11Mbps High Speed Wireless LAN Compact Flash Adapter

Date of Issue: June. 7th, 2001

Technical Support

Users could download and upgrade the most recent software version from the supplier's web site or refer to the selling contact for the latest information. If you have difficulty resolving the problem while installing or using the Wireless LAN Compact Flash Adapter, please contact the supplier for support.

About This Manual

11Mbps Wireless LAN Compact Flash Adapter User Manual is first published on June, 2001. The manual includes procedures for the setup of the 11Mbps Wireless LAN Compact Flash Adapter under Windows CE 3.0 Pocket/Handheld PC. Take a moment to read through this manual and familiarize yourself with wireless technology.

Software Information

The software package works only on the Wireless LAN Compact Flash Adapter and Wireless LAN PCMCIA Card, and contains the following versions of driver and utility programs.

- Driver -- Version 0.9.2

  (The driver supports more CPU types than above, however, only above listed are tested.)

- Utility -- Version 0.9.2

  (The utility has been tested on above listed devices. Other types may work as well.)

FCC Information

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.

Federal Communications Commission (FCC) 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 or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

FCC RF Radiation Exposure Statement:

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

2. CAUTION: To comply with FCC RF exposure compliance requirements, a separation distance of at least 2.5cm must be maintained between the antenna of this device and all persons.

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Chapter 1 Introduction

The 11Mbps IEEE 802.11b Wireless LAN Compact Flash Adapter is a standard CF interface adapter integrated with wireless LAN technology. It provides you the easiest, fastest, way to access your wireless and wired network. The Wireless Compact Flash Adapter, which utilizes the latest advancement of PC industry – Compact Flash technology, allows you to install and use the card reader easier than ever before. 11Mbps data rate gives equivalent Ethernet speed to access corporate network or the Internet in a wireless environment. When installed, 11Mbps Wireless LAN Compact Flash Adapter is able to communicate with any 802.11 and 802.11b compliant products.

1-1 Features and Benefits

1. Supports 1, 2, 5.5 and 11 Mbps data rate.
2. Working range up to 800 ft. in an open environment.
3. Supports point-to-point and point-to-multipoint access.
4. Seamless connectivity to wired Ethernet and PC network LAN's augments existing networks quickly and easily.
5. Direct Sequence Spread Spectrum (DSSS) technology provides robust, interference-resistant and secure wireless connection.
6. Wireless connection without the cost of cabling.
7. Supports CE 3.0 Handheld/Pocket PC.
8. Support high security WEP encryption (64-bit and 128-bit)
9. Supports Plug and Play.
10. Easy installation.

1-2 Applications

11Mbps Wireless LAN products offers a fast, reliable, cost-effective solution for wireless client access to the network in applications like these:

1. **Remote access to corporate network information**
   E-mail, file transfer and terminal emulation.

2. **Difficult-to-wire environments**
   Historical or old buildings, asbestos installations, and open area where wiring is difficult to deploy.

3. **Frequently changing environments**
   Retailers, manufacturers and those who frequently rearrange the workplace and change location.

4. **Temporary LANs for special projects or peak time**
   Trade shows, exhibitions and construction sites where a temporary network will be practical. Retailers, airline and shipping companies need additional workstations during peak period. Auditors requiring workgroups at customer sites.

5. **Access to database for mobile workers**
   Doctors, nurses, retailers, accessing their database while being mobile in the hospital, retail store or office campus.

6. **SOHO (Small Office and Home Office) users**
   SOHO users need easy and quick installation of a small computer network.

7. **High security connection**

   The secure wireless network can be installed quickly and provide flexibility. (Please refer to page 11 for encryption configuration.)

1-3 Product Kit

11Mbps Wireless LAN Compact Flash comes with the following items. Please go through each item below. If any listed item is not included or found damaged, please contact your local dealer.

11Mbps Wireless LAN Compact Flash Kit Includes:

- 11Mbps Wireless LAN Compact Flash…….…… x 1
- Software and Documentation CD or Floppy Diskette……..……. x 1
- 11Mbps Wireless LAN Compact Flash Quick Start Guide……..……. x 1

1-4 System Requirements

The Wireless LAN Compact Flash Adapter supports the following Handheld/Pocket PCs:

Pocket PC (PPC)

- Compaq: iPaq (CPU: Strong ARM)
- HP: Jonada 525 and 548 (CPU: SH3)
- Casio: E115 and E125 (MIPS R4000)

  .....

Handheld PC (HPC)

- Sharp: Telios (MIPS R3000)
- HP: Jornada 720 (Strong ARM)
- Intel: Pentium/X86 CPU

  .....

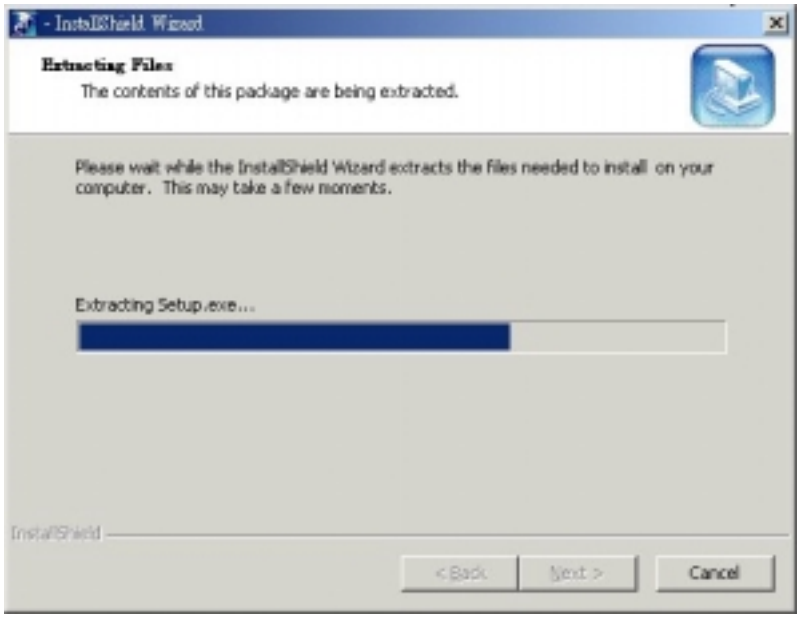
More to come, check with supplier's website.

