ENTERASYS
NETWORKS™

NetSight

Element Manager

MicroMMAC-T User's Guide

Notice

Enterasys Networks reserves the right to make changes in specifications and other information contained in this document without prior notice. The reader should in all cases consult Enterasys Networks to determine whether any such changes have been made.

The hardware, firmware, or software described in this manual is subject to change without notice.

IN NO EVENT SHALL ENTERASYS NETWORKS BE LIABLE FOR ANY INCIDENTAL, INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING BUT NOT LIMITED TO LOST PROFITS) ARISING OUT OF OR RELATED TO THIS MANUAL OR THE INFORMATION CONTAINED IN IT, EVEN IF ENTERASYS NETWORKS HAS BEEN ADVISED OF, KNOWN, OR SHOULD HAVE KNOWN, THE POSSIBILITY OF SUCH DAMAGES.

Virus Disclaimer

Enterasys has tested its software with current virus checking technologies. However, because no anti-virus system is 100% reliable, we strongly caution you to write protect and then verify that the Licensed Software, prior to installing it, is virus-free with an anti-virus system in which you have confidence.

Enterasys Networks makes no representations or warranties to the effect that the Licensed Software is virus-free.

AppleTalk, Apple, Macintosh, and TokenTalk are registered trademarks; and Apple Remote Access and EtherTalk are trademarks of Apple Computer, Inc.

SmartBoost is a trademark of American Power Conversion

ST is a registered trademark and C++ is a trademark of AT&T

Banyan and VINES are registered trademarks of Banyan Systems, Inc.

cisco, ciscoSystems, and AGS+ are registered trademarks; and cBus, cisco Router, CRM, IGS, and MGS are trademarks of cisco Systems, Inc.

GatorBox is a registered trademark; and GatorMail, GatorMIM, GatorPrint, GatorShare, GatorStar, GatorStar GX-M, and XGator are trademarks of Cayman Systems, Inc.

CompuServe is a registered trademark of CompuServe Incorporated

X Window System is a trademark of Consortium, Inc.

CTERM, DECnet, and ULTRIX are registered trademarks; and DEC, DEC C++, DECnet-DOS, DECstation, VAX DOCUMENT, VMA, and VT are trademarks of Digital Equipment Corporation

Fore Systems, ForeRunner, and ForeRunner ASX-100 are trademarks of Fore Systems, Inc.

PC/TCP is a registered trademark of FTP Software, Inc.

HP OpenView is a registered trademark of Hewlett-Packard, Inc.

AIX, IBM, OS/2, NetView, and PS/2 are registered trademarks; and AT, Micro Channel, PC, PC-DOS, PC/XT, Personal Computer AT, Operating System/2, Personal System/2, RISC System/6000, and Workplace Shell are trademarks of International Business Machines Corporation

i960 microprocessor is a registered trademark; and Intel and Multichannel are trademarks of Intel Corporation

Microsoft, MS-DOS, and Windows are registered trademarks of Microsoft Corporation

Chameleon, ChameleonNFS, Chameleon 32, IPX/link, and NEWT are trademarks of NETMANAGE, Inc.

NetWare and Novell are registered trademarks; and Internetwork Packet Exchange (IPX), IPX, and Network File System (NFS) are trademarks of Novell, Inc.

Motif and MS are registered trademarks; and Open Software Foundation, OSF, OSF/1, and OSF/Motif are trademarks of The Open Software Foundation, Inc.

Silicon Graphics and IRIS are registered trademarks; and Indigo and IRIX are trademarks of Silicon Graphics, Inc.

NFS, PC-NFS, SPARC, Sun Microsystems, and Sun Workstation are registered trademarks; and OpenWindows, SPARCstation, SPARCstation IPC, SPARCstation IPX, Sun, Sun-2, Sun-3, Sun-4, Sun386i, SunNet, SunOS, SunSPARC, and SunView are trademarks of Sun Microsystems, Inc.

OPEN LOOK and UNIX are registered trademarks of Unix System Laboratories, Inc.

Ethernet, NS, Xerox Network Systems and XNS are trademarks of Xerox Corporation

ANNEX, ANNEX-II, ANNEX-IIe, ANNEX-3, ANNEX-802.5, MICRO-ANNEX-XL, and MICRO-ANNEX-ELS are trademarks of Xylogics, Inc.

MAXserver and Xyplex are trademarks of Xyplex, Inc.

Restricted Rights Notice

(Applicable to licenses to the United States Government only.)

1. Use, duplication, or disclosure by the Government is subject to restrictions as set forth in subparagraph (c) (1) (ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013.

    Enterasys Networks, 35 Industrial Way, Rochester, New Hampshire 03867-0505.

2. (a) This computer software is submitted with restricted rights. It may not be used, reproduced, or disclosed by the Government except as provided in paragraph (b) of this Notice or as otherwise expressly stated in the contract.

    (b) This computer software may be:

        (1) Used or copied for use in or with the computer or computers for which it was acquired, including use at any Government installation to which such computer or computers may be transferred;

        (2) Used or copied for use in a backup computer if any computer for which it was acquired is inoperative;

        (3) Reproduced for safekeeping (archives) or backup purposes;

        (4) Modified, adapted, or combined with other computer software, provided that the modified, combined, or adapted portions of the derivative software incorporating restricted computer software are made subject to the same restricted rights;

        (5) Disclosed to and reproduced for use by support service contractors in accordance with subparagraphs (b) (1) through (4) of this clause, provided the Government makes such disclosure or reproduction subject to these restricted rights; and

        (6) Used or copied for use in or transferred to a replacement computer.

    (c) Notwithstanding the foregoing, if this computer software is published copyrighted computer software, it is licensed to the Government, without disclosure prohibitions, with the minimum rights set forth in paragraph (b) of this clause.

    (d) Any other rights or limitations regarding the use, duplication, or disclosure of this computer software are to be expressly stated in, or incorporated in, the contract.

    (e) This Notice shall be marked on any reproduction of this computer software, in whole or in part.

Contents

Chapter 3   Token Ring Statistics

Chapter 4   Token Ring Alarms

Chapter 5   The Station List and Station Map

Index

Introduction

How to use this guide; related guides; software conventions; getting help; MicroMMAC-T firmware versions

Welcome to the *NetSight Element Manager for the MicroMMAC-T User's Guide.* We have designed this guide to serve as a simple reference for using NetSight Element Manager for the MicroMMAC-22T/24T and MicroMMAC-42T/44T.

The **MicroMMAC-22T/24T**™ and **MicroMMAC-42T/44T**™ are intelligent Token Ring hubs that provide front panel ports for network connections, a rear-panel HubSTACK™ Interconnect Bus port for stackable connections, and a rear-panel port for one optional Bridge Router Interface Module™ (BRIM®) that provides the MicroMMAC-T™ with bridging and routing capability. All the devices fully conform to the IEEE 802.5 standards, and provide the flexibility to connect networks using a variety of media via 12 or 24 active RJ45 ports for STP or UTP lobe connections. All of the models are functionally identical; the only difference among them is the configuration of the front panel ports: the MicroMMAC-22T has 12 built-in active UTP RJ45 lobe ports; the MicroMMAC-24T has 24 built-in active UTP RJ45 lobe ports; the MicroMMAC-42T has 12 built-in active STP RJ45 lobe ports; and the MicroMMAC-44T has 24 built-in active STP RJ45 lobe ports. Using the MicroMMAC-T's external HubSTACK-IN and HubSTACK-OUT connections on the rear of the unit, you can stack as many as four of Cabletron's STH Series non-intelligent Token Ring hubs with one MicroMMAC-T, and the entire stack can be managed by the MicroMMAC-T as a single Token Ring. This configuration allows you to expand the connectivity of the MicroMMAC-T to up to 120 ports.

> **NOTE**
>
> *Since the devices covered in this **User's Guide** are functionally identical, they will be jointly referred to throughout the text as the MicroMMAC-T. Likewise, since the only differences in the windows for each device will be the device name (MicroMMAC-24T, MicroMMAC-44T, etc.) and the number of ports displayed, only the MicroMMAC-24T windows will be shown.*

NetSight Element Manager provides remote management for the MicroMMAC-T, including:

• Front panel status display with administrative state, network load, and error percentages available for each port.

• Management Station Configuration.

• Station List and Map Windows.

• Full statistics display for the hub and individual stations (with both numerical and graphical display options).

• Alarm Limits based on frame counts, frame errors, or beacon frames.

You should read this manual thoroughly to understand NetSight Element Manager for the MicroMMAC-T.

Using This Guide

Each chapter in this guide describes one major functionality or a collection of several smaller functionalities of the MicroMMAC-T device module. This guide contains information about software functions that are accessed directly from the device icon; for information about management functions that are accessed via the NetSight Element Manager platform, consult the *NetSight Element Manager User's Guide* and *NetSight Element Manager Tools Guide*.

Chapter 1, **Introduction**, provides a list of related documentation, describes certain software conventions, and shows you how to contact the Enterasys Networks Global Call Center.

Chapter 2, **The MicroMMAC-T Chassis View**, describes the visual display of the MicroMMAC-T's front panel and explains how to use the mouse within the Chassis View; the operation of several chassis-level management functions — such as changing the port status display, enabling and disabling ports, configuring the management station, and setting device date and time — is also described here.

Chapter 3, **Token Ring Statistics**, describes the Statistics, Timer Statistics, Summary Statistics, and Performance Graph selections available at the Network, Management Station, and Port levels. Each of these selections provides a slightly different view of the network information being collected by the MicroMMAC-T.

Chapter 4, **Token Ring Alarms**, provides instructions on configuring and setting ring-level alarms for network events, ring-level station alarms that apply to all stations on a ring, or station-level alarms for individual stations on a ring.

Chapter 5, **The Station List and Station Map**, describes how to use these windows to view your ring topology, either in list or graphical (map) format, and how to access statistics and set alarm limits for your ring stations.

We assume that you have a general working knowledge of Token Ring IEEE 802.5 type data communications networks and their physical layer components.

Related Manuals

The MicroMMAC-T user's guide is only part of a complete document set designed to provide comprehensive information about the features available to you through NetSight Element Manager. Other guides that include important information related to managing the MicroMMAC-T include:

Enterasys' ***NetSight Element Manager User's Guide***

Enterasys' ***NetSight Element Manager Tools Guide***

Enterasys' ***NetSight Element Manager Remote Administration Tools User's Guide***

Enterasys' ***NetSight Element Manager Remote Monitoring (RMON) Guide***

Enterasys' ***NetSight Element Manager Alarm and Event Handling User's Guide***

Enterasys' ***Network Troubleshooting Guide***

Microsoft Corporation's ***Microsoft Windows User's Guide***

For more information about the capabilities of the MicroMMAC-T, consult the appropriate hardware documentation.

Software Conventions

NetSight Element Manager's device user interface contains a number of elements that are common to most windows and that operate the same regardless of which window they appear in. A brief description of some of the most common elements appears below; note that the information provided here is not repeated in the descriptions of specific windows and/or functions.

Using the Mouse

This document assumes you are using a Windows-compatible mouse with two buttons; if you are using a three button mouse, you should ignore the operation of the middle button when following procedures in this document. Procedures within the NetSight Element Manager document set refer to these buttons as follows:

Left Mouse Button
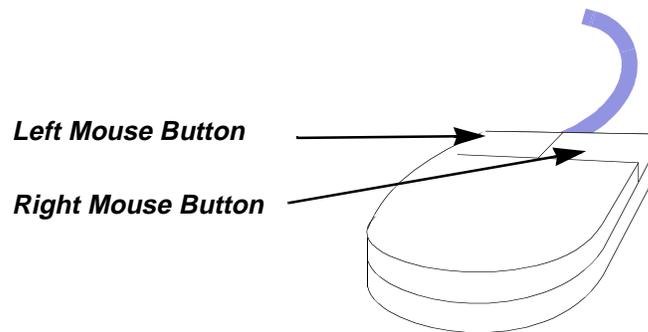
Right Mouse Button

Figure 1-1. Mouse Buttons

For many mouse operations, this document assumes that the left (primary) mouse button is to be used, and references to activating a menu or button will not include instructions about which mouse button to use.

However, in instances in which right (secondary) mouse button functionality is available, instructions will explicitly refer to **right** mouse button usage. Also, in situations where you may be switching between mouse buttons in the same area or window, instructions may also explicitly refer to both **left** and **right** mouse buttons.

Instructions to perform a mouse operation include the following terms:

• **Pointing** means to position the mouse cursor over an area without pressing either mouse button.

• **Clicking** means to position the mouse pointer over the indicated target, then press and release the appropriate mouse button. This is most commonly used to select or activate objects, such as menus or buttons.

• **Double-clicking** means to position the mouse pointer over the indicated target, then press and release the mouse button two times in rapid succession. This is commonly used to activate an object's default operation, such as opening a window from an icon. Note that there is a distinction made between "click twice" and "double-click," since "click twice" implies a slower motion.

• **Pressing** means to position the mouse pointer over the indicated target, then press and hold the mouse button until the described action is completed. It is often a pre-cursor to Drag operations.

• **Dragging** means to move the mouse pointer across the screen while holding the mouse button down. It is often used for drag-and-drop operations to copy information from one window of the screen into another, and to highlight editable text.

Using Window Buttons

The `Cancel` button that appears at the bottom of most windows allows you to exit a window and terminate any unsaved changes you have made. You may also have to use this button to close a window after you have made any necessary changes and set them by clicking on an `OK`, `Set`, or `Apply` button.

An `OK`, `Set`, or `Apply` button appears in windows that have configurable values; it allows you to confirm and SET changes you have made to those values. In some windows, you may have to use this button to confirm each individual set; in other windows, you can set several values at once and confirm the sets with one click on the button.

The `Help` button brings up a Help text box with information specific to the current window. For more information concerning Help buttons, see **Getting Help**, page 1-7.

The command buttons, for example `Bridge`, call up a menu listing the windows, screens, or commands available for that topic.

Any menu topic followed by ... (three dots) — for example **Statistics...** — calls up a window or screen associated with that topic.

Common MicroMMAC-T Window Fields

Similar descriptive information is displayed in boxes at the top of most device-specific windows in NetSight Element Manager, as illustrated in Figure 1-2.
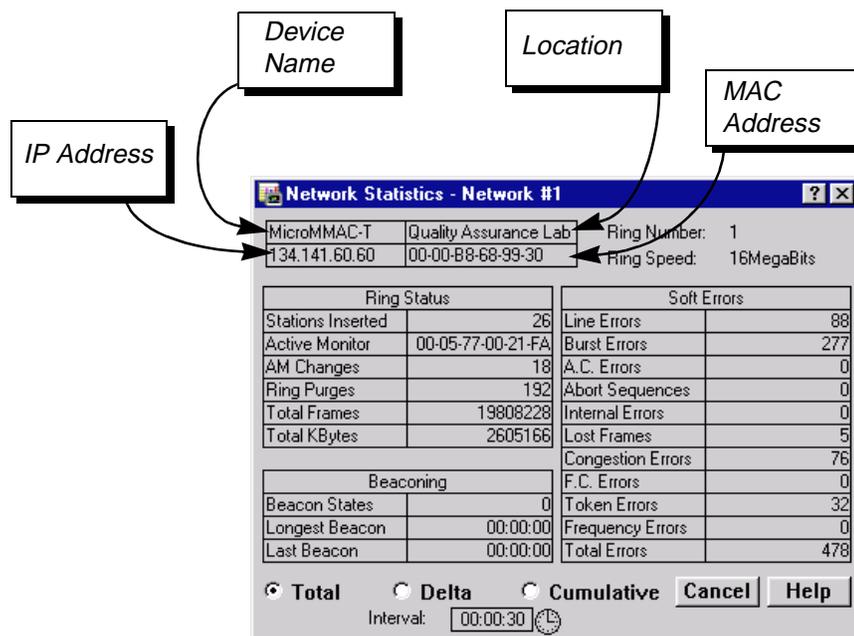
Figure 1-2. Sample Window Showing Informational Text Boxes

Device Name
Displays the user-defined name of the device. The device name can be changed via the System Group window; see the *Generic SNMP User's Guide* for details.

IP Address
Displays the device's IP (Internet Protocol) Address; this will be the IP address used to define the device icon. IP addresses are assigned via Local Management for the MicroMMAC-T; they cannot be changed via NetSight Element Manager.

Location
Displays the user-defined location of the device. The location is entered through the System Group window; see the *Generic SNMP User's Guide* for details.

MAC Address
Displays the manufacturer-set MAC address associated with the IP address used to define the MicroMMAC-T icon. This address is factory-set and cannot be altered via NetSight Element Manager. The device's MAC address may be altered using local management; if so, the locally administered MAC address will appear in this field.

Getting Help

This section describes two different methods of getting help for questions or concerns you may have while using NetSight Element Manager.

Using On-line Help

You can use the MicroMMAC-T window [Help] buttons to obtain information specific to the device. When you click on a Help button, a window will appear that contains context-sensitive on-screen documentation that will assist you in the use of the windows and their associated command and menu options. Note that if a Help button is grayed out, on-line help has not yet been implemented for the associated window.

From the **Help** menu accessed from the Chassis View window menu bar, you can access on-line Help specific to the Chassis View window, as well as bring up the Chassis Manager window for reference. Refer to **Chapter 2** for information on the Chassis View and Chassis Manager windows.

> **NOTE**
>
> *All of the NetSight Element Manager help windows use the standard Microsoft Windows help facility; if you are unfamiliar with this feature of Windows, you can select __Help__ —>__How to Use Help__ from the Program Manager window, or consult your Microsoft Windows **User's Guide**.*

Getting Help from Enterasys Global Call Center

If you need technical support related to NetSight Element Manager, contact the Enterasys Global Call Center via one of the following methods:

By phone:	(603) 332-9400 *24 hours a day, 365 days a year*
By mail:	Enterasys Networks Technical Support Rochester, NH 03866-5005
By Internet mail:	support@ctron.com
FTP:	ftp.ctron.com (134.141.197.25)
Login	anonymous
Password	your email address
By BBS:	(603) 335-3358
Modem Setting	8N1: 8 data bits, 1 stop bit, No parity

Send your questions, comments, and suggestions regarding NetSight documentation to NetSight Technical Communications via the following address:

Netsight_docs@enterasys.com

To locate product specific information, refer to the Enterasys Web site:

http://www.enterasys.com/.
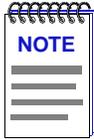
> **NOTE**
>
> *For the highest firmware versions successfully tested with NetSight Element Manager 2.2.1, refer to the Readme file from the NetSight Element Manager program group. If you have an earlier version of firmware and experience problems, contact the Global Technical Assistance Center.*

The MicroMMAC-T Chassis View

Information displayed in the Chassis View window; the Chassis Manager window; Hub management functions

The MicroMMAC-T Chassis View window is the main screen that immediately informs you of the current configuration of your MicroMMAC-T via a graphical display of the device's front panel. The Chassis View displays the condition of individual ports on the MicroMMAC-T. The Chassis View window serves as a single point of access to all other MicroMMAC-T windows and screens, which are discussed at length in this and the following chapters.

