Instant**Wave**™ *PCI/PC Card*

2Mbps Wireless LAN

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

Packing List

The package contents vary depending on whether you have purchased the PnP PCI Card, or the PC Card version:

The PCI Card package should contain the following items:

- One PCI Card

- One Antenna

- One CD ROM (Windows Driver and Utility program)

- One Diskette for Windows NT

- This User's Guide

The PC Card package should contain the following items:

- One PC Card

- One CD ROM (Windows Driver and Utility program)

- One Diskette for Windows NT

- This User's Guide

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Introduction

Congratulations on choosing an InstantWave wireless networking family product. InstantWave was designed with a *"Maximizing the convenience of networking"* philosophy in mind. You will find InstantWave very easy to configure and use.

This User's 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.

InstantWave Family

The InstantWave PCI and PC Card are part of the InstantWave family of easy to use high performance wireless communication products. The family products include:
- InstantWave PC Card (NW610A)
- InstantWave PCI Card (NW630A)
- InstantWave Access Point (NW660A)

System Requirements

Hardware Platform

A station must be an x86 compatible PC with a PCI bus or PCMCIA interface. The minimum system configuration is the same as that required to run MS Windows (Windows 95, 98, NT 4.0).

Software Environment

The stations operate in conjunction with most of the MS Windows (Windows 95, 98, NT 4.0), Novell NetWare series.

Glossary

Wireless Network

In the IEEE 802.11 definition, a wireless network is classified as an Ad-Hoc network or an Infrastructure network.

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.

Wireless Stations

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.
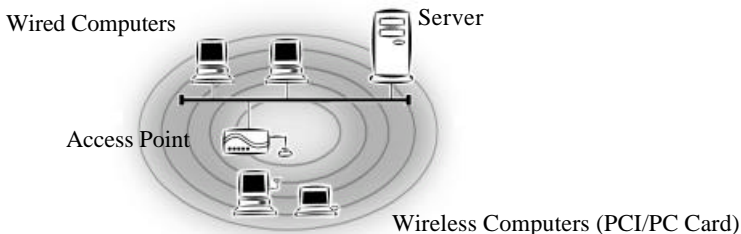

Wired Computers

Server

Access Point

Wireless Computers (PCI/PC Card)

Figure 2.   An Infrastructure Network

Group ID/BSSID

A Group ID (the 802.11 standard uses the term BSSID) is the ID of a wireless cell. A wireless cell is usually made up of stations in an area that the radio signal can comfortably cover. In other words, any wireless station in the cell can communicate with any other within reach of the radio signal (**Figure 3**).

Figure 3.   A Wireless Cell (Group)

Domain Name/ESSID

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 4 depicts a common wireless network setup.
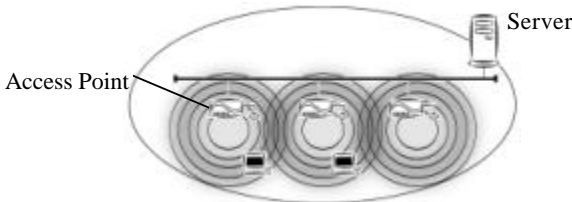
Figure 4.   Roaming in the Same Domain

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.

Carrier Set

InstantWave products use the unlicensed ISM (Industrial, Scientific, Medical) band to communicate through radio waves. Different countries offer different radio frequencies to be used as the ISM band. There are four frequency bands defined by 802.11: Japan (2.471GHz – 2.497 GHz), USA, Canada, and Europe (2.4 GHz – 2.4835 GHz), Spain (2.445 GHz – 2.475 GHz), France (2.4465 GHz – 2.4835 GHz). If a user wants to use InstantWave in a country not listed above, he/she needs to check with their government's regulating body to find the correct frequency band to use. All InstantWave products are supplied preset to the country of sale's frequency band.

Access Point

An Access Point (AP) provides a transparent bridged connection between a wired network and a wireless network and allows wireless stations to communicate with devices attached to a wired network.

It manages the flow of data packets from the wired LAN to the Wireless LAN and vice versa.

Getting Started

This section explains how to quickly setup a wireless station.

Hardware Installation

PCI Card Installation

To install the InstantWave PCI Card into a computer, simply follow these steps:

step1. Turn off the power to your computer and all peripherals and unplug the power cord from the wall socket

step2. Remove the computer's cover

step3. Select a free PCI Bus expansion slot and remove the slot cover

step4. Carefully install the card in the expansion slot (**Figure 5**) by firmly pressing until the card is snugly seated. Be sure the card is fully home. Fasten the retaining bracket with the screw from the slot cover

PCI card

PCI Expansion Slot
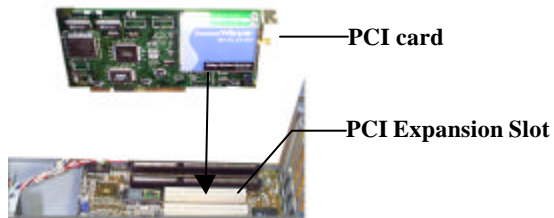
Figure 5.   Inserting the Card

step5. Replace the computer cover and reconnect the previously disconnected cables

step6. Screw the antenna into the InstantWave card (**Figure 6**)

