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For a period of one (1) year from the date of purchase by the retail customer, Proxim warrants the RangeLAN2 LAN Adapter against defects in materials and workmanship. Proxim will not honor this warranty if there has been any attempt to tamper with or remove the Adapter's external foil label.

This warranty does not cover and Proxim will not be liable for any damage or failure caused by misuse, abuse, acts of God, accidents, or other causes beyond Proxim's control, or claim by other than the original purchaser.

If, after inspection, Proxim determines there is a defect, Proxim will repair or replace the Adapter at no cost to you. To return defective merchandise to Proxim please call Proxim Technical Support at: (408) 731-2640 to obtain a Return Merchandise Authorization (RMA) Number.

In no event shall Proxim, Incorporated be responsible or liable for any damages arising:

❑ From the use of the product;

❑ From the loss of use, revenue or profit of the product; or

❑ As a result of any event, circumstance, action, or abuse beyond the control of Proxim, Incorporated;

Whether such damages be direct, indirect, consequential, special or otherwise and whether such damages are incurred by the person to whom this warranty extends or a third party.

Part # 7360.0118
Rev. B

Warranty Return Policy

If you have a problem with your RangeLAN2 product, please call Proxim Technical Support at (408) 731-2640. Proxim Technical Support will assist with resolving any technical difficulties you may have with your Proxim product.

After calling Proxim Technical Support, if your product is found to be defective, you may return the product to Proxim after obtaining an RMA (Return Materials Authorization) number from Proxim Customer Service. The product must be returned in its original packaging. The RMA number should be clearly marked on the outside of the box. Proxim cannot be held responsible for any product returned without an RMA number, and no product will be accepted without an RMA number.

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 the receiver.
- ❑ Connect the equipment into an outlet on a circuit different from that which the receiver is connected.
- ❑ Consult the dealer or an experienced radio/TV technician for help.

EUROPEAN TELECOMMUNICATIONS STANDARDS INSTITUTE
Statement of Compliance
Information to User

This equipment has been tested and found to comply with the European Telecommunication Standard ETS 300.328. This standard covers Wideband Data Transmission Systems referred to in the CEPT recommendation T/R 10.01. This type of accepted equipment is 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.

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1. Introduction

Congratulations on your purchase of RangeLAN2 7110, a PCI-bus wireless LAN adapter. As with all members of the RangeLAN2 family, RangeLAN2 7110 is a long range, high performance, wireless LAN adapter card that allows your computer to communicate with other computers on the network without wires.

The RangeLAN2 7110 was designed to be a "plug-and-play" product. Simply install the adapter board into an available PCI expansion slot in your computer and load the driver. Then you're connected without wires to your network's existing electronic mail, printers, software applications, and other network resources. That's how simple it is!

The RangeLAN2 7110 may be placed in Windows 95, Windows 98, Windows 2000, or Windows NT computers. Your RangeLAN2 7110 wireless clients "look" like standard network nodes to the operating system.

Today, Proxim is the leading supplier of spread spectrum radio networking technology for local area environments. Proxim's unmatched spread spectrum networking expertise and the company's extensive experience serving the communications needs of the mobile computing user are some of the reasons why RangeLAN2 is a market leader and why it has been chosen by more OEM integrators than all other alternatives combined.

The RangeLAN2 Family

The RangeLAN2 7110 is part of a family of high-performance products that provides a complete wireless networking solution.

- **RangeLAN2 7100** is a wireless LAN adapter that fits into a standard PC/AT ISA bus slot.

- **RangeLAN2 7400** is a high performance wireless LAN adapter which fits into a PCMCIA Type II slot in a notebook, laptop, or pen-based computer.

- **RangeLAN2 7510/752x** Access Points allow easy expandibility of a wireless network by increasing range and facilitating mobility applications. Operating at the Data Link Layer (layer 2) of the OSI model, the Access Point provides protocol-independent access for RangeLAN2 devices into existing wired Ethernet LANs.

- **RangeLAN2 753x** Access Point allows seamless access for RangeLAN2 devices into existing wired Token Ring network.

- **RangeLAN2 754x** Extension Point extends the coverage area of an existing RangeLAN2 network.

- **RangeLAN2 791x** Serial Adapter is a wireless serial device which replaces an RS-232 cable.

- **RangeLAN2 792x** Ethernet Adapter converts any Ethernet-ready device into a wireless node on a RangeLAN2 network.

The Product Package

Each RangeLAN2 7110 PCI Adapter package comes with:

- ❑ One RangeLAN2 wireless LAN adapter.
- ❑ Three 3 1/2" disks -- one containing Windows 95 & 98 drivers and utilities, one containing Windows 2000 drivers and utilities, and one containing Windows NT drivers and utilities.
- ❑ One antenna.
- ❑ One RangeLAN2 User's Guide.

If any of these items are missing or damaged, please contact your reseller or Proxim Technical Support.

System Requirements

To begin using the RangeLAN2 7110 adapter, you need the following minimum system requirements:

- ❑ A computer with an available PCI expansion slot that has Windows 95, Windows 98, Windows 2000, or Windows NT installed.
- ❑ At least one other RangeLAN2 product installed on the network.

2. Installing the RangeLAN2 7110 Card

The RangeLAN2 7110 has two hardware components: the PCI card and the antenna, as shown in Figure 1 below.



Figure 1
RangeLAN2 7110 Card

Installing the Card and Antenna

The RangeLAN2 7110 PCI Card fits into a PCI (Peripheral Components Interconnect) expansion slot in your computer. The PCI slot is typically a beige or off-white plastic casing surrounding two rows of gold connectors on the computer's motherboard.

If you cannot identify the PCI slot, refer to your PC's manual for assistance. Follow these steps to install the RangeLAN2 PCI Card and antenna:

1. Turn off your computer and unplug its power cord from the wall outlet for safety purposes.

2. Remove the computer cover.

3. Locate an unused PCI slot and refer to your PC's manual for instructions on how to remove the plate that covers the slot, if one exists.

4. Align the RangeLAN2 PCI Card over the empty slot. Firmly insert the card into the slot.

5. Secure the card's metal bracket to the computer following the directions provided in your PC's manual.

6. Replace the computer cover.

7. Plug the computer's power cord back into the wall outlet.

8. Locate the RangeLAN2 7110 antenna connector at the back of your computer.

9. Snap on the end of the antenna cable to the connector on the back of the card. Place the antenna on top of your desk, computer, or monitor.

Note:

FCC regulations mandate that the RangeLAN2 7110 antenna not be alterable. Therefore, the RangeLAN2 7110 Card uses a custom antenna connector. Do not attempt to use a different antenna or you may damage the connector and the card.

3. Windows 95/98 Installation

This chapter describes the installation of the Windows 95/98 software drivers and utilities. Install the software driver only after you have installed the hardware as described in Chapter 2. The RangeLAN2 Windows 95/98 driver installs just like any other network card driver under Windows 95 or Windows 98.

Note:

During the installation of the RangeLAN2 7110 PCI Card, you may be prompted to insert a Windows 95 or 98 CD-ROM, depending on the computer's operating system, in order to complete the installation. Please confirm that you have either the Windows 95 or 98 CD, diskettes, or Cabinet files available before proceeding with this installation.

If the computer has Windows 98 installed, the "Add New Hardware Wizard" will appear, as shown below, the first time you turn on the computer after you have inserted the card into a PCI slot.



Insert the RangeLAN2 Windows 95/98 driver diskette into the disk drive and click <Next>.

When prompted, direct the Add New Hardware Wizard to search for the best driver for this device, as shown below. Click <Next> to continue.



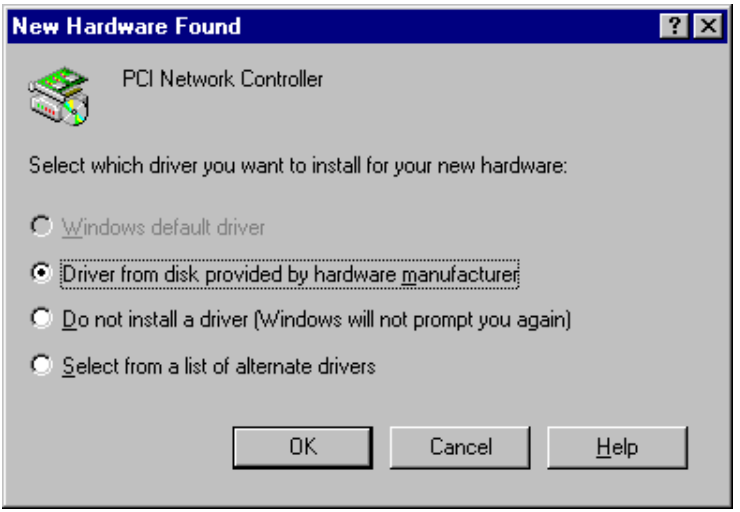
When prompted, check the box labeled “Floppy disk drives” so that the wizard will search the disk drive for the RangeLAN2 driver, as shown below.



Click <Next> to continue and follow the on-screen instructions to complete the installation of the RangeLAN2 7110 Adapter.

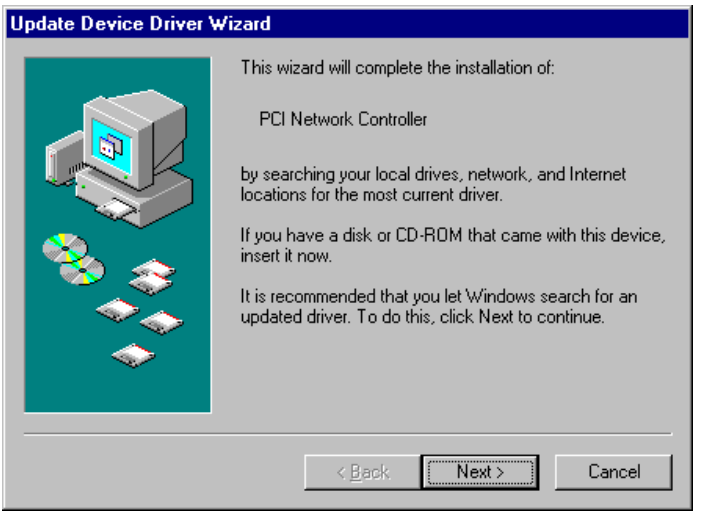
If you are using Windows 95, either the “New Hardware Found” wizard or the “Update Device Driver Wizard,” depending on which version of Windows 95 the computer has installed, will appear the first time you turn on the computer after you have inserted the card into a PCI slot.

If you have the standard version of Windows 95 installed, the New Hardware Found wizard will appear, as shown below.



Choose “Driver from disk provided by hardware manufacturer” and click <Next>. Insert the RangeLAN2 Windows 95/98 driver diskette into the disk drive and follow the on-screen instructions.

If you have the B version of Windows 95, the Update Device Driver Wizard will appear, as shown below.



Insert the RangeLAN2 Windows 95/98 driver diskette into the disk drive and click <Next>. Follow the on-screen instructions to complete the installation of the RangeLAN2 7110 PCI Adapter.

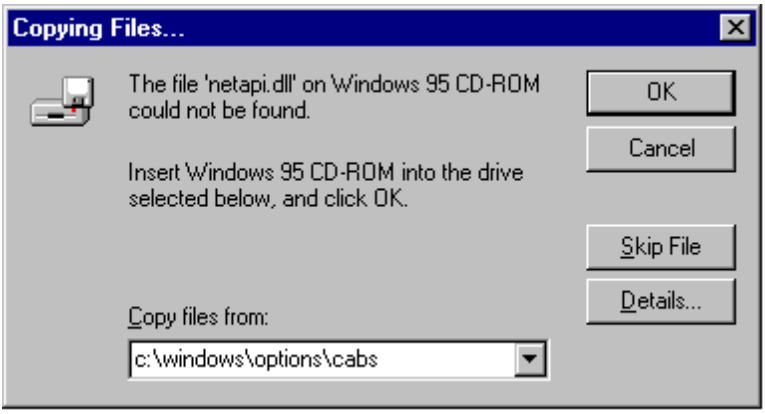
Note that during the installation, you may be prompted to insert the Windows 95 or 98 CD-ROM so that the installation wizard can copy certain Windows networking files, as shown below.



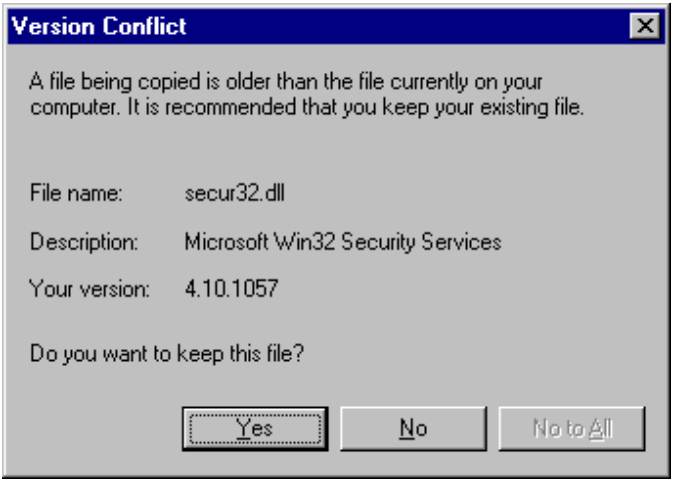
If you have the CD available, insert it into the CD-ROM drive when prompted.

