

WaveBuddy WLAN PC Card/PCI/USB Adapter

User Guide

EWP-813WA1

EWU-531WA1

EWC-351WA1

Version 1.0

11Wave Technology Inc.

INFORMATION TO USER

Federal Communications Commission Statement

This product has been tested and complies with the specifications 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. The antenna used for this transmitter must be installed to provide a separation distance of least 20 centimeters from all persons and must operate in conjunction with other antenna or transmitters. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to 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 is found 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 or device
- ◇ Connect the equipment to an outlet other than receiver's
- ◇ Consult a dealer or an experienced radio/TV technician for assistance

Notice: The Part 15 radio device operates on a non-interference basis with other devices operating at this frequency. Any change or modification not expressly approved by the party responsible could void the user's authority to operate the device.

Regulatory

The wireless LAN Card must be installed and used in strict accordance with the manufacturer's instructions. This device complies with the following radio frequency and safety standards.

USA - Federal Communications Commission (FCC)

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference that may cause undesired operation.

Europe - R&TTE Directive

This device complies with the specifications listed below:

- ☒ ETS 300-826 General EMC requirements for Radio equipment.
- ☒ ETS 300-328 Technical requirements for Radio equipment.
- ☒ EN60950 Safety requirements for Radio equipment.

EU Countries not intended for use

The ETSI version of this device is intended for home and office use in Austria, Belgium, Denmark, Finland, France (with Frequency channel restrictions), Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom.

The ETSI version of this device is also authorized for use in EFTA member states Iceland, Liechtenstein, Norway and Switzerland.

Table of Contents

1. INTRODUCTION	1
1.1 THE WAVEBUDDY WIRELESS LAN NIC	1
1.2 FEATURES	1
1.3 PACKAGE CONTENTS	1
1.4 SYSTEM REQUIREMENTS	2
2. NETWORK CONFIGURATION AND PLANNING	3
2.1 WIRELESS LAN BASIC	3
3. INSTALLATION FOR WINDOWS 9X/ME/2000/XP	4
3.1 WHAT YOU NEED TO KNOW ABOUT WINDOWS 9X/ME/2000/XP	4
3.2 WHAT YOU WILL NEED	4
3.3 INSTALL PCI ADAPTER DRIVER	4
3.4 INSTALL PCI ADAPTER UTILITY	5
3.5 INSTALL PC CARD/USB ADAPTER DRIVER AND UTILITY	9
3.6 UNINSTALL PROCEDURE UNDER WINDOWS 9X/ME	13
3.7 UNINSTALL PROCEDURE UNDER WINDOWS 2000/XP	13
4. INSTALLATION FOR WINDOWS NT 4.0	15
4.1 WHAT YOU NEED TO KNOW ABOUT WINDOWS NT 4.0	15
4.2 WHAT YOU WILL NEED	15
4.3 INSTALL PCI ADAPTER	15
4.4 INSTALL PC CARD	16
4.5 INSTALL UTILITY	17
4.6 UNINSTALL PROCEDURE UNDER WINDOWS NT 4.0	17
5. WLAN CONFIGURATION & MONITOR UTILITY	18
5.1 HOW TO ACCESS THE WLAN CONFIGURATION & MONITOR UTILITY	18
5.2 USING THE WLAN CONFIGURATION & MONITOR UTILITY	18
5.3 COLLABORATING WITH WINDOWS XP	23
APPENDIX A	25
APPENDIX B : GLOSSARY	27

1. Introduction

1.1 The WaveBuddy Wireless LAN NIC

Thank you for purchasing the WaveBuddy Wireless LAN product. The WaveBuddy WLAN Network Interface Card (NIC) family includes:

- WLAN PCI Adapter/56K Modem Combo
- WLAN PC Card
- WLAN USB Adapter

The WLAN NIC provides access to Wireless Local Networks (WLANs) using the IEEE 802.11b Standard.

The product is compatible with Windows 98/ME/2000/XP with Plug-and-Play capability. For Windows NT, the installation follows typical hardware installation procedures. Once the driver and utility software is installed, you can use the Configuration Utility to set up the device.

1.2 Features

- IEEE 802.11b Direct Sequence high rate compatible
- High data rate, 11/5.5/2/1 Mbps
- Auto Rate fallback
- IPX, NetBEUI, TCP/IP protocols supported.
- Wired Equivalent Privacy Algorithm (WEP) (64 bits/128 bits)
- 802.11 Power save in infrastructure mode
- Passive/Active scan. Long/Short preamble
- RTS/CTS handshake
- Site Survey
- Roaming
- Dynamic configuration
- Beacon and Probe response generation in an IBSS.
- Plug-and-Play and easy setup

1.3 Package Contents

Please make sure that your received the following with

- One WaveBuddy WLAN card/adaptor
- One Software Tools CD (Drivers and User Guide on CD)
- Quick Installation Guide
- One USB cable for the USB Adapter

1.4 System Requirements

- Operating System: MS Windows 9x/ME/2000, Windows NT 4.0 with Service Pack 4 or later, Windows XP
- Desktop PC or notebook PC with CD-ROM drive
- 10M bytes free disk space for utility and driver installation.

2. Network Configuration and Planning

2.1 Wireless LAN Basic

A Wireless LAN is an implementation or extension of regular LAN using radio wave as the transmission medium instead of cables. A computer equipped with a WLAN NIC is called a WLAN Station.

A WLAN can be configured in following modes:

- **Infrastructure Mode:** A device called Access Point acts as the base station for WLAN Stations. The AP is connected to a wired LAN to extend network services to WLAN Stations. The combination of an AP and its WLAN Stations is called a Basic Service Set (BSS). Every BSS should have a unique ID, called SSID, that is shared by the AP and its WLAN Stations.
- **Ad-Hoc (Point-to-Point) Mode:** A set of WLAN Stations can talk to each other in this configuration. There is no need for an AP in this case. Unlike Infrastructure mode that uses SSID to establish connections, Ad-Hoc WLAN Stations need to share the same Channel among them. The Channel in this context is actually the radio frequency used by the WLAN NIC.

In general, when a WLAN Station is working in Infrastructure Mode, it will scan the neighborhood looking for an AP with the same SSID. It will then automatically switch to the Channel used by that AP. As a result, there is no need to select the Channel on the WLAN Station in this mode.

On the other hand, in Ad-Hoc Mode, all WLAN Stations must select a common Channel before making the connections. SSID is irrelevant in this case.

3. Installation for Windows 9x/Me/2000/XP

Use the procedures described in this section to install and configure the WLAN NIC under Windows 9x/Me/2000/XP. If you are using Windows NT, please go to the next section.

3.1 What You Need to Know About Windows 9x/Me/2000/XP

Although similar in appearance, Windows 9x/Me/2000/XP and Windows NT 4.0 use different procedures when installing a new hardware.

Throughout this section it is assumed that you have a basic working knowledge of Windows 95/98/Me/2000/XP and of how to install new network devices on them.

Windows 9x/Me/2000/XP operating system supports the “Plug-and-Play” feature. This means that the first you install a new hardware, the operating system will detect the hardware and automatically search and install the driver.

3.2 What You Will Need

During the installation, you may be prompted to load operating system files from the Windows installation disk. Please keep this disk handy.

You will need the Software Tools CD provided with your package.

Note: With Windows 2000/XP, you need to log in as the “Administrator” or with the privilege to install the WLAN NIC.

3.3 Install PCI Adapter Driver

The WaveBuddy WLAN PCI Adapter is a WLAN/56K Modem combo. If you do not need the modem capability, please skip its installation process.

1. Turn off the PC and remove the power cord. Plug the WLAN PCI Adapter into a free slot.
2. Restart the PC, Windows will detect the WLAN PCI Adapter and start driver installation.
3. Select “Search for a suitable driver for my device (recommended)”.
4. Click “Next”.
5. Select “Specify a location” as shown in the following.
6. Please insert the CD as given into CD-ROM.
7. Browse to your CD-ROM drive (assuming it is the D: drive). Go to **D:\WaveBuddy\WLAN Card & Adapter\Drivers \PCI-miniPCI\OS** and click on “OK”. Please select the correct OS you are using.

