IBM

10/100 Ethernet Stackable Hub 8245
Model 012, 024, 112, and 124

Installation and Planning Guide

> **Note:**
>
> Before using this information and the product it supports, be sure to read the safety information under "Safety Information" on page xiii and the general and emission notices in Appendix A.

First Edition (August 1998)

This edition applies to Version 1.0 of IBM 10/100 Ethernet Stackable Hub 8245.

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Safety Information

⚠️ **Danger:** Before you begin to install this product, read the safety information in *Caution: Safety Information–Read This Firs*t, SD21-0030. This booklet describes safe procedures for cabling and plugging in electrical equipment.

⚠️ **Gevarr:** Voodrat u begint met de installatie van dit produkt, moet u eerst de veiligheidsinstructies lezen in de brochure *PAS OP! Veiligheidsinstructies–Lees dit eerst*, SD21-0030. Hierin wordt beschreven hoe u electrische apparatuur op een veilige manier moet bekabelen en aansluiten

⚠️ **Danger:** Avant de procéder à l'nstallation de ce produit, lisez d'abord les consignes de sécurité dans la brochure *ATTENTION: Consignes de sécurité–A lire au préalable,* SD21-0030. Cette brochure décrit les procédures pour câbler et connecter les appareils électriques en toute sécurité.

⚠️ **Perigo:** Antes de começar a instaler deste produto, leia as informações de segurança contidas em *Cuidado: Informações Sobre Segurança–Leia Primeiro*, SD21-0030. Esse folheto descreve procedimentos de segurança para a instalação de cabos e conexões em equipamentos elétricos.

⚠️

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Upozornění: než zahájíte instalaci tohoto produktu, přečtěte si nejprve bezpečnostní informace v pokynech „Bezpečnostní informace" č. 21-0030. Tato brožurka popisuje bezpečnostní opatření pro kabeláž a zapojení elektrického zařízení.

 Fare! Før du installerer dette produkt, skal du læse sikkerhedsforskrifterne i *NB: Sikkerhedsforskrifter – Læs dette først* SD21-0030. Vejledningen beskriver den fremgangsmåde, du skal bruge ved tilslutning af kabler og udstyr.

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 VARRA: Ennen kuin aloitat tämän tuotteen asennuksen, lue julkaisussa *Varoitus: Turvaohjeet–Lue tämä ensin,*SD21-0030, olevat turvaohjeet. Tässä kirjasessa on ohjeet siitä, mitensähkölaitteet kaapeloidaan ja kytketään turvallisesti.

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 Vorsicht: Bevor mit der Installation des Produktes begonnen wird, die Sicherheitshinweise in *Achtung: Sicherheitsinformationen–Bitte zuerst lesen.* IBM Form SD21-0030. Diese Veröffentilchung beschreibt die Sicherheitsvorkehrungen für das Verkabien und Anschließen elektrischer Geräte.

⚠️

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⚠️

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小冊子SD21-0030 の「最初にお読みください」
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⚠️

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equipamentos.

⚠️

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SD21-0030. В этой брошюре описаны безопас-
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　　請先閱讀 - 安全資訊 SD21-0030
　　此冊子說明插接電器設備之電纜線的安全程序。

About This Manual

This manual explains how to install and service the IBM 10/100 Ethernet Stackable Hub 8245, Models 012, 024, 112, and 124.

Who Should Read This Manual

This manual is intended for use by installation technicians, network administrators, and service personnel.

How This Manual Is Organized

- Chapter 1, "Introduction," provides a functional product description and cabling requirements.

- Chapter 2, "Installation," describes installation and cabling procedures.

- Chapter 3, "Control Panel Management," describes how to use the 10/100 Ethernet Stackable Hub control panel.

- Chapter 4, "Using the Management Interface," describes how to use the EIA 232 management port through a local connection.

- Chapter 5, "Using Web Management," describes how to use an Internet web browser to connect to and manage your 10/100 Ethernet Stackable Hub.

- Chapter 6, "Troubleshooting and Service," provides troubleshooting procedures, how to get help from IBM, and procedures for downloading new code.

- Appendix A, "Notices" describes product notices and provides warranty information.

- Appendix B, "Cable Pinout Diagrams" shows cable and pin configurations.

Prerequisite Publication

Caution: Safety Information - Read This First, SD21-0030.

Chapter 1. Introduction

This chapter describes the features of the IBM 10/100 Ethernet Stackable Hub, Models 012, 024, 112, and 124. It provides a functional overview that can help you integrate the 10/100 Ethernet Stackable Hub into your new or existing network.

The 10/100 Ethernet Stackable Hub is a 10BASE-T/100BASE-TX dual-speed intelligent Ethernet hub. The 10/100 Ethernet Stackable Hub consists of 12 and 24 port managed and manageable units with many features that make monitoring, configuring and expanding a LAN easy and efficient.

The 10/100 Ethernet Stackable Hub is designed for use in medium-sized workgroups or remote locations that are part of a large campus network.

The 10/100 Ethernet Stackable Hub series has four models, two managed hubs with 12 or 24 ports (models 112 and 124) and two manageable hubs with 12 or 24 ports (models 012 and 024). One managed hub can manage all the manageable hubs in a stack. Manageable hubs can be stacked without a managed hub and work without management features.

Managed Models

Managed models 112 and 124 display system and port information in the control panel as shown in Figure 1-1 and Figure 1-2.

Figure 1-1   10/100 Ethernet Stackable Hub Model 112

Figure 1-2   10/100 Ethernet Stackable Hub Model 124

Manageable Models

Manageable models 012 and 024 indicate their port status through an LED panel with LEDs for every port indicating link status (Link/Rx) and port speed (10 Mbps/100 Mbps) as shown in Figure 1-3 and Figure 1-4. Utilization is indicated with five graduated LEDs and collisions are indicated with a Collision LED for each segment.

Figure 1-3 10/100 Ethernet Stackable Hub Model 012

Figure 1-4 10/100 Ethernet Stackable Hub Model 024

Product Features

Models 012 and 024 Features

- 12/24 MDI-X 10BASE-T/100BASE-TX ports with shielded RJ-45 connectors
- Two MDI ports that share ports 1 and 12 with shielded RJ-45 connectors
- All ports use UTP/STP cable - category 3, 4, or 5 for 10 Mbps, category 5 for 100 Mbps
- All ports support auto partition/reconnect capability
- All ports support auto polarity reversal
- Jabber protection
- Hub ID indicator is automatically set by stack position
- Compliance with IEEE802.3 10BASE-T standard
- Compliance with IEEE802.3u 100BASE-TX standard
- Compliance with IEEE802.3u 100BASE-FX standard (optional module)
- Compliance with IEEE802.3 repeater standard
- Per port status LED (Link, Rx, and speed)
- Per segment collision LED
- Per segment utilization indicator
- An optional module slot for one of the following modules:
    - A 10/100 bridge with 10BASE-T/100BASE-TX Uplink
    - A 10/100 bridge with 100BASE-FX Uplink
    - An AUI Expansion Module

Models 112 and 124 Features

These models include the features of models 012 and 024 (except LEDs) plus the following features:

- One EIA232 Management Port (DTE male) which supports local console management or out-of-band management
- Network utilization indicators for both 10 Mbps and 100 Mbps segments
- Management function through the control panel
- Support for in-band Telnet, SNMP, and Web-based management capability
- Support for software upgrade capability through the standard TFTP protocol
- Support for RFC1213 MIB-II, RFC1516 Repeater MIB, RFC1757 RMON MIB (Group 1, 2, 3, and 9), and proprietary MIB

- Support for traps to report the hub event to the specified SNMP managers and Web-based manager.

- Group/port control and status monitoring capability

- Statistics counters monitoring capability

- RMON (Group 1, 2, 3, 9) probe capability

- Redundant link capability

- Security (Intrusion) control capability

- Address (source MAC address) tracking capability

- Address (source MAC address) searching capability

- Broadcast storm protection

- BootP Protocol

Functional Characteristics

Figures 1-5 and 1-6 identify the components of the 10/100 Ethernet Stackable Hub.
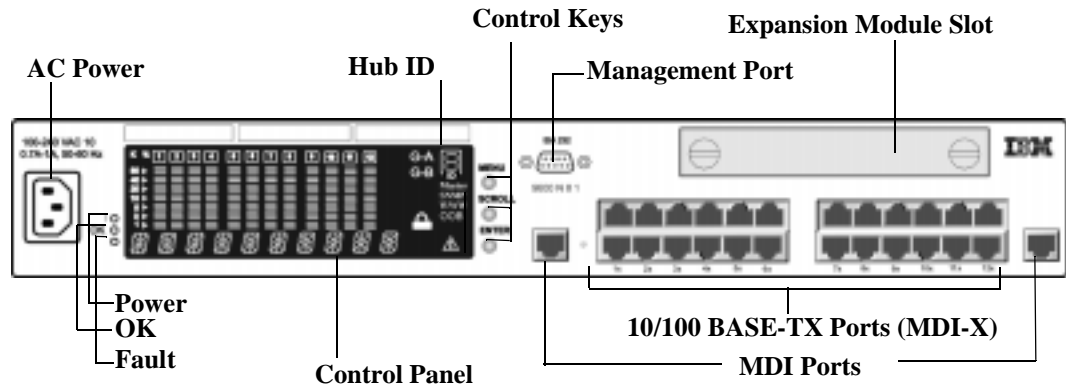
Figure 1-5 Model 124 Front Panel
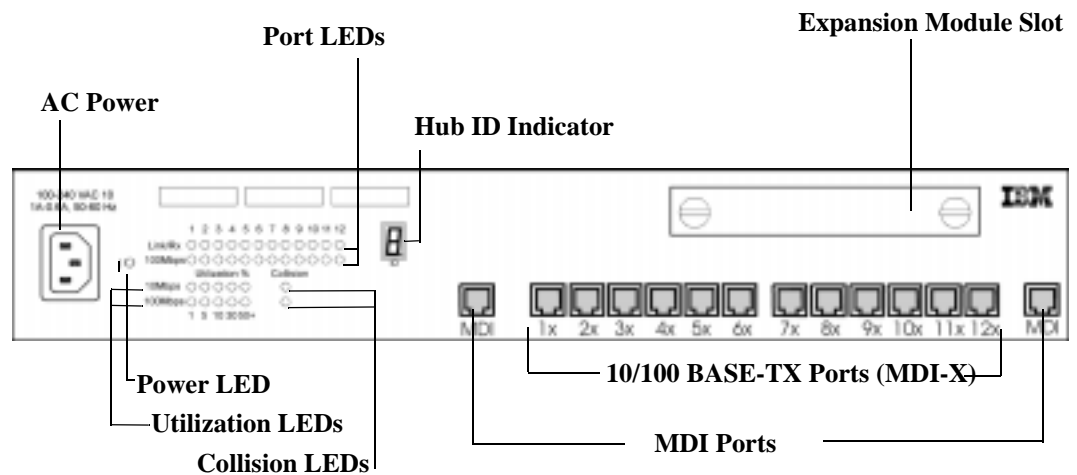
Figure 1-6 Model 012 Front Panel

Status and Activity Indicators

Manageable models 012 and 024 indicate their port status with different colors or flashing LEDs for each port. LED traffic statistic information is indicated with five graduated Utilization LEDs, one for 10 Mbps and another for 100 Mbps communications. Each 10 Mbps and 100 Mbps segment has its own Collision LED.
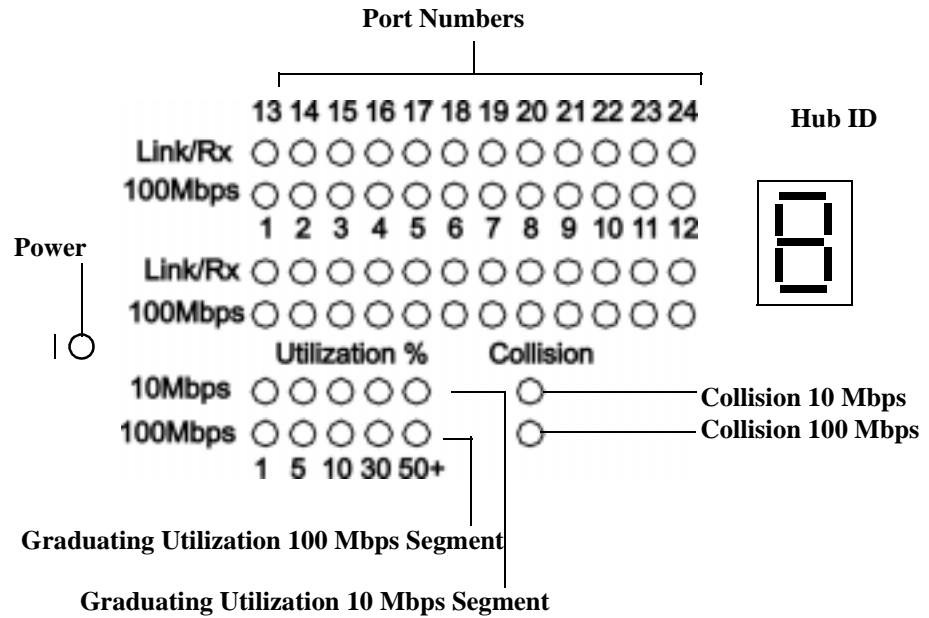
Figure 1-7 LEDs for the manageable models

Table 1-1 LED Indicators and Meanings

LED	Status	Meaning
Power	On	There is power to the hub.
Utilization	On	Indicates percentage of utilization with an array of LEDs. The number below the LED indicates the percentage of hub capacity being used. For example, if all five LEDs are on, the hub is being heavily utilized. Data traffic within the hub is 50% (or more) of its capacity.
Collision	On	Indicates there are collisions on the 10 Mbps or 100 Mbps segment.
Link/Rx	On	The port is linked.
Link/Rx	Blinking	The port is receiving data.
Link/Rx	Off	Indicates this port is in link down state, auto partitioned, or disabled by the administrator.
100 Mbps	On	The port speed is 100 Mbps.
100 Mbps	Off	The port speed is 10 Mbps.

Control Panel

The Control Panel, shown in Figure 1-8, provides overall utilization statistics that allow you to monitor all the ports at a glance, as well as providing detailed error and configuration information by port.
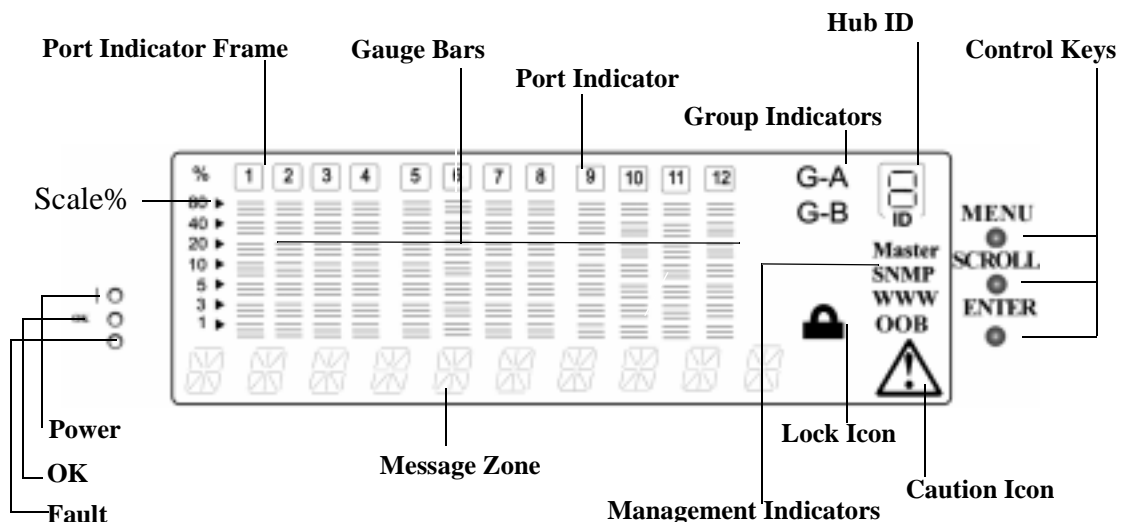
Figure 1-8 Control Panel

Power

    Power LED indicates power is connected.

OK

    Diagnostic OK LED indicates the POST test was run without errors.

Fault

    Diagnostic Fault indicates the POST test found an error.

%

    The relative percentage of utilization or collision. Each port has its own percentage scale.

Port Indicators

    Indicates a port number.

Port Indicator Frame

    Indicates which ports are disabled.

Message Zone

    Displays test messages, the menu items, and status information.

Gauge Bars

    Displays port-related information such as utilization.

Lock Icon

    Indicated that the control panel configuration is locked.

G-A

    Displays status of ports 1 to 12 in Port Group A.

G-B

    Displays status of ports 13 to 24 in Port Group B.

Master

    Indicates that the hub is a managed hub.

SNMP

    Indicates that the hub is SNMP-manageable.

WWW

    Indicates that the Web Management feature is enabled.

OOB

    Indicates that out-of-band is enabled.

CAUTION ICON

    Not used.

Hub ID

The 10/100 Ethernet Stackable Hub ID is automatically set based on the stack position. Each hub that is added to the stack is assigned a Hub ID from 1 to 6 depending on its position in the stack.

Control Keys

The control keys are used to cycle through the menus and make selections.

The following table summarizes the control keys functions.

Table 1-2 Control Keys

MENU	Return to the previous level
SCROLL	Choose another topic within the same level
ENTER	Go to the next level, view status, or confirm the configurable settings.

Communication Ports

- Ethernet Ports - 12/24 MDI-X 10BASE-T/100BASE-TX Ethernet. All ports use UTP/STP category 3, 4, or 5 cables with RJ-45 connectors for 10 Mbps and Category 5 for 100 Mbps.

- MDI Ports - two shared ports; one shared with Port 1 and one shared with Port 12. The MDI ports take priority when shared with ports 1 and 12. These ports use UTP/STP category 3, 4, or 5 cables with RJ-45 connectors for 10 Mbps and Category 5 for 100 Mbps.

- Expansion Ports - One expansion slot located on the front panel. This slot allows you to add a 100BASE-FX uplink, 10BASE-T/100BASE-TX Uplink, or an AUI Expansion Module.

Management Port

The management port is an EIA 232 (formerly RS232-C) serial interface that is used to configure the 10/100 Ethernet Stackable Hub. A terminal emulator can be connected to this port for local console or out-of-band (SLIP) management.

For a VT-100 terminal connection to the management port, the following settings are required:

- **Baud rate:** 9600 bps
- **Character size:** 8 data bits per character
- **Stop bits:** 1 stop bit
- **Parity bit:** no parity

For out-of-band (SLIP) management, the management port can be configured using the local console/remote Telnet, the Web-based manager, or the SNMP manager.

- **Baud rate:** 2400 bps, 4800 bps, 9600 bps, or 19200 bps
- **Character size:** 8 data bits per character
- **Stop bits:** 1 stop bit
- **Parity bit:** no parity

Optional Modules

Three types of expansion modules are available for the 10/100 Ethernet Stackable Hub. These modules can be inserted into the expansion slot which is located on the front panel of the 10/100 Ethernet Stackable Hub.

- A 10/100 Bridge with 10BASE-T/100BASE-TX Uplink as shown in Figure 1-9.

  - Supports store and forward and back-pressure for both internal and external bridges

The TX Module's internal bridge enables the hub to pass data between 10 Mbps and 100 Mbps segments. The external bridge allows you to cascade other stacks through its 10/100-TX Uplink.

- A 10/100 Bridge with 100BASE-FX Uplink as shown in Figure 1-10.

  - Supports store and forward and back-pressure for both internal and external bridges

The FX Module's internal bridge enables the hub to pass data between 10 Mbps and 100 Mbps segments. The external bridge allows you to cascade other stacks through its FX Uplink using fiber cable. FX connections allow cable lengths up to 2 km (1.2 mi) when operating in full-duplex mode and 412 m (1352 ft) when operating in half-duplex mode.

- An AUI Expansion Module as shown in Figure 1-11.

  - Attaches to the 10 Mbps segment and supports half-duplex mode.

Figure 1-9 10/100 Bridge with 10BASE-T/100BASE-TX Uplink

Figure 1-10 10/100 Bridge with 100BASE-FX Uplink
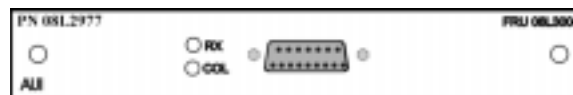
Figure 1-11 AUI Expansion Module

Physical Characteristics and Requirements

Power Requirements

- A standard ac power cord.
- Input voltage: 100 V ac to 240 V ac.
- Input frequency: 50 Hz to 60 Hz.
- Input current max: 1 A at 100 V ac or 0.7 A at 240 V ac.

Operating Environment

Table 1-3 Operating Environment

Environment	Ambient Temp	Relative Humidity	Wet Bulb Temp
Power on	10° to 40° C (50° to 104° F)	8 to 80%	27° C
Storage	-25° to 70° C (-13° to 158° F)	5 to 80%	29° C
Shipment	-40° to 60° C (-40° to 140° F)	5 to 100%	29° C

Physical Dimensions

Table 1-4 Physical Dimensions

Width	439.4 mm (17.3 in) 1.5U rack mountable
Height	64 mm (2.5 in)
Length	217 mm (8.5 in)
Weight for models 012, 024	3.6 kg (7.9 lb)
Weight for models 112, 124	3.8 kg (8.4 lb)

Power Dissipation

47 watts maximum (160 BTU per hour).

dB Rating

40 dB

EMC Certifications

- FCC Class A
- CISPR-22 Class A

Safety Certifications

- UL 1950
- CSA
- IEC 950
- CB Bulletin

Chapter 2. Installation

This chapter describes installation procedures. Before installing the 10/100 Ethernet Stackable Hub, be sure to read the "Safety Information" on page xiii and the notices and warranty information in Appendix A, "Notices."

Installation Summary

Table 2-1 10/100 Ethernet Stackable Hub Installation Procedures

Step	Procedure	Reference
1.	Read the safety information booklet shipped with the 10/100 Ethernet Stackable Hub	SD21-0030
2.	Unpack the 10/100 Ethernet Stackable Hub	"Unpacking Instructions"
3.	Rack-mount the 10/100 Ethernet Stackable Hub	"Rack Mounting the 10/100 Ethernet Stackable Hub" on page 2-2
4.	Perform power-on checkout	"Power-On Checkout" on page 2-2
5.	Install an Expansion Module	"Installing an Optional Module" on page 2-3
6.	Connect the Cables	"Cabling" on page 2-5
7.	Configure the 10/100 Ethernet Stackable Hub	"Connecting Null Modem Cable to the Management Port" on page 2-6

Unpacking Instructions

Step 1. Verify that the following items are in the package along with this manual:
- An Ethernet Stackable Hub
- 2 rack mounting brackets and 8 screws
- A power cord
- A Stack Link Cable
- 8245 Quick Reference Guide (preinstalled in the card tray beneath the Ethernet Stackable Hub)
- Safety Manual

Step 2. Visually inspect the unit to ensure that it was not damaged during shipping. If any items are missing or damaged, contact your place of purchase.

Rack Mounting the 10/100 Ethernet Stackable Hub

Follow these steps to mount the 10/100 Ethernet Stackable Hub in a rack:

Step 1. Install the two mounting brackets to the sides of the Ethernet Stackable Hub using the brackets and screws provided.

Step 2. Insert the hub into a 19-inch rack.

Note: Ensure that the ventilation holes are not obstructed. The rack-mounting screws are not provided.
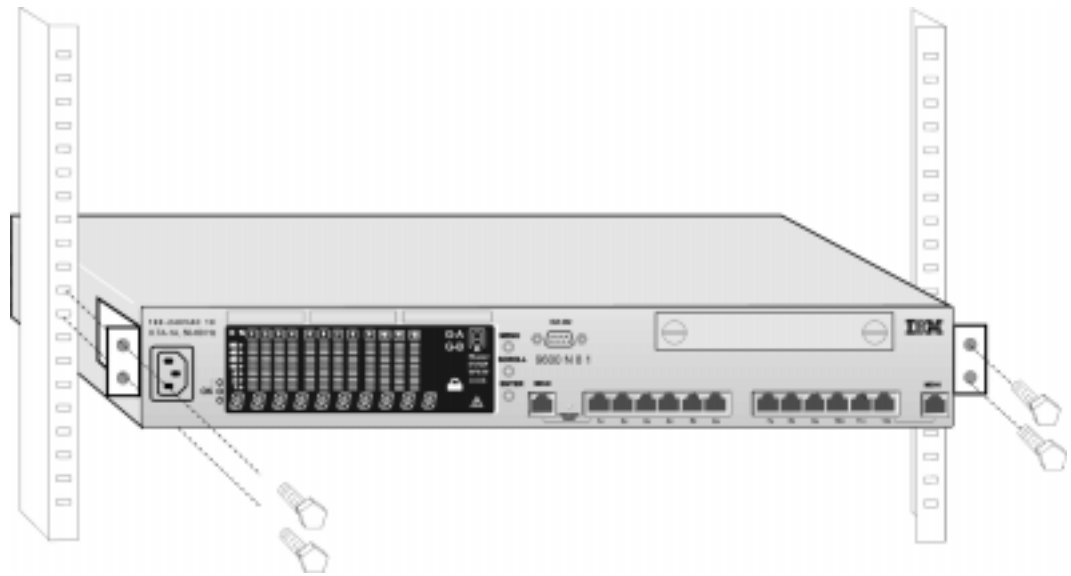
Figure 2-1 Rack Mounting the 10/100 Ethernet Stackable Hub

Power-On Checkout

Connect the ac power cable from the front panel to the power source. This powers on the Ethernet Stackable Hub.

When the Ethernet Stackable Hub is powered-on, it runs a Power On Self-Test (POST). Tests such as NMU MODE, TEST EEPROM, and TEST NIC are run. A display area on the control panel called the *message zone* indicates the particular test being run. If all the tests pass, a final result SELF TEST OK is displayed in the message zone. After the POST completes, the control panel defaults to UTILIZATION status. If a test detects an error during the POST, an error message is displayed. See Chapter 6, "Troubleshooting and Service," for more information on error messages.

Installing an Optional Module

Power down the Ethernet Stackable Hub before installing an expansion module.

Three optional bridge modules are available for the 8245 10/100 Ethernet Stackable Hub—10/100 Bridge with 10/100-TX Uplink Module (PN 08L2975), 10/100 Bridge with 100BASE-FX Uplink Module (PN 08L2972) and AUI Expansion Module (PN 08L2977). The 100BASE-FX use SC-type connectors with multi-mode fiber.
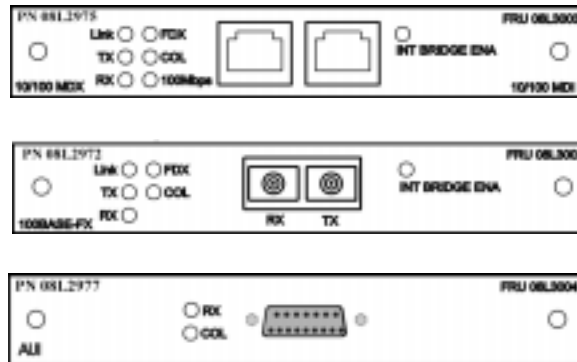
Figure 2-2 10/100 Bridge with 10/100-TX Uplink Module, 10/100 Bridge with 100BASE-FX Uplink Module and AUI Expansion Module

To install these modules, perform the following steps.

Notes:

1. These modules are not hot-swappable. You must remove power from the 8245 before installing or replacing a bridge module.

2. You should enable the internal bridge on only one bridge module when you have multiple bridge modules installed in a stack. This prevents a network loop condition.

3. The 10/100 Bridge with 10/100-TX Uplink and the 10/100 Bridge with 10/100-FX Uplink modules are shipped with the internal bridge disabled.

Step 1. Set the DIP Switch for the internal bridge. See Figure 2-3 and 2-4 for the correct switch settings.

DIP Switch Setting for the 10/100 Bridge with 10/100-TX Uplink Module

DIP 1 to 4 set to ON to enable the internal bridge.

DIP 5 to 8 Not used.
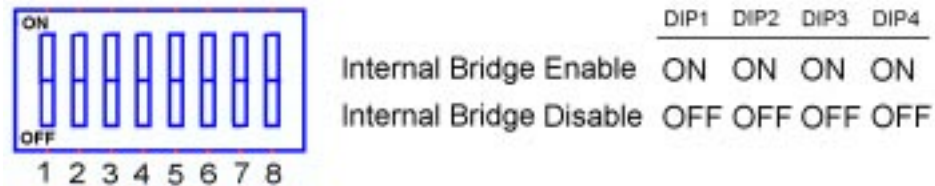
Figure 2-3 TX Module DIP Switch Setting

DIP Switch Setting for the 10/100 Bridge with 100BASE-FX Uplink Module

DIP 1 to 4 set to ON to enable the internal bridge.

DIP 5 set to ON to enable FX half duplex or set to OFF for full duplex.

DIP 6 to 8 Not used.
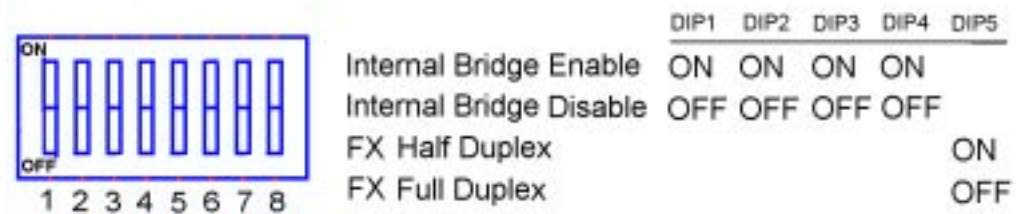
Figure 2-4 FX Module DIP Switch Setting

Step 2. Remove the power from the 8245 by disconnecting the power cable from the ac outlet.

Step 3. Remove the installed bridge module or blank cover by turning the two knobs on the front counterclockwise as shown in Figure 2-5.

Figure 2-5 Removing the Blank Module Panel

Step 4. Insert the new module, ensuring that the edges slide through the guides, as shown in Figure 2-6.
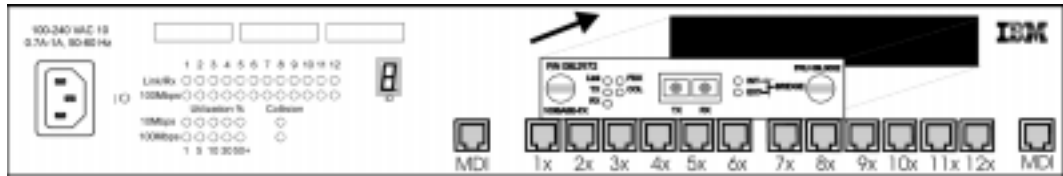
Figure 2-6 Insert the Module

Step 5. Turn the two knobs on the new bridge module until they are securely attached to the 8245.

Step 6. Connect the appropriate communication cable to the new module.

Step 7. Reconnect the ac power cord to the wall outlet.

For information about attaching cables to the newly installed expansion module, see "Cabling" on page 2-5.

Cabling

Cable Tips:

- Avoid stretching or bending cables.

- Avoid routing cables near potential sources of electromagnetic interference, such as motorized devices or fluorescent lights.

- Route cables away from aisles and walkways to avoid creating trip hazards. Use floor cable covers to secure cables if such routes cannot be avoided.

Attaching Cables to Ports

Step 1. Refer to your network documentation to determine each cable's port or expansion slot assignment.

Step 2. Using appropriate connectors, connect the cables to the ports or expansion slots.

Step 3. Start by labeling each end of the cable. This will simplify network troubleshooting later. As a minimum, we suggest a label contain:

At the Hub end of the cable

- A unique identifier for the cable
- Location of the far end of the cable
- MAC address of the device at the far end of the cable

At the opposite end of the cable

- The port number to which the cable is attached

Connecting Null Modem Cable to the Management Port

To access the Ethernet Stackable Hub, perform the following:

Step 1. Connect one end of a null modem cable (direct connection) to the 10/100 Ethernet Stackable Hub management port labeled EIA 232, see Figure 2-7.

Step 2. Connect the other end to the communication port on your PC.

For information on setting up a session through the management port, see "Setting Up a Management Session" on page 4-1.
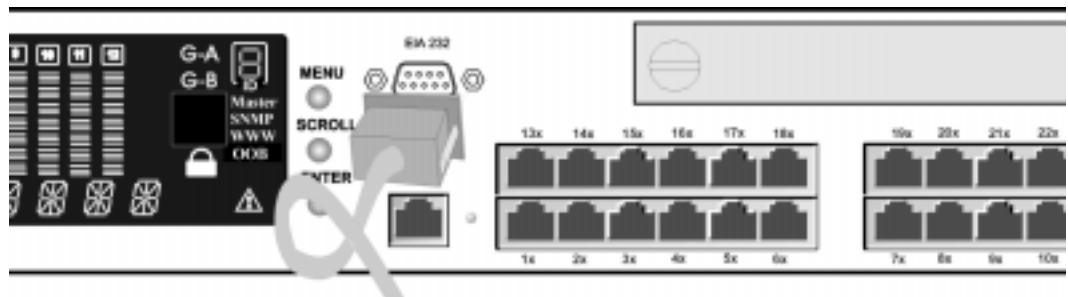
Figure 2-7 Connecting to the Management Port.

Ethernet Connections

To connect a workstation to the 10/100 Ethernet Stackable Hub, connect one end of the UTP/STP cable to a workstation's Ethernet RJ-45 port and the other end to a port on the hub.
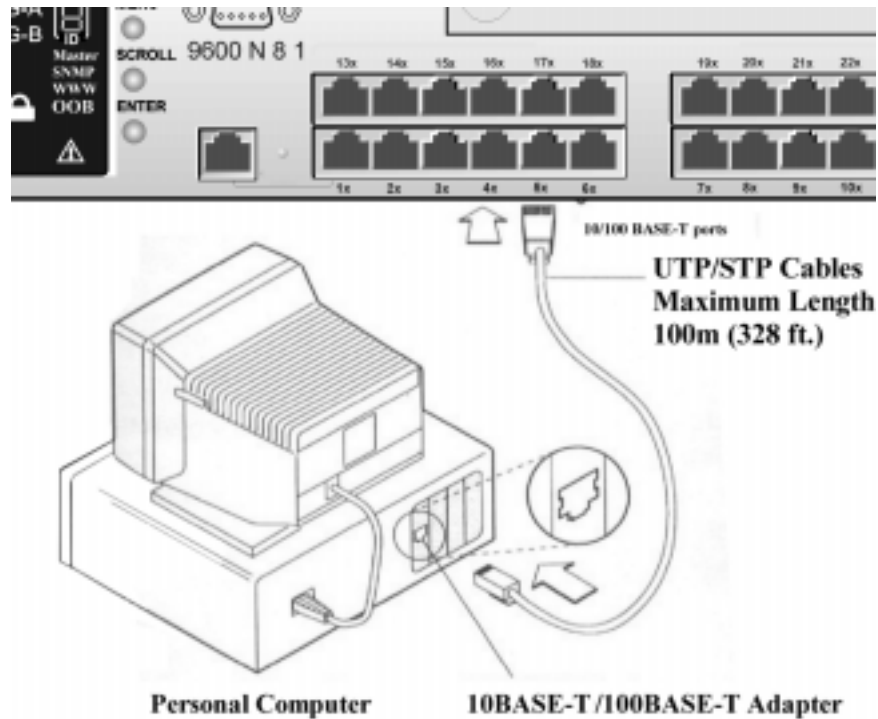
Figure 2-8 Connecting Workstations

Maximum length of cable between the Ethernet Stackable Hub and other devices is 100 m (328 ft).

Connecting a Modem

Connect one end of a serial cable (direct connection) to a modem and the other end to the management port of the 10/100 Ethernet Stackable Hub.

Cables and Distances between Devices

Devices attached to the front of the 10/100 Ethernet Stackable Hub using UTP/STP category 3, 4, or 5 cabling follow the rules established in the IEEE 802.3 standard for 10BASE-T Ethernet implementation.

Straight-Through Cables

All the front panel ports, including the MDI ports, use straight-through cables to attach devices.

Crossover Cables

Crossover cables are used when linking MDI to MDI ports or MDI-X to MDI-X ports.

Maximum Cable Lengths

Table 2-2 lists the maximum recommended cable lengths between the 10/100 Ethernet Stackable Hub and workstations.

Table 2-2 Recommended Maximum Cable Lengths

Ethernet Type	Maximum Segment Length
10BASE-T	100 m (328 ft)
100BASE-TX (Hub to Workstation)	100 m (328 ft)
100BASE-TX (Hub to Hub via repeater ports)	5 m (16.4 ft)
100BASE-TX (Hub to Hub via bridge modules)	100 m (328 ft)
100BASE-FX	Half Duplex - 412 m (1352 ft) Full Duplex - 2000 m (6560 ft)

Cabling Requirements

10BASE-T ports will operate correctly on any of the following cables:

- Category 3, 4, or 5, 100-ohm UTP or STP cable and connection hardware as specified in the ANSI/TIA/EIA 568-A or CSA T529 standards.

- 150-ohm STP-A cable and components as specified in these standards.

