Installation and Reference for the BayStack 150-series Ethernet Hubs

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Bay Networks

Bay Networks

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Preface

Congratulations on your purchase of a BayStack™ 150-series hub. The BayStack 150-series hubs let you build a 10 megabit per second (Mb/s) Ethernet hub stack with convenient setup, offering an unprecedented degree of flexibility, and turn your network into the ideal connectivity solution by maximizing network performance. The BayStack 150 and 152 hubs provide full Simple Network Management Protocol (SNMP) manageability.

In this guide, the BayStack 150, 151, 152, and 153 Ethernet Hubs are referred to collectively as the BayStack 150-series hubs.

Purpose

This guide provides information about using the features and capabilities of the BayStack 150-series hubs, including using the interface to perform network management operations from the BayStack 150 and 152 hubs.

Audience

This guide is intended for Ethernet local area network administrators with the following background:

- Working knowledge of IBM PC terminology and operation
- Working knowledge of DOS 5.0
- Working knowledge of 10BASE-T operations
- Familiarity with the IP or UNIX protocols
- Bay Networks® network experience

Conventions

This section describes the conventions used in this guide.

Special Message Formats

This guide uses the following formats to highlight special messages:

Note: This format is used to highlight information of importance or special interest.

Caution: This format is used to highlight information that will help you prevent equipment failure or loss of data.

Warning: This format is used to highlight material involving possibility of injury or equipment damage.

Two-tiered Procedure Format

The procedural steps in this guide are presented in a two-tiered format. The first tier describes the step very briefly but precisely. An experienced user may need to read only the first tier to complete the task. The second tier describes the step in more detail and includes results of performing the step.

Use of Enter, Type, and Press

This guide uses “enter,” “type,” and “press” to describe the following actions:

- When you read “enter,” type the text and press the Enter key.
- When you read “type,” type the text, but do not press the Enter key.
- When you read “press,” press only the alphanumeric or named key.

Other Conventions

This guide uses the following typographical conventions:

italics	Book titles and UNIX file, command, and directory names.
`courier font`	Screen text, user-typed command-line entries.
Initial Caps	Menu titles and window and button names.
[Enter]	Named keys in text are shown enclosed in square brackets. The notation [Enter] is used for the Enter key and the Return key.
[Ctrl]+C	Two or more keys that must be pressed simultaneously are shown in text linked with a plus (+) sign.

Related Publication

For more information about using the BayStack 150-series hubs, refer to *BayStack 150-series Ethernet Hubs Installation Instructions* (Bay Networks part number 893-01028-A). Translated into five languages, this document provides installation procedures for the BayStack 150-series hubs. Most of the information is presented through illustrations.

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Sydney, Australia	61-2-9927-8800	61-2-9927-8811
Tokyo, Japan	81-3-5402-0180	81-3-5402-0173

Use Express Routing Code 100 for support on Ethernet hub products.

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Chapter 1
Introduction

This chapter gives you an overview of the BayStack 150-series hubs, provides a list of the features of the hubs, describes the front and rear panels of the hubs, and explains in detail the components on each of the panels.

Overview

An overview of the BayStack 150-series hubs includes the following items:

- Media connection flexibility

  The hubs support multiple Ethernet media types, with 12 or 24 ports for twisted pair cabling and one AUI port that provides connectivity for a variety of Ethernet wiring environments, from basic workgroups to remote branch offices. An appropriate external transceiver allows the AUI port to be used to connect to any type of 10 Mb/s Ethernet medium.

- Stackability and manageability

  A stack of BayStack 150-series hubs can be separated up to 100 meters (m) apart and still maintain their manageability. Up to eight hubs can be connected together using unshielded twisted pair (UTP) or shielded twisted pair (STP) cable. When daisy-chaining eight hubs, seven client hubs (the BayStack 151 and 153 hubs) can be used to share the SNMP management agent of the managed hub (BayStack 150 and 152 hubs) to provide a connectivity solution for departmental Ethernet networks ranging up to 200 (192 twisted pair + 8 AUI) nodes. Bandwidth can be increased substantially using microsegmentation and LAN switching technologies.

- Innovative display

  The hubs are equipped with a large, clear display that shows an extensive array of information at a glance, including link, receive, and partitioning status; bandwidth utilization; collision ratio; and data transmission errors. Runt occurrences, data packet corruption, management status, late collisions, and connection to the communication port are shown on the BayStack 150 and 152 hubs.

- Security

  The hubs support intrusion control and eavesdrop protection, which prevents unauthorized individuals from accessing the network. Through the network management software, Ethernet addresses that represent authorized users can be assigned to each hub port. If a packet is received from a port that contains a source address from other than the authorized user, the port is disabled and a notification is sent to the network manager.

Features

The BayStack 150-series hubs have the following features:

- Compliance with the IEEE 802.3 standards
- Sturdy metal enclosure
- Independent RJ-45 ports for Category 3, 4, and 5 twisted pair wiring (either UTP or STP) to nodes in a 10BASE-T-compliant network
  - 12 RJ-45 ports on the BayStack 152 and 153 hubs
  - 24 RJ-45 ports on the BayStack 150 and 151 hubs
- A switchable uplink port that allows stacks of hubs to be daisychained together easily to further expand the network
- Hub stack cascade cabling that does the following:
  - Allows a total distance of 100 meters (m) between the first hub and the last hub in the daisy chain
  - Expands network capacity up to 8 hubs in a single stack for a maximum of 192 ports (and 8 AUI ports)

- A recessed AUI connector that does the following:
  - Accommodates most standard Ethernet transceivers
  - Allows the transceiver to be safely and conveniently tucked away
  - Has a custom tray for easy insertion and removal of a recessed transceiver or cable
- A clear, easy-to-read front panel display that provides comprehensive diagnostic indication of network status, allowing managers to diagnose and troubleshoot instantly
- SNMP-based management from the BayStack 150 and 152 hubs
- Full configurability for either in-band or out-of-band signaling using any SNMP-based network management system
- A flash EPROM for software upgradability that is downloadable from a Trivial File Transfer Protocol (TFTP) server

  (A download request can be initiated from either Optivity or an out-of-band console.)
- Automatic bad port partition, collision detection, and jabber protection
- A built-in removable power supply (replaceable without opening the enclosure) that can be easily removed and replaced should damage occur
- Automatic voltage selection (100 to 240 VAC, 50 to 60 Hz) without fuse changes or manual voltage range settings
- A slim one-unit profile, making the hub usable as a standalone desktop unit or as a rack-mountable unit
- Compliance with:
  - FCC Class A
  - CE Mark
  - VCCI Level 1
- Hub IDs automatically assigned during initialization or when daisy-chain links are changed
- An RS-232 communication port for out-of-band management.

  Telnet network management is also supported. The RS-232 serial console port can be configured as either local console or remote access through Telnet, as well as updating to the latest firmware via TFTP.

- Redundant backup management

  To maximize management uptime, two managed hubs can be put in the same stack. If the first one goes down, the backup hub can automatically take over to provide uninterrupted traffic monitoring and network control.

Physical Description

The following sections provide physical descriptions of the hubs and an overview of the components on the front and rear panels. If you are using the BayStack 151 or 153 hub, your unit may not have some of the components. The unused components are clearly indicated in the descriptions in this chapter.

Front Panel

The front panel of the hub contains the RJ-45 10BASE-T Ethernet ports, the LEDs, and the MDI/MDI-X switch for port 1. Figure 1-1 and Figure 1-3, respectively, illustrate the front panels of the BayStack 150 and 152 hubs, the units that have built-in network management modules (NMMs). Figure 1-2 and Figure 1-4, respectively, illustrate the front panels of the BayStack 151 and 153 hubs, the units that do not have built-in NMMs.

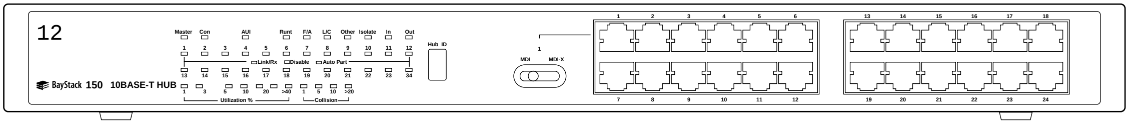

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Figure 1-1. Front panel of the BayStack 150 hub

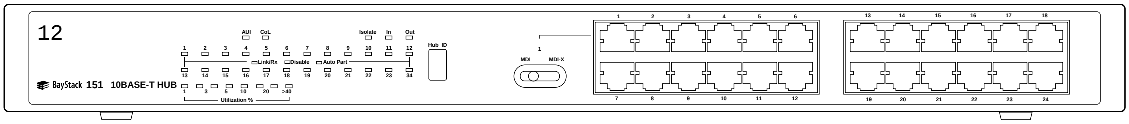

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Figure 1-2. Front panel of the BayStack 151 hub

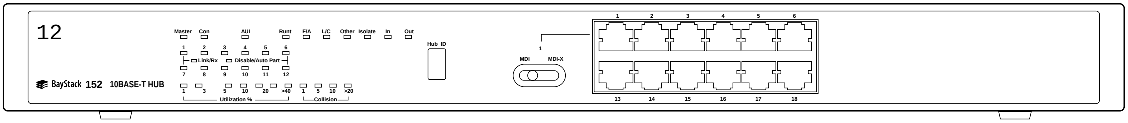


Figure 1-3. Front panel of the BayStack 152 hub

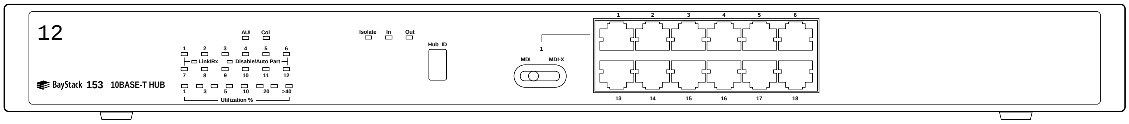


Figure 1-4. Front panel of the BayStack 153 hub

RJ-45 10BASE-T Ethernet Ports

The RJ-45 10BASE-T Ethernet ports are used for connecting the hub to network devices using 10BASE-T shielded or unshielded twisted-pair cable. Each of the Ethernet ports are MDI-X (normal) ports. The Ethernet ports connect to workstations and servers using straight-through cables and to other hubs using crossover cables.

MDI and MDI-X Switch

The MDI and MDI-X switch converts port 1 from an MDI-X (normal) port to an MDI (uplink) port to allow you to connect the hub to an Ethernet switch or to another hub using a straight-through cable.

LED Indicators

Each of the ports has an LED to indicate port status. The LEDs indicate link, activity, and partitioning status. The port status indicators always come on when the hub is powered on. In normal operation, after the POST (power-on self-test) is completed, the LEDs turn off.

Table 1-1 describes the LEDs that monitor the hub status.

Table 1-1. Description of hub status LEDs

Label	Color	Activity	Description
Master (BayStack 150 and 152 hubs only)	Green	On	The hub is serving as an active managed hub in the stack.
Con (BayStack 150 and 152 hubs only)	Green	On	The communications port is being used for the console interface or out-of-band network management. The mode of the console port is set using the console interface or an SNMP-based network management system.
AUI	Green	Blinking	A transceiver is attached to the AUI port on the rear panel of the hub, and data packets are being received through the AUI port.
	Yellow	On	The AUI port is partitioned.
Runt (BayStack 150 and 152 hubs only)	Amber	On	The hub is receiving a packet that is too short. Ethernet packets must be at least 64 bytes long. Runts are often a normal side effect of collisions.
F/A (BayStack 150 and 152 hubs only)	Amber	On	Data packets have been corrupted during transmission. A frame check sequence (FCS) error occurs when a data packet fails an internal consistency check. An alignment error occurs when the bits in a packet do not add up to a whole number of bytes.
L/C (BayStack 150 and 152 hubs only)	Amber	On	A collision is detected that happened after the 512th bit of a frame. Late collisions may be caused by overly long delays in the Ethernet network, either because a cable is too long or there are too many repeaters or hubs on the network.
Other (BayStack 150 and 152 hubs only)	Amber	On	Other types of Ethernet errors are occurring.
Isolate	Amber	On	The hub has been manually segmented from the rest of the network. Usually, the hubs are connected together into a single Ethernet collision domain through the daisy-chain connectors on the back. Segmenting a hub places the hub in its own collision domain while allowing it to be managed with the rest of the stack.
In	Green	On	Another hub is connected to the In cascade port on the back of the hub.
Out	Green	On	Another hub is connected to the Out cascade port on the back of the hub.

Table 1-1. Description of hub status LEDs (continued)

Label	Color	Activity	Description
Col (BayStack 151 and 153 hubs only)	Amber	Blinking	Collision is occurring on one of the ports. Collisions occur when two or more devices on the network attempt to transmit at the same time. Whenever there is a collision, all of the devices involved back off and retransmit after a small delay. Collisions are normal on an Ethernet network, but when excessive collisions occur, the bandwidth of the network is reduced. This response may indicate network overload or some sort of hardware or wiring problem.
Collision/1,5,10, ≥20 (BayStack 151 and 153 hubs only)	Amber	On	Collision rate is measured in units of tens of collisions per second.
Hub ID			The Unit ID of the hub is displayed. In a hub stack, each hub unit should have a unique ID. The hub is capable of setting the hub ID automatically, freeing you from having to do so. Using the NMM, if you have the BayStack 150 or BayStack152 hub, you can turn on Group ID flashing, which will make the hub ID indicator flash off and on. This ID flashing may be useful for identifying a specific hub or a hub stack within a large bank of hubs.
Utilization %	Green	Blinking	The amount of data traffic is measured. When the data traffic exceeds 40%, the last LED blinks amber.

Table 1-2 describes the LEDs that monitor each port.

Table 1-2. Description of port status LEDs

Label	Color	Activity	Description
Link/Rx	Green	On	The port is connected to a port on an Ethernet device that is powered on, and the connection between the ports is valid.
		Off	The port is connected to a port on an Ethernet device that is powered off. The connection between the port on the hub and the port on the connected device is not valid.
		Blinking	The connected port is receiving data packets. Each data packet will be transmitted through all other connected ports on the hub (or all ports in the hub stack).
Disable	Yellow	On	The port has been manually partitioned.
Autopartition	Yellow	Blinking	The port has been automatically partitioned.