Figure 6.   Connecting the Adapter Card Antenna

step7. Repeat the above procedure to fit an InstantWave card into each of the other computers to be networked

PC Card Installation

The PC Card fits into a Type II or Type III PCMCIA slot. The antenna is encased in a plastic case, in line with the main body of the PC card, such that it extends outside the PCMCIA slot when the card is inserted. The slot must allow for a card extension of up to 30mm as specified in the PC Card specifications.

step1. Insert the PC Card into the Type II slot of the computer. Insert the card with the 68-pin connector facing the slot and the label facing up (**Figure 7**)

Figure 7.   Inserting the PC Card

step2. Repeat the above procedure for each of the other computers to be networked

LEDs

The PCI and PC Card each have two LEDs. Both will blink when the adapter is initialized. In normal use the green LED blinks when the adapter transmits data, and the orange LED blinks on data reception.

Driver Installation/Uninstallation

For Windows 95 see the following section, for Windows 98 go to page 12, for Windows NT 4.0 go to page 14.

Installation in Windows 95

As the installation method for the Windows 95 versions is slightly different, you should begin by identifying your version.
Right click *My Computer* and click *Properties*. The *System Properties* screen will open (**Figure 8**).

Check the version number
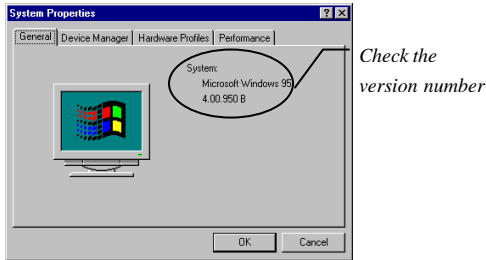
Figure 8. System Properties

On the *General* card you will find the Windows 95 version number:

- **If the version number is 4.00.950 or 4.00.950a you are running the original version of Windows 95. (Follow procedure A below)**
- **For version 4.00.950 B or later, go to procedure B on page 8**

Procedure A (For Windows 95 versions 4.00.950 and 4.00.950a)

step1.   Turn on the power and start Windows 95

step2.   Windows 95 will detect the adapter and the *New Hardware Found* dialog box will open (**Figure 9**)
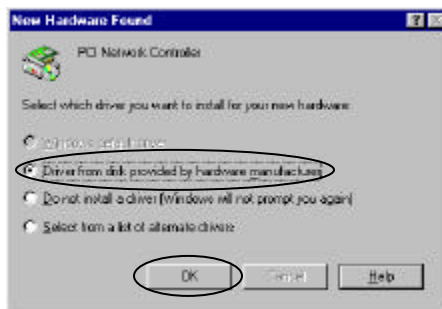
Figure 9.   New Hardware Found

step3. Choose *Driver from disk provided by hardware manufacturer,* and click *OK*. The *Install From Disk* dialog box will open (**Figure 10**)
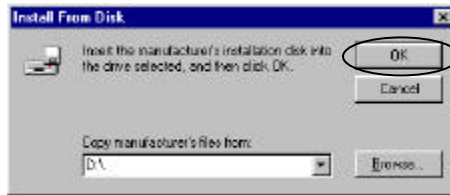
Figure 10. Install From Disk

step4. Insert the InstantWave CD-ROM in the CD drive. The driver is in the root directory of the CD-ROM. Type D:\ (or whatever your CD drive is) and click *OK.* The system will copy the driver files to the Windows 95 system

step5. Go to page 10, and follow steps 7 to 13 as described in *Procedure B*

Procedure B (For Windows 95 4.00.950 B and 4.00.950 C)

step1. Turn on the power and start Windows 95

step2. Windows 95 will detect the adapter and the *Update Device Driver Wizard* dialog box will open (**Figure 11**)
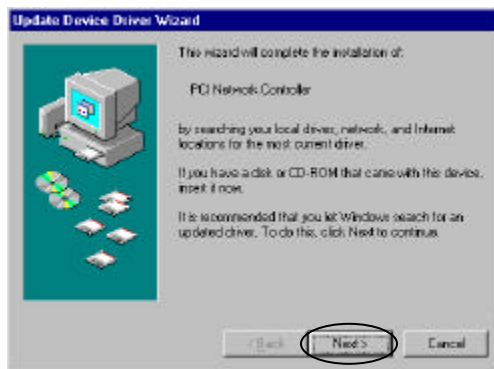
Figure 11. Update Device Driver Wizard-1

step3. Insert the InstantWave CD-ROM in the CD drive and click *Next*

step4. The *Update Device Driver Wizard* will indicate that Windows 95 found the driver in the root directory of the CD-ROM (**Figure 12**). Click *Finish*
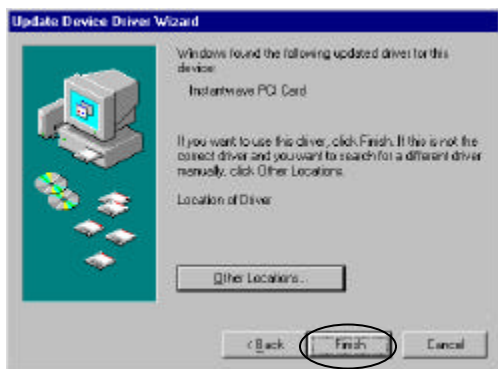
Figure 12. Update Device Driver Wizard-2

step5. The installer will copy the driver files into the system. There is a known problem with the Windows 95 OSR2 device installer. The installer may default to the wrong source location. Typically, the installer source path defaults to the Windows installation location. The user should manually redirect the installer to the correct source location. The following dialog boxes will be displayed

