Quantum

Quantum SuperLoader™

SuperLoader™

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Preface

This chapter describes this guide's audience, purpose, organization, document conventions, and product safety.

> **Note:** Due to the nature of their similarities, this manual is for the SuperLoader™ DLT™, the SuperLoader SDLT™, the SuperLoader LTO-1, and the SuperLoader LTO-2. Many component parts are not interchangeable. These include the magazines, cartridges, drive carrier assembly, magazine blank, magazine handle, and the bar code scanner. Please order the appropriate part numbers when replacing these items.
>
> Refer to the appropriate Quick Start reference guide for instructions on Customer-Replaceable Units (see Related Quantum Documentation on page xxi).

Audience

This user manual is designed and written for end users and field service engineers.

Purpose

The purpose of this manual is to provide end users with the following information:

- SuperLoader description and specifications
- SuperLoader installation and configuration
- Tape cartridge description and general overview
- SuperLoader operation
- Troubleshooting

Document Organization

This manual is organized as follows:

- Chapter 1, Introduction - This chapter provides a general overview of the SuperLoader's components and functionality.

- Chapter 2, Installation and Configuration - This chapter describes how to unpack, install, configure, remove, and repack the SuperLoader.

- Chapter 3, Tape Cartridge Use - This chapter describes tape cartridge care and usage.

- Chapter 4, SuperLoader Operation - This chapter describes the components of the SuperLoader, setting passwords, setting modes, loading cartridges, installing magazines, and testing the SuperLoader's functionality.

- Chapter 5, Troubleshooting - This chapter describes how to determine and repair minor and major problems that may occur in the SuperLoader. It also contains information relating to the error and event logs.

- Chapter 6, Diagnostics - This chapter describes the Power-On Self Test (POST) and diagnostic tests for testing the SuperLoader's functionality and for troubleshooting errors.

- Appendix A, Basic Information Logs - This appendix describes the logs for the SuperLoader and tape drives. It contains a description of each log type including log block descriptor and field descriptions.

- Appendix B, Specifications - This appendix describes the SuperLoader's specifications.

- Appendix C, Time Zones - This appendix provides a listing of Time Zones for setting the time on the SuperLoader.

- [Appendix D, Regulatory Statements](#) - This appendix provides required regulatory statements for the SuperLoader.

Related Documentation

Documents related to the Quantum SuperLoader are shown below:

Related Quantum Documentation

Document No.	Document Title	Document Description
81-81263	*Quantum SuperLoader Quick Start Guide*	This guide contains a sequence of steps recommended for unpacking, installing, and setting up your SuperLoader.
81-81264	*Quantum SuperLoader Drive Carrier Assembly (DCA) Quick Start Guide*	This guide contains a sequence of steps recommended for unpacking and installing a DCA.
81-81265	*Quantum SuperLoader Magazine Quick Start Guide*	This guide contains a sequence of steps recommended for unpacking and installing a magazine.
81-81266	*Quantum SuperLoader Bar Code Reader Quick Start Guide*	This guide contains a sequence of steps recommended for unpacking and installing a bar code reader.
81-81267	*Quantum SuperLoader Slide Rail Kit Quick Start Guide*	This guide contains a sequence of steps recommended for unpacking and installing a slide rail kit.
81-81237	*How to Ship the SuperLoader*	This guide provides information on the proper packing for returning the SuperLoader for repair.

Notational Conventions

This manual uses the following conventions to designate specific elements:

> **Note:** Notes emphasize important information related to the main topic.

> **Caution:** Cautions indicate potential hazards to equipment and are included to prevent damage to equipment.

> **Warning:** Warnings indicate potential hazards to personal safety and are included to prevent injury.

LCD Screen Shots

Screen shots for the front panel LCD appear as follows:

Figure 1 LCD Front Panel Screen
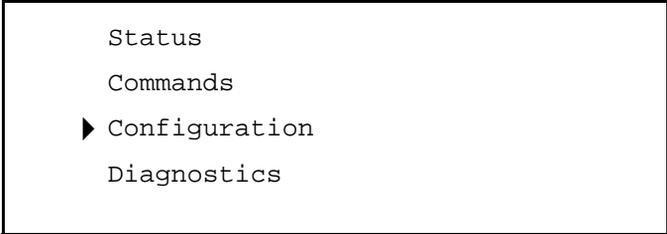
```
    Status

    Commands

  ▶ Configuration

    Diagnostics
```

Screen shots for On-board Remote Management sometimes contain callouts and appear as shown in [figure 2](#).

Figure 2 On-board Remote Management Screen
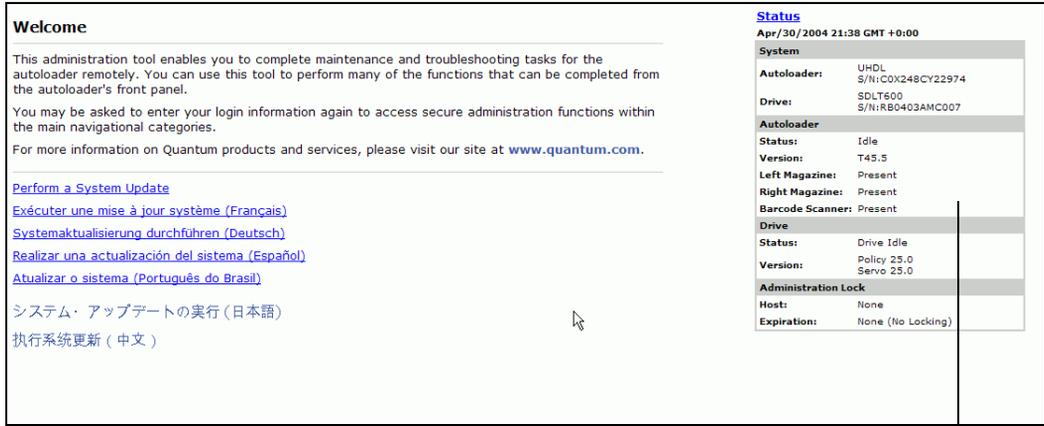
Status Information

SCSI-2 Specification

The SCSI-2 communications specification is the proposed American National Standard for information systems, dated March 9, 1990. Copies may be obtained from:

Global Engineering Documents
15 Inverness Way, East
Englewood, CO 80112
(800) 854-7179 or (303) 397-2740

Contact Information

This section provides contact information for worldwide customer support.

Quantum

To order documentation for the Quantum SuperLoader or other products contact:

Quantum Corporation
P.O. Box 57100
Irvine, CA 92619-7100
(949) 856-7800
(800) 284-5101

Technical Publications

To comment on existing documentation, send e-mail to:

doc-comments@quantum.com

Visit the Quantum home page at:

http://www.Quantum.com

Customer Support

The Quantum Customer Support Department provides a 24-hour help desk that can be reached at:

North/South America	(949) 725-2100 or (800) 284-5101
Asia/Pacific Rim	(International Code) +61 7 3839 0988
Europe/Middle East/Africa:	(International Code) +44 (0) 1256 848748

Send faxes for the Customer Support Department to:

North/South America	(949) 725-2176
Asia/Pacific Rim	(International Code) +61 7 3839 0955
Europe/Middle East/Africa:	(International Code) +44 (0) 1256 848777

Send e-mail for the Customer Support Department to:

North/South America	www.quantum.com/askaquestion
Asia/Pacific Rim	apachelp@quantum.com
Europe/Middle East/Africa:	eurohelp@quantum.com

Preface
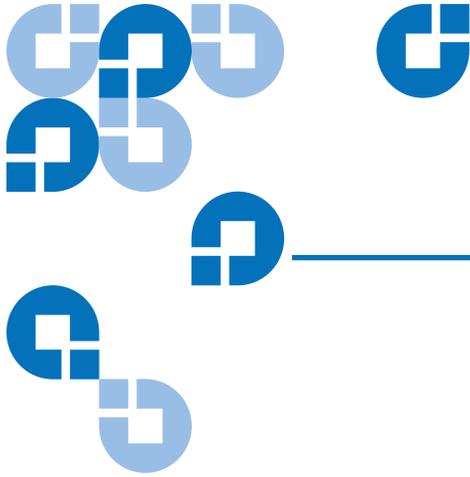
Introduction

This chapter describes the SuperLoader components and functionality.

General Description

Data backup is essential to protect irreplaceable information. Backing up data to magnetic tape is an easy, cost-efficient method used by many small and medium sized businesses. However, most enterprises have so much data that a single backup tape is not enough; the information has to be spread across numerous tapes. To avoid constantly changing tapes manually, many tape backup systems include a SuperLoader.

Each SuperLoader is a robot that includes a tape drive and one or two magazines for tape cartridges. The user's application can automatically load and unload tape cartridges as required for data backup or data retrieval. SuperLoaders provide compact, high capacity, but low cost method for simple, unattended data backup.

The SuperLoader contains either the DLT1, SDLT 220, SDLT 320, SDLT 600, HP LTO-1, or HP LTO-2 tape drive, and one or two magazines containing up to eight cartridges each. A single cartridge can be inserted directly via a password-protected mailslot. The cartridge inserts directly into the tape drive provided there is no cartridge already in the drive, or you can load the cartridge into a magazine slot provided there is no cartridge already in the slot.

> **Note:** Throughout this manual, SuperLoaders containing the DLT1, SDLT 220, SDLT 320, or SDLT 600 tape drives are referred to as *SuperLoader DLT*. For those SuperLoaders containing HP LTO-1 or HP LTO-2 tape drives, they are referred to as *SuperLoader LTO*. In instances where the information is common to all variants, the reference will be *SuperLoader*.

The front panel on the SuperLoader includes a liquid crystal display (LCD) screen and four function keys. A scrolling menu on the LCD screen allows you to obtain information from the SuperLoader and enter commands. The front panel also includes two light emitting diodes (LEDs) indicating the SuperLoader's ready status and error status.

The SuperLoader connects to your host server via a SCSI connection allowing the host to send data and commands automatically. You can also connect to the SuperLoader using an Ethernet connection to perform administrative functions and download system updates.

Front View

The mailslot, LCD, function keys, status LEDs, power switch, and left and right magazines are visible on the front panel of the SuperLoader (see figure 3).

Figure 3 SuperLoader
Front View

Mailslot

Left magazine/blank   **Status LEDs**   **Right magazine/blank**

Power switch   **LCD**   **4 Function keys**
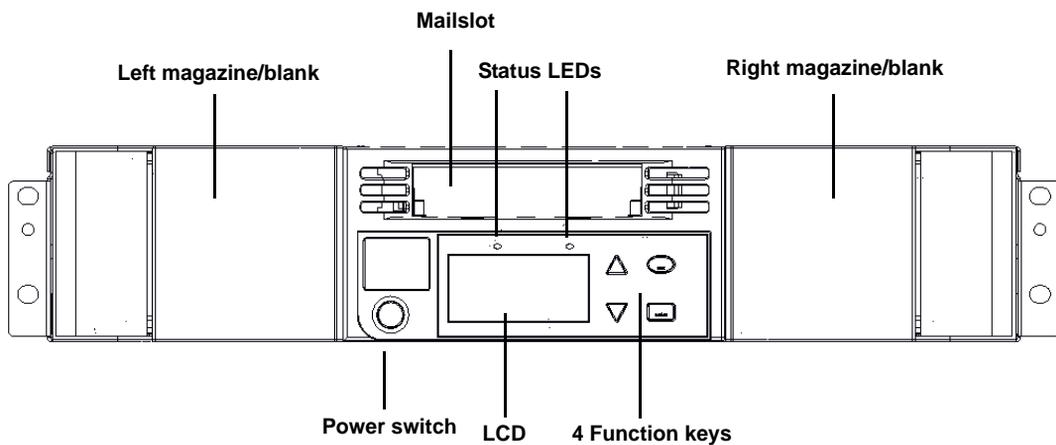
Mailslot   The SuperLoader has a manual entry port, the mailslot, which you can use to load or unload a single cartridge. To maintain security, the mailslot can be password protected. You can insert a cartridge in the mailslot even if both magazines are completely filled, so long as the tape drive itself is empty. You can also pass a tape cartridge from the mailslot to the magazine if the drive is full but the magazine is not.

> **Note:**   You should run an inventory from the host application after using the mailslot. The mailslot is not directly available from the host application.

LCD

The LCD allows you to use the scrolling menu to perform diagnostics and to enter commands.

Function Keys

The function keys allow scrolling through menus to make selections as shown in figure 4. These function keys are described in table 1.

Figure 4 Function Keys

Ready LED   Fault LED   Escape

Scroll up

Scroll down
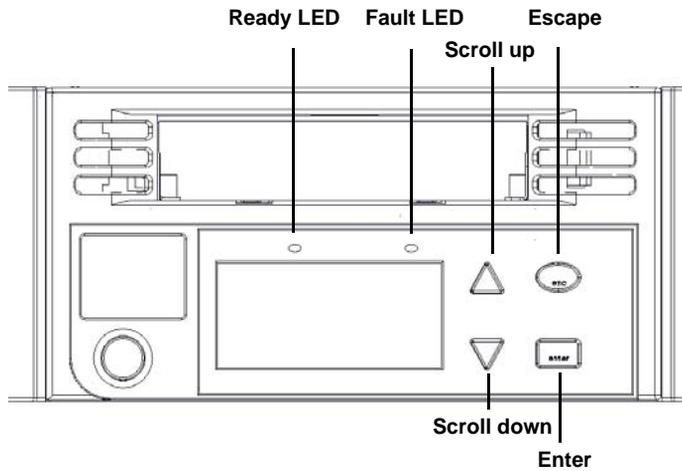
Enter

Function Key	Description
Enter	Press to select an option
Escape	Press to return to the previous menu, to move backwards on a screen, or to abort an operation
▲ (Scroll Up)	Press to move up through a menu or through the menu settings
▼ (Scroll Down)	Press to move down through a menu or through the menu settings

Status LEDs

The status LEDs show SuperLoader and drive status information. The green **Ready** LED shows ready status information, and the amber **Fault** LED shows fault status information. A solid **Fault** LED indicates an error, and a blinking **Fault** LED indicates a need for attention.

Power Switch

The power switch is a soft key, which means that if the SuperLoader is moving any cartridges when you press the power switch, it finishes moving them before powering off. Any other functions, such as writing to a tape or performing a diagnostic, are interrupted and terminated when you press the power switch. However, the SuperLoader attempts to write cached data to tape before the unit powers down.

Magazines

The SuperLoader is equipped with one or two cartridge magazines (see figure 5). The magazines are removable and each magazine accommodates up to eight cartridges. If your SuperLoader contains only one magazine, a magazine blank is installed in the other magazine bay. The handles on magazines and magazine blanks are removable and allow you to configure any magazine or magazine blank to fit in either the left or the right magazine bay.

The magazines store the tape cartridges and can also store the cleaning cartridge. The magazines also contain the part of the robotics that moves the cartridges inside the SuperLoader.

Figure 5 Magazine
(left and right sides)
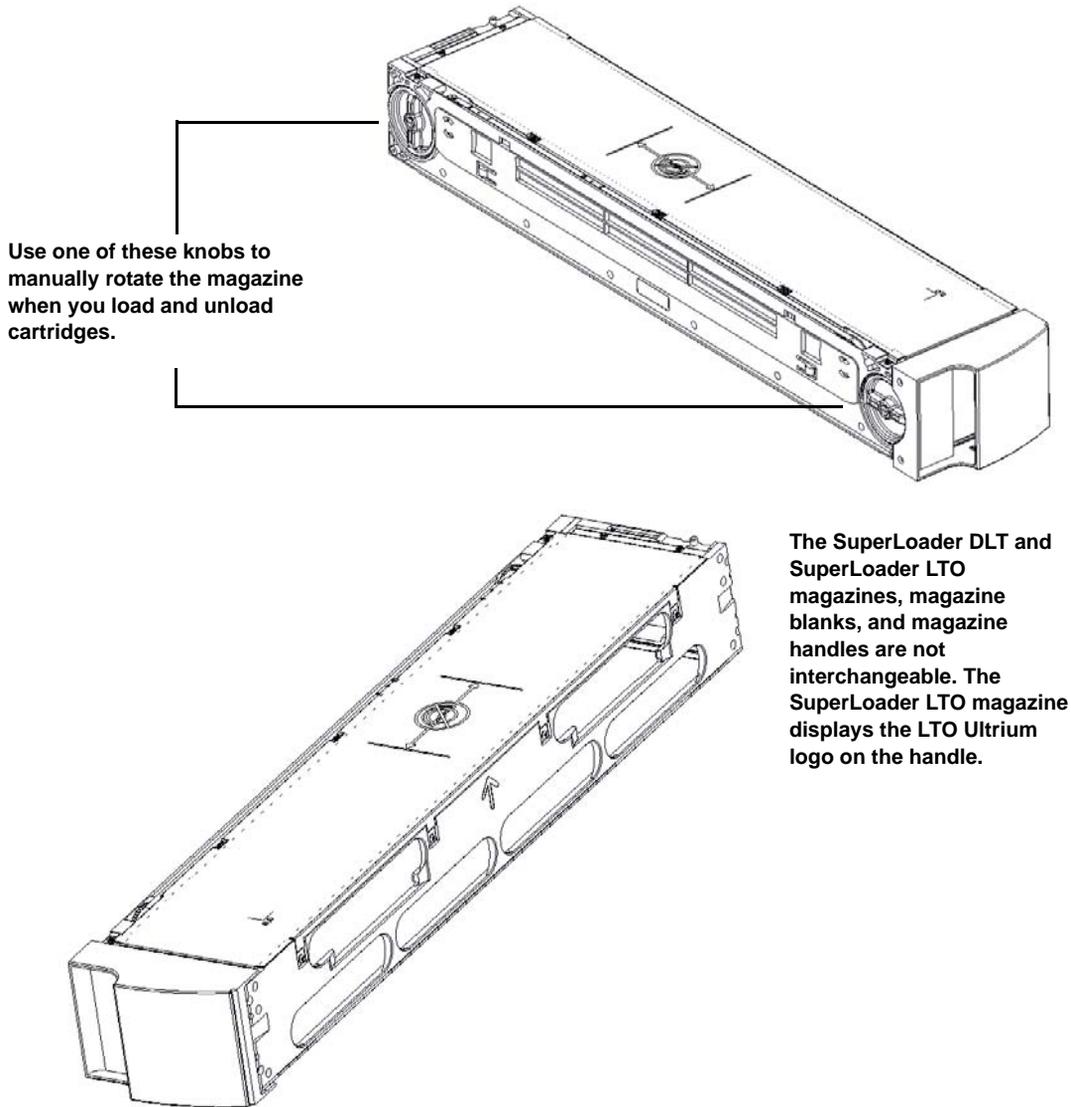
**Use one of these knobs to
manually rotate the magazine
when you load and unload
cartridges.**

**The SuperLoader DLT and
SuperLoader LTO
magazines, magazine
blanks, and magazine
handles are not
interchangeable. The
SuperLoader LTO magazine
displays the LTO Ultrium
logo on the handle.**

Figure 6 Magazine
Blank
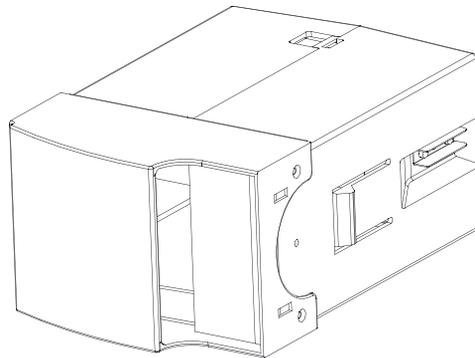
Rear View

The fans and connection ports are visible on the back of the SuperLoader as illustrated in figure 7 for SuperLoader DLT, and in figure 8 for SuperLoader LTO.

Figure 7 SuperLoader
DLT Rear View

Power supply cooling fan

AC power switch

AC power

System cooling fan

Ethernet connection

SCSI connector
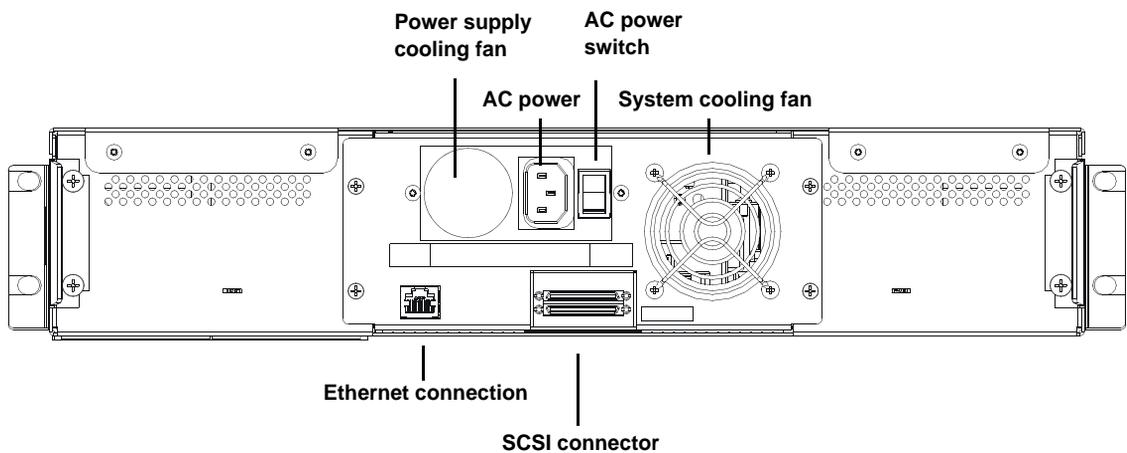
Figure 8 SuperLoader
LTO Rear View
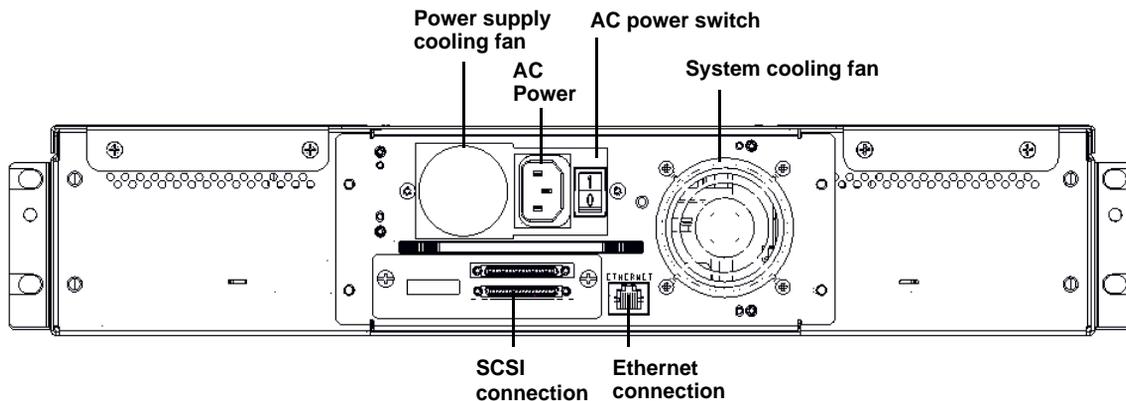
Cooling Fans

The SuperLoader has a system cooling fan, plus a second fan to cool the power supply. These fans maintain the acceptable temperature range for the tape drive path and all internal electronics. See appendix B on page 243 for details about required specifications.

AC Power

The SuperLoader requires a nominal voltage in the range of 110 volts AC to 220 volts AC to operate.

Ethernet Connection

The SuperLoader's Ethernet connection allows you to connect the SuperLoader to a network, enabling remote administration. The SuperLoader can also connect to an Simple Network Management Protocol (SNMP) server and a time server.

The Ethernet connection supports HyperText Transfer Protocol (http). You can download system updates and perform administrative tasks, including diagnostics, using http, such as with a Web browser.

SCSI Connection   A low-voltage differential (LVD) SCSI connection links the SuperLoader to the external host server. LVD connections allow you to have more devices and longer cable lengths than single ended (SE) SCSI connections. The LVD SCSI connection uses an 0.8 mm offset Very High Density (VHD) connector.

Internal View

Figure 9 shows how the components of the SuperLoader fit together. The picker sits behind the front panel and mailslot, and can "put" and "get" cartridges to/from the mailslot, magazines, and tape drive. The drive carrier assembly (DCA) contains the tape drive, internal power supply, and cooling fan, and can be removed and replaced as a single component.

Figure 9 Internal View
of the SuperLoader

Bar code reader bay

DCA

**Picker with
misinsertion feature
and turret spreader**

Magazine   **Mailslot**   **Picker**   **Magazine blank**
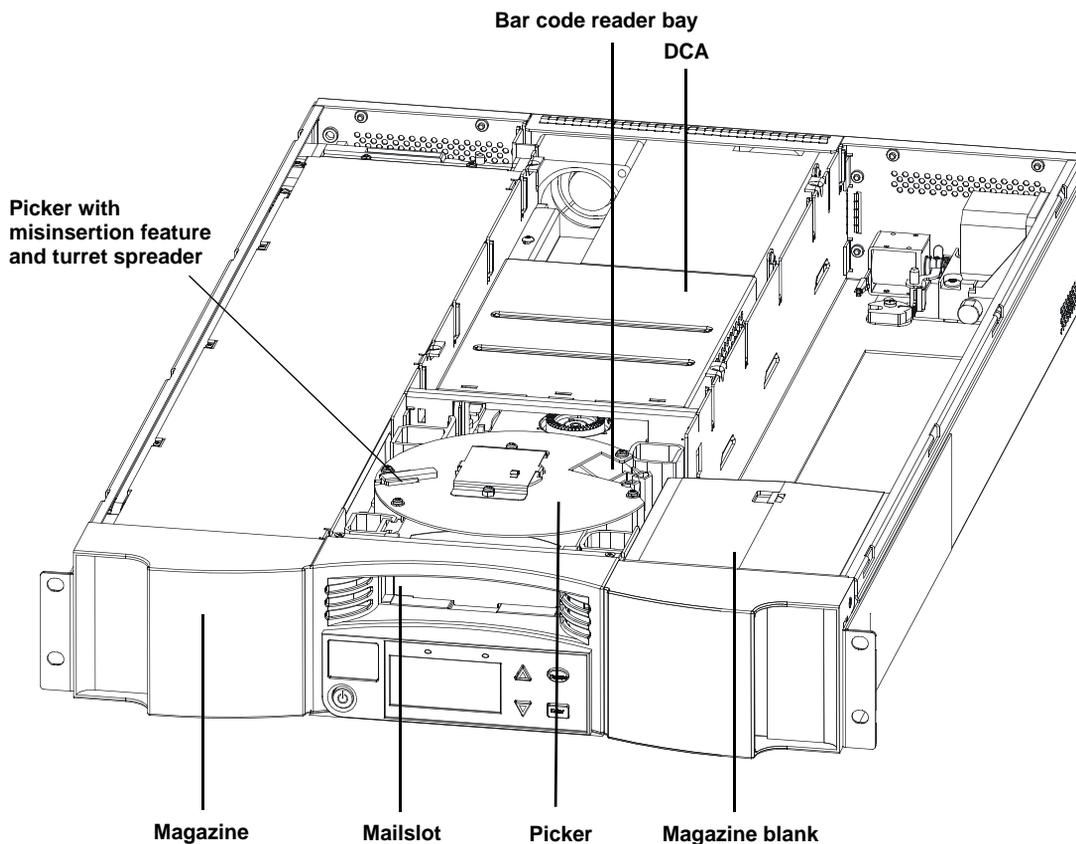
> **Note:** Due to the nature of their similarities, unless noted otherwise,
> these illustrations are for the SuperLoader DLT and the
> SuperLoader LTO. Many component parts are not
> interchangeable. These include the magazines, cartridges,
> drive carrier assembly, magazine blank, magazine handle, and
> the bar code scanner. Please order the appropriate part
> numbers when replacing these items.

Picker

The picker is the component of the SuperLoader that shuttles cartridges between the drive, both magazines, and the mailslot. It has two degrees of freedom: rotation and translation. The rotation axis positions the picker platform in front of each location while the translation axis moves cartridges on and off of the picker platform. By combining these two degrees of freedom, a pin on the translation axis engages and disengages a notch on the right side of the cartridge for pushing and pulling the cartridge on and off of the platform.

Drive Carrier Assembly (DCA)

The DCA is configured with either a DLT1, SDLT 220, SDLT 320, SDLT 600, HP LTO-1, or HP LTO-2 tape drive. The DCA facilitates easy removal of the drive. To change tape drives, you can replace the DCA without having to remove the top cover of the SuperLoader. The SuperLoader LTO DCA is not interchangeable with the SuperLoader DLT or SDLT DCA. For further information, refer to the *SuperLoader Drive Carrier Assembly (DCA) Quick Start Guide*.

Bar Code Reader

Since the bar code reader is optional, your SuperLoader may be equipped with a bar code reader when you receive it, or you may decide to install one later. The bar code reader provides inventory feedback to the host application and/or LCD panel/On-board Remote Manager by reading the cartridge bar code labels. A full 16-cartridge inventory scan may take up to 90 seconds. The SuperLoader DLT bar code reader and the SuperLoader LTO bar code reader are **not** interchangeable. For further information, refer to the *SuperLoader Bar Code Reader Quick Start Guide*.

Supported Software

The SuperLoader is compatible with most operating systems such as:

- NetWare®
- Windows® 2000
- Windows® 2003
- Windows® XP
- Windows Server™ 2003
- Novell®
- Solaris™
- HP-UX®
- Linux® (Red Hat®, SuSe®, Caldera™, and TurboLinux®)
- AIX™

The SuperLoader is also compatible with most popular backup software applications, including:

- CAI ARCserve®
- VERITAS™ NetBackup™
- VERITAS BackupExec™
- IBM® Tivoli® Storage Manager
- LEGATO Networker®

> **Note:**   Please check with your operating system supplier and your backup software vendor to verify which version is required for this SuperLoader.

Installation and Configuration

This chapter describes how to rack mount and configure the SuperLoader.

Preparation

Before you install your new SuperLoader, unpack it carefully and inspect it for any damage that might have occurred during shipping. The *SuperLoader Quick Start Guide* included in the packaging describes all the necessary information to unpack and inspect your SuperLoader correctly. Please locate the *SuperLoader Quick Start Guide* and follow the directions.

Ensure that the work area is free from conditions that could cause electrostatic discharge (ESD). Discharge static electricity from your body by touching a known grounded surface, such as your computer's metal chassis.

SCSI Bus Requirements

You must connect the SuperLoader to one of the following SCSI bus types:

- Wide, SCSI-2, LVD
- SE SCSI bus

> **Note:** The SuperLoader is not compatible with a High-Voltage Differential (HVD) SCSI bus.

Your SCSI host adapter card must also support the SCSI bus type used to connect the SuperLoader. If you use a LVD SCSI bus, use a host adapter card with a connection for the VHDCI cable.

> **Note:** If you use an SE SCSI bus, the tape drive's performance is limited to the maximum data transfer speed of the bus.

> **Note:** The maximum number of SuperLoaders supported per SCSI bus is four.

> **Note:** The SuperLoader may not work with multiple SCSI LUNS when attached to a RAID controller. The SuperLoader is not recommended for use with a RAID controller. If this problem occurs, it is recommended that the SuperLoader be attached to a separate SCSI bus controller on the host or server.

Accessories

The following accessories are shipped with each SuperLoader:

- Quick Start Guide
- SCSI host cable
- SCSI terminator
- Hardware to rack mount the SuperLoader
- One magazine blank
- Power cable
- Documentation CD containing all of the documentation in Adobe® Portable Document Format (PDF)

- Bar code labels

**Installation
Location
Requirements**

The SuperLoader is designed to fit in a standard 19-inch rack using either the long or short brackets (depending on the depth of the rack) or the optional slide rail kit. When choosing an installation location, make sure that it meets the criteria found in table 2 and table 3.

Table 2   Location
Criteria

Requirement	Description
Rack Size	Standard 19 inch
Room Temperature	10 to 35 degrees C (50 to 95 degrees F)
Power Source	Line frequency: 50 to 60 Hz
Air Quality	Good air quality with minimal sources of particulate contamination. Avoid placing the SuperLoader near cooling or exhaust vents, printing machines, frequently used doors and walkways, stacks of supplies that collect dust, and smoke-filled rooms. **Caution:** Excessive dust or other debris in the tape path can damage tape and tape drives.
Humidity	20% to 80% relative humidity (non-condensing)
Minimum Clearance (to Facilitate Component Removal and Installation)	*Front:* 27.0 in. (686 mm), including 2.0 in. (51 mm) from the front mounting rail to the inside of the front door. *Rear:* 17.0 in. (432 mm). Using the appropriate SuperLoader bracket, ensure the rear door closes (see figure 10).
Proximity to the Host Computer	The SCSI bus maximum length is 39.37 ft. (12 m) including all SCSI bus lengths within the SuperLoader. The SCSI bus lengths are 16 in. (406.4 mm) per SuperLoader DLT/SDLT or 23.5 in. (596.9 mm) per SuperLoader LTO.

Table 3   UL Criteria

General Hazards	
Elevated Operating Ambient Temperature	When installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum recommended ambient (TMRA).
Reduced Air Flow	Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
Mechanical Loading	Mounting of the equipment in a rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
Circuit Overloading	Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing the concern.
Reliable Earthing (Grounding)	Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit, such as use of power strips.

Rack Mounting the SuperLoader

The SuperLoader can be rack mounted in two ways:

- Attached directly to the cabinet rails (stationary)
- Attached to an optional slide rail kit (removable)

Only the stationary installation is included in this manual.

> **Note:** To mount the SuperLoader on the slide rail, refer to the *SuperLoader Slide Rail Kit Installation Quick Start Guide* shipped with the optional shelf assembly. The *SuperLoader Slide Rail Kit Installation Quick Start Guide* is also available on the Documentation CD or at **www.Quantum.com**.

Figure 10 Clearance
Requirements for
Rack Mounting

**Minimum clearance to load
or unload a magazine from
the system**

27.0" [686 mm]

**Minimum clearance to load
a tape via the mailslot**

Clearance to door inside a rack

2.0" [51 mm]

6.0" [152 mm]

FRONT

**Minimum clearance
between the rear of the
SuperLoader and the
inside of the rack (using
standard mounting
brackets adjusted to their
closest setting)**

**Minimum side
clearance (both
sides)**

1.0" [25 mm]

3.4" [86 mm]

REAR

**General
Preparation for
Rack Mount
Installation**

Take the following general safety steps before beginning either rack
mount installation.

1 Lower the cabinet feet.

2 Extend the cabinet anti-tip device, if available.

3 Ensure that the cabinet and all rack mounted equipment have a
reliable ground connection.

4 Verify that the total current of all rack mounted components
(including the SuperLoader) will not exceed the current rating of the
power distribution unit or outlet receptacles.

5 Secure the help of at least one other person. At least two people are
required to safely install the SuperLoader into a rack cabinet.

Warning:	Failure to take these safety steps may result in personal injury or equipment damage.

Caution:	Do not remove the top cover of the SuperLoader during the installation process. Removing the top cover could result in damage to the SuperLoader.

**Stationary Rack
Mount Installation**

This section describes the steps for attaching the SuperLoader directly to
the rails of a rack.

1 Make sure you have the following tools and parts:

- #2 PHILLIPS® screwdriver

- Level

- The following SuperLoader accessory kit parts (see figure 11):

  - Four SuperLoader brackets (two long and two short to
    accommodate different rack depths)

    Use the short SuperLoader brackets (74-60604-03) unless the
    distance from the front mounting rail to the rear mounting
    rail is less than 30.25 in. (76.84 cm).

  - Two support brackets (74-60605-01)

  - Eight 10-32 x 1/4 inch button head screws for the support
    brackets (four per support bracket)

- The following parts shipped with the rack:
  - Eight clip nuts
  - Eight screws

Figure 11 Required
Parts for Installation

**Short SuperLoader
brackets (74-60604-03)**

**Long SuperLoader
brackets (74-60604-01)**

**Support brackets
(74-60605-01)**

Support bracket screws
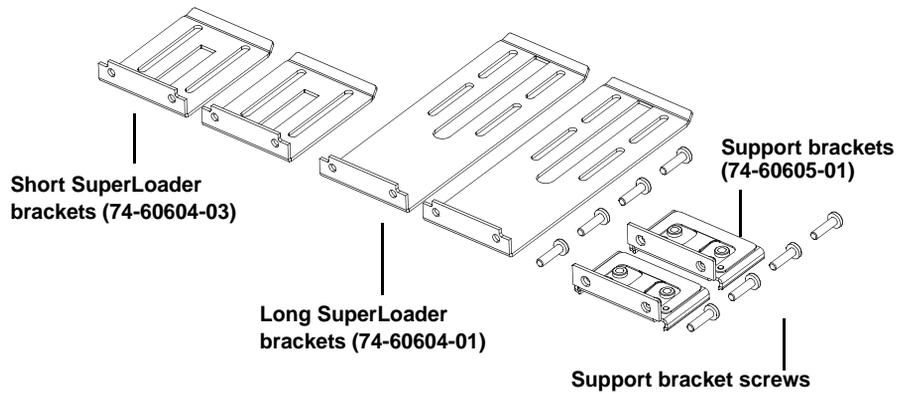
2 Install two clip nuts, 1.75 in. (44.45 mm) apart, onto each of the four
rails of the rack, making sure that you install each pair of clip nuts at
exactly the same level (see figure 12).

Figure 12 Installing
Two Clip Nuts
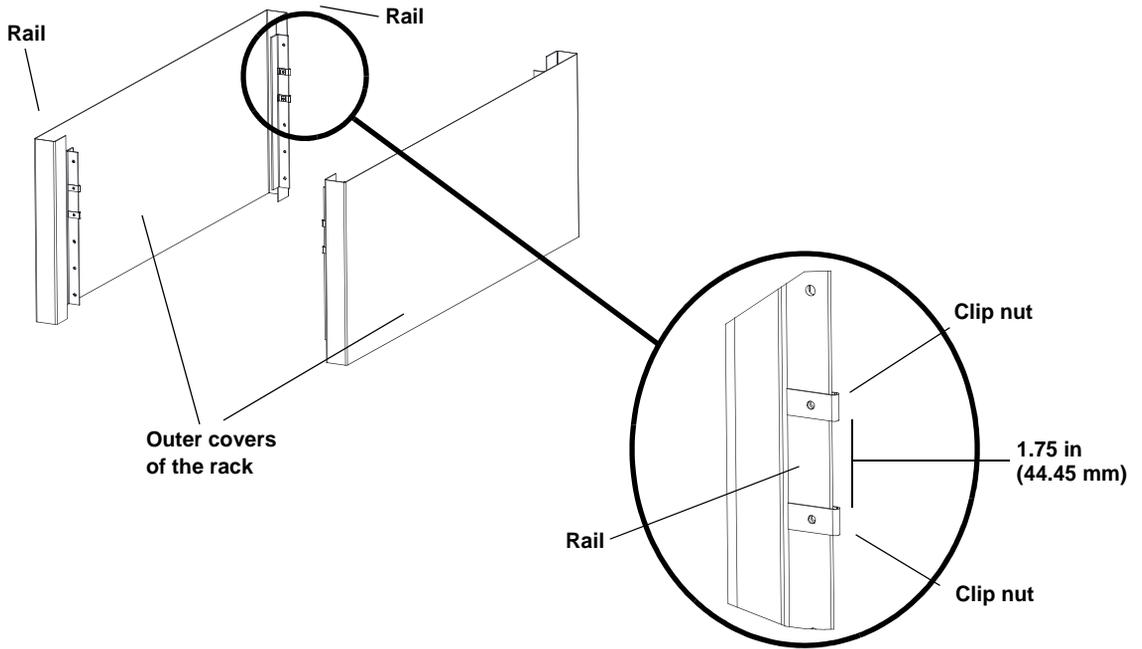
3 Select the long or short SuperLoader brackets (depending on the depth of the rack), and then attach them to the rear of the SuperLoader (see figure 13).

Figure 13 Attaching
SuperLoader Brackets

**SuperLoader
(SuperLoader DLT illustrated)**

Screws (10-32 x 1/4 only)

SuperLoader bracket
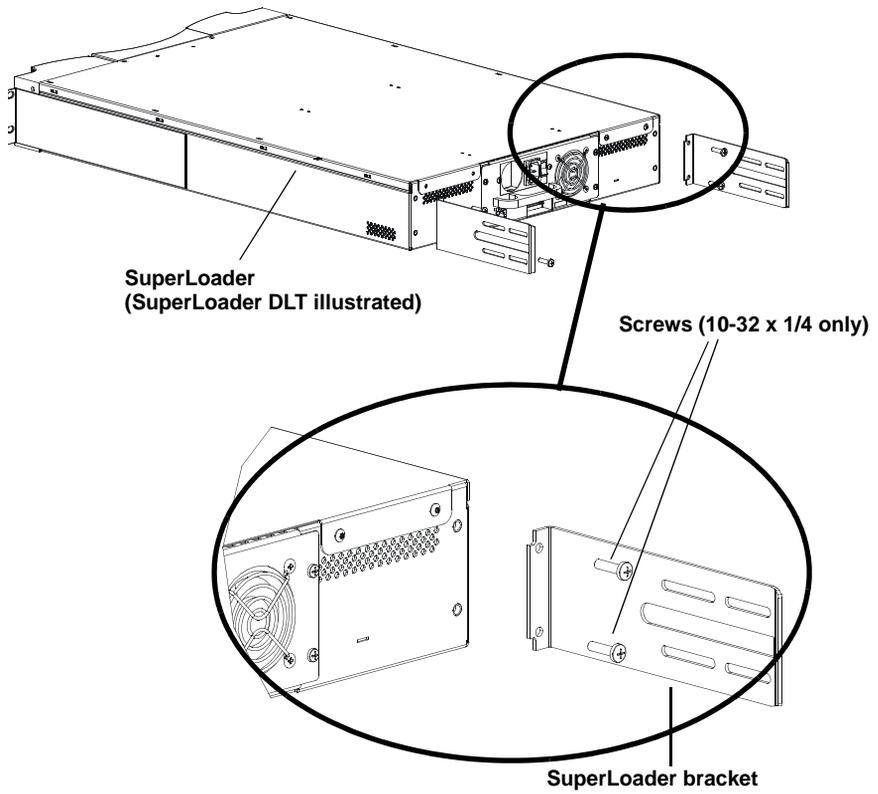
4 Using rack screws, attach a support bracket to the clip nuts on each rear rail (see figure 14.)