Rear Panel

The rear panel of the BayStack 150-series hubs, as illustrated in Figure 1-5 and Figure 1-6, contains the stackable cascade connectors, the AUI port, a receptacle for the power cord, and an outlet for the removable power supply. As illustrated in Figure 1-5, the BayStack 150 and 152 hubs also have a communications port.

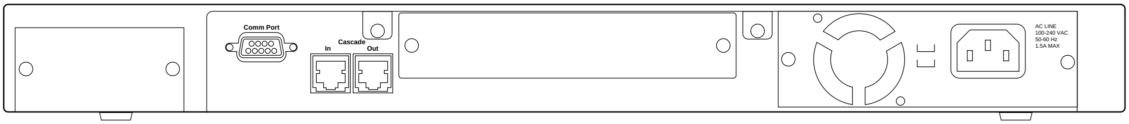


Figure 1-5. Rear panel of the BayStack 150 and 152 hubs

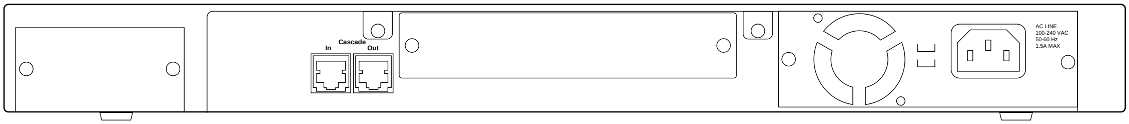


Figure 1-6. Rear panel of the BayStack 151 and 153 hubs

Cascade Connectors

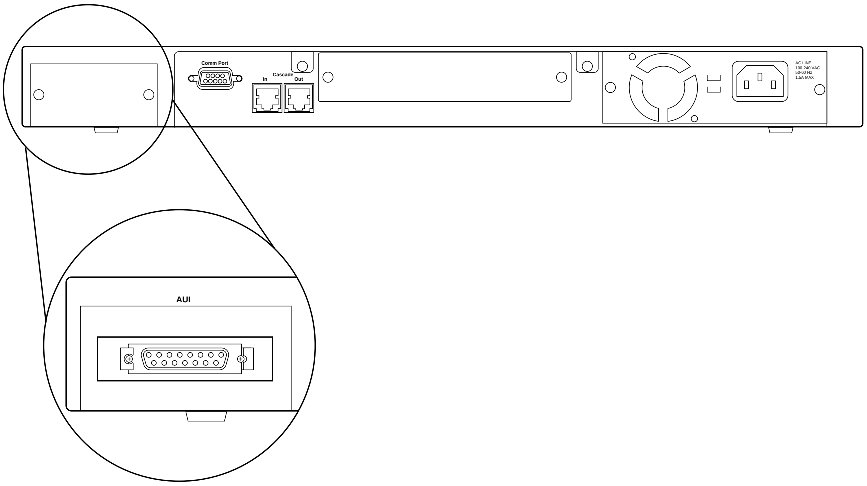
The stackable cascade connectors consist of two RJ-45 ports. They allow you to connect the hubs together in a stack of up to 8 hubs and a maximum of 200 ports (192 10BASE-T Ethernet ports plus 8 AUI connections).

Communications Port

The Communications Port (only on the BayStack 150 and 152 hubs) is used to connect the managed hub to a network management station for out-of-band management or for simple management using the communications port. The communications port has a standard 9-pin RS-232 female connector.

AUI Port

The AUI port is used for connecting the hub to a 10BASE5 thick Ethernet backbone or to other types of Ethernet media. The recessed AUI port (see Figure 1-7) accommodates most standard transceivers, also known as Media Access Units (MAUs), allowing the transceiver to be safely and conveniently tucked away.



7644EA

Figure 1-7. AUI port on the rear panel of the hub

Removable Power Supply

The removable power supply can be purchased and changed in case of failure. The power supply consists of an IEC receptacle, a fan, circuitry, and a connector to the hub. For further information about power supply replacement, refer to Appendix B, “Replacing the Power Supply.”

Chapter 2
Planning the Network Configuration

This chapter provides information for planning your network and incorporating the BayStack 150 and 152 hubs into your network.

Building Hub Stacks

You can combine up to eight hubs (BayStack 150 and 152 hubs or any other combination of BayStack 150-series hubs) into a single manageable hub stack. Building a hub stack has two advantages:

- All of the hubs can be managed as a single unit using a network management system or the console interface. Up to 200 10BASE-T ports can be controlled and monitored from a single management screen. Only one managed hub is required, and less costly unmanaged hubs can be used for the rest of the stack.
- The entire hub stack counts as a single repeater hub when planning your network. The Ethernet standard requires that there be at most four repeaters between any two stations on the network. Using the built-in daisy-chain ports on the hub allows you to link eight hubs together without violating the repeater count limitation.

Ethernet Rules

When planning your network, it is important to keep the following Ethernet configuration rules in mind:

- Make sure that there are no more than four repeaters (including hubs or hub stacks) between any two stations on the network.
- If you need to exceed the repeater limit, use a bridge or Ethernet switch to divide the network into separate collision domains.
- Make sure that none of the cable links exceed the maximum length for that type of cable.

Hub Roles

The BayStack 150-series hubs support both managed (BayStack 150 and 152) hubs and unmanaged (BayStack 151 and 153) hubs. In addition, more than one managed hub can be placed in a single hub stack. Therefore, a hub in the stack can take on different roles depending on the type of hub it is and its position in the hub stack.

Position in the Stack

Hubs in the hub stack are connected using the two daisy-chain Cascade ports located at the rear of the hub. The positions and roles of the hubs within the stack are described in the following sections.

Managed Hub Roles

You can include more than one managed hub in a hub stack, allowing you to continue to manage the hub stack, even if the management agent of one of the managed hubs fails. The hub currently managing the stack is called the active managed hub, and other managed hubs in the stack are called standby managed hubs.

If a managed hub is at the head of the stack, it automatically becomes the active managed hub. Otherwise, it will wait for management commands from another managed hub upstream. If it receives commands from a managed hub, it becomes a standby managed hub, controlled by the active managed hub. If it does not receive any commands, or if the active managed hub fails, it will become the active managed hub.

If there are more than two managed hubs in the stack, the standby indicator of the additional managed hubs will not light. However, if the active managed hub at the head of the stack fails, the first standby managed hub will become the active managed hub and the next managed hub will then become a standby managed hub.

A managed hub can only manage hubs that are downstream from it. Therefore, you should place the hub that you want to serve as the active managed hub at the head of the stack. If you want to use standby managed hubs, you should place them directly downstream of the active managed hub. Otherwise, you will not be able to control or monitor any unmanaged hubs upstream of the managed hub.

Each managed hub has its own IP address. All managed hubs respond to SNMP management commands, although only the active managed hub is capable of controlling and monitoring other hubs. If the active managed hub fails, then you will need to use the IP address of the new active managed hub to manage the other hubs in the stack.

Unmanaged Hub Roles

An unmanaged hub can operate as a standalone hub or can be a managed hub controlled by an upstream active managed hub.

If there are no managed hubs in the hub stack, or if the active managed hub in the stack fails and there is no standby managed hub to take its place, the unmanaged hubs will be standalone hubs. However, the hubs continue to communicate with other hubs in the stack through the cascade cable connections. In a case where the managed hub fails, you should turn power to the unmanaged hubs off and then on again to insure that they are in a valid state before using them as standalone hubs. Standalone hubs all have a hub ID of 0. When a hub is a standalone hub, all ports will be enabled and all settings such as hub segmenting and intrusion security will have no effect.

When there is a working active managed hub in the stack, then each unmanaged hub in the stack will be a managed hub controlled by the active managed hub and will have its own hub identification (ID).

Hub ID Numbers

Hub ID numbers, displayed on the front of the hub, are determined automatically by the managed hub. When the managed hub starts up, it begins to assign hub ID numbers to the standby managed hub and all of the unmanaged hubs. The managed hub remembers the hub ID associated with each hub in the stack; even if a hub is removed, the other hubs will keep their original hub IDs. When you add a new hub to the stack, the managed hub will assign it an unused hub ID.

Cascading Hubs into a Hub Stack

Hubs are daisy chained together using 4-pair, Category 5, twisted pair cabling with RJ-45 plugs on each end. A cascade cable of 30 centimeters (cm) is included with the hub. If you need to make a longer cable, refer to the pinout information on page D-3 of Appendix D, “Cables and Connectors.” The total length of all the cables, measured from the first hub in the stack to the last, must not exceed 100 m.

Chapter 3
Installation

This chapter provides information about and procedures for checking the package contents, preparing the site, and installing and verifying the installation of the BayStack 150-series hubs.

Package Contents

Unpack the contents of the package and verify them against the following list:

- One of the following BayStack 150-series hubs
  - BayStack 150 (24-port managed hub)
  - BayStack 151 (24-port unmanaged hub)
  - BayStack 152 (12-port managed hub)
  - BayStack 153 (12-port unmanaged hub)
- Accessory kit to include cabling, transceiver tray, four self-adhesive rubber feet for installing the hub on a flat surface, and brackets with screws for mounting the hub in a rack
- Appropriate power cord
- This manual
- *BayStack 150-series Ethernet Hubs Installation Instructions*

Operating Environment

Before you begin installing your hub, prepare the installation site. Make sure the operating environment, as listed in Appendix A, “Technical Specifications,” meets the physical requirements of the hub.

Power Specifications

The BayStack 150-series hubs feature an autoselecting 100 to 240 VAC, 50 to 60 Hz power supply unit that works in most countries around the world.

Before connecting the hub to power with the supplied power cord, make sure any cord used has a CEE-22 standard V female connector on one end. Make sure the power cord has a plug on the other end that is appropriate for the country where you are using the hub.

Caution: Use only power cords with a grounding path. Without a proper ground, a person touching the unit is in danger of receiving an electrical shock. Lack of a grounding path to the unit may result in excessive conducted or radiated emissions.

Installing the Hub on a Flat Surface

Making sure the bottom surface of the chassis is clean and dry, apply one of the four self-adhesive rubber feet to each of the marked locations on the bottom of the hub.

To install the hub, set the unit on a tabletop, shelf, or any other flat surface. Allow at least 2 inches on each side for proper ventilation and 5 inches at the back for power cord clearance.

Installing the Hub in a Rack

Confirm that the rack is an EIA-standard 19-inch rack. For rack mounting convenience, a pair of mounting brackets is included with the BayStack 150-series hubs. You need a #2 Phillips screwdriver for attaching the mounting brackets. As illustrated in Figure 3-1, attach the mounting brackets with the machine screws that are included with the rack mount kit, and then mount the hub in the rack.

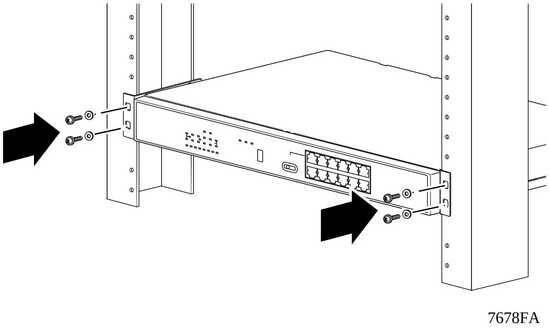


Figure 3-1. Installing the BayStack 150-series hubs in a rack

Cascading Hubs

Hubs in the hub stack are connected using the Cascade ports located at the rear of the hub. Each hub has an In port and an Out port. Hubs are daisy chained together by connecting the Out port of one hub to the In port of the next hub in the chain. A typical stack arrangement (with a BayStack 150 or 152 hub at the top of the stack) is illustrated in Figure 3-2.

All hubs connected through the In port of a hub can be considered downstream of the hub positioned higher in the stack, and all hubs connected through the Out port of the hub can be considered downstream of the hub positioned higher in the stack. If a hub does not have any upstream hubs, it is at the head of the stack.

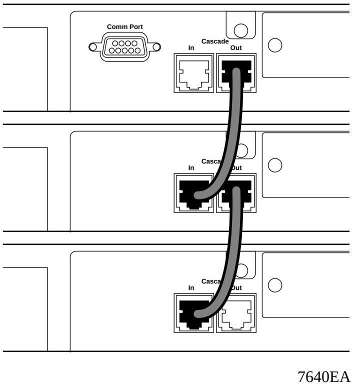


Figure 3-2. A typical stack arrangement

Network Connections

Once you have set up your hubs and connected them in a stack, you are ready to connect network stations and to connect your hub to the rest of your Ethernet network. This section tells how to connect your hub to workstations and to other hubs and network components on your local area network.

Be sure to refer to "Ethernet Rules" on page 2-2 when planning your network connections.

Connecting Stations to the Hub

The RJ-45 10BASE-T Ethernet ports on your hub are used for connecting the hub directly to network devices using crossover or straight-through 10BASE-T shielded or unshielded twisted-pair (STP or UTP) cables.

Port 1 on the BayStack 150-series hubs is an RJ-45 10BASE-T Ethernet port, configurable by a sliding switch to either an MDI (uplink) port or an MDI-X (normal) port. All of the other ports on the BayStack 150-series hubs are MDI-X (normal) 10BASE-T Ethernet ports and are not configurable.

Refer to Table 3-1 for information on setting the configurable switches and using crossover or straight-through twisted pair cables when connecting to other devices. Refer to Chapter D, “Cables and Connectors,” for more information about crossover and straight-through twisted pair cables.

Table 3-1. Selecting cables for connecting to other devices

Port Configuration	Connecting device	Connecting port	Twisted pair cable
MDI (Uplink)	Switch or hub	MDI-X (Normal)	Straight-through
MDI-X (Normal)	Switch or hub	MDI-X (Normal)	Crossover
	PC or server	MDI (Uplink)	Straight-through

Insert the RJ-45 plug at one end into the Ethernet 10BASE-T port on the front of the hub and at the other end into the Ethernet 10BASE-T port on the connecting device. When the hub and the connected device at the other end of the connection are turned on and the cable is connected at both ends, the Link LED for the port should light.

If the Link LED does not light, follow these steps:

1. **Make sure that the connectors are seated correctly at both ends of the cable.**
2. **Check the continuity of the wires in the cable, as well as the pin assignments on the RJ-45 plug.**
3. **Make sure the network station where the port is connected is plugged in and powered on.**
4. **Check that the right type of cable is connected to port 1 and that the MDI/MDI-X switch is set correctly for that port.**

Daisy Chaining Hub Stacks

If you have to expand your network beyond an 8-port stack or connect your hub to other parts of your network, you can daisy chain it using several different network media, including 10BASE-T twisted-pair cabling, 10BASE2 thin coaxial cabling, 10BASE5 thick coaxial cabling, and FOIRL or 10BASE-FL fiber optic cabling.