If you do not have a CD-ROM drive or do not have the Windows 95 or 98 CD available, it is possible that the computer has Windows cabinet files (CABS) already installed.

If the computer has the Windows CABS files on its hard drive, point the installation wizard to the Windows CABS directory which is typically located in "C:\WINDOWS\OPTIONS\CABS," as shown in the example below.



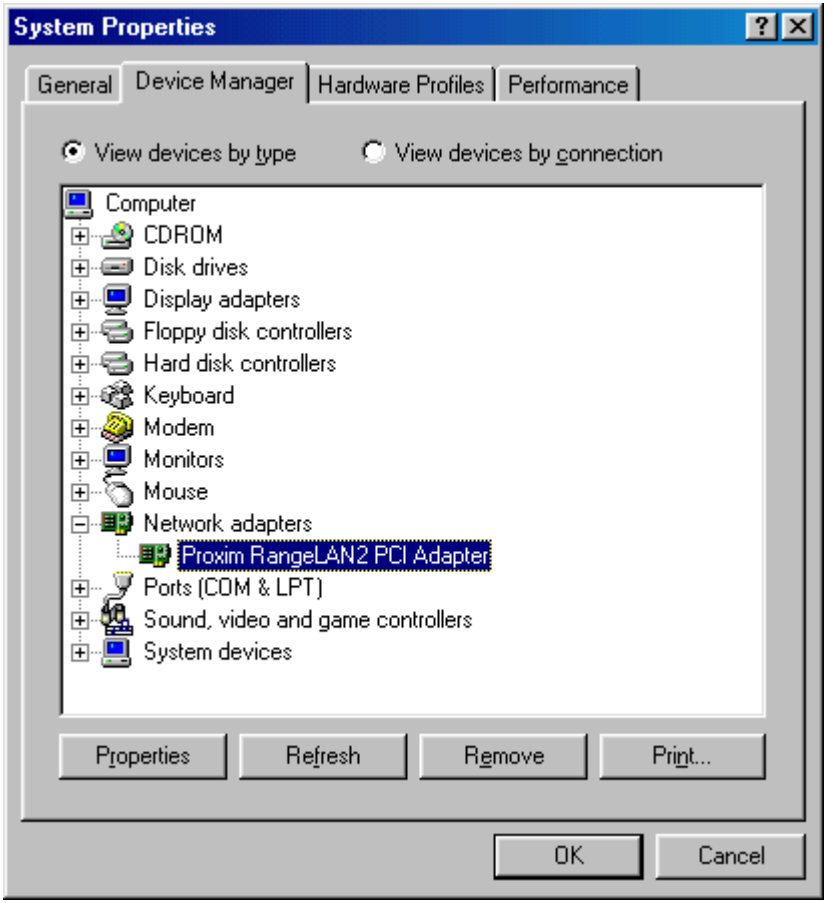
The computer will copy all of the Windows files required to complete the installation of the RangeLAN2 7110 PCI Adapter. If the computer prompts you that a file you are copying is older than the one currently on the system, keep the existing file by clicking the <Yes> button, as shown below.



Note that you may be prompted to enter the location of the file "RL2API.INF" during installation. This file is located on the RangeLAN2 Windows 95/98 driver diskette. Direct the installation wizard to search the floppy disk drive if you are prompted for this file.

Restart the computer when prompted to do so by the Add New Hardware Wizard or Update Device Driver Wizard.

The RangeLAN2 7110 PCI Card Adapter should now be successfully installed. To confirm that the adapter has been successfully installed, open the Device Manager, located within the Control Panel's System icon. Expand the Device Manager's Network adapters category and highlight the RangeLAN2 PCI Adapter entry, as shown below.

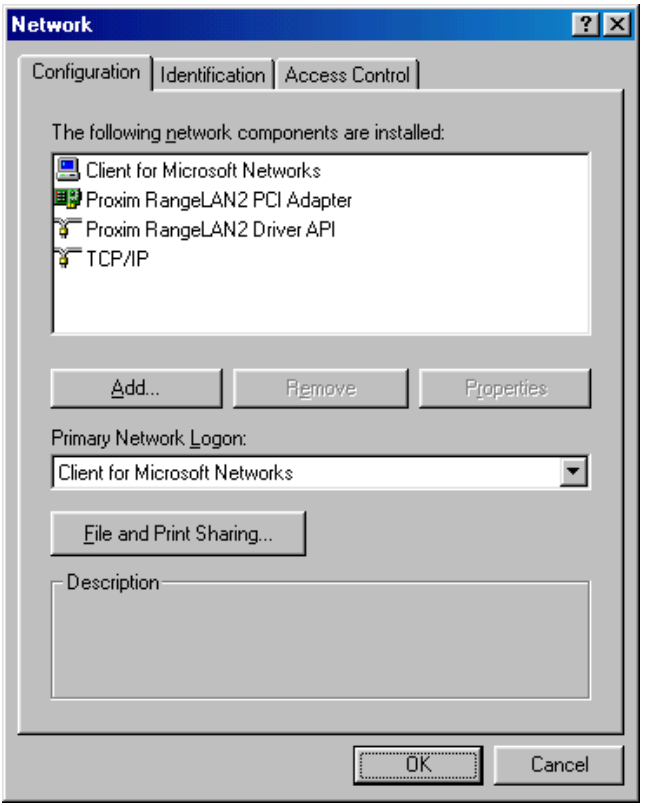


Click the <Properties> button to display the adapter's Properties screen. The Device status should read "This device is working properly."

If the card is not listed within the Device Manager, then the card has not been properly installed. If the card's Device Manager entry has a yellow "!" next to it or the Device status field reports that the card is not working properly, then either the card has not

been installed properly or the computer has a system conflict. You may also receive a RangeLAN2 Status Monitor error message if the card is not working properly. Refer to the troubleshooting suggestions in Chapter 9 for information on how to solve these types of installation problems.

If you already have existing network components installed when loading the RangeLAN2 Windows 95/98 driver, the 7110 adapter will bind to the existing networking client and protocols and add Client for Microsoft Networks and the TCP/IP protocol, if they are not already loaded. If no network components exist before the RangeLAN2 driver is installed, the driver will add Client for Microsoft Networks and the TCP/IP protocol, as shown below.



The installation procedure will also install the RangeLAN2 Utilities and a protocol called the RangeLAN2 Driver API. This protocol must be installed in order for the RangeLAN2 Utilities to run under Windows 95 and 98. The utilities are added to a new folder under the Start Menu's Programs group called RangeLAN2 Utilities. This folder contains the RangeLAN2 Site Survey & Configuration Tool and the RangeLAN2 Status Monitor. The RangeLAN2 Status Monitor is also added to the StartUp folder and will be launched each time the operating system starts.

See Appendix A for more information on the RangeLAN2 Utilities.

Reinstalling the Windows 95/98 Driver

If at any time you need to reinstall the Windows 95/98 driver, follow these steps:

- ❑ Remove the "Proxim RangeLAN2 PCI Adapter" entry from the Control Panel's Network icon.

- ❑ Remove the following RangeLAN2 files, if present:

C:\WINDOWS\INF\NETPROXM.INF
C:\WINDOWS\INF\RL2API.INF
C:\WINDOWS\INF\OTHER\RangeLAN2NETPROXM.INF
C:\WINDOWS\SYSTEM\RL2API.VXD
C:\WINDOWS\SYSTEM\RL2WIN95.SYS
C:\WINDOWS\START MENU\PROGRAMS\STARTUP\STATMON.LNK
C:\PROGRAM FILES\RL2*.* (Remove all files and directory)
C:\START MENU\PROGRAMS\RL2*.* (Remove all files and directory)

Note:

By default, Windows 95/98 will hide some of these file types. Confirm that you have configured Windows 95/98 to show all files before assuming that these files are not present. The "Hidden Files" option is available under the Folder Options heading of the Windows Explorer's View Menu.

- ❑ Restart the computer.
- ❑ Reinstall the driver following the instructions given earlier this chapter.
- ❑ Reset the required networking parameters from within the Control Panel's Network icon (such as an IP Address).
- ❑ Reset the RangeLAN2 configuration parameters from within the Control Panel's Network icon or from within the RangeLAN2 Site Survey & Configuration Tool.

4. Windows 2000 Installation

This chapter describes the installation of the Windows 2000 software drivers and utilities. Install the software driver only after you have installed the hardware as described in Chapter 2.

Follow these steps to install a RangeLAN2 7110 PCI Card in a Windows 2000 computer:

1. With the computer turned off, install the RangeLAN2 PCI Card and antenna as described in Chapter 2.

2. Turn on the computer and logon to Windows 2000.

3. Insert the RangeLAN2 Windows 2000 driver diskette into the computer's disk drive.

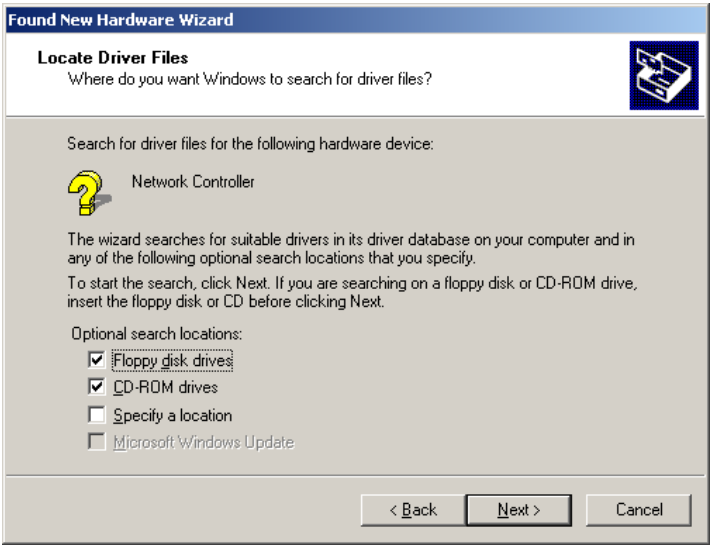
4. The Found New Hardware Wizard will automatically detect the card, as shown below. Click <Next> to continue.



5. Select “Search for a suitable driver for my device (recommended)” and click <Next>, as shown below.

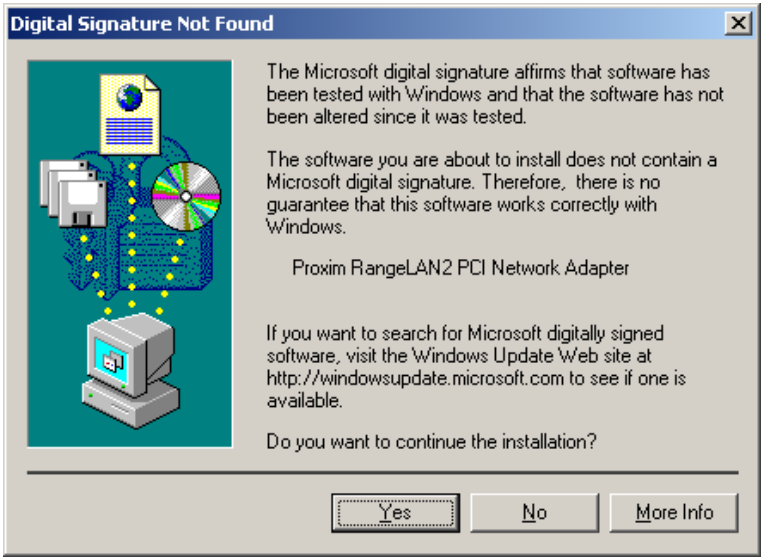


6. Place a check mark next to the “Floppy Disk Drives” option and click <Next>, as shown below.

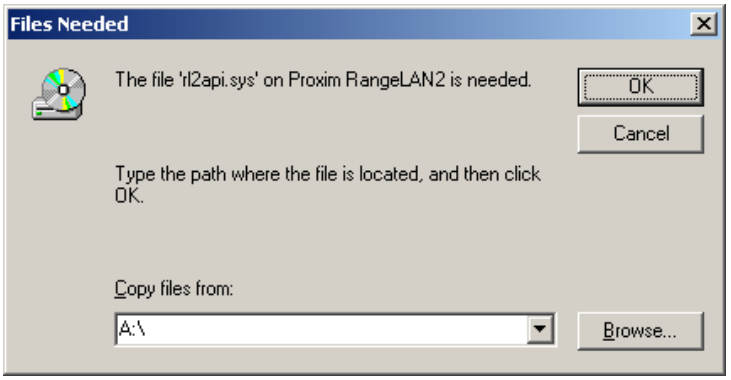


7. The New Hardware Wizard will prompt you once it has located the RangeLAN2 driver. Click <Next> to install the driver.

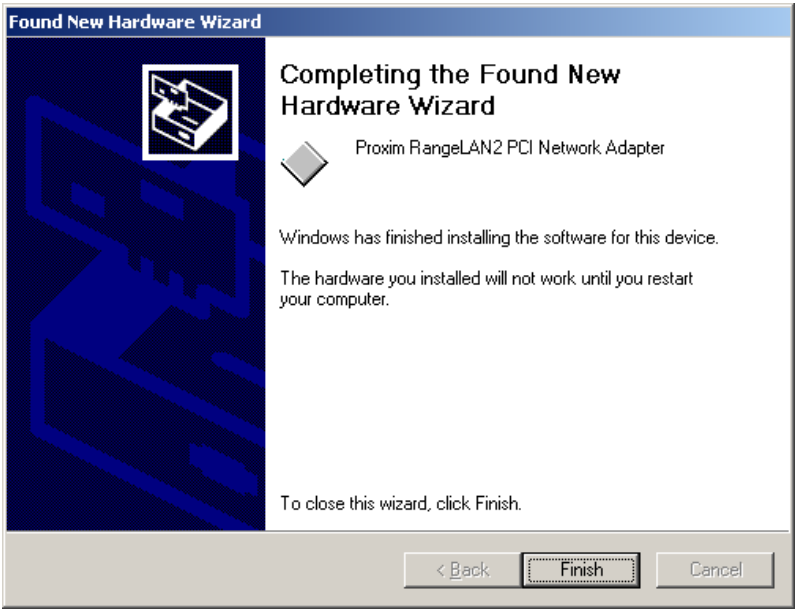
8. Click <Yes> to continue if the New Hardware Wizard prompts you that the RangeLAN2 driver does not contain a Microsoft Digital Signature, as shown below.