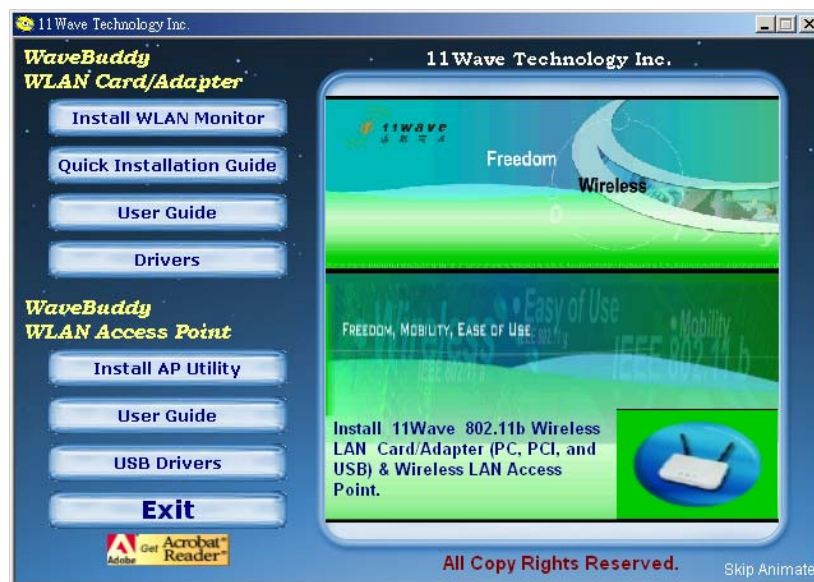
8. Click on “Next”.
9. Window will automatically look for the proper driver itself.
10. Click on “Next”.
11. Please click on “Yes” to continue the installation.
12. Windows has finished installing the WLAN software. Please click on “Finish”.

For Smart Link 56K Modem card, follow the same steps. Its driver can be found in **D:\WaveBuddy\WLAN Card & Adapter\Drivers\ PCI-miniPCI\Modem\OS**.

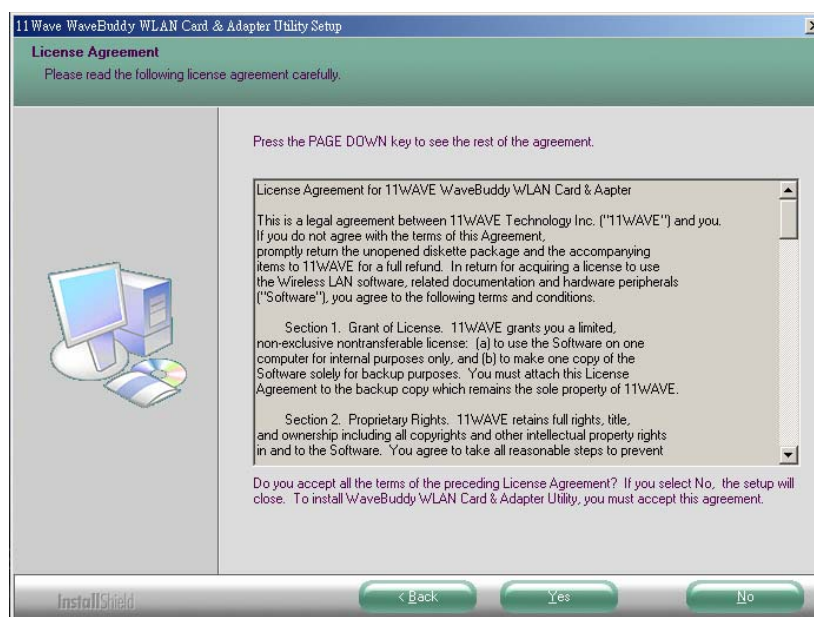
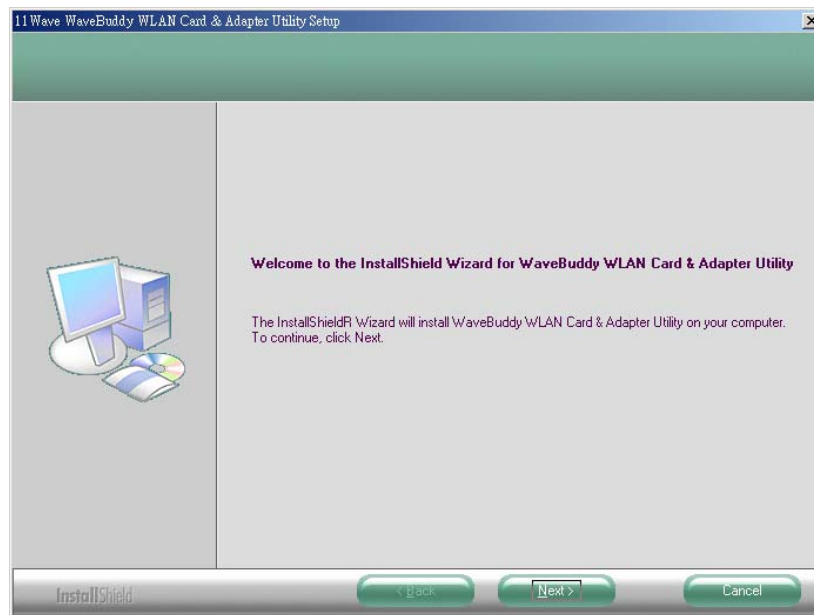
Please refer to readme.txt (**D:\WaveBuddy\WLAN Card & Adapter\Drivers \PCI-miniPCI\Modem\OS\readme.txt**) for more details on the Smart Link 56K Modem.

3.4 Install PCI Adapter Utility

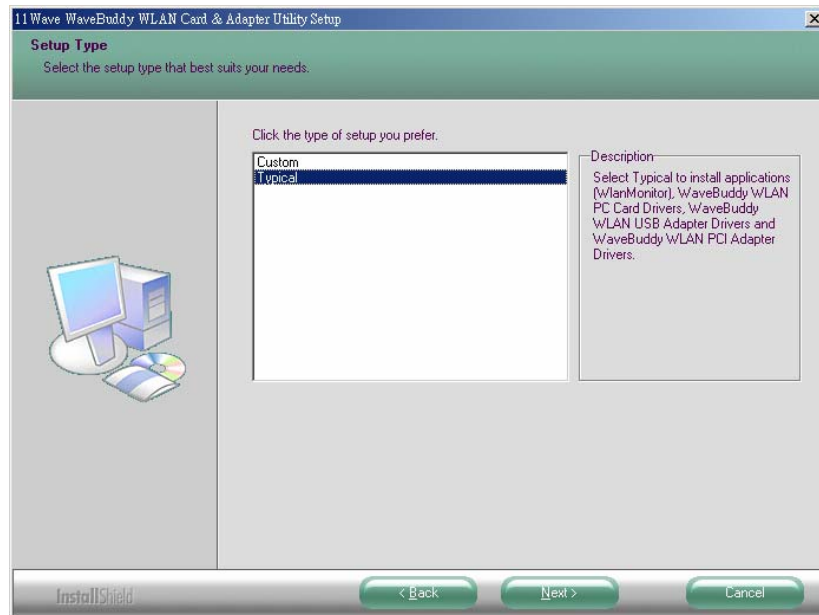
1. Insert the given Installation CD into your CD-ROM driver. Unless you have deactivated the autorun feature of Windows, the screen shown below should appear automatically. If this screen doesn’t appear automatically, you can access the installation by clicking the **Autorun** button and choosing **Run**. In the drop-down box provided type **D:\Autorun.exe** (where D: is the letter of your CD-ROM drive). Alternately, double-click My Computer and double-click the **Autorun.exe** icon in the folder that appears or browse to your CD-ROM drive and go to **\WaveBuddy\WLAN Card & Adapter\ WLAN Monitor Utility** and click on the **Setup.exe**.



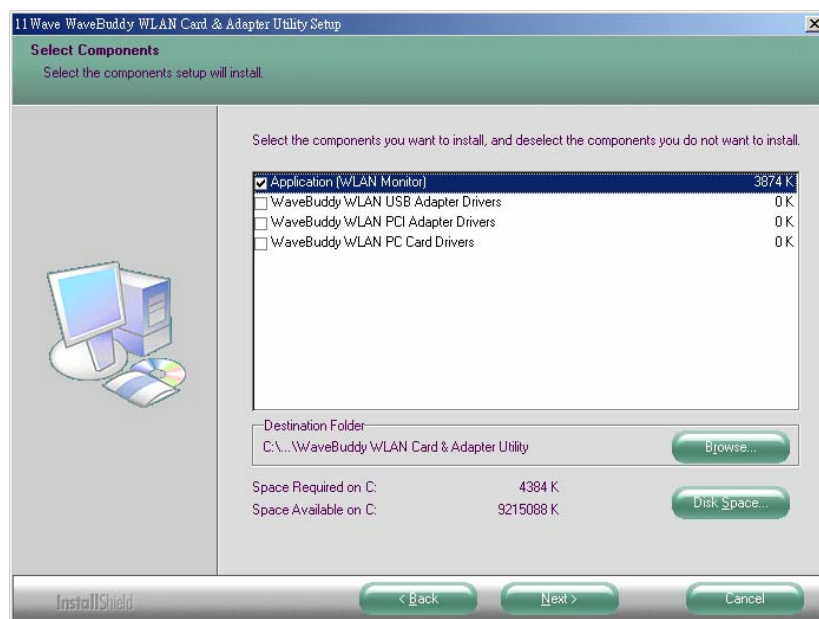
2. Click the “**Install WLAN Monitor**” button to start the application installation process.
3. Follow the installation instructions from the InstallShield Wizard by pressing the “**Next**” button.