Chapter 2 Installing Wireless Compact Flash Adapter

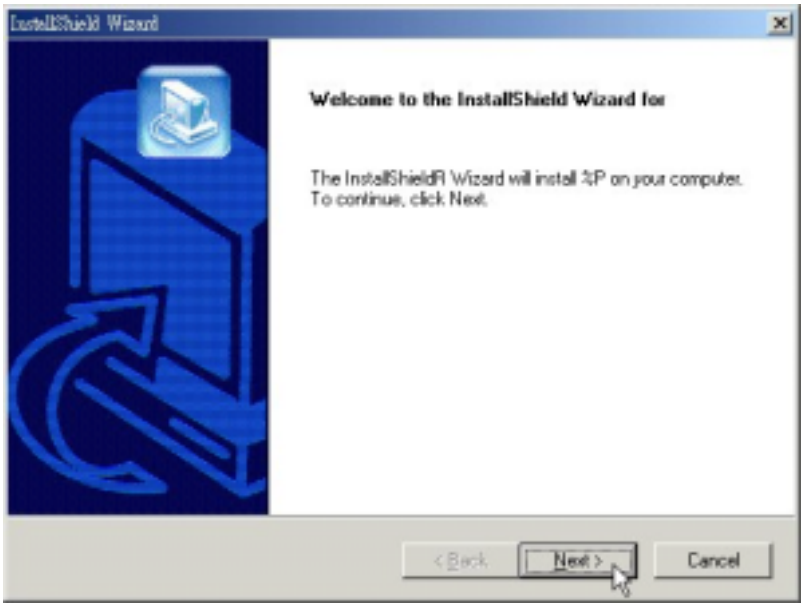
This chapter describes the installation of the 11Mbps Wireless LAN Compact Flash driver for the CE 3.0 Handheld/Pocket PC.

2-1 Install the Setup Utility

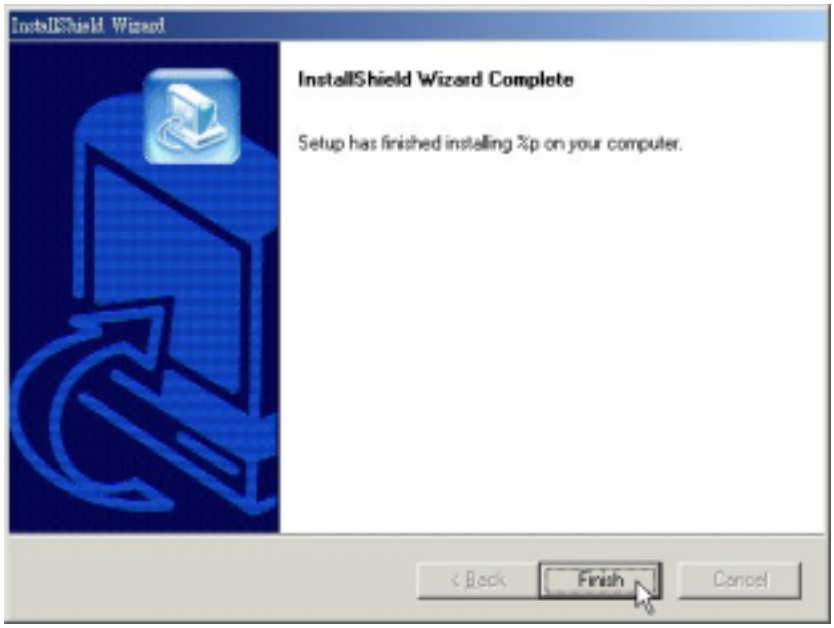
1. Establish a connection between host PC and PDA device by *Microsoft Active Sync*.
2. Execute **XIPPC.exe** (for Pocket PC) or **XIHPC.exe** (for Handheld PC) to install the driver and utility.



3. A *InstallShield Wizard* window appears. Click **Next** to proceed.



4. Follow on-screen instructions to install the Setup Utility. Click **Finish** to complete the installation. Restart your PDA.