Note: Be sure to attach the support brackets correctly; the side of the bracket with only two holes should be secured to the rail.

Tighten the screws just enough to hold the support brackets firmly against the rail while still allowing the support bracket to be slightly shifted by hand. This shifting will help facilitate the engagement of SuperLoader brackets as the SuperLoader is installed in the rack. You will fully tighten the screws in step 8.

Figure 14 Attaching Support Brackets
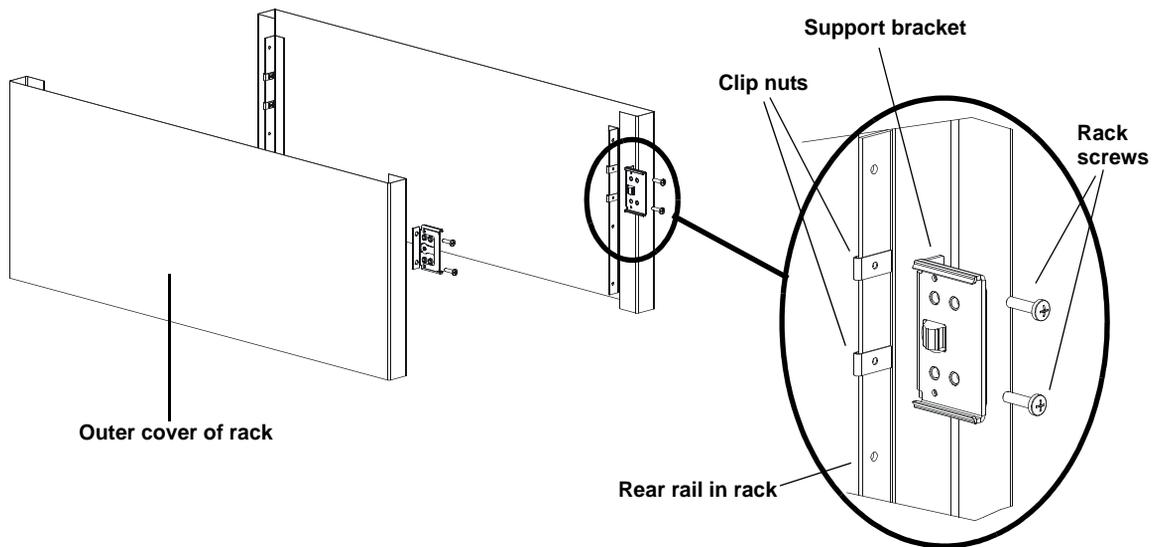
5 With the help of a second installer, insert the SuperLoader into the rack so that the SuperLoader brackets slide into corresponding support brackets on the rear rails and the tabs at the front of the SuperLoader align flush with the clip nuts on the front rails (see <u>figure 15</u>).

> **Caution:**   Do not release the front end of the SuperLoader until it can be secured to the rack.

Figure 15 Sliding SuperLoader into Rack

**SuperLoader bracket
(SuperLoader DLT illustrated)**

Support bracket
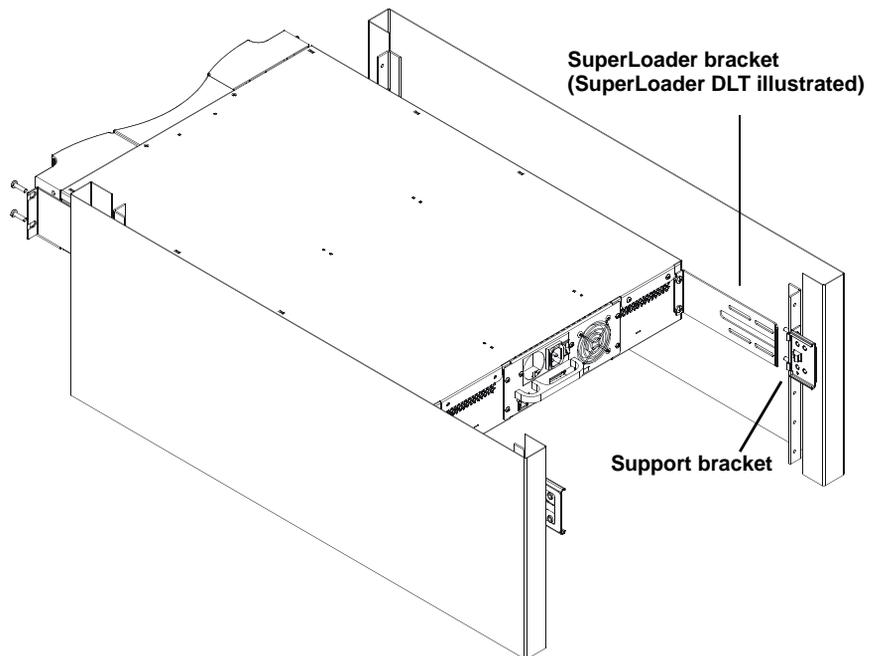
6 While the other installer holds the front end of the SuperLoader, secure the SuperLoader in the rack by doing the following:

a Secure the front end of the SuperLoader to the rack using four rack screws (two per tab) as shown in <u>figure 16</u>. Tighten the screws just enough to secure the SuperLoader to the front rails.

Figure 16 Front Alignment
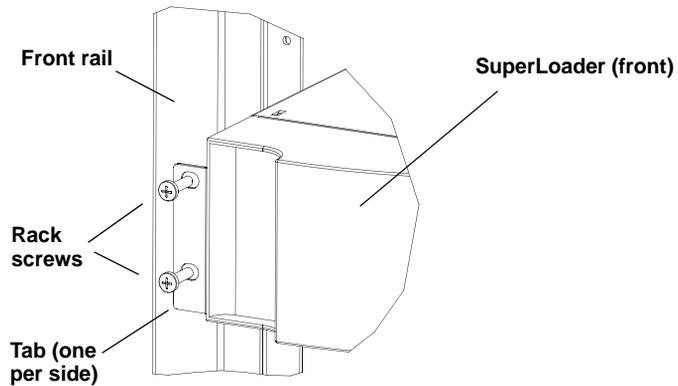
b Install four screws (two per side) to secure the support brackets to the SuperLoader brackets (see <u>figure 17</u>).

Figure 17 Connecting Support Brackets
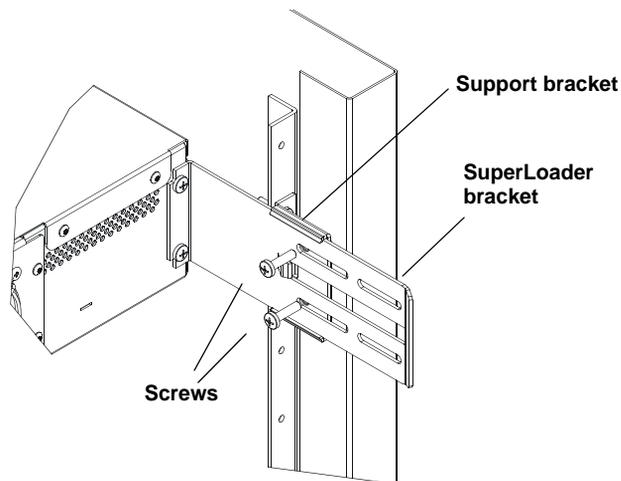
7 Verify that the SuperLoader is level. Adjust as needed.

8 When the SuperLoader is level, tighten all screws securing the SuperLoader to the rack. This includes the following:

- Four screws securing the SuperLoader tabs to the front rails.

- Four screws securing the support brackets to the rear rails.

- Four screws securing the SuperLoader brackets to the support brackets.

Making the SCSI Connection

The SCSI connection allows the host computer to communicate with the SuperLoader.

Note:	You must have already installed a SCSI host adapter card in the host computer. The adapter card must be LVD or SE compatible.

Before you start, make sure that your cable is long enough to reach from the SuperLoader to the host computer. Remember, the SCSI bus maximum length is 39.37 ft. (12 m) including all SCSI bus lengths within the SuperLoader. The SCSI bus lengths are 16 in. (406.4 mm) per SuperLoader DLT/SDLT or 23.5 in. (596.9 mm) per SuperLoader LTO.

Caution:	When installing cables, be careful not to damage the SCSI pins on the connectors. Damaged pins will cause the connection to fail.

To Make the SCSI Connection:

1 If the host computer is connected to a network, check with the system administrator before turning off power.

2 Properly power off all peripheral devices connected to the host computer.

3 Power off the host computer and any peripheral devices.

4 Install the supplied VHDCI SCSI cable to the double-stacked SCSI connector on the back of the SuperLoader/DCA and tighten the screws. You can install the SCSI cable in either port.

Figure 18 Making the
SCSI Connection

**Double-stacked SCSI connector
(SuperLoader DLT)**

**Double-stacked SCSI connector
(SuperLoader LTO)**
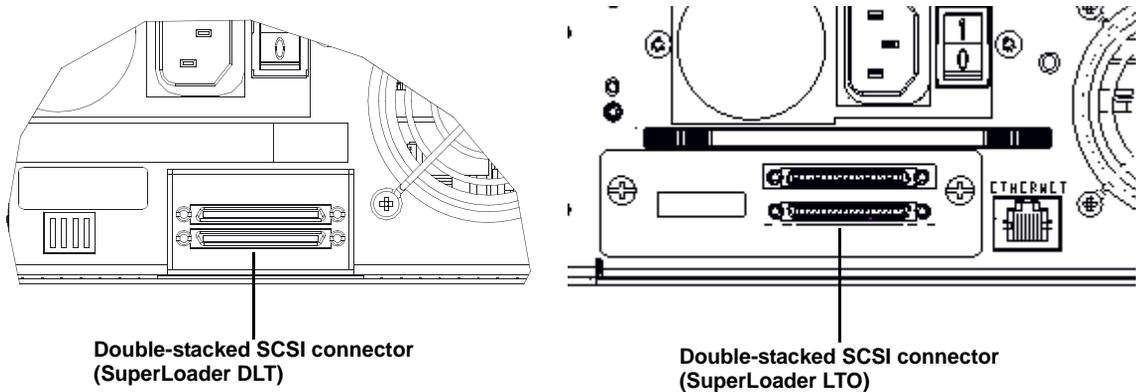
> **Note:** Notice that the connector on the end of the cable is offset. Make sure that you install it with the correct orientation so that you can fit a terminator or another cable in the other port.

5 If the SuperLoader is the last device on the SCSI bus, install the supplied SCSI terminator to the remaining port that is on the SuperLoader/DCA, and then tighten the screws.

> **Note:** On all SuperLoaders, SCSI terminators must be used for proper operation of the drive.

6 Attach the other end of the SCSI cable to the SCSI host adapter card.

7 Power on any peripheral devices that you powered off in step 2.

> **Note:** Do not power on the host computer at this time. First, you must configure the SuperLoader (see Configuration on page 30).

After you have made the SCSI connection, you need to connect the SuperLoader's power cable and then power on the SuperLoader (see <u>Powering On the SuperLoader</u>).

Powering On the SuperLoader

A power cable was supplied with your SuperLoader. Carefully inspect it and make sure that it is the correct one for your country or region. If the supplied power cable is not correct, contact your customer service representative or your point-of-sale person.

To Connect the Power Cable:

> **Note:** The first time you power on the SuperLoader, do not power on the host first.

1 Make sure the power switch on the back of the SuperLoader is off (the **0** is pressed).

2 Connect the female end of the power cable to the power connector on the back of the SuperLoader.

3 Plug the male end of the power cable into the power source.

To Power on the SuperLoader:

1 Push the power switch that is on the back of the SuperLoader to the **On** position (the **1** is pressed). Wait while the SuperLoader performs its POST. During this time, the following activities occur:

- The LCD screen indicates the model

- The LCD screen shows the Quantum logo and a progress bar, indicating the progress of the POST

- The SuperLoader performs a calibration and magazine element status

- The **Ready** LED flashes green

Chapter 2 Installation and Configuration
Powering On the SuperLoader

Once the power-on sequence completes and the SuperLoader is ready, the LCD lists the SuperLoader options that are present and the **Ready** LED is steady green.

> **Note:** When the SuperLoader is idle for a while, the company logo appears, the LCD backlight turns off (into power-save mode), and the drive type (if known) or the date and time appears.

Figure 19 Sample Idle Screen Display (SuperLoader LTO illustrated)

Quantum.

HP Ultrium

> **Note:** After powering up the SuperLoader using the method described above, you should use the switch on the front to power off and on the SuperLoader.

2 When you first power on the SuperLoader, it automatically runs a POST. During the POST, the left (green) LED flashes. After the POST, the left (green) and right (amber) LED flash alternately back and forth. Do one of the following:

- If the SuperLoader powers on successfully, continue configuring the SuperLoader (see Configuration).

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- If the SuperLoader does not power on successfully, check the following:

  - Power switch is on

  - Power cable is inserted correctly

  - SCSI bus is terminated

  - SCSI cable is connected to the SuperLoader and host computer

  - No error code appears on the SuperLoader LCD

  If you cannot resolve the problem yourself, contact your service representative or Quantum Customer Support.

  When you first power on the SuperLoader, the setting for the Internet Protocol (IP) address is static with the address **192.168.20.128**. If you want to use Dynamic Host Configuration Protocol (DHCP) to change the IP address, see IP Address on page 34. To determine the IP address when using DHCP, view the Ethernet status information (see SCSI ID on page 109).

Configuration

To configure your SuperLoader, start with the main menu on the front panel. If the main menu is not already visible on the LCD, press **Enter**.

Figure 20 LCD Front Panel

```
Status

Commands

Configuration

Diagnostics
```
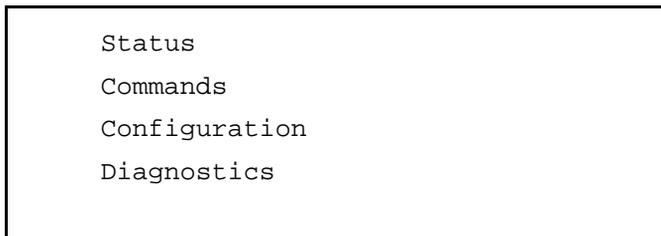
When you first power on the SuperLoader, the default is set with no password protection. However, after you set the security option, all the configuration functionality is password-protected. You need an administrator-level password to configure the SuperLoader.

To Disconnect Power from AC Mains:

1 Press the power switch on the front panel and hold for approximately five seconds.

2 When the LCD screen goes blank, push the AC power switch on the back of the SuperLoader to the **OFF** position (the 0 is pressed).

> **Note:** The SuperLoader power inlet serves as the disconnect device.

The configuration submenu has the following options:

Figure 21 Submenu for Configuration

SuperLoader DLT/SDLT (prior to v45)
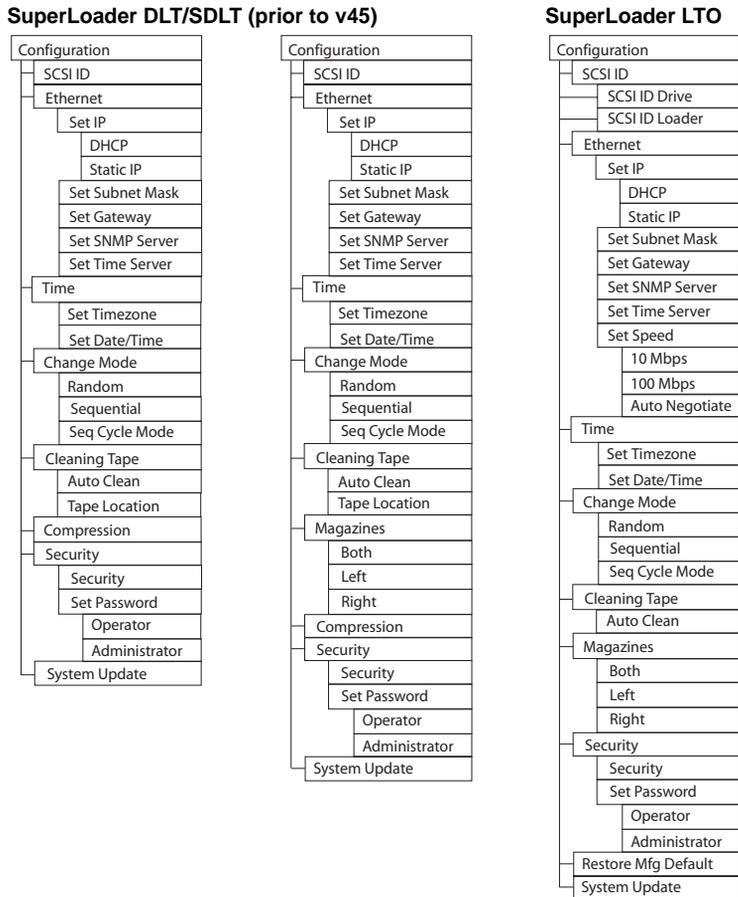
SuperLoader LTO

To configure the SuperLoader, you must verify the setup of the following:

- SCSI ID(s). For the SuperLoader DLT and SuperLoader SDLT, there is a single SCSI ID. For the SuperLoader LTO, there are separate SCSI IDs for the drive and the loader.

- Magazine(s)

- Ethernet IP address (if you are not using DHCP)

- SNMP server IP address — only if SNMP is being used

- Time server IP address (or the time zone, date, and time, if configuring manually) — only if a time server is being used

- Control mode

- Security option

Setting SCSI ID

Each SCSI device attached to a server or workstation must have a unique SCSI ID. For the SuperLoader DLT, you need one SCSI ID for the SuperLoader. For SuperLoader LTO models, you need to set up separate SCSI IDs for the tape drive and the SuperLoader.

Check the IDs on all other SCSI devices that are on the SCSI bus, including the SCSI host adapter, and select unused SCSI IDs for the SuperLoader robotics (all models) and drive (SDLT 600 drive and LTO drive only). The factory default SCSI IDs for the SuperLoader robotics, SDLT 600 drive, and LTO drive are 04 and 05 respectively, but you can select any unused number between 00 and 15. If the SuperLoader factory default SCSI IDs are being used by other devices on the SCSI bus, you need to change these SCSI IDs to avoid conflicts.

To Set the SCSI ID:

1 If the main menu is not already visible, press **Enter**.

2 On the main menu, scroll to **Configuration** and press **Enter**.

Figure 22 Main Menu
(LCD)

```
        Status
        Commands
      ▶ Configuration
        Diagnostics
```
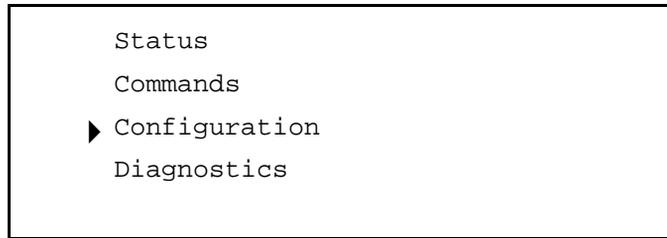
3 On the Configuration submenu, scroll to **SCSI ID** and press **Enter**.

Figure 23 Configuration
Menu (LCD)

DLT/SDLT

```
      ▶ SCSI ID
        Ethernet
        Time
        Change Mode
        Cleaning Tape
```

LTO

```
    ▶ ↑ ↓  to change
      Enter to Continue


      SCSI ID Drive: 5
      SCSI ID Loader: 4
```
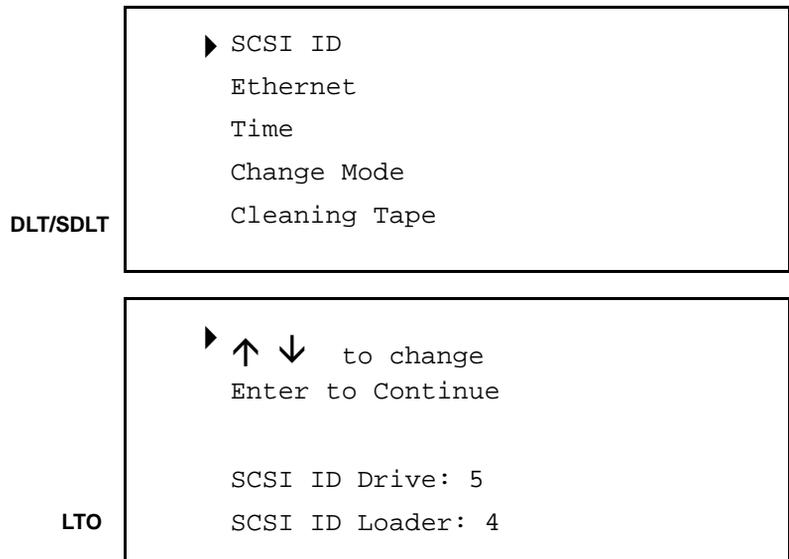
4 Scroll to the number you want to set as the SuperLoader's SCSI ID,
then press **Enter**. Cycle Power new SCSI ID appears on the LCD.

5 Press and hold the power button on the front panel until System
Shutdown Please Wait appears on the LCD. Power Off appears on the
LCD, then the SuperLoader shuts off.

6 Press the power button again to power on the SuperLoader. The new
SCSI ID is now in effect.

Setting Ethernet

Ethernet is the method the SuperLoader uses to access a network. With an Ethernet connection, you can remotely access the SuperLoader over the network to which it is connected. To use the Ethernet connection, you must define the following:

- A dynamic or static IP address for the SuperLoader (required)

- A subnet mask (required)

- An IP gateway (optional)

- A Simple Network Management Protocol (SNMP) server (optional)

- A time server, or set the time and time zone manually (optional)

IP Address An IP address is the address of any device attached to a network. Each device must have a unique IP address. IP addresses are written as four sets of numbers separated by periods ranging from 0.0.0.0 up to and including 255.255.255.255.

IP addresses are either permanent or dynamically assigned. A permanent, or static, address remains the same each time the device connects to the network. A dynamic address may change each time the device connects to the network and is assigned by the network server using DHCP.

To Set a Dynamic IP Address:

1 On the main menu, scroll to **Configuration**, then press **Enter**.

Figure 24 Main Menu (LCD)
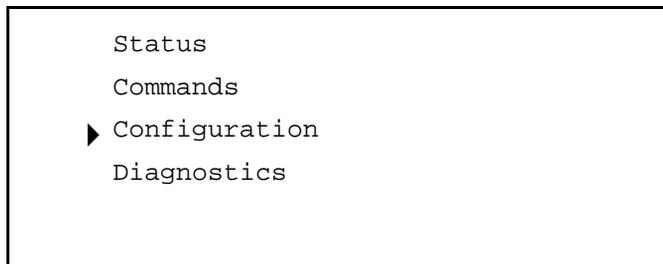
```
        Status

        Commands

    ▶  Configuration

        Diagnostics

```

2 On the Configuration menu, scroll to **Ethernet**, then press **Enter**.

3 On the Ethernet submenu, scroll to **Set IP**, then press **Enter**.

4 Scroll to **DHCP**, then press **Enter**. Please reboot to use DHCP appears on the LCD.

5 Press and hold the power button on the front panel until System Shutdown Please Wait appears on the LCD. Power Off appears on the LCD, then the SuperLoader shuts off.

6 Press the power button again to power on the SuperLoader. The IP address is changed.

To display the IP address, see <u>View Ethernet Information</u> on page 96.

To Set a Static IP Address:

1 On the main menu, scroll to **Configuration**, then press **Enter**.

Figure 25 Main Menu
(LCD)

```
        Status
        Commands
    ▶ Configuration
        Diagnostics


```

2 On the Configuration menu, scroll to **Ethernet**, then press **Enter**.

3 On the Ethernet submenu, scroll to **Set IP**, then press **Enter**.

4 Scroll to **Static IP**, then press **Enter**. The cursor automatically appears at the first digit.

Figure 26 Static IP
Selection

```
       DHCP
    ▶ Static IP
       010.050.021.018



```
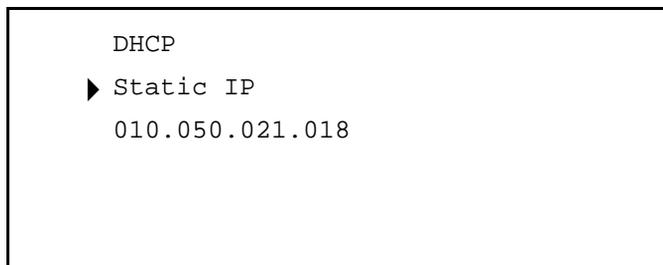
5 At each position of the IP address, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

> **Note:** If you make a mistake, press **Escape** to backspace to the digit you want to change.

6 When you have advanced through all of the digits of the IP address, the SuperLoader displays Enter to save.

7 Press **Enter**. The Configuration submenu appears and the static IP is now in effect. You do not need to reboot the SuperLoader.

8 Press **Escape** or **Enter** to return to the Ethernet submenu.

Subnet Mask

Creating a subnet mask is a method to split IP networks into a series of subgroups, or subnets, to improve performance and security.

To Set a Subnet Mask:

1 On the main menu, scroll to **Configuration**, then press **Enter**.

Figure 27 Main Menu (LCD)
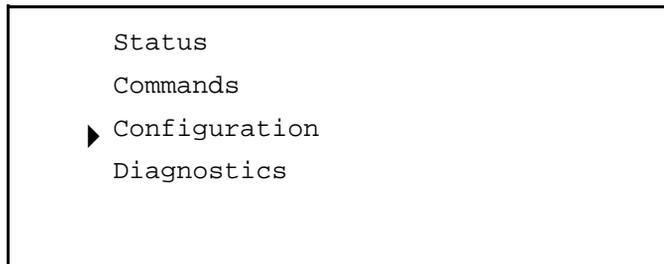
```
          Status
          Commands
      ▶  Configuration
          Diagnostics
```

2 On the Configuration menu, scroll to **Ethernet**, then press **Enter**.

3 On the Ethernet submenu, scroll to **Set Subnet Mask**, then press **Enter**.

4 Scroll to **Static IP**, then press **Enter**. The cursor automatically appears at the first digit.

Figure 28 Set Subnet Mask

```
          Subnet Mask Address
          255.255.255.000
```
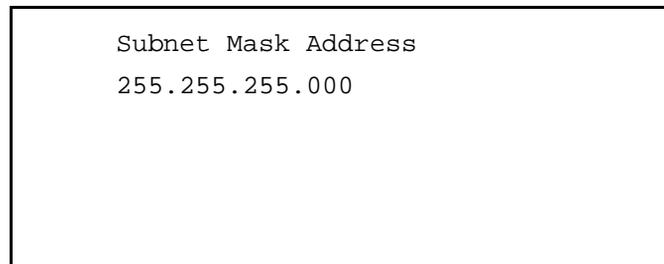
5 At each position of the Subnet Mask address, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

Note: If you make a mistake, press **Escape** to backspace to the digit you want to change.

6 When you have advanced through all of the digits of the IP address, the SuperLoader displays Enter to save.

7 Press **Enter**. SUB addr changed to appears on the LCD. You do not need to reboot the SuperLoader.

8 Press **Escape** or **Enter** to return to the Ethernet submenu.

IP Gateway   An IP gateway is a device that converts data to the IP protocol.

To Set an IP Gateway:

1 On the main menu, scroll to **Configuration**, then press **Enter**.

Figure 29 Main Menu
(LCD)
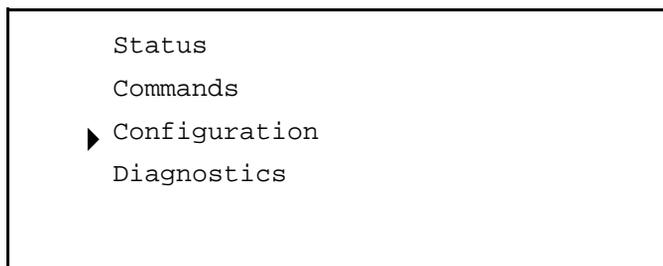
```
        Status

        Commands

    ▶ Configuration

        Diagnostics


```

2 On the Configuration menu, scroll to **Ethernet**, then press **Enter**.

3 On the Ethernet submenu, scroll to **Set Gateway**, then press **Enter**. The cursor automatically appears at the first digit.

Figure 30 IP Gateway

```
        Gateway Address

    ▶ 255.255.255.255



```
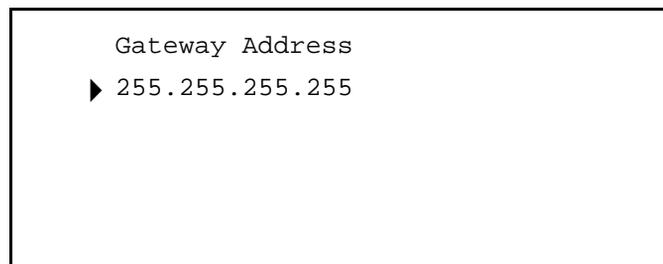
4 At each position of the gateway address, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

> **Note:** If you make a mistake, press **Escape** to backspace to the digit you want to change.

5 When you have advanced through all of the digits of the IP address, the SuperLoader displays Enter to save.

6 Press **Enter**. GW changed to appears on the display. You do not need to reboot the SuperLoader.

7 Press **Escape** or **Enter** to return to the Ethernet submenu.

Setting the SNMP Server

An SNMP server monitors a network by processing reporting activity in each network device (hub, router, bridge, and so on). The server uses this information to define what is obtainable from each device and what can be controlled (turned off, on, and so forth).

To Set an SNMP Server:

1 On the main menu, scroll to **Configuration**, then press **Enter**.

Figure 31 Main Menu (LCD)
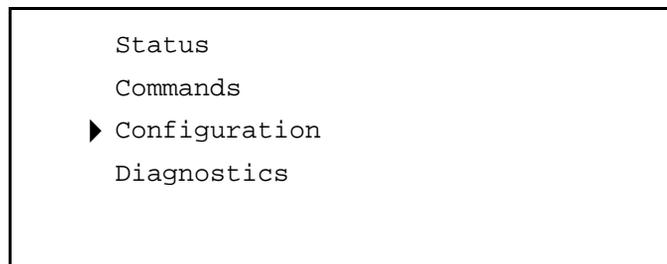
```
        Status
        Commands
      ▶ Configuration
        Diagnostics
```

2 On the Configuration menu, scroll to **Ethernet**, then press **Enter**.

3 On the Ethernet submenu, scroll to **Set SNMP Server**, then press **Enter**. The cursor automatically appears at the first digit.

```
         SNMP Server Address
    ▶ 255.255.255.255
```
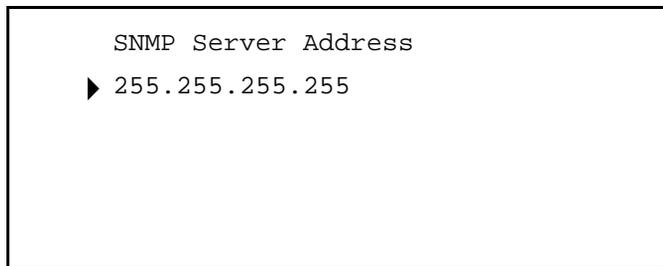
4 At each position of the SNMP server address, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

> **Note:** If you make a mistake, press **Escape** to backspace to the digit you want to change.

5 When you have advanced through all of the digits of the IP address, the SuperLoader displays Enter to save.

6 Press **Enter**. SNMP Server changed to appears on the display. You do not need to reboot the SuperLoader.

7 Press **Escape** or **Enter** to return to the Ethernet submenu.

Setting the Time Server

If you locate a time server that is compatible with Simple Network Time Protocol (SNTP), you can connect the SuperLoader to a server that will supply the correct date and time. The SuperLoader uses this information to time stamp information in its memory.

To Set a Time Server:

1 On the main menu, scroll to **Configuration**, then press **Enter**.

Figure 33 Main Menu
(LCD)
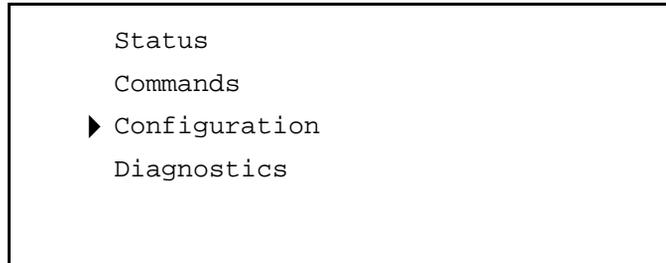
```
         Status
         Commands
      ▶ Configuration
         Diagnostics

```

2 On the Configuration menu, scroll to **Ethernet**, then press **Enter**.

3 On the Ethernet submenu, scroll to **Set Time Server**, then press **Enter**. The cursor automatically appears at the first digit.

Figure 34 Setting a
Time Server

```
       Time Server Address
    ▶ 192.005.041.041


```
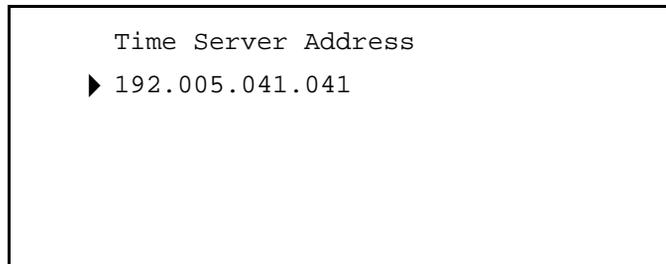
4 At each position of the time server address, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

> **Note:**   If you make a mistake, press **Escape** to backspace to the digit you want to change.

5 When you have advanced through all of the digits of the IP address, the SuperLoader displays Enter to save.

6 Press **Enter**. Time Server changed to appears on the display. You do not need to reboot the SuperLoader.

7 Press **Escape** or **Enter** to return to the Ethernet submenu.

Setting the Time

The system time is displayed by the On-board Remote Manager and it is used internally when logging events and errors. The system time is either regular time or power-on time. Regular time is Month/Date/Year Time, for example Nov/21/2004 19:28. Power-on time is Power On Cycles/ Power On Hours. For example, POC: 00121, POH: 00002:07:45 where POC is the number of times the system has booted since it was manufactured, and POH is the number of hours, minutes, and seconds since the last system boot. If regular time is known, it will be used, otherwise, power on time is used.

The SuperLoader LTO and the SuperLoader DLT with an SDLT 600 drive have the ability to keep track of time when powered off. All other SuperLoaders must be reset after each power up. The time can be reset automatically if a time server is configured (see). Otherwise, the time can be set manually from the front panel or from the On-board Remote Manager. The time zone setting is not lost when the SuperLoader is powered off.

> **Note:**   With the SuperLoader LTO and the SuperLoader DLT with the SDLT 600 drive, the system automatically adjusts for daylight savings time based on the time zone setting. For all other SuperLoaders, whether you connect the SuperLoader to a time server or not, if you want to include time changes for daylight savings time, you must change the time zone manually.

To Set the Time Zone:

1 On the main menu, scroll to **Configuration**, then press **Enter**.

Figure 35 Main Menu
(LCD)
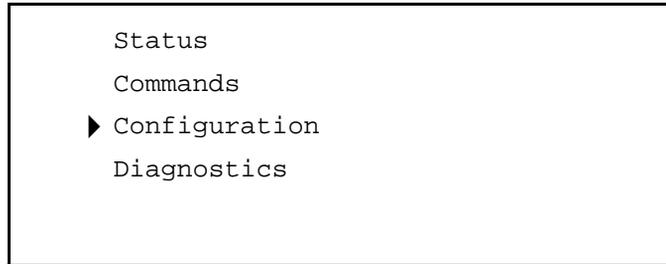
```
          Status

          Commands

        ▶ Configuration

          Diagnostics


```

2 On the Configuration menu, scroll to **Time**, then press **Enter**.

3 On the Time submenu, scroll to **Set Timezone**, then press **Enter**. The Time Zone screen appears, allowing you to set the hours. The cursor automatically appears at the first digit.

Figure 36 Setting a
Time Zone (Hours)

```
          Time Zone: set hrs


          GMT -6:00


```
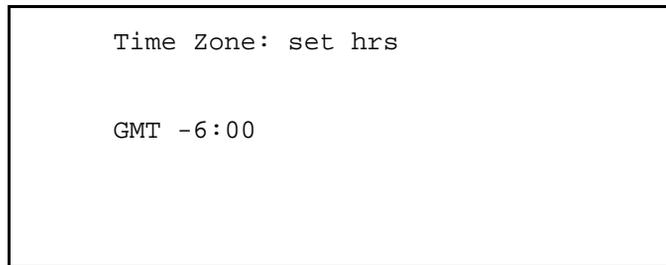
4 Scroll to set the number of hours' difference between your local time and GMT. If you do not know the difference between your local time and GMT, refer to appendix C on page 251.

Figure 37 Setting a
Time Zone (Minutes)

```
          Time Zone: set hrs


          GMT -6:00
```
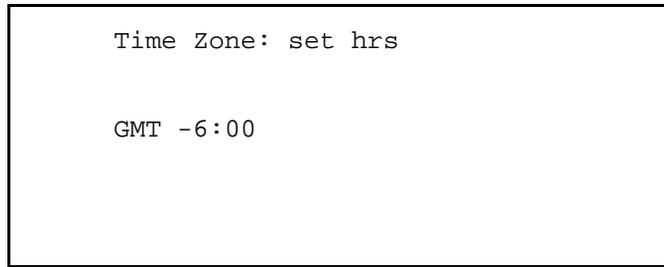
5 Scroll to set the number of minutes' difference between your local
time and GMT, then press **Enter**. The new time zone is set.

6 Press **Escape** or **Enter** as necessary to return to the main menu.

To Set the Date and Time:

1 On the main menu, scroll to **Configuration**, then press **Enter**.

Figure 38 Main Menu
(LCD)
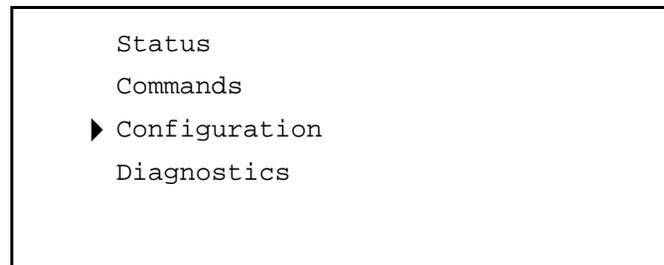
```
          Status
          Commands
        ▶ Configuration
          Diagnostics
```
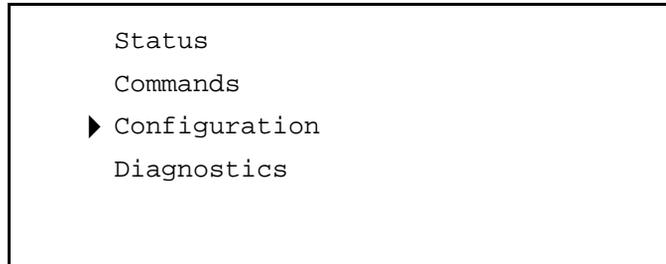
2 On the Configuration menu, scroll to **Time**, then press **Enter**.

3 On the Time submenu, scroll to **Set Date/Time**, then press **Enter**. The
Date/Time screen appears, allowing you to set the date and time. The
cursor automatically appears at the first digit.

Figure 39 Setting the
Date and Time

```
YYY.MM.DD.HH.MM
2002.01.01.12.00


Use 24 hour format
Time zone GMT -6:00
```

4 The first four digits represent the current year. At each position of the year, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

> **Note:** Throughout this procedure, if you make a mistake, press **Escape** to backspace to the digit you want to change.

5 The next two digits represent the current month. At each position of the month, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

6 The next two digits represent the current day. At each position of the day, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

7 The next two digits represent the current hour. At each position of the hour, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

8 The last two digits represent the current minute. At each position of the minute, use the up and down arrows to change the value of each digit. Press **Enter** to advance the cursor to the next digit.

9 Enter to save appears on the LCD. Press **Enter** to save.

10 Press **Escape** to return to the main menu.

Setting the Change Mode

You can set the SuperLoader to either **Random** or **Sequential**. The default control mode is **Random**.

In **Random Mode**, you (or the backup software) can specify which cartridge you want to use and where you want it to go. You will probably use this mode the most.

The **Sequential Mode** supports certain backup applications that do not manage media. During backup, when one cartridge is read or written to the end of the tape, the SuperLoader automatically returns that cartridge to its slot and loads the cartridge from the next higher numbered slot to the tape drive to be read or written to. This continues until the backup software stops accessing the drive or until all the cartridges have been sequentially accessed. The SuperLoader does not move the media until the host requests the tape drive to unload the tape via a SCSI unload command.

In **Seq Cycle Mode**, which is an option of the **Sequential Mode**, the SuperLoader automatically starts over with magazine slot 1 when the last cartridge is used (slot 16 or highest filled slot). If this control mode is not set, the SuperLoader stops when the last cartridge available has been used. In **Seq Cycle Mode**, the SuperLoader continues to cycle until a user stops it.

To Set the Change Mode:

1 On the main menu, scroll to **Configuration**, then press **Enter**.

Figure 40 Main Menu (LCD)

```
          Status

          Commands

        ▶ Configuration

          Diagnostics

```
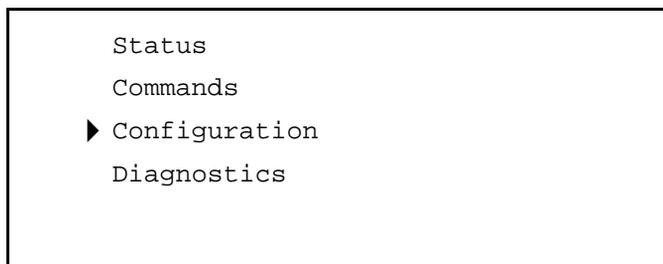
2 On the Configuration menu, scroll to **Change Mode**, then press **Enter**. The mode options appear. A check mark appears next to the currently enabled mode.

