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Limited Warranty, Disclaimer, Limitation Of Liability
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 # 7360.0053
Rev. G

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 7100, an ISA bus wireless LAN adapter. As with all members of the RangeLAN2 family, RangeLAN2 7100 is a long range, high performance, wireless LAN adapter card that allows your computer to communicate with other computers on the network without wires.

RangeLAN2 7100 was designed to be easy to use. In most cases, you can use the default settings and just install the adapter board into a standard PC/AT bus slot and load the driver — the same way you are used to installing wired Network Interface Cards (NICs). 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 7100 may be placed in Windows 95, Windows 98, Windows 2000, or Windows NT computers, NetWare clients, or in any network node that supports ODI or NDIS drivers. Your RangeLAN2 7100 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

RangeLAN2 7100 is part of a family of high-performance products that provides a complete wireless networking solution.

- **RangeLAN2 7110** is a wireless LAN adapter that fits into a standard PCI bus slot.
- **RangeLAN2 7400** is a high performance wireless LAN adapter which fits into a PCMCIA Type II slot on 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

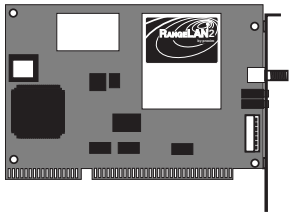
Each RangeLAN2 adapter package comes with:

- ❑ One RangeLAN2 wireless LAN adapter.
- ❑ Four 3 1/2" disks -- one containing DOS drivers and utilities, 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.

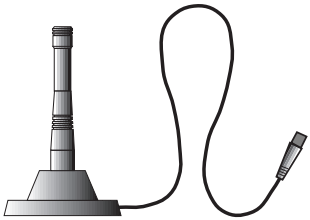
If any of these items are missing or damaged, please contact your reseller or Proxim Technical Support.



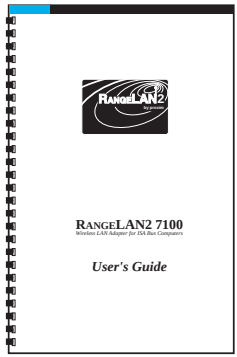
RangeLAN2 7100 Drivers and Utility Diskettes



RangeLAN2 7100 Network Interface Card



RangeLAN2 7100 Antenna



RangeLAN2 7100 Manual

Figure 1
RangeLAN2 Components

System Requirements

To begin using your RangeLAN2 7100 adapter, you need the following minimum system requirements:

- ❑ A PC/AT computer or 100% compatible with an available slot.
- ❑ Windows 95, Windows 98, Windows 2000, Windows NT, or a network operating system that uses ODI or NDIS drivers like NetWare 3.1X/4.X, Personal NetWare, or Windows for Workgroups.
- ❑ At least one other RangeLAN2 product installed on the network.

2. Installing the RangeLAN2 7100 Card

The RangeLAN2 7100 has two hardware components: the ISA card and the antenna. See Figure 2 and Figure 3 respectively.

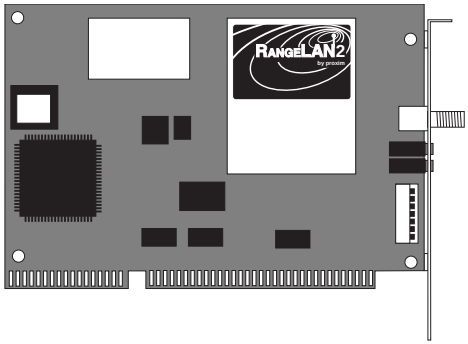


Figure 2
RangeLAN2 7100 Card

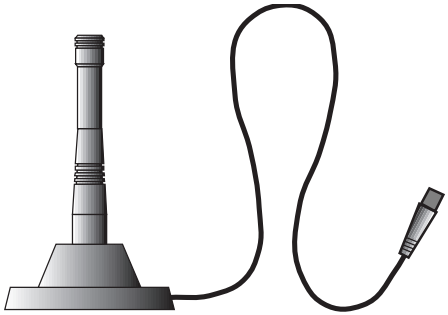


Figure 3
RangeLAN2 7100 Antenna

Default Hardware Settings for I/O Port Address

RangeLAN2 7100 has one bank of dip switches which is used to set the I/O Port Address. For most installations the RangeLAN2 default I/O Port Address setting of 270 will work. All RangeLAN2 7100 cards are shipped with this default setting. Please confirm this setting before installing the RangeLAN2 card by matching the diagram below:

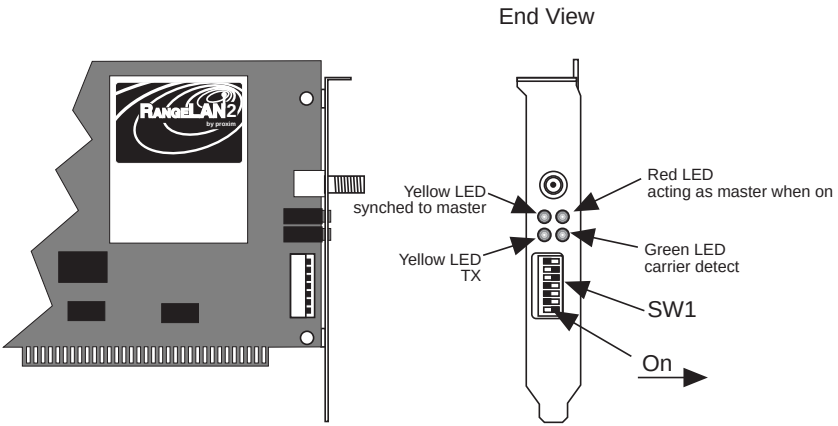


Figure 4
Default Switch Setting for the RangeLAN2 7100 Card

At this point, you should determine if you will have a hardware conflict at I/O Port Address 270. If so, you will need to change the I/O Port Address by modifying the dip switch setting of the RangeLAN2 7100 card and changing the software driver setting. Appendix A describes how to modify the I/O Base Address switch setting.

Installation of the Card

After setting the I/O Port Address, you are ready to install the card. The card may be placed in either a 16-bit ISA-bus slot or an 8-bit ISA-bus slot in your computer.

1. Turn off your computer and unplug it from the wall outlet for safety.

2. Remove the computer cover.

3. Locate an unused ISA slot and use a screwdriver to remove the retaining screw. Remove the metal slot cover.

4. Align the RangeLAN2 card over the slot and insert it firmly into the slot.

5. Use the screw from the slot cover to secure the card's metal bracket to the computer.

6. Replace the computer cover.

7. Plug the computer back into the wall outlet.

Antenna Installation

1. Locate the antenna connector of the RangeLAN2 7100 at the back of your computer as shown in Figure 5 below.

2. Firmly screw the end of the RangeLAN2 antenna cable onto the connector in a clockwise motion. Place the antenna on top of your desk or computer.

Note:

FCC regulations mandate that the RangeLAN2 7100 antenna not be alterable. Therefore, the RangeLAN2 7100 Card uses a custom antenna connector. Do not attempt to use a different antenna or you may damage the connector and the card.

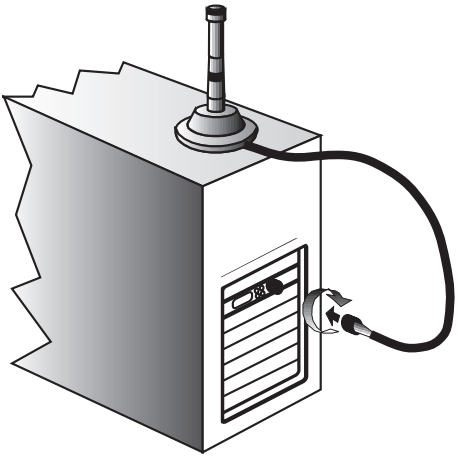


Figure 5
Attachment of the RangeLAN2 7100 Antenna

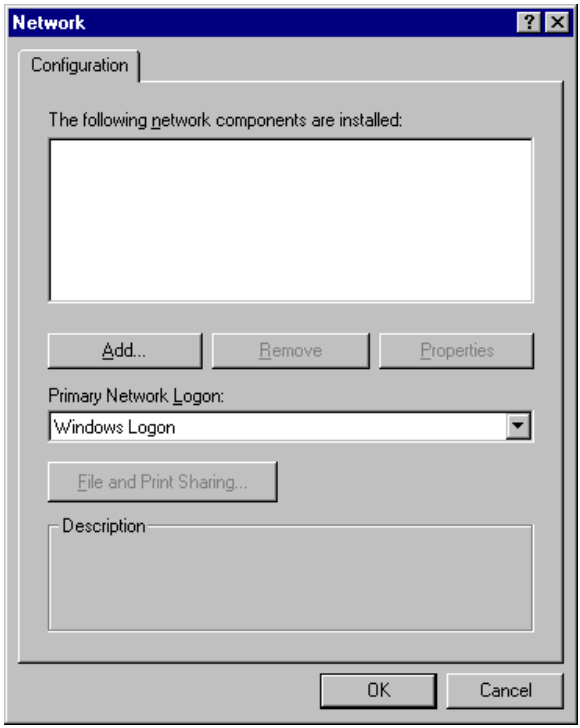
3. Windows Installation Procedure

This chapter describes the installation of the Windows 95/98, 2000, and NT software drivers and utilities once the hardware has been installed as described in Chapter 2.

