the appropriate subsection as required.

4.1 Accessing the Client Manager

You can access the Client Manager by any of the following methods:

- Tapping the wireless icon on the system tray.

- If the wireless icon is not found on the system tray, tap **Start** > **Settings** and then the **Agere Client** icon.

When the main screen of the Client Manager pops up, it displays the following information:

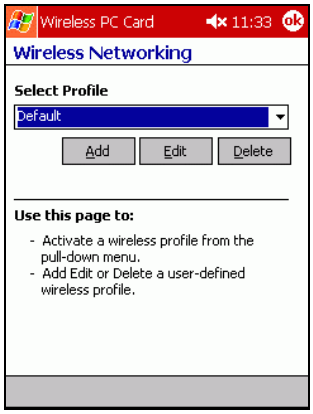
- **Network:** The current active configuration profile.
- **Connection:** The communications quality of your connection.
- **AP:** The MAC address of the AP your Wireless CF Card has associated with. This information is blank if your card is working in Peer-to-Peer Group mode.
- **Channel:** The channel used by the current wireless network.
- **Encryption:** Indicates whether encryption is enabled.

4.2 Configuration for Peer-to-Peer Group

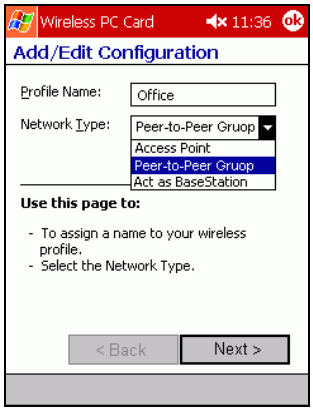
To connect to other wireless clients to form a Peer-to-Peer group, please take out the steps below:

1. Enter the main screen of the Client Manager and tap on the **Edit Wireless Profiles** link at the bottom.

2. Tap on the **Add** button to add a new profile or select one existing profile from the **Select Profile** drop-down list and then tap on **Edit** to modify the settings.



3. Enter these fields and then tap **Next**.
   - **Profile Name**: Enter a unique name to identify this configuration. A maximum of 32 characters is allowed.
   - **Network Type:** Select **Peer-to-Peer Group**.

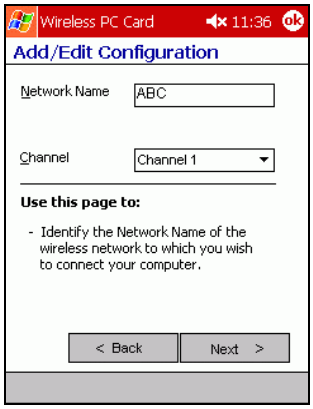


4. In the **Network Name** field, enter a network name with a maximum limit of 32 characters. It is the name of the wireless group you want to participate in. The network name for all stations in a single Peer-to-Peer Group must be the same.

   From the **Channel Number** list, select the channel to be used. In a Peer-to-Peer Group, all the wireless clients use the same channel for communication. If your Pocket PC is the first station to start the workgroup, it will use the channel selected in the active profile.

   Note that the available channels are different according to your geographic location. Make sure to select the legal frequency channels allowed in your regulatory domain.

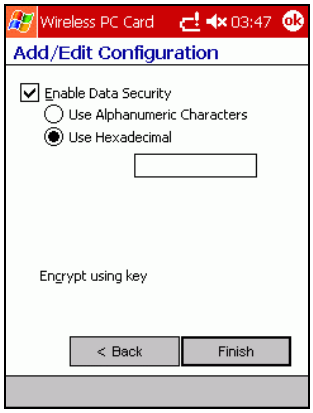
   - 1-11 channels for US, Canada (FCC)
   - 1-14 channels for Japan (TELEC)
   - 1-13 channels for Europe (ETSI)
   - 10-13 channels for France



5. If your are going to set security, check the **Enable Data Security** checkbox and choose to use Alphanumeric characters or Hexadecimal digits format to enter your WEP key. Then enter your WEP key in the provided field.