3 Do one of the following:

- To leave the mode the same, press **Escape**.

- To modify the change mode, scroll to the mode to which you want to set the SuperLoader and press **Enter**. Reboot to enable new mode appears on the LCD.

  - Press and hold the power button on the front panel until System Shutdown Please Wait appears on the LCD. Power Off appears on the LCD and the SuperLoader shuts off.

  - Press the power button again to power up the SuperLoader. The new control mode is now in effect.

> **Note:** When you enable **Sequential Mode**, the loader device no longer appears on the SCSI bus; only the tape drive appears.

Sequential Mode Operations

If you enable **Sequential Mode**, you must use the Sequential Ops submenu under the Commands menu to operate the SuperLoader after you reboot.

- The **Start** command allows you to load the first cartridge.

- The **Resume** command allows you to continue from the next unused slot, if a user stopped the cycle.

- The **Stop** command allows you to stop the cycle.

To Start Sequential Mode Operation:

1 On the main menu, scroll to **Commands**, then press **Enter**.

Figure 41 Main Menu
(LCD)
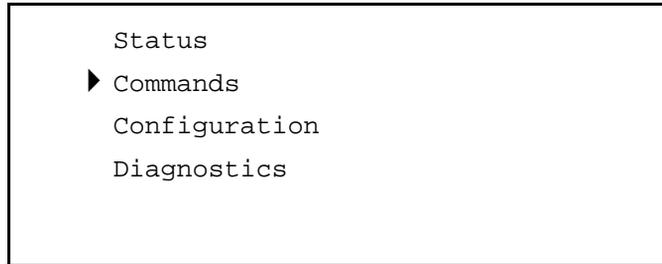
```
          Status

       ▶ Commands

          Configuration

          Diagnostics
```

2 On the Commands menu, scroll to **Sequential Ops**, then press **Enter**.

3 On the Sequential Ops submenu, scroll to **Start**, then press **Enter**.
   Moving first tape to drive appears on the LCD.

To Stop Sequential Mode Operation:

1 On the main menu, scroll to **Commands**, then press **Enter**.

Figure 42 Main Menu
(LCD)
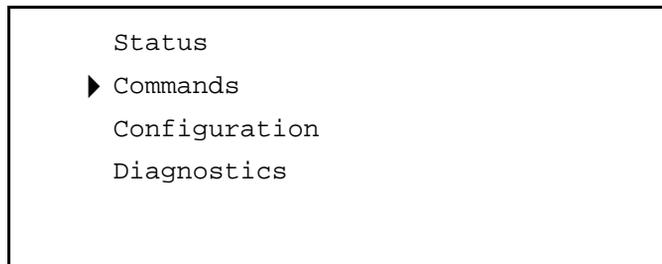
```
          Status

       ▶ Commands

          Configuration

          Diagnostics
```

2 On the Commands menu, scroll to **Sequential Ops**, then press **Enter**.

3 On the Sequential Ops submenu, scroll to **Stop**, then press **Enter**.
   Ejecting tape from drive appears on the LCD.

To Resume Sequential Mode Operation:

1 On the main menu, scroll to **Commands**, then press **Enter**.

Figure 43 Main Menu
(LCD)
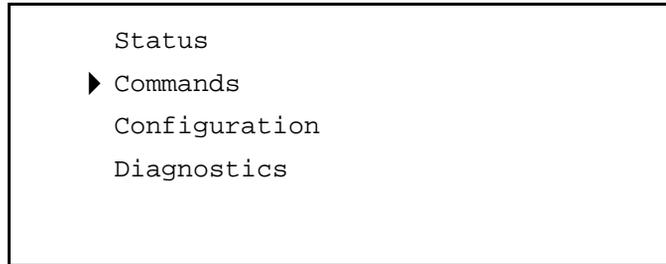
```
      Status
   ▶ Commands
      Configuration
      Diagnostics

```

2 On the Commands menu, scroll to **Sequential Ops**, then press **Enter**.

3 On the Sequential Ops submenu, scroll to **Resume**, then press **Enter**.
   Moving next tape to drive appears on the LCD.

Setting Security

You can add security to the front panel by password-protecting the
SuperLoader's functionality. The security only protects the front panel
functionality. The default security setting is **Off**, meaning that no
password is required. However, you can enable the security option so
that users must enter a password to access functionality.

Security Option   When you first power on the SuperLoader, the security option is set to
Off. Use the following procedure to enable the security option. You must
have an administrator-level password to set passwords.

To Set the Security Option:

1 On the main menu, scroll to **Configuration**, then press **Enter**.
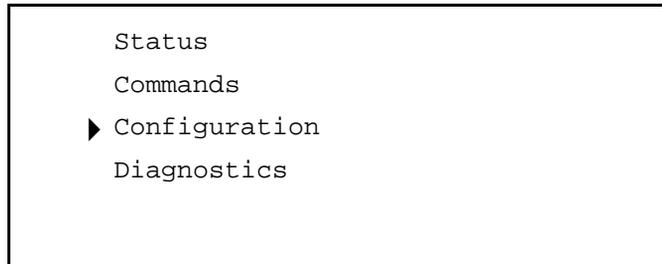
```
         Status

         Commands

       ▶ Configuration

         Diagnostics


```

2 On the Configuration menu, scroll to **Security**, then press **Enter**.

3 On the Security submenu, scroll to **Security**. If a check mark appears after the work, the security option is on. If no check mark appears, the security option is off.

4 To change the setting, press **Enter**. This toggles the security option. For example, if the security option was set to **On**, it is now set to **Off**, and no check mark appears.

Setting Magazines

In some cases, SuperLoader owners were being charged Independent Software Vendor (ISV) licensing fees for two-magazine SuperLoaders although only one magazine was configured. This occurred because the ISV software was registering the SuperLoader as a two-magazine device, regardless of the number of magazines configured.

With the release of v20 and v45 autoloader firmware, you have the ability to set the number of magazines being used in the SuperLoader.

v20 Firmware and the SuperLoader LTO

The v20 autoloader firmware was written to allow ISV packages to correctly identify the configuration of LTO-based SuperLoaders. This firmware release does not require changing the existing versions of the drive code. After installing v20 and configuring your SuperLoader LTO (see Setting Magazines), your one-magazine SuperLoader will be identified properly by the leading ISV packages. The autoloader firmware upgrade allows you to take advantage of lower ISV licensing fees for single-magazine operation.

v45 Firmware and the SuperLoader DLT (excludes DLT1)

The v45 autoloader firmware was written to allow ISV packages to correctly identify the configuration of DLT-based SuperLoaders. This firmware release does not require changing the existing version of the drive code. After installing v45 and configuring your SuperLoader DLT (excluding the SuperLoader DLT1), your one-magazine SuperLoader will be identified properly by the leading ISV packages. The autoloader firmware upgrade allows you to take advantage of lower ISV licensing fees for single-magazine operation. After installing the firmware, follow the configuration procedure outlined in Setting Magazines.

v45 Firmware and the SuperLoader DLT1

The v45 autoloader firmware was written to allow ISV packages to correctly identify the configuration of SuperLoader DLT1.

> **Note:** This firmware release requires that the drive firmware be upgraded to v63 at the same time the SuperLoader firmware is upgraded to v45.

The autoloader and drive firmware upgrades allow you to take advantage of lower ISV licensing fees for single-magazine operations. After installing the firmware, follow the configuration procedure outlined in Setting Magazines.

Passwords

Many operations on the SuperLoader are password-protected to ensure data integrity. You can set passwords to administrator level and to operator level. Operator-level users have access to the Commands and Status menus. Administrator-level users have access to all functionality.

> **Note:** Passwords must be exactly six numeric characters long. The default is **000000** for both the administrator and operator password.

To Set a Password:

1 On the main menu, scroll to **Configuration**, then press **Enter**.

Figure 45 Main Menu (LCD)
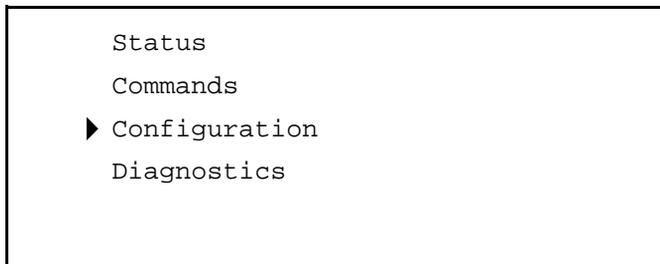
```
        Status

        Commands

    ▶ Configuration

        Diagnostics

```

2 On the Configuration menu, scroll to **Security**, then press **Enter**.

3 On the Security submenu, scroll to **Set Password**, then press **Enter**.

4 To set a password to the operator level, scroll to **Operator**. To set a password to the administrator level, scroll to **Administrator**, then press **Enter**. The **Set Password** screen appears.

5 Press **Enter**. If you are not logged in as Administrator, press **Enter** again to log in. A textbox appears above the first asterisk.

6 In the textbox, scroll to the first character of the password. The cursor automatically appears at the first number of the password.

Figure 46 Password
Screen

```
                Login as
                Administrator
                0
                * * * * * *
```
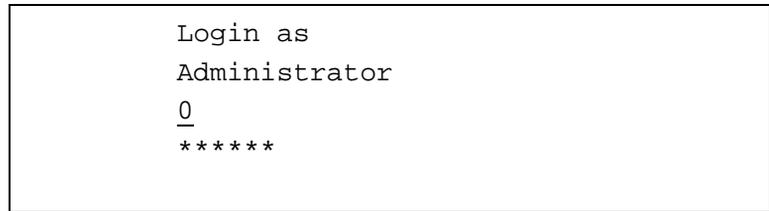
7 At each position of the password, use the up and down arrows to change the value of each number. Press **Enter** to advance the cursor to the next number.

> **Note:** If you make a mistake, press **Escape** to backspace to the digit you want to change.

8 Press **Enter**. The textbox above the asterisk disappears and another textbox appears above the next asterisk.

9 Repeat steps 7 and 8 to enter the remaining digits of the password. When you have entered six numbers, the SuperLoader displays Submit Password below the asterisks.

10 Press **Enter** to submit the password. Password Successfully changed appears on the LCD.

11 Press **Enter**. The Operator and Administrator options reappear. You can either enter another password or press **Escape** or **Enter** to return to the main menu.

Getting Lost Passwords

If you forget the administrator-level password, you cannot access the SuperLoader's functionality to enter a new password. In this case, you must call your customer service representative. When you call, have the SuperLoader connected to the Ethernet and open the On-board Remote Manager.

> **Note:** You can reset front panel passwords to the factory defaults from the On-board Remote Manager. However, if the On-board Remote Management passwords are lost, you must call Quantum Customer Support.
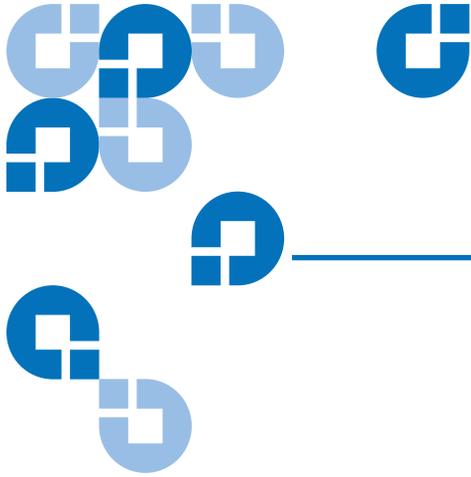
Tape Cartridge Use

Your SuperLoader uses magnetic tape technology to collect, backup, and archive data. Magnetic tape is made of flexible plastic that is coated with a ferromagnetic material on one side. A read/write head in the tape drive discharges electrical impulses onto the moving ferromagnetic surface, recording data as bits of positive and negative polarity. Therefore, it is important to protect the tape from magnetic fields by properly caring for them.

This chapter describes the magnetic tapes and how to handle them properly. It also describes how to clean the tape drive.

Tape Cartridges Defined

Magnetic tape comes in many sizes and shapes. Your SuperLoader uses DLTtape™ IV, Super DLTtape I (SDLT I), Super DLTtape II, or Ultrium™ format tape (LTO). The type of drive installed in your SuperLoader determines which tape you use.

Caution:	Do not load Super DLTtape II cartridges into a SDLT 220 or SDLT 320 drive. The Super DLTtape II may become lodged in the drive. The DCA must be removed from the SuperLoader and the tape cartridge extracted manually from the drive.

For the DLT1 tape drive, only use DLTtape IV cartridges. DLTtape IV cartridges contain DLTtape, which provides a storage capacity of up to 40 GB (native) per cartridge. The tape cartridge shell is charcoal and has no pattern (see figure 47).

Note:	The DLT1 tape drive automatically detects any other cartridge types and any cartridges that have an unrecognized format. Do not use DLTtape III, IIIxt, or Cleaning Tape III cartridges.

Note:	The SDLT 600 drive automatically detects any other cartridge types and any cartridges that have an unrecognized format. Do not use DLTtape III, IIIxt, or Cleaning Tape III cartridges.

For the SDLT 220 or SDLT 320 tape drives, use Super DLTtape I cartridges. Super DLTtape I cartridges contain Super DLTtape, which provides a storage capacity of up to 110 GB (native) per cartridge in the SDLT 220, and 160 GB (native) per cartridge in the SDLT 320. The tape cartridge shell is green in color and has a distinctive pattern (see figure 47).

For the SDLT 600 tape drive, use Super DLTtape II cartridges. Super DLTtape II provides a storage capacity of up to 300 GB (native) per cartridge in the SDLT 600. The tape shell is blue in color and has a distinctive look (see figure 48).

Note:	The Super DLTtape cartridge has a keying feature to ensure it cannot be loaded into previous generation DLT drives. However, data backed up on a DLTtape IV cartridge can be retrieved by a Super DLTtape-based drive containing the backward-read compatible features.

Note:	The Super DLTtape II cartridge has a keying feature to ensure it cannot be loaded into previous generation DLT drives. However, data backed up on a DLTtape IV cartridge can be retrieved by a Super DLTtape-based drive containing the backward-read compatible features.

Figure 47   DLTtape IV and Super DLTtape I Cartridges

DLTtape IV

Super DLTtape I
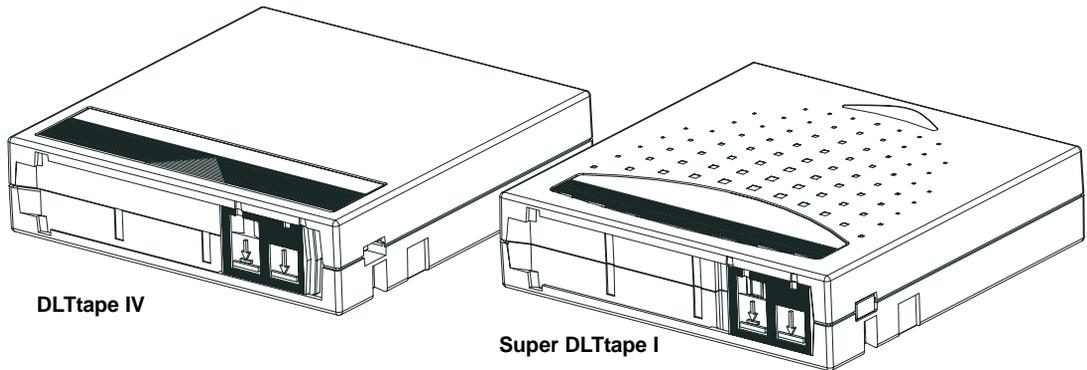
Figure 48 SDLT II
Cartridge
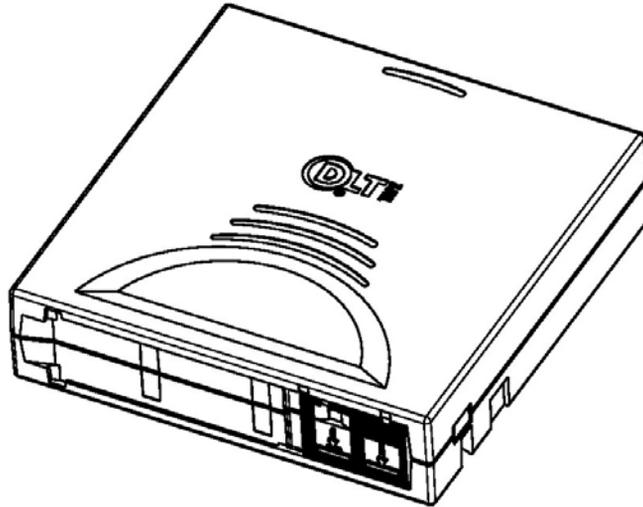
SDLT II Cartridge (for SDLT 600 drives)

For the Hewlett-Packard (HP) LTO tape drive, use Ultrium format tape
cartridges, generation 1 or 2. Ultrium format tape cartridges (see
figure 49) provide a native storage capacity of 100 GB (generation 1) or
200 GB (generation 2) per cartridge.

Figure 49 Ultrium
Format Tape Cartridge
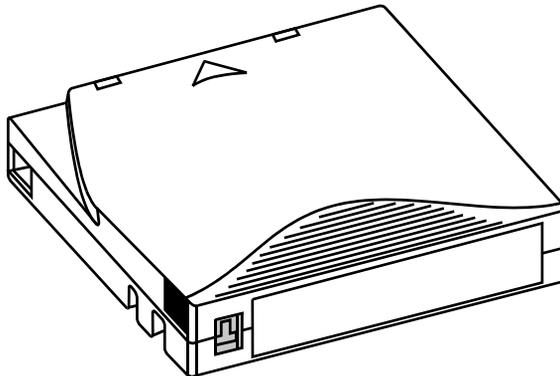
LTO Cartridge (generation 1 and 2)

Tape Maintenance

To greatly reduce the chance of problems with your tape cartridges or damage to your tape drive, follow the guidelines as listed in the appropriate tape product manuals supplied with the cartridges.

The Write-Protect Switch

All DLT tape cartridges have a write-protect switch (see figure 50) to prevent accidental erasure of data. When you enable write-protection, existing data on the tape cannot be overwritten, nor can additional data be appended to the tape. When you disable write-protection, existing data on the tape can be overwritten, and additional data can be appended.

Note: Before loading a cartridge into your SuperLoader, make sure that you set the write-protect switch to the desired position.

Figure 50 Write-Protect Switch (SDLT Shown)

Orange indicator

Write-protect
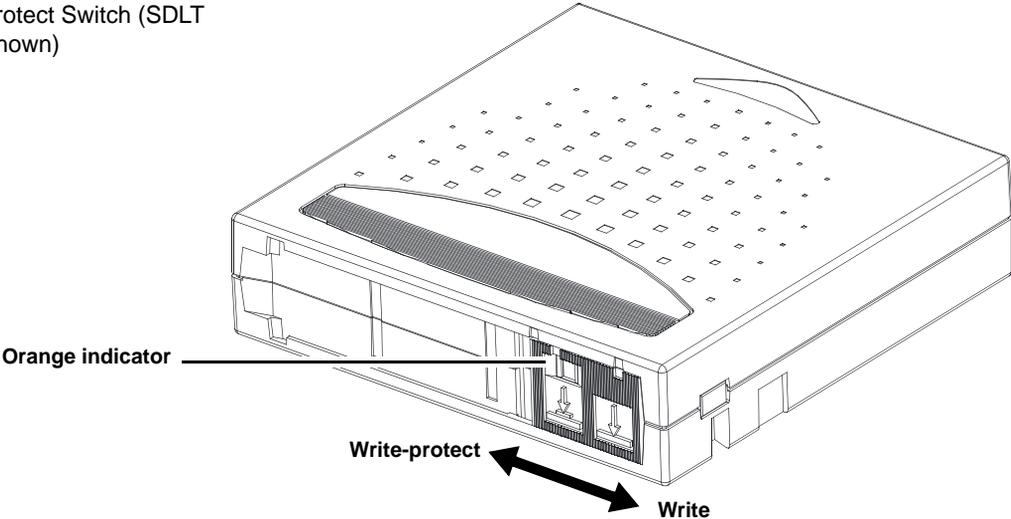
Write

Table 4 shows the status of the indicator and the results for each write-protect switch position.

Table 4   Write-Protect
Switch Positions

Write-Protect Switch Position	Write-Protect Indicator	Result
Write-Protected	Visible	Data cannot be written to the tape. Existing data on the tape cannot be overwritten. Additional data cannot be appended to the media.
Write-Enabled	Not visible	Unless the cartridge is write-protected via software: • data can be written to the tape. • existing data on the tape can be overwritten. • additional data can be appended to the media.

Tape Drive Cleaning

Your tape drive's read/write head may need to be cleaned periodically. When cleaning is needed, the drive automatically requests cleaning. An autoclean operation can be managed by the backup software or the SuperLoader.

Note: Do not configure both the SuperLoader and the backup software to autoclean the drive.

You can also initiate a manual cleaning from the front panel and On-board Remote Manager as needed.

To clean your tape drive, you need to use a cleaning tape. The cleaning tape looks similar to a data tape, except the tape shell is a generally a different color, such as beige.

Note:	If Auto Clean is not enabled using the SuperLoader, you should not allocate a slot for the cleaning tape through the SuperLoader. Instead, allocate a slot through your application.

Insert the Cleaning Tape

You can insert the cleaning tape by one of the following methods:

- Load the cleaning tape directly into an ejected magazine and then reload the magazine (see Eject a Magazine on page 82).

- Insert the cleaning tape through the mailslot.

To Insert a DLT/SDLT Cleaning Tape through the Mailslot:

Note:	This process is for the SuperLoader DLT with firmware versions **prior to v45**.

1 On the main menu, scroll to **Command**, then press **Enter**.

2 On the Command submenu, scroll to **Cleaning Tape**, then press **Enter**.

3 On the Cleaning Tape submenu, scroll to **Enter Cleaning Tape**, then press **Enter**. A countdown appears on the LCD. You have 20 seconds to insert the cleaning tape through the mailslot before it re-locks. Push the cartridge in until you meet resistance. If you do not push the cartridge in far enough, the SuperLoader rejects the tape.

4 Once you have inserted the cartridge, the prompt Enter to Continue appears. You have 20 seconds to respond, then press **Enter**.

Note:	If the insert cartridge function fails, the cartridge ejects and you will have to perform steps 3 and 4 again.

5 Once you insert the cleaning tape through the mailslot, proceed directly to manual cleaning or store the cleaning tape in a magazine slot to be used later (see Manual Cleaning (DLT/SDLT Only)).

To Insert an LTO Cleaning Tape Through the Mailslot:

> **Note:** This process is for the SuperLoader LTO with firmware
> version **v20 or later**, and the SuperLoader DLT with firmware
> versions **v45 or later**.

1 On the main menu, scroll to **Configuration**, then press **Enter**.

2 On the Configuration submenu, select **Auto Clean**, then press **Enter**.
The system displays a magazine map (see figure 51) and prompts
you to select a location for the cleaning tape.

Figure 51 Magazine
Map

Slot 1	Slot 2*	Slot 3*	Slot 4*
Slot 5	Slot 6	Slot 7*	Slot 8*
Slot 9	Slot 10	Slot 11*	Slot 12*
Slot 13*	Slot 14	Slot 15	Slot 16!
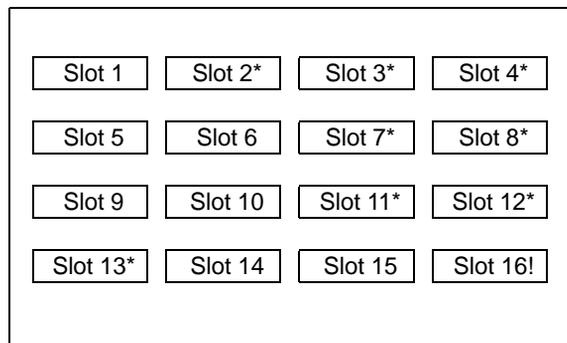
3 Scroll to the slot where you want to store the cleaning tape, then press
Enter.

4 Insert the cleaning cartridge into the mailslot. The SuperLoader
automatically moves the cleaning cartridge to the location you
selected in step 3.

> **Note:** Since the cleaning cartridge is stored in a designated slot as
> part of the insertion procedure, a separate procedure to
> store the cleaning tape is not required.

Storing the Cleaning Tape (DLT/SDLT Only) in a Magazine

Storing your DLT/SDLT cleaning tape in a magazine is a good practice. When you store the cleaning tape, you can use it in the following ways:

• You can use it later for manual cleaning (see Manual Cleaning (DLT/SDLT Only)).

• If the Auto Clean function is enabled, the SuperLoader can move the cleaning tape from the magazine slot to the tape drive and, after the cleaning cycle, return it to its slot (see Auto Clean).

• If the backup software's cleaning function is enabled, the software can move the cleaning tape from the magazine slot to the tape drive and, after the cleaning cycle, return it to its slot. For more information, see your backup software's documentation.

To Store the DLT/SDLT Cleaning Tape:

Note: This process is for the SuperLoader DLT with firmware versions **prior to v45**.

1 After you insert the DLT/SDLT cleaning tape through the mailslot, scroll to **Configuration** on the main menu, then press **Enter**. The Configuration submenu appears.

2 On the Configuration submenu, scroll to **Tape Location**, then press **Enter**. A map of all the magazine slots appears (see figure 51).

Whenever a map of the magazine slots appears on the display, an asterisk (*****) indicates a slot that is occupied by a data cartridge, and an exclamation point (**!**) indicates a slot that is assigned to a cleaning cartridge. An ampersand (**@**) indicates an empty slot that is reserved for use by a cleaning cartridge.

3 Scroll to the slot where you want to store the cleaning tape, then press **Enter**. The SuperLoader moves the tape to its new location.

Note: If you store the cleaning tape, you must specify in which slot the tape is to be stored.

Eject the Cleaning Tape

You need to eject the cleaning tape from the SuperLoader under the following conditions:

- If you do not want to store the cleaning tape in a magazine slot after manually cleaning the tape drive (DLT/SDLT only)

- If the cleaning tape has expired

When the tape has been used up, Cleaning Tape Expired appears on the front panel LCD. If you store your cleaning tape, store a new cleaning tape after you eject the expired one (see Manual Cleaning (DLT/SDLT Only)).

**To Eject a DLT/SDLT Cleaning Tape
(on Libraries with Firmware prior to v45):**

1 On the main menu, scroll to **Command**, then press **Enter**.

2 On the Command submenu, scroll to **Cleaning Tape**, then press **Enter**.

3 On the Cleaning Tape submenu, scroll to **Eject Cleaning Tape**, then press **Enter**. The SuperLoader ejects the cleaning tape from the mailslot.

**To Eject a Cleaning Tape
(on Libraries with Firmware v45 or later):**

1 On the main menu, scroll to **Configuration**, then press **Enter**.

2 On the Configuration submenu, scroll to **Auto Clean**, then press **Enter**. This deselects Auto Clean and causes the cleaning tape to be ejected.

Tape Drive Cleaning Methods

You can clean your tape drive in three ways:

- Manual cleaning (DLT/SDLT only)

- Auto Clean

- Software

**Manual Cleaning
(DLT/SDLT Only)**

If neither Auto Clean nor the backup software's cleaning option are enabled, and the drive requires cleaning, the SuperLoader displays a cleaning message on the LCD.

> **Note:** This process is for the SuperLoader DLT with firmware versions **prior to v45**.
>
> For SuperLoader DLT and SuperLoader SDLT units with firmware versions of **v45 or later**, a manual clean can be done by simply moving a cleaning tape to the drive. You can either insert a cleaning tape from the mailslot directly to the drive as shown in Insert a Single Cartridge on page 78, or if the cleaning tape resides in a magazine slot, see Move a Single Cartridge on page 80.

> **Caution:** Because the cleaning cartridge is abrasive, you should not use it unless the cleaning message appears.

To Clean the Tape Drive Manually:

1 On the main menu, scroll to **Command**, then press **Enter**.

2 On the Command submenu, scroll to **Cleaning Tape**, then press **Enter**.

3 On the Cleaning Tape submenu, scroll to **Load to Drive**, then press **Enter**. The SuperLoader moves the cleaning tape from its slot to the tape drive and then cleans the drive with it. When the cleaning is finished, you must return the cleaning tape to its magazine slot.

4 On the main menu, scroll to **Command**, then press **Enter**.

5 On the Command submenu, scroll to **Cleaning Tape**, then press **Enter**.

6 On the Cleaning Tape submenu, scroll to **Unload from Drive**, then press **Enter**. The SuperLoader removes the cleaning tape from the tape drive.

7 When you have finished manually cleaning the tape drive, do one of the following:

- Store it to its magazine slot (see <u>Storing the Cleaning Tape (DLT/ SDLT Only) in a Magazine</u>).

- Eject the cleaning tape from the SuperLoader (see <u>Eject the Cleaning Tape</u>).

Auto Clean

The Auto Clean feature permits the SuperLoader to automatically perform the cleaning process without interrupting normal operations. The Auto Clean feature is disabled (turned off) by default.

With Auto Clean enabled, the SuperLoader monitors the cleaning requirements of the tape drive. When the drive indicates a Cleaning Needed status, the SuperLoader automatically checks the tape drive for a data cartridge and, if a data cartridge is loaded, the SuperLoader waits for the host to eject the cartridge from the drive. Then, the SuperLoader removes the cleaning cartridge from its slot and inserts it into the tape drive. After the cleaning completes, the SuperLoader puts the cleaning tape away and then awaits the next command. Even if the user requests a data cartridge to be loaded, the SuperLoader uses the cleaning tape first.

During the cleaning cycle, the LCD screen shows the following messages indicating the progress:

- Loading Cleaning Cartridge. The SuperLoader is loading the cleaning cartridge from its magazine slot into the tape drive.

- Cleaning Drive. The cleaning cartridge is running in the tape drive.

- Unloading Cleaning Cartridge. The SuperLoader is returning the cleaning tape to its magazine slot.

> **Note:** If you enable Auto Clean, make sure the cleaning option in your backup software is turned off.

After completing the cleaning cycle, the SuperLoader returns the cleaning cartridge to its slot.

Before you enable the Auto Clean option, you must designate which slot contains the cleaning cartridge and load the cleaning cartridge into that slot. If you have not done this, the SuperLoader will not allow you to enable Auto Clean.

To Set Auto Clean:

1 On the main menu, scroll to **Configuration**, then press **Enter**.

2 On the Configuration submenu, scroll to **Cleaning Tape**, then press **Enter**.

3 On the Cleaning Tape submenu, scroll to **Auto Clean On/Off**. If Auto Clean is enabled, the menu item appears as Auto Clean On. If Auto clean is disabled, it appears as Auto Clean Off.

4 To change the setting, press the up or down scroll key once, then press **Enter**.

Software

Set the cleaning option in your software application (if available) so that the software monitors drive cleaning. If your application software supports automatic cleaning, store a cleaning cartridge in the slot specified by the application.

Figure 52 Media
Compatibility Chart
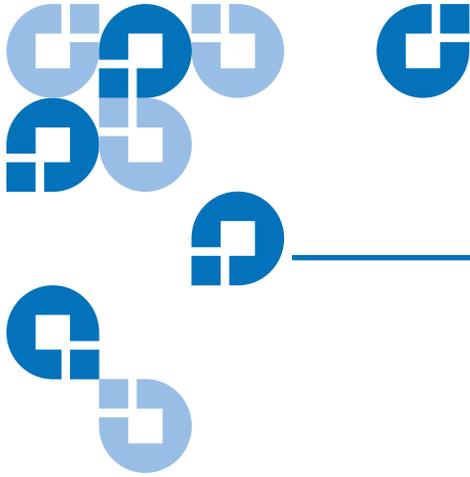
SuperLoader Operation

This chapter describes how to operate the SuperLoader.

You can operate the SuperLoader by any of the following methods:

- SuperLoader's front panel
- Ethernet On-board Remote Management
- Host backup software

The front panel is located on the front of the SuperLoader and must be operated manually.

The Ethernet connection allows you to perform administrative functions remotely using On-board Remote Management.

The SCSI bus connects the SuperLoader to the host server and the backup software. You can perform any functions contained in the backup software.

Front Panel Components

The front panel includes a blue backlit LCD, four function keys (▲ [scroll up], ▼ [scroll down], **Enter**, and **Escape**), and two LEDs.

Function Keys   Use the function keys to navigate through the menu and select options. Use the up and down scroll buttons to position the cursor next to the item you want. Once the cursor is in place, press **Enter** to select the item. To return to a previous menu without making a selection, use the **Escape** button. The **Escape** button can also function as a backspace key.

LEDs   The LEDs display SuperLoader and drive status information. When the SuperLoader is powered on, the left, green LED gives ready status information, and the right, amber LED gives fault status information.

Table 5   LED Display

Indicator	State	Operating Condition
Left (green)	On	SuperLoader and tape drive are idle.
	Slow flash	Tape drive only is active.
	Fast flash	SuperLoader only is active or SuperLoader and tape drive are active.
Right (amber)	Off	No errors or problems detected.
	On	Tape drive or SuperLoader error is detected.
	Continuous flash	Non-hardware error or attention message is detected (for example, cleaning is required).
	Brief flash	POST in progress.

LCD   The screen displays a scrolling menu that allows you to access
                            information and execute commands.

> **Note:**   When the SuperLoader is idle for a few minutes, the logo
>   screen saver appears on the LCD. Press any function key to
>   bring up the top-level menu.

The four menus displayed on the LCD are circular menus. That is, you
can scroll through the options using either the up or down scroll buttons.

Front Panel Menus

The first menu on the front panel contains the top-level menu items, each
of which contains submenus as shown in <u>figure 53</u> (SuperLoader DLT)
and <u>figure 54</u> (SuperLoader LTO).

Figure 53 SuperLoader
DLT Menu Tree
Structure

Status	Commands	Configuration	Diagnostics
AutoLoader	**Eject**	**SCSI ID**	**Error Logs**
Status	Tape to Mail Slot	**Ethernet**	Hard
Version	By Barcode	Set IP	Soft
Element Status	By Location	DHCP	Update
Drive	From Drive	Static IP	Halt Test
Status	Right Magazine	Set Subnet Mask	Self Test
Version	Left Magazine	Set Gateway	Health Check
Ethernet	**Enter (Mail Slot)**	Set SNMP Server	Picker Test
	To Drive	Set Time Server	Magazine Test
	To Location	**Time**	Inventory Test
	Move	Set Timezone	Drive Read Test
	Inventory	Set Date/Time	Drive Write Test
	Enter Password	**Change Mode**	Drive Read/Write
	Operator	Random	Sales Demo
	Administrator	Mixed	
	Log Out	Sequential	
	Cleaning Tape	Seq Cycle Mode	
	Load to Drive	**Cleaning Tape**	
	Unload from Drive	Auto Clean	
	Enter Cleaning Tape	Tape Location	
	Eject Cleaning Tape	**Magazines**	
	Sequential Ops	Both	
	Start	Left	
	Resume	Right	
	Stop	**Compression**	
	Home	**Security**	
		Security	
		Set Password	
		Operator	
		Administrator	
		System Update	

Figure 54 SuperLoader
LTO Menu Tree
Structure

Status

AutoLoader
- Status
- Version
- Element Status

Drive
- Status
- Version

Ethernet

Flex IO

Commands

Eject
- Tape to Mail Slot
  - By Barcode
  - By Location
  - From Drive
- Right Magazine
- Left Magazine

Enter (Mail Slot)
- To Drive
- To Location

Move

Inventory

Enter Password
- Operator
- Administrator

Log Out

Sequential Ops
- Start
- Resume
- Stop

Home

Configuration

SCSI ID
- SCSI ID Drive
- SCSI ID Loader

Ethernet
- Set IP
  - DHCP
  - Static IP
- Set Subnet Mask
- Set Gateway
- Set SNMP Server
- Set Time Server
- Set Speed
  - 10 Mbps
  - 100 Mbps
  - Auto Negotiate

Time
- Set Timezone
- Set Date/Time

Change Mode
- Random
- Sequential
- Seq Cycle Mode

Cleaning Tape
- Auto Clean

Magazines
- Both
- Left
- Right

Security
- Security
- Set Password
  - Operator
  - Administrator

Restore Mfg Defaults

System Update

Diagnostics

Error Logs
- Hard
- Soft
- Update

Halt Test

Self Test

Health Check

Picker Test

Magazine Test

Inventory Test

Sales Demo

All the functionality accessed from the scrolling menu is password-protected. Two levels of security are built into the menu. The lower-level security is the operator level and the higher-level security is the administrator level. There is one password for each level.

The administrator password allows access to all the functionality available. The operator password allows access to all the functionality in the **Command** and **Status** submenus.

Commands Menu

Using the **Commands** menu, you can perform the following procedures. The list of procedures follows the order of the **Commands** menu.

-

-

-

-

-

-

- Enter Passwords

-

-

- Logout

-

Status Menu

Using the **Status** menu, you can perform the following procedures. The list of procedures follows the order of the **Status** menu.

-

-

-

-

-

-

Configuration Menu

Using the **Configuration** menu, you can perform the following procedures. The list of procedures follows the order of the **Configuration** menu.

-

-

-

-

-

-

-

Diagnostics Menu

Using the **Diagnostics** menu, you can view the Error Logs and also run diagnostic tests.

Front Panel Functionality

> **Note:** If security is enabled and you try to execute a command without entering a password, the SuperLoader displays the **Enter Password** screen until you enter a password. Once you enter a password, the SuperLoader takes you back to the command screen that you were at prior to entering the password.

You can perform the following functions through the front panel.

Enter Passwords

Many functions on the SuperLoader may be password protected to ensure data integrity. To access the menu items necessary to execute these functions, you must first enter your password. All passwords are six numeric digits long.

To Enter a Password:

Security must be turned on before you can enter a password (see Set Security Options on page 118).

1   On the main menu, scroll to **Commands**, then press **Enter**.

2   On the Commands submenu, scroll to **Enter Password**, then press **Enter**.

3   On the Enter Password submenu, scroll to:

   • **Operator** to enter an operator-level password.

   • **Administrator** to enter an administrator-level password.

4   Press **Enter**. The Login screen appears with a row of asterisks. A textbox appears above the first asterisk.

5   In the textbox, scroll to the first number of the password. The cursor automatically appears at the first character of the password. The following is an example screen for an Administrator.

Figure 55 Log In Sample

```
                Login as
                Administrator
                0
                ******
```
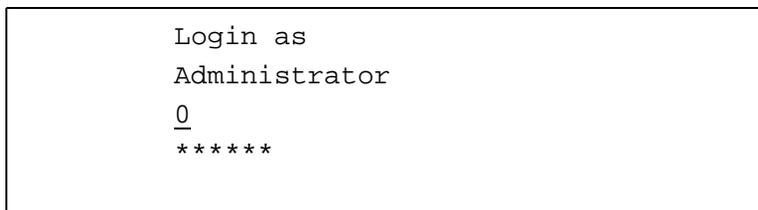
6   At each position of the password, use the up and down arrow to change the value of each number. Press **Enter** to advance your cursor to the next digit.

> **Note:**   If you make a mistake, press **Escape** to backspace to the digit you want to change.

7   Press **Enter**. The textbox above the asterisk disappears and another textbox appears above the next asterisk.

8   Repeat steps 6 and 7 to enter the remaining digits of your password. When you have finished entering your password, the LCD displays Submit Password below the asterisks.

9 Press **Enter** to submit your password. You return to the Enter Password submenu. If you submitted an incorrect password, Incorrect appears on the LCD and the row of asterisks reappears so that you can re-enter the password.

When you enter a password, all password-protected functionality is available until you log out (see Logout). If you do not use the front panel for a period of time, the logo reappears on the LCD. When the logo reappears, the SuperLoader has automatically logged you out. You will have to re-enter your password again to access the menu functionality.

Logout

To logout of the SuperLoader, use the following procedure.

1 On the main menu, scroll to **Commands**, then press **Enter**.

2 On the Commands submenu, scroll to **Log Out**, then press **Enter**. Session Complete appears on the LCD.

> **Note:** You can also press **Escape** to log out. Continue pressing **Escape** as required until the logo appears.

Set Change Mode Settings

To modify the change mode, see Setting the Change Mode on page 46.

Using Data Cartridges

If your SuperLoader is equipped with the DLT1 drive, you must use DLTtape IV media. If your drive is the SDLT 220, SDLT 320, or SDLT 600 drive, it can read DLTtape IV media but can read and write only to SDLT tape. If your SuperLoader is equipped with the LTO drive, it can read and write to Ultrium format tape only.

If you try to load an incompatible tape, the fault status LED will show solid yellow and the LCD screen shows an error message.

Typically, when you first install your SuperLoader, you load your cartridges into the magazines and then load the magazines into the SuperLoader. However, you can insert and eject cartridges individually using the mailslot, or you can eject a magazine, manually load and unload cartridges, then load the magazine back into the SuperLoader. The SuperLoader automatically detects the presence of a cartridge in the magazine slot.

> **Note:** On the front panel menu, whenever you see **Enter** or **Eject**, it means the tape enters and leaves the SuperLoader through the mailslot. Whenever you see **Load** or **Unload**, it means the tape is loaded into or unloaded from the tape drive.

If you try to perform an illegal operation, the SuperLoader refuses to perform the operation. For example, if you try to load a cartridge through the mailslot to the drive but the drive already contains a cartridge, the mailslot does not unlock. If you try to unload a cartridge from the drive while the SuperLoader is writing to the tape, the command will not be initiated until the write command is completed.