9. Click <OK> if prompted to insert the Proxim RangeLAN2 CD-ROM and direct Windows to search for the RL2API.SYS file on the floppy disk drive (typically, this is drive A:), as shown below.



10. Click <Finish> after the New Hardware Wizard has completed the installation of the RangeLAN2 Card, as shown below.



11. Restart the computer when prompted.

12. Logon to Windows 2000.

The RangeLAN2 Card should now be installed and functioning properly.

In addition, the RangeLAN2 Tools should also be installed. The tools are added to a new folder under Start Menu/Programs called RangeLAN2 Tools. This folder contains the RangeLAN2 Site Survey & Configuration Tool and the RangeLAN2 Status Monitor, which is a program icon that loads in the Windows System Tray. The RangeLAN2 Status Monitor is also added to the StartUp folder and will be launched automatically each time the operating system starts.

See Appendix A for more information on the RangeLAN2 Tools.

Note that the RangeLAN2 7110 PCI Card will bind to any existing networking components, such as Client for Microsoft Networks and the Internet Protocol (TCP) and add the Proxim RangeLAN2 Client Protocol.

If you receive an error message stating that the Proxim RangeLAN2 PCI Network Adapter is not properly installed following the restart in Step #11 above, refer to Chapter 9 for troubleshooting suggestions.

Reinstalling the Windows 2000 Driver

If at any time you need to reinstall the Windows 2000 driver, follow these steps:

1. Right-click the RangeLAN2 Status Monitor icon located in the Windows System Tray to launch the Status Monitor information screen. Click <Exit App> to close the Status Monitor application.

2. Open the Control Panel and double-click the System icon.

3. Select the Hardware tab.

4. Click the <Device Manager> button.

5. Expand the Network adapters category and right-click the “Proxim RangeLAN2 PCI Network Adapter” entry.

6. Select "Uninstall..." from the drop-down list and click <OK> to confirm device removal.

7. Restart the computer when prompted. The Found New Hardware Wizard will automatically detect the card and begin the driver installation.

8. Reinstall the driver following the above instructions.

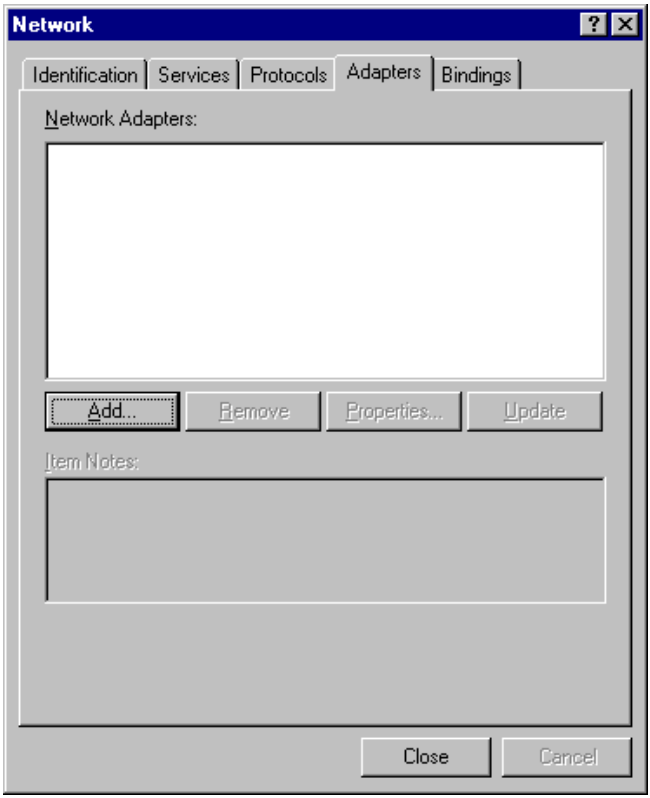
9. If necessary, reset the RangeLAN2 configuration parameters from within the RangeLAN2 Site Survey & Configuration Tool.

5. Windows NT 4.0 Installation

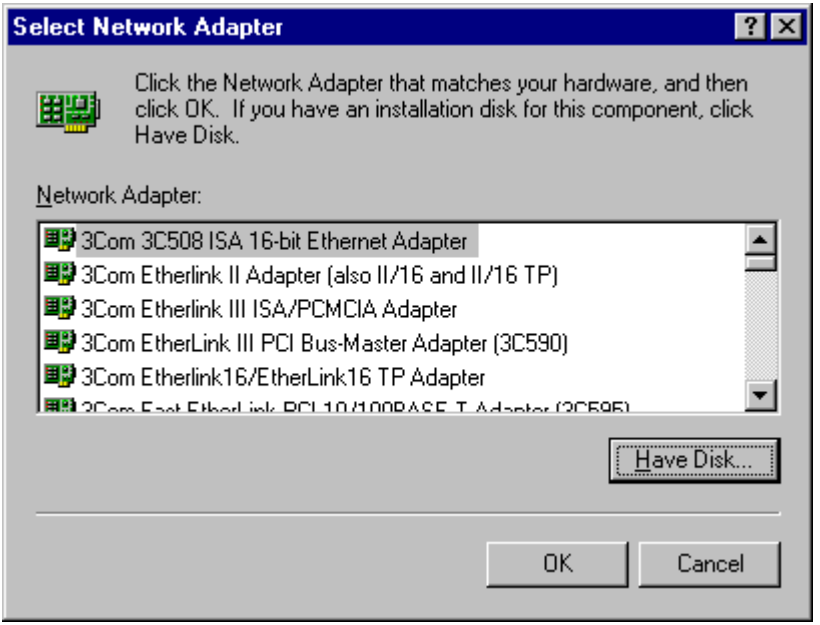
This chapter describes the installation of the Windows NT 4.0 software drivers and utilities. Install the software driver only after you have installed the hardware as described in Chapter 2.

Since Windows NT 4.0 is not a plug and play operating system, the RangeLAN2 7110 PCI Adapter will not be auto-detected the first time you turn on the computer after you have inserted the card into a PCI slot.

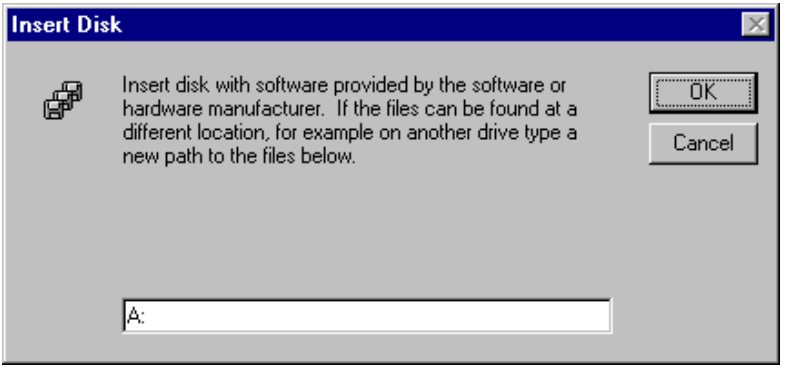
To install the driver, go to the Network icon in the Control Panel and choose the Adapters tab, as shown below.



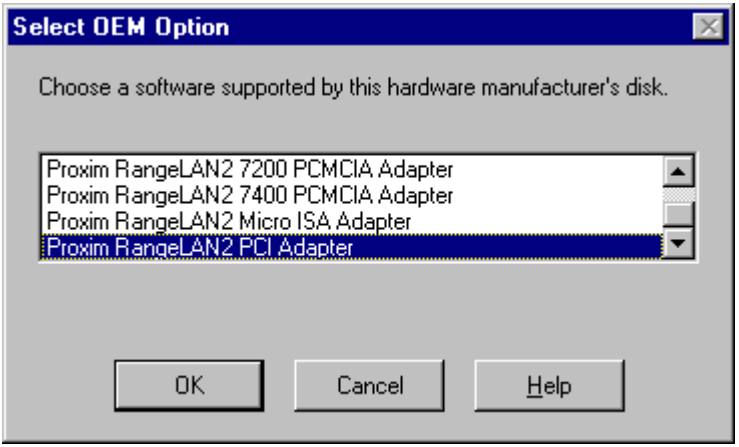
Select the <Add> button and choose the <Have Disk> option from the “Select Network Adapter” dialog box, as shown below.



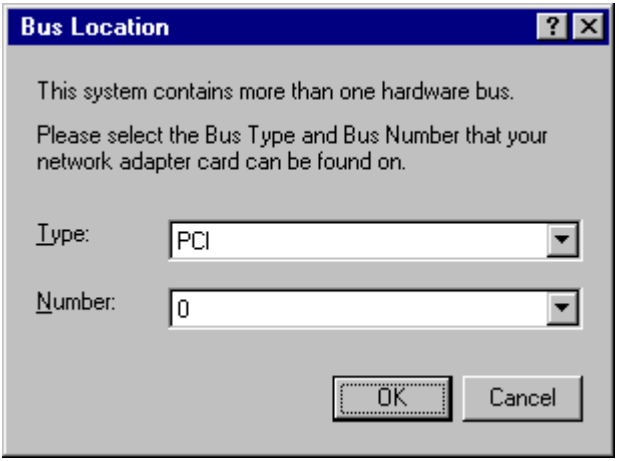
Insert the Proxim RangeLAN2 Windows NT driver diskette into the disk drive when prompted, as shown below.



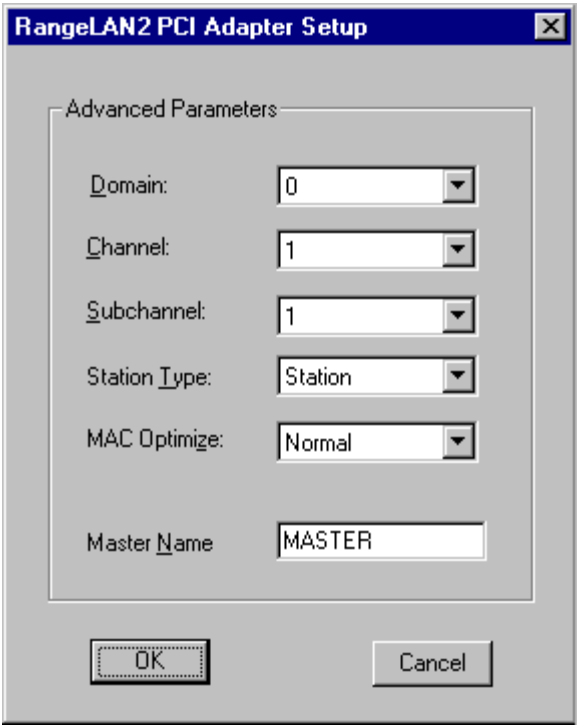
Windows NT will scan the driver diskette and create an OEM Option list. Choose “Proxim RangeLAN2 PCI Adapter” from the list and click <OK> as shown below.