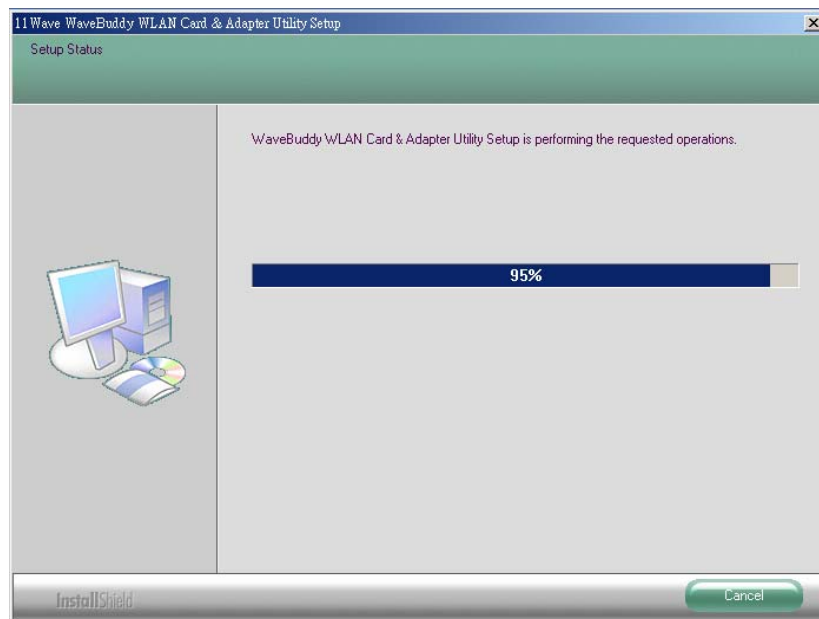
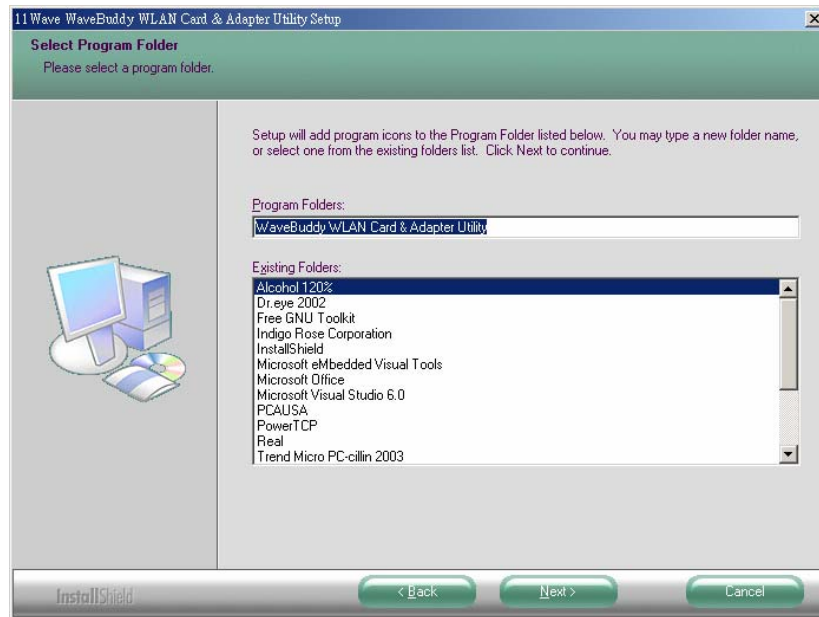
4. You will be asked which Setup Type to use.

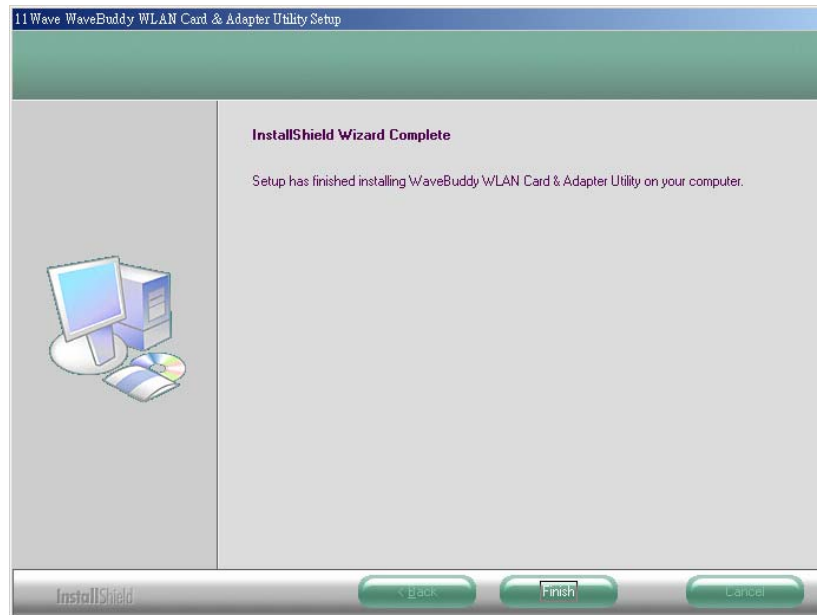


5. Choose the “**Custom**” installation. You need only select “Application (WLAN Monitor)” components in this case. Click “**Next**” to continue.



6. Windows will prompt you to add program icons to Program Folder. Click “**Next**” to continue.

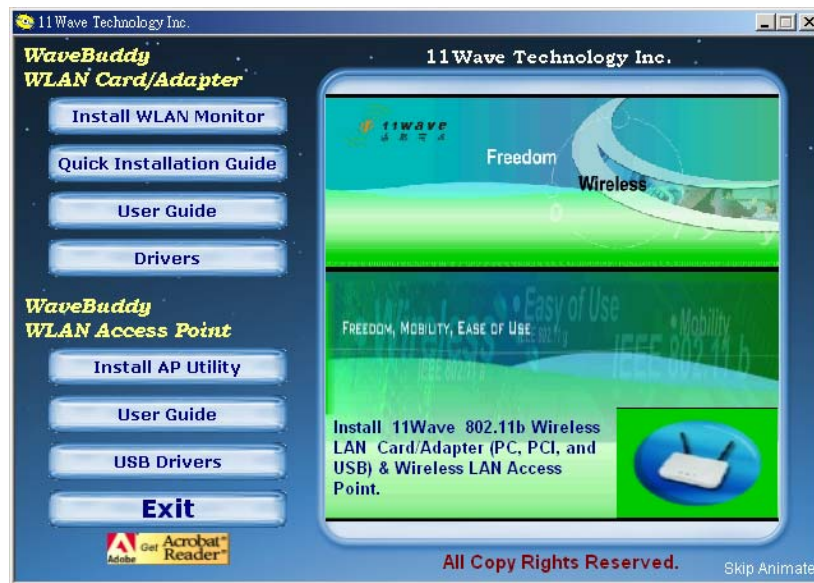




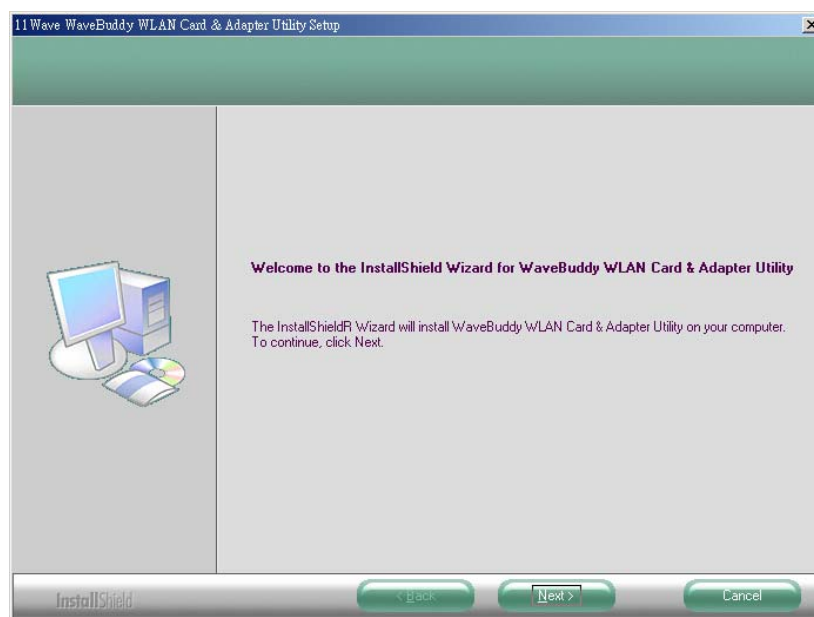
7. Click “**Finish**” the installation.