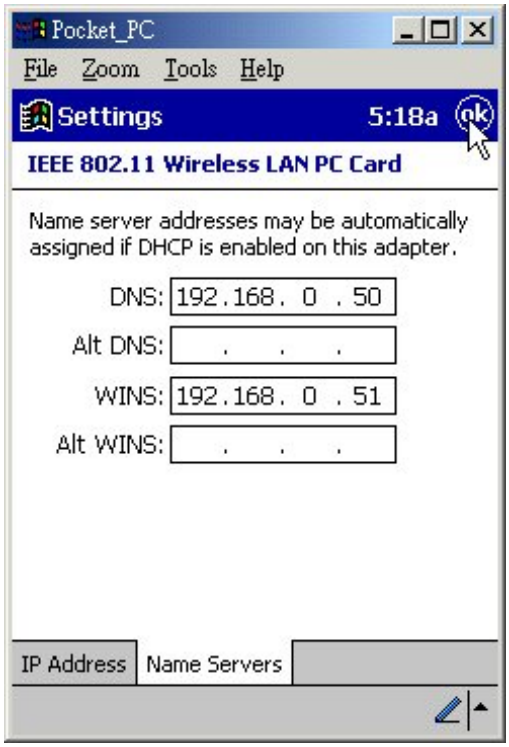


2-2 Install the Wireless LAN Compact Flash Adapter

1. Connect the 11Mbps Wireless Compact Flash Adapter to your PDA. The PDA will auto-detect the Wireless Compact Flash Adapter and an "**Unrecognized Card**" windows shows up to prompt you to enter the driver name. Enter "**wlan11**" (for Z-Com brand please type "**xi800**") and click **OK** to continue.

2. Assign an IP address to your Wireless LAN Compact Flash Adapter. You may either set the Wireless LAN Compact Flash Adapter to obtain an IP address from your DHCP server, or to be assigned with a fixed IP address.

3. Go to the **Name Servers** field. Configure the related networking parameters such as DNS and WIN information if necessary. For these IP address please consult your MIS.



Upon completion of installation, the Wireless LAN Compact Flash Adapter will start to look for an Access Point with Green LED blinking. The Green LED will stay steady once the Wireless LAN Compact Flash Adapter successfully associates with an Access Point. To configure the Wireless LAN Compact Flash Adapter please proceed to the next chapter " *Using Wireless LAN Compact Flash Adapter*".

Chapter 3 Using Wireless LAN Compact Flash Adapter

This chapter gives you assistance with detailed description of setting the 11Mbps Wireless LAN Compact Flash Adapter with the Wireless LAN Utility under Pocket/Handheld PC.

3-1 Using the Wireless LAN Utility Under Pocket PC

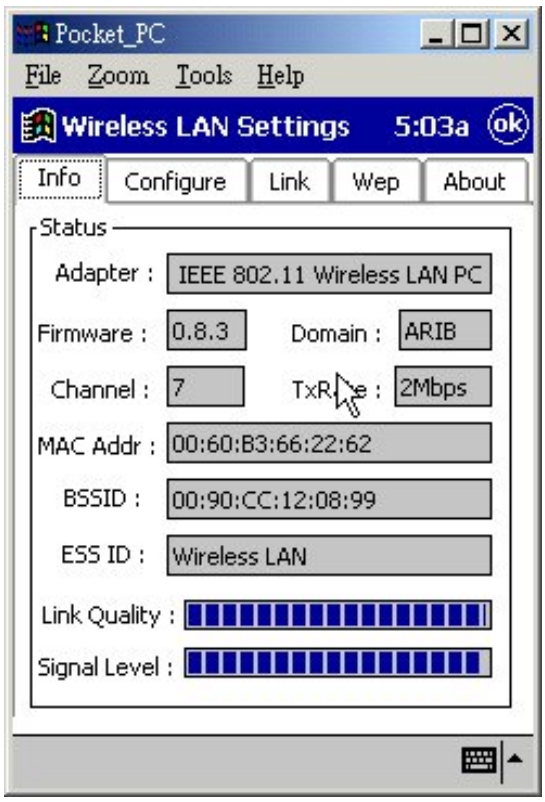
The 11Mbps Wireless LAN Compact Flash Adapter is a ready-to-use device. Its default settings perform for a typical **Infrastructure Wireless LAN**. Simply install the Wireless LAN Compact Flash Adapter onto your computer and it is ready to use. In special situations however, you may adjust configuration settings depending on how you would like to manage your wireless network. The Wireless LAN Utility provides you an easy interface to make configuration changes and perform user-level diagnostics on your Wireless LAN Compact Flash Adapter.

1. Go to **Start** → **Settings**. Go to the **System** tab, and click the "**Wireless LAN Settings**" icon.

2. A configuration window appears. The 11Mbps Wireless LAN Utility provides the 5 following items for you to configure and monitor the 11Mbps Wireless Compact Flash Adapter.

Info

The **Info** tab displays the current status of the Wireless Compact Flash Adapter.



Adapter - Displays name of the Wireless Compact Flash Adapter.

Firmware - Displays the firmware version that is equipped with your hardware.

Domain - The regulated operating frequency per country.

Channel - Displays the current channel that the Wireless Compact Flash is using.

MAC Address - It is a hardware identification number that distinguishes the unit from others.

BSSID - Shows MAC Address of the Access Point that the Wireless LAN Compact Flash Adapter associates with.

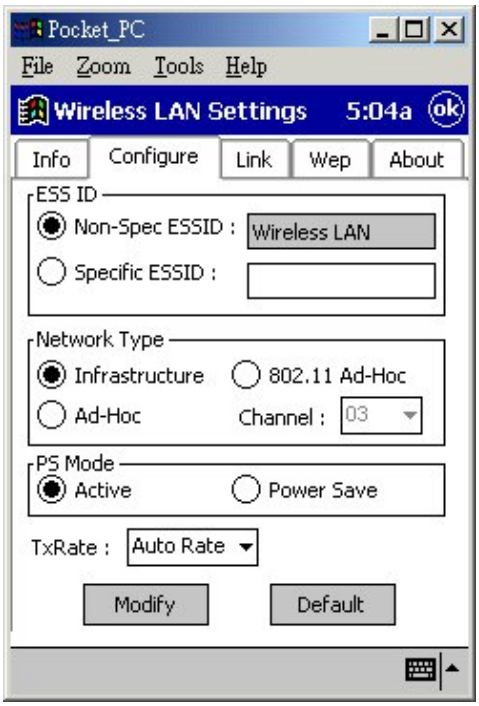
ESSID - Displays the Access Point hat the Wireless LAN Compact Flash Adapter associates with.