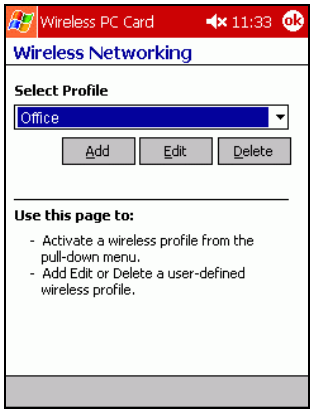
   When using Hexadecimal format, only digits 0-9 and letters a-f, A-F are allowed. Make sure to enter the character matching the required key format and length as below:

	ASCII characters	Hexadecimal digits
40 bit	5 alphanumeric characters	10 hexadecimal digits
104 bit	13 alphanumeric characters	26 hexadecimal digits

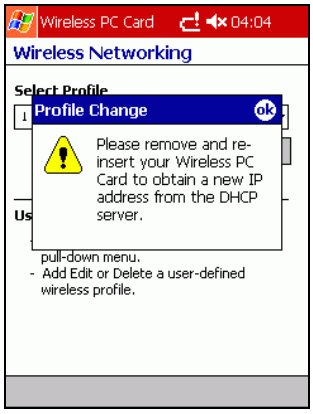


After completing all the required settings, tap on the **Finish** button.

6. You will return to the first screen. Make sure the profile appearing in the **Select Profile** field is the one you want to apply. Then tap on **OK** on the upper right corner.



7. If you are prompted to remove and re-insert your Wireless CF Card to obtain a new IP address, just do as the request and then tap on **OK**.



At this stage, you can see that current connection status on the main screen of the wireless utility.

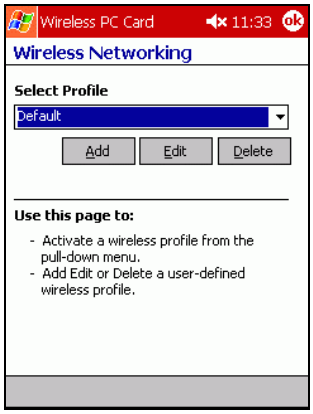
When you return to your desktop, the wireless icon always appears as the figure below to indicate a Peer-to-Peer Grope mode.

4.3 Configuration for Access Point Connection

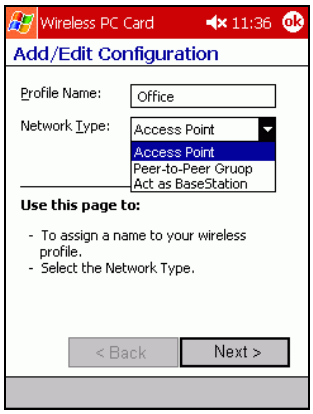
To connect to a wired/wireless network through an Access Point, please take out the steps below:

1. Enter the main screen of the Client Manager and tap on the **Edit Wireless Profiles** link at the bottom.

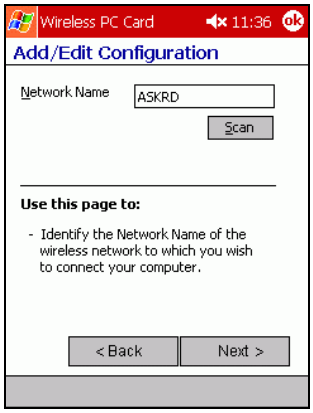
2. Tap on the **Add** button to add a new profile or select one existing profile from the **Select Profile** drop-down list and then tap on **Edit** to modify the settings.



3. Enter these fields and then tap **Next**.
   - **Profile Name**: Enter a unique name to identify this configuration. A maximum of 32 characters is allowed.
   - **Network Type:** Select **Access Point**.



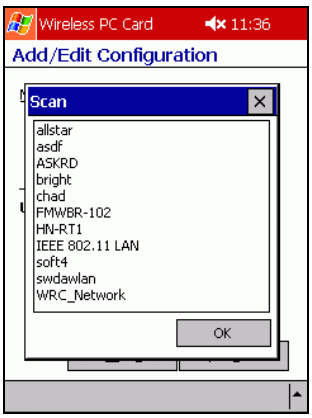
4. In the **Network Name** field, enter a network name with a maximum limit of 32 characters. It is the name of the Infrastructure network you want to participate in. The network name for all stations in a single Infrastructure network must be the same.