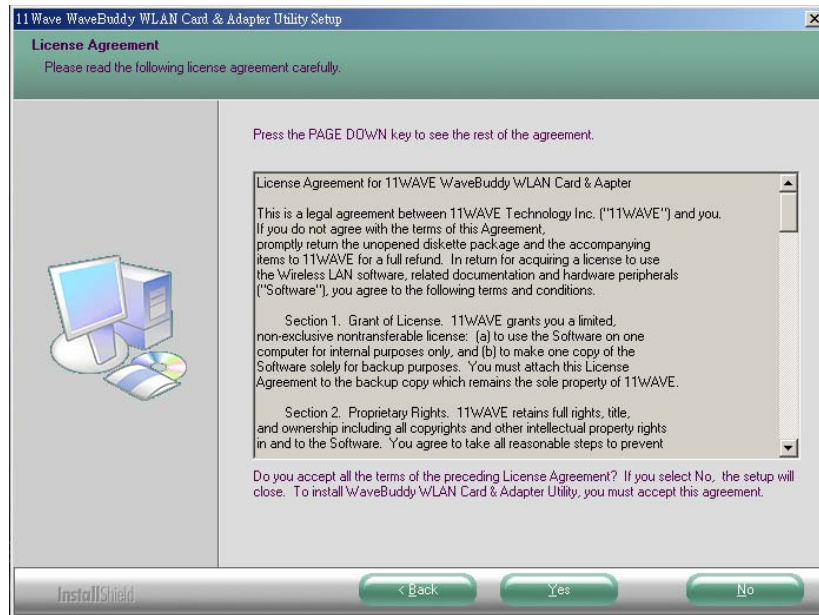
3.5 Install PC Card/USB Adapter Driver and Utility

1. Power on the computer. **Do not insert the PC Card or connect the USB Adapter just yet.** The setup procedure described below will install both the drivers and the utility software.
2. Insert the given Installation CD into your CD-ROM driver. Unless you have deactivated the autorun feature of Windows, the screen shown below should appear automatically. If this screen doesn't appear automatically, you can access the installation by clicking the **Autorun** button and choosing **Run**. In the drop-down box provided type **D:\Autorun.exe** (where D: is the letter of your CD-ROM drive). Alternately, double-click My Computer and double-click the **Autorun.exe** icon in the folder that appears or browse to your CD-ROM drive and go to **\WaveBuddy\WLAN Card & Adapter\ WLAN Monitor Utility** and click on the **Setup.exe**.

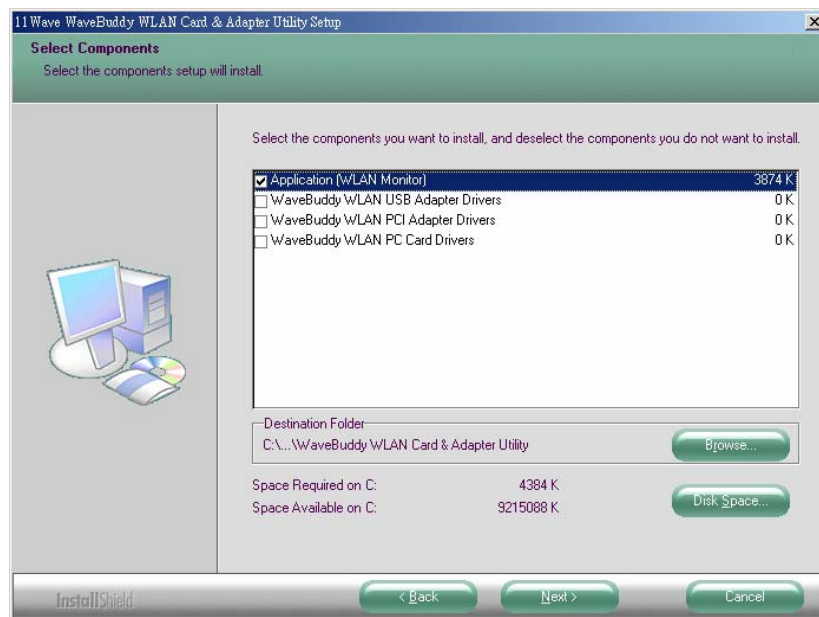


3. Click the **“Install WLAN Monitor”** button to start the driver and utility installation process.
4. Follow the installation instructions from the InstallShield Wizard by clicking the **“Next”** button.

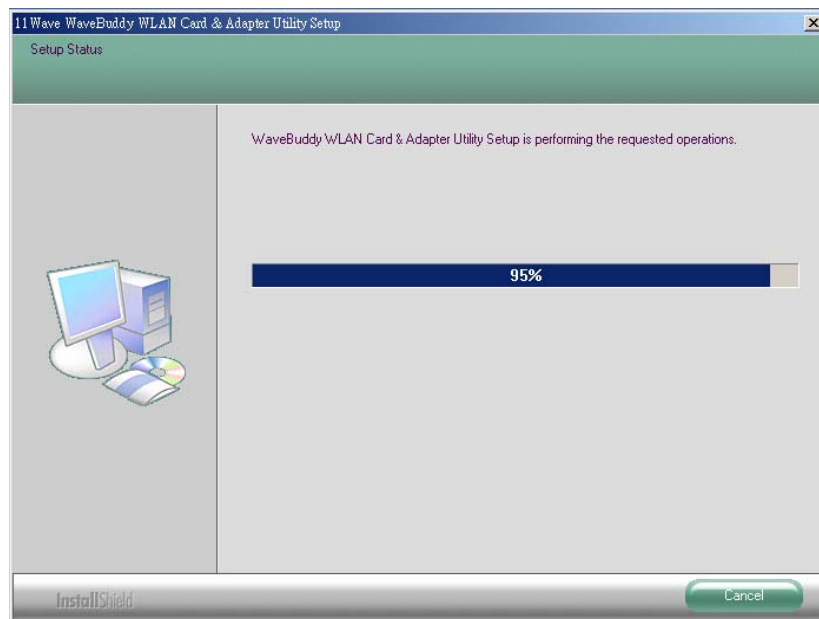
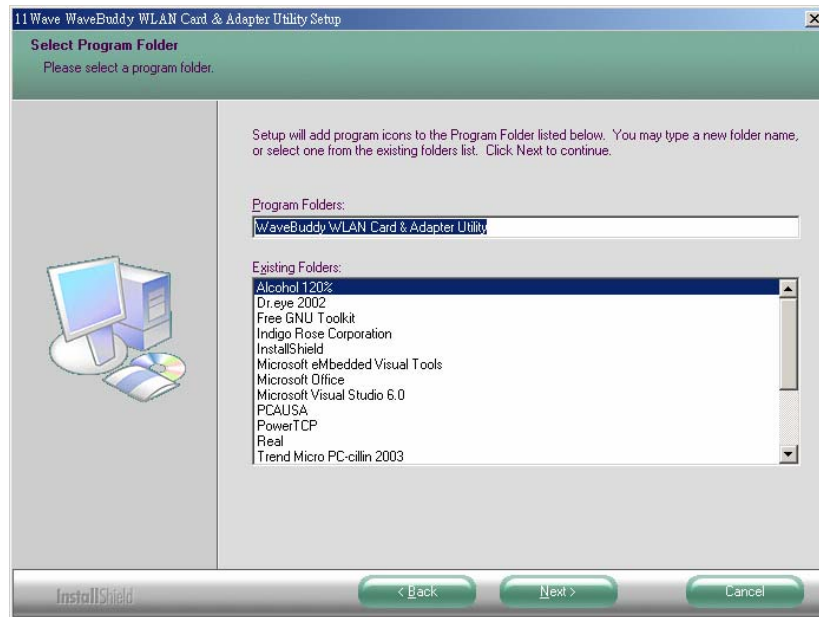


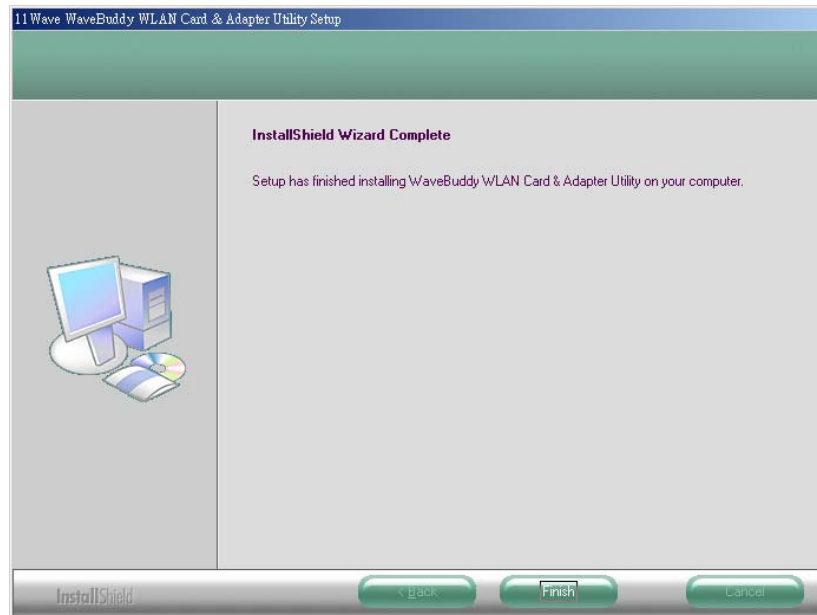


5. You will be asked with the Setup Type to use. Select Custom and choose the type of hardware being installed. Make sure the "Application(WLAN Monitor)" is also selected.