- IBM Cabling System types 1, 6, and 9, 150-ohm STP-A cable. If you are using 150-ohm cabling systems, impedance matching devices must be used in conjunction with the cable.

- Category 3, 4, or 5, 100-ohm and 120-ohm, balanced, shielded or unshielded cables and components, as specified in the ISO/IEC 11801 standard.

- 150-ohm, balanced, shielded or unshielded cables and components as specified in the ISO/IEC 11801 standard.

- Any link that meets the specifications of a Class D link. If you are using 150-ohm cabling systems, impedance matching devices must be used in conjunction with the cable.

Notes:

1. All devices connected to the cables must be grounded.
2. Do not use telephone extension cables in 10BASE-T networks. The wire pairs in those cables are not twisted and the cable does not meet other requirements for use in a 10BASE-T network.

100BASE-TX ports require the following cable:

- Class II Hub Category 5 UTP or STP cable.

Cabling Requirements for 10/100 Bridge with 10BASE-T/100BASE-TX Module

This module incorporates two RJ-45 connectors, one MDI-X and one MDI. The MDI-X port performs an internal crossover function that allows easy connection to other devices using standard straight-through cables. The MDI ports do not have the internal crossover function, permitting connection to devices having an internal crossover function using standard straight-through cables.

Note: Maximum cable length specifications are outlined in "Maximum Cable Lengths" on page 2-8. For connection to 100BASE-TX networks, you can only use category 5 cables.

Cabling Requirements for 10/100 Bridge with 10/100BASE-FX Module

This module incorporates two SC-type connectors, one RX and one TX, that require multimode fiber cable.

Stacking Hubs with Stack Link cables

Hubs can be stacked by using Stack Link Cables (PN 25L4900). This cable extends the number of ports on a segment beyond the limit afforded by a single hub. You can stack up to six Ethernet Stackable Hubs using Stack Link cables.

Removing and Replacing a Hub from the Stack

Follow the procedure to add or remove an Ethernet Stackable Hub from the stack:

Attention: **Care must be used in connecting and disconnecting the stack link cables to prevent accidental bending or breaking of the signal pins.**

Notes:

1. Make sure the power to each hub is disconnected.
2. Connect the lower connector (B) at the rear panel of the first hub and to the upper connector (A) of the hub below it as shown in Figure 2-9 on page 2-10.

3. Continue with Step 2 until all hubs are connected. You may connect up to six hubs in a stack.

4. Connect power to each hub.

To remove a hub from the stack, power down the stack, disconnect the cables from the hub, remove the hub and re-connect cables to other hubs.

Note: The managed hub can be positioned anywhere in the stack.
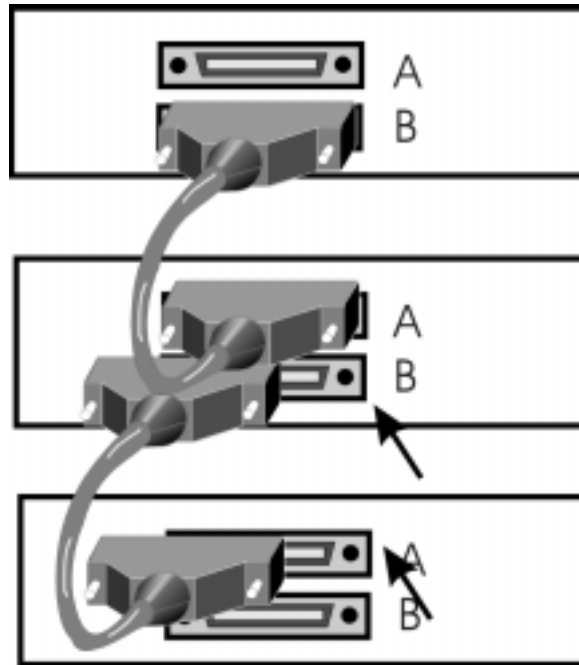
Figure 2-9 Stacking hubs with Stack Link Cable

Cascading Ethernet Hubs

The best way to appreciate the benefit of stacking hubs is to examine the method of interconnection used by simpler Ethernet workgroup hubs, which interconnect by cascading. Cascaded hubs are in the same collision domain. Figure 2-10 shows four Ethernet workgroup hubs labeled A, B, C and D. Hub B and Stack C are cascaded from Stack A. If using straight through cables, you would attach one end to a MDI port on stack A to a MDI-X port on hub B, another to a MDI-X port on stack A to a MDI port on stack C, and so forth. See Figure 2-10 for an example using straight through cables. Crossover cables are needed for MDI to MDI and MDI-X to MDI-X connections.
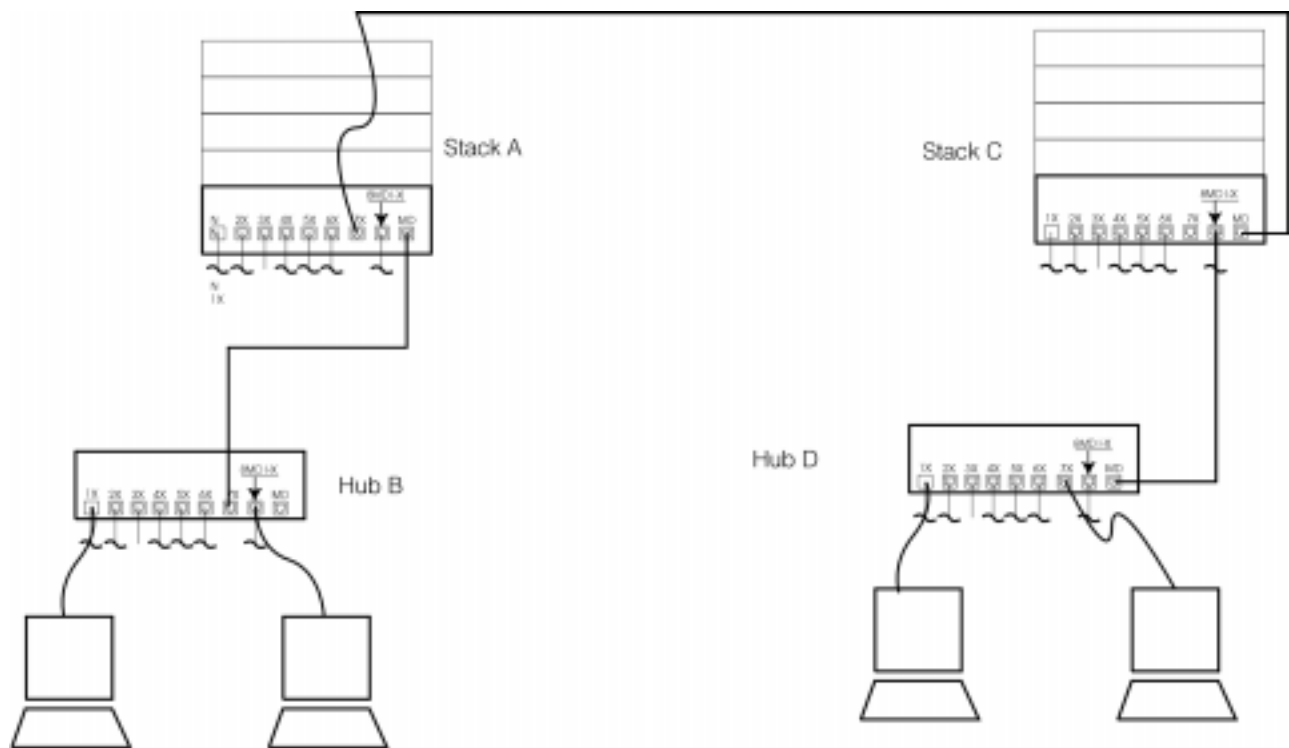
Figure 2-10 Cascading Ethernet Hubs

Because data sent from the workstation on Hub B must pass through four hubs along the way to the workstations on Hub D, the workstation on Hub D is said to be four repeater hops from the workstation on Hub B. A repeater hop is counted whenever an Ethernet frame passes through a repeater. A stack of up to six 10/100 Ethernet Stackable Hubs is considered one hop.

Connecting Two Stacks of 10/100 Ethernet Stackable Hubs

- **10Mbps connections:** If 10Mbps connections are made between stacks, the IEEE 802.3 standard specifies that a frame sent from one workstation to another should not pass through more than four repeaters on the way to its destination and will not contain more that 5 segments between any end devices in the same collision domain. Category 3, 4, or 5 cables can be used for 10 Mbps connections and the maximum length of each segment is 100 m (328 ft). Therefore there may be up to 500 m (1640 ft) between end devices that have been cascaded at 10 Mbps. The 10 Mbps segments of the cascaded hubs are in the same collision domain.

  Note: The 10/100 Ethernet Stackable Hub supports auto negotiation. When connecting two stacks together, they will automatically link at 100 Mbps. To run at 10 Mbps, you will need to manually configure the ports to 10 Mbps.

- **100Mbps connections:** If 100Mbps connections are made between stacks, the IEEE 802.3u standard specifies that there may be only one repeater cascaded from another in the same collision domain. Only category 5 cable may be used and it can not be longer than 5m. Therefore, the maximum cable distance between end devices that have been cascaded at 100 Mbps is 205 m (672 ft). The 100 Mbps segments of the cascaded hubs are in the same collision domain.

- **External Bridge connections:** The external bridge separates collision domains. If you connect the external 10BASE-T/100BASE-TX bridge module of one stack to a MDI or MDI-X port another stack, no hops are counted. This connection may be 10 Mbps or 100 Mbps and may be up to 100 m (328 ft) in length.

  You can connect two stacks of 10/100 Ethernet Stackable Hubs with two 100BASE-FX bridge modules. The fiber distances may be 412 m (1352 ft) if half duplex and 2000 m (6560 ft) if full duplex.

  This method will allow you to cascade unlimited numbers of 10/100 Ethernet Stackable Hubs.

Chapter 3. Control Panel Management

The control panel is an effective management tool for monitoring and configuring the 10/100 Ethernet Stackable Hub. It displays the following types of information:

- Port Utilization
- Port Statistics
- Port Configuration
- Hub Configuration

Control Panel

The control panel shown in Figure 3-1 has the following features:

Figure 1-11 Vacuum Fluorescent Display (VFD)—displays port and hub information in an easy-to-read format.

• Control Keys (**MENU**, **SCROLL**, and **ENTER**)—enables you to select menu items, make configuration settings, and navigate the menu structure.
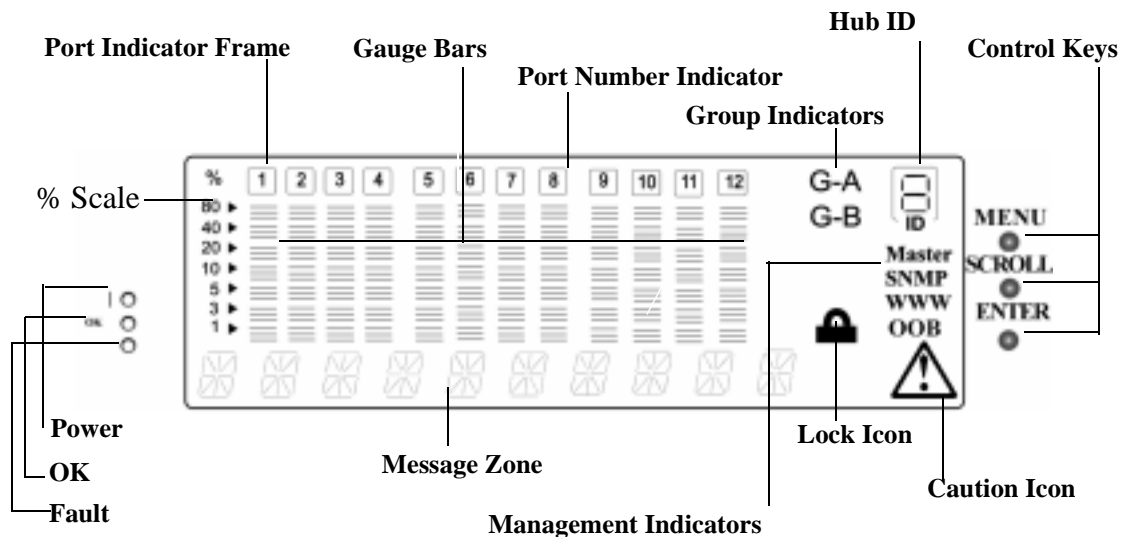
Figure 3-1 Control Panel

VFD Display

The Vacuum Florescent Display (VFD) displays the following port and system information:

% Scale

> The relative percentage of utilization or collision.

Port Number Indicators (1 to 12)

> Port Number Indicators indicate the number of a port, and with their brightness, indicate status information. See Table 3-1.

Port Indicator Frame (▢)

> Port Indicator indicates which ports are disabled. See Table 3-1.

Table 3-1 Port Information

Number	Frame	Indicates
Normal	Off	Port is available but link is down.
Bright	Off	Port is available and link is up.
Flashing	Off	Link is up and receiving data.
Bright	On	The port is disabled by the administrator.
Bright	Blinking	The port is auto partitioned by the device.

Message Zone

> Displays test messages, the menu items, and status information.

Gauge Bars

> Displays information such as utilization or port status.

Lock Icon

> Indicates that the control panel configuration is locked.

G-A

> Displays status of ports 1 to 12 in Port Group A.

G-B

> Displays status of ports 13 to 24 in Port Group B.

Master

> Indicates that the hub is a managed hub.

SNMP

> Indicates that the hub is SNMP-manageable.

WWW

> Indicates that the Web Management feature is enabled.

OOB

Indicates that out-of-band is enabled.

Caution Icon

Not used.

Control Keys

The control keys are used to navigate through the Menus and to make selections. Table 3-2 lists the function of each key.

Table 3-2 Control keys

Key	Action
MENU	Return to the previous level
SCROLL	Choose another topic within the same level
ENTER	Go to the next level or view status

Power and Error Indicators

Power

Power LED indicates power is connected.

OK

Diagnostic OK LED indicates the self diagnostics test was run without errors.

Fault

Diagnostic Fault indicates the self diagnostic test found an error

Table 3-3 Power and Error LEDs

LED	Position	State	Meaning
(Power) (green)	Top	On	The 10/100 Ethernet Stackable Hub power supply current is good.
OK (green)	Middle	On	The hub is working correctly.
		Off	The hub is not working correctly.
Unlabeled (fault) (amber)	Bottom	On	A power-on failure has occurred.
		Off	The hub is working correctly.
		Blinking	Diagnostics are in progress.

Menu Structure

Figure 3-2 on page 3-4 shows the control panel's menu structure.

Figure 3-2 Menu Structure

| UTILIZATION | ↔ | GROUP SELECT | ↔ | STATISTICS | ↔ | PORT STATUS | ↔ | PORT CONFIG | ↔ | UNIT CONFIG | ↔ | SYSTEM INFO | ↔ |

GROUP X

PORT 1 to 12

PORT 13 to 24

PORT X

READABLE FRM
READABLE OCT
FCS ERRORS
ALIGN ERRORS
FRM TOO LONG
SHORT EVENTS
RUNTS
COLLISIONS
LATE EVENTS
VERY LONG EN
RATE MISMTCH
AUTO PART
TOTAL ERRORS

PORT X

ALL PORTS

10M PORTS
100M PORTS
LINK UP
LINK DOWN
POLAR NORMAL
POLAR REVERS
NO AUTO PART
AUTO PART
ENABLE
DISABLE

ALL PORTS

PORT X

ENABLED
DISABLED
AUTO NEGO
10BASE-T
100BASE-X

CONSOLE LOCK

NETWORK CONF

IP ADDRESS
SUBNET MASK
DEF GATEWAY

SET PASSWORD

SYS RESTART

CONTINUE
CANCEL

SYS DEFAULT

CONTINUE
CANCEL

EIA232 CONFG

BAUD RATE

2400
4800
9600
19200

H/W VER
S/W VER
IP ADDRESS
SUBNET MASK
DEF GATEWAY

Control Panel Inactivity

If the control keys are not used for a period of 15 minutes, the control panel configuration is automatically locked and the VFD returns to utilization mode.

After an hour of inactivity, the VFD turns off. Pressing any control key reactivates the VFD.

Monitoring Network Utilization

You can observe the network traffic in the Control Panel by selecting the Utilization menu as shown in Figure 3-3. The utilization rate of each segment is represented by a bar graph consisting of 7 gauge bars, which shift continuously from left to right as time elapses, as shown in Figure 3-3 and Figure 3-4. In the message zone, the word "UTILIZATION" alternates periodically with the labels "10 M 100 M."

Figure 3-3 Utilization for 10 Mbps and 100 Mbps segments

The 10 M segment utilization is displayed on the left and the 100 M segment utilization is displayed on the right.

Each bar represents the total utilization for this segment at the same moment, the first bar in each segment is the most recent total utilization

7 bar graphs representing the history of utilization for 10 Mbps segment

7 bar graphs representing the history of utilization for 100 Mbps segment
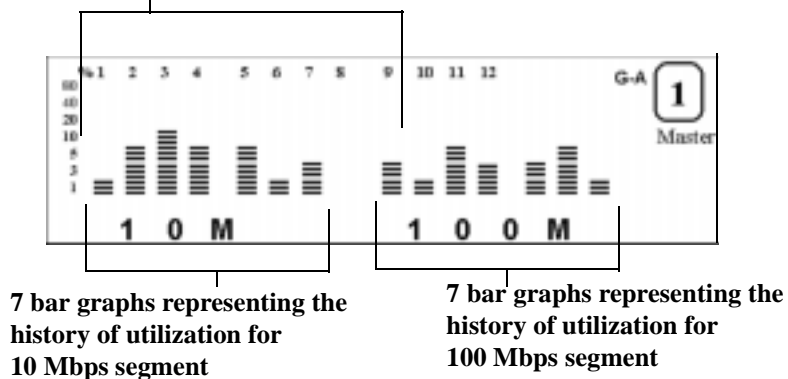
Figure 3-4 Utilization for 10 Mbps and 100 Mbps segments

Selecting Hub

In the hub selection main menu "**GROUP SELECT**" is displayed in the message zone. The hub ID, in the Message Zone, is referred to as GROUP. The current hub ID is indicated by the "group cursor" (3 bar scales) under the port indicator as shown in Figure 3-5.

Figure 3-5 Group Select

Figure 3-6 illustrates the current hub ID is 2, by the "group cursor" under port indicator 2 and by "GROUP   2" in the Message Zone.
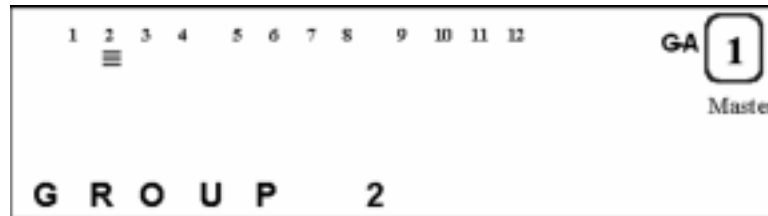
Figure 3-6 Group 2

Monitoring Detailed Port Statistics

Statistics of each port for a selected hub can be monitored by selecting the Port Statistics menu. The current selected hub, for example, Hub 3, is indicated by the 3 bar scales under the port indicator number as shown in Figure 3-7.

Figure 3-7 Statistics

To Select a Port

Step 1. On the port statistics main menu, press **ENTER** to select a port for viewing its statistic counter.

Step 2. On the port selection menu, the current hub (Hub 3) is indicated by 3 bar scales under the port number indicator. The selected port number is displayed in the message zone, and 6 bar scales below the port number (port cursor) also indicates the current selected port as shown in Figure 3-8.
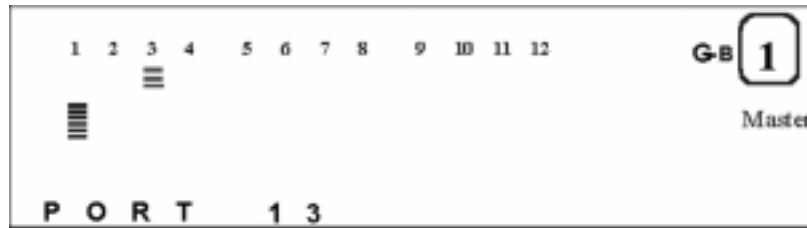
Figure 3-8 Port Select

Step 3. Press **SCROLL** to select the next port. The "port cursor" will move to the corresponding position under the port number indicator, and the corresponding port number is displayed in the message zone.

Step 4. Press **ENTER** to confirm the selection of the port; and go to the counter selection menu. The name of the port statistic counter is displayed in the message zone. Figure 3-9 shows the readable frame (READABLE FRM) statistic counter in the Message Zone for port 13 of hub 3.
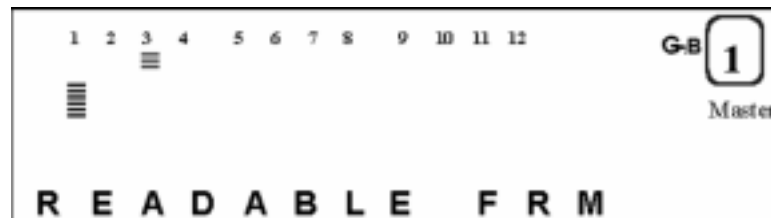
Figure 3-9 Readable Frame

Step 5. Press **SCROLL** to scroll through each type of counter.

Step 6. Press **ENTER** to view the value of the counter. The value of the counter is displayed in the message zone. Figure 3-10 shows the statistic counter, 1500 readable frames for port 13 of hub 3.

Figure 3-10 Statistic Counter Value

READABLE FRAMES

The total number of frames received on the hub port.

READABLE OCTETS

The total number of octets of data received on the hub port.

FCS ERRORS

The total number of packets received by the port that had bad Frame Check Sequence.

ALIGN ERRORS

The total number of packets received that have bad FCS with a non-integral number of octets.

FRM TOO LONG

The total number of received packets that were longer than 1518 octets (including FCS octets but excluding framing bits) but were otherwise well formed.

SHORT EVENTS

The total number of received packets that were less than 64 octets (including FCS octets but excluding framing bits) and were otherwise well formed.

RUNTS

The total number of received packets that were less than 64 octets due to collisions or activity duration was greater than the ShortEventMaxTime event and less than the ValidPacketMinTime event.

COLLISIONS

Total collisions.

LATE EVENTS

Total events received by the port where the activity duration is greater than the LateEventThreshold.

VERY LONG EVENTS

Total events received by the port where the activity duration is greater than the MAU Jabber Lockup Protection timer TW3.

RATE MISMATCH

Total frames received by the port with no collisions and the activity duration was greater than the ValidPacketMinTime event and also frequency (data rate) is detectably mismatched from the local frames mismatch frequency.

AUTO PART

Total number of times the port was auto-partitioned.

TOTAL ERRORS

Total errors received by the port including FCS errors, Align errors, Frame Too Long, Short Events, Late Events, Very Long Events and Rate Mismatch.

Monitoring Port Status Information

Monitor detailed port information by selecting the Port Status menu. Press **SCROLL** until "PORT STATUS" is displayed in the message zone. The currently selected hub is indicated by the "group cursor" under the port ID indicator as shown in Figure 3-11.

Figure 3-11 Port Status

Selecting Ports

You can view the status of all ports either in a single display or a single port.

Single Port

To view the status of a single port.

Step 1. Press **ENTER** to go to the port selection menu, "PORT X" is displayed in the message zone, and a bar graph is displayed under the port number as shown in Figure 3-12.

Step 2. Press **SCROLL** to select a port.

Step 3. Press **ENTER** to view port status. The port status scrolls automatically until any control key is pressed.

Figure 3-12 Individual Port Status

All Ports

To view the status of all ports:

Step 1. Press **ENTER** to go to the port selection menu.

Step 2. Press **SCROLL** to scroll to "All PORTS". A bar graph under all the ports is displayed in the message zone. The top row of bars represents ports 13 to 24 and the bottom row represents ports 1 to 12.
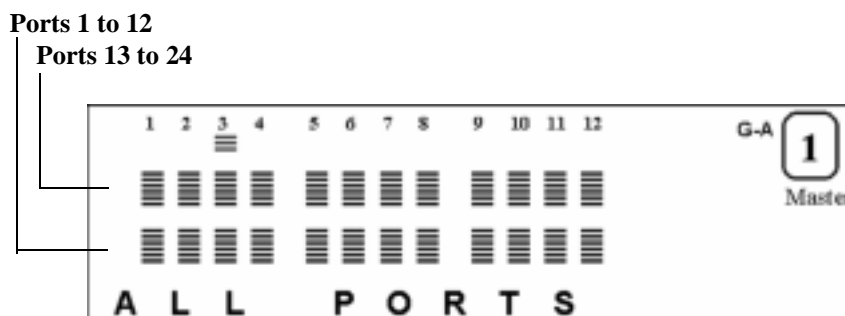
Figure 3-13 All ports

Step 3. Press **ENTER** to view all port status. A bar graph is displayed under each port number that is configured as shown in the message zone. Figure 3-14 shows the ports configured as 10 Mbps ports on hub 3.
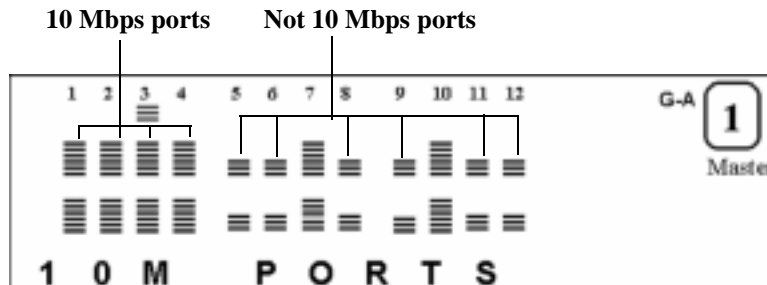
Figure 3-14 All 10 Mbps Ports

Step 4. The name of port status is displayed in the message zone. Press **SCROLL** to view the next status of all ports. Figure 3-15 shows the ports configured as 100 Mbps ports on hub 3.
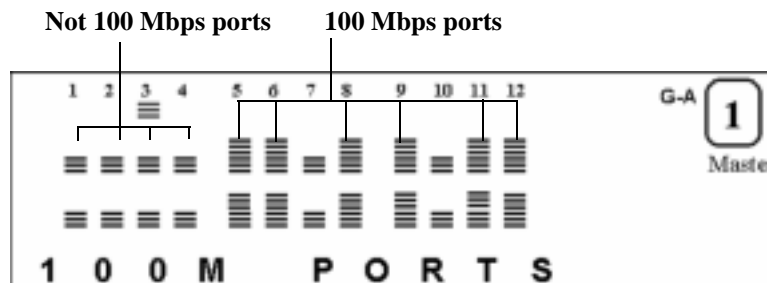
Figure 3-15 100 Mbps Ports Status

Table 3-4 lists the possible status of ports.

Table 3-4 Port Status

10M PORTS	The port is set to a 10 Mbps port.
100M PORTS	The port is set to a 100 Mbps port.
LINK UP	The port is linked.
LINK DOWN	The port link is down.
POLAR NORMAL	The receive (Rx) polarity of the port is normal.
POLAR REVERS	The receiver (Rx) polarity has been automatically crossed by the hub.
NO AUTO PART	The port is not auto partitioned.
AUTO PART	The port is auto partitioned.
ENABLE	The port is enabled.
DISABLE	The port is disabled.

Configuring Ports

The PORT CONFIG menu allows you to configure individual ports or all ports at one time. You are prompted to enter the password when the console is locked. The ports must be configured to match the devices at the other end of the link. Settings such as speed must be identical. All ports are set to default to AUTO NEGO. When the AUTO NEGO mode is set, the highest speed supported by both ends is negotiated by the port and the device at the other end.

In the Port Setting menu, "PORT CONFIG" is displayed in the message zone and the currently selected hub is indicated by the "group cursor" under the port number indicator as shown in Figure 3-16.

Figure 3-16 Port Configuration

To Configure "All PORTS"

Step 1. Press **ENTER** to go to the port selection menu.

Step 2. Press **SCROLL** to select "All PORTS."

Step 3. Press **ENTER**. The configuration is displayed in the message zone as shown in Figure 3-17.
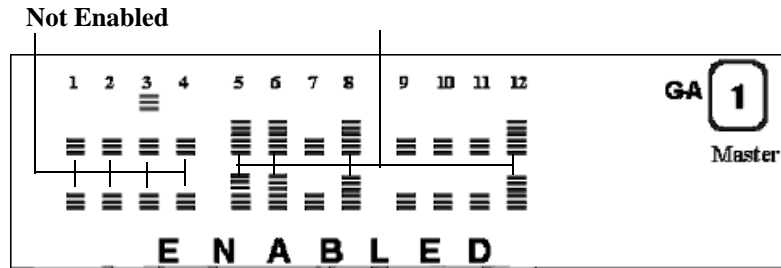
Figure 3-17 Current Port Configuration (All Ports)

Step 4. Press **SCROLL** to scroll through each configuration item.

Step 5. Press **ENTER** to apply the configuration to all ports.

To Configure Single Ports

Step 1. Press **ENTER** to go to the port selection menu.

Step 2. Press **SCROLL** to select a port.

Step 3. Press **ENTER**. The status of the port is displayed as shown in Figure 3-18.

Figure 3-18 Current Configuration

Step 4. Press **SCROLL** to scroll through each configuration item.

Step 5. Press **ENTER** to apply the configuration to the port.

The applied configuration is indicated by an asterisk sign displayed before the name of the configuration in the message zone, otherwise the asterisk sign will not appear as shown in Figure 3-19.
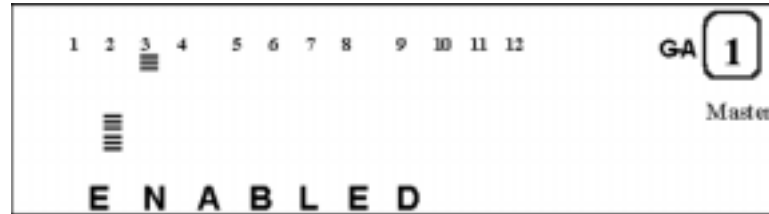
Figure 3-19 Current Port Configuration (single port)

The following is a list of port configuration options:

- ENABLED
- DISABLED
- AUTONEGO
- 10 BASE-T
- 100 BASE-X

Unit Configuration

The unit configuration menu allows you to configure the 10/100 Ethernet Stackable Hub. When the device is locked, you are prompted for a password. How to enter the password entry is described in "Unlock/Lock the Control Panel" on page 3-14.

To configure the Unit:

Step 1. Scroll to UNIT CONFIG and press **ENTER**.

Step 2. Enter the password (if the control panel is locked).

Step 3. Scroll to the appropriate menu item and press **ENTER** then follow the procedure for the selected item.

Figure 3-20 Unit Config Main Menu

Unlock/Lock the Control Panel

Control panel security is maintained by the console lock menu. The lock icon is an amber lock symbol on the lower right of the VFD and is On when the control panel configuration is locked. When the control panel is unlocked, it automatically locks again after 15 minutes of inactivity. You must unlock the control panel to access the port configuration and unit configuration menus.

To unlock the control panel:

Step 1. Scroll to UNIT CONFIG and press **ENTER**.

Step 2. Enter the password. The default password is 0000. The control panel is now unlocked.

To lock the control panel at any time:

Step 1. Scroll to UNIT CONFIG and press **ENTER**.

Step 2. Scroll to CONSOLE LOCK and press **ENTER** twice, an "*" appears before LOCK.

Step 3. Press **MENU** to exit.

The control panel is locked as shown in Figure 3-21 and the lock icon appears in the control panel.

Figure 3-21 Control Panel Lock

Network Configuration

You can configure the hub IP address, subnet mask, and default gateway with the Network Configuration Menu.

IP address

The current IP address is displayed in the IP address configuration menu.

Figure 3-22 IP Address

To configure the IP address:

Step 1. Scroll to UNIT CONFIG and press **ENTER**.

Step 2. Scroll to NETWORK CONF and press **ENTER.**

Step 3. Scroll to IP ADDRESS and press **ENTER**.

Step 4. Press **SCROLL** to increase the digit (0 to 9).

Step 5. Press **ENTER** to set the digit and move the cursor to the next digit. The current digit is blinking.

Step 6. The hub must be restarted for the configuration to take effect.

Since the message zone cannot contain the whole IP address, the IP address will shift left when the last digit in the message zone is set as shown in Figure 3-23. When user completes the setting of the IP address, system will validate the IP address. If the IP address is valid, the display will show the IP address, and system will apply the setting when the system is restarted. Otherwise, the system will reject it, and a message "FAIL" is displayed for a few seconds. The invalid IP address is displayed again to allow the user to modify it.
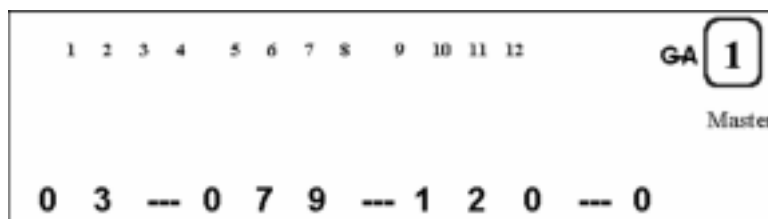
Figure 3-23 IP Address Shift Left

Subnet Mask

> The subnet mask is displayed and configured the same as the IP address.

Default Gateway

> The default gateway is displayed and configured the same as the IP address.

Securing the 10/100 Ethernet Stackable Hub

The 10/100 Ethernet Stackable Hub is secured by automatically locking the control panel. A password must be entered to unlock the control panel before configurations can be made. You can configure a four digit password. The default password is 0000.

Unlock and Set Password

Step 1. Scroll to UNIT CONFIG and press **ENTER**. You are prompted to enter the password, ****** PSW** appears in the message zone and the first "*" flashes. Press **SCROLL** to increase the digit.

Step 2. Unlock the control panel by entering the default password 0000, one digit at a time by pressing **SCROLL** once and **ENTER** once to progress to the next digit.

Step 3. Repeat Step 2 three times. The control panel is unlocked.

Step 4. Scroll to SET PASSWORD and press **ENTER**.

Step 5. Enter a new password and press **ENTER**.
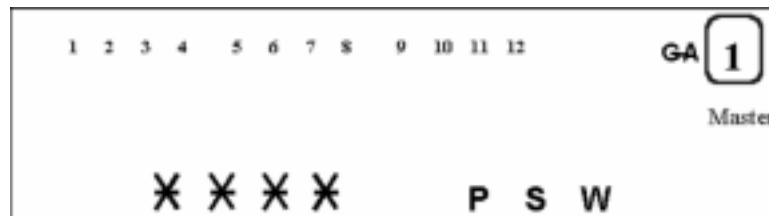
Figure 3-24 Set Password

Restart the 10/100 Ethernet Stackable Hub

Using the system restart menu, you can restart the system. At this time, your configurations will be used to set up the system.

Step 1. Scroll to UNIT CONFIG and press **ENTER**.

Step 2. Scroll to SYS RESTART and press **ENTER.**

Step 3. Press **ENTER** at "CONTINUE" or press **SCROLL** to end the action at the menu option "CANCEL".

Step 4. Press **ENTER** to confirm.

Figure 3-25 Continue

Restore System Default Settings

Selecting the option resets all settings back to the factory default settings. All custom settings, including password, port configurations and unit configurations will be set to factory default settings.

Restore the system defaults with the following steps:

Step 1. Scroll to UNIT CONFIG and press **ENTER**.

Step 2. Scroll to SYS DEFAULT and press **ENTER** to confirm.

Configuring EIA 232 Port

You can configure the baud rate for SLIP connections. The default (9600) is indicated with an "*".

Step 1. Scroll to UNIT CONFIG and press **ENTER**.

Step 2. Scroll to EIA232 CONFG and press **ENTER**.

Step 3. Scroll to baud rate and press and hold **ENTER** until an "*" appears in front of the number. Press **MENU** to exit.

Baud Rate:

- 2400
- 4800
- 9600
- 19200

System Information

To view system information:

Scroll to **SYSTEM INFO** menu and press **ENTER**. The following system information is sequentially displayed until **MENU** or **SCROLL** is pressed:

- Hardware Version
- Software Version
- IP Address
- Subnet Mask
- Default Gateway

Chapter 4. Using the Management Interface

The 10/100 Ethernet Stackable Hub incorporates a powerful management interface that supports VT100 terminal emulation.

Setting Up a Management Session

You can set up a management session by connecting a direct null modem cable between the management port on the 10/100 Ethernet Stackable Hub and the communication port of your PC or terminal.

To connect a local terminal to the 10/100 Ethernet Stackable Hub, perform the following steps:

Step 1. Install a terminal emulation application, such as Windows Hyperterminal, on your PC.

Step 2. Configure the terminal emulation application as follows:

Baud rate	9600
Parity	None
Data bits	8
Stop bits	1
Flow Control	None

Step 3. If you are using Microsoft Windows terminal emulation, disable the "Use Function, Arrow, and Ctrl Keys for Windows" option in the Terminal Preferences menu under Settings.

Step 4. Connect the EIA 232 management port on the 10/100 Ethernet Stackable Hub to your PC or DTE device using a null modem cable or straight-through cable and null-modem adapter. The 10/100 Ethernet Stackable Hub has a 9-pin, male connector. For more information, see "Connecting Null Modem Cable to the Management Port" on page 2-6.

