LBP01
User's Manual

(December 2001)

TRADEMARKS
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NOTE
Information in this manual is subject to change without notice.

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Regulations Information

Federal Communications 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 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 Caution:

To ensure continued compliance, use only shielded interface cables when connecting to computer or peripheral devices. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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.

Important Note:

FCC Radiation Exposure Statement:

- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.
- This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

Safety Precautions

- Be sure to read and follow all warning notices and instructions.
- In order to extend the life of the device it is advised to store it in a protective casing whenever carrying the computing device on travel and not operating the device.
- Never use abrasive materials or rinse the device with liquids.
- At all times, it will be the responsibility of the end-user to ensure that an outdoor antenna installation complies with local radio regulations.
- Do not service the product by yourself. Refer all servicing to qualified service personnel.
- In order to limit Radio Frequency (RF) exposure, the following rules should be applied:
  - Install the antenna in a location where a distance of 20 cm from the antenna may be maintained.
  - While installing the antenna in the location, please do not turn on power of the device.
  - While the device is working (transmitting or receiving), please do not touch or move the antenna.
  - Do not operate a portable transmitter near unshielded blasting caps or in an explosive environment unless it is a type especially qualified for such use.

1 Introduction

This chapter introduces the features and functions of the product.

1.1 Product Description

Congratulations on purchasing this PCMCIA Wireless Local Area Network (WLAN) Card.

Your WLAN PC Card's 11 Mbps data rate provides an equivalent Ethernet speed to access corporate networks or the Internet in a wireless environment. When installed, the WLAN PC Card is able to communicate with any 802.11b-compliant product, allowing you to work anywhere in the coverage area, enjoying its convenience and mobility.

Your PC Card features:

- IEEE 802.11b and Wi-Fi-compliant 11 Mbps WLAN access solution
- Seamless wireless roaming
- Direct Sequence Spread Spectrum (DSSS) standard
- Wired Equivalent Privacy (WEP) 128-bit data encryption
- Frequency range at 2.4 GHz ISM band
- Automatic data rate selection at 11 Mbps, 5.5 Mbps, 2 Mbps, and 1 Mbps
- PCMCIA Type II Plug-and-Play
- High sensitivity and output power

Typical applications include:

- IEEE 802.11b-compliant WLAN radio
- Portable PC wireless modem
- Point-to-Point data
- Wireless home networking
- Small Office Home Office (SOHO) wireless application

1.2 Product View

Ref	Component	Description
❶	**Power and Transmit/Receive Indicator**	Glows red when the WLAN PC Card is inserted into a PCMCIA slot and is deriving power from it. Glows green when the WLAN PC Card is sensing/ transmitting wireless data.
❷	**Integrated Antenna**	Allows the WLAN PC Card to receive and transmit wireless data.

2 Setting Up

This chapter tells you how to setup the device for use.

2.1 System Requirements

To use the device, you need:

- Operating system: Windows 98, Windows Me, Windows 2000, Windows CE
- Available PCMCIA slot on your computing device
- Driver CD
- Windows installation disks (in case you are prompted for the operating system files)

2.2 Installing the Driver and Utility

> **CAUTION:** Do not insert your WLAN PC Card into the PCMCIA slot at this stage until you are required to do so.

For Windows 98/Me/2000

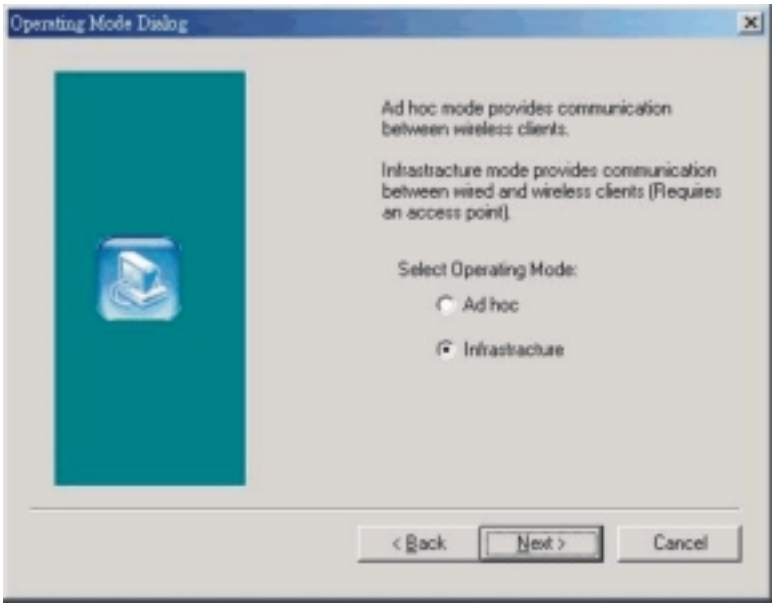
> **NOTE:** When using Windows 2000 and before proceeding, make sure you have logged on as "Administrator."