Figure 13. Insert Disk
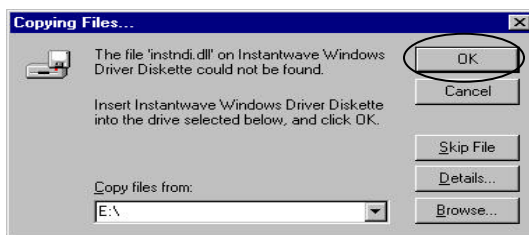
Figure 14. Copying Files

step6. Click *OK* on each screen. After the driver files have been copied, setup is complete

step7. After the InstantWave Utility files have been copied, the *Network Identification* dialog box will open (**Figure 15**). Enter a unique computer name and the Domain Name (ESSID) of the network to which the wireless adapter will connect
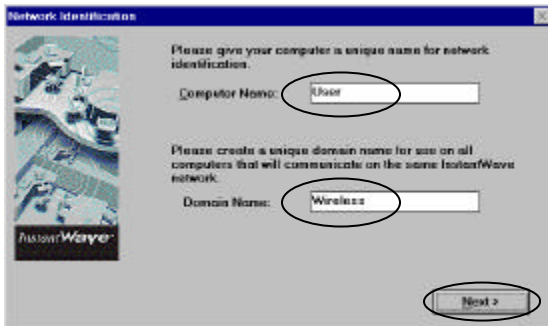
Figure 15. Network Identification

step8. Click *Next*. The *Network Properties* dialog box will open (**Figure 16**)
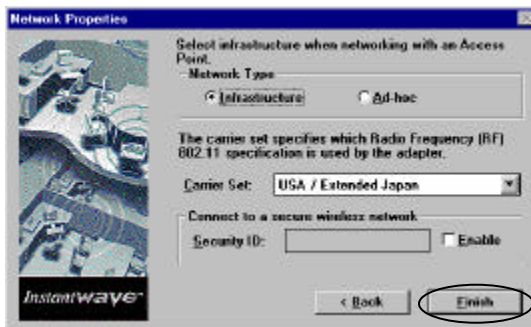
Figure 16. Network Properties

step9. Select the Network Type and Carrier Set. If the station is connected to an Access Point, Infrastructure mode must be specified. Select Ad Hoc mode to make a peer to peer connection to other wireless stations. If the country of operation is different from the country in which the product was purchased, the user can change the carrier set. All wireless stations and Access Points must use the same Carrier Set in order to communicate. Security can be enabled to restrict unauthorized access. When security is enabled, a Security ID is requested. The longest string for the Security ID is eight characters. All the wireless devices must have the same Security ID in order to communicate with each other. Click *Finish*

step10. Depending on your current installation of Windows 95, the setup program may ask you to insert the Windows 95 CD-ROM

step11. The *System Settings Change* dialog box will ask you if you want to restart your computer. Remove the CD-ROM from the drive and click *Yes*

step12. After rebooting, the system will automatically install the InstantWave Utility Program and execute it. The user can monitor the wireless LAN's status and configure the adapter's properties via this program (see page 17 for details)

step13. If the TCP/IP protocols are required (necessary for Internet access), add them by clicking *Start/Control Panel/Network/Configuration*

That completes the hardware and driver installation.

Uninstalling the Adapter from Windows 95

You may need to uninstall your adapter for the following reasons:

1. The installation fails or is interrupted by unknown factors. If this happens the InstantWave Adapter will be marked with an exclamation mark "!" in Device Manager. Uninstall the adapter using methods described below and then restart your computer. The Windows 95 plug and play function will detect the adapter again

2. You want to remove the device

The uninstallation process is as follows:

To completely remove the adapter and driver from your system you will need to physically remove the adapter (with the system powered off). The removal procedure is the reverse of the Hardware Installation procedure on page 5. Restart the computer and then proceed as follows:

step1. In *Control Panel* click the *Network* icon

step2. Highlight the InstantWave adapter driver entry

step3. Click the *Remove* button to remove the old InstantWave adapter driver

step4. Click *OK.* The system will ask you to restart the PC. Click *Yes*

Installation in Windows 98

Driver installation and uninstallation in Windows 98 is basically the same as that of Windows 95 OSR2. Complete the following procedure to install the driver program for Windows 98.

step1. Turn on the power and start Windows 98

step2. Windows 98 will detect the adapter and the *Add New Hardware Wizard* dialog box will open (**Figure 17**)

Figure 17. Add New Hardware Wizard-1

step3. Click *Next*

Figure 18. Add New Hardware Wizard-2

step4. Choose *Search for the best driver for your device* (**Figure 18**). Click *Next* to open the following screen (**Figure 19**)

Figure 19. Add New Hardware Wizard-3

step5. Insert the InstantWave CD-ROM and click *Next*

step6. The *Add New Hardware Wizard* will indicate that Windows 98 found the driver in the root directory of the CD-ROM (**Figure 20**). Click *Next*

Figure 20. Add New Hardware Wizard-4

step7. Go to page 10, and follow steps 7 to 13

The default network protocol for Windows 98 is TCP/IP. If other network protocols are required they can be added via *Control Panel/Network* .