Insert a Single Cartridge

When you want to load a single cartridge into the SuperLoader, you can use the mailslot. However, if the Security option is turned on, you have to enter a valid password to unlock the mailslot before you can load a cartridge. When you insert a cartridge through the mailslot, you can load it into the tape drive or store it in a magazine.

To Insert a Cartridge in the Tape Drive:

1 On the main menu, scroll to **Commands**, then press **Enter**.

2 On the Commands submenu, scroll to **Enter**, then press **Enter**.

3 On the Enter submenu, scroll to **To Drive**, then press **Enter**.

> **Note:** After Load cartridge appears on the LCD, a countdown appears. You have 20 seconds to load a cartridge through the mailslot before it re-locks.

> **Note:** For the SuperLoader DLT, push in the cartridge until you meet resistance. The cartridge will be about two inches (5.0 cm) inside the mailslot, and only the end of the cartridge will be visible through the mailslot door.
>
> For the SuperLoader LTO, push in the cartridge completely. The door cover drops and lightly taps your fingers when the cartridge is inserted completely.

Figure 56 Loading a
Cartridge (SDLT Tape
Shown)

4 Once you have inserted the cartridge, the prompt Enter to Continue appears. You have 20 seconds to press **Enter** in response.

> **Note:** If the insert cartridge function fails, the cartridge ejects and you will have to perform steps 3 and 4 again.

To Insert a Cartridge in a Magazine Slot:

1 On the main menu, scroll to **Commands**, then press **Enter**.

2 On the Commands submenu, scroll to **Enter**, then press **Enter**.

3 On the Enter submenu, scroll to **To Location**, then press **Enter**. A map of all the magazine slots appears. Slots that are occupied by a data cartridge are indicated by an asterisk (*****). The slot that is occupied by a cleaning tape is indicated with an ampersand (**@**), if AutoClean is enabled.

4 Scroll to the slot where you want to store the cartridge, then press **Enter**. After Load cartridge appears on the LCD, a countdown appears. You have 20 seconds to load a cartridge through the mailslot before it re-locks. The SuperLoader automatically loads the cartridge into the selected slot.

> **Note:** If the load cartridge function fails, the cartridge ejects and you will have to perform steps 3 and 4 again.

5 Once you have inserted the cartridge, the prompt Enter to Continue appears. You have 20 seconds to press **Enter** in response.

Move a Single Cartridge

You can easily move a single cartridge from one location to another inside the SuperLoader.

To Move a Single Cartridge:

1 On the main menu, scroll to **Commands**, then press **Enter**.

2 On the Commands submenu, scroll to **Move**, then press **Enter**. The Move screen appears under **From:**, scroll to the current location of the cartridge you want to move. Slots that are occupied by a data cartridge are indicated by an asterisk (*****), then press **Enter**.

3 Under **To:**, scroll to the location to which you want to move the cartridge. Slots that are occupied by a data cartridge are indicated by an asterisk (*****), then press **Enter**. The LCD shows Ent or Esc? below your selections.

4 Press **Enter**. An hourglass appears on the LCD as the SuperLoader moves the cartridge to its new location.

If you select an empty location, No Source Element appears on the LCD. Choose a different location.

If you select a location that is already occupied, Destination Full appears on the LCD. Choose a different location.

Eject a Single Cartridge

When you want to remove a single cartridge from the SuperLoader, you can specify the cartridge you want by bar code or location, or choose the cartridge currently in the tape drive.

To Eject a Cartridge by Bar Code:

1 On the main menu, scroll to **Commands**, then press **Enter**.

2 On the Commands submenu, scroll to **Eject**, then press **Enter**.

3 On the Eject submenu, scroll to **Cartridge**, then press **Enter**.

4 Scroll to **By Barcode**. A bar code label appears.

5 Scroll to the label that corresponds to the cartridge you want to eject. Press **Enter**. An hourglass appears on the LCD as the cartridge you want is ejected from the mailslot. Wait until the hourglass disappears from the LCD before pulling out the cartridge.

To Eject a Cartridge by Location:

1 On the main menu, scroll to **Commands**, then press **Enter**.

2 On the Commands submenu, scroll to **Eject**, then press **Enter**.

3 On the Eject submenu, scroll to **Cartridge**, then press **Enter**.

4 Scroll to **By Location**. A map of all the magazine slots appears. Slots that are occupied by a data cartridge are indicated by an asterisk (*****). The slot that is occupied by a cleaning tape is indicated with an ampersand (**@**), if AutoClean is enabled. Scroll to the slot containing the cartridge you want to eject.

5 Press **Enter**. An hourglass appears on the LCD as the cartridge you want is ejected from the mailslot. Wait until the hourglass disappears from the LCD before pulling out the cartridge.
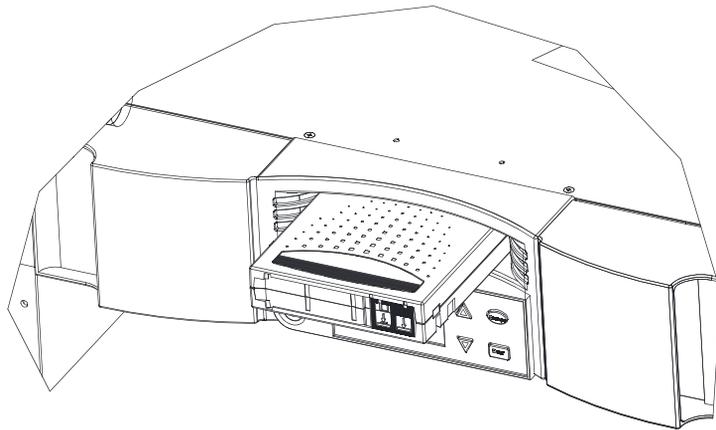
To Eject a Cartridge from the Tape Drive:

1 On the main menu, scroll to **Command**, then press **Enter**.

2 On the Commands submenu, scroll to **Eject**, then press **Enter**.

3 On the Eject submenu, scroll to **Cartridge**, then press **Enter**.

4 Scroll to **From Drive**, then press **Enter**. An hourglass appears on the LCD as the cartridge you want is ejected from the mailslot. Wait until the hourglass disappears from the LCD before pulling out the cartridge.

Use of Magazines and Magazine Blanks

The SuperLoader will not run unless both magazine openings are properly closed. One way that you can close the openings is to use two magazines. If you use only one magazine, then you must fill the other magazine opening with a magazine blank for the unit to become operational. For more information on changing magazines and blanks, refer to the *SuperLoader Magazine Installation and Configuration Quick Start Guide*.

Note:	Magazines, magazine blanks, and magazine handles are not interchangeable between the SuperLoader DLT and the SuperLoader LTO. Please order the appropriate part numbers when replacing these items.

Caution:	When removing magazines or blanks, be certain that no robotic operations are in process. Failure to do so will stop the robot.

Eject a Magazine

When you want to remove several cartridges at once, eject the magazine(s) first.

To Eject a Magazine:

1 On the main menu, scroll to **Commands**, then press **Enter**.

2 On the Commands submenu, scroll to **Eject**, then press **Enter**.

3 On the Eject submenu, scroll to **Right Magazine** or **Left Magazine**, then press **Enter**. You will hear a distinctive popping sound as the appropriate magazine is ejected from the SuperLoader. Left magazine has been ejected or Right magazine has been ejected appears on the LCD.

Caution:	To prevent damage to the SuperLoader or the magazine, use both hands when removing the magazine from the SuperLoader, supporting the entire length of the magazine.

4 Grasp the magazine by the handle with one hand and slide it out, supporting it underneath with the other hand.

Note:	Once you eject a magazine, you must fully remove it or fully reinstall it before power off the SuperLoader.

Install a Magazine To install a magazine into the SuperLoader, use the following procedure.

To Install a Magazine:

1 Grasp the magazine by the handle with one hand and support it underneath with the other hand.

2 Slide the magazine into the magazine bay until it clicks. Make sure that you position the magazine correctly. It should slide smoothly. If you meet resistance, verify the orientation of the magazine.

Figure 57 Installing a Magazine

Knob
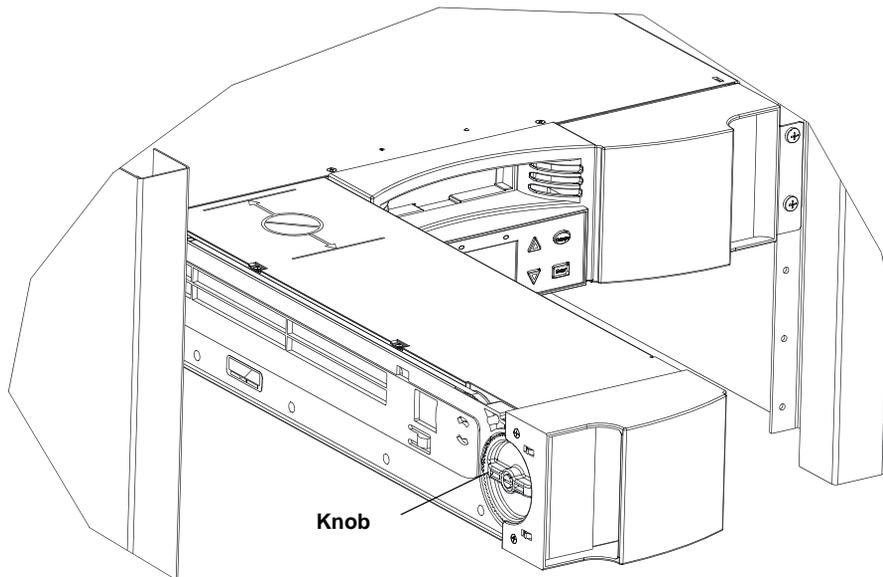
The magazine is correctly installed when you feel it click into place and the front is flush with the front panel. Left Mag Inserted or Right Mag Inserted appears on the LCD. The SuperLoader automatically runs an inventory.

Caution:	Be careful not to turn the knob at the top of the magazine while, as shown in figure 57, the magazine is partially inserted into the SuperLoader. Doing so may cause damage to the magazine or SuperLoader.

Figure 58 Installing a Magazine (continued)
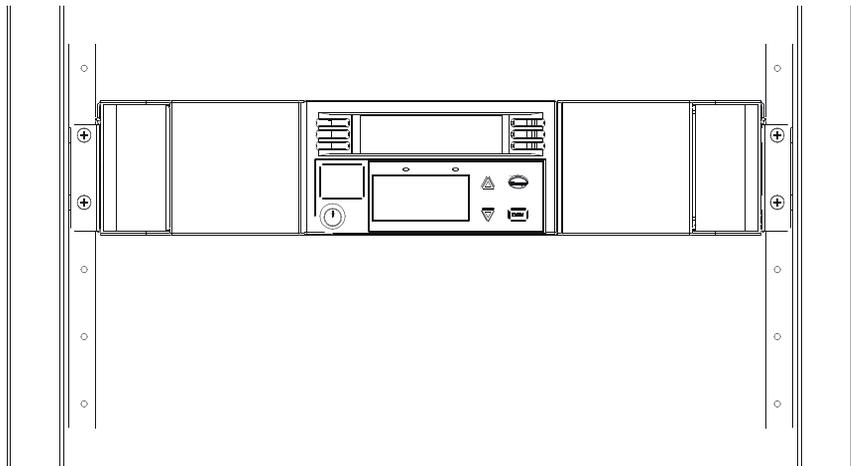
Manually Operate the Magazine

The following procedure describes how to operate a magazine.

To Load Cartridges into a Fully Ejected Magazine:

There are two knobs located on each end of the magazine. You can move the slots within the magazine by using these two knobs. You can use the two openings along the top of the magazine and the four openings along the bottom of the magazine to load and unload cartridges from the eight slots within each magazine.

Figure 59 View of
Magazines

View of right side of right magazine

Knob   **Knob**
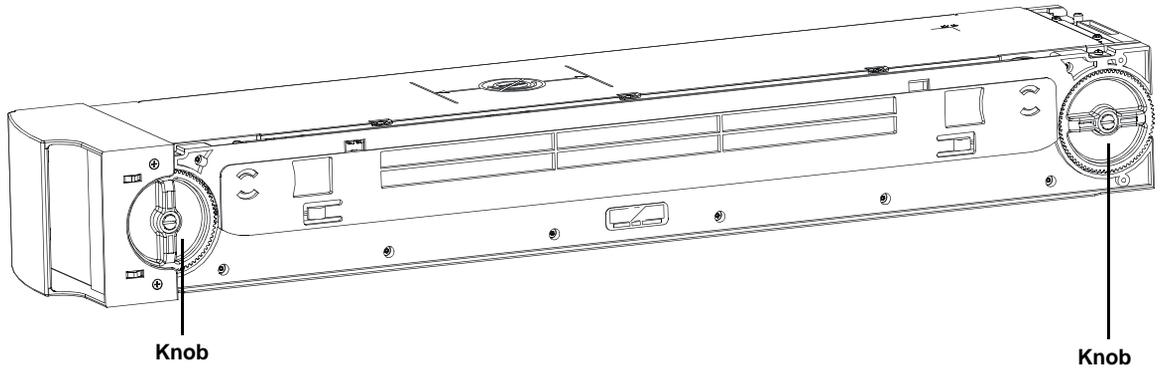
View of right side of left magazine
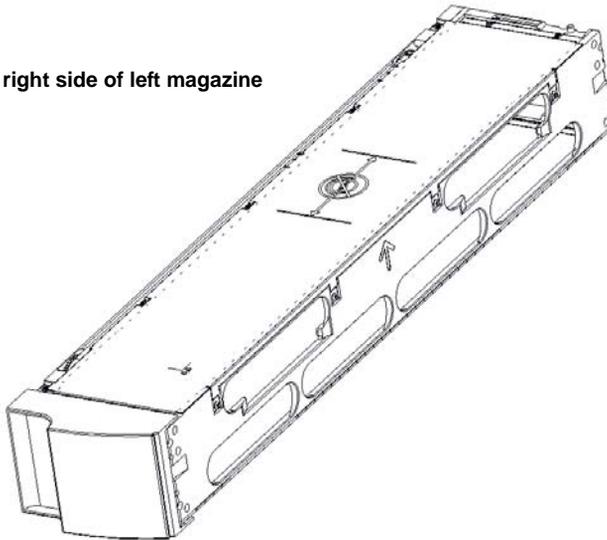
Caution:	While you can load and unload a cartridge without fully removing the magazine, it is recommended that you fully remove the magazine. If the magazine is not fully removed, do not rotate the magazine.

1 To load cartridges in the magazine, center a slot within one of the six openings located on the side of the magazine.
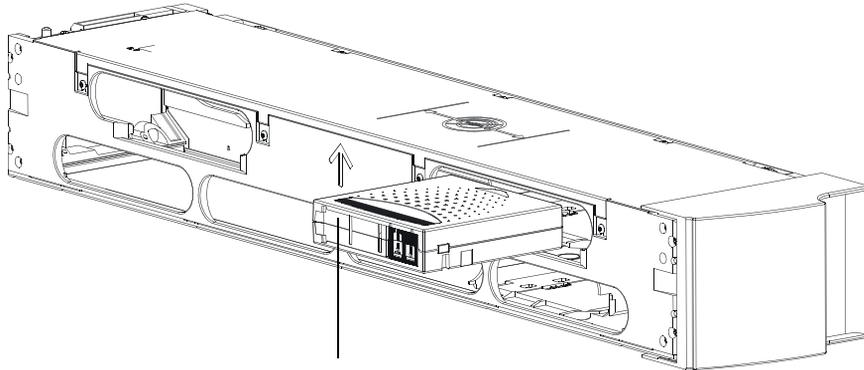
Correct orientation of cartridge relative to the magazine

2 Properly orient the cartridge.

> **Note:**   There is a keying feature in each slot that only allows you to fully insert the cartridge one way.

3 Fully insert the cartridge into the slot. When pushing the cartridge into the slot, you will feel a small resistance (detent) until the cartridge is properly latched into the slot. All forward progress stops when the cartridge is fully inserted.

> **Note:**   It is fastest to load the cartridges when the magazine is fully removed from the SuperLoader using the four lower openings. When all four are loaded, rotate the next four empty slots into position for loading the next four cartridges.

To Unload Cartridges from a Fully Ejected Magazine:

You can remove a cartridge in the same manner as you insert it. Use the knobs to center the desired slot(s) in the openings on the side of the magazine. Using your thumb and index finger, pull out the cartridge. You will feel a small resistance but continue to pull the cartridge until it comes free.

To Load and Unload Cartridges from a Partially Ejected Magazine:

You can conveniently load and unload a cartridge from the magazine without fully removing the magazine.

Caution:	When unloading or loading cartridges from a partially ejected magazine, do not manually operate the magazine when it is positioned between the two marks on the top cover. Manually operating the magazine in this location can cause damage to the SuperLoader and magazine.

1 Pull the ejected magazine until the large upper slot is accessible.

Figure 61 Upper Slot of Magazine (SDLT Shown)
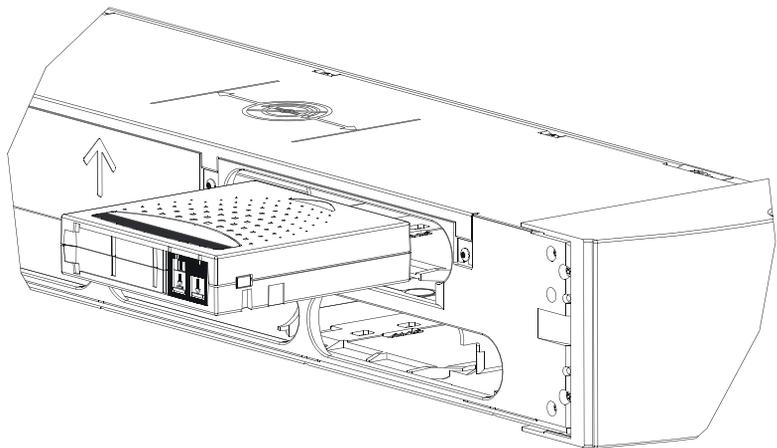
2 Rotate the desired slot into position (centered in the opening). Either load or unload a cartridge to that location. Do not expose more than the large upper opening when manually operating the magazine.

Figure 62 Top of
Magazine
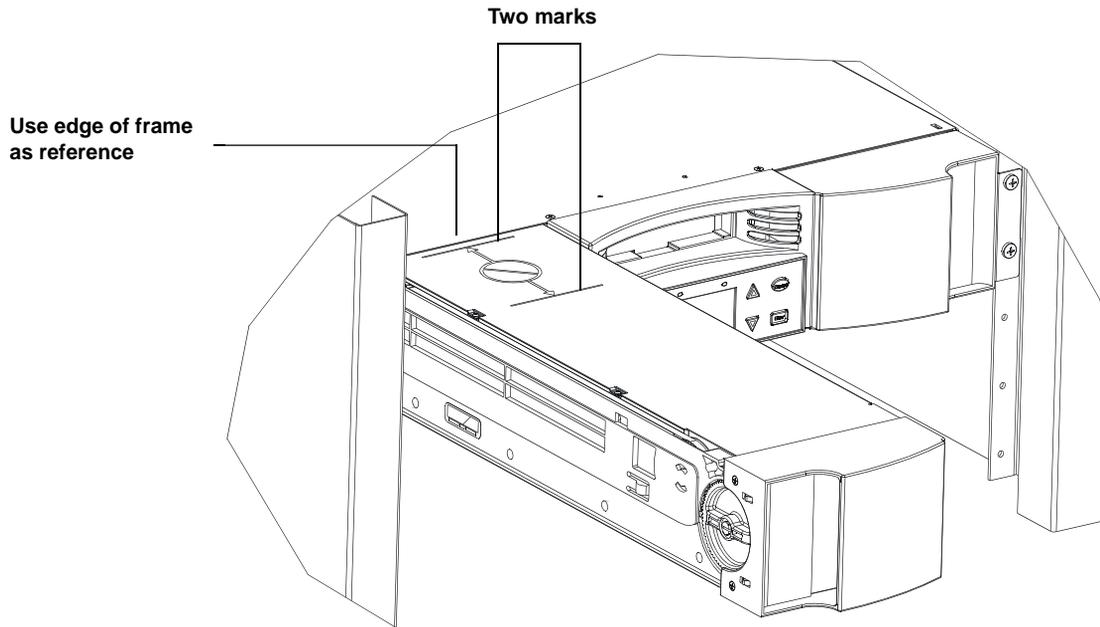
To Identify a Slot:

Each slot has an identification number that is exposed when the slots are in the upper section of the magazine. You can see the identification mark on the top side of the magazine.

Each slot has a unique identification number that corresponds to the side on which the magazine is operating. If the magazine is operating on the left side, the slots are numbered L1 through L8. If the magazine is operating on the right side, the slots are numbered R9 through R16.

Figure 63 Identifying
a Magazine Slot
(SDLT Shown)

Top of magazine view

Left side slot number **Right side slot number**
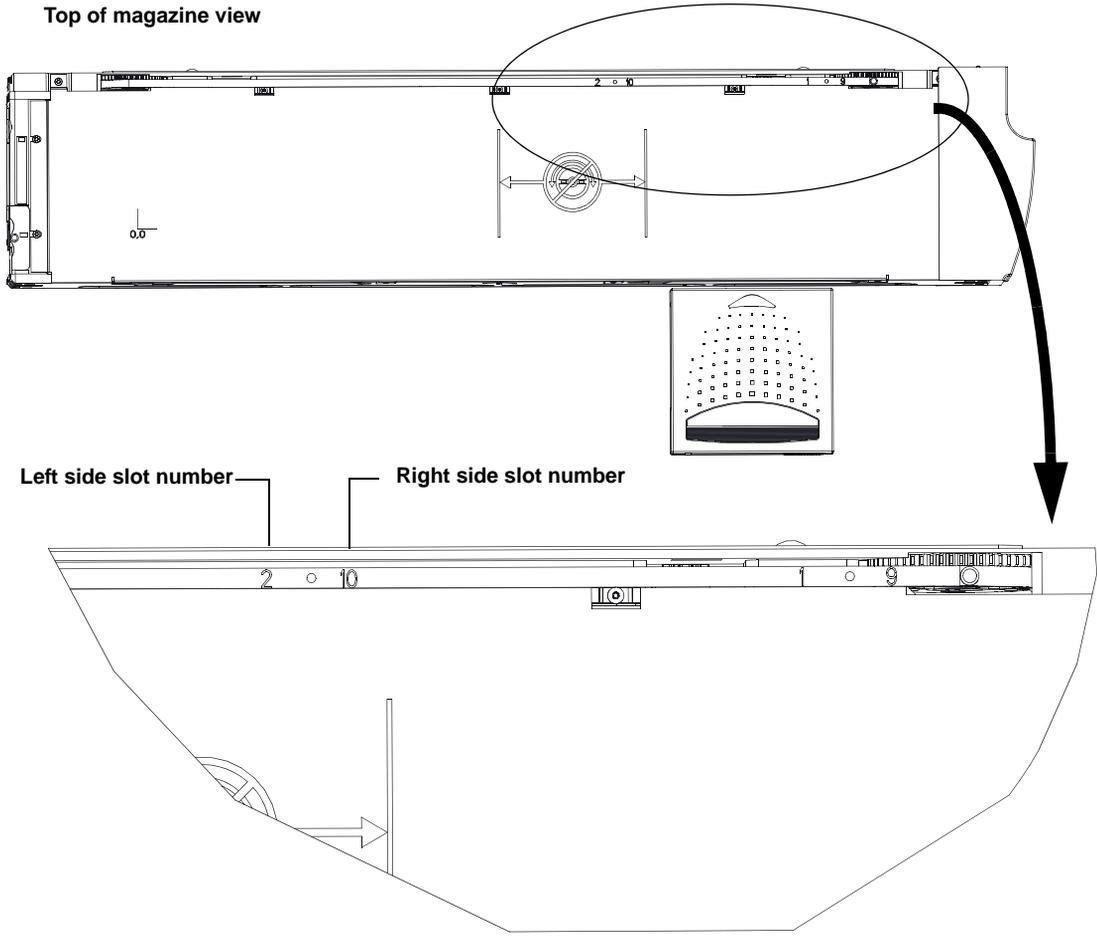
View Status Information

From the scrolling menu, you can view the following information:

- SuperLoader status
- Firmware version
- Element status
- Tape drive status
- Tape drive version
- Ethernet information

View SuperLoader Status

The SuperLoader status provides information about:

- Whether a magazine is installed or not
- SCSI connection status
- Ethernet connection status
- Whether a bar code reader is installed or not

To View the SuperLoader Status:

1 On the main menu, scroll to **Status**, then press **Enter**.

2 On the Status submenu, scroll to **SuperLoader**, then press **Enter**.

3 On the SuperLoader submenu, scroll to **Status**, then press **Enter**. A list of messages similar to the following screen appears.

Figure 64 LCD
Messages

DLT/
SDLT
```
          Magazines: L=* R=*
          Loader: ONLINE
          Drive: ONLINE
          Mode: Random
          Barcode Reader: *
```

LTO
```
          SCSI ID 4
          Magazines: L=* R=*
          Mode: Random
          Barcode Reader: *
```

Table 6 describes the meaning of each message.

Table 6 SuperLoader
Status

Magazines	
L=*	The left magazine is present.
R=*	The right magazine is present.
Loader (DLT/SDLT Only)	
ONLINE	The SuperLoader is available for use.
OFFLINE	The SuperLoader is not available.
Drive	
ONLINE	The drive is available for use.
OFFLINE	The drive is not available for use.
Mode	
Random	The change mode is set to Random.
Sequential	The change mode is set to Sequential.
Barcode Reader	
*	A bar code reader is present.

View Firmware Version

To view the current firmware version, use the following procedure.

To View the Firmware Version:

1   On the main menu, scroll to **Status**, then press **Enter**.

2   On the Status submenu, scroll to **Autoloader**, then press **Enter**.

3   On the SuperLoader submenu, scroll to **Version**, then press **Enter**. A list of messages similar to figure 65 appears.

Figure 65 Firmware Version Display

```
          Firmware: VX.XX
          EDC: 8919EE2A
          HW & ME Rev: 1 1
```

Table 7 describes the meaning of each message.

Table 7 Firmware Version Description

Firmware	The number indicates the firmware version.
EDC	The number indicates the **Error Detection Code** that was generated when the firmware was installed. The SuperLoader uses this number to verify that the firmware and the memory holding the firmware are good.
HW Rev	The number indicates the hardware version.
ME Rev	The number indicates the mechanical version.

View Element Status

The element status reports the status of the magazine slots. The status indicates whether a slot contains a cartridge or not, and which slot is allocated as the cleaning cartridge's slot.

To View an Element's Status:

1 On the main menu, scroll to **Status**, then press **Enter**.

2 On the Status submenu, scroll to **Autoloader**, then press **Enter**.

3 On the SuperLoader submenu, scroll to **Element Status**, then press **Enter**. The following appears:

Figure 66 Element Status

```
             *Drive: QWC159
             *Mailslot: QWC189
             Picker:
             Enter to View
             Magazines
```

4 Press **Enter**. A map of all the magazine slots appears. Slots that are occupied by a data cartridge are indicated by an asterisk (*****). The empty slot that is assigned to a cleaning tape is indicated with an exclamation point (**!**). The slot that is occupied by a cleaning tape is indicated with an ampersand (**@**).

Figure 67 Magazine Slot Map
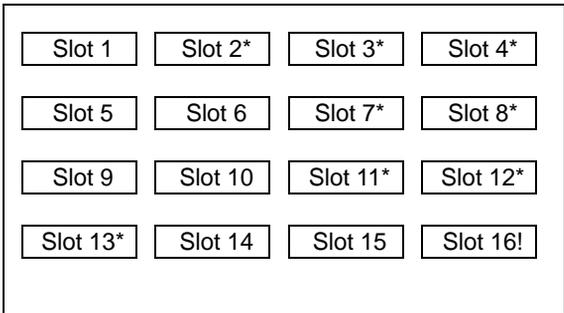
5 Scroll to the slot containing the cartridge for which you want to see the label, or the cartridge you want to move, then press **Enter**.

   The Element Status screen appears, displaying the bar code label for that cartridge. A move command also appears on the screen.

Figure 68 Element
Status

```
              Label:
              QWC159
              Move Slot 5 To:
                *Slot 16
              Esc to Exit
```

Note: The **Move** command appears only if the security is
disabled or if you are logged in as Administrator or
Operator.

a   If you want to move the cartridge scroll until the location you
want to move to appears under **TO:**, then press **Enter**.

b   If you do not want to move the cartridge, press **Escape**.

**View Tape Drive
Status**

To view the tape drive status, use the following procedure.

To View the Tape Drive Status:

1   On the main menu, scroll to **Status**, then press **Enter**.

2   On the Status submenu, scroll to **Drive**, then press **Enter**.

3   On the Drive submenu, scroll to **Status**, then press **Enter**. A list of
messages similar to figure 69 appears.

Figure 69 Tape Drive
Status (DLT/SDLT
Shown)

```
            SCSI ID 6
            Loader LUN 1
            Compression Disabled
```

Table 8 describes the meaning of each message.

SCSI ID	Indicates the drive's SCSI ID number.
Loader LUN (DLT/SDLT only)	Indicates the Logical Unit Number of the media changer device.
Compression	Indicates whether the tape drive compression is enabled or disabled.

View Tape Drive Version

To view the tape drive version, use the following procedure.

To View the Tape Drive Version:

1 On the main menu, scroll to **Status**, then press **Enter**.

2 On the Status submenu, scroll to **Drive**, then press **Enter**.

3 On the Drive submenu, scroll to **Version**, then press **Enter**. A list of messages similar to the following screen appears.

Figure 70 Tape Drive
Version

DLT/SDLT

```
Product Type: SDLT
Policy: 35.7
Servo: 35.4
```

LTO

```
Product Type: HP Ultrium 1
Version: X.XX
```

Table 9 describes the meaning of each message.

Table 9 Tape Drive Version	**Product Type**	Indicates the type of drive installed (DLT1, SDLT 220, SDLT 320, SDLT 600, or HP Ultrium 1).
	Policy (DLT/SDLT Only)	Indicates the version of the policy processor for the tape drive, typically the tape drive firmware version.
	Servo (DLT/SDLT Only)	Indicates the servo processor firmware version.
	Version (LTO Only)	Indicates the version number of the drive.

View Ethernet Information

To view the Ethernet information, use the following procedure.

To View Ethernet Information:

1 On the main menu, scroll to **Status**, then press **Enter**.

2 On the Status submenu, scroll to **Ethernet**, then press **Enter**. A list of messages similar to the following screen appears.

Figure 71 View Ethernet Information

```
MAC address:
00-e0-9e-03-0d-de
IP address:
192.168.202.128
Network: Online
```

Table 10 describes the meaning of each message.

Table 10 Ethernet
Information Messages

MAC address	The unique network identifier associated with the SuperLoader.
IP address	Indicates the static IP address or currently assigned dynamic IP address. The text DHCP displays in this case.
Network	Indicates whether the SuperLoader is connected to the network or not.

**View Flex I/O
Information**

To view the Flex I/O information, use the following procedure.

To View Flex I/O Information:

1 On the main menu, scroll to Status, then press **Enter**.

2 On the Status submenu, scroll to **Flex IO**, then press **Enter**. A list of messages similar to figure 72 appears.

Figure 72 View Flex I/O
Information (Scrolled
Down)

```
        192.168.202.128
        Network: Online
        Flex I/O Status:
        SCSI SE/LVD 80 MB/second
        Version: X.XX
```

Table 11 Flex I/O
Information

IP address	Indicates the static IP address or currently assigned dynamic IP address. The text DHCP displays in this case.
Network:	Indicates whether the SuperLoader is connected to the network or not.

Flex I/O Status:	Indicates the type of Flex I/O card that is installed
Version:	Indicates the current version of the Flex I/O firmware.

Run Inventory

The SuperLoader automatically runs an inventory whenever you power it back on or insert a magazine. An inventory checks each magazine slot, the drive, the picker, and the mailslot to determine if a cartridge is present. If so, it also reads the bar code label, if possible. If you need to run an inventory in addition to this, you can do so manually.

> **Note:** No bar code labels can be read if there is a tape in the picker.

To Perform an Inventory Manually:

1 On the main menu, scroll to **Commands**, then press **Enter**.

2 On the Commands submenu, scroll to **Inventory**, then press **Enter**. The SuperLoader scans the bar codes of all the cartridges present.

Set Data Compression

For the SuperLoader DLT, you can set the SuperLoader to write data to the tape in its native (uncompressed) format or to compress it.

> **Note:** This command is not available for the SuperLoader LTO.

Compressing the data means that the SuperLoader can write twice as much data to the same amount of tape. Compression also increases the performance of the data transfers from or to the SCSI bus. Typically you will want to leave this option enabled.

> **Note:** If the data that you are writing to the tape is already compressed, the compression option will expand the data rather than compress it.

To Set Compression Option:

1 On the main menu, scroll to **Configuration**, then press **Enter**.

2 On the Configuration submenu, scroll to **Compression**, then press **Enter**. If a check appears next to Compression, the compression option is enabled. If no check mark appears, the compression option is disabled.

   a To leave the compression option unchanged, press **Escape**.

   b To change the compression option, press **Enter**.

Updating the System

You can update your SuperLoader's firmware through the front panel, using a Firmware Upgrade Tape.

> **Caution:** Never turn off your SuperLoader or the host server or workstation during the firmware update process. Doing so can damage the tape drive's controller hardware.

To Update Firmware from a Tape:

1 If there is a cartridge currently in the tape drive, remove it before proceeding.

2 On the main menu, scroll to **Configuration**, then press **Enter**.

3 On the Configuration submenu, scroll to **System Update**, then press **Enter**. An hourglass appears on the panel display, then a 20-second countdown appears.

4 Insert the Firmware Upgrade Tape into the mailslot. The SuperLoader automatically loads the upgrade tape into the tape drive. Messages appear on the display panel to indicate the update's progress. The update typically takes two or three minutes.

5 When Reboot appears on the LCD, power the SuperLoader off then on again.

To Access a Backup Copy of the Firmware:

If a power interruption or some other interruption occurs while you are updating the firmware on the SuperLoader, the firmware may become corrupted. However, you can access a backup copy of the firmware by changing the position of the jumpers located on the front of the Drive Carrier Assembly (DCA) (see).

Figure 73 Accessing the Backup Copy of Firmware (SuperLoader DLT Shown)
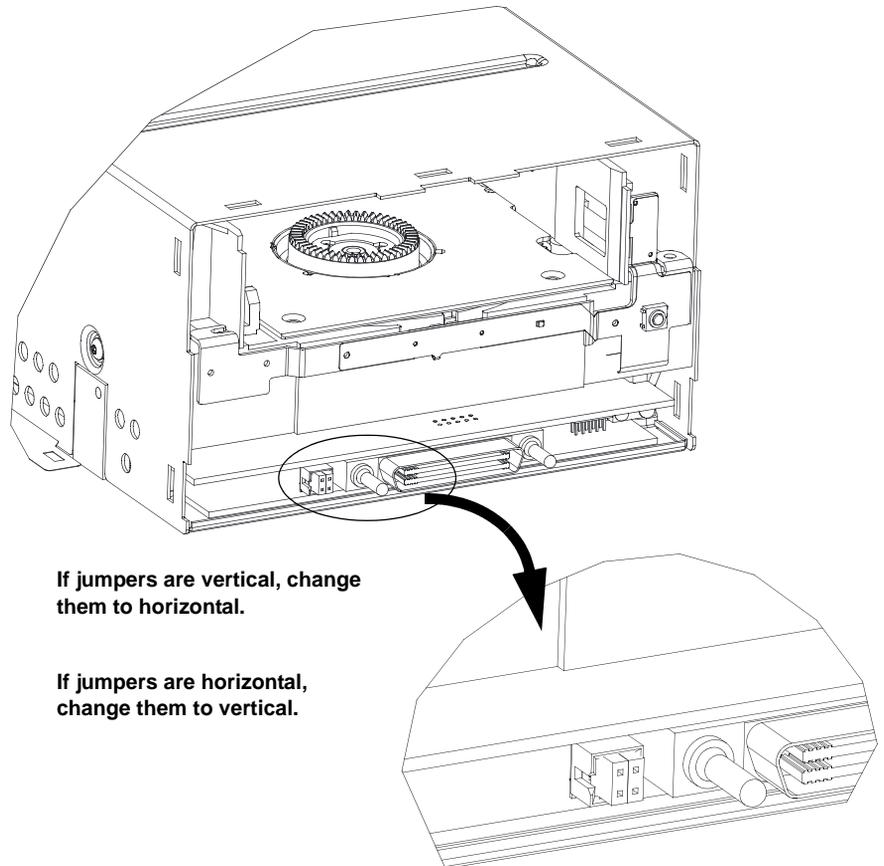
If jumpers are vertical, change them to horizontal.

If jumpers are horizontal, change them to vertical.

To Change the Position of the Jumpers:

1 Remove the DCA. For more information on this procedure, refer to the *SuperLoader Drive Carrier Assembly (DCA) Replacement Quick Start Guide*.

2 Change the jumpers from vertical to horizontal or horizontal to vertical.

3 Reinstall the DCA.

The SuperLoader will use the firmware from the backup copy. When the firmware backup copy is up and running, this copy becomes the primary and the SuperLoader runs from this location until a new firmware update is again executed.

On-board Remote Management

Your SuperLoader's firmware includes an Ethernet interface to allow remote administration of the SuperLoader. The interface, called On-board Remote Management, includes a Web server that provides an HTML-based GUI designed for ease of use.

Many of the operations that you can perform from the front panel you can also perform remotely using On-board Remote Management. You can perform the following operations from On-board Remote Management:

- <u>Moving Tapes</u> on page 106

- <u>Set to Home</u> on page 106

- <u>Sequential Operations</u> on page 107

- <u>System Operations Options</u> on page 109

- <u>Set Networking Options</u> on page 117

- <u>Set Security Options</u> on page 118

- <u>Run Diagnostic Tests</u> on page 124

- <u>Perform System Updates</u> on page 127

Open On-board Remote Management

On-board Remote Management has an HTML interface, which means you use a browser to open it. You must have Microsoft Internet Explorer 4.0 or higher, or Netscape 4.0 or higher. You need an operator password to access the **Commands** page, and you need an administrator password to access the **Configurations**, **Diagnostics**, and **Updates** pages.

To open the On-board Remote Management tool:

1 On your computer, open your browser.

2 In the browser's address field, enter the IP address for your SuperLoader (see <u>View Ethernet Information</u> on page 96).

The Home page appears in your browser window.

Chapter 4 SuperLoader Operation
On-board Remote Management

Figure 74 On-board
Remote Management
Home Page

Click Status to update the status information.

Status Information

Status Information   Status information appears on the right-hand side of the Home page and
every page of On-board Remote Management except the Updates page.
The status information is updated automatically every 60 seconds. So
changes to the status appear in the status window update, but may take
approximately 60 seconds to refresh. You can also click **Status** to get an
immediate update on the system.

The menu headings also appear at the top of every page. To access the
functionality under the menu heading, click the menu heading. The first
time that you connect, On-board Remote Management prompts you for
your username and password, then it displays the opening page for that
menu.

**Default Username
and Password**   The default username for On-board Remote Management is **guest**. The
default password is **guest.**

The username and password are case sensitive and should be entered in
all lower case letters. The default username and password are valid if no
usernames have been configured.

Time Display   The time displayed is either regular time or power-on time. Regular time
is Month/Date/Year Time, such as Nov/21/2003 19:28. Power-on time is
Power On Cycles (POC)/Power On Hours (POH), such as POC:00121,
POH: 00002:07:45.

- POC (5-digit number) is the number of times the system has booted
  since it was manufactured.

- POH is the number of hours, minutes, and seconds that the system
  has been on since the current boot occurred. For example, POC: 00121,
  POH: 00000:00:10

If regular time is known, it is used. Otherwise, power-on time is used.

**Feedback on
Pages**   If there is feedback when you submit a request, the feedback appears to
the left of the **submit** button, as shown in <u>figure 75</u>. In some cases, you
may have to scroll to see the feedback information.

Figure 75 Feedback
in On-board Remote
Management Screen
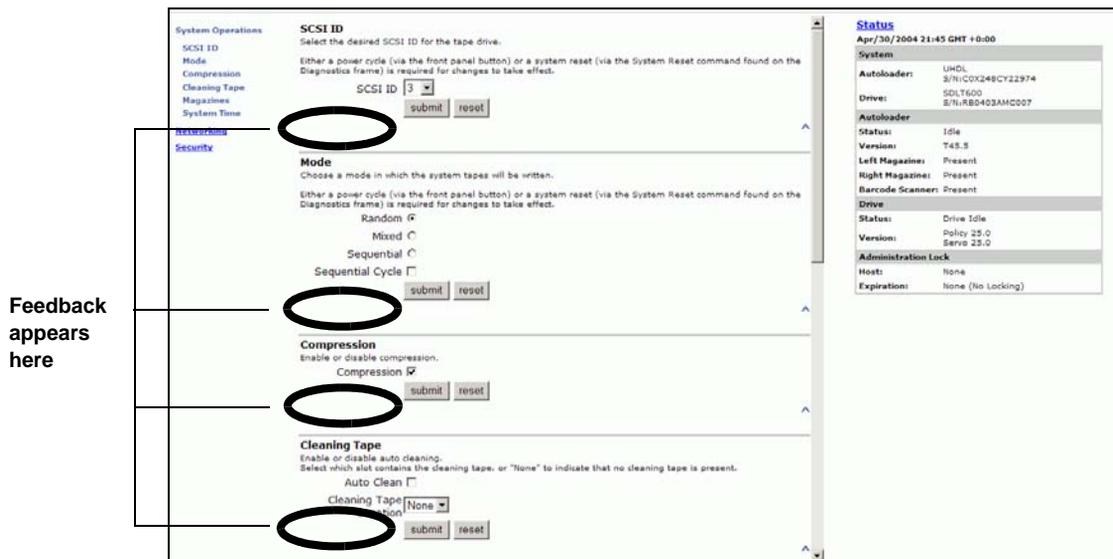
Commands Page

You can move tapes, run a system inventory, reset the picker to its home position, or perform sequential operations from the Commands page. When you click **Commands**, the following page appears:

Figure 76 Commands Page

Moving Tapes   From a remote location, you can request that a tape be moved from one
position to another.