Step 5. Press **Enter** 2 or 3 times and the login panel to the management interface appears.

Setting Up a Telnet Session

You can use any Telnet application that emulates a VT100 terminal to establish an in-band session on the 10/100 Ethernet Stackable Hub. Only one Telnet session can be active at a time. Before you can start a Telnet session, you must configure IP parameters for the 10/100 Ethernet Stackable Hub. This is done by using the Network Configuration Menu on the control panel or by using the serial management port. To open a Telnet session, you must specify the IP address assigned to the 10/100 Ethernet Stackable Hub. For information on how to specify an IP address in your Telnet application, refer to your Telnet application documentation. When the connection is established, the management interface login panel is displayed, as shown in Figure 4-3 on page 4-5.

Note: Telnet is a component of most TCP/IP applications. You need to install TCP/IP on your workstation before you can use this interface.

Navigating the Management Session

Selecting Help on any panel presents the Help Menu shown in Figure 4-1.

```
          IBM 10/100 Ethernet Stackable Hub 8245
                    - Help Menu -

          <Ctrl>-Q: Invoke Help Menu
          <Ctrl>-R: Refresh Screen

          [Enter]: Confirm Input
          [Tab]: Goto next Tabstop
          <Ctrl> -Z: Goto next Tabstop
          <Ctrl> -W: Goto previous Tabstop
          <Ctrl>-S/ <Ctrl>-A: Select/Toggle <FIELD> value
          [Esc]: Exit to Previous Menu


                    [ESC] TO GO BACK
```
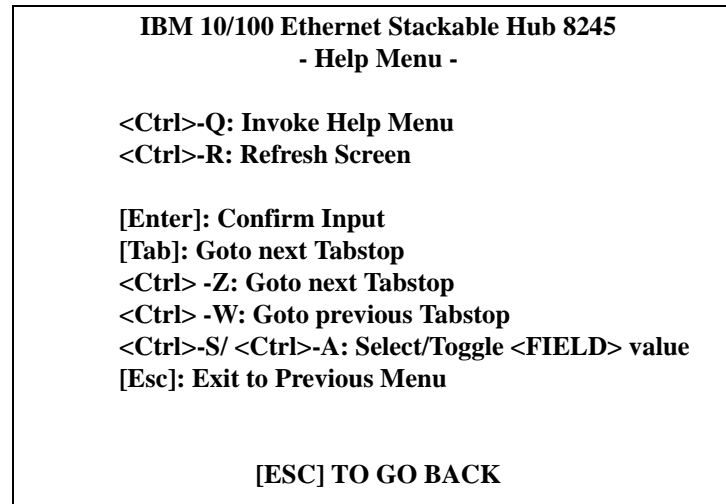
Figure 4-1 Help Menu

This Help menu lists additional keystroke functions.

Panel Command Usage:

- The commands available on each panel are displayed at the bottom of the panel.

- Use the Tab and Up and Down arrow keys to toggle through the available commands. Use the Left and Right arrow keys to toggle through selections within a command. If brackets enclose a field on a panel, [*field*], you must type in the value of that field. If less-than and greater-than signs, *<field>* enclose a field on a panel, you can toggle a list of values with the toggle command, Ctrl+S.

Status and read only fields are auto-refreshed every five seconds. Editable and input fields are not auto-refreshed but can be refreshed by pressing F2. Index fields, such as group number and port number, are refreshed each time the cursor moves through the index field.

Menu Conventions

The menu conventions used in the management interface are shown in Figure 4-2.
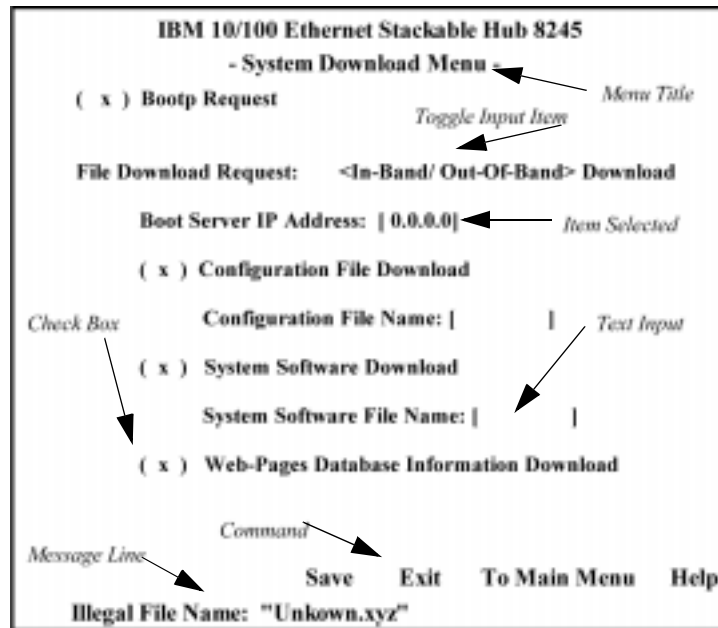
Figure 4-2 Menu Conventions

Menu Title

> Describes the current configuration menu.

Toggle Input Item

> Allows you to toggle the available options for items that appear between "< >" symbols. Toggle with Ctrl+S.

Item Selected

> Highlights the current cursor location.

Check Box

> Allows you to select or deselect items. Parentheses, "( )", preceding and item denote a check box.

Text Input

> Allows you to enter text from the keyboard. Highlighted items appearing between square brackets, "[ ]", are text input fields that you may edit.

Message Line

> Displays messages, usually error messages, indicating how to proceed.

Command

> Presents the valid commands allowed in the current menu.

Note: Panel refreshes occur every few seconds. Only status fields will be refreshed.

Beginning a Management Session

The login panel, as shown in Figure 4-3, appears when you establish a connection between your terminal and the 10/100 Ethernet Stackable Hub.

Note: If the terminal panel does not appear, press **Enter** two or three times.

```
              IBM 10/100 Ethernet Stackable Hub 8245




















                     User Name: [ admin ]
                     Password:  [         ]


     Use <Tab> key to move between User Name and Password, and press <Enter>
```
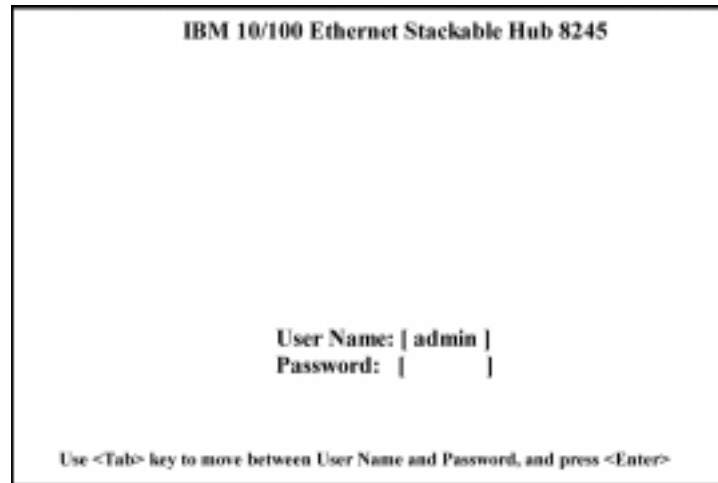
Figure 4-3 Login Screen

To begin a console session, perform the following steps:

Step 1. Type your user name, if one has been configured. User names and passwords are NOT case sensitive. The 10/100 Ethernet Stackable Hub comes with two default user names. One default is "admin" and requires no password. The other default is "guest" and has a password of "guest." Press **Enter**.

Step 2. Type in the password, if one has been configured. There is no default password for a user name. Press **Enter** to advance to the Main Menu.

Main Menu

Selecting this option presents the Main Menu as shown in Figure 4-4.

IBM 10/100 Ethernet Stackable Hub 8245
- Main Menu -

System Information
Management Setup
Device Control
Network Monitor
User Authentication
System Utility

LOGOUT   HELP
Use <Tab> key to select the item, then press <Enter>
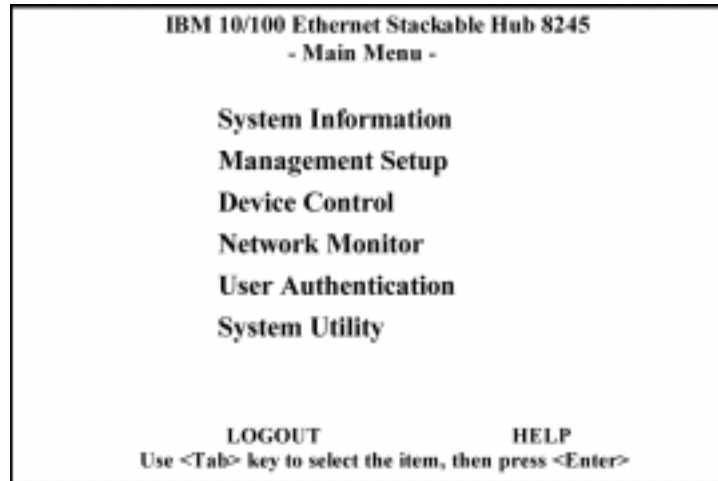
Figure 4-4 Main Menu

System Information

Allows you to view general system information as well as specifying location and contact information.

Management Setup

Allows you to view and specify management configurations.

Device Control

Allows you to monitor and configure hubs.

Network Monitor

Allows you to monitor statistic counters.

User Authentication

Allows you to configure user names and passwords.

System Utility

Allows you to configure software downloads, restart options, and Telnet session timeout intervals.

System Information

Selecting this option presents the System Information Menu as shown in Figure 4-5.


```
         IBM 10/100 Ethernet Stackable Hub 8245
               - System Information Menu -


   System Description: 10/100 Mbps Ethernet Hub

   Product Version:        V1
   BOOT ROM Version:      1.00
   System Software Version: 1.00
   Web-Pages Version:      1.00

   System Object ID:     1.3.6.1.4.1.2.6.147
   System Up Time:       0 days  0 hrs  0 min  0 sec
   System Contact:       [███████████████████████]
   System Name:          [                        ]
   System Location:      [ IBM 10/100 Ethernet Stackable Hub (8245 ]
   System Manager:         SNMP and WEB

   MIBs  Supported:    RFC1213, RFC1215, RFC1516,  RFC1757
                       and proprietary MIB.


   SAVE          EXIT          MAIN MENU        HELP
```

Figure 4-5 System Information Menu

The System Information Menu provides information about the version of the system software installed on the 10/100 Ethernet Stackable Hub.

You can specify up to 48 alphanumeric characters each for the System Name, Contact, and Location to provide useful information to all users concerning the 10/100 Ethernet Stackable Hub. The information on this panel should be kept current so that persons requiring assistance know whom to contact.

Notes:

1. You must select **SAVE** to save any changes you have made.
2. The MIBs supported field is for information only.

System Description

A textual description of the entity. This also includes the name and version identification of the system's hardware type, software operating system, and networking software.

System Object ID

The vendor's authoritative identification of the network management subsystem is contained in the 10/100 Ethernet Stackable Hub. This value is allocated within the SMI enterprises' subtree (1.3.6.1.4.1) and provides an easy and unambiguous means for determining what kind of device is being managed.

System Manager

The management capability that this system supports (SNMP and WEB).

System Up Time

The time since the network management portion of the system was last restarted or powered on.

Management Setup

Selecting this option displays the Management Setup Menu shown in Figure 4-6.

IBM 10/100 Ethernet Stackable Hub 8245
- Management Setup Menu -

Network Configuration

Serial Port Configuration

SNMP Community

Trap Receiver Setup

Management Capability Setup

Trap Filter

EXIT   MAIN MENU   HELP
Use <Tab> key to select the item, and press the <Enter>...
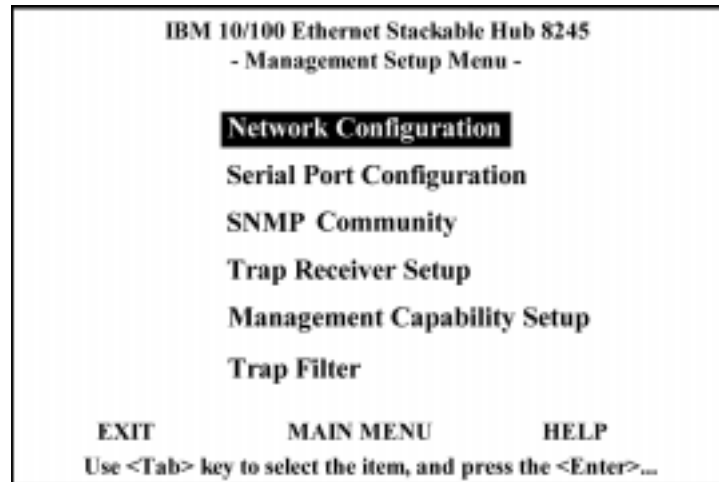
Figure 4-6 Management Setup Menu

Network Configuration

> Set IP address, Subnet Mask, Default Gateway, and SLIP address.

Serial Port Configuration

> View and configure the management port.

SNMP Community

> Configure community names and access right.

Trap Receiver

> Set up community trap addresses.

Management Capability Setup

> Enable or disable Web access and out-of-band management.

Trap Filter

> Enable/disable trap filters.

Network Configuration

Selecting this option displays the Network Configuration Menu shown in Figure 4-7.

The Network Configuration Menu allows setting up Ethernet and SLIP connections to the 10/100 Ethernet Stackable Hub. Network Interface <1> is used to configure Ethernet connections, and Network Interface <2> is used to configure SLIP connections.

Ethernet Configurations

An Ethernet connection allows you to monitor and configure the hub with a local console via Telnet Session, a Web browser, or SNMP management. You need to configure the IP Address and Subnet Mask to work with your LAN settings before you can make an Ethernet connection.

```
        IBM 10/100 Ethernet Stackable Hub 8245
              - Network Configuration Menu -

Network Interface:< 1 >

  Interface Type:  Ethernet

  MAC Address:  00-04-AC-1C-80-23

     Configuration:        Current      New

         IP Address:        0.0.0.0     [0.0.0.0]

         Subnet Mask:       0.0.0.0     [0.0.0.0]

         Default Gateway:   0.0.0.0     [0.0.0.0]




   SAVE         EXIT              MAIN MENU       HELP
```

Figure 4-7 Network Configuration Menu (Network Interface <1>Interface type: Ethernet)

IP Address

The dotted decimal address assigned to the 10/100 Ethernet Stackable Hub.

Subnet Mask

The dotted decimal subnet mask assigned to the 10/100 Ethernet Stackable Hub.

Default Gateway

The dotted decimal IP address of the default gateway assigned to the 10/100 Ethernet Stackable Hub.

The 10/100 Ethernet Stackable Hub must be restarted before the IP address, subnet mask, and default gateway can take effect. To ensure the new information is correct, a "ping" should be done from another device connected to the 10/100 Ethernet Stackable Hub.

Note: The hub does not respond to ping packages that are greater than 1484 bytes.

SLIP Configurations

SLIP connections enable monitoring and configuring the 10/100 Ethernet Stackable Hub remotely with a modem.

```
        IBM 10/100 Ethernet Stackable Hub 8245
              - Network Configuration Menu -


   Network Interface:< 2 >

     Interface Type:   SLIP


        Baud Rate:           9600
        Character Size:        8
        Parity:               No
        Stop Bits:             1


        Configuration:         Current     New


        IP Address:           0.0.0.0    [0.0.0.0]
        Subnet Mask:          0.0.0.0    [0.0.0.0]




     SAVE       EXIT          MAIN MENU      HELP
```

Figure 4-8 Network Configuration Menu (Network Interface <2>Interface type: SLIP)

The baud rate, character size, parity, and stop bits are read only and not configurable on this menu.

Baud Rate

> The current serial port baud rate that can be configured from the Serial Port Configuration Menu.

Character Size

> 8 bits character size

Parity

> None

Stop Bits

> 1 stop bit

IP Address

> The dotted decimal address assigned to the SLIP interface of the 10/100 Ethernet Stackable Hub.

Subnet Mask

> The dotted decimal mask assigned to the SLIP interface of the 10/100 Ethernet Stackable Hub management port.

Serial Port Configuration

Selecting this option displays the Serial Port Configuration Menus as shown in Figure 4-9 and Figure 4-10.

The management port must be configured as shown in Figure 4-9 to connect a PC to the 10/100 Ethernet Stackable Hub management port.

Console

The Console Mode is used to view the configurations required to make a VT100 terminal emulator connection to the 10/100 Ethernet Stackable Hub.
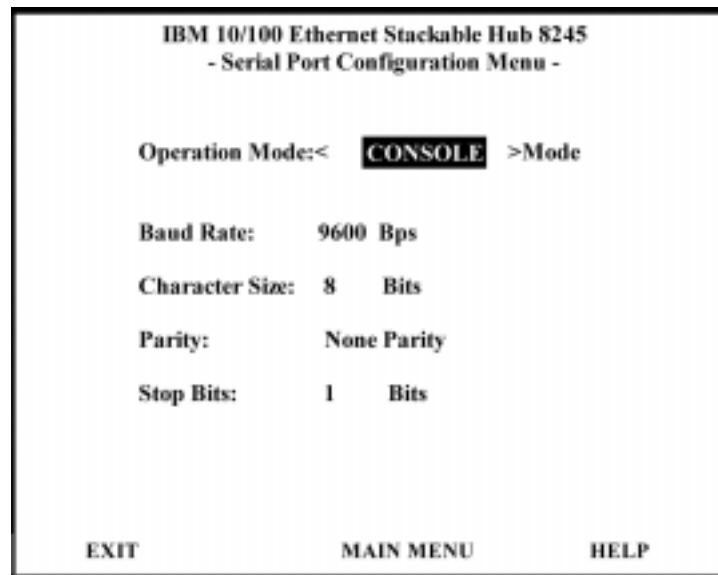
Figure 4-9 Serial Port (Console)

Note: The information displayed on the Serial Port Configuration Menu is read only and is not configurable on this menu.

Out-of-Band

Out-of-band mode enables setting up serial port configurations for making a connection to the 10/100 Ethernet Stackable Hub management port using a modem.
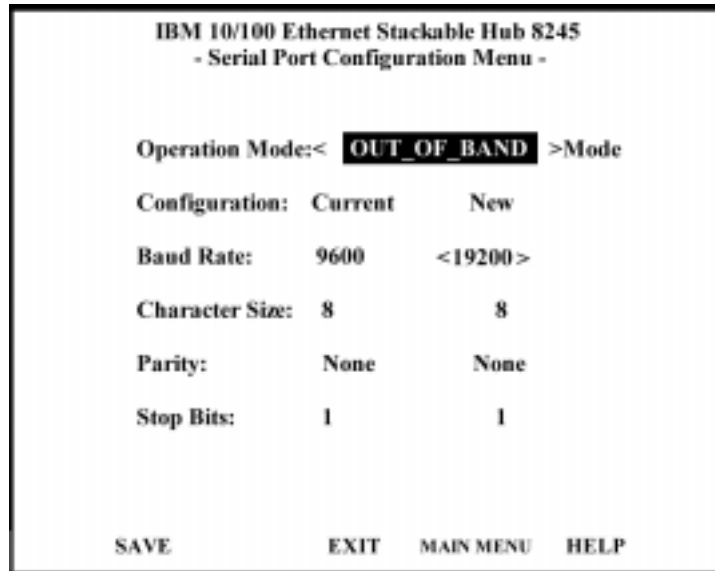
Figure 4-10 Serial Port (Out-of-Band)

Baud Rate

> The baud rate can be set to one of the following 2400 bps, 4800 bps, 9600 bps, 19200 bps. The default is 9600.

Character Size

> 8 bits character size

Parity

> No parity

Stop Bits

> 1 stop bit

Select **SAVE** to retain the new configuration. The new configuration takes effect if out-of-band management is enabled.

When SLIP is enabled, the EIA 232 port can be used for SLIP only. The EIA 232 port cannot be used to gain access to a management session via VT100 terminal emulation. If the SLIP connection is malfunctioning, you can disable SLIP by rebooting and pressing Enter when the Abort message appears. The message will appear for only 10 seconds. Also, the OOB will appear on the lower right hand side of the control panel when out-of-band management is enabled.

SNMP Community Setup

From the Community Menu, Figure 4-11, you can manage all aspects of SNMP communities. You can add, delete, or edit SNMP community names, set access rights, and alter the community state. Community names are case sensitive; Private and private are considered different. You cannot enter the same name more than once. If you do, an error message will appear at the bottom of the screen. You can clear the error by pressing the ESC key.

```
         IBM 10/100 Ethernet Stackable Hub 8245
                  - SNMP Community Menu -

Index   SNMP Community Name     Access Right    Status
--------------------------------------------------------

1       public                  Read Only       <Enable>

2       private                 Read/Write      <Disable>

3

4

5

6



        EXIT               MAIN MENU            HELP
        Use <Tab> or arrow keys to select entry; <Enter> to EDIT
```

Figure 4-11 SNMP Community Menu

This menu lets you assign up to six SNMP communities.

Community Name

> Text string up to 16 characters.

Access Right

- Read Only
  - The SNMP manager can only view the status of the hub.
- Read/Write
  - The SNMP manager can view and configure the hub.

Status

- **Enable:** To enable a SNMP Community.
- **Disable:** To disable a SNMP Community.

To add a community name:

Step 1. Highlight an index number and press **Enter.** An editable panel is presented as shown in Figure 4-12 on page 4-15.

Step 2. Enter a name in the Input field.

Step 3. Set the access right and status

Step 4. Highlight **ADD**, and press **Enter**, the new name is entered and displayed.

```
              IBM 10/100 Ethernet Stackable Hub 8245
                    - SNMP Community Menu -


     SNMP Community Name                Access Right    Status
     --------------------------------   --------------  --------------

     [                            ]     Read Only       <Disable>










          ADD   DELETE   UPDATE   EXIT   MAIN MENU   HELP
```
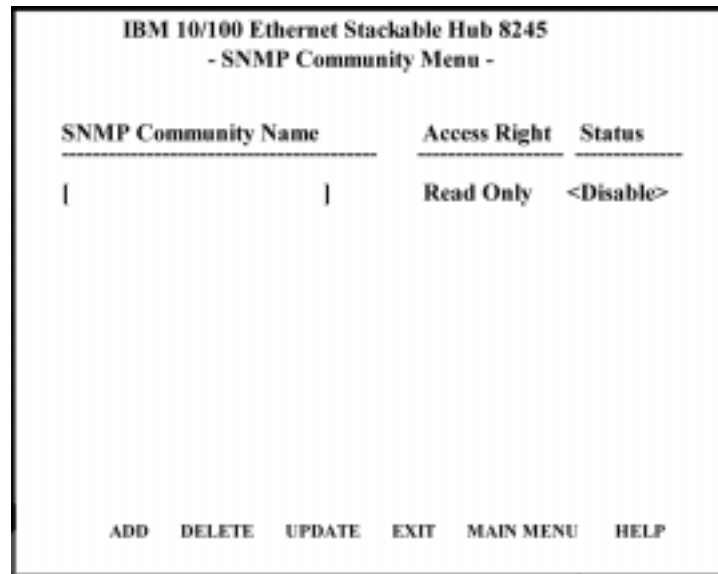
Figure 4-12 SNMP Community Menu-2

To edit a community name:

Step 1. Enter an existing name in the Input field and press **Enter**.

Step 2. Change the access right and status.

Step 3. Highlight **Update** and press **Enter**.

Step 4. Highlight **Delete** and press **Enter** to delete an existing name.

Trap Receiver

Selecting this option displays the Trap Receiver Menu shown in Figure 4-13.

Figure 4-13 Trap Receiver Menu

Traps are messages sent across a network to an SNMP Network Manager. These messages alert the manager to changes in the 10/100 Ethernet Stackable Hub. You can set up to six trap receivers.

Index

A number to identify a trap receiver (1 to 6).

Community Name

The authorized SNMP community string of the remote network manager (maximum 16 characters).

IP Address

The IP Address of the remote network manager station to which traps should be sent.

Status

A trap receiver's status can be either active or inactive. Trap receivers with active status receive all traps sent by the hub.

To setup trap receivers:

Step 1. Use the tab or arrow keys to select an index entry. Press **Enter** to edit or setup a trap receiver.

Step 2. Enter the **Community Name**, **IP Address**, and **Set Status**.

Step 3. Select **UPDATE**.

Step 4. Repeat Steps 1 to 3 for each new trap receiver.

Management Capability Setup

Selecting this option presents the Management Capability Setup Menu as shown in Figure 4-14.
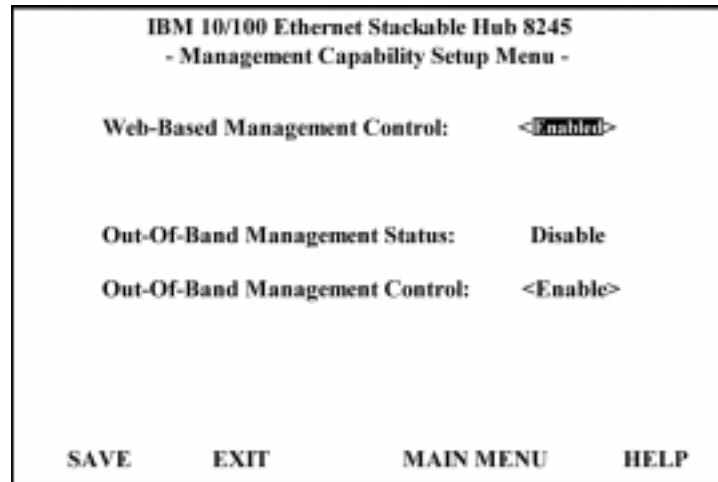
Figure 4-14 Management Capability Setup Menu

This menu lets you enable or disable Web-based management and out-of-band management.

Web-Based Management

Enables or disables Web-based management. The new configuration takes effect after executing **SAVE**.

Out-Of-Band Management Status

Displays the current status.

Out-Of-Band Management Control

Enables or disables out-of-band management (SLIP).
- When connecting with local serial port, this setting takes effect immediately.
- When connecting with Telnet, the system must be restarted before the setting takes effect.

Trap Filter

Selecting this option presents the Trap Filter Menu as shown in Figure 4-15.

```
            IBM 10/100 Ethernet Stackable Hub 8245
                     - Trap Filter Menu -

    ( X )  hubRfc1215LinkDownTrapFilter
    ( X )  hubRfc1215LinkUpTrapFilter
    ( X )  hubRfc1215AuthenticationTrapFilter
    ( X )  hubRfc1516rptrHealthTrapFilter
    ( X )  hubRfc1516rptrGroupChangeTrapFilter
    ( X )  hubRfc1516rptrResetEventTrapFilter
    ( X )  helloTrapFilter


  *** Note ***
  (x): the trap filter is turned-off and its associated trap is enabled.
  ( ): the trap filter is turned-on and its associated trap is disabled.


  SAVE         EXIT        MAIN MENU       HELP
  Use <Tab> key to select the item, and press the <Enter>...
```

Figure 4-15 Trap Filter Menu

This menu lets you enable or disable trap filters for those traps defined by RFC1215 and RFC1516. Deselecting a trap filter disables the filter and no traps are sent for the specified trap. The default is all traps enabled.

Device Control

Selecting this option presents the Device Control Menu as shown in Figure 4-16.

```
┌─────────────────────────────────────────────────────┐
│           IBM 10/100 Ethernet Stackable Hub 8245      │
│                  - Device Control Menu -              │
│                                                       │
│                                                       │
│              ▐ Repeater Group Control/Status ▌        │
│                                                       │
│                Repeater Port Control/Status           │
│                                                       │
│                Bridge  Module  Control/Status         │
│                                                       │
│                External AUI Module Control/Status     │
│                                                       │
│                Redundant Link Control                 │
│                                                       │
│                Security  Intrusion                    │
│                                                       │
│                                                       │
│                                                       │
│          EXIT            MAIN MENU          HELP       │
│    Use <Tab> key to select the item, and press the <Enter> ...
└─────────────────────────────────────────────────────┘
```
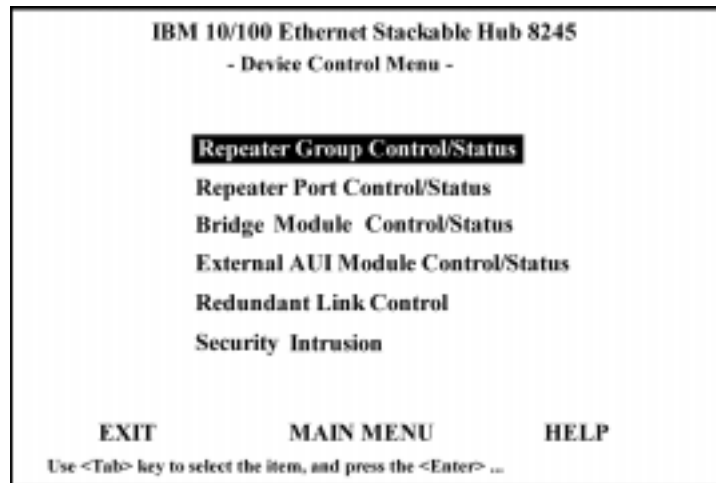
Figure 4-16 Device Control Menu

This menu lets you configure each hub in the stack.

Repeater Group Control/Status
> View and configure hubs.

Repeater Port Control/Status
> View and configure hub ports.

Bridge Module Control/Status
> View and configure bridge modules.

External AUI Module Control/Status
> View and configure external AUI module.

Redundant Link Control
> Configure redundant link pairs.

Security Intrusion
> Configure hub security.

Repeater Group Control/Status

Selecting this option presents the Repeater Group Control/Status Menu as shown in Figure 4-17.

Figure 4-17 Repeater Group Control/Status

The Repeater Group Control/Status displays the status of hubs and allows enabling or disabling a hub as well as naming and resetting the hub.

Group Number

The 10/100 Ethernet Stackable Hub ID assigned to the hub in the stack (1 to 6).

Port Capacity

The maximum number of ports that can be contained within the group.

Machine Type

Identifies the machine type (8245).

Model Number

The model number of the hub (012, 024, 112 or 124).

Repeater Type

The repeater type of the group (10/100 Mbps Class II).

Group Role

• Managed: A managed hub that can manage other hubs in the stack.

• Manageable: A manageable hub.

HW Revision

The hardware version of the 10/100 Ethernet Stackable Hub.

Group Serial Number

> The serial number of the hub.

Group Last Changed

> The value of system up time since any of the following conditions occurred:
> - When a hub is connected or removed from the stack.
> - Hub restarted.
> - This instance of group was created (such as, when a device or module was added to the system).
> - A change in the value of hub operational status.
> - Ports were added or removed as members of the group (such as, group admin enabled or disabled).
> - Any of the counters associated with this hub that have been reset.

Group Partitioned Ports

> The total number of partitioned ports in the group.

Group Operational Status

> - **Operational:** The hub is connected to the stack and is functional.
> - **Not Present:** The hub is not present or is not functioning.

Group Admin State

> Enable or disable the specific group segment. The default value is Enable Both 10 Mbps and 100 Mbps Admin only.
> - **Enable-10:** Only the 10 Mbps segment of a given group is connected to the back plane of stack. The 100 Mbps segment of a given group is isolated from stack.
> - **Enable-100:** Only the 100 Mbps segment of a given group is connected to the back plane of stack. The 10 Mbps segment of a given group is isolated from stack.
> - **Enable-10-100:** Both 10 Mbps and 100 Mbps segments of a given group are connected to the back plane of stack.
> - **Disable-10-100:** Both 10 Mbps and 100 Mbps segments of a given group are isolated from stack.

Group Reset

> All, some, or none of the group's function can be changed by selecting one of these options:
>
> **Note:** The selected option takes effect after **SAVE** is selected.
> - **Not Reset:** None of the options are reset.
> - **Reset All:** The function logic, counters, and repeater configuration of group will be reset. This is identical to a cold restart.

- **Reset Function Logic Only:** The function logic of the group will be reset. The counters and repeater configuration will be held static and will not be reset. This reset operation will reset the link status of each port to 'Link Down.' This will cause a Link Status Change event to be raised.
- **Reset Counters Only:** The counters of each port will be reset to 0, but the function logic and repeater configuration will be held static and will not be reset.

Group Name

The name assigned to this hub (up to 28 characters) cannot be accessed by SNMP Manager.

Group Last Change Notify

- **Enable:** Sends out a trap when a setting in the Repeater Group Control changes.
- **Disable:** Does not send out a trap when the setting in the Repeater Group Control changes.

To change the setting of a given group:

Step 1. Select the group by number.

Step 2. Set new value to Group Admin State.

Step 3. Set reset request to Group Reset field.

Step 4. Type in the name to the Group Name field.

Step 5. Set Group Last Change Notify field.

Step 6. Select **SAVE**.

Repeater Port Control/Status

Selecting this option presents the Repeater Port Control/Status as shown in Figure 4-18.


```
                    IBM 10/100 Ethernet Stackable Hub 8245
                     - Repeater Port Control/Status Menu -

>>Group Number:  |  ▮  |                   Port Number:  |   1   |
-----------------------------------------------------------------------
Port Status:
    Link Status:              Link Up/Down
    Polarity Status:          Normal/Reversed
    Auto Partition:           Partitioned/Not Partitioned
    Speed:                    10Mbps/100Mbps Speed
    Isolate Status:           Isolated/Not Isolated/NA
    Interface Type:           RJ-45 TP/10/100 Mbps TP

Port Control:
    Admin State:              <Enabled/Disabled>
    Link Test State:          <Enabled>
    Speed Control:            <Auto Negotiate/Force 10-TP/Force 100-TP>
    Link Status Change Notify: <Enabled/Disabled>


PREVGROUP  NEXTGROUP  PREVPORT  NEXTPORT  SAVE  EXIT  MAINMENU  HELP
```

Figure 4-18 Repeater Port Control/Status

The Repeater Port Control/Status menu provides information about a hub's port status. A hub can be selected with the PREV GROUP and NEXT GROUP commands and its ports with the PREV PORT and NEXT PORT commands. The selected port state can be configured.

Group Number

The Ethernet Stackable Hub ID assigned to the hub in the stack (1 to 6).

Port Number

The port number of the hub specified in the Group Number.

Link Status

The current link status of the port.

- **Link Down:** Link pulses are not detected on this port.
- **Link Up:** Link pulses are being received on this port.

Note: When port link test function is disabled, the Port Link Status always returns Link Up for ports.

Polarity Status

The current polarity link status of the port.

- **Normal:** The receive polarity of the given port is not reversed.
- **Reversed:** The receive polarity of the given port is reversed and has been auto-

matically crossed by the repeater.

Auto Partition

The current partition status of the port.

- **Not Partitioned:** The port is not partitioned
- **Partitioned:** The port is partitioned

Speed

The current speed of the port (10 Mbps/100 Mbps).

Isolate Status (100 Mbps Port Only)

Indicates whether this 100 Mbps port is currently isolated by the repeater.

- **Not Isolated:** The port is not isolated.
- **Isolated:** The port is isolated.

Interface Type

The interface type of the port (10/100 Mbps TP).

Admin State

The current administration state of the port (enable/disable).

Link Test

Enable or disable link testing.

Note: Redundant link pairs must have Link Test enabled.

Speed Control

The port speed. The port will automatically connect to the 10 Mbps or 100 Mbps segment based on its port speed.

- **Auto Negotiate:** The speed is detected and the duplex mode is forced to half duplex.
- **Force 10-TP:** The port speed is forced to 10 Mbps.
- **Force 100-TP:** The port speed is forced to 100 Mbps.

Link Status Change Notify

- **Enable:** The trap is sent.
- **Disable:** The trap is not sent.

Note: Whenever the Port Link Status is changed, the "hubPortLinkStsChgTrap" will be raised by the agent.

Bridge Module Control/Status

Selecting this option presents the Bridge Module Control/Status Menu as shown in Figure 4-19.

```
┌─────────────────────────────────────────────────────────────────┐
│              IBM 10/100 Ethernet Stackable Hub 8245              │
│                 - Bridge Module Control/Status Menu -            │
│                                                                 │
│  Group Number: [ 1 ]                                            │
│  _____                                        │
│                                                                 │
│                                                                 │
│  Bridge Module Status:                                          │
│    Description:                                                 │
│    External Port Interface Type:  RJ-45 TP                      │
│    External Port Link Status:  Link Down                        │
│    External Port Speed:        Half-Duplex-10 Mbps              │
│    Hardware Status:            Oper-As-Internal-Plus-External-Bridge │
│                                                                 │
│  Bridge Module Control:                                         │
│    External Function Admin State:         < Disable >           │
│    Internal Function Admin State:         < Disable >           │
│    External Port Link Status Change Notify:  < Disable >        │
│                                                                 │
│                                                                 │
│    PREV GROUP   NEXT GROUP   SAVE    EXIT   MAIN MENU   HELP     │
└─────────────────────────────────────────────────────────────────┘
```

Figure 4-19 Bridge Module Control/Status Menu

Group Number

The hub ID number assigned to the Ethernet Stackable Hub (1 to 6).

Bridge Module Status

Bridge Description

A description of the characteristics of this bridge module.

- 10/100 Bridge with 10/100-TX Uplink
- 10/100 Bridge with 100 BASE-FX Uplink

Bridge External Port Interface Type

Indicates the interface type of external port for a given bridge module.