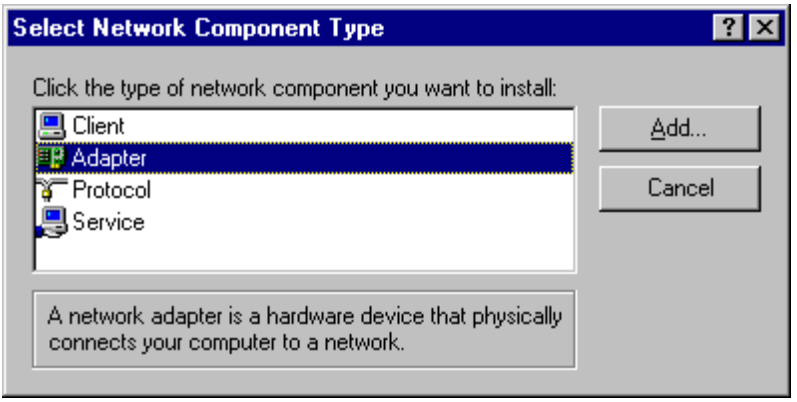
Installing the Windows 95/98 Drivers & Tools

The RangeLAN2 7100 ISA adapter is not a plug and play device. Once the hardware is installed, it will not be automatically detected by Windows 95 or Windows 98.

To install the RangeLAN2 Windows 95/98 driver, go to the Network icon located in the Control Panel, as shown below.



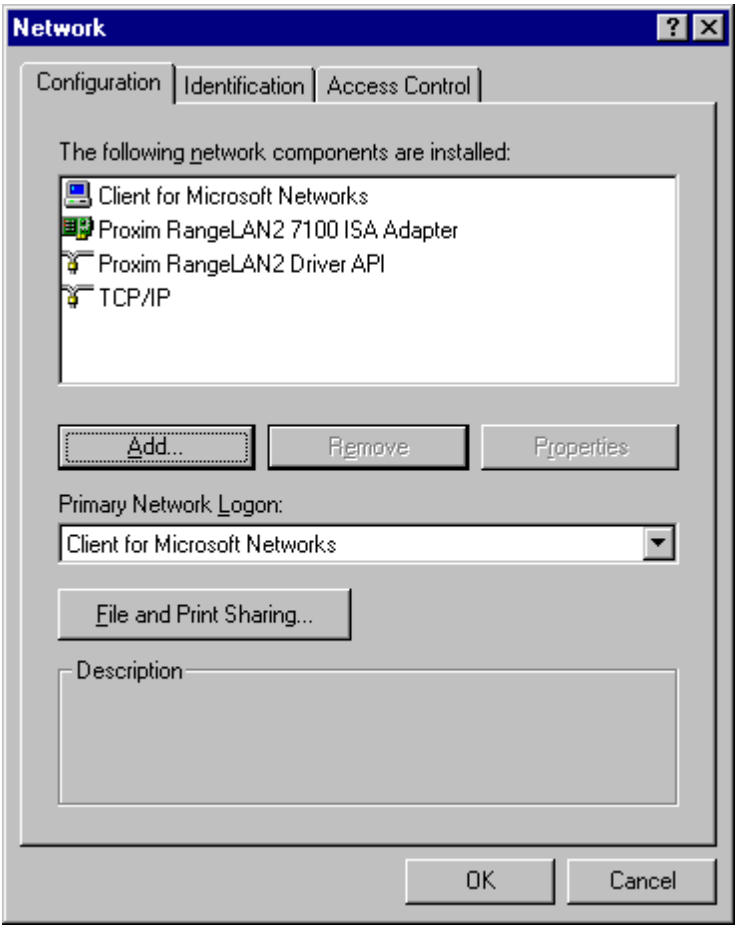
Click the <Add> button to display the “Select Network Component Type” screen.



Highlight “Adapter” and click the <Add> button, as shown above. Windows 95 or 98 will build a list of compatible network adapters. Click the <Have Disk> button which appears in the lower right hand corner of this list.

Insert the Windows 95/98 driver diskette when prompted. A list of compatible Proxim devices will appear. Select “Proxim RangeLAN2 7100 ISA Adapter” from the list. Click <OK> to return to the “Network” screen.

If you already have existing network components installed when loading the RangeLAN2 Windows 95/98 driver, the 7100 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 add a protocol called RL2API. This protocol is required for the RangeLAN2 Utilities to run in Windows 95 or Windows 98.

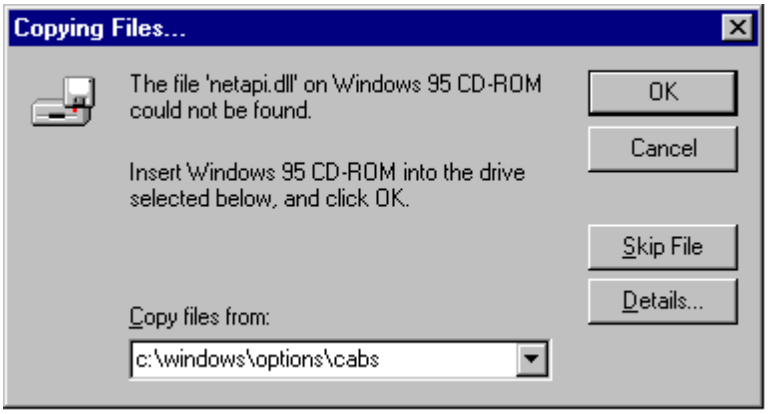
Add any additional network components required by your network (such as the NetBEUI protocol or File and Printer Sharing),

and click <OK>. You will be prompted to choose a “Configuration Type” for the 7100 adapter. Select “Basic Configuration 0” and click <OK> to complete the installation.

Note that during the installation, you may be prompted to insert the Windows 95 or 98 CD-ROM so that the installation can copy certain Windows networking files. If you have the CD available, insert it into the CD-ROM drive when prompted.

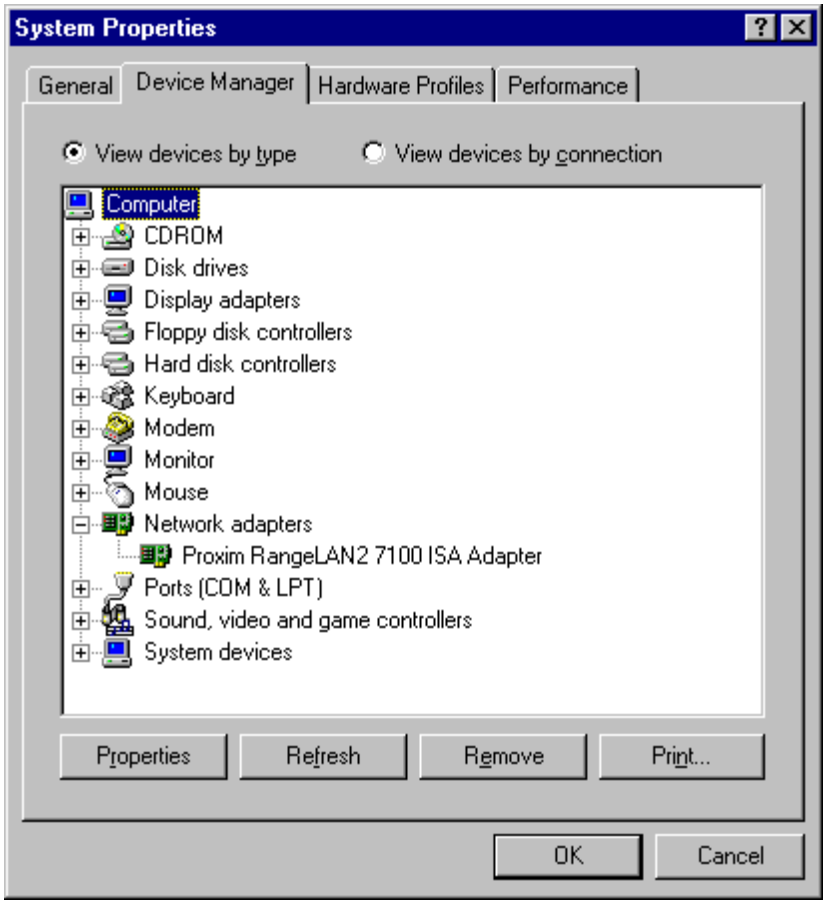
If you do not have a CD-ROM drive or do not have the Windows 95 or 98 CD available, it is possible that the computer has Windows cabinet files (CABS) already installed.

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



Restart the computer when prompted to do so. After the computer restarts, the RangeLAN2 Windows 95/98 driver should be loaded successfully.

To confirm that the driver has been loaded correctly, open the Device Manger located in the System icon and look for the "Proxim RangeLAN2 7100 ISA Adapter" entry under the Network Adapters category, as shown below.



Double-click on the entry to view the properties for the card. The Device Status for the card should read: "This device is working properly."

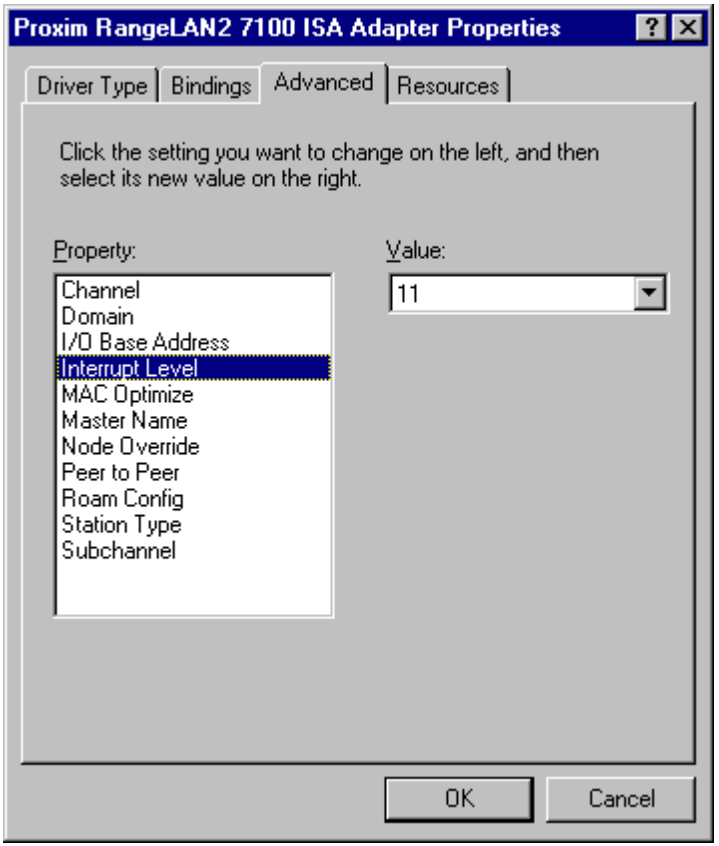
If the RangeLAN2 7100 ISA Adapter entry has an “!” or an “X” next to its description, as shown below, then the card did not install properly.