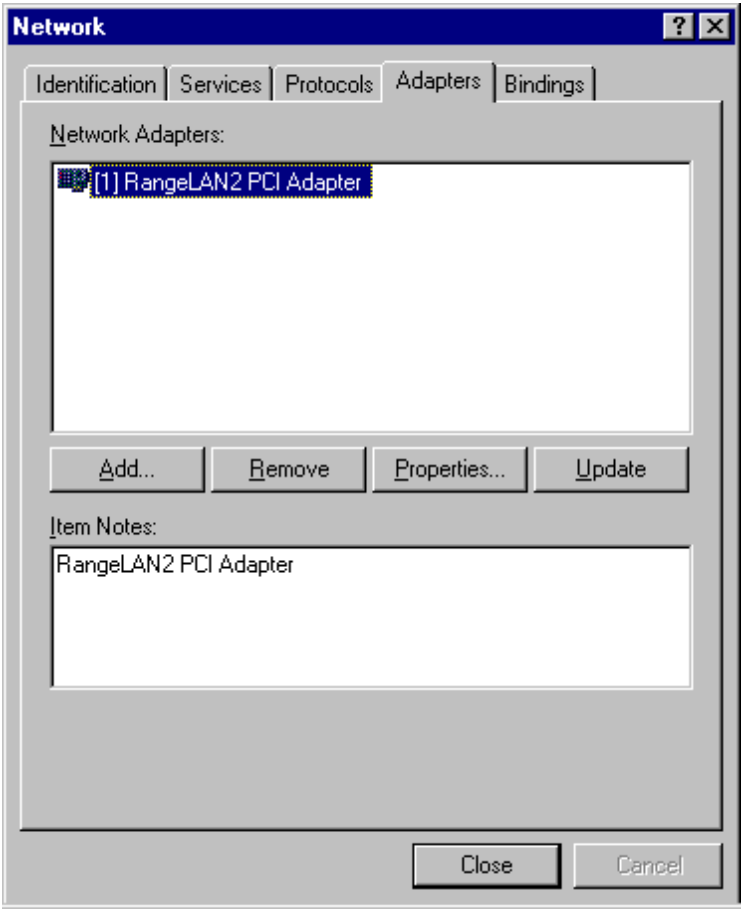
Follow the on-screen instructions to complete the installation. When prompted to select a Bus Type and Number, choose PCI and Bus Number 0, as shown below.



When the installation is complete, the Card Setup screen will appear, as shown below.



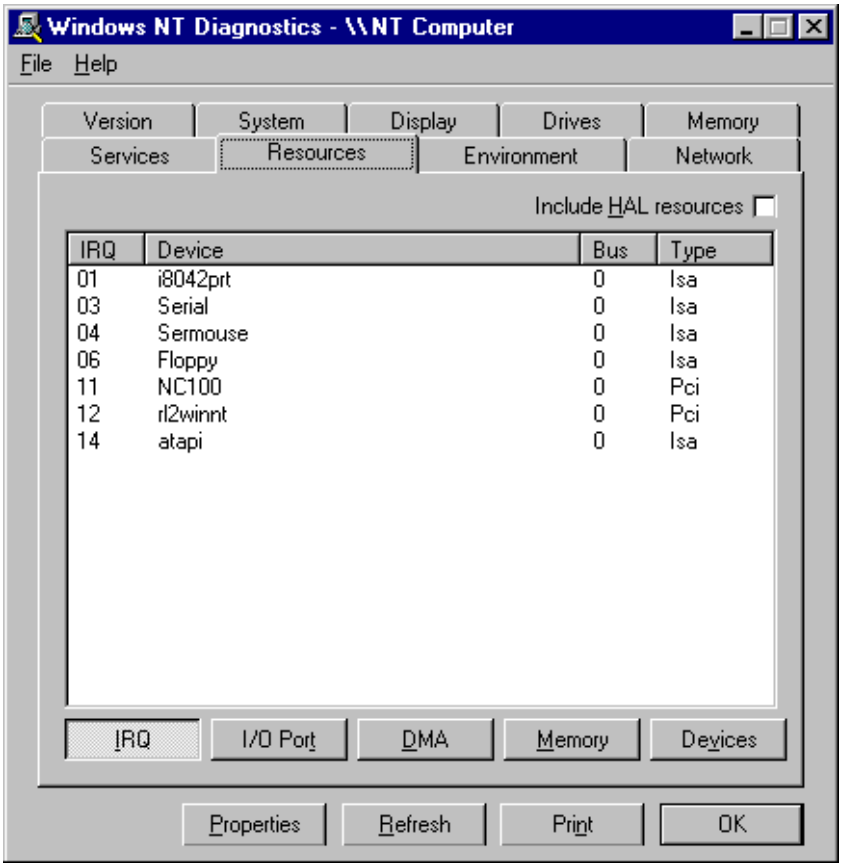
Change any RangeLAN2 parameters as required by your wireless network configuration. Note that you can also change the RangeLAN2 parameters using the RangeLAN2 Site Survey & Configuration Tool, which is described later in this chapter and in Appendix A. Click <OK> to return to the Network Adapters screen, as shown below.



Install or configure any other Network parameters, including Services or Protocols, before choosing <Close>. Restart your computer when prompted to do so.

After the computer restarts, the RangeLAN2 Windows NT driver should be loaded. To confirm that the card has been properly installed, open the Windows NT Diagnostics utility in the Administrative Tools section of the Start Menu to confirm that the

RangeLAN2 Card has been assigned system resources. In the example below, the RangeLAN2 PCI Card, labeled “rl2winnt,” is using IRQ 12.



However, if the driver did not load properly, the Windows NT Event Viewer will report that an error has occurred. In addition, if you have already installed the RangeLAN2 Utilities, the RangeLAN2 Status Monitor will also report that the card is not working properly. If the RangeLAN2 7110 PCI Adapter did not

install properly, refer to Chapter 9 for troubleshooting suggestions that may help you solve the installation problem.

Once the RangeLAN2 7110 PCI Card Adapter has been successfully installed, run SETUP.EXE from the Windows NT driver diskette to install the RangeLAN2 Utilities.

The utilities will be added to a new folder under the Start Menu's Programs group called RangeLAN2 Utilities. This folder will contain the RangeLAN2 Site Survey & Configuration Tool and the RangeLAN2 Status Monitor. The RangeLAN2 Status Monitor will also be added to the StartUp folder and will be launched each time the operating system starts.

See Appendix A for more information on the RangeLAN2 Utilities.

Reinstalling the Windows NT 4.0 Driver

If at any time you need to reinstall the Windows NT driver, follow these steps:

- ❑ Remove the RangeLAN2 PCI Adapter entry from the Adapters list in the Control Panel's Network icon.
- ❑ Remove the driver file, RL2WINNT.SYS, from the WINNT\SYSTEM32\DRIVERS directory.
- ❑ Remove the RangeLAN2 Status Monitor program from the Control Panel's Add/Remove icon to uninstall the RangeLAN2 Utilities.
- ❑ Restart the computer.

- ❑ Reinstall the driver following the above instructions.
- ❑ Reset the required networking parameters from within the Control Panel's Network icon (such as an IP address).
- ❑ Run SETUP.EXE from the Windows NT driver diskette to install the RangeLAN2 Utilities.
- ❑ Reset the required RangeLAN2 parameters from within the Card Setup screen (located in Control Panel's Network icon) or from within the RangeLAN2 Site Survey & Configuration Tool.

6. Wireless Topologies

RangeLAN2 products look and operate similar to Ethernet products. The only difference is that a radio replaces the wire between various nodes. This means that all of your existing applications that operate over Ethernet will work with RangeLAN2 without any special wireless networking software. Wireless products are typically used in several network topologies as described in this chapter.

Ad Hoc

With wireless LANs, one or more computers easily establish an ad hoc network when the units are in range of each other. Each computer can dynamically connect and reconnect to the others with no additional configuration, using off-the-shelf peer-to-peer network operating systems. With this capability, many companies are developing applications optimized for ad hoc networks.

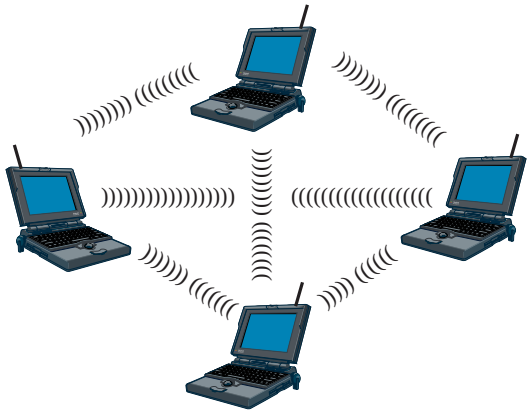


Figure 2
Ad Hoc

Infrastructure

Many companies have an existing Ethernet or wired LAN infrastructure and want to be able to extend that capability to wireless nodes. This is accomplished by attaching an Access Point to the wired LAN which allows the wireless clients to access the network resources.

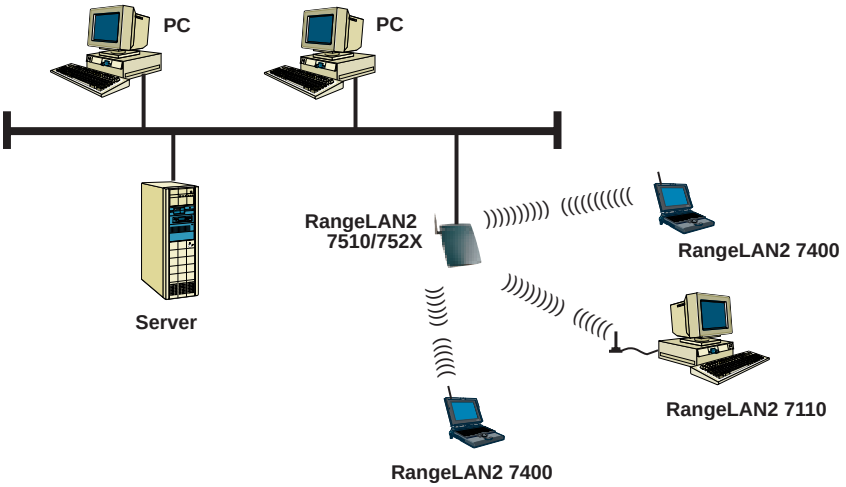


Figure 3
Single AP

For larger environments, RangeLAN2 products support the ability to roam from one wireless cell to another while maintaining the same network connection. The Access Points establish coverage areas or cells similar in concept to those of a cellular phone network. The mobile clients will connect to any Access Point that is within range.

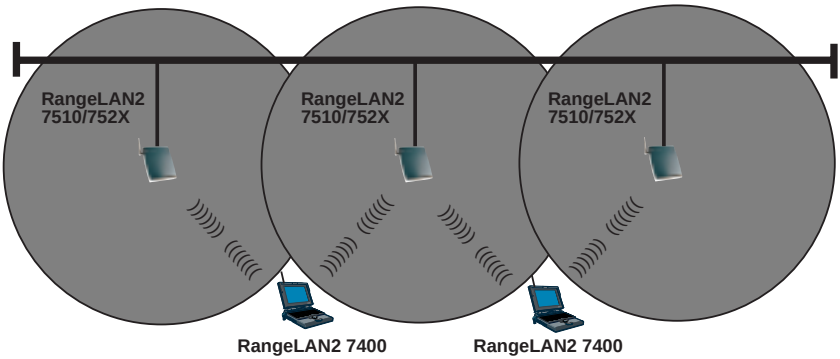


Figure 4
Roaming - Light Overlap

With RangeLAN2's multi-channel architecture, Access Points can be placed within the same cell area to increase the aggregate throughput supported by the network. In addition, the overlapping cells offer redundancy of coverage required on networks where downtime is not tolerable.

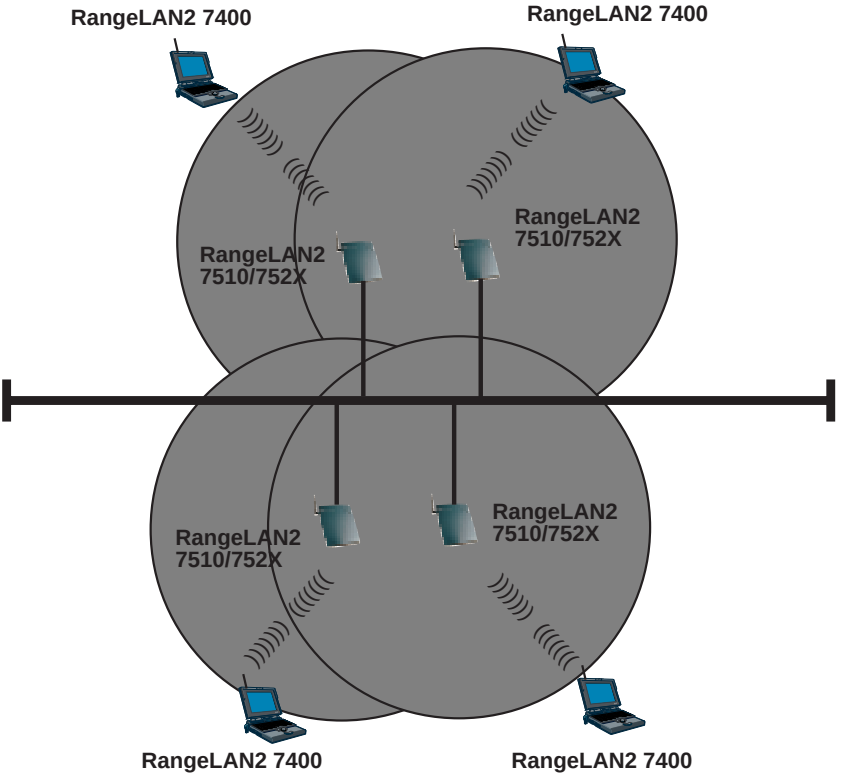


Figure 5
Roaming - Heavy Overlap

Each RangeLAN2 Access Point within a roaming network must be configured as a Master on a unique Channel/Subchannel pair, but all must have the same Domain number and Security ID. The portable PCs are equipped with RangeLAN2 7110 PCI adapters or RangeLAN2 7400 cards, which are also set to the same Domain. As the portable PC *seamlessly* switches from cell to cell, its network connectivity is preserved.