Link Quality - Link quality monitors the quality of the data transmission between the Wireless Compact Flash Adapter and an Access Point.

Signal Level - This bar graph displays signal strength as reported by the radio, averaged over all frames that are received from the Access Point.

Configuration

The Configuration tab contains several fields where the current parameters of the Wireless LAN Compact Flash Adapter can be viewed and changed. You will see current configuration information in terms of Network Type, ESSID, PS Mode, and Tx Rate. Upon modification of parameters for the Wireless LAN Compact Flash Adapter, click the **Modify** button to make the changes take effect.



ESSID

The SSID is an unique ID given to the Access Point. Wireless clients associating to Access Points must have the same ESSID. The default value **Non-Spec ESSID** means when the Wireless Compact Flash Adapter starts to work, it will associate with the Access Point that gives the fastest response. You may also enter a specific ESSID (Access Point) you desire to connect with. It is recommended you specify an ESSID for your Wireless LAN Compact Flash Adapter. This will prevent your computer from unintentionally connecting to a different wireless network.

Network Type

To connect your wireless station to a local network infrastructure as described in Appendix A " **Network Configuration**" on page 16, set the station operation mode to **Infrastructure** (with Access Point, default setting). In case you do not wish to connect to a network infrastructure, but prefer to setup a small wireless workgroup also described on page 17, you can enable the **Ad-Hoc** or **802.11 Ad-Hoc** (without Access Point) tick box. When the **Ad-Hoc** mode is selected, be sure to set your wireless stations with the same channel. To use the **802.11 Ad-Hoc** mode, the same channel and ESSID among wireless stations are acquired.

PS mode

The PS (Power Save) option is designed to conserve battery life of you computer. When Power Save is enabled, your 11Mbps Wireless LAN Compact Flash Adapter will go into sleep mode to minimize power consumption.

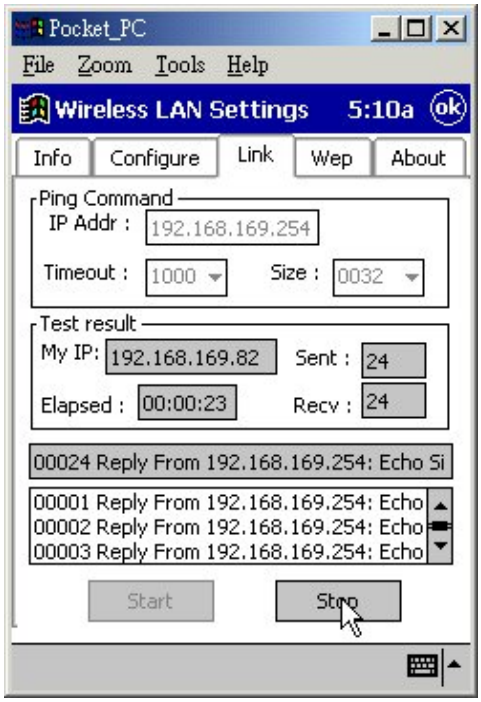
NOTE: When power saving mode is enabled, the Access Points you use need to support power saving as well so that the communication can be established.

TX Rate

The 11Mbps Wireless LAN Compact Flash Adapter provides various data rate options for you to select. Data rates options include **Fully Auto**, **Fixed 1Mb/s**, **Fixed 2Mb/s**, **Auto Select 1M or 2M**, **Fixed 5.5Mb/s**, and **Fixed 11Mb/s**. In most networking scenarios, you will see that the factory-set default "**Fully Auto**" will prove the most efficient. This setting will allow your 11Mbps Wireless LAN Compact Flash Adapter to operate at the maximum data rate. When the communications quality drops below a certain level, the Wireless LAN Compact Flash Adapter will automatically switch to a lower data rate. Transmission at lower data speeds is usually more reliable. However, when the communications quality improves again, the Wireless LAN Compact Flash Adapter will gradually increase the data rate again, until it has reached the highest available transmit rate.

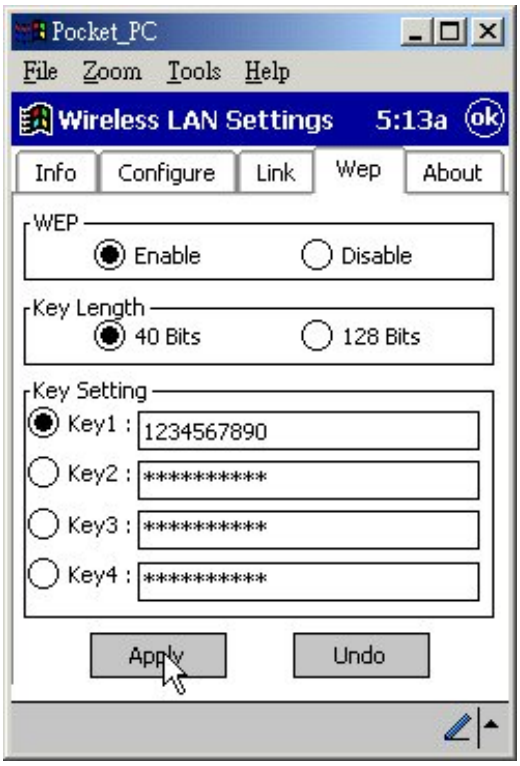
Link

Similar to Ping Command, this tool allows you to point-to-point data transmission quality between two stations. By entering IP address of another station and set the timeout and packet size you may check whether the communication has been made successfully or not.