Most likely, the card has a resource conflict and is trying to use an Interrupt Request (IRQ) or I/O Base Address which is either already in use or not available for use by the card. Double-click the “Computer” entry in the Device Manager to view the list of

resources currently in use by the computer. Make a note of what resources appear to be available.

Go to the Network icon and highlight the “Proxim RangeLAN2 7100 ISA Adapter” entry in the configuration list. Click <Properties> to enter the “Proxim RangeLAN2 7100 ISA Adapter Properties” screen. Choose “Advanced” to view the current configuration settings for the card, as shown below.



Using the drop-down menu, change the value for the Interrupt Request and I/O Base Address if the default settings are conflicting with another system device.

Note:
If you change the I/O Base Address value in the "Proxim RangeLAN2 7100 Adapter Properties" screen, you must also change the dip switch settings on the back of the card. See Appendix A for information on how to set the dip switch to the appropriate I/O Base Address value.

Click <OK> to return to the Network configuration screen, and click <OK> again to return to the Windows 95 or 98 desktop. Restart the computer when prompted. Alternatively, you may want to shut down the computer if you need to change the positions of the dip switches on the back of the ISA adapter.

After the computer restarts, the RangeLAN2 Windows 95/98 driver should be loaded successfully. However, if you still experience problems, see Chapter 8 for more troubleshooting suggestions.

The installation procedure will also install the RangeLAN2 Utilities. The utilities are added to a new folder under Start Menu/ Programs called RangeLAN2 Utilities. It will contain 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 B 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 7100 ISA Adapter" entry from Control Panel / Network icon.
- ❑ Restart the computer.
- ❑ Reinstall the driver following the above instructions.
- ❑ Reset the required networking parameters in Control Panel / Network (such as an IP address).
- ❑ Reset the RangeLAN2 configuration parameters in Control Panel / Network or from within the RangeLAN2 Site Survey & Configuration Tool.

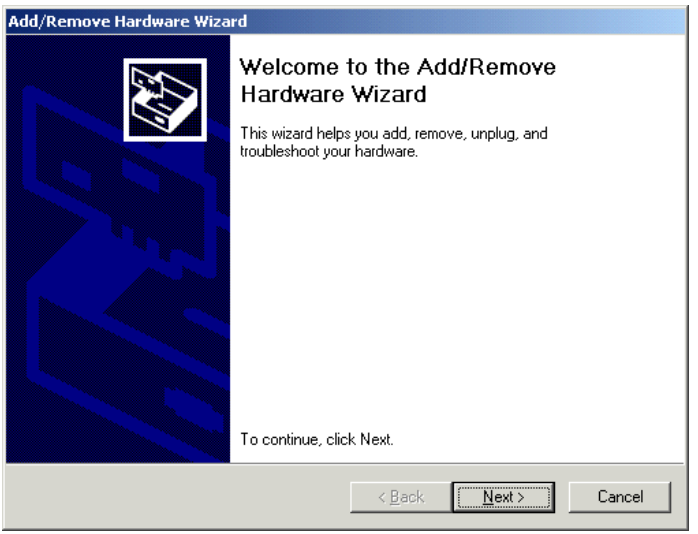
Installing the Windows 2000 Driver & Tools

The RangeLAN2 7100 ISA adapter is not a plug and play device. Once the hardware is installed, it will not be automatically detected by Windows 2000.

Follow these steps to install the RangeLAN2 Windows 2000 driver:

1. With the computer turned off, install the RangeLAN2 ISA 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. Open the Control Panel and double-click the Add/Remove Hardware icon to launch the Add/Remove Hardware Wizard, as shown below.



5. Click <Next> to continue. Be patient while Windows attempts to detect a new plug and play device.

6. Select "Add/Troubleshoot a device" within the Choose a Hardware Task screen and click <Next>.

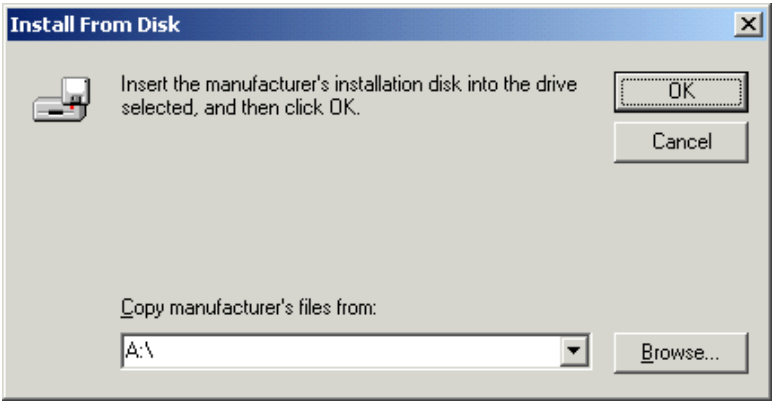
7. Select "Add a new device" from the Devices list within the Choose a Hardware Device screen and click <Next>.

8. Select "No, I want to select the hardware from a list" within the Find New Hardware screen and click <Next>.

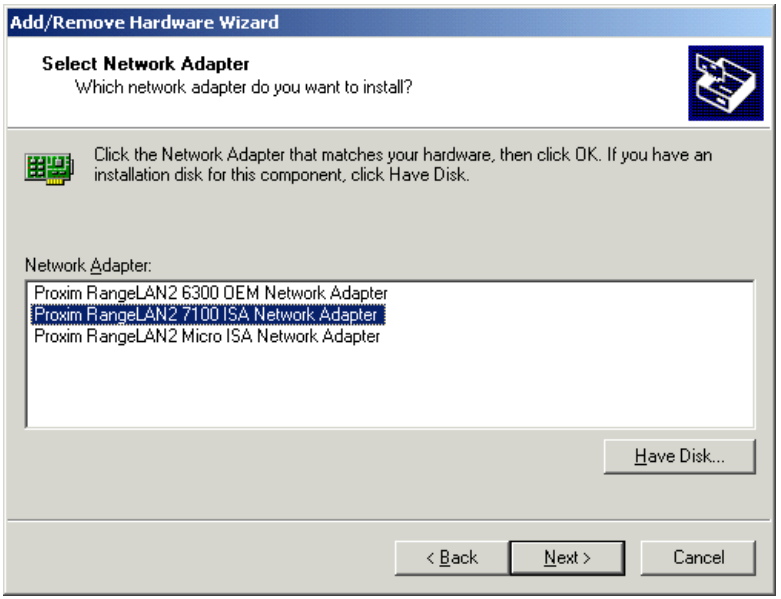
9. Select "Network adapters" from the Hardware types list and click <Next>.

10. Click <Have Disk> within the Select Network Adapter screen.

11. Point the installation wizard to search the RangeLAN2 Windows 2000 driver diskette (typically, this is drive A:). as shown below.

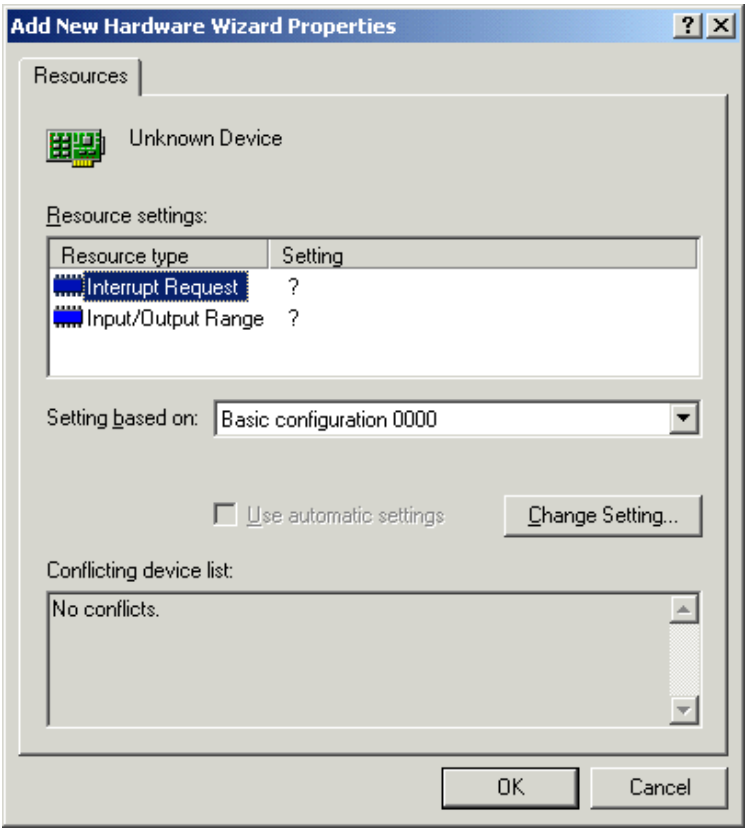


12. Select the "Proxim RangeLAN2 7100 ISA Network Adapter" entry from the list of Proxim adapters, as shown below, and click <Next>.