The user can move freely between the RangeLAN2 Access Points in the network. When the roaming PC leaves the transmission range of one RangeLAN2 Access Point, the software automatically polls the other RangeLAN2 Access Point(s) in the same Domain to continue the network connection.

See the previous illustrations for examples of networks set up with RangeLAN2 roaming Domains. Many more network configurations exist. Proxim's diverse line of RangeLAN2 products allows you to customize your wireless configuration to meet your specific networking needs.

Note that the cells must overlap to ensure that there are no gaps in coverage and that the roaming PC will always have an available connection to the wired network.



Note:

Roaming stations will only roam between RangeLAN2 Access Points and Extension Points with the same Domain and Security ID.

Guidelines for Roaming

- ❑ Roaming occurs between RangeLAN2 Access Points and Extension Points. It does not occur between RangeLAN2 Ethernet Adapters or RangeLAN2 adapter cards that are installed in network file servers.

- ❑ All RangeLAN2 Access Points must have the same Domain and Security ID.

- ❑ All RangeLAN2 Access Points have a unique Channel/ Subchannel pair. Preferably, they should have unique Channels. Use the Subchannel only when you have used all 15 Channels in the same coverage area.

- ❑ All workstations with RangeLAN2 adapter cards are configured as Stations with a Domain and Security ID that match the values used by the RangeLAN2 Access Points between which they will roam.

- ❑ For contiguous coverage, the cells created by RangeLAN2 Access Points must overlap.

- ❑ Roaming will not occur across routers unless you use a third party software utility like Mobile IP.

7. Understanding RangeLAN2

This chapter lays the background for understanding the radio parameters that can be configured when a RangeLAN2 7110 is installed. Refer to Chapters 3, 4, and 5 for instructions on how to install the software driver.

RangeLAN2 radios use a radio technology called frequency hopping spread spectrum. This means that the radio signal is constantly moving from one frequency to another while sending packets of data. This hopping technique allows for multiple hopping patterns to be used in the same area and minimizes interference.

RangeLAN2 Software Parameters

Station Type

In order for this system to work, in each subnetwork there must be one unit that coordinates the hops. This unit is called the Master. It might help you to think of the Master as the conductor of a frequency hopping orchestra. The Master keeps time so all units know when to hop and to what frequency.

Units classified as Stations synchronize to the Master and follow its signal to learn what frequency in the pattern the Master is currently using.

An acting "Master" can be configured either as a Master or Alternate Master. Alternate Masters act either as a Master or a Station. If an Alternate Master unit is unable to locate any other Master within range, it acts as a Master. If a Master is already present, then the Alternate Master acts as a Station. When there are multiple Alternate Masters, they coordinate among themselves to determine who will become the Master.

There must be at least one RangeLAN2 device on the network designated the Master. In most network configurations, the RangeLAN2 Access Point should be the Master with all clients defined as Stations. In a roaming environment, all RangeLAN2 Access Points will be configured as Masters. The RangeLAN2 7110 and RangeLAN2 7400 clients are all configured as Stations and roam from one Master to another.

In peer-to-peer network operating systems without a RangeLAN2 Access Point, you may designate one computer as a Master; typically, this should be a non-mobile computer with a RangeLAN2 7110 Adapter installed or connected to a RangeLAN2 Ethernet Adapter. The other workstations on the network should be positioned within the coverage area of the Master unit. It is a good idea to set up at least one additional unit on the network as an Alternate Master device as well. However, you should set the smallest number of RangeLAN2 devices to Alternate Master in order to increase performance. For performance considerations regarding the setting of this parameter, refer to Chapter 7, "Performance Hints."

Domain *default=0*

In order to establish communications, all Station Types require the same Domain number. Radios on different Domains cannot communicate with each other. The Domain is a software filter which does not affect the actual radio frequency or the frequency hopping sequence.

You may want to set everyone on your network to the same Domain. For larger wireless networks, use the Domain to establish roaming subnetworks throughout your building. For example, the Engineering Department may use Domain 2 and the

Sales Department may use Domain 5. Then engineers can only roam within the geographical area mapped out by RangeLAN2 7510/752x Access Points with a Domain setting of 2.

The Domain is a number between 0 and 15, and 0 is the default setting.

Channel *default=1*

Each Master can select one of 15 Channels to establish communications with Stations. Each Channel number sets a unique frequency hopping sequence allowing for multiple subnetworks with higher data rate transmission capability in the same air space. You may think of the Channel as a pipe. In order to communicate, radios must be on the same Channel and there must be one (and only one) Master that provides the timing for that Channel.

There are 15 independent Channels designated 1 through 15, and 1 is the default setting. This means that there are 15 different sequences of frequency hops. Each Channel is at a different frequency at a different time. For networks with multiple Masters (like in a roaming environment), set each Master to a different channel for optimum performance.

You need only set the Channel on a Master or Alternate Master. Stations will ignore the parameter if it is set.

Subchannel *default=1*

The Subchannel is a software code that is appended to each radio packet. It does not affect the frequency hopping sequence like a Channel does. Use a Subchannel if you need more than 15 Masters in the same area and have used all 15 Channels.

For example, you can use Channel 1, Subchannel 1 for Network A and Channel 1, Subchannel 2 for Network B. The two networks will not communicate with one another. They are, however, still sharing the same 1.6 Mbps pipe since they are both using Channel 1.

The Subchannels are designated 1 through 15, and 1 is the default setting.

You need only set the Subchannel on a Master or Alternate Master. Stations will ignore the parameter if it is set.

Master Name *optional*

This optional parameter of up to 11 characters specifies an alphanumeric name to simplify the identification of each Master in your network.

You need only set the Master Name on a Master or Alternate Master. Stations will ignore this parameter if it is set.

Security ID

To further improve the security of a wireless subnetwork, each unit requires the same Security ID to establish communication. The Security ID is used on all RangeLAN2 products and all Station Types. This ID is encrypted and stored on the RangeLAN2 7110 PCI Card itself, not in software. It cannot be accessed, but you may change it. However, if you do change it, then you will also need to change the Security ID on all of the other RangeLAN2 devices in order to reestablish communication between the devices.

The Security ID is a string of up to 20 alphanumeric characters. There are 1,048,576 unique choices for the Security ID. The default Security ID for all RangeLAN2 products is blank (an empty string).

You may change the Security ID from within the Site Survey & Configuration Tool. Refer to Appendix A for more information on how to set the Security ID.

MAC Optimize *default=Normal*

This parameter can help improve throughput for small networks. If you have 8 or fewer wireless nodes communicating with a RangeLAN2 7110 card configured as a Master, then set this parameter to Light on the Master unit. (You can have more than 8 nodes synchronized to a RangeLAN2 Master but only 8 or fewer communicating at the same time for the Light parameter setting.) In networks with more than 8 concurrent wireless users, set the parameter to Normal.

You need only set the MAC Optimize parameter on a Master or Alternate Master. Stations will ignore this parameter if it is set.

Roam Config *default=Normal*

The Roam Config parameter allows you to determine how tolerate a Station is to radio phenomena that can cause the unit to roam from one RangeLAN2 Access Point or Extension Point to another.

In areas with many RangeLAN2 Access Points (or Extension Points) that provide heavy overlapping coverage, set this param-

eter to Fast to maintain high throughput for each of the wireless nodes.

In most networks, set the Roam Config parameter to Normal. Wireless node throughput will not change noticeably, and an overabundance of Access Points is not required.

If the wireless coverage area provided by RangeLAN2 Access Points (or Extension Points) is sparse, set the Roam Config parameter to Slow. Wireless nodes will not roam until they are nearly out of range of the Access Point.

You need only set the Roam Config parameter on a Station or Alternate Master. Masters will ignore this parameter if it is set.

Peer to Peer *default=Yes*

If the Peer to Peer parameter is set to Yes, wireless Stations can communicate with one another. If set to No, the wireless nodes will only communicate with the Master unit. This results in a shorter synchronization time between the wireless clients and the Master unit. There are programs whose timings are inappropriate for wireless networking, resulting in the wireless nodes losing the network connection unless this parameter box is unchecked.

In general, Proxim recommends that you leave this parameter set to Yes, unless Stations only need to communicate with the Master and will never need to communicate with each other.

You need only set the Peer to Peer parameter on a Station or Alternate Master. Masters will ignore this parameter if it is set.

Inactivity Timeout *default=None*

RangeLAN2 PC Cards have the ability to enter a low-power, inactivity doze mode in order to conserve battery life. The doze mode is automatically engaged after a certain period of time has elapsed since the computer has sent or received data over the network. Once the card has entered the doze mode, it can be awakened by a Master unit attempting to send data to it. A Master unit cannot be configured to doze or else you would lose all communication on your network. The time before dozing is calculated by adding the Inactivity Minutes and Inactivity Seconds parameters and rounding to the nearest 5 second interval.

This parameter is primarily meant to be used with RangeLAN2 PC Cards installed in mobile devices that have a finite battery charge. Therefore, by default, the RangeLAN2 7110 PCI Adapter has power management disabled with Inactivity Minutes and Inactivity Seconds both set to 0.

Node Override

The Node Override field allows you to change the MAC address that the RangeLAN2 card will broadcast during the current network session. If this field is not filled out or an illegal address is entered, the MAC address burned in at the factory will be used.

Illegal addresses include multicast addresses and non-hexadecimal characters in the address. A multicast address contains an odd number in the second digit. For example, the address 010000000000 is a multicast address and an illegal value for a node override.

When displayed on a network analyzer or the RangeLAN2 Utilities, the address displayed will be that entered by the user but with bit 2 of the most significant byte set. For example, if you entered 000000000000 as the node override address, 020000000000 will be displayed as the node address. If you entered 040000000000, 060000000000 will be displayed as the node address. This is best understood when the digits are converted into binary. Each hexadecimal digit of a MAC address is represented by 4 binary characters. The digit 2 is represented as 0010, i.e., bit 2 of the most significant byte is set to 1. The digit 4 is represented as 0100 in binary, so this would be converted to 0110 (or 6 in decimal) so that bit 2 of the most significant byte could be set. Note that this only affects the second digit of the MAC address.

The Node Override parameter is only visible in the Advanced tab of the RangeLAN2 Card's properties screen.

8. Performance Hints

This section offers several suggestions for how to the improve performance of a RangeLAN2 network.

Designating Devices as Masters and Alternate Masters

RangeLAN2 uses a spread spectrum frequency hopping technique. This means that the radio signal is constantly moving from one frequency to another in a predefined sequence. In order for several RangeLAN2 radios to communicate, they must be at the same frequency at the same time.

Proxim has devised a method whereby one unit, called the Master, sets the pace for the other radios. All Stations look to the Master to determine where to hop and when. If there is no Master present, a node configured as an Alternate Master will decide to become the Master for that session.

This configuration leaves the system administrator for the network with the task of configuring each wireless device on the network as a Master, Alternate Master, or Station. In most cases, using the default configurations for each of the drivers will work fine. But there may be times when the administrator wants to change the configuration for performance or other reasons. Here are several factors to consider:

1. Each wireless cell must have only one active Master.

2. The Master must be within range of the other wireless Stations on the network.

3. The Master should not be a node which will be moved or turned off like a laptop or a user's personal computer.

4. In general, the RangeLAN2 Access Points are configured as Masters. This configuration allows wireless clients to roam between available Access Points.

5. If there are no RangeLAN2 Access Point(s) on the network, the server in a server/client-based network is usually configured as the Master. Without a RangeLAN2 Access Point, the clients will be unable to roam between different Masters and maintain network connectivity.

6. If there are no RangeLAN2 Access Point(s) on a peer-to-peer network, one Master and at least one Alternate Master should be configured. The Alternate Master will take over Master functions in the event that the Master is unavailable. Without a RangeLAN2 Access Point, the clients will be unable to roam between different Masters and maintain network connectivity.

7. On a network with all laptop computers, it may be advisable for all machines to be Alternate Masters if there is no RangeLAN2 Access Point configured as the Master.

8. You will achieve better performance by configuring the fewest number of machines possible as Alternate Masters.

9. No device should be configured as an Alternate Master in a roaming environment that contains RangeLAN2 Access Points and/or Extension Points.

Microwave Ovens

Microwave ovens operate in the same frequency band as RangeLAN2. Therefore, if you use a microwave within range of RangeLAN2 you may notice network performance degradation. However, both your microwave and your RangeLAN2 network will continue to function.