Connecting to "Open" Access Point

If this field is filled in with the special SSID name "**any**", your Wireless CF Card will connect to the first compatible and "open" AP with the best signal strength within the connection range. It allows your Wireless CF Card to wander across networks with different SSID.

Taping the **Scan** button will pop up a separate window to display the available "open" networks in the air. You can quickly retrieve the desired network name by tapping on the network you want to connect to.



Connecting to a "Closed" Access Point

The **Scan** feature will not be able to detect the “Closed” Access Point which are set to deny access of wireless clients with incorrect SSID or with the SSID of “any”. To connect to such an Access Point, you will need to enter all the settings that apply to the Access Point.

5. If your are going to set security, check the **Enable Data Security** checkbox and choose to use Alphanumeric characters or Hexadecimal digits format to enter your WEP key. Then enter up to four WEP keys in the provided fields.

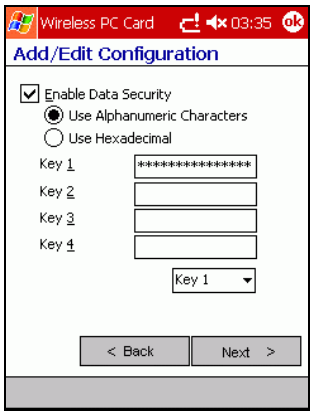
Note: Your WEP keys must be the same as those keys used by the AP you want to associate with.

When using Hexadecimal format, only digits 0-9 and letters a-f, A-F are allowed. Make sure to enter the character matching the required key format and length as below:

	ASCII characters	Hexadecimal digits
40 bit	5 alphanumeric characters	10 hexadecimal digits
104 bit	13 alphanumeric characters	26 hexadecimal digits

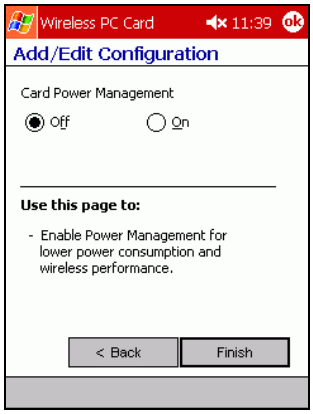
After entering the keys, in the drop-down list below the Key 4 field, select one of the entered keys to encrypt the data you are going to transmit.

Note: When using WEP keys for data encryption, all the wireless stations and AP in an Infrastructure network must use identical encryption key values and key position. To join a WEP-enabled wireless network, make sure to use the same WEP keys as your target AP.



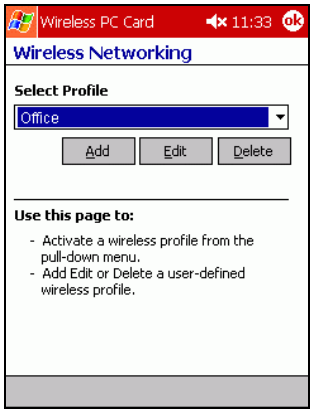
6. Select whether to enable **Card Power Management** to adjust the power consumption behavior of the Wireless CF Card. Subject to the type of network traffic power management may have some impact on network performance.

When enabled, your Pocket PC will go to ‘sleep mode’ whenever activity is low to minimize power consumption. At regular intervals it will wake up to verify whether there is network traffic addressed to the wireless card.



After completing all the required settings, tap on the **Finish** button.

7. You will return to the first screen. Make sure the profile appearing in the **Select Profile** field is the one you want to apply. Then tap on **OK** on the upper right corner.


Wireless PC Card
11:33
ok
Wireless Networking
Select Profile
Office
Add
Edit
Delete
Use this page to:
- Activate a wireless profile from the pull-down menu.
- Add Edit or Delete a user-defined wireless profile.

At this stage, you can see that current connection status on the main screen of the wireless utility.

