



PCI CardLINK™ Model 150

USER'S MANUAL



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FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct interference at his own expense.

FCC Registration Number: MCIP101, PCIPC

DISCLAIMER

The instructions in this document have been carefully checked for accuracy and are presumed to be reliable. RadioLAN and its writers assume no responsibility for inaccuracies and reserves the right to modify and revise this document without notice. It is our goal at RadioLAN to always supply accurate and reliable documentation. If you discover a discrepancy in this document, please e-mail your comments or suggested corrections to: info@radiolan.com.

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INTRODUCTION

Welcome to wireless networking. The RadioLAN PCI CardLINK™ adapter allows you to connect a PC with a 32-bit PCI slot to a RadioLAN wireless network. RadioLAN wireless networks allow network stations to access shared network resources using a full 10Mbps connection, without typical cabling requirements.

The RadioLAN PCI CardLINK comes with NDIS 4 and NDIS 5 drivers to support the following Microsoft Operating Systems:

- Windows 95™ B or later
- Windows NT™ 4.0 SP3 or later
- Windows 98™
- Windows 2000™

Installation procedures for each of the above operating systems are explained later.

The PCI CardLINK also comes with RadioNET™ Manager, RadioLAN's powerful network connection application.

RadioNET Manager manages network stations, enabling them to function at an optimum level. You can also track and test the quality of communications within a network. With RadioNET Manager you can:

- View detailed information for a specific station
- View several stations at once
- Modify station name
- Modify station Subnet ID
- Enable optional features, like encryption
- Identify access type for each station
- Test individual stations to determine success/failure rate of transmissions
- Test the communication connection between stations

CAUTIONS

- This adapter requires PCI 2.2 BIOS support. Many of the latest PCI 2.1 BIOS PCs support PCI 2.2 functions. If the adapter is not working, you may need a BIOS update from your PC Manufacturer.
- Do not try to use this adapter across a PCI to PCI Bridge. This is not supported and will not work. Only use the PCI CardLINK in a primary bus PCI slot. Consult your PC's documentation to determine if any slots are across a bridge. Generally, if there are 4 PCI slots or less, then all are primary slots.
- Do not remove the PCMCIA card from the PCI CardLINK adapter and try to use it in a laptop. This configuration is not supported and voids the warranty.

SYSTEM REQUIREMENTS

To use RadioNET Manager on a station, computers must meet or exceed the following requirements:

- IBM™-compatible 486 or greater
- 16Mb of RAM
- CD-ROM drive
- Hard disk drive with 2Mb of available space

RANGE OF OPERATION

Within the data range, a station can exchange information at full Ethernet speeds. For best operation, RadioLAN recommends that you locate all stations within a 120-foot circular area (see Figure 1). This ensures proper operation of the network's CSMA/CA feature, which overcomes network communication collisions.

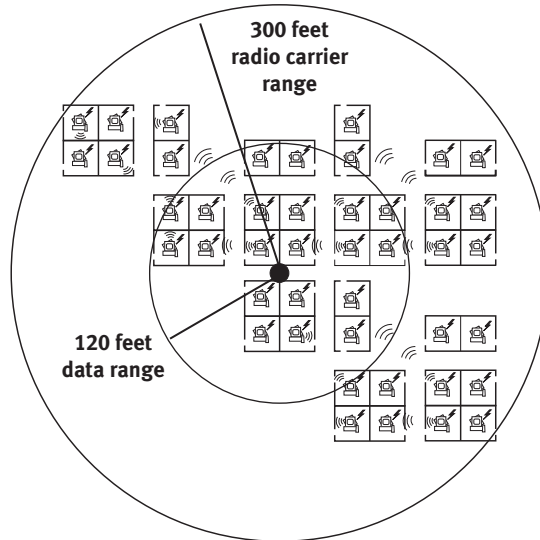


Figure 1: Range of Operation

Obstructions can decrease the data range: RadioLAN products are designed to operate in a semi-open office environment. Listed below are some obstructions that may reduce your data range:

- Walls made of a metallic substance
- Thick concrete walls
- Walls reinforced with metallic studs
- Foil-backed insulation installed within walls
- Desktop objects that surround your RadioLAN transceiver

Roaming

RadioLAN networks provide an automatic ability to select the Access Point with the best signal. (Note: The term **Access Point** in this manual refers to RadioLAN's BackboneLINK™). This allows the stations to move from one Access Point to another without user intervention. For instance, a portable computer using a RadioLAN PCMCIA card may easily move from one area of the building to another area served by a separate Access Point, while receiving constant 10Mbps service. This allows the user to take the computer from the office area to a conference room and continue to work on the network. The station's software manages the relationship to the nearest Access Point, and when conditions change, the station will notify the new Access Point that it is selected to provide service for that station, and the old Access Point to discontinue service. This is done automatically and seamlessly.

Performing a Site Survey

Performing a site survey allows you to map out your signal quality ratings throughout the office area. To perform the survey, you need a laptop and an Access Point. For example, a RadioLAN BackboneLINK™ and a wireless notebook station using the RadioLAN MOBILINK™. While testing, each station is monitoring the other for connectivity quality.

Mapping the Site

Create a map of the wireless site. On the map, mark the locations of each stationary station; for example, mark each office where a wireless station will be located. Also specify and mark the station that will connect to the hard-wired 10BaseT local area network. In this example, the Access Point is the center point of the wireless network. From the Access Point, measure the distance to each office where a wireless station is located. Note the distance at each station on the map.

Performing the Test

To perform the test, you must first setup the laptop station to monitor the Access Point. To configure the station, see Monitor on page 6 for more information.

1. Install and run RadioNET Manager on the laptop. *See Section 2: RadioNET Manager*
2. View the INFO – CONNECTIVITY screen at the laptop station to monitor the connectivity quality of the Access Point. See Connectivity on page 7 for more information.
3. Raise and locate the Access Point's transceiver to the highest possible location, clear from obstructions on any side.
4. With the portable notebook station, move to the location where each wireless station will be located. Locate the notebook so that you can position its transceiver as close to the location where the proposed station's transmitter will be located. Place the transceiver, then call up the NETWORK INFORMATION AND CONNECTIVITY screen onto the notebook's screen. Read the rating for the Access Point. If the Access Point does not have a rating of 5, attempt to raise the value to 5 by relocating the transceiver. Note the highest rating that you attain during the test on the map. Also note the location of the transceiver where this rating was a 5.

Next, move to the next designated station location. Repeat the steps above until you note each location's connectivity quality rating from the notebook.

When you have completed your mapping, you will have an illustrated view of the best connectivity quality that can be attained between the Access Point and each station in the network. You will also be familiar with the best locations to position transceivers throughout the network.

INSTALLING RADIONET™ MANAGER

Installing RadioNET Manager:

1. Insert the CD-Rom into the appropriate drive.
2. Click on Start, then click on Run.
3. Enter D:\rnetmgr\setup.exe (If your CD-Rom drive letter is different, substitute you CD-Rom drive letter for D). Click on OK.
4. Follow the instructions on the screen to complete the setup.

USING RADIONET MANAGER

The RadioNET Manager program allows you to use your computer to configure and manage the wireless local area network. There are three main screens that allow you to make selections that identify your computer as a network station, and to run tests for quality communication.

On program screens there are several items to interact with:

- Entry Fields
- Drop-down List Boxes
- Buttons
- Check Boxes

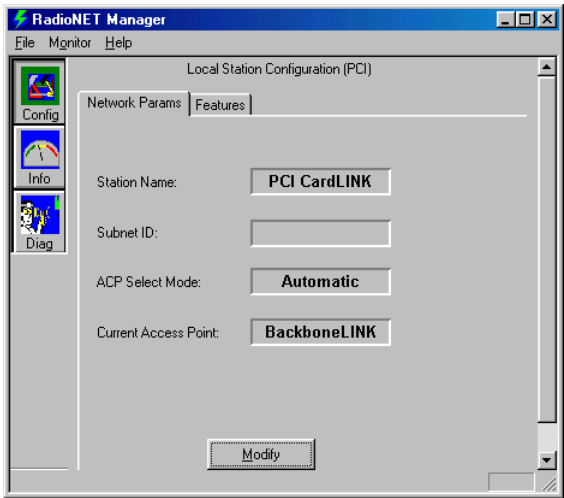


Figure 2: Local Station Configuration Screen, Network Parameters

Common Buttons Found on Screens

While using RadioNET Manager, you will see navigation buttons. These buttons may appear on one or more screens in the program. Familiarize yourself with these buttons, shown in Table 1.

Table 1: Buttons Commonly Used in the Program

This Button	Causes This Action
Close	This button allows you to close the particular operation you are performing without exiting from RadioNET Manager.
Ok	This button allows you to accept any changes and /or move on to another function within the program.
Cancel	The program stops the operation. In some cases, it may also cause the program to move to the previous screen.