6. Windows will prompt you to add program icons to Program Folder. Click "Next" to continue.





7. Click **“Finish”** to complete installation.

8. **Now you may insert the PC Card or connect the USB Adapter.**

3.6 Uninstall Procedure Under Windows 9x/Me

In order to uninstall the WLAN Configuration & Monitor Utility from Windows 9x/Me, you must press the “Change/Remove” button under the Control Panel (Start -> Settings -> Control Panel -> Add/Remove Programs -> WaveBuddy WLAN Card & Adapter Utility).

Note: It is recommended to stop the WLAN device and exit the utility prior to starting the uninstallation procedure.

The above procedure uninstalls the WLAN Configuration & Monitor Utility, but not the driver for the device. In order to uninstall the WaveBuddy WLAN card/adapter driver from Windows 9x/Me, you must double click on the “Network” option in the “Control Panel” (Start -> Settings -> Control Panel). Select the “WaveBuddy WLAN PC/PCI/USB Card/Adapter” from the list and press the “Remove” button. The system will prompt you to re-boot. Click "Yes" to re-boot.

3.7 Uninstall Procedure Under Windows 2000/XP

Follow the same “Add/Remote Programs” procedure to remove the WLAN Monitor Utility as described in the last section.

In order to uninstall the WaveBuddy WLAN card/adapter driver from Windows 2000/XP you must select it in the Device Manager of Windows 2000/XP and press “Uninstall”.

If for any reason you cannot apply this procedure, you can uninstall the device using the

following procedure:

1. Open “Control Panel”
2. Double click “Add/Remove Hardware” icon to start the wizard
3. When the Add/Remove Hardware wizard starts click “Next”
4. Select “Uninstall/Unplug a device” and click “Next”
5. Select “Uninstall a device” and click “Next”
6. Check the “Show hidden devices” checkbox and locate the device in the device list
7. Select the device and click “Next”
8. Select “Yes, I want to uninstall the device” and click “Next”
9. Click “Finish”
10. The device is removed from your system configuration

Note: It is recommended to stop the WLAN device and exit the WLAN Monitor prior to starting the uninstallation procedure.

4. Installation for Windows NT 4.0

4.1 What You Need to Know About Windows NT 4.0

Although Windows NT 4.0 is similar in appearance with Windows 95/98/Me, and Windows 2000, they have different philosophy when installing a new hardware.

Throughout this section it is assumed that you have a basic working knowledge of Windows NT 4.0 and of how to install new network cards on them. However, in this paragraph, some specific features of Windows NT 4.0 are briefly explained.

Unlike Windows 95/98/Me, and Windows 2000, Windows NT 4.0 does not support the “Plug & Play” and “Hot Swapping” features.

In Windows NT 4.0 you need to inform the operating system about the existence of the new card in order to start installing the driver. Also, if you want to swap cards, you need to restart the PC in order to recognize the card.

Another difference between Windows 95/98/Me and Windows NT 4.0 is how these operating systems handle the “User Profiles” feature. Windows 2000 handle “User Profiles” in the same way as Windows NT 4.0.

In Windows 95/98/Me, the “User Profiles” are used only in order to customize the appearance of the desktop between the different users. However, in Windows NT 4.0, “User Profiles” play the role of accounts and are associated with certain privileges on the machine. Therefore, we have different “User Profiles” (and privileges) for simple users, power users, and administrators. The privilege settings for each user are set in the “User Manager” program of Windows NT 4.0.

4.2 What You Will Need

During the installation, you may be prompted to load operating system files from the Windows installation disk. Please have this disk handy.

You will need the Software Tools CD provided with your package.

Note: With Windows NT, you will need to log in as the “Administrator” or with the privilege to install the WLAN NIC. Also you will need to have at least NT Service Pack 4 installed.

4.3 Install PCI Adapter

- 1) Click Start->Settings->Control Panel.
- 2) Double-click the “Network” icon.
- 3) In the “Network Settings” window you will be prompted to install Windows NT Networking in case no network has been installed yet. Click “Yes” and follow the instruction on the screen. If networking had been already installed, you will see a dialog with several tabs. In the “Adapters” tab click the “Add” button. Windows NT Networking Setup will determine

the type of network adapter card that you are going to use.

- 4) When prompted to select a driver, locate the driver provided with your Drivers, and Software Tools CD.
- 5) Next Windows will start copying the files. In case there is a version conflict between one or more of the files being copied and the files in your system, you should normally keep the latest version.
- 6) Finally, when the installation has been completed, you will need to restart your computer.

Note: If the card is not working properly, after a restart procedure, you should make sure that your system has free resources ever it may shows them as being available.

4.4 Install PC Card

Since Windows NT 4.0 do not support “Plug & Play”, you must enable the detection of PC cards by the operating system by following the following procedure:

1. Click Start->Settings->Control Panel.
2. Double-click the “Devices” icon
3. Select “PCMCIA” from the list and click the “Startup” button.
4. Set the Startup type to “Boot” and click “OK”.
5. Click “Close” on the “Devices” window.

In order to let the operating system know about your new card, you must enable the Network support:

1. Click Start->Settings->Control Panel.
2. Double-click the “Network” icon.
3. In the “Network Settings” window you will be prompted to install Windows NT Networking in case no network has been installed yet. Click “Yes” and follow the instruction on the screen. If networking had been already installed, you will see a dialog with several tabs. In the “Adapters” tab click the “Add” button. Windows NT Networking Setup will determine the type of network adapter card that you are going to use.
4. When prompted to select a driver, locate the driver provided with your Drivers, and Software Tools CD.
5. During the installation, a dialog box appears asking for the I/O Base and IRQ resource information. In order to find out which values to use, go to Start -> Programs -> Administrative Tools -> Windows NT Diagnostics -> select the “Resources” tab -> press the “IRQ” button. Select one free IRQ from the list. Next, press the button “I/O Port” and choose an 0x20 free I/O space. Add these values into the dialog box. If at any point after the installation you want to change these values, go to the Control Panel -> Network, select the Adapters tab, press the Properties button, and fill in the new values.
6. Next Windows will start copying the files. In case there is a version conflict between one or more of the files being copied and the files in your system, you should normally keep the latest version.

7. Finally, when the installation has been completed, you will need to restart your computer.

4.5 Install Utility

Regardless which type of hardware you are installing under Windows NT 4.0, you can use procedures described in Section 3.4 “Install PCI Adapter Utility” to install the WLAN Monitor utility.

4.6 Uninstall Procedure Under Windows NT 4.0

In order to uninstall the WaveBuddy WLAN card from Windows NT 4.0, you must double click on the “Network” option in the “Control Panel” (Start -> Settings -> Control Panel). Select the “WaveBuddy WLAN PC Card/PCI Adapter” from the list and press the “Remove” button.

Note: It is recommended to stop the wireless LAN card/adaptor and exit the WLAN Monitor prior to starting the uninstallation procedure.

5. WLAN Configuration & Monitor Utility

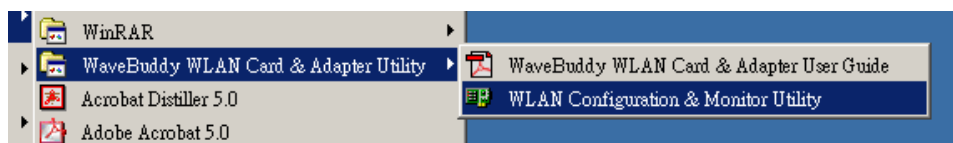
The WLAN Configuration & Monitor Utility (WLAN Monitor) is the application that helps you to configure the wireless LAN card/adapter and monitor its status. Unlike the standard method of configuring the card via the operating system utilities (e.g. Control Panel/Adapter Properties), this application provides more functionalities with a user friendly GUI.

Note: Please keep in mind that the WLAN Configuration & Monitor Utility can be used to change the configuration parameters only when the device is active. When the cards are not in use, please use the Control Panel method.

5.1 How to Access the WLAN Configuration & Monitor Utility

The WLAN Configuration & Monitor Utility is installed with the Drivers when you run the program “Aautorun.exe,” as described before.

There are two ways to bring up the application, To use the Windows Start-Up menu, you can locate the application under Start -> Programs ->WaveBuddy WLAN Card & Adapter Utility -> WLAN Configuration & Monitor Utility.



A more convenient way is to use the icon in the system tray, located in the lower right corner of the screen, to access the application.

5.2 Using the WLAN Configuration & Monitor Utility

The WLAN Configuration & Monitor Utility appears as an icon on the system tray of Windows every time the card is activated. You can open it by double-clicking on this icon.