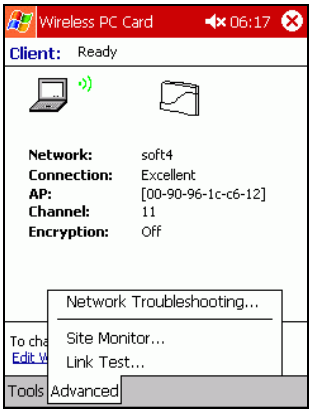
4.4 Site Monitor

You can use the Site Monitor feature to display the communications quality of your Pocket PC with multiple wireless devices in its vicinity. The Site Monitor allows you to conduct a site survey to:

- Determine the overall wireless coverage of your network.
- Optimize placement of the Access Points, to provide seamless connectivity to mobile stations.
- Roam throughout the wireless network environment with your Wireless CF Card. You will be able to identify areas that may not have adequate coverage, or that suffer from interference by other equipment such as microwave ovens.

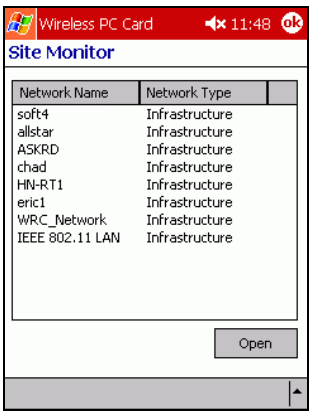
To use the Site Monitor function:

1. Enter the main screen of the Client Manager. Tap on the **Advanced** link at the bottom and then the **Site Monitor** option.

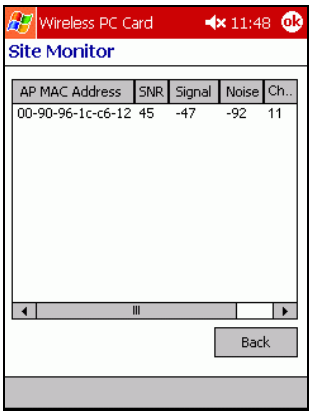


2. This will open the **Site Monitor** screen to display the scan results. To view detailed information of a certain network, tap on the network you want to monitor and then tap on the **Open** button.

Note: The **Site Monitor** list will only display “open” Access Points.



3. Then you will be provided with the following information for the chosen network:
   - **AP MAC Address:** The MAC address for the AP.
   - **SNR:** The Signal-to-Noise Ratio (SNR) is the primary diagnostic counter to diagnose wireless performance. SNR indicates the relative strength of the received Signal Level compared to the Local Noise Level.
     In most environments, SNR is a good indicator for the quality of the radio link between transmitter and receiver. A higher SNR value means a better quality radio link.
   - **Signal:** Indicates the strength of the wireless signal as received at the Wireless CF Card.
   - **Noise:** Reflects the level of radio interference.
   - **Channel:** The channel used by the network.



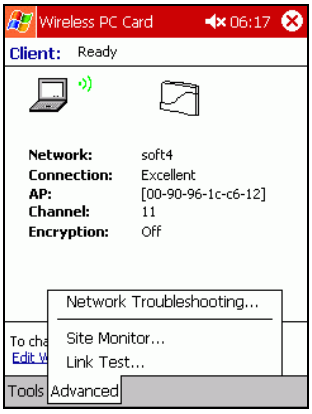
4.5 Link Test

In a Peer-to-Peer Group, you can use the Link Test feature to analyze your link quality with another peer in the same group. In Link Test Mode, your computer will actively exchange messages with your Link Test partner at regular intervals. The Link Test mode will analyze the messages as received on your adapter and the test partner of the link to determine:

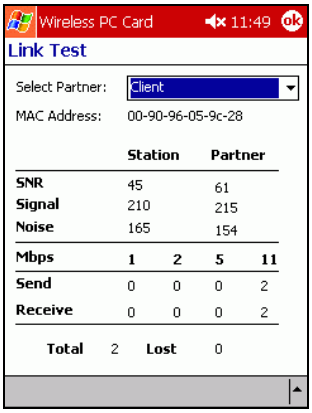
- Radio Quality, comparing the Signal Level to the Noise Level and calculate the SNR.
- Throughput Efficiency, by comparing:
  - The total number of Sent Messages to Received Messages, and calculate the number of Messages Lost.
  - The number of messages transmitted at the supported Transmit Rates

To start the Link Test function:

1. Enter the main screen of the Client Manager. Tap on the **Advanced** link at the bottom and then the **Link Test** option.