To access the MicroMMAC-T Chassis View window, use one of the following options:

1. In any map, list, or tree view, double-click on the MicroMMAC-T you wish to manage;

or

1. In any map, list, or tree view, click the **left** mouse button once to select the **MicroMMAC-T** you wish to manage.

2. Select **Manage —> Node** from the primary window menu bar, or select the Manage Node toolbar button.

or

1. In any map, list, or tree view, click the **right** mouse button once to select the **MicroMMAC-T** you wish to manage.

2. On the resulting menu, click to select **Manage**.

Viewing Chassis Information

The MicroMMAC-T Chassis View window (Figure 2-1) provides a graphic representation of the MicroMMAC-T's front panel, including a color-coded port display which immediately informs you of the current configuration and status of all station and ring ports on the device.

Click on the module number to change the Chassis View to display a different module in the MicroMMAC-T controlled stack.

The module index will change to reflect which module in the stack is currently displayed. Click here to view the menu for the displayed module.
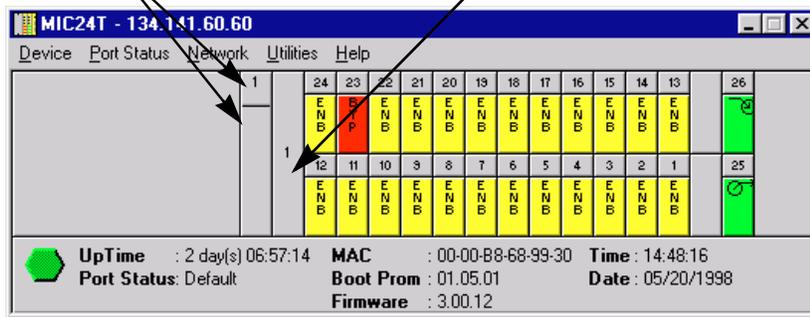
Figure 2-1. MicroMMAC-T Chassis View Window

By clicking in designated areas of the chassis graphical display (as detailed later in this chapter), or by using the menu bar at the top of the Chassis View window, you can access all of the menus that lead to more detailed device-, network-, module-, and port-level windows.

> **TIP**
>
> *When you move the mouse cursor over a management "hot spot" the cursor icon will change into a "hand" (🖑) to indicate that clicking in the current location will bring up a management option.*

Front Panel Information

The areas around the main port display provide the following device information:

IP
The IP address assigned to the MicroMMAC-T appears in the title bar of the Chassis View window; this field will display the IP address you have used to create the MicroMMAC-T icon. IP addresses are assigned via Local Management.

Connection Status
This color-coded area indicates the current state of the MicroMMAC-T in communicating with the NetSight Element Manager.

• **Green** indicates it is responding to device polls (valid connection).

• **Magenta** indicates it is in a temporary stand-by mode while it responds to a physical change in the hub; note that port menus are inactive during this stand-by state.

• **Blue** indicates an unknown contact status – polling has not yet been established with the MicroMMAC-T.

• **Red** indicates it is not responding to device polls (device is off line, or device polling has failed across the network for some other reason).

UpTime
The amount of time, in a day(s) hh:mm:ss format, that the MicroMMAC-T has been running since the last start-up.

Port Status
If management for your device supports a variable port display (detailed in **Port Status Displays**, page 2-9), this field will show the display currently in effect. If only a single port display is available, or if the default view is in effect, this field will state **Default**.

MAC
The physical layer address associated with the IP address used to define the MicroMMAC-T icon. MAC addresses are hard-coded in the device, and are not configurable via NetSight Element Manager. The device's MAC address may be altered using local management; if so, the locally administered MAC address will appear in this field.

Boot Prom
The revision of BOOT PROM installed in the MicroMMAC-T.

Firmware
The revision of device firmware stored in the MicroMMAC-T's FLASH PROMs.

Time

The current time, in a 24-hour hh:mm:ss format, set in the internal clock.

Date

The current date, in an mm/dd/yyyy format, set in the internal clock.
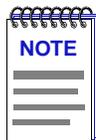
NOTE	*You can set the date and time by using the **Edit Device Date** and **Edit Device Time** options on the Device menu; see **Setting the Device Date and Time**, page 2-23 for details.*
	In accordance with Year 2000 compliance requirements, NetSight Element Manager now displays and allows you to set all date s with four-digit year values.

Menu Structure

By clicking on various areas of the MicroMMAC-T Chassis View display, you can access menus with device-, network-, module-, and port-level options, as well as utility applications that apply to the device. The following illustration displays the menu structure and indicates where to click to access the various menus.
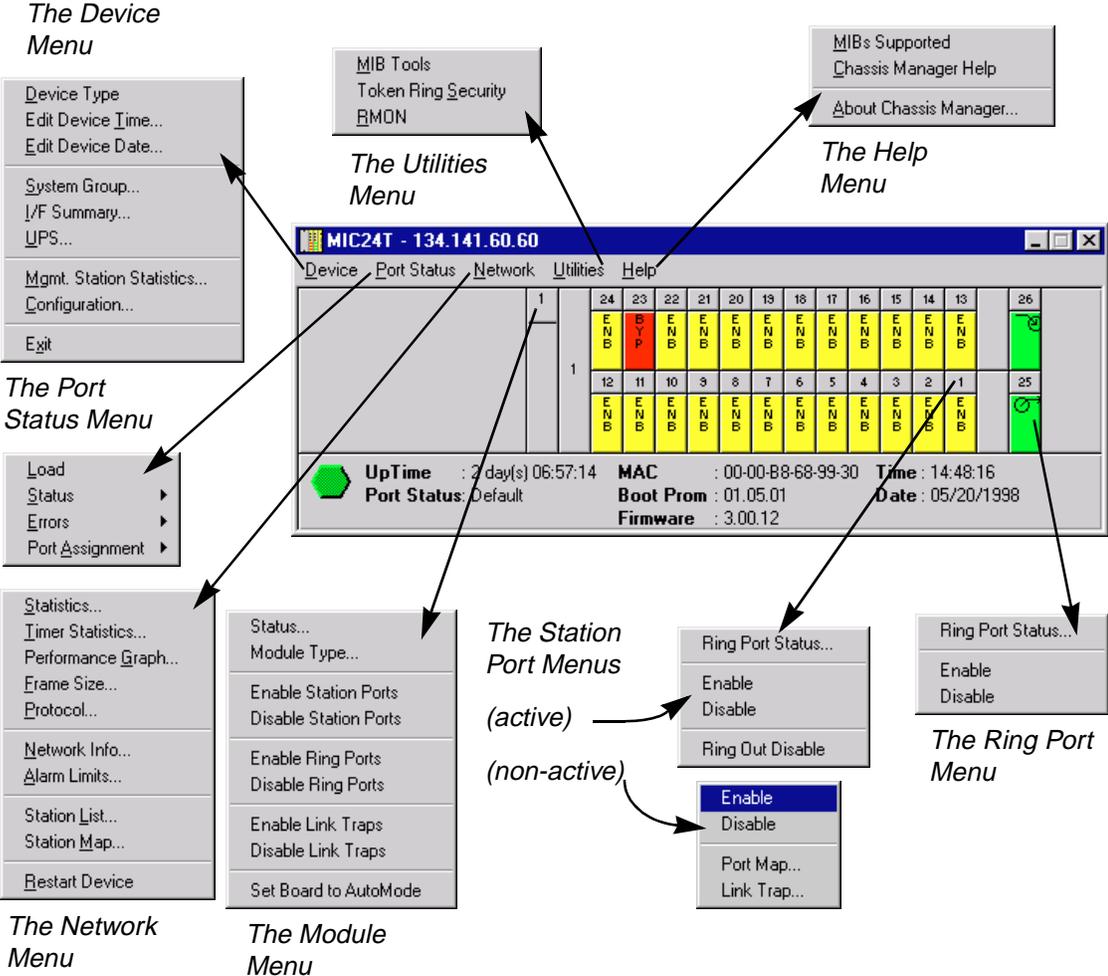
Figure 2-2. MicroMMAC-T Chassis View Menu Structure
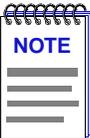
> **NOTE**
>
> *Additional menus (e.g., FDDI) and/or menu options may be available from the Chassis View if you have a BRIM installed in the MicroMMAC-T. These menu options are discussed in the **Bridge/Router Interface Module (BRIM) User's Guide** included in your documentation set.*

The Device Menu

From the **Device** Menu at the Chassis View window menu bar, you can access the following selections:

• **Device Type...**, which displays a window containing a description of the device being modeled; see **Viewing Hardware Types**, page 2-12, for details.

- **Edit Device Time...** and **Edit Device Date...**, which allow you to set the MicroMMAC-T's internal clock. See **Setting the Device Date and Time**, page 2-23, for details

- **System Group...**, which allows you to manage the MicroMMAC-T via SNMP MIB II. Refer to the *Generic SNMP User's Guide* for further information.

- **I/F Summary**, which lets you view statistics for the traffic processed by each SNMP MIB II interface on your device. See **Viewing I/F Summary Information**, page 2-32, for details.

- **UPS...**, which brings up a window that allows you to configure an Uninterruptable Power Supply attached to your MicroMMAC-T; see **Using an Uninterruptable Power Supply (UPS)**, page 2-24, for details.

- **Mgmt. Station Statistics...**, allows you to view network statistics for the MicroMMAC-T's on board ring management station. See Chapter 3, **Token Ring Statistics**, for details.

- **Configuration...**, allows you to configure the ring management station, including setting a device name and location, setting the error report timer delay, enabling or disabling the automatic beacon recovery process (ABRP), and inhibiting the active monitor. You can set up a ring management station configuration for each MicroMMAC-T-managed ring network. See **Management Station Configuration**, page 2-14, for details.

- **Exit**, which closes the MicroMMAC-T Chassis View window.

The Port Status Menu

The **Port Status** menu allows you to select the status information that will be displayed in the port text boxes in the logical Chassis View window:

- **Load** will display the portion of network load processed by each port as a percentage of the theoretical maximum load (4 or 16 Mbits/sec) of a Token Ring network.

- **Status** allows you to select one of two status type displays: Admin/Link or Admin.

- **Errors** allows you to display the percentage per port of the specific Error you select.

- **Port Assignment** displays either the current FNB connection status or the Network association of each port.

For more information on the port display options available via this menu, see **Selecting a Port Status View**, page 2-9.

The Network Menu

The first level of this menu lists the active ring network (**Network 1**) that is managed by the device; clicking on the **Network 1** selection brings up a menu with the following selections:

- **Statistics...**, which brings up the network-level Statistics windows; see Chapter 3, **Token Ring Statistics**, for more information.

- **Timer Statistics...**, which opens the network-level Timer Statistics windows; see **Chapter 3** for more information.

- **Performance Graph...**, which opens the Performance Graph windows; see **Chapter 3**.

- **Frame Size...**, which allows you to see the actual sizes of the frames on the ring network controlled by your MicroMMAC-T; see **Chapter 3**.

- **Protocol...**, which allows you to see how many frames received by the MicroMMAC-T are of a given protocol; see **Chapter 3**.

- **Network Info...**, which allows you to view status and configuration information for each ring in your MicroMMAC-T-controlled MMAC; see **Viewing Network Information**, page 2-18, for details.

- **Alarm Limits...**, which launches the network-level alarms window; see Chapter 4, **Token Ring Alarms**, for alarm configuration information.

- **Station List...**, which allows you to view and configure the stations on the currently monitored ring network; see Chapter 5, **The Station List and Station Map**, for details.

- **Station Map...**, which graphically illustrates the ring configuration in downstream neighbor order from the currently monitored MicroMMAC-T, and provides address information for individual stations inserted into the ring; see **Chapter 5**.

- **Restart Device**, which allows you to perform a software reset for the MicroMMAC-T; see **Resetting the Device**, page 2-27, for details.

The Utilities Menu

From the **Utilities** menu you can select the MIBTree utility (providing direct access to the MicroMMAC-T's MIB information), Token Ring Security, which allows you to configure security for Cabletron Systems new Dot 5 Token Ring devices (like the MicroMMAC-T), and the RMON utility, a remote monitoring feature that is supported by many of Cabletron Systems' intelligent devices. These selections are also available from the **Utilities** menu at the top of the NetSight Element Manager map window. Refer to your *Tools Guide*, included in this package, for a thorough explanation of the MIBTree, Token Ring Security, and RMON utilities.

The Help Menu

The **Help** Menu has three selections:

- **MIBS Supported**, which brings up the Chassis Manager window. See **The Chassis Manager Window**, page 2-12.

- **Chassis Manager Help**, which brings up a help window with information specifically related to using the Chassis Manager and Chassis View windows.

- **About Chassis Manager...**, which displays version information for the Chassis Manager application in use.

The Module Menus

Module menus for each module in the MicroMMAC-T controlled stack displayed in the Chassis View window provide the following selections:

- **Status...**, which updates you on the condition of a selected module. See **Viewing Module Status**, page 2-20, for details.

- **Module Type...**, which brings up a window containing a description of the selected module; see **Viewing Hardware Types**, page 2-12.

- **Enable/Disable Station Ports**, which allow you to enable or disable all station ports on the selected module; see **Enabling and Disabling Ports**, page 2-31.

- **Enable/Disable Ring Ports**, which allow you to enable or disable all ring ports on the selected module. These selections will only appear in the Module menu for modules which have ring-in/out ports. See **Enabling and Disabling Ports**, page 2-31, for details.

- **Enable/Disable Link Traps**, which allow you to enable or disable link traps for all ports on the selected board. See **Enabling and Disabling Link Traps**, page 2-29.

- **Set Board to Automode**, which allows you to quickly configure a module in the MicroMMAC-T controlled stack to operate according to its default settings. See **Setting Token Ring Boards to Automode**, page 2-30, for details.

The Port Menus

The Port menu selections vary according to the port's status. The menu for station ports with an inserted station includes the following selections:

- **Statistics...**, which brings up the Station Statistics window showing performance and error statistics for the selected port. See Chapter 3, **Token Ring Statistics**, for details.

- **Timer Statistics...**, which invokes the Station Timer Statistics window. See **Chapter 3** for details.

- **Alarm Limits...**, which launches the station-level alarms window; see Chapter 4, **Token Ring Alarms**, for alarm configuration information.

- **Performance Graph...**, which brings up the Station Port Performance Graph. See **Chapter 3** for details.

All Station Port menus, regardless of port status, contain the following selections:

- **Enable/Disable**, which allow you to administratively enable or disable the selected port. See **Enabling and Disabling Ports**,page 2-31, for details.

- **Port Map...**, which allows you to enable or disable port mapping for the selected port. See **Enabling and Disabling Port Mapping**, page 2-28, for details.

- **Link Trap...**, which allows you to enable or disable link traps for the selected port. See **Enabling and Disabling Link Traps**, page 2-29.

- **Ring Out Enable/Disable**, which allow you to switch the function of a station port to that of a ring-out port. See **Ring Out Enable/Disable**,page 2-32, for details.

The Ring Port Menus
Clicking on a ring port (   ) on a module will display the ring port menu, which allows you to view the status of the selected ring port, as well as enable or disable the port. The ring port menu offers the following selections:

- **Ring Port Status...**, which invokes the Ring Port Status window. See **Viewing Ring Port Status**,page 2-21, for details.

- **Enable/Disable**, which allow you to administratively enable or disable the selected ring port. See **Enabling and Disabling Ports**,page 2-31, for details.
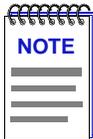
> **NOTE**
>
> *Additional menus (e.g., FDDI) and/or menu options may be available from the Chassis View if you have a BRIM installed in the MicroMMAC-T. These menu options are discussed in the **Bridge/Router Interface Module (BRIM) User's Guide** included in your documentation set.*

Port Status Displays

When you open the Chassis View window, each port on the MicroMMAC-T will display its Admin/Link status (defined below); to change this status display, select one of the options on the Port Status menu, as described in the following sections.

Selecting a Port Status View

To change the status view of your ports:

1. Click on **Port Status** on the menu bar at the top of the Chassis View window; the Port Status menu will appear.

2. Drag down (and to the right, if necessary) to select the status information you want to display. The port text boxes will display the appropriate status information.

Port status view options are:

Load
If you choose **Load**, the port text boxes will display the percentage of network load processed by each port during the last polling interval. This percentage reflects the network load generated by devices connected to the port compared to the theoretical maximum load (4 or 16 Mbits/sec) of a Token Ring network.

Status
You can view two **Status** categories for your ports which reflect six possible Admin/Link or Admin status conditions:

• **Admin/Link** — ENB (enabled), BYP (bypassed), LNK (linked), or INS (inserted)

• **Admin** — ON or OFF

If you have selected the **Admin/Link** status mode, a port is considered:

• ENB (enabled) if the port has been enabled by management, but there is no station linked to that port.

• BYP (bypassed) if the port has been disabled by management, and there is no station linked to that port.

• LNK (linked) when the port has been disabled by management, and there is a station linked to that port.

• INS (inserted) when the port has been enabled by management, and there is a station linked to that port.

If you have selected the **Admin** status mode, a port is considered:

• ON if the port is enabled.

• OFF if the port has been disabled by management.

Errors
If you choose the **Errors** mode, an additional menu offers the following options:

Errors	Total Soft Errors, Line, Burst, AC, Abort Sequences, Internal, Lost Frames, Congestion, FC, Token, or Frequency

The port status boxes will display the percentage for each active port that represents what portion of that port's total traffic is of the specific error type that you selected. See Chapter 3, **Token Ring Statistics**, for complete descriptions of these error types.

Select one of the **Errors** options to see what percentage of the total frames received by each active port during the last polling interval was of the error type you selected. This percentage reflects the number of errors generated by devices connected to that port in relation to the total number of frames processed by the port (errors ÷ [errors + frames]).

> **NOTE**
>
> *In NetSight Element Manager, the polling interval is set via the **Tools—>Options** window available from the primary window menu bar.*
>
> *Refer to the **NetSight Element Manager User's Guide** for full information on setting device polling intervals.*

Port Assignment

You can view two **Port <u>A</u>ssignment** categories for your ports:

- If you select **<u>F</u>NB View**, the port text boxes will display their current FNB connection status. For single-ring devices like the MicroMMAC-T, the only possible status condition is FNB 1.

