InstantWave™

11Mbps Wireless

USB Adapter

User's Guide

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FCC WARNING

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

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the 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

FCC RF Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

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Packing List

The Wireless USB Adapter package should contain the following items:

- One InstantWave 11Mbps Wireless USB Adapter
- One USB Cable
- One CD ROM (contains drivers, Utility, User's Guide in PDF format)
- Quick Installation Guide

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Introduction

Thank you for choosing an InstantWave 11Mbps wireless networking product. This guide gives comprehensive instructions on installing and using the InstantWave PCI and PC Cards, and also explains how to install and use the InstantWave utility program.

System Requirements

Hardware

A station must be an x86 compatible PC with a USB interface. The minimum system configuration is the same as that required to run MS Windows (Windows 98, Me, 2000, or XP).

Software

The stations operate in conjunction with most of the MS Windows OS's (Windows 98, Me, 2000, or XP). The PC Card may also be installed in the Pocket PC 2000/2002 OS.

Terminology Used in this Guide

Ad Hoc Network

An Ad Hoc network is formed by a number of wireless stations (without an Access Point) communicating via radio waves. For the users, the shared resources on the wireless network appear exactly as they would on a regular wired network. The wireless operation of the network is totally transparent. Figure 1 depicts a typical Ad Hoc network scenario.

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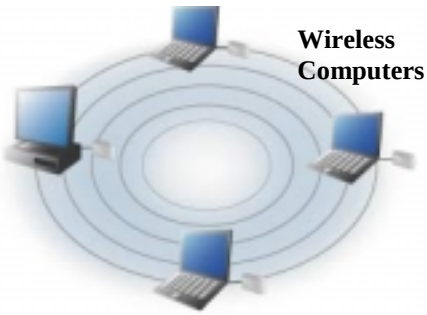

Figure 1. An Ad Hoc Network

Infrastructure Network

An Infrastructure network is formed by several stations and one Access Point (AP), with the stations within range of the AP. Figure 2 depicts a typical Infrastructure network topology.

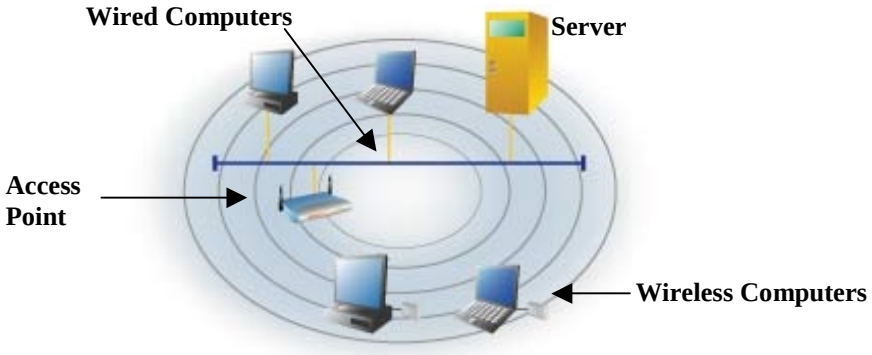

Figure 2. An Infrastructure Network

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BSSID/MAC ID

BSSID (Basic Service Set ID) is an ID unique to each AP that is factory set and is identical to the MAC ID (Media Access Control ID). It allows each AP to be identified on the network.

Domain Name/SSID

A domain is usually defined by the network administrator as a segment/subnet of a large network and may be made up of overlapping wireless cells. Wireless nodes can roam freely within the same domain without disconnecting from the network. Figure 3 depicts a common wireless network setup.

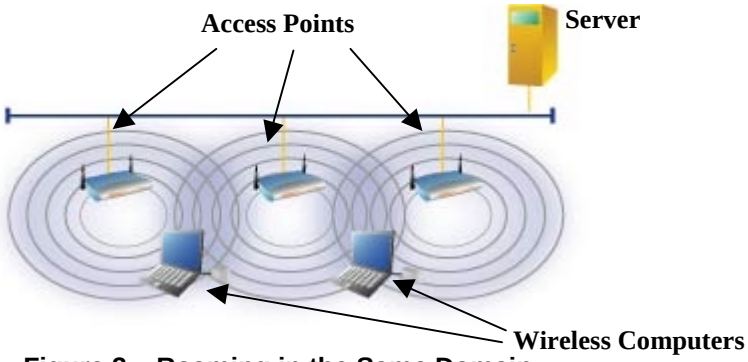

Figure 3. Roaming in the Same Domain

Roaming

The convenience of a mobile PC is the ability to move freely. The concept is similar to that of a cellular phone moving from one base station to another. InstantWave offers built-in high-performance seamless roaming capabilities.

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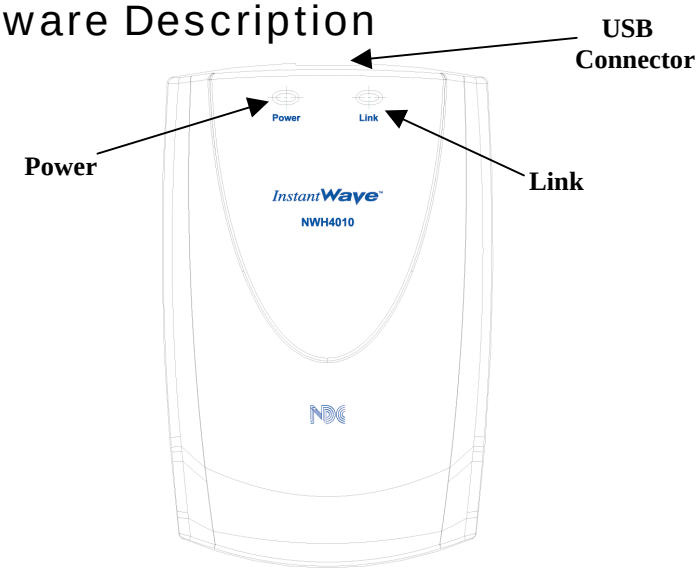

Figure 4. The Front Panel

LED Indicators

LED	*Color*	*Description*
Power	Red	Lit: Power on Off: No power
Link	Blinking Yellow	Sensing/Transmitting wireless data
	Solid Yellow Green	Standard operational mode
	Off	No wireless activity

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Installation/Uninstallation

The product is designed to operate in Windows 98SE, Windows Me, Windows 2000, and Windows XP. Follow the installation wizard provided by your operating system to install the software.

Important 1: *For installation in Windows 98SE/Me/2000, install the NDC InstantWave 11Mbps Wireless USB Utility/Driver first before inserting the NDC InstantWave 11Mbps Wireless USB Adapter.*

Important 2: *For installation in Windows XP, the NDC InstantWave 11Mbps Wireless USB Adapter supports the Wireless Zero Configuration service, (see* Installation in Windows XP*, page 11) for driver and hardware installation.*

Important 3: *It is recommended to close other applications before installing the NDC InstantWave 11Mbps Wireless USB Adapter.*

Utility/Driver Installation in Windows 98SE/Me/2000

step1. Insert the NDC InstantWave 11Mbps Wireless USB Adapter installation CD into your CD-ROM drive. The setup program will then automatically start (Figure 5)

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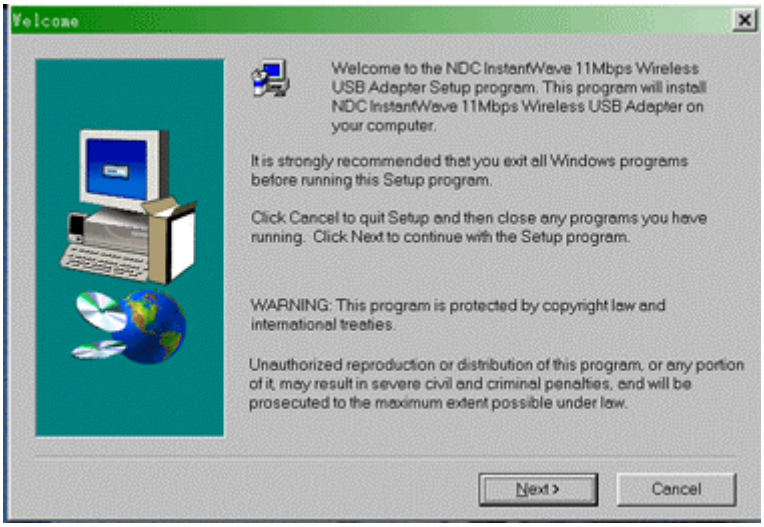