1. Insert the driver CD into the CD-ROM drive and double-click the file `SETUP.EXE` under the `Win98_Me_2000` directory.
2. Follow the onscreen instructions to continue.

3. When the next screen appears, select the first option “Application & PCMCIA Drivers” to install the utility (Configuration and Monitor Application) and the WLAN PC Card driver.

NOTE: If the WLAN PC Card driver have been previously installed and have not been uninstalled prior to this latest installation, the new driver will overwrite the old one without prompting you.

4. After you have confirmed the driver’s “Destination Location” as well as the “Program Folders,” choose the mode of operation whether Ad-Hoc or Infrastructure on the **Operating Mode Dialog** window.



- **Ad-Hoc Mode**
  In Ad-Hoc mode the wireless stations can communicate directly with each other.

  When selecting the Ad-Hoc mode you need to specify the ESSID and the Channel parameters.

  – ESSID: All stations participating in the Ad-Hoc network should have the same ESSID.

  – Channel: Select the 14 channels available for use.

- **Infrastructure Mode**
  In Infrastructure mode the use of an Access Point (AP) is necessary for wireless stations to communicate with each other.

  When selecting the Infrastructure mode you need to specify the ESSID.

  – ESSID: Specify the ESSID of the AP to which the wireless station will be associated with.

NOTE: You can still change the Operating Mode afterwards using the Configuration & Monitor Application utility.

5. After you have made your selection, click **Next** and a window listing your installation setting appears. If the settings are correct, click **Next** to continue. In case you made a mistake, click **Back** to make the correction and follow the onscreen instructions to exit the installation.

   > **NOTE:** For Windows 2000, select **Yes** when the "Digital Signature Not Found" window appears.

6. Re-boot your system after completing the installation.

For Windows CE

1. Insert the driver CD into the CD-ROM drive and double-click the file `SETUP.EXE` under the `WinCE` directory.
2. Follow the onscreen instructions to continue.
3. Re-boot your system after completing the installation.

2.3 Inserting the WLAN PC Card

> **NOTE:** Make sure that the WLAN PC Card's driver as well as the Configuration & Monitor Application utility has been properly installed (see previous section).

1. Find an available Type II PCMCIA slot in your computing device
2. With the WLAN PC Card adapter's 68-pin connector facing the PCMCIA slot, slide the card completely into the slot (refer to your system manual for the correct orientation).

   > **NOTE:** If you have never installed the driver of the PCMCIA slot of your system, then Windows® would automatically detect the new hardware and may prompt you to install it. Have the Windows installation CD ready (in case you are prompted for it) and follow the onscreen instructions to install the driver.

2.4 Removing the WLAN PC Card

The PCMCIA slot permits “hot swapping” of PC Card, allowing you to insert or remove the WLAN PC Card from the slot whenever you like, even when the power to your computer is on. However, you are advised to always disable the WLAN PC Card prior to removing it from the PCMCIA slot. This allows the Windows® operating system to log off from the network server, disable the driver properly through the Control Panel, and disconnect power to the PCMCIA slot.

3 Using the Configuration & Monitor Application Utility

In special circumstances, you may need to change configuration settings depending on how you would like to manage your wireless network. The Configuration & Monitor Application utility enables you to make configuration changes and perform user-level diagnostics on your WLAN PC Card as well as monitor the status of communication.