Using Twisted Pair Cable for Cascading

You can connect hubs or hub stacks together using ordinary twisted pair cabling. This is the simplest method, but the distance between hub stacks cannot exceed 100 m and two RJ-45 connector ports must be available on each of the first and last hubs for the cascade connections.

Twisted pair cabling is usually used to connect repeater hubs to Ethernet switches.

There are two different ways of cascading hubs using 10BASE-T cabling. The first way is to use a crossover cable, which connects the transmitter of one hub to the receiver of the other hub. Refer to Table 3-1 on page 5 for information on choosing cables.

Using the AUI Port for Cascading

On the rear panel of the BayStack 150-series hubs, there is an AUI connector designed for connecting the hub to various types of Ethernet media such as thick Ethernet coaxial cable (10BASE5), thin Ethernet coax (10BASE2), or fiber optic cabling (10BASE-FL). The AUI connector is recessed, allowing most types of transceivers, known as Media Access Units (MAUs), to be installed partially recessed within the rear panel of the hub. To make inserting and removing the transceiver easier, a transceiver tray has been included with the hub.

Note: Because measurements of MAUs from different manufacturers may vary, all MAUs may not fit properly into the tray. The MAU can be used without the transceiver tray by removing the door covering the AUI port and inserting the MAU directly into the AUI connector until the connection is secure.

To install a transceiver using the tray, refer to Figure 3-3 and follow these steps:

1. **Place the transceiver in the tray with the slotted stubs on the male AUI connector of the transceiver fitting into the slots on the front of the tray.**
2. **Unscrew the door covering the AUI port.**
3. **Slide the tray and transceiver into the slot until the connection is secure.**

   Most transceivers should fit easily within the slot. To accommodate a larger transceiver, insert a standard AUI cable using the tray. In this case, the cable serves as a short extension to allow the transceiver to be used externally to the hub enclosure.

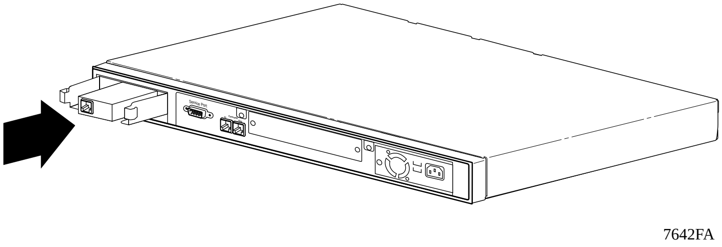


Figure 3-3. Installing the transceiver tray

Using Thin Coaxial Cable for Cascading

With the addition of a 10BASE2 transceiver connected to the AUI port at the rear of the hub, you can cascade the hub to other hubs or stations using thin coaxial cabling. This method of cascading hubs gives additional flexibility over using twisted pair cable, because you can cascade up to thirty hubs on a single thin coaxial cable segment. The entire coaxial segment may be up to 185 m long.

Each device on the thin coaxial segment needs to have a BNC port or to use a 10BASE2 transceiver. The cables should be connected to the BNC ports using BNC T-connectors, and there should be 50-ohm terminating resistors on each end. Make sure that you leave at least 0.5 m of coaxial cable between any two nodes on the thin coaxial cable segment.

Using Thick Coaxial Cable for Cascading

Transceivers connected to the AUI port can be used for connecting thick coaxial Ethernet (10BASE5) or fiber optic (FOIRL or 10BASE-FL) cabling to the hub.

A thick Ethernet trunk can be up to 500 m long (preferably a single piece of cable), and should have 50-ohm terminating resistors at each end. The cable shield should be grounded at one end. A 10BASE5 transceiver usually taps directly into the coaxial cable; taps should be placed at 2.5 m intervals, and you can have a maximum of 100 taps on a single cable segment. You can connect the transceiver to the AUI port on a hub using an AUI cable up to 50 m long.

Using Fiber Optic Cable for Cascading

Using a fiber optic transceiver, you can link to another hub or a hub stack up to 1000 m away using Fiber Optic Inter-Repeater Link (FOIRL), or up to 2000 m away using 10BASE-FL. The fiber optic transceiver should be inserted into the AUI port. Two fiber optic cables are required; the transmit line of each transceiver should be connected to the receive connector of the other.

When connecting a transceiver to the hub, the signal quality error (SQE) test function of the transceiver must be disabled.

Completing the Installation

To connect power on your hub and verify installation, follow these steps:

1. **Plug the female IEC connector of the power cable into the power connector on the back of the hub.**
2. **Insert the three-pronged plug on the power cord into a nonswitched, grounded power outlet on a wall, a power strip, or a grounded extension cord.**

When the managed hub is powered on, it does a power-on self-test (POST) to verify that all of its components are working properly. As the test is performed, the test progress is displayed on your terminal console.

After you have completed all necessary installation steps, verify that the installation was successful by checking hub LEDs, port connections, and configuration guidelines.

Your stack of hubs should meet these criteria:

- Cable connections are in place.
- All hubs and modules are installed.
- Power is connected to all hubs in the stack.
- The hub and any installed modules have completed their diagnostic cycle.

Checking the Diagnostic Displays

When you connect power to a hub, it performs the following diagnostic cycle:

- The LEDs on the managed hub in the stack and then the LEDs on the unmanaged hubs in the stack flash in two sequences before returning to normal operation as described in Table 1-1 and Table 1-2 in Chapter 1, “Introduction.”
- A boot verification message is displayed if a display terminal is connected to the communications port of a hub. For more information about connecting to the communications port, see “Connecting to the Communications Port” in Chapter 4, “Initializing the Network Management Module,” and Chapter 5, “Using the Configuration Menus.”

Troubleshooting

Use the diagnostic displays to help you identify the type of problem you have; then check the following:

- Verify that all hubs in the stack are powered on.
- Verify that all hubs in the stack are operating within the stack and are not isolated.

  If any hub ID displays a 0, it is isolated. Check that the cascade cable connections follow compliance, and check the software to see that the hub has not been isolated through the management software.
- Verify that each cable and port connection has the correct pin assignment and there are no loose connections.

  A good link on a port is verified by the lit LED for that port.

- Verify that all media adapters and expansion slot modules are correctly installed.
- Verify that your NMM is functioning correctly. For further information about the NMM, refer to Chapter 4, “Initializing the Network Management Module.”
- Verify that your installation complies with all BayStack and Ethernet guidelines in Chapter 2, “Planning the Network Configuration.”
- Use Optivity or other network management software to monitor the network and to verify that the hub and modules are operating correctly. To do this, refer to the documentation included with your network management software.

Chapter 4
Initializing the Network Management Module

This chapter describes how to initialize the built-in network management modules (NMMs) for the BayStack 150 and 152 hubs.

Only after the NMM has been initialized is it possible to manage your BayStack 150-series hubs or stack of hubs. For further information about using the menus after your NMM has been initialized, refer to Chapter 5, “Using the Configuration Menus.”

Only after the NMM has been initialized is it possible to use the Telnet Protocol to remotely access and manage your hub or stack. For further information about using Telnet, refer to “Using the Telnet Protocol to Access the Configuration Menu,” on page 4-10 of this chapter.

Understanding the NMM Booting and Initializing Process

For an NMM to start itself (boot) properly, you first have to initialize it; that is, you must provide it with the information it needs to find and communicate with the network management software. This section gives an overview of the boot process and general initialization requirements.

After power is connected to the hub, the NMM starts its four-stage boot process.

- In the first stage, the NMM runs self-test diagnostics. Diagnostic messages are displayed on your monitor if you have a terminal connected to the Comm (communications) port (see Figure 1-5 on page 1-8). If no errors are detected, the NMM continues to the second stage.

- In the second stage, the NMM sends out a Bootstrap Protocol (BootP) request for the IP address of the server. The NMM boot mode parameter determines whether the NMM should look for this address locally in electrically erasable programmable read-only memory (EEPROM) or from a file stored remotely on a server (network using BootP). The NMM needs its address to identify itself to the network management software. Once the NMM receives its address, it continues to the third stage.
- In the third stage, the NMM requests configuration data. The config load mode parameter determines whether the NMM should look for this data locally (Local) or from a file stored remotely on a server (Remote, Remote w/ Local Backup). The configuration data tells the NMM how to interact with the network and other network devices. Once the NMM reads the configuration data, it continues to the final stage of the boot process.
- In the fourth and final stage, the NMM requests an agent image. The image load mode parameter (Local, Remote, Remote w/Local Backup) determines whether a local or remote agent image is used. The configuration file can be used to specify the path name and file name of the agent image. The agent image program allows the NMM to monitor network activity, respond to SNMP requests, and collect network performance statistics.

After completing the boot process, the NMM starts actively monitoring your network.

Initializing the NMM to Boot Remotely

An NMM can receive all of its boot information remotely through a BootP/load server. The benefit of having one remote location for downloading boot information to all the NMMs in your network is that you can configure and download new files to all NMMs from a single convenient location. Downloading files from a single location eliminates the need for individual configuration of each NMM.

Setting up the BootP/load Server

The configuration and image files must be on your server if you want the NMM to get those files from a BootP/load server on your network.

Note: For instructions on where to store the configuration and image files and how to make them available on your BootP/load server or network management station, refer to the documentation included with those products. In general, you must copy the files to a specified directory and modify the configuration file.

The NMM gets the server IP address and the path and file name for the NMM configuration file from the /etc/bootptab.txt file. The NMM configuration file, in turn, can specify the path name and the file name of the image file. The NMM sends a request to the server to read the NMM configuration file using TFTP and then requests the server to transfer the image file using TFTP.

Note: Configuration and image files are available from the Bay Networks home page on the World Wide Web (http://support.baynetworks.com/software/Ethernet) or through an FTP server at 134.177.3.26 (/ftp/pub/Agents).

You can change the file names of your configuration and image files as needed for use in your own network. You may also need to modify other files on your server to allow the NMM to boot from your network. For more information about changing your configuration file, refer to Appendix C, “Boot Configuration File.”

Connecting to the Communications Port

You use the RS-232 port (Comm Port) on the rear panel of the BayStack 150 and 152 hubs to initialize your NMM for booting locally, for booting remotely through a BootP/load server, or for a modem connection using Telnet. You can also use the Comm Port to verify boot diagnostics as the NMM runs automated self-tests and attaches to the segment.

If you are connecting a terminal or PC to the console port, refer to instructions in your equipment documentation to configure the terminal or PC to the parameters in Table 4-1.

Table 4-1. Management console configuration parameters

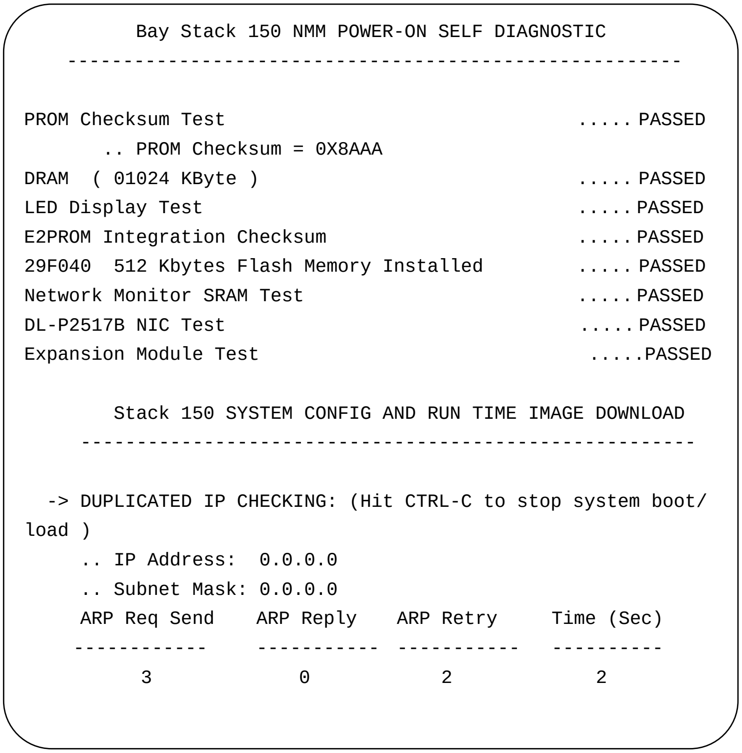
Parameter	Value
Baud rate	9600
Data bits	8
Stop bits	1
Parity	None

To connect a terminal or PC to the BayStack 150 or 152 hub to start the boot process and initialize the built-in NMM, follow these steps:

1. **Connect the DB-9 plug at the end of the straight-through cable to the console port on the rear panel of the hub.**
2. **Connect the other end of the cable into the appropriate port on the terminal or PC.**
3. **Turn on power to the hub by connecting the power cord first to the power receptacle on the rear panel of the hub and then to the wall outlet.**

Starting the Booting Process and Initializing the NMM

When you turn on power to the hub, the boot process begins. Then after a valid connection has been established, diagnostic messages similar to those in Figure 4-1 are displayed.