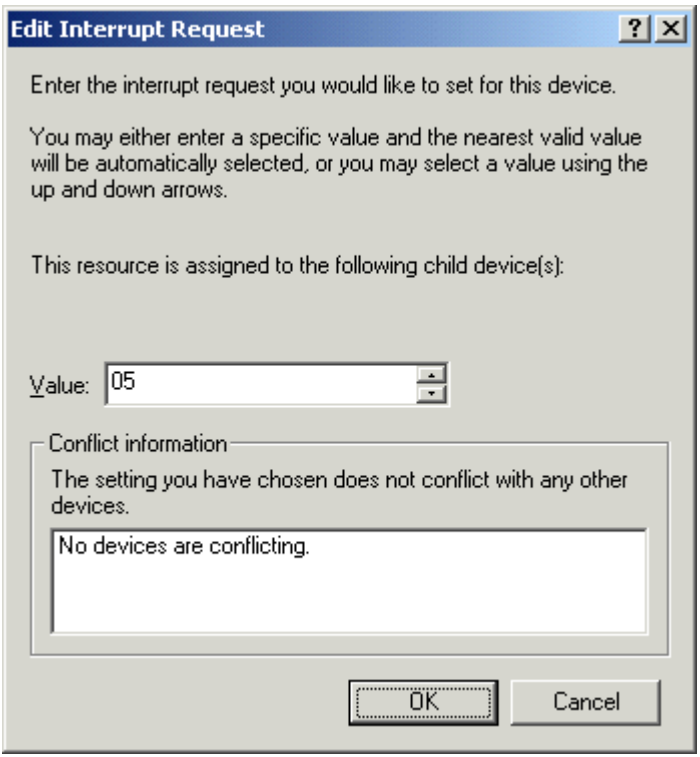


13. Click <OK> when prompted that Windows could not detect the settings of the card.

14. Highlight “Interrupt Request”, as shown below, and click <Change Setting...>.



15. Scroll through the available Interrupt Requests to find a value for which “No devices are conflicting,” as shown below. Click <OK> to return to the Resources screen.



Note:

You may find that your computer has no free Interrupt Request available for use. In this case, try setting the Interrupt Request to a value of 3 or 4, which generally corresponds to COM2 or COM1, respectively. (This assumes that another device, such as an internal modem, is not already using IRQ 3 or 4 and that you are not actively using the COM port associated with IRQ 3 or 4.)

16. Highlight the "Input/Output Range" resource entry and click <Change Setting...>.

17. Scroll through the available I/O ranges to find a value for which "No devices are conflicting." Click <OK> to return to the Resources screen.

Note:
The dip switch settings on the back of the card must match the I/O Base Address you configured in Step #17 in order for the card to properly initialize. Refer to Appendix A for information on how to set the dip switch to correspond to a specific I/O Base Address.

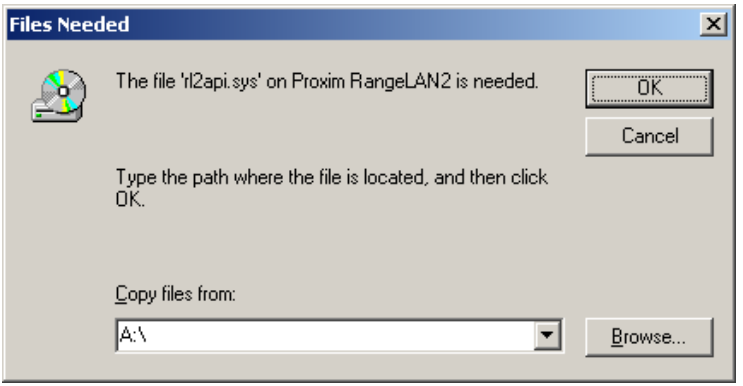
18. Click <OK> to continue.

19. Click <OK> when prompted to confirm that you have manually adjusted one or more settings.

20. Click <Next> to begin the software installation.

21. Click <Yes> to continue if prompted that the RangeLAN2 driver does not contain a Microsoft Digital Signature.

22. 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.



23. Click <Finish> to close the Add/Remove Hardware Wizard.

24. Restart the computer when prompted.

25. Logon to Windows 2000.

The RangeLAN2 ISA 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 B for more information on the RangeLAN2 Tools.

Note that the RangeLAN2 7100 ISA 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 RangeLAN2 7100 ISA Network Adapter is not properly installed following the restart in Step #24 above, confirm that the dip switch setting on the back of the card matches the I/O Base Address that you configured in Step #17.

If the dip switch setting matches the I/O Base Address value but the card did not initialize, then most likely the card is not working because of a resource conflict: the RangeLAN2 ISA Card is trying to use an Interrupt Request (IRQ) or I/O Base Address which is either already in use or not available for use by the card.

Open the Device Manager (located within the Control Panel's System icon) and double-click the RangeLAN2 7100 ISA Network Adapter entry (this entry should have an "!" next to it).

Click the Resources tab and manually change the resource settings for the card to find other available resources which the card can use.

Click <OK> for these new settings to take effect and restart the computer when prompted. After the computer restarts, the RangeLAN2 Windows 2000 driver should be loaded successfully.

However, if you continue to experience installation problems, see Chapter 8 for more 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 7100 ISA Network Adapter" entry.

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

7. Restart the computer when prompted.

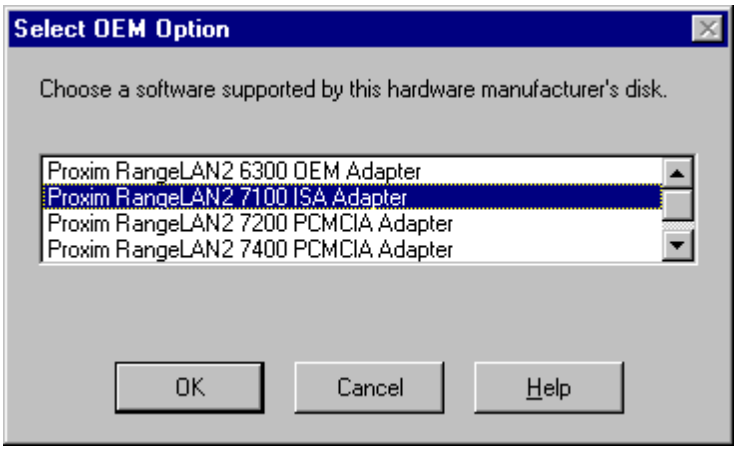
8. Reinstall the driver following the above instructions.

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

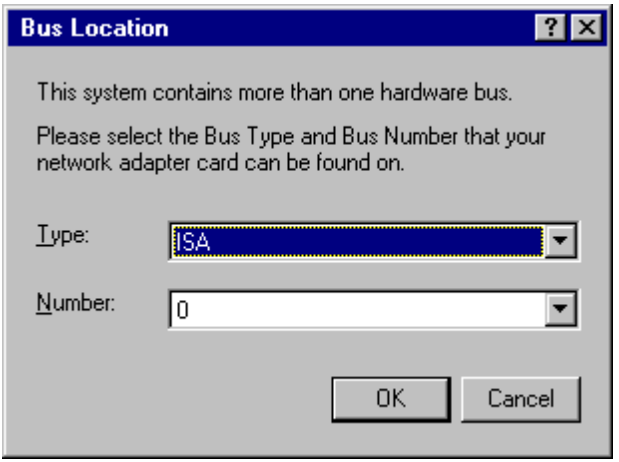
Installing the Windows NT 4.0 Driver & Tools

To install the Windows NT 4.0 driver, go to the Network icon in the Control Panel and choose the Adapter tab. Click on the <Add> button and choose the <Have Disk> option. Insert the Proxim RangeLAN2 Windows NT driver diskette into the disk drive when prompted.

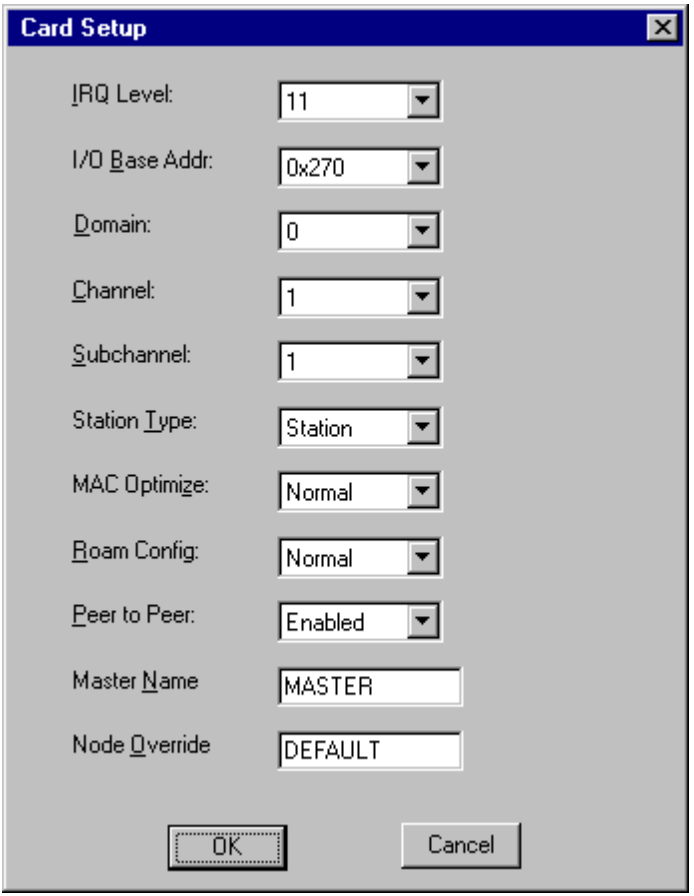
Windows NT will create an OEM Option list. Choose “Proxim RangeLAN2 7100 ISA Adapter” from the list and click <OK> as shown below.