Uninstalling the Adapter from Windows 98

step1. Click *Start/Settings/Control Panel,* and double-click the *Network* icon, then highlight the InstantWave adapter driver entry

step2. Click the *Remove* button to remove the old InstantWave adapter driver

step3. Click *OK.* The system will ask you to restart the PC. Click *Yes*

Installation in Windows NT 4.0

Important: *Before installing the driver in Windows NT 4.0, check that in the computer's BIOS on the* **PnP and PCI Settings** *page, "***PnP OS Installed***" is set to* **NO**.

step1. Double-click *My Computer*, double-click *Control Panel*

step2. Double-click the *Network* icon to open the *Network* window. Select the *Adapters* card

step3. Click *Add*. The *Select Network Adapter* dialog box will open

step4. Click *Have Disk*

step5. Insert the Windows NT driver diskette into drive a (or b) and then type **a:\winnt** (or **b:\winnt**)

step6. Click *OK*. The *Select OEM Option* dialog box will open (**Figure 21**)
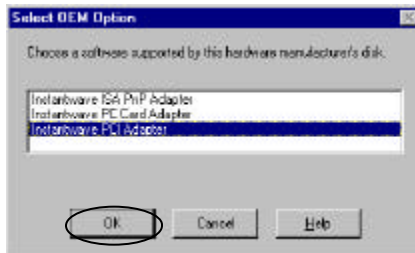

Figure 21. Select OEM Option

step7. Select the correct adapter and click *OK.* If *PC Card* is selected, the dialog box for setting the Interrupt number and I/O address will be shown. Users can specify a different Interrupt number and I/O address for this adapter if there is a conflict with an existing card in the computer
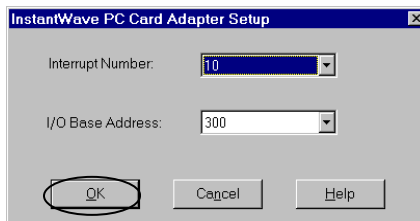
Figure 22. InstantWave Adapter Setup

step8. Click *OK*. The *InstantWave PCI Adapter Setup* dialog box will open (**Figure 23**). Select the Network Type and Carrier Set. If the station is connected to an Access Point, *Infrastructure mode* must be specified. Select *Ad Hoc mode* to make a peer to peer connection to other wireless stations. If the country of operation is different from the country in which the product was purchased, the user can change the carrier set. All wireless stations and Access Points must use the same Carrier Set in order to communicate. The Domain name should be the same as the network domain to which the station will be connected
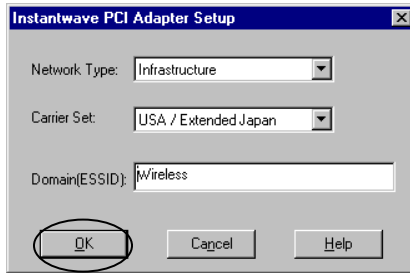
Figure 23. Select the Network Type and Carrier Set

step9. Click *OK*. The *Roaming* dialog box will open (**Figure 24**)
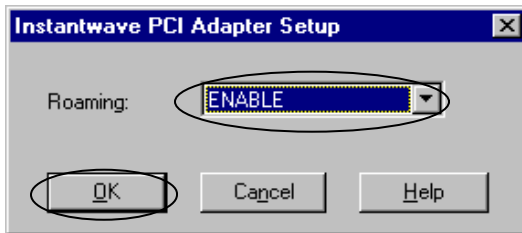
Figure 24. Set Roaming Switch

step10. When *Roaming* is enabled, the station is allowed to roam to another Access Point under the same Domain Name whenever the radio signal quality of the currently connected AP is below an acceptable level. Click *OK*. The *Security* dialog box will appear (**Figure 25**)
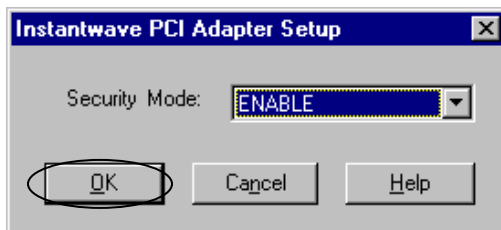
Figure 25. Set Security

step11. Security is enabled to restrict unauthorized access. When security is enabled a Security ID is requested (**Figure 26**)
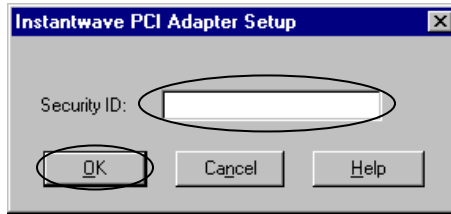
Figure 26. Enter Security ID

step12. The longest string for the security ID is eight characters. All the wireless devices must have the same Security ID in order to communicate with each other. Enter a Security ID and click *OK*. Windows NT will begin copying files

step13. The *InstantWave Adapter* will now be shown on the *Adapters* card in the *Network* configuration box. Click *Close*

step14. If the user needs to bind the adapter to TCP/IP, then the TCP/IP protocols must be added

step15. The *Network Settings Change* dialog box will ask you to restart the computer. Remove the floppy disk from the floppy drive and click *Yes* to complete the installation