RadioNET Manager Menu Items

The menu items are located across the top of the screen just below the RadioNET Manager title line. The functions available to you are listed below.

- **File**
- **Monitor**
- **Help**

You can use these options in conjunction with various screens in the program, but not all options are available at all times. The menu items make it easy for you to exit the program, change the monitor station, and receive assistance.

File

The file menu allows you to exit the application.

Exit

This selection permits you to exit the program and return to the primary operating screen.

Monitor

The **Monitor** Menu gives you the option to view information about a wireless station in your subnet that you chose to track for signal quality. The menu also allows you to change the station that you are reviewing by clicking on the **Select** option. The options give you the ability to move quickly and easily through a large list of stations.

Monitoring Another Station

It may be important to monitor a station, especially if you are roaming about the office, working with a portable notebook computer. For example, if you need to ensure communication with a resource on the hard-wired network, you would monitor your Access Point to that network for signal quality. If, while monitoring, you notice that the signal quality indicator (connectivity) displays a level of 2 or lower, you might re-orient your transceiver for better signal quality.

You can also view statistics related to the communication between your station and the one that you are monitoring. See Statistics on page 12 for more information about statistics.

Details

The **Details** menu option opens the MONITOR STATION DETAILS screen.

Monitor Station Details

This screen displays read-only information about a specific station within the network. It lists the station name and its communication quality or connectivity.

Monitoring Remote Stations from the Task Bar

While RadioNET Manager is operating, the Task Bar (usually located on the bottom of the Windows Desktop) displays a button, which indicates the connectivity of the remote station.

The lightning bolt on the left side of the button changes color, indicating the connectivity quality of the remote station. The bolt's color indicates connectivity. By default, this button monitors the Access Point in use. If you change the **Station monitored** field, RadioNET Manager stores the selection until again changed.

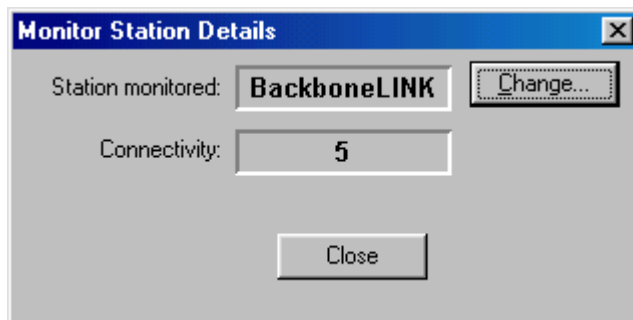


Figure 3: Monitor Station Details Screen

Connectivity

This read-only field measures the **Connectivity** (quality) of a remote station's communication with other stations in the group. The connectivity is rated with a number between 0 and 5 that represents the readability of the radio signal for the station indicated. A score of 5, the highest, indicated optimum performance of the station's radio signal. Scores of 3 or 4 indicate satisfactory signal transmission from the station. A score of 2 or lower indicates a need to make a change in the position of the transceivers used to send and receive the signal.

Change

The **Change** button leads you to the MONITOR STATION SELECTION screen, where you can select a different station to monitor for connectivity quality (see Select for more information).

Close

When you have finished reviewing the information provided in the MONITOR STATION DETAILS screen, you may return to the main screen by clicking on Close.

Select

The **Select** menu item leads you to the MONITOR STATION SELECTION screen, where you can select a different station to monitor for connectivity quality.

Track Access Point

This checkbox must be cleared to select a station other than your current Access Point. When checked, the current Access Point is being monitored.

Station to Monitor

This item allows you to specify another station on the wireless network, which you can monitor for communication quality (connectivity). A listing of choices is provided in the drop-down box. Choose a station and click **OK** to view the station details, as displayed in the MONITOR STATION DETAILS screen.

Exiting the Screen

To exit the MONITOR STATION SELECTION screen and save the change, click on OK. To exit and keep the old settings, click on cancel. You will return to the main screen or to the MONITOR STATION DETAILS screen (depending on how you entered).

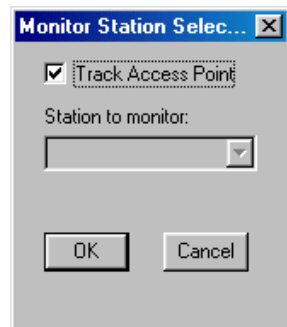


Figure 4: Monitor Station Selection

Help

If you encounter difficulties while using RadioNET Manager, you will need specific information about the program you are using to receive assistance from the RadioLAN Technical Support Staff. This information is contained in the ABOUT RADIONET MANAGER screen. The screen can be accessed through the Help menu option at the top of the screen.

About RadioNET Manager

This screen contains information about the version of the software. This information is needed by the RadioLAN Technical Support Staff to assist you with any difficulties you may encounter while operating the program

OK

Once the necessary information has been attained, exit the screen by clicking OK.



Figure 5: RadioNET Manager Version Information Screen

RADIO NET MANAGER VIEW ICONS

RadioNET Manager displays three viewing options. These options are displayed as icons on the left side of the screen. From top to bottom, the view options are:

- Local Station Configuration View (default view)
- Information View
- Diagnostic View



Figure 6, 7, 8: Shots of buttons

Local Station Configuration View

Network Parameters

Network Parameters are settings that identify your computer to the network. These settings also give you access to the hard-wired network by way of an Access Point.

The LOCAL STATION CONFIGURATION screen gives the network parameters of the station. It provides the following read-only information:

- Station Name
- Subnet ID
- ACP Select Mode
- Current Access Point

Click on **Modify** to display the MODIFY NETWORK PARAMETERS screen, allowing you to change information on the screen.

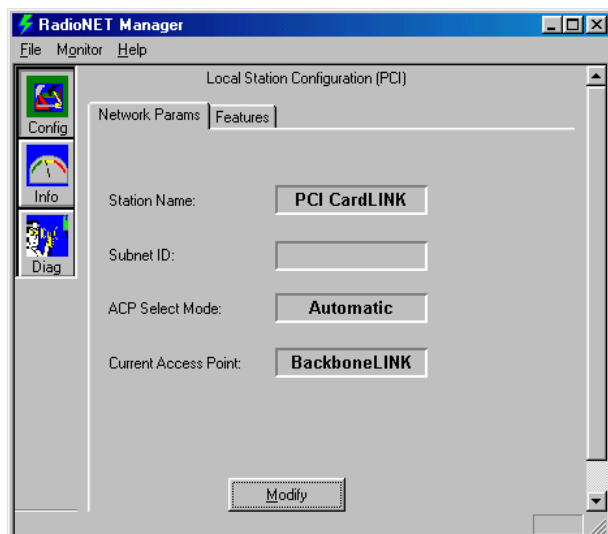


Figure 9: Local Station Configuration Screen

Station Name

The station name is a unique name that provides information about that particular station. Usually the station user's name, or a name describing the function of the desk where the station is located, is used to make it easier for others to identify the station on various screens. Maximum length is 12.

Subnet ID

The Subnet ID is a network group's password. This ID allows all users with the same ID to communicate with one another and share resources. Users with a different Subnet ID will not be able to communicate (unless they change their Subnet ID). Maximum length is 4.

Station to use as Access Point

Clear the checkbox next to Automatic, and use the drop down box to select a Static Access Point.



Warning: If that Access Point goes down, the current station can not access the wired network. Leave the box checked to have the station automatically choose the best Access Point.

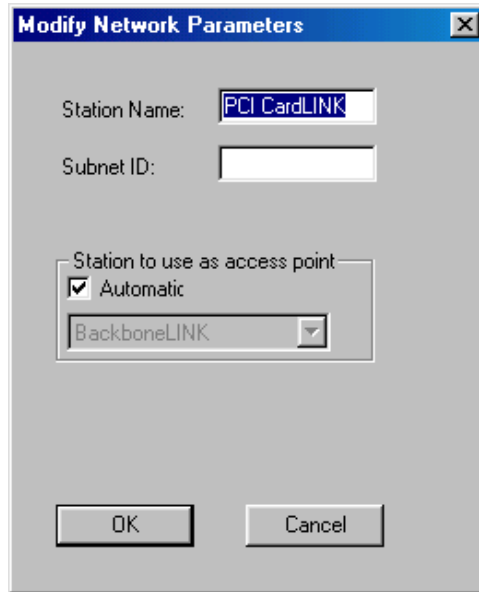


Figure 10: Modify Network Parameters Screen

Features

Click the upgrade button to enter an optional Feature. Encryption is a possible feature, and a key from RadioLAN is required to use this Feature.

Network Information and Statistics View

To enter the Information View select the middle icon. This view is a three-tab file that provides information about the network stations, their connectivity and station transmission statistics.