- If you select **<u>R</u>ing View**, the port text boxes will display their current network association status. The status conditions are: R1 (ring 1) and ORPH (orphan).

Ring Port Status

For the Ring-In/Out ports, two status conditions are possible:

- **Active** ( ), when the port is active and passing data.

- **Wrapped** ( ), when there has been a termination of data communications at the port, and data has been rerouted to the backup path.

Port Status Color Codes

The port display options incorporate the following color-coding scheme:

- For the **<u>S</u>tatus** display options (Admin/Link or Admin) - green = INS/ON, yellow = ENB, red = BYP/LNK/OFF, and blue = N/A (not available).

- For the **Port <u>A</u>ssignment** display options - magenta = FNB/R 1, and gray = ORPH.

For the **<u>E</u>rrors** Port Status selection, color codes will continue to reflect the most recently selected mode which incorporates its own color coding scheme.

The Chassis Manager Window

Like most networking devices, Cabletron's devices draw their functionality from a collection of proprietary MIBs and IETF RFCs. In addition, Cabletron's newer intelligent devices – like the MicroMMAC-T – organize their MIB data into a series of "components." A MIB component is a logical grouping of MIB data, and each group controls a defined set of objects. For example, MicroMMAC-T chassis information is organized into its own component; network information resides in another component. Note, too, that there is no one-to-one correspondence between MIBs and MIB components; a single MIB component might contain objects from several different proprietary MIBs and RFCs.

The Chassis Manager window, Figure 2-3, is a read-only window that displays the MIBs and the MIB components — and, therefore, the functionality — supported by the currently monitored device.

To view the Chassis Manager window:

1. Click on **Help** on the menu bar at the top of the Chassis View window**.**

2. Click on **MIBs Supported**.

MIB Components are listed here; remember, there's no one-to-one correspondence between MIBs and MIB Components

The MIBs which provide the MicroMMAC-T's functionality — both proprietary MIBs and IETF RFCs — are listed here
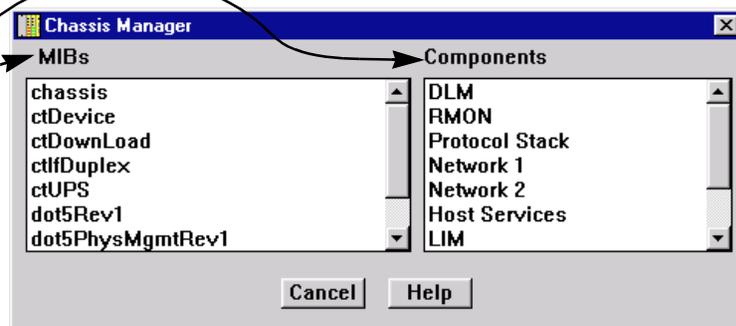
Figure 2-3. Sample Chassis Manager Window

Viewing Hardware Types

In addition to the graphical displays described above, a menu option available at the device-level provides specific information about the physical characteristics of the MicroMMAC-T module.

Device Type

Choosing the **Device Type...** option from the **Device** menu brings up a window that describes the management device being modeled:

Figure 2-4. Sample Device Type Window

Module Type

By selecting the Module Type option from the Module menu on the MicroMMAC-T Chassis View window, you can view a description of the module types in your MicroMMAC-T-controlled HubSTACK.

To view a module type:

1. Click on the **Module** index of the desired module in the HubSTACK. The Module menu will appear.

2. Drag down to **Module Type...**. A Module Type text box, similar to the example shown in Figure 2-5, will appear describing the module type. If Module Type is not supported by the selected module, "Unknown" will appear in the text box.

Figure 2-5. Sample Module Type Text Box

Managing the Hub

In addition to the performance and configuration information described in the preceding sections, the Chassis View also provides you with the tools you need to configure your hub and keep it operating properly. Hub management functions include configuring the management station, viewing network information, viewing ring port status, setting device date and time, resetting the device, enabling and disabling port mapping and link traps, and enabling and disabling station ports.

Management Station Configuration

Selecting **<u>Configuration</u>...** from the **<u>Device</u>** menu will invoke the TR Management Station Configuration window, where you can configure the module's onboard management station.

Accessing the TR Management Station Configuration Window

To access the TR Management Station Configuration window from the Chassis View window.

1. Click on the **<u>Device</u>** menu selection on the menu bar at the top of the chassis manager window**.** The Device menu will appear.

2. Click to highlight the **<u>Configuration</u>...** selection. The TR Management Station Configuration window will appear.

The TR Management Station Configuration window (Figure 2-6) allows you to specify the ring functions that the on-board MicroMMAC-T management station will perform for its associated ring: it allows you to enable or disable automated beacon recovery, and allows you to inhibit the station's ability to become the active monitor. You can also specify the management station name and physical drop number (location), and the delay time between the recording and the reporting of an error.

The upper left corner of the window contains the MicroMMAC-T name, location, Physical (MAC) and IP addresses, and uptime.
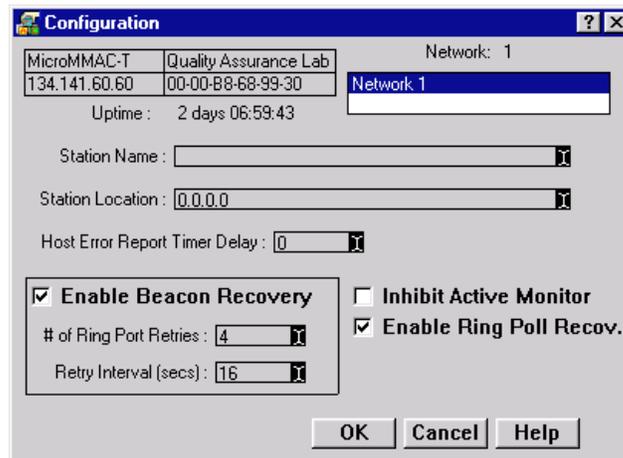
Figure 2-6. The TR Management Station Configuration Window

Setting Station Name and Location

The Station Name text box allows you to assign a name to your ring management station. To set the management station name:

1. In the Network list in the upper right corner of the window, double-click on the **Network 1** selection.

2. Click on the I-bar cursor in the **Station Name** text box; the Station Name Configuration window, Figure 2-7,will appear.

Figure 2-7. Station Name Configuration Window

3. Type in the desired management station name.

4. Click on **OK**. The name will change in the text box, and then at the MicroMMAC-T management station itself. Click on **Cancel** to close the window.

The Station Location text box allows you to assign the management station's physical drop identifier. The station's physical drop is an administratively assigned numeric string that you can use to identify a station's physical location. If assigned, the drop will appear as a subvector in certain Token Ring MAC frames (such as a new active monitor frame, report error frames, or the report station address frame used in the neighbor notification process); it will also be reported in the RMON Token Ring Station Configuration window (see the *User's Guide* for details). A physical drop is a four-byte value expressed dotted decimal notation, much like an IP address; each byte of the value can be any number from 0 to 255.

To alter the device location (physical drop identifier):

1. In the Network list in the upper right corner of the window, double-click on the **Network 1** selection.

2. Click on the I-bar cursor in the **Station Location** text box; the Station Location Configuration window, Figure 2-8, will appear.

Figure 2-8. Station Location Configuration Window

3. Type in the desired management station location, being sure to use the appropriate dotted decimal format.
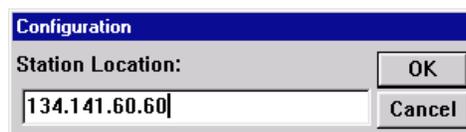
4. Click on **OK**. The location will change in the text box, and then at the MicroMMAC-T management station itself. Click on **Cancel** to close the window.

Specifying Ring Management Functions

You can use the Host Error Report Timer Delay, Inhibit Active Monitor, and Enable Beacon Recovery fields to control the way that the MicroMMAC-T's management station will handle certain ring management functions:

Host Error Report Timer Delay
The Error Report Timer Delay determines the delay time between the time an error is detected and recorded and the time it is reported.

Inhibit Active Monitor
You can remove the MicroMMAC-T's management station from active monitor contention by activating the **Inhibit Active Monitor** field. Checking this box will remove the management station from active monitor contention, which occurs as part of the recovery procedures initiated after certain ring error situations. If you inhibit the active monitor function for a management station which is currently serving as the active monitor, that station will continue as active monitor until the next contention.

Enable Beacon Recovery
If the Automatic Beacon Recovery Process (ABRP) option is enabled, the selected management station will automatically attempt to repair its ring when it detects an unusually high concentration of hard errors that have not been corrected by normal ring recovery procedures. ABRP is a sequential process that is designed to isolate the source of the errors as quickly as possible.

If a frequent occurrence of hard errors is detected, the management station first determines if the problem is internal or external to the hub by turning each ring port off to see if the error condition clears. If the beaconing goes away (because it is external to the hub), the MicroMMAC-T enables the Ring In/Out ports at the interval specified in the **Retry Interval** field for the number of times specified in the **# of Ring Port Retries** field to see if the beacon condition on the network has cleared. If the beaconing continues after the specified number of retries, the faulty Ring In/Out ports remain disabled.

If the beaconing continues when the Ring In/Out ports are shut off, then the problem is internal to the hub. The MicroMMAC-T individually bypasses each module to isolate the one with the fault (as evidenced by ring recovery on bypass). When the module with the fault is identified, the module is reinserted, and that module's ports are turned off one by one until the ring recovers again. The last port turned off is considered the failing port. Once the failing port is

identified, all ports which were previously turned off are turned back on. The failing port will be retried once at a pre-determined interval; if beaconing continues, the port will remain disabled.

Once ABRP is completed, the MicroMMAC-T generates traps to the remote management workstation which will pinpoint the problem's cause, including:

- the beaconing adapter's address
- its NAUN address
- beacon type
- port(s) and/or module(s) bypassed
- duration that the ring beaconed

You must then enable the faulty module or port before it can be used again. This prevents a user from rebooting a problem station which may bring the ring down.

To configure the beacon recovery and active monitor settings:

1. In the Network list in the upper right corner of the window, double-click on the **Network 1** selection.

2. Click the mouse on the checkbox associated with the desired function. An **X** in the checkbox means that the selected function is activated.

3. If you are activating beacon recovery, be sure to configure the **# of Ring Port Retries** and the **Retry Interval** (in seconds) by clicking on the appropriate I-bar cursor and entering the desired value in the resulting window. Allowable values for **# of Ring Port Retries** are 0 - 100 and 999, where 0 will disable retries, 1-100 will set the number of retries, and 999 will retry the port indefinitely.

4. Click on **OK**.

To change the host error report timer delay:

1. In the Network list in the upper right corner of the window, double-click on the **Network 1** selection.

2. Click on the I-bar cursor in the **Host Error Report Timer Delay** text box.

3. In the resulting window, type in the desired delay time between the recording and the reporting of an error.

4. Click on **OK**.

Enable Ring Poll Recovery
The **Ring Poll Recovery** option allows you to control the way each of the MicroMMAC-T management stations will respond when one or more stations stop participating in the ring polling process, which can prevent certain stations from inserting into the ring. When this option is enabled, the MicroMMAC-T will detect ring poll failures and remove the offending stations from the ring. Ring poll failure detection is based on the Neighbor Notification MAC frame (NNI) transmitted by the Active Monitor. Upon receipt of four consecutive NNI frames, the MicroMMAC-T will compare the information in the NNI frame with the ring's

station list, and transmit a Remove Ring Station MAC frame to the offending station. This option is enabled by default.
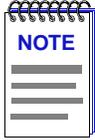
> **NOTE**
>
> *This feature is available for devices running firmware versions 3.00.09 and later only.*

Viewing Network Information

At the Network Information window (Figure 2-9), you can view status and configuration information for each ring in your MicroMMAC-T-controlled hub. You can identify each ring by name using the Network Name field.

To access the Network Information window:

1. At the MicroMMAC-T Chassis View window, click on the **Network** menu selection, then on the **Network 1** entry to display the Network menu selections.

2. Click on **Network Info...**. The Network Information window will appear.

Selecting the Ring

If there is more than one ring network residing in your hub, you can view information for each ring by using the **Previous** and **Next** buttons. By default, the rings are identified only by an index number: Ring 1 is the MicroMMAC-T-managed ring; any additional rings are indexed in ascending order.

The field to the left of the **Previous** and **Next** buttons displays the selected ring in terms of total rings currently supported on the hub, in X (current ring) of X (configured rings) format.

To view the next ring in sequence, click on the **Next** button. When you have reached the last available ring, the Next button will be grayed out to indicate that no more rings are available.

To return to a prior ring, click on the **Previous** button. The Previous button will be grayed out when you reach the first ring detected by the MicroMMAC-T.
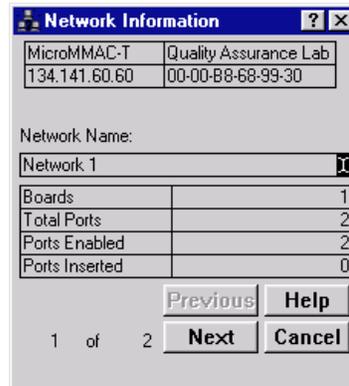
Figure 2-9.   The Network Information Window

Network Information Window Fields

Network Name
This field allows you to assign a name to the selected ring network; to do so, simply click on the I-bar cursor, and enter the desired name in the resulting window.

Boards
This field indicates the number of modules that compose the selected ring network.

Total Ports
This field indicates the number of available ports (including ring ports and station ports) on the modules composing the currently selected ring network; note that this count includes *only* those inserted stations physically present in the same hub as the MicroMMAC-T, and *only* those which are part of the MicroMMAC-T's management domain.

Ports Enabled
This field indicates the number of ports in the current ring network that are enabled by network management; note that this count includes *only* those inserted stations physically present in the same hub as the MicroMMAC-T, and *only* those which are part of the MicroMMAC-T's management domain.

Ports Inserted
This field indicates the number of ports in the current ring network that are inserted and enabled by management; note that this count includes *only* those inserted stations physically present in the same hub as the MicroMMAC-T, and *only* those which are part of the MicroMMAC-T's management domain.
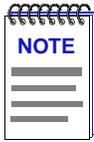
> **NOTE**
> *For a complete count on the total number of ports and the number of ports enabled and inserted — including those not physically residing in the hub — see **Network Statistics** in Chapter 3.*

X (Ring) of X (Configured Rings)
This field indicates the currently selected ring and the number of configured rings in the hub.

Viewing Module Status

The Token Ring Board Status window (Figure 2-10) updates you on the condition of a selected module in the HubSTACK. To access the Token Ring Board Status window:

1. Click on the **Module Index** for the desired module. The Module menu will appear.

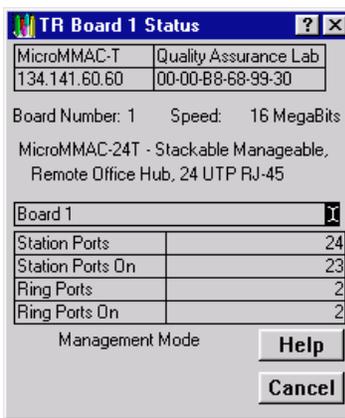2. Drag down to **Status...**. The Token Ring Board Status window will appear.

Figure 2-10. The Token Ring Board Status Window

Token Ring Board Status Window Fields

Board Number
The HubSTACK Interconnect Bus port number on the MicroMMAC-T occupied by the currently selected module.

Speed
The ring speed (4 or 16 MBits/sec) for which the module is configured.

Board Name
Displays the name assigned to the selected module; you can edit this name by clicking on the I-bar cursor and entering a new name in the resulting window.

Station Ports
The number of station port connectors present on the selected module.

Station Ports On
The number of station ports on the module which are currently enabled by management. Note that this count does not necessarily indicate the number of stations that are actually connected and active.

Ring Ports
The number of Ring-in and Ring-out ports on the selected module. Note that this will include any station ports that have been converted to ring-out ports.

Ring Ports On
The number of Ring-in and Ring-out ports that are currently enabled by management. Note that this count does not necessarily indicate the number of ring ports that are actually connected (not wrapped) and active.

Management Mode/AutoMode
This field indicates whether the module is in Management Mode (hardware defaults have been altered through NetSight Element Manager), or is in AutoMode (set to operate according to hardware defaults). See **Setting Token Ring Boards to Automode**, page 2-30, for more information.

Ring Speed Fault
If the selected module is responsible for a ring speed fault – either because of its own speed setting or the speed setting of a module connected through its ring in/ring out ports – an error message will appear at the bottom of the board status window. This is the only ring error that will be displayed here.

Viewing Ring Port Status

The Ring Port Status window (Figure 2-11) updates you on the configuration and wire fault status of the selected ring port, and allows you to configure the media type and phantom current settings on modules which support those features.

Accessing the Ring Port Status window

To access the Ring Port Status window:

1. Click on a ring port (   ). The Ring Port pull-down menu will appear.

2. Click on **Ring Port Status...**. The Ring Port Status window will appear. The following section describes the window.
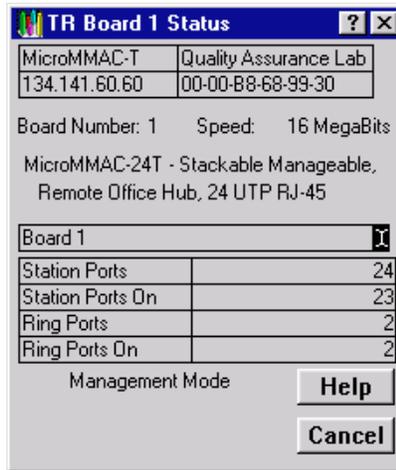
Figure 2-11. The Ring Port Status Window

Ring Port Status Window Fields

The window contains the following fields:

Board Number
The HubSTACK Interconnect Bus port number on the MicroMMAC-T occupied by the module containing the selected ring port.

Port
Displays the port index number and type (Ring In/Ring Out) of the selected ring port.

Last Wire Fault
This field displays either the last date and time the MicroMMAC-T was reset, or the date and time that a wire fault on the selected port last occurred.

Media Type
This field allows you to select the media type of the ring port. This field does not apply to the MicroMMAC-T, and is therefore grayed-out.

Phantom Current
This field allows you to activate or deactivate phantom current for the selected ring port. Devices that support this feature — called the autowrap feature — use a phantom current to act as a carrier sense between two connected ring ports. If the carrier sense is broken (i.e., the wire is broken) the phantom current is lost and the ports automatically wrap to maintain the continuity of the ring.