**step16.** Owing to Windows NT constraints, the InstantWave Windows Utility Program will not be automatically installed. The user needs to install this program by following the procedure described on page 17

Uninstalling the Adapter from Windows NT 4.0

step1. Click *Start/Settings/Control Panel*, and double-click the *Network* icon.

step2. Highlight the InstantWave adapter driver entry and click *Remove*

step3. Click *Close*. The system will ask you to restart the PC. Click *Yes*

The InstantWave Windows Utility Program

The InstantWave Utility program is a Windows-based application that allows users to monitor and configure the wireless adapter. The program includes a Network Watcher tool that allows users to determine the best location to place the InstantWave products, or to diagnose the wireless network for problems.

The utility program allows users to configure the wireless network type (Ad-Hoc or Infrastructure), Domain name (segmented networks), and set the Roaming capability (Enable/Disable). The *Network Watcher* tool allows users to view existing groups (Group ID/BSSID. See an explanation of this term on page 3) of wireless cells in a Domain. It provides the option to join a particular group in the network.

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

InstantWave Utility Installation

Insert the InstantWave Utility program setup CD-ROM

step1. From the *Start* menu, select *Run*, and type: d:\utility\setup.exe

step2. Click the *OK* button to start the setup program. The InstantWave Welcome screen will appear. After reading the installation description, click *Next* to advance to the *Choose Destination Location* dialog box (**Figure 27**)
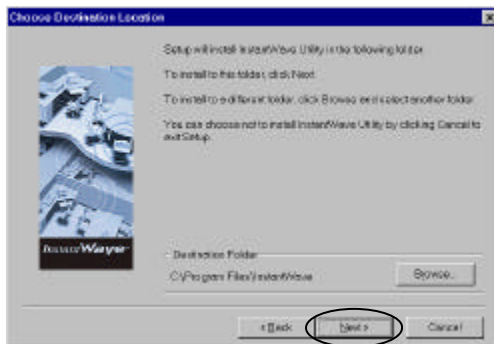
Figure 27. Choose Destination Location

step3. From the *Choose Destination Location* dialog box, click *Next* to copy the program files to the default location, *C:\Program Files\InstantWave*, or click *Browse* to choose another location

step4. The setup program will copy the necessary files into the specified directory. File copying progress will be displayed in the InstantWave utility setup screen. Check *I would like to launch InstantWave Utility*, and click *OK*. The *InstantWave Information* dialog box will be displayed

step5. Click *OK* to complete the installation. The InstantWave Utility toolbar will open (**Figure 29**)

Using the InstantWave Utility Program

The following section explains how to use the InstantWave Utility.

step1. Click the *Start* button on the taskbar

step2. Go to *Programs* and *InstantWave Utility*. The Station Utility tools will be shown (**Figure 28**)
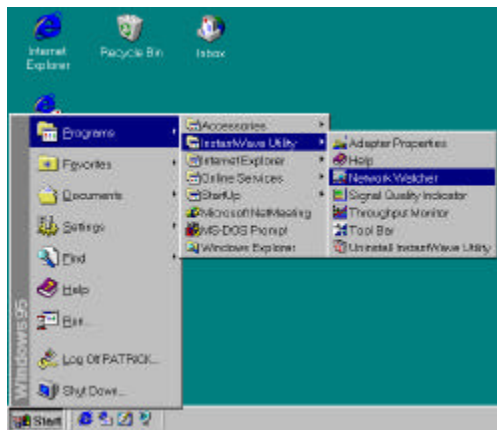
Figure 28. InstantWave Utility

step3. Click *Toolbar* and the task icons will appear in the upper right corner of the screen, offering fast access to the utility functions (**Figure 29**)

Figure 29. Toolbar

step4. Click the icon for the task you wish to perform. The functions provided by the utility program are, reading from left to right on Figure 29:

- Adapter Properties
- Network Watcher
- Signal Quality Indicator
- Throughput Monitor

step5. Right-click the InstantWave Utility toolbar. Four functions are provided:

- **Move** is used to move the toolbar to a suitable screen position
- **Close** is used to close the Toolbar
- **Preferences** allows you to customize utility settings
- **About** provides product information

step6. Click *Preferences*. The *Preferences* dialogue box will be shown (**Figure 30**)
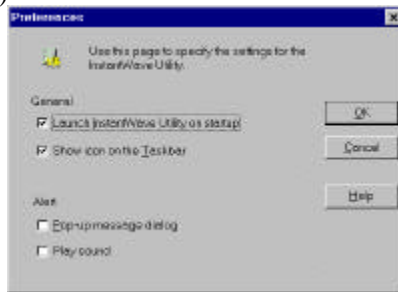
Figure 30. Preferences

- *Launch InstantWave Utility on startup* automatically starts the utility at each system boot
- *Show Icon on the Taskbar* displays an icon on the taskbar (**Figure 31**)

Figure 31. Lamp Icon

- The color of the icon indicates the wireless adapter card's current status:

Color	Status
Black	The wireless adapter or the driver is not working properly
Red	Poor signal quality
Yellow	Acceptable signal quality
Green	Good signal quality

- *Pop up message dialog* is used to display a warning message in case of abnormal conditions
- *Play sound* is used to generate an alert sound in case of abnormal conditions

Right-click on the icon to open a popup menu for fast access to the Utility program, Preferences, and Help.