Information View Icons

In this view several icons are used to provide information about the stations.

Station Info

The STATION INFORMATION tab provides the following information about the network:

- Icons indicating the type of interface access node being used by each station.
- Name of each station in the network
- RadioNET address of each station in the network
- Type of adapter used by each station (which coincides with the icon displayed to the left of the station name)
- Access Point that the station is using
- ACP Enable activated/deactivated

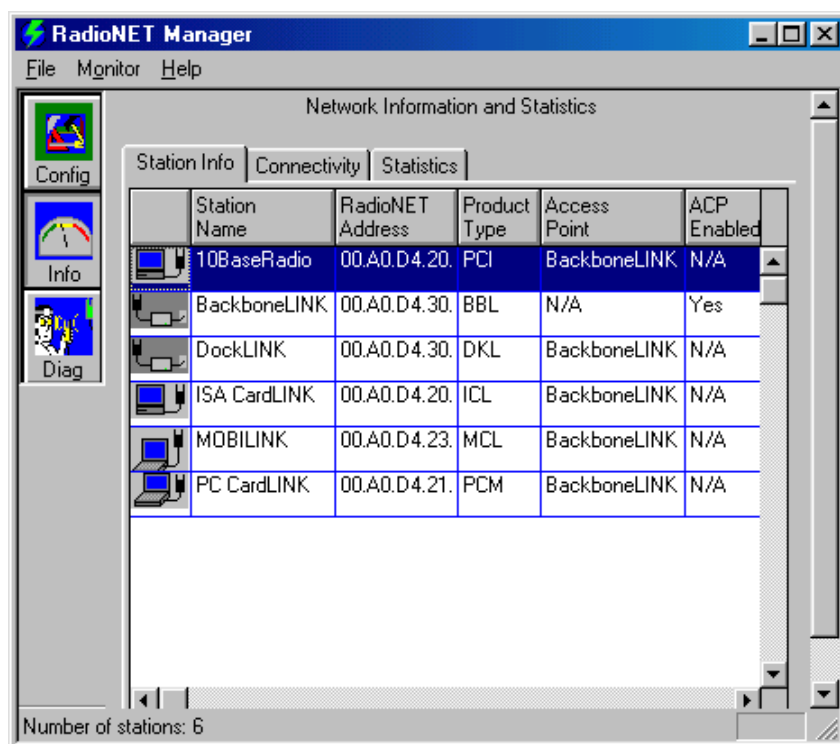


Figure 11: Network Information and Station Info Tab

The information contained in this table is read-only information and can only be modified through individual station modifications in the MODIFY NETWORK PARAMETERS found under the Configuration View.

Station Name

This column lists the Station Name of each PC on the wireless network.

RadioNET Address

This column lists the MAC address for each station on the wireless network.

Adapter Type

This column lists the station type for each station on the wireless network.

Access Point

This column lists the MAC address or name of each wireless station's Access Point to the hard-wired network.

ACP Enable

This column indicates if the wireless access point is enabled. N/A indicates that the station in that row is not an Access Point station.

Connectivity

The CONNECTIVITY tab of the NETWORK INFORMATION screen contains a read-only listing of stations and their current connectivity. RadioNET Manager calculates connectivity quality based upon signal strength and interference on the carrier.

You can use this tab to test the connectivity of the stations listed so that you can determine each station's ability to communicate with your station. Table 2 on page ?? lists the numeric and color ratings for Connectivity ratings 0 - 5. During the test, RadioNET Manager updates station connectivity ratings dynamically.

Name

This column displays the station name for each station within the network to be tested.

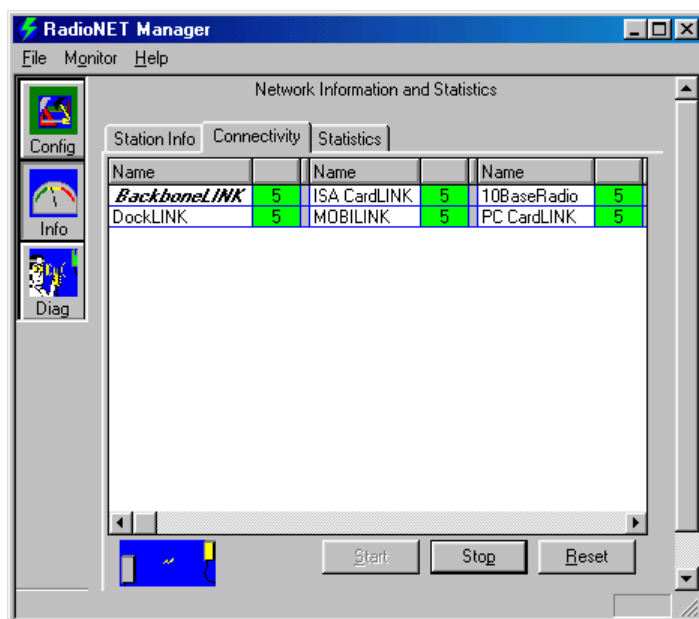


Figure 12: Network Information and Connectivity Screen

Quality (Colored) Column

The **Quality** column is immediately to the right of the name columns. The quality of communication is rated from 0 - 5, with 5 being the highest, or best possible score. This column indicates the connectivity (or quality) of communication with that station. This number may change when station connectivity is tested. Right click on the white area of the screen for a percent scale, instead of a 0 - 5 scale.

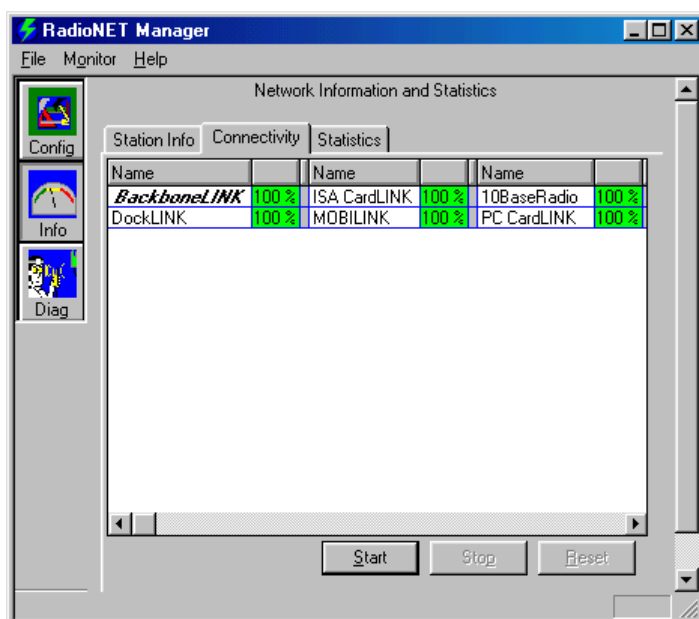


Figure 13: Connectivity Screen using Percent Scale

Start

The **Start** button is the first button to the left at the bottom of the connectivity screen. Click it to initiate the connectivity test for communication quality of stations within the network. When the test is initiated, an animated icon appears in the left-hand corner of the screen throughout the testing process.

Stop

The **Stop** button is located at the bottom of the screen between the Start and Reset buttons. By clicking the Stop button, you can end the connectivity test, making the animated icon in the left-hand corner disappear. If you change to another RadioNET Manager screen, or minimize RadioNET Manager the test stops.

Table 2: Signal Quality

Score	Color	Transceiver Orientation
5	Green	Best location
4	Green	Good location
3	Yellow	Improve if possible
0,1,2	Red	Need to Improve

Reset

The **Reset** button is located on the bottom-right hand corner of the screen. This button allows you to clear information collected during the connectivity test, and restart the test.

Statistics

RadioNET Manager collects statistics including these while monitoring another station (see *Monitoring Another Station* on page 6).

The NETWORK AND INFORMATION STATISTICS screen tab is a read-only screen that provides the following statistical data about network station transmissions and receipts:

- Total number of transmissions
- Percent of successful transmissions
- Average number of retransmissions
- Total number of failed transmissions
- Rate of transmissions in Frames/sec

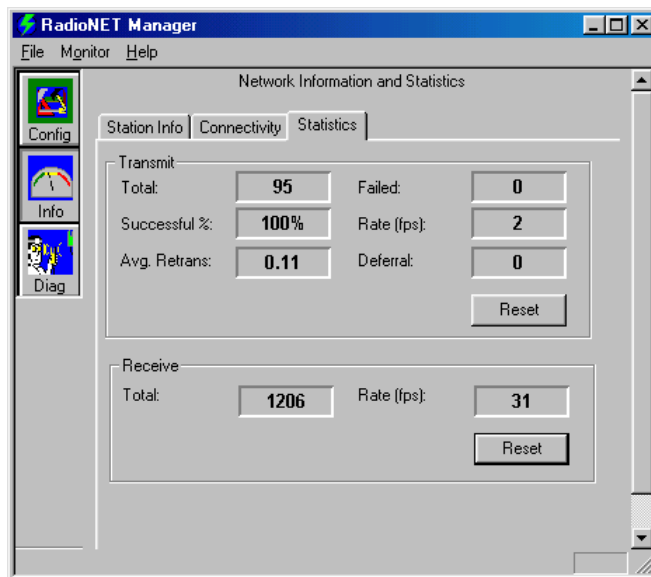


Figure 14: Network Information and Statistics Screen

- Total number of deferred transmissions
- Total number of transmissions received
- Rate of receiving in Frames/sec

Transmit and Receive Totals

Indicates the total number of frames sent to and received from other stations.