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

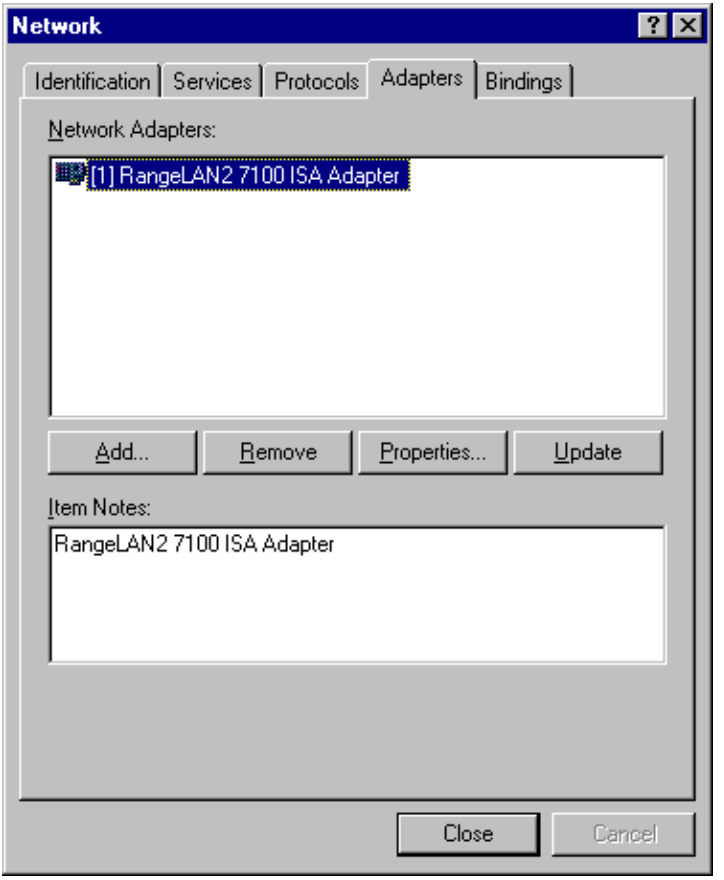


When the installation is complete, the Card Setup screen will appear, as shown below.



Note that the IRQ Level and I/O Base Address must each be configured to a value which is not already in use or reserved by another device.

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. However, if the driver did not load properly, the Windows NT Event Viewer will report that an error has occurred.

If the RangeLAN2 7100 adapter did not install properly, the card most likely has a resource conflict and is trying to use an Interrupt Level (IRQ) or I/O Base Address which is either already in use or not available for use by the card.

Open the Windows NT Diagnostics utility in the Administrative Tools section of the Start Menu to view the resources currently in use by the computer. After you have confirmed what resources are available, click the Adapters tab of the Network Icon and view the properties for the RangeLAN2 7100 ISA Adapter to return to the Card Setup screen. Change the IRQ Level or I/O Base Address to a value that Windows NT reports is not currently in use. See Chapter 8 for more troubleshooting suggestions.

Note:
If you change the I/O Base Address value in the "Proxim RangeLAN2 7100 Adapter Properties" screen, you must also change the dip switch settings on the back of the card. See Appendix A for information on how to set the dip switch to the appropriate I/O Base Address value.

Once the RangeLAN2 7100 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 Start Menu / Programs 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 B 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 device from the Adapters list in the Network icon.
- ❑ Remove the driver file, RL2WINNT.SYS, from the WINNT\SYSTEM32\DRIVERS directory.
- ❑ Reinstall the driver following the above instructions.
- ❑ Reset the required parameters within the Card Setup screen (located in Control Panel / Network) or within the RangeLAN2 Site Survey & Configuration Tool.

4. DOS Installation

This chapter describes the installation of the DOS driver software and utilities once the hardware has been installed, as described in Chapter 2.

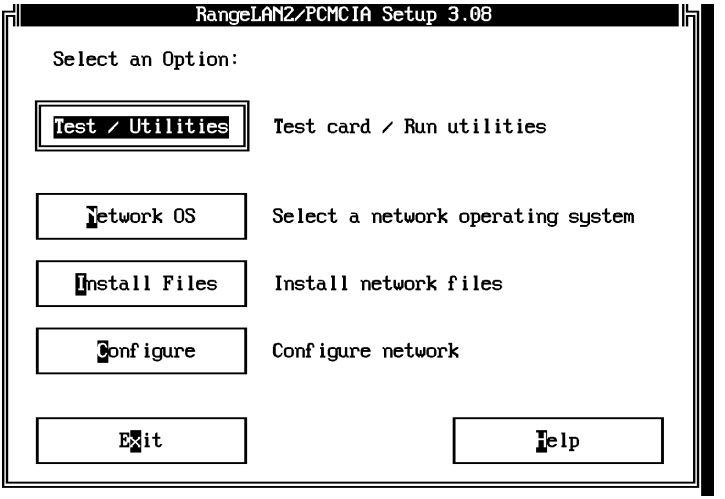
Installing Drivers Using RL2SETUP

If your Network Operating System (NOS) does not have an installation procedure, you may use RL2SETUP to install the ODI or NDIS driver software.

Put the RangeLAN2 7100 DOS driver diskette in a floppy drive on your computer and run the setup program:

```
C:\> A:   (or B:)
A:\> RL2SETUP
```

If you wish to install the ODI driver, choose ODI Peer-to-Peer or ODI with Access Point (depending on whether or not the station will communicate through a RangeLAN2 Access Point) as the NOS and then click the <Install Files> button. If you wish to install the NDIS driver, choose Generic NDIS Peer-to-Peer or NDIS with Access Point (depending on whether or not the station will communicate through a RangeLAN2 Access Point) as the NOS and then click the <Install Files> button. Set the directory name to match that of the NOS directory. The proper driver and configuration file will be installed. Next, choose <Configure> and set the proper software options.



After configuring, choose <Test / Utilities> to verify your selections do not conflict with other devices in the PC.

Note:
RL2SETUP may not run properly unless there are 512 Kbytes available DOS memory before the utility is executed. Also, note that RL2SETUP will load only if the RangeLAN2 driver is not already loaded in DOS memory.

Installing Drivers Using the NOS Installation

In general, most Network Operating Systems (NOS's) have an installation procedure. A general overview of NOS installation procedures using the RangeLAN2 drivers is described here.

At some point in the installation, the user is asked to pick from a list of network interface cards. Look for an "OEM-supplied" option which will allow you to supply the diskette containing the RangeLAN2 software drivers. The RangeLAN2 driver to be installed is usually either RL2ISA.COM or RL2ISA.DOS.

RL2ISA.COM is a DOS ODI driver. RL2ISA.DOS is a DOS real-mode NDIS 2 driver.

If the installation procedure does not have an “OEM-supplied” option, choose a network interface card from the given list. This card's ODI or NDIS driver will then be installed. After installation, you will need to manually search for all instances of this driver and replace them with either RL2ISA.COM if an ODI driver was installed or RL2ISA.DOS if an NDIS driver was installed. Additionally, you will need to replace the installed driver's configuration with the RangeLAN2 options in the ASCII-editable NET.CFG or PROTOCOL.INI file for the ODI or NDIS driver respectively.

Setting Parameters for ODI and NDIS Drivers

A sample NET.CFG and PROTOCOL.INI file are listed:

ODI - NET.CFG

```
LINK DRIVER RL2ISA
```

`int`	`15`	Sets Interrupt (IRQ) line to be used. Valid options are 3, 4, 5, 7, 10, 11, 12, or 15.
`port`	`270`	Sets the I/O Port Address. This Port must match the dip switch setting.
`domain`	`0`	Sets the network Domain. This must match the Domain of the server or Access Point to which you want to connect and be a number between 0 and 15.
`station_type`	`0`	Sets the status of the RangeLAN2 7100 card as Master (2), Alternate Master (1), or non-master (0) Station.
`frame ethernet_802.3`		Indicates that RangeLAN2 sends Ethernet packets that follow the 802.3 specification.

`channel`	`1`	Sets the Channel to be used when this machine is acting as the Master. It is a number between 1 and 15.
`subchannel`	`1`	Sets the Subchannel to be used when this machine is acting as the Master. It is a number between 1 and 15.
`master_name`	`MASTER`	Sets the name of this machine when it is acting as a Master. The Master Name may be up to 11 characters in length with no spaces.
`mac_optimize`	`1`	Optimizes for the number of concurrent nodes. Choose Light (0) or Normal (1).
`roam_config`	`1`	Sets the roaming speed. Choose Fast (2), Normal (1), or Slow (0).
`peer_to_peer`	`Y`	Turns on or off the ability to talk to other RangeLAN2 peers.

NDIS - PROTOCOL.INI

`[RL2ISA]`
`DriverName=rl2isa$`

`Int=15`	Sets Interrupt (IRQ) line. Valid options are 3, 4, 5, 7, 10, 11, 12, or 15.
`Port=0x270`	Sets the I/O Port Address. This Port must match the dip switch setting.
`Channel=1`	Sets the Channel to be used when this machine is acting as the Master. It is a number between 1 and 15.
`Subchannel=1`	Sets the Subchannel to be used when this machine is acting as the Master. It is a number between 1 and 15.

`Domain=0`	Sets the network Domain. This must match the Domain of the server to which you want to connect and be a number between 0 and 15.
`Station_type=1`	Sets the status of this machine as Master (2), Alternate Master (1), or non-master Station (0).
`Master_name=MASTER`	Sets the name of this machine when it is acting as the Master. The Master Name may be up to 11 characters in length with no spaces.
`MAC_optimize=1`	Optimizes for the number of concurrent nodes. Choose Light (0) or Normal (1).
`Roam_config=1`	Sets the roaming speed. Choose Fast (2), Normal (1), or Slow (0).
`Peer_to_peer=Y`	Turns on or off the ability to talk to other RangeLAN2 peers.

When the RangeLAN2 7100 card is being used as a Master or Alternate Master, you will use the parameters Channel, Subchannel, Master_Name, and MAC_Optimize.

When the RangeLAN2 7100 card is being used as a Station, you do not need to set the Channel, Subchannel, Master_Name, or MAC_Optimize parameters. If set, they will be ignored. The Station will adopt those parameters from any Master to which it connects (roams).

5. 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.