2. From the **Select Partner** drop-down list, select a test partner. The link test results will be then displayed.

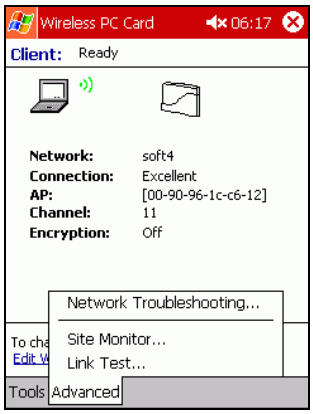


4.6 Network Troubleshooting

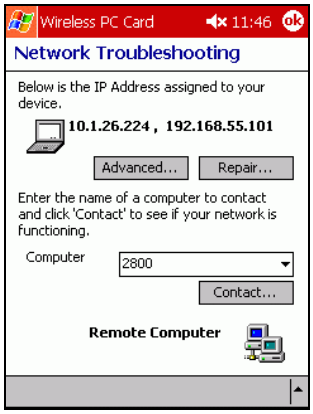
If your Wireless CF Card cannot connect to a wireless network, you can use the troubleshooting function to identify possible reasons.

To use the troubleshooting function:

Enter the main screen of the Client Manager. Tap on the **Advanced** link at the bottom and then the **Network Troubleshooting** option. This will open the main screen of Network Troubleshooting.

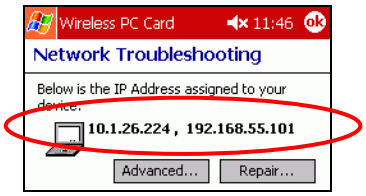


The Network Troubleshooting function allows you to perform a couple of tasks. See the ensuing sections for more information.

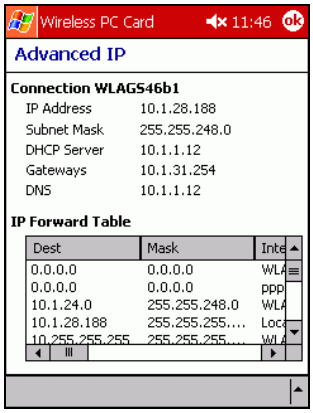


4.6.1 Viewing Current IP Address

In the Network Troubleshooting screen, you can see the IP address assigned to your device. It could be a fixed IP address you manually specified or a dynamic one assigned by the DHCP server on the network.

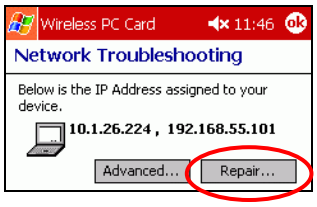


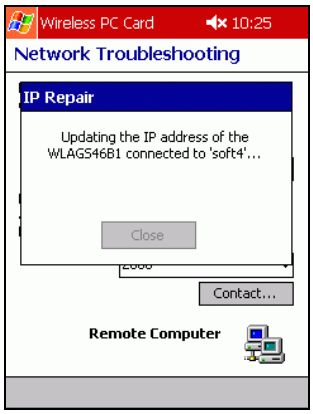
Tapping the **Advanced** button allows you to view detailed IP information.



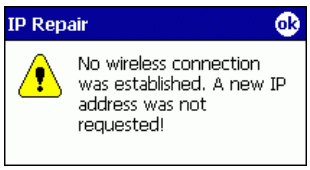
4.6.2 Renewing IP Address

If your Wireless CF Card is set to use a dynamic IP address assigned by the DHCP server on the network, you can tap on the **Repair** button to update the IP assignment.





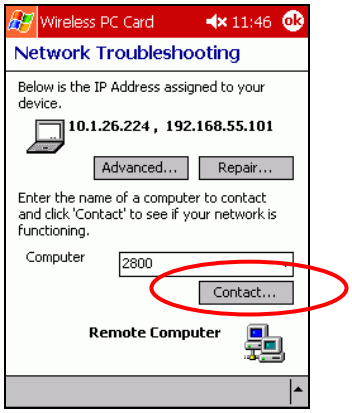
Note that to request a new IP address, the prerequisite is your Wireless CF Card has successfully connected to an Infrastructure network where a DHPC server is available. Otherwise your IP update process will fail.