Range

Every environment is unique with different obstacles, barriers, materials, etc. and, therefore, it is difficult to determine the exact range that will be achieved without testing. The site survey tool was developed to aid in this process. Additionally, Proxim has developed some guidelines to estimate the range that users will see when the product is installed in their facility, but there are no hard and fast specifications.

Radio signals may reflect off obstacles or be absorbed by others depending on their construction. For example, with two standard 100 mW RangeLAN2 radios you may achieve up to 1000' in open space outdoors where the two antennas are line of sight, meaning they see each other with no obstacles. However, the same two units will only achieve up to 500' of range when they have to travel through the cubicles usually used in modern offices. If there are office walls to penetrate, the signal range may decrease even further to up to 300'.

Proper antenna placement can help improve RangeLAN2 performance. Try to place the antenna so that it extends above the top of the computer or sits on top of a monitor.

9. Troubleshooting

RangeLAN2 7110 is designed to be very easy to install and operate. If you do experience difficulties, however, use the information in this chapter to help diagnose and solve the problem. If you cannot resolve the problem, contact Proxim, as described in Appendix E, "How to Reach Technical Support."

How to Obtain Help with Your LAN Installation

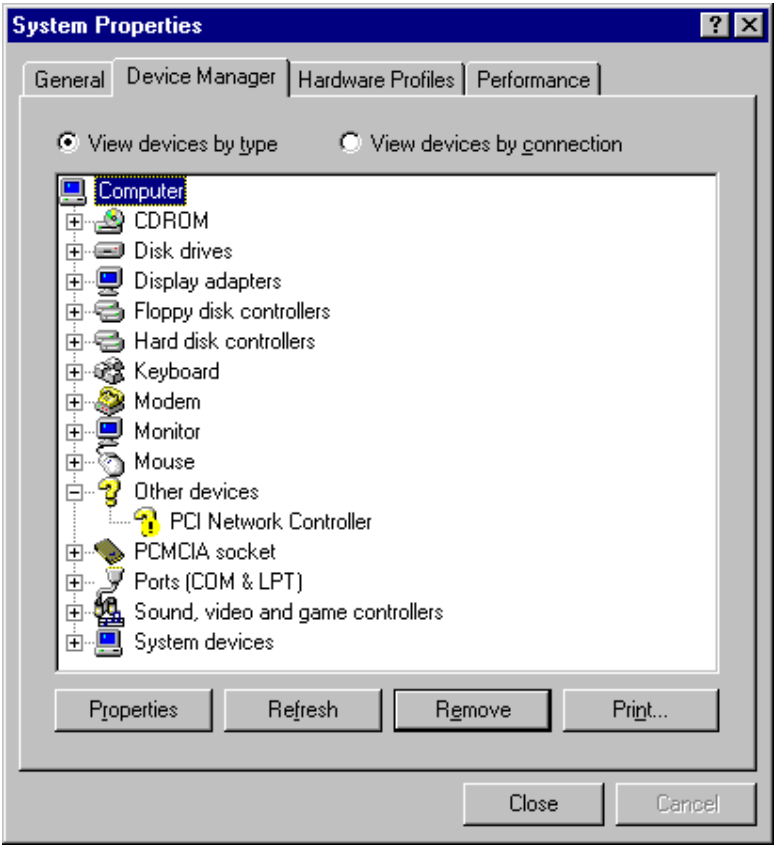
If you require assistance to install your LAN, Proxim can put you in touch with a RangeLAN2 Reseller in your area. The reseller is an expert in the design, installation, and maintenance of LANs and will be able to examine your needs and recommend the most cost-effective solution for your LAN whether you are installing a new LAN or adding on to an existing one. For the location of the RangeLAN2 reseller nearest you, contact Proxim at 800-229-1630 and ask for the Sales Department.

Windows 95/98 Installation Problems

Chapter 3 describes how to install the RangeLAN2 driver in a computer running Windows 95 or Windows 98. This section provides some suggestions to resolve many of the common installation problems with the RangeLAN2 7110 PCI Card.

Problem 1: I have installed the RangeLAN2 driver but no Device Manager entry has been created for the RangeLAN2 7110 PCI Adapter.

Solution 1: Double-click the Control Panel's System icon and click the "Device Manager" tab. Check the Network Adapters category for a "Proxim RangeLAN2 PCI Adapter" entry. If this entry does not exist, check the Other Devices category for a "PCI Network Controller" entry, as shown below.



If this entry exists, highlight it and click <Remove>. Restart the computer and Windows 95/98 will automatically detect the RangeLAN2 PCI Adapter. Follow the instructions in Chapter 3 to install the RangeLAN2 driver.

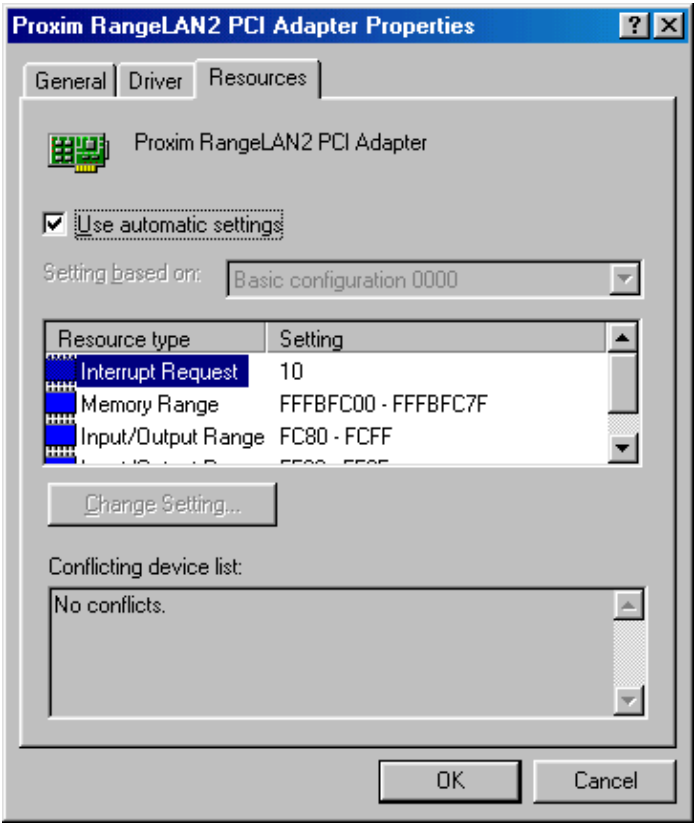
Problem 2: Windows 95/98 did not automatically recognize the RangeLAN2 PCI Adapter when I turned on the computer.

Solution 2: Windows 95/98 will automatically detect the RangeLAN2 PCI Adapter as a PCI Network Controller. If Windows does not recognize the card, check the Device Manager for a "PCI Network Controller" entry in the Other Devices category and follow the procedure outlined in Solution 1. Also, confirm that the PCI card has been properly inserted in a free PCI slot on the computer's motherboard.

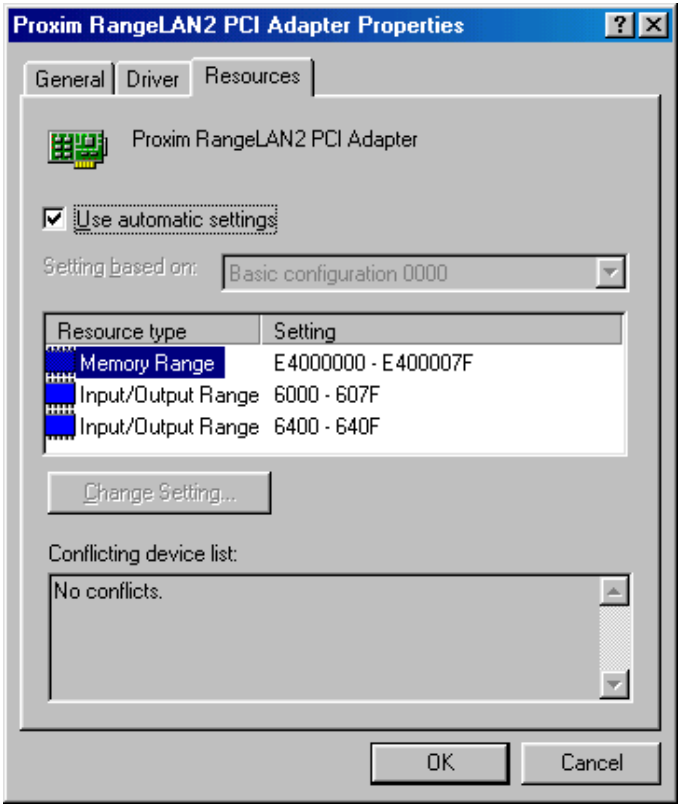
Problem 3: After installing the driver, the RangeLAN2 PCI Adapter's entry in the Device Manager has a yellow exclamation point next to it, as shown below.



Solution 3: If a yellow "!" appears next to the RangeLAN2 adapter's Device Manager entry, then the card is not working properly. This is due either to an error during installation or to a system conflict. To identify the cause of the error, highlight the "Proxim RangeLAN2 PCI Adapter" entry and click the <Properties> button. Next, click the Resources tab and determine if the card has been assigned any resources. If the card has been assigned no resources, then there was an error during installation. Reinstall the RangeLAN2 driver following the instructions at the end of Chapter 3. If the card has been assigned resources, then confirm that it has been assigned one IRQ, at least one I/O Base Address, and one Memory Range, as shown below.

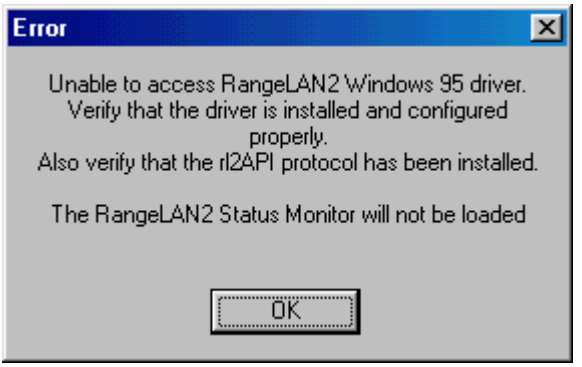


If the card is not working, most likely it has not been assigned an IRQ, as shown below.



A computer's BIOS (Basic Input/Output System) automatically assigns resources to PCI cards during boot-up. The resources assigned to a PCI card cannot be changed within Windows 95/98, only within the BIOS. If the PCI card has not been assigned an IRQ, check the PCI configuration settings within the BIOS Setup screen to assign the RangeLAN2 PCI Card available resources. If problems persist, contact the PC's manufacturer to determine if an updated BIOS version is available that provides improved support for PCI devices.

Problem 4: After installing the driver and restarting the computer, the following error message appears:



Solution 4: This error will appear if the RangeLAN2 adapter is not working properly but the RangeLAN2 Utilities have been successfully installed. Most likely, this is due either to an error during installation or a conflict between the operating system and the computer's BIOS. Refer to Solution 3 for more information about this.

Windows NT 4.0 Installation Problems

If the RangeLAN2 PCI Adapter fails to install under Windows NT 4.0, check the PCI Configuration settings within the computer's BIOS Setup screen to confirm that available resources are being assigned to the RangeLAN2 card. A computer's BIOS (Basic Input/Output System) automatically assigns resources to PCI cards during boot-up. The resources assigned to a PCI card cannot be changed within Windows NT, only within the BIOS. If problems persist, contact the PC's manufacturer to determine if an updated BIOS version is available that provides improved support for PCI devices.

Windows 2000 Installation Problems

Chapter 4 describes how to install the RangeLAN2 driver in a computer running Windows 2000. This section provides some suggestions to resolve many of the common installation problems with the RangeLAN2 7110 PCI Card.

Problem 1: I have installed the RangeLAN2 driver but no Device Manager entry has been created for the RangeLAN2 7110 PCI Adapter.

Solution 1: Double-click the Control Panel's System icon and choose the Hardware tab. Click the <Device Manager> button to view the Device Manager. Check the Network Adapters category for a "Proxim RangeLAN2 PCI Network Adapter" entry. If this entry does not exist, check the Other Devices category for a "Network Controller" entry, as shown below.

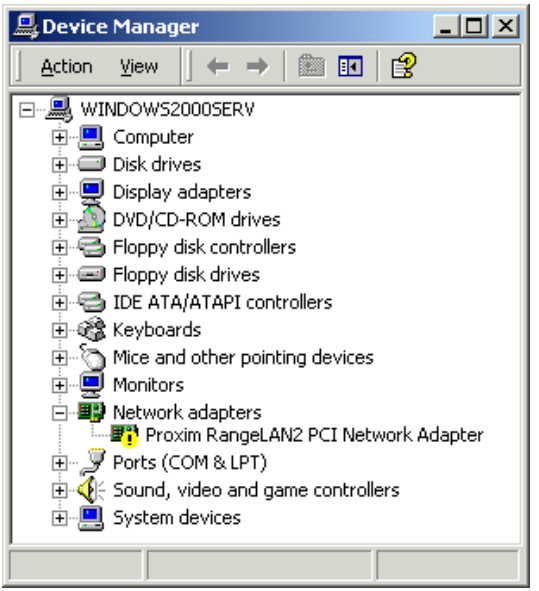


If this entry exists, right-click the entry and choose “Uninstall...” Restart the computer and Windows 2000 will automatically detect the RangeLAN2 PCI Adapter. Follow the instructions in Chapter 4 to install the RangeLAN2 driver.