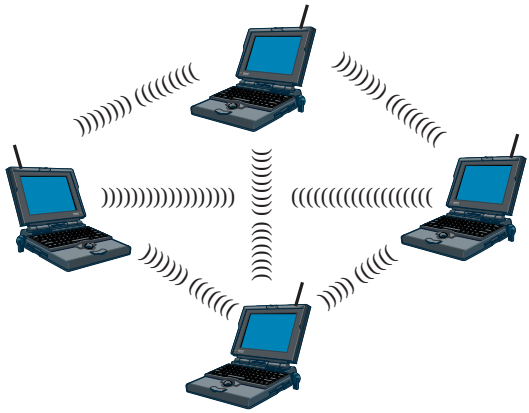


Figure 6
Ad Hoc

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.

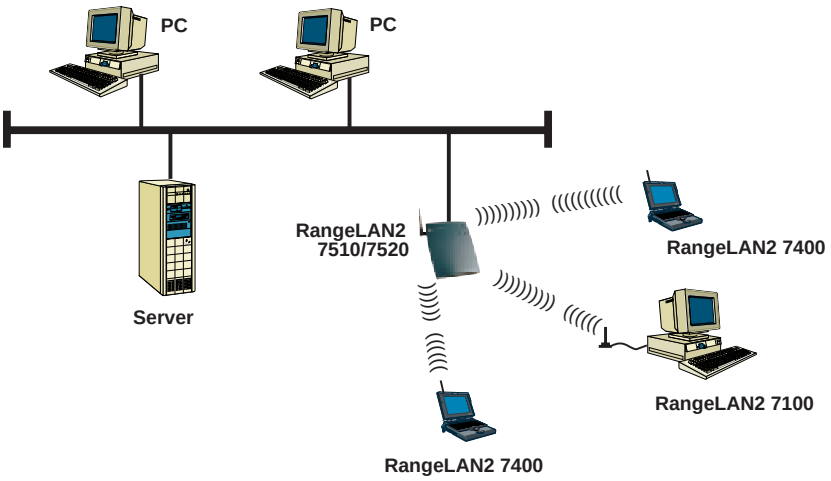


Figure 7
Single AP

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 with any Access Point that is within range.

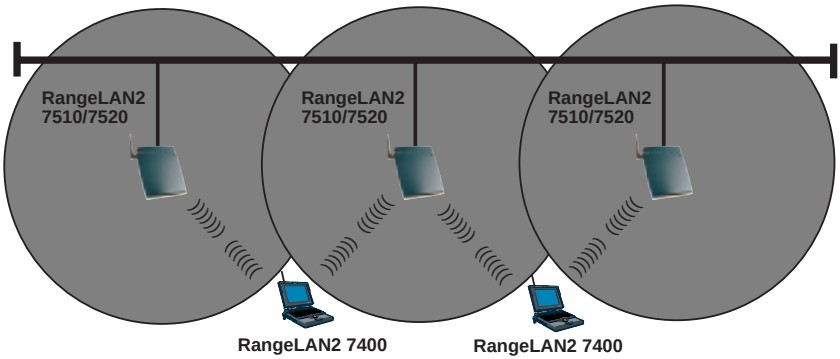


Figure 8
Roaming - Light Overlap

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 in networks where downtime is not tolerable.

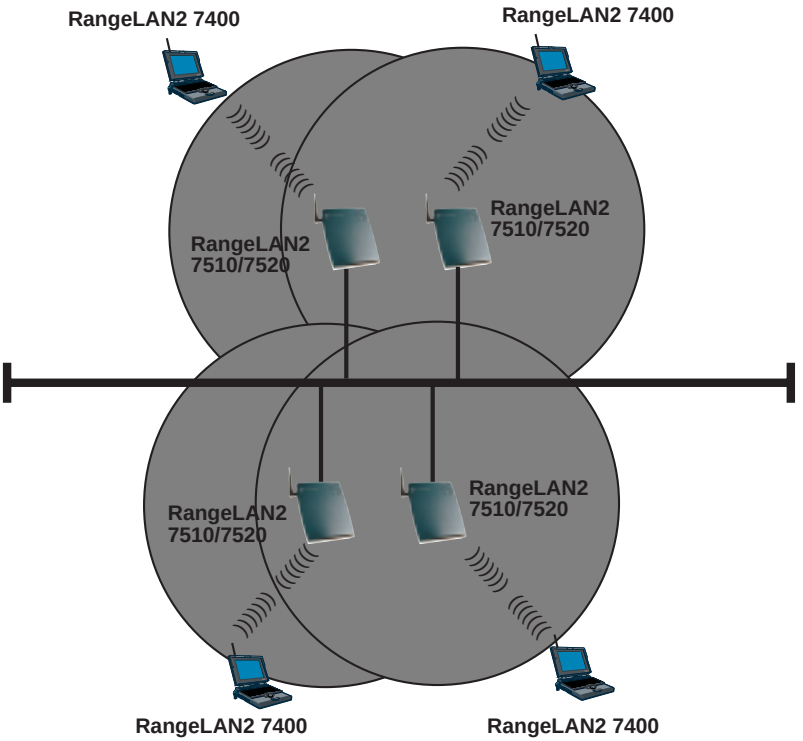


Figure 9
Roaming - Heavy Overlap

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 ISA 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 a connection available.

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 7100 ISA 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 7100 or 7400 cards are configured as Stations with a Domain and Security ID that matches 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.

6. Understanding RangeLAN2

This chapter lays the background for understanding the radio parameters that can be configured when a RangeLAN2 7100 is installed. Refer to Chapters 3 and 4 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 amongst themselves to determine who will become the Master.

There must be at least one RangeLAN2 device on the network designated the Master. For most network operating systems, the RangeLAN2 7510/752x 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 7100 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 7100 card 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."

The Station_Type settings for the DOS drivers are as follows:

- ❑ Master = 2
- ❑ Alternate Master = 1
- ❑ Station = 0

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 hop 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 with 0 as 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 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 the 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 7100 card itself, not in software. The Security ID 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 or from within the RL2SETUP program. Refer to Appendix B for more information on how to set the Security ID.

MAC_Optimize *default=1*

This parameter can help improve throughput for small networks. If you have 8 or fewer wireless nodes communicating with a RangeLAN2 7100 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 the parameter if it is set.

The MAC_Optimize settings for the DOS drivers are as follows:

- ❑ Light = 0
- ❑ Normal = 1

Roam_Config *default=1*

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 parameter 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 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 the parameter if it is set.

The Roam_Config settings for the DOS drivers are as follows:

- ❑ Slow = 0
- ❑ Normal = 1
- ❑ Fast = 2

Peer_to_Peer *default=Y*

If the Peer_to_Peer parameter is set to Yes, wireless clients 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 the parameter if it is set.

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.

For Windows users, the Node Override parameter is only visible in the Advanced tab of the RangeLAN2 Card's properties screen.

7. Performance Hints

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

Running Large Executable Files Efficiently

You may notice that certain executable files like Novell's LOGIN program can take a long time to start up. You can make this more efficient if you copy the file to your local hard disk. This way the server is only accessed to read data files, which will allow for better performance.

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 and when to hop. 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 issues. 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 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.

8. Troubleshooting

RangeLAN2 7100 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 F, "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.

RangeLAN2 7100 LEDs

There are four LEDs on the RangeLAN2 7100 card:

- ❑ The red LED in the upper right is on steady when the card is acting as a Master. There should be only one card on the subnetwork with this light on at any time.
- ❑ The yellow LED in the upper left is lit when the RangeLAN2 7100 card is synchronized to a Master.
- ❑ The bottom yellow LED flickers as an indication that the card is communicating with another radio.
- ❑ The bottom green LED lights whenever the card detects another unit that is transmitting.

Commonly Asked Technical Support Questions

This section discusses some of the most common problems using the 7100 card and offers possible solutions.

Problem/Symptom Question	Possible Solution/Answer	Chapter in User's Guide
My computer reports a conflict at the default I/O Base Address of 270. I have changed the I/O Address to a new value, but the card still does not work.	You may not have set the dip switch to correspond to the new I/O Base Address you assigned to the card. Each time you change the I/O Base Address in the adapter's properties screen, you must also reconfigure the dip switches on the back of the card.	3, Appendix A
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 same Domain and Security ID as the other RangeLAN2 devices on your network.	3, 5, 6, Appendix B
I have looked at the list of resources used by computer and there are no free IRQs. What can I do?	Most resource conflicts are caused by a shortage of IRQs. If all IRQs are in use, try settings the card to IRQ 3 or 4, which are typically reserved for COM ports, even when the COM port is not in use. However, if you are actively using the COM ports or other devices are actively using these IRQs, you will need to remove one of the devices from your computer to make an IRQ available for the 7100 card.	3

Problem/Symptom Question	Possible Solution/Answer	Chapter in User's Guide
The driver failed to load.	Check that you have configured an I/O Base Address or IRQ Level. Also, confirm that the dip switch settings on the back of the card correspond to the configured I/O Base Address.	3, 4, Appendix A
Why can't I synchronize with an Access Point?	Your RangeLAN2 ISA adapter 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.	5, 6, Appendix B
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 7100 card is within range of this Master device.	5, 6, Appendix B
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.	7
How do I know if I'm out of range?	When running in Windows 95, 98, 2000, or NT, 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 may not be at optimal range. When using the DOS NDIS or ODI driver, run RL2SETUP to perform a site survey.	Appendix B

Problem/Symptom Question	Possible Solution/Answer	Chapter in User's Guide
When my computer boots up, I get an error from the RangeLAN2 Status Monitor. Why?	Check to ensure that the RangeLAN2 driver is properly installed. Also, confirm that the ISA card is properly seated in the computer's ISA slot.	2, 3, 4
How do I know if the RangeLAN2 7100 adapter is acting as a Master or a Station?	Look at the LEDs on the back of the card. If the red LED is on solid, then the unit is configured as a Master. I the yellow Synched to Master LED is on steady, then the unit is configured as a Station and successfully synchronized to a RangeLAN2 Master.	8
How do I change the Security ID for the RangeLAN2 7100 adapter?	As a security measure, the Security ID is stored on the RangeLAN2 7100 adapter itself, not in software. The only way to change the Security ID is with the Windows Site Survey & Configuration Tool or RL2SETUP.	Appendix B
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 four diskettes, each for a different operating system.	1

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. Setting the Dip Switch

Configuration of the RangeLAN2 7100 Card

This section describes how to select the I/O Port Address of the RangeLAN2 7100 card using the DIP switch. Note that the setting selected using the DIP switch must match the setting specified when the software driver is configured.