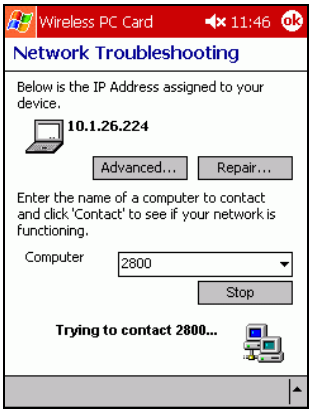


4.6.3 Contacting a Computer

You can also connect a computer on the network to see if your network is functioning.

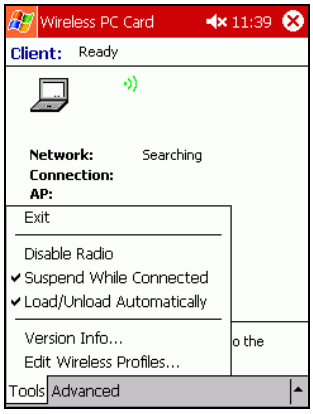
To do this, enter the name of the target remote computer in the Computer field and then tap on the **Contact** button. If the target computer did not response, make sure you have entered a correct IP address or name per on-screen instructions.




Wireless PC Card
11:46
ok
Network Troubleshooting
Below is the IP Address assigned to your device.
10.1.26.224
Advanced...
Repair...
Enter the name of a computer to contact and click 'Contact' to see if your network is functioning.
Computer
2800
Stop
Trying to contact 2800...

4.7 Tools

This section describes the **Tools** menu of the Client Manager.



- **Enable/Disable Radio**

  Allows you to enable or disable the radio.

- **Suspend While Connected**

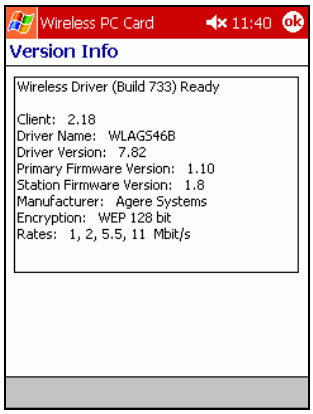
  If this option is checked, when the inserted Wireless CF Card is not in use, your Pocket PC will enter suspend mode and the Wireless CF Card will be powered off to prevent draining your battery.

Note: If you have changed the suspend options, you will be prompted to reset your device to enable the new settings.

- **Version Info**

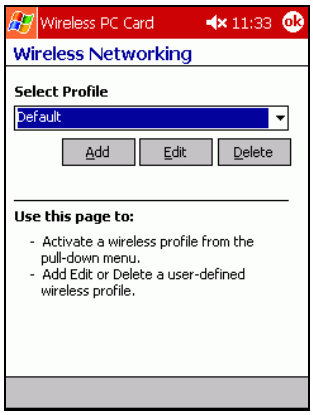
  Allows you to verify the version of individual software components.

Note: The displayed information is subject to release version.



- **Edit Wireless Profiles**

  Allows you to edit the wireless profiles. Selecting a profile from the drop-down menu and then tapping **Edit** will launch a step-by-step editing process. You can end the editing at any point by tapping on the **OK** at the upper right corner.



4.8 Checking Connection Status

You can check your wireless link quality via the Client Manager icon on the system tray. The communications quality is expressed in different color coding and indicators. The corresponding link quality is given in the table below.

Note: The indicator is always blank if your Wireless CF Card is in Peer-to-Peer Group mode.

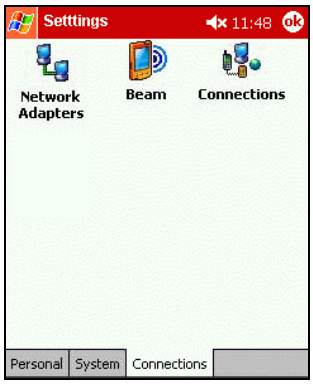
Indicator	Color	Radio Connection Quality
 	Green	Excellent radio connection Your Wireless CF Card has an excellent radio connection with the network, allowing excellent network communication at the highest transmit rate.
	Green	Good radio connection Your Wireless CF Card has a good radio connection with the network, allowing normal network communication.
	Yellow	Marginal radio connection The radio signal is weak. Your Wireless CF Card has a marginal radio connection with the network. This connection does allow network communication, but you might observe a degradation of the network response times due to (re)transmissions at a lower transmit rate. Move closer to the target Access Point.
	Red	Poor radio connection or no radio connection. The radio signal is very weak. Save your files and move closer to the target Access Point.
	Blank	No Connection You have moved out of range of the wireless network or your card has been set to operate in Peer-to-Peer Group mode.
		No network connection The wireless program could not detect the presence of the Wireless CF Card.