Adapter Properties

There are two ways to access Adapter Properties. One is by clicking **Start/Programs/InstantWave Utility/Adapter Properties**. The other is by clicking the *Adapter Properties* icon on the InstantWave Utility's tool bar. Adapter Properties allows the user to view the adapter properties, and to change the wireless configuration of the Station.

Configuration

Configuration displays, and allows you to modify, some important parameters of the InstantWave adapter. All parameter changes are saved and are referred to by the InstantWave driver when the system boots. Therefore, most of the parameter changes require a system reboot to make them effective. Changes to *Enable Roaming* do not require a system reboot. The configuration tab is shown below (**Figure 32**).
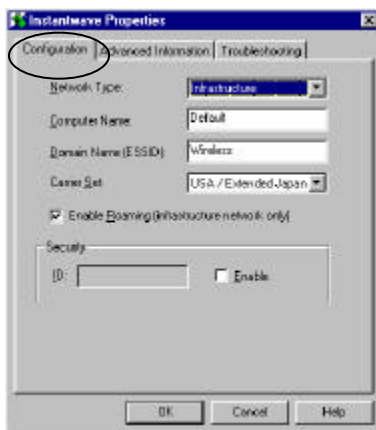
Figure 32. Configuration

- *Network Type* - The 802.11 Wireless Specifications allow for two types of network, *Infrastructure* or *Ad-Hoc* (see the Glossary on page 2). *Infrastructure* is used when networking with an Access Point. The default setting is *Infrastructure*
- *Computer Name* - The *Computer Name* must be the same name as entered in *Control Panel/Network/Identification.*
- *Domain Name* - Stations and APs in the same group must use the same domain name. This field is defined in the 802.11 Wireless Standard as ESSID

(Extended Service Set ID). Having the same Domain Name allows all wireless nodes in the same Domain (or Cell) to communicate with each other. The default setting is *Wireless*

- *Carrier Set* - This is preset to the U.S.A., Canada, Europe, Spain, France, or Japan depending on where the product is sold. The parameter shown indicates which Radio Frequency (RF) 802.11 specification is currently in use in the adapter

- *Enable Roaming* - Roaming can be turned on or off. When roaming is enabled, the station is allowed to roam to another Access Point in the same domain when the radio signal quality of the currently connected AP is below an acceptable level

- *Security Setting* - Security can be turned on to restrict unauthorized access. When Security is enabled a Security ID is requested. The longest string for the Security ID is eight characters. All the wireless devices must have the same Security ID in order to communicate with each other

Click *OK* to close the window. A pop-up screen will ask if you wish to reboot your computer to make the changes effective. Click *Yes*

Advanced Information

Click the *Advanced Information* tab to view the Adapter Properties (**Figure 33**).

Figure 33. Wireless Adapter Properties

The window is divided into three sections as described below:

- *Basic Information* - This section contains the manufacturer's name and the InstantWave MAC firmware version number. The information is read from the MAC firmware of the InstantWave card

- *Hardware Configuration Information* - Shows the adapter bus type, IO address, IRQ number, and the station MAC address

- *Adapter Status* - Displays the adapter's working status

Troubleshooting

Should a problem be encountered using the wireless adapter that cannot be resolved using the 'Troubleshooting' section of this manual, click the *Troubleshooting* tab (**Figure 34**). A diagnosis program will run and report the message. Send the diagnostic message together with a description of the symptoms to NDC's technical support via email.
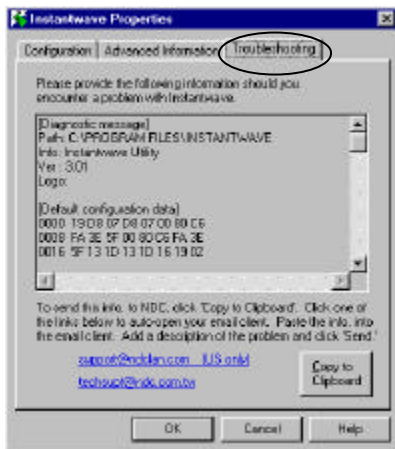

Figure 34. Troubleshooting

Network Watcher (Infrastructure)

In an Infrastructure network, *Network Watcher* scans for all existing wireless cells in range and displays the AP names, the MAC address, the Domain Name, the Signal Strength, the number of stations currently connected to each AP, and the connection status. When *Network Watcher* is run, the program first reads and displays information stored in the database. The signal strength entry shows either Green (strong signal), or Yellow (average signal). The information is not dynamically updated. To refresh the data click the *Scan* button. *Network Watcher* also gives users the option of selecting an Access Point to join with manually.