If you are attaching a ring port on a module that supports autowrap to a ring port on an older device that does not (or to a third party device that supports its own proprietary autowrap feature), you must disable the phantom current on the module that supports autowrap for the connection to be valid. Remember though, once you have disabled the phantom current, the autowrap feature will not be supported; if the cable connecting those two ports breaks, the entire ring will go down— and stay down — until the broken cable is identified and either repaired or disconnected from both ring ports.

If you are attaching a device that does not support autowrap (e.g., an older TRMIM-10R or 20R or a TRC800 passive concentrator) to a module that supports autowrap, you must disable the phantom current to the module that supports autowrap for the connection to be valid. Remember though, once you have disabled the phantom current, the autowrap feature will not be supported if the ring breaks.

Using the Media Type and Phantom Current Radio Buttons

To select the appropriate media type (fiber optic or shielded twisted pair) or activate or deactivate the phantom current.

1. Click on the appropriate selection.

2. Click on **OK**.

Setting the Device Date and Time

The **Device** menu allows you to change the date and time stored in the device's internal clock by selecting the **Edit Device Time** and **Edit Device Date** options from the menu.

To edit the device time:

1. Click on **Device** on the Chassis View window menu bar to access the Device menu; drag down to **Edit Device Time...**, and release.

2. The Device Time change window, Figure 2-12, will appear.
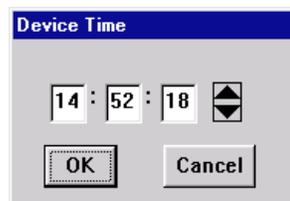

Figure 2-12. Device Time Change Window

3. Enter the new time in a 24-hour hh:mm:ss format by highlighting the field you wish to change and using the up and down arrow buttons to change the time.

4. Click on **OK** to save your changes, or on **Cancel** to cancel.

To edit the device date:

1. Click on **Device** on the Chassis View window menu bar to access the Device menu; drag down to **Edit Device Date...**, and release.

2. The Device Date change window, Figure 2-13, will appear.

Figure 2-13. Device Date Change Window

3. Enter the new date in a mm/dd/yyyy format by highlighting the field you wish to change and using the up and down arrow buttons to change the date.

4. Click on **OK** to save your changes, or on **Cancel** to cancel.

NOTE

In accordance with Year 2000 compliance requirements, NetSight Element Manager now displays and allows you to set all dates with four-digit year values..

Using an Uninterruptable Power Supply (UPS)

Your MicroMMAC-T supports the use of a UPS (uninterruptable power supply) through the COM 1 port. (For more information on the use of a UPS with the MicroMMAC-T, consult the MicroMMAC-T Installation Manual that was included when you purchased the unit.) You can view or change the status of the UPS connected to your MicroMMAC-T at the UPS window.

Please note that the UPS window will only be active if you currently have a UPS attached to your MicroMMAC-T through the appropriate port, and you have correctly set the **SET UPS ID** field.

WARNING

*Do not set the **SET UPS ID** field unless you have a UPS attached to the MicroMMAC-T, or you will disrupt your use of NetSight Element Manager.*

Accessing the UPS Window

At the UPS window, you can configure the UPS ID model type for the uninterruptable power supply you have attached to the appropriate port on your MicroMMAC-T.

You can also view information concerning the UPS connected to your MicroMMAC-T including:

• The amount of time that your UPS has been running since the last start-up

• The line voltage and battery output

• The actual battery capacity of the UPS (dynamic bar graph)

You can also use a button at the bottom of the window to disconnect your UPS, or you can use the Test option to initiate a self test of the unit.

To access the UPS window:

1. From the MicroMMAC-T Chassis View window, click on **Device** in the menu bar to access the Device menu.

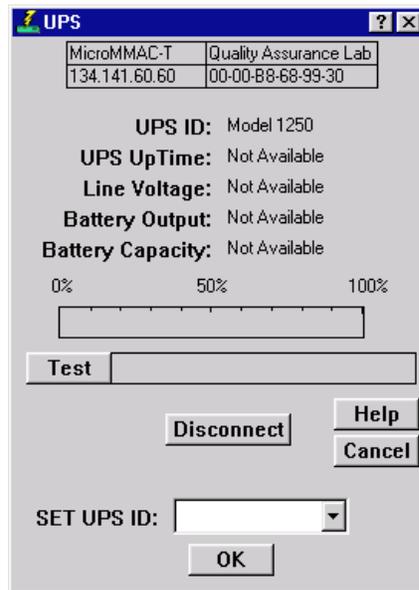2. Drag down to **UPS...**, and release. The UPS window, Figure 2-14, will appear.

Figure 2-14. The UPS Window

UPS ID

Displays the manufacturer and model type code of the UPS attached to the modem port of the MicroMMAC-T. You must assign this type code for the UPS window to be active. (See **Setting the UPS ID**, below, for instructions for setting the type code for your UPS.) The valid type codes are:

- Model 370
- Model 400
- Model 600
- Model 900
- Model 1250
- Model 2000

UPS Uptime

Displays the number of hours that the UPS has been operating since the last time it was started up.

Line Voltage

Displays the voltage coming through the line attached to the MicroMMAC-T.

Battery Output

Displays the amount of battery output voltage.

Battery Capacity

Displays the percentage of remaining battery capacity (100% indicates a fully charged battery).

Test Results

Displays the result of the last self-test performed by the UPS. The possible test results are:

Unit OK	The UPS unit is in working order.
Unit Failed	The UPS unit has failed the self-test. Check the unit for damage or consult your UPS User's Manual.
Bad Battery	The UPS unit battery is bad.
No recent test	No UPS self-test has been performed in the last five minutes.
Unit in test... Please standby	The UPS is currently in test mode.

Setting the UPS ID

You need to set the UPS ID typecode that indicates the manufacturer and model of the UPS.

To set the UPS ID:

1. Click on the **arrow** next to the **SET UPS ID** text box. A Model number menu will appear. Scroll to highlight the appropriate UPS ID. (Consult the manual that was included when you purchased your UPS for the correct Model ID number.)

2. Click on **OK**. The UPS ID you have chosen will appear in the text box, and the UPS window will be active.

If your UPS unit does not function after you have set this ID, check the manual you received with the UPS to ensure that you have chosen the correct UPS ID. If you need to change the ID, follow the directions given above.

Using the Test Option

You can use the test option to activate a self-test cycle for your unit. This self-test will check the viability of your unit and its battery.

To activate the test:

1. Click on the **Test** button. The unit will begin its self-test. The results of the test will appear in the Test Result text box next to the Test button.

Using the Disconnect Option

You can disconnect the UPS attached to your MicroMMAC-T through its COM port, as follows:

1. Click on the **Disconnect** button near the bottom of the UPS window. Your UPS will now be disconnected.

To reconnect, simply click on **OK**, or else close, and then re-open the UPS window.

Resetting the Device

You can use the **Restart Device** selection to perform a software reset of the MicroMMAC-T. To reset the device:

1. Click on the **Network** menu selection on the menu bar at the top of the Chassis View window. The Network pull-down menu will appear.

2. Click on **Restart Device**.

A software reset will now be performed for the MicroMMAC-T. All counters for the current MicroMMAC-T-managed ring return to their initial values, and the device will re-insert into the ring.

Enabling and Disabling Port Mapping

Port Mapping enables the MicroMMAC-T to determine if station address information can be matched to a specific module and port index. This ability is important during the Automatic Beacon Recovery Process, when the MicroMMAC-T needs to match address information contained in beacon frames with physical port locations so it can determine the "fault region" and locate failing ports.

When Port Mapping is enabled, the MicroMMAC-T can determine if a port is physically linked to the hub without being mapped as part of the ring network — that is, the device does not participate in neighbor notification. If a port in this condition is detected, the MicroMMAC-T will physically shut down the port to prevent ring problems. Port Mapping is enabled by default.

However, you may want to attach a device to the hub — such as a ring analyzer — that does not participate in the normal operation of token ring protocol. In this case, you will want to disable Port Mapping for the port to which that device will be attached, to ensure that the MicroMMAC-T does not shut the port down.

> **! CAUTION**
>
> *If you wish to insert an analyzer on a ring, be sure you disable Port Mapping on the port you use for insertion; if you don't, the MicroMMAC-T will detect that a station which is not participating in neighbor notification has been inserted, and will shut down the port. Also, be sure you do **not** insert anything other than an analyzer into a port whose mapping function has been disabled, since the MicroMMAC-T will not recognize the link status of that port, and will therefore not be able to map ports correctly (since it detects more stations than linked ports).*

The Port Map window (Figure 2-15) allows you to view the current state of port mapping for the selected port, and allows you to either enable or disable port mapping for the port.

To enable or disable port mapping for a selected port:

1. Click on the desired **Port** index on a module display in the Chassis View window. The Port pull-down menu will appear.

2. Click on **Port Map...**. The Port Map window, Figure 2-15, will appear.

Figure 2-15. The Port Map Window

3. Click on the **Port Map Enable** radio button to activate port mapping for the port, or the **Port Map Disable** radio button to turn off port mapping.

4. Click **OK**. Port mapping for the selected port will now be enabled or disabled as desired.

Enabling and Disabling Link Traps

Link traps are generated to management stations in the MicroMMAC-T's Trap Table when stations insert into the ring (i.e., the port status on the MicroMMAC-T changes from ENB to INS) or remove themselves from the ring (i.e., the port status changes from INS to ENB). By default, these traps are disabled at a station to reduce the amount of management traffic on your network. You can use NetSight Element Manager to enable these traps for a selected station, so that you can more fully view its network activity.

The Link Trap window (Figure 2-16) allows you to view the current state of link traps for the selected port, and allows you to either enable or disable link traps for the port.

To enable or disable link traps for a selected port:

1. Click on the desired **Port** index on a module display in the Chassis View window. The Port pull-down menu will appear.

2. Click on **Link Trap...**. The Link Trap window, Figure 2-16, will appear.

Figure 2-16. The Link Trap Window

3. Click on the **Link Trap Enable** radio button to activate link traps for the port, or the **Link Trap Disable** radio button to turn off link traps.

4. Click **OK**. Link traps for the selected port will now be enabled or disabled as desired.

Enabling and Disabling Link Traps at the Board Level

You can quickly enable or disable link traps for all ports on a board by selecting **Enable Link Traps** or **Disable Link Traps** from the Board menu. To do so:

1. Click on the desired **Board** index in the Chassis View window. The Board pull-down menu will appear.

2. Click on **Enable Link Traps** or **Disable Link Traps**, as desired.

Link traps will be enabled or disabled for all ports on the selected board.

Setting Token Ring Boards to Automode

By selecting **Set Board to Automode** from the Module menu, you can quickly configure a module in the HubSTACK to operate according to its default hardware settings. To set a module to AutoMode:

1. Click on the desired **Module** index in the Chassis View window. The Module pull-down menu will appear.

2. Click on **Set Board to AutoMode** to enable the AutoMode setting.

    A pop-up window will appear, asking whether you wish to set the board to AutoMode.

3. Click on **Yes** to select AutoMode, or **No** to return to the Chassis Status window.

If you selected AutoMode, the module will now be configured to operate according to its default hardware settings. Note that if a set is made to the module using NetSight Element Manager, the module will automatically return to management mode.

Enabling and Disabling Ports

Enabling and Disabling Station Ports

From the Module and Port menus on the MicroMMAC-T Chassis View window, you can enable and disable all station ports on a selected module, as well as individual station ports, respectively.

To enable or disable all station ports on a selected module:

1. Click on the **Module Index** for the desired module. The Module pull-down menu will appear.

2. Click on **Enable Station Ports** to enable the ports, or **Disable Station Ports** to disable the ports.

The module's station ports will now be enabled or disabled as desired.

To enable or disable an individual station port:

1. Click on the **Port Index** for the desired port. The Port menu will appear.

2. Click on **Enable** to enable the port, or **Disable** to disable the port. The port will now be enabled or disabled as desired.

Enabling and Disabling Ring Ports

From the Module and Ring Port menus on the MicroMMAC-T Chassis View window, you can enable and disable all ring-in/out ports on a selected module, as well as individual ring-in/out ports, respectively.

To enable or disable the Ring-in/Ring-out Ports on a selected module:

1. Click on the **Module Index** for the desired module. The Module pull-down menu will appear.

2. Click on **Enable Ring Ports** to enable the ports, or **Disable Ring Ports** to disable the ports.

The module's Ring-in/Ring-out ports will now be enabled or disabled as desired.

To enable or disable individual ring-in/out ports on the MicroMMAC-T:

1. Click on the **Port Index** for the desired ring-in/out port. The Ring Port menu will appear.

2. Click on **Enable** to enable the port, or **Disable** to disable the port. The port will now be enabled or disabled as desired.

Ring Out Enable/Disable

The MicroMMAC-T gives you the ability to switch the function of a station port to that of a ring-out port using the **Ring Out Enable** and **Ring Out Disable** options in the Port menu. Note that these options are not available for ports with an inserted station.

To convert a station port to a ring-out port:

1. Click on the desired Port index. The Port pull-down menu will appear.

2. Click on **Ring Out Enable** to convert the station port into a ring-out port. The converted port will assume the full functionality of a ring-out port, and will reflect as such in the Chassis View window. The port status will now display as that of a ring-out port, and the port menu will now assume ring port menu properties.

To convert the ring-out port back into a station port:

1. Click on the converted port. A Ring Port pull-down menu will appear.

2. Click on **Ring Out Disable** to revert the functionality of the port back to a station port.

Viewing I/F Summary Information

The **I/F Summary** menu option available from the Device menu lets you view statistics for the traffic processed by each network interface on your device. The window also provides access to a detailed statistics window that breaks down Transmit and Receive traffic for each interface.

To access the I/F Summary window:

1. From the Module View, click on the **Device** option from the menu bar.

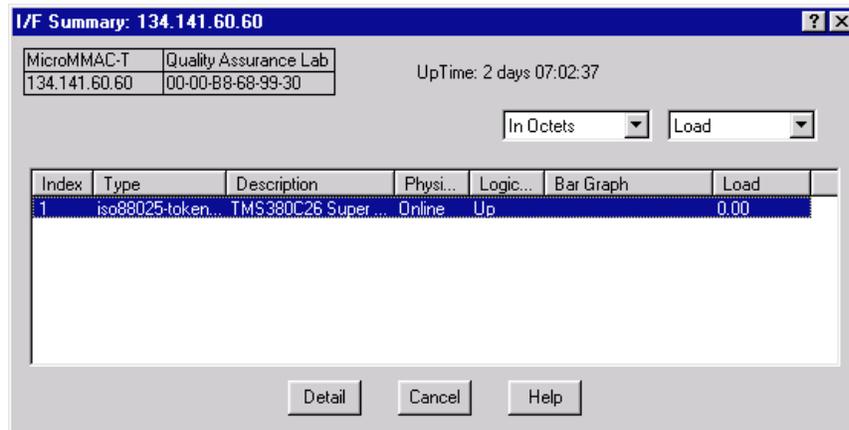2. Click again to select **I/F Summary**, and release. The I/F Summary window, Figure 2-17, will appear.

Figure 2-17. I/F Summary Window

The I/F Summary window provides a variety of descriptive information about each interface on your device, as well as statistics which display each interface's performance.

The following descriptive information is provided for each interface:

UpTime
The **UpTime** field lists the amount of time, in a days, hh:mm:ss format, that the device has been running since the last start-up.

Index
The index value assigned to each interface on the device.

Type
The type of the interface, distinguished by the physical/link protocol(s) running immediately below the network layer.

Description
A text description of the interface.

Physical Status
Displays the current physical status — or operational state — of the interface: **Online** or **Offline**.

Logical Status
Displays the current logical status — or administrative state — of the interface: **Up** or **Down**.

Interface Performance Statistics/Bar Graphs

The statistical values (and, where available, the accompanying bar graphs) to the right of the interface description fields provide a quick summary of interface performance. You can select the statistical value you want to display and the units in which you want those values displayed by using the two menu fields directly above the interface display area, as follows:

1. In the right-most menu field, click on the down arrow and select the unit in which you wish to display the selected statistic: **Load**, **Raw Counts**, or **Rate**.

NOTE

*Bar graphs are only available when **Load** is the selected base unit; if you select **Raw Counts** or **Rate**, the Bar Graph column will be removed from the interface display.*

2. Once you have selected the base unit, click on the down arrow in the left-most field to specify the statistic you'd like to display. Note that the options available from this menu will vary depending on the base unit you have selected.

After you select a new display mode, the statistics (and graphs, where applicable) will refresh to reflect the current choice, as described below.

Raw Counts

The total count of network traffic received or transmitted on the indicated interface since device counters were last reset. Raw counts are provided for the following parameters:

In Octets	Octets received on the interface, including framing characters.
In Packets	Packets (both unicast and non-unicast) received by the device interface and delivered to a higher-layer protocol.
In Discards	Packets received by the device interface that were discarded even though no errors prevented them from being delivered to a higher layer protocol (e.g., to free up buffer space in the device).
In Errors	Packets received by the device interface that contained errors that prevented them from being delivered to a higher-layer protocol.
In Unknown	Packets received by the device interface that were discarded because of an unknown or unsupported protocol.
Out Octets	Octets transmitted by the interface, including framing characters.

Out Packets	Packets transmitted, at the request of a higher level protocol, by the device interface to a subnetwork address (both unicast and non-unicast).
Out Discards	Outbound packets that were discarded by the device interface even though no errors were detected that would prevent them from being transmitted. A possible reason for discard would be to free up buffer space in the device.
Out Errors	Outbound packets that could not be transmitted by the device interface because they contained errors.

Load

The number of bytes processed by the indicated interface during the last poll interval in comparison to the theoretical maximum load for that interface type. Load is further defined by the following parameters:

In Octets	The number of bytes received by this interface, expressed as a percentage of the theoretical maximum load.
Out Octets	The number of bytes transmitted by this interface, expressed as a percentage of the theoretical maximum load.

When you select this option, a Bar Graph field will be added to the interface display area; this field is only available when **Load** is the selected base unit.

Rate

The count for the selected statistic during the last poll interval. The available parameters are the same as those provided for Raw Counts. Refer to the Raw Counts section, above, for a complete description of each parameter.

Viewing Interface Detail

The Interface Statistics window provides detailed MIB-II interface statistical information — including counts for both transmit and receive packets, and error and buffering information — for each individual port interface. Color-coded pie charts also let you graphically view statistics for both received and transmitted Unicast, Multicast, Discarded, and Error packets.