Problem 2: Windows 2000 did not automatically recognize the RangeLAN2 PCI Adapter when I turned on the computer.

Solution 2: Windows 2000 will automatically detect the RangeLAN2 PCI Adapter as a Network Controller. If Windows does not recognize the card, check the Device Manager for a “Network Controller” entry in the Other Devices category and follow the procedure outlined in Solution 1. Also, confirm that the PCI card has been properly inserted in a free PCI slot on the computer’s motherboard.

Problem 3: After installing the driver, the RangeLAN2 PCI Network Adapter entry in the Device Manager has a yellow exclamation point next to it, as shown below.



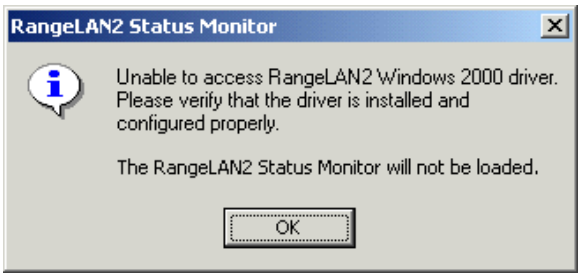
Solution 3: If a yellow "!" appears next to the RangeLAN2 adapter's Device Manager entry, then the card is not working properly. This is most likely caused by a system conflict.

Open the Resources tab of the RangeLAN2 Card's Device Manager entry to confirm that the card has been assigned one IRQ, at least one I/O Base Address, and one Memory Range.

If one of these resources entries are missing, you may need to reconfigure the computer's BIOS.

A computer's BIOS (Basic Input/Output System) automatically assigns resources to PCI cards during boot-up. The resources assigned to a PCI card cannot be changed within Windows 2000, only within the BIOS. If the PCI card has not been assigned an IRQ, check the PCI configuration settings within the BIOS Setup screen to assign the RangeLAN2 PCI Card available resources. If problems persist, contact the PC's manufacturer to determine if an updated BIOS version is available that provides improved support for PCI devices.

Problem 4: After installing the driver and restarting the computer, the following error message appears:



Solution 4: This error will appear if the RangeLAN2 adapter is not working properly but the RangeLAN2 Utilities have been successfully installed. Most likely, this is due to a conflict between the operating system and the computer's BIOS. Refer to Solution 3 for more information about this.

Commonly Asked Technical Support Questions

This section discusses some of the most common problems using the RangeLAN2 7110 PCI Adapter and offers possible solutions.

Problem/Symptom Question	Possible Solution/Answer	Chapter in User's Guide
I insert the driver diskette when prompted, but my operating system reports that the disk does not contain the appropriate files.	Verify that you are using the correct driver diskette for your operating system. The RangeLAN2 card ships with three diskettes, each for a different operating system.	1, 3, 4, 5
The RangeLAN2 7110 PCI Adapter does not install properly. I checked the Device Manager entry, and it has not been assigned an IRQ.	Check the computer's BIOS settings to ensure that the BIOS is assigning valid resources to PCI cards. If problems persist, contact the PC's manufacturer to determine if an updated BIOS version is available that provides improved support for PCI devices.	9
The RangeLAN2 driver loads successfully, but I can't communicate with the network.	You may not be synchronized with an Access Point or another RangeLAN2 device configured as a Master, or you may not be in range. Run the RangeLAN2 Site Survey & Configuration Tool to determine if you are in range. Also confirm that you have the sameDomain and Security ID as the other RangeLAN2 devices on your network.	6, 7, Appendix A
Why can't I synchronize with an Access Point?	Your RangeLAN2 PC card may not have the same Domain and Security ID as the Access Point. Also, confirm that the Access Point is operational and has a solid green Status LED.	6, 7, Appendix A

Problem/Symptom Question	Possible Solution/Answer	Chapter in User's Guide
Why can't I communicate with other RangeLAN2 cards in an Ad Hoc wireless network?	Your RangeLAN2 card may not have the same Domain and Security ID as the other RangeLAN2 devices on the network. Also, confirm that one and only one device is configured as Master and that the RangeLAN2 PCI card is within range of this Master device. Peer-to-peer communication must also be enabled for Stations to communicate with each other.	6, 7, Appendix A
How do I change the Security ID for the RangeLAN2 7110 PCI Adapter?	As a security measure, the Security ID is stored on the RangeLAN2 7110 PCI Card's radio. The only way to change the Security ID is with the Site Survey & Configuration Tool.	Appendix A
What happens if I go out of range?	This is determined by the network and the amount of time you are out of range, but you may be logged off the network. The same thing will happen if you unplugged a wired Ethernet cable.	8
How do I know if I'm out of range?	Use the RangeLAN2 Utilities. The Status Monitor will indicate if the card is out of range and the Site Survey & Configuration Tool will determine the strength of a radio connection. With a Link Quality lower than 4, you are not at optimal range.	Appendix A

Other

If there is additional information that becomes available after the printing of this manual, there will be a README file on the Proxim distribution diskette included in your package.

A. RangeLAN2 Utilities

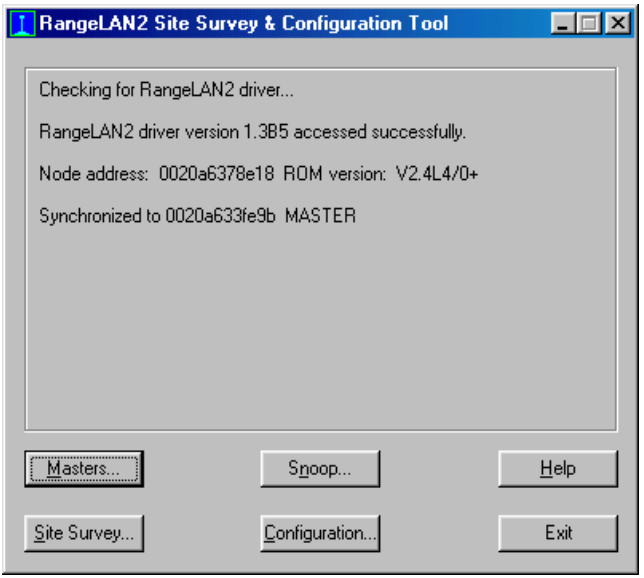
There are two tools provided with the RangeLAN2 7110 PCI Adapter for diagnostics, configuration, and site survey purposes: the RangeLAN2 Site Survey & Configuration Tool and the RangeLAN2 Status Monitor.

RangeLAN2 Site Survey & Configuration Tool

In Windows 95/98 and 2000, the Site Survey & Configuration Tool requires that the driver and the RL2API protocol already be installed before it will function. In Windows NT, the tool requires that only the driver be installed before it will function.

Diagnostics

When the Windows tool launches, it will indicate whether or not it found the driver. The node address, ROM version, and synchronization status of the RangeLAN2 card will be displayed.



Site Survey

The purpose of the site survey tool is to enable users to configure their network with the appropriate number and placement of Access Points for their wireless networks. Start the site survey tool by clicking the <Site Survey> button. This will display the Link Quality and Signal Strengths between the computer running the Site Survey and other RangeLAN2 products on the network.

Node address lists the RangeLAN2 adapter's node address or MAC address. The Master is always listed first with its node address and Master Name (unless the unit performing the site survey is the acting Master).

The higher the Link Quality number from a particular node, the greater the communication path. A Link Quality number of 0 indicates that the node is no longer responding at all. This is the most important parameter to watch on this screen in order to verify that you will be able to maintain a reliable wireless connection. Note that RangeLAN2 7400 PC Cards in doze mode will report an artificially low Link Quality number.

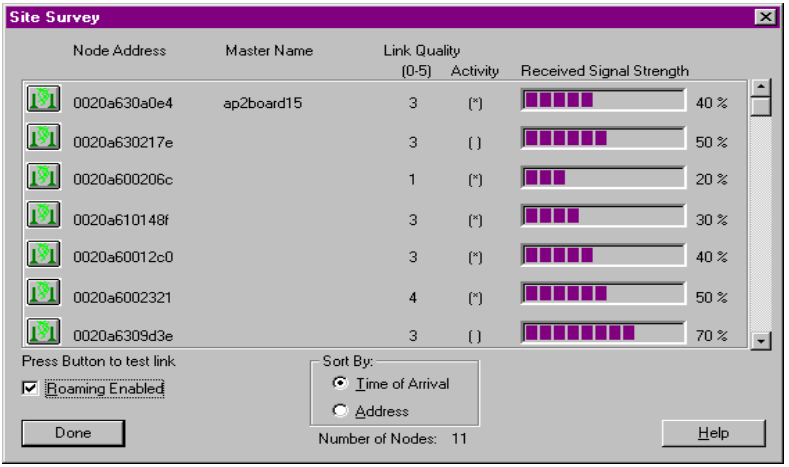
An asterisk in the Activity column indicates that the last packet sent was answered. The lack of an asterisk means that the receiving unit did not respond to the packet.

Received signal strength indicates how strong a signal was received from a particular node. It is not necessarily indicative of the throughput on the link.

If you check the Roaming Enabled box, you can roam about your environment and as you leave the range of one Master, the site survey will continue as you seamlessly roam and re-synchronize to another Master.

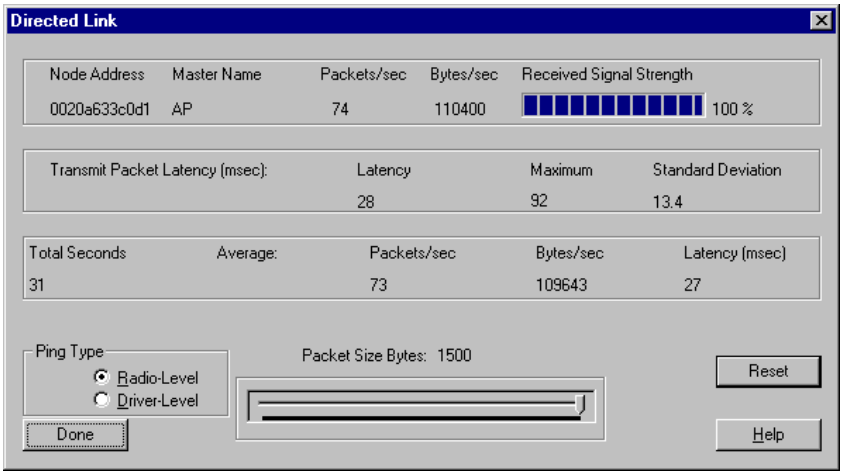
You can sort the listed units by order of arrival or by node address of the packets. Additionally, the bottom of the screen shows how many units responded to this site survey, meaning how many are within range and on the same Domain and Security ID as the surveying unit.

You may check the link between this machine and other displayed nodes by a click of the mouse on the icon to the left of the node address. If you choose to check the link with another unit, it may decrease the performance of that unit.



Point to Point Site Survey

In addition to performing a broadcast site survey, you may determine the connection strength between two specific machines by clicking the icon to the left of a node's MAC address. The Received Signal Strength, Packets per second, and Kilobytes per second are displayed giving you an indication of the link quality between the surveying machine and the node you selected. You can vary the packet sizes to simulate network performance.



The <Reset> button allows you to restart the directed link test without exiting from the Point to Point Site Survey screen.

The Ping Type box allows you to choose between a Radio-Level ping and a Driver-Level ping when performing the directed link test. The Radio-Level ping, Proxim's original diagnostic tool, displays the strength of the connection between the two radios that comprise the link test. The Driver-Level ping is similar to the Radio-Level ping, but it involves the RangeLAN2 driver in the link test.

Proxim recommends that you use the Radio-Level ping to perform a site survey following the procedure outlined in the RangeLAN2 Technical Training Guide. If you would like to learn more about the site survey procedure, you should consider signing up for a RangeLAN2 Technical Training class in your area. Go to Proxim's web site at http://www.proxim.com/ for more information.

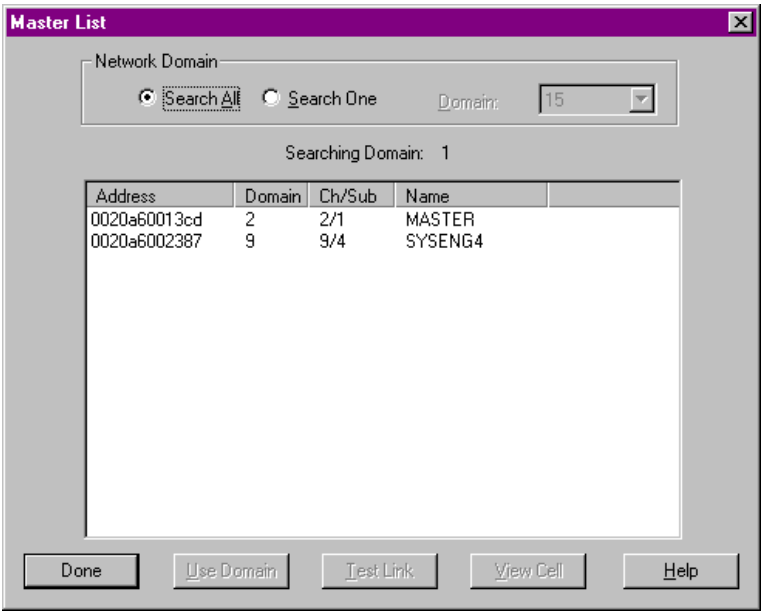
Proxim recommends that you use the Driver-Level ping as a troubleshooting tool in existing RangeLAN2 installations. The Driver-Level ping will provide a better analysis of a wireless connection because the Driver-Level ping incorporates more elements of the RangeLAN2 communication mechanism than the Radio-Level ping.