Successful %

The percentage of test frames that successfully reached their destination station.

Avg Retrans

This field displays the average number of retransmissions. The system retransmits a data frame when the remote station has not acknowledged the original frame.

Failed

This field displays the total number of frames that were not acknowledged by the remote station.

Transmit and Receive Rate

This field displays the speed at which the frames are being sent or received each second.

Deferral

This field displays the number of frames that were deferred to the deferral buffer, and were not transmitted over the network. Frames are deferred when they are damaged, or otherwise not suitable for reliable broadcast.

Transmit and Receive Reset

This button clears the information from all fields in the same section of the screen.

Network Diagnostic View

Ping

The NETWORK PING screen allows you to send test frames to any of the stations on the wireless network. Ping does not test stations connected to a hard-wired network. The test frame forces a response from the remote station, which acknowledges the test. This test continues until you choose **Cancel** or until the **Frames sent** field equals the **Frames to send** field on the screen. During the test, several read-only fields report the status of the test. This information will help you determine how well each station is communicating within the network.

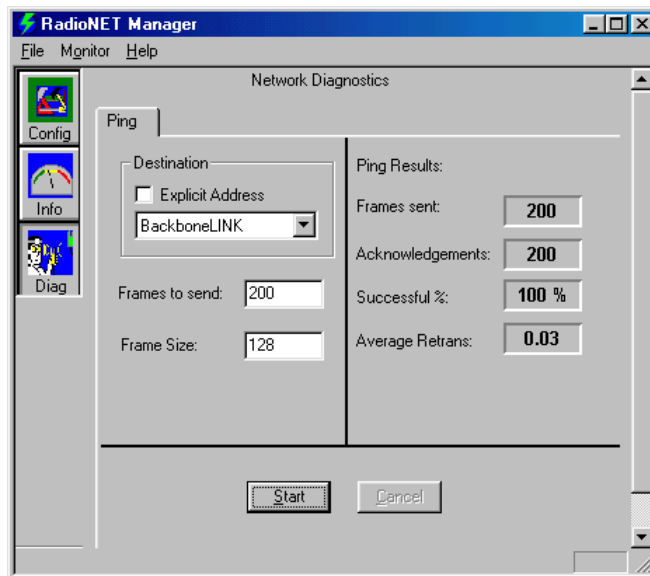


Figure 15: Network Ping Screen

Explicit Address

This check box causes the **Destination** drop down list box to change to a field to type in MAC addresses. If this box is not checked, the **Destination** drop down list box displays a list of station names on the network which have the same **Subnet ID** as this station.

Frames to Send

This field allows you to select the number of data frames that you will transmit to the station listed in the **Destination** box.

Frame Size

This field allows you to select the size of data frames that you will transmit to the station listed in the **Destination** box.

Frames Sent

This read-only field indicates the total number of frames that have been sent during the Ping test.

Acknowledgements

This display-only field tallies the total number of acknowledgements received by this station. This field only counts acknowledgements from the Station in the **Destination** box.

Successful

This display-only field indicates the percentage of the total frames that were acknowledged by the station being tested.

Average Retrans

This display-only field indicates the average retransmissions per frame.

Cancel

The **Cancel** button stops the Ping test before it finishes sending all the frames in the **Frames to Send** field. Statistics gathered in display-only fields stop counting, but continue to display until exiting the screen. RadioNET Manager stores these statistics until you exit the program.

Radiolan has provided this information to help you quickly and easily install the station equipment. Please read the entire information before you begin. **Remember to remove power from your PC before handling circuit boards.**

PREPARING THE TRANSCEIVER

The Transceiver is the only external component in the RadioLAN system (see Figure 16). It contains an internal radio and antenna that allow your personal computer to communicate with other computers on the same network without making hard-wired cable connections to a hub. Each PC using RadioLAN to connect to the wireless network must have a transceiver.

There is an indicator LED on the transceiver between the two cylindrical antennas. The indicator illuminates when your station senses activity on the network.

The transceiver comes complete with a stand, used for placing it onto your computer's monitor or on a cubical wall. Simply slide the transceiver into the stand (see Figure 17), then place the transceiver onto a flat surface, or hang it from a cubical wall.

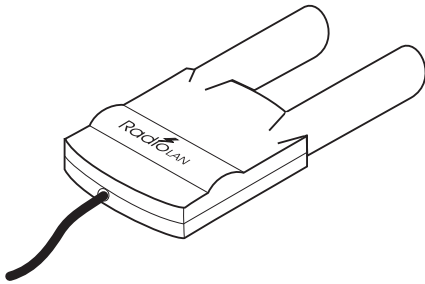


Figure 16: The Transceiver

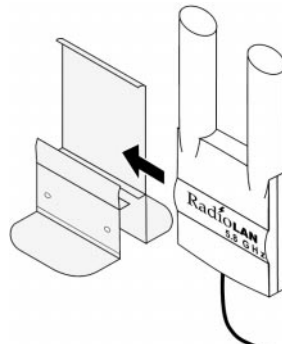


Figure 17: Sliding the Transceiver into the Stand

INSTALLING THE PCI CARDLINK

The purpose of the PCI CardLINK adapter card is to interface the transceiver with your personal computer. It connects to a primary bus PCI slot in your PC.

Before installing the PCI CardLINK card, remove power from your PC, then open the PC by following the PC manufacturer's instructions.

1. Locate an available PCI slot on your computer's system board. Look on page 2 for cautions on PCI slots and systems.
2. Static electricity may damage the components on the adapter card. Touch a grounded metallic object before handling the card. It is best to handle the card by holding its bracket or edges. Remove the PCI CardLINK card from its static-resistant packaging.
3. Record the serial number in the space provided on your QuickStart Guide.
4. Align the PCI CardLINK card's edge connector with the opening in the slot.
5. While holding the card perpendicular to the system board, press the card firmly into the slot.

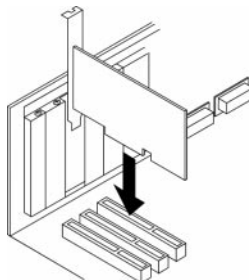


Figure 19. Aligning and connecting the Adapter Card

6. Secure the card's bracket to the PC chassis by installing the screw provided with the PC.
7. Follow the PC manufacturer's instructions while closing your PC's enclosure.

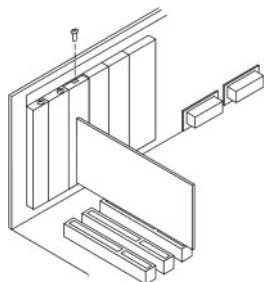


Figure 20: Securing the Bracket to the PC Chassis

CONNECTING THE TRANSCEIVER CABLE TO THE PCI CARDLINK

The connector at the end of the transceiver cable does not fit the jack on the Model 150 card's bracket.

1. Connect the connector with screws on the adapter cable to the connector at the end of the transceiver's cable.
2. Using the adapter cable provided with the kit, attach the connector with the locking mechanism to the Model 150 card's jack.

The connector only attaches to the card in one direction. As you plug the connector into the jack, the ends of the two levers move slightly inward, then spring outward as the connector is completely inserted into the jack of the card. This locks the connector into the jack.

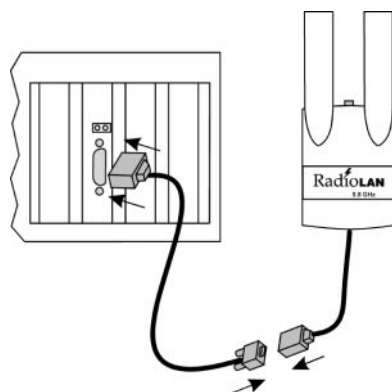


Figure 21: Connecting the Transceiver to the Adapter Card

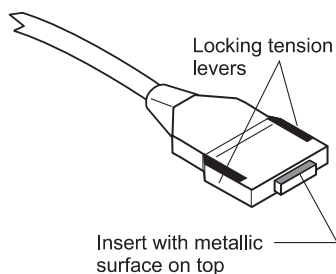


Figure 22: The Cable Connector

PLACING THE RADIO TRANSCEIVER

You can place the radio transceiver onto a desktop, or you can hang the transceiver on a cubical wall. If you choose to hang the transceiver, use a strip of Velcro™ to secure the stand to the top of the wall. When placing the transceiver, follow these guidelines:

- Never place the transceiver in an area where it will be closely surrounded by objects that can block its signal.
- Always orient the antenna perpendicular to the horizon. You can point the antenna to the ceiling or to the floor.
- Always locate the transceiver within 120 feet of other wireless stations in the network.