The figure below shows how to set the DIP switch:

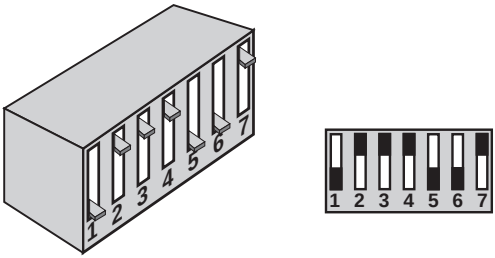


Figure 10
Setting the DIP Switch

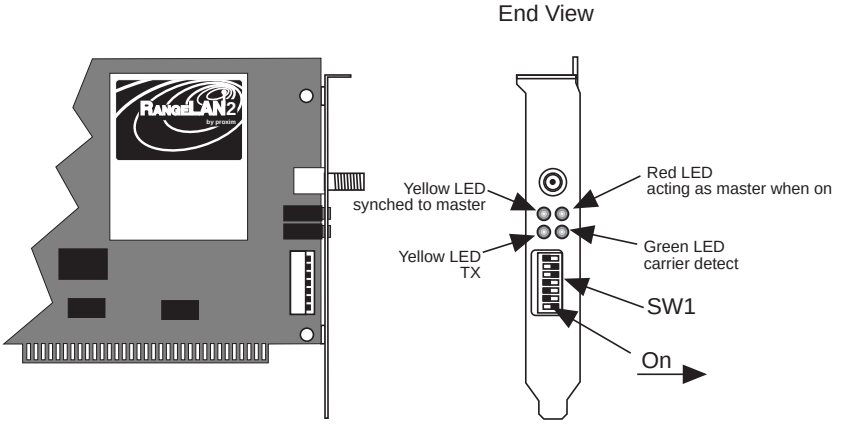


Figure 11
RangeLAN2 7100 Card DIP Switches

I/O Address Configuration

The switch selects the I/O Port Address of the board. The card consumes eight I/O addresses, starting with the Port Address selected using the switch. Figure 12 shows the switch settings for different I/O Port Addresses.

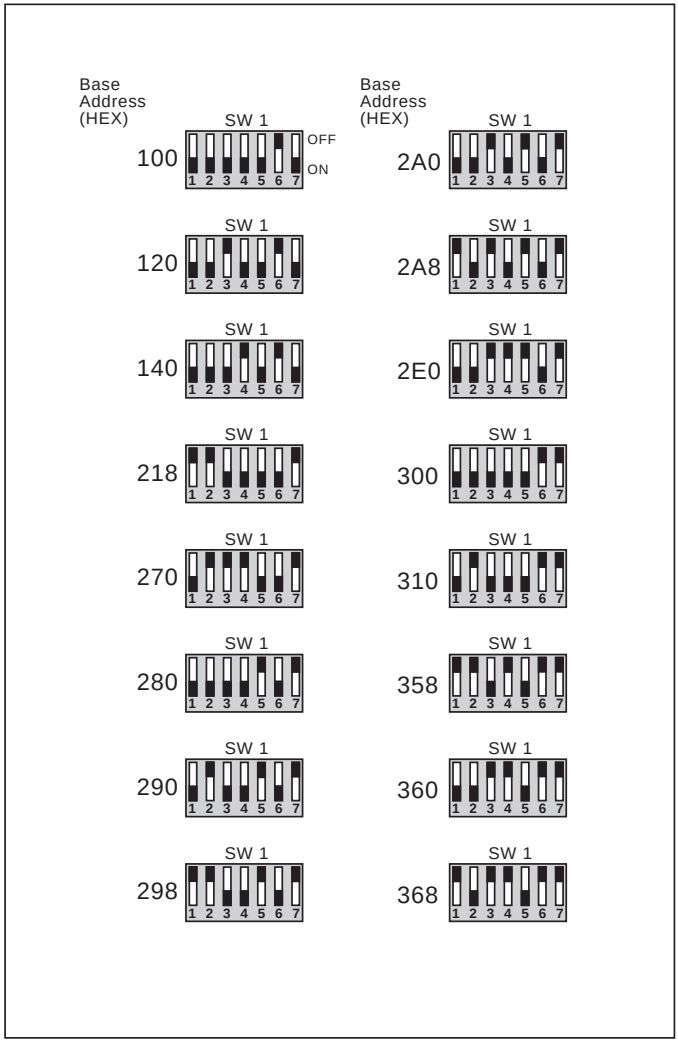


Figure 12
Setting the I/O DIP Switch

B. RangeLAN2 Utilities

The RangeLAN2 Site Survey & Configuration Tool & RL2SETUP

There are two different tools provided with the RangeLAN2 7100 card for diagnostics, configuration, and site survey purposes. The RangeLAN2 Site Survey & Configuration Tool runs in Windows 95, Windows 98, Windows 2000, and Windows NT; the RL2SETUP program runs in DOS.

The RL2SETUP program will only load if other DOS drivers are **NOT** already loaded in memory. In Windows 95/98 and Windows 2000, the RangeLAN2 Site Survey & Configuration Tool requires that the driver and RL2API protocol already be installed before it will function. In Windows NT, the tool requires that the driver be installed before it will function.

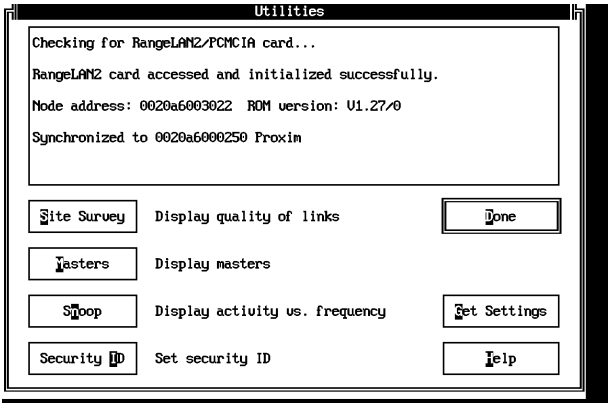
Other than these requirements, these two tools are nearly identical, although the Site Survey & Configuration Tool offers some additional features. Screen shots in this appendix are of the Windows tool but apply to the DOS tool unless otherwise noted.

Note:
The Windows Site Survey & Configuration Tool does not run in Windows 3.x.

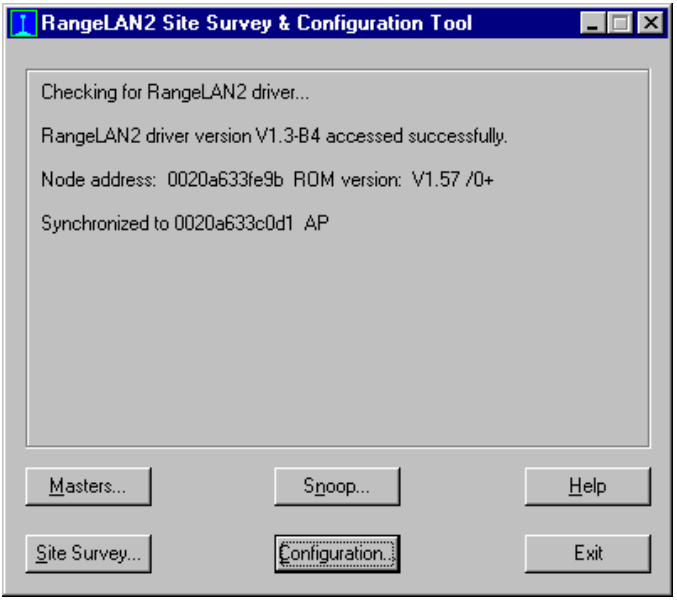
Diagnostics

To test the hardware settings of the RangeLAN2 7100 card in DOS, use the RL2SETUP program. Start the RL2SETUP program and choose the <Test / Utilities> button. If you have a hardware conflict between RangeLAN2 7100 and another card in your computer, you will see an error message. Otherwise, the

node address, ROM version, and synchronization status of the RangeLAN2 7100 card will be displayed.



When the Windows tool launches, it will indicate whether it found the driver. The node address, ROM version, and synchronization status of the RangeLAN2 7100 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 using the <Site Survey> button on the Windows tool, or the <Site Survey> button from the <Test / Utilities> box in the DOS tool. Both site survey programs show the Link Quality and Signal Strengths of the other RangeLAN2 products on the network.

Node address lists the RangeLAN2 card's node address/serial number. The Master is always listed first with its node address and Master Name (unless this unit 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.

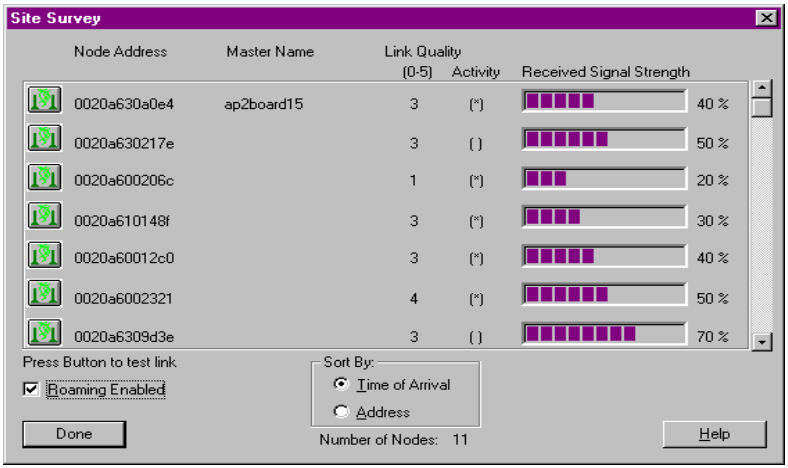
An asterisk in the Activity column indicates that the last packet sent was answered. The lack of an asterisk means that the receiving unit did not respond to the packet.