- TP port with RJ-45 interface
- Multi-Mode with SC type interface

External Port Link Status

The current link status of the installed module. This value is read only.

- Link Up
- Link Down

External Port Speed

    The module's external port speed. This value is read only.

- Half Duplex 10 Mbps
- Full Duplex 10 Mbps
- Half Duplex 100 Mbps
- Full Duplex 100 Mbps

Hardware Status

    Indicates the operation status of this bridge module.

- **Operate as Internal Plus External Bridge:** The internal bridge function and the external bridge function are enabled.
- **Operate as External Bridge Only:** The internal bridge function of a given bridge module is disabled via the hardware configuration.
- **Not Present:** There is no bridge module installed in the given group.

Bridge Module Control

External Function Admin State

- **Enable:** Enables the external bridge function.
- **Disable:** Disables external bridge function of a given bridge. Once the external bridge function is disabled, you must enable it to restore external bridge operation.

    The default value is Disable.

Internal Function Admin State

- **Enable:** Enables the internal bridge function. The internal hardware DIP switch must also be enabled for the internal bridge to function.

    Note: The internal bridge must be enabled in hardware with the DIP switch settings before the Admin state can be enabled. See Figure 2-3 and 2-4.

- **Disable:** Disables the internal bridge function when the internal hardware DIP switches have been enabled. Once the internal bridge function is disabled, you must enable it to restore the internal bridge operation.

    The default value is Disable.

Notes:

1. These modules are not "hot-swappable." You must remove power from the 8245 before installing or removing bridge modules.
2. You should enable the internal bridge on only one bridge module if you have multiple bridge modules installed in the stack. This prevents a network loop condition.

External Port Link Status Change Notify

    If enabled a trap will be sent to the receiver when link status of the port has changed.

- **Enable:** The trap is sent to the trap receivers.
- **Disable:** No trap is sent.

External AUI Module Control / Status

Selecting this option presents the External AUI Module Control/Status Menu as shown in Figure 4-20.

```
┌─────────────────────────────────────────────────────────────┐
│              IBM 10/100 Ethernet Stackable Hub 8245          │
│            - External AUI  Module  Control/Status  Menu -    │
│        ─────                                                 │
│                                                              │
│                                                              │
│   Group Number:    [ ▉ ]                                     │
│   ----------------------------------------                   │
│                                                              │
│                                                              │
│       AUI Module Control                                     │
│         Admin State:              <Enable/Disable>           │
│                                                              │
│                                                              │
│                                                              │
│                                                              │
│                                                              │
│    PREV GROUP    NEXT GROUP   SAVE   EXIT   MAIN MENU   HELP  │
└─────────────────────────────────────────────────────────────┘
```

Figure 4-20 External AUI Module Control / Status Menu

The external AUI module is used to connect AUI devices to the 10/100 Ethernet Stackable Hub. The AUI Module is an external bridge and does not have an internal 10/100 bridge.

Group Number

A 10/100 Ethernet Stackable Hub ID in the stack (1 to 6).

Admin State

You can set this object to enable/disable the AUI port operation.

Redundant Link Control

Selecting this option presents the Redundant Link Control Menu as shown in Figure 4-21.

Figure 4-21 Redundant Link Control

The Redundant Link Control menu allows configuring up to 18 pairs of redundant links. A redundant pair consists of any two physically linked ports in the 10/100 Ethernet Stackable Hub stack, where one is the primary link port and the other is the secondary link port. The primary link is the *active* link between two devices, and the secondary is a backup and is set to *inactive* to prevent looping. In the event that the primary link fails, the secondary link becomes active. The secondary link stays active even if the primary link recovers. You must manually reset the primary link status to active in order to re-instate the redundant pair.

You configure a primary link by assigning a specific port on a specific hub to a Link Pair Index. You assign a secondary link by assigning a specific port on a specific hub to the same Link Pair Index.

Link Pair Index

The number identifying the redundant link pair (1 to 18).

Primary Link Group

This object identifies the hub ID of primary link for a given redundant link pair.

Primary Link Port

This object identifies the port number of primary link for a given redundant link pair.

Secondary Link Group

This object identifies the hub ID of secondary link for a given redundant link pair.

Secondary Link Port

> This object identifies the port number of secondary link for a given redundant link pair.

Active Link

> This object indicates the current status for a given redundant link pair.
> - **Primary:** The primary port is currently the active link.
> - **Secondary:** The secondary port is currently the active link.
> - **Both fail:** Both the primary and secondary links have failed.

Link Switch Over Notify

> If the link status of active link is *down* for more than five seconds, then the *active link failed* is detected and "port switch over" is performed, and a trap is sent to the trap receivers.
> - **Enable:** A trap is sent to the trap receivers if a switch over occurs.
> - **Disable:** No trap is sent to the trap receivers if a switch over occurs.

Status

> You can enable, disable, or suspend the operation of specific redundant link pairs.
> - **Enable:** The redundant link pair is in the normal operation mode.The primary port is active, and the secondary port is disabled.
> - **Disable:** If you disable the primary port from the port control/status menu, the status of this link pair is changed to the *suspend state* and indicates that the active port has been disabled and the redundant link function is temporarily suspended. If you enable the primary port later on, the status of this redundant link pair is changed to *enabled*.
>
>   If you disable the secondary port, the status of this link pair is changed to the *suspend* state, and both ports are disabled. If you enable the secondary port later on, the status of this link pair is changed to enabled, and the redundant link pair is in the normal operation mode.
>
>   **Notes:**
>   1. Setting the redundant link to disable does not cause the ports to be switched over.
>   2. Redundant link pairs must have Link Test enabled.
> - **Suspend:** Indicates that the active ports are disabled and the redundant link function is temporarily suspended until you set its state to *enable*.
>
>   **Note:** The Suspend state does not cause the port to be switched over.
> - **Invalid:** Purge the configuration of a redundant link pair from the system database.
> - **Return-to-primary:** Selecting this option and pressing Enter reassigns the primary link as active link again. A trap is sent to the trap receivers if the status of the redundant link is *enable*. If the status is *suspend* then the link pair is reactivated but no trap is sent.

Configuring Link Pairs

Step 1. Select a Link Pair (1-18). Use NEXT PAGE to select pairs 10 through 18.

> **Note:** At least one link pair must be entered on the FIRST PAGE in order to go to the NEXT PAGE.

Step 2. Enter the Primary Link Group (1 to 6).

Step 3. Enter the Primary Link Port (1 to 12/24).

Step 4. Enter the Secondary Link Group (1 to 6).

> **Note:** You can configure and save the Secondary Link Group and the Primary Link Group as the same hub. However, this will be of no use in the event of a hub failure.

Step 5. Enter the Secondary Link Port (1 to 12/24).

Step 6. Enable the Link Switch Over Notify (Optional).

Step 7. Enable the Status.

Step 8. Select **SAVE** to update the new Linked Pair. Repeat these steps for each Link Pair.

Editing a Link Pair

You can edit a Link Pair by entering the Link Pair number of an existing Link Pair and reconfiguring the rest of the columns. Select **SAVE** and the Link Pair is updated to the new settings.

Deleting a Link Pair

You can delete a Link Pair by entering the Link Pair number (of an existing Link Pair) and setting the Status to Invalid, then select **SAVE**, the Link Pair is removed.

Security Intrusion Control/Status

Selecting this option presents the Security Intrusion Control/Status Menu as shown in Figure 4-22.

```
              IBM 10/100 Ethernet Stackable Hub 8245
              - Security Intrusion Control/Status  Menu -

   Group Number:  | ■ |       Port Number: |  1   |
   ------------------------------------------------------------------

      Intrusion Status:                       <Enable/Disable/Invalid>
      Intrusion Authentication Address Auto Learn: <Enabled/Disabled>
      Intrusion Authentication MAC Address:      [00-00-00-00-00-00]
      Intrusion Action:          <No Action/Send Trap/Partition Port
                                       Send-Trap-and-Patition Port >

      Intrusion Violation:                        No-Detected
      Intrusion Violated MAC Address:




   PREV GROUP   NEXT GROUP  PREV PORT  NEXT PORT  SAVE  EXIT  MAIN MENU   HELP
```

Figure 4-22 Security Intrusion Control/Status Menu

The intrusion control enables you to set up secure ports that allow access by a single authorized MAC address.

Group Number

The hub ID number that is assigned to the 10/100 Ethernet Stackable Hub (1 to 6).

Port Number

The port number of the hub that is specified in the Group Number (1 to 12/24).

Intrusion Status

- **Enable:** Enable the security intrusion control for the current port.
- **Disable:** The security intrusion control of a given port is disabled.
- **Invalid:** Purge the security intrusion control configuration for the current port from the system database.

Intrusion Authentication Address Auto Learn

- **Enable:** The hub learns the MAC address of the first device that this port receives data from. After learning the MAC address the auto learn function is disabled and the recorded MAC address is the authorized MAC address. This address is displayed in the Intrusion Authentication MAC address field.
- **Disabled:** Auto learn operation is disabled.

Intrusion Authentication MAC Address

The MAC address of a device that is allowed to connect with this particular port.

Intrusion Action

The action that is performed when the hub detects an intrusion of an unauthorized MAC address.

- **No Action:** No action will be taken.
- **Send Trap:** A trap is sent to the trap receivers.
- **Partition Port:** The port is partitioned.
- **Send-Trap-and-Partition Port:** The port is partitioned and a trap is sent to the trap receivers.

Intrusion Violation

- **Detected:** The MAC address that caused the intrusion is written to the Intrusion Violated MAC Address field.
- **No-Detected:** No intrusion has been detected.

Intrusion Violated MAC Address

Displays the MAC address of the last unauthorized device to send to this port.

Notes:

1. If another hub or unrouted switch is attached to a port with Security Intrusion enabled, then only one of possibly many MAC addresses will be allowed to pass data.
2. When using the up arrow key to go from Port Number to Group Number, any data previously changed prior to saving will be reset to it's previous state.

Network Monitor

Selecting this option presents the Network Monitor Menu as shown in Figure 4-23.

```
IBM 10/100 Ethernet Stackable Hub 8245
         - Network Monitor Menu -

    Repeater Statistics Information

    Repeater Group Statistics Information

    Repeater Port Statistics Information

    Address Tracking Information

    Address Search Information

    Broadcast Storm Protection

    Broadcast Storm Detected

  EXIT              MAIN MENU              HELP
    Use <Tab> key to select the item, then press <Enter>
```
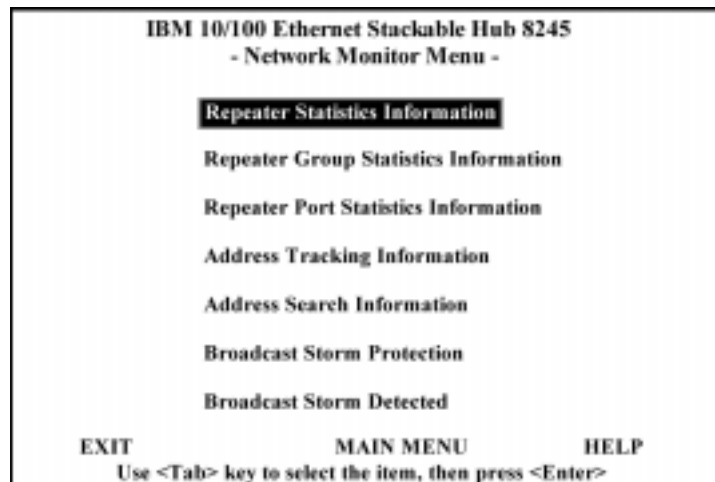
Figure 4-23 Network Monitor Menu

This menu lets you monitor the network traffic and analyze the network utilization.

Repeater Statistics Information

> Hub statistics such as Tx collisions, total frames and total errors and total octets for both 10 Mbps segments and 100 Mbps segments.

Repeater Group Statistics Information

> Displays the statistic counters for each hub.

Repeater Port Statistics Information

> Displays the statistic counters for each port.

Address Tracking Information

> Provides a way for a network management application to passively gather information about which network addresses are connected to which ports of a hub.

Address Search Information

> Active address tracking capability is used to watch for a given MAC address and report which port it was seen on.

Broadcast Storm Protection

> Monitor the broadcast counters of each hub port to detect if the broadcast storming exists in the network.

Broadcast Storm Detected

> Each hub port or optional module port which causes the broadcast storm is displayed.

Repeater Statistics Information

Selecting this option presents the Repeater Statistics Information Menu as shown in Figure 4-24.


```
          IBM 10/100 Ethernet Stackable Hub 8245
          - Repeater Statistics Information Menu -


Display Mode: < Absolute >
                    10 M Segement    100 M Segment
-------------------------------------------------------------
Total Tx Collisions :    0               0
Total Frames :           0               0
Total Errors :           0               0
Total Octets :           0               0




     EXIT           MAIN MENU          HELP
```

Figure 4-24 Repeater Statistics Information Menu

Display Mode

> Displays counters for the 10 Mbps and 100 Mbps segment for all hubs in the stack.

> • **Absolute Mode:** Select **Absolute Display Mode** and press **Enter**. Each counter will represent the value collected since system start. The user cannot clear absolute counters.

> • **Relative Mode:** Select **Relative Display Mode** and press **Enter** key. Each counter will be cleared to 0, and then represents the value collected since the relative mode was selected. You can reset the relative counters to 0 by changing to Absolute Mode then change back to Relative Mode.

Total Tx Collisions

> The number of transmission collisions that have occurred in this stack.

Total Frames

> The number of frames received in this stack.

Total Errors

> Total errors received by the stack including FCS errors, Align errors, Frame Too Long, Short Events, Late Events, Very Long Events and Rate Mismatches.

Total Octets

> The number of octets contained in the valid frames that have been received by this stack.

Repeater Group Statistics Information

Selecting this option presents the Repeater Group Statistics Information Menu as shown in Figure 4-25.

```
            IBM 10/100 Ethernet Stackable Hub 8245
           - Repeater Group Statistics Information Menu -

Group Number: [2]        Display Mode: < Absolute >

                              10M Segment    100M Segment
     -------------------------------------------------------
              Total Frames:    0               0

              Total Errors:    0               0

              Total Octets:    0               0



        PREV GROUP    NEXT GROUP    EXIT    MAIN MENU    HELP
```

Figure 4-25 Repeater Group Statistics Information Menu (Absolute)

Repeater Group Statistics Information Menu displays statistics information counters for the current port of the current hub. Counters are displayed in *Absolute* or *Relative* values by toggling the display mode. Absolute values represent the value collected since system start. You cannot clear absolute counters. Relative counters represent the values collected since the relative mode was selected. You can reset the relative counters to zero by changing to Absolute Mode then changing back to Relative Mode.

Group Number

The ID number of an 10/100 Ethernet Stackable Hub in the stack (1 to 6).

Display Mode

Display counters in Absolute or Relative values. Relative counters represent the values collected since the relative mode was selected. Absolute values represent the value collected since system start.

Total Frames   0 to 2^{32}-1 (4294967295 decimal)

The number of frames of valid frame length that have been received on the ports of this hub and not including FCS Error and Collision Event.

Total Octets   0 to 2^{32}-1 (10M segment) / 0 to 2^{64}-1 (100M segment)

The total number of octets contained in the valid frames that have been received on the ports of this hub.

Total Errors   0 to 2^{32}-1

Total errors received by the port including FCS errors, Align errors, Frame Too Long, Short Events, Late Events, Very Long Events and Rate Mismatch.

Repeater Port Statistics Information

Selecting this option presents the Repeater Port Statistics Information Menu as shown in Figure 4-26.

Figure 4-26 Repeater Port Statistics Information Menu

The Repeater Port Statistics Information Menu displays counter information for the current port of the current hub. A hub can be selected with the PREV GROUP and NEXT GROUP commands and its ports with the PREV PORT and NEXT PORT commands.

Display Mode

Display counters in Absolute or Relative values. Relative counters represent the values collected since the relative mode was selected. Absolute values represent the value collected since system start.

Group Number

The ID number of an 10/100 Ethernet Stackable Hub in the stack (1 to 6).

Port Number

Port number of selected group (1 to 12/24).

Readable Frames

Total readable frames received by the port.

Broadcast Packets

The total number of good packets received which were directed to a broadcast address. Note that this does not include multicast packets.

Multicast Packets

The total number of good packets received which were directed to a multicast address. Note that this number does not include packets directed to the broadcast address.

FCS Errors

The total number of packets received by the port that had bad Frame Check Sequence.

Alignment Errors

Total Alignment Errors frames within the proper size (64 to 1518 octets) received by the port.

Frame Too Long

Total frames received by the port that were longer than 1518 octets (excluding framing bits, but including FCS octets).

Short Events

Total frames received by the port that were shorter than 64 octets or activity duration was shorter than the event, ShortEventMaxTime. (74 to 82 bit times)

Runts

The total number of packets received that were less than 64 octets due to collisions or activity duration was greater than the ShortEventMaxTime event and less than the ValidPacketMinTime event.

Collisions

Total collisions.

Late Events

Total events received by the port where the activity duration is greater than the LateEventThreshold.

Very Long Events

Total events received by the port where the activity duration is greater than the MAU Jabber Lockup Protection timer TW3.

Data Rate Mismatches

Total frames received by the port with no collisions and the activity duration was greater than the ValidPacketMinTime event and also frequency (data rate) is detectably mismatched from the local frames mismatch frequency.

Auto Partitions

Total number of times the port was auto-partitioned.

Isolates (100M only)

Total isolates for 100M transmissions. This counter is incremented by one each time that a port automatically isolates as a consequence of false carrier events. The conditions which cause a port to automatically isolate are defined by the transition from the False Carrier state to the Link Unstable state. The port will automatically recover.

Symbol Errors (100M only)

Total symbol errors for 100 Mbps transmissions. This counter is incremented by one for each valid length packet received at the port with at least one occurrence of an invalid data symbol. This can increment only once per valid carrier event. The approximate minimum time for rollover of this counter is 7.4 hours at 100Mb/s.

Total Errors

Total errors received by the port including FCS errors, Align errors, Frame Too Long, Short Events, Late Events, Very Long Events and Rate Mismatch.

Address Tracking Information

Selecting this option presents the Address Tracking Information Menu as shown in Figure 4-27.

```
┌──────────────────────────────────────────────────────────────┐
│                   IBM 10/100 Ethernet Stackable Hub 8245      │
│                   - Address Tracking Information Menu -        │
│                                                                │
│  Group Number: [1 ]                  Port Number: [1 ]        │
│  ------------------------------------------------------------  │
│                                                                │
│  Source  Address Changes: 212        Last Source  Address: 00-00-0-00-00-00 │
│  Source MAC Address Tracking List:                             │
│       00-00-00-00-00-00                                        │
│                                                                │
│                                                                │
│                                                                │
│                                                                │
│                                                                │
│                                                                │
│  PREV GROUP  NEXT GROUP  PREV PORT  NEXT PORT  EXIT  MAIN MENU  HELP │
└──────────────────────────────────────────────────────────────┘
```
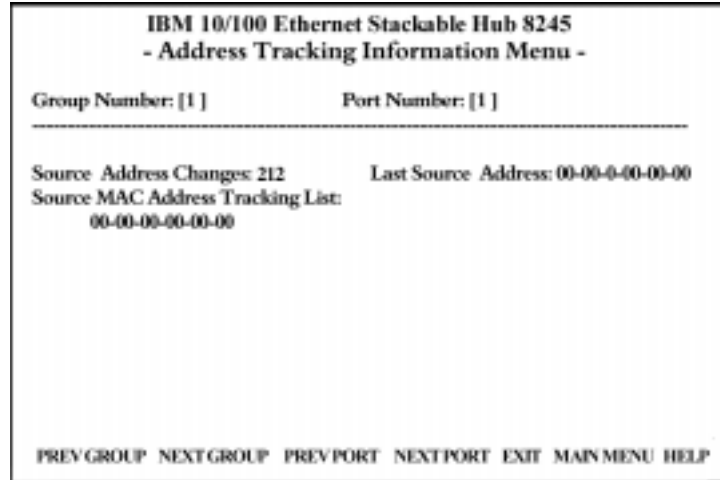
Figure 4-27 Address Tracking Information

The 10/100 Ethernet Stackable Hub provides per port based node (MAC address based) tracking capability. The node tracking function records the source MAC of each data packet and provide the filters for data analysis.

Source Address Changes

This counter is incremented by one for each time that the Last Source Address for this port has changed. This may indicate whether a link is connected to a single device or another multi-user segment. The approximate minimum time for roll-over of this counter is 81 hours.

Last Source Address

Indicates the Source MAC Address of the last readable frame received by this port. If this port has received no frames since the hub began monitoring the port activity, a null string will be displayed.

Source MAC Address Tracking List

A list of source MAC addresses that were recently received on this port. The first Source MAC Address (00-04-AC-1C-80-23 for example) in the tracking list contains the value that is given by the Last Source Address for this port. This list can contain 15 entries. The list does not age out, the first entries are deleted to accommodate new entries when the list is full.

Address Search Information

Selecting this option presents the Address Search Information Menu as shown in Figure 4-28.

```
        IBM 10/100 Ethernet Stackable Hub 8245
            - Address Search Information  Menu -


  Address Search Index:  [ 1 ]
  -------------------------------------------------------------
       Address Search Lock:       0
       Address Search Status:     < Not-In-Use>
       Address Searched:          [00-00-00-00-00-00]
       Address Search State:      None
       Address Search Group:
       Address Search Port:
       Address Search Owner:      Console/Web




  PREV ADDR SEARCH   NEXT ADDR SEARCH   SAVE   EXIT   MAIN MENU   HELP
```
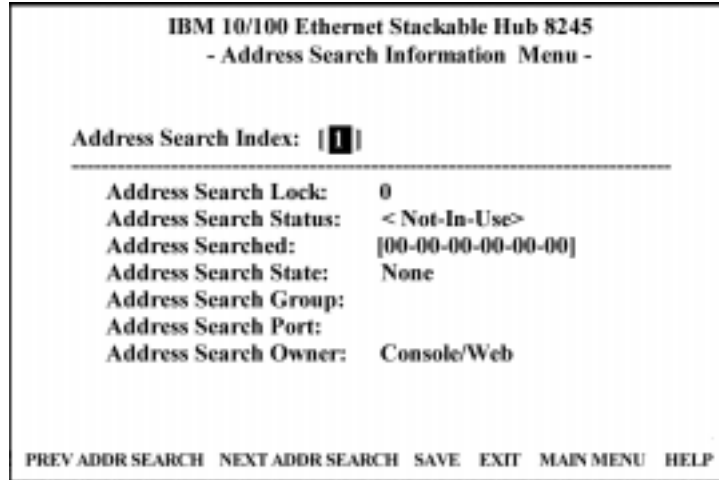
Figure 4-28 Address Search Information Menu

The 10/100 Ethernet Stackable Hub provides per segment based source (MAC address) matching capability. The active address tracking capability is used to watch for a given MAC address and report which port it was seen on. This capability can be also used to collect the necessary information for mapping the topology of a network. Up to 8 MAC addresses can be searched simultaneously.

Address Search Index

Identifies the index of the source address to be searched in the system for which this entry contains information (1-8).

Address Search Lock

Used by a management station as an advisory lock for a search entry. The search lock increments by 1, if the address is available. The number will be incremented to the maximum value of 2^{32}-1 and then roll over to zero.

Address Search Status

- **In Use:** A management station has obtained ownership.
- **Not in Use:** No other management station has obtained ownership.

A management station first retrieves the values of the appropriate instances of the Address Search Lock and Address Search Status objects, periodically repeating the retrieval if necessary, until the value of Address Search Status is "Not In Use." The management station then tries to set the Address Search Lock *In Use*. If the set operation succeeds, then the management station has obtained ownership of the entry, and the value of Address Search Lock is incremented to 1. Failure of the set operation indicates that some other manager has obtained ownership of the entry.

Address Searched

Specify MAC address for search.

Address Search State

The current state of the MAC address search on this hub.

- **Single:** The hub detects the address on one port only.
- **Multiple:** The hub detects the address on more than one port.
- **None:** The hub does not detect the address of any port.

The state is initially set to none.

Address Search Group

The Hub ID number received, whose source address corresponds to the address searched (1 to 6).

Address Search Port

The port number received, whose source address corresponds to the address searched (1 to 12/24).

Address Search Owner

The entity which currently has *ownership* of this search entry.

The owner for a given address search entry could be one of the following:

- **CONSOLE:** If the entry is locked by the Local Console/Remote Telnet, the owner is CONSOLE.
- **WEB:** If the entry is locked by the Web-based manager, the owner is WEB.
- **hubrptrAddrSearchOwner:** If the entry is locked by the SNMP manager, the owner will be given by the SNMP manager by setting the MIB object hubrptrAddrSearchOwner.

Broadcast Storm Protection

Selecting this option presents the Broadcast Storm Protection Menu as shown in Figure 4-29.

```
          IBM 10/100 Ethernet Stackable Hub 8245
              - Broadcast Storm Protection Menu -

Segment ID:  < 10Mbps  >
_____

  Segment Broadcast Packet Rate Threshold:          | 0  |  Packets/Sec

  Optional Module Broadcast Packet Rate Threshold: | 0   |  Packets/Sec

  Port Broadcast Packet Rate Threshold:             | 0  |  Packets/Sec

  Broadcast Alarm Action:   < No-Action            >

  Broadcast Alarm Status:   < Invalid >



     SAVE          EXIT          MAIN MENU          HELP
```
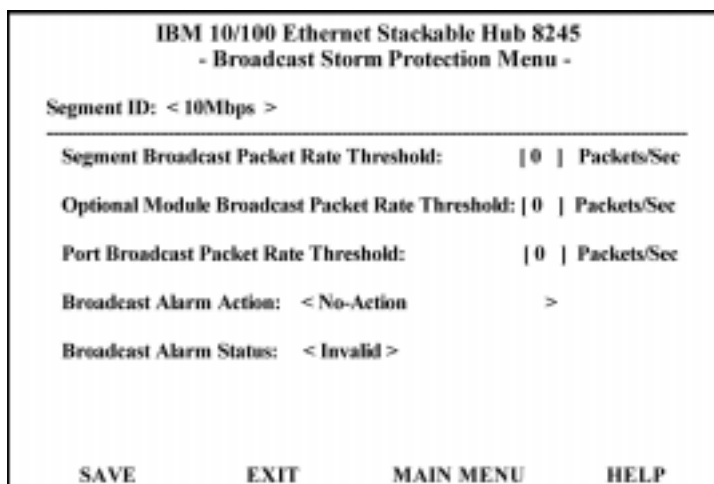
Figure 4-29 Broadcast Storm Protection Menu

The 10/100 Ethernet Stackable Hub periodically monitors the broadcast counters of each hub port to detect a broadcast storm condition. The hub port that causes the broadcast storm can be automatically partitioned, or a trap can be sent to the trap receivers or both. The 10/100 Ethernet Stackable Hub continually monitors those ports that have been partitioned to check if the broadcast storm condition still exists. The port will be permanently partitioned if the broadcast storm does not subside within 2 minutes.

You can configure the broadcast threshold value for each port, each segment, and each optional module. The Segment Rate Threshold, Port Rate Threshold, and Optional Module Rate Threshold determines whether the broadcast storm exists or not.

Segment ID

The Segment ID specifies the segment where the broadcast storm protection function is applied (10 Mbps/100 Mbps segment).

Segment Broadcast Packet Rate Threshold

The number of broadcast packets received on a given segment per second. The range is 0 to 14 880 packets per second.

Optional Module Broadcast Packet Rate Threshold

The number of broadcast packets received on each uplink of a given optional module per second. The range is 0 to 14 880 packets per second.

Port Broadcast Packet Rate Threshold

The number of broadcast packets received on a given port per second. The range is 0 to 14 880 packets per second.

Broadcast Alarm Action

Once broadcast storm is detected on a given port, segment, or optional module, the proper action shall be performed based on the value specified by its Broadcast Alarm Action.

- **Partition Port:** The port will be disabled. Once a port is partitioned due to broadcast storm, the Broadcast Storm protection function will continue to monitor the port. The port is disabled for 15 seconds and re-enabled for five seconds. This process is repeated for two minutes. If the broadcast storm still exists after two minutes, the port is disabled and will no longer be monitored for the broadcast storm.

    Note: It is up to the user to enable the port once the source of the broadcast storm has been handled. The user must re-enable a port that has been disabled for a broadcast storm that lasts more than two minutes. The user should resolve the broadcast storm before re-enabling the port.

- **Send-Trap-and-Partition-Port:** The port will be disabled and a trap will be sent.
- **Send-Trap:** A trap is sent.
- **No-Action:** No action will be taken.

Broadcast Alarm Status

- **Enable:** Enable the broadcast monitoring and protection function on this segment
- **Disable:** Disable the broadcast monitoring and protection function on this segment
- **Invalid:** Purge the broadcast monitoring and protection setting for this segment

Formula for calculating Broadcast packet rate

$$\text{Broadcast packet rate} \quad = \quad \frac{\text{Broadcast packet received}}{\text{Seconds}}$$

Configuring Broadcast Storm Protection

To detect the broadcast storm of the 10/100 Ethernet Stackable Hub, the users have to configure the following parameters from the Broadcast Storm Protection Menu:

1. Select **100 Mbps Segment** from **Segment ID** field.
2. Configure **Segment Broadcast Packet Rate Threshold**.
3. Configure **Optional Module Broadcast Packet Rate Threshold**.

    Note: The "Optional Module Broadcast Packet Rate Threshold" of 100 Mbps segment is used for both 10 Mbps and 100 Mbps Broadcast Storm Detection.

4. Configure **Broadcast Alarm Action.**
5. Enable the broadcast storm protection function.

To detect the broadcast storm of AUI module, the users have to configure the following parameters from the Broadcast Storm Protection Menu:

1. Select **10 Mbps Segment** from **Segment ID** field.

2. Configure **Segment Broadcast Packet Rate Threshold**.

3. Configure **Optional Module Broadcast Packet Rate Threshold**.

   Note: The **Optional Module Broadcast Packet Rate Threshold** of 10 Mbps segment is used for AUI module broadcast storm detection.

4. Configure **Broadcast Alarm Action**.

5. Enable the broadcast storm protection function.

Broadcast Storm Detected

Selecting this option presents the Broadcast Storm Detected Menu as shown in Figure 4-30.

```
┌─────────────────────────────────────────────────────────────┐
│           IBM 10/100 Ethernet Stackable Hub 8245             │
│              - Broadcast Storm Detected Menu -               │
│                                                              │
│                                                              │
│   Broadcast Storm detected on    Group 1          Port 5     │
│                                                              │
│                                                              │
│                                                              │
│                                                              │
│                                                              │
│                                                              │
│                                                              │
│                                                              │
│     PREV PAGE   NEXT PAGE   EXIT   MAIN MENU   HELP          │
└─────────────────────────────────────────────────────────────┘
```
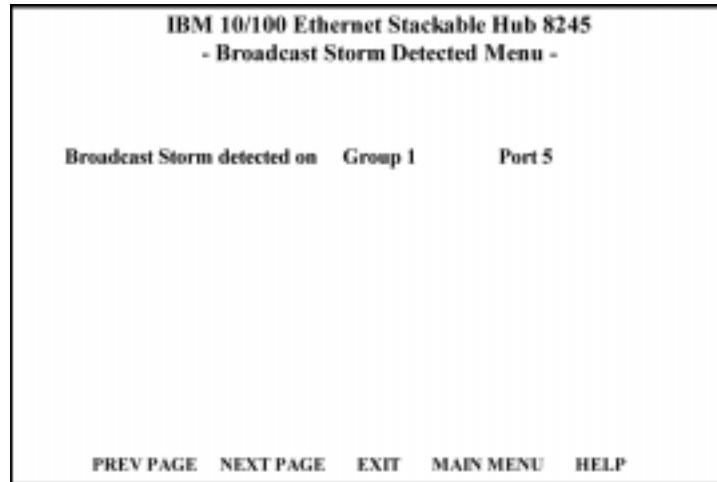
Figure 4-30 Broadcast Storm Detected Menu

Each broadcast storm is detected, the hub and port number is listed in this menu. If there has been no storms detected, this menu is empty. A maximum of 32 broadcast storms will be displayed, 16 per page. The list is updated on a first-in, first-out basis when the maximum of 32 are reached.

User Authentication

Selecting this option presents the User Authentication Menu as shown in Figure 4-31.

Figure 4-31 User Authentication Menu

This menu lets you define up to six different users. The passwords are the same for both the management session and the web. You can also change the password for the control panel.

Note: User Names and Passwords are not case sensitive. To define a user, perform the following steps:

1. Select an Index number and press **Enter**.
2. Enter a user name of up to 12 characters.
3. Enter a password of up to 6 alphanumeric characters.
4. Specify **Read Only** or **Read/Write** privilege, and press **Enter**.
5. Select **ADD**.
6. Select **EXIT**.

   Note: The control panel password can be only four digits (0-9).

The 10/100 Ethernet Stackable Hub comes with three default user names.

- **Admin** requires no password.
- **Guest** has a password of "guest".
- **Control Panel** has a password of "0000".

System Utility

Selecting this option presents the System Utility Menu as shown in Figure 4-32.

IBM 10/100 Ethernet Stackable Hub 8245
- System Utility Menu -

System Download

System Restart

Factory Reset

Login Timeout Interval

Configuration Upload Setting

Configuration Upload Request/Status

EXIT   MAIN MENU   HELP
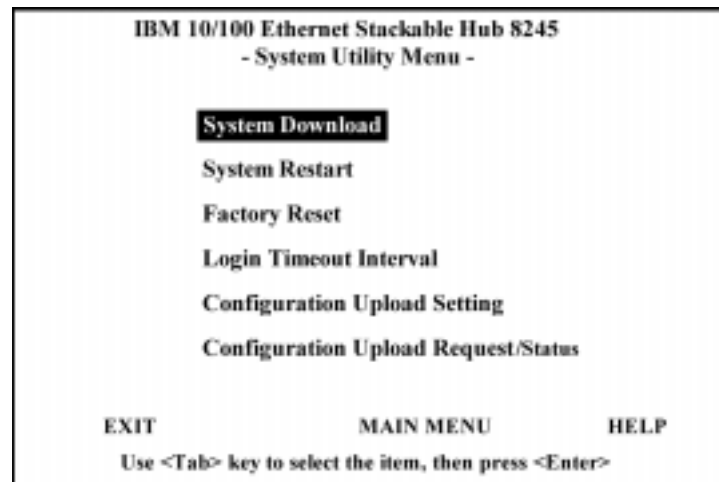Use <Tab> key to select the item, then press <Enter>

Figure 4-32 System Utility Menu

The System Utility Menu lets you download microcode, restart the Hub, reset the Hub to the factory default, set the login time-outs, configure the upload settings and request an upload.

System Download

Configure type of download.

System Restart

Restart the Hub.

Factory Reset

Reset to factory configuration.

Login Timeout Interval

Set the amount of time before a Telnet automatically logs out, when requesting an upload.

Configuration Upload Setting

Set the IP Address of the server and the file name to be uploaded.

Configuration Upload Request/Status

Submit a request for a configuration file upload.

System Download

Selecting this option presents the System Download Menu as shown in Figure 4-33.

Figure 4-33 System Download Menu

This menu lets you perform a BootP request and a TFTP code download. To request an IP address, subnet mask, and a default gateway address from your BootP server, perform the following steps:

Step 1. Select BootP REQUEST

> **Note:** Not all DHCP servers support basic BootP services. If you experience a problem check your DHCP server manual.

Step 2. Perform a cold restart on the system. For information on restarting your system, see "System Utility" on page 4-49.

You should perform a code download only to update existing software or if existing code has become corrupted. Before performing a system download, make sure that you know the IP address of your TFTP server and the location of the files on the server.

Note: Use the following naming convention:

- **BOOT ROM Code download:** 8245Vxxx.BT
- **Web Pages Database Information Download:** 8245Vxxx.WEB
- **System Software Download:** 8245Vxxx.RT

Where, xxx is the version number.

To download TFTP code, perform the following:

Step 1. Enter the IP address of the TFTP server.

Step 2. Select the downloads that you want to perform.

Step 3. Enter the path and file name for each of the downloads you have selected (for example, C:\microcode\8245V101.BT).

Step 4. Save the configuration.

Step 5. Restart the system using a cold start.

System Restart

Selecting this option presents the System Restart Menu as shown in Figure 4-34.


```
              IBM 10/100 Ethernet Stackable Hub 8245
                      - System Restart  Menu -




             System Restart:  < Cold Start >








         EXECUTE              EXIT    MAIN MENU   HELP
```
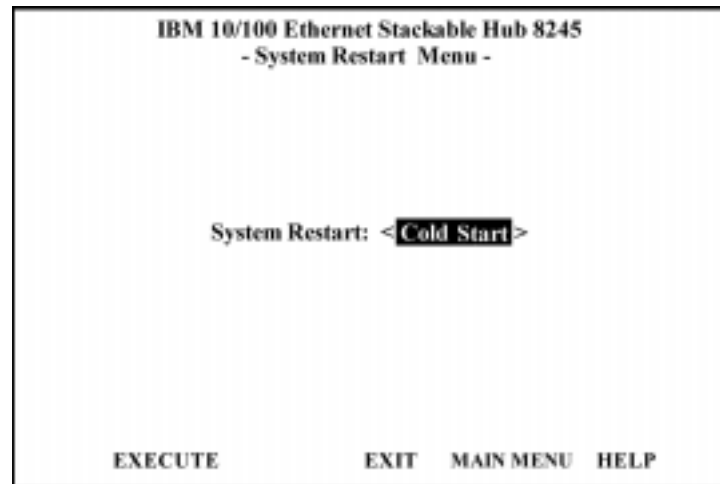
Figure 4-34 System Restart

The System Restart Menu lets you perform a *cold* or *warm* restart.