Figure 35. Network Watcher (Infrastructure)

Scan

Click *Scan* to obtain and display updated data. You may need to wait a short time depending on the number of wireless cell replies received.

Join

Selecting one of the APs from the list will enable the *Join* command. The *Join* command allows you to manually connect to a specific AP.

If joining cannot be accomplished within 20 seconds (possibly due to an AP that has gone off the air since the data was last refreshed, to RF interference, or a busy AP), the operation will fail. If this happens, you may try joining with the same AP again, or select another AP to join.

Network Watcher (Ad-Hoc)

On an Ad-Hoc network, *Network Watcher* displays all the wireless nodes (with their Computer Name and Node Address (MAC ID)s) that are currently connected in the same Group as this station (**Figure 36**). The inactive timer counts the period that there is no traffic between it and the other connected stations.
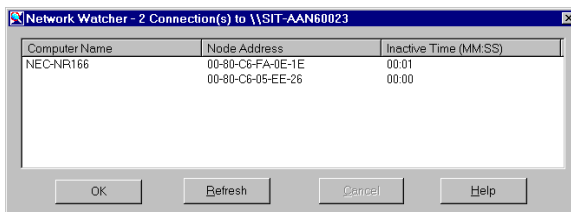

Figure 36. Network Watcher (Ad-Hoc)

Refresh

Click *Refresh* to obtain and display updated data. You may need to wait a short time depending on the number of replies received.

Signal Quality Indicator

Signal Quality Indicator dynamically displays the present radio signal quality (**Figure 37**). The quality level is indicated by colors. Green means the signal is good, Yellow indicates the signal is fair, Red denotes the signal is poor. When the signal color reaches the yellow to red border, the station will start to roam if roaming is enabled.

Figure 37. Signal Quality Indicator

Throughput Monitor

This item enables users to monitor the throughput (transmitted and received bits) of the wireless station (**Figure 38**).
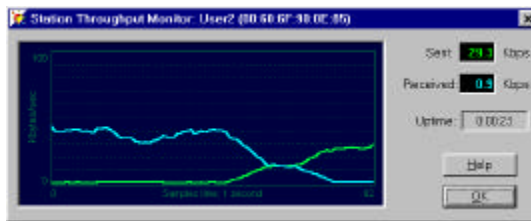
Figure 38. View Station Throughput

The graph shows the amount of transmitted/received bits from/to this station.

Uninstalling the Utility Program

Should you wish to uninstall the InstantWave Utility program, click *Start/Programs/InstantWave Utility/Uninstall InstantWave Utility*

Or complete the following steps:

step1.   Click *Start/Settings/Control Panel*

step2.   Click *Add/Remove Programs* and select *InstantWave Utility*

step3.   Click the *Remove* button

Software Upgrade Procedures

Windows NDIS Driver Upgrade

Follow the instructions below to install a new NDIS PCI/PC Card driver release.

step1. In *Control Panel*, click the *Network* icon, then highlight the InstantWave adapter driver entry

step2. Click the *Remove* button to remove the old InstantWave adapter driver

step3. Click *Close*. The system will ask you to reboot the PC. Click *Yes*

After removing the old InstantWave adapter driver, follow the installation procedure for your operating system. For Windows 95 versions 4.00.950 and 4.00.950a go to page 7, for Windows 95 4.00.950 B and 4.00.950 C go to page 8, for Windows 98 go to page 12, and for Windows NT 4.0 go to page 14.

InstantWave Utility Upgrade

step1. Click *Control Panel*. Click *Add/Remove Programs*, and remove the old InstantWave Utility from the program list

step2. Follow the InstantWave Utility Installation procedure on page 17 to install the new InstantWave Utility

Troubleshooting

Windows 95/98

Installation Problems

Windows could not find the adapter

- The adapter is not properly inserted in the slot

    1. Power off the computer
    2. Remove and reinsert the wireless adapter
    3. Reboot the computer and re-install the adapter driver

- A previous adapter installation was aborted by the user, or by Windows

    1. Look in *Control Panel/System/Device Manager/?-Unknown Devices* for a Wireless adapter entry
    2. If an entry exists, delete it from the list, and exit the Control Panel/System folder
    3. Reboot the computer and re-install the adapter driver

The InstantWave adapter driver cannot be started. Windows displayed a driver startup problem message window

- IRQ conflict with other device

    1. Open *Control Panel/System/Device Manager/Network Adapters*. You will see an exclamation sign displayed on the wireless adapter icon
    2. Highlight the wireless LAN adapter entry and click on the *Properties* button
    3. Select the *Resources* tab. You will see a device conflict message displayed in the *Conflicting Device* list
    4. Uncheck *Use automatic settings*, and click on the *Change Setting* button
    5. Select a new IRQ value. When the *Conflicting Device list* confirms there are no conflicts, click *OK* to close the windows
    6. Reboot the computer

There are more than one wireless adapter entries shown in the Control Panel/Network folder. You do not know which one is the current one

- A previously installed wireless adapter entry for a different card was not removed
    1. Remove all wireless LAN adapter entries from the *Network* window
    2. Reboot the PC to re-install the wireless adapter