Figure 5. Welcome

step2. Click ***Next*** to go to the next screen (Figure 6)

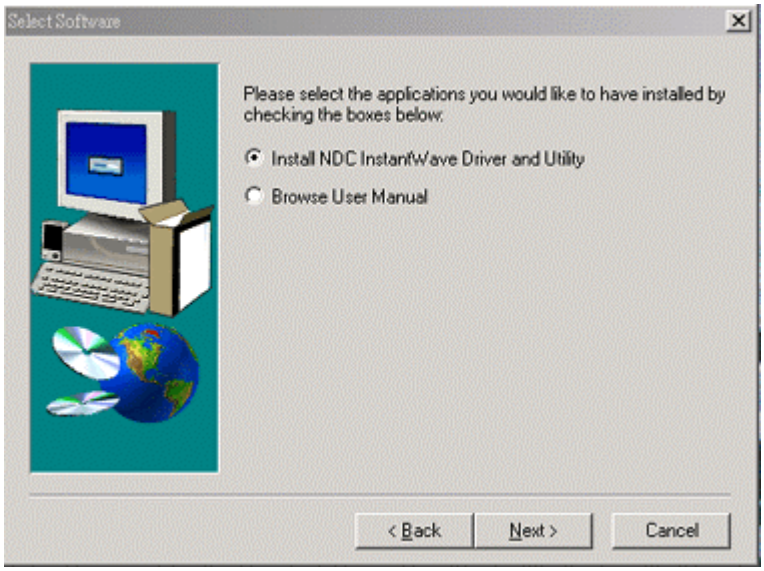

Figure 6. Select Software

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step3. Select the applications you would like to install, and click ***Next*** (Figure 6). The default destination folder is displayed in the setup dialog column (Figure 7). If you selected *Browse User Manual*, the system will prompt you to install Acrobat Reader later in the installation (Figure 10, page 8)

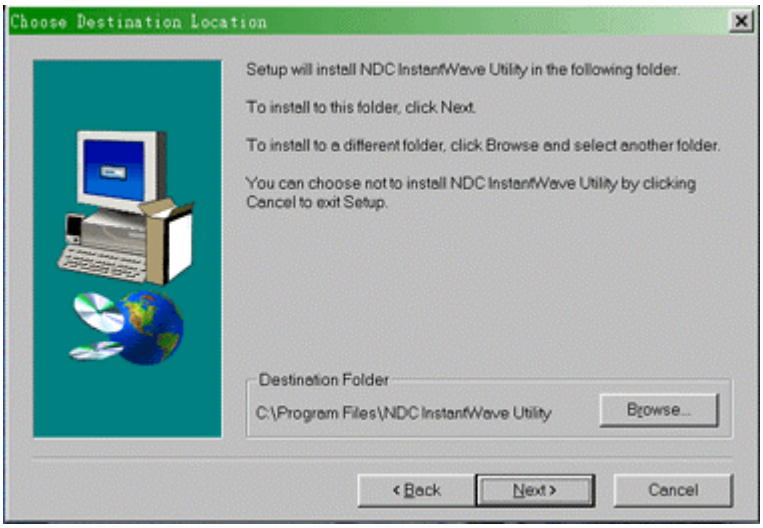

Figure 7. Choose Destination Location

step4. Click ***Next*** to go to the next screen (Figure 8)

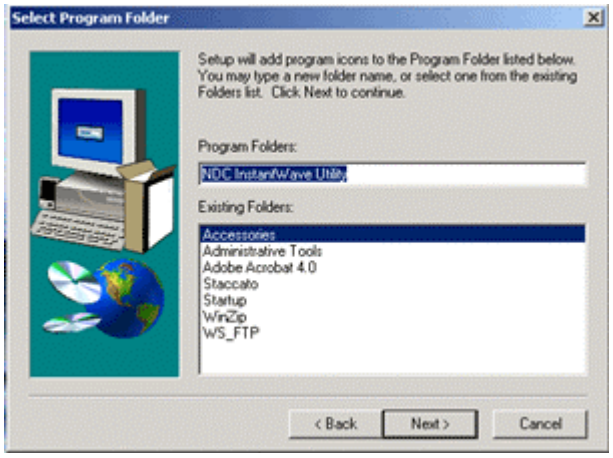

Figure 8. Select Program Folder

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step5. Click ***Next*** to the next screen (Figure 9)

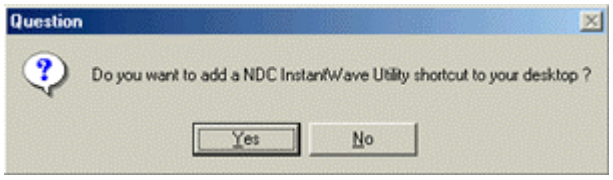

Figure 9. Add a shortcut

step6. Click ***Yes***

step7. The user manual is published in Portable Document Format (PDF). If Acrobat reader in not installed, the following message will be shown (Figure 10) and the system will automatically enter the Acrobat Reader installation screen. Follow the instructions to complete the Acrobat Reader 4.05 installation.

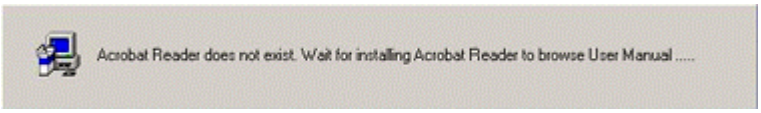

Figure 10. Acrobat Reader Installing

step8. The driver, utility and user manual will be copied to the system. Wait for the setup program to finish the installation (Figure 11)

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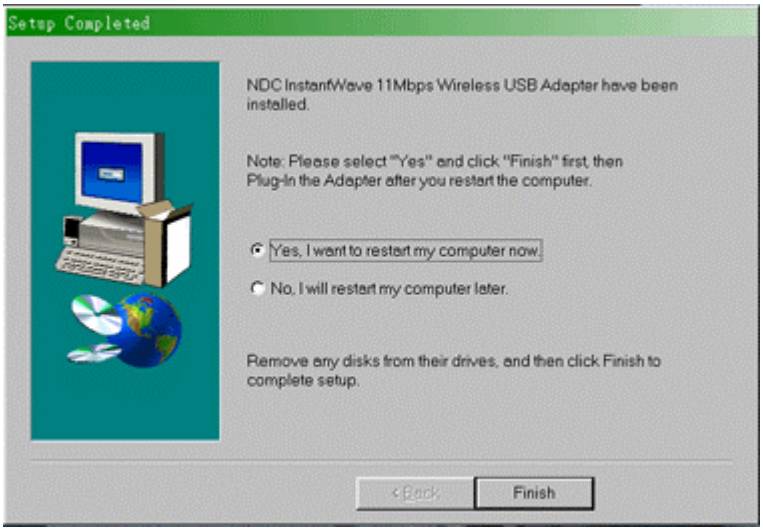

Figure 11. Setup Complete

step9. Select *Yes, I want to restart my computer now* and click ***Finish*** to complete the installation

step10. For hardware installation of the NDC InstantWave 11Mbps Wireless USB adapter, refer to the next section Hardware Installation in Windows 98SE/Me/2000.

Hardware Installation in Windows 98SE/Me/2000

The NDC InstantWave 11Mbps Wireless USB driver and utility are included on the accompanying installation CD. Be sure you have completed the installation procedures in the previous section before installing the hardware (your USB network adapter will not work properly if the driver and utilities are not installed correctly).

step1. After completing the software installation, connect a USB cable to the USB Adapter and to a USB port on the computer. The *New Hardware Found* screen will open (Figure 12)

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Figure 12. New Hardware Found

If you are asked to insert the Windows 98SE CD-ROM during the installation, insert your Windows 98SE CD-ROM and click ***Yes***. Microsoft Internet Explorer may start up. Please close it.

step2. When the USB adapter setup task is complete, start the NDC InstantWave Utility. To start the utility, refer to Using the Utility, page 22

Additional Note for Windows 2000

If you install the NDC InstantWave 11Mbps Wireless USB Adapter under Windows 2000, a message will appear as shown in Figure 13.