To Move a Tape:

1 On any On-board Remote Management page, click **Commands**.

2 From the drop-down menu under **From:**, select the current location of
the tape that you want to move.

> **Note:**   You can also click the slot on the graphic to select it.

From the drop-down menu under **To:**, select the location to which you
want to move the tape, then click **submit**.

Inventory   The SuperLoader automatically runs an inventory whenever you power
it on or insert a magazine. If you need to run an inventory in addition to
this, you can use On-board Remote Management to do it remotely.

To Run an Inventory:

1 On any On-board Remote Management page, click **Commands**.

2 On the Commands page, click **Inventory**.

Set to Home   If the SuperLoader is not able to successfully execute a move or inventory
command, try executing a **Home** command and then retry the move or
inventory command again.

The **Home** command resets the SuperLoader as a means to help the
SuperLoader recover from an unexpected internal condition.

To Set to Home:

1 On any On-board Remote Management page, click **Commands**.

2 On the Commands page, click **Home**.

Sequential Operations

The Sequential Operations Mode supports certain backup applications that do not manage media. During backup, when one cartridge is read or written to the end of the tape, the SuperLoader automatically returns that cartridge to its slot and loads the cartridge from the next higher numbered slot to the tape drive to be read or written to. This continues until the backup software stops accessing the drive or until all the cartridges have been sequentially accessed. The SuperLoader does not move the media until the host requests the tape drive to unload.

- To start Sequential Operations, click **Start**. This moves the first available cartridge from the storage slot to the drive.

- To stop Sequential Operations, click **Stop**. This removes the cartridge from the drive and places it back into the cartridge's previous storage slot.

- To resume Sequential operations, click **Resume**. This moves the next cartridge to the tape drive.

> **Note:** You must perform a **Start** or **Resume** command to load a cartridge into the tape drive before starting a host backup.

Configurations Page

The Configurations page includes a submenu on the left-hand side of the page. When you click **Configurations**, the following page appears.

Figure 77 Screen for
Configurations Page

You can set the System Operations, Networking, and Security options from this page.

**System
Operations
Options**

When you click **System Operations**, the following page appears.

Figure 78 Systems
Operations Page
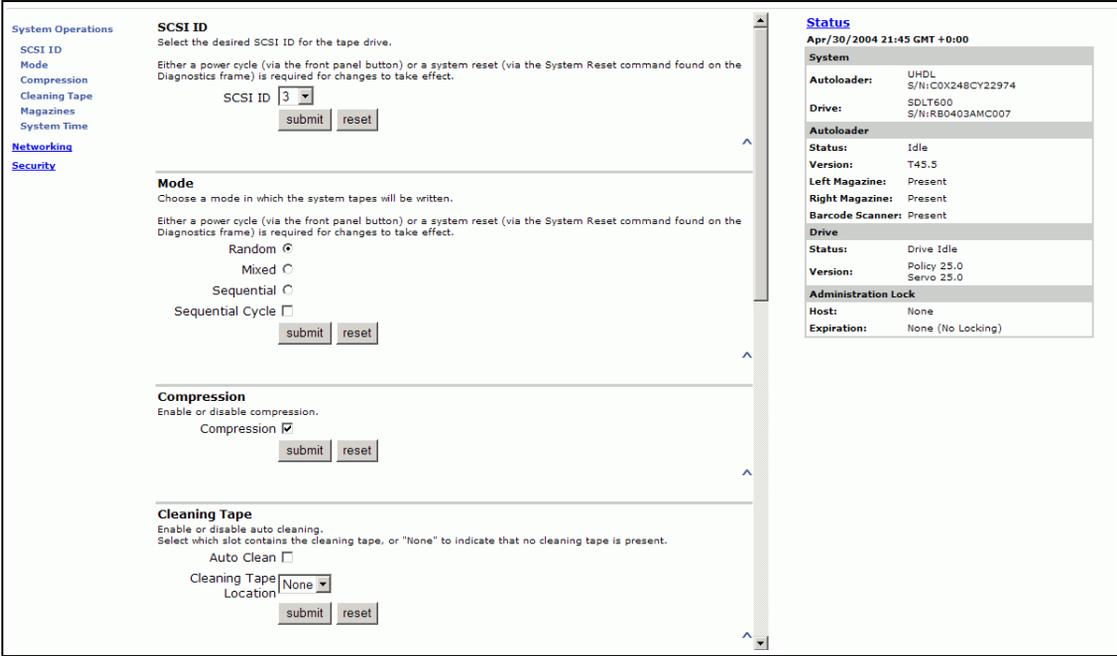
SCSI ID

You can change the SuperLoader's and tape drive's SCSI ID from On-board Remote Management.

To Change the SCSI ID:

1 On any On-board Remote Management page, click **Configurations** from the banner.

Figure 79 Screen for Configurations

2 From the drop-down list under **SCSI ID**, click the number to assign for the new SCSI ID. Both the autoloader and drive IDs must be unique on the SCSI bus.

3 Click **submit**. You must perform a system reset before the new SCSI IDs take effect, or you can use the front panel to power cycle your machine.

Set the Mode   To set the Mode on the SuperLoader, use the following procedure.

To Set the Mode:

1 On any On-board Remote Management page, click **Configurations** from the banner.

Figure 80 Setting the Mode

2 Under **Mode**, the current mode is marked. To change the mode, select a different option. The **Sequential Cycle** check box is ignored if **Sequential Mode** is not selected.

3 Click **submit**. You must perform a system reset before the new Mode takes effect, or you can use the front panel to power cycle the machine.

**View the
Compression
Setting**

To view the Compression Setting on the SuperLoader, use the following
procedure.

To View the Compression Setting:

1 On any On-board Remote Management page, click **Configurations**
from the banner.

- If a check mark appears in the box next to **Compression**,
  compression is enabled. To disable compression, click the box to
  remove the check mark.

- If no check mark appears in the box next to **Compression**,
  compression is disabled. To enable compression, click the box to
  enter a check mark.

2 Click **submit**.

Figure 81 Viewing the
Compression Setting

**Set the Cleaning
Mode**

To enable the **Auto Clean** function, you must also designate a full slot for the cleaning tape cartridge. If a slot has not been designated, the box displays None.

To designate the cleaning tape slot:

1 Load a cleaning tape into an empty slot using the Commands page (see <u>Commands Menu</u> on page 74).

2 Enable **Auto Clean**.

> **Note:** If **Auto Clean** is disabled, the cleaning tape will be automatically ejected via the mailslot.

To Set Auto Clean:

1 On any On-board Remote Management page, click **Configurations**.

2 If a check mark appears in the box next to **Auto Clean**, the option is enabled. To disable AutoClean, click the box to remove the check mark.

If no check mark appears in the box next to **Auto Clean**, the option is disabled. To enable **Auto Clean**, click the box to enter a check mark.

3 Click **submit**.

Set the Magazines

This setting is used to report the number of storage elements and the element address to the SCSI host. This setting must match the physical configuration in order for correct information to be reported. This setting only affects the information reported to the SCSI host. This setting does not affect the access to magazines slots from the front panel or On-board Remote Manager. Those interfaces are based on the physical configuration.

When configured for **Both** magazines, the SuperLoader always reports 16 storage elements to the SCSI host. This allows the removal and reinstall of magazines without affecting what is reported to the host. When configured for **Left** or **Right**, the SuperLoader will always report eight storage elements to the SCSI host.

The element addresses vary depending on which magazine is configured. If **Left** or **Right** is selected, and both magazines are physically installed, the front panel and On-board Remote Manager will allow user access to the other magazine, but the SCSI host will not have access.

To set the Magazine option:

1 On the main menu, scroll to **Configuration**, then press **Enter**.

2 On the **Configuration** menu, scroll to **Magazines**, then press **Enter**. The **Magazine** options display. A check mark appears after the currently enabled mode.

3 Do one of the following:

- To leave the **Magazine** mode unchanged, press **Escape**.

- To change the **Magazine** configuration, scroll to the setting you want for the SuperLoader, and then press **Enter**. These settings are **Both**, **Right**, and **Left**.

  The message This will require a power cycle and an ISV configuration change. Enter To Continue is displayed.

- To leave the setting unchanged, press **Escape**.

- To continue with the change, press **Enter**. The message Please power cycle the tape autoloader and reconfigure the ISV app. displays.

Set the System Time

The system time is displayed by the On-board Remote Manager and it is used internally when logging events and errors (see <u>Time Display</u> on page 104).

The SuperLoader LTO and the SuperLoader DLT with an SDLT 600 drive have the ability to keep track of time when powered off. All other SuperLoaders must be reset after each power up. The time can be reset automatically if a time server is configured (see Set Networking Options). Otherwise, the time can be set manually from the front panel or through the On-board Remote Manager. The time zone setting is not lost when powered off.

> **Note:** With the SuperLoader LTO and the SuperLoader DLT with an SDLT 600 drive, the system automatically adjusts for daylight savings time based on the time zone setting. For other SuperLoaders, whether you connect the SuperLoader to a time server or not, if you want to include time changes for daylight savings time, you must change the time zone manually.

**To Set the System Time
(for SuperLoader LTO and SuperLoader DLT with SDLT 600 drive):**

1 On any On-board Remote Management page, click **Configurations** from the banner.

2 Using the drop-down list next to **Time Zone**, select the appropriate time zone. This setting is used to manage daylight savings time changes.

3 From the **Month** drop-down list, select the current month.

4 In the **Day** field, type the current day.

5 In the **Year** field, type the current year.

6 In the **Hour** textbox, type the current hour, in 24-hour format.

7 In the **Minute** textbox, type the current minute.

8 Click **submit**. This concludes the procedure for SuperLoaders other than the SuperLoader LTO and SuperLoader DLT with an SDLT 600 drive.

**To Set the System Time
(for all other SuperLoader models):**

1 Using the first drop-down list next to **Time Zone**, select the number of hours' difference between your local time and Greenwich Mean Time (GMT).

> **Note:** For example, if you live in Colorado, the time difference is -6 hours in the summer and -7 hours in the winter (see <u>appendix C</u> on page 251).

Figure 82 Setting the System Time

2 From the second drop-down list next to **Time Zone**, select the number of minutes' difference between your local time and Greenwich Mean Time (GMT).

3 From the **Month** drop-down list, select the current month.

4 In the **Day** field, type the current day.

5 In the **Year** field, type the current year.

6 In the **Hour** textbox, type the current hour, in 24-hour format.

7 In the **Minute** textbox, type the current minute.

8 Click **submit**.

Set Networking Options

When you originally installed the SuperLoader, you set the Ethernet configurations through the front panel. However, you can change them through the On-board Remote Management tool.

To Change the Ethernet Configurations:

1 On any On-board Remote Management page, click **Configurations** from the banner.

2 On the Configurations menu, click **Networking** (see figure 83).

Figure 83 Setting Network Options
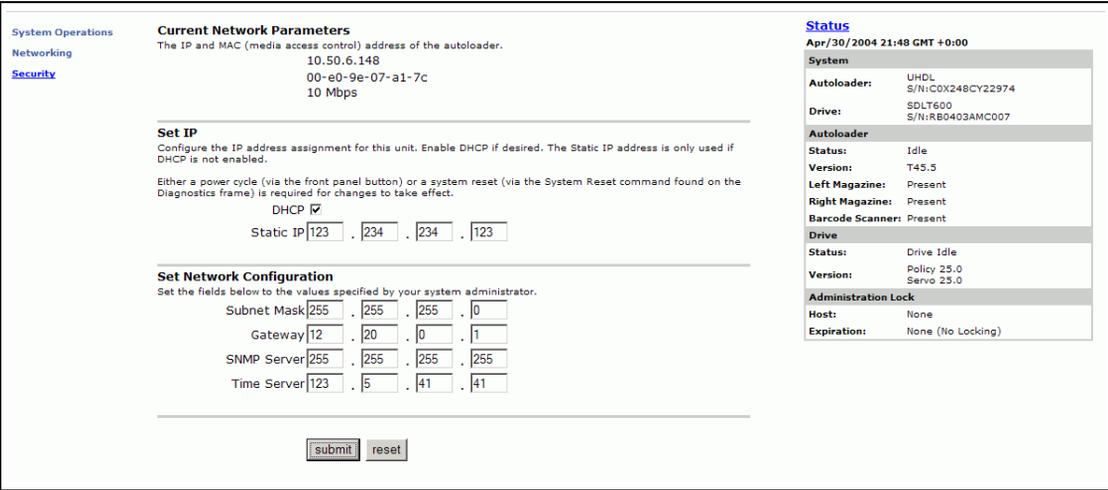
3 If a check mark appears in the box next to **DHCP**, the dynamic IP address option is enabled. To set a static IP address:

    a Clear the check box to remove the check mark.

    b In the IP address fields, type the static IP address, using the **Tab** key to move from box to box.

4 If no check mark appears in the box next to **DHCP** (Dynamic Host Configuration Protocol), the static IP address option is enabled. To change a static IP address, type in the new address in the IP address fields using the **Tab** key to move from box to box.

5 To change the IP address from a static address to a dynamic address, click the box next to DHCP.

6 To change the values of the subnet mask, gateway, Simple Network Management Protocol (SNMP) server, or the time server, type in the new address, using the **Tab** key to move from box to box.

7 Click **submit**. You must perform a system reset before the new IP address takes effect, or you can use the front panel to power cycle your machine.

Set Security Options

When you enable the security option, users must enter a password to access the SuperLoader's front panel functionality. A password allows either administrator-level access or operator-level access (see Setting Security on page 49).

To Set the Security Option:

1 On any On-board Remote Management page, click **Configurations** from the banner.

2 On the secondary menu, click **Security** (see figure 84).

Figure 84 Setting
Security Options

To Reset the Front Panel Password:

1 On any On-board Remote Management page, click **Configurations** from the banner.

2 On the secondary menu, click **Security**.

3 Select the check box next to **Reset Front Panel Password**. A check mark appears.

4 Click **submit**.

To Set a Password:

When you enter your password on the SuperLoader's front panel there is no associated username. However, when you click any menu heading on the On-board Remote Management's home page, you are prompted for a user name and password. The default username and password is **guest** and **guest**. The text entry is case sensitive.

With On-board Remote Management, you can set up to four user names and IDs, which can include both alpha and numeric characters. User names and IDs must be between four and eight characters long.

1 On any On-board Remote Management page, click **Configurations** from the banner.

2 On the secondary menu, click **Security**.

3 From the drop-down list next to **Select User Type**, select **Administrator** or **Operator**.

4 In the **Username** field, enter a user name.

5 In the **Password** field, enter the new password.

6 In the **Verify Password** field, re-enter the same new password.

7 Click **submit**.

Note:	To view the list of currently defined users, click **submit** with **Select User Type** chosen.

To Set the Authorized Client List:

1 On any On-board Remote Management page, click **Configurations** from the banner.

2 On the secondary menu, click **Security**.

Figure 85 Setting
Authorized Client List
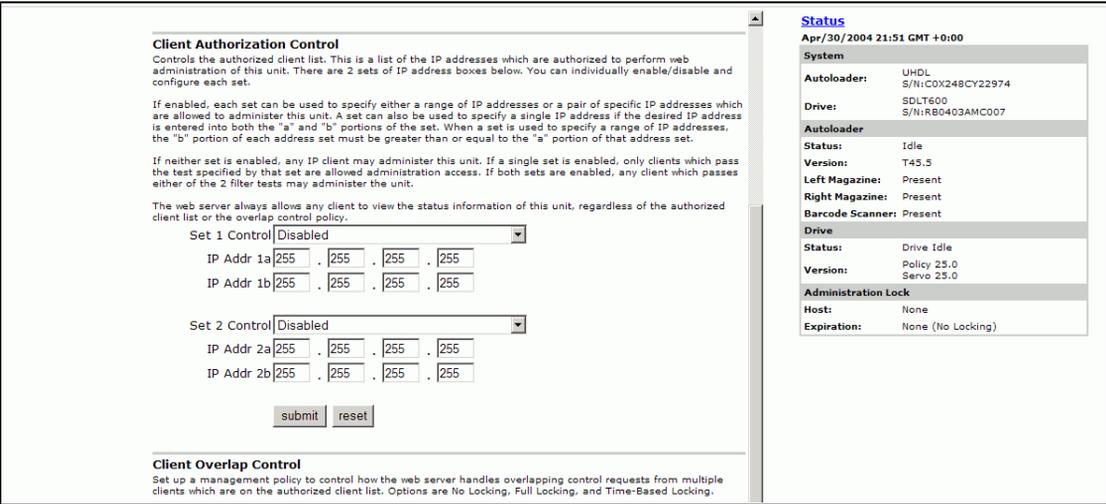
Under **Client Authorization Control** is a list of the IP addresses that are authorized to perform On-board Remote Management for this specific unit. There are two sets of IP address boxes. You can individually enable/disable and configure each set.

If enabled, each set can be used to specify either a range of IP addresses or a pair of specific IP addresses that are allowed to administer this unit. A set can also be used to specify a single IP address if the desired IP address is entered into both the "a" and "b" portions of the set. When a set is used to specify a range of IP addresses, the "b" portion of each address set must be greater than or equal to the "a" portion of that address set.

If neither set is enabled, any IP client can administer the unit. If a single set is enabled, only clients that pass the test specified by that set are allowed administrator access. If both sets are enabled, any client that passes either of the two filter tests can administer the unit.

The web server always allows any client to view the status information of the unit, regardless of the authorized client list or the overlap control policy.

3 Use the drop-down box to select **Enable** or **Disabled**.

Figure 86 Disabling
Sets

4 Type the IP addresses in the boxes.

5 Click **submit**.

To Set the Client Overlap Control:

1 On any On-board Remote Management page, click **Configurations** from the banner.

2 On the secondary menu, click **Security**.

Figure 87 Setting
Client Overlap Control

3 Select a security option from the **Client Overlap Control** options:

- **No Locking** allows multiple users to access the system and issue requests.

- **Full Locking** allows only one user to access the system and issue requests.

- **Time-based Locking** allows only one user to access the system and issue requests with the lock expiring after a designated amount of inactivity (in seconds).

- **Home/Logout** is used to release a full or time-based lock and permit another user to access the system.

> **Note:** Locking is only available to users on the authorized client list.

4 Click **submit**.

Diagnostics Page

From the Diagnostics page, you can run the loader tests.

Run Diagnostic Tests

To run diagnostic tests on the SuperLoader, use the following procedure.

To Run a Diagnostic Test:

1 On any On-board Remote Management page, click **Diagnostics** from the banner.

2 From the **Test** drop-down menu, select the diagnostic test that you want to run.

Figure 88 Diagnostics Page

3 Specify a loop count if desired.

4 Click **submit**.

5 While the test is running, you can view the status of the test. Under **View Diagnostic Test Progress**, click **View Status**. A separate screen indicates which test is running and the current status of the diagnostic test.

Figure 89 View Test
Status


```
Test name: Self Test *Running*
Current Sequence: Init Data
Count: 0
Current Status: Unknown (0x0)
Temperatures (Celsius) - Tape Drive:19 Picker:36 DCA:29
POH: 0222:41:04, Test Time:0000:00:01
```

Status
Apr/30/2004 21:54 GMT +0:00

System	
Autoloader:	UHDL S/N:C0X248CY22974
Drive:	SDLT600 S/N:RB0403AMC007

Autoloader	
Status:	Idle
Version:	T45.5
Left Magazine:	Present
Right Magazine:	Present
Barcode Scanner:	Present

Drive	
Status:	Drive Idle
Version:	Policy 25.0 Servo 25.0

Administration Lock	
Host:	None
Expiration:	None (No Locking)

6 To refresh the status information, click **Diagnostics** and then click **View Status** again.

To View Error or History Logs:

1 On any On-board Remote Management page, click **Diagnostics** from the banner.

2 Under **View Error and History Logs**, select **SuperLoader** or **Drive** (see <u>figure 90</u>). Drive logs are currently unavailable.

Figure 90   Viewing
Error or History Logs

3   Under **View Error and History Logs**, click **View Logs**. You can also save the logs to a file by clicking **Save Logs**. If you save the logs to a file, you must select a destination folder within 60 seconds.

> **Note:**   These logs are valuable for assessing problems. Service personnel may want to use these logs.

**Identify
SuperLoader**

You can identify the physical location of the SuperLoader by requesting the LCD backlight to flash for a specified number of seconds.

1   Under **Identification**, enter the number of seconds.

2   Click **Identify**. The LCD backlight flashes for the specified number of seconds.

Perform a System Reset

You can perform a system reset by clicking **System Reset** under **System Reset**. A system resets takes at least 3 minutes if there is a tape in the drive, or approximately 30 seconds otherwise. You will use system reset when making SCSI ID changes, mode changes, magazine, and IP address changes.

System Updates Page

Perform System Updates

You can browse to find system updates and then upload the updates.

To Get System Updates:

1 On any On-board Remote Management page, click **Updates** from the banner.

2 Click **Browse**. Navigate to the location of the system update.

Figure 91 System Updates
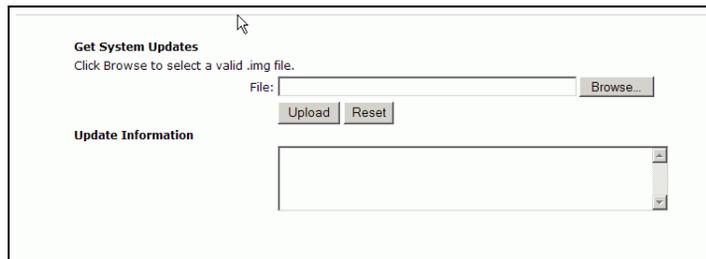
Get System Updates
Click Browse to select a valid .img file.
File: [   ] Browse...
Upload   Reset
Update Information
[   ]

3 Click **Upload**.

4 Click **OK** in response to the confirmation box. The SuperLoader automatically uploads the new code and updates the system.
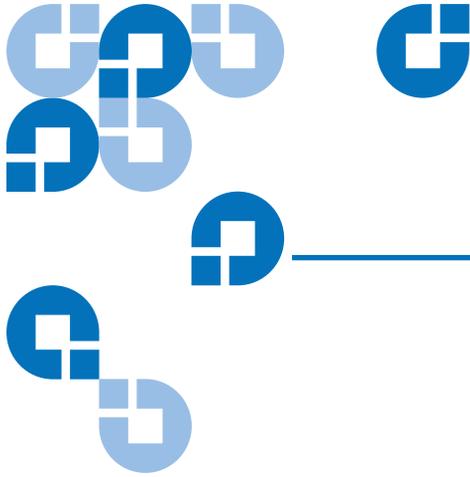
Troubleshooting

Errors that you may experience with your SuperLoader can range from severe hardware damage to simple connection problems. Before you return your SuperLoader to Quantum or your service provider, you may be able to fix the problem yourself by following some basic troubleshooting procedures.

This chapter describes how to troubleshoot common errors. It also describes how to contact Quantum support and how to return the Customer Replaceable Unit (CRU) that is failing for exchange or repair if necessary.

Other than drive cleaning, there is no recommended routine maintenance of the SuperLoader.

Before Contacting Quantum Support

Before you contact Quantum Support or your service provider, be sure that you try all appropriate recommended procedures. The front panel provides some troubleshooting capabilities, but is limited. On-board Remote Management provides more detailed information about the present state of the SuperLoader and past performance and is more helpful for troubleshooting errors.

Table 12 describes the probable cause and suggested action for each problem that you may encounter.

Table 12   Suggested Actions for Performance Problems

Problem	Probable Cause	Suggested Action
The front panel does not display information.	The connection to the LCD has failed.	• Use the On-board Remote Management to troubleshoot error.
The user starts a code update from the front panel without inserting a tape.		• Power cycle the unit.
The SuperLoader does not respond on the front panel SCSI bus or Ethernet. Bug checks appear immediately after loading a new version of firmware.	The firmware is corrupted.	• Change the position of the jumpers. For more information, see To Change the Position of the Jumpers: on page 101.
The SuperLoader is operating slowly.	The SuperLoader is incorrectly configured for the operating system.	• Go to the Quantum Support Website **www.Quantum.com** for compatibility requirements.
The SuperLoader does not turn on.	The power cable or source is malfunctioning. The SuperLoader is incorrectly configures.	• Check all outlets and power cords for proper connection. • Go to the Quantum Support Web site **www.Quantum.com** for compatibility requirements.

Problem	Probable Cause	Suggested Action
The front panel and light indicators do not turn on.		• Verify that the SuperLoader is plugged in. • Verify that the power switch on the back is turned on. • Verify that the DCA is locked into the SuperLoader chassis with the four screws supplied. • Contact your Service Provider or Quantum Support.
The front panel does not display information, but light indicators above the front panel are turned on.		• Connect to the SuperLoader, using On-board Remote Management with an Ethernet connection and issue a **Reset** from the Diagnostic page. • Verify that the DCA is locked into the SuperLoader chassis with the four screws supplied. • On the front panel, press and hold the power switch for 15 seconds, then turn the rear power switch off. Wait 60 seconds and turn the rear power switch back on. • Contact your Service Provider or Quantum Support.

Problem	Probable Cause	Suggested Action
The SuperLoader does not communicate with the host system via the SCSI bus.		• Verify that the SCSI cables are connected to the rear of the SuperLoader and that the correct LVD host controller card is installed. • Verify that the SCSI cables are not damaged or crimped and the total SCSI cable length is not exceeding the maximum required length. • Verify that a LVD SCSI Terminator is attached to both the last and first SCSI device on the SCSI bus. • Verify that the SuperLoader SCSI ID (DLT/SDLT), or the SuperLoader and drive SCSI IDs (LTO), are set to unique SCSI IDs that is not used by any other SCSI device on the same SCSI Bus. • Issue a System Reset either by using the On-board Remote Management Diagnostic System Reset or by turning off power from the front panel. • Contact your Service Provider or Quantum Support.
The tape drive responds on the SCSI bus to the host, but the SuperLoader does not respond.		• For DLT/SDLT, verify that the SuperLoader LUN is set to 1. To do this, select Status on the LCD front panel, then select Drive, and then Status. For LTO, verify that the SuperLoader SCSI ID is not being used by another device. • Go to the **Configuration** menu, and verify that the mode is set to **Random**. • If all SCSI IDs are unique, check SCSI cables and terminators. • Verify that the host application and the device drivers are installed with the most current patches to support SuperLoader.

Problem	Probable Cause	Suggested Action
The SuperLoader does not communicate with the Host system via the Ethernet.		• Verify that the Ethernet cable is connected to the correct hub. • Verify the Ethernet configuration settings via the front panel. If the DHCP server is available, Ethernet status should indicate DHCP, otherwise you must set a unique IP address and mask. • Power off the SuperLoader by turning off the system from the front panel and turning it back on. • Contact your Service Provider or Quantum Support.
The application software reports a failure locating a piece of media or fails to move a piece of media as requested.		• Use the On-board Remote Management page and verify that the media is in the expected location internal to the SuperLoader. • Using the On-board Remote Management diagnostic tool, execute the **Health Check** command. • Issue a **System Reset** either by using the On-board Remote Management Diagnostic System Reset or by turning the power off from the front panel. • Contact your Service Provider or Quantum Support.

Problem	Probable Cause	Suggested Action
The application software reports an error while reading or writing a piece of media.		• Try a different piece of media. • From the On-board Remote Management Diagnostic page, execute the **Write/Read Tape Drive** test. • Issue a **System Reset** either by using the On-board Remote Management Diagnostic System Reset or cycle the power from the front panel. • Contact your Service Provider or Quantum Support.
Other failures occur		• Issue a **System Reset** either by using the On-board Remote Management Diagnostic System Reset or by turning the power off from the front panel. • Contact your Service Provider or Quantum Support.

Contacting Quantum Technical Support

If necessary, obtain technical assistance by calling the support representative nearest you. Domestic and international contact information for Quantum Customer Support can be found by referring to

Returning Units for Repair

If the problem with your SuperLoader is so severe that you cannot troubleshoot the problem, return the SuperLoader, or any of its parts, for repair. This section describes what steps you need to take before returning the unit.

Note: If you cannot troubleshoot the problem, you must first call Quantum Customer Support to receive authorization. Unless the support center authorizes the return of the entire SuperLoader, you will be billed by Quantum for doing the troubleshooting.

Return Authorization Process

If you need to return the SuperLoader, or any of its parts to Quantum, you must first obtain a Return Authorization (RA) number from Quantum. This number ensures that your products are received correctly, that any associated billings are posted properly, and that the repaired or replaced product is returned to the correct address.

How to Obtain a Return Authorization Number

To obtain a RA number, contact the nearest Quantum Customer Service Center. For Customer Service Center locations, see <u>Customer Support</u> on page xxiv. An RA request may be made by FAX, e-mail, telephone, or letter. The following information is required when requesting a RA number:

- Quantum serial number (located on the back of the unit)

- Quantum part number (located on the back of the unit)

- Reason for return, if known

- Warranty status, if known

- Purchase order number (required for credit or out-of-warranty transactions)

Upon receiving the above information, Quantum's Customer Service staff will provide a RA number, and ship the new part directly to the customer within 48 hours. The customer should then take the bad part and return it in the same shipping box the good part was shipped in.

Please mark all shipping containers and shipping documents used for the return of the product prominently with the RA number. This ensures prompt handling upon receipt by Quantum.

Policies and Procedures

Quantum uses the following policies and procedures when processing returned units:

Turn Around Time Policy

It is Quantum's intention to meet or exceed agreed upon turn around time commitments to our customers. Turn around time goals for all configurations for DLT, LTO-1, LTO-2, DLTtape, SDLT, and DLTstor products are generally five working days or less.

> **Note:** Quantum measures turn around time based on receipt of shipment at Quantum's dock until shipment from Quantum's dock.

Shipment Discrepancies

It is our intention to work with our customers to minimize and eventually eliminate discrepant return shipments. These shipments cause delays in receiving product for return/replacement. Discrepant shipments include, but are not limited to the following:

- Handling Damage, including poor packing of product returned
- Return of non-Quantum product
- Short or over shipments
- Unauthorized returns
- Bulk shipments

Any shipment containing discrepancies falls outside of Quantum's standard turn around time commitment.

Package Standards

Improper packaging may result in additional damage to the returned product. It is extremely important that the return shipment meets the packaging specifications to ensure continued warranty service. If you require additional packaging materials, contact Quantum Customer Support.

Damage During Shipment

If you feel your product was damaged during shipment, you may wish to file a claim with your carrier. Quantum takes photographs of shipments received with visible damage, and, upon request, these photographs can be provided to you to assist in filing a claim. It is, however, the responsibility of the sender and carrier to resolve the damage claim.

Non-Quantum Product Shipment Policy

In the event that non-Quantum product or enclosures are returned to any of our service centers, we will return these products to the sender, freight collect.

How to Handle Damage Information

Products that are returned to Quantum with handling damage, including poorly packaged products, may be subject to the following:

• A fee for testing and handling

• Out-of-warranty repair charges

• The product being returned, unrepaired

• Having the warranty voided and the product returned, ruled unrepairable

The customer will be advised of any products returned that are confirmed damaged products. Depending upon the degree of damage to the product, the customer will be notified of the available options. Should Quantum not receive a response back from the customer within five working days, the products will be returned to the sender, freight collect.

Freight Charges

Returned product must be sent to Quantum with the freight charges prepaid, whether the product is in- or out-of-warranty. Replacement and repaired products will be shipped freight prepaid by Quantum.

International Requirements

Import/Export Controls – Equipment may not be serviced by Quantum Corporation if there is reason to believe that the equipment was exported or re-exported in violation of the United States or international export regulations. In addition, no product will be replaced for which a validated license cannot be produced when requested by Quantum.

Third Party Returns – If a party outside of the United States wishes to return a product for repair to a Quantum Service Center, and the party is not the original buyer, Quantum must ensure compliance with all governmental import and export regulations. The party should initially contact the appropriate local service center (see Customer Support on page xxiv).

For international returns to the U.S., the original, validated U.S. Export authorization or license is required if the party requesting the return is not the original buyer. Returns to other country's service centers must conform to that country's regulations.

Customs invoices for all returns should clearly state the reason for the return, the value of the merchandise and an attachment of serial number information, when available.

Repair Process All work is performed under controlled conditions and all handling of the product is done in accordance with electrostatic discharge (ESD) controls. Each repaired product is tested and verified against original manufacturing specifications. Configuration and firmware are upgraded to the latest applicable released revision.

How to Return the SuperLoader for Service

If you need to return the SuperLoader to the factory for service, first verify which customer replaceable unit (CRU) that you need to return and return only that CRU, not the entire SuperLoader.

Note:	The various Quick Start Guides on the documentation CD contain instructions for upgrading/replacing the drive carrier assembly (DCA), bar code reader, cartridge magazine, and slide rail kit customer-replaceable units (CRUs).

Once you determine the CRU to replace, contact your service provider. If your service provider instructs you to return the SuperLoader directly to Quantum, contact Quantum Technical Support to obtain a Return Authorization (RA) number and the shipping address. When you have the RA number, follow the instructions below.

To Prepare the SuperLoader for Shipment:

1 Remove all cartridges from the unit.

2 Power off the SuperLoader via the front panel.

3 Remove the power, Ethernet, and SCSI cables, and any terminators from the SuperLoader.

Note:	Do not ship these items if you are returning the SuperLoader to the factory.

To Remove the SuperLoader from the Rack:

1 Loosen the four screws that connect the two support brackets to the two SuperLoader brackets.

Figure 92 Removing the SuperLoader from the Rack
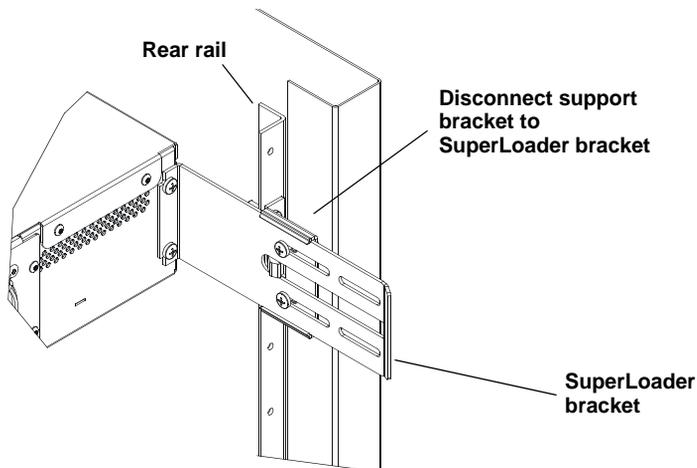
2 Loosen the four screws on the front of the SuperLoader that attach the two front tabs (support brackets) to the front rails. Do not remove the screws completely at this time.

Figure 93 Loosening the Support Brackets
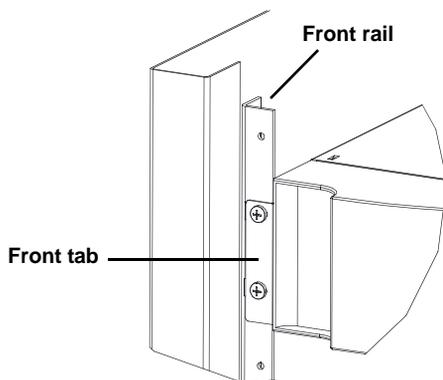
3 Remove the four screws at the back of the SuperLoader that connect the support brackets (two screws per bracket) to the SuperLoader brackets.

Figure 94 Connecting
Support Brackets

Support bracket

SuperLoader bracket

Screws

Rear rail
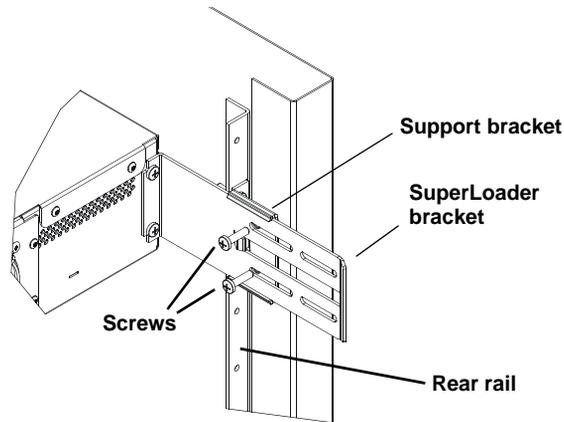
4 While supporting the front of the SuperLoader, remove the four front screws.

> **Caution:**   Injury may occur if the unit is not supported when you remove the front screws. The screws are holding up the front of the unit.

5 Using two people, or an appropriately rated mechanical lift, remove the SuperLoader from the rack by sliding the SuperLoader out and supporting it from the bottom. The person handling the back of the unit must depress the locking tab on the support bracket while sliding the unit forward.

6 Loosen the four screws and remove the SuperLoader brackets from the back of the SuperLoader.

Figure 95 Removing
the Brackets

SuperLoader (SDLT model)

Screws

SuperLoader bracket
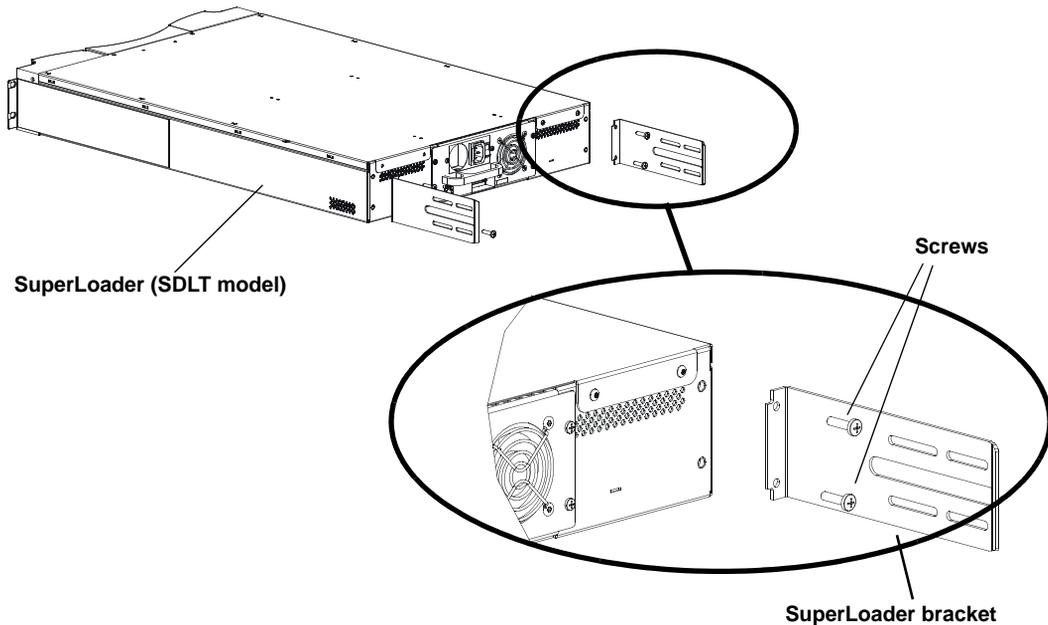
7 Place the SuperLoader into the original packaging box. If you no longer have the original packaging, contact your service representative to purchase the packaging kit.

To Pack the SuperLoader

Use the original packing material to pack the SuperLoader: the shipping container, two foam insert packing pieces, the accessory kit box (or the filler tube if your SuperLoader did not come with an accessory kit box), and the antistatic bag. You will also need packing tape.

Figure 96 Shipping
Materials

Front

**Foam insert (one for each side
of the autoloader)**

Accessory kit

Carton
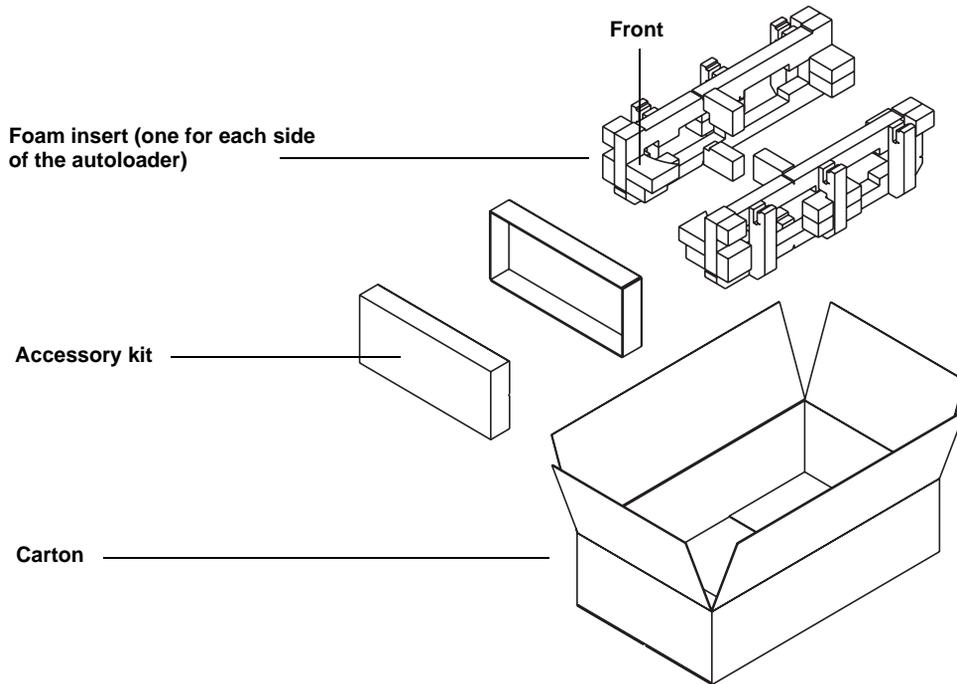
1 Place the antistatic bag over the SuperLoader.