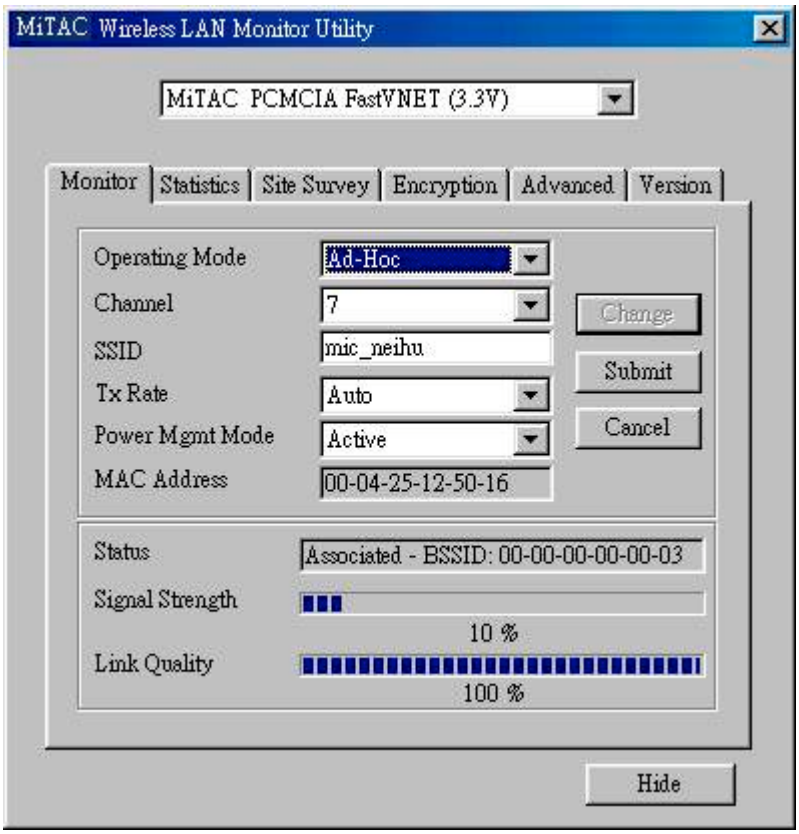
3.1 For Windows 98/Me/2000

1. Make sure that the Configuration & Monitor Application utility has been installed properly (see Chapter 2).
2. As soon as a link is established, the Configuration & Monitor Application utility appears as an icon on the Windows' system tray. Double-click on this icon.

   NOTES:
   - When the station is in Infrastructure mode and not associated with an AP, color of the icon is red.
   - When the station is in Infrastructure mode and associated with an AP, color of icon is blue.
   - When the station is in Ad-Hoc mode, color of icon is always blue.
   - When the station is in Ad-Hoc mode and the WLAN PC Card is resetting and initializing, color of icon is red.

3. When the Configuration & Monitor Application utility appears onscreen, make sure that "PCMCIA Card" is selected on the very top of the window.

Monitor



The following configuration parameters are shown:

- **Operating Mode**
  Allows you to choose between *Ad-Hoc* or *Infrastructure* mode. In *Ad-Hoc* mode the wireless stations can communicate directly with each other. In *Infrastructure* mode the use of an Access Point (AP) is necessary for wireless stations to communicate with each other.

- **Channel**
  This item is available only if *Ad-Hoc* mode was selected in the previous field. Select the 14 channels available for use.

- **SSID**
  When using the wireless station in an *Ad-Hoc* mode then all participating stations should have the same SSID. When using the wireless station in an *Infrastructure* mode the SSID must be the same as the SSID of the AP it is associated with.

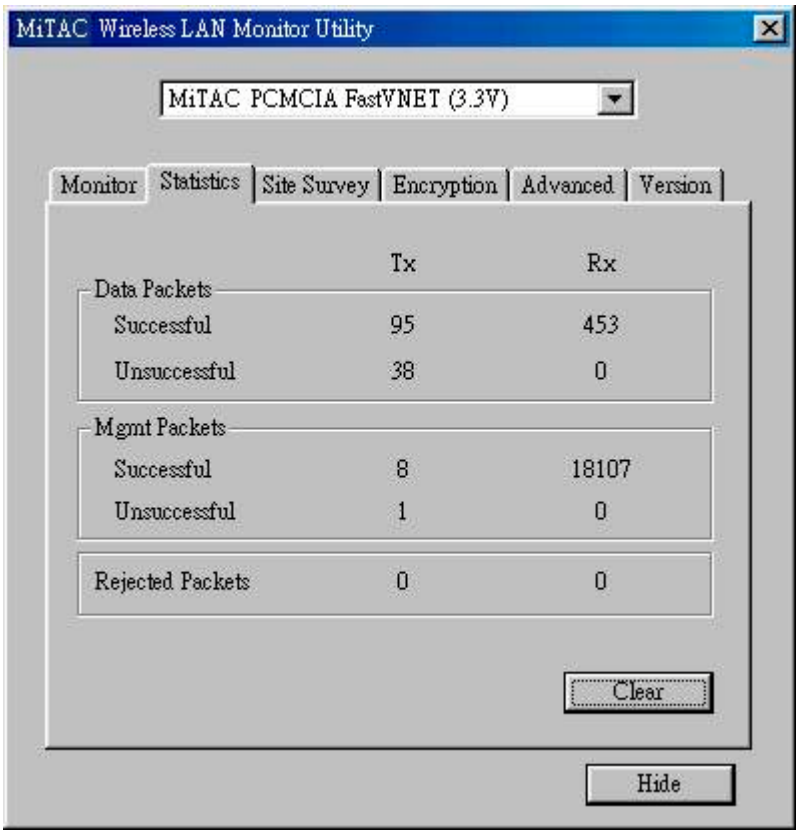
- **TxRate**
  Allows you to specify the transmission rate or choose *Auto*.