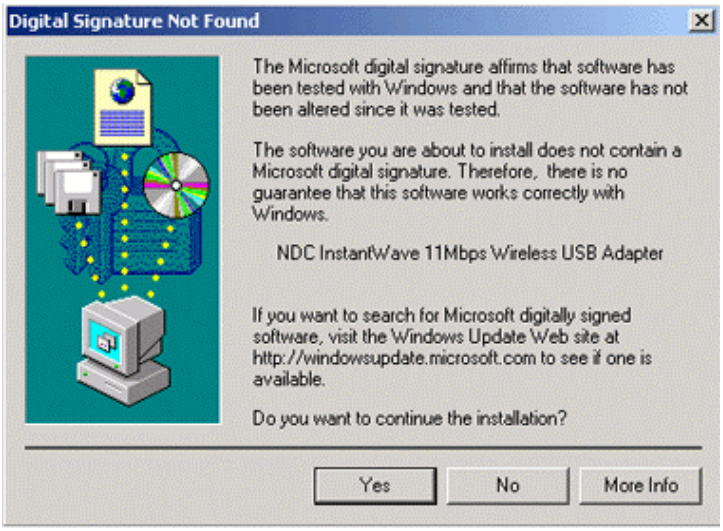

Figure 13. Digital Signature Not Found

Click ***Yes*** to complete the USB adapter setup.

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Installation in Windows XP

The NDC InstantWave 11Mbps Wireless USB Adapter supports the Windows XP Wireless Zero Configuration service. There is no need to install a third-party utility program.

step1. Insert the NDC InstantWave 11Mbps Wireless USB Adapter installation CD into your CD-ROM drive. The setup program will automatically start (Figure 14)

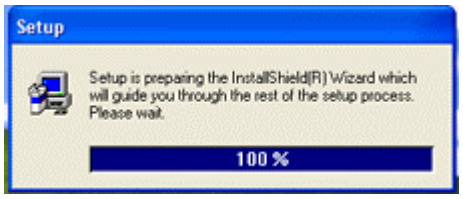

Figure 14. Setup in Windows XP

step2. The setup program will copy driver files used by the NDC InstantWave 11Mbps Wireless USB adapter to the system and then close automatically

step3. Connect a USB cable to the USB Adapter and to a USB port on the computer. The *Found New Hardware Wizard* will automatically open (Figure 15)

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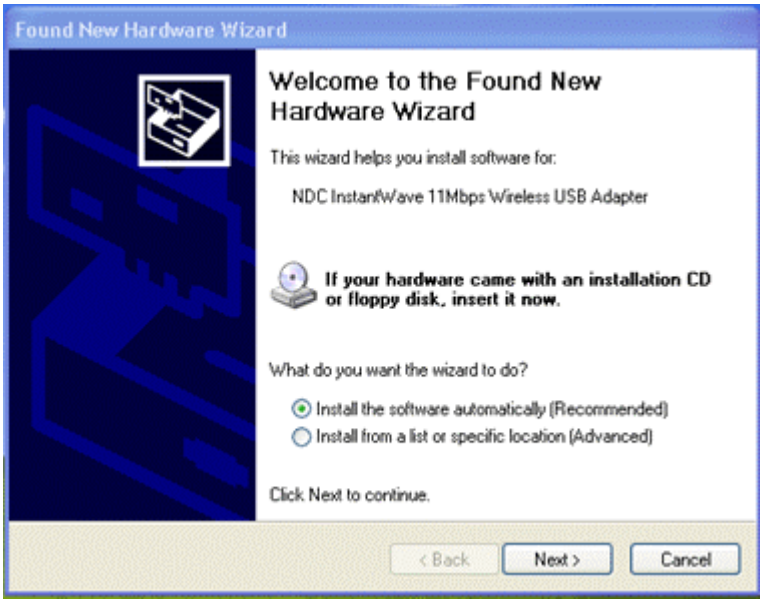

Figure 15. Found New Hardware Wizard-1

step4. Select *Install the software automatically* and click ***Next*** to go to the next screen (Figure 16)

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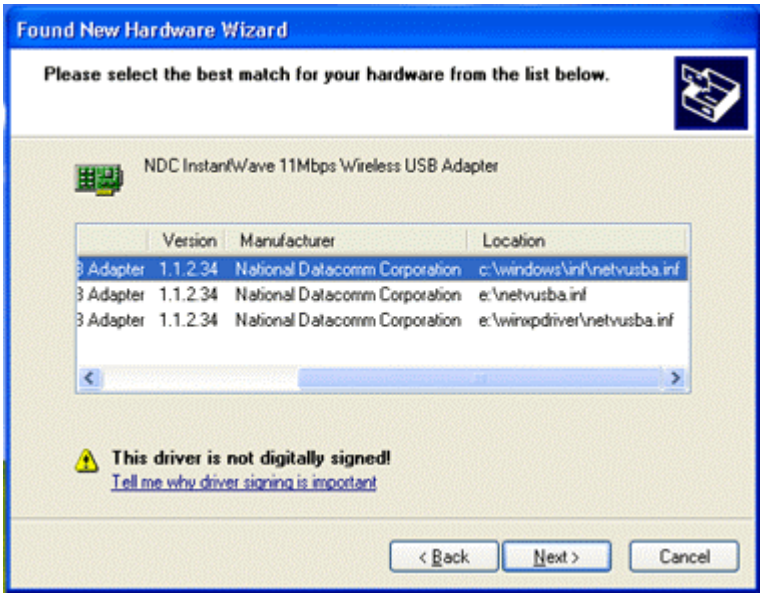

Figure 16. Found New Hardware Wizard-2

step5. Select the location *c:\windows\inf\netvusba.inf* and click ***Next***. A message will appear as shown in (Figure 17)

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Figure 17. Hardware Installation

step6. Click ***Continue Anyway*** to complete the USB adapter setup (Figure 18)

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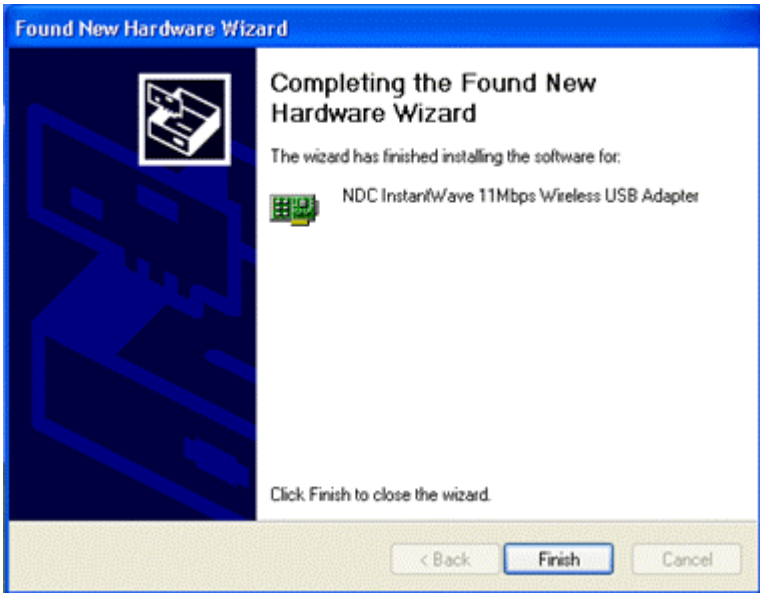

Figure 18. Found New Hardware Wizard

step7. Click ***Finish*** to close the wizard

step8. For connection to the wireless network, See Windows XP, page *32*

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Uninstalling the USB Adapter

Important: *When removing the NDC InstantWave 11Mbps Wireless USB Adapter, you will lose your connection to the network. Make sure you have closed all files and network applications (such as e-mail) prior to removal.*

Additional Note for Windows 2000

If you remove your USB device in Windows 2000 without stopping it first, an *Unsafe Removal of Device* message will appear (Figure 19).