You can restart the system at any time without losing configuration settings, except in the case of a download. When you select EXECUTE and then press **Enter**, a warning message informs the user that system restart will be performed right now.

Warm

A warm restart restarts the hub at the runtime code. For most cases, a warm restart is sufficient, except in the case of a BootP request or code download.

Cold

A cold restart restarts the hub at the BOOT ROM level and is the same as unplugging and re-plugging power to the hub. A cold restart is needed when the user performs a BootP request or code download.

Factory Reset

Selecting this option presents the Factory Reset Menu as shown in Figure 4-35.

```
            IBM 10/100 Ethernet Stackable Hub 8245
                    - Factory Reset Menu -


    Network Configurations:  <  Not Reset     >

        Factory Default:
               IP Address:        0.0.0.0
               Subnet Mask:       0.0.0.0
               Default Gateway:   0.0.0.0

    User Authentication Configuration: <              >


    Factory Default:
                            User Name   Password   Priviledge
                            ----------  ---------  -----------
          System Console :   admin                 Read/Write

          Control Panel  :   ----------   0000      Read/Write


        EXECUTE      EXIT        MAIN MENU       HELP
```
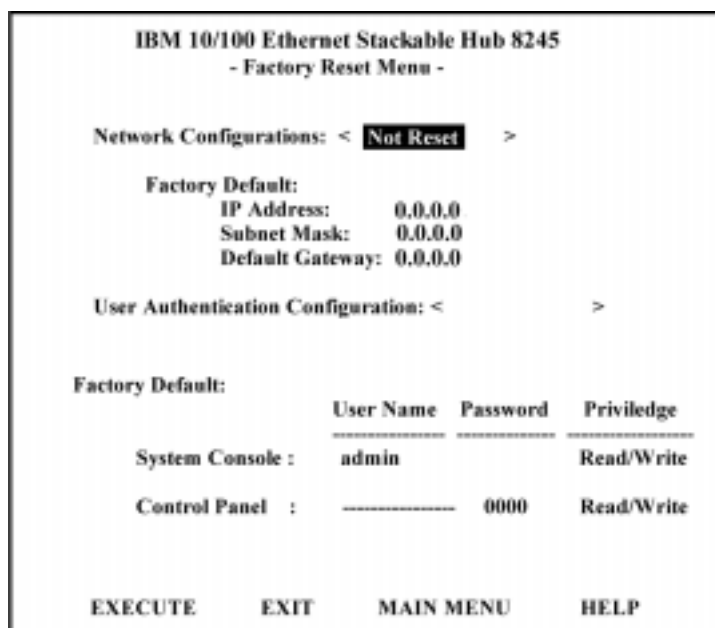
Figure 4-35 Factory Reset Menu

The Factory Reset Menu lets you return all Hub settings to the original default settings.

When you issue a factory reset, all of your custom settings are overwritten.

To perform the factory reset, do the following steps:

Step 1. Select how the network configuration will be processed during a factory reset:

- **Not Reset:** Current network configuration is saved.
- **Reset from BootP:** Request a new network configuration from BootP server.
- **Reset to Factory Default:** Current network configuration is reset to factory defaults.

Step 2. Select how the user authentication configuration will be processed during a factory reset:

- **Not Reset:** Current user authentication configuration is saved.
- **Reset to Factory Default:** Current user authentication configuration returns to factory defaults.

Step 3. Select **EXECUTE** and press **Enter**.

When **EXECUTE** and **Enter** are selected, a warning message informs the user that system configuration data will be reset right now.

Login Timeout Interval

Selecting this option presents the Login Timeout Interval Menu as shown in Figure 4-36.

```
            IBM 10/100 Ethernet Stackable Hub 8245
                   - Login Timeout Interval -




      Telnet Session Auto Logout Interval: |5  |  Minutes  (0..60)







      SAVE          EXIT         MAIN MENU        HELP
```
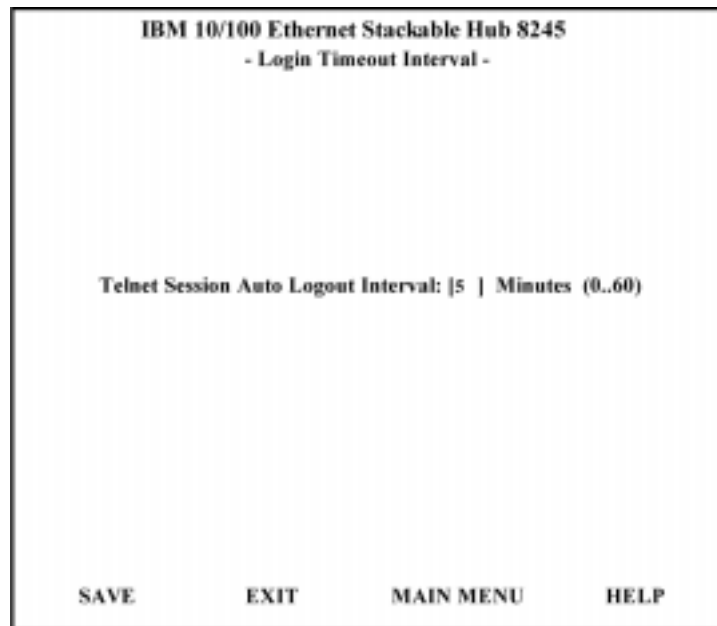
Figure 4-36 Login Timeout Interval Menu

This menu lets you select the time after which an established Telnet session is automatically logged out if inactive. The range is zero to 60 minutes. The default is five minutes. If you specify zero, the session remains logged in regardless of how long it is inactive.

Configuration Upload Setting

Selecting this option presents the Configuration Upload Setting Menu as shown in Figure 4-37.

```
                IBM 10/100 Ethernet Stackable Hub 8245
                  - Configuration Upload Setting Menu -



         TFTP Server IP Address:        [ 0.0.0.0      ]
         Configuration File Name: [                            ]









         SAVE           EXIT         MAIN MENU        HELP
```

Figure 4-37 Configuration Upload Setting Menu

The 10/100 Ethernet Stackable Hub provides the capability to upload the hub configuration data to the remote server in binary format. You can upload your configuration files and save as a backup in case you need to restore your system settings.

Enter the TFTP Server IP Address and the chosen file name (for example: filename.CFG) and the path where the files will be uploaded to on the server. Select **SAVE** to save your configuration settings, and then request the upload using the Configuration Upload Request Menu. See "Configuration Upload Request" on page 4-56.

TFTP Server IP Address
   The IP address of the server that the configuration files are to be stored.

Configuration File Name
   The name of the configuration file and the full path of saving location on server.

Configuration Upload Request

Selecting this option presents the Configuration Upload Request Menu as shown in Figure 4-38.

```
┌─────────────────────────────────────────────────────────┐
│            IBM 10/100 Ethernet Stackable Hub 8245        │
│          - Configuration File Upload Request/Status Menu -│
│                                                          │
│   New Upload Request                                     │
│   TFTP Server IP Address:210.68.0.21                     │
│   Configuration Filename: LL_Hub1.cfg                    │
│                                                          │
│   Current Status                                         │
│   TFTP Server IP Address:210.68.0.21                     │
│   Configuration FileName:LANlord.cfg                     │
│   Current State:                                         │
│   Time Elapsed:20 Seconds                                │
│   Upload Status:No-Error/No-Such-File                    │
│         /Access-Violation/Disk Full                      │
│         /Timeout/Other Error                             │
│   ─────────────────────────────────────────             │
│                          %                               │
│   SUBMIT    ABORT    EXIT    MAIN MENU    HELP           │
└─────────────────────────────────────────────────────────┘
```

Figure 4-38 Configuration Upload Menu

This menu displays information only. See Figure 4-38 as an example. To edit configuration upload settings, see "Configuration Upload Setting" on page 4-55.

Select SUBMIT to make the Upload Request.

TFTP Server IP Address
    The IP address of the server that the configuration files will be uploaded to.

Configuration File Name
    The name of the configuration file and the full path.

Current State
    When the configuration file download is complete, **completed** is displayed.

Time Elapsed
    The time elapsed since starting the upload request.

Upload Status

The status of the data transfer with regard to errors.

- **No Error:** The upload was successfully stored in the specified configuration file.
- **No-Such-File:** The path specified in the Configuration Filename field, can not be found on the TFTP Server.
- **Access Violation:** The file specified Configuration Filename field is Write Protected.
- **Disk Full:** The disk specified Configuration Filename field, is full.
- **Timeout:** The TFTP upload timeouts has expired, 20 seconds. A progress bar is displayed in the menu showing the progress.
- **Other Error:** Other errors that are defined by the system.

Once you have uploaded your configuration files you can download them if necessary. See "System Download" on page 4-50 for information about downloading configuration files.

Chapter 5. Using Web Management

You can use your web browser to configure the 10/100 Ethernet Stackable Hub. Enter the hub's IP address or host name in your web browser's address field. You are prompted for a user name and password.

The 10/100 Ethernet Stackable Hub comes with two default user names. One default is "ADMIN" and requires no password. The other default is "GUEST" and has a password of "GUEST". (User names and passwords are not case sensitive.)
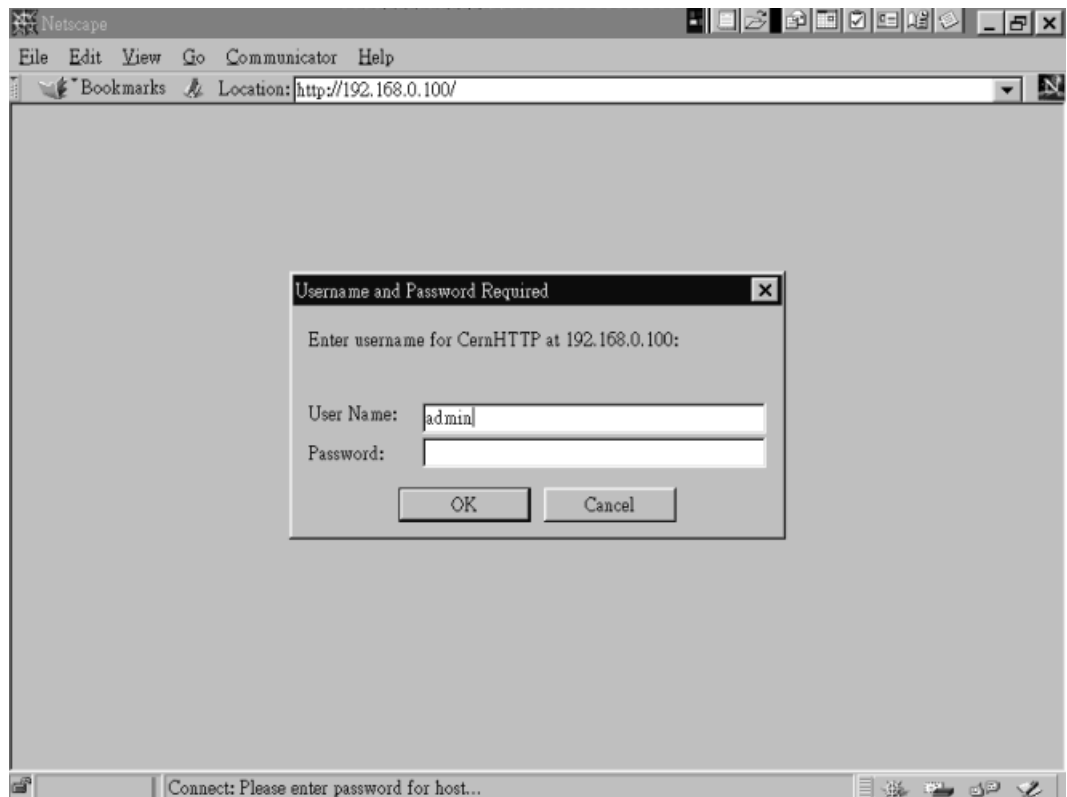

Figure 5-1 Login Menu

Home Page

After logging in the IBM 10/100 Ethernet Stackable Hub home page is presented as shown in Figure 5-2. This menu also contains a link to the IBM home page (www.ibm.com).

Figure 5-2 Home page

The Home Page presents the following menus:

System Information

> The System Information Menu provides information related to the version of the system software installed on the 10/100 Ethernet Stackable Hub.

Management Setup

> Allows you to setup the management functions of the 10/100 Ethernet Stackable Hub.

Device Control

> Allows you to configure the hubs and their ports.

Network Monitor

> Allows you to configure network monitoring.

RMON

> Allows you to configure remote monitoring.

System Utility

Allows you to use and configure the system utilities.

Help

Presents help guide for Microsoft Internet Explorer users and shows how to enable the trap window.

Trap Frame Window

The Trap Frame window is displayed when the web browser connects to the 10/100 Ethernet Stackable Hub as shown in Figure 5-3.
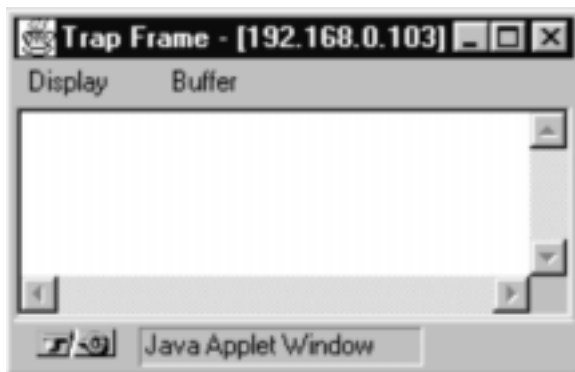

Figure 5-3 Trap Frame Window

This window receives all traps from the hub except for cold start, Hello, and RMON traps. The maximum number of traps displayed depends on system resources and capacity.

Table 5-1 Trap Frame Information

Display	Lets you manage how you want to display traps:
	• **Pause:** Stops displaying any new traps.
	• **Continue:** Resumes displaying new traps.
	• **Clear:** Clears the traps displayed on the Trap Frame window.
Buffer	Lets you control the traps in the buffer:
	• **Delete:** Deletes all the traps in the buffer.
	• **Dump:** Dumps all the traps in the buffer to the Trap Frame window.

Hub Graphic

A graphic picture of the 10/100 Ethernet Stackable Hub displayed in the top section of each of the web pages is a Java applet that allows you to view the 10/100 Ethernet Stackable Hub.
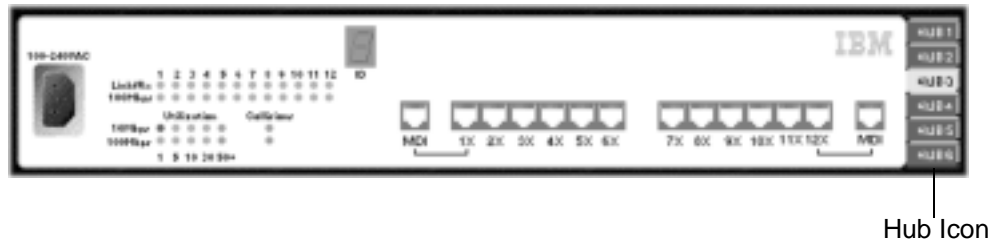

Hub Icon

Figure 5-4 Hub Graphic

Note: The Java Applet for the management unit is displayed as a manageable unit.

Hub Icon

Selecting a hub icon will display a graphical picture of that hub and show it's current status.

- **Green:** A manageable hub.
- **Blue:** A managed hub.
- **Gray:** A hub is disconnected or is unavailable.

7-Segment Display

A range of 1 to 6 indicates the hub id of connected hub

LED Status

- Link/Rx LEDs:

    Off: Link down
    Green: Link up
    Green and blinking: Packet receiving

- 100 Mbps LEDs:
    Off: 10 Mbps speed
    Green: 100 Mbps speed

- Collision LEDs:
    Amber: Collision detected
    Off: No collision

- Utilization Indicators:

- 5 LED levels show the utilization of 10 Mbps and 100 Mbps segments.

    Note: Five 10 Mbps segment utilization LEDs (green, green, green, green, amber). Five 100 Mbps segment utilization LEDs (green, green, green, green, amber).

• TP Port Connector:
> **White (inside inner frame):** Link up
> **Amber (inner frame):** auto partitioned
> **White (frame):** admin disabled

If you click with the right mouse button on any port, a menu is presented. You can use your left mouse button to make the following port selections:

Table 5-2 Port Information

Statistic	Displays the Repeater Port Statistic Information Menu for the selected port (see Figure 5-22 on page 5-41)
Control	Lets you enable or disable ports: • **ADMIN Enable:** enables the selected port • **ADMIN Disable:** disables the selected port

The status of the individual ports is shown in the hub picture. Figure 5-5 shows how port status is graphically displayed for each port.
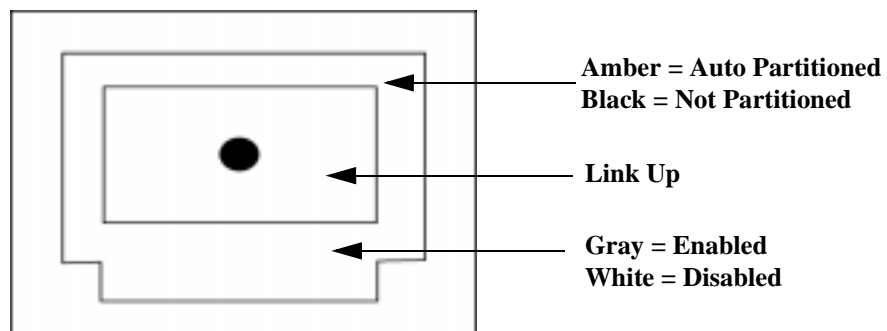
Figure 5-5 Hub Port Status Legend

If you click with the right mouse button on the unit itself, a menu is presented. You can use your left mouse button to make the following unit selections:

Table 5-3 Unit Information

INFO	Displays the Repeater Group Control/Status menu for the unit
STATISTIC	Display the Repeater Statistics Information Menu
TRAP	Opens a trap window for the specified hub if trap window does not exist

System Information

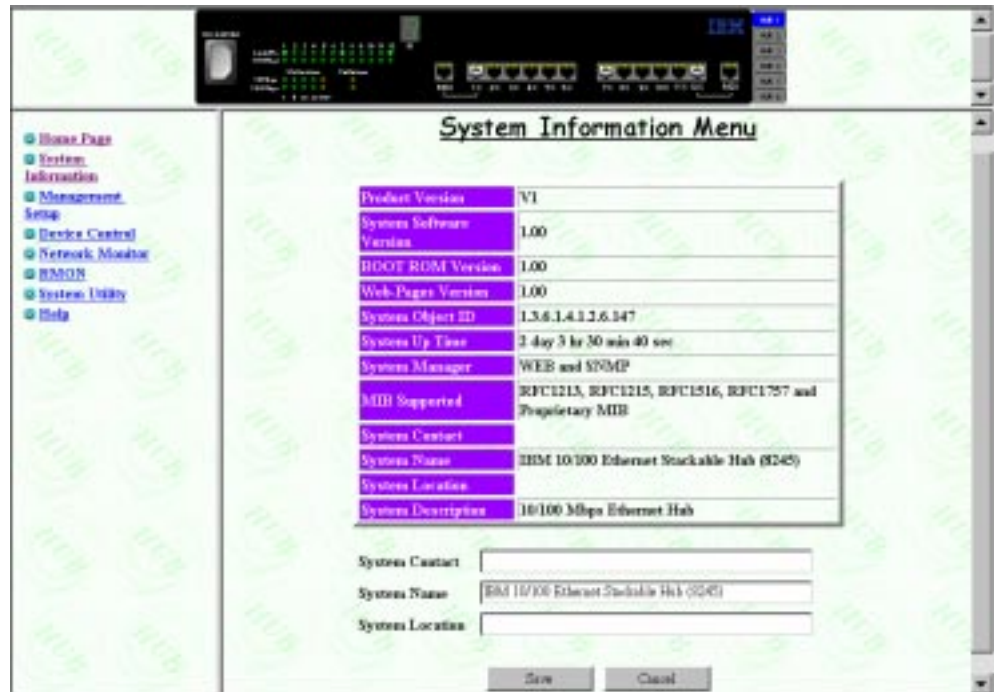Selecting this option presents the System Information menu as shown in Figure 5-6.

Figure 5-6 System Information

The System Information Panel provides information related to the version of the system software installed on the 10/100 Ethernet Stackable Hub.

You can specify up to 48 alphanumeric characters for each of these: System Contact, System Name, and System Location to provide useful information to all users concerning the 10/100 Ethernet Stackable Hub. The information on this menu should be kept current so that persons requiring assistance know whom to contact.

Notes:

1. You must select **SAVE** to save any changes you have made.
2. The MIBs supported field is for information only.

System Description

A textual description of the entity. This also includes the name and version identification of the system's hardware type, software operating system, and networking software.

System Object ID

The vendor's authoritative identification of the network management subsystem is contained in the 10/100 Ethernet Stackable Hub. This value is allocated within the SMI enterprises' subtree (1.3.6.1.4.1) and provides an easy and unambiguous means for determining what kind of device is being managed.

System Manager

The management capability that this system supports (SNMP and WEB).

System Up Time

The time since the network management portion of the system was last restarted or powered on.

Management Setup

Selecting this option presents the following options:

Network Configuration

Set IP address, Subnet Mask, and Default Gateway address

Serial Port Configuration

Configure serial port for communications.

SNMP Community

Configure community names and access.

Trap Receiver

Set up community trap addresses.

Trap Filter

Setup trap filters.

Network Configuration

Selecting the Network Configuration Menu allows you to select the Ethernet configuration menu shown in Figure 5-7 and the SLIP configuration menu shown in Figure 5-8.

Note: The 10/100 Ethernet Stackable Hub must be restarted for the changes to take effect. For information on restarting the 10/100 Ethernet Stackable Hub, see "System Utility" on page 5-70.

Ethernet Menu

An Ethernet connection allows you to monitor and configure the hub with a local console via Telnet session, a Web browser, or SNMP management. You need to configure the ID Address, and Subnet Mask to work with your LAN settings before you can make an Ethernet connection.
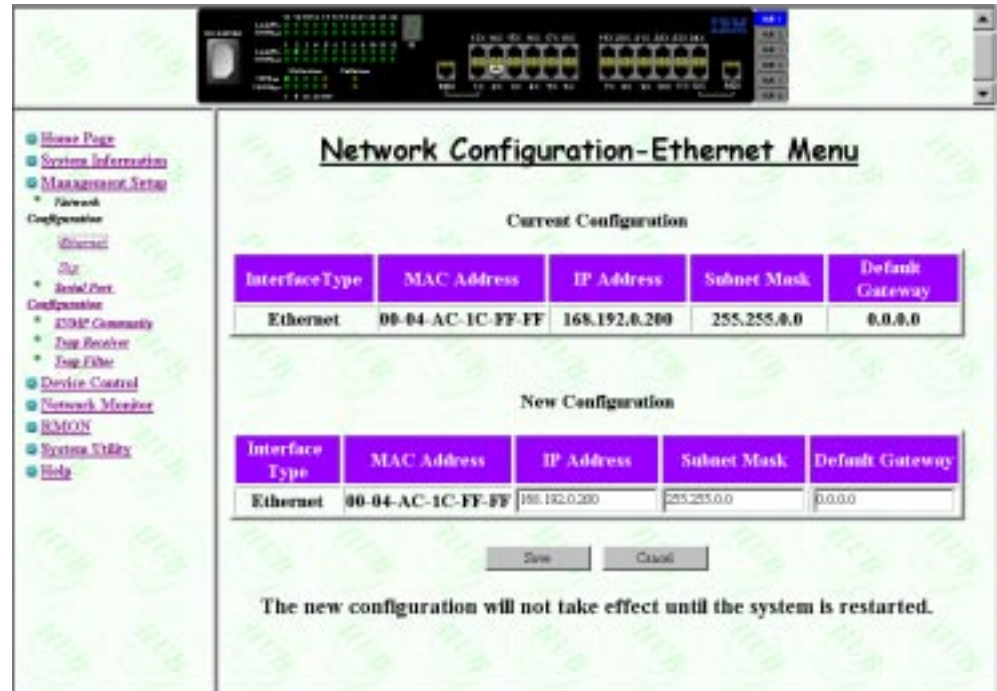

Figure 5-7 Network Configuration-Ethernet Menu

IP Address

The dotted decimal IP Address assigned to the 10/100 Ethernet Stackable Hub.

Subnet Mask

The dotted decimal Subnet Mask assigned to the 10/100 Ethernet Stackable Hub.

Default Gateway

The dotted decimal IP address of the default router assigned to the 10/100 Ethernet Stackable Hub.

Current Configuration

The IP configuration that is currently running on the 10/100 Ethernet Stackable Hub.

New Configuration

The IP configuration that will become the new current configuration when the hub is restarted.

The 10/100 Ethernet Stackable Hub must be restarted before the IP address, subnet mask, and default gateway can take effect. To ensure the new information is correct, a "ping" should be done from another device connected to the 10/100 Ethernet Stackable Hub.

Note: The hub does not respond to ping packages that are greater than 1484 bytes.

SLIP Menu

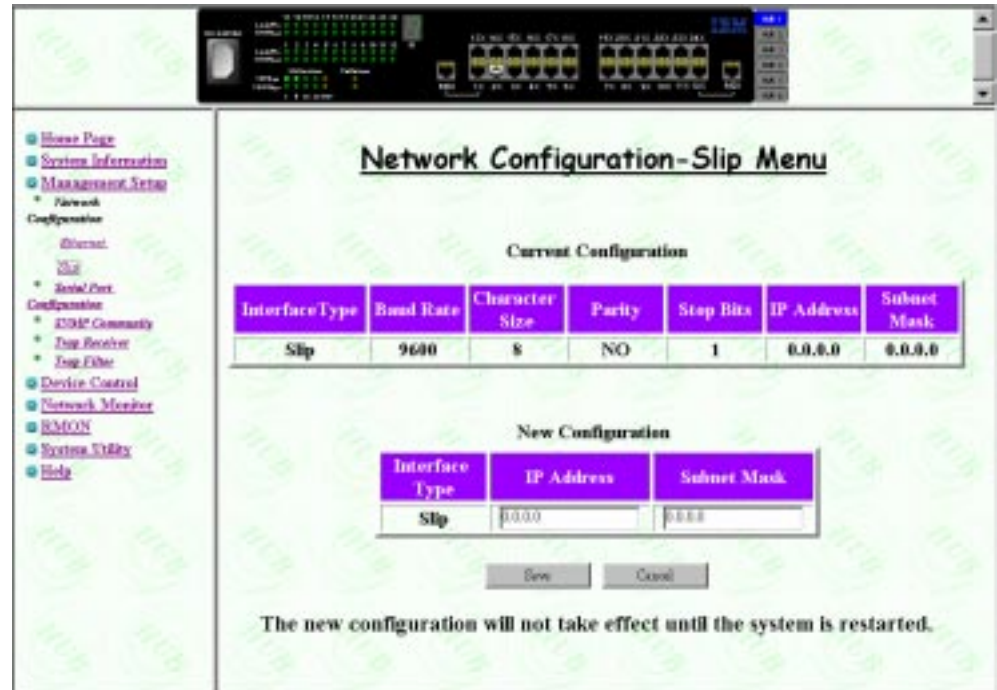SLIP connections enable monitoring and configuring of the 10/100 Ethernet Stackable Hub remotely with a modem.

Figure 5-8 Network Configuration-SLIP Menu

The baud rate, character types, and stop bits are read only and are not configurable on this menu.

Current Configuration

The SLIP configuration that is currently running on the 10/100 Ethernet Stackable Hub.

New Configuration

The SLIP configuration that will become the new current configuration when the hub is restarted.

IP Address

The dotted decimal address assigned to the SLIP interface of the 10/100 Ethernet Stackable Hub.

Subnet Mask

The dotted decimal Subnet Mask assigned to the SLIP interface of the 10/100 Ethernet Stackable Hub.

Serial Port Configuration

The Serial Port Configuration Menu allows you to view Console and configure SLIP connections.

Console

Selecting this option presents the Serial Port Configuration-Console Menu as shown in Figure 5-9. The console is used to view the configurations required to make a VT100 terminal emulator connection to the 10/100 Ethernet Stackable Hub.
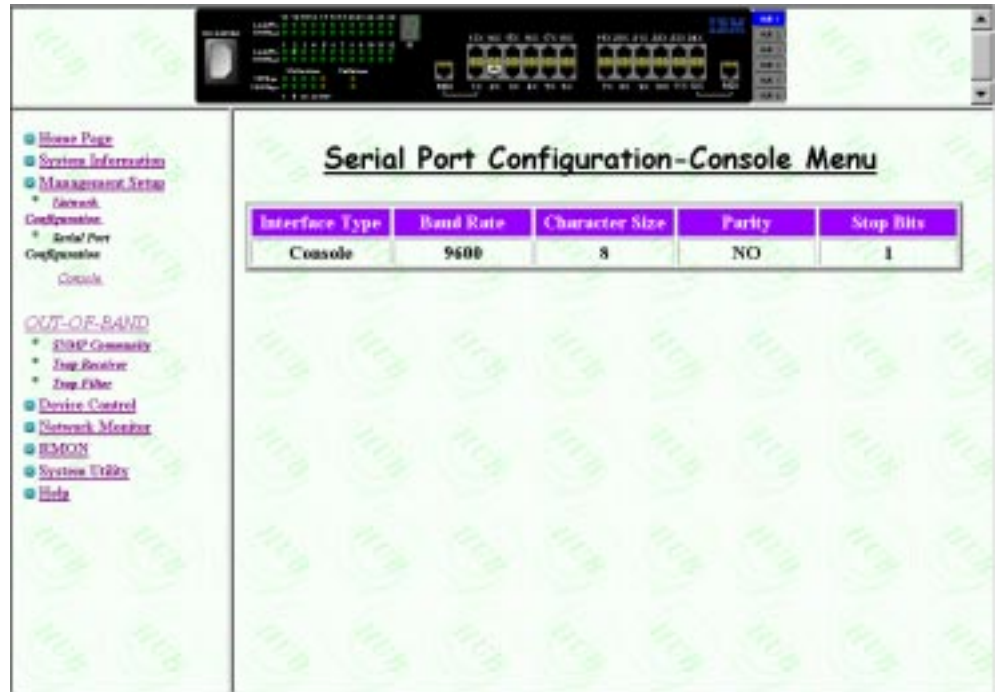

Figure 5-9 Serial Port Configuration -Console Menu

Note: The information in this menu is read only and these are the settings required when making a console connection to the 10/100 Ethernet Stackable Hub.

Out-Of-Band

Selecting this option presents the Serial Port Configuration-Out of Band Menu as shown in Figure 5-10. Out-of-band enables setting up serial port configurations for making a connection to the 10/100 Ethernet Stackable Hub management port using a modem.

Figure 5-10 Serial Port Configuration-Out Of Band Menu

Current Configuration

> The current out-of-band (OOB) configuration.

New Configuration

> The new OOB configuration that will be updated after **SAVE** has been selected. You must restart the hub before these settings take effect.

Baud Rate

> You can set the baud rate to any of the following: 2400, 4800, 9600, or 19200. The default is 9600.

Character Size

> 8 bits character size .

Parity

> No Parity.

Stop Bits

      1 stop bit.

When SLIP is enabled, the EIA 232 port can be used for SLIP only. The EIA 232 port cannot be used to gain access to a management session via VT100 terminal emulation. See on page 4-13.

SNMP Community Setup

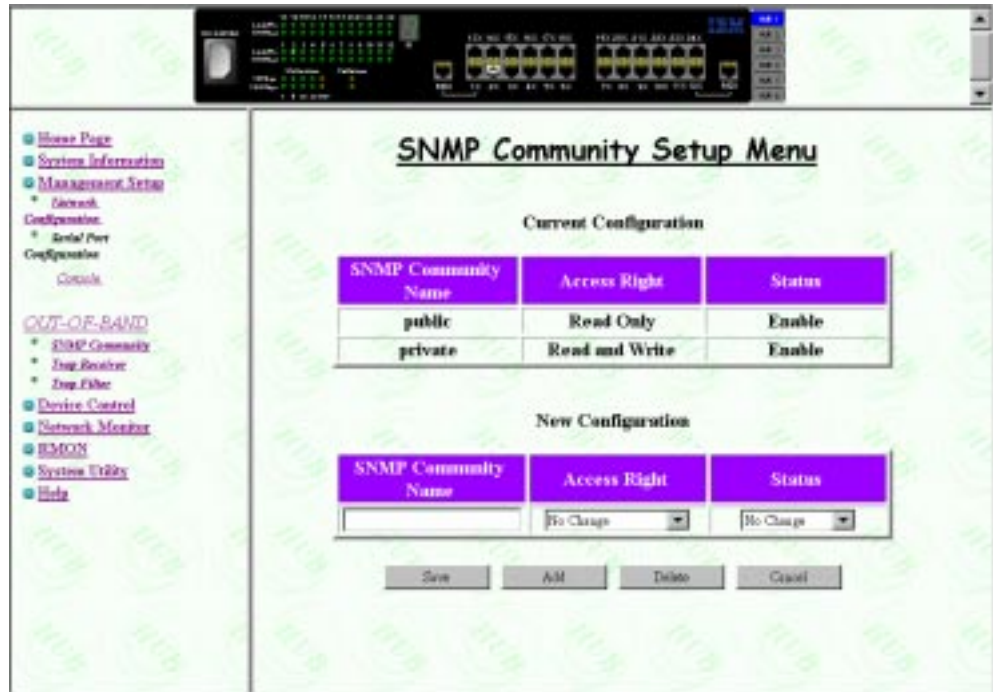Selecting this option presents the SNMP Community Setup Menu as shown in Figure 5-11.

Figure 5-11 SNMP Community Setup Menu

The SNMP Community Setup Menu enables configuring up to 6 community names.You can add or edit SNMP community names, set the access right and status. Community names *are case sensitive*, Private and private are considered different.

To add a community name:

Step 1. Select **Management Setup** from the Main Menu.

Step 2. Select **SNMP Community Setup**. The SNMP Community Setup Menu is loaded.

Step 3. Enter a **Community Name**. Entering an existing name will overwrite the existing name when saved.

Step 4. Set the **Access Right**.

Step 5. Set the **Status**.

Step 6. Select **Add** to add the new community name. Select **SAVE** to update.

Step 7. Repeat steps 3 to 6 for each additional name.

SNMP Community Name

It consists of a text string up to 16 characters.

A valid community name that exists in the SNMP Community. "public" and "private" are already entered allowing you to use the SNMP community without any configuration settings. These two community names can be edited or renamed as well as any new community names added.

Access Right

You can configure the Access Right to "Read Only" or "Read and Write".

Status

The status of community names (Enable or Disable)

• **Enable:** To enable a SNMP community.

• **Disable:** To disable a SNMP community.

Trap Receiver Setup

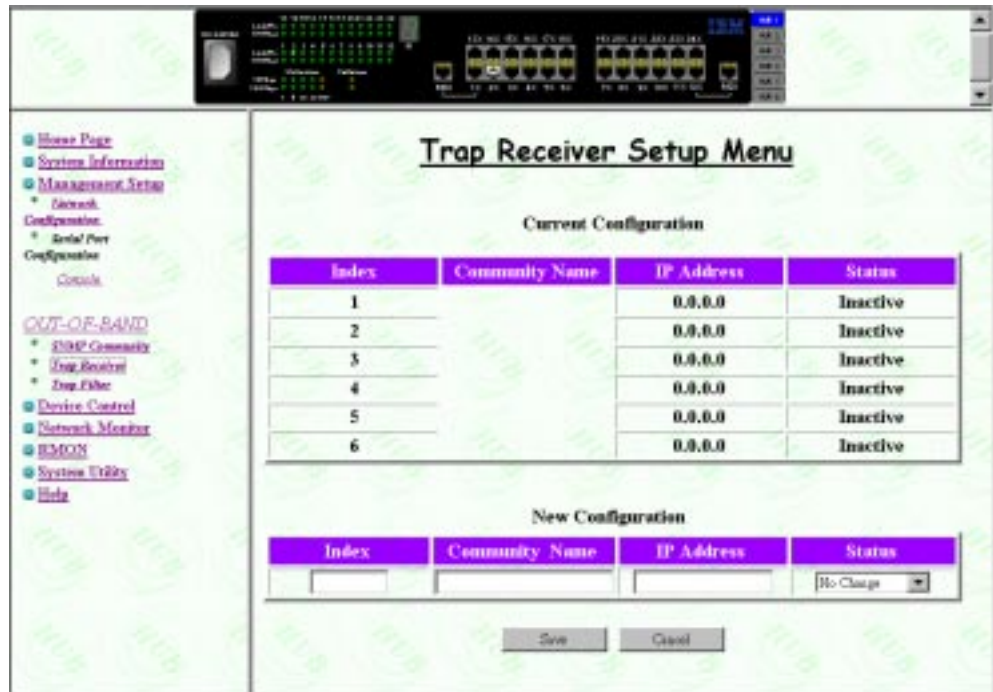Selecting this option presents the Trap Receiver Setup Menu as shown in Figure 5-12.