When the WLAN Station is in infrastructure mode and not associated to an Access Point, the color of the icon is red. As soon as the station associates itself to an Access Point (see “*Site Survey*” section), the icon color changes to blue.

In Ad-Hoc mode the color is always blue, except when the card is resetting and initializing.



The WLAN Monitor application has several panels serving various functions. If you are trying to connect to a Wireless LAN for the first time, we recommend you choose the “Site Survey” panel first. It will show you available APs in the area. From there you can choose the AP to connect and configure the WLAN NIC accordingly.

5.2.1 Monitor

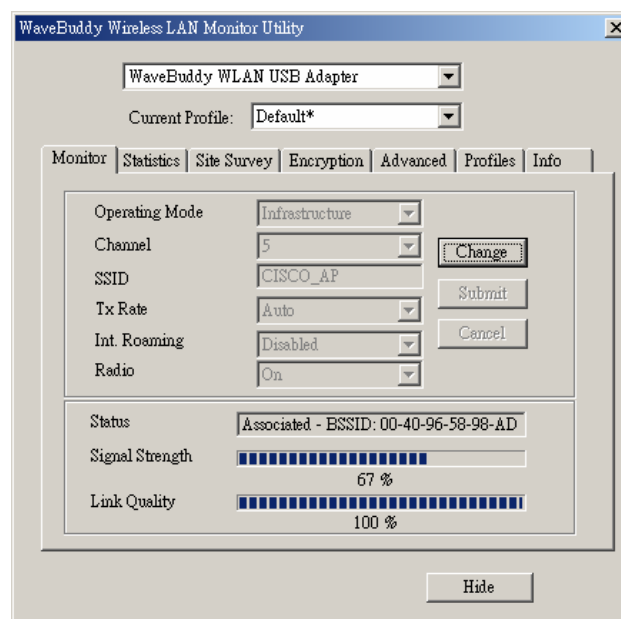
A typical screen of the application in Infrastructure mode is shown below. The configuration parameters are shown at the top of the screen (Operation Mode, Channel, SSID, TxRate, Int. Roaming, Radio and MAC Address of the USB card).

In the middle of the screen there is information about the status of the communication (the BSSID of the Access Point to which the card is associated, Signal Strength, and Link Quality). In order to change the configuration parameters press the “Change” button, make your changes and then press “Submit” in order to save your changes.

If the WLAN station will be connecting to an AP to access a wired LAN, select the Infrastructure Operating Mode and set the SSID to that of the AP. You do not need to set the Channel number.

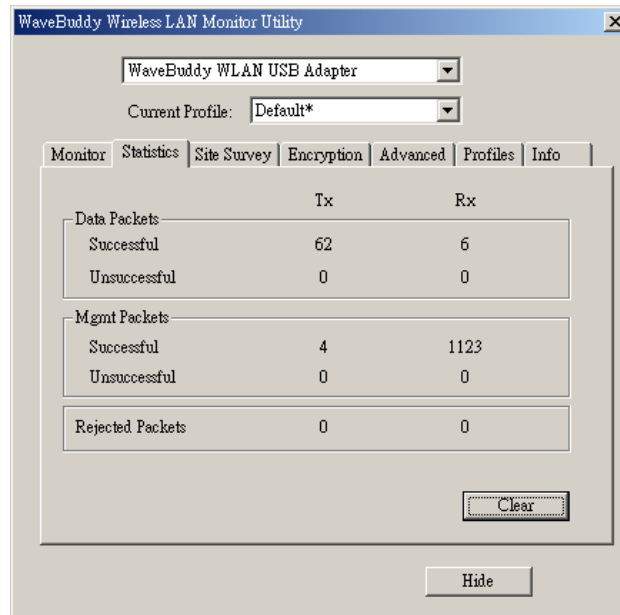
If the WLAN station will be forming an Ad-Hoc LAN wireless LAN, select the Ad-Hoc Operating Mode and set the Channel number. You do not need to set the SSID.

For the rest of the parameters, we recommend using the default value unless you are familiar with wireless networking.



5.2.2 Statistics

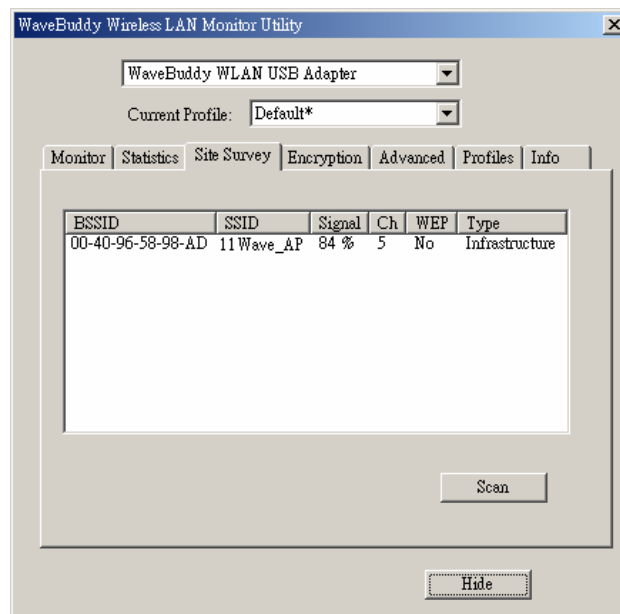
This panel shows you the statistics of the WLAN connection (Data packets, Management Packets and Rejected packets). In order to renew or update this list of statistics, press the “Clear” button.



5.2.3 Site Survey

This panel displays all APs within the radio transmission range. In this example, the card only sees one Access Point. In order to update this list, press the “Re-Scan” button.

If you want to associate with a particular AP, double-click it on its BSSID, the application will take you back to the *Monitor* panel, displaying the status of the new connection.

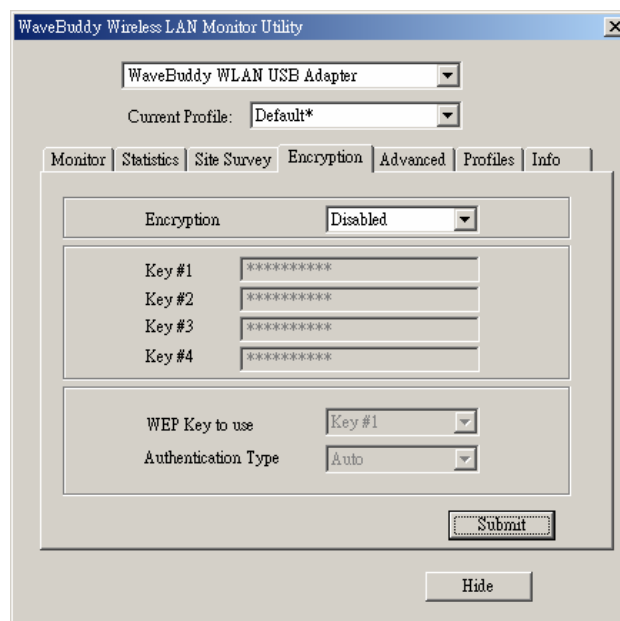


5.2.4 Encryption

This panel allows you to enter up to four different WEP keys and specify which one to use. If you will not be using encryption, select Disabled and ignore this panel.

If you decided to use encryption, you can choose any of the available WEP keys (1 to 4). Please keep in mind that the WEP keys must be in HEX format (0-9ABCDEF).

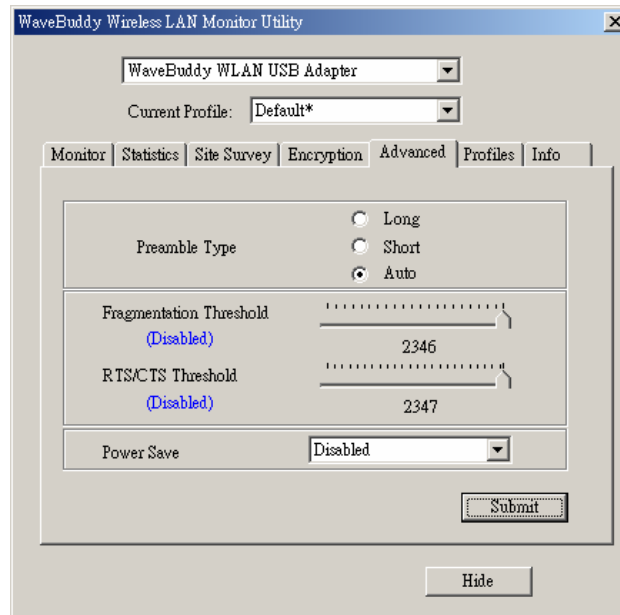
Finally, you have the option to select whether *Open System*, *Shared Key*, or *Auto* authentication will be used. We recommend using “Auto”. Press the “Submit” button for the changes to take effect.