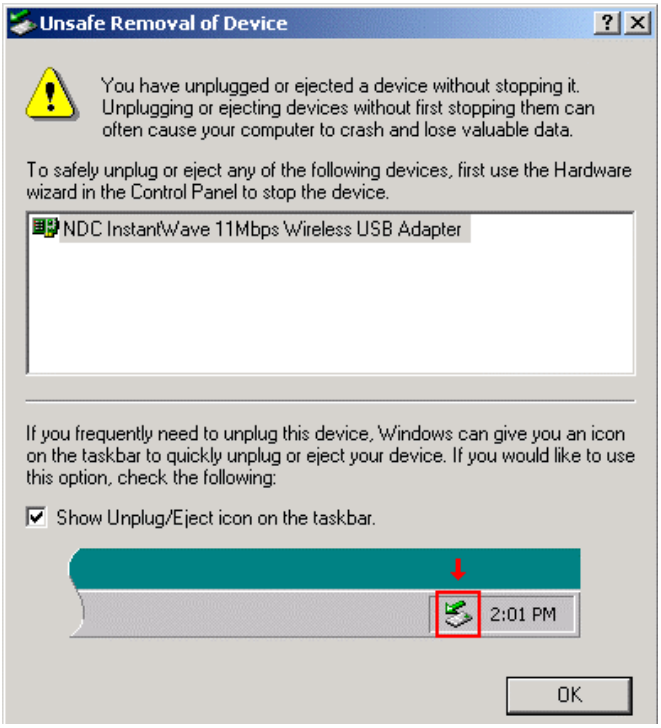

Figure 19. Unsafe Removal of Device

Click ***OK***.

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Uninstalling the Driver and Utility

Windows 98SE/Me/2000

step1. Disconnect the NDC InstantWave 11Mbps Wireless USB Adapter

step2. To uninstall the NDC InstantWave 11Mbps Wireless USB Utility and Driver, click ***Start/Programs/NDC InstantWave Utility/UnInstallation*** (Figure 20)

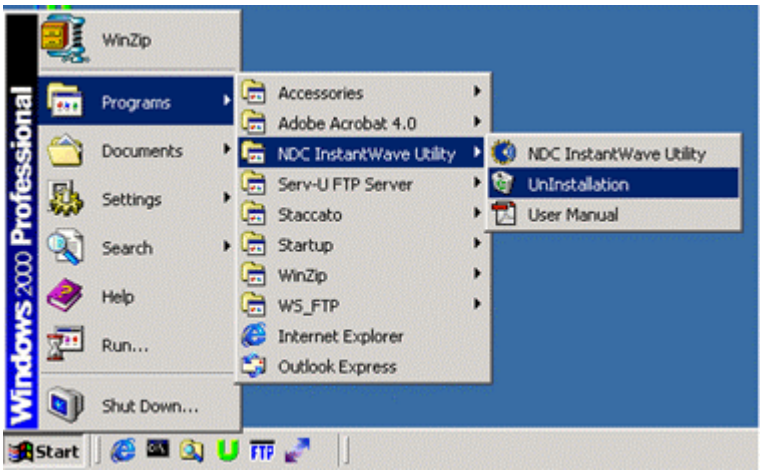

Figure 20. UnInstallation

step3. You will be asked to confirm the removal (Figure 21)

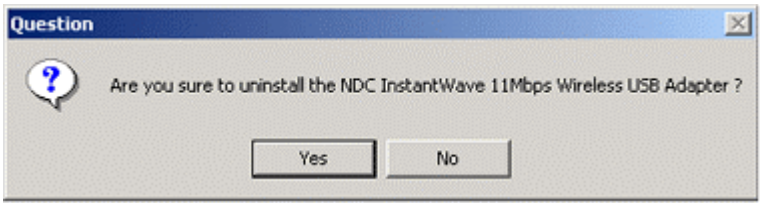

Figure 21. Question-1

step4. Click ***Yes***

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For Windows 98/Me systems

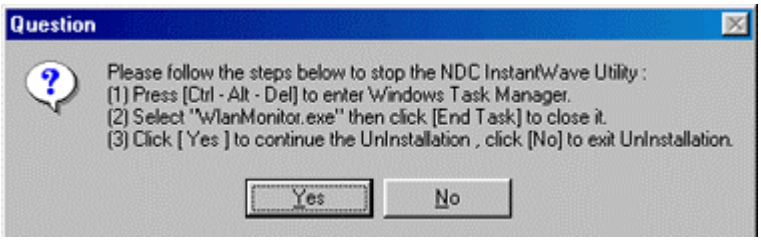

Figure 22. Question-2

Follow the instructions (for Windows 98/Me, see Figure 22; for Windows 2000, see Figure 23) to stop the *WlanMonitor.exe* program before clicking ***Yes.***

For Windows 2000

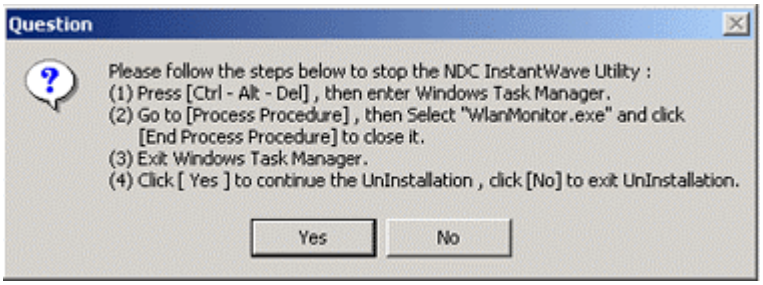

Figure 23. Question-3

Additional Note for Windows 2000

step1. The operating system will display an ***Information*** box asking you to remove the USB Adapter from Device Manager (Figure 24)

Figure 24. Information-1

step2. Click ***OK***. The system will open *Device Manager* automatically (Figure 25)

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Figure 25. Information-2

step3. Click ***OK***, and right-click ***NDC InstantWave 11Mbps Wireless USB Adapter***. Select ***Uninstall.*** The ***Uninstall Complete*** screen will open (Figure 26)

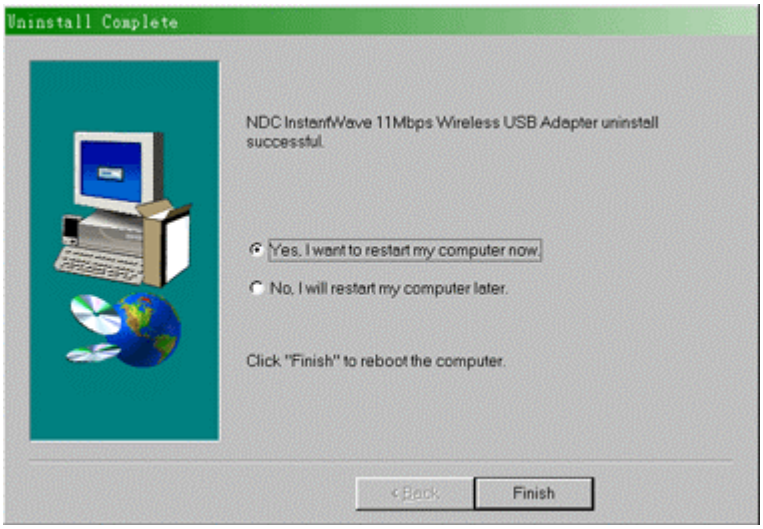

Figure 26. Uninstall complete

step4. Click ***Finish***

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Windows XP

step1. Open ***Start/Settings/Control Panel/System/System Properties*** (Figure 27)