2 Place one of the foam endcaps onto one side of the SuperLoader.
Place the second foam insert onto the other side of the SuperLoader
and make sure the pieces fit snugly onto the SuperLoader.

> **Note:** One end of the foam insert has a curved piece. This end of
> the foam insert is designed to fit the front of the
> SuperLoader.

3 Place the SuperLoader down into the shipping box and push the back
of the SuperLoader towards the back end of the box.

4 Insert the empty accessory kit box (or filler tube) into the shipping
box at the front end of the SuperLoader in the space between the
SuperLoader foam inserts and the shipping container.

5 Place any necessary paperwork on top of the SuperLoader inside the box.

6 Close and seal the box.

7 Place the shipping label on the box.

Check for Errors

Errors are problems that occur while operating the SuperLoader. They prevent the SuperLoader from completing a specific action. When an error occurs, two things can happen:

- No error message appears, but the SuperLoader fails to complete the action.

- An error message appears on the front panel or in the On-board Remote Management screen (see Screen Display of Hard Error Logs).

When either of these things occur, the system generates a log of the error. You can use these error logs to determine the type of error, when it occurred, and what parts of the SuperLoader it affects. The error logs also describe what you must do to fix the error or which parts of the SuperLoader need to be repaired or replaced.

Different types of error logs are generated for the SuperLoader and the tape drive.

- SuperLoader error logs provide information if the errors relate to data cartridge movement.

- Tape drive error logs provide information if the errors relate the tape drive's read/write performance.

Figure 97 describes how to determine which error logs to use.

Figure 97 Error
Flowchart
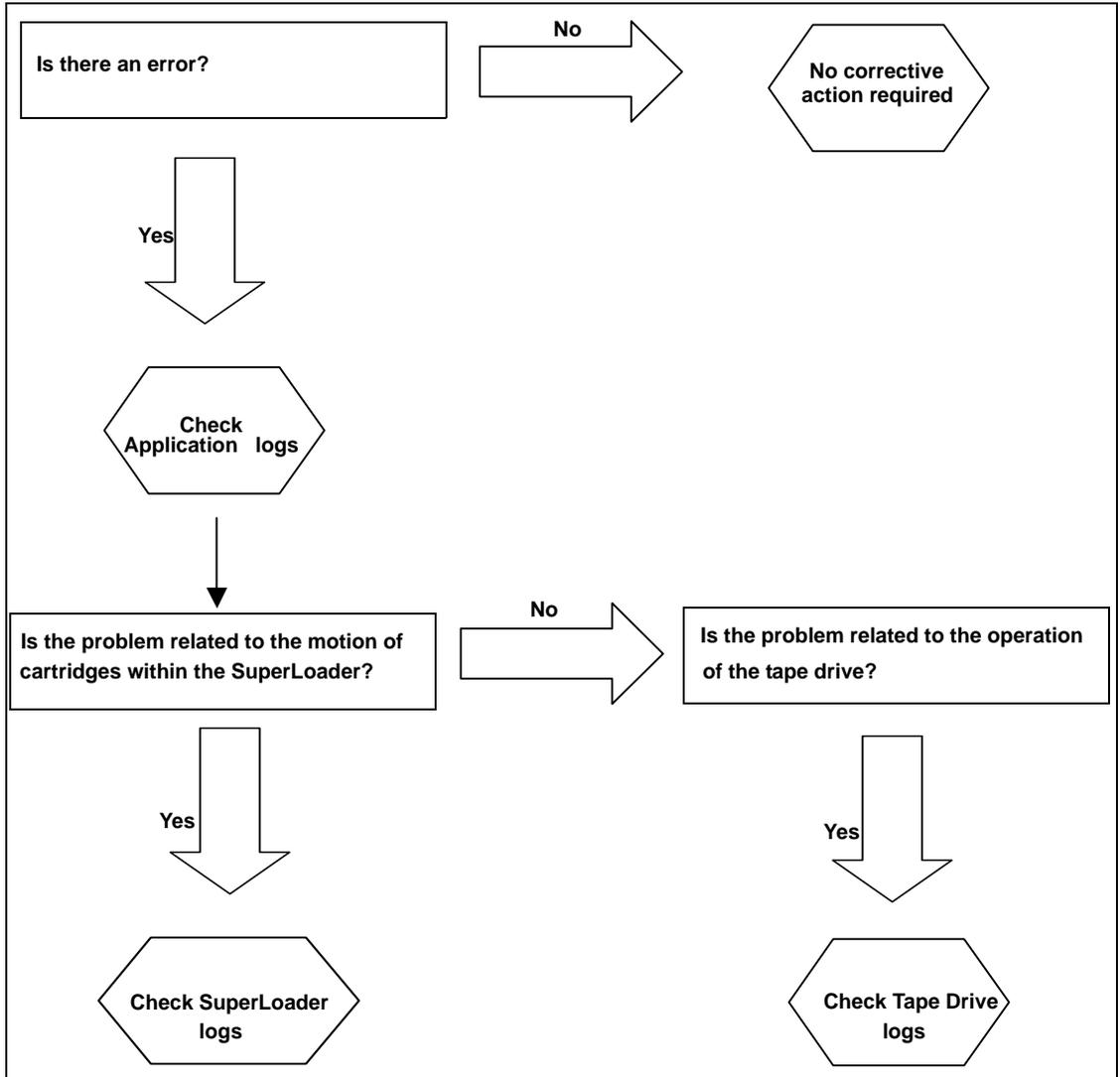
> **Note:** While there are other types of logs besides error logs, the other
> types of logs will not help you troubleshoot errors. Instead,
> they provide you with basic information (see appendix A,
> Basic Information Logs).

- SuperLoader Error Logs
- Tape Drive Error Logs on page 165

SuperLoader Error Logs

The SuperLoader generates four types of logs. For troubleshooting errors,
you will only use one type, Hard Error logs. The screen displays the error
message and the Hard Error logs record all hard error events (see
appendix A on page 229).

> **Note:** To troubleshoot hard errors, you may need to power cycle,
> repair, or replace the unit.

**Screen Display of
Hard Error Logs**

Table 13 lists the error messages that are shown on the LCD. Use table 13
to determine the error code. Refer to table 15 on page 156 for a list of
suggested actions.

Table 13   Screen
Display of Hard Error
Logs

Screen Display	Error Code
TX ALD success	00
TX Deleted	01
TX Pool error	02
TX PTR error	03

Screen Display	Error Code
TX Wait error	04
TX Size error	05
TX Group error	06
TX EVT Timeout	07
TX Option error	08
TX QUE error	09
TX QUE Timeout	0A
TX QUE Full	0B
TX SEM error	0C
TX SEM Timeout	0D
TX Thread error	0E
TX Priority err	0F
TX No Memory	10
TX Start error	10
TX Delete error	11
TX Resume error	12
TX Caller error	13
TX Suspend error	14
TX Timer error	15
TX Tick error	16
TX Activate error	17
TX Thresh error	18

Screen Display	Error Code
TX Suspend Lifted	19
SYS Cmd started	20
SYS Failure	21
SYS Busy	22
SYS Timeout	23
SYS SW err	24
SYS HW err	25
SYS Msg snd id err	26
SYS Msg bad	27
SYS Msg param bad	28
SYS Inv element	29
SYS Inv elem status	2A
SYS Element tbl bad	2B
SYS Global corrupt	2C
SYS Stack corrupt	2D
SYS Stack low	2E
SYS Stack ovflw	2F
SYS POST fail	30
SYS Watchdog fail	31
SYS PWR on/restart	32
SYS PWR down	33
SYS Overload	34

Screen Display	Error Code
SYS Performance	35
SYS Asyc stop	36
SYS Cleaning error	37
SYS 12C Device Error	38
SYS offline	39
SYS Door locked	3A
SYS Open front	3B
SYS Over temp	3C
SYS Drive Error	3D
SYS Drv Load Err	3E
SYS Drv Unload Err	3F
Command in Progress	51
Unsupported Command	52
Command Failed	53
Device Not Ready	54
Invalid Element Address	55
Invalid Page Code	56
Invalid Test #	57
Exchange Command/Not Supported	58
Invalid Command Parameter	59
Mechanical Positioning\Error	5A
Destination Element Full	5B

Screen Display	Error Code
Source Element Empty	5C
Magazine Not Present	5D
Self Test Failure	5E
Barcode Reader\Not Present	5F
Internal Hardware\Error	60
No Volume Tag\Information Available	61
CUP In Progress	62
Unload Retry	63
Overtemp	64
Rejected Command	6E
Communication Error	6F
SRVO Failure	A0
SRVO Reserved	A1
SRVO HW/MTR timeout	A2
SRVO SW error	A3
SRVO Not calibrated	A4
SRVO No src element	A5
SRVO No mag	A6
SRVO Mail Slot full	A7
SRVO Dest full	A8
SRVO Pkr full	A9
SRVO PKR crt sns err	AA

Screen Display	Error Code
SRVO DRV pth sns err	AB
SRVO MSdoor sns err	AC
SRVO MSdoor sol err	AD
SRVO Initialize err	AE
SRVO Event-1st err	AF
PKR Rot Sensor bad	B0
PKR no Rot Flag	B1
PKR Rot Flag bad	B2
PKR Trans Sensor bad	B3
PKR Trans Sns1 bad	B4
PKR Trans Sns2 bad	B5
PKR Trans Flag bad	B6
PKR Rot cal lost	B7
PKR Trans cal lost	B8
PKR Rot lost	B9
PKR Trans lost	BA
PKR Rot pos error	BB
PKR Trans pos error	BC
PKR Dropped cartridge	BD
PKR Missed cartridge	BE
PKR Jammed cartridge	BF
MTR Unknown err	C0

Screen Display	Error Code
MTR SW error	C1
MTR HW error	C2
MTR Setup error	C3
MTR Position error	C4
MTR Direction error	C5
MTR Runaway error	C6
MTR Corrupt error	C7
MTR Accel error	C8
MTR Sensor noise	C9
MTR Timeout	CA
MTR Skipping	CB
MTR Stalled	CC
MTR Jammed	CD
MTR Stopped	CF
MAG Solenoid bad	D0
MAG Present Sns bad	D1
MAG Pos Sensor bad	D2
MAG Pos Sensor 1 bad	D3
MAG Pos Sensor 2 bad	D4
MAG Flag Missing	D5
MAG Flag bad	D6
MAG No slot 0	D7

Screen Display	Error Code
MAG Multi slot 0	D8
MAG Tolerance	D9
MAG Cal lost	DA
MAG Pos lost	DB
MAG Pos err	DC
MAG Slot pos error	DE
MAG Jammed cart	DF

Hard Error Log Display

You can retrieve Hard Error logs through On-board Remote Management. Partial information about Hard Error logs can be retrieved from the front panel and SCSI. Figure 98 shows an example of the way a Hard Error log appears in HyperText Transfer Protocol (HTTP) format.

Figure 98 Hard Error Log as Displayed via FTP and On-board Remote Management

```
Block 1, 004/016 entries @ 64 bytes each, wrap @ 004, erase @ 008

0000: 2004-Jan-27, 17:24:06.001, Error: 002f0222, Context: 4802/00000000
       65460621: 00610004: ffffffff: ffffffff
         ff741e03: 0075ff63: 0566063f: 007f0000
       ffffffff: ffffffff: ffffffff: ffffffff

0001: 2004-Jan-27, 17:24: 08.036, Error: c02f0223, Context: 4802/00000000
       00000000: 00000000: 00000000: 00000000
       00000000: 00000000: 00000000: 00000000
       00000000: 00000000: 00000000: 00000000
       00000000: 00000000: 00000000: 00000000
0002: 2004-Jan-27, 17:38: 19.777, Error: 002f0222, Context: 4802/00000000
         65460621: 00610004: ffffffff: ffffffff
         ff741e03: 0075ff63: 0566063f: 007f0000
       ffffffff: ffffffff: ffffffff: ffffffff:
0003: 2004-Jan-27, 17:38: 21.812, Error: c02f0223, Context: 4802/00000000
```

The front panel and SCSI display only the most important information for each log. Figure 99 shows an example of how a Hard Error log appears in front panel and SCSI formats.

Figure 99 Hard Error
Log as Displayed on
Front Panel and SCSI
Formats

```
Time: 17:24:06.001
Error: 002f0222
Context: 4802/ 00000000
```
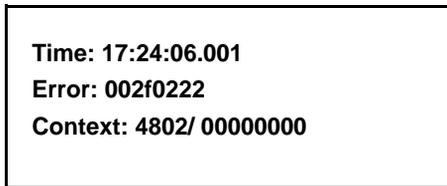
Whenever the SuperLoader generates a Hard Error log, On-board
Remote Management automatically displays the log information. For the
other retrieval methods, you must request the information.

To Retrieve Hard Error Log Information from the Front Panel:

  1 On the main menu, scroll to **Diagnostics**, then press **Enter.** The
      Diagnostics submenu appears.

  2 On the submenu, scroll to **Error Logs**, then press **Enter.** The Error
      Log submenu appears.

  3 On the submenu, scroll to **Hard**, then press **Enter.** The log
      information appears.

**To Retrieve Hard Error Log Information from On-board Remote
Management:**

  1 Click the On-board Remote Management icon on your computer
      desktop.

  2 Click **Diagnostics**. The login window appears.

  3 Type your username and password, then press **Enter.** The Diagnostic
      sub-menu appears.

  4 Click **View Logs**.

  5 If you want to save logs to your hard drive, click **Save Logs.** If you
      save log to a file, you must select a destination folder within 60
      seconds.

To Retrieve Hard Error Log Information from SCSI:

To retrieve Hard Error log information from SCSI, execute the Log Sense command and access log page 7.

Hard Error Log Fields

Hard Error logs contain three main fields. By interpreting the information in these fields you can determine how to troubleshoot errors (see table 14).

Table 14   Hard Error Log Fields

Field	Description
Time Stamp	The time the event occurred. This field helps correlate the event with a possible application interruption. If the unit is unable to acquire the correct time/date from the SNTP time server or the front panel, the timestamp contains values indicating the power cycle number and the time an entry was written relative to that power cycle, listed as Power On Hours (POH). **Note:** The unit has no internal real time clock and requires the user to set the time of day from the front panel or the network interface (SNTP).
Error Code	The type of error and action to which the event is related. This field helps identify what caused the event to occur (see Error Code Field Description).
Context	The event's software register information.

Error Code Field Description

Error codes appear as 8-character strings made up of either letters or numbers for a total of 32 bits. Figure 100 shows the block descriptor for the Hard Error log codes.

Figure 100 Error
Code Block Descriptor
for Hard and Soft
Event Logs

Bits 31-30	Bits 29-28	Bits 27-24	Bits 23-20	Bits 19-16	Bits 15-12	Bits 11-8	Bits 7-4	Bits 3-0
Recovery Action	Task ID		Error Type		Error Location			

Table 15 describes each field in error code.

Table 15   Error Code
Field Descriptions

Field	Description
Recovery Action	Defines what the SuperLoader will do based on the event that occurred. • If the value is 0, the SuperLoader will continue operations since this is typically a soft recoverable event, or an event that is just recording an action for when the development team is working on enhancements. • If the value is other than 0, then you must reboot the SuperLoader in order to recover from the event. The reboot will happen automatically.

Task ID: Defines what firmware task was being performed at the time of the event

Task ID (in Hex)	Description
00	System Timer
01	Servo
02	Picker
03	Magazine Left
04	Magazine Right
05	Magazine Up left

Field	Description
06	Magazine Up Right
07	Loader
08	Bar Code Reader
09	Front Panel
0A	IP
0B	Diagnostic
0C	Error
0D	Code Update
0E	PSP
0F	PSP Timer
10	Volume Servo Manager
11	HTTP
12	SNTP
20	Idle
3e	Watch Dog
3f	Un-handle Interrupt

Error: Defines the type of error or event that did occur. Follow the suggested actions to troubleshoot each type of error.

Software Location ID: Defines a location in the firmware internal to the task being performed. This ID is used by firmware engineering to identify what part of the actual firmware task detected the event.

Error Code Listing   Table 16 lists the possible errors and suggested actions.

Table 16   Error Code
Listing

Error	Description	Suggested Actions
00-25	General Software flags	• Check for a Hard Error log. If an error appears in the Hard Error log, power cycle the SuperLoader and run the Health test. • Check the Quantum Web site for firmware updates. • If all previous steps fail, contact Quantum Customer Support and/or replace the DCA.
26	Message Send ID error	• Check the SCSI bus cables and terminators. • Check the Host Adapter. • Power cycle the SuperLoader. Repeat checks after power cycle. • If all previous steps fail, contact Quantum Customer Support and/or replace the DCA.
27	Message Bad	• Check the SCSI bus cables and terminators. • Check the Host Adapter. • If all previous steps fail, contact Quantum Customer Support and/or replace the DCA.
28	Message parameter Bad	• Check the host device driver. • Check the host application. • Check the SCSI bus cables and terminators. • Check the Host adapter. • Power cycle the SuperLoader. Repeat checks after power cycle. • If all previous steps fail, contact Quantum Customer Support and/or replace the DCA.

Error	Description	Suggested Actions
29	Invalid Element	• Check the host device driver. • Check the host application. • Power cycle the SuperLoader. Repeat checks after power cycle. • If all previous steps fail, contact Quantum Customer Support and/or replace the DCA.
2A	Invalid Element Status	• Check the host device driver. • Check the host application. • Power cycle the SuperLoader. Repeat checks after power cycle. • If all previous steps fail, contact Quantum Customer Support and /or replace the DCA.
2B-2F	Firmware tables and stacks invalid	• Check for a hard log. If an error appears in the Hard log, power cycle the SuperLoader and run the Health test. • Check the Quantum Web site for firmware updates. • If all previous steps fail, contact Quantum Customer Support and/or replace the DCA.
30	Post Failure	• Verify that the DCA is fully seated and that all 4 screws are tight. • Verify that the magazines are fully seated. • Power cycle. • Contact Quantum Customer Support.
31-38	System Monitoring type events	• Check for a Hard log. If an error appears in the Hard log, power cycle the SuperLoader and run the Health test. • Check the Quantum Web site for firmware updates. • If all previous steps fail, contact Quantum Customer Support and/or replace the DCA.
39	Offline	• No action required.
3A	Door Locked	• No action required.

Error	Description	Suggested Actions
3B	Open Front	• Install the magazine or magazine blank. • Replace the magazine or magazine blank. (Try a second one if possible.) • If all previous steps fail, contact Quantum Customer Support and/or replace the chassis/picker assembly.
3C	Over Temp	• Verify that the temperature of the SuperLoader inlet air is within specifications. • Clear debris from any openings of the SuperLoader, both in the front and back. • Verify that both fans are working. If fans are bad, contact Quantum Customer Support and/or replace the DCA.
3D	Drive Error	• Check the Drive Log Sense for Drive errors. If the drive is still logging errors, contact Quantum Customer Support and/or replace the DCA. • If the drive is logging Read/Write Errors, run the Tape Drive Write/Read test. If the drive test fails, repeat the test with new media. If the drive fails with two different pieces of media, contact Quantum Customer Support and/or replace the DCA.
3E	Load Error	• Verify that the cartridge does not have labels or other matter any where on the cartridge except where labels are expected to be places. • Try to load a different piece of media. • If multiple pieces of media fail, contact Quantum Customer Support and/or replace the DCA.
3F	Unload Error	• Verify that the cartridge does not have labels or other matter any where on the cartridge except where labels are expected to be placed. • Try to load a different piece of media. • If multiple pieces of media fail, contact Quantum Customer Support and/or replace the DCA.

Error	Description	Suggested Actions
60-69	Internal communication events	• Power cycle. • If the previous steps fails, contact Quantum Customer Support and/or replace the DCA.
A0-A4	Picker Servo Errors	• Run the Health test. • If repeated events appear in the Hard log, power cycle the SuperLoader. Repeat tests after power cycle. • If the previous steps fails, contact Quantum Customer Support and/or replace the chassis/picker assembly.
A5	Source Element Empty	• Verify that the expected source really does have a cartridge. • Run the Health test. • If the source is a magazine, replace the cartridge in that slot with a different cartridge and try again. If error continues, replace the magazine. • If source is the tape drive, verify the tape drive has a cartridge and it was ejected. • Power cycle the SuperLoader. • If the error continues, contact Quantum Customer Support and/or replace the chassis/picker assembly.
A6	Source Magazine Missing	• Verify that the magazine is installed correctly into the SuperLoader. • Remove and insert the magazine again. • Try a second magazine if possible. • Power cycle the SuperLoader. • If the error continues, contact Quantum Customer Support and/or replace the chassis/picker assembly.

Error	Description	Suggested Actions
A7	Mailslot full	• Verify that the magazine is installed correctly into the SuperLoader. • Remove and insert the magazine again. • Try a second magazine if possible. • Power cycle the SuperLoader. • If all previous steps fail, contact Quantum Customer Support and/or replace the magazine and/or the chassis/picker assembly.
A8	Destination Element Full	• Verify the expected destination really does not have a cartridge. • Run the Health test. • If destination is a magazine, install and remove a cartridge from the selected slot and try again. If error continues, replace the magazine. • If destination is the tape drive verify the tape drive does not have a cartridge. • Power cycle the SuperLoader. • If the error continues, contact Quantum Customer Support and/or replace the DCA and/or the chassis/picker assembly. • If the cartridge is in the mailslot opening, remove it. • Verify that the mailslot door is fully closed. • Verify that there is no debris in mailslot opening.
A9	Picker Full	• Look in the front of the SuperLoader and confirm that the picker is full. • Run the Health test. • If all previous steps fail, contact Quantum Customer Support and/or replace the chassis/picker assembly.

Error	Description	Suggested Actions
AA	Picker Cartridge Sensor Error	• Perform calibration and confirm calibration is successful. • Run the Health test. • If the problem prevents the test from running, contact Quantum Customer Support and/or replace the chassis/picker assembly.
AB	Drive Path Sensor Error	• Run the Health test. • Power cycle the SuperLoader. • If all previous steps fail, contact Quantum Customer Support and/or replace the chassis/picker assembly.
AC	Mail Slot Door Sensor Error	• Insert a cartridge into the SuperLoader via the mail slot. • Power cycle the SuperLoader. • If all previous steps fail, contact Quantum Customer Support and/or replace the chassis/picker assembly.
AD	Mail Slot Solenoid Error	• Insert a cartridge into the SuperLoader via the mail slot. • Power cycle the SuperLoader. • If all previous steps fail, contact Quantum Customer Support and/or replace the chassis/picker assembly.
AE	Unknown Servo Error	• Run the Health test. • If all previous steps fail, contact Quantum Customer Support and/or replace the DCA and/or the chassis/picker assembly.
AF	Error Log Information Event	• No action required.
B0-BF	Error Events related to the picker not rotating or translating correctly.	• Run the Health test. • Power cycle the SuperLoader. • If all previous steps fail, contact Quantum Customer Support and/or replace the chassis/picker assembly.

Error	Description	Suggested Actions
C0	Unknown Motor Error	• Run the Health test. • Power cycle the SuperLoader. • If all previous steps fail, contact Quantum Customer Support and/or replace the chassis/picker assembly.
D0	Magazine Solenoid Bad	• Check the Task ID in the hard log to determine if the problem is the right or left magazine. • Remove and insert the magazine. Verify that the magazine slides freely and clicks and locks into place. • Power cycle the SuperLoader. • Try a different magazine. • If all previous steps fail, contact Quantum Customer Support and/or replace the chassis/picker assembly.
D1	Magazine Present Sensor Bad	• Check the Task ID in the Hard Event Log to determine if the problem is the right or left magazine. • Remove and insert the magazine. • Power cycle the SuperLoader. • Make sure that the sensor is not blocked by debris. • If all previous steps fail, contact Quantum Customer Support and/or replace the chassis/picker assembly.
D2-D4	Position Sensor Bad	• Check the Task ID in the Hard log to determine if the problem is the right or left magazine. • Remove and insert the magazine. • Try a different magazine, if possible. • Power cycle the SuperLoader. • If all previous steps fail, contact Quantum Customer Support and/or replace the chassis/picker assembly.

Error	Description	Suggested Actions
D5-DE	Cartridge flags located on the magazine may be bad or the sensor to detect the flags may have a problem.	• Check the Task ID in the Hard log to determine if the problem is the right or left magazine. • Remove and insert the magazine. • Try a different magazine, if possible. • Make sure that the sensor is not blocked by debris. • Power cycle the SuperLoader. • If all previous steps fail, contact Quantum Customer Support and/or replace the chassis/picker assembly.
DF	Jammed Cartridge	• Check the Task ID in the Hard log to determine if the problem is the right or left magazine. • Power cycle the SuperLoader. • Contact Quantum Customer Support.

Tape Drive Error Logs

The tape drive generates six types of logs. For troubleshooting errors, you will only use SCSI Check Condition Error logs, Bugcheck Error logs, and Event Error logs. For more information on the other log types (see appendix A, Basic Information Logs).

Note: Unless noted otherwise, these samples do not apply to the DLT1 tape drive.

Error Log Display   Partial information about tape drive error logs can be retrieved from SCSI. Figure 101 shows an example of how tape drive logs appear.

Figure 101 Example
Tape Drive Error Log

Event log number   **Event number or name**   **POH/PC**

Event Log # 2 - Event: A401 [V80-0 4-AUG-1998] 000:03:52.153 POH/PC= 340/16
110013B9 571E0101 00400000 00130000 02D10000 00440000 00000000 220024CA
00000000 04720000 00000000 00000000 00000000 00000000 00000000 000000000
00000000

Figure 102 Example
DLT1 Tape Drive Error
Log

Packet # 229 - Event: Dir RD Error [V46-0] Up Time: 000:02:05.815 SLOT: 0(hex)   POH: 1571 PCYC: 54
0F200F01 02800280 25001F00 0000B06E 00000000 0011EB68 00000000 00000000
00000305 F0DEC203 004BD89C 0000004A 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000

Packet # 230 - Event: Dir RD Error [V46-0] Up Time: 000:02:08.444 SLOT: 0(hex)   POH: 1586 PCYC: 57
0F200F01 02800280 25001F00 0000B06E 00000000 0011EB68 00000000 00000000
00000000 0281CA7B 004BD89C 0000004A 00000000 00000000 00000000 00000000
00000000 00000055 00000000 00000000

Packet # 231 - Event: AFF5   [V46-0] Up Time: 000:32:08.561 SLOT: 0(hex)   POH: 1586 PCYC: 57
00000000 00000000 00000000 00000000 0BB3B200 00004C00 00000000 C4000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000

Error Log
Information

All tape drive error logs contain three main fields. Table 17 describes each
of these fields.

Table 17 Tape Drive
Field Descriptions

Field	Description
Event Log Number	A sequence number that indicates the order in which the event was logged.
Event Number or Name	The field appears in every event log, but varies depending on the event type. This field indicates the type of log.
POH/PC	The tracking information for how many power-on-hours (POH) the drive has had since it was shipped from Quantum. This is how many hours the drive has had power applied regardless of the number of times it is turned on and off. POH is updated once every 60 minutes the drive has had power applied to it with no interruptions. Power cycles (PC) is how many times the drive has experienced a power on cycle. Each time a drive logs a Hard Event, it will increment this count as well.

In addition to these main fields, each type of log contains specialized fields, Refer to the following sections for information about each log types' specialized fields:

- SCSI Check Condition Error Logs

- Bugcheck Error Logs on page 173

- Event Error Logs on page 174

SCSI Check Condition Error Logs

SCSI Check Condition Error logs record SCSI events that have been sent to the host in response to a command not completing successfully. These logs may be related to the events logged prior to this entry indicating that the event created a check condition that the host should know about (see figure 103).

Figure 103 SCSI
Check Condition Error
Log

Sense Key

Media ID

Event Log #6 - SCSI Event: POH/PC/MID/SK/ASC/ASCQ/ AddErr=340/16/13B9571E/1/80/02**/**

ASC/ASCQ
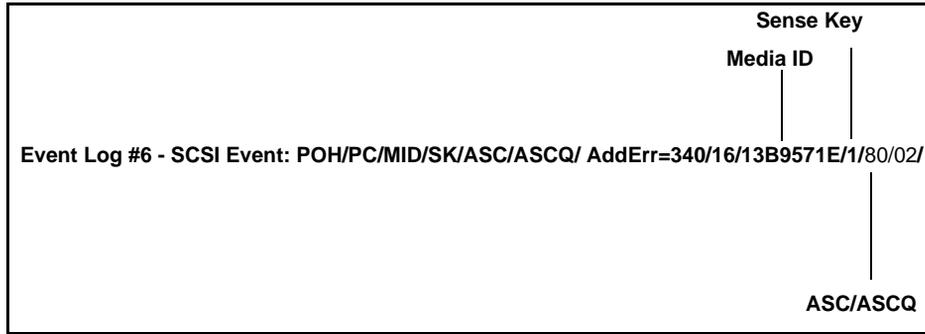
Table 18 describes each of the SCSI Check Condition log's specialized fields.

Table 18 SCSI Check
Condition Error Log
Field Descriptions

Field	Description
Media ID	A Media ID which is an internal identification number, written to the media the first time the media is used, to aid in tracking media to the different events, This ID does not correlate to any media ID used by application software
Sense Key	The SCSI equivalents of Sense Key as defined by the SCSI standards. See table 19 on page 169 for Sense Key definitions.
ASC/ASCQ	The SCSI equivalents of Additional Sense Code (ASC) and Additional Sense Code Qualifier (ASCQ) as defined by the SCSI Standards. See table 20 on page 171 for ASC/ASCQ descriptions and suggested actions.

Table 19 describes the sense keys.

Table 19   Sense Key
Field Definitions

Sense Key	Definition
0h	**No Sense**. This is an indicator that the drive did not have an error but that the host system may have sent an incorrect command or that a field in the changing parameters information was not correct. This is also an indicator that a request to move the tape past an EOD or a read of a filemark may have been attempted.
1h	**Recovered Error**. The drive had a recoverable error. This is one in which the drive detected something that may not be correct, but that the problem would not prevent the drive from functioning correctly. It may be just an indicator of an event that the drive was able to correct. For example, a Cleaning Requested status shows that the drive wants a cleaning tape used, but will still function correctly without it. This sense key will only be recorded in the logs if it is a Cleaning Requested condition.
2h	**Not Ready**. The drive is not ready for tape functionality. This is not reported in the drive log pages.
3h	**Medium Error**. The drive was not able to read or write successfully to the tape. Look at the Event Logs and correlate the events with media and system logs to determine if this is due to media or the drive. This sense key is recorded in the drive logs.
4h	**Hardware Error**. The drive has detected an error condition related to the hardware. You will need to refer to the sense Key and ASCQ, along with other event logs to best understand the error. Based on the log information, replace the appropriate component. This sense key does get logged each time it is reported.
5h	**Illegal Request**. The requested command had an incorrect parameter defined and you will need to review the actual command and parameter to determine what was wrong. This is not logged in the drive logs.

Sense Key	Definition
6h	**Unit Attention**. A condition exists that impacts the drive's functionality. Examples include a SCSI Bus reset, or a transition from ready to not ready. A reset is required because Mode Page setting may change after a reset and the host will need to know that. This sense key is not logged in the drive logs.
7h	**Data Protected**. The media currently in the drive is write protected. This can be a hardware write protect of software. This sense key is not logged in the drive logs.
8h	**Blank Check**. While reading, writing, or doing a search on the media that the drive encountered a EOD mark or a long gap was detected. A long gap may be the result of a drive stopping the write command without doing the proper command termination. This sense key is not reported in the drive logs.
9h	**Code Update**. The firmware in a drive has been changed. The ASC and ASCQ will indicate what the new revision of the drive firmware changes that may have occurred.
Bh	**Command Aborted**. The tape drive has aborted a drive command. Check the sense code and qualifier to better understand why. This sense key is not reported in the drive logs.
Dh	**Volume overflow**. The tape drive has reached the physical EOT and can no longer write data to the tape. This sense key is not reported in the drive logs.
Eh	**Miscompare**. During the drive self tests, the drive has detected a data miscompare while execution the internal test. This error would be a indicator that the drive should be returned for repair.

Table 20 describes the ASC/ASCQ fields.

Table 20   ASC/ASCQ
Field Description

ASC/ASCQ	Description	Suggested Action
0C/00	**Write Error**. Drive was not able to successfully write the customer data to the tape.	• Problem may be the tape cartridge or the drive. Check logs to correlate A401/A501 events with media type and ID system logs. • Run Tape Drive Write/ Read test with two pieces of media. If test fails, replace DCA.
11/00	**Unrecoverable Read Error**. After exhausting the read recovery algorithms the drive was not able to read the data correctly	• Problem may be the tape cartridge or the drive. Check logs to correlate A400/A500 events with media type and ID with system logs. Look for write errors to this media from this drive or others as that may be the result of this read error. • Run Tape Drive Write/Read test with two pieces of media. If test fails, replace DCA.
40/8x	**POST Error**. The drive during power on self test has detected an error.	• Errors of this type indicate a drive problem. Verify the SCSI bus is terminated correctly and if this continues replace the drive or DCA.
14/00	**Entity Not Found**. A logical block that was written on the tape was not found while trying to read the data.	• Problem may be the tape cartridge or the drive. Check drive logs to correlate events that may have led up to this condition. • Run Tape Drive Write/Read test with two pieces of media. If test fails, replace DCA.
47/00	**SCSI Partity Error**. SCSI bus communications problem	• Check SCSI Cables, Terminators, all devices attached to SCSI bus.

ASC/ASCQ	Description	Suggested Action
80/00	**Calibration Error**. The drive failed calibration.	• Recommend using a cleaning tape or try a different piece of media. If this persists it may be a drive problem. Look at the other drive logs to understand the failure action. Cleaning light should be on when this is reported. • Run Tape Drive Write/Read test with two pieces of media. If test fails, replace DCA.
80/01	**Cleaning Required**. The drive has detected a condition in which a cleaning tape must be used.	• Use a cleaning tape and /or different media. Check drive logs to review related events. If this persists with multiple media after cleaning replace the drive. If all related to one piece of media replace that tape cartridge. • Run Tape Drive Write/Read test with two pieces of media. If test fails, replace DCA.
80/02	**Cleaning Requested**. The drive has detected that using a cleaning tape would prevent possible failures due to debris on the head.	• Cleaning light should be on when this is reported. Use a cleaning tape. If this persists verify if this is with the same media or different media and frequency. Different media at a high frequency indicates drive is failing and should be replaced. Infrequent reports of this event will indicate media and/or environmental conditions should be checked.
80/03	**Soft Error Exceeds Threshold**. The drive has detected that a high soft error rate has occurred which may lead to a hard error.	• Use a cleaning tape to insure that drive heads are clean. If this persists use the drive logs to correlate this condition with other events and replace the drive if this is frequent with multiple media. The same media ID with multiple entries indicate a media problem. • Run Tape Drive Write/Read test with two pieces of media. If test fails, replace DCA.

Bugcheck Error Logs

Bugcheck Error logs typically indicate that the DLT firmware has reached a point in the decision process that requires a drive reset. There are 11 bugchecks, indicated by the Bugcheck Error field found in the event log's first line. The following conditions may cause a bugcheck:

- Hardware errors

- Media errors

- Power supply problems

- External conditions (shock, vibe, hot, cold, and so on)

- Firmware problems

> **Note:** Typically, firmware problems are not the cause and you should check for other sources. If it is assumed to be a firmware issue, contact Quantum Customer Support for assistance.

Figure 104 shows an example of a Bugcheck Error log.

Figure 104 Bugcheck Error Log

```
              Event Number
                   |
Event Log # 4 - BugCheck Error: B810 [T9-9 14-Jun-1999]
  PC=0005738E SR= 2500 Cntxt= Intrp 041:40;08.100 POH/PC=78/16
   MSP = 0011A4C0 ISRret = 0000E90 (IDLE)
            00002000 000B828 0000EE78 000E9DC 0006E984 00000000 00000013 001241F8
            00230100 001052C0 00111C78 00111CB8 00117F74 0011A1D0 0011A4D0 0011AA90
Temp 37 C
```

Table 21 describes the Bugcheck logs' specialized field.

Table 21   Bugcheck
Log Field Descriptions

Field	Description
Event Number: The Event Number is one of the common first line fields explained in the Event Types sections. Below is a listing of the Bugchecks for each event number.	

Number	Description
B810	Library Port Communications problems — Library or Drive Problem. If the problem continues multiple times after you reset the drive, replace the DCA.
E204	Unexpected Timer 2 Interrupt — Drive or DCA Problem.
EE01	Spurious Non-Askable Interrupt — Drive or DCA Problem.
EE02	Spurious Timer Interrupt — Drive or DCA Problem.
EE03	Spurious Level 5 Interrupt — Drive or DCA Problem.
EE04	Spurious Drive Comm Interrupt — Drive, DCA, or Loader Problem.
EE06	Spurious Diagnostic Comm Interrupt — Drive or DCA Problem.
EE08	Watch Dog Timer Expired — SCSI Bus, Host Controller, Drive, or DCA Problem.
EE09	Spurious Power Fail — Power supply, Power cables, or DCA Problem.
EE0D	Spurious Level 6 Interrupt — Drive or DCA Problem.
F202	Loader Time-Out — Loader or DCA Failure.

Event Error Logs   These logs record basic drive events including drive errors, calibration, and history related actions. There are 14 event error logs, indicated by the Event number filed is located on the First Line. All Event Error logs contain the same specialized fields. <u>Figure 105</u> shows a sample Event Error log.

V number   Date   Time stamp

Event Log # 3 - Event: A401 [V80-0 4-Aug-1998] 000:03:52.153 POH/PC = 340/16
110013B9 571E0101 00400000 00130000 02D10000 00440000 00000000 220024CA
00000000 04720000 00000000 00000000 00000000 00000000 00000000 00000000
00000000

Table 22 describes each of the Event Error log's specialized fields.

Field	Description
V Number	The version of firmware the drive was using when the event was logged.
Date	A reference date for when the firmware was created by Quantum
Time Stamp	The total time in which the tape drive has had power applied to the tape drive, since the last power cycle. This is hours, minutes, seconds, and milliseconds. There is no date associated with the power up time.

In addition to the specialized fields, each Event Error log has specific information about the cause and suggested actions to follow for troubleshooting errors. This information can be found in the block descriptors of each log. Use the following sections to find information on each Event Error log:

- A400: Read Error

A400: Read Error

Read Error is a recorded event indication that the tape drive detected a condition in which the drive was not successfully able to read the data from a particular location on the media.

Figure 106 Read
Error Block Descriptor

Long Word	Byte 03	Byte 02	Byte 01	Byte 00
1			(MSB) Media ID	
2	Media ID (LDB)			
3		Media Format		
4				Track
5	Physical Block Number on Track			
6-17				

Table 23   Read Error
Field Descriptions

Field	Description
Media ID	Identifier placed on the media when the calibration tracks are written. This is used to help track which piece of media was in the drive at the time of the event.
Media Format	The value of this field defines the format or density the media is written. 4 = DLT 260 8 = DLT600 10 = DLT2000/2000XT 20 = DLT4000 40 = DLT7000 80 = DLT8000 300 = SDLT220 310 = SDLT320 300 = SDLT220 320 = SDLT600 blank media is reported as unknown
Track	The Logical Track Number the heads are on at the time of the event. The DLT tape drive is a linear recording device with multiple tracks. The Read/Write Head Assembly has more than one head so that multiple physical tracks of data are read or written at the same time. These multiple tracks are referred to a one logical track.
Physical Block Number on Track	A physical location on the media based on distance from the end-of-track depending on which direction the tape is moving. Tape moving from Beginning of Tape (BOT) side of tape to End of Tape (EOT) side is distance from BOT. In the opposite direction, it is the location from the EOT side of the tape. This data, with the track number, can be used to help identify if repeated failures always occur at the same spot, meaning data written wrong, or bad spot on media.

Cause   This error could be due to one or more of the following:

- A bad spot on the media

- A failure of the drive to determine the data read from the tape was good due to CRC

- Other indicators used by the drive to insure data integrity

- The data originally written was not written correctly.

Suggested Actions   Following is a list of suggested actions:

- Verify if multiple events on the same media occur, or multiple events on different media occur. With this information, you can determine if the failure is caused by the media or the drive.

- Make sure the event is not due to media being written badly by some other drive. To confirm the media was not written incorrectly, look for A401 events with the same media ID on this drive and other drives this media may have been written to.

> **Note:** If the drive logs this error, the cleaning light may be turned on recommending a cleaning as well.

- Run a Tape Drive Write/Read test with two pieces of media. If test fails, replace the DCA.

A401: Write Error

Write Error is an event in which the tape drive detected a condition that the drive was not successfully able to write data to the media.

Figure 107 Write
Error Block Descriptor

Long Word	Byte 03	Byte 02	Byte 01	Byte 00
1			(MSB) Media ID	
2	Media ID (LDB)			
3		Media Format		
4				Track
5	Physical Block Number on Track			
6-17				

Table 24   Write Error
Field Descriptor

Field	Description
Media ID	Identifier placed on the media when the calibration tracks are written. Used to help track which piece of media was in the drive at the time of a failure. A new, unused, piece of media will have the media ID written on the first write command from BOT. If the drive failed during calibration and a write command from BOT was issued, the drive will rewrite the calibration tracks changing the media ID at the time.
Media Format	Format/Density the media is written. 4 = DLT 260 8 = DLT600 10 = DLT2000/2000XT 20 = DLT4000 40 = DLT7000 80 = DLT8000 300 = SDLT220 310 = SDLT320 300 = SDLT220 320 = SDLT600 blank media is reported as unknown
Track	The Logical Track Number the heads are on at the time of the event. The DLT tape drive is a linear recording device with multiple tracks. The Read/Write Head Assembly has more than one head so that multiple physical tracks of data are read or written at the same time. These multiple tracks are referred to a one logical track.
Physical Block Number on Track	A physical location on the media based on distance from the end-of-track depending on which direction the tape is moving. Tape moving from BOT side of tape to EOT side is distance from BOT. In the opposite direction it is the location from the EOT side of the tape. This data with the track number can be used to help identify if repeated failures always occur at the same spot, meaning data written wrong, or bad spot on media.