- **Power Mgmt Mode**
  Allows you to enable or disable power management.

- **MAC Address**
  On a Local Area Network (LAN) or other network, the MAC (Media Access Control) address is your computer's unique hardware number. On an Ethernet LAN, it is the same as your Ethernet address.

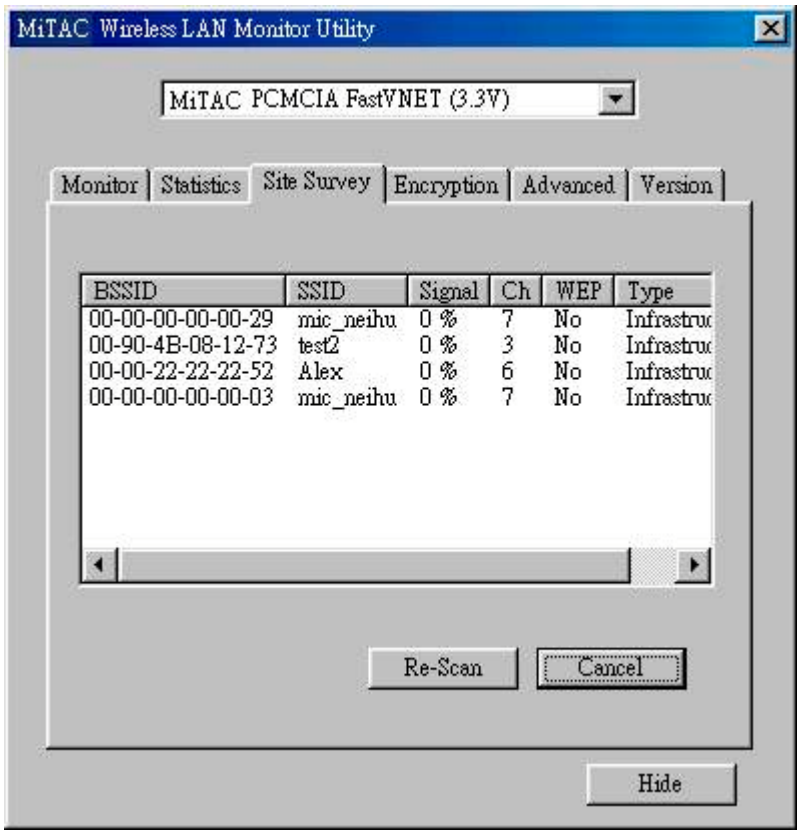
The communication status is also shown (BSSID of the AP to which the WLAN PC Card is associated, Signal Strength, and Link Quality). To change the configuration parameters press **Change**, make your changes then click **Submit** to save your changes.

Statistics



The **Statistics** utility allows you to view the statistic (Packets) information (Data Packets, Mgmt Packets, and Rejected Packets). To renew or update the list of statistics, press **Clear**.