The screenshot shows the 'WaveBuddy Wireless LAN Monitor Utility' window. At the top, there is a dropdown menu for 'WaveBuddy WLAN USB Adapter' and a 'Current Profile' dropdown set to 'Default*'. Below these are tabs for 'Monitor', 'Statistics', 'Site Survey', 'Encryption', 'Advanced', 'Profiles', and 'Info'. The 'Encryption' tab is active, showing an 'Encryption' dropdown set to 'Disabled'. Below this are four input fields for 'Key #1', 'Key #2', 'Key #3', and 'Key #4', each containing a series of asterisks. Further down, there is a 'WEP Key to use' dropdown set to 'Key #1' and an 'Authentication Type' dropdown set to 'Auto'. At the bottom right of the panel are 'Submit' and 'Hide' buttons.

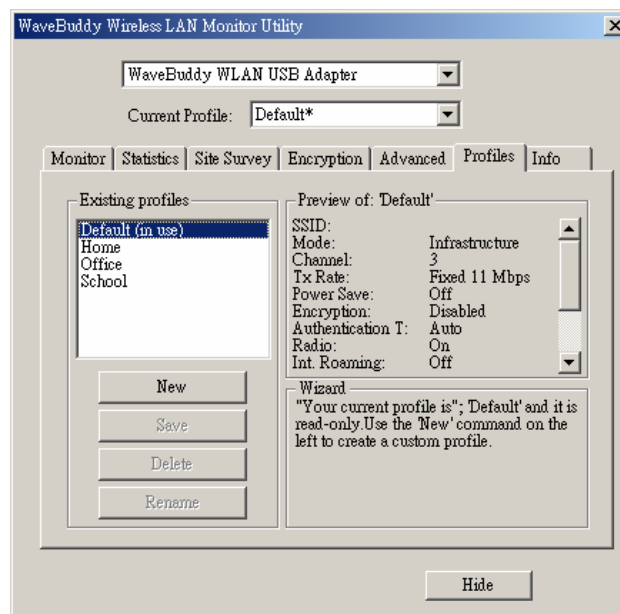
5.2.5 Advanced

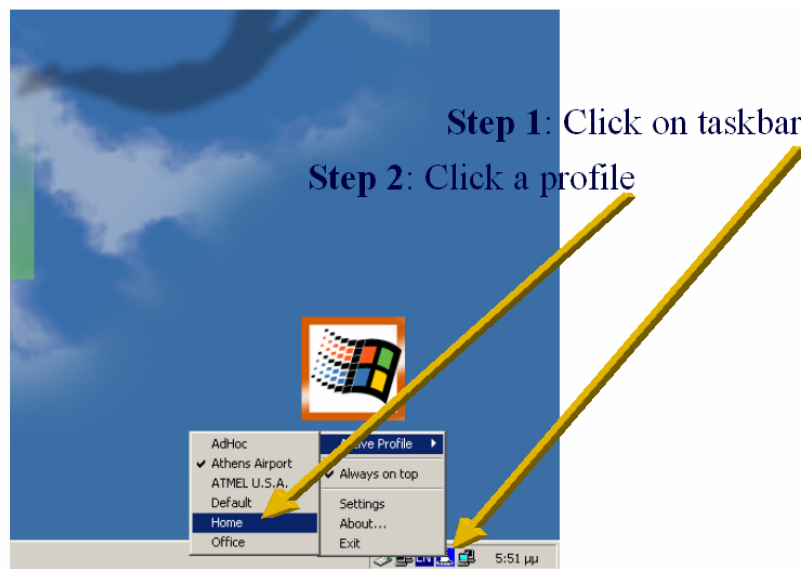
This panel changes advanced configuration settings, we do not recommend you changing these parameters unless you are familiar with wireless networking.



5.2.6 Profiles

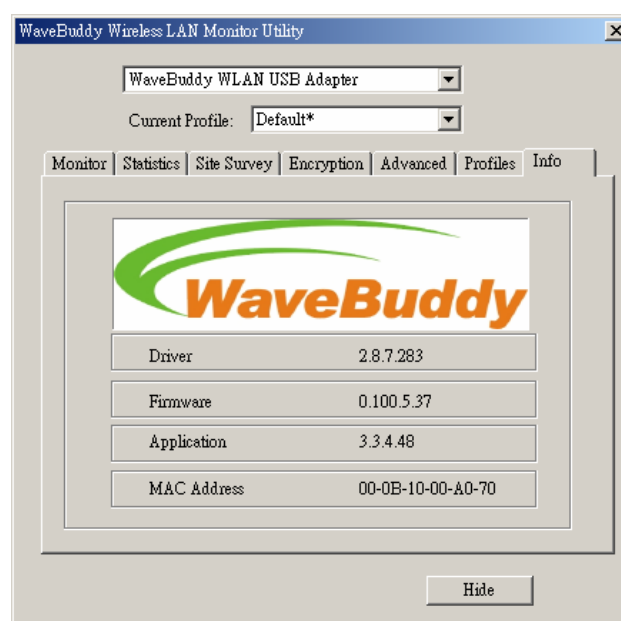
This panel allows you to create different profiles to connect to different Wireless LANs. For example, you may need various profiles to work at home, office or school. By setting up profiles beforehand, you can easily switch between them with the WLAN Monitor icon.





5.2.7 Info

This panel displays basic information about the WLAN device.

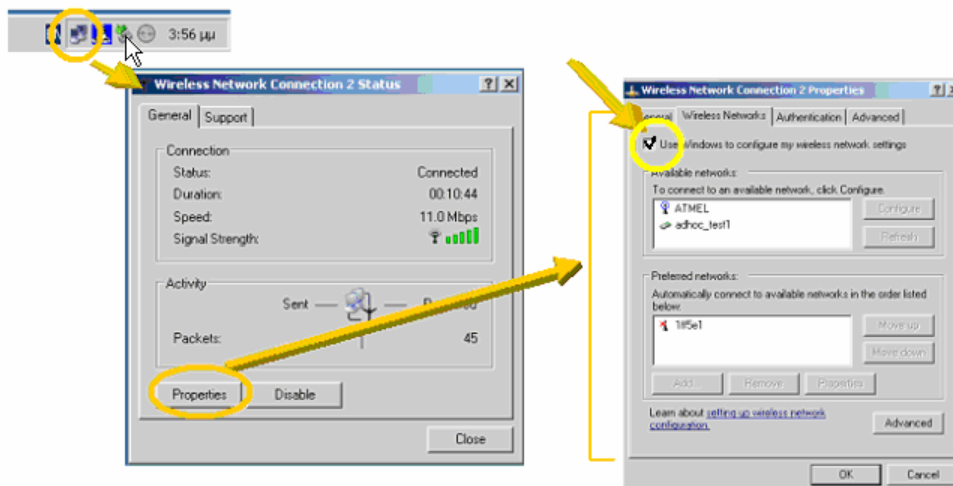


5.3 Collaborating with Windows XP

In order to configure the wireless LAN card/adaptor, you have two methods to use.

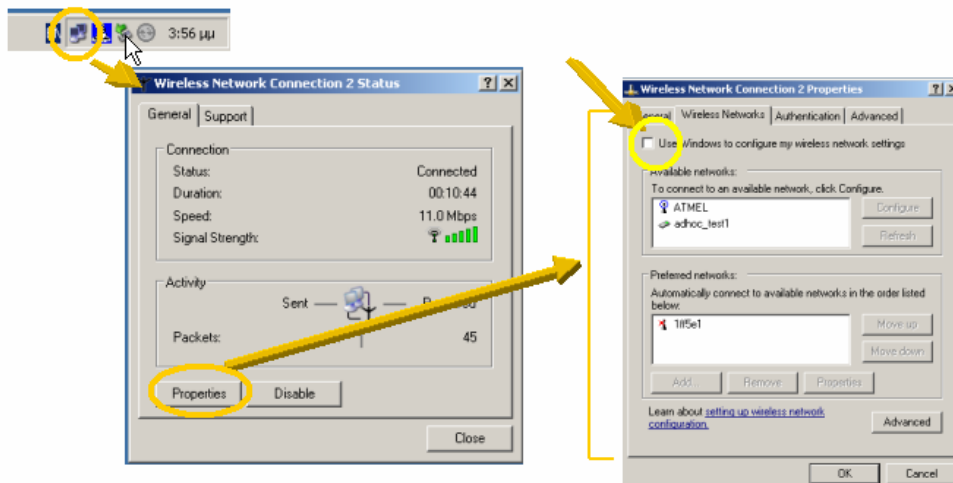
Method1: Selecting the WinXP built-in Application

- Step1. Click the wireless connection icon in taskbar
- Step2. Launch connection properties
- Step3. Launch **Wireless Networks** tab
- Step4. **Check** “Use Windows to configure any wireless network settings”
- Step5. Then WLAN Monitor is disable.