Windows NT 4.0

Installation Problems

Windows NT 4.0 could not find the adapter

- The adapter is not properly inserted in the slot
    1. Power off the computer
    2. Remove and reinsert the wireless adapter
    3. Reboot the computer and re-install the adapter driver

- A previous adapter installation was aborted by the user, or by Windows NT 4.0
    1. Look in *Control Panel/Network/Adapters*
    2. If an *InstantWave adapter* entry exists, remove it from the list and exit the Control Panel/Network dialog box
    3. Reboot the computer and re-install the adapter driver

The InstantWave adapter driver cannot be started and the adapter LEDs are not flashing

- More than one driver is present in the Network setup folder
    1. Click *Control Panel/Network/Adapters*
    2. If there is more than one entry for the same InstantWave adapter, remove them all
    3. Reboot Windows NT
    4. Reinstall the InstantWave adapter driver

General

Utility Error Messages
Cannot find the Wireless adapter

- The Wireless adapter driver is installed, but the wireless adapter is not in the computer slot

  > If you are using the wireless PC card, you will only need to re-insert the PC card into the PCMCIA slot to re-enable the driver. However, if you are using the PCI adapter, you will need to power down the PC and insert the PCI card, then reboot the computer

Adapter is not responding

- The card is in the system. The wireless adapter driver is not functioning. Follow the *Installation Problems* section of troubleshooting to resolve driver startup problems

- The green PC feature is setup to cut the system power to the adapter slot when it is in 'PC Sleep' mode. The Windows Utility will temporarily lose contact with the adapter during Sleep mode

  > Re-starting the Windows Utility after the PC is out of Sleep mode will bring back the adapter. The long-term solution to this problem is to disable (through the PC BIOS) the PC Sleep function

Operational Problems
The Wireless adapter appears to be functioning. The Tx/Rx LEDs are flashing. However, no network PC can be found when run in Infrastructure Wireless Network mode

- Station is having difficulties finding an AP to join
  1. Use *Network Watcher* to scan for all APs in the same wireless domain
  2. Select the first AP that has its signal quality displayed in green, and join to it
  3. If all the APs' signal quality indicator shows yellow, or no AP is on the list, you may be too far away from any AP to be associated. Move closer to an AP

- You have only one AP, and the PC is not placed too far from it, but the PC still has difficulties finding the AP
  1. Check that the antennas are properly connected to the AP and the station
  2. Make sure that the AP is powered on and working
  3. Use *Network Watcher* to find and join with the AP

Radio signal quality indicates Yellow or Red whilst in Infrastructure mode

- The connected AP is too far away

    1. Use Network Watcher to find an AP with a stronger signal
    2. Move your PC closer to the connected AP

- The adapter antenna is not connected, or its signal path is blocked by metal casing, e.g. metal filing cabinets

    1. Make sure the antenna is firmly screwed in
    2. Arrange the antenna position to get the best radio signal quality

Transmission or reception throughput is low during network file accessing

- Many stations are connected to the same group and heavily utilizing the network

    1. On an Infrastructure wireless network, use *Network Watcher* to find, and connect to, a different AP with only a few PC connections
    2. In an Ad-Hoc environment, form your own wireless group with a different wireless domain name to start a different channel hopping pattern

Ad-Hoc stations can't join each other

- Two stations started at the same time

    Reboot one station

- Different Domain Name (ESSID)

    Change the ESSID, using the InstantWave utility program, to match that of the other stations on the Ad-hoc network
    OR
    Go to *Control Panel/Network/InstantWaveAdapter /Properties/Advanced/ESSID*, and change it there

Technical Support

If you are having a problem using an NDC product and cannot resolve it, please note the following information and contact NDC Technical Support:

- What you were doing when the error occurred
- What error messages you saw
- Whether the problem can be reproduced
- The serial number of the product

Send the above information and the output of the **Troubleshooting** screen (see page 22) to one of the following addresses:

> support@ndclan.com (US only)
> techsupt@ndc.com.tw (Europe and Asia Pacific)

For other information about NDC, please visit us at:

> www.sohoware.com
> www.ndc.com.tw

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 diskette media containing the software are 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
- 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 freight 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.

For the following equipment:

Product Name: **: InstantWave Wireless PCI/PC Card**

Model Number: **: NW610A (PC Card)**

 NW630A (PCI Card)

Produced by:

Manufacturer's **: NATIONAL DATACOMM CORPORATION**
Name
Manufacturer's **: 2F, NO. 28, INDUSTRY EAST 9TH ROAD**
 Address **SCIENCE PARK, HSINCHU,**
 TAIWAN, R.O.C.

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
Electromagnetic Compatibility (89/ 336/ EEC).
The product meets or exceeds the following EMC standards:

 Europe:

 ETS 300-328, ETS 300-339, ETS 300-826

 France:

 SP/DGPT/ATAS/23, ETS 300-328, ETS 300-339

The manufacturer/importer is responsible for this declaration:

Company Name **: NDC (EUROPE) CO., LTD**

Company Address **: 1, EARLSFORT CENTRE,**
 HATCH STREET,
 DUBLIN 2, IRELAND

Person authorized to make this declaration:

Name **: CHANG-HUA CHIANG**

Position/Title **: MANAGING DIRECTOR**

Date   **Legal Signature**

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