Encryption

To prevent unauthorized wireless stations from accessing data transmitted over the network, the 11Mbps Wireless LAN Compact Flash Adapter offers highly secure data encryption, known as WEP (Wired Equivalent Privacy). If you desire to use WEP encryption, please select the **Enable** check box and set the following values.



There are two types of WEP encryption described as follows:

40 Bit – Requires wireless stations to use data encryption with 40 Bit algorithm when communicating with the Access Point.

128 Bit – Allows wireless clients to communicate with the Access Point with data 128 Bit encryption algorithm.

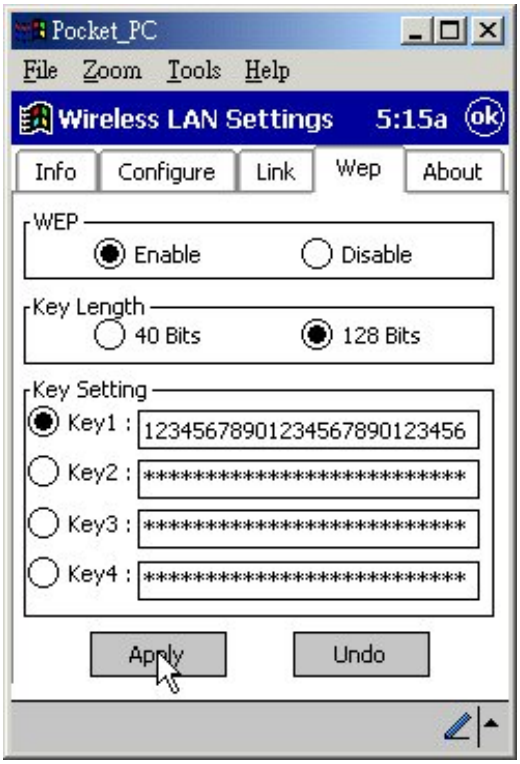
The **Encryption** tab enables you to identify up to 4 different encryption keys and select one of them to encrypt your transmission data. The key value of your choice may either be:

For 40-bit encryption:

- 10 digit hexadecimal values in the range of "A-F", "a-f" and "0-9" (e.g. 11AA22BB33, shown as above figure).

For 128-bit encryption:

- 26 digit hexadecimal values in the range of "A-F", "a-f" and "0-9", preceded by the characters values (e.g. 11AA22BB33123456789ABCDEFF, shown as below)



About

The **About** tab shows driver and utility version of the Wireless LAN Compact Flash Adapter.

3-2 Using the Wireless LAN Utility Under Handheld PC

The usage of Wireless LAN Utility under Handheld PC is exactly the same with that under Pocket PC. The only difference is the window size. The following is brief description on the Wireless LAN Utility. For more details please refer to *3-1 Using the Wireless LAN Utility Under Pocket PC*.

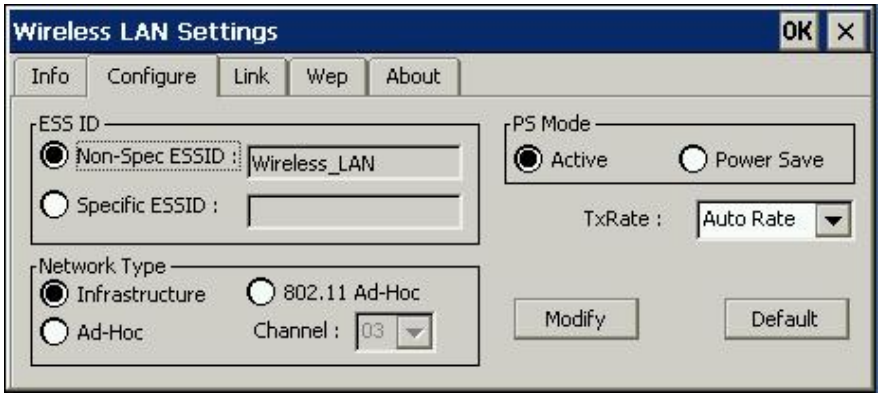
1. Go to **Start→Settings**. Click the "**Wireless LAN Settings**" icon. A configuration window shows up. When you minimize the window by clicking the **OK** button on the upper right corner of the utility window, a system tray icon will be loaded on the toolbar. Clicking on the icon will open the configuration window again. The description of each item is as follows:

Info:

This item shows the current information on the 11Mbps Wireless LAN Compact Flash Adapter such as Adapter Name, Firmware, Domain, Channel, Tx Rate, MAC Address, BSSID, ESSID, Link Quality and Signal Level.