Method2: Selecting the WLAN Monitor

- Step1. Click the wireless connection icon in taskbar
- Step2. Launch connection properties
- Step3. Launch **Wireless Networks** tab
- Step4. **Uncheck** “Use Windows to configure any wireless network settings”
- Step5. Then WLAN Monitor takes the action.



Appendix A

15.21

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

Prohibition of co-location

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

15.105 Federal Communications Commission (FCC) Requirements, Part 15

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.

Caution Statement of the FCC Radio Frequency Exposure

This Wireless LAN radio device has been evaluated under FCC Bulletin OET 65C and found compliant to the requirements as set forth in CFR 47 Sections 2.1091, 2.1093, and 15.247(b)(4) addressing RF Exposure from radio frequency devices. The radiation output power of this Wireless LAN device is far below the FCC radio frequency exposure limits. Nevertheless, this device shall be used in such a manner that the potential for human contact during normal operation—as a mobile device but use in a body-worn way is strictly prohibit. When using this device, a certain separation distance between antenna and nearby persons has to be kept to ensure RF exposure compliance.

Regulatory information / Disclaimers

Installation and use of this Wireless LAN device must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications (including the antennas) made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment. The manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this device, or the substitution of the connecting cables and equipment other than manufacturer specified. It is the responsibility of the user to correct any interference caused by such unauthorized modification, substitution or attachment. Manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government regulations arising from failing to comply with these guidelines.

MPE Statement (Safety Information)

Your device contains a low power transmitter. When device is transmitted it sends out Radio Frequency (RF) signal.

Safety Information

CAUTION: To maintain compliance with FCC's RF exposure guidelines, this equipment should be installed and operated with minimum distance 20 cm between the radiator and your body. Use on the supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.

Appendix B : Glossary

A

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

Ad-Hoc Mode - A client setting that provides independent peer to peer connectivity in a wireless LAN. An alternative setup is where PCs communicate with each other through an access point.

B

Bandwidth - The transmission capacity of a given facility, in terms of how much data the facility can transmit in a fixed amount of time; expressed in bits per second (bps).

Bit - A binary digit. The value - 0 or 1-used in the binary numbering system. Also, the smallest form of data.

BSS - Stands for **Basic Service Set**. An Access Point associated with several stations.

D

Default Gateway - The routing device used to forward all traffic that is not addressed to a station within the local subnet.

DHCP server and client - DHCP stands for Dynamic Host Configuration Protocol. This protocol is designed to automatically load parameters for the TCP/IP network, including the IP address, host name, domain name, netmask, default gateway, and name server address. The machine that provides this service is called the DHCP server, and its client computers are called DHCP clients. If client computers support DHCP, a TCP/IP configuration is not needed on each client computer.

Diversity Antennas - An intelligent system of two antennas that continually senses incoming radio signals and automatically selects the antenna best positioned to receive it.

Domain - A subnetwork comprised of a group of clients and servers under the control of one security database. Dividing LANs into domains improves performance and security.

Driver - A workstation or server software module that provides an interface between a network interface card and the upper-layer protocol software running in the computer; it is designed for a specific NIC, and is installed during the initial installation of a network compatible client or server operating system.

DSSS (Direct-Sequencing Spread-Spectrum) - DSSS operate over the radio airwaves in the unlicensed ISM band (industrial, scientific, medical). DSSS uses a radio transmitter to spread data packets over a fixed range of frequency band.

E

Encryption - A security method that applies a specific algorithm to data in order to alter the data's appearance and prevent other devices from reading the information.

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

ESS - Stands for Extended Service Set. More than one BSS can be configured as an Extended Service Set. An ESS basically a roaming domain.

F

Firmware - Program that is inserted into programmable read-only memory (programmable read-only memory), thus becoming a permanent part of a computing device.

Fragmentation Threshold Value - Indicates how much of the network resources is devoted to recovering packet errors. The value should remain at its default setting of 2,432. If you experience high packet error rates, you can decrease this value but it will likely decrease overall network performance. Only minor modifications of this value are recommended.

Fragmentation - Breaking a packet into smaller units when transmitting over a network medium that cannot support the original size of the packet.

I

IEEE - The Institute of Electrical and Electronics Engineers.

IEEE 802.11 - The IEEE standard that specifies a carrier sense media access control and physical layer specifications for 1 and 2 megabit per second wireless LANs.

IEEE 802.11b - The IEEE standard that specifies a carrier sense media access control and physical layer specifications for 5.5 and 11 megabit per second wireless LANs.

IEEE 802.3 - The IEEE standard that specifies carrier sense media access control and physical layer specifications for Ethernet LANs.

Infrastructure Mode - A client setting providing connectivity to an Access Point. As compared to Ad-Hoc Mode where PCs communicate directly with each other clients set in infrastructure Mode all pass data through a central Access Point. The Access Point not only mediates Wireless network traffic in the immediate neighborhood but also provides communication with the wired network.

IP Address - An IP address is a 32-bit number that identifies each sender & receiver of information that is sent across the Internet. An IP address has two parts: the identifier of a particular network on the Internet and one identifier of a particular device (which can be a server or a workstation within that network).

IRQ - Interrupt ReQuest, A hardware interrupt on a PC. There are 16 IRQ lines used to signal the CPU that peripheral event has started or terminated. In most cases, two devices cannot use the same line.

ISM band - The FCC and their counterparts outside of the U.S. have set aside bandwidth for

unlicensed use in the ISM (Industrial, Scientific and Medical) band. Spectrum in the vicinity of 2.4 GHz, in particular, is being made available worldwide. This presents a truly revolutionary opportunity to place convenient high-speed wireless capabilities in the hands of users around the globe.

L

LAN - A local area network (LAN) is a group of computers and associated devices that share a common communications line and typically share the resources of a single processor or server within a small geographic area (for example, within an office building).

M

MAC Address - 12-digit hexadecimal number that identifies a networking product on the network.

Mbps (Megabits per second) - One million bits per second; unit of measurement for data transmission.

N

Network - A system that transmits any combination of voice, video and/or data between users.

Node - A network junction or connection point, typically a computer or work station.

O

Open System - Is when the sender and the recipient do not share a secret key. Each party generates its own key-pair and asks the receiver to accept the (usually randomly) generated key. Once accepted, this key is used for a short time only; then a new key is generated and agreed upon.

P

Packet - A unit of data routed between an origin and a destination in a network.

PCMCIA - Personal Computer Memory Card International Association, which develops standards for PC cards, formerly known as PCMCIA cards, are available in three types which are about the same length and width as credit cards, but range in thickness from 3.3mm(Type I), 5.0mm(Type II), to 10.5mm(Type III). These cards can be used for many functions, including memory storage, as landline modems and as wireless LAN.

Plug and Play - The ability of a computer system to configure expansion boards and other devices automatically without requiring the user to turn off the system during installation.

R

Roaming - The ability to use a wireless device and be able to move from one access point's range to another without losing the connection.

RTS/CTS Threshold Value - Should remain at its default setting of 2,347. A preamble is a

signal used to synchronize the transmission timing between two or more systems. A series of transmission pulses is sent before the data to indicate that “someone is about transmit data.” This ensures that systems receiving the information correctly when the data transmission starts.

S

Shared Key - Is when both the sender and recipient share a secret key. Both units use this key for an extended length of time, sometimes indefinitely. Any eavesdropper that discovers the key may decipher all packets until the key is changed.

Signal Strength - The signal level indicates the strength of the signal as received at the wireless network interface.

SNMP (Simple Network Management Protocol) - A standard network protocol that can be used to manage networks locally, or worldwide via the Internet.

SSID (Service Set Identifier) - Is the unique name shared among all points in a wireless network. The SSID must be identical for all points in the network. It is case sensitive and must not exceed 32 characters.

Static IP Address - A permanent IP address that is assigned to a node in an IP or a TCP/IP network.

Subnet - A subnet is a logical sub-division of a Local Area Network that has been divided by means of routers or gateways. A subnet may include multiple LAN segments. Each subnet is identified by the Subnet Mask.

T

TCP/IP (Transmission Control Protocol/Internet Protocol) - The basic communication language or protocol of the Internet. It can also be used as a communications protocol in a private network (either an intranet or an extranet). When you are set up with direct access to the Internet, your computer is provided with a copy of the TCP/IP program just as every other computer that you may send messages to or get information from also has a copy of TCP/IP.

Throughput - The amount of data moved successfully from one place to another in a given time period.

Tx Rate - Transmission Rate.

W

WEP (Wired Equivalent Privacy) - The optional cryptographic confidentiality algorithm specified by IEEE 802.11 used to provide data confidentiality that is subjectively equivalent to the confidentiality of a wired LAN medium that does not employ cryptographic techniques to enhance privacy.

Windows workgroup - A Windows workgroup can consist of either wireless or wired network connections or a combination of the two. Usually a Windows workgroup consists of members who are related because of a shared function, e.g. members of the same department. For a Windows workgroup it is not relevant where the workgroup participants are located, since the members of a Windows workgroup are identified by their workgroup name only.