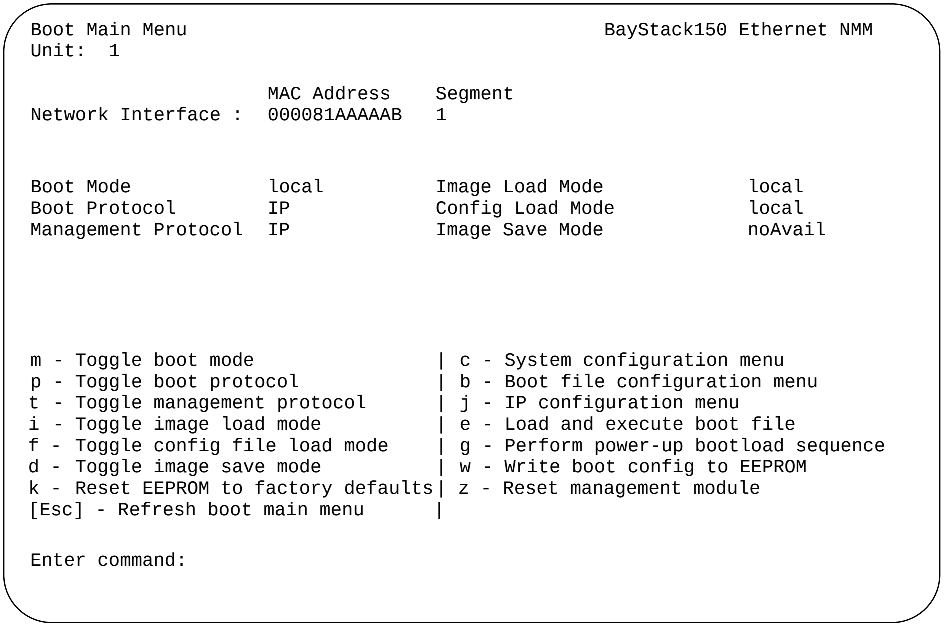


```
           Bay Stack 150 NMM POWER-ON SELF DIAGNOSTIC
     -------------------------------------------------------

PROM Checksum Test                                  ..... PASSED
       .. PROM Checksum = 0X8AAA
DRAM  ( 01024 KByte )                               ..... PASSED
LED Display Test                                    ..... PASSED
E2PROM Integration Checksum                         ..... PASSED
29F040  512 Kbytes Flash Memory Installed           ..... PASSED
Network Monitor SRAM Test                           ..... PASSED
DL-P2517B NIC Test                                  ..... PASSED
Expansion Module Test                                .....PASSED

        Stack 150 SYSTEM CONFIG AND RUN TIME IMAGE DOWNLOAD
      -------------------------------------------------------

  -> DUPLICATED IP CHECKING: (Hit CTRL-C to stop system boot/
load )
     .. IP Address:  0.0.0.0
     .. Subnet Mask: 0.0.0.0
     ARP Req Send    ARP Reply    ARP Retry     Time (Sec)
    ------------    -----------  -----------   ----------
          3              0            2             2
```

Figure 4-1. Diagnostic display

To initialize the NMM, follow these steps:

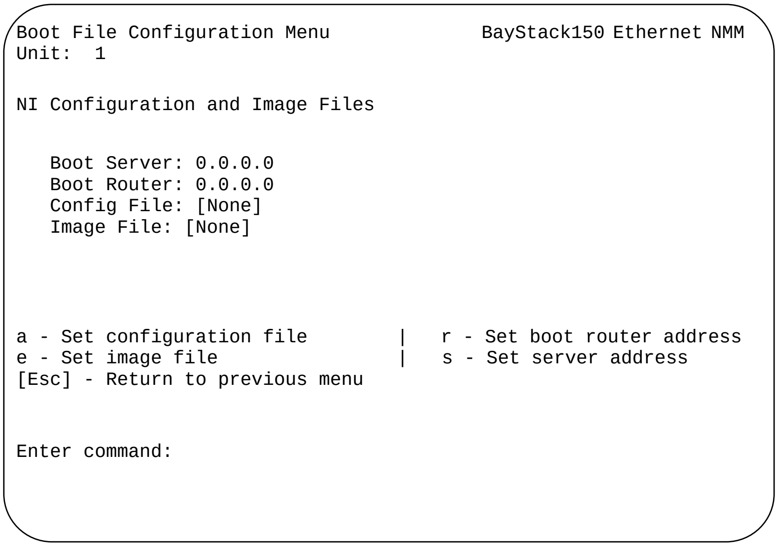
1. **Press [Ctrl]+C to display the boot Main Menu, as illustrated in Figure 4-2.**



```
Boot Main Menu                                               BayStack150 Ethernet NMM
Unit:  1

                     MAC Address    Segment
Network Interface :  000081AAAAAB   1


Boot Mode            local          Image Load Mode              local
Boot Protocol        IP             Config Load Mode             local
Management Protocol  IP             Image Save Mode              noAvail




m - Toggle boot mode                 | c - System configuration menu
p - Toggle boot protocol             | b - Boot file configuration menu
t - Toggle management protocol       | j - IP configuration menu
i - Toggle image load mode           | e - Load and execute boot file
f - Toggle config file load mode     | g - Perform power-up bootload sequence
d - Toggle image save mode           | w - Write boot config to EEPROM
k - Reset EEPROM to factory defaults| z - Reset management module
[Esc] - Refresh boot main menu       |

Enter command:
```

Figure 4-2. Boot Main Menu

2. **Press i to toggle the Image Load Mode selection to Network.**
3. **Press f to toggle the Config File Load Mode selection to Network.**
4. **Press b to display the Boot File Configuration Menu, as illustrated in Figure 4-3.**



```
Boot File Configuration Menu                    BayStack150 Ethernet NMM
Unit:  1

NI Configuration and Image Files

   Boot Server: 0.0.0.0
   Boot Router: 0.0.0.0
   Config File: [None]
   Image File: [None]




a - Set configuration file        |   r - Set boot router address
e - Set image file                |   s - Set server address
[Esc] - Return to previous menu


Enter command:
```

Figure 4-3. Boot File Configuration Menu

5. **Press a to select Set configuration file.**

   Enter the path where the configuration file is stored and the name of the configuration file (for example, eftpboot/6150.100.cfg).

6. **Press e to select Set image file.**

   Enter the path where the image file is stored and the name of the image file (for example, /eftpboot/6150.100.img).

7. **Press r to select Set boot router address.**

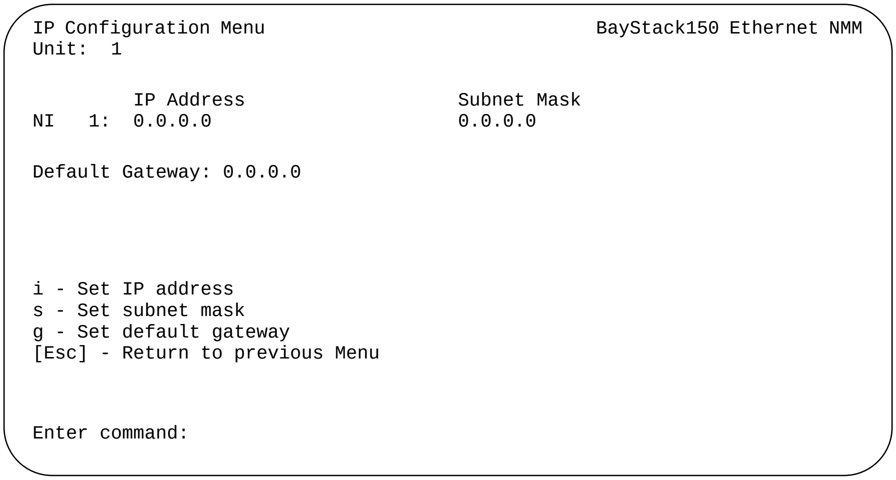
   Enter the IP address of the boot router (for example, 10.10.3.1).

8. **Press s to select Set server address.**

   Enter the address of the server where the image and configuration files are stored (for example, 10.10.3.200).

9. **Press [Esc] to return to the Boot Main Menu, as illustrated in Figure 4-2.**

10. **Press j to display the IP Configuration Menu, as illustrated in Figure 4-4.**



```
IP Configuration Menu                                BayStack150 Ethernet NMM
Unit:  1


         IP Address                     Subnet Mask
NI   1:  0.0.0.0                        0.0.0.0


Default Gateway: 0.0.0.0






i - Set IP address
s - Set subnet mask
g - Set default gateway
[Esc] - Return to previous Menu



Enter command:
```

Figure 4-4. IP Configuration Menu

11. **Press i to select Set IP address.**

    Enter the IP address of the hub (for example, 10.10.3.50).

12. **Press s to select Set subnet mask.**

    Enter the subnet mask number (for example, 255.255.255.0) if necessary for your network. If not applicable, skip to step 13.

13. **Press g to select Set default gateway.**

    Enter the IP address for your default gateway (for example, 10.10.3.1) if necessary for your network. If not applicable, skip to step 14.

14. **Press [Esc] to return to the Boot Main Menu, as illustrated in Figure 4-2.**

15. **Press w to select Write boot config to EEPROM.**

    All the parameters that you set for booting are written to the EEPROM in the NMM of your BayStack 150 or BayStack 152 hub.

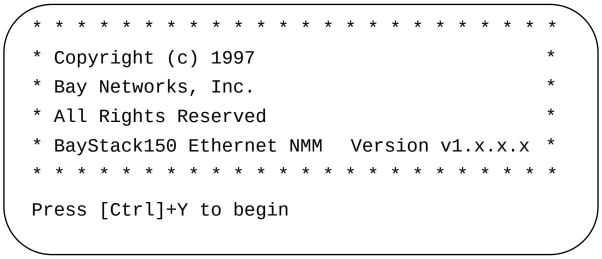
16. **Press e or z to execute the boot file.**

    Select e to load and execute the boot file.

    Select z to reset the network management module.

    The booting process begins. The diagnostics are displayed (as illustrated in Figure 4-1 on page 4-5), the image and configuration files are retrieved from the server or workstation and loaded onto the NMM, and the BayStack NMM copyright screen (as illustrated in Figure 4-5) is displayed.

    The NMM is now ready to monitor your network devices.



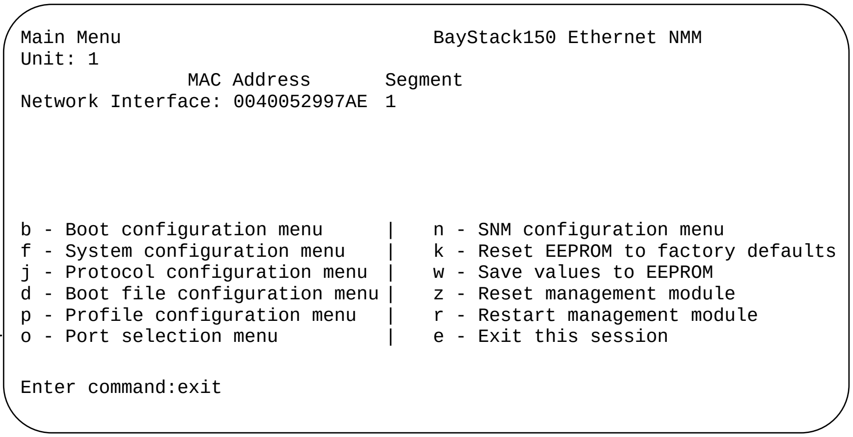
```
* * * * * * * * * * * * * * * * * * * * * * * *
* Copyright (c) 1997                            *
* Bay Networks, Inc.                            *
* All Rights Reserved                           *
* BayStack150 Ethernet NMM   Version v1.x.x.x   *
* * * * * * * * * * * * * * * * * * * * * * * *

Press [Ctrl]+Y to begin
```

Figure 4-5. BayStack NMM copyright screen

Note: This copyright screen appears after every power-up sequence or reset.

17. **Press [Ctrl]+Y to display the runtime Main Menu, as illustrated in Figure 4-6.**

    This menu is referred to as the runtime Main Menu because parameters can be set during runtime. Boot menus are menus that are displayed to enable you to set parameters for the boot process when initializing your NMM. For more information about setting parameters from both boot and runtime menus, refer to Chapter 5, “Using the Configuration Menus.”



```
Main Menu                            BayStack150 Ethernet NMM
Unit: 1
               MAC Address       Segment
Network Interface: 0040052997AE  1





b - Boot configuration menu      |    n - SNM configuration menu
f - System configuration menu    |    k - Reset EEPROM to factory defaults
j - Protocol configuration menu  |    w - Save values to EEPROM
d - Boot file configuration menu |    z - Reset management module
p - Profile configuration menu   |    r - Restart management module
o - Port selection menu          |    e - Exit this session

Enter command:exit
```

Figure 4-6. Main Menu

Using the Telnet Protocol to Access the Configuration Menu

After the built-in NMM in your BayStack 150 or BayStack 152 hub has been initialized, you can use the Telnet Protocol for managing your hub or stack of hubs remotely. To manage hubs remotely using a Telnet application, follow these steps:

1. **Enter the IP address of the active managed hub you want to access.**

   The copyright screen is displayed, as illustrated in Figure 4-5.

2. **Press [Ctrl]+Y to display the Main Menu, as illustrated in Figure 4-6.**

For information about setting parameters from the menus, refer to Chapter 5, “Using the Configuration Menus.”

Chapter 5
Using the Configuration Menus

This chapter provides information about the boot and runtime menus of the BayStack 150 and 152 hubs.

Accessing the NMM Configuration Menus

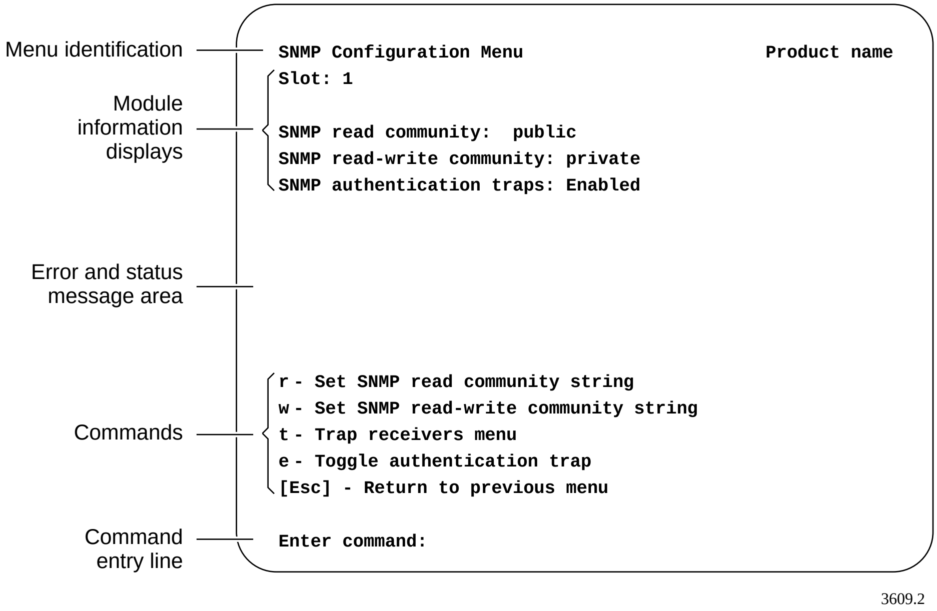
To modify the configuration parameters of a BayStack NMM through the communications port, use a terminal connected to the communications port to access the two series of configuration menus.