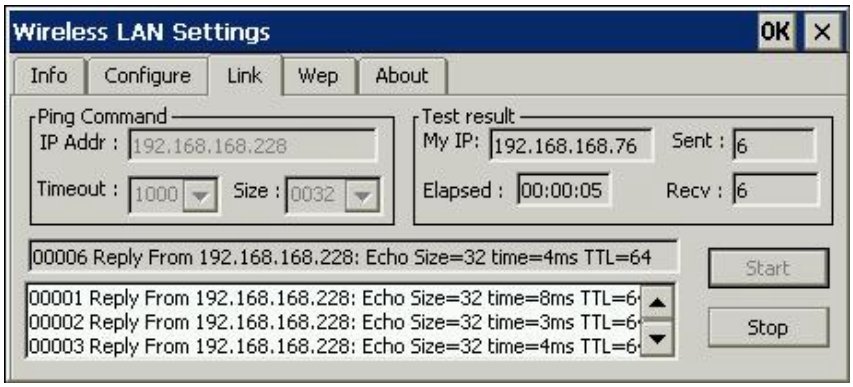
Configure:

This item allows you to modify the configuration parameters for the 11Mbps Wireless Compact Flash Adapter such as ESSID, Network Type, Channel, PS mode, and Tx Rate. After making changes on the configuration, click on the **Modify** button to make the changes take affect.



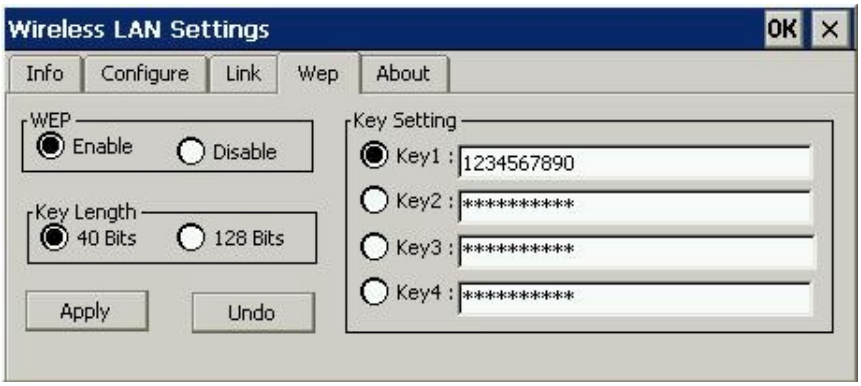
Link:

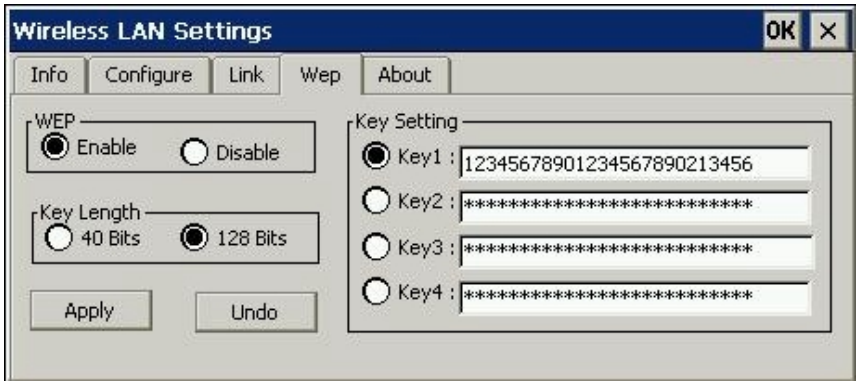
Similar to Ping Command, this tool allows you to check point-to-point data transmission quality between two nodes. By entering IP address of another node and set the timeout and packet size you may know whether the communication has been made successfully or not.



WEP

The encryption function enables you to encrypt and decrypt your wireless data, making your data more secure. To enable the WEP encryption, select the "**Enable**" check box, select the Key Length, either 40 bit or 128 bit, and enter the WEP Keys in the Key field. *For 40-Bits encryption the key values are* 10 digit hexadecimal values in the range of "A-F", "a-f" and "0-9" (e.g. 11AA22BB33). *For 128-Bits encryption the key values are* 26 digit hexadecimal values in the range of "A-F", "a-f" and "0-9" (e.g. 11AA22BB33123456789ABCDEFF). After entering the WEP keys, choose a WEP Key to use and then click **Apply** to make the configuration take effect.





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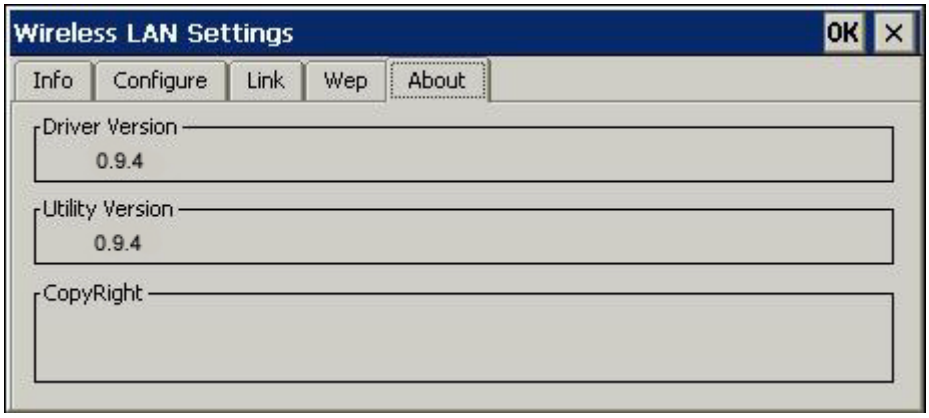

Caveat

- Due to WinCE's nature of the first application at power-on resuming to that at power-off, if you are stuck at the utility program, you may use the PDA's reset bottom to terminate it. And activate it again when needed.
- Sometimes, your wireless connection to AP may disconnect for any reason. You can reset and force a connection request by going to utility program, then select "config", check parameters, then select "modify" to force a re-scan.
- If your device roams to a new AP which is in a different subnet, you may need to remove and re-insert the Wireless LAN Compact Flash Adapter to force an execution of "release and renew" of an re-assignment of IP address in a DHCP Access Point environment.