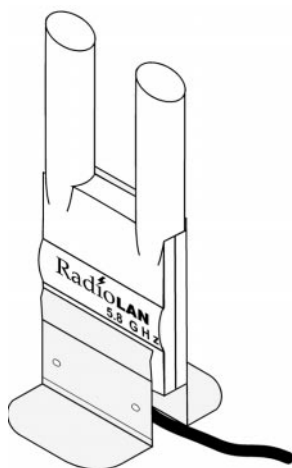


Figure 23: Placing the stand on a Desktop

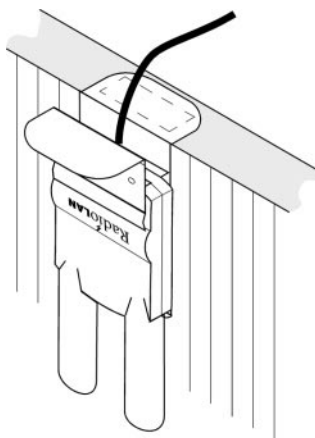


Figure 24: Hanging the Stand from a Cubicle Wall

UNPLUGGING THE CONNECTOR

To remove the connector from the jack, you must press both side levers inward. This releases the locking mechanism. While pressing the levers inward, gently pull the connector away from the jack. Be careful not to pull the smaller PCMCIA card out of the main adapter.

Never grasp and tug the cable to remove the connector from the jack. Using the cable to pull the connector away from the jack can damage the cable. Always grasp the connector as you remove it from the jack.

WINDOWS 95 B OR LATER

The PCI CardLINK can be inserted before or after driver installation. Windows 95 cannot detect the adapter, so bring up the Control Panel by clicking on Start, then Settings, then Control Panel. Choose Add New Hardware from the Control Panel, then Click on Next.

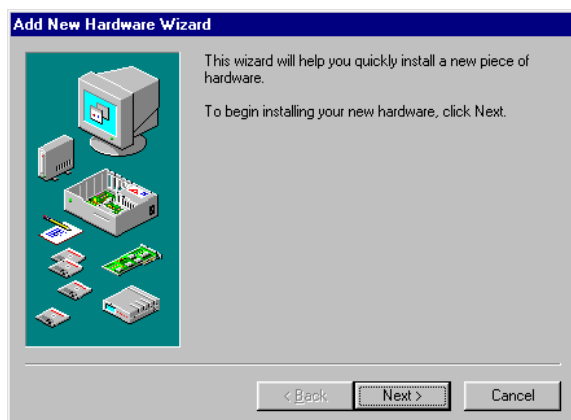


Figure 26: Add New Hardware

Choose No, so Windows does not search for an adapter, then Click on Next.



Figure 27: Search For New Hardware

Choose Network Adapters from the list, and Click on Next.



Figure 28: Network Adapters

Click on Have Disk, then insert the RadioLAN 10BaseRadio PCI Driver CD.

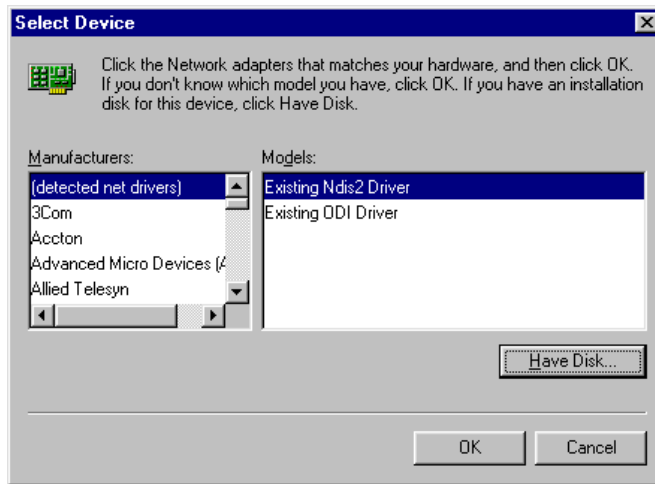


Figure 29: Have Disk

Enter the path for the CD (For example, D:\), then Click on OK. You will see RadioLAN 10BaseRadio PCI highlighted, then Click on OK.

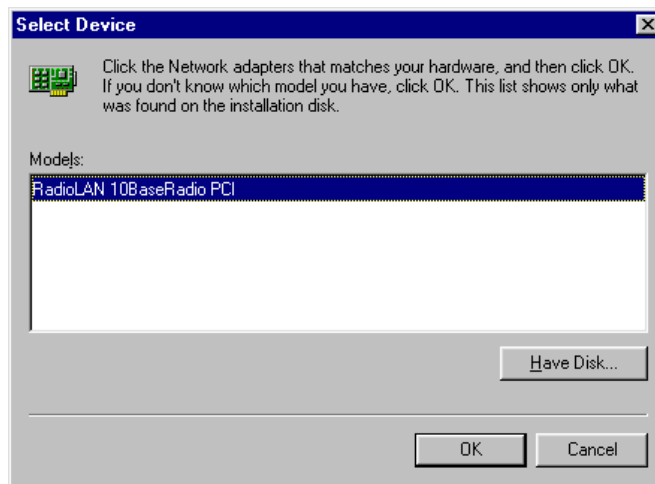


Figure 30: Select RadioLAN Device

Windows 95 will assign the resources displayed, then Click on Next. Windows 95 will copy files from the Driver CD, then ask for the Windows 95 CD. Insert the CD or enter another path then press OK. Click on Finish. Click on Yes to Shutdown the PC.

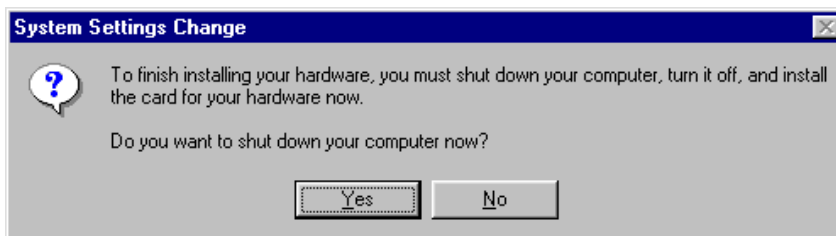


Figure 31: System Settings Change

If the PCI CardLINK was not inserted into the PC, do so now as instructed above. Turn on the PC.

WINDOWS NT 4.0 SERVICE PACK 3 OR LATER

The PCI CardLINK must be inserted into the PC before installation of the driver. In Windows, bring up the Control Panel by Clicking on Start, then Settings, then Control Panel. Choose Network. Select the Adapters Tab, and then Click on Add.

Click on Have Disk, then insert the RadioLAN 10BaseRadio PCI Driver CD.

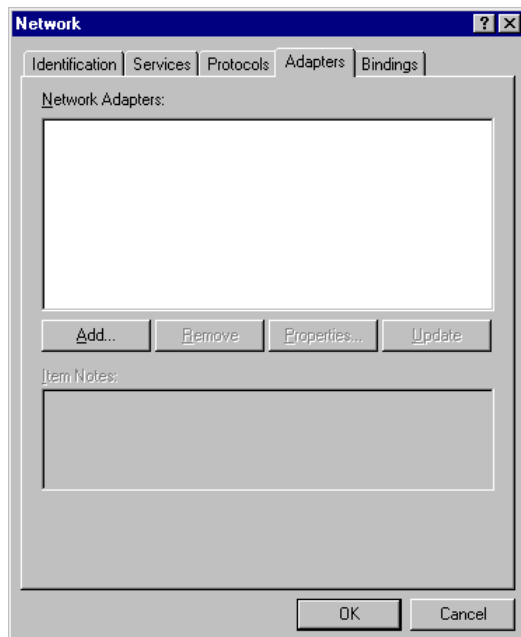


Figure 32: Network Control Panel

Enter the path for the CD (For example, D:\), then Click on OK. The RadioLAN 10BaseRadio PCI will be highlighted.