Cause

This error could be due to one or more of the following:

- A bad spot on the media

- A failure of the drive to determine the data written was good during the read after write

Suggested Actions

Following is a list of suggested actions:

- Check the Media IDs. Multiple Media IDs may indicate that the drive is the problem. Similar media ID may indicate that the media is the problem.

- Use a cleaning tape and try the same media again. Then try different media before indication that the drive is the failure.

Note:	If the drive logs this error, the cleaning light may be lit recommending a cleaning as well

Run a Tape Drive Write/Read test with two pieces of media. If test fails, replace the DCA.

A402: Drive Error

Drive Error indicated the drive has detected something out of the ordinary during normal operations. If this is a hard error, the drive will not be functional for reading, writing, or successfully loading or unloading the media.

Figure 108 Drive
Error Block Descriptor

Long Word	Byte 03	Byte 02	Byte 01	Byte 00
1			(MSB) Media ID	
2	Media ID (LDB)			
3	Drive Error Code		Drive Status on Error	
4-8				
9				ASCQ
10	ASC	Sense Key		
11-12				
13			POST Flag	
14	POST Flag			
15-17				

Table 25   Drive Error
Log Field Descriptions

Field	Description
Media ID	Identifier placed on the media when the calibration tracks are written. Used to help track which piece of media was in the drive at the time of failure.
Drive Error Code	Drive Error Codes listed are listed only as major codes indicating a category of drive error types rather than listing all possible error codes. The individual error codes are not important for determining if the event is hardware, media, or some other source of the error. Use the Suggested Actions to troubleshoot the error.

Major Error Code	Description	Suggested Action
0000h-001Fh	Power on Self Test Error	• Check Power • Check Post Flags
0020h-003Fh	Initialization Errors	• Check Power • If Repeating, ensure no media loaded • No Media and repeat drive replacement
0040h-004Fh	Cartridge Insertion Errors	• Check Cartridge
0050-005F	Cartridge Unload Errors	• Check Cartridge/Leaders
0060h-006F	Cartridge Unload Errors	• Check Cartridge/Leaders
0070h-007F	Cartridge Extraction Errors	• Check Cartridge/Leaders
0080h-009Fh	Servo Errors	• Possible drive or DCA problem, try multiple media
00A0h-00Afh	Miscellaneous Tape Motion Errors	• Possible drive or DCA problem, try multiple media

Field	Description	
00B0h-00BFh	Hardware Errors	• Possible Drive or DCA problem
00C0h-00EFh	Interrupt Trap Errors	• Possible Drive or DCA problem, try multiple media
00E0h-00EFh	Interrupt Trap Errors	• Possible Drive or DCA problem
00F0h-00FFh	Miscellaneous Errors	• Possible Drive or DCA problem

Drive Status (on Error)

Bit	Description
15	Drive is in the Process of using a Cleaning Tape
14	Drive has a Cartridge Inserted
13	Drive has No Tape Tension
12	Drive is in the Process of Calibrating after loading a tape cartridge
11	Drive is in the Process or Rewinding the tape to BOT
10	Drive is at a End of Track
09	Drive is on the Correct Track and physical location of the media
08	Drive is Moving the Tape and Seeking to a Track location
07	Drive is Stopped on Tape
06	Drive is at EOT
05	Drive is at BOT
04	Drive is Unloaded with No Cartridge
03	Drive is Unloaded with a Cartridge
02	Drive is in the Process of Unloading the tape

Field	Description
01	Drive is in the Process of Loading a tape but has not entered the calibration phase of the load
00	Drive is in the Process of Initializing (typical after power on or a total drive reset)

POST Flags: 32-bit register to indicate the POST failure that failed. Figure 109 shows the breakdown of the 32-bit register. The next section indicates the fields and a brief description.

FE	Fatal Error was detected
RE	Reportable Error was detected
LF	Last Fail Event Log contains valid information
MF	Multiple Failures were detected
UI	Unexpected interrupt was detected
Failing Section	If not equal to 0, return drive for repair
Failing Subsection	If not equal to 0, return drive for repair
Detected Error	If not equal to 0, return drive to repair

Figure 109 32-Bit
Register

31	30	29	28	27	26	24	23	16	15	8	7	0
FE	RE	LF	MF	UI	Unused		Failing Section		Failing Sub-section		Detected Error	

Cause

This error could be due to one of the following:

- Items such as a dropped leader
- An error internal to the drive

Suggested Actions

Following is a list of suggested actions:

- Look for how frequent the events are being logged and how they relate to the media ID. Multiple events of this type would be an indicator that there may be a problem with the drive or the piece of media being used.

- Run a Tape Drive Write/Read test and power cycle the unit.

A403: Loader Log

This Event Log entry is used by drive loader/Library OEM suppliers in which the library/loader supplier should provide additional details.

Figure 110 Loader Error Field Descriptions

Long Word	Byte 03	Byte 03	Byte 01	Byte 00
1			(MSB) Media Loader Identifier	
2	Media Loader Identifier			
3	Media Loader Identifier (LSB)			
4	(MSB) Media Loader Unit Number (LSB)		Loader Error	Loader Command Status
5	Loader Command			
6			Event Reference Number	
7-17				

Table 26   Loader
Error Field
Descriptions

Field	Description
Media Loader Identifier	Code to identify loader type
Media Loader Unit Number	Code to identify loader unit number
Loader Error	Loader error type
Loader Command Status	Status of the loader command that executed
Loader Command	Loader command that was executed
Event Reference Number	Number being used to count the number of events that have occurred

Cause   This error is due to a problem with the SuperLoader.

Suggested Actions   Look at the SuperLoader Error logs. For information on how to locate and troubleshoot the problem, see SuperLoader Error Logs on page 146.

A404/A405: Calibration

A404 and A405 are related event logs regarding drive calibration. A405 is a continuation of A404. Both event logs contain 20 long words.

Figure 111 Calibration
Block Descriptor

Long Word	Byte 03	Byte 02	Byte 01	Byte 00
1			(MSB) Media ID	
2	Media ID (LDB)			
3	Cal Fail		Cal Info Flags	
4-20				

Table 27 Calibration
Field Descriptions

Field	Description
Media ID	Identifier placed on the media when the calibration tracks are written. This is used to help track which piece of media was in the drive at the time of failure. A new, unused, piece of media will have this happen on the first write command from BOT or if the drive has failed during calibration and a write command from BOT will rewrite the calibration tracks changing the media ID at the time. If the calibration failed the Media ID will not be valid.

Cal Fail: Status of the Calibration (reason for calibration failure)

Bit	Description
15	Calibration Track was Not Found in the Correct Location (there are multiple Calibration tracks on a tape)

Field	Description
14	Forward and Backward Offset of Calibration Tracks too Far Apart
13	Backward Offset of Calibration Tracks too Far Apart
12	Forward Offset of Calibration Tracks too Far Apart
11	Bottom Edge of Tape Found too Far From Bottom Head Stop location
10	Amplitude Calibration low
09	No Write Gate
08	2F Amplitude Out of Specification
07	Write Current Out of Specification
06	Resolution Calculation Failed
05	Tension Calculation Failed
04	Bottom Edge of Tape Not Found
03	Bottom Edge of Tape too Close to Bottom head Stop location
02	Width of a Calibration Track Out of Specification (any one of the calibration tracks)
01	Media type Unknown
00	Number of Calibration Tracks Inconsistent with Media Type

Cal Info Flags: Used to help verify the media type and the format of that media that was inserted as to what the user had expected to use. This is another verification to determine if it is media or a user induced failure. Calibration Tracks Successfully Found.

Bit	Description
15	Unused (DLT2000/4000 only) Current Calibration is in Azimuth Mode (DLT 7000/8000 only)

Field	Description
14	Calibration Failed (DLT 2000/4000 only) Vertical R/W Offset Okay (DLT7000/8000 only)
13	Calibration Successful, but a Cleaning Limit exceeded (DLT2000/4000 only) Azimuth R/W Offset is Okay (DLT7000/8000 only)
12	Desperation Read Mode (Drive not Calibrated to write but will attempt to read only)
11	Tilt Position Okay (DLT7000/8000 only)
10	Calibration Tracks Written
09	Tape Edge Found
08	Write Current Okay
07	Signal-to-Noise Okay
06	Resolution Okay
05	2F Amplitude Okay
04	Tape Tension Okay
03	No Calibration Tracks Found
02	Width of a Calibration Track Out of Specification (any one of the calibration tracks)
01	Head Stepper Position Okay
00	Cleaning Light Turned On

Cause   This error is due to a drive failing calibration.

Suggested Actions

Following is a list of suggested actions:

- The data in the Cal Fail log word is critical to determine if the drive failed calibration and why. If the drive does a write from BOT, this failure is no longer important as the calibration information is overwritten with new data.

- This event can be used to help understand why a drive may be getting multiple cleaning lights and if the cleaning lights are all related to calibration errors. A cleaning light will come on if a drive gets a Hard Read or Write Error as well.

- To verify if this is all due to the same piece of media, the system/ application logs need to be correlated to when these events occurred. If it is the same media, replace it or try a write from BOT to see if it clears.

- Run a Tape Drive Write/Read test with two pieces of media. If test fails, replace the DCA.

A407: Directory Read

The directory referenced in this event log is DLT unique. This directory contains information the drive uses to allow for fast location of data on the tape. Without the directory a space command to end-of-data on a full tape could take as much as 6 hours. The DLT tape drive maintains this directory to reduces the space to a location on tape time to less than a few minutes depending on tape speed of the drive. The host or application software does not have access to this directory information.

Figure 112 Directory
Read Block Descriptor

Long Word	Byte 03	Byte 02	Byte 01	Byte 00
1				Called Mode
2			Format	
3	Flags	Status	Status 2	Status 3
4				
5	Media ID			
6-20				

Table 28   Directory
Read Field
Descriptions

Field	Description
Called Mode	What function was being performed when the event was logged.
	1= Read of the Directory when Loading the tape.
	2= Write of the Directory while Unloading the tape.
	3= Write of Directory from BOT. This is the step in which the drive erases the directory when loading the media. This occurs after the directory was read during the tape load process.
Media Format	Format/Density the media is written.
	4 = DLT 260
	8 = DLT600
	10 = DLT2000/2000XT
	20 = DLT4000
	40 = DLT7000
	80 = DLT8000
	300 = SDLT220
	310 = SDLT320
	300 = SDLT220
	320 = SDLT600
	blank media is reported as unknown

Flags: Information DLT drive uses to determine further action if any take in rebuilding this information and a possible reason why the directory event was logged

<u>Bit</u>	<u>Description</u>
0	Read on Load Complete
1	Inhibit Directory Write
2	LBN 0 Found

Field	Description
3	DIR Write Failed
4	Tape Format Mismatch
5	Event Log Generated
6	Tape Format Unknown
7	Non-Zero First Track (DLT 4000 Reserved)
Status	Results of the directory read from the media during the load of media. Status is also displayed in byte 18 of Request Sense Response. 0 = Directory 1 = No Directory Found 2 = Media Contained Only a Partial Directory 3 = Directory Read was Complete

Field	Description
Status 2	Status of the Directory located on the media at BOT. Reason for the directory event if due to the BOT directory. DLT keeps the master copy of the directory near BOT. Other directory information is maintained in EEPROM and at the EOT side of the media as back up if the BOT directory is lost.
	01h = TK50/70 - No Directory
	0Ah = Inconsistent Formats
	0Bh = Wrong Format
	0Ch = The Reserved fields in the Directory were not equal to 0
	0Dh = This is a Partitioned Tape
	14h = No Directory Blocks Read
	15h = No Directory Blocks read
	16h = Not all Directory Blocks were Present
	1Eh = Sync Lock Failure Trying to Read the Directory
	1Fh = Revision Level Mismatch (revision of directory format and expected revision)
	20h = Verify Failed
	21h = Unit on Write-Form BOT
	22h = Truncated due to a Tape=Marker EDC
	28h = Good Initialized directory read
	29h = Good Directory Read (Has Partial EOD)
	2Ah = Complete directory

Field	Description
Status 3	Directory Recovery Status (EEPROM directory status used for recovery)
	01h = Recovered Directory, but pending validation
	0Ah = No LBN 0
	0Bh = Media ID of media and EEPROM directory do not match
	0Ch = On Tape directory not empty
	0Dh = Sync lock Mismatch
	14h = Bugcheck during directory update

Cause

This is due to the DLT needing to rebuild the directory

Suggested Actions

Following is a list of suggested actions:

- This information can be used to determine if the application may be timing out due to the DLT needing to rebuild the directory or a Space/Locate command may be taking too long.

- Check to insure the previous drive that used this media did not have an A408 Event indicating it could not write the directory successfully. A partial directory may be the result from a drive that lost power while the media was still loaded. Please confirm this or confirm that the last drive to use this media did to have a directory write problem.

- Perform a complete Read Only test on the media to determine if the media is readable.

A408: Directory Write

Directory write provides information as to why the DLT tape drive was not successful in writing a directory to the media. If a drive fails to write a good directory the next drive to load the tape may log an A407 Event, and it may have excessively long response times to a space or locate SCSI command.

> **Note:** This event will not occur on SDLT tape drives.

Figure 113 Directory
Write Block Descriptor

Long Word	Byte 03	Byte 02	Byte 01	Byte 00
1				Called Mode
2	Format			
3	Flags	Status	Status 2	Status 3
4				
5	Media ID			
6-20				

Table 29   Directory
Write Field
Descriptions

Field	Description
Called Mode	What function was being performed when the event was logged.
	1= Read of the Directory when Loading the Tape
	2= Write of the Directory while Unloading the tape.
	3= Write of Directory from BOT. This is the invalidation of the directory when loading the media.
Media Format	Format/Density the media is written.
	4 = DLT 260
	8 = DLT600
	10 = DLT2000/2000XT
	20 = DLT4000
	40 = DLT7000
	80 = DLT8000
	300 = SDLT220
	310 = SDLT320
	300 = SDLT220
	320 = SDLT600
	blank media is reported as unknown

Flags: Information DLT drive uses to determine further action if any take in rebuilding this information and a possible reason why the directory event was logged.

Bit	Description
0	Read on Load Complete
1	Inhibit Directory Write
2	LBN 0 Found

Field	Description
3	DIR Write Failed
4	Tape Format Mismatch
5	Event Log Generated
6	Tape Format Unknown
7	Non-Zero First Track (DLT 4000 Reserved)
Status	Results of the directory read from the media during the load of media. Status is also displayed in byte 18 of Request Sense Response. 0 = Directory Unknown 1 = No Directory Found 2 = Media Contained Only a Partial Directory 3 = Directory Read was Complete

Field	Description
Status 2	Status of the Directory located on the media at BOT. Reason for the directory event if due to the BOT directory. DLT keeps the master copy of the directory near BOT. Other directory information is maintained in EEPROM and at the EOT side of the media as back up if the BOT directory is lost.
	01h = TK50/70 - No Directory
	0Ah = Inconsistent Formats
	0Bh = Wrong Format
	0Ch = The Reserved fields in the Directory were not equal to 0
	0Dh = This is a Partitioned Tape
	14h = No Directory Blocks Read
	15h = No Directory Blocks read
	16h = Not all Directory Blocks were Present
	1Eh = Sync Lock Failure Trying to Read the Directory
	1Fh = Revision Level Mismatch (revision of directory format and expected revision)
	20h = Verify Failed
	21h = Unit on Write-Form BOT
	22h = Truncated due to a Tape=Marker EDC
	28h = Good Initialized directory read
	29h = Good Directory Read (Has Partial EOD)
	2Ah = Complete directory
Status 3	Directory Recovery Status (EEPROM directory status used for recovery)
	01h = Recovered Directory, but pending validation
	0Ah = No LBN 0
	0Bh = Media ID of media and EEPROM directory do not match
	0Ch = On Tape directory not empty
	0Dh = Sync lock Mismatch
	14h = Bugcheck during directory update

A500: SDLT Hard Read Error

Read Error is a recorded event indication the tape drive detected a condition in which the drive was not successfully able to read the data from a particular location on the media.

Figure 114 Hard Read Error/Hard Write Error Block Descriptor

Long Word	Byte 03	Byte 02	Byte 01	Byte 00
1	Media ID			
2	Physical Block Number (PBN)			
3	Tape Address			
4-12				
13	Media Type		Tape Format	
14			Tape Number	
15	Retry Count	Logical Blk Num (LBN)		
16	Head Wear Hours		BRC Head Wear Hours	

Table 30   Hard Read
Error/Hard Write Error
Field Descriptions

Field	Description
Media ID	Random number used to identify tapes
Physical Block Number (PBN)	Physical block location where the error occurred. There is one physical block for each read/write head on each track. For example, if there are 4 separate heads and 10 tracks, there would be 40 physical blocks on a single point of that media.
Tape Address	Location on tape in inches
Track Number	Track number where error occurred
Retry Count	Retry count used when reading
Logical Block Number (LBN)	A block of data on media that includes all physical block associated with all heads for that single point of media. For example, in the forward direction if there are 4 heads and 10 tracks 5 forward and 5 backwards, there would be two logical block going backwards. Yet these two logical blocks would equate to 10 physical blocks.
Head Wear Hours	Number of Head Wear Hours for the SDLT Head reported by Servo
BBC Head Wear Hours	Number of head Wear Hours for the BRC Head reported by Servo

Cause   This error could be due to one or more of the following:

- A bad spot on the media

- A failure of the drive to determine the data read from the tape was good due to bad CRC

- Other indicators used by the drive to insure data integrity

- The data originally written was not written correctly

Suggested Actions

Following is a list of suggested actions:

• Verify if multiple events on the same media occur, or multiple events on different media occur. With this information you can determine if the failures is media caused or drive caused.

• Make sure the event is not due to media being written badly by some other drive. To confirm the media was not written incorrectly, look for A401 events with the same media ID on this drive and other drives this media may have been written to.

> **Note:** If the drive logs this error, the cleaning light may be turned on recommending a cleaning as well.

• Run a Tape Drive Write/Read test with two pieces of media. If test fails, replace the DCA.

A501: SDLT Hard Write Error

Write Error is an event is which the tape drive detected a condition that the drive was not successfully able to write data to the media.

Figure 115 Hard Read Error/Hard Write Error Block Descriptor

Long Word	Byte 03	Byte 02	Byte 01	Byte 00
1	Media ID			
2	Physical Block Number (PBN)			
3	Tape Address			
4-12				
13	Media Type		Tape Format	

14			Tape Number	
15	Retry Count	Logical Blk Num (LBN)		
16	Head Wear Hours		BRC Head Wear Hours	

Table 31   Hard Read
Error/Hard Write Error
Field Descriptions

Field	Description
Media ID	Random number used to identify tapes
Physical Block Number (PBN)	Physical block location where the error occurred. There is one physical block for each read/write head on each track. For example, if there are 4 separate heads and 10 tracks, there would be 40 physical blocks on a single point of that media.
Tape Address	Location on tape in inches
Track Number	Track number where error occurred
Retry Count	Retry count used when reading
Logical Block Number (LBN)	A block of data on media that includes all physical block associated with all heads for that single point of media. For example, in the forward direction if there are 4 heads and 10 tracks 5 forward and 5 backwards, there would be two logical blocks going backwards. Yet these two logical blocks would equate to 10 physical blocks.
Head Wear Hours	Number of Head Wear Hours for the SDLT Head reported by Servo
BBC Head Wear Hours	Number of Head Wear Hours for the BRC Head reported by Servo

Cause

This error could be due to one or more of the following:

- A bad spot on the media

- A failure of the drive to determine the data read from the tape was good due to bad CRC

Suggested Actions

Following is a list of suggested actions:

- Check the Media IDs. Multiple Media IDs may indicate the drive is the problem. Similar media IDs may indicate the media is the problem.

- Use a cleaning tape and try the same media again. Then try different media before indicating the drive as the failure.

> **Note:** If the drive logs this error, the cleaning light may be turned on recommending a cleaning as well.

- Run a Tape Drive Write/Read test with two pieces of media. If test fails, replace the DCA.

A502: SDLT Loader Communication Error

Figure 116 Loader Communication Error Block Description

Long Word	Byte 03	Byte 02	Byte 01	Byte 00
1	Loader Communication Status			

Table 32 Loader Communication Error Field Description

Description	Value
Loader Communication Status: Status of communication problem	
Overrun Error	0x10

Description	Value
Parity Error	0x20
Framing Error	0x40

Cause

This error could be due to an internal communication error.

Suggested Actions

Following is a list of suggested actions:

- Power cycle the unit.

- If the problem repeats, perform an SuperLoader Random Access test.

- If problem repeats, replace the DCA.

A503: SDLT Drive-Servo Error

The Drive Servo Error occurs when the SDLT tape drive experiences Servo errors. There errors will result in Tape Drive Read/Write Errors.

Figure 117 Drive Servo Error Block Descriptor

Long Word	Byte 03	Byte 02	Byte 01	Byte 00
1	Log Type			
2				
3	Drive Error Code		Drive Status (MSW)	
4	Drive Status (LSW)			
5			Track Number	

6	Physical Block Number (PBN)	
7-11		
12	Power on Hours (LSW)	Power on Hours (MSW)
13	Head Wear Hours	
14		POST Flags (MSW)
15	POST Flags (LSW)	
16-36		

Table 33   Drive Servo
Error Field
Descriptions

Field	Description	
	Description	Value
	Calibration Failure	0x15
	Drive Command Time Out	0x09
	Controller to Drive Interface	0x0A
	Drive Command Time Out	0x21
	Drive Event	0x20

Drive Error Code: Error code from Servo processor

	Major Error Code	Description	Possible Action
	0000h-001Fh	Power on Self Test Error	Check Power Check Post Flags

Field	Description		
	0020h-003Fh	Initialization Errors	Check Power If Repeating ensure no media loaded No Media and repeat drive replacement
	0040h-004Fh	Cartridge Insertion Errors	Check Cartridge
	0050-005F	Cartridge Unload Errors	Check Cartridge/Leaders
	0060h-006F	Cartridge Unload Errors	Check Cartridge/Leaders
	0070-007F	Cartridge Extraction Errors	Check Cartridge/Leaders
	0080h-009Fh	Servo Errors	Possible drive, try multiple media
	00A0h-00Afh	Miscellaneous Tape Motion Errors	Possible drive, try multiple media
	00B0h-00BFh	Hardware Errors	Possible Drive
	00C0h-00DFh	Internal Software Errors	Possible drive, try multiple media
	00E0h-00EFh	Interrupt Trap Errors	Possible Drive
	00F0h-00FFh	Miscellaneous Errors	Possible Drive

Drive Status (on Error)

	MSW Bits	Description	
	03	15 undefined	

Field	Description	
	02	Drive did not buckle the tape when loading
	01	Drive is unloading a tape
	00	Drive is loading a tape
	LSW Bits	**Description**
	15	Drive is running a cleaning tape
	14	Drive is ejecting a cartridge
	13	Drive has No Tape Tension
	12	Drive is in the Process of Calibration after loading a tape cartridge
	11	Drive is in the Process of Rewinding the tape to BOT
	10	Drive is at a End of Track
	09	Drive is on the Correct Track and physical location of the media
	08	Drive is Moving the Tape and Seeking to a Track location
	07	Drive is Stopped on Tape
	06	Drive is at EOT
	05	Drive is at BOT
	04	Drive is in process of loading the tape step 2
	03	Drive is in process of loading the tape step 1
	02	A cartridge has been inserted
	01	No cartridge has been inserted

Field	Description	
	00	Drive is in the Process of Initializing (typical after power on or a total drive reset)
POST Flags	**MSW Bits**	**Description**
	15	Unused
	14	Unused
	13	Unused
	12	Unused
	11	Unused
	10	Unused
	09	Unused
	08	Unused
	07	Unused
	06	Unused
	05	Unused
	04	Unused
	03	Unused
	02	Unused
	01	Unused
	00	EEROM Bad
	LSW Bits	**Description**
	15	Unused
	14	BOT LED bad
	13	Unused

Field	Description	
12	A to D test failed	
11	Unused	
10	Unused	
09	EEROM check sum failed	
08	12 volts bad	
07	Unused	
06	Unused	
05	PLL clock test failed	
04	EEROM check sum failed	
03	Code check sum failed	
02	RAM test failed	
01	Address Line test failed	
00	RAM test failed	

Cause   This error could be due to grave failure to track the optical servo or electrical servo.

Suggested Actions   Run a Tape Drive Write/Read test with two pieces of media. If test fails, replace the DCA.

A507/A508: Directory Read Failure/Directory Write Failure

These events indicate a possible problem in reading or writing to the tape directly.

Figure 118 Directory Read Failure/Write Failure Block Descriptor

Long Word	Byte 03	Byte 02	Byte 01	Byte 00
1				Called Mode
2	Save Format		New Format	
3	Flags			
4	Read Fail Status	Status	Status 2	EEPROM Status
5				
6	Media ID			
7	CR Message Pointer			
8	Track Size			
9	EOT Status			
10-12				

Table 34   Directory
Read Failure/Write
Failure Field
Descriptions

Field	Description	
Called Mode	Directory mode called from	
	Mode	Value
	READ on LOAD	1
	WRITE on UNLOAD	2
	WRITE from BOT	3
	READ BOTH REVERSE	4
	READ BOTH FORWARD	5

Field	Description	
Save Format	Tape format before reading directory	
	Format	**Value**
	TK85	0x0204
	TK86	0x0208
	DLT 2000	0x0210
	DLT 4000	0x0220
	DLT 7000	0x0240
	DLT 8000	0x0280
	DLT1	0x0290
	SDLT 220	0x0300
	SDLT 320	0x0310
	SDLT 600	0x0320
	Unknown	0x0000
	Initial	0x0001
New Format	Tape format of the directory. For format values, see the Save Format field.	

Field	Description	
Flags	Directory flags	
	<u>Bits</u>	<u>Description</u>
	14-31	Filler
	13	Calibration On Load success
	12	Lram directory stale
	11	Tape direction rev
	10	Directory stale
	09	Retry needed
	08	Directory clobbered
	07	Non-zero first track
	06	Unknown format
	05	Event log
	04	Format mismatch
	03	Directory Write failed
	02	LBN 0 found
	01	Inhibit directory write
	00	Read On Load complete

Field	Description	
Read Fail Status	Status for Directory Read failures	
	Description	Value
	Unknown	0x0
	Retry failed	0x1
	No Blocks	0x2
	Goofy Blocks	0x3
	No Block 0	0x4
	Bad ECC	0x5
	Directory Cell Recovery	0x6
	Directory Cell stale	0x7
	Directory Cell fail	0x8
	Serpentine	0x9
	Verify fail	0xA
	BOT fail	0xB
	BOT No Blocks	0xC
	BOT Bad ECC	0xD
	Indeterminate Blocks	0xE
	Could not correct	0xF
	System Error	0x10
	Calibration failed	0x11
	Drive Error	0x12

Field	Description	
Status	Media directory status	
	Description	**Value**
	Directory unknown	0
	No directory	1
	Partial directory	2
	Directory complete	3
	Directory stale	4
EEPROM Status	EEPROM directory status	
	Description	**Value**
	Directory recovered	1
	No LBN 0	10
	Media ID mismatch	11
	On Tape directory not empty	12
	Sync Lock mismatch	13
	Directory unreliable	20
Media ID	Media ID from tape	

Field	Description	
EOT Status	Directory status four	
	Description	Value
	Directory recovered	1
	Directory attempt	2
	Bad directory cell structure	10
	Bad directory cell entry	11
	Invalid track	12
	Sync Lock mismatch	20
	Track zero	21
	Directory No Pair	30
	Directory Zeroed	31
	Directory Bad Revision	32
	Directory Bad Media ID	33
	Directory RSTO	34

Cause   This error could be due to one of the following:

- Drive may need to rebuild to directory
- Drive is having difficulty writing to directory

**Suggested
Actions**

Following is a list of suggested actions:

- Check for other Write Errors.

- Perform a Tape Drive Write/Read test with two pieces of media. If test fails, replace the DCA.

- Perform a complete Drive Read Only test.
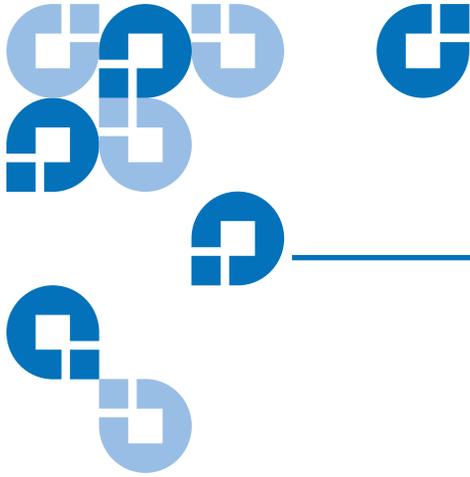
Diagnostics

The POST and diagnostic tests are helpful tools for testing the SuperLoader's functionality and for troubleshooting errors. With the results from the POST and diagnostic tests, you can determine how well the SuperLoader is working and locate any problems.

The Diagnostics chapter describes the POST and its various tests. This chapter also explains how to perform diagnostic tests from the front panel and On-board Remote Management.

POST

Every time you turn on the SuperLoader, the POST checks all of the SuperLoader's basic components. If you experience problems with the SuperLoader, the POST is a good method to determine if any major parts are malfunctioning.

**POST
Descriptions**   Table 35 describes the different tests that the POST performs.

Table 35   POST
Descriptions

POST	Test Description
MICROP	Tests the microprocessor's general purpose registers
IRAM	Tests the microprocessor's internal RAM
Addr Lines	Bit walks the SRAM address lines
SRAM	Test the 512k SRAM
Code Chksum	Verifies the Flash image checksum
EERom	Checks the EERom area and verifies the checksums
PLL Clock	Tests that the microprocessor's PLL is synchronized correctly
LCD	Verifies that the LCD is present and working correctly
Ethernet	Configures and verifies communication with the Ethernet chip
Barcode	Verifies that the bar code reader is present and performs a hardware handshake
Temperature Sense	Pass/Fails the MDM and configures the AHIM temperature sensors
MDM	Verifies that the MDM is present and checks the sensors
Fan	Verifies that the fan is operating correctly

Perform a POST   If you experience errors while operating your SuperLoader, you may
need to reboot the SuperLoader to perform a POST.

To Reboot the SuperLoader:

1 Hold down the **Power** button until System Shutdown Please Wait... appears.

2 Release the **Power** button. The SuperLoader turns off.

3 Press the **Power** button again to turn the SuperLoader on. POST runs automatically.

Interpret the POST Results

While the POST is running, a progress indicator showing the name of the test displays on the front panel. If the SuperLoader is working properly, the message System Ready and the current configuration display after the POST completes successfully.

If the SuperLoader is not working properly, error messages display on the front panel (see Check for Errors on page 144).

Diagnostic Tests

Diagnostic tests allow you to calibrate parts of the SuperLoader, check the condition of parts, or test the SuperLoader's functionally. From the front panel, you can perform all of the diagnostic tests. Since certain tests require you to manually insert a cartridge, you can perform only some of the diagnostic tests using On-board Remote Management (see On-board Remote Management Diagnostic Tests on page 226).

Note: On-board Remote Management allows you to request all diagnostic tests, but any tests that require a cartridge to be inserted will time-out unless someone manually inserts the cartridge at the appropriate time.

Set the Security

When you enable the security function, the diagnostic tests are password protected to ensure data integrate. To access any of the diagnostic tests, you must first enter an Administrator password. If you do not enter the password, you will be prompted when you attempt to perform a diagnostic test.

To Enter an Administrator Password:

1 On the main menu, scroll to **Commands**, then press **Enter**.

2 On the Command submenu, scroll to **Enter Password**, then press **Enter**.

3 On the Enter Password submenu, scroll to **Administrator**, then press **Enter**.

The Login screen appears with a row of asterisks. A textbox appears above the first asterisk.

4 In the textbox, scroll to the first number of the password, then press **Enter**. The textbox above the asterisk disappears and another textbox appears above the next asterisk.

5 Repeat step 4 to enter the remaining numbers of your password.

> **Note:** Press **Escape** to backspace to a previous textbox, if necessary.

When you have finished entering your password, the LCD displays Submit Password below the asterisks.

6 Press **Enter** to submit your password. You return to the **Enter Password** submenu.

Stop a Diagnostic Test

At times you may need to stop a diagnostic test while it is in progress. Certain diagnostic tests even require you to stop them or they run continuously. To stop a diagnostic test while it is running, use the **Halt Test** function. When you select **Halt Test**, any picker or magazine functions complete and then the Diagnostic test is stopped.

To Perform a Halt Test from the Front Panel:

1 While the diagnostic test that you wish to stop is running, press **Escape.** The Diagnostic submenu appears.

2 On the submenu, scroll to **Halt Test**, then press **Enter.** User Abort appears.

3 Press **Enter** to return to the Diagnostics submenu. Refer to On-board Remote Management for any test results.

To Perform a Halt Test on On-board Remote Management:

1 Select Halt Test from the Diagnostics drop-down menu, and click **submit.**

2 Select **View Status** to see the results of the command. Test Stopped appears along with any text results.

Front Panel Diagnostic Tests

You can perform the following diagnostic tests using the front panel:

• Halt Test

• Self Test

• Health Check

• Picker Test

• Magazine Test

• Inventory Test

• Drive Read Test (only runs on SDLT)

• Drive Write Test (only runs on SDLT)

• Drive Read/Write Test

To Perform Any of the Front Panel Diagnostic Tests:

Note: The Drive Read Test, Drive Write Test, and Drive Read/Write Tests require that a cartridge be present in the drive before the test is run (see Insert a Single Cartridge on page 78).

Note: The Drive Read Test and the Drive Write Test are only available on units that use SDLT drives.

1 From the main menu, scroll to **Diagnostics** and press **Enter**.

2 Scroll to the test that you want to run and press **Enter**.

If you are already logged in as Administrator, the test begins executing immediately. The message Running Test appears while the test is running. To stop the test prematurely, follow the procedure To Perform Any of the Front Panel Diagnostic Tests:. Each test takes

from 30 seconds to several minutes to complete. The Health Check test displays an ongoing progress indicator while executing. When the test completes, either the message Test Successful appears or the message Test Failed and an error code appears. Proceed to step 4.

3 If you are not logged in, you will be asked to enter the Administrator password. Do the following:

    a Enter the administrator password by using the Up and Down Scroll arrows to select each digit, and press the **Enter** key to move to the next digit. To move to the previous digit, press the **Escape** key. When you have entered the entire 6-digit password, you will be asked to press the **Enter** one more time to submit the password. If the password is incorrect, you will be asked to re-enter it using the same procedure. Otherwise, you will be returned to the Diagnostic Test menu. Press **Enter** to run the desired test. Running Test appears while the test is running. To stop the test prematurely, follow the procedure To Perform a Halt Test from the Front Panel:.

    b Each test takes from 30 seconds to several minutes to complete. The Health Check test displays an ongoing progress indicator while executing. When the test completes, either the message Test Successful appears or the message Test Failed and an error code appear. Proceed to step 4.

4 If the test is successful, press **Enter** to return to the Diagnostic test menu. For detailed results of a test, use On-board Remote Management to retrieve the Diagnostic test status (see Troubleshooting on page 129).

On-board Remote Management Diagnostic Tests

Since some of the diagnostic tests require you to insert a cartridge into the SuperLoader, you cannot perform these tests from a remote location. You can perform the following diagnostic tests from On-board Remote Management:

- Halt Test

- Self Test

- Health Check

- Picker Test

- Magazine Test

- Inventory Test

- Drive Read Test (only runs on SDLT)

- Drive Write Test (only runs on SDLT)

- Drive Read/Write Test

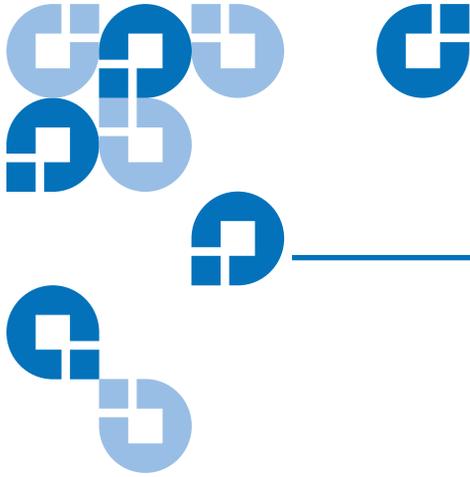| |
|---|
| **Note:** On-board Remote Management allows you to request all diagnostic tests, but any tests that require a cartridge to be inserted will time-out unless someone manually inserts the cartridge at the appropriate time. |

Diagnostics Using On-board Remote Management

Many tests can be run using On-board Remote Management.

To Perform the On-board Remote Management Diagnostic Tests:

Note: The Drive Read Test, Drive Write Test, and Drive Read/Write Tests require that a cartridge be present in the drive before the test is run (see <u>Insert a Single Cartridge</u> on page 78).

Note: The Drive Read Test and the Drive Write Test are only available on units that use SDLT drives.

1 Open a web browser and connect to the SuperLoader. The On-board Remote Management main menu appears.

2 Click the **Diagnostics** tab. A login window appears.

3 Type an administrator username and a password, then click **Enter**. The Diagnostics submenu appears.

4 Select the test you wish to perform from the Diagnostics drop-down menu, then click **submit.** The selected diagnostic test runs. While the test is running, you can view the status of the test. Under **View Diagnostic Test Progress**, click, **View Status**.

Whenever any system or application actions occur, the SuperLoader or tape drive generates logs recording the action. You can use some of these logs to troubleshoot errors. These logs are described in chapter 5, Troubleshooting. The other logs contain diagnostic and history information and are explained in this appendix.

This appendix describes the logs for the SuperLoader and tape drives. It contains a description of each log type including the log's block descriptor and field descriptions.

Log Descriptions

The SuperLoader and tape drive generate different types of logs. SuperLoader logs provide information if the error relates to data cartridge movement. Tape drive logs provide information on the tape drive's read/write performance. For more information on the different types of logs, see the following sections:

- SuperLoader Logs
- Tape Drive Logs on page 238

Although there are several types of logs, all of them have the same basic format and are interpreted in same manner. For information on interpreting logs, see Before Contacting Quantum Support on page 129.

SuperLoader Logs

The SuperLoader generates seven types of logs. The following sections describe the first six types:

- [Soft Logs](#) on page 236
- [Update Logs](#) on page 236
- [Shadow Event Log](#) on page 236
- [Boot Logs](#) on page 237
- [OEM Logs](#) on page 237
- [ID Logs](#) on page 237

The last type of log, Hard Error logs, are used for troubleshooting purposed and described in [chapter 5, Troubleshooting](#).

You can retrieve and view each of the six log types through different methods. [Table 36](#) shows the ways in which you can retrieve each log type.

Table 36   Log Retrieval Methods

Log Type	http	Front Panel	SCSI
Soft	Yes	Yes	No
Update	Yes	Yes	No
Shadow	Yes	No	No
Boot	Yes	No	No
OEM	Yes	No	Yes
ID	Yes	No	Yes
Hard	Yes	Yes	Yes

**Common
Information**

SuperLoader logs have the following information in common.

Log Display

Figure 119 shows an example of how SuperLoader logs appear.

Figure 119 Log
Display

Time stamp	Error code	Context

Block 1, 007/370 entries @ 16 bytes each, wrap @ 000, erase @ 300
0000: 2001-Jun-27, 17: 23: 57. 333, Error: 00000001, Context: 0002 / 00000003
0001: 2001-Jun-27, 17: 24: 06. 000, Error: 002f0220, Context: 7220 / 00000000
0002: 2001-Jun-27, 17: 24: 18. 041, Error: 02002062, Context: 0000 / 00000000
0003: 2001-Jun-27, 17: 24: 28. 000, Error: 0c320000, Context: 0000 / 000000ff
0004: 2001-Jun-27, 17: 38: 19. 776, Error: 002f0220, Context: 7220 / 00000000
0005: 2001-Jun-27, 17: 38: 31. 041, Error: 02002062, Context: 0000 / 00000000
0006: 2001-Jun-27, 17: 38: 41. 000, Error: 0c320000, Context: 0000 / 000000ff
00000000: 000000000: 00000000: 00000000

Log Fields

The logs contain three main fields. Table 37 describes these fields.

Table 37 Basic
Information
(SuperLoader) Log
Fields

Field	Description
Time Stamp	The time the event occurred. This field helps correlate the event with a possible application interruption. If the unit is unable to acquire the correct time/date from the SNTP time server or the front panel, the timestamp contains values indicating the power cycle number and the time an entry was written relative to that power cycle, listed as power on hours (POH). **Note:** The unit has no internal real time clock and requires the user to set the time of day from the front panel or acquire time via the network interface (SNTP).
Error Code	The type of error or action to which the event is related. This field helps identify what caused the event to occur. For specific information on the Error Code, see the Error Code field descriptions in the following sections.
Context	The event's software register information.

Error Codes   Error codes appear as 8-character strings made up of either letters or numbers for a total of 32 bits. Figure 120 shows the block descriptor for the error codes.