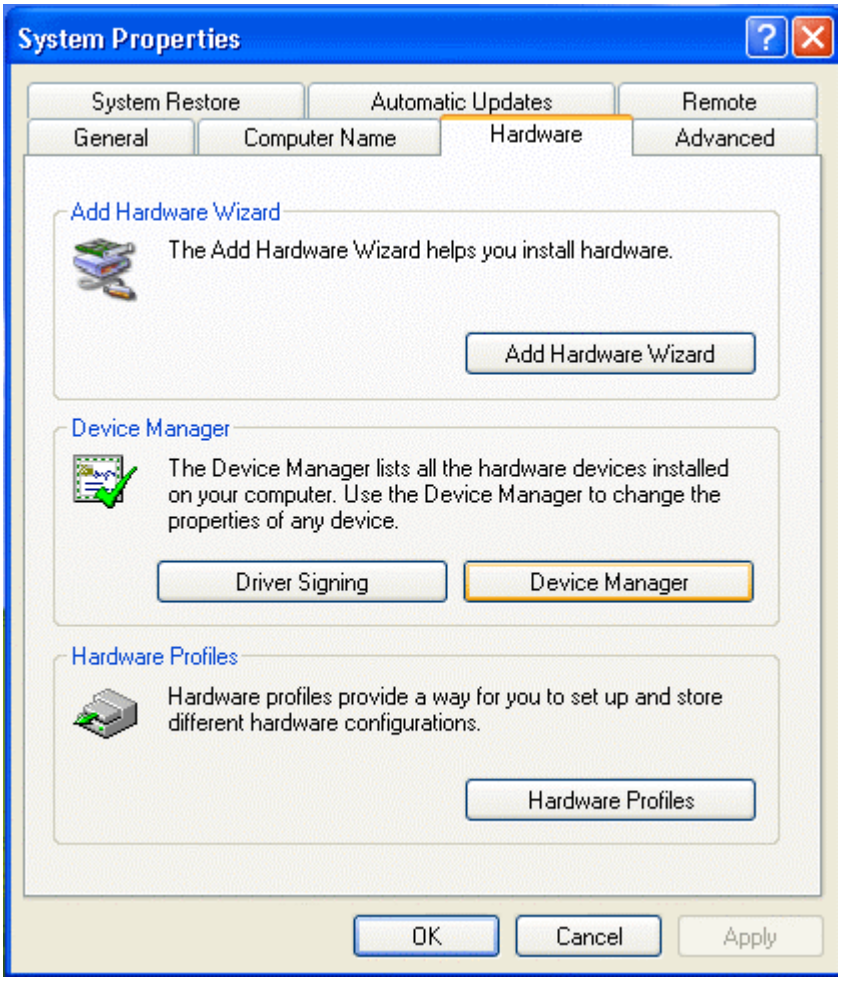

Figure 27. System Properties

step2. Click ***Device Manager***

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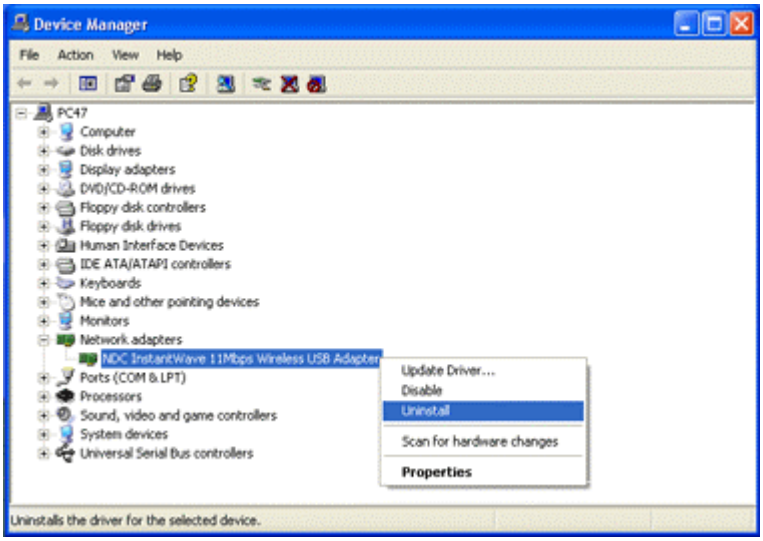

Figure 28. Device Manager

step3. Right-click the *NDC InstantWave 11Mbps Wireless USB Adapter* entry under *Network Adapters*, and then click ***Uninstall*** (Figure 28)

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Using the Utility

The NDC InstantWave 11Mbps Wireless USB Adapter has its own management utility. An icon will appear in the taskbar when you click the NDC InstantWave Utility shortcut on your desktop. The Utility includes six tabs: Settings, Statistics, Site Survey, Encryption, Advanced, and Version.

The utility allows users to configure the wireless network type (Ad hoc or Infrastructure), Domain name (SSID) and Security (WEP). The *Site Survey* tool allows users to view existing groups (Domain name/SSID of wireless cells in a Domain). It provides the option to manually join a particular group in the network.

Tools are also provided for viewing the network in terms of wireless signal quality, and for monitoring the station data throughput.

Important: *For Windows XP users, the NDC InstantWave 11Mbps USB Adapter supports the Wireless Zero Configuration service and may be configured from the Windows XP built-in wireless utility.* *See Windows XP, page 32.*

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Windows 98SE/Me/2000

Click ***Start/Programs/NDC InstantWave Utility/NDC InstantWave Utility*** (Figure 29)

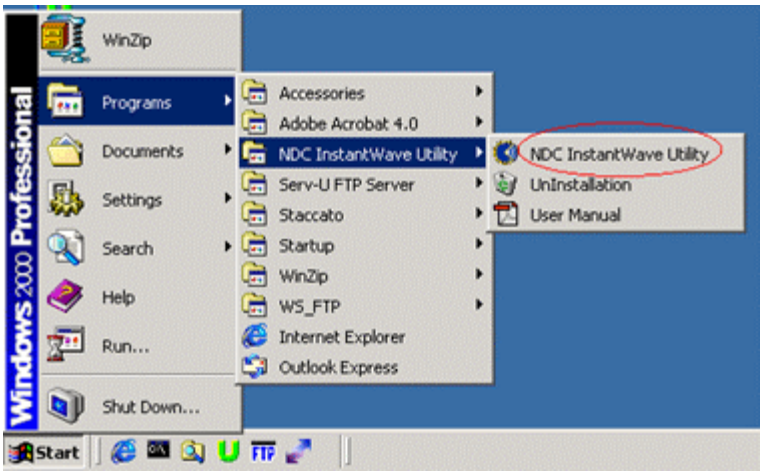

Figure 29. NDC InstantWave Utility

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Setting

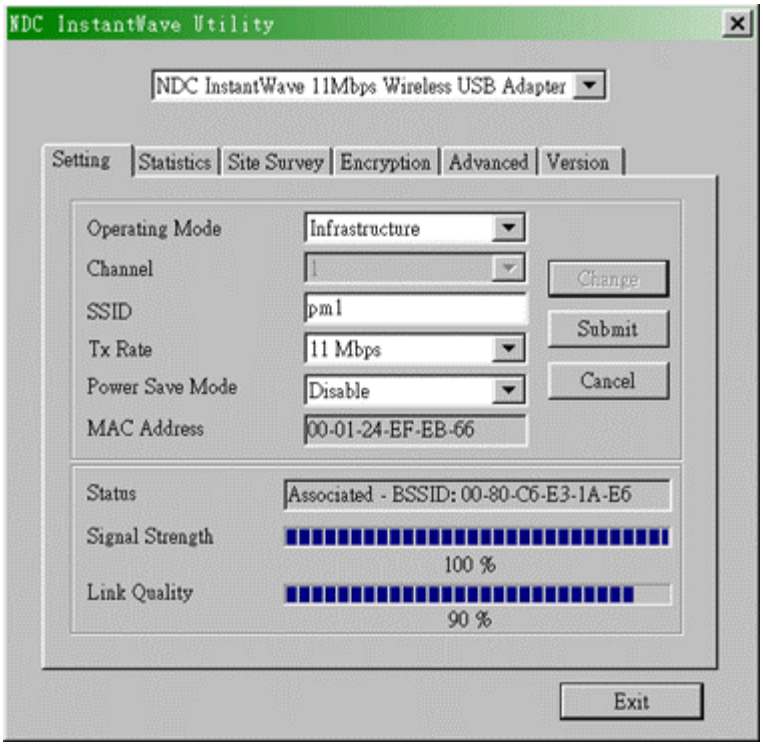

Figure 30. Setting

- Operating Mode:

If you want to connect to an Access Point (AP), set the operating mode to *Infrastructure*. If your network consists of only wireless stations (without an AP) set the mode to *802.11 Ad-Hoc*.

- Channel:

The radio channel used for networking. The Channel number must be the same on all stations that will be within the local LAN. It can be changed only under 802.11 Ad-Hoc Mode. If the mode is set to Infrastructure, this parameter will not be active and the stations will automatically use the channel that the AP uses.

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- SSID:

SSID is the group name that will be shared by each member of your wireless network. You will only be able to connect with an Access Point (AP) or wireless station that has the same SSID. The SSID is case sensitive.

- TX Rate:

Sets a transmission rate: 1Mbps, 2Mbps, 5.5Mbps, 11Mbps, or fully Auto. Lower settings can improve transmission rates in environments subject to heavy radio interference.

- Power Save Mode:

Puts the USB adapter to sleep when not in use in order to save battery power.

- MAC Address:

Read-only field that shows the MAC address of your NDC InstantWave 11Mbps Wireless USB adapter.

- Status:

Shows the status of the connection and the BSSID.

- Signal Strength & Link Quality:

Use these tools to place your station for optimum transmission rates.