Appendix A Network Configuration

The 11Mbps Wireless LAN products support the same network configuration options of the legacy Ethernet LANs as defined by IEEE 802 standard committee.

The 11Mbps Wireless LAN products can be configured as:

- Ad-Hoc for departmental or SOHO LANs
- Infrastructure for enterprise LANs
- LAN-Interconnection for point-to-point link as a campus backbone.

A-1 Network Topology

- **Ad-Hoc**

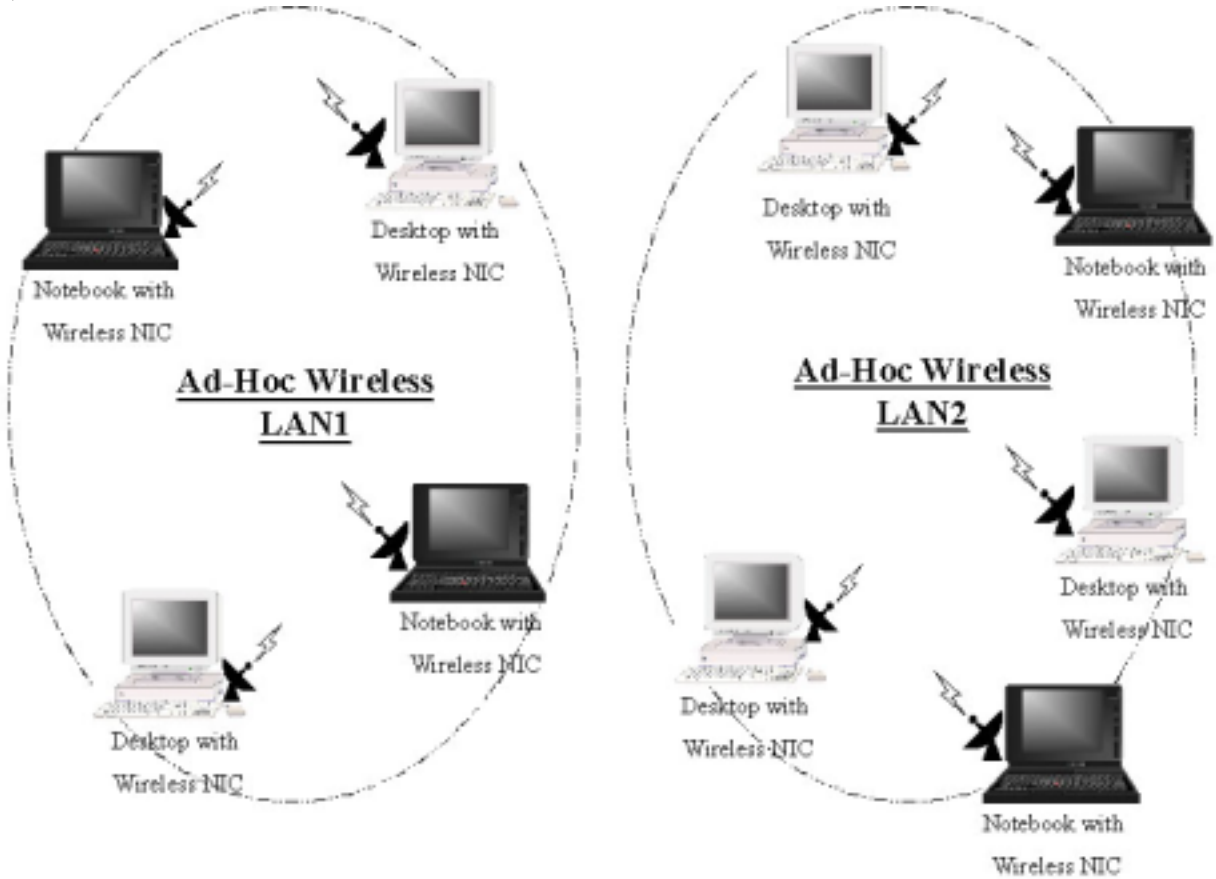

Fig An Example of Ad-Hoc Wireless LAN

An Ad-Hoc wireless LAN is a group of computers, each equipped with one wireless adapter, connected as an independent wireless LAN. Computers in a specific Ad-Hoc wireless LAN must be configured at the same radio channel.

Ad-Hoc wireless LAN is applicable at a departmental scale for a branch or SOHO operation.