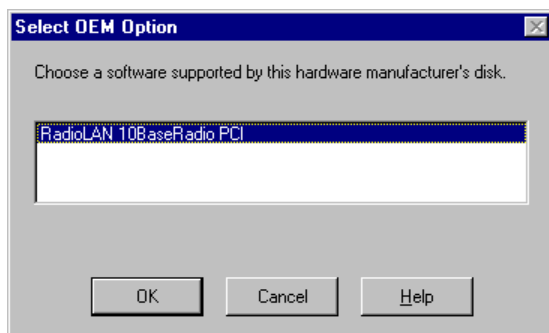


Figure 33: Select RadioLAN Device

Click on OK. The Memory Address or I/O Base Address may be modified.

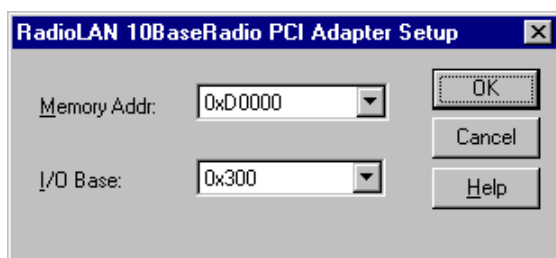


Figure 34: Adjust Settings

(Use Windows NT Diagnostics to determine free resources). Click on OK. Click on Close.

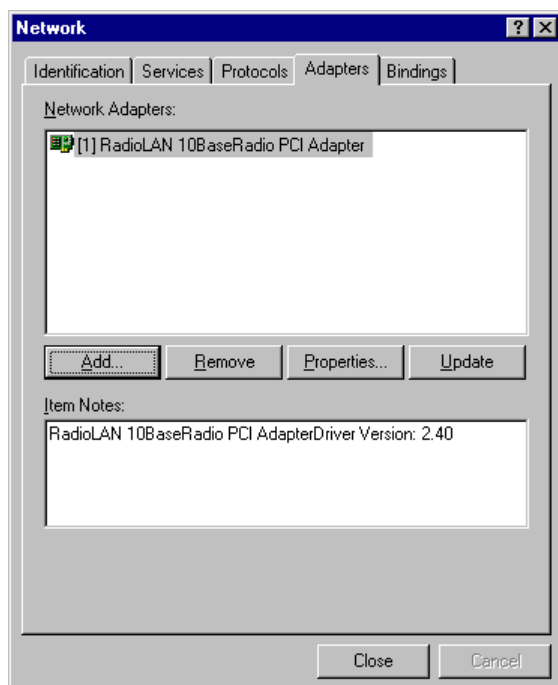


Figure 35: Network Adapters

(You may be asked for Protocol Settings).

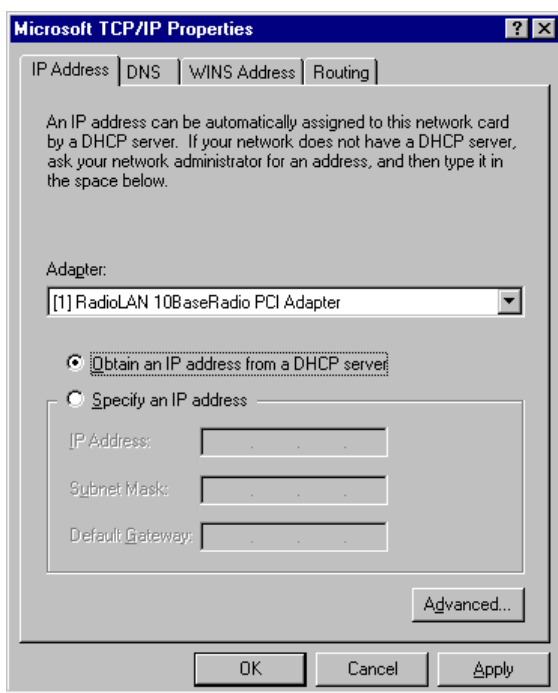


Figure 36: TCP/IP Properties

Click on Yes to Restart.

WINDOWS 98

Insert the PCI CardLINK into the PC. After Windows comes up it will detect a PCI CardBus Bridge, Click Next twice.



Figure 37: Add New Hardware

Clear all boxes, then Click Next twice. Windows will copy some files, then Click on Finish. If asked to reboot, Click No. Windows will detect another PCI CardBus Bridge, Click Next twice. Clear all boxes, then Click Next twice. Windows will copy some files then Click on Finish. Click on Yes to reboot.

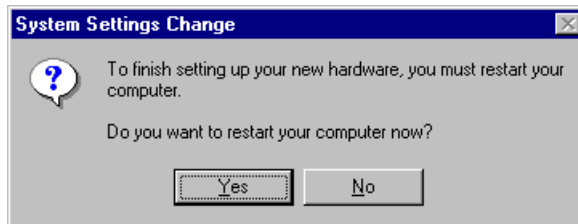


Figure 38: Restart

Windows will detect PCMCIA Card Services and automatically install it. Windows will detect the RadioLAN 10BaseRadio Network (PCI Card).



Figure 39: Detect RadioLAN Device

Click Next twice, clear all boxes, then check on Specify a location. Insert the RadioLAN 10BaseRadio PCI Driver CD and enter D:\WIN98, or substitute your CD drive letter for D, then Click Next twice.



Figure 40: Specify a location

If asked for the RadioLAN Driver Disk enter D:\WIN98 and Click on OK. If asked for the Windows 98 CD, enter the location, and Click on OK. Click on Finish.

If you want to change Network Protocols or Client settings, then Click on No when asked to reboot, change those settings in the Network Control Panel, then when asked to reboot, choose Yes. Otherwise Click on Yes to reboot.

WINDOWS 2000

Insert the PCI CardLINK into the PC. After Windows comes up it will automatically detect two PCI CardBus Bridges. Windows will detect the RadioLAN_10BaseRadio_Network_(PCI_Card).

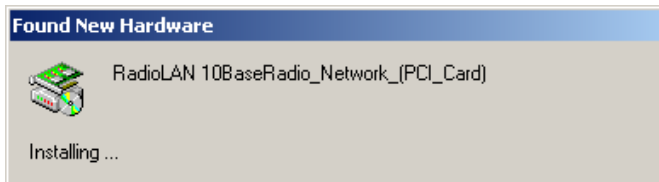


Figure 41: Found New Hardware

The Found New Hardware Wizard will appear.



Figure 42: New Hardware Wizard

Click Next twice, clear all boxes, then check Specify a location.

Click Next, then insert the RadioLAN 10BaseRadio PCI Driver CD, and enter D:\WIN2000, or substitute your CD drive letter for D, then Click OK. Click on Next, and the Digital Signature Screen Not Found Window will appear, Click on Yes.

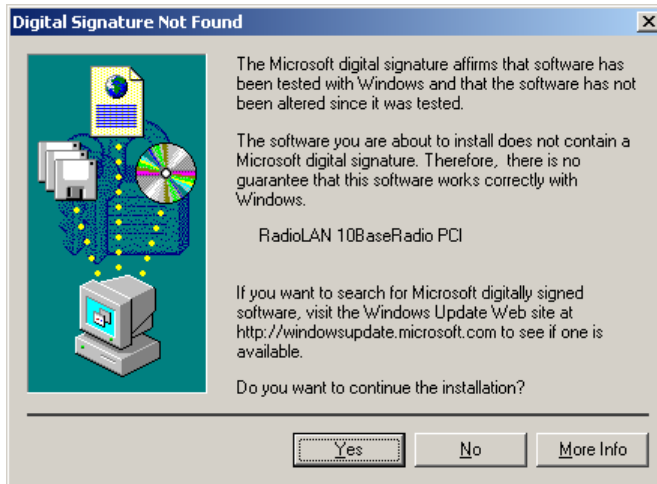


Figure 43: Digital Signature

Click on Finish.

There is no reboot necessary. If you want to change Network Protocols or Client settings, then go to Start, then Setting, and choose Network and Dial-up Connections. Choose the Local Area Connection that represents the RadioLAN 10BaseRadio PCI and then choose File from the Menu, and then Properties.

DRIVER REMOVAL FOR WINDOWS 95 B OR LATER, AND WINDOWS 98

To remove the drivers for a RadioLAN 10BaseRadio PCI Adapter from the Windows 95 or Windows 98 Operating System, use the following procedures:

Invoke the Network Setup program, Click on the My Computer icon, followed by the Control Panel folder, and then the Network icon.

Highlight the RadioLAN 10BaseRadio PCI selection and Click on the Remove button.

You will be asked to restart the system.

DRIVER REMOVAL FOR WINDOWS NT 4.0 SP3 OR LATER

To remove the driver for a RadioLAN 10BaseRadio PCI Adapter from the Windows NT 4.0 Operating System, use the following procedures:

Launch the Network Setup program. Click on Control Panel, and then Network.