Changing Parameters

step1. Click the ***Change*** button

step2. Choose the parameter you wish to change

step3. After changing a parameter, click ***Submit***

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Statistics

- Displays ***Data Packets***, ***Management Packets,*** and ***Rejected Packets*** transmitted/received.

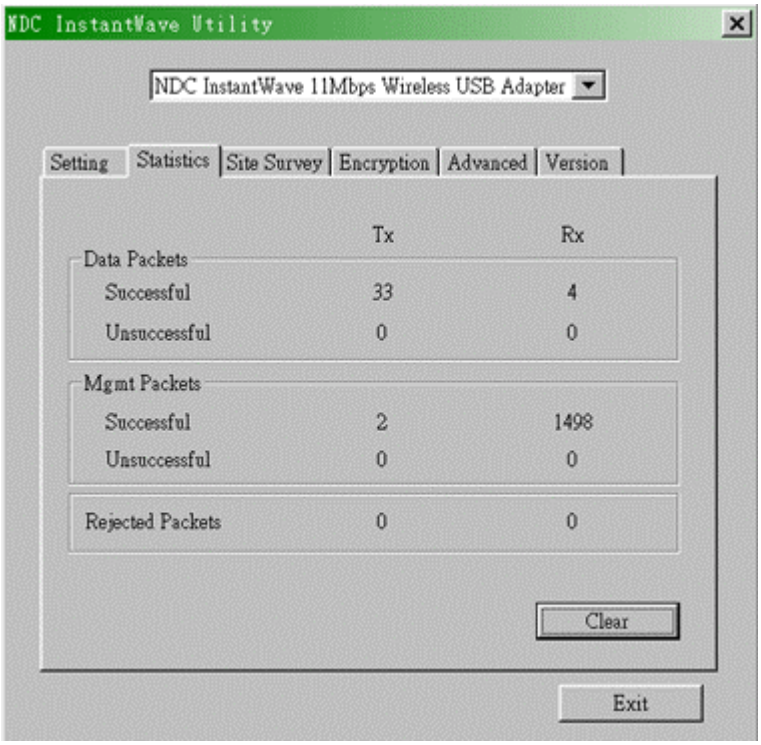

Figure 31. Statistic

Click the ***Clear*** button to reset the *Statistics* page.

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Site Survey

- The screen shows the Access Point/stations around your NDC InstantWave 11Mbps Wireless USB Adapter (Figure 32). Includes the BSSID, SSID, signal strength, the wireless channel used, WEP encryption enabled or not, and the operating mode.

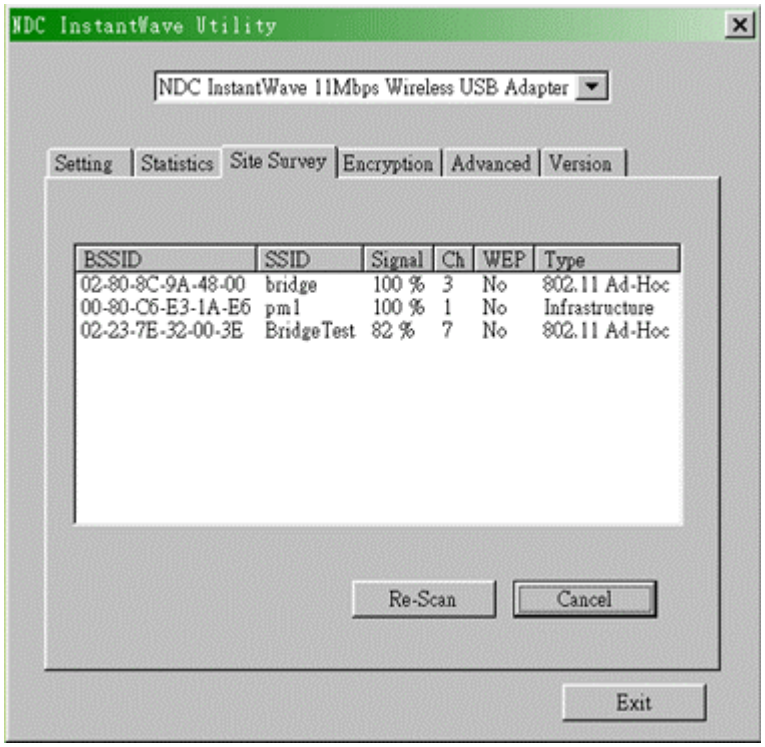

Figure 32. Site Survey

- Click the ***Re-scan*** button to refresh the screen and search for other wireless devices.
- Double-click a BSSID to connect to that device.

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Encryption

The WEP Key needs to be the same for all IEEE 802.11b devices that will be in the network (Figure 33).

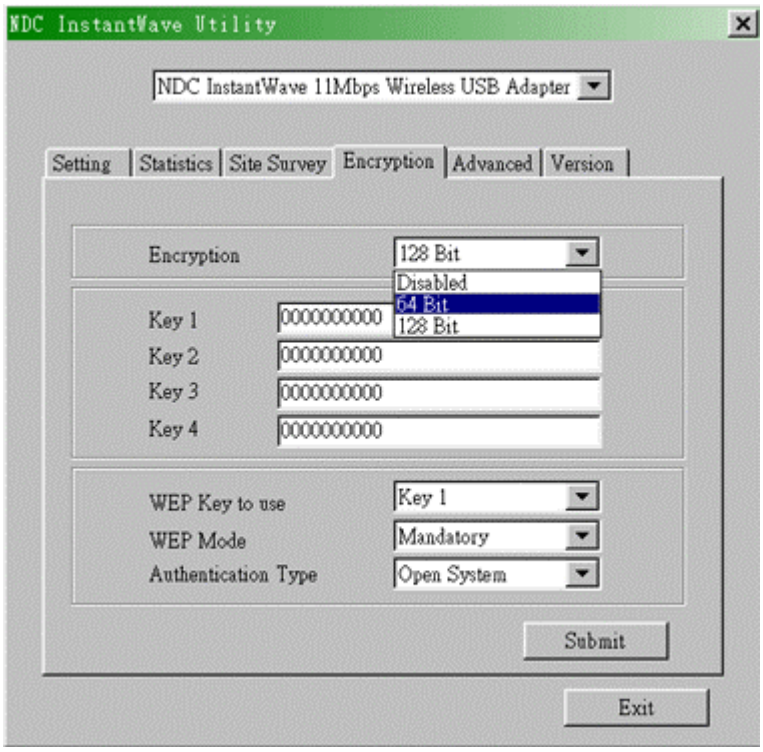

Figure 33. Encryption

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Infrastructure Mode:

Note: Before enabling the WEP function, you must obtain the WEP key (Hexadecimal code only, A~F and 0~9) used in the Access Point and then apply these codes as the WEP Key.

(1) Select 64 Bit if you have obtained a 10 number key from the Access Point; select 128 Bit if you have obtained a 26 number key from the Access Point

(2) Enter the hexadecimal codes into one of the fields marked Key 1~4. Up to 4 sets of WEP keys may be entered

Example of a 64 Bit WEP Key

Key 1	1023c2d2e5
Key 2	0000000000
Key 3	0000000000
Key 4	0000000000

Note: Unused keys MUST contain ten zeros in 64 Bit mode

Example of a 128 Bit WEP Key

Key 1	1e23c2d225b012ee29e689c123
Key 2	00000000000000000000000000
Key 3	00000000000000000000000000
Key 4	00000000000000000000000000

Note: Unused keys MUST contain twenty six zeros in 128 Bit mode

(3) WEP Key: Select a WEP Key (Key 1 to Key 4)

(4) WEP Mode: Mandatory for communicating with all stations having WEP enabled or Optional for WEP disabled

(5) Authentication Type: Open System or Shared Key (Select Shared Key for operation with an Access Point)

After all settings are complete, click ***Submit*** to save the settings.

Important: *The WEP key must be exactly the same on all WEP enabled wireless devices that will communicate with each other.*

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Advanced

- This screen shows the advanced settings of the NDC InstantWave adapter (Figure 34).