5 Setting Up TCP/IP

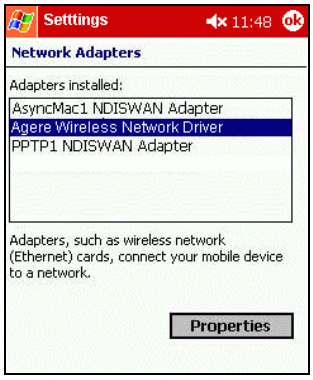
This chapter contains instructions for configuring the TCP/IP protocol of the Wireless CF Card. The IP address policy depends on your network. You should configure your TCP/IP protocol as instructed by your network administrator.

To configure the TCP/IP settings in Window CE, carry out the steps below:

1. Tapping **Start** > **Settings** > **Connections** > **Network Adapters**.



2. In the **Adapters installed** list, tap on your Wireless CF Card, e.g., **Agere Wireless Network Driver,** and then tap on **Properties**.



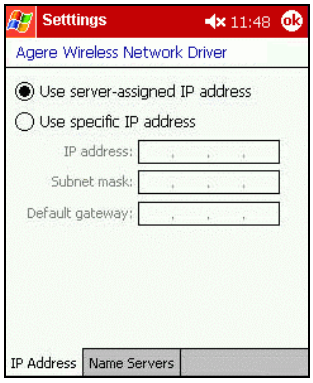
3. On the **IP Address** tab, choose one of the methods as required:

   Option A: User server-assigned IP address.

   Then an IP address will be automatically assigned to your Wireless CF Card.

   Option B: Use specific IP address.

   Manually enter the IP address, subnet mask and default gateway in corresponding fields as instructed by your network administrator.



4. After finishing the settings, tap on the **OK** on the upper right corner. If the Wireless CF Card is inserted to your Pocket PC, remove and re-insert it to activate the new settings.

6 Troubleshooting

Radio interference.

You may be able to eliminate any interference by trying the following:

- Reseat the Wireless CF Card.
- Increase the distance between the Wireless CF Card and the device causing the radio interference.
- Keep the device with the Wireless CF Card away from the microwave oven and large metal objects.
- Consult the dealer or an experienced radio technician for help.

No radio link.

If your Wireless CF Card cannot make a connection to another AP or wireless client, it could be due to one of the following reasons:

- Incorrect SSID. Make sure the SSID is the same as your targeted AP or wireless client.
- Make sure you use correct WEP settings (if applicable) as your targeted AP or wireless client.

Poor link quality.

If the link quality is poor (e.g., less than 20%), it could be due to one of the following reasons:

- Check that there is no radio interference in the radio network.
- Decrease the distance to your targeted AP or wireless client.

Appendix A: Glossary

10BaseT

An IEEE standard (802.3) for operating 10 Mbps Ethernet networks (LANs) with twisted pair cabling and a wiring hub.

Access Point

An internetworking device that seamlessly connects wired and wireless networks. Access Points combined with a distributed system support the creation of multiple radio cells that enable roaming throughout a facility.

Ad Hoc

A network composed solely of Wireless CF Cards within mutual communication range of each other (no Access Point connected).

BSS

*Basic Service Se*t. A set of Wireless CF Cards controlled by a single coordination function.

Channel

A medium used to pass protocol data units that can be used simultaneously in the same volume of space by other channels of the same physical layer, with an acceptably low frame error ratio due to mutual interference.

ESS

*Extended Service Se*t. A set of one or more interconnected Basic Service Sets (BSSs) and integrated Local Area Networks (LANs) can be configured as an Extended Service Set.