To open the Interface Statistics window:

1. In the I/F Summary window, click to select the interface for which you'd like to view more detailed statistics.

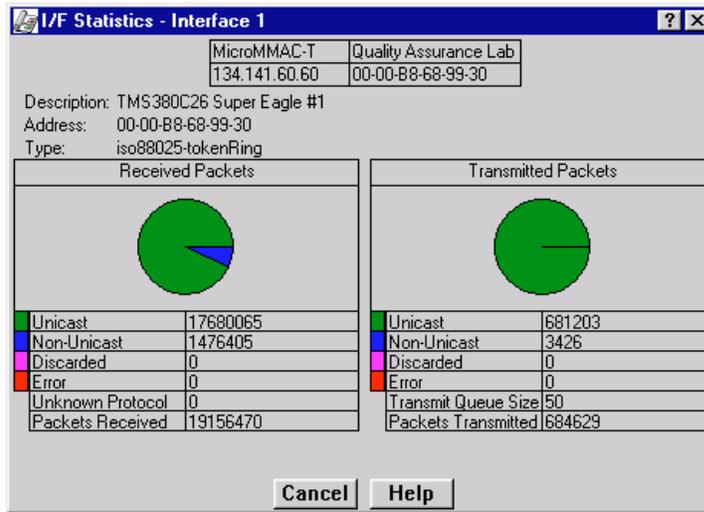2. Click on **Detail**. The appropriate I/F Statistics window, Figure 2-18, will appear.

Figure 2-18. Interface Detail Window

> **TIP**
>
> *You can also access this information via the I/F Statistics option available on the individual port menus; see Chapter 3, Token Ring Statistics, for more information.*

Three informational fields appear in the upper portion of the window:

Description
Displays the interface description for the currently selected interface: Ethernet.

Address
Displays the MAC (physical) address of the selected interface.

Type
Displays the interface type of the selected port: ethernet-csmacd.

The lower portion of the window provides the following transmit and receive statistics; note that the first four statistics are also graphically displayed in the pie charts.

Unicast
Displays the number of packets transmitted to or received from this interface that had a single, unique destination address. These statistics are displayed in the pie chart, color-coded green.

Non-Unicast
Displays the number of packets transmitted to or received from this interface that had a destination address that is recognized by more than one device on the network segment. The multicast field includes a count of broadcast packets — those that are recognized by *all* devices on a segment. These statistics are displayed in the pie chart, color-coded dark blue.

Discarded
Displays the number of packets which were discarded even though they contained no errors that would prevent transmission. Good packets are typically discarded to free up buffer space when the network becomes very busy; if this is occurring routinely, it usually means that network traffic is overwhelming the device. To solve this problem, you may need to re-configure your bridging parameters, or perhaps re-configure your network to add additional bridges or switches.

These statistics are displayed in the pie chart, color-coded magenta.

Error
Displays the number of packets received or transmitted that contained errors. These statistics are displayed in the pie chart, color-coded red.

Unknown Protocol *(Received only)*
Displays the number of packets received which were discarded because they were created under an unknown or unsupported protocol.

Packets Received *(Received only)*
Displays the number of packets received by the selected interface.

Transmit Queue Size *(Transmit only)*
Displays the number of packets currently queued for transmission from this interface. The amount of device memory devoted to buffer space, and the traffic level on the target network, determine how large the output packet queue can grow before the MicroMMAC-T will begin to discard packets.

Packets Transmitted *(Transmit only)*
Displays the number of packets transmitted by this interface.

Making Sense of Detail Statistics

The statistics available in this window can give you an idea of how an interface is performing; by using the statistics in a few simple calculations, it's also possible to get a sense of an interface's activity level:

To calculate the percentage of input errors:

```
Received Errors /Packets Received
```

To calculate the percentage of output errors:

> **Transmitted Errors /Packets Transmitted**

To calculate the total number of inbound and outbound discards:

> **Received Discards + Transmitted Discards**

To calculate the percentage of inbound packets that were discarded:

> **Received Discards /Packets Received**

To calculate the percentage of outbound packets that were discarded:

> **Transmit Discards /Packets Transmitted**

NOTE	*Unlike the Interface Detail window, which this window replaces, the Interface Statistics window does not offer **Disable** or **Test** options. These options are available in the Interface Group window, which can be accessed via the System Group window (select **System Group...** from the **Device** menu). Refer to your **Generic SNMP User's Guide** for further information on the System Group and Interface Group windows.*

Token Ring Statistics

Using Statistics window features; monitoring ring-level statistics, timer statistics, and performance graphs; monitoring management station statistics; monitoring port-level statistics, timer statistics, and performance graphs

NetSight Element Manager provides valuable performance statistics from the Network, Management Station, and Port levels. The statistics windows include ring status information, beacon statistics, error counts, timer statistics, frame size and protocol statistics, and performance graphs.

Statistics Window Features

Many of the token ring statistics windows allow you to measure and view statistics according to different scales, and set a time interval after which statistics are automatically updated. The following sections detail these features.

Setting Total, Delta, or Cumulative Counts

By using the radio buttons located at the bottom of the Network, TR Management Station, and Station (Port) Statistics windows, you can change the time period during which the statistics shown in the window are collected. An example of this group of radio buttons is shown in Figure 3-1.

Figure 3-1. Sample Total, Delta, and Cumulative Radio Buttons

Using these radio buttons, you can choose whether to view the statistics gathered since the MicroMMAC-T was last restarted or (if you are monitoring port-level statistics) since the station was first inserted (**Total**), during the last polling interval (**Delta**), or accumulated from zero at a user-defined point (**Cumulative**). You set the interval to update information (from 1 second to 23 hours, 59 minutes, 59 seconds) by using the clock symbol at the bottom of the window (See **Setting the Statistics Poll Interval**, below, for details on using the clock symbol).

To choose Total, Delta, or Cumulative:

*   Click on the **Total** radio button. After the completion of the current polling cycle plus one complete polling cycle, the screen will display the sum of statistics processed since the MicroMMAC-T was last restarted or (if you are monitoring port-level statistics) since the station was first inserted. These totals are read from the device and updated at each subsequent polling interval.

*   Click on the **Delta** radio button. After the completion of the current polling cycle plus two more polling cycles, the screen will display the count of statistics processed during the last polling interval. These counts are refreshed after each polling cycle.

*   Click on the **Cumulative** radio button. After the completion of the current polling cycle, the screen will display the count of statistics processed during the last polling interval, and then will accumulate statistics with each polling cycle thereafter until another display option is chosen.

Viewing Elapsed, Average, and Peak Activity Levels

Timer Statistics windows measure activity levels for different network events on a color-coded strip chart. An example of this chart is shown in Figure 3-2.

Figure 3-2. A Sample Timer Statistics Chart

The activity states and their colors are:

*   Elapsed (Green) — Indicates the level of activity during the last time interval.

*   Average (Blue) — Indicates the average level of activity over all time intervals since the window was invoked.

- Peak (Magenta) — Indicates the maximum level of activity over all time intervals since the window was invoked.

Statistics displayed in the color-coded strip charts will automatically update within the time interval you have set using the clock symbol at the bottom of the window (See **Setting the Statistics Poll Interval**, below, for details on using the clock symbol).

Setting the Statistics Poll Interval

Information displayed in the Statistics and Timer Statistics windows is updated after (or, for windows in Delta mode, displayed for) the time period defined by the Interval field available in each window. Each statistics window collects and displays data according to its default polling interval. You can re-configure this interval for each instance of a statistics window by using the clock symbol found in the Statistics and Timer Statistics windows. Note that the poll interval returns to its default value each time you close and then re-open a statistics window.

> **NOTE**
>
> *In NetSight Element Manager, the polling interval is set via the* ***Tools—>Options*** *available from the primary window menu bar.*
>
> *Refer to the* ***NetSight Element Manager User's Guide*** *for full information on setting device polling intervals.*

To set the Poll Interval:

1. Click on 🕐 next to the Interval information box. The New Timer Interval text box will appear.
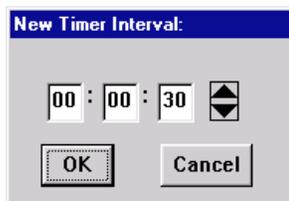

Figure 3-3. The New Timer Interval Text Box

2. Using the mouse, highlight the **hour** field; type in the desired number of hours (using a 24 hour format), or use the arrow buttons to change the value. Valid time values range from 1 second to 23 hours, 59 minutes, 59 seconds.

3. Following the same process, select the minutes and seconds fields and either type in a new value or use the arrow buttons to change the value.

4. Click on **OK**. The new Time Interval will take effect for the current instance of the window in which you have set it. Remember, the poll interval returns to its default value each time you close, and then re-open a statistics window.

Network Level Statistics

Using the **Network** pull-down menu, you can view performance statistics for the MicroMMAC-T-managed ring. The MicroMMAC-T-managed ring is represented by the **Network 1** entry in the Network pull-down menu.

Windows which allow you to view performance information for a ring include:

*   Statistics
*   Timer Statistics
*   Performance Graphs
*   Frame Size
*   Protocol

Accessing the Network Statistics Selections

To access the Network Statistics selections:

1. At the MicroMMAC-T Chassis View window, click on the **Network** menu selection, then on the **Network 1** entry to access the following statistics selections:

*   **Statistics...**
*   **Timer Statistics...**
*   **Performance Graph...**
*   **Frame Size...**
*   **Protocol...**

2. Highlight your selection. Each selection has an associated window.

The Network Statistics Window

At the Network Statistics window (Figure 3-4), you can view Ring Status, Beaconing, and Error fields for a MicroMMAC-T-managed ring.

General Information Fields

There are two general information fields in the Network Statistics Window:

Ring Number
This field displays the number provided by the Ring Parameter Server that is used to identify the current ring. Possible values are 0001-0FFF (hexadecimal).

Ring Speed
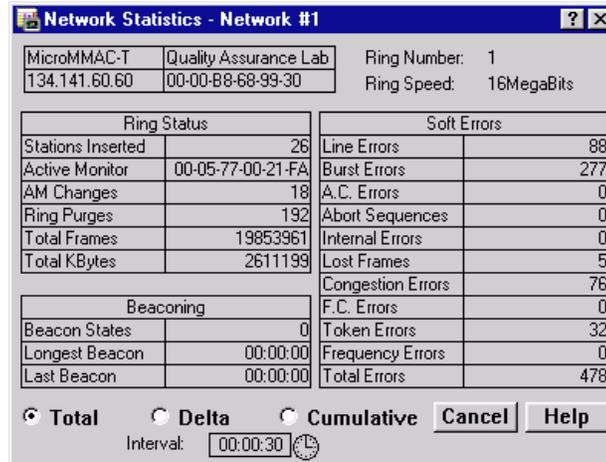The operating speed (4 Mbit/sec or 16 Mbit/sec) of the current ring.

Figure 3-4.   The Network Statistics Window

By using the radio buttons located at the bottom of the Network Statistics window, you can choose whether to view the statistics gathered since the MicroMMAC-T was last started up (**Total**), counted during the last polling interval (**Delta**), or accumulated from zero at a user-defined point (**Cumulative**). See **Setting Total, Delta, or Cumulative Counts**, page 3-1, for details.

Set the time interval to update information (from 1 second to 23 hours, 59 minutes, 59 seconds) by using the clock symbol at the bottom of the window. See **Setting the Statistics Poll Interval**, page 3-3, for details.

Ring Status Fields

Ring Status fields include:

Stations Inserted
Displays the total number of stations that are currently inserted on the ring. This number indicates all stations, regardless of whether they are connected to the MicroMMAC-T hub.

Active Monitor
Displays the MAC address of the active monitor on the ring.

AM (Active Monitor) Changes
Displays the number of times the active monitor has changed on the ring.

Ring Purges
Displays the number of times the active monitor has purged the ring since the network was created, or since the MicroMMAC-T was last reset. This includes the purge at the end of the active monitor selection process. The count is not reset when the active monitor changes.

Total Frames
Displays the number of frames that have been transmitted on the ring.

Total KBytes
Displays the total number of kilobytes that have been transmitted on the ring. This number is the sum of all data bytes in each frame.

Beacon Statistics

A Beacon is transmitted when a hardware error is detected on the ring, including: wire faults, frequency errors, or ring signal loss.

Note that the Longest Beacon and Last Beacon fields are read from the device (Total update), and are not subject to Delta or Cumulative update options.

Beacon States
This field lists the count of beaconing occurrences on the ring.

Longest Beacon
This field lists the duration of the longest beaconing occurrence (not subject to Delta/Cumulative update).

Last Beacon
This field provides the duration of the last beacon (not subject to Delta/Cumulative update).

Soft Error Fields

Line Errors
Displays the total number of line errors that the management station has detected. These are recorded when a receiving station detects a data corruption in a frame that was initially transmitted as a good frame, with the E bit (error flag) set at zero (0).

A power surge on the ring (line of transmission) may cause the data portion of a frame or token to be corrupted. The frame or token then may contain a non-data bit between the data start and end delimiters, or a Frame Check Sequence (FCS) error.

The first station detecting the data corruption sets the E bit to 1 in the ending delimiter of the frame and logs the error. This prevents other stations from logging the error and isolates the portion of the line which is causing the data corruption.

Burst Errors
Displays the total number of burst errors detected on the ring. These errors occur when a station does not clock an incoming data signal correctly.

Token ring protocol uses Differential Manchester Encoding for its signalling format. Using this code, each bit time is halved, with a correct signal having a transition at the center of the bit time (i.e., switching between 0 and 1, or vice versa, in the middle of the bit time). Burst errors occur when a station receives five half-bits of Manchester encoded data without a change in phase from 0 to 1 (thus indicating no change in data value).

These usually occur when there was a brief disruption on the cable, or a brief electrical surge or electronic noise on the network.

A.C. Errors
The count of AC Errors detected on the ring. These indicate that the reporting station's Nearest Active Upstream Neighbor (NAUN) is faulty, because it is unable to report its address during neighbor notification.

If a station receives more than one Active Monitor Present (AMP) or Standby Monitor Present (SMP) frame with the Address Recognized Indicator (ARI) and Frame Copied Indicator (FCI) bits set to 0 without receiving an intervening AMP frame with these bits set to 1, it recognizes that its NAUN failed to set the ARI/FCI bits.

The detecting station indicates the error to the active monitor, then ends the ring poll process by not transmitting an SMP frame.

Abort Sequences
The count of abort delimiters transmitted on the ring. These are recorded when a station detects a corrupted token while transmitting, then sends an abort delimiter to halt frame transmission before the expected end-frame sequence.This error will cause the active monitor to restore the ring through the ring purge process. This error is somewhat uncommon, and often indicates a failing adapter. A common cause of abort sequences is overheating by the adapter in an overloaded system. Note that the adapter may also issue an Internal Error simultaneously, which will cause the adapter to remove itself from the ring.

Internal Errors
Displays the total number of internal errors detected on the ring. These are recorded when a station recognizes a recoverable internal error in its own adapter. You can use this to detect a station in marginal operating condition, possibly with an inoperable chipset, timers, or counters. A large number of internal errors can indicate that one or more stations on the monitored ring are in marginal operating condition.

Lost Frames

Displays the number of lost frame errors detected on the ring. These occur when a station is transmitting and its TRR (Timer, Return to Repeat) timer expires. This timer ensures that the station returns to the data repeat state.

Lost frames are usually caused by a station entering or leaving the ring as the frame is circulating – since this often throws the ring temporarily out of synchronization. Lost frames will cause the active monitor to initiate the ring purge process and issue a new token.

Congestion Errors

Displays the total number of error conditions when a ring station recognizes a frame addressed to it, but has no available buffer space; that is, the station is receiving frames faster than its adapter can copy information from the buffers. This indicates that the station is congested.

F.C. Errors

Displays the count of frame copied (FC) errors detected on the ring. These are recorded when the management station recognizes a frame addressed to it and detects that the Frame Status field's Address bits are set to 1, indicating a possible line surge or duplicate address.

Note that it is virtually impossible to have a ring with duplicate addresses, since most of the time the ring uses the hard-coded address on the adapter, and duplicate addresses are checked for when a station inserts itself into the ring. However, a system administrator can pass a locally assigned address to the adapter, so it is possible to unintentionally administer a duplicate address while a device is on the ring. This error is more commonly caused by transparent bridging on a token ring network.

Token Errors

Displays the number of token errors detected on the ring. These occur when the management station, as the active monitor, recognizes an error condition that needs a token transmitted. This occurs when the TVX (Timer, Valid Transmission) timer expires. This timer records the time in which a valid transmission can occur.

As in lost frames, the major cause for token errors is the disruption of the ring as stations enter or leave the ring. Note that token errors are only reported by an active monitor. If you see a token error reported by another station, it was serving as active monitor at some previous time.

Frequency Errors

A frequency error occurs when the ring clock frequency and the station's internal crystal clock frequency differ by an excessive amount. This type of error happens more often on 16 Mbps rings than on 4 Mbps rings; it can also be a symptom of too many stations on the ring.

Detection of a frequency error initiates the monitor contention process, since this typically indicates that the active monitor is not present or is malfunctioning.

Total Errors
The sum of all errors currently recorded.

Network Timer Statistics

You can use the Network Timer Statistics window (Figure 3-5) to view the number of frames, errors, and bytes processed by the ring over a user-defined time interval (allowable time settings are 1 second to 23 hours, 59 minutes, 59 seconds). This allows you to quickly scan the display to obtain information concerning the network activity.
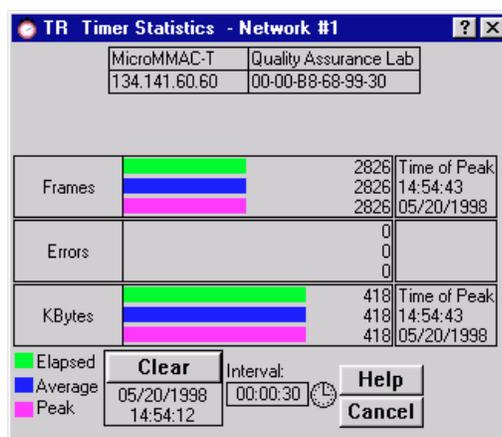

Figure 3-5. Network Timer Statistics Window

Statistics are displayed in color-coded strip charts which automatically update within the time interval you have set. See **Viewing Elapsed, Average, and Peak Activity Levels**, page 3-2, for details about the Timer Statistics chart measurements.