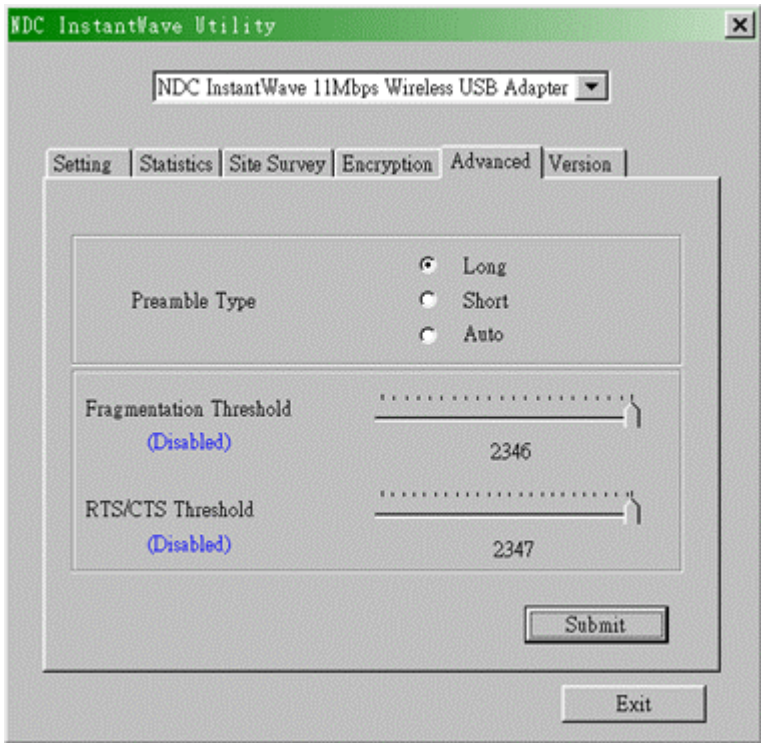

Figure 34. Advanced

- It includes ***Preamble Type***, ***Fragmentation Threshold***, and ***RS/CTS Threshold***. We suggest you use the default settings: Preamble Type: Long.
- Click ***Submit*** to save the settings.

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Version

The screen shows the Driver, Firmware, and Application versions of the NDC InstantWave 11Mbps Wireless USB Utility/Driver (Figure 35).

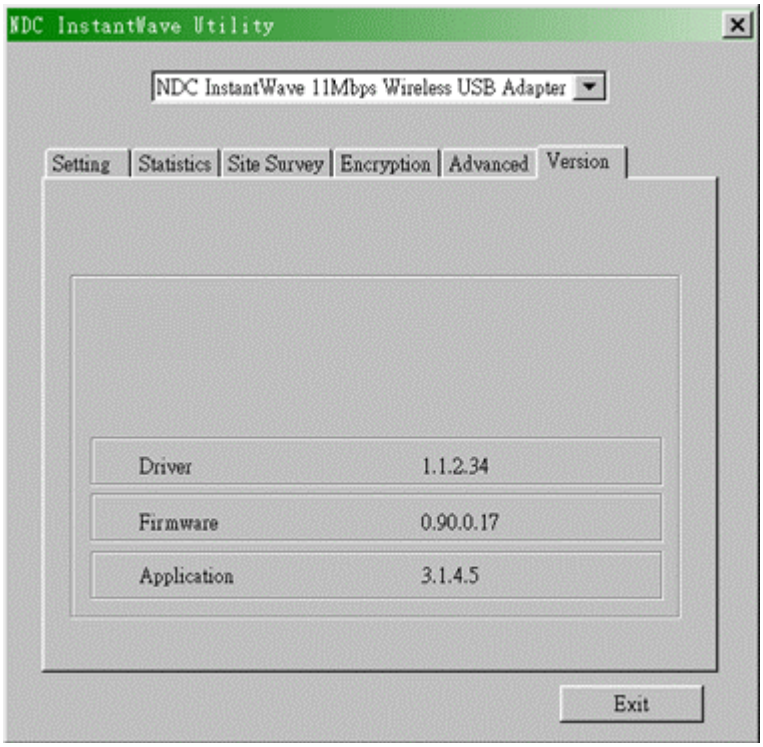

Figure 35. Version

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Windows XP

step1. Right-click the network connection icon in the taskbar (Figure 36)

Figure 36. View Available Wireless Networks

step2. Click ***View Available Wireless Networks***

step3. On the *Connect to Wireless Network screen* (Figure 37), select the wireless network that you want to connect to

step4. If a network key is required for WEP and is not automatically provided for you, type the key in the *Network key* field (Figure 37). If the network key is automatically provided, leave this field blank

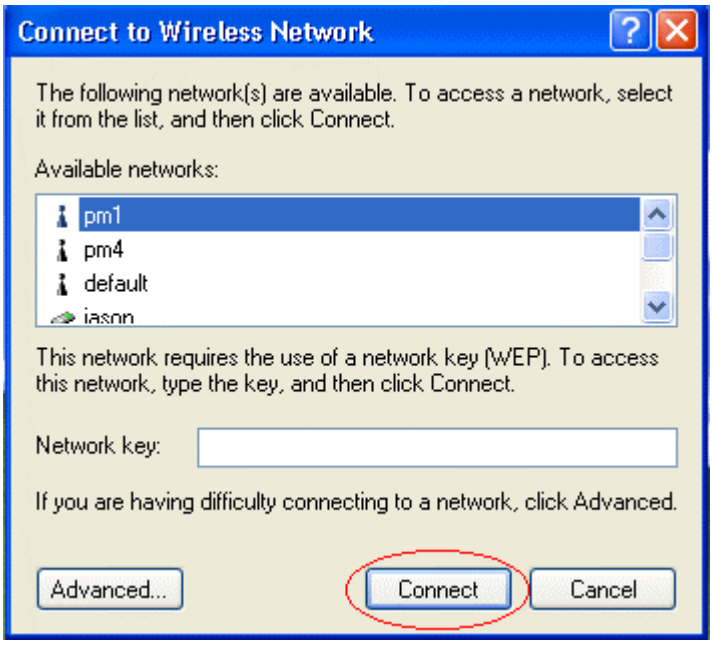

Figure 37. Connect to Wireless Network

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step5. Click ***Connect***

Figure 38. Connect to Wireless Network

step6. To configure additional wireless network connection settings, click ***Advanced*** (Figure 38). The *Wireless Network Connection Properties* dialog box will open (Figure 39)

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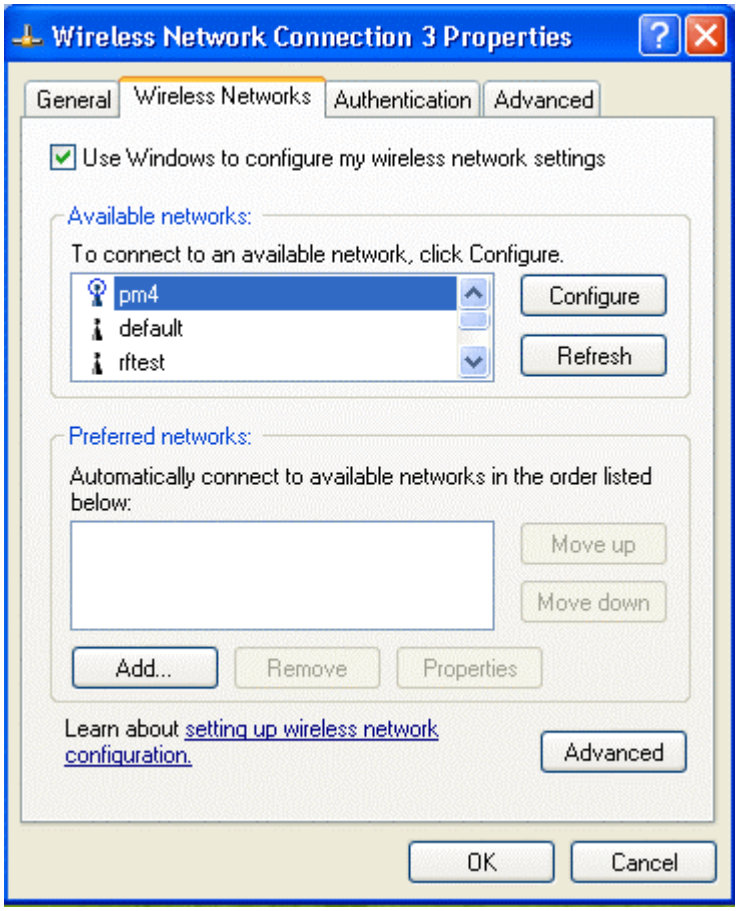

Figure 39. Wireless Network Connection Properties

step7. Open ***Wireless Network Connection Properties***, and then configure the settings in the ***Wireless Networks*** tab

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Troubleshooting

This section provides you with some troubleshooting information should you encounter installation or operation problems on InstantWave products. If your problems still cannot be remedied after going through the Troubleshooting section, check the FAQs at http://www.ndc.com.tw/support/faq.htm

If you still have a problem, call the reseller from whom you purchased the InstantWave products, or contact NDC technical support for assistance (see Technical Support, page 38).