Ethernet

The most widely used medium access method, which is defined by the IEEE 802.3 standard. Ethernet is normally a shared media LAN; i.e., all the devices on the network segment share total bandwidth. Ethernet networks operate at 10Mbps using CSMA/CD to run over 10BaseT cables.

Gateway

A network component that acts as an entrance to another network.

IEEE 802.11

The IEEE 802.xx is a set of specifications for LANs from the Institute of Electrical and Electronic Engineers (IEEE). Most wired networks conform to 802.3, the specification for CSMA/CD-based Ethernet networks or 802.5, the specification for token ring networks. 802.11 defines the standard for wireless LANs encompassing three incompatible (non-interoperable) technologies: Frequency Hopping Spread Spectrum (FHSS), Direct Sequence Spread Spectrum (DSSS), and Infrared. IEEE standards ensure interoperability between systems of the same type.

Infrastructure

A wireless network centered about an Access Point. In this environment, the Access Point not only provides communication with the wired network but also mediates wireless network traffic in the immediate neighborhood.

IP

*Internet Protoco*l. The standard protocol within TCP/IP that defines the basic unit of information passed across an Internet connection by breaking down data messages into packets, routing and transporting the packets over network connections, then reassembling the packets at their destination. IP corresponds to the network layer in the ISO/OSI model.

Appendix B: Specifications

Software

Standards Compliance

- IEEE 802.11 / 802.11b Standard
- IEEE 802.3 Standard
- IEEE 802.1d MAC Bridges Standard

Wireless LAN Features

- Fully compliant with IEEE 802.11 / IEEE 802.11b DSSS devices
- Provide 11 / 5.5 / 2 / 1 Mbps wireless connectivity to the wireless clients
- Auto fallback data rate under noisy environment
- IEEE 802.11 Wireless function
- Distributed Coordination Function (DCF)
    - CSMA/CA
    - Backoff Procedure
    - NAV Management
    - ACK Procedure
    - Retransmission of unacknowledged frames
- RTS/CTS Handshake
- Duplicate Detection and Recovery
- Beacon Generation
- Probe Response
- Fragmentation and Reassembly
- Wired Equivalent Privacy Algorithm
- Authentication Algorithm
- Power Management
- Short Preamble and Long Preamble
- Association / Re-association / De-association

Operating System Compatibility

CE OS Version (Driver)	Device Type	Device Name
WinCE 2 .11	Handheld PC	HPC 3.0 / HPC Pro
WinCE 2.12	Handheld PC	N/A
WinCE 3.x	Handheld PC	HPC 2000
	Palm sized PC	PocketPC
		PocketPC 2002
WinCE .NET (4.0)	Handheld PC	N/A
	Palm sized PC	N/A

Roaming

- Seamless roaming within the 802.11 and 802.11b wireless LAN infrastructure

Security Features

- 40-bit key plus 24-bit initialization vector (as defined by IEEE 802.11 WEP)
- 104-bit key plus 24-bit initialization vector (128 RC4)

Configuration and Management

- Clear LED Indicators for real time monitor current network status

Hardware

Interface

- One 2.4GHz RF interface for Wireless LAN connection

Radio Characteristics

- Frequency Band: 2.400 ~ 2.4835 GHz ISM Band (subject to local regulations)
- Spreading: Direct Sequence Spread Spectrum (11-chip Barker sequence)
- Modulation
  - CCK: 11Mbps and 5.5Mbps
  - DQPSK: 2Mbps
  - DBPSK: 1Mbps
- Number of Channels
  - 1-11 channels for US, Canada (FCC)
  - 1-14 channels for Japan (TELEC)
  - 1-13 channels for Europe (ETSI)
  - 10-13 channels for France
- Data Rate: 11Mbps / 5.5Mbps / 2Mbps / 1Mbps
- Antenna: Two chip antennas
- Transmit Power: 13dBm (typical)
- Receiver Sensitivity: -84dBm @ FER < 8%

Power and Operation Environment Requirement

- Power Consumption
  - Continuous: TX mode: 260 mA
  - Idle mode: 160 mA

Temperature

- Operating: 0°C to 55°C
- Storage: -20°C to 75°C
- Relative Humidity: 5% to 80% (non-condensing)

Physical

- Dimensions: 57.04 mm (L) × 42.80 mm (W)