You can also refresh the statistics at any time by clicking on the **Clear** button. This will refresh the Station Timer Stats window to collect new network statistics. (The timestamp, indicating the last time that the Timer Stats box was cleared, will also update.)

Set the time interval to update information (from 1 second to 23 hours, 59 minutes, 59 seconds) by using the clock symbol at the bottom of the window. See **Setting the Statistics Poll Interval**, page 3-3, for details.

Network Timer Statistics Window Fields

The Timer Statistics window fields display the different network events measured by the Timer Statistics chart. The following Timer Statistics window fields appear for the network:

Frames
Displays the elapsed, average, and peak levels of good frames transmitted on the network.

Errors
Displays the elapsed, average, and peak levels of errors received by the network.

KBytes
Displays the elapsed, average, and peak levels of kilobytes processed by the network.

Network Performance Graphs

The Network Performance Graphs (Figure 3-6) provide real-time statistics reporting. The color-coded strip charts allow you to visually track the performance of the entire network. Each strip chart graph shows you the amount of traffic going through the network, as well as the number of network events (errors, ring purges, or beacon states) it has experienced.

You select the type of events to monitor by using the buttons at the bottom left of this window, and their associated pull-down menus. You can choose to view total errors, ring purges, beacon frames, or no network events. You can also choose to view traffic in frames or percent load, or not view it at all. Each time you change the parameters of the graph, it will refresh itself.

The graph has an x axis that indicates the 60 second interval over which charting occurs continuously, while the y axis measures the amount of traffic or network events that are processed by the network.
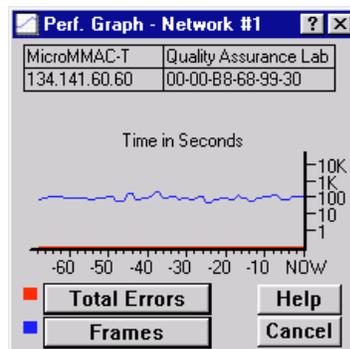
Figure 3-6.   Network Performance Graph

Network Performance Graph Statistics

The Network Performance Graph contains the following statistics:

Network Events (Red)

Total Errors	The total number of soft errors of any kind processed by the network.
Ring Purges	The total number of times the ring's active monitor has issued a ring purge command.
Beacon States	The number of beacon states on the ring which have been corrected by the automatic beacon recovery process (ABRP).
Nothing	The Network Events scale is not currently measuring any network events statistics coming through the network.

Traffic (Blue)

Frames	The total number of good frames transmitted and received by the network.
Percent Load	Reflects the load generated by the network compared to its theoretical maximum load (4 or 16 Mbits/sec).
Nothing	The Traffic scale is not currently measuring the traffic or load processed by the network.

Configuring the Network Performance Graph

1. Using the mouse, click on the **Network Events** button (with the red square marker to its left). The Network Events pull-down menu will appear.

2. Click on the desired mode (**Total Errors**, **Ring Purges**, **Beacon States**, or **Nothing**). The mode you have chosen will appear in the button. The Performance Graph will refresh and begin to measure, using the new mode.

3. Click on the **Traffic** button (with the blue square marker to its left). The Traffic pull-down menu will appear.

4. Click on the desired mode (**Frames**, **Percent Load**, or **Nothing**). The mode you have chosen will appear in the button. The Performance Graph will refresh and begin to measure, using the new mode.

The Performance Graph will now monitor the network using the user-defined modes. (Click on **Cancel** to stop monitoring and exit the screen.)

The Frame Size Window

At the Frame Size window, Figure 3-7, you can see the actual sizes of the frames on the ring network controlled by your MicroMMAC-T.

The frame sizes and corresponding colors are:

- <<64 (Red)
- 64-127 (Green)
- 128-255 (Rose)
- 256-511 (Yellow)
- 512-1023 (Gray)
- 1024-2047 (Cyan)
- 2048-4095 (Magenta)
- >>4095 (Orange)
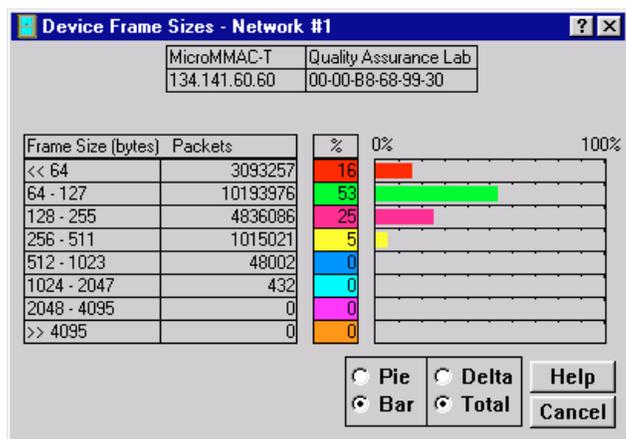
Figure 3-7. The Device Frame Sizes Window

These frame size statistics are presented in numerical, bar graph, and pie chart form.

Total and Delta Graph Display

You can choose whether to view the total count of frame sizes (Total), or to view the count of frame sizes during the last polling interval set for NetSight Element Manager (Delta).

To choose Delta or Total:

- Click on the **Delta** radio button. The numbers to the left of the selected graph display the count of frame sizes processed during the last polling interval. The dynamic bar graph or pie chart to the right of the numbers gives a color-coded real-time view of the numerical count.

• Click on the **Total** radio button. The numbers to the left of the selected graph (in the color-coded boxes) display the total count of frame sizes processed since the most recent start-up of the MicroMMAC-T. The dynamic bar graph or pie chart to the right of the numbers reflects counts processed since the last start-up.

Using the Pie and Bar Radio Buttons

You can use the Pie and Bar radio buttons to switch from the bar graph to the pie chart to view the size of frames passing through the MicroMMAC-T. Both graph types reflect the type of collection you have chosen: Total or Delta. See Figure 3-8 for a view of the Device Frame Sizes window with a pie chart displayed.

 To display a pie chart or bar graph:

1. Click on the **Pie** or **Bar** radio button. The color-coded Pie chart or the Bar graph will appear on the window, depending on your choice.
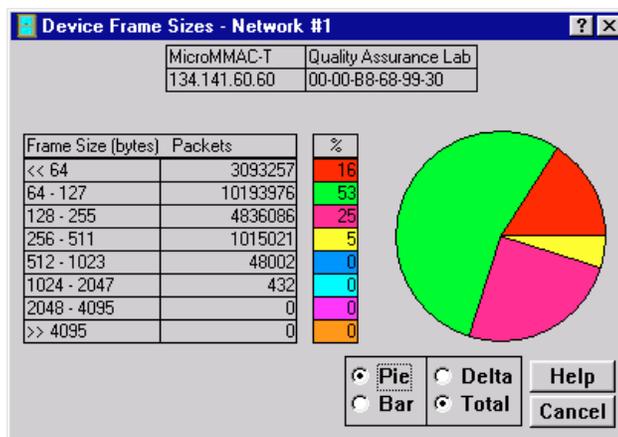
Figure 3-8. Frame Sizes Window with Pie Chart

The Protocol Statistics Window

At the Protocol Statistics window (Figure 3-9) you can see how many frames are received by the MicroMMAC-T for a given protocol.
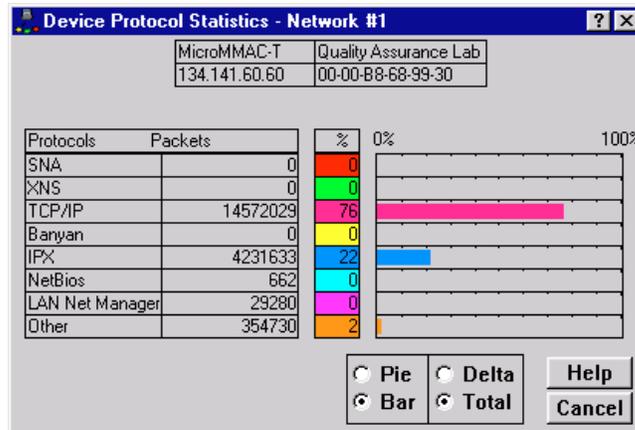
Figure 3-9. Protocol Statistics Window with Bar Graph

You can view statistics for the following protocols (note the corresponding colors):

- SNA™ (Red)
- XNS™ (Green)
- TCP/IP (Rose)
- Banyan™ (Yellow)
- IPX™ (Blue)
- NetBios™ (Turquoise)
- LAN Net Manager™ (Magenta)
- All other protocols (Orange)

These protocol statistics are presented in numerical, bar graph, and pie chart form.

Total and Delta Graph Display

You can choose whether to view the total count of protocol types (Total), or to view the count of protocol types during the last polling interval set for NetSight Element Manager (Delta).

To choose Delta or Total:

- Click on the **Delta** radio button. The numbers to the left of the graphs will now display the count of protocol types processed during the last polling interval. The dynamic graphs to the right of the numbers give a color-coded real-time view of the numerical count.

- Click on the **Total** radio button. The window will now display the total count of protocol types processed since the most recent start-up of the MicroMMAC-T. The dynamic bar graph or pie chart to the right of the numbers reflects counts processed since the last start-up.

Using the Pie and Bar Radio Buttons

You can use the Pie and Bar radio buttons to switch from bar graph to pie chart. With the pie chart or bar graph, you can view the traffic, broken into protocols, that is passing through the MicroMMAC-T. Both graphs will reflect the type of collection you have chosen: Total or Delta.

To display a pie chart or bar graph:

1. Click on the **Pie** or **Bar** radio button. The Pie chart or the Bar graph, as you have selected, will appear on the window.

Management Station Statistics

Through the Device menu, you can view network statistics for the MicroMMAC-T's on board ring management station.

Accessing the Management Station Statistics Selection

To access the Intelligent Module pull-down menu from the MicroMMAC-T Chassis View window:

1. Click on the **Device** menu selection on the menu bar in the MicroMMAC-T Chassis View. The Device menu will appear.

2. Click to highlight the **Mgmt. Station Statistics...** selection. The TR Management Station Statistics window will appear.

The upper left corner of the The TR Management Station Statistics window (Figure 3-10) contains the module's name, location, and MAC and IP addresses. The window also lists the current ring speed set at the device.
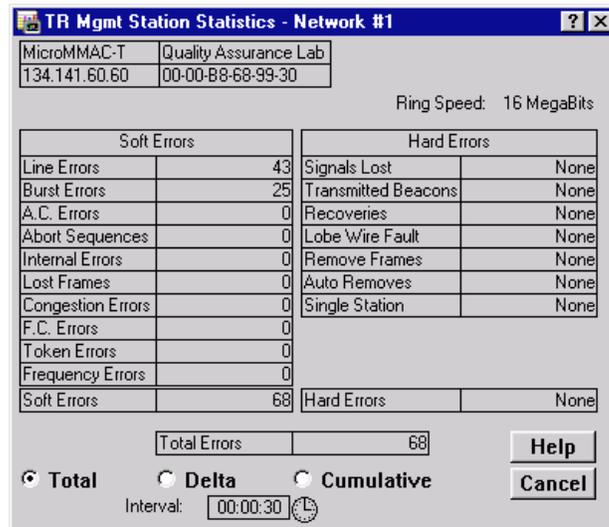
Figure 3-10. The TR Management Station Statistics Window

This window also lists both soft and hard error conditions detected by the MicroMMAC-T's management station, as explained in the following sections.

The **Total Errors** field indicates the sum of both soft and hard errors that the management station has detected.

By using the radio buttons located at the bottom of the TR Management Station Statistics window, you can choose whether to view the statistics gathered since the MicroMMAC-T was last started up (**Total**), counted during the last polling interval (**Delta**), or accumulated from zero at a user-defined point (**Cumulative**). See **Setting Total, Delta, or Cumulative Counts**, page 3-1, for details.

Set the time interval to update information (from 1 second to 23 hours, 59 minutes, 59 seconds) by using the clock symbol at the bottom of the window. See **Setting the Statistics Poll Interval**, page 3-3, for details.

Soft Errors Fields

Line Errors
The count of line errors that the management station has detected on the ring. This error indicates a non-data bit between the starting and ending delimiters of data, or a frame check sequence error.

Burst Errors
The count of burst errors that the management station has detected on the ring. This error indicates a bit information-encoding error when there are no transitions between 0 and 1 over five half-bit times.

A.C. Errors
The count detected by the management station of frames (Protocol Data Units or PDUs) containing errors in the A or C bits.

Abort Sequences
The management station's count of abort sequences detected on the ring, which were issued by ring stations during transmission.

Internal Errors
The number of recoverable internal errors detected by the management station, indicating a ring station in marginal operating condition.

Lost Frames
The number of frames detected by the management station that were transmitted on the ring, but did not return to the transmitting station because the Timer Return to Repeat (TRR) timer expired.

Congestion Errors
The number of times the management station has not been able to copy a PDU addressed to it because of a lack of internal buffering.

FC Errors
The management station's count of PDU detected on the ring with the A bits already set to 1, which indicates a possible electrical line disturbance, or a duplicate address on the ring.

Token Errors
The number of times the ring's active monitor detected an error that required the transmission of a token.

Frequency Errors
The number of times that the management station has detected that the incoming frequency differs from the expected frequency by more than allowed.

Soft Errors
The total number of soft errors the management station has detected.

Hard Errors Fields

If a particular type of hard error is detected by the management station, "Detected" will be displayed in the appropriate hard error field. If no hard errors are detected, the field will display "None."

Signals Lost
These errors occur if the management station has detected a loss of signal condition, which can be the result of a broken ring, a faulty wiring concentrator, or a receiver or transmitter malfunction.

Transmitted Beacons

Beacon frames are transmitted by ring stations when certain error conditions are detected. These frames notify all ring stations that there is a problem, and causes the stations in the fault domain (the beaconing station and its NAUN) to remove themselves from the ring and perform a loopback test. If either station fails the test, its removal should allow the ring to recover.

Recoveries

Indicates that claim tokens have been detected on the ring. Claim token frames are issued during the active monitor contention process; their presence on the ring indicates that the ring is recovering from the loss of the active monitor. This counter is reset once the new active monitor is chosen and issues a ring purge to reset the ring.

Lobe Wire Fault

Indicates that a station on the ring has detected a short or open condition on its lobe wires. This condition is detected by the loss of the phantom current. A station detecting this condition will remove itself from the ring.

Remove Frames

Indicates that a Remove MAC frame has been detected on the ring. A Remove MAC frame forces the receiving station to remove itself from the ring. Once a station has removed itself from the ring, its actions will depend upon its design: some devices will automatically try to re-insert after a pre-determined timeout period; as part of the re-insertion process, those devices will perform a loopback test to verify that their MAC adapters are operating properly. Stations which do not automatically attempt re-insertion will simply remain off the ring until they are manually re-inserted.

Auto Removes

Indicates that one or more stations has failed a loopback test performed as a result of a beaconing condition, and has therefore removed itself from the ring.

Single Station

This condition indicates that the management station has determined that it is the only station on the ring.

Hard Errors

If the management station has detected hard errors on the ring, this field will display "Detected." If no hard errors were detected, this field will display "None."

Port Level Statistics

Through the Station Port pull-down menu, you can view statistics for a station inserted into a ring, and graphically monitor the selected station via Timer Statistics and the Performance Graph. The following sections detail how to access the Station Port pull-down menu, and how to use the menu to view numerical and graphical statistics for a station port.

Accessing the Station Port Menu

To access a Station Port menu:

In the Chassis View window, click on any **inserted** station port (i.e.   ) on the MicroMMAC-T port display.
The Station Port menu will appear, offering the following statistics selections:

- **Statistics...**
- **Timer Statistics...**
- **Performance Graph...**

3. Click the mouse to highlight your selection. The associated window will appear.

Each window is described in the following three sections.

The Station Statistics Window

The Station Statistics window (Figure 3-11) contains fields which allow you to configure the station port, and view performance and error statistics for the selected port.

By using the radio buttons located at the right of the Station Statistics window, you can choose whether to view the statistics gathered since the station was first inserted (**Total**), counted during the last polling interval (**Delta**), or accumulated from zero at a user-defined point (**Cumulative**). See **Setting Total, Delta, or Cumulative Counts**,page 3-1, for details.

Set the time interval to update information (from 1 second to 23 hours, 59 minutes, 59 seconds) by using the clock symbol at the bottom of the window. See **Setting the Statistics Poll Interval**, page 3-3, for details.
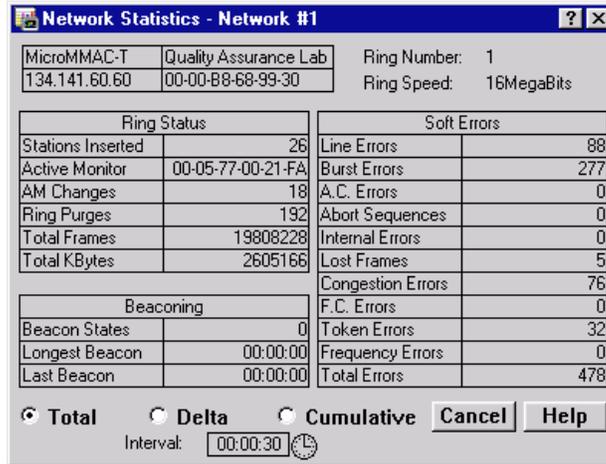
Figure 3-11. The Station Statistics Window

The Station Statistics Window General Fields

The Station Statistics window contains the following fields:

Station Name
Use this editable field to assign a name to the station attached to the selected port.

Location
Use this editable field to assign a drop number to the station attached to the selected port.

Link Time
The length of time (in days, hours, minutes, and seconds) that the selected station has been inserted into the ring.

The Station Statistics Window Performance Fields

The following fields give general performance information for the selected station.

Total Frames
The total number of frames transmitted by the selected station port since its attached station inserted into the ring.

Total KBytes
The total number of kilobytes transmitted by the selected station port since its attached station inserted into the ring.

The Station Statistics Window Soft Error Fields

The following fields break down soft errors for the selected station.

Line Errors
The count of line errors detected by the selected station port. This error indicates a non-data bit between the starting and ending delimiters of data, or a frame check sequence error.

Burst Errors
The count of burst errors detected by the selected station port. This error indicates a bit information-encoding error when there are no transitions between 0 and 1 over five half-bit times.

A.C. Errors
The number of Protocol Data Units (PDUs) containing errors in the A or C bits detected by the selected station port.

Abort Sequences
The number of times the selected port has transmitted abort sequences during transmission.

Internal Errors
The number of recoverable internal errors detected by the selected port, indicating that its attached station is in marginal operating condition.