Also, use the Driver-Level ping in environments containing a large amount of metal. The RangeLAN2 radio signals will bounce off metal, and this may result in a phenomenon known as multipath, which may reduce data throughput. The Driver-Level ping is designed to compensate for the multipath phenomenon and will provide a better estimate of the area covered by a RangeLAN2 device than the Radio-Level ping.

Master Search

If you use the Roaming feature of the RangeLAN2 family, you may be interested in knowing which Master devices are within range. To display all of the Masters within range along with their Domain, Channel, Subchannel, and Master Name, choose the <Masters> button.

Additionally, you can survey the units that are synchronized to a particular Master by choosing that Master from the displayed list. Click the <View Cell> button to perform a broadcast Site Survey of that Master's wireless cell. Click the <Test Link> button to perform a directed Site Survey with the selected Master. Choose the <Use Domain> button to change the surveying unit's Domain to match the Domain of the selected Master.

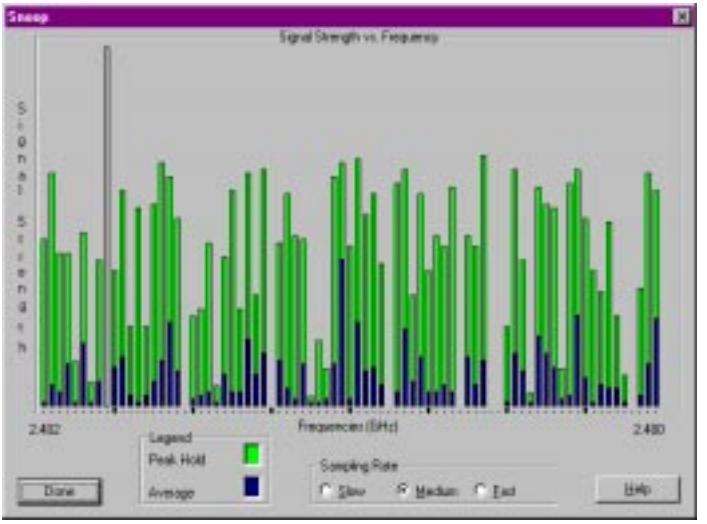


Snoop

If you want to see the activity in the frequency band in which RangeLAN2 operates, you may want to "snoop" this band. To do so, choose the <Snoop> button.

Both the peak and average activity levels on the different frequencies are displayed.

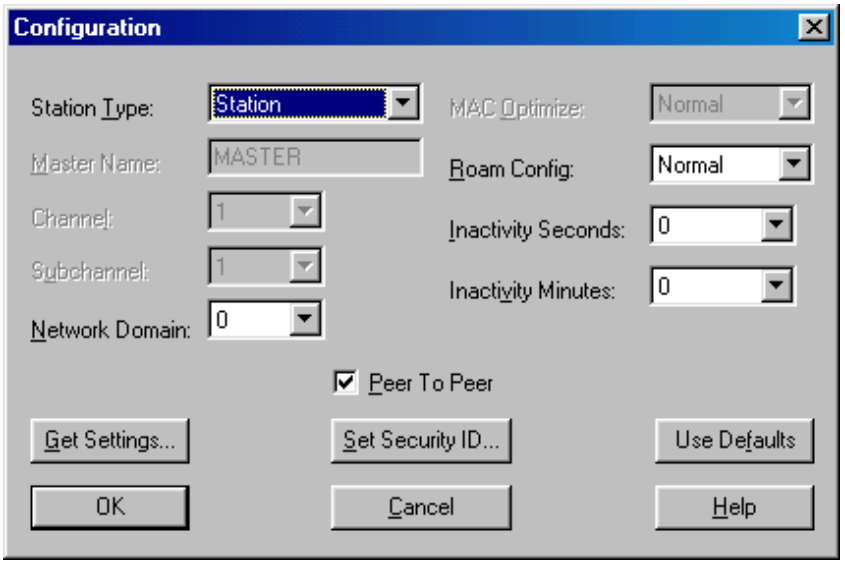
If there are no other RangeLAN2 products running in an area, bars indicate potential sources of interference. If there are other RangeLAN2 products running in the area, you will see the frequency hops.



Configuration Changes

Change the driver settings by clicking the <Configuration> button. The RangeLAN2 parameters are described in Chapter 6.

Note that only some of the RangeLAN2 parameters may be available within the configuration screen depending on the device's Station Type. As shown in the example below, when a RangeLAN2 card is configured as a Station, the Channel, Subchannel, and MAC Optimize parameters are grayed out, since these parameters are only configured on Master devices.



Setting the RangeLAN2 Security ID

As an added security measure, RangeLAN2 allows you to set a Security ID for each RangeLAN2 card installed on a network. **All cards must have matching Security IDs in order to communicate.**

To set the RangeLAN2 Security ID, choose the <Configuration> button and then click the <Set Security ID> button.

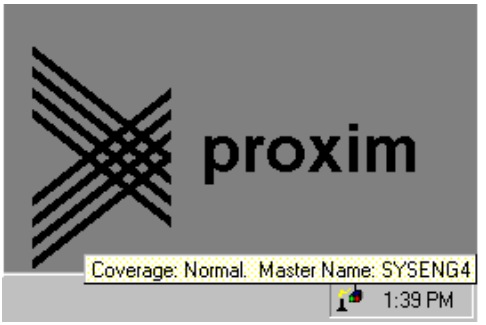
To change the Security ID to default settings, leave the Security ID field blank and choose <OK>.

RangeLAN2 Status Monitor

The second RangeLAN2 Utility, the RangeLAN2 Status Monitor, is loaded each time the operating system starts and places an

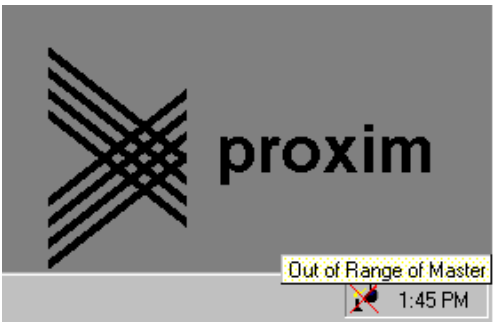
icon in the Windows System Tray, next to the time. The icon changes in appearance to indicate whether or not this node is synchronized to a Master.

When within range of a RangeLAN2 Master, the icon will look like this and report the synchronization status when the mouse cursor is placed over it:

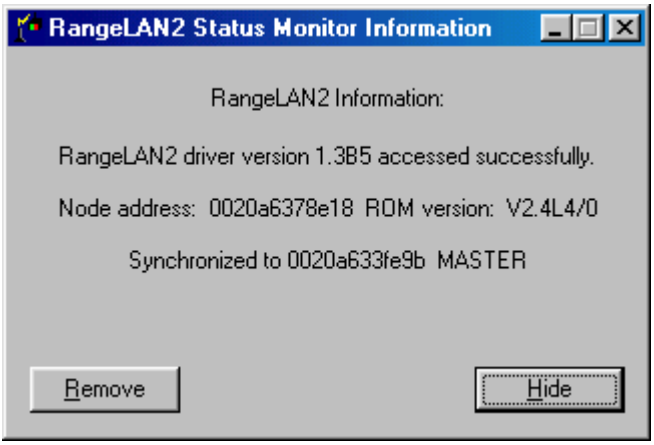


You should note that if the wireless client roams from one Master Access Point to another, this change will not be reflected in the synchronization status dialog box until the mouse cursor is moved off and then back onto the Status Monitor icon.

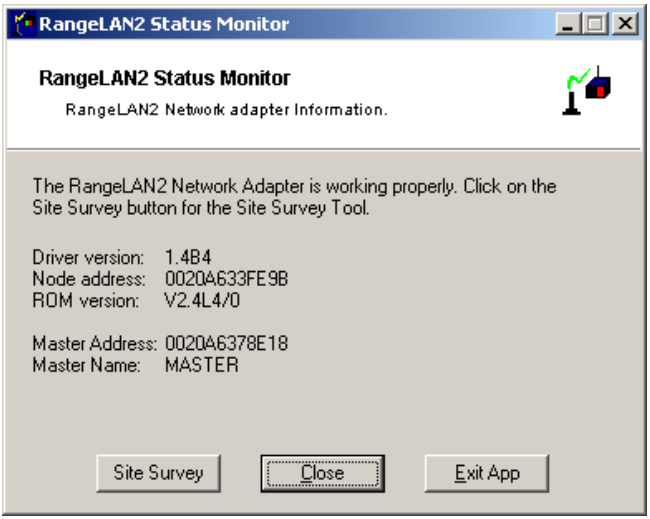
When not in range of a RangeLAN2 Master, the icon will look like this regardless of mouse activity:



You can also right click on this icon to get more information about the current synchronization status. The screen shot below is from the Windows 95, 98, and NT Status Monitor:



The screen shot below is from the Windows 2000 Status Monitor:



Double-clicking the icon with the left mouse button launches the Site Survey & Configuration Tool.

B. Glossary

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

Bandwidth — The size (in Hertz) of the frequency range that a signal transmission occupies. Typical narrow band signals occupy a 25 KHz bandwidth. The RangeLAN2 signal occupies a 1 MHz bandwidth.

Channel — In RangeLAN2 networks, the channel refers to the frequency hopping sequence the card follows.

CSMA/CA — (Carrier Sense Multiple Access/Collision Avoidance) — CSMA is a protocol in which each node senses whether or not a channel is in use before attempting to transmit information. CA is an optimization by which channel time is reserved to avoid collisions.

Frequency Hopping — A spread spectrum technique by which the band is divided into a number of channels and the transmissions hop from channel to channel in a pre-specified sequence.

Interference — A situation that occurs when an unwanted RF signal occupies the same frequency band as a desired signal.

Narrow Band — A channel of about 25 KHz bandwidth in the RF spectrum. The FCC allocates Narrow Band channels and issues a license to the user. Each user of a specific narrow band frequency range must obtain a site license from the FCC.

Spread Spectrum — A radio data transmission modulation technique by which the transmitted signal is spread over a bandwidth wider than the information bandwidth. Spread Spectrum bands are designated by the FCC and require no user license.

C. Parameters

Parameter Name	Range	Default
Station Type	Station, Alternate Master, Master	Station
Domain	0-15	0
+ Channel	1-15	1
+ Subchannel	1-15	1
+ Master Name	11 characters	MASTER
Security ID	0-20 characters	blank
+ MAC Optimize	Light, Normal	Normal
* Roam Config	Slow, Normal, Fast	Normal
* Peer to Peer	Yes, No	Yes

+ Set on Master and Alternate Master only

* Set on Station and Alternate Master only

D. Specifications

The following technical specification is for reference purposes only. Actual product's performance and compliance with local telecommunications regulations may vary from country to country. Proxim, Inc. will only ship products that are type approved in the destination country.

Bus Interface	PCI (Peripheral Components Interconnect)
Range	Up to 500' Indoors Up to 1000' Outdoors
Data Rate	1.6 Mbps
Media Access Protocol	OpenAir CSMA/CA
Ethernet compatibility	Ethernet packet types and Ethernet Addressing
Frequency Band	2.4-2.483 GHz (in the U.S.) (spread spectrum frequency hopping)
Independent Channels	15
Output Power	100 mW

Warning!

It is the responsibility of the users of the RangeLAN2 PCI Card to guarantee that the antenna is operated at least one (1) inch from any person. This is necessary to insure that the product is operated in accordance with the RF Guidelines for Human Exposure which have been adopted by the Federal Communications Commission.

E. How to Reach Technical Support

If you're having a problem using RangeLAN2 7110 and can't resolve it with the information in Chapter 9, gather the following information and contact Proxim Technical Support:

- ❑ What kind of network are you using?
- ❑ What were you doing when the error occurred?
- ❑ What error message did you see?
- ❑ Can you reproduce the problem?
- ❑ What version of the RangeLAN2 7110 driver are you using?

You can reach Proxim Technical Support by voice, fax, email, or mail:

Tel: 800-477-6946 or 408-731-2640
Fax: 408-731-3676
Web: http://www.proxim.com
Email: support@proxim.com

Proxim, Inc.
Attn: Technical Support
510 DeGuigne Drive
Sunnyvale, CA 94085

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