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 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 this unit.

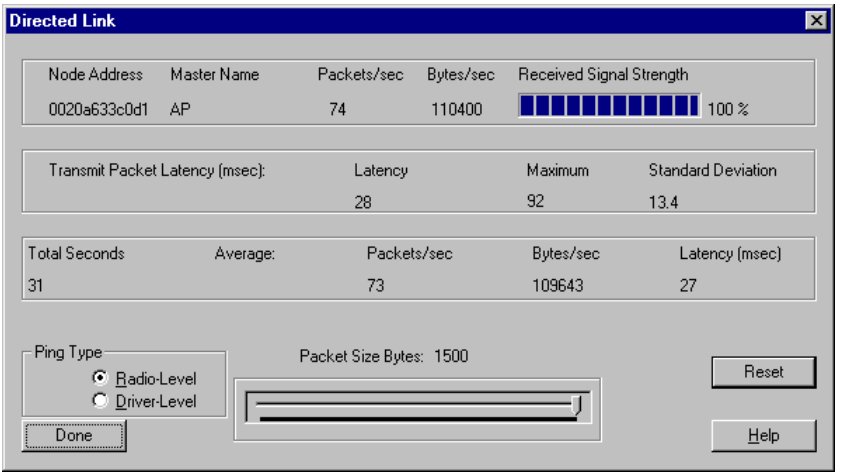
You may check the link between this machine and other displayed nodes by a click of the mouse on the icon to the left of the node address. If you choose to check the link with another unit, it may decrease the performance of that unit.



Point to Point Site Survey

An additional feature of the DOS and Windows utilities is the ability to determine the Link Quality between two specific machines. In the Windows utility, click on the icon next to the MAC address. In the DOS version, click a node address with the mouse or press the <Spacebar> when the node address is highlighted. 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 Windows Site Survey & Configuration Tool has two additional features not included in RL2SETUP: a <Reset> button and two options for Ping Type. The <Reset> button allows you to restart the directed link test without exiting 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

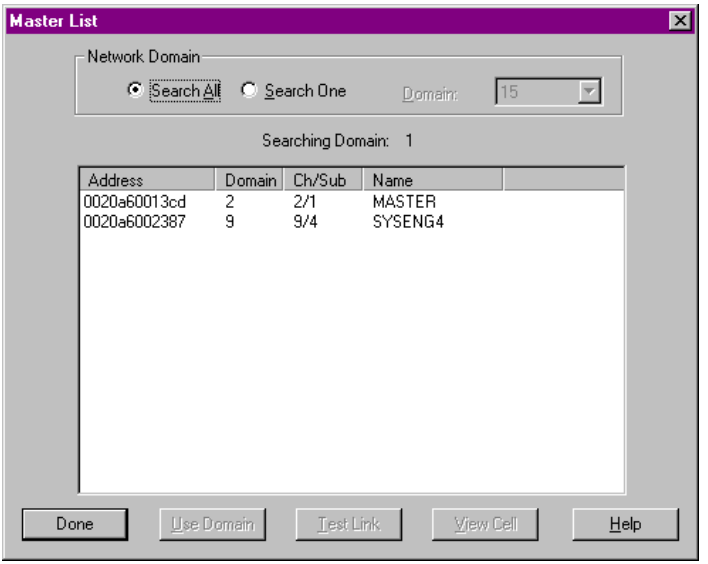
learn more about the site survey procedure, you should consider signing up for a RangeLAN2 Technical Training class in your area. Go to Proxim's web site at http://www.proxim.com/ for more information.

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 in the Windows tools, or click the <Test / Utilities> button in the RL2SETUP program in DOS. Additionally, you can survey the units that are synchronized to a particular Master by choosing that Master from the displayed list.

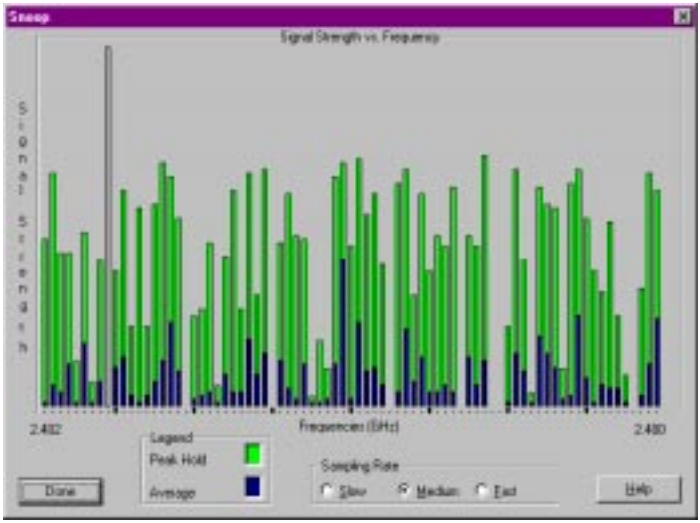


Snoop

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 in Windows, or after <Test / Utilities> from the RL2SETUP program.

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 from the <Configuration> button of the Windows tool or from the <Configure> button on the DOS tool.

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.**

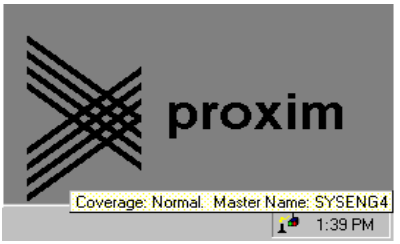
To set the RangeLAN2 Security ID, choose the <Configuration> button from the Windows tool or the <Set Security ID> button from within the <Test / Utilities> button on RL2SETUP.

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

RangeLAN2 Status Monitor

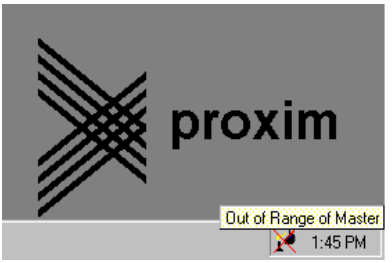
In Windows, after the Site Survey & Configuration Tool is installed, the RangeLAN2 Status Monitor will also be installed and loaded each time the operating system starts. The icon will change to indicate whether or not this node is within range of the Master.

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

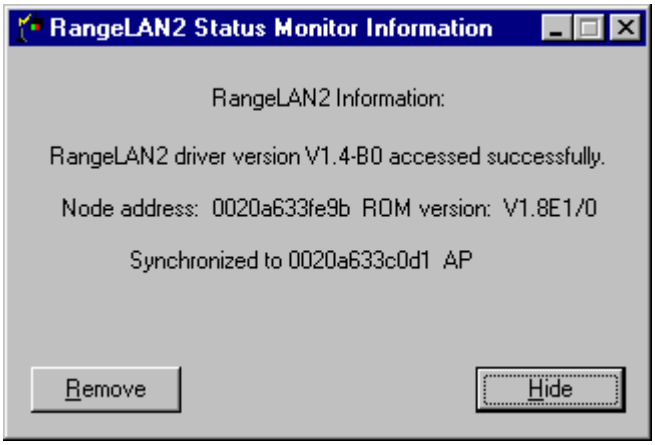


You should note that if the wireless client roams from one Master Access Point to another, this change will not be reflected in the synchronization status dialog box until the mouse cursor is moved off and then back onto the Status Monitor icon.

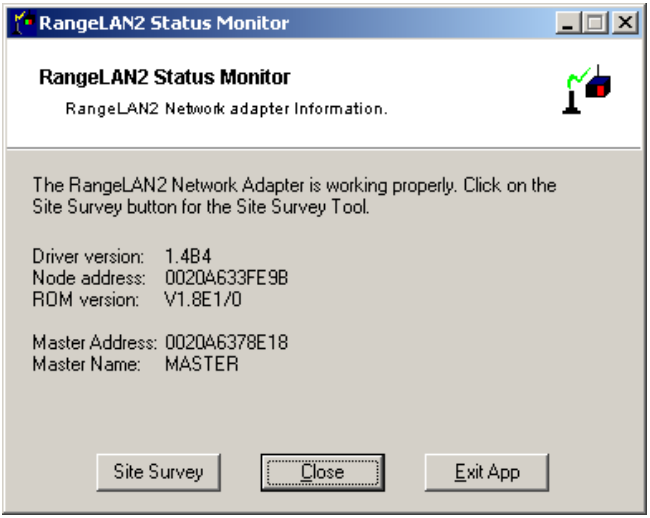
When not in range, the icon will look like this regardless of mouse activity:



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.

C. 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.

D. Parameters

Parameter Name	Range	Default
Port Address	100, 120, 140, 218, 270, 280, 290, 298, 2A0, 2A8, 2E0, 300, 310, 358, 360, 310, 358, 360, 368	270
IRQ	3, 4, 5, 7, 10, 11, 12, 15	11
Station Type	Station (0), Alternate Master (1), Master (2)	Station (0)
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 (0), Normal (1)	Normal (1)
* Roam Config	Slow (0), Normal (1), Fast (2)	Normal (1)
* Peer to Peer	Yes/No	Yes

+ Set on Master and Alternate Master only

* Set on Station and Alternate Master only

E. 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	ISA Bus (PC/XT or PC/AT)
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
Size	1/2 card for PC XT/AT bus computers (3.9” x 6.2”)
ETSI Testing	For purposes of ETS 300 328 type testing, the RangeLAN2 7100 Adapter was tested in host computers over a temperature range of +5C to +35C.

F. How to Reach Technical Support

If you're having a problem using RangeLAN2 7100 and can't resolve it with the information in Chapter 8, 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 7100 card and 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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