Lost Frames
The number of frames that the selected port has transmitted that have not returned because the Timer Return to Repeat (TRR) timer has expired.

Congestion Errors
The number of times the selected port has not been able to copy a PDU addressed to it because of a lack of internal buffering.

F.C. Errors
The number of PDU addressed to the selected station that have the A bits already set to 1, which indicates a possible electrical line disturbance, or a duplicate address on the ring.

Token Errors
The number of times the selected station, while acting as the active monitor, has detected an error that required the transmission of a token.

Frequency Errors
The number of times the selected station has detected that the incoming signal's frequency differed from the expected frequency by more than allowed.

Total Errors
The total number of errors accounted for by the selected port.

The Station Timer Statistics Window

At the Station Timer Statistics window (Figure 3-12), you can view the number of frames, errors, and bytes processed by the selected station port over a user-defined time interval (allowable time settings are 1 second to 23 hours, 59 minutes, 59 seconds). The displayed statistics will automatically update within the time interval you have set at the Interval text box at the bottom of the screen.
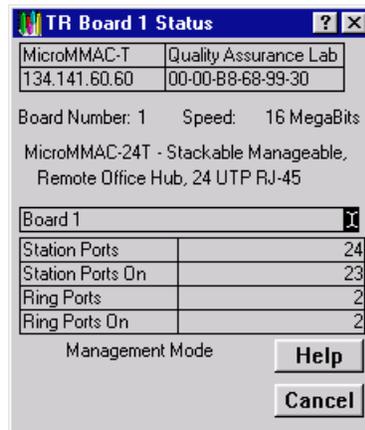
Figure 3-12. Station Timer Statistics Window

Two fields directly above the bar graphs identify the currently selected port by its board and port number and its MAC address.

Bar charts graphically represent the elapsed, average, and peak times that frames, bytes, and soft errors are passing through the port. These charts are color-coded to allow you to quickly scan the display and obtain needed information concerning the port's activity level. See **Viewing Elapsed, Average, and Peak Activity Levels**, page 3-2, for details about the Timer Statistics chart measurements.

You can also refresh the statistics at any time by clicking on the **Clear** button. This will refresh the Station Timer Stats window to collect new network statistics. (The time under the Clear button will also update, indicating the last time that the Timer Stats box was cleared.)

The Timer Statistics chart automatically updates within the time interval you have set. Set the time interval to update information (from 1 second to 23 hours, 59 minutes, 59 seconds) by using the clock symbol at the bottom of the window. See **Setting the Statistics Poll Interval**, page 3-3, for details.

Station Timer Statistics Window Fields

The Timer Statistics window fields display the different network events measured by the Timer Statistics chart. The following Timer Statistics window fields appear for the network:

Frames
Displays the elapsed, average, and peak levels of good frames generated by the station attached to the port.

Errors
Displays the elapsed, average, and peak levels of errors received by the station port.

KBytes
Displays the elapsed, average, and peak levels of kilobytes processed by the station port.

Port Performance Graphs

Port Performance Graphs (Figure 3-13) provide real-time statistics reporting. The color-coded strip charts allow you to visually track the performance of the selected station. Each strip chart graph shows you the amount of traffic going through the station port, as well as the number of errors experienced at the particular port.

Directly above the graph, three fields identify the currently selected port by its board and port index and its MAC address.
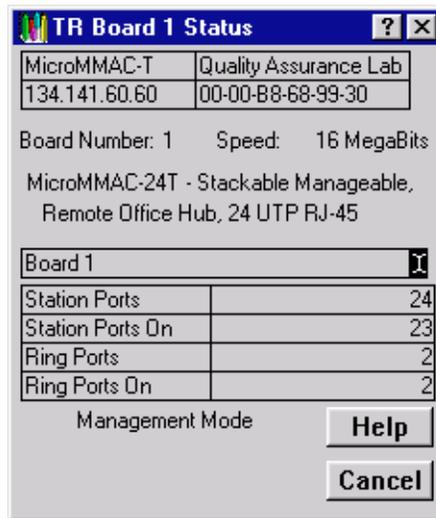
Figure 3-13. Station Port Performance Graph

The graph has an x axis that indicates the 60 second interval over which charting occurs continuously, while the y axis measures the amount of traffic or errors that are processed by the station port.

Using the **Total Errors** button (with the red square marker to its left) at the bottom of this window, you can choose whether or not to monitor the total errors detected at the station port (its pull-down menu offers Total Errors or Nothing - **Total Errors** is selected by default). When you click on the Total Errors button, its pull-down menu will appear. If you change the parameters, the Performance Graph will refresh, and the button label will change to reflect the selection.

Using the **Traffic** button (with the blue square marker to its left) at the bottom of this window, you can select the way you wish to view the traffic rate (Frames, Percent Load, or Nothing - **Frames** is selected by default). When you click on the Traffic button, its pull-down menu will appear. If you change the parameters, the Performance Graph will refresh, and the button label will change to reflect the selection.

Port Performance Graph Statistics

The Port Performance Graph contains the following statistics:

Total Errors (Red)

Total Errors	The total number of soft errors of any kind processed by the station port.
Nothing	The Total Errors scale is not currently measuring the number of errors coming through the station port.

Traffic (Blue)

Frames   The total number of good frames transmitted and received by the station port.

Percent Load   Reflects the network load generated by the station port compared to the theoretical maximum load (4 or 16 Mbits/sec.) of a Token Ring Network.

Nothing   The Traffic scale is not currently measuring the traffic or load processed by the station port.

Configuring the Port Performance Graph

1. Click on the **Total Errors** button (with the red square marker to its left). The Total Errors pull-down menu will appear.

2. Click on the desired Total Errors mode (**Total Errors** or **Nothing**). The mode you have chosen will appear in the button. The Performance Graph will refresh and begin to measure using the new mode.

3. Click on the **Traffic** button (with the blue square marker to its left). The Traffic pull-down menu will appear.

4. Click on the desired Traffic mode (**Frames**, **Percent Load**, or **Nothing**). The mode you have chosen will appear in the button. The Performance Graph will refresh and begin to measure using the new mode.

The Performance Graph will now monitor the station port using the user-defined mode. (Click on **Cancel** to stop monitoring and exit the screen.)

Token Ring Alarms

The ring-level Alarm Limits window; setting alarm limits for network events; accessing the Station Alarm Limits window; setting station-level alarm limits

Alarms work in conjunction with NetSight Element Manager to inform you when certain defined thresholds have been reached. Using the Chassis View Network menu, you can configure and set ring-level alarms for network events, or ring-level station alarms which apply to all stations on a ring. Through the Chassis View Station Port menus, the Station List window, and the Station Map, you can configure and set station-level alarms for individual stations on a ring.

Ring-Level Alarm Limits

When you access the Alarm Limits window (Figure 4-1) from the Network menu, you can configure and set alarms to be notified of ring errors and events in NetSight Element Manager's Alarm Log facility.

> **NOTE**
>
> *To receive alarms at your NetSight Element Manager station, its IP address must be entered into the MicroMMAC-T's Trap Table via local management. or the Remote Administration Tools application. Please refer to the **Remote Administration Tools User's Guide** and/or the **L ocal Management Guide** for your device if you need further information. For information on opening NetSight Element Manager's alarm logging facility, refer to the **Alarm and Event Handling User's Guide.***

Accessing the Alarm Limits Window

To access the Alarm Limits window from the Chassis View window:

1. Click to display the **Network** pull-down menu.

2. In the Network pull-down menu, click on the **Network 1** entry, then drag right and down to select **Alarm Limits...**. The Alarm Limits window (Figure 4-1) will appear.

3. Set the alarm limits as instructed in **Setting Ring-Level Alarm Limits**, below.
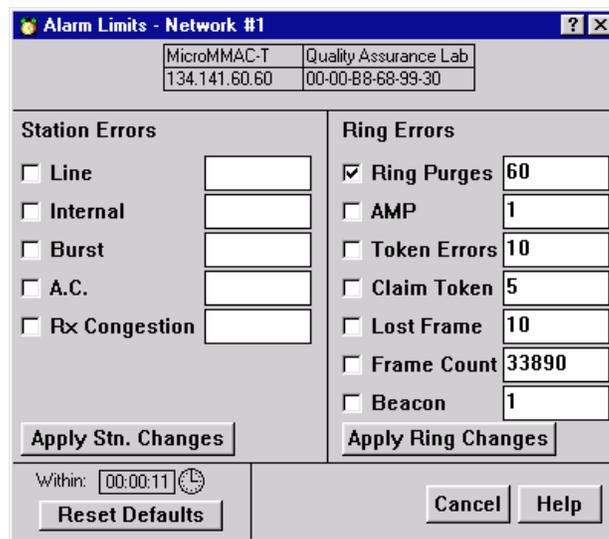
Figure 4-1. The Alarm Limits Window
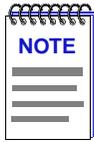
Ring-Level Alarm Limits for Network Events

The following thresholds, listed in the section of the window labeled **Ring Errors**, are based on the number of occurrences of the selected event on the ring within a user-defined time interval.

Ring Purges
The number of times (since the ring network was created or the MicroMMAC-T was last reset) that the ring's active monitor can purge the ring (including purges at the end of the active monitor selection process). Note that the ring purge count is not reset when the active monitor changes. The default value is 70.

AMP
The number of times that a duplicate active monitor can be detected on a ring within the alarm time base before an alarm is triggered.

The default value is 1.

Token Errors	The threshold of errors requiring the management station (while acting as the active monitor) to transmit a token onto the monitored ring before it issues an alarm. The default value is 10.
Claim Token	The number of times that a claim token can be released by ring stations within the given time base before an alarm is triggered. A claim token is released by a ring station when it detects that the active monitor is absent or malfunctioning. Stations receiving the claim token will participate in the monitor contention process to determine a new active monitor. The default value is 5.
Lost Frame	The number of lost frames that the management station transmits onto the monitored ring before triggering an alarm. Lost frames are frames that do not return before the management station's Timer Return to Repeat (TRR) timer expires. These can be caused by stations entering or leaving the ring during frame transmission. The default value is 10.
Frame Count	The number of frames that can be transmitted on the ring within the time base before the alarm limit is reached.
	For a network running at 16 Mbits/sec, the default value is 33,890. This number represents the maximum bandwidth used by 64 byte frames transmitted over the network during the default 10 second alarm time base.
	For a network running at 4 Mbits/sec, the default value is 18,920 (of 64 byte frames).
Beacon	The number of beacons that can be detected on the ring within the time base before the alarm limit is reached. A station transmits a beacon when its monitor contention timer expires, indicating that an Active Monitor could not be elected. Beaconing provides a method for the beaconing station and its NAUN to check their lobe wiring and to begin the monitor contention process if necessary. The default value is 1.

Ring-Level Station Alarms

When you set a ring-level station alarm (using the fields in the section of the window labeled **Station Errors**), the alarm threshold will be applied to all stations inserted into the currently monitored ring network. These values will override any pre-set station-level alarms, so these fields can be used to quickly apply one set of station-level alarm limits to all stations on the ring.

NOTE
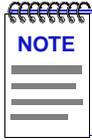
*When the Alarm Limits window is invoked, the **Station Errors** fields do not present any values. This is because it is possible that station-level alarm limits have been set at individual stations (via the Station Alarm Limits window) that may differ from those set at other individual stations or at the ring level. Refer to the Station Alarm Limits windows for individual stations to view their current station-level alarm limits.*

The following thresholds, listed in the section of the window labeled **Station Errors**, are based on the number of occurrences of the selected event detected by the station within a user-defined time interval.

Line
The threshold of line errors detected by the selected station port. These indicate a non-data bit between the starting and ending delimiters of data, or an FCS error. The default value is 2.

Internal
The threshold of recoverable internal errors detected by the selected port, indicating that the Network Interface Card of its attached station may be in marginal operating condition. The default value is 1.

Burst
The threshold of burst errors detected by the selected station port. These signify a bit information-encoding error (no transitions between 0 and 1 over five half-bit times). The default value is 10.

A.C.
The threshold of frames detected by the selected station port that contain errors in the A or C bits. The default value is 2.

Rx Congestion
The threshold at which the port cannot copy a frame addressed to it because of a lack of internal buffering. The default value is 124.

Setting Ring-Level Alarm Limits

To set an alarm:

1. If you wish to alter the default threshold values, place the text cursor into the desired alarm event field, and type in the threshold value.

2. To enable an alarm, click on the checkbox next to the desired alarm event field. An **X** in the checkbox indicates that the alarm is enabled.

3. Click on the clock icon next to the **Within:** field. A New Alarm Timebase text box will appear. In this text box, you enter the time interval for the specified number of events to occur before the alarm is activated.

> **NOTE**
>
> *The time interval set using the New Alarm Timebase textbox will apply to all alarms set in the Alarm Limits and Station Alarm Limits windows. The timebase needs only to be set once to apply to all alarms. You do not need to set the timebase for each separate alarm.*

4. Highlight the **hour**, **minute**, or **second** field, and type the desired interval in each (or click the cursor in the desired field, and click on the appropriate arrow to scroll the interval up or down). Note that the minimum possible time interval is 10 seconds. Any lower time interval entered will default back to the last acceptable time entered.

5. Click on **OK** to return to the Alarm Limits window.

6. To enable any ring-level alarms you have selected for the device, click on **Apply Ring Changes**. To enable any ring-level station alarms selected for the device, click on **Apply Stn. Changes**. Note that if you have set a ring-level station alarm, pop-up messages will inform you as each station is set.

   Click on **Reset Defaults** to restore the default alarm thresholds.

Your MicroMMAC-T alarm limits are now set. When an alarm threshold is exceeded, an alarm will be generated. To view a list of the alarms, check NetSight Element Manager's alarm logging facility. Refer to the ***Alarm and Event Handling User's Guide*** for more information on viewing the alarm logging facility.

Station-Level Alarm Limits

You may also set Station-level alarm limits for individual stations on the currently monitored ring network via the Chassis View Station Port menus, the Station List window, or the Station Map. Note that setting Station-level alarms using the Station Alarm Limits window will override any pre-set station alarms. See Chapter 5, **The Station List and Station Map**, for more information on the Station List window and the Station Map.

Accessing the Station Alarm Limits Window from the Port Menu

To access the Station Alarm Limits window via the Chassis View Station Port menu:

1. In the Chassis View window, click on any **inserted** station port on one of the board displays. The Port pull-down menu will appear.

2. Click on **Alarm Limits...**. The Station Alarm Limits window (Figure 4-2) will appear.

3. Set the station alarm limits as instructed in the **Setting Station-Level Alarm Limits** section, below.

Accessing the Station Alarm Limits Window from the Station List

To access the Station Alarm Limits window via the Station List window:

1. Click to display the **Network** pull-down menu.

2. In the Network pull-down menu, click on the **Network 1** entry, then drag right and down to select **Station List**. The Station List window will appear.

3. Click on the **Alarm Limits** radio button in the lower left of the window.

4. Double-click on the station for which you want to set alarms. The station will be highlighted to show it is selected. The Station Alarm Limits window (Figure 4-2) will appear.

5. Set the station alarm limits as instructed in the **Setting Station-Level Alarm Limits** section, below.

Accessing the Station Alarm Limits Window from the Station Map

To access the Station Alarm Limits window via the Station Map:

1. Click to display the **Network** pull-down menu.

2. In the Network pull-down menu, click on the **Network 1** entry, then drag right and down to select **Station Map**. The Station Map will appear.

3. Click on the station icon in the map representing the station for which you wish to set station alarm limits. The Station Command menu will appear.

4. In the Station Command menu, click on **Alarm Limits...**. The Station Alarm Limits window (Figure 4-2) will appear.

5. Set the station alarm limits as instructed in the **Setting Station-Level Alarm Limits** section, below.
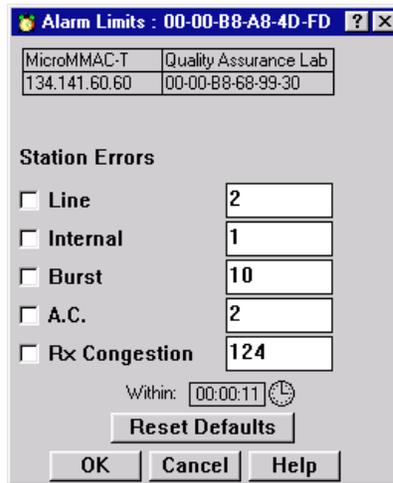
Figure 4-2. The Station Alarm Limits Window

Setting Station-Level Alarm Limits

To set an alarm for an individual station on the ring:

1. Place the text cursor into the desired alarm event field, and type in the threshold value.

2. To enable an alarm, click on the checkbox next to the desired alarm event field. An **X** in the checkbox indicates that the alarm is enabled.

3. Click on the clock icon next to the **Within:** field. A New Alarm Timebase text box will appear. In this text box, you enter the time interval for the specified number of events to occur before the alarm is activated.

| NOTE | *The time interval set using the New Alarm Timebase textbox will apply to all alarms set in the Station Alarm Limits window. The timebase needs only to be set once to apply to all alarms for the station. You do not need to set the timebase for each separate alarm.* |

4. Highlight the **hour**, **minute**, or **second** field, and type the desired interval in each (or click the cursor in the desired field, and click on the appropriate arrow to scroll the interval up or down). Note that the minimum possible time interval is 10 seconds. Any lower time interval entered will default back to the last acceptable time entered. Click on **OK** to return to the Alarm Limits window.

5. Click on **OK** to enable all selected alarms for the station.

    Click on **Reset Defaults** to restore the default alarm thresholds.

Your station alarm limits are now set. When an alarm threshold is exceeded, an alarm will be generated. To view a list of the alarms, check NetSight Element Manager's alarm logging facility. Refer to the ***Alarm and Event Handling User's Guide*** for more information on viewing the alarm logging facility.

The Station List and Station Map

The Station List window and fields; viewing station statistics; removing a station from the ring; the Station Map; the Station Command menu; manipulating the Station Map

The Station List window conveniently allows you to view statistics and configure the stations on the currently monitored ring network.

The Station Map graphically illustrates the ring configuration in downstream neighbor order from the currently monitored MicroMMAC-T, and provides address information for individual stations inserted into the ring.

Both windows also allow you to access statistics, timer statistics, and performance graphs for each inserted ring station (including the MicroMMAC-T's onboard management station), and also remove stations from the ring.

You can also set alarm limits for individual stations through the Station List and Station Map windows.