Figure 5-12 Trap Receiver Setup Menu

Traps are sent across a network to an SNMP Network Manager.These messages alert the manager to changes in the 10/100 10/100 Ethernet Stackable Hub. You can setup up to 6 trap receivers to receive traps when network events occur.

To setup trap receivers:

Step 1. Enter an **Index**, **Community Name, IP Address,** and set **Status**.

Step 2. Select **SAVE**.

Step 3. Repeat steps 1 and 2 for each new trap receiver.

Index

A number to identify a trap receiver (1 to 6).

Community Name

The SNMP community string of the remote network manager (maximum 16 characters).

IP Address

The IP Address of the remote network manager station to which traps should be sent.

Status

Active or Inactive. When set to active the trap receiver will receive traps when a trap event is raised.

Trap Filter

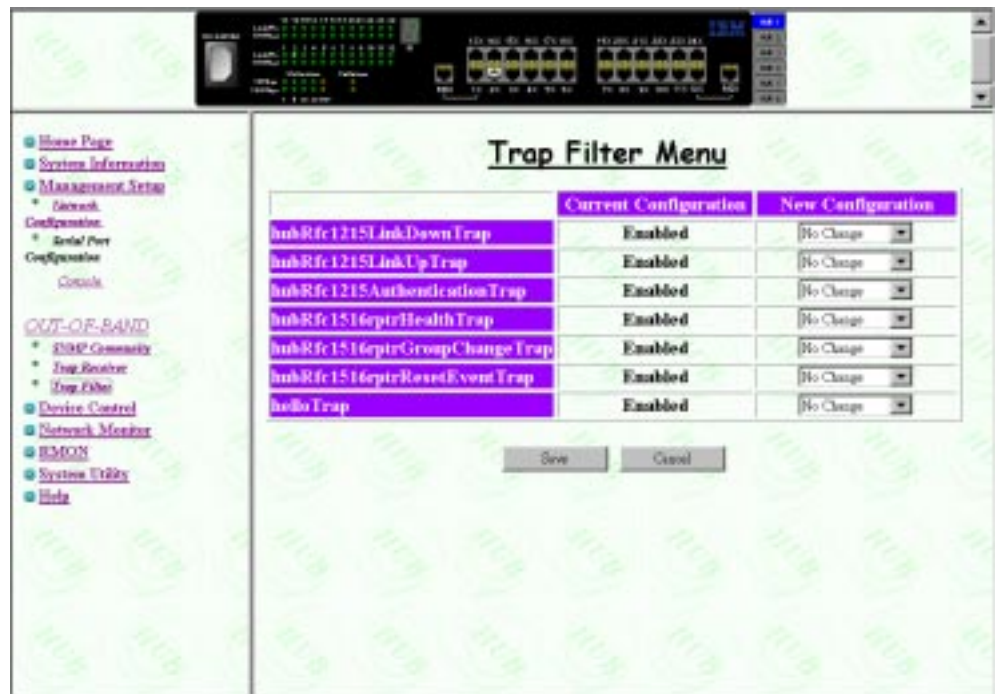Selecting this option presents the Trap Filter Menu as shown in Figure 5-13.

Figure 5-13 Trap Filter Menu

The trap filter menu allows you enable/disable trap filters. Enabled trap filters send traps to the trap receivers when the associated events occur. These traps are defined by RFC1215 and RFC156.

Device Control

The Device Control Menu presents the following menus:

Repeater Group Control/Status

Configure hubs.

Repeater Port Control/Status

Configure ports.

Bridge Module Control/Status

Configure bridge module.

External AUI Module Control/Status

Configure external AUI module.

Redundant Links Control

Configure redundant links.

Security Intrusion Control/Status

Configure security intrusion.

Repeater Group Control/Status

Selecting this option presents the Repeater Group Control/Status Menu as shown in Figure 5-14.

Figure 5-14 Repeater Group Control/Status Menu

You can view the status and configure each hub in the 10/100 10/100 Ethernet Stackable Hub stack or reset to the default setting.

To configure a hub in the 10/100 Ethernet Stackable Hub stack:

Step 1. Select an 10/100 Ethernet Stackable Hub number from the Group Number (Hub ID) pull down menu (1 to 6).

Step 2. Select **Submit**, to load the hub's configuration settings.

Step 3. Edit the current configurations.

Step 4. Select **SAVE**, to update the new configuration.

Port Capacity

The number of ports that the selected hub has available (12/24).

Repeater Type

The type of hub that is selected. 10/100 Mbps Class-II .

Group Role

The role of the selected hub (Managed or Manageable).

HW Revision

The hub base board hardware version.

Group Serial Number

Selected hub's serial number.

Group Last Change

The following will cause a group last change event:

• When a hub is connected to or removed from the stack.

• Hub restarted.

• When a device or module is added to the system.

• A change in the value of hub Operational Status.

• Ports were added or removed as members of the hub (such as group admin enabled or disabled).

• Any of the counters associated with this hub reset.

Group Partitioned Ports

The total number of ports in the hub group that has been auto partitioned by the hub due to broadcast storm or excessive collisions.

Group Operation

The current status of this group:

• **Operational:** the hub is connected to the stack and is functioning.

• **Not present:** the hub is not present on the stack.

Group Admin State

Enable or disable the specific group segment. The default value is Enable Both 10 Mbps and 100 Mbps Admin Only.

• **No Change:** None of these will be modified.

• **Enabled 10:** Only the 10 Mbps segment of a given group is connected to the back plane of stack. The 100 Mbps segment of a given group is isolated from stack.

• **Enabled 100:** Only the 100 Mbps segment of a given group is connected to the back plane of stack. The 10 Mbps segment of a given group is isolated from stack.

• **Enabled All:** Both 10 Mbps and 100 Mbps segments of a given group are connected to the back plane of stack. This is the default.

• **Disabled All:** Both 10 Mbps and 100 Mbps segments of a given group are isolated from stack.

Group Reset

All, some or none of the group's function can be changed by selecting one of these options:

Note: The selected option takes effect after **SAVE** is selected.

• **No Change:** None of these are modified.

• **Reset All:** The function logic, counters, and hub configuration of group will be reset. This is identical to a cold start.

• **Function Only:** The function logic of group will be reset. The counters and hub configuration will be held static and will not be reset. This reset operation will reset the link status of each port to 'Link Down' that can cause a Link Status Change event to be raised.

• **Counters Only:** The counters of each port will be reset to 0, but the function logic and hub configuration will be held static and will not be reset.

Group Name

The name assigned to this hub, up to 28 characters (cannot be accessed by SNMP Manager).

Group Last Change Notify

• **Enabled:** Send out a trap when the value of 'Group Last Change' is changed.

• **Disabled:** The default. No trap is sent when the Group Last Change Notify is changed.

Repeater Port Control/Status

Selecting this option presents the Repeater Port Control/Status menu as shown in Figure 5-15.

Figure 5-15 Repeater Port Control/Status Menu

You can select a group (hub) from the group number pull down menu, then select SUBMIT.

To configure a port on an 10/100 Ethernet Stackable Hub in the stack:

Step 1. Select a port from the Port Number pull down menu (1 to 12/24).

Step 2. Select **Submit**, to load the ports current configuration settings.

Step 3. Configure the port.

Step 4. Select **SAVE** to update the new port configuration.

Step 5. Repeat steps 1 to 4 for each port.

Group Number

An 10/100 Ethernet Stackable Hub ID in the stack (1 to 6).

Port Number

The current port number of the current hub.

Link Status

The current link status of the port.

• **Link Down:** Link pulses are not detected on this port.

• **Link Up:** Link pulses are being received on this port.

Note: When the port link test function is disabled, the Port Link Status always returns the Link Up for ports.

Polarity Status

The current polarity link status of the port.

• **Rx Polarity Normal:** The receive polarity of the given port is not reversed.

• **Rx Polarity Reversed:** The receive polarity of the given port is reversed and has been automatically crossed by the hub.

Auto Partition

The current partition status of the port.

• **Not Auto Partitioned:** The port is not partitioned

• **Auto Partitioned:** The port is partitioned

Speed

The current speed of the port (10 Mbps/100 Mbps).

Isolate Status (100 Mbps Port Only)

Indicates whether this 100 Mbps port is currently isolated by the repeater.

• **Not Isolated:** The port is not isolated.

• **Isolated:** The port is isolated.

Interface Type

The interface type of the port (10/100 Mbps TP).

Admin State

The current administration state of the port (enable/disable).

Link Test

Enable or disable link testing.

Note: Redundant link pairs must have Link Test enabled.

Speed Control

The port speed. The port will automatically connect to the 10 Mbps or 100 Mbps segment based on its port speed.

- **Auto Negotiate:** The speed is detected and the duplex mode is forced to half duplex.

- **10 Mbps:** The port speed is forced to 10 Mbps.

- **100 Mbps:** The port speed is forced to 100 Mbps.

Link Status Change Notify

- **Enable:** The trap is sent.

- **Disable:** The trap is not sent.

Note: Whenever the Port Link Status is changed, the "hubPortLinkStsChgTrap" will be raised by the agent.

Bridge Module Control/Status

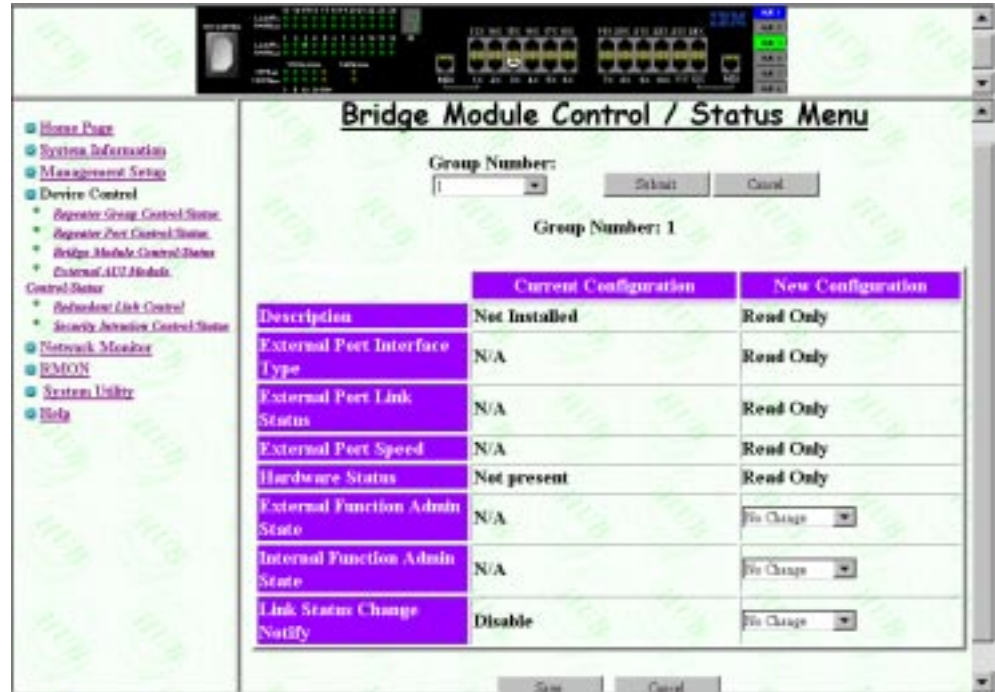Selecting this option presents the Bridge Module Control/Status menu as shown in Figure 5-16.

Figure 5-16 Bridge Module Control/Status Menu

The Bridge Module has two internal and one external bridge port. The two internal ports bridge the 10/100 Ethernet Stackable Hub's 10 Mbps segment and 100 Mbps segment. The external port is used to bridge external devices.

To configure the Bridge Module:

Step 1. Select an 10/100 Ethernet Stackable Hub from the Group Number pull down menu.

Step 2. Select **Submit**, to load the configuration for the selected hub.

Step 3. Make the appropriate configurations in the New Configurations panel.

Step 4. Select **SAVE** to update the module's new configuration.

Group Number

The ID number of the current 10/100 Ethernet Stackable Hub (1 to 6).

Description

Description of the slide in module currently installed. The value is read-only.

External Port Interface Type

Description of the external port, for example RJ-45.

External Port Link Status

> The current link status of the installed module. The value is read-only. (Link up or link down.)

External Port Speed

> The modules external port speed. (The value is read only.)

Hardware Status

> Read-only description of the hardware status.

External Function Admin State

> You can enable or disable external bridge function.

Internal Function Admin State

> You can enable or disable internal bridge function if the hardware DIP switches have been enabled.
>
> **Note:** The internal bridge must be enabled with the DIP switch settings before the Admin state can be enabled.
>
> See "Installing an Optional Module" on page 2-3.
>
> **Notes:**
>
> 1. These modules are not "hot-swappable." You must remove power from the 8245 before installing or removing bridge modules.
> 2. You should enable the internal bridge on only one bridge module if you have multiple bridge modules installed in the stack. This prevents a network loop condition.

Link Status Change Notify

> When enabled, a trap will be sent to the receiver when link status of the port has changed.
>
> • **Enabled:** A trap is sent to the trap receivers if the link status changes.
>
> • **Disabled:** No trap is sent to the trap receivers if the link status changes.

External AUI Module Control/Status

Selecting this option presents the External AUI Module Control/Status menu as shown in Figure 5-17.
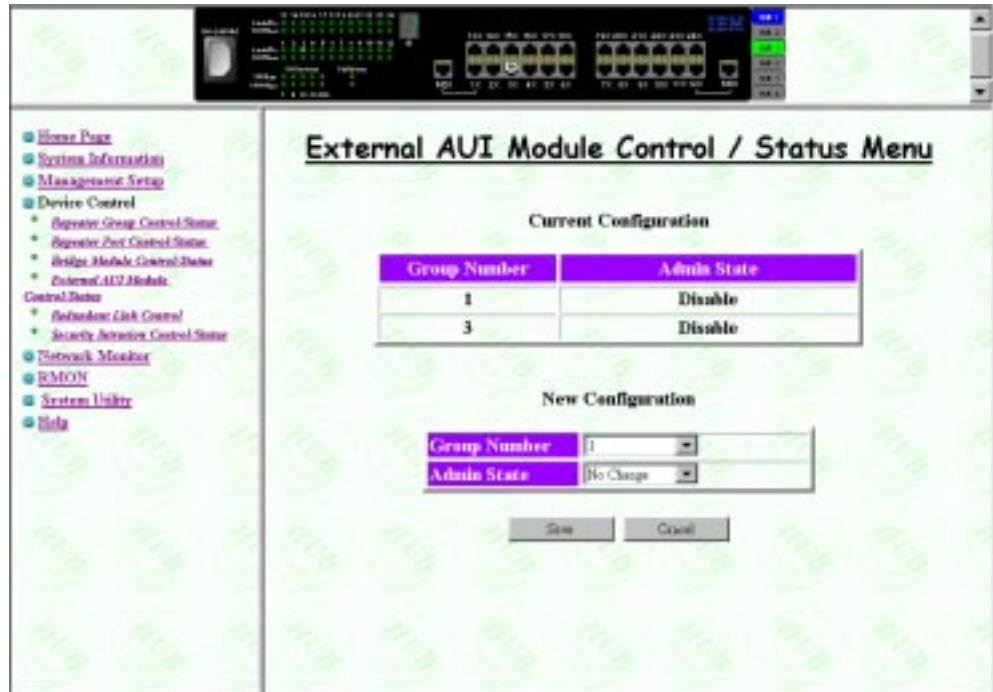

Figure 5-17 External AUI Module Control/Status Menu

The External AUI Module is used to connect AUI devices to the 10/100 Ethernet Stackable Hub. The AUI Module is a external bridge and does not have an internal 10/100 bridge.

Group Number

An 10/100 Ethernet Stackable Hub ID in the stack (1 to 6).

Admin State

Enable or disable AUI port operation.

Redundant Link Control

Selecting this option presents the Redundant Link Control menu as shown in Figure 5-18.
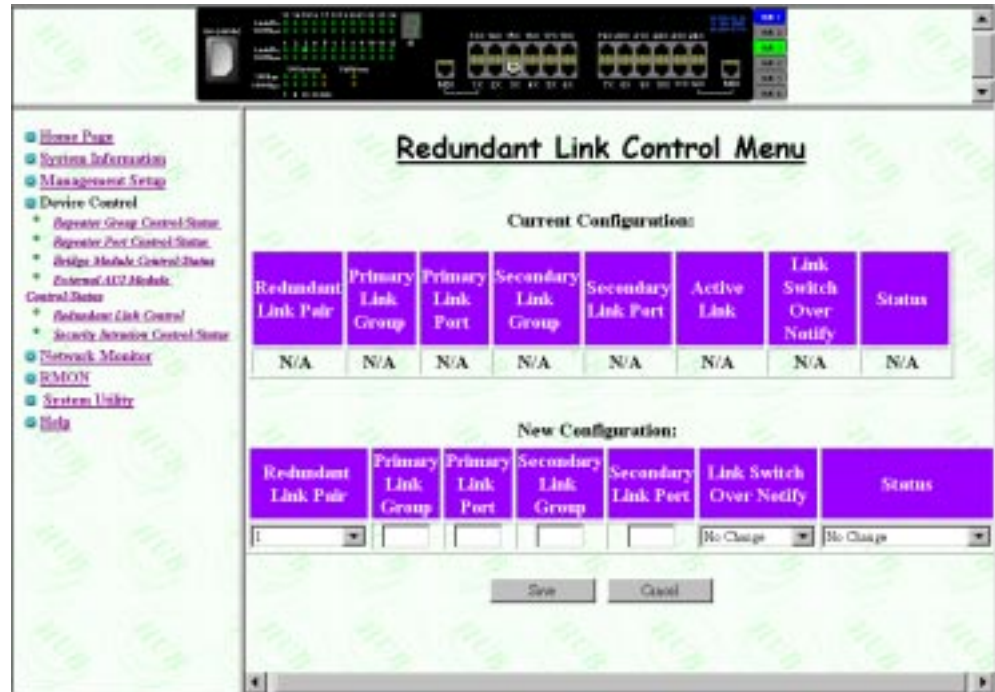

Figure 5-18 Redundant Link Control

The Redundant Link Control menu allows configuring up to 18 pairs of redundant links. A redundant pair consists of any two physically linked ports in the 10/100 Ethernet Stackable Hub stack, where one is the primary link port and a secondary link port. The primary link is the *active* link between two devices and the secondary is a backup and is set to *inactive* to prevent looping. In the event that the primary link fails, the secondary link becomes active. The secondary link stays active even if the primary link recovers. You must manually reset the primary link status to active in order to re-instate the redundant pair.

You can configure a primary link by assigning a specific port on a specific hub to a Link Pair Index. You can assign a secondary link by assigning a specific port on a specific hub to the same Link Pair Index.

To add or edit a Redundant Link Pair:

Step 1. Select a Redundant Link Pair Index from the pull down menu.

Step 2. Enter **Group**, **Port**, **Link Switch Over Notify**, and **Status Information**.

Step 3. Select **SAVE**. The information becomes effective immediately.

Redundant Link Pair

Index number for a linked pair (1 to 18).

Primary Link Group

This object identifies the hub ID number of primary link for a given redundant link pair.

Primary Link Port

This object identifies the port number of primary link for a given redundant link pair.

Secondary Link Group

This object identifies the hub id of secondary link for a given redundant link pair.

Secondary Link Port

This object identifies the port number of secondary link for a given redundant link pair.

Active Link

This object indicates the current status for a given redundant link pair.

• **Primary:** The port is currently the active primary link.

• **Secondary:** The port is currently the secondary port.

• **Both fail:** The secondary link port is the active link and it has failed. To reinstate the link pair set the link pair status to enable.

Link Switch Over Notify

If the link status of active link is "down" for more than 5 seconds, then the *active link failed* is detected and *port switch over* is performed and a trap is sent to the trap receivers.

• **Enable:** A trap is sent to the trap receivers.

• **Disable:** A trap is not sent to the trap receivers.

Status

You can **enable, disable** or **suspend** the operation of specific redundant link pairs.

• **Enable:** The redundant link pair is in the normal operation mode.The primary port is active and the secondary port is disabled.

• **Disable:** If you *disable the primary port* from the port control/status menus, the status of this link pair is changed to the *suspend state* and indicates that active port has been disabled and the redundant link function is temporary suspended. If you enable the primary port later on, the status of this redundant link pair is changed to *enabled*.

If you *disable the secondary port*, the status of this link pair is changed to the *suspend* state and both ports are disabled. If you enable the secondary port later on, the status of this link pair is changed to enabled and the redundant link pair is in the normal operation mode.

Notes:

1. Setting the redundant link to disable does not cause the ports to be switched over.

2. Redundant link pairs must have Link Test enabled.

• **Return-to-primary:** Selecting this option and pressing enter re-assigns the primary link as active link again. A trap is sent to the trap receivers if the status of the redundant link is enable. If the status is suspend then the link pair is reactivated but no trap is sent.

• **Suspend:** Indicates that the active ports are disabled and the redundant link function is temporarily suspended until you set its state to *enable*.

Note: The suspend state does not cause the port to be switched over.

Security Intrusion Control/Status

Selecting this option presents the Security Intrusion Control/Status menu as shown in Figure 5-19.
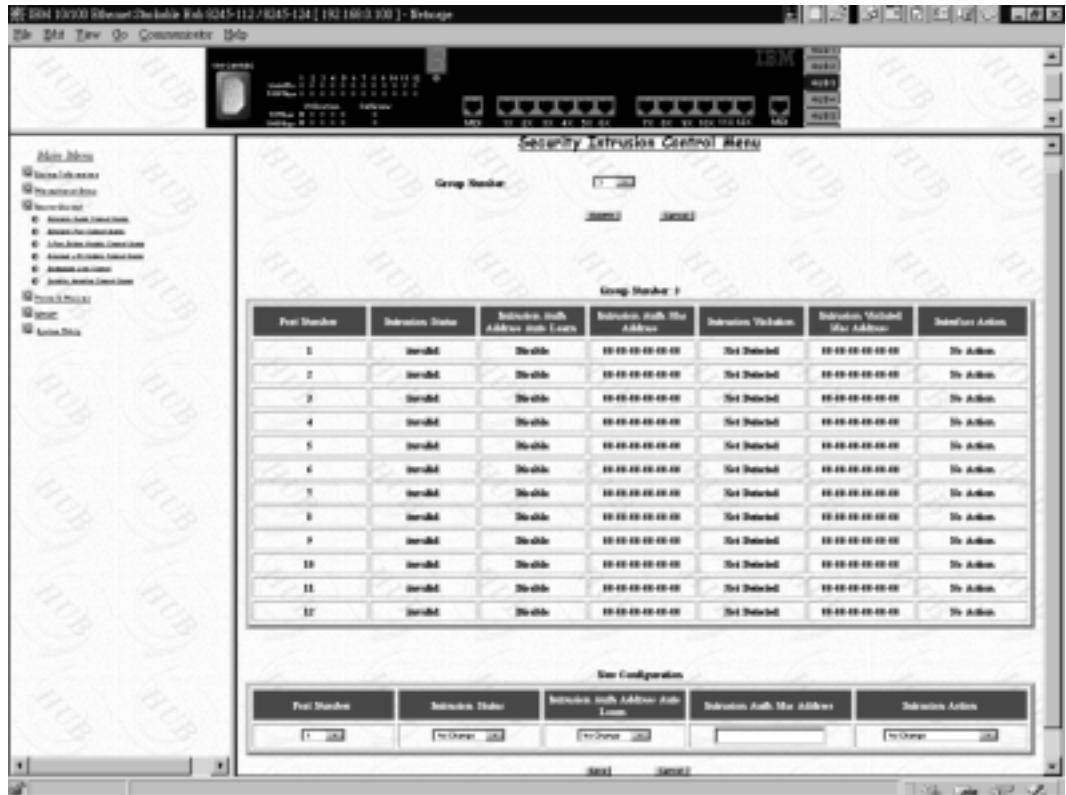

Figure 5-19 Security Intrusion Control/Status Menu

The intrusion control enables you to set up secure ports that allow access by a single authorized MAC address.

Step 1. Enter **Group Number** and press **Submit** to get intrusion information on a hub.

Step 2. To add or edit intrusion on a port, select **Port Number** from the pull down menu.

Step 3. Enter **Intrusion Status**, **Auto Learn**, **MAC Address Information,** and **Caption**.

Step 4. Press **SAVE**. The information becomes effective immediately.

Group Number

The Group Number is used to specify a hub range (1 to 6).

Port Number

Specifies 1 to 12/24 port of a given hub.

Intrusion Status

- **Enable:** Enable the security intrusion control for the current port.

- **Disable:** The security intrusion control of a given port is disabled

- **Invalid:** Purge the security intrusion control configuration for the current port from the system database.

Intrusion Authentication Address Auto Learn

- **Enable:** The hub records the MAC address of the first device that the current port receives data from. The learn function is then disabled and the recorded MAC address becomes the authorized MAC address. This address is displayed in the Intrusion Authentication MAC address field.

- **Disabled:** Auto learn operation is disabled.

Intrusion Authentication MAC Address

The MAC address of a device that is allowed to connect with this particular port.

Intrusion Violation

- **Detected:** When an intrusion of an unauthorized MAC address occurs, the MAC address that caused the intrusion is written to the Intrusion Violated MAC Address field.

- **Not-Detected:** No intrusion has been detected.

Intrusion Violated MAC Address

Displays the MAC address of the last unauthorized device to contact this port.

Intrusion Action

The action that will be performed when the hub detects an intrusion.

- **No Action:** No action will be taken.

- **Send Trap:** A trap is sent to the trap receivers.

- **Partition:** The port is partitioned.

- **Send Trap And Partition:** The port is partitioned and a trap is sent to the trap receivers.

Note: If another hub or unrouted switch is attached to a port with Security Intrusion enabled, then only one of possibly many MAC addresses will be allowed to pass data.

Network Monitor

This menu lets you monitor the network traffic and analyze the network utilization. Selecting this option presents the following menus:

Repeater Statistics Information

Displays the total statistic counters for the 10 Mbps and 100 Mbps segments for all hubs in the stack.

Repeater Group Statistics Information

Displays the statistic counters for each hub.

Repeater Port Statistics Information

Displays the statistic counters for each port.

Address Tracking Information

Provides a way for a network management application to passively gather information about which network addresses are connected to which ports of a hub.

Address Search Information

Active address tracking capability is used to watch for a given MAC address and report which port it was seen on.

Broadcast Storm Protection

Monitor the broadcast counters of each hub port to detect if the broadcast storming exists in the network.

Broadcast Storm Detected

Each hub port or optional module port which causes broadcast storm will be displayed.

Repeater Statistics Information

Selecting this option presents the Repeater Statistics Information Menu as shown in Figure 5-20.
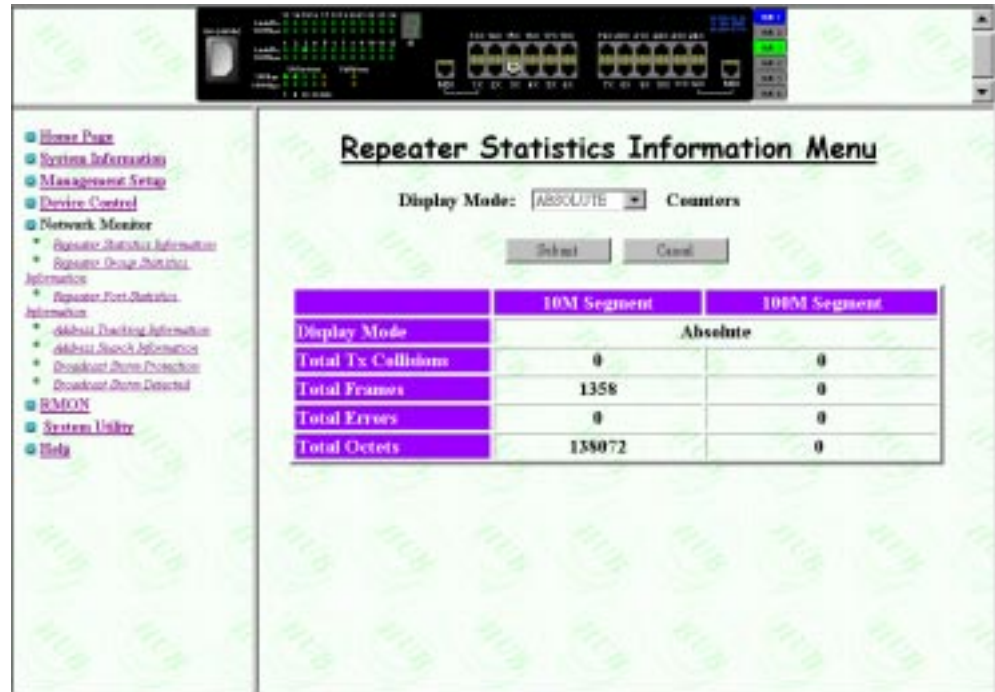

Figure 5-20 Repeater Statistics Information Menu

Display Mode

Displays counters for the 10 Mbps and 100 Mbps segment for all hubs in the stack.

- **Absolute Mode:** Select **Absolute Display Mode** and press **ENTER**. Each counter will represent the value collected since system start. The user cannot clear absolute counters.

- **Relative Mode:** Select **Relative Display Mode** and press **ENTER** key. Each counter will be cleared to 0, and then represents the value collected since the relative mode was selected. You can reset the relative counters to 0 by changing to Absolute Mode then change back to Relative Mode.

Total Tx Collisions

The number of transmission collisions that have occurred in this stack segment.

Total Frames

The number of frames of valid frame length that have been received on the ports of this stack segment and not including FCS Error and Collision Event.

Total Errors

Total errors received by the stack segment including FCS errors, Align errors, Frame Too Long, Short Events, Late Events, Very Long Events and Rate Mismatch.

Total Octets

The number of octets contained in the valid frames that have been received by this stack segment.

Repeater Group Statistics Information

Selecting this option presents the Repeater Group Statistics Information menu as shown in Figure 5-21.
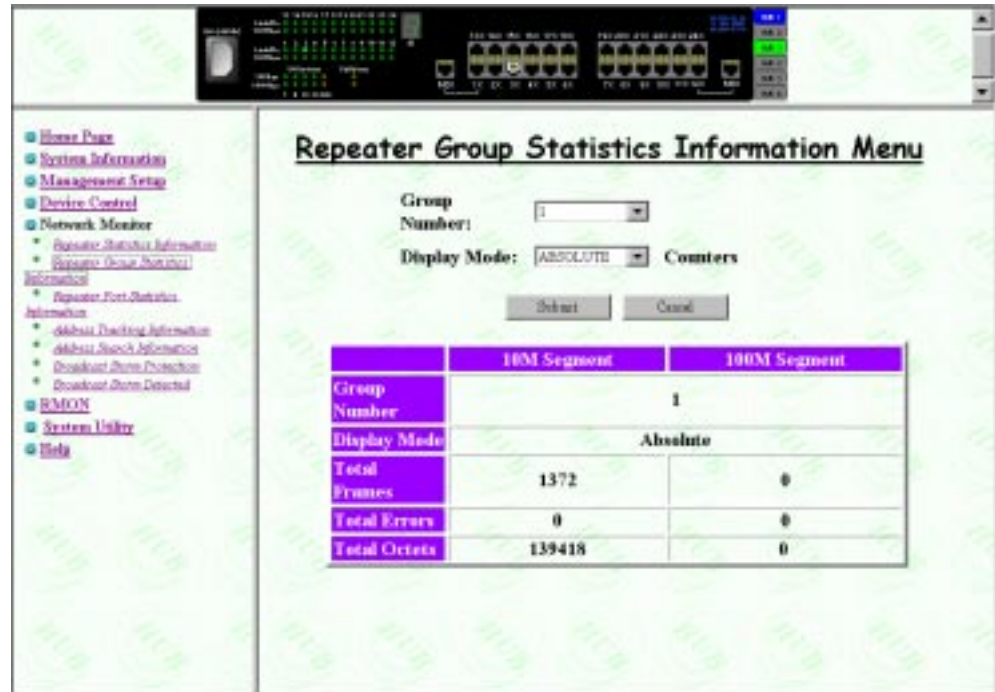

Figure 5-21 Repeater Group Statistics Information Menu

Statistics information counters for the current hub (Group Number). Counters are displayed in Absolute or Relative values by toggling the display mode. Absolute values represent the value collected since system start. You can not clear absolute counters. Relative counters represent the values collected since the relatively mode was selected. You can reset the relative counters to 0 by changing to Absolute Mode then change back to Relative Mode.

Group Number

> The ID number of an 10/100 Ethernet Stackable Hub in the stack (1 to 6).

Display Mode

> Display counters in Absolute or Relative values.

Total Frames

> The number of frames of valid frame length that have been received on the ports of this hub and not including FCS Error and Collision Event.

Total Octets

> The total number of octets contained in the valid frames that have been received on the ports of this hub.

Total Errors

> Total errors received by all of the ports of this hub. Errors include, FCS errors, Align errors, Frame Too Long, Short Events, Late Events, Very Long Events and Rate Mismatch.

Repeater Port Statistics Information

Selecting this option presents the Repeater Port Statistics Information menu as shown in Figure 5-22. This displays counter information for the current port of the current hub.

Figure 5-22 Repeater Port Statistics Information

To view port statistic counters:

Step 1. Select the Hub ID (Group Number) of the 10/100 Ethernet Stackable Hub to read from.

Step 2. Select a port.

Step 3. Select the display mode.

Step 4. Select **Submit** to load the port counter information for the port on the selected hub.

Group Number

The ID number of an 10/100 Ethernet Stackable Hub in the stack (1 to 6).

Port Number

Port number of selected group (1 to 12/24).

Display Mode

Display counters in Absolute or Relative values.

Readable Frames

Total readable frames received by the port.

Readable Octets

Total readable octets received by this port.

FCS Errors

The total number of packets received by the port that had bad Frame Check Sequence.

Alignment Errors

Total Alignment Errors frames within the proper size (64 to 1518 octets) received by the port.

Frame Too Long

Total frames received by the port that were longer than 1518 octets (excluding framing bits, but including FCS octets).

Short Events

Total frames received by the port that were shorter than 64 octets or activity duration was shorter than the event, ShortEventMaxTime (74 to 82 bit times).

Runts

The total number of packets received that were less than 64 octets due to collisions or activity duration was greater than the ShortEventMaxTime event and less than the ValidPacketMinTime event.

Collisions

Total collisions transmissions on a port.

Late Events

Total events received by the port where the activity duration is greater than the LateEventThreshold.

Very Long Events

Total events received by the port where the activity duration is greater than the MAU Jabber Lockup Protection timer TW3.

Data Rate Mismatches

Total frames received by the port with no collisions and the activity duration was greater than the ValidPacketMinTime event and also frequency (data rate) is detectably mismatched from the local frames mismatch frequency.

Auto Partitions

Total number of times the port was auto-partitioned.

Isolates (100 M only)

Total isolates for 100M transmissions. This counter is incremented by one each time that a port automatically isolates as a consequence of false carrier events. The conditions which cause a port to automatically isolate are defined by the transition from the False Carrier state to the Link Unstable state. The port will automatically recover.

Symbol Errors (100 M only)

Total symbol errors for 100 M transmissions. This counter is incremented by one for each valid length packet received at the port with at least one occurrence of an invalid data symbol. This can increment only once per valid carrier event.

Total Errors

Total errors received by the port including FCS errors, Align errors, Frame Too Long, Short Events, Late Events, Very Long Events and Rate Mismatch.

Broadcast Packets

Total broadcast packets received by the port.

Multicast Packets

Total multicast packets received by the port.

Address Tracking Information

Selecting this option presents the Address Tracking Information Menu as shown in
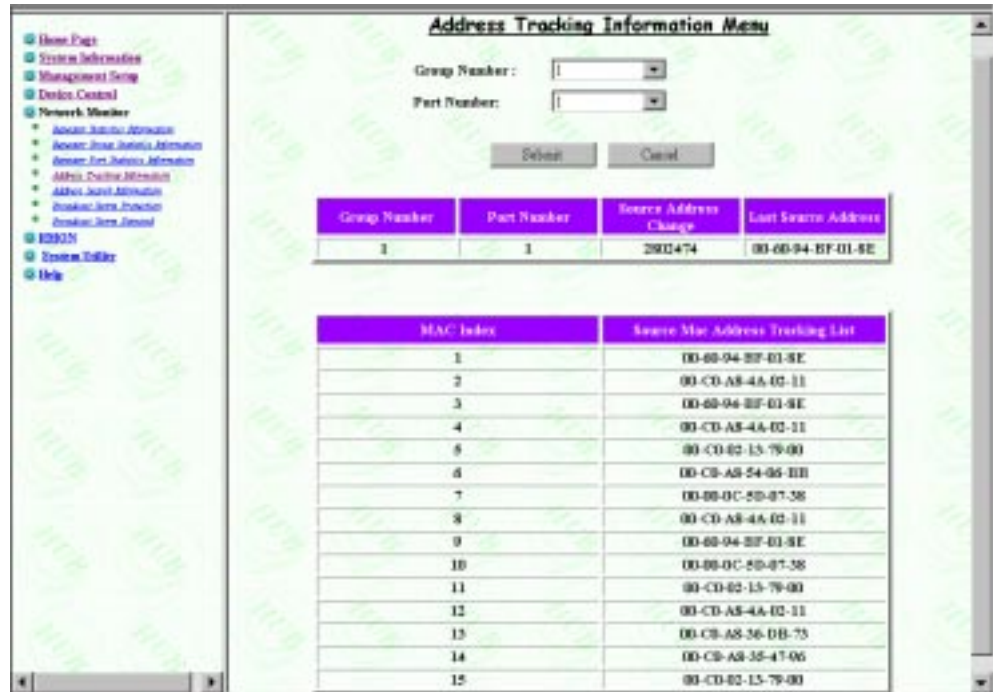Figure 5-23.