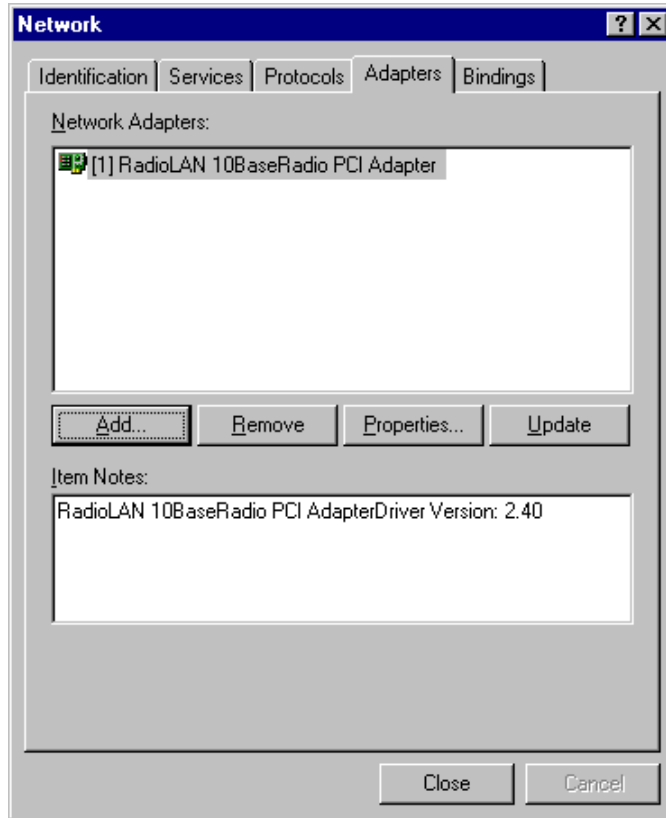


Figure 44: Network Adapter Control Panel

Highlight the RadioLAN 10BaseRadio PCI Adapter from the Adapter folder.

Click on the Remove button and respond with Yes when asked to confirm removal of the driver.

Click on the Restart Now button to restart the Operating System.

DRIVER REMOVAL FOR WINDOWS 2000

To remove the driver for a RadioLAN/10 adapter from a Windows 2000 Operating System, use the following procedure:

Go to Start, Settings, Control Panel, System, Hardware. Click on Hardware Wizard. Click on Next. Choose Uninstall/Unplug a device and Click on Next.

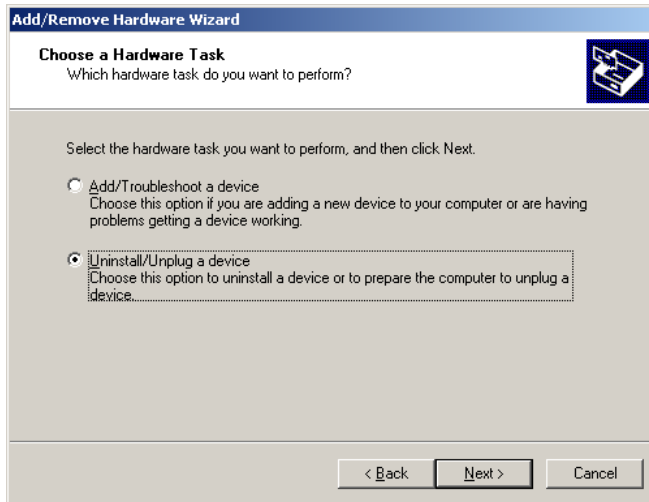


Figure 45: Uninstall a Device

Choose Uninstall a device and Click on Next.

Choose RadioLAN 10BaseRadio PCI and Click on Next.

Choose Yes and Click on Next.

Click on Finish.

Be sure your PC supports PCI 2.2 BIOS functions and your adapter is placed in a 32-bit PCI primary bus slot. Always make sure the PCMCIA card is firmly in the PCI card and the transceiver is firmly attached.

WINDOWS 95 B OR LATER

Problems associated with the startup of RadioLAN drivers are reported via the Control Panel, System, Device Manager. The most common problem is resource conflicts. Verify available resources.

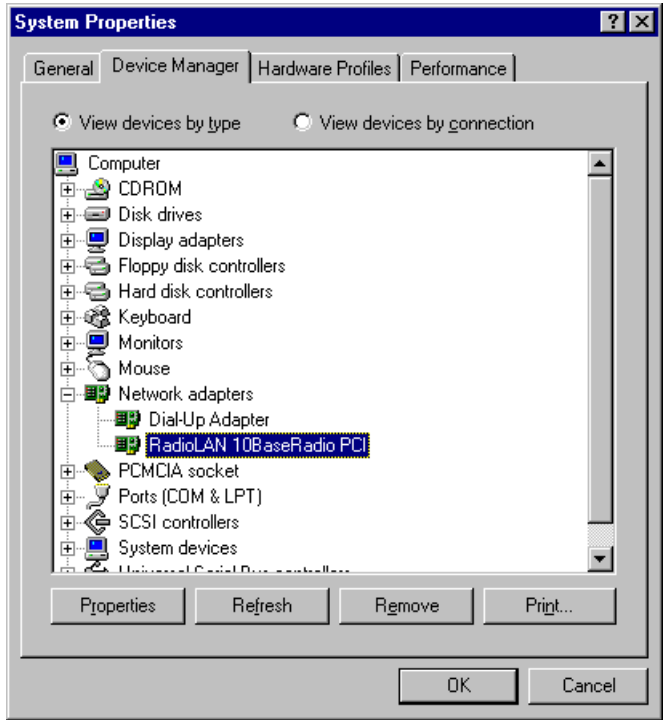


Figure 46: Device Manager

WINDOWS 98

Problems with the RadioLAN drivers may be viewed from the Control Panel, System Device Manager. If a yellow mark is next to the RadioLAN 10BaseRadio PCI selection, then the driver is not loaded. If the PCI CardBus Bridges are not detected, then you may need a newer PCI BIOS. If the PCI CardLINK is not detected, you may have a defective card.

WINDOWS NT 4.0 SP3 OR LATER

Problems associated with the startup of RadioLAN drivers are reported via the Event View application in the Administrative Tools Folder. The most common problems relate to resource conflicts. Use Windows NT Diagnostics and your system's BIOS configuration to verify if the resources set for the RadioLAN 10BaseRadio Adapter are available.

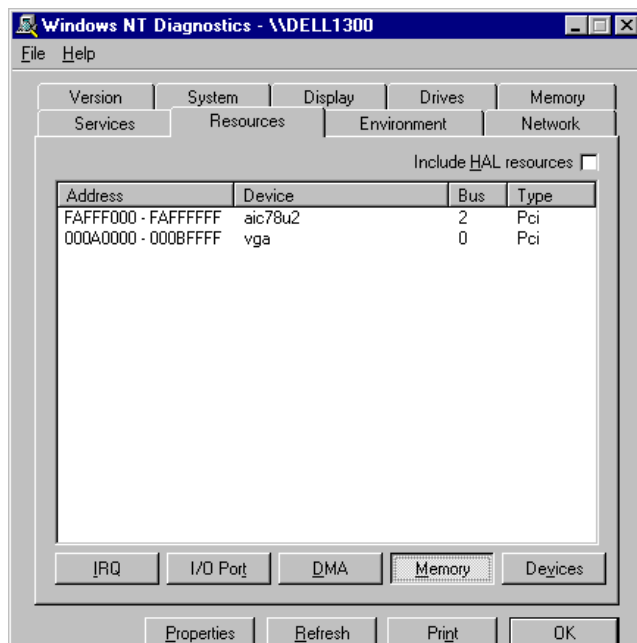


Figure 47: NT Diagnostics

WINDOWS 2000

Problems associated with the startup of RadioLAN drivers are reported via the Event Viewer, or view the Device Manager.

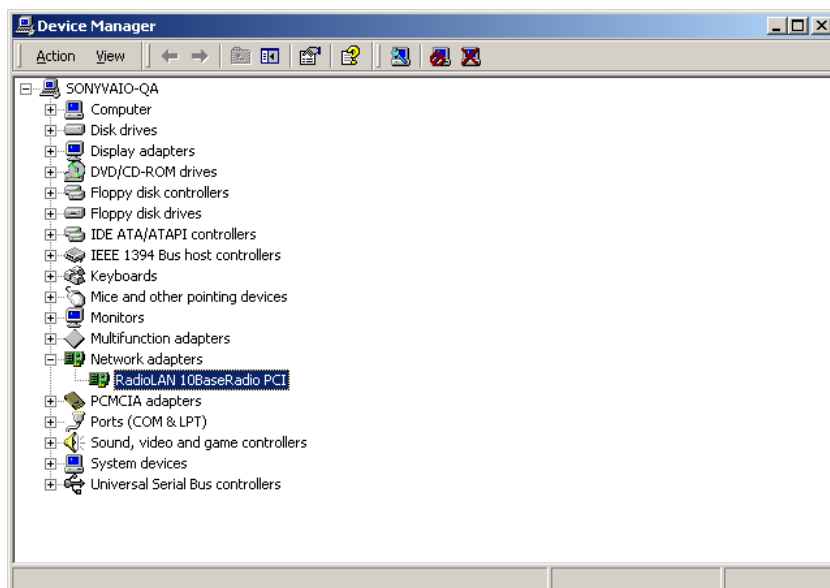


Figure 48: Device Manager

If the PCI CardBus Bridges are not detected, then you may need a newer PCI BIOS. If the PCI CardLINK is not detected, you may have a defective card.