◆ **Infrastructure**

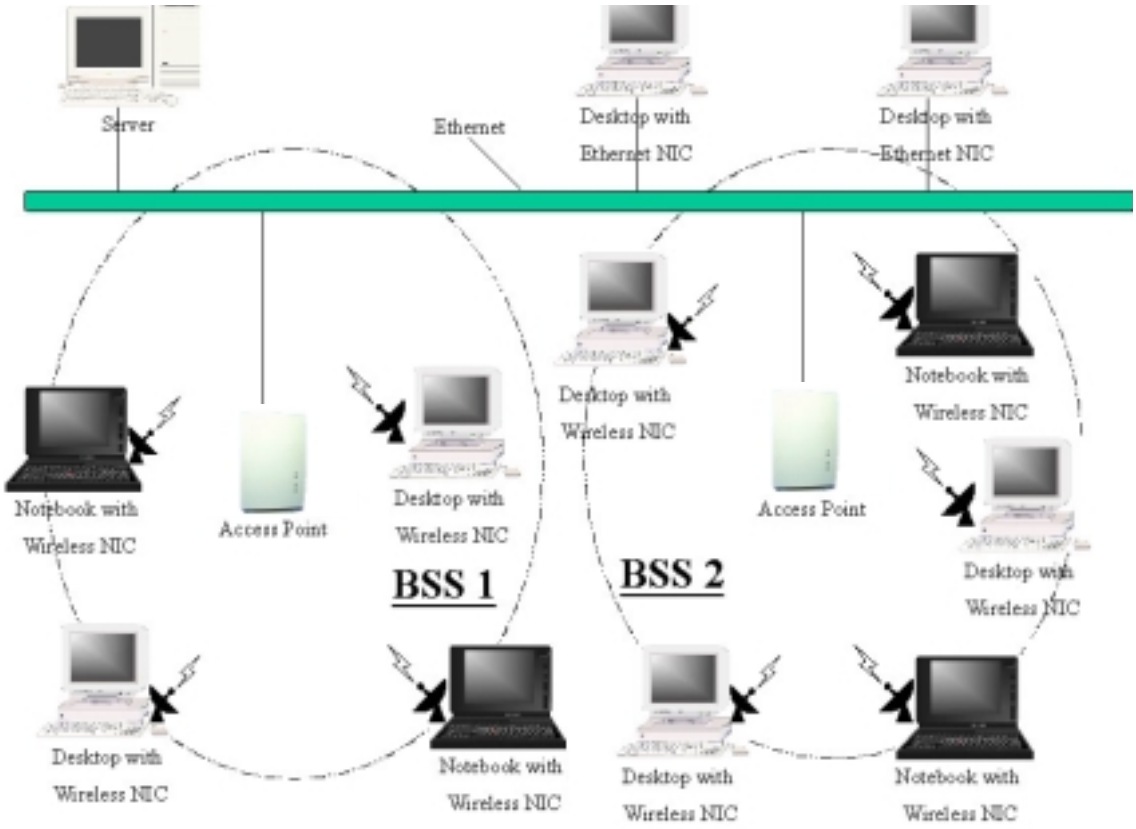

Fig An Example of Infrastructure Wireless LAN

The 11Mbps Wireless LAN devices provides access to a wired LAN for wireless workstations. An integrated wireless and wired LAN is called an Infrastructure configuration. A group of wireless LAN PC users and an Access Point construct a Basic Service Set (BSS). Each wireless-equipped PC in this BSS can talk to any computer in the wired LAN infrastructure via the Access Point.

Infrastructure configuration will extend the accessibility of a wireless station to the wired LAN. Multiple Access Points will allow roaming and it will increase the transmission range. The Access Point is also able to forward data within its BSS. The effective transmission range in an infrastructure LAN is **doubled**.

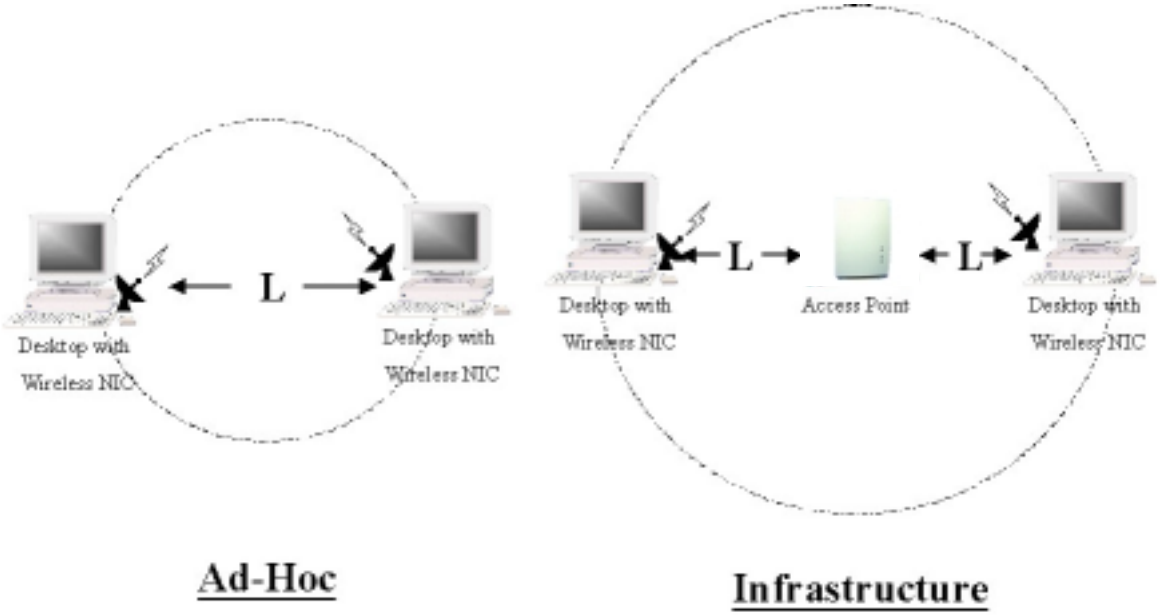

Fig The effective Transmission Range