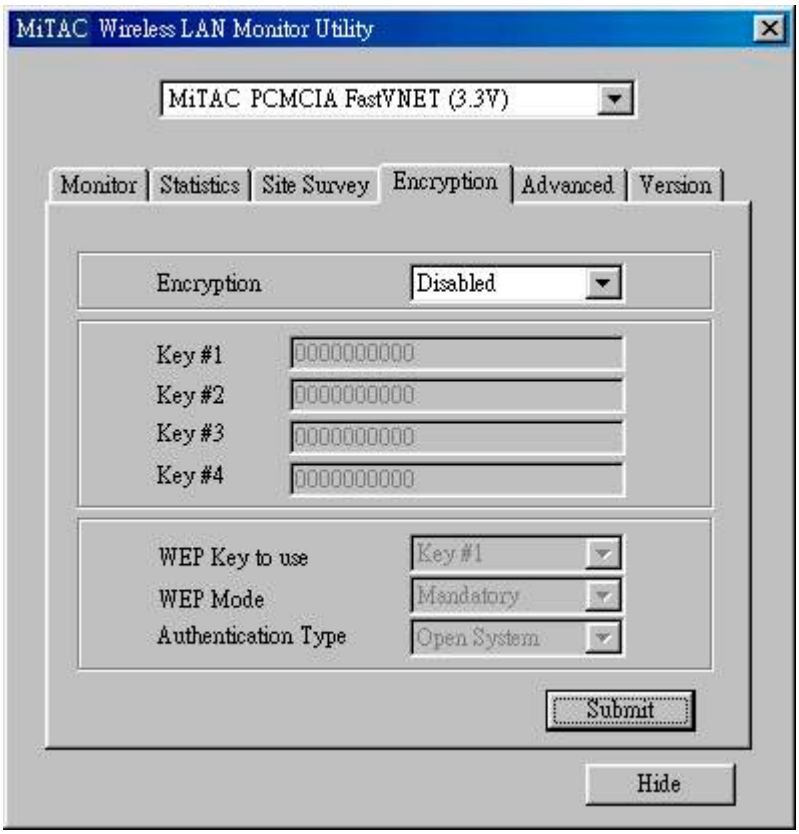
Site Survey



The **Site Survey** utility allows you to scan all the channels to locate all the APs (Access Points) within range of your WLAN PC Card. When an/various AP(s) are located, information regarding the BSSID and SSID, signal strength and channel where the AP operates, whether or not WEP encryption is used, and the operating mode is shown. Click **Re-Scan** to update the list.

To associate with any of the APs listed, double-click on your choice (on the BSSID field) and the utility will take you back to the **Monitor** utility showing you the parameters of the newly established connection.

Encryption



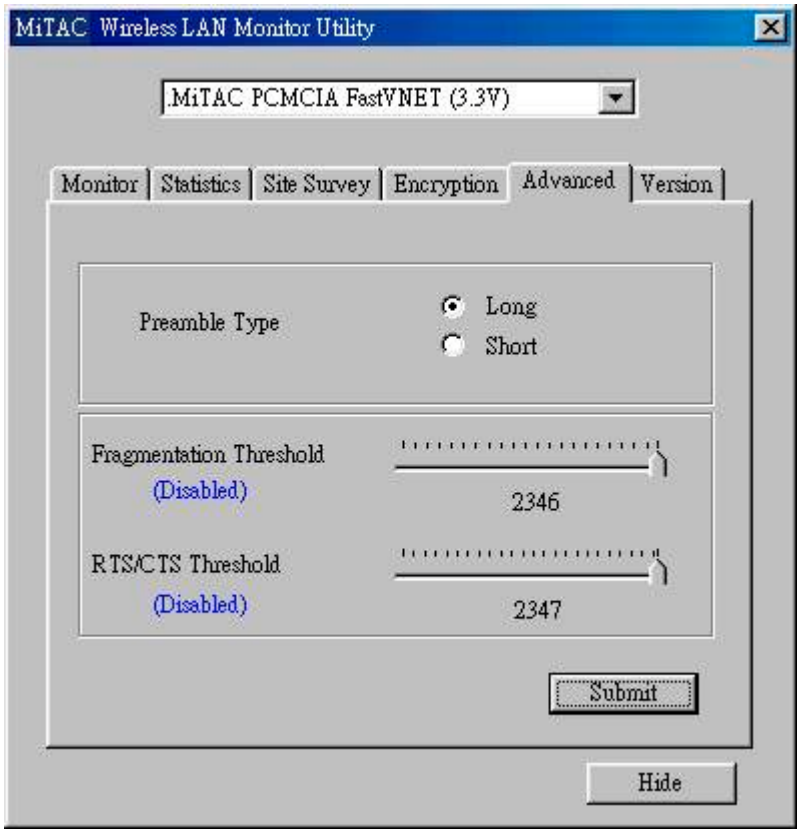
The **Encryption** utility allows you to set four different WEP keys and specify which one to use. To set encryption:

1. Choose *Enabled* on the **Encryption** window.
2. Select any of the available WEP keys (**Key #1** to **#4**) on the **WEP Key to use** window. The WEP keys must be in HEX (hexadecimal) format.
3. Select the **WEP Mode** (*Mandatory* or *Optional*).
    - If *Mandatory* is selected, then not only must you use WEP encryption but also any other station you are communicating with must also use WEP encryption for a link to be established. This requirement is part of the IEEE 802.11b standard.