- The boot configuration menus allow you to set the primary boot configuration and initialize the NMM; that is, they tell the NMM how to identify itself to the network management software and where to look for its configuration and image information. These menus are available only before the image code is loaded and the NMM is initialized. To access the Boot Main Menu (see Figure 4-2 on page 4-6), press [Ctrl]+C from the Diagnostic display (see Figure 4-1 on page 4-5). Refer to Chapter 4, “Initializing the Network Management Module,” for further instructions on initializing.
- The runtime configuration menus allow you to change the NMM operating parameters while the NMM is running. You can access these menus only after the NMM is operating.

  To access the runtime Main Menu, press [Ctrl]+Y from the NMM copyright screen (see Figure 4-5 on page 4-9).

About the Configuration Menus

BayStack NMM configuration menus have a format similar to the sample shown in Figure 5-1.



```
SNMP Configuration Menu                          Product name
Slot: 1

SNMP read community:  public
SNMP read-write community: private
SNMP authentication traps: Enabled






r - Set SNMP read community string
w - Set SNMP read-write community string
t - Trap receivers menu
e - Toggle authentication trap
[Esc] - Return to previous menu

Enter command:
```

Figure 5-1. Sample configuration menu

The screen layout is based on common 80-character by 24-line ASCII terminal display characteristics. Menu information is divided into the following five parts:

- Menu identification (menu title)
- Module information displays
- Error and status messages
- Commands
- Command entry line

Reading Module Information Displays

Some menus contain display fields that show current configuration parameter values. In some cases, the display fields show read-only parameter values that are set through hardware jumpers or switches. In other cases, the display fields show parameter values that are set through commands initiated in that menu.

Reading Error and Status Messages

The configuration program displays error and status messages in the area between the module information displays and the commands.

Executing Commands

Some commands switch between two or more settings; these commands “toggle” a condition. Other commands are used to enter command information; these commands set, add, or delete a parameter value. Still other commands initiate a direct action.

To use menu commands, follow these steps:

1. **Enter the letter for the command you want to issue.**

   Some commands display another menu with its own commands. From one of these menus, you again enter the letter for the command you want to issue.

   When you enter a command that sets or changes a parameter value, a submenu is displayed or a prompt and a text-entry field are displayed at the bottom of the menu. When a command displays a text-entry field, enter the requested information and press [Enter].

   When you enter a toggle command, that parameter value changes in the display portion of the menu. For example, when the SNMP Configuration Menu (shown in Figure 5-1) displays:

   ```
   SNMP authentication trap: Enabled
   ```

   Entering the e command [Toggle authentication trap] changes the display to read:

   ```
   SNMP authentication trap: Disabled
   ```

2. **Repeat step 1 if you want to change other parameters.**

3. **Press [Esc] to return to the main menu when you have finished in that submenu, if you are working from a submenu.**

   If you are working from a main menu, choose an appropriate command from the command list.

Caution: Choosing the option to reset your hub results in the NMM saving the factory default configuration and could cause an interruption of network activity and require reconfiguration of the NMM configuration parameters.

Boot Configuration Menus and Commands

The commands found in the boot configuration menus primarily deal with how the NMM boots (from the network or from EEPROM), the protocol the NMM uses in the boot process (IP), the names and locations of the configuration and image files, and the directions for downloading the correct configuration and image information.

The boot configuration menus consist of a Main Menu and three submenus, as shown in Figure 5-2.

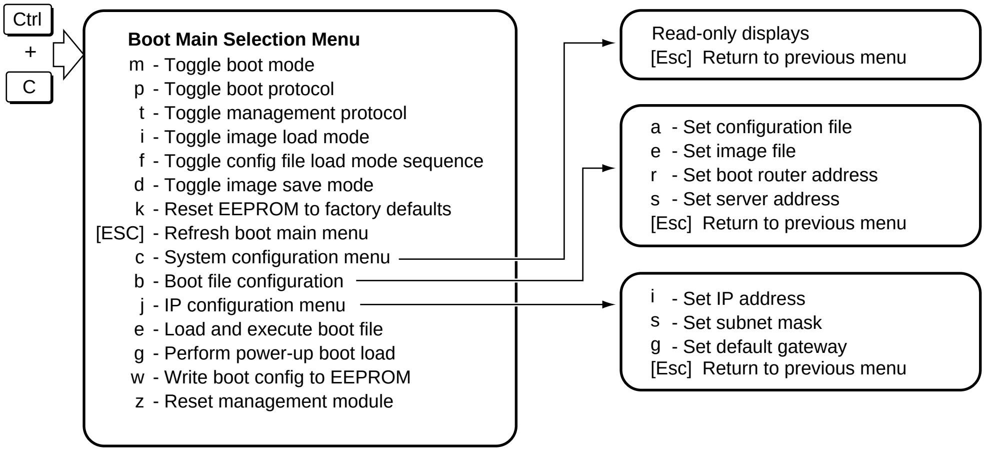

Ctrl
+
C
Boot Main Selection Menu
m - Toggle boot mode
p - Toggle boot protocol
t - Toggle management protocol
i - Toggle image load mode
f - Toggle config file load mode sequence
d - Toggle image save mode
k - Reset EEPROM to factory defaults
[ESC] - Refresh boot main menu
c - System configuration menu
b - Boot file configuration
j - IP configuration menu
e - Load and execute boot file
g - Perform power-up boot load
w - Write boot config to EEPROM
z - Reset management module
Read-only displays
[Esc] Return to previous menu
a - Set configuration file
e - Set image file
r - Set boot router address
s - Set server address
[Esc] Return to previous menu
i - Set IP address
s - Set subnet mask
g - Set default gateway
[Esc] Return to previous menu

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Figure 5-2. Boot configuration menu hierarchy flowchart

Boot Main Menu

When you press [Ctrl]+C from the system diagnostic display, the boot Main Menu (as illustrated in Figure 4-2 on page 4-6) is displayed. Select from the commands shown in Table 5-1.

Caution: When using the commands from the boot Main Menu, always save any values to EEPROM after making changes by pressing w. By not saving your changes and pressing e, g, or z, you lose the values that you have entered.

Table 5-1. Boot Main Menu commands

Command	Function
m	**[Toggle boot mode]** Use this command to switch boot mode between net (network) and local. The default is net.
p	**[Toggle boot protocol]** Use this command to display the boot protocol. Because IP is the only protocol that is used, you cannot toggle your selection.
t	**[Toggle management protocol]** Use this command to display the management protocol. Because IP is the only protocol that is used, you cannot toggle your selection.
i	**[Toggle image load mode]** Use this command to switch image load mode between net (network) and local.
f	**[Toggle config load mode sequence]** Use this command to switch the configuration load mode between net (network) and local.
d	**[Toggle image save mode]** Use this command to toggle image save mode. The options are writeIfDiff, writeIfNewer, and noWrite.
k	**[Reset EEPROM to factory defaults]** Use this command to reset the EEPROM contents to the factory default settings.
[Esc]	**[Refresh boot main menu]** Use this command to refresh the Boot Main Menu screen.
c	**[System configuration menu]** Use this command to access the System Configuration Menu. You can view system hardware configuration information in this menu.
b	**[Boot file configuration menu]** Use this command to access the Boot File Configuration Menu.
j	**[IP configuration menu]** Use this command to display the IP Configuration Menu. You can set the IP address of the NMM, subnet mask, and default gateway.

Table 5-1. Boot Main Menu commands (continued)

Command	Function
e	**[Load and execute boot file]** Use this command to load and start the boot process.
g	**[Perform power-up bootload]** Use this command to perform a full BootP/TFTP boot load sequence.
w	**[Write boot config to EEPROM]** Use this command to save all newly set parameter values to EEPROM. The NMM uses these new values during its next boot load cycle.
z	**[Reset management module]** Use this command to reset the NMM and start the self-test and loading process. This command prompts you to verify the reset.

Boot System Configuration Menu

When you press c from the boot Main Menu, the boot System Configuration Menu is displayed. This menu is a read-only display. The only command item is [Esc] to return to the previous menu.

The boot System Configuration Menu includes the following information display:

- Revision codes for the NMM printed circuit board
- Memory configurations and processor type
- Status of RAM tests

Boot File Configuration Menu

When you press b from the Boot Main Menu, the Boot File Configuration Menu is displayed. Select from the commands in Table 5-2.

Table 5-2. Boot File Configuration Menu commands

Command	Function
a	**[Set configuration file]** Use this command to select the name of the configuration file. This command prompts you to enter the path name and file name of the configuration file.
e	**[Set image file]** Use this command to select the name of the image file. This command prompts you to enter the path name and file name of the image file.

Table 5-2. Boot File Configuration Menu commands (continued)

Command	Function
r	**[Set boot router address]** Use this command to set the IP address of the boot router.
s	**[Set server address]** Use this command to set the address of the server where the image and configuration files are stored.
[Esc]	**[Return to previous menu]** Press [Esc] to return to the Main Menu.

Boot IP Configuration Menu

When you press j from the Boot Main Menu, the boot IP Configuration Menu is displayed. Select from the commands shown in Table 5-3.

Table 5-3. Protocol Configuration Menu commands

Command	Function
i	**[Set IP address]** Use this command to set the IP address for the NMM. This command prompts you to enter the IP address for the NMM in dotted-decimal notation.
s	**[Set subnet mask]** Use this command to set the IP address that serves as the subnet mask. This command prompts you to specify the subnet mask IP address in dotted-decimal notation.
g	**[Set default gateway]** Use this command to set the default gateway.
[Esc]	**[Return to previous menu]** Use this command to return to the Boot Main Menu.

Runtime Configuration Menus and Commands

The runtime configuration menus provide a way to change operating values while the NMM is running. You can access this set of menus only after the image code is loaded. Press [Ctrl]+Y from the copyright screen (shown in Figure 4-5 on page 4-9).

The runtime configuration menus consist of a Main Menu and seven submenus, as shown in Figure 5-3.

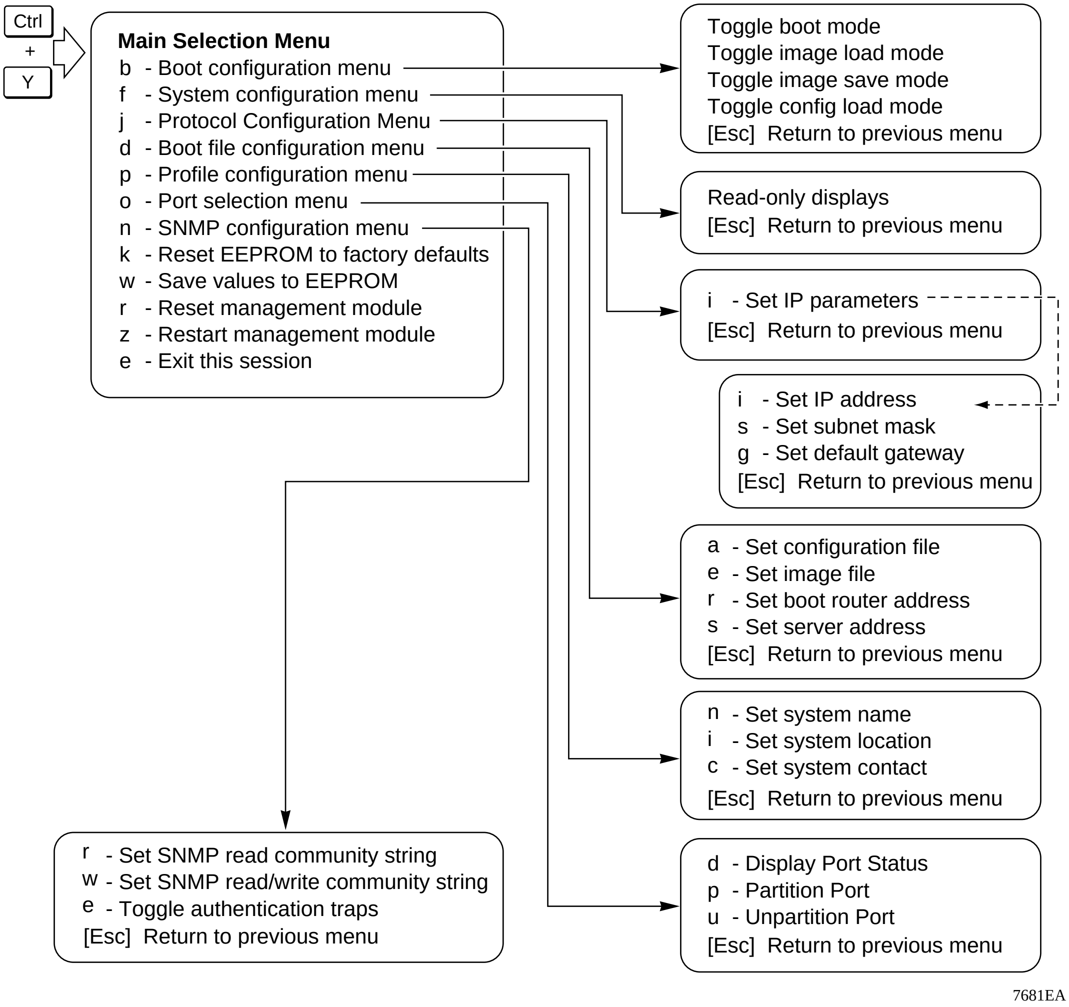
Ctrl
+
Y
Main Selection Menu
b - Boot configuration menu
f - System configuration menu
j - Protocol Configuration Menu
d - Boot file configuration menu
p - Profile configuration menu
o - Port selection menu
n - SNMP configuration menu
k - Reset EEPROM to factory defaults
w - Save values to EEPROM
r - Reset management module
z - Restart management module
e - Exit this session
Toggle boot mode
Toggle image load mode
Toggle image save mode
Toggle config load mode
[Esc] Return to previous menu
Read-only displays
[Esc] Return to previous menu
i - Set IP parameters
[Esc] Return to previous menu
i - Set IP address
s - Set subnet mask
g - Set default gateway
[Esc] Return to previous menu
a - Set configuration file
e - Set image file
r - Set boot router address
s - Set server address
[Esc] Return to previous menu
n - Set system name
i - Set system location
c - Set system contact
[Esc] Return to previous menu
r - Set SNMP read community string
w - Set SNMP read/write community string
e - Toggle authentication traps
[Esc] Return to previous menu
d - Display Port Status
p - Partition Port
u - Unpartition Port
[Esc] Return to previous menu
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Figure 5-3. Runtime configuration menu hierarchy flowchart

Note: Changes to runtime commands require that you press the w command to save configuration changes to EEPROM. Pressing r to reset the management module or pressing z to restart the management module prevents the changes being written to EEPROM.