The Station List Window

At the MicroMMAC-T Station List window (Figure 5-1), you can view each station on the ring network supported by the MicroMMAC-T (including stations physically attached to another device that are on the ring) in ring order starting from the MicroMMAC-T's management station. Using this window, you can view statistics for each station on the monitored ring, as well as temporarily remove a station port from the ring network, and set alarm limits for individual stations.

To access the Station List window, select **Station List...** from the **Network** menu on the MicroMMAC-T Chassis View window.
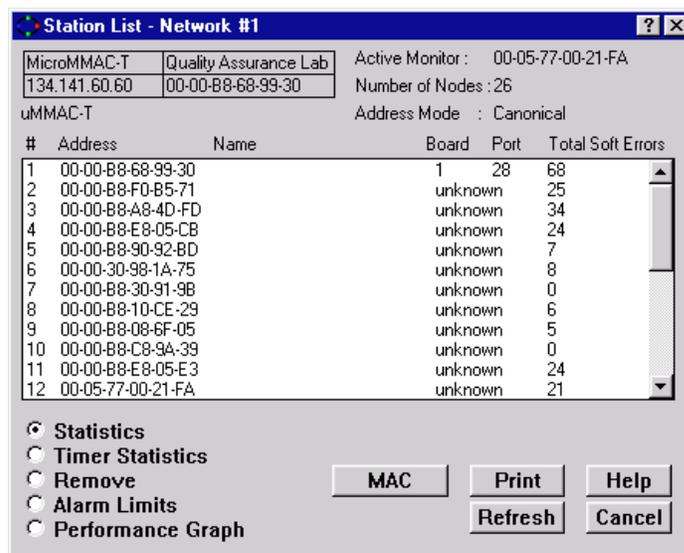
Figure 5-1. The Station List Window

Station List Window Fields

The Station List window contains the following fields:

General Fields

Active Monitor
The physical address of the current active monitor on the ring you are monitoring. Note this address always displays in Canonical format.

Number of Nodes/Stations
The number of stations inserted into the ring that you are monitoring.

Address Mode
The Address Mode display of the listed stations, as selected by the MAC button at the bottom of the window. This field displays either MAC (Ethernet format) or Canonical (Token Ring format). Note that the label on the Address Mode button will display the address mode *not* currently in use.

Station Fields

 # (Station Number)
The numerical order of the station in downstream relation from the MicroMMAC-T management station.

MAC Address
The address of the station in Token Ring (Canonical) or Ethernet (MAC) format.

Name
The name assigned to the station through remote management. You can assign this name via the Station Statistics window, as described in the **Token Ring Statistics** chapter of this guide.

Board
The board index to which the station is attached. If a station is not attached to the MicroMMAC-T, this field will list "unknown," since no link is detected to the MicroMMAC-T itself.

Port
The port index into which the station is inserted. Note that if the station is not attached to the MicroMMAC-T, this field will list "unknown," since no link is detected to the MicroMMAC-T itself.

Total Soft Errors
The total number of soft errors detected by the station.

Viewing Station Statistics

To view Statistics for a station:

1. Click on the **Statistics** radio button at the bottom left of the window.

2. Double-click on the station for which you want to view Statistics. The station will be highlighted to show it is selected. The TR Management Station Statistics window will appear if you have selected the MicroMMAC-T, or the Station Statistics window will appear if you have selected a ring station.

For a complete explanation of these windows, refer to **The TR Management Station Statistics Window** and **The Station Statistics Window**, in the **Token Ring Statistics** chapter of this guide.

Viewing Station Timer Statistics

To view Station Timer Statistics:

1. Click on the **Timer Statistics** radio button at the bottom left of the window.

2. Double-click on the station for which you want to view Timer Statistics. The station will be highlighted to show it is selected, and the Station Timer Statistics window will appear.

For a complete explanation of this window, refer to ***The Station Timer Statistics Window***, in the **Token Ring Statistics** chapter of this guide.

Note that you can also view Timer Statistics for the MicroMMAC-T Management Station via this method.

Removing a Station from the Ring

When you use the Remove radio button, the MicroMMAC-T sends a Remove MAC Frame to the selected station. Upon receiving this frame, the station will perform a loopback test to verify that its MAC adapter is functioning correctly.

If the station fails the loopback test, it will stay off the ring. If it passes the test, its actions will depend on the adapter's manufacturer. Cabletron DNI cards (and some others) will reinsert into the ring automatically. IBM adapters (and others) will remove themselves from the ring until the station is re-booted.

Note that you cannot remove the MicroMMAC-T Management Station from the ring.

To remove a station from the monitored ring:

1. Click on the **Remove** radio button in the lower left of the window.

2. Double-click on the station which you want to remove from the ring. The station will be highlighted to show it is selected. The selected station will be removed from the ring network, and the port will switch to Link condition.

Setting Station Alarms

Using the Alarm Limits radio button you can invoke the Station Alarm Limits window, where you can configure and set alarms that will notify your management station of specified levels of errors reported by individual stations on your ring network.

To invoke the Station Alarm Limits window:

1. Click on the **Alarm Limits** radio button at the bottom left of the window.

2. Double-click on the station for which you want to set the alarm limits. The station will be highlighted to show it is selected. The Station Alarm Limits window will appear.

Refer to Chapter 4, **Token Ring Alarms**, for full information on setting station alarm limits.

Viewing the Station Port Performance Graph

Using the Performance Graph radio button you can invoke the Port Performance Graph, which provides real-time statistics reporting. The color-coded strip charts allow you to visually track the performance of the selected station. Each strip chart graph shows you the amount of traffic going through the station port, as well as the number of errors experienced at the particular port.

To view a station's performance graph:

1. Click on the **Performance Graph** radio button at the bottom left of the window.

2. Double-click on the station for which you want to view the performance graph. The station will be highlighted to show it is selected. The Port Performance Graph will appear.

Refer to Chapter 3, **Token Ring Statistics**, for full information on viewing the Port Performance Graph.

Using the MAC/Canonical Button

To switch the station address display between MAC (Ethernet) and Canonical (Token Ring) format, click on the **MAC/Canonical** button at the bottom of the window. The address field of each listed station will reflect the current selection. Note that the button itself will display the address mode ***not*** currently in effect.

Printing the Station List

To print the contents of the Station List, click on the **Print** button at the bottom of the screen. An ASCII file containing the number, address, name, board and port index, and error information will be spooled to the Microsoft Windows print manager.

Resetting Counters

To reset all error and performance counters for the current ring managed by the MicroMMAC-T, click on the # (Station Number) symbol atop the station index number column. A dialog box will appear showing the last reset time (if any) and "Reset All Counters Now?". Click on **OK** to reset the counters. The error and performance counters will be reset to their initial values.

This will reset all Network Statistics counters to zero (for statistics gathered from all stations on the currently monitored ring that are attached to the MicroMMAC-T-controlled hub). It will also reset individual stations' error and performance counters (seen in the Station Statistics windows) for stations attached to the currently monitored ring.

Although statistics are only reset for the stations attached to the currently monitored hub, the reset will be reflected in all station lists for a ring spanning more than one hub.

> ⚠️ **CAUTION**
>
> *Resetting the counters effectively "wipes" the error history of the MicroMMAC-T since it was last reset. Be aware of others monitoring the ring.*

The Station Map

The Station Map window (Figure 5-2) graphically illustrates the ring configuration in downstream neighbor order with respect to the currently monitored module, and displays address information for individual stations inserted into the ring. It also allows you to access statistics or timer statistics for each inserted ring station, including the MicroMMAC-T's onboard management station. You can also use the window to remove stations from the ring, and set station alarm limits.
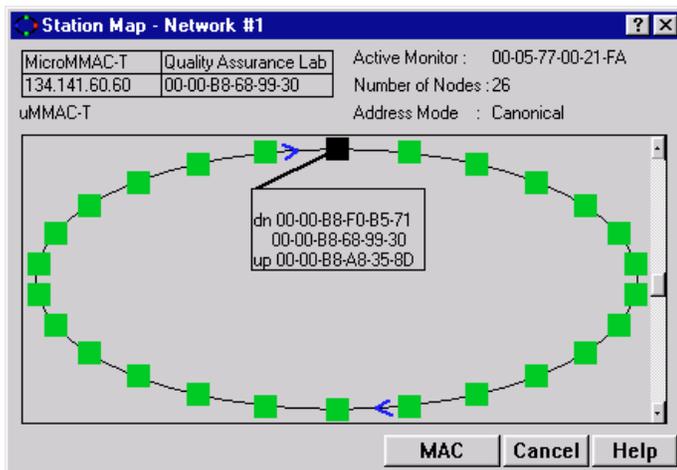
Figure 5-2. The Station Map Window

Note that this map will update automatically to reflect a change in the ring network (e.g., a station removing itself from or inserting into the ring).

To access the Station Map, select **Station Map...** from the **Network** menu on the MicroMMAC-T Chassis View window. The Station Map window will appear.

Station Map Window Fields

Active Monitor
Indicates the physical address of the Active Monitor on the ring. Note this address always displays in Canonical format.

Number of Nodes
Indicates the number of stations currently inserted into the ring.

Address Mode
The Address Mode display of the map stations, as selected by the MAC button at the bottom of the window. This field displays either MAC (Ethernet format) or Canonical (Token Ring format). Note that the label on the Address Mode button will display the address mode *not* currently in use.

Viewing the Station Map

The Station Map window displays your ring in a scrollable panel.

The ring is represented by a single ellipse, with arrows indicating the ring direction. If the default size of the window is sufficient for the number of stations, the ellipse is sized to fit within the panel. However, in a ring with many stations, the size of the ellipse may exceed the window's default size. In this case, you can use the scroll bar to access stations which are out of view, or resize the window.

Each node is graphically represented, in ring order, by a square on the ring. The squares are color coded, with the black square representing the MicroMMAC-T management station, and green squares indicating inserted ring stations.

The selected MicroMMAC-T is initially presented in one of two positions.

• If the entire ring fits in the display panel, the MicroMMAC-T is represented by the topmost (12 o' clock) station square.

• If the ring exceeds the panel size, the MicroMMAC-T is represented by the rightmost (3 o' clock) station square.

The MicroMMAC-T's downstream neighbors are displayed in order, in a clockwise rotation from the management module. Upstream stations are displayed counterclockwise.

Using the mouse, you can access text boxes (see Figure 5-3) which display address information for the selected station and its neighbors. The mouse also brings up a command menu for the station.

Station Pop-up Text Boxes

Station pop-up text boxes display address information for stations on the network. To activate a station text box, use the mouse as follows:

1. Move the mouse to position the cursor over the desired station.

2. Depress the **left mouse button** to activate a text box for the station. A line will appear linking the text box to its station.
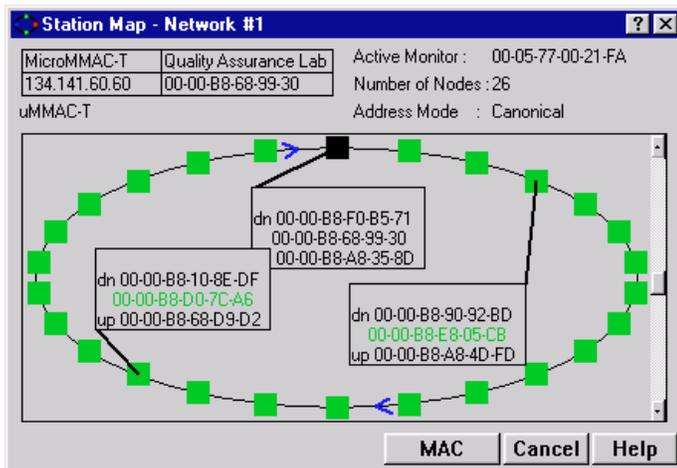
Figure 5-3. Station Map with Text Boxes

3. To position the station text box in the ring map, drag the mouse while depressing the left button. The station text box will reposition in the panel in relation to the cursor drag.

Once you position the station text box as desired, release the left button to fix it in place.

You can make an active text box disappear by positioning the cursor on the box, and pressing the **left mouse button**.

Each station text box contains the following information:

Name
The name assigned to the station through remote management. This field will appear empty if a name has not been assigned. You can assign this name via the Station Statistics window, as described in the **Token Ring Statistics** chapter of this guide.

Dn
The physical address of the selected node's downstream neighbor, if available.

Node Address
The physical address of the selected node.

Up
The physical address of the selected node's upstream neighbor, if available.

The Station Command Menu

You can also use the mouse to bring up a command menu, which will allow you to access Statistics or Timer Statistics specific to the selected station, as well as remove the station from the ring, and invoke the Station Alarm Limits window.

If you double-click the left mouse button with the cursor positioned over the desired station, the pop-up command menu will appear with the following options.

Statistics

Click on this option to bring up the Station Statistics window if a ring station is selected, or the TR Mgmt Station Statistics window if the MicroMMAC-T Management Station is selected. Refer to the **Token Ring Statistics** chapter for information on these windows.

Timer Statistics

Click on this option to bring up the Station Timer Statistics Window if a ring station is selected, or the Timer Statistics window for the MicroMMAC-T's onboard management station, if it is selected. Refer to the **Token Ring Statistics** chapter for information on these windows.

Remove

Click on this option to remove the selected station from the ring so that it can perform a loopback test. When you click this button, the MicroMMAC-T sends a Remove MAC Frame to the selected station. Upon receiving this frame, the station will perform a loopback test to verify that its MAC adapter is functioning correctly.

If the station fails the loopback test, it will stay off the ring. If it passes the test, its actions will depend on the manufacturer of the adapter card. Cabletron DNI cards (and some others) will reinsert into the ring automatically. IBM adapter cards (and others) will remove themselves from the ring until the station is re-booted.

Note that you cannot remove the MicroMMAC-T Management Station from the ring, so this option is grayed-out when the MicroMMAC-T is selected.

Alarm Limits

Click this selection to bring up the Station Alarm Limits window to set alarms at individual ring stations. Refer to the **Token Ring Alarms** chapter for full information on setting station alarm limits.

Performance Graph

Click this selection to invoke the Station Port Performance Graph, which allows you to visually track the performance of the selected station. Refer to the **Token Ring Statistics** chapter for details on the Station Port Performance Graph.

Manipulating the Station Map

You can manipulate the station map by magnifying portions of the map, rotating the ring, or resizing the map window.

Magnifying a Portion of the Map

In a ring with many stations, you may want to magnify portions of the map to facilitate working with individual station text boxes or command menus. You use the mouse to zoom in on a specified portion of the map (Figure 5-4), or to magnify a quadrant of the map.

The following mouse operations will cause the window to zoom as described. Note that once you change the display mode, all individual node text boxes will disappear.
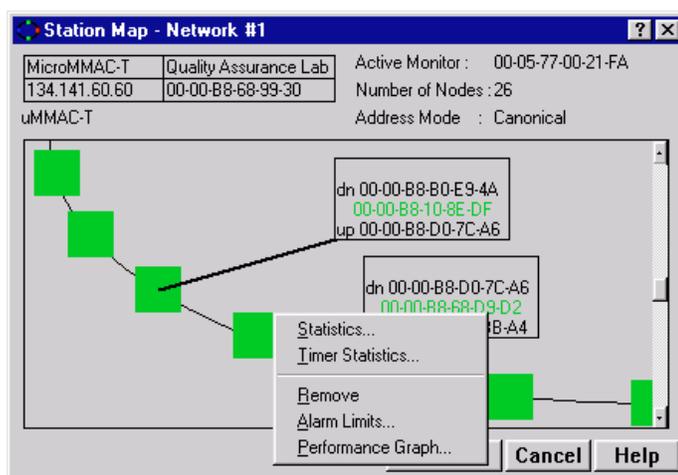
Figure 5-4. Station Map in Zoom Mode (with Command Menu)

Left/Right Button Double-Click When Cursor is Near Station	The display will zoom to the vicinity of that node. This is useful for focusing on a single station or contiguous group of stations. Double-click again to zoom out.
Left/Right Button Double-Click When Cursor is Not Near Station	The display will zoom into the quadrant containing the cursor. A station must be present in the quadrant. Double-click again to zoom out.
Depress, Drag, and Release Right Button	Depressing the button will create a lasso cursor, that expands or contracts as you drag the mouse to encompass the desired nodes. Release the cursor to zoom in on the selected stations. This feature is useful if you wish to view stations on opposite sides of the ring.

Rotating the Station Map

You can use the scroll bar to rotate the station map, as follows and as illustrated in Figure 5-5:
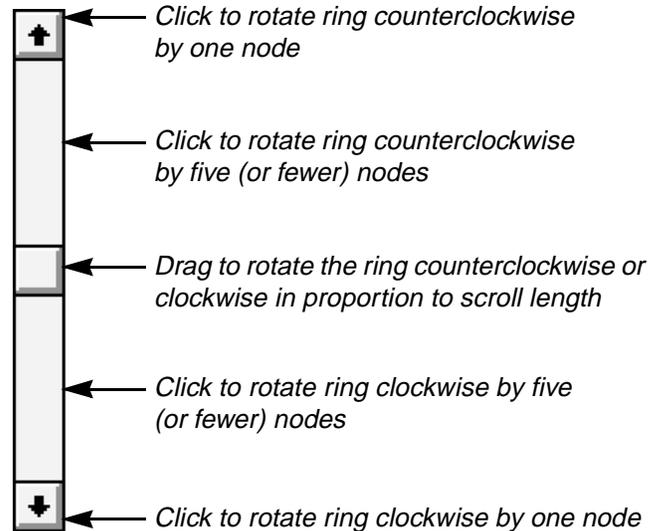
Figure 5-5. Using the Scroll Bar to Rotate the Ring

Scroll Bar Up Arrow	Rotates the ring counterclockwise by one station
Scroll Bar Down Arrow	Rotates the ring clockwise by one station.
Scroll Box	If dragged up, rotates the ring counter-clockwise by a number of stations proportional to the amount of movement.
	If dragged down, rotates the ring clockwise by a number of stations proportional to the amount of movement.
	Once the scroll box reaches its upper or lower limit, you can only continue scrolling in the same direction by using the scroll arrows.
Page Up (Click on Track Above Scroll Box)	Rotates the ring counterclockwise by 5 stations. If there are 5 or fewer stations on the ring, the ring will rotate by the total number of nodes minus one.
Page Down (Click on Track Below Scroll Box)	Rotates the ring clockwise by 5 stations. If there are 5 or fewer stations on the ring, the ring will rotate by the total number of stations minus one.

Resizing the Station Map Window

You can resize the Station Map window just like any other window, by moving the cursor to the window's boundary (the cursor will display as a two-headed arrow), depressing the left mouse button, and dragging to shrink or expand the window. This may cause an adjustment to the size or position of the station squares to reflect the new display area.