- If *Optional* is selected, then your station can communicate with every other station regardless if they use WEP encryption or not.

4. Select the **Authentication Type** (*Open System* or *Shared Key*).
5. Press **Submit** for any changes to take effect.

Advanced



The **Advanced** utility allows you change the following advanced configuration settings:

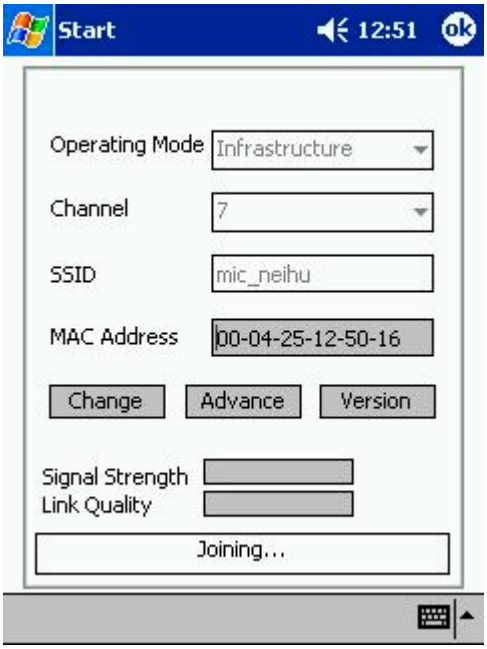
- **Preamble Type**
  Before selecting *Short*, make sure that the other station(s) and AP supports this feature. The WLAN PC Card has an auto-detect feature that allows it to select the **Preamble Type** depending on the **Preamble Type** of the AP it is associated with.

- **Fragmentation Threshold**
  RTS/CTS Threshold
  Allows you to set the Fragmentation Threshold (threshold for the activation of the fragmentation mechanism) as well as the RTS Threshold (threshold for the activation of the RTS/CTS mechanism). Transmitter contending for the medium may not hear each other. RTS/CTS mechanism can solve this "Hidden Node Problem." If the packet size is smaller than the preset RTS Threshold size, the RTS/CTS mechanism will not be enabled. To enable Fragmentation and RTS/CTS Threshold, move the slide bar with your mouse and then use the right and left arrow keyboard keys to select an exact number. The figure shows the recommended configuration setting.

3.2 For Windows CE

1. Make sure that the Configuration & Monitor Application utility has been installed properly (see Chapter 2).

2. Start the Configuration & Monitor Application utility on your portable computing device. The following screen appears. Click **Change** to edit any of the values except MAC Address.



Operating Mode

Allows you to choose between *Ad-Hoc* or *Infrastructure* mode. In *Ad-Hoc* mode the wireless stations can communicate directly with each other. In *Infrastructure* mode the use of an Access Point (AP) is necessary for wireless stations to communicate with each other.

Channel

This item is available only if *Ad-Hoc* mode was selected in the previous field. Select the 14 channels available for use.

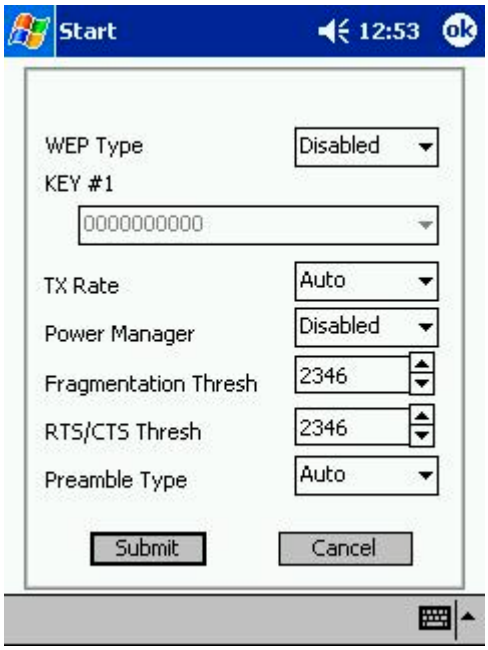
SSID

When using the wireless station in an *Ad-Hoc* mode then all participating stations should have the same SSID. When using the wireless station in an *Infrastructure* mode the SSID must be the same as the SSID of the AP it is associated with.