Runtime Main Menu

The commands listed in Table 5-4 can be selected from the runtime Main Menu.

Table 5-4. Runtime Main Menu commands

Command	Function
b	**[Boot configuration menu]** Use this command to display the Boot Configuration Menu. You can toggle the boot mode, the image and config file load modes, and the image save modes from this menu (see "Runtime Boot Configuration Menu" later in this chapter).
f	**[System configuration menu]** Use this command to display the System Configuration Menu. You can view system hardware configuration information in this menu (see "Runtime System Configuration Menu" later in this chapter).
j	**[Protocol configuration menu]** Use this command to display the Protocol Configuration Menu. You can set or modify the IP parameters from this menu (see "Runtime Protocol Configuration Menu" later in this chapter).
d	**[Boot file configuration menu]** Use this command to display the Boot File Configuration Menu. You can set or modify the image and configuration tables for the NMM, including the address of the boot server and the address of the boot router in this menu (see "Runtime Boot File Configuration Menu" later in this chapter).
p	**[Profile configuration menu]** Use this command to display the Profile Configuration Menu. You can enter descriptions for the system name, system location, and system contact in this menu (see "Runtime Profile Configuration Menu" later in this chapter).
o	**[Port selection menu]** Use this command to display the Port Selection Table Menu. You can display the port status and partition or unpartition the ports for a specified hub (see "Runtime Port Selection Table Menu" later in this chapter).
n	**[SNMP configuration menu]** Use this command to display the SNMP Configuration Menu. You can set or modify the SNMP parameters for the NMM in this menu (see "Runtime SNMP Configuration Menu" later in this chapter).
k	**[Reset EEPROM to factory defaults]** Use this command to reset the EEPROM contents to the factory default settings. This command prompts you to verify the reset request.
w	**[Save values to EEPROM]** Use this command to save any changed parameter values to EEPROM. When you enter this command, an informational message confirming the save is displayed.

Table 5-4. Runtime Main Menu commands (continued)

Command	Function
z	**[Reset management module]** Use this command to reset the NMM. This command initiates the NMM self-test and hardware reset process. This command prompts you to confirm the reset.
r	**[Restart management module]** Use this message to restart the NMM. This command causes the NMM to load and execute the agent code stored in NMM memory. This command prompts you to confirm the restart.
e	**[Exit this session]** Use this command to exit the menus and return to the copyright screen.

Runtime Boot Configuration Menu

When you press b from the runtime Main Menu, the Boot Configuration Menu is displayed. This menu displays the current values and next boot values for the boot mode, image load mode, image save mode, and configuration load mode for the NMM. You can select from the commands shown in Table 5-5.

Table 5-5. Runtime boot Configuration Menu commands

Command	Function
m	**[Toggle boot mode]** Use this command to switch the boot mode between net (network) and local. The default is net.
i	**[Toggle image load mode]** Use this command to switch image load mode between local, net (network), and locAsBk. The default is locAsBk.
s	**[Toggle image save mode]** Use this command to switch the image save mode between noWrite, writeIfNewer, and writeIfDiff. The default is writeIfDiff.
c	**[Toggle config load mode]** Use this command to switch configuration load mode between local, net (network), and locAsBk. The default is locAsBk.
[Esc]	**[Return to previous menu]** Use this command to return to the runtime Main Menu.

Runtime System Configuration Menu

When you press f from the runtime Main Menu, the System Configuration Menu is displayed. This is a display screen only. Choosing escape returns you to the previous menu.

Runtime Protocol Configuration Menu

When you press j from the runtime Main Menu, the Protocol Configuration Menu is displayed. The menu displays the current values and next boot values for the management protocol, default gateway (router), and frame type for the NMM. You can select from the commands shown in Table 5-6.

Table 5-6. Runtime Protocol Configuration Menu commands

Command	Function
i	**[IP configuration menu]** Use this command to display the IP Configuration Menu. Use this command to set the IP address, subnet mask, and default gateway (router) (see "Runtime IP Configuration Menu" next in this chapter).
[Esc]	**[Return to previous menu]** Use this command to return to the runtime Main Menu.

Runtime IP Configuration Menu

When you press i from the runtime Protocol Configuration Menu, the IP Configuration Menu is displayed. Select from the commands shown in Table 5-7.

Table 5-7. Runtime IP Configuration Menu commands

Command	Function
i	**[Set IP address]** Use this command to set the IP address for the NMM. This command prompts you to specify the IP address using dotted-decimal notation.
s	**[Set subnet mask]** Use this command to set the subnet mask. This command prompts you to specify the subnet mask using dotted-decimal notation.
g	**[Set default gateway]** Use this command to set the IP address for a default gateway for the NMM. You can set only one default gateway. This command prompts you to specify the IP address using dotted-decimal notation.
[Esc]	**[Return to previous menu]** Use this command to return to the runtime Protocol Configuration Menu.

Runtime Boot File Configuration Menu

When you press d from the runtime Main Menu, the boot File Configuration Menu is displayed. The menu displays the current boot server, boot router, configuration file, and image file. Select from the commands shown in Table 5-8.

Table 5-8. Runtime boot File Configuration Menu commands

Command	Function
a	**[Set configuration file]** Use this command to add a configuration file to the configuration table. This command prompts you to specify the full UNIX or DOS path and file name.
e	**[Set image file]** Use this command to add an image file to the image table. This command prompts you to specify the image table entry and the full UNIX or DOS path and file name.
r	**[Set boot router address]** Use this command to set the boot IP address of the router. This command prompts you to specify the IP address of the router using dotted-decimal notation.
s	**[Set server address]** Use this command to set the IP address of the server. This command prompts you to specify the IP address of the server using dotted-decimal notation.

Table 5-8. Runtime boot File Configuration Menu commands

Command	Function
[Esc]	**[Return to previous menu]** Use this command to return to the runtime Main Menu.

Runtime Profile Configuration Menu

When you press p from the runtime Main Menu, the Profile Configuration Menu is displayed. The menu displays the current system name, system location, and system contact. The names you enter can be any convenient description of up to 255 alphanumeric characters. Select from the commands shown in Table 5-9.

Table 5-9. Runtime Profile Configuration Menu commands

Command	Function
n	**[Set system name]** Use this command to identify the unit in which the NMM is installed. This command prompts you to specify a system name.
l	**[Set system location]** Use this command to identify the location of the unit. This command prompts you to specify a system location name.
c	**[Set system contact]** Use this command to identify the administrator or contact person associated with the unit. This command prompts you to specify a system contact name.
[Esc]	**[Return to previous menu]** Use this command to return to the runtime Main Menu.

Runtime Port Selection Table Menu

When you press o from the runtime Main Menu, the runtime Port Selection Table Menu is displayed. Select from the commands shown in Table 5-10.

Table 5-10. Runtime Port Selection Table Menu commands

Command	Function
d	**[Display port status]** Use this command to display the Port Status Menu and to view the partition status for each port on any of the hubs in the stack. This command prompts you to select a unit number for the ports you want to view (see "Runtime SNMP Configuration Menu" next in this chapter).
p	**[Partition port]** Use this command to partition a port or group of ports on a selected hub. This command prompts you to select a unit number for the hub ports you want to partition. You can enter either one port or a range of ports, or both, if they are separated by a space. For example, to partition port 1 and also ports 5 to 8, enter 1 5-8. The status field displays the current status of each port on the selected hub.
u	**[Unpartition port]** Use this command to unpartition a port or group of ports on a selected hub. This command prompts you to select a unit number for the hub ports you want to partition. You can enter either one port or a range of ports, or both, if they are separated by a space. For example, to unpartition port 1 and also ports 5 to 8, enter 1 5-8.The status field displays the current status of each port on the selected hub.
[Esc]	**[Return to previous menu]** Use this command to return to the runtime Main Menu.

Runtime SNMP Configuration Menu

When you press n from the runtime Main Menu, the SNMP Configuration Menu is displayed. The menu displays the current SNMP read and read-write community strings and the authentication traps setting for the NMM. Select from the commands shown in Table 5-11.

Table 5-11. Runtime SNMP Configuration Menu commands

Command	Function
r	**[Set SNMP read community string]** Use this command to set the SNMP read community string. This command prompts you to enter an alphanumeric character string of up to 20 characters.
w	**[Set SNMP read-write community string]** Use this command to set the SNMP read-write community string. This command prompts you to enter an alphanumeric character string of up to 20 characters.
e	**[Toggle authentication traps]** Use this command to turn the authentication traps feature on (enabled) and off (disabled). The default setting is enabled.
[Esc]	**[Return to previous menu]** Use this command to return to the runtime Main Menu.

Appendix A
Technical Specifications

This appendix provides technical specifications for the BayStack 150-series hubs.

General Specifications

**Network Protocol
and Standards Compatibility**

ISO/IEC 802-3 (ANSI/IEEE 802.3I)
10BASE-T, Ethernet

IEEE 802.3 10BASE5 Ethernet

Data Rate

10 Mb/s differential Manchester encoded

Interface

RJ-45 connector for 10BASE-T

AUI connector for 10BASE5, 10BASE2

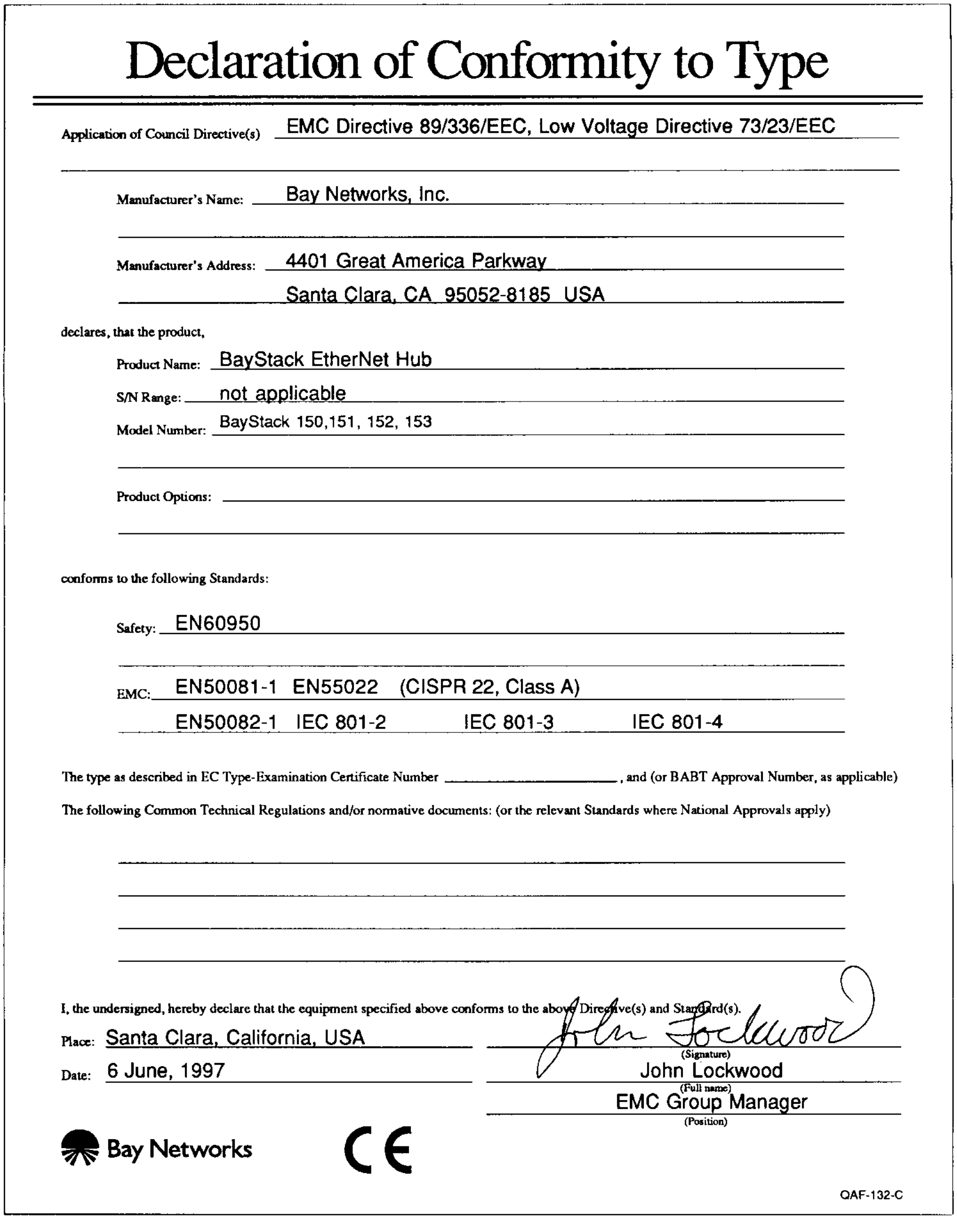
Electrical Specifications

Input power:	90 to 240 VAC, 50W Maximum, 50 - 60 Hz
Power consumption:	50W (BayStack 150 and 152 hubs) 20W (BayStack 151 and 153 hubs)

Physical Specifications	
Weight:	6.2 lb (BayStack 150 hub) 3.0 kg
	5.5 lb (BayStack 151 hub) 2.7 kg
	6.0 lb (BayStack 152 hub) 2.9 kg
	5.3 lb (BayStack 153 hub) 2.6 kg
Dimensions:	(D) 8.46 by (W) 17.2 by (H) 1.73 in. (D) 217 by (W) 441 by (H) 44.4 mm
Environmental Specifications	
Operating Temperature:	0 to 50° C
Storage Temperature:	-20° C to 65° C
Operating humidity:	20% to 80% relative humidity, noncondensing
Storage humidity:	5% to 90%, relative humidity, noncondensing
Electromagnetic Emissions	
Meets requirements of:	FCC Part 15, Subpart B, Class A
	EN 55022, Class A AS/NZS 3548 Class A
	EN55 022 (Cispr 22) Class A
	VCCI Class 1 ITE
Electromagnetic Susceptibility	
Meets requirements of:	
	EN 50082-1
Electrostatic discharge (ESD)	EC801-2, Level 2
Radiated electromagnetic field	EC801-2, Level 2
Electrical fast transient/burst	EC801-4, Level 2
Safety Agency Approvals	
UL 1950	
CSA C22.2 #950	
TUV EN60950	

Declaration of Conformity

The following Declaration of Conformity identifies the BayStack 150-series Ethernet hubs, the Bay Networks name and address, and the applicable specifications that are recognized in the European community.