Question/Symptom	***Answer/Suggested Solution***
Compatibility Issues: *I. Why is it the NWH4010 can be installed in certain machines but not in others?* *II. On some machines, why is it the NWH4010 can be installed only on some specific ports?* *III. Why is it the NWH4010 can be installed only on some USB hubs?*	These situations happen with all USB devices. There have been some compatibility issues in USB devices since USB was first implemented. Please use the NWH4010 in compatible USB ports/hubs only.
How can I connect the NWH4010 with an Apple Airport Base Station using encryption?	Go to the Airport Administration Utility and select your Base Station. It will ask you for the Base Station password. Enter the password. The *Configure Base Station* window will come up. At the top, select the Base Station Menu. Select *Equivalent Network Password*. Enter this as the manual hex key for the NWH4010. Do NOT enter it as the passphrase.

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I'm confused, some of the wireless devices say they are using 40 bit encryption, others say they are using 128 bit and/or 64 bit. Are these encryption levels compatible with each other?	128 bit WEP devices can be used with 40 or 64 bit WEP devices as long as the device driver has a way to set the lower encryption level. The encryption level is determined by the encryption key length. If a device is capable of 128 bit encryption, it is also capable of 40 bit, unless the vendor decides for some reason not allow the lower encryption level. 64 bit WEP is the same as 40 bit WEP. The lower level of WEP encryption uses a 40 bit 10 hex character secret key set by the user and a 24 bit Initialization Vector which is not under user control. Some vendors refer to this level of WEP as 40 bit, others as 64 bit. Either way, they're the same encryption level and can interoperate. The higher level of WEP encryption, commonly referred to as 128 bit WEP, actually uses a 104 bit , 26 hex character secret key, set by the user and a 24 bit Initialization Vector which is not under user control.
Problems Associating with an Access Point	Follow the instructions below if your client adapter fails to associate with an access point. I. If possible, move your workstation a few feet closer to the access point and try again. II. Make sure the NWH4010 USB adapter cable is securely inserted in the computer's USB port and the USB adapter. III. Check that the access point is powered on and operating. IV. Check that all parameters are set properly for both the USB client adapter and the access point. These include the SSID, WEP activation, network type, channel, etc.

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Problems Connecting to the Network	After you have installed the appropriate driver and client utilities, contact your network administrator if you have a problem connecting to the network. Proxy server, network protocols, and further authentication information might be needed to connect to the network.
Is the "Domain Name (SSID)" of the adapter (NWH4010) case-sensitive?	Please note the following points when inputting an SSID during wireless LAN adapter installation: (1). The “Domain Name (SSID)” of the adapter (NWH4010) is case-sensitive. (2). There should NOT be any spaces within the SSID.

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Technical Support

Support from Your Network Supplier

If assistance is required, call your supplier for help. Have the following information ready before you make the call.

1. LED status
2. A list of the product hardware (including revision levels), and a brief description of the network structure
3. Details of recent configuration changes, if applicable

Support from NDC

If you have any problems that you cannot resolve with the information in troubleshooting, or the FAQs at http://www.ndc.com.tw/support/faq.htm note the following information and contact our technical support team:

- What you were doing when the error occurred
- What error message you saw
- Whether the problem can be reproduced
- The serial number of the product
- The firmware version and the debug information

NDC Technical Support is available via:

E-mail: techsupt@ndc.com.tw

For other information about NDC, please visit us at: www.ndclan.com

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NDC Limited Warranty

Hardware

NDC warrants its products to be free of defects in workmanship and materials, under normal use and service, for a period of 12 months from the date of purchase from NDC or its Authorized Reseller, and for the period of time specified in the documentation supplied with each product.

Should a product fail to be in good working order during the applicable warranty period, NDC will, at its option and expense, repair or replace it, or deliver to the purchaser an equivalent product or part at no additional charge except as set forth below. Repair parts and replacement products are furnished on an exchange basis and will be either reconditioned or new. All replaced products and parts will become the property of NDC. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

NDC shall not be liable under this warranty if its testing and examination disclose that the alleged defect in the product does not exist or was caused by the purchaser's, or any third party's misuse, neglect, improper installation or testing, unauthorized attempt to repair or modify, or any other cause beyond the range of the intended use, or by accident, fire, lightning, or other hazard.

Software

Software and documentation materials are supplied "as is" without warranty as to their performance, merchantability, or fitness for any particular purpose. However, the media containing the software is covered by a 90-day warranty that protects the purchaser against failure within that period.

Limited Warranty Service Procedures

Any product (1) received in error, (2) in a defective or non-functioning condition, or (3) exhibiting a defect under normal working conditions, can be returned to NDC by following these steps:

You must prepare:

- Dated proof of purchase
- Product model number & quantity
- Product serial number
- Precise reason for return

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- Your name/address/email address/telephone/fax

1. Inform the distributor or retailer.
2. Ship the product back to the distributor/retailer with prepaid freight. The purchaser must pay the shipping fee from the distributor/retailer to NDC. Any package sent C.O.D. (Cash On Delivery) will be refused.
3. Charges: Usually RMA (Returned Material Authorization) items will be returned to the purchaser via airmail, prepaid by NDC. If returned by another carrier, the purchaser will pay the difference. A return freight and handling fee will be charged to the purchaser if NDC determines that there was "No Problem Found" or that the damage was caused by the user.

Warning

NDC is not responsible for the integrity of any data on storage equipment (hard drives, tape drives, floppy diskettes, etc.). We strongly recommend that our customers back their data up before sending such equipment in for diagnosis or repair.

Services after Warranty Period

After the warranty period expires, all products can be repaired for a reasonable service charge. The shipping charges to and from the NDC facility will be borne by the purchaser.

Return for Credit

In the case of a DOA (Dead on Arrival) or a shipping error, a return for credit will automatically be applied to the purchaser's account, unless otherwise requested.

Limitation of Liability

All expressed and implied warranties of a product's merchantability, or of its fitness for a particular purpose, are limited in duration to the applicable period as set forth in this limited warranty, and no warranty will be considered valid after its expiration date.

If this product does not function as warranted, your sole remedy shall be repair or replacement as provided for above. In no case shall NDC be liable for any incidental, consequential, special, or indirect damages resulting from loss of data, loss of profits, or loss of use, even if NDC or an authorized NDC distributor/dealer has been advised of the possibility of such damages, or for any claim by any other party.

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EC DECLARATION OF CONFORMITY

For the following equipment:

Product Name : InstantWave 11Mbps Wireless USB Adapter

Model Number : NWH4010

is hereby confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to R&TTE Directive(99/ 5/ EC). For the evaluation regarding the electromagnetic compatibility, the following standards were applied.

The product meets or exceeds the following EMC standards:

EN 300 328-2	**July 2000**	**V1.1.1**
ETS 300 826	**November 1997**	
EN 60950	**August 1992**	**A1, A2, A3, A4, A11**

The manufacturer/importer is responsible for this declaration:

Company Name : NDC Europe

Company Address : 1, Earlsfort Centre
Hatch Street
Dublin 2, Ireland

Person authorized to make this declaration:

Name : Changhua Chiang

Position/Title : President & CEO

March 15, 2002

Date **Legal Signature**

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Appendix

The appendix lists the channels supported by the world's regulatory domains.

The channel numbers, channel center frequencies, and regulatory domains are shown in the table.

Channel Number	***Center Frequency (MHz)***	***FCC/ Canada***	***ETSI***	***Spain***	***France***	***Japan***
1	2412	O	O			O
2	2417	O	O			O
3	2422	O	O			O
4	2427	O	O			O
5	2432	O	O			O
6	2437	O	O			O
7	2442	O	O			O
8	2447	O	O			O
9	2452	O	O			O
10	2457	O	O	O	O	O
11	2462	O	O	O	O	O
12	2467		O		O	O
13	2472		O		O	O
14	2484					O

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