Figure 5-23 Address Tracking Information Menu

The 10/100 Ethernet Stackable Hub provides per port based address (MAC address
based) tracking capability. The address tracking function records the source MAC of
each data packet and provide the filters for data analysis.

Group Number

> The ID number of an 10/100 Ethernet Stackable Hub in the stack (1 to 6).

Port Number

> Port number of selected group (1 to 12/24).

Source Address Changes

> This counter is incremented by one for each time that the Last Source Address
> for this port has changed. This may indicate whether a link is connected to a
> single device or another multi-user segment. The approximate minimum time
> for roll-over of this counter is 81 hours.

Last Source Address

> Indicates the Source MAC Address of the last readable frame received by this
> port. If this port has received no frames since the hub began monitoring the
> port activity, a null string will be displayed.

Source MAC Address Tracking List

A list of source MAC addresses that were recently received on this port. The first Source MAC Address (00-40-AC-1C-80-23 for example) in the tracking list contains the value that is given by the Last Source Address for this port. This list can contain 15 entries. The first entries are deleted to accommodate new entries when the list is full.

MAC Index of Address Tracking Information of Web-based Management

The MAC Index is used to indicate the ordering of source MAC address seen on the port.

Address Search Information

Selecting this option presents the Address Search Information menu as shown in Figure 5-24.
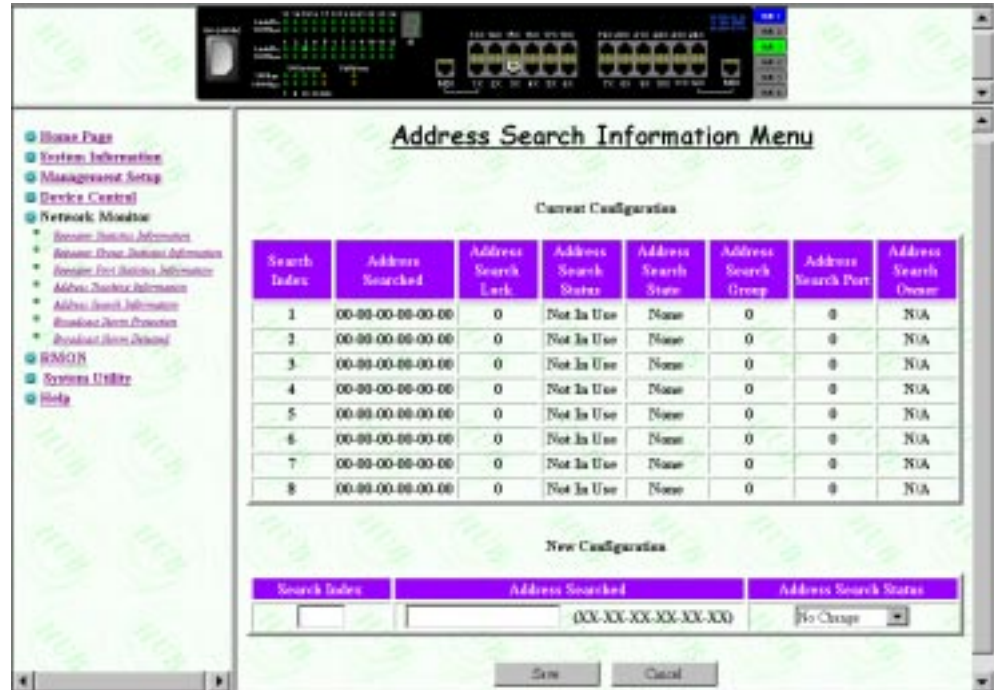

Figure 5-24 Address Search Information Menu

This active address search capability is used to watch for a given MAC address and report which port it was seen on. This capability can be also used to collect the necessary information for mapping the topology of a network. Up to 8 MAC address can be searched simultaneously.

To perform an address search:

Step 1. Enter an Index number in the Search Index field at the bottom of the Address Search Information Menu (1 to 8).

Step 2. Type in the source MAC address to be searched.

Step 3. Set Address Search Status to "In-Use".

Step 4. Execute **SAVE** command to get the owner of this entry. If the entry is free and available, the Address Search Lock will be increased by 1, Address Search Status will be set to "In Use", and Address Search Owner will be set to "Web". Otherwise the request to own the entry will be rejected.

Step 5. Repeat Steps 1 to 4 for each address to be searched.

Search Index

Identifies the index of the source address to be searched in the system for which this entry contains information (1 to 8).

Address Searched

Identifies the source address to be searched in the system for which this entry contains information.

Address Search Lock

Used by a management station as an advisory lock for a search entry. The search lock will increment by 1 up to 2^{32}-1, if the address is available.

Address Search Status

- **In Use:** A management station has obtained ownership.

- **Not in Use:** No other management station has obtained ownership.

A management station first retrieves the values of the appropriate instances of the Address Search Lock and Address Search Status objects, periodically repeating the retrieval if necessary, until the value of Address Search Status is "Not In Use." The management station then tries to set the same instance of the Address Search Lock object to the value it just retrieved, the same instance of the Address Search Status object to *In Use*, and the corresponding instance of Address Search Owner to a value indicating itself. If the set operation succeeds, then the management station has obtained ownership of the entry, and the value of Address Search Lock is incremented by the agent (as per the semantics of INTEGER). Failure of the set operation indicates that some other manager has obtained ownership of the entry.

Address Search State

The current state of the MAC address search on this hub (None, Single, or Multiple).

Note: The result of address search for a given Source MAC Address is represented by **Address Search State, Address Search Group,** and **Address Search Port**.

- Source MAC Address is detected on a port: Address Search State is set to **Single,** (Address Search Group, Address Search Port) shows the detected port number.

- Source MAC Address is detected on multiple ports: Address Search State is set to **Multiple,** (Address Search Group, Address Search Port) shows the port number, which detects the given Source MAC Address first.

- Source MAC Address is not detected on any port: Address Search State is set to **None,** (Address Search Group, Address Search Port) is undetermined.

Address Search Group

The hub id number received, whose source address corresponds to the address searched (1 to 6).

Address Search Port

The port number received, whose source address corresponds to the address searched (1 to 12/24).

Address Search Owner

The management capability which currently has ownership of this search entry.

The owner for a given address search entry could be one of the following:

- **CONSOLE:** If the entry is locked by the Local Console/Remote Telnet, the owner is CONSOLE.

- **WEB:** If the entry is locked by the Web-based manager, the owner is WEB.

- **hubrptrAddrSearchOwner:** If the entry is locked by the SNMP manager, the owner will be given by the SNMP manager by setting the MIB object hubrptrAddrSearchOwner.

Broadcast Storm Protection

Selecting this option presents the Broadcast Storm Protection Menu as shown in Figure 5-25.
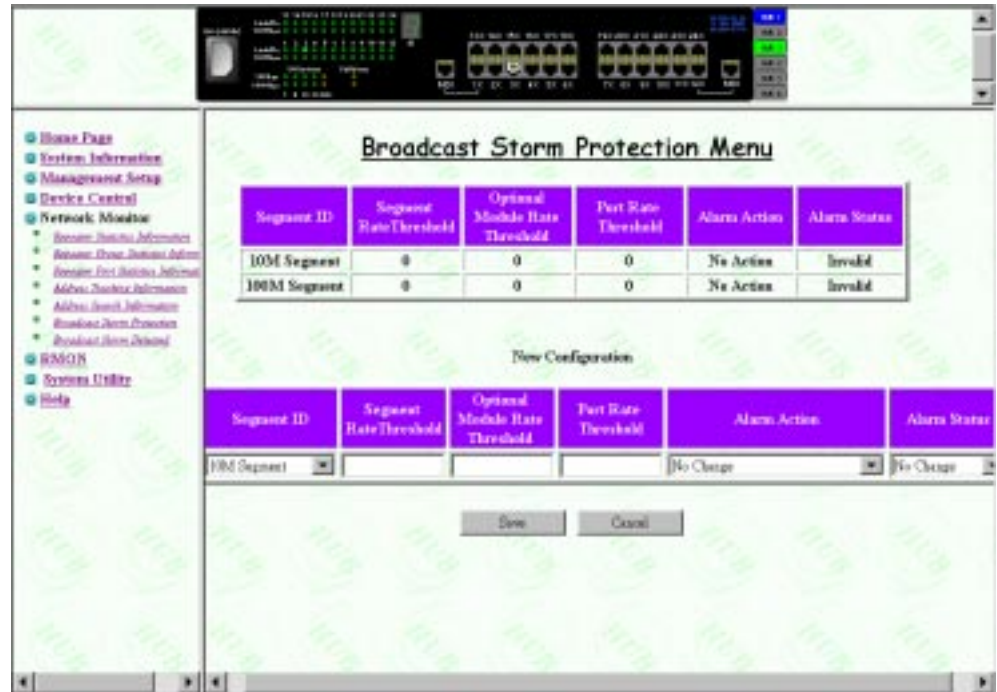

Figure 5-25 Broadcast Storm Protection

The 10/100 Ethernet Stackable Hub periodically monitors the broadcast counters of each hub port to detect a broadcast storm condition. The hub port that causes the broadcast storm can be automatically partitioned, or a trap can be sent to the trap receivers, or both. The 10/100 Ethernet Stackable Hub continually monitors those ports that have been partitioned to check if the broadcast storm condition still exists. The partitioned hub port is auto recovered to normal operation once the broadcast storm condition is released.

Users can configure the broadcast threshold value for each port, each segment, and each optional module. The Segment Rate Threshold, Port Rate Threshold, and Optional Module Rate Threshold determines whether the broadcast storm exists or not.

Segment ID

Specifies the segment where the broadcast storm protection function is applied (10 Mbps/100 Mbps Segment).

Segment Rate Threshold

The number of broadcast packets received on a given segment per second. The range is 0 to 14,880 packets per second.

Optional Module Rate Threshold

The number of broadcast packets received on each uplink of a given optional module per second. The range is 0 to 14,880 packets per second.

Broadcast Port Rate Threshold

The number of broadcast packets received on a given port per second. The range is 0 to 14,880 packets per second.

Broadcast Alarm Action

Once broadcast storm is detected on a given port, segment, or uplink port, the Alarm Detection Status will be set to *Detected*, and the proper action shall be performed based on the value specified by its Broadcast Alarm Action

• **Partition:** The port will be disabled. Once a port is partitioned due to broadcast storm, the Broadcast Storm protection function will continue to monitor the port. The port is disabled for 15 seconds and re-enabled for 5 seconds. This process is repeated for 2 minutes.

Note: It is up to the user to enable the port once the source of the broadcast storm has been handled.

• **Send Trap and Partition:** The port will be disabled and a trap will be sent.

• **Sent Trap:** The trap will be sent.

• **None:** No action will be taken.

Broadcast Alarm Status

• **Enabled:** Enables the broadcast monitoring and protection function on this segment.

• **Disabled:** Disables the broadcast monitoring and protection function on this segment.

• **Invalid:** Purges the broadcast monitoring and protection setting for this segment.

Formula for calculating Broadcast packet rate

$$\text{Broadcast packet rate} \quad = \quad \frac{\text{Broadcast packet received}}{\text{Seconds}}$$

Configuring Broadcast Storm Protection

To detect the broadcast storm of the 10/100 Ethernet Stackable Hub, the users have to configure the following parameters from the Broadcast Storm Protection Menu:

1. Select **100 Mbps Segment** from **Segment ID** field.
2. Configure **Segment Broadcast Packet Rate Threshold**.

3. Configure **Optional Module Broadcast Packet Rate Threshold**.

   Note: The "Optional Module Broadcast Packet Rate Threshold" of 100 Mbps segment is used for both 10 Mbps and 100 Mbps Broadcast Storm Detection.

4. Configure **Broadcast Alarm Action.**

5. Enable the broadcast storm protection function.

   To detect the broadcast storm of AUI module, the users have to configure the following parameters from the Broadcast Storm Protection Menu:

1. Select **10 Mbps Segment** from **Segment ID** field.

2. Configure **Segment Broadcast Packet Rate Threshold**.

3. Configure **Optional Module Broadcast Packet Rate Threshold**.

   Note: The **Optional Module Broadcast Packet Rate Threshold** of 10 Mbps segment is used for AUI module broadcast storm detection.

4. Configure **Broadcast Alarm Action**.

5. Enable the broadcast storm protection function.

Broadcast Storm Detected

Selecting this option presents the Broadcast Storm Protection Menu as shown in Figure 5-26.
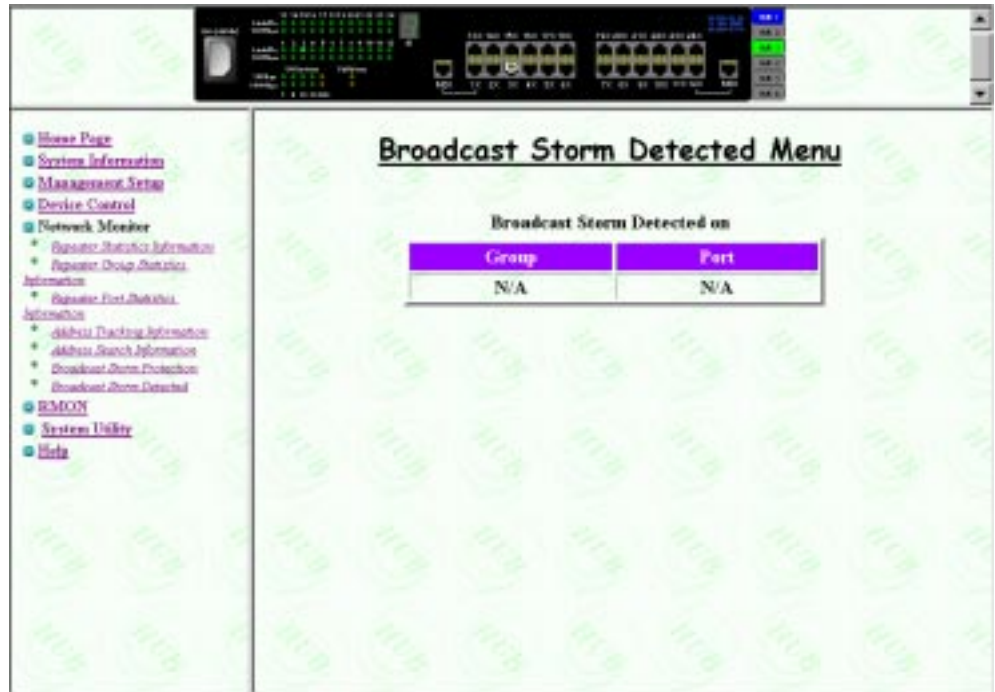

Figure 5-26 Broadcast Storm Detected Menu

Each broadcast storm is detected, the hub and port number is listed in this menu. If there has been no storms detected, this menu is empty.

RMON

Remote Monitoring MIB (RMON) allows you to monitor LANs remotely. RMON allows you to remain at one workstation and collect information on all switch ports.

Configuration

Selecting this option presents the following menus:

RMON Statistic Group Configuration

Configure hub data source.

RMON History Group Configuration

Configure history groups.

RMON Alarm Group Configuration

Configure alarm groups.

RMON Event Group Configuration

Configure event groups.

RMON Statistics Information

View statistics information by index.

RMON History Information

View history information by index.

RMON Event Log

View event log by index.

RMON Statistic Group Configuration

Selecting this option presents the RMON Statistics Group Configuration Menu as shown in Figure 5-27.
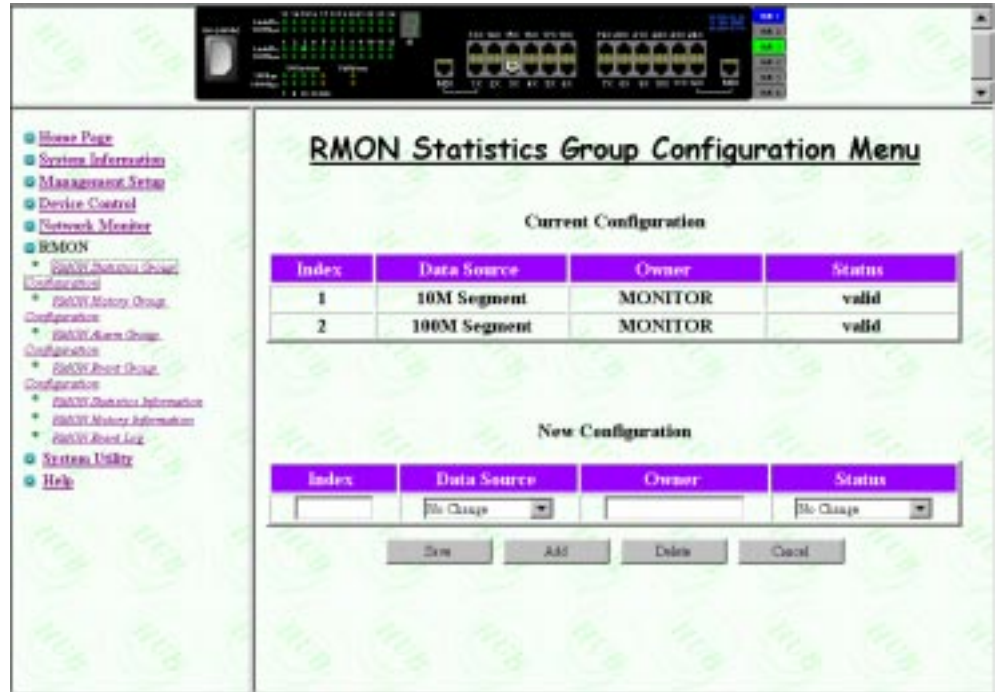

Figure 5-27 RMON Statistics Group Configuration Menu

The Statistic Group Configuration Menu displays current group settings and provides new configuration entry fields.

To create a new entry of RMON statistics from the RMON Statistics Group Configuration Menu:

Step 1. Go to New Configuration.

Step 2. Type in a new index value to the Index field.

Step 3. Select **10 M Segment** or **100 M Segment** from the Data Source field.

Step 4. Type owner's name to the Owner field.

Step 5. To enable, select **Valid** from the Status menu, otherwise it will appear as UnderCreation.

Step 6. Select **Add** to create a new entry.

Statistic Group Index

> A value from 1 to 65535. The value must be unique. Not to be confused with Data Source Index.

> • **Data Source Index:** "This object identifies the source of the data for which historical data was collected and placed in a media-specific table on behalf of this historyControlEntry. This source can be any interface on this device. In order to identify a particular interface, this object shall identify the instance of the ifIndex object, defined in RFC 1213 and RFC 1573 [4, 6] for the desired interface. For example, if an entry were to receive data from interface #1, this object would be set to ifIndex.1."

Data Source

> Displays the data source as segment 10 Mbps or 100 Mbps. The default is 10 Mbps.

Owner

> Displays the owner of the statistics. The owner is always the monitor.

Status

> Displays the current status of each port.

> • **Valid:** An entry is fully configured and consistent.

> • **UnderCreation:** An entry is in the process of being created and might be incomplete. If an entry is valid, the entry should be made UnderCreation to be modified.

> • **Invalid:** Entry is cleared.

Add	To create a new entry
Save	To update an existed entry with Status value set to "UnderCreation"
Delete	To delete an existed entry
Cancel	To abort the configuration change

RMON History Group Configuration

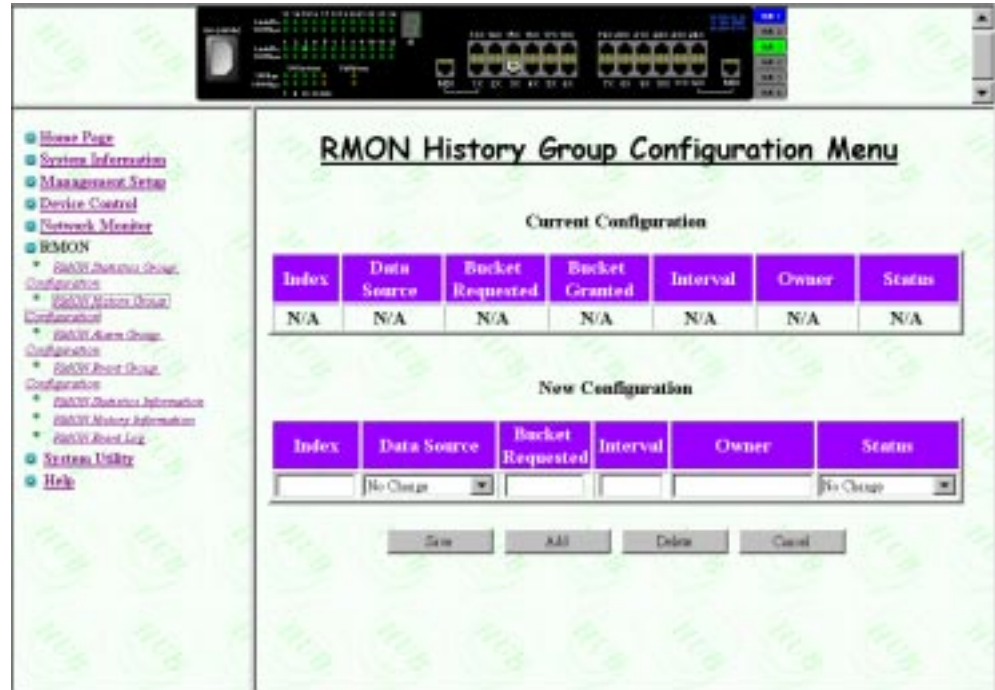Selecting this option presents the RMON History Group Configuration Menu as shown in Figure 5-28.

Figure 5-28 RMON History Group Configuration Menu

This menu provides a means of correlating the data gathered by the statistics group over time. It records statistical samples according to the user-specified time interval and duration and stores them for later retrieval.

- Selecting **Save** updates an existing entry with Status value set to UnderCreation.
- Selecting **Add** creates a new entry.

To create a new entry of RMON history from the RMON History Group Configuration Menu:

Step 1. Go to New Configuration.

Step 2. Type in a new index value to the Index field.

Step 3. Select **10 M Segment** or **100 M Segment** from the Data Source field.

Step 4. Type in the number of buckets requested.

Step 5. Type in the interval in seconds between buckets.

Step 6. Type owner's name to the Owner field.

Step 7. To enable, select **Valid** from the Status menu, otherwise it will appear as UnderCreation.

Step 8. Select **Add** to create a new entry.

History Group Index

> A value from 1 to 65535. The value must be unique. Not to be confused with Data Source Index.
>
> • **Data Source Index:** "This object identifies the source of the data for which historical data was collected and placed in a media-specific table on behalf of this historyControlEntry. This source can be any interface on this device. In order to identify a particular interface, this object shall identify the instance of the ifIndex object, defined in RFC 1213 and RFC 1573 [4, 6] for the desired interface. For example, if an entry were to receive data from interface #1, this object would be set to ifIndex.1."

Data Source

> Displays the data source as segment 10 Mbps or 100 Mbps. The default is 10 Mbps.

Bucket requested

> Number of sample buckets you want to collect and store. The range is 1 to 65535. The default is 50 buckets.

Bucket granted

> Number of sample buckets that will be collected and stored. The number granted is affected by available resources.

Interval

> Interval in seconds, between bucket samples. The range of the interval is 1 to 3600 seconds (1 hour). The default is 1800 seconds.

Owner

> The entity that configured this entry and is using the resources assigned to it. A string of up to 12 characters.

Status

> A valid status has all fields filled in. Setting the status to invalid deletes the index. Index's with incomplete information in some fields automatically sets the status as UnderCreation.
>
> • **Valid:** An entry is fully configured and consistent.
>
> • **UnderCreation:** An entry is in the process of being created and might be incomplete. If an entry is valid, the entry should be made UnderCreation to be modified.
>
> • **Invalid:** Entry is cleared.

Add	To create a new entry
Save	To update an existed entry with Status value set to "UnderCreation"
Delete	To delete an existed entry
Cancel	To abort the configuration change

RMON Alarm Group Configuration

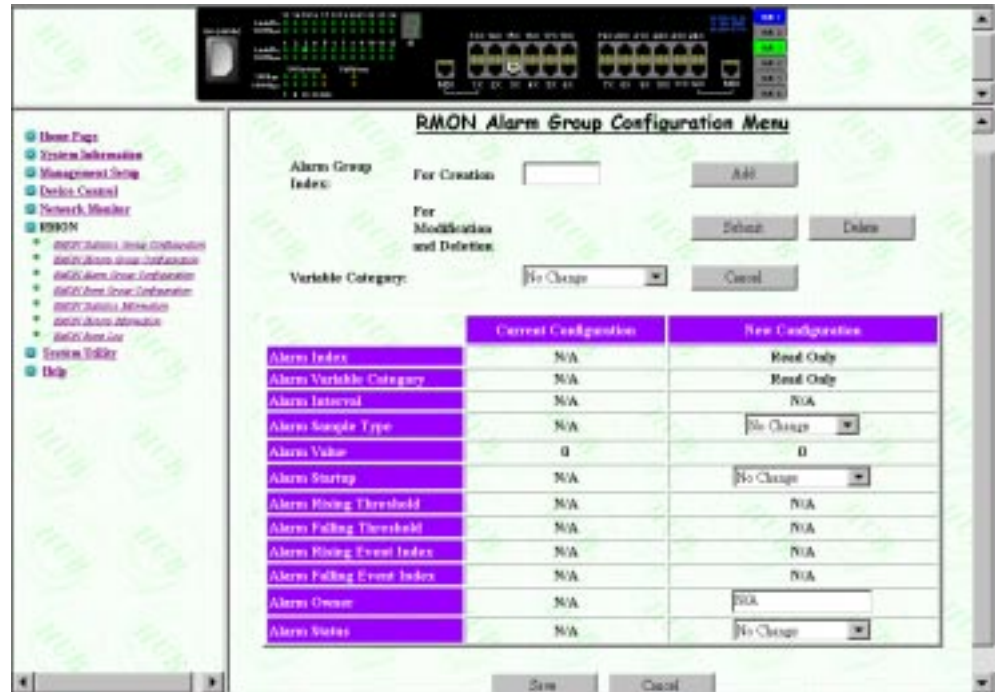Selecting this option presents the RMON Alarm Group Configuration Menu as shown in Figure 5-29.

Figure 5-29 RMON Alarm Group Configuration Menu

You can create up to 16 Alarm Control entries through the Web-based manager or an SNMP manager. The Alarm Group is used to track extraordinary events or activities. It permits you to set the RMON alarms to specific thresholds. When the traffic volume exceeds or drops below those thresholds, an event is activated. A rising threshold is used to monitor the value of a tracked variable when it rises above a particular level. A falling threshold is used to monitor the value of a tracked variable when it falls below a particular level. Thresholds can be set against either an absolute value or a delta (change in) value. Alarms can generate an action response through the Events Group.

The user can base on the following procedures to create a new Alarm Control entry:

    a) Go to the RMON Alarm Group Configuration Menu

    b) Create a new entry using the following steps:

      Step 1. Go to **Alarm Group Index** and type the index number on **For Creation** field to select a new index.

      Step 2. Select one of the variable categories from the Variable Category field.

          • **RMON:** The alarm variable will be one of the RMON Ethernet Statistics counters.

          • **Repeater Group:** The alarm variable will be one of the group counters specified by RFC1516 Repeater MIB (for 10 Mbps segments only).

- **Repeater Port:** The alarm variable will be one of the port counters specified by RFC1516 Repeater MIB (for 10 M and 100 M segment common counters only).

Step 3. Execute **Add** command. A new entry will be created based on the variable category with default value as shown in the following menu.

c) Go to **New Configuration** area and type in the following configuration data for a new entry:
- Alarm Interval
- **Counter ID:** Specifies the particular counter id of a given variable category to be sampled.
   - For RMON variable, select a counter from the Counter ID field.
   - For Repeater Group variable, select the group number from Group Number field and select a counter from the Counter ID field.
   - For Repeater Port variable, select the group/port number from Group/Port Number field and select a counter from the Counter ID field.
- Alarm Sample Type
- Alarm Startup
- Alarm Rising Threshold
- Alarm Falling Threshold
- Alarm Rising Event Index
- Alarm Falling Event Index
- Alarm Owner (12 characters)
- Alarm Status (UnderCreation and Valid)

d) Execute **SAVE** command.

To update an existing Alarm Control entry:

a) Select an existing index from the list box "For Modification and Deletion."
b) Select **Submit** for modification, or select **Delete** to delete the entry.
c) Modify the contents on the table if **Submit** is selected.

Alarm Group Index

A value from 1 to 65535. The value must be unique. Not to be confused with Data Source Index.

- **Data Source Index:** "This object identifies the source of the data for which historical data was collected and placed in a media-specific table on behalf of this historyControlEntry. This source can be any interface on this device. In order to identify a particular interface, this object shall identify the instance of the ifIndex object, defined in RFC 1213 and RFC 1573 [4, 6] for the desired interface. For example, if an entry were to receive data from interface #1, this object would be set to ifIndex.1."

Variable Category

- **RMON:** An RMON Ethernet Statistics counter.

- **Repeater Group:** A group counter specified by RFC1516 repeater MIB for 10 Mbps segments only.

- **Repeater Port:** A port counter specified by RFC1516 repeater MIB for 10 Mbps and 100 Mbps segments common counters only.

Alarm Interval

Time in seconds over which the data is sampled for each bucket. The range is 1-3600 seconds (1 hour). The default is 1800 seconds.

Alarm Sample Type

- **Absolute:** Value stored is compared directly to the threshold level.

- **Delta:** The value of the selected variable at the last sample is subtracted from the current value, and the difference is compared with the threshold value.

Alarm Startup

Of rising and falling thresholds, the one that must be crossed first for an event to be generated.

- **risingAlarm:** Event is generated when the rising threshold is crossed first.

- **fallingAlarm:** Event is generated when the falling threshold is crossed first.

- **bothAlarm:** Event is generated when either the rising or falling threshold is crossed first.

Alarm Rising Threshold

Threshold for the sampled statistic. When the current sampled value is GREATER THAN OR EQUAL TO this threshold, AND the value of this sample at the last sampling interval was LESS THAN the threshold, then a single event is generated. After a rising event is generated, another rising event is not generated until the sampled value falls below this threshold and reaches the falling threshold.

Alarm Falling Threshold

Threshold for the sampled statistic. When the current sampled value is LESS THAN OR EQUAL TO this threshold, AND the value of this sample at the last sampling interval was GREATER THAN the threshold, then a single event is generated. After a falling event is generated, another falling event is not generated until the sampled value rises above this threshold and reaches the rising threshold.

Alarm Rising Event Index

Index of the event entry that is Index used when the rising threshold is crossed. It must coincide with the Event Group Index. The range is 0 to 65 535. If you choose 0, no event is generated when this threshold is met.

Alarm Falling Event Index

Index of the event entry that is used when the falling threshold is crossed. It must coincide with the Event Group Index. The range is 0 to 65 535. If you choose 0, no event is generated when this threshold is met.

Alarm Owner

Text field to identify the owner.

Alarm Status

- **Valid:** An entry is fully configured and consistent.

- **UnderCreation:** An entry is in the process of being created and might be incomplete. If an entry is valid, the entry should be made UnderCreation to be modified.

- **Invalid:** Entry is cleared.

Save	To update an existed entry with Status value set to "UnderCreation"
Cancel	To abort the configuration change

RMON Event Group Configuration

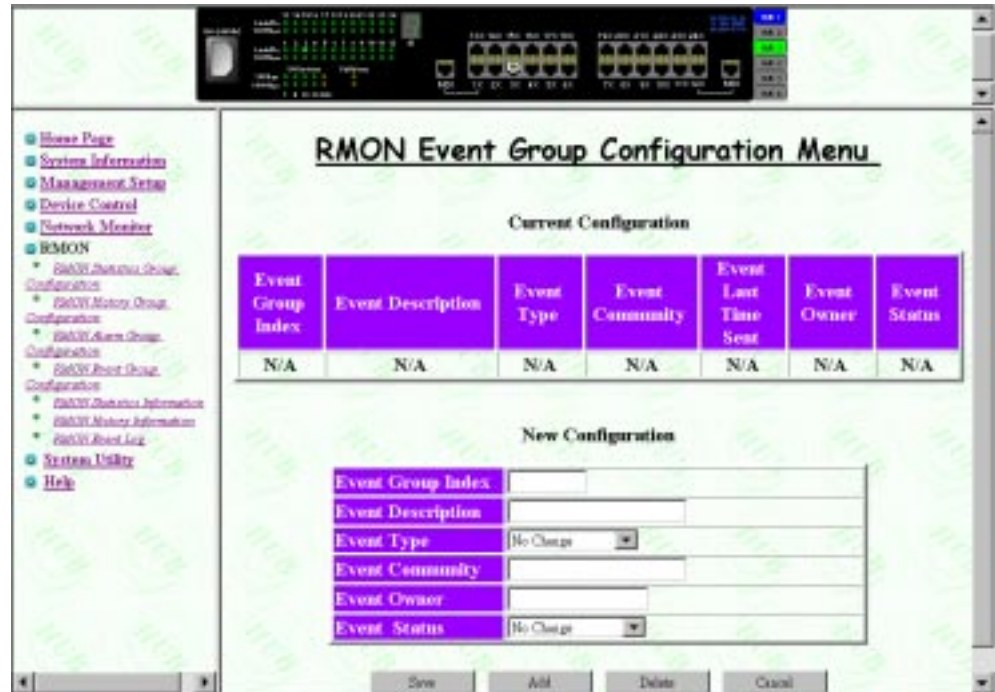Selecting this option presents the RMON Event Group Configuration Menu as shown in Figure 5-29.

Figure 5-30 RMON Event Group Configuration Menu

You can create up to 32 Alarm Control entries through the Web-based manager or an SNMP manager.

To create a new entry of RMON event from the RMON Event Group Configuration Menu:

Step 1. Go to New Configuration.

Step 2. Type in a new index in the Event Group index field.

Step 3. Type in optional Event Description.

Step 4. Select **Event Type** from the menu.

Step 5. Type in the Event Community name.

Step 6. Type owner's name to the Owner field.

Step 7. To enable, select **Valid** from the Status menu, otherwise it will appear as UnderCreation.

Step 8. Select **Add** to create a new entry.

Event Group Index

A value from 1 to 65535. The value must be unique. Not to be confused with Data Source Index.

- **Data Source Index:** "This object identifies the source of the data for which historical data was collected and placed in a media-specific table on behalf of this historyControlEntry. This source can be any interface on this device. In order to identify a particular interface, this object shall identify the instance of the ifIndex object, defined in RFC 1213 and RFC 1573 [4, 6] for the desired interface. For example, if an entry were to receive data from interface #1, this object would be set to ifIndex.1."

Event Description

A comment that describes this event.

Event Type

- **None:** No action will be taken.

- **Log:** When an alarm occurs, the alarm status will be logged.

- **Trap:** When an alarm occurs, a trap will be sent to the specified SNMP community.

- **Log and Trap:** When an alarm occurs, the alarm status will be logged and a trap will be sent to the specified SNMP community.

Event Community

An octet string that specifies the SNMP community to which an SNMP trap is to be sent (up to 16 characters).

Event Last Time Sent

The value of System Up Time at the time this event entry last generated an event.

Event Owner

Text field to identify the owner, up to 12 characters.

Event Status

- **Valid:** An entry is fully configured and consistent.

- **UnderCreation:** An entry is in the process of being created and may be incomplete. If an entry is valid, the entry should be made UnderCreation to be modified.

- **Invalid:** Entry is cleared.

Add	To create a new entry
Save	To update an existed entry with Status value set to "UnderCreation"
Delete	To delete an existed entry
Cancel	To abort the configuration change

RMON Statistic Information

Selecting this option presents the RMON Statistic Information Menu as shown in Figure 5-31.

Figure 5-31 RMON Statistic Information Menu

An Ethernet Statistics entry contains a collection of statistics (counters) kept for a particular Ethernet interface.

Ethernet Statistics Index

> The value of Ethernet Statistics Index uniquely identifies an Ethernet Statistics entry.