Declaration of Conformity to Type

Application of Council Directive(s) EMC Directive 89/336/EEC, Low Voltage Directive 73/23/EEC

Manufacturer's Name: Bay Networks, Inc.

Manufacturer's Address: 4401 Great America Parkway
Santa Clara, CA 95052-8185 USA

declares, that the product,

Product Name: BayStack EtherNet Hub

S/N Range: not applicable

Model Number: BayStack 150,151, 152, 153

Product Options:

conforms to the following Standards:

Safety: EN60950

EMC: EN50081-1 EN55022 (CISPR 22, Class A)
EN50082-1 IEC 801-2 IEC 801-3 IEC 801-4

The type as described in EC Type-Examination Certificate Number ____________, and (or BABT Approval Number, as applicable)

The following Common Technical Regulations and/or normative documents: (or the relevant Standards where National Approvals apply)

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

Place: Santa Clara, California, USA

Date: 6 June, 1997

John Lockwood
(Signature)

John Lockwood
(Full name)

EMC Group Manager
(Position)

Bay Networks

CE

QAF-132-C

Appendix B
Replacing the Power Supply

This appendix provides instructions for ordering and replacing the removable power supply for the BayStack 150-series hubs.

Ordering the Power Supply

The removable power supply can be obtained by ordering Bay Networks part number CG1005011 from the price list.

Caution: The removable power supply that is available by ordering from Bay Networks is the power supply for the BayStack 150 and 152 hubs and operates in all of the BayStack 150-series hubs. Do not swap power supplies that are currently operating in your BayStack 151 and 153 hubs and insert them in BayStack 150 and 152 hubs. Because of different power requirements, using the incorrect power supply may cause your hub to malfunction.

Replacing the Power Supply

The hub comes with a removable power supply for easy replacement. In the event that the power supply fails or is damaged, replace the power supply by referring to Figure B-1 and following these steps:

1. **Disconnect the power cord from the wall outlet.**
2. **Disconnect the power cord from its connector on the rear of the hub.**
3. **Using a Phillips screwdriver, remove the screws securing the power supply to release the unit.**

4. **Using the tool that is provided when you order a removable power supply, remove the power supply by placing the tool in the slots on the back of the power supply unit and slide it out the rear of the chassis.**

Caution: Do not plug the power supply in when it is outside the chassis. Plugging in the power supply could cause personal injury and damage to the power supply.

5. **Slide the replacement power supply into the chassis, engaging the connector carefully.**

6. **Attach the power cord to the connector of the power supply and connect the other end of the power cord to the AC supply source.**

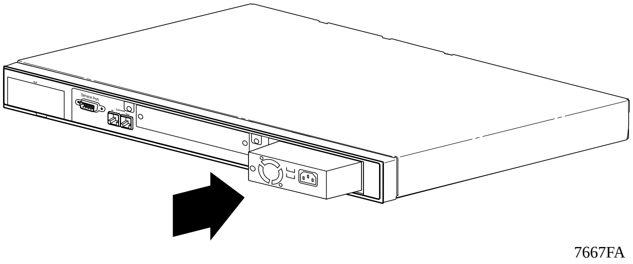


Figure B-1. Replacing the power supply

Appendix C
Boot Configuration File

This appendix describes the process you use to modify the configuration file of a BayStack 150 or 152 hub NMM when you want the NMM to load its operating image from a load server.

You can edit the configuration file directly using a text editor available on the load server. Because there is no default path name or file name for the NMM image file, you must specify a path name and a file name.

The configuration file is a text file, usually stored on the server with a .CFG extension. It can be up to 10 kilobytes (KB) long. Lines beginning with a pound sign (#) are considered comments that are ignored by the hub. All other lines are commands, which are interpreted by the managed hub.

Caution: Always make a backup copy of the NMM configuration file to use as a reference before editing the NMM configuration file.

Sample Configuration File

```
# This is a sample configuration file for the Bay Stack 150 NMM.
# Delete the '#' character to uncomment the lines that you want the NMM to read.
# Maximum length of a line is 120 characters.
#
# Each (non-comment) line of the configuration file specifies the value of one object.
#
# Syntax of object values: Strings are enclosed in double quotes; enumerated
# types are not.
#
# Hint: You need not specify the ".0" instance for scalar objects.
#
# MIB names are used. Tabular objects are indexed by suffixing the
# object name with ".instance-number". Scalar objects have a ".0" suffix.

############ SYSTEM NAME ######################################################
# Specify the name of the hub. Maximum of 255 characters.
#
# Example:
sysName "Payroll’s Hub"

############ SYSTEM CONTACT ###################################################
# Specify the name & phone of the hub administrator  or contact person.
# Maximum of 255 characters.
#
# Example:
sysContact "John Smith x 52827"

############ SYSTEM LOCATION ##################################################
# Specify the location of the hub. Maximum of 255 characters.
#
# Example:
sysLocation "3rd Floor"

############ MGMT PROTOCOL ###################################################
# Specify the transport protocol to use. The only valid value is:
# ipOnly.
#
# Example:
# s5AgInfoMgmtProtocolNxtBoot.0 ipOnly
s5AgInfoMgmtProtocolNxtBoot.0 ipOnly

############ BOOT MODE ##############################################
# Specify the boot mode for this NMM.  Valid choices are net and local.
# The default setting is net.
# This value will be applied the next time you reset the unit.
# local means get the ip address for this unit from the memory,
# net means get ip # using bootp protocol.
#
# Example:
# s5AgInfoBootMode.0 net
s5AgInfoBootMode.0 local

############ CONFIGURATION LOAD MODE ###############################
# Specify the configuration load mode for this NMM.  Valid choices
# are: local, net, and locAsBk. The default setting is locAsBk.
# This value will be applied the next time you reset the unit.
# locAsBk means get it from network. If for some reason you cannot get it,
# use the one in memory.
#
# Example:
# s5AgInfoCfgLoadMode.0 net
s5AgInfoCfgLoadMode.0 net

############ IMAGE LOAD MODE #######################################
# Specify the image load mode for this NMM.  Valid choices are:
# local, net, locAsBk and netIfNewer. The default setting is locAsBk.
# This value will be applied the next time you reset the unit.
# Note: Boot firmware versions A & B do not support netIfNewer.
#
# Example:
#s5AgInfoImgLoadMode.0 local
s5AgInfoImgLoadMode.0 locAsBk

############ IMAGE SAVE MODE #######################################
# Specify the image save mode for this NMM.  Valid choices are
# writeIfDiff, writeIfNewer, and noWrite.
# Note: Boot firmware versions A & B supports only writeIfDiff.
#
# Example:
# s5AgInfoImgSaveMode.0 writeIfDiff
s5AgInfoImgSaveMode.0 writeIfDiff

############ Primary Default Router ###############################
# Specify the IP address of the primary default router for this NMM.
# This value will be applied the next time you reset the unit.
#
# Example:
# s5AgInfoNxtBootDfltGwAddr.0  0.0.0.0
s5AgInfoNxtBootDfltGwAddr.0 10.160.120.1
```

```
######################### IP ADDRESS ##############################
# Assign IP address to the NMM.
# This value will be applied to the unit as soon as the unit reads this cfg file.
#
# Format:
# s5AgMyIfNxtBootIpAddr.1 x.x.x.x
# You must include the ".1" instance value.
#
# Example:
s5AgMyIfNxtBootIpAddr.1 10.160.120.150
############ SUBNET MASK #############################
# Assign local subnet mask for the NMM.
# Default for Class A IP Address is 255.0.0.0.
# Default for Class B IP Address is 255.255.0.0.
# Default for Class C IP Address is 255.255.255.0.
# This value will be applied to the unit as soon as the unit reads this cfg file.
#
# Format:
# s5AgMyIfNxtBootNetMask.1 x.x.x.x
# You must include the ".1" instance value.
#
# Example:
# s5AgMyIfNxtBootNetMask.1    255.255.255.0
s5AgMyIfNxtBootNetMask.1    255.255.255.0
############ CONFIG  FILE NAME PER INTERFACE #######################
# Specify file name for NMM configuration file.
# Maximum of 64 characters.
# This value will be applied the next time you reset the unit.
#
# Format:
# s5AgMyIfCfgFname.1 <name of configuration file>
# You must include the ".1" instance value.
#
# Example:
# s5AgMyIfCfgFname.1   "bs150.cfg"
s5AgMyIfCfgFname.1   "/tftpboot/b150_100.cfg"
################# IMAGE FILE NAME PER INTERFACE ####################
# Specify file name for the NMM image file.
# Maximum of 128 characters.
# This value will be applied the next time you reset the unit.
#
# Format:
# s5AgMyIfImgFname.1 <name of image file>
# You must include the ".1" instance value.
#
# Example:
# s5AgMyIfImgFname.1 "bs150.img"
s5AgMyIfImgFname.1 "/tftpboot/b150_100.img"
```

```
############ LOAD SERVER PER INTERFACE ##############################
# Specify the IP address of the load server.
# This value will be applied the next time you reset the unit.
#
# Format:
# s5AgMyIfLdSvrAddr.1 x.x.x.x
# You must include the ".1" instance value.
#
# Example:
s5AgMyIfLdSvrAddr.1 10.160.120.254

############ BOOT ROUTER PER INTERFACE ##############################
# Specify the IP address of the boot router.
# This value will be applied the next time you reset the unit.
#
# Format:
# s5AgMyIfBootRouterAddr.1 x.x.x.x
# You must include the ".1" instance value.
#
# Example:
s5AgMyIfBootRouterAddr.1 10.160.120.1
############ IP TRAP RECEIVERS ######################################
# Enter the list of IP trap receiver entries.
# For each entry you must specify an IP address, a trap-community
# string (maximum of 20 characters), and an age-out time (in seconds).
# All three values must be specified for each entry. The age-time must
# be specified last.
# A maximum of four entries can be specified.
#
# Format:
# s5AgTrpRcvrNetAddr.<trap receiver number> x.x.x.x
# s5AgTrpRcvrComm.<trap receiver number> <trap community>
# s5AgTrpRcvrAgeTime.<trap receiver number> <age-out time>
#
# Example:
s5AgTrpRcvrNetAddr.1 10.170.50.151
s5AgTrpRcvrComm.1 "private"
s5AgTrpRcvrAgeTime.1 0
s5AgTrpRcvrNetAddr.2 10.160.120.254
s5AgTrpRcvrComm.2 "private"
s5AgTrpRcvrAgeTime.2 0
s5AgTrpRcvrNetAddr.3 10.160.120.252
s5AgTrpRcvrComm.3 "rteread"
s5AgTrpRcvrAgeTime.3 0
s5AgTrpRcvrNetAddr.4 10.160.120.151
s5AgTrpRcvrComm.4 "rtewrite"
s5AgTrpRcvrAgeTime.4 0
```

```
############ SNMP COMMUNITY STRINGS ################################
# Specify the SNMP read community string, and the read-write
# community string. Maximum of 20 characters each.
#
# Example:
#s5AgComStrRo "public"
#s5AgComStrRw "private"
s5AgComStrRo "rteread"
s5AgComStrRw "rtewrite"
###################### TOPOLOGY STATUS #############################
# Set the topology status. This setting controls
# whether or not the NMM participates in the topology algorithm.
# Set the value to topOff if you do not want the NMM to
# participate in the topology algorithm. Valid choices are:
# topOn and topOff.
# The default is topOn.
#
# Format:
# s5EnMsTopStatus.x.x.x.x  <topOn | topOff>
#    where "x.x.x.x" is the IP address of the NMM.
#
# Example:
# s5EnMsTopStatus.123.123.200.4 topOff
s5EnMsTopStatus.10.160.120.150  topOn

############ BAYSECURE SECURITY FEATURE ###########################
# RULES : There are 3 separate settings for users to configure.
#               1) timePartion (optional) - see description below.
#               2) BaySecure Port Security Configuration Table.
#               3) BaySecure Node Access Software Control Configuration Table.
#
# NOTE: The Rule #2 and #3 must be set according to the table definition
# in your User Guide.
#--------------------------------------------------------------------------
#
# 1) Global Variable : timePartition.
#
# In BaySecure Port Security Configuration Table, the SoftwareAction
# Mode can be either partitionPort or sendTrapPart. There are two types
# of partition that a user can choose from: permanent-partition
# or timed-partition partition_interval where partition_interval
# is an optional. The timed-partition will be done if the partition_interval
# is greater than zero.  If the user chooses to omit the timed-partition,
# the default value is zero, i.e no timed-partion.
# The value indicates the duration of time for port partitioning in minutes.
#
#Example: time partition for 2 minutes.
#s5time-partition 2
```

```
#
#----------------------------------------------
# 2) BaySecure Port Security Configuration Table Setting
#
# In BaySecure Port Security Configuration Table, the following
# variables have to be set accordingly:
#
#             Key Word    : s5baysecure-port.
#
#             Comp Number : the index of the comp containing the board on which
#                       the port is located. Comp 0 is NOT allowed; Otherwise,
#                       the entire entry will be ignored.
#
#             Port Number : the index of the port on the board. Port 0 is NOT
#                       allowed and does not exist.
#
# SecurityType: 1) noSecurity or Turn OFF the Port Security. (first release bs150
# support)
#                 2) eavesdrop Protection. (first release bs150 support)
#               3) software Intrusion Control. (first release bs150 support)
#                 4) software Intrusion Control PLUS eavesdrop Protection. (first
#                  release bs150 support)
#               5) hardware Intrusion Control.
#               6) hardware Intrusion Control PLUS eavesdrop Protection.
#               7) advance Intrusion Control.
#               8) advance Intrusion Control PLUS eavesdrop Protection.
#
# Address Learn Mode: 1) not Applicable.
#                       2) no Auto Learn.
#                       3) single MAC Address User Entry.
#                       4) continue Auto Learn.
#                       5) one Shot Auto Learn.
#
#             MAC Address : If the Address Learn Mode is (3) single MAC Address
#                       User Entry, then a single MAC address is required of
#                       allowed station is required; Otherwise, the entire
#                       entry will be ignored. MAC Address is default to zero.
#
# Hardware Action : 1) not Applicable.
#                   2) no Action BUT warning.
#                   3) intrusion Control with Port Partition Enable.
#                   4) intrusion Control with Port Jamming and Auto Heal.
#                   5) eavesdrop Protection Enable.
#                  6) intrusion Control with Port Partition Enable PLUS
#                     eavesdrop Protection Enable.
#                  7) intrusion Control with Port Jamming and Auto Heal
#                     PLUS eavesdrop Protection Enable.
#
#   Software Action : 1) not Applicable.
#                     2) no Action.
#                     3) send WARNING to Network Management Station.
#                     4) partition Port.
#                     5) send WARNING to Network Management Station PLUS
#                        partition Port.
#
#    Execution Type : 1) not Applicable.
#                     2) create if there is no previous configuration or
#                        else, this entire entry will be ignored.
#
#
#-----------------------------------------------------------------------
# EXAMPLE #1 :  Node Access Software Control Only
#
# key word:       s5baysecure-port
# component number: 20;   /* Unit number displayed is 4. You enter 4 x 5 = 20.
# Multiply the displayed # by 5.
# port number:    3;
# Security Type:  2;   /* Eavesdrop protection nodeAccessCtrlType(2) */
# AddrLearnMode: 4; /* ContinuousAutoLearn(4) */
# MAC Addr:       0;   /* no MAC Address. System will learn the address */
# Hardware Action Mode:5; /* eavesProtectEn(5) */
# Software ActionMode: 2; /* noAction(2) */
# Execution Type:2; /* create */
#---------------------------------------------
# Need to change only the first two digits, component number and port.
# The rest remains same.
s5baysecure-port  20 3 2 4 0 5 2 2
#-----------------------------------------------------------------------
# EXAMPLE #2 : Node Access Software Control Only
#
# key word:       s5baysecure-port
# comp number:    15; /* Unit number displayed is 3. */
# port number:     6;
# Security Type:   3;  /* softIntrusCtrl(3) */
# AddrLearnMode:  1; /* notApplicable(1) */
# MAC Addr:        0;  /* no MAC Address default to zero */
# Hardware Action Mode: 1; /* notApplicable(1) */
# Software ActionMode:  2; /* noAction(2) or SendTrap(3) or partitionPort(4)
# or sendTrapPart(5) */
# Execution Type: 2; /* create */
#---------------------------------------------
```

```
# Need to change only the first two digits (unit# and port#) and the one before
# last (SW action)
# Node Access Software Control Only allows node in a port by consulting the
# BaySecure Node Access Software Control Configuration Table defined below.
# The allowed node and notallowed node table should accompany these settings
# for the MAC address values.
# Port 6 on unit 3 is configured for software intrusion control with no software action
s5baysecure-port 15 6 3 1 0 1 2 2
# Port 13 on unit 8 is configured for software intrusion control with
# software action send trap to entries in trap receiver table.
s5baysecure-port 40 13 3 1 0 1 3 2
# Port 8 on unit 2 is configured for software intrusion control with software
# action to partition port.  If s5time-partition was
# not commented then the port will time-partition for the value specified.
# (see description above for s5time-partition).
s5baysecure-port 10 8 3 1 0 1 4 2
# Port 10 on unit 5 is configured for software intrusion control with trap and
# partition.
s5baysecure-port 25 10 3 1 0 1 5 2
#----------------------------------------------
# 3) BaySecure Node Access Software Control Configuration Table Setting
#
# In BaySecure Node Access Software Control Configuration Table,  the
# following variables have to be set accordingly:
#
#           Key Word    : s5baysecure-node.
#
#      Segment Type : 1) Backplane Segment Type.
#                     2) Local Segment Type.
#                     3) All Segment Type (i.e. the Segment number will
#                        apply both Segment types).
#
#       Segment Number : the segment number of the specified segment type.
# The segment number 0 is referred to ALL segments of the specified segment type.
#
#              Comp Number : the index of the comp containing the board on which
#             the port is located. Comp 0 is referred to ALL comp in the chassis.
#
#           Port Number : the index of the port on the board. Port 0 is
#            referred to ALL ports in the board.
#
#              MAC Address : MAC address can be referred to allowed station or
#            not-allowed station which is indicated by the Node Access
#             Controlled Type.
#
#          NodeAccessCtrlType: 1) node Allow.
#                              2) node NOT Allow.
#
```

```
#    Execution Type : 1) not Applicable.
#                       2) create
#
#
#-------------------------------------------------------------------------
# EXAMPLE #1 : BaySecure Node Access Software Control Configuration Table
#
# key word:       s5baysecure-node
# segment type:   (1);
# segment number:(1);
# comp number:    (4);
# port number:    (5);
# MAC Address:    0800201A5890
# NodeAccessCtrlType:(1);
# Execution Type:(2);
#
#
#----------------------------------------------
#
#-------------------------------------------------------------------------
# EXAMPLE #2 : BaySecure Node Access Software Control Configuration Table
#
# key word:       s5baysecure-node
# segment type:   1;  /* This can be backplaneSeg(1) or allType(3) */
# segment number:0;/* wild card 0 is used here to indicate all segment.
# Bs150 does not allow segmentation */
# component number:0; /* wild card 0 is used here to indicate all units.
# Otherwise the unit # x 5 should be entered */
# port number:    0;  /* wild card 0 is used here to indicate all ports in the unit */
# MAC Address:    000081111AAB
# NodeAccessCtrlType:1;/* nodeAllow(1) and nodeNotAllow(2) */
# Execution Type:2;/* create(2), delete(3), or modify(4)
#
#-------------------------------------------------------------------------
# Total Node Address = 50  (in allowed node)
# Total Node Address = 50  (in not allowed node)
# The following are the valid combination for seg type/seg num/comp num/port num.
# 3 0 0 0         this is super user without any restriction.
# 3 0 u 0         u can be 0, 5, 10, 15, 20, 25, 30, 35, 40 to represent any unit, unit
1, 2, 3, 4, 5, 6, 7, or 8.
# 3 0 u b     u same as above. b a valid port number 1-25.
# 1 1 0 0
# 1 1 u 0
# 1 1 u p
# The following address is allowed on all units.
s5baysecure-node 3 0 0 0 000000000042 1 2
# The following address is allowed on all ports in unit 2.
s5baysecure-node 3 0 10 0 000000000043 1 2
```

```
# The following addr is not allowed anywhere in unit 5.
s5baysecure-node 3 0 25 0 000000000044 2 2
# IP STATIC ROUTES #############################
# Define static IP routes for specific destination IP addresses.
# Static routes are specified by two parameters:
# - IP mask of significant bits in network address (network mask)
# - IP address of next hop to reach the network (next hop IP address)
#
# Format:
# ipRouteNextHop.<dest IP addr> <next hop IP addr>
# ipRouteMask.<dest IP addr> <network mask>
#
# Example:
# ipRouteNextHop.10.0.0.0   13.23.200.1
# ipRouteMask.10.0.0.0   255.0.0.0
############ IP ROUTER CONTROL INFO #############################
# Set parameters to control IP routing. For each entry you must
# specify the IP router default lifetime and the default router
# selection method. You may also need to specify the method for
# ICMP router solicitations.
#
# Format:
# s5AgIpRtrDefaultTimeToLive.0 <time in seconds>
# s5AgIpDefaultRtrSelectionMode.0 {config|static|dynamic}
# s5AgIpRtrDiscoverySolicitMode.0 {multicast|broadcast}
#
# s5AgIpRtrDefaultTimeToLive specifies the default lifetime for IP
# routers in seconds. Valid choices are between 60 and 3600 seconds.
# The default value is 600.
#
# s5AgIpDefaultRtrSelectionMode specifies the method to select the
# default IP router. Valid choices are config, static and dynamic.
# The default value is dynamic.
#
# s5AgIpRtrDiscoverySolicitMode specifies the IP address for ICMP
# router solicitations when the default router selection mode is
# dynamic. Valid choices are multicast and broadcast.
# The default value is broadcast.
#
# Example:
# s5AgIpRtrDefaultTimeToLive.0 600
# s5AgIpDefaultRtrSelectionMode.0 dynamic
# s5AgIpRtrDiscoverySolicitMode.0 multicast
#
# Format:
# s5AgIpRtrDefaultTimeToLive.0
# s5AgIpDefaultRtrSelectionMode.0
# s5AgIpRtrDiscoverySolicitMode.0
```

```
#
# Example:
# s5AgIpRtrDefaultTimeToLive.0  600
# s5AgIpDefaultRtrSelectionMode.0 dynamic
# s5AgIpRtrDiscoverySolicitMode.0 multicast
############# SAVE TO NON-VOLATILE MEMORY ###########################
# Set this action object to cause parameter values to be written to
# non-volatile memory, so that they'll be preserved across a reboot.
#
# Example:
# s5AgInfoWriteCfg.0 write
s5AgInfoWriteCfg.0 write
```