MAC Address

On a Local Area Network (LAN) or other network, the MAC (Media Access Control) address is your computer's unique hardware number. On an Ethernet LAN, it is the same as your Ethernet address.

Upon clicking **Advance**, the following screen appears:



WEP Type

Allows you to choose between *64 Bit* and *128 Bit*, or disable WEP encryption.

Key #1 ~ #4

Select any of the available WEP keys (**Key #1** to **#4**). When *64 Bit* **WEP Type** was selected in the previous item then the WEP keys must be in decimal format. When *128 Bit* **WEP Type** was selected then the WEP keys must be in HEX (hexadecimal) format.

TX Rate

Allows you to specify the transmission rate or choose *Auto*.

Power Manager

Allows you to enable or disable power management.

Fragmentation Thresh
RTS/CTS Thresh

Allows you to set the Fragmentation Threshold (threshold for the activation of the fragmentation mechanism) as well as the RTS Threshold (threshold for the activation of the RTS/CTS mechanism). Transmitter contending for the medium may not hear each other. RTS/CTS mechanism can solve this “Hidden Node Problem.” If the packet size is smaller than the preset RTS Threshold size, the RTS/CTS mechanism will not be enabled.

Preamble Type

Before selecting *Short*, make sure that the other station(s) and AP supports this feature. The WLAN PC Card has an auto-detect feature that allows it to select the **Preamble Type** depending on the **Preamble Type** of the AP it is associated with.

After making the desired changes, click **Submit** to go back to the previous screen.

A Appendix

A.1 Specifications

NOTE: Specifications are subject to change without notice.

Parts		Specifications
MAC (AT76C502A)		Wireless interface compliant with IEEE 802.11b-standard, wireless LAN MAC unit with ARM7TDMI RISC processor, integrated 128-byte transmit and 128-byte receive FIFOs, wireless MAC layer function
Baseband (RF3000)		On-chip ADCs and DACs, RSSI, AGC BPSK/QPSK/CCK, supports antenna diversity
Memory	EEPROM	ATMEI 4K SPI serial EEPROM (AT25040)
	SRAM	Standard 128 K x 8 SRAM
Transceiver (RF2948)		45 ~ 500 MHz IF Quad Demod, on-chip variable baseband filters, quadrature modulator and upconverter, 2.7 ~ 3.6 V operation, 2.4 GHz PA driver
LAN/Mixer (RF2494)		Single 2.7 ~ 3.6 V power supply, 2400 ~ 2500 MHz operation, two gain settings: 28 dB or 12 dB, 4.5 dB cascaded NF, high gain mode
Interface		PCMCIA Type II interface supply voltage (Vcc): +3.3 V_{DC}, +5V_{DC}
Dimension (W×H×D)		54×5×90 mm
Weight		Less than 30 g
Environment temperature		Operating: 0°C (32°F) to 55°C (131°F)
Regulation		FCC, CE, UL
OS support		Windows 98/Me/2000/CE

A.2 Uninstalling the Utility and Driver

Configuration & Monitor Application Utility

For Windows 98/Me/2000

1. Exit the Configuration & Monitor Application utility if it is currently active.
2. Select the "PC Card (PCMCIA)" icon by clicking on **Start**, then **Settings**, then **Control Panel** and stop the WLAN PC Card.
3. Select the "Uninstall Configuration & Monitor Application" option by clicking on **Start**, then **Programs**, then **802.11 Wireless LAN.**

> **NOTE:** If during the uninstall process you receive an error message, insert the driver CD and try to uninstall again.

For Windows CE

Uninstall the Configuration & Monitor Application utility as you would normally remove any other application or program on your portable computing device.

WLAN PC Card

For Windows 98/Me –

1. Select the "Network" icon by clicking on **Start**, then **Settings**, then **Control Panel**.
2. Select the "WLAN PC Card" from the list and click on **Remove.**
3. When the system prompts you to re-boot, select "Yes."

For Windows 2000 –

1. Make sure that the WLAN PC Card is plugged into the PCMCIA slot.

2. Select the WLAN PC Card under **Device Manager.**
3. Click on **Uninstall.**