Display Mode

> Displays counters for the 10 Mbps and 100 Mbps segment for all hubs in the stack.
>
> • **Absolute Mode:** Select **Absolute Display Mode** and select **Submit**. Each counter will represent the value collected since system start. The user cannot clear absolute counters.
>
> • **Relative Mode:** Select **Relative Display Mode** and select **Submit**. Each counter will be cleared to 0, and then represents the value collected since the relative mode was selected. You can reset the relative counters to 0 by changing to Absolute Mode then change back to Relative Mode.

Readable Frames

> A whole number representing the total readable frames received by the port.

Multicast Frames

Total number of good packets directed to this port, not including packets directed to the broadcast address.

Broadcast Frames

The total number of packets transmitted that were directed to the broadcast address. Does not include packets directed to multicast address.

Packet Size 64

The number of packets received that were 64 octets.

Packet Size 65 to 127

The number of packets received that were between 65 to 127 octets.

Packet Size 128 to 255

The number of packets received that were between 128 to 255 octets.

Packet Size 256 to 511

The number of packets received that were between 256 to 511 octets.

Packet Size 512 to 1023

The number of packets received that were between 512 to 1023 octets.

Packet Size1024 to 1518

The number of packets received that were between 1024 to 1518 octets.

CRC Alignment Errors

The total CRC or alignment error frames within the proper size (64-1518 octets).

Undersize Packets

The number of packets received that were less than 64 octets long and were otherwise well formed.

Oversize Packets

The number of packets received that were longer than 1518 octets and were otherwise well formed.

Fragments

The total number of packets that were received that were longer than 1518 octets and had an FCS or alignment error.

Jabbers

The number of packets received that were less than 64 octets and had an FCS or alignment error.

Collisions

The number of collisions.

Readable Octets

The total number of octets of data, including bad packets and FCS Octets, received on the hub and excluding framing bits.

Drop Events

The number of events in which packets were dropped by the monitor due to lack of resources.

RMON History Information

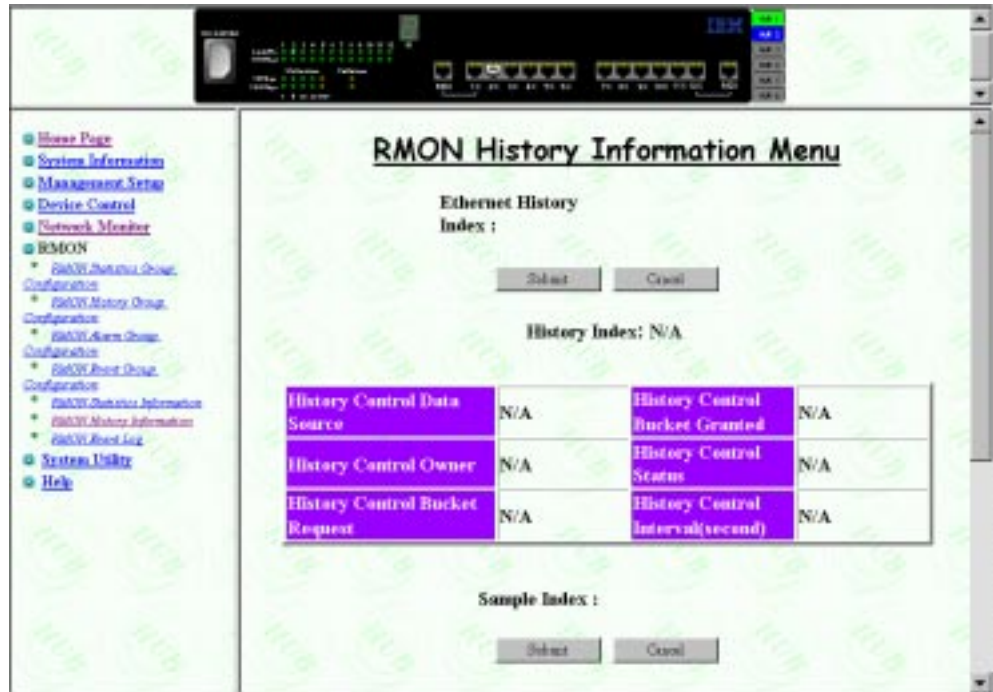Selecting this option presents the RMON History Information Menu as shown in Figure 5-32.

Figure 5-32 RMON History Information Menu

You use this menu to view the Ethernet information.

Ethernet History Index

> The index number of a history event. The range is 1 through 65535. The maximum number of entries is 16.

Sample Index

> The index number of the sample statistics taken, based on the number of buckets granted. This index starts at 1 to a maximum of 20.

RMON Event Log

Selecting this option presents the RMON Event Log Menu as shown in Figure 5-33.

Figure 5-33 RMON Event Log Menu

This panel creates entries in an event log and sends SNMP traps to the management workstation.

Event Index

A number that identifies an entry in the event table.

Log Index

An entry is made in the log table for each event.

Event Description

A comment that describes this event.

Event Type

• **None:** No action will be taken.

• **Log:** When an alarm occurs, the alarm status will be logged.

• **Trap:** When an alarm occurs, a trap will be sent to the specified SNMP community.

• **Log and Trap:** When an alarm occurs, the alarm status will be logged and a trap will be sent to the specified SNMP community.

Event Community

An octet string that specifies the SNMP community to which an SNMP trap is to be sent. (Up to 16 characters.)

Event Owner

Text field to identify the owner, up to 12 characters.

Event Status

- **Valid:** An entry is fully configured and consistent.

- **UnderCreation:** An entry is in the process of being created and might be incomplete. If   an entry is valid, the entry should be made UnderCreation to be modified.

- **Invalid:** Entry is cleared.

Log Time

The system time that this log was generated.

Log Description

A comment that describes this event.

System Utility

Selecting this option presents the System Restart Menu.

System Restart

Selecting this option presents the System Restart Menu as shown in Figure 5-34.

Figure 5-34 System Restart Menu

The system Restart menu lets you perform a *Warm* restart.

You can restart the system at any time without losing configuration settings, except in the case of a download. When you **EXECUTE** and **Enter**, a warning message inform the user that system restart will be performed right now.

Warm Start

A warm restart will restart the hub at the runtime code. For most cases, a warm restart is sufficient, except in the case of a BOOTP request or code download.

Help

Selecting this option presents the Help Menu as shown in Figure 5-35, Figure 5-36 and Figure 5-37.
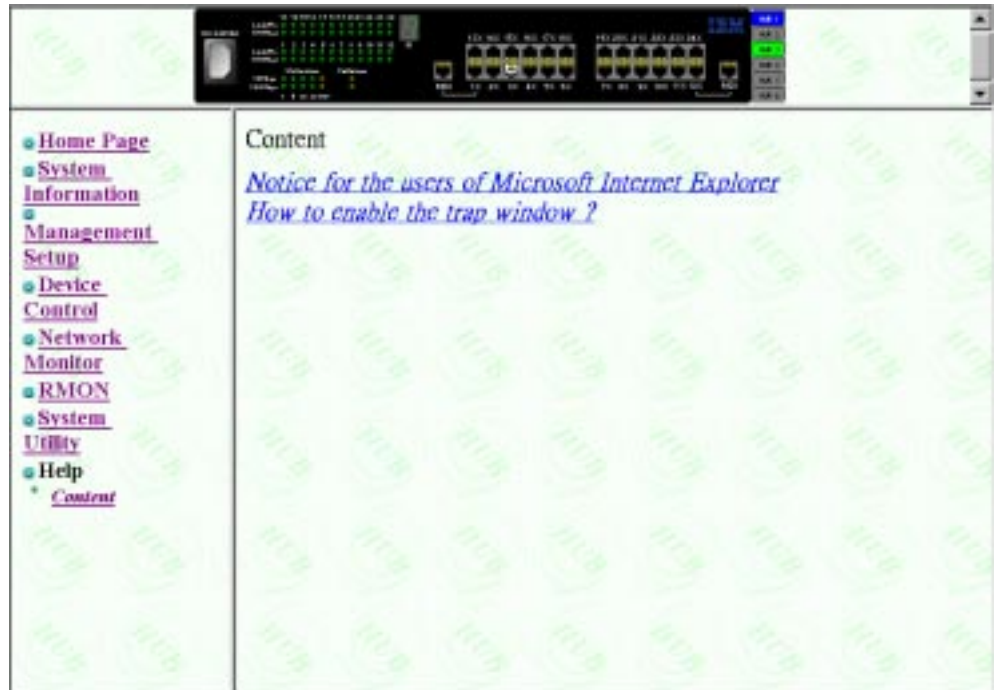

Figure 5-35 Help Menu-1

Content

- Notice for users of Microsoft Internet Explorer

    - Selecting this option presents the Help Menu-2
- How to enable the trap window

    - Selecting this option presents the Help Menu-3

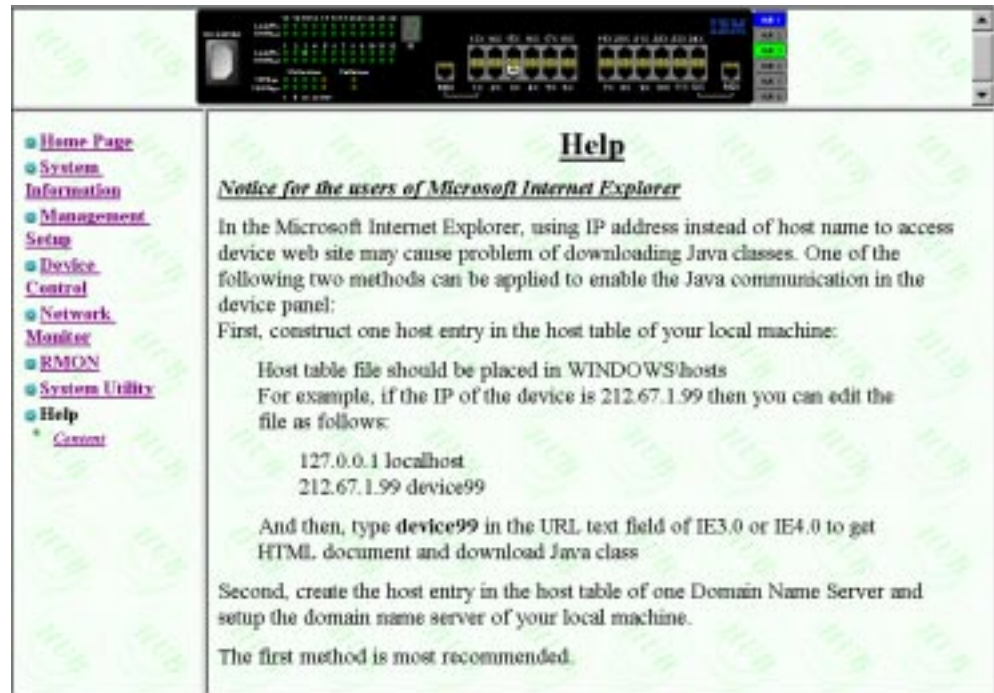Figure 5-36 presents Help for Internet Explorer users.

Figure 5-36 Help Menu-2

This menu gives instructions for making connections to the 10/100 Ethernet Stackable Hub using Microsoft Internet Explorer.

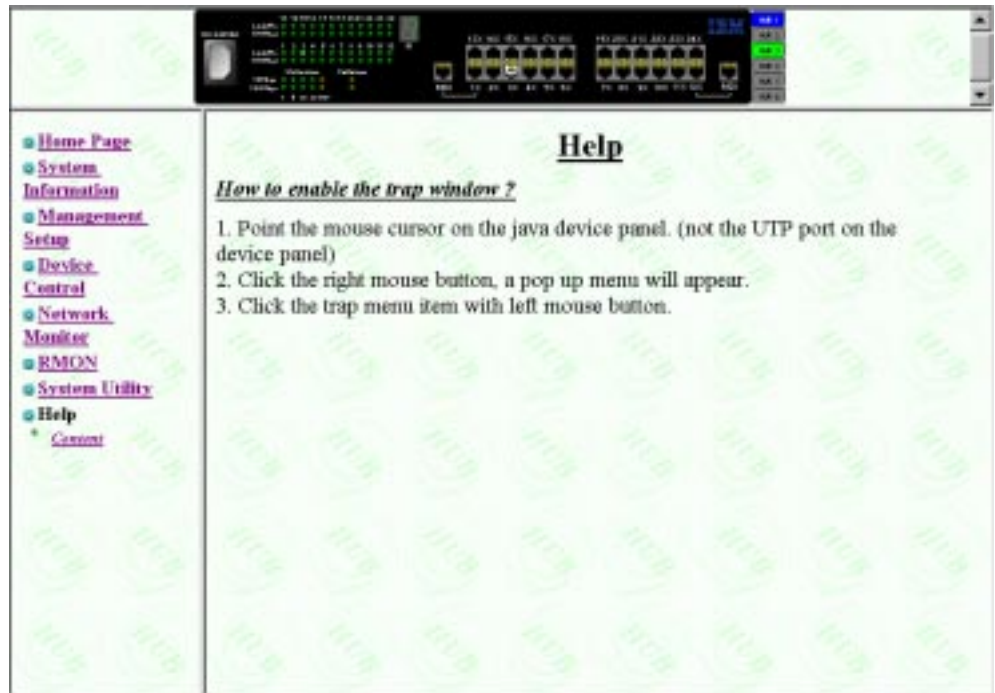Figure 5-37 presents help for enabling the trap window.

Figure 5-37 Help Menu-3

Chapter 6. Troubleshooting and Service

This chapter contains procedures that help you troubleshoot problems with the 10/100 Ethernet Stackable Hub and its connections to other devices.

Be sure to read "Safety Information" on page xiii before proceeding.

Diagnosing Problems

The following sections contain lists of symptoms and actions to assist in problem resolution prior to contacting IBM Support.

Power On Self-Test Failures

When the 10/100 Ethernet Stackable Hub is powered on or if a cold restart is initiated, it performs a Power On Self-Test (POST). If you are connected to the EIA 232 port and have your VT100-compatible terminal running, the following scrolling text appears on your monitor depending on whether the test fails or completes successfully:

```
BOOT ROM Integrity Test........ OK
BOOT ROM Integrity Test........ FAILED
       Expected checksum = 0x12345678
       Error checksum    = 0xFFFFFFFF

DRAM Test (04096 Kbytes)........ OK
DRAM Test (00000 Kbytes)........ FAILED
       Failed location = 0x80000000
       Test pattern    = 0x80001234
       Error pattern   = 0xFFFFFFFF

New Version BOOT ROM........ AVAILABLE
New Version BOOT ROM........ NOT FOUND

VFD Display Access Test........ OK
VFD Display Access Test........ FAILED

Flash Memory (512 Kbytes) Installed...... OK
Flash Memory Device Type........ UNKNOWN

Flash Memory (1024 Kbytes) Installed [2]........ OK
Flash Memory Device Type [2]........ UNKNOWN

Run Time Image Integration Test........ OK
Run Time Image Integration Test....... FAILED
-- Please reload run time image

Web-Pages Integration Test........ OK
Web-Pages Integration Test........ FAILED
-- Please reload Web-Pages
```

```
EEPROM Read/Write Test........ OK
EEPROM Read/Write Test........ FAILED

NIC Controller Access Test........ OK
NIC Controller Access Test........ FAILED

NIC Controller Loop Back Test........ OK
NIC Controller Loop Back Test........ FAILED

MAC Address = 00 4A C1 C1 23 45
Repeater Controller And Serial Management Interface Access Test...... OK
Repeater Controller And Serial Management Interface Access Test.. FAILED
```

If any of the POST fails, disconnect and reconnect the power to retry the POST.

Run Time Integrity Test Failure: If the Run Time Integrity test fails, you might have a problem that could be corrected by reloading the system software. For information on reloading your system software, see "BOOT ROM Console".

Web Pages Integrity Test Failures: If the Web Pages Integrity test fails, you might have a problem that could be corrected by reloading the Web Pages Database information. For information on reloading your Web Pages Database information, see "BOOT ROM Console".

If any other test fails, contact IBM Support.

BOOT ROM Console

Connect your VT100 compatible terminal emulator to the EIA 232 management port to see the POST's text messages. When the POST completes, the following message is displayed:

```
[Enter]: Abort Boot Loader
```

Notes:

1. If you do not select the abort command within 12 seconds, the 10/100 Ethernet Stackable Hub is automatically reset.
2. The BOOT ROM menu is a subset of the functions available on the main menu of the management interface described in Chapter 4, "Using the Management Interface."

Selecting the abort command presents the BOOT ROM login panel as shown in Figure 6-1 on page 6-3.


```
                 IBM 10/100 Ethernet Stackable Hub 8245
                       - BOOT ROM Version: 1.00




                            User Name: [ admin ]
                            Password:  [        ]


            <Ctrl + E> to Resume BOOT LOADER
      Use <Tab> key to move between User Name and Password, and press <Enter>
```
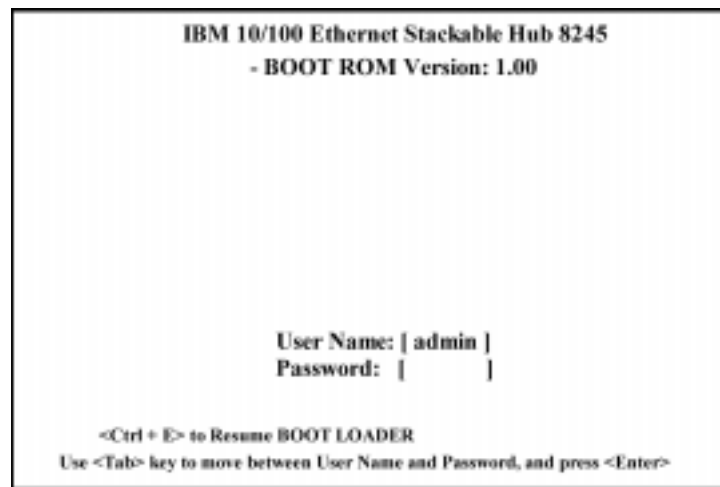
Figure 6-1 BOOT ROM Login Panel

You can log in using a previously defined user name and password, or you can use one of the default user names. One default user name, ADMIN, requires no password. The other default user name, GUEST, has a password of GUEST. (Note that user names and passwords are not case sensitive.)

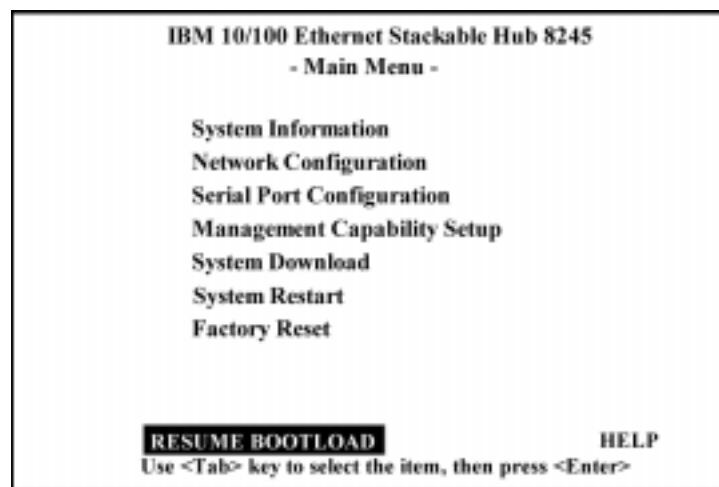After you have logged in, the BOOT ROM console main menu shown in Figure 6-2 is presented.


```
                 IBM 10/100 Ethernet Stackable Hub 8245
                            - Main Menu -

                    System Information
                    Network Configuration
                    Serial Port Configuration
                    Management Capability Setup
                    System Download
                    System Restart
                    Factory Reset



      RESUME BOOTLOAD                                   HELP
            Use <Tab> key to select the item, then press <Enter>
```

Figure 6-2 BOOT ROM Main Menu

You can select **System Download** to reload the code on your 10/100 Ethernet Stackable Hub. See "System Download" on page 4-50 for more information on downloading code. To exit the main menu, select **RESUME BOOT LOAD** to continue booting the 10/100 Ethernet Stackable Hub.

Help

The Help Menu lists all the keyboard commands used in a Console session.

```
          IBM 10/100 Ethernet Stackable Hub 8245
                     - Help Menu -


<Ctrl> Q :              Invoke Help Menu
<Ctrl> R :              Refreshes Screen

[Enter] :               Confirm Input
[Tab] :                 Goto the next Tabstop
<Ctrl> Z :              Goto the next Tabstop
<Ctrl> W :              Goto previous Tabstop
<Ctrl> S/ <Ctrl> A :    Select/Toggle <FIELD> value
[Esc] :                 Exit to Previous Menu



             [ESC] : TO GO BACK
```

Figure 6-3 Help Menu

LEDs

Symptom	Action
Power LED does not light.	• Check the power cable to ensure it is firmly connected to both the 10/100 Ethernet Stackable Hub and the power outlet.
	• Ensure there is power at the power outlet
OK LED is Off or fault LED is On.	• The 10/100 Ethernet Stackable Hub is malfunctioning. Repower or cold restart the hub. If the 10/100 Ethernet Stackable Hub still fails, contact IBM support.

Control Panel

Symptom	Action
Port Indicator Frame On.	• The port has been disabled by the administrator.
	• The operating status of this port is set to "No".
Port Number Frame is blinking.	Port has been partitioned due to a broadcast storm. Message zone displays BRDCST STORM.
Port Number Indicator On (but not bright), port number frame Off, port is available, but link is still down.	Check the following: • All connections are secure. • The device at both ends of the cable are powered-on. • The cable is good. • The correct type of cable (either crossover or straight through) is used. If connected devices are MDI-X only, ensure that you are using either MDI-X port or a crossover cable and an MDI-X port.

EIA 232 Port

Symptom	Action
Menu panels incorrectly displayed.	• Check that the VT-100 terminal emulator is correctly configured: 9600 bps, 8 data bits, 1 stop bit, no parity, and VT-100 emulation.
	• Check that the Ethernet Stackable Hub is configured for console mode.
Login menu does not display.	• Check that the VT-100 terminal emulator is correctly configured: 9600 bps, 8 data bits, 1 stop bit, no parity, and VT-100 emulation.
	• Perform the command line "wake up" procedure by pressing **ENTER** two or three times or press **Ctrl**+**R** to refresh the panel.
	• Verify that you are using a null-modem cable or a serial cable with a null-modem adapter.

Telnet Session

Symptom	Action
Telnet workstation cannot access the 10/100 Ethernet Stackable Hub.	• Check the 10/100 Ethernet Stackable Hub's IP address, subnet, mask, and default gateway are correctly configured. • Ensure that you entered the IP address or host name of the 10/100 Ethernet Stackable Hub correctly when invoking the Telnet facility.

Password

Symptom	Action
Lost Control Panel Password.	Use the management interface (either by a Telnet session or by using the EIA 232 port) and reset the control panel password using the User Authentication Menu. See "User Authentication" on page 4-48.
Lost Control Panel Password (Web or Management Interface).	• Contact network administrator for a new password. • Contact another user with READ/WRITE access • Contact IBM support. **Note:** If no user has READ/WRITE access, contact IBM support.

Web Browser

Note: Web Browsers must support Java 1.0 Multiframe HTML. The 10/100 Ethernet Stackable Hub has been tested using Netscape Navigator Version 3.04, 4.03, and 4.04 and Microsoft Internet Explorer 3.02 and 4.0 in both Microsoft Windows 95 and Microsoft Windows NT 4.0.

Symptom	Action
Web browser cannot access the hub.	• Check that the 10/100 Ethernet Stackable Hub's IP address, subnet mask and default gateway are correctly configured. • Ensure that you enter the IP address of the hub correctly on your web browser. • If you are using Microsoft Internet Explorer, see "Help for Using Internet Explorer."
The Java applet graphic of the hub does not appear.	Clear the memory cache and the disk cache of your Web browser. For example, in Netscape 4.03 select **Edit/Preferences/Advanced/Cache** and then select **Clear Memory Cache** and **Clear Disk Cache**.

Help for Using Internet Explorer

In the Microsoft Internet Explorer, using an IP address instead of a host name can cause problems related to Java classes. You can use either of the following methods to help Java applets find their class information.

Method One:

1. Construct a host entry in the host table of your local machine.

   • Place the host table file in WINDOWS/hosts. For example, if the IP address of the hub is 212.67.1.99, and you choose a unique host name, "device 99", then you can edit the file as follows:

     - 127.0.0.1 localhost

     - 212.67.1.99 device99

2. Type **device99** in the URL text field of IE 3.0 or IE 4.0 to get the HTML document and download the Java class.

Method Two: Create the host entry in the host table of one Domain Name Server and setup the domain name server of your local machine.

Note: Method One is the recommended method.

Obtaining Software

You can obtain the latest level of code, MIBs, tips, and publications about the 10/100 Ethernet Stackable Hub through the Internet.

WWW Site

1. Access the IBM Networking Technical Support:

   ```
   http://www.networking.ibm.com/support
   ```

2. Select 8245 for the Product Number menu.

   You can access product announcements, publications, technical tips, and code downloads. You can also subscribe to receive e-mail notifications of code updates, tips, and FAQs for the 10/100 Ethernet Stackable Hub.

3. Locate and download the following files 8245Vxxx.EXE. The file includes BOOT ROM, Web Pages Database information, system software code, and readme file.

   Note: In this filename, xxx is the version number.

FTP Site

1. Access the IBM Networking Environment anonymous FTP site:

   ```
   ftp.networking.ibm.com/pub/products/lanprods/hub
   ```

2. Login as anonymous.

3. Enter your e-mail address as your password.

4. Locate and download the following file 8245Vxxx.EXE. The file includes BOOT ROM, Web Pages Database information, system software code, and readme file.

   Note: In this filename, xxx is the version number.

Obtaining Service

If you need assistance in troubleshooting or if you need service for your 10/100 Ethernet Stackable Hub, call IBM at **1-800-772-2227** in the United States and **1-800-426-7378 (1-800-IBM-SERV)** in Canada. See Appendix A, "Notices," for information concerning service for the product.

Appendix A. Notices

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This IBM product is made to high safety standards. It complies inherently with telecommunications safety standard BS 6301. It is not designed to provide protection from excessive voltages appearing externally at its interfaces. Therefore, when this product is connected to a public telecommunications network via any other equipment, and you connect to this product items not supplied by IBM United Kingdom Ltd., you must comply with mandatory telecommunications safety requirements.

Statement of Compliance with the United Kingdom Telecommunications Act 1984

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connections to the public telecommunications systems in the United Kingdom.

Electronic Emission Notices

Federal Communications Commission (FCC) Statement

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

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Industry Canada Class A Emission Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité aux normes d'Industrie Canada

Cet appareil numérique de la classe A est conform à la norme NMB-003 du Canada.

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This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for an failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

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Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 30. August 1995 (bzw. der EMC EG Richlinie 89/336).

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Konformitätserklärung nach Paragraph 5 des EMVG ist die IBM Deutschland Informationssysteme GmbH, 70548 Stuttgart.

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Das Gerät erfüllt die Schutzanforderungen nach EN 50082-1 und EN 55022 Klasse A.

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EN 50082-1 Hinweis
"Wird dieses Gerät in einer industriellen Umgebung betrieben (wie in EN 50082-2 festgelegt), dann kann es dabei eventuell gestört werden. In solch einem Fall ist der Abstand bzw. die Abschirmung zu der industriellen Störquelle zu verößern."

Anmerkung
Um die Einhaltung des EMVG sicherzusellen sind die Geräte, wie in den IBM Handbüchern angegeben, zu installieren und zu betreiben

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Machine	8245 10/100 Ethernet Stackable Hub Models 012, 024, 112 and 124

Warranty Period* One Year

*Elements and accessories are warranted for three months. Contact your place of purchase for warranty service information.

Production Status

Each Machine is manufactured from new parts, or new and serviceable used parts (which perform like new parts). In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's warranty terms apply.

The IBM Warranty

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. IBM calculates the expiration of the warranty period from the Machine's Date of Installation. The date on your receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

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If a Machine does not function as warranted during the warranty period, IBM in its sole discretion will repair, replace it (with a Machine that is at least functionally equivalent), or refund the purchase price. To obtain coverage under the warranty you may be required to present proof of purchase.This warranty is non-transferable by the end-user customer.

This warranty is non-transferable by the end-user customer.

Warranty Service

To obtain warranty service for the Machine, you should contact your reseller or call IBM. In the United States, call IBM at 1-800-772-2227. In Canada, call IBM at 1-800-IBM-SERV (1-800-426-7378). You may be required to present proof of purchase.

Depending on the Machine, the service may be 1) a "Repair" service at your location (called "On-site") or at one of IBM's or a reseller's service locations (called "Carry-in") or 2) an "Exchange" service, either On-site or Carry-in.

When a type of service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced.

It is your responsibility to:

1. obtain authorization from the owner (for example, your lessor) to have IBM or your reseller service a Machine that you do not own;

2. where applicable, before service is provided—

   a) follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provide,

   b) secure all programs, data, and funds contained in a Machine,

   c) inform IBM or your reseller of changes in a Machine's location, and

   d) for a Machine with exchange service, remove all features, parts, options, alterations, and attachments not under warranty service. Also, the Machine must be free of any legal obligations or restrictions that prevent its exchange; and

3. be responsible for loss of, or damage to, a Machine in transit when you are responsible for the transportation charges.

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IBM does not warrant uninterrupted or error-free operation of a Machine.

Misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible may void the warranties.

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Appendix B.   Cable Pinout Diagrams

Straight-Through 10BASE-T/100BASE-TX Cables

10BASE-T/100BASE-TX connections to devices such as workstations and servers require straight-through cables, as shown in Figure B-1 and Figure B-2 for UTP and Figure B-3 on page B-2 for STP.

Two standards are shown for wiring UTP connectors, T568-A and T568-B. The only difference between them is in the color of the insulation around the wires.
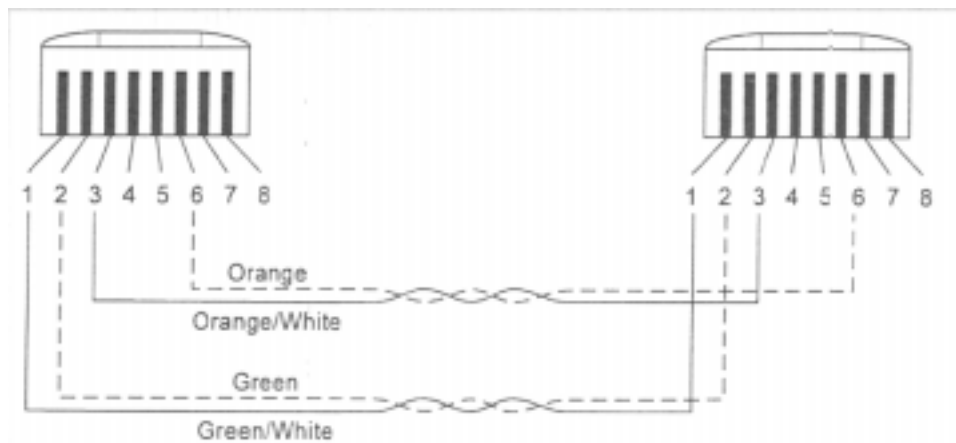

*Figure B-1 Straight-Through UTP Cable (RJ-45 to RJ-45), T568A*

Figure B-2 Straight-Through UTP Cable (RJ-45 to RJ-45), T568B

Straight-Through 10BASE-T/100BASE-TX Cables for STP
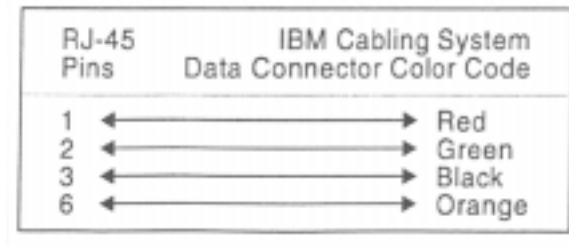
Figure B-3 Straight-Through STP Cable (RJ-45 to IBM Data Connector)

Crossover 10BASE-T/100BASE-TX Cables

Crossover cables are typically required when making 10BASE-T/100BASE-TX connections to other hubs. The 8245 does not require crossover cables, but if you need them, Figure B-4 and Figure B-5 show you how to wire the connectors for UTP and Figure B-6 on page B-3 shows you how to wire the connectors for UTP.

Two standards are shown for wiring UTP connectors, T568-A and T568-B. The only difference between them is in the color of the insulation around the wires.
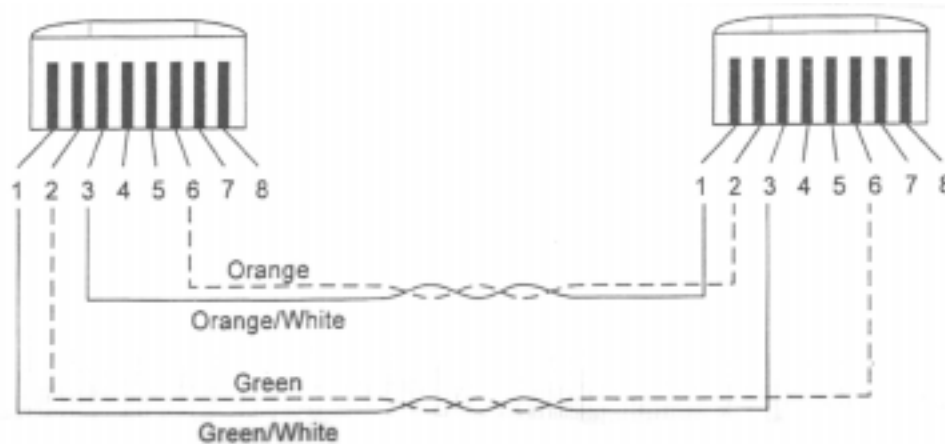
Figure B-4 Crossover UTP Cable (RJ-45 to RJ-45), T568-A
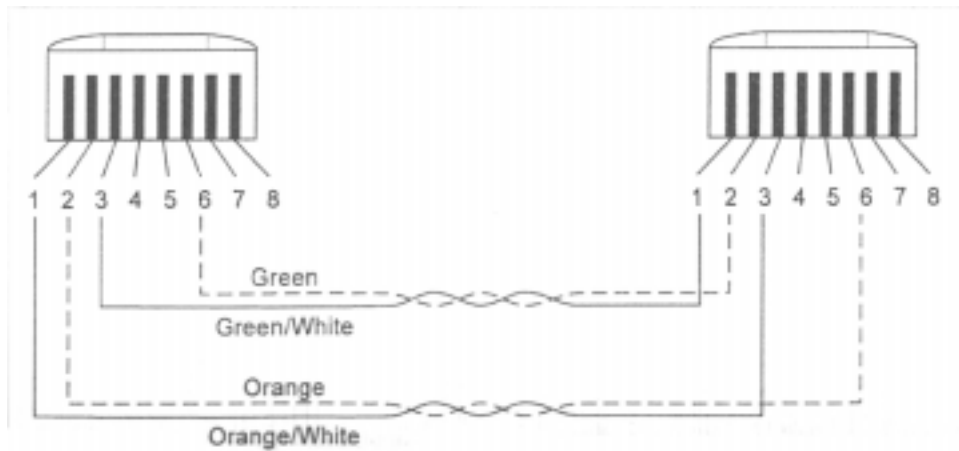
Figure B-5 Crossover UTP Cable (RJ-45 to RJ-45), T568-B

Crossover 10BASE-T/100BASE-TX Cables for STP
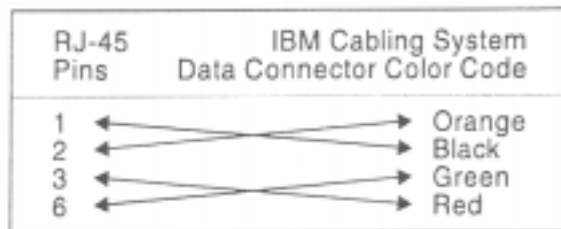
Figure B-6 Crossover STP Cable (RJ-45 to IBM Data Connector)

Null Modem Cable

A null modem cable should be used for a direct connection from a PC serial port to the 8245 Management Port.
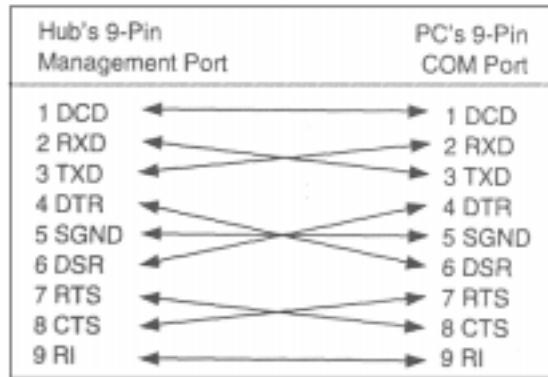

Hub's 9-Pin Management Port	PC's 9-Pin COM Port
1 DCD	1 DCD
2 RXD	2 RXD
3 TXD	3 TXD
4 DTR	4 DTR
5 SGND	5 SGND
6 DSR	6 DSR
7 RTS	7 RTS
8 CTS	8 CTS
9 RI	9 RI

Figure B-7 Null Modem Cable Connection

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IBM 10/100 Ethernet Stackable Hub 8245
Installation and Planning Guide
Part Number 08L2957

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	❏	❏

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Easy to find	❏	❏
Easy to understand	❏	❏
Well organized	❏	❏
Applicable to your task	❏	❏

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