Figure 120 Error
Code Block Descriptor
for Hard and Soft
Event Logs

Bits 31-30	Bits 29-24	Bits 23-16	Bits 16-0
Recovery Action	Task ID	Error Type	Error Location

Table 38   Error Code
Field Descriptions

Field	Description
Recovery Action	Defines what the SuperLoader will do based on the event that occurred. • If the value is 0 the SuperLoader will continue operations since this is typically a soft recoverable event, or an event that is just recording a action for when the develop team is working on enhancements. • If the value is other than 0, then you must reboot the SuperLoader in order to recover from the event. The reboot will happen automatically.
Task ID	Defines what firmware task was being performed at the time of the event.
Task ID in (Hex)	Description
00	System Timer
01	Servo
02	Picker
03	Magazine Left
04	Magazine Right
05	Magazine Up left
06	Magazine Up right
07	Loader
08	Barcode Reader
09	Front Panel
0A	IP
0B	Diagnostic
0C	Error
0D	Code Update

Field	Description
<u>Task ID in (Hex)</u>	<u>Description</u>
0E	PSP
0F	PSP Timer
11	HTTP
12	SNTP
20	Idle
3e	Watch Dog
3f	Un-handle Interrupt
Error Type	Defines the type of error or event that did occur.
<u>Code</u>	<u>Description</u>
00-25	General Software flags
26	Message Send ID error
27	Message Bad
28	Message parameter Bad
29	Invalid Element
2A	Invalid Element Status
2B-2F	Firmware tables and stacks invalid
30	Post Failure
31-38	System Monitoring type events
39	Limits Error
3A	Door Locked
3B	Open Front

Field	Description
Code	Description
3C	Over Temp
3D	Drive Error
3E	Load Error
3F	Unload Error
60-69	Internal communication events
A0-A4	Picker Servo Errors
A5	Source Element Empty
A6	Source Magazine Missing
A7	Destination Magazine Missing
A8	Destination Element Full
A9	Picker Full
AA	Picker Cartridge Sensor Error
AB	Drive Path Sensor Error
AC	Mail Slot Door Sensor Error
AD	Mail Slot Solenoid Error
AE	Unknown Servo Error
AF	Error Log Information Event
B0-BF	Error Events related to the picker not rotating or translating correctly.
C0	Unknown Motor Error
D0	Magazine Solenoid Bad
D1	Magazine Present Sensor Bad

Field	Description
<u>Code</u>	<u>Description</u>
D2-D4	Position Sensor Bad
D5-DE	Cartridge flags located on the magazine may be bad or the sensor to detect the flags may have a problem
DF	Jammed Cartridge
Software Location ID	Defines a location in the firmware internal to the task being performed. This ID is used by firmware engineering to identify what part of the actual firmware task detected the event.

Soft Logs   Soft logs record the SuperLoader's history during different conditions. They are similar to hard logs but may have been overwritten by a recovery action.

Update Logs   Update Logs record firmware changes and upgrades in the SuperLoader. An update log also records when hardware is updated or changed.

Shadow Event Log

> **Note:**   There are no important fields in the Shadow Event log. This log is used only at Quantum Engineering.

Shadow logs record the picker EEPROM used only at Quantum Engineering. Shadow logs appear differently than the other logs (see <u>figure 121</u>).

Figure 121 Shadow
Event Log

```
Block 1, 001/001 entries @ 512 bytes each, wrap @ 000, erase @ 001
0000: EEROM Shadow:
d9c9afff: ffffffff: ffffffff: ffffffff: ffffffff: ffffffff: ffffffff: ffffffff
ffffffff: ffffffff: ffffffff: ffffffff: 00e00012: 0d549e03: c0a8147a: ffffffff
ffffffff: ffffffff: c0a81412: ffffffff: ffffffff: ffffffff: ffffffff: ffffffff
ffffffff: ffffffff: ffffffff: ffffffff: ffffffff: ffffffff: ffffffff: ffffffff
ffffffff: ffffffff: ffffffff: ffffffff: ffffffff: ffffffff: ffffffff: ffffffff
00000000: 00000000: ffffffff: ffffffff: ffffffff: ffffffff: ffffffff: ffffffff
ffffffff: 0000001a: ffffffff: 00000000: 00000000: ffff0000: ffffffff: ffffffff
00000000: 00000000: 00000000: 00000000: 00000000: 00000000: 00000000: 00000000
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00000000: 00000000: 00000000: 00000000: 00000000: 00000000: 00000000: 00000000
00000000: 00000000: 00000000: 00000000: 00000000: 00000000: 00000000: 00000000
ffffffff: ffffffff: ffffffff: ffffffff: ffffffff: ffffffff: ffffffff: ffffffff
```

Boot Logs

Boot Logs keep track of the boot status in terms of number of hours the unit has been powered on, the number of times the SuperLoader has been rebooted, and the reason for the reboot.

OEM Logs

OEM Logs store information specific to the OEM.

ID Logs

ID Logs store information specific to the OEM.

Tape Drive Logs

The tape drive generates six types of logs. SCSI Check Condition Error logs, Bugcheck Error logs, and Event Error Logs are described in chapter 5 on page 129. This section describes the other tape drive logs.

Common Information

Tape drive logs have the following information in common.

Log Display

Partial information about tape drive logs can be retrieved from SCSI and On-board Remote Management (see figure 122).

Figure 122 Example Tape Drive Log

Event log number	Event number or name	POH/PC

Event Log # 2 - Event: A401 [V80-0 4-AUG-1998] 000:03:52.153 POH/PC = 340 / 16
    110013B9 571E0101 00400000 00130000 02D10000 00440000 00000000 220024CA
    00000000 04720000 00000000 00000000 00000000 00000000 00000000 00000000
    00000000

Log Fields

All tape drive logs contain three main fields. Table 39 describes each of these fields.

Table 39   Tape Drive
Field Descriptions

Field	Description
Event Log Number	A sequence number that indicates the order in which the event was logged.
Event Number or Name	This field appears in every event log, but varies depending on the event type. This field indicates the type of log.
POH/PC	The tracking information for how many power-on-hours (POH) the drive has had since it was shipped from Quantum. This is how many hours the drive has had power applied regardless of the number of times it is turned on and off. POH is updated once every 60 minutes the drive has had power applied to the drive with no interruptions. Power cycles (PC) is how many times the drive has experienced a power on cycle. Each time a drive logs a Hard Event, it will increment this count as well.

In addition to these main fields, each type of basic information log contains specialized fields. Refer to the following sections for information about each log types' fields:

- POST Failure Logs

- DLT Drive Diagnostic Results Logs

- DLT Firmware Changes

POST Failure Logs

These events indicate that the SuperLoader or tape drive detected a failure when power was applied. The POST may have failed during a reset and retry (see figure 123).

> **Note:** This event type only indicates each time the test ran and experienced the error condition.

Figure 123 POST
Failures Event Log

Last fail

Event Log # 4 - PO / ST Error - Last Fail: 88021950 POH / PC = 527 / 71
  70000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

Table 40 describes Post Failures Event Log fields.

Table 40   POST
Failures Event Log
Field Description

Field	Description
Last Fail	The type of failure that was experienced.

**DLT Drive
Diagnostic Results
Logs**

Each time the SuperLoader or tape drive runs an internal diagnostic, it logs the results of that test. If a **SCSI SEND DIAGNOSTIC** command was issued to the drive, the results of the test would be seen in both the SCSI response to the command as well as an entry in the log page (see figure 124).

Figure 124 DLT Drive
Diagnostics Event Log

```
Event Log # 5 - Diag ILOG: POH/PC = 6/3
Test: IWR-RD Time: 6:07, Sts-Miscompare
DLT8000 ENt. Wr/Rd: 299545/169
Compare ON ErrRate Wr: 1.4145 / MB, Rd: 357. 14/ Gb
pHWE: 0 pHRE: 0
4 - Chan. Wr Metrics
Wr - CRC: 69091, 21 22 9 36 / 1 6 1 4
Wr - DO:   297, 9 13 12 10 / 12 17 14 12
4 - Chan. Rd Metrics
Rd - CRC:   394, 24 15 6 34 / 4 9 1 6
Rd - DO:     22, 27 23 14 23 / 5 5 0 5
Rd-MissingBlks:       10, ReRds: 0
Temp 46 C
```

Table 41 describes the DLT Diagnostic Results Event Log fields.

Table 41   DLT Drive
Diagnostics Field
Descriptions

Field	Description
Test	Information about the test run and the results.

**DLT Firmware
Changes**

Each time the DLT tape drive is requested to change the firmware
version, either by tape or SCSI, three possible entries may be logged.

- If an attempt to enter the code update routine was entered and not successful, the following log is displayed in the format of an Event log.

Event Log#6-Event: CA02 [V60-0 14-AUG_1997] 000:00:04.455 POH/PC=0/7
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000

- If a successful code update entry occurs, the following log is displayed in the format of an Event log.

Event log # 7 - CUP Event: POH/PC = 0/8
Drv CUP status: Complete
Drv Old: 03-18/Fd5C
Drv New: 03-21/DFF7
Cnt CUP status: Complete
Cnt Old: V060/2C5CE36E (14-Aug-1997 16:30:40) Pers: (21-1)
Cnt New: V080/03CBD1BE (4-AUG-1998 13:48:33) Pers: (28-1)

- If a successful code update entry occurs and is reported to the host system through a SCSI check condition, the following log is displayed in the format of a Key SCSI Check Condition log.

Event Log # 8 - SCSI Event: POH/PC/MID/SK/ASC/ASCQ/AddErr=0/8/00000000/9/21/50/00
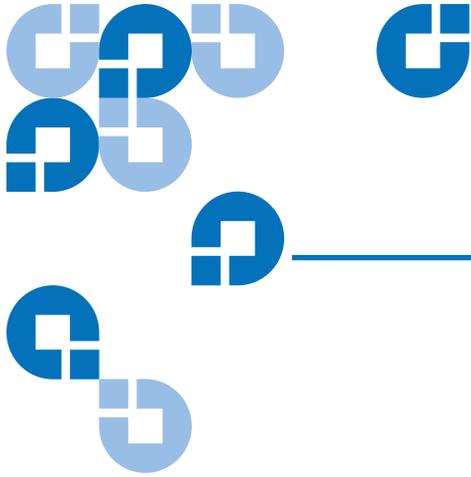
Specifications

This appendix describes the specifications relating to the SuperLoader. The SuperLoader is equipped with one of the following drive types:

- DLT1
- SDLT 220
- SDLT 320
- SDLT 600
- HP LTO-1
- HP LTO-2

SuperLoader Physical Specifications

Rack Mount	
Height	3.5 inches (8.9 cm)
Width	17.7 inches (45.0 cm)
Length	29.71 inches (75.46 cm)
Footprint	3.4 square feet (0.32 square meters)
Weight (without media)	50 pounds (22.7 kg)
Shipping	55 pounds (24.9 kg)

The SuperLoader requires a standard 19-inch rack. With a mounting kit, the SuperLoader does not exceed 2U form factor.

SuperLoader Performance Specifications

Mean Cycles Between Failure (MCBF)	1,000,000 cycles
Mean Time To Repair (MTTR)	30 minutes
Initialize element status	90 seconds (typical)
Typical cycle time	Less than 40 seconds. One cycle consists of moving a cartridge from the tape drive to a magazine slot, selecting another magazine slot, and then moving the cartridge back to the tape drive. It does not include the time that the tape drive takes to unload or load/calibrate.
Mean SDLT/DLT1 cartridge load time	60 seconds

Avg load time (after placing cartridge in drive)	LTO=< 19 seconds SDLT=12 seconds (typical) DLT1=59 seconds (typical)
Avg unload time (from BOT)	LTO=< 19 seconds SDLT=12 seconds DLT1=17 seconds
Max transfer rate	DLT1=3 MB/sec. (native) SDLT 220 = 11 MB/sec. (native) SDLT 320 = 16 MB/sec. (native) SDLT 600 = 36 MB/sec. (native) HP LTO Gen I = 15 MB/sec. (native) HP LTO Gen II = 30 MB/sec. (native)

Media Capacity

Storage capacity (DLT1)	1280 GB (compressed) with 16 cartridges
Storage capacity (SDLT 220)	3520 GB (compressed) with 16 cartridges
Storage capacity (SDLT 320)	5120 GB (compressed) with 16 cartridges
Storage capacity (SDLT 600)	9600 GB (compressed) with 16 cartridges
Storage capacity (LTO-1)	3200 GB (compressed) with 16 cartridges
Storage capacity (LTO-2)	6400 GB (compressed) with 16 cartridges

SuperLoader Power Specifications

Line voltage	**60 Hz system**: 90 to 265 VAC; **50 Hz system**: 90 to 265 VAC
Line frequency	47 Hz to 63 Hz
AC Input current	**60 Hz system**: 4.0 A (RMS) for 115 VAC **50 Hz system**: 4.0 A (RMS) for 230 VAC
Power consumption	60 Hz = 75 W; 50 Hz = 80 W (SDLT, DLT) 60 Hz = 82 W; 50 Hz = 79 W (LTO Gen1)

SuperLoader Environmental Specifications

Temperature Range (Dry Bulb)	
Operating	+10°C to +35°C
Non-Operating	- 40°C to +65°C

Temperature Variation	
Operating	10°C per hour
Non-Operating	20°C per hour

Humidity	
Operating	20% to 80% non-condensing
Non-Operating	10% to 90% non-condensing
Gradient	10% per hour without condensation

Wet Bulb	
Operating	26°C max
Non-Operating	29°C max

Altitude	
Operating	-500 to 10,000 feet (-153 m to 3048 m)
Non-Operating	-500 to 40,000 feet (-153 m to 12192 m)

SuperLoader Vibration Specifications

Operating	
Swept Sine Vibration	5 to 500 Hz, 0.25 G, 0.01 inch (0.254 mm) to smooth crossover, 1 8ve/min, (X, Y, Z) axes
Random Vibration	0.25 Grms, 5 to 500 Hz (X, Y, Z) axes
Non-Operating	
Swept Sine Vibration	5 to 500 Hz, 0.75 G, 0.02 inch(0.51 mm) to smooth crossover, 1 8ve/min, (X, Y, Z) axes
Random Vibration	1.06 Grms, 5 to 500 Hz (X, Y, Z) axes

SuperLoader Shock Specifications

Operating	3 G, 5 ms half-sine, 3 pulses (+/-) per axis, X, Y, Z
Non-Operating	20 G, 8 ms half-sine, 3 shocks (+/-) per axis, X, Y, Z

SuperLoader Product Safety/Compliance

The SuperLoader complies with the following Electromagnetic Interference (EMI) standards and directives:

- EEC Directive 89336 CE BS6527 (UK)
- EN55022 (EU)
- EN55024 (EU)
- CFR 47, 1995 FCC Rules Part 15B Class B (MDOC)
- IECS-003 Canada
- V-3/97.04 VCCI Class B (Japan)
- AS/NZS 3548 Australia / New Zealand (C-tick Mark)
- CNS 13438 BSMI Class A Taiwan

The SuperLoader meets or exceeds the following safety requirements and is certified to bear the GS mark:

- U.S. (UL 1950)
- Canada (CSA C22.2 No. 950)
- Europe (EN60950/IEC 950)

SuperLoader Acoustic and Noise Limits

Specification	Operating
Acoustics	Idle: 50 dbA
	Full operation: 60 dBA

SCSI Specifications

The SuperLoader uses an LVD SCSI connection. SCSI connectors are VHDCI SCSI connectors. All cables conform to SPI-4 (SCSI Parallel Interface-4), Revision 7. Please refer to this document for more information.

SCSI Cable and Terminator Requirements

If the SuperLoader is the last device on the SCSI bus you must attach a terminator to the SCSI connector on the back panel of the SuperLoader. There must be a terminator on each end of the SCSI bus. Typically, the host adapter provides the front-end termination.

SCSI Cable Length

LVD SCSI configurations have a maximum allowable bus length of 12 m. To determine the cable length of the bus, measure the lengths of the SCSI cables connecting each device to that bus and add those lengths together for the total length. To that total length, add 16 inches (40.64 cm) for the internal SCSI cable length. On an LTO system, the SCSI bus length is 23.5 inches (596.9 mm).

Ethernet

The remote management port is 10/100 BaseT.
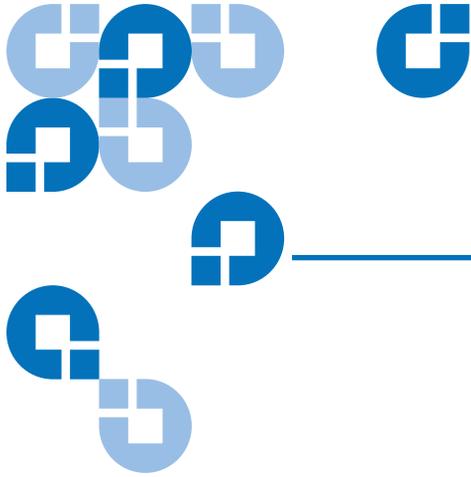
Time Zones

This appendix outlines the various times and time zones. This information is used to set the time.

Table 42   Times and
Time Zones

Country/Region	Time Zone	Time
Canada/USA	Newfoundland Standard Time	GMT - 3:30
	Newfoundland Daylight Time	GMT - 2:30
	Atlantic Standard Time	GMT - 4:00
	Atlantic Daylight Time	GMT - 3:00
	Eastern Standard Time	GMT - 5:00
	Eastern Daylight Time	GMT - 4:00
	Central Standard Time	GMT - 6:00
	Central Daylight Time	GMT - 5:00
	Mountain Standard Time	GMT - 7:00
	Mountain Daylight Time	GMT - 6:00
	Pacific Standard Time	GMT - 8:00
	Pacific Daylight Time	GMT - 7:00
	Alaska Standard Time	GMT - 9:00
	Alaska Daylight Time	GMT - 8:00
	Hawaii Standard Time	GMT - 10:00

Country/Region	Time Zone	Time
Mexico	Time Zone I Standard Time	GMT - 6:00
	Time Zone I Summer Time	GMT - 5:00
	Time Zone II Standard Time	GMT - 7:00
	Time Zone II Summer Time	GMT - 6:00
	Time Zone III Standard Time	GMT - 8:00
	Time Zone III Summer Time	GMT - 7:00
	Time Zone IV Standard Time	GMT - 7:00
	Time Zone IV Summer Time	GMT - 6:00
Central America (except Panama)	Standard Time	GMT - 6:00
Panama	Standard Time	GMT - 5:00
Colombia, Ecuador, Peru	Standard Time	GMT - 5:00
Chile, Paraguay	Standard Time	GMT - 4:00
	Daylight Time	GMT - 3:00
Argentina, French Guiana, Suriname, Uruguay	Standard Time	GMT - 3:00
Brazil	Standard Time	GMT - 3:00
	Summer Time	GMT - 2:00
	West Brazil	GMT - 2:00
	Northeast Brazil	GMT - 4:00
	Acre	GMT - 5:00
Bolivia, Venezuela, Guyana	Standard Time	GMT - 4:00

Country/Region	Time Zone	Time
Europe	Western European Standard Time	GMT
	Western European Summer Time	GMT + 1:00
	Central European Standard Time	GMT + 1:00
	Central European Summer Time	GMT + 2:00
	Eastern European Standard Time	GMT + 2:00
	Eastern European Summer Time	GMT + 3:00
China/Hong Kong/Macau	Standard Time	GMT + 8:00
Japan, North Korea, South Korea	Standard Time	GMT + 9:00
Australia	Eastern Standard Time	GMT + 10:00
	Eastern Daylight Time	GMT + 11:00
	Central Standard Time	GMT + 9:30
	Central Daylight Time	GMT + 10:30
	Western Standard Time	GMT + 8:00
New Zealand (except Chatham Islands)	Standard Time	GMT + 12:00
	Daylight Time	GMT + 13:00
Chatham Islands	Standard Time	GMT + 12:45
	Daylight Time	GMT + 13:45
Vietnam, Cambodia, Laos, Thailand	Standard Time	GMT + 7:00
India	Standard Time	GMT + 5:30
Pakistan	Standard Time	GMT + 5:00
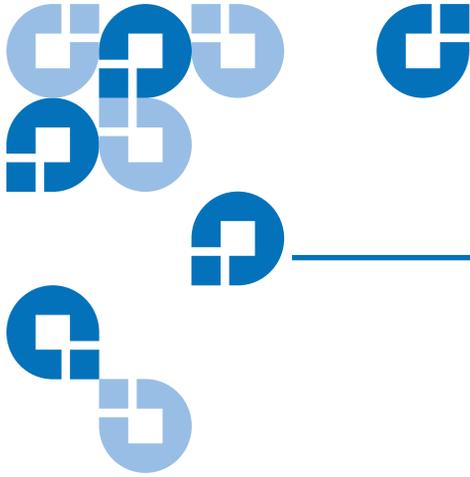
Regulatory Statements

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. Any modifications to this device—unless expressly approved by the manufacturer—can void the user's authority to operate this equipment under part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) This device must accept any interference that may cause undesirable operation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

- Consult the dealer or an experienced radio/TV technician for help.

> **Note:**   Additional information on the need to interconnect the device with shielded (data) cables or the need for special devices, such as ferrite beads on cables, is required if such means of interference suppression was used in the qualification test for the device. This information will vary from device to device and needs to be obtained from the EMC group or product manager.

Taiwan Statement

警告使用者:

這是甲類的資訊產品,在居住的
環境中使用時,可能會造成射頻
干擾,在這種情況下,使用者會
被要求採取某些適當的對策。

Japan Notice

　この装置は，情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＢ情報技術装置です。この装置は，家庭環境で使用することを目的としていますが，この装置がラジオやテレビジョン受信機に近接して使用されると，受信障害を引き起こすことがあります。
　取扱説明書に従って正しい取り扱いをして下さい。

Canadian Notice (Avis Canadien)

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme Canadian Notice (Avis Canadien)

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) and its amendment (93/68/EECD) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (in brackets are the equivalent international standards):

- EN55022 (CISPR 22) - Electromagnetic Interference

- EN50082-1 (IEC801-2, IEC801-3, IEC801-4) - Electromagnetic Immunity

- EN60950 (IEC950) - Product Safety

Product Safety Electrostatic Discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.

- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.

- Place parts on a grounded surface before removing them from their containers.

- Avoid touching pins, leads, or circuitry.

- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

Use a wrist strap connected by a ground cable to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 mega-ohm 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.

Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.

Use conductive field service tools.

Laser Safety

The bar code reader is a Class 1 laser product (per EIC 60825). This laser complies with 21 CFR 1040.10 and 1040.11.

Taiwan Battery Recycling Label

The Taiwan EPA requires dry battery manufacturing or importing firms in accordance with Article 15 of the Waste Disposal Act to indicate the recovery marks on the batteries used in sales, giveaway or promotion. Contact a qualified Taiwanese recycler for proper battery disposal.

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SuperLoader User's Guide
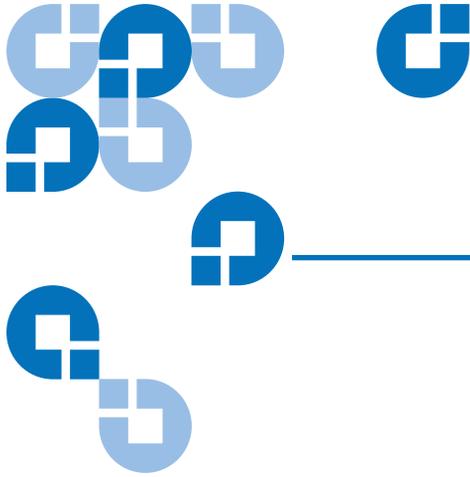
Glossary

access   Read, write, or update information on a storage medium, such as tape.

access time   The interval between the time a request for data is made by the system and the time the data is available from the drive.

allocation   The process of assigning particular areas of the media to particular data or instructions.

archiving   The removal of data from the computer system on to secondary storage media that is safely stored away.

autoloader   A robot that includes one tape drive and one or more magazines of tape cartridges. Autoloaders are used for unattended data backup.

backup   A copy of a file, directory, or volume on a separate storage device from the original, for the purpose of retrieval in case the original is accidentally erased, damaged, or destroyed.

backward compatibility   The ability of a current drive product to read tapes written on earlier model drives.

base plate   An aluminum die casting that acts as the support platform for the other modules and for the drive enclosure. The base plate is standard 5.25 inch (133.35 mm) full-high form factor and includes the precision mounting holds used to install Super DLTtape drives into a server or tape library. The TCM acts as the prime base plate for the Super DLTtape system.

bus   A communication pathway between components in a computer system.

C

C   Celsius. A measurement of temperature where 0 degrees is the freezing and 100 degrees is the boiling point of water.

cartridge receiver   At tape insertion, the cartridge receiver assembly is responsible for guiding the tape into its operating position, opening its door, unlocking the cartridge brakes, and securing the tape for operation. At tape ejection, the cartridge receiver assembly reverses the process and automatically ejects the tape a fixed distance from the front of the drive.

compressed capacity   Capacity after data has been processed to reduce storage space while maintaining data integrity using either software or hardware.

cartridge tape module (CPTM)   The Super DLTtape CTM contains the AMP media feature of Quantum's LGMR technology. The main function of the CTM is to provide the magnetic recording media used by the drive to store customer information. The CTM also provides the protective cartridge that allows the media to be removed and stored safely.

D

data compression   A process that reduces the amount of storage space required to hold a particular block of data. Data transfer speed and total tape capacity are affected by the data compression achieved. In accordance with industry practice, a typical compression ratio is 2:1 of data storage. Actual compression ratios achieved are dependent on the redundancy of data files being recorded.

data control module (DCM)   The DCM contains several of the functions and features of Quantum's LGMR technology, which is at the heart of the Super DLTtape technology. Of the five technologies that constitute the LGMR technology, two are found in the DCM. These are the POS and the MRC heads. The main functions of the DCM are to provide the path and guides for all tape motion inside the drive and to write data to and read data from the tape.

device   According to SCSI specification, up to eight SCSI devices can be connected to a single SCSI bus. Each SCSI device contains a SCSI ID number that can be set to 0 through 7.

device driver   A low-level (usually kernel-mode) operating system component that enables a PC to communicate with peripheral devices such as fixed disk drives, CD-ROMs, and tape drives. Each kind of device requires a different driver. Device driver programs are loaded into memory at boot time.

DHCP   Dynamic Host Configuration Protocol. Software that automatically assigns IP addresses to client stations logging onto a TCP/IP network.

differential   A term referring to the electrical characteristics of the signal used on the SCSI bus interface. Differential signals minimize the effect of common mode signal noise and allow the SCSI bus to operate reliably over greater distances at a higher speed.

domain   A group of computers, programs, and devices on a network administered as a unit with common procedures and rules for use by a specific group of users. A user logs on to the domain to gain access to the resources.

driver   A software program allowing the operating system to control a device such as a library, printer, or video card. Many devices do not respond properly if the correct driver is not installed in the computer.

E

ECC   Error Correction Code, also known as Error Checking and Correction. The incorporation of extra parity bits in transmitted data in order to detect errors that can be corrected by the controller.

EDC   Error Detection Code. DLT tape drives include a 16-bit EDC with every 4 KB of user data. The EDC helps the drive detect and recover any errors that may occur.

EEPROM   Electronically-Erasable Programmable Read Only Memory. An integrated circuit memory chip that can store programs and data in a non-volatile state. These devices, which are used to store firmware in DLT tape drives, can be erased and reprogrammed with new data.

EMI   Electromagnetic Interference. Electrical interference caused by electromagnetic radiation.

encoding   The protocol by which particular data patterns are changed prior to being written on the tape surface as a pattern of On and Off or 1 and 0 signals.

erase   The removal of data from a piece of media.

error   A message that occurs when there is a loss of ability to interpret recorded data. Usually due to magnetic issues or defects in or on the media.

Error Correction Code   See ECC.

Error Detection Code   See EDC.

Ethernet   a local-area network (LAN) protocol using high-speed communications at 10 megabits per second.

external drive   A drive mounted in an enclosure, separate from the computer system enclosure, with its own power supply and fan, and connected to the system by a cable.

F

F   Fahrenheit. A temperature measurement system where 32 degrees is the freezing point and 212 degrees is the boiling point of water.

FCC   Federal Communications Commission. A United States agency responsible for enforcing communications related regulations stating how much radiation computers and other electronic equipment are allowed to emit.

files   A distinct group of data blocks.

file-by-file backup   A recording method that records data a single file at a time as opposed to mirroring a tape or block of data.

firmware   Permanent or semi-permanent instructions and data programmed directly into the circuitry of programmable read-only memory or electronically-erasable programmable read-only memory chips. Used for controlling the operation of the computer or tape drive. Distinct from software, which is stored in random access memory and can be altered with ease.

format   A magnetic track pattern that specifies the locations of the tracks and sectors. This information must exist on a tape before it can store any user data. Formatting erases any previously stored data.

formatted capacity   The amount of room left to store data on a tape after writing the sector headers, boundary definitions, and timing information during a format operation.

Form Factor 1   The industry standard that defines the physical, external dimensions of a particular device.

Form Factor 2   The general geometric dimensions of a drive or width of a piece of tape media.

FTP   File Transfer Protocol. A protocol used to transfer files over a TCP/IP network.

full height   Dimensions of a drive that meet standard height requirements, usually 3.25 inches (82.55 mm) for a tape or disk drive product.

G

GB   Gigabyte. A unit of measure consisting of one billion bytes (one thousand megabytes).

GHz   Gigahertz. A measurement of frequency that equals one thousand million Hz, or one thousand MHz. Speeds for computer microprocessors, buses, and interfaces are often measured in GHz.

H

half height   Standard drive size equivalent to half the vertical space of a 5.25 inch (133.35 mm) drive.

hard drive   A drive that reads and writes data on a hard disk. The terms hard drive and hard disk are often used interchangeably.

hard error   A data error that persists when the tape is reread, usually caused by defects in the physical surface.

head   The tiny electromagnetic coil and metal pole used to create and read back the magnetic patters on the tape. Also known as the read/write head.

head life   The length of time a tape drive head will function without replacement or repair, usually measured in hours of use.

Hierarchical Storage Management (HSM)   A method of storing massive amounts of data in tape libraries that allows for easy and rapid recall of the material. Due to the lowering cost of disk drives, HSM has yet to reach its full potential.

HTTP   Hypertext Transfer Protocol. A protocol for exchanging files between computers connected to the Internet.

Hz   Hertz. A unit of frequency measurement that equals 1 cycle per second. Computers and electronic devices are often measured in kilohertz (kHz), megahertz (MHz), gigahertz (GHz), or terahertz (THz).

I

ISV   Independent Software Vendor.

image backup   A backup option that takes a "snapshot" of an entire system by writing a volume image to tape sector-by-sector, rather than file-by-file. This method of backup is very fast and allows companies to backup critical information in a limited backup window.

interface   A hardware or software protocol, contained in the electronics of the tape controller and tape drive that managed the exchange of data between the drive and computer. The most common interfaces for small computer systems are AT (IDE) and SCSI.

internal drive   A drive mounted inside one of a computer's drive bays.

Internet   A worldwide network of computer servers originally developed by the federal government as a communication system in the event of nuclear war or other wide-scale disaster.

intranet   A private version of the Internet that provides a cost-effective way to publish critical information and provide an interactive communication path for heterogeneous systems.

IP   Internet Protocol. A communications protocol which contains a network address and routes a message to a different network.

J

jumper   A tiny connector box that slips over two pins that protrude from a circuit board. The jumper can be moved to change electrical connectors. When in place, the jumper connects the pins electrically. Some board manufacturers use dual in-line package (DIP) switches instead of jumpers.

K

KB   Kilobyte. A unit of measure consisting of 1,024 bytes.

kHz   Kilohertz. A measurement of frequency that equals 1000 Hz.

L

LAN   Local Area Network. A computer network covering a relatively small area. A LAN usually is confined to a building or a few nearby buildings. A LAN can be connected to another LAN over any distance through telephone lines and radio waves to form a wide area network (WAN).

LCD   Liquid Crystal Display. The technology used by portable computer and flat-panel displays. The Operator Control Panel on the front of the SuperLoader is an LCD screen.

Lempel-Ziv Algorithm   A data compression technique used in all DLT tape drives. Named after Abraham Lempel and Jacob Ziv.

library system   A system that uses a robotic mechanism to automatically load and unload tape cartridges into one or more tape drives. Distinguishable from stackers and autoloaders in their ability to provide random access to tape cartridges. The DLTstor is a tape library system offered by Quantum Corporation.

linear recording   Recording technology in which data is written in tracks that run the length of the tape media. Contrast with helical scan technology which records data diagonally across the tape.

M

MB   Megabyte. A unit of measurement equal to 1 million bytes.

MCBF   Mean Cycles Between Failures. This is average cycle count between possible failures. A cycle is the movement of a cartridge from the tape drive to a magazine slot and the selection of another cartridge and moving that cartridge back to the drive.

MHz   MegaHertz. A measurement of frequency in millions of cycles per second.

MTBF   Mean Time Between Failures. Reliability rating indicating the expected failure rate of a product in power on hours (POH). Since manufacturers differ in the ways they determine the MTBF, comparisons of products should always take into account the MTBF calculation method.

MTTR   Mean Time to Repair. The average time it takes to repair a drive that has failed for some reason. This only takes into consideration the changing of the major subassemblies such as the printed circuit board or sealed housing. Component-level repair is not included in this number as this type of repair cannot be performed in the field.

media   The material or device used to store information in a storage subsystem, such as a tape or disk drive. DLTtape media is a high-grade metal particle (MP) formulation that takes advantage of the latest advances in binder chemistry. By combining both solid and liquid lubricants in the tape binder system, tape and head wear are reduced while repelling airborne particles that could affect read/write head performance. In addition, by using a uniform particle shape, a dense binding system, a smooth coating surface, and a specially selected base file, Quantum DLTtape half-inch cartridge tapes take advantage of shorter wavelength recording schemes to ensure read compatibility with future generations of DLT drives.

Metal Particle (MP) tape   A magnetic recording media in which a flexible base is coated with a mixture of magnetic particles and a bonding agent. See also media.

microprocessor   The integrated circuit chip that performs the bulk of data processing and controls the operation of all of the parts of the system.

microsecond (μs)   One millionth of a second (.000001 sec.).

millisecond (ms)   One thousandth of a second (.001 sec.).

minicomputer   A somewhat out-of-date term used to describe a class of multi-user computer that was one notch below a mainframe system. Minicomputer popularity fell with the rise in popularity of the networked PC. Today's server systems perform many of the functions that were once the domain of minicomputers.

Mission Critical   Applications that are vital to a company or organization's well-being.

N

native mode   Refers to the uncompressed storage capacity of a tape or disk subsystem. for instance, a DLT 7000 tape drive can store 35 GB in native mode and 70 GB with 2:1 compression.

near-on-line storage   An application that uses a tape drive or tape automation system in much the same way as a hard disk drive. Provides easy access to large amounts of critical information.

O

overhead   Command overhead refers to the processing time required by the controller, host adapter, or drive prior to the execution of a command. Lower command overhead yields higher drive performance.

overwrite   To write data on top of existing data thus erasing the original data.

OEM   Original Equipment Manufacturer.

P

parallel channel architecture   Allows DLT tape drives to read/write multiple channels simultaneously providing an industry-leading data transfer rate in the DLT 7000 drive. with this architecture, data blocks are not required to be located on any particular track or in consecutive order. This channel-independent block structure provides a powerful write-error handling system that allows bad blocks to be rewritten on the next available command.

Partial Response, Maximum Likelihood   PRML. A technology that allows a disk or tape drive's read channel to pack more data in the same amount of space on magnetic media.

peak transfer rate   The maximum speed with which information moves inside a tape drive or between drive and host. Usually measured in megabytes per second.

performance   A measure of the speed of the drive during normal operation. Factors affecting performance are seek times, transfer rate, and command overhead.

peripheral   A device added to a system as a complement to the basic central processing unit (CPU), such as a disk drive, tape drive, or printer.

POH   Power-on Hours. The unit of measurement for mean time between failure (MTBF), expressed as the number of hours that the drive is powered on. See MTBF.

POST   Power-on Self Test. Diagnostics programs, loaded automatically by the BIOS, that perform basic tests on the major system components, such as memory, cartridge and magazine information. If no problems are detected during POST, the system continues the start-up process.

PRML   See Partial Response, Maximum Likelihood.

Q

QIC   Quarter Inch Cartridge. A tape storage subsystem that uses 0.25 inch (6.35 mm) wide media.

R

RAM   Random Access Memory. an integrated circuit memory chip that allows information to be stored and retrieved by a microprocessor or controller. The information can be stored or accessed in any order, and all storage locations are equally accessible.

RAIT   Redundant Array of Independent Tape Drives

random access   The ability to directly locate any piece of data without having to read everything in memory or on disk.

read after write   A mode of operation that has the computer read back each data block immediately after it is written on the tape, checking that the data read back is the same as recorded.

read/write head   The mechanism by which data is recorded onto magnetic media in a tape drive system. See read after write.

Reed-Solomon error correction   An error correction technique based on research done by Irving reed and Gustave Solomon at MIT's lincoln Laboratory in the 1960s. First used to check the accuracy of data received from the Voyager spacecraft.

restore   To replace data on the hard drive from another media source.

ROM   Read Only Memory. Integrated circuit chip containing programs and data that can be accessed and read but cannot be modified.

S

SCSI Small Computer System Interface. An American National Standards Institute (ANSI) interface between the computer and peripheral controllers. Apple MacIntosh systems and many UNIX operating system workstations use the SCSI interface.

scalability Refers to the capability provided by the DLT tape drive family to read tapes from previous generations of drives. Allows users to upgrade to a faster, higher capacity DLT drive, yet still be able to read tape recorded on an older system. The term also refers to the ability of DLT tape library systems to be upgraded with a higher performance DLT drive and thus provide more capacity and performance in the same footprint. See backward compatibility.

seek The movement of a read/write head to a specific data track.

self cleaning head Found in all DLT tape drives. Tiny ridges on either side of the DLT drive read/write head continuously wipe the tape clean as it passes over the head. This is why there is no periodic cleaning prescribed for DLT tape drives.

server A powerful computer system with a large hard disk drive that serves the information access and communication needs of multiple users. Often servers are dedicated to a particular function such as Internet access, printing, file management, backup, and network communications.

servo data Magnetic markings written on the media that guide the read/write heads to the proper position.

shelf life The length of time that a tape can be stored without losing its magnetic strength. For DLTtape media, this period is 30 years or more.

shock rating A rating, expressed in Gs which stands for multiples of gravity, of how much shock a tape drive can sustain without damage. Operating and non-operating shock levels are usually specified separately.

SMTP Simple Mail Transfer Protocol. An e-mail protocol on the Internet that defines the message format and the message transfer agent.

SNMP simple Network Management Protocol. A protocol that monitors and controls a network.

SNTP Simple Network Time Protocol. SNTP is based on NTP, the Network Time Protocol, an industry standard way for computers to synchronize their time to an external reference standard. NTP and SNTP are fully interoperable. Each consists of a client, for example the SuperLoader, which obtains the current time (in UTC) from either an SNTP server or an NTP one. SNTP and NTP are in wide use on the Internet. NTP is specified by RFC1305. SNTP is specified by RFC2030.

soft error   A faulty data reading that does not recur if the same data is reread from the disk or corrected by ECC. Usually caused by power fluctuations or noise spikes.

stacker   A tape automation system that sequentially loads and unloads tape cartridges. does not provide random access to cartridges of the data stored on them.

stepper   A type of motor that moves in discrete amounts with each electrical pulse.

supply reel   The reel of tape contained within the DLTtape cartridge. DLTtape IV, for example, contains 1,800 feet (548.64 m) of tape.

surface   The side of the tape that is coated with the magnetic material for recording data.

sustained transfer rate   The data transfer rate of a tape drive in native mode. for example, the DLT 7000 has a sustained transfer rate of 5 MB in native mode, and up to 10 MB at 2:1 compression.

system manufacturers   Makers of computer systems and tape library systems.

Symmetric Phase Recording (SPR)   A recording technique introduced with the DLT 7000 that writes data at alternating angles in a herringbone pattern thereby eliminating the need for guard bands between data tracks, and providing higher data density.

T

TPI   Tracks per Inch. A DLT 7000 tape drive, for example, writes data a density of 416 tpi, or 208 tracks across the width of the half-inch DLTtape media.

take-up reel   The reel inside every DLT tape drive onto which DLTtape media is wound. The in-the-drive take-up reel enables DLT tape systems to operate using a single-reel cartridge and thereby pack more tape and data into every cartridge.

tape path   The path through which tape moves from the cartridge, past the read/write head, and onto the take-up reel. The patented DLT drive head guide assembly provides a gentle and solid path that ensures tracking accuracy and long tape life.

tar   A UNIX operating system command that stands for "create tape archives" and/or extract files.

TCM

TCP/IP   Transmission Control Protocol/Internet Protocol. A communications protocol which ensures that the total amount of bytes sent is received correctly, and also provides the routing information.

thin film   A type of coating allowing very thin layers of magnetic material used on tape drive read/write heads. Media with thin film surfaces can store greater amounts of data.

track   A linear or angled pattern of data written on a tape surface. DLT tape drives write information on multiple tracks simultaneously.

track-to-track seek time   The time required for the read/write heads to move to an adjacent track.

transfer rate   The rate at which the drive sends and receives data from the controller. Usually measured in megabytes per second. A DLT 7000 drive, for example, has a native transfer rate of 5 MB/s.

U

unformatted capacity   The total number of usable bytes on the media, including the space that will be required later to record location, boundary definitions, and timing information. See also formatted capacity.

V

volume   The quantity of information written on a piece of media. Typically measured in megabytes or gigabytes.

W

Write Once, Read Many (WORM)   An optical disk technology that allows the drive to store and read back data but prevents the drive from erasing information once it has been written.

write-protected   Files or media that cannot be changed. user write-protection when you want to protect data from being changed or destroyed. To write-protect most tape cartridges, slide the write-protect tab to the "locked" position.

Z

ZIF   Zero Insertion Force. A type of socket or connector allowing a computer chip or bar code reader to be inserted or removed with no stress applied to either the chip or bar code reader and its respective socket.

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