Appendix D
Cables and Connectors

This appendix provides specifications for cables and connectors used for the BayStack 150-series hubs.

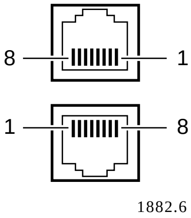
10BASE-T UTP Cable

For 10BASE-T connections, use shielded twisted pair cable or 0.4 - 0.6 mm (22-26 AWG) 8-wire unshielded twisted pair cable. Configure your network according to the following guidelines:

- Maximum segment length of 100 meters
- Use of an eight-position modular plug (RJ-45)

Table D-1 shows the RJ-45 pin assignment.

Table D-1. RJ-45 pin assignments

RJ-45 plug and RJ-45 10BASE-T Ethernet port	Pin	MDI-X (normal) port	MDI (uplink) port
	1	RX+ (Receive)	TX+ (Transmit)
	2	RX- (Receive)	TX- (Transmit)
	3	TX+ (Transmit)	RX+ (Receive)
	4	Not used	
	5	Not used	
	6	TX- (Transmit)	RX- (Receive)
	7	Not used	
	8	Not used	

Straight-through and Crossover Cables

For two devices to communicate, the transmitter of each device must be connected to the receiver of the other device. The crossover function is usually implemented internally as part of the circuitry in the device. Computers and workstation adapter cards are usually media-dependent interface ports, called MDI or uplink ports. Most hub and switch ports are configured as media-dependent interfaces with built-in crossover ports, called MDI-X or normal ports. Refer to the instructions in Chapter 3, “Installation,” for appropriate cable use and connection.

Figure D-1 illustrates a straight-through twisted pair cable.

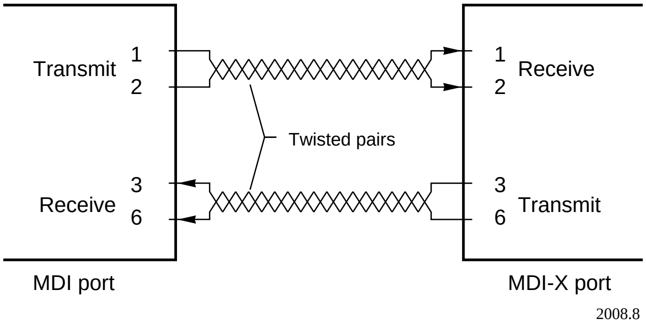


Figure D-1. Straight-through twisted pair cable

Figure D-2 illustrates a crossover twisted pair cable.

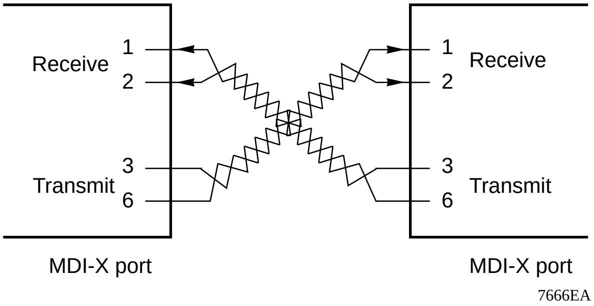


Figure D-2. Crossover twisted pair cable

Daisy-chain Cable for Cascading

To stack the BayStack 150-series hubs, use the 30 cm twisted pair daisy-chain cable that is supplied with the hub. If you want to make your own longer cable, use ordinary Category 5 cable with RJ-45 plugs on each end and refer to the pin assignments in Table D-2. All four pairs of the 8-wire cable are used.

Cascade cables may be of any length. However, the distance between the first hub and the last hub in the stack must not exceed 100 m.

Table D-2. RJ-45 plug pin assignment for cascade cable

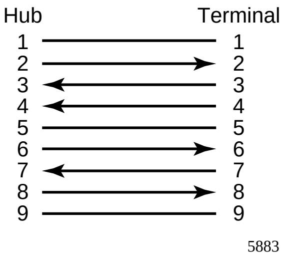
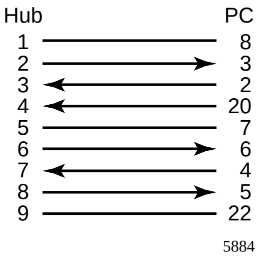
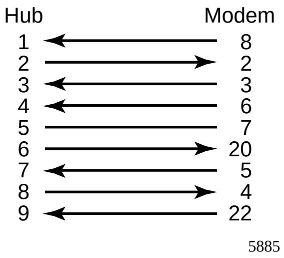
Contact	Daisy chain IN	Daisy chain OUT
1	Link IN	Link OUT
2	Link OUT	Link IN
3	Data-	Data-
4	Management+	Management+
5	Management-	Management-
6	Data+	Data+
7	ID-	ID-
8	ID+	ID+

NOTE: Pins 1/2, 3/6, 4/5, and 7/8 must be pairs. Splitting the cable will most likely cause errors.

RS-232 Port Connection

You can connect to the RS-232 serial port of the BayStack 150-series hubs by using a 9-pin female connector. The port can be connected to a VT-100 type terminal, a PC, or a workstation emulating a VT-100 terminal. The connection can be either local or remote through a modem. For a remote connection, a modem cable with a 9-pin male connector on the hub side is needed. Table D-3 shows the connections necessary for local and remote connection to 9-pin and 25-pin RS-232 devices.

Table D-3. Communication port connection options

Hub to terminal	Hub to PC	Hub to modem
DB-9 to DB-9	DB-9 to DB-25	DB-9 to DB-25
 Hub Terminal 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9 5883	 Hub PC 1 8 2 3 3 2 4 20 5 7 6 6 7 4 8 5 9 22 5884	 Hub Modem 1 8 2 2 3 3 4 6 5 7 6 20 7 5 8 4 9 22 5885

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