OPERATING INDICATORS

After installing and powering your PC, you should notice flashing on the LED indicators found on the radio transceiver. It is normal to see these indicators flashing while in operation.

If you are not able to resolve a problem, see the RadioLAN Web Site for technical assistance:
<http://www.radiolan.com/technical.html>

If you have technical questions, or have determined that your equipment is damaged, contact RadioLAN for assistance at the following telephone number:

Toll Free: 888-2-RadioLAN (888-272-3465)

Email: support@radiolan.com

Please have the following information available and ready:

- Your name, address and phone number
- The serial number of the RadioLAN part in question
- A description of the problem that you are experiencing

Technical Support may ask you to run tests and give results of those tests. It is therefore best if you are located at your station when you call.

Technical Support Hours from 8:00 am to 5:00 pm PST.

GLOSSARY

This glossary provides definitions for some technical terms related to local area networks.

10BaseRadio™	Developed by RadioLAN, a technology that manages the wireless network ensuring reliable, high-speed networking.
10BaseT	IEEE 802.3 established this standard for Ethernet over unshielded twisted-pair wiring. This standard uses the same wiring styles as modern telephone systems. 10BaseT is based on a topology in which each node is connected to a network hub (central wiring center), with a cable-length limitation of 325 feet (100 meters).
Access Point	A station that allows the passage of frames from the wireless network to a hard-wired LAN.
Adapter Card	An interface card that installs inside the computer. The adapter card connects the Transceiver to the computer. It also stores the station's configuration programming.
Base Address	An exact location in memory where information or program instructions are stored.
Bridge	A device used to connect different networks together, allowing multiple networks to communicate with one another.
Buttons	A screen object that launches a routine such as: causing the program to display another screen, exiting the program, or saving information from the program.
Check Boxes	A screen object which allows the user to select an option.
CSMA/CA	Carrier Sense Multiple Access/Collision Avoidance. A base-band protocol with a built-in collision-avoidance technique. Each network node listens before transmitting, then transmits only when the data carrier is free from traffic. If two nodes send data at exactly the same time and a collision occurs, each node retransmits the data. To avoid another collision, each of the nodes waits for a different random length of time before attempting to send data again.
Data Range	The maximum distance between stations in which data can still be received at Ethernet speeds.
Device Driver	Software that acts as an interface between the operating system and an add on device.
DMA	Direct Memory Access. A method of moving information from a device, such as a hard disk, into memory without using the resources of the main processor for the transfer.
Drop-down list box	A screen object that allows the user to select an item from other items presented in a list.
EEPROM	Electrically Erasable Programmable Read-Only Memory. A memory chip that allows data to be recorded and erased by electrical signals.
Entry Fields	A screen object that allows the user to make entries into a program.
ESD	Electrostatic discharge. Minute amounts of electricity, usually caused by a static buildup, which can damage electronic components.

GLOSSARY OF TERMS

APPENDIX A:

Ethernet	Originally developed by Xerox™ in 1976, Ethernet is a standard network protocol and cabling scheme with a data transfer rate of 10 megabits per second. Ethernet uses a bus topology capable of connecting up to 1024 PCs and workstations within each main branch. Network computers are connected by twisted-pair wiring, or by using either thick or thin coaxial cable. Ethernet uses Carrier Sense Multiple Access/Collision Detection (CSMA/CD) to prevent network failures or collisions when two computers try to network at the same time.
Explicit Address	The physical address.
FCC	Federal Communications Commission. A government agency which regulates all machinery generating radio-frequency signals.
Frame	A group of bits that make up a block of data adapted for transfer as a single unit.
Hub	A central controlling device in the network.
Hz	Hertz. The number of cycles that a frequency makes in a given amount of time. Radio Frequency is measured in Hertz. RadioLAN uses a carrier that broadcasts at the 5.8Ghz (gigaHertz) band, or at the radio band where the frequency modulates at five billion, eight hundred million cycles each second.
I/O Address	See base address.
IRQ	Interrupt Request Line. A method of signaling the PC's processor of an action that has been taken, so that the processor can handle the request.
ISM Band	International Science and Medicine band. An unlicensed band in the radio frequency spectrum. This part of the frequency band is typically used by the scientific community and satellite communications systems.
Jack	An electrical connector into which a plug can be inserted.
Jumpers	A removable connector that joins two pins on a circuit board creating an electrical connection.
LAN	Local Area Network. A group of computers connected together in order to share resources and communicate with each other.
MAC Address	Media Access Control Address. The address that identifies your adapter card. This address is unique. No other device uses the same address number.
Mbps	Mega bits per second. A measurement indicating the amount of data bits that move from one location to another in "millions of bits".
Node	Any device, such as a station, that is connected to a network.
PCI	Peripheral Component Interconnect. PCI Local Bus is the most common standard for connecting peripherals to the PC motherboard.
Ping	A program used for testing network connectivity. Ping transmits a special diagnostic packet to a specific location on the network, then forces the receiving station to send a reply indicating that the packet reached its destination.
Radio Carrier	An electrical signal that is present when no data is being transmitted.
Radio Carrier Range	The maximum distance between stations in which the radio carrier can still be received.

RadioLAN/10	RadioLAN's family of 10Mbps wireless LAN products. These products are based on 10BaseRadio
Radius	The distance from the center of a circle to the outside edge of the circle.
RF	Radio Frequency.
RJ45	An eight-pin modular connector used to connect the 10BaseT feed to the adapter card.
Screen	The visual component of a graphical user interface containing objects that a user can control such as scroll bars, entry fields, drop-down list boxes, and check boxes.
Spread-Spectrum	A technology that shares lower frequency bands.
Station	A computer using RadioLAN wireless networking equipment.
Station Name	A method of identifying your station to other stations attached to the network.
Subnet	Subordinate Network. A group of stations grouped away from the rest of the network. Stations within a subnet share the same Subnet ID.
Transceiver	A device that transmits and receives frames broadcasted to and from other stations on the wireless network.

Specifications for PCI CardLINK™ Model 150:

Part number:	150-008
Bus Interface	32-bit PCI slot, compliant with the PCI Local Bus Specification Rev 2.2
Media Access Protocol	CSMA/CA for wireless domain
Dimensions	156.7mm X 98mm (6.16 inches x 3.9 inches)
Weight	3.8 oz (107.7 grams)
Transmit	612 mA (5V)
Receive	400 mA (5V)
Operating System Support	Plug & Play, Windows 95 B or Later, 98, NT 4.0 SP3 or Later, 2000

RadioLAN Family of Products:

RadioLAN/10™ System	PCI CardLINK™ (For desktop computers with PCI slot) ISA CardLINK™ (For desktop computers with ISA slot) PC CardLINK™ (A two-piece PCMCIA) MOBILINK™ (For notebook computers) BackboneLINK™ (Stand-alone access point) DockLINK™ (Wireless transceiver)
RadioLAN Outdoor Bridge Products	Campus BridgeLINK™ (Building-to-building bridge)
Warranty	1 Year parts and labor (Return to factory)
Frequency	5.8 GHz ISM Band (unlicensed), U-NII band (unlicensed)
Technology	Narrow band microwave transmission
Throughput	10Mbps
Range	Up to 120' radius (35 meters) – semi-open, 300' radius (90 meters) open environments; will cover approx. 15,000-45,000 square feet (1200-3800 square meters)
Security	2 – level network access control, optional RSA™ encryption 40-bit or 128-bit
Topology	Peer-to-peer architecture
Minimum computer requirements	486 or faster with 16MB RAM (101,130,140,150)
Modulation Technique	Differential pulse position modulation
Standards	10BaseT (IEEE 802.3)

Radio Transceiver Unit

Transmission power	50mW peak power per station, 25mW average power per 100 milliseconds
Antenna	2 omni-directional antennas with diversity
LEDs	1 connection LED

Software

Wireless Operating System	10BaseRadio™
Management	RadioNET™ Manager
Driver Support	NDIS 4, NDIS 5 (drivers included)

Environmental

Temperature	0 - 60° C
Relative humidity	20 – 80%
Approvals	FCC Part 15.249 and 15.407, CE ETSI: ETS.300.440 CEPT/LPD/DK/9731