Quantum|ATL PowerStor L200 Series Library

User's Guide

6322500-04

Ver. 4, Rel. 0

Quantum | ATL PowerStor L200 Series Library User's Guide, 6322500-04**,** Ver. 4, Rel. 0**,** August 2001, Made in USA.

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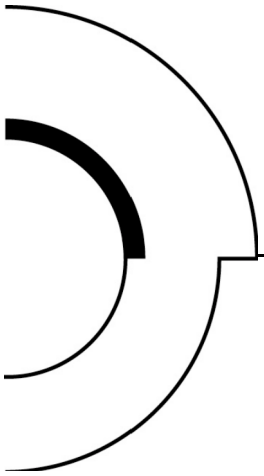

Preface

This manual introduces the PowerStor L200 Series library (library) and describes library operations, configuration, servicing, and basic troubleshooting.

Audience

This manual is written for library operators.

Purpose

This manual provides the following information about the library:

- Installing the library
- Basic library operations
- Operator control panel
- Using the library
- Service commands
- SCSI interface
- Troubleshooting

Notational Conventions

This manual uses the following conventions:

Caution: Cautions indicate potential hazard to equipment or data.

Warning: Warnings indicate potential hazard to personal safety.

Note: Note emphasizes important information related to the main topic.

This manual uses the following conventions:

- Right side of the library — Refers to the right side as you face the component being described.
- Left side of the library — Refers to the left side as you face the component being described.
- *b* — All binary numbers are succeeded by “b.”
- *h* — All hexadecimal numbers are succeeded by “h.”
- Error or attention conditions are represented in parenthesis that translate as follows:

  (SK=S ASC=AA ASCQ=QQ)

  where:

  S — hexadecimal sense key value

  AA — hexadecimal additional sense code

  QQ — hexadecimal additional sense code qualifiers

Related Documents

The following documents are related to the library:

Document No.	Document Title	Document Description
6321102	Quantum	ATL PowerStor L200 Series Library Unpacking Instructions	Contains information necessary to receive and unpack the library

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

Contacts

Quantum | ATL Corporate Headquarters

To order documentation on the library or other products contact:

Quantum | ATL
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:

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Visit the Quantum | ATL home page at:

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Chapter 1
Overview

This chapter provides an overall description of the PowerStor L200 Series library (library) and includes the following sections:

Library Configuration

The library can hold up to eight cartridges and houses a single tape drive. The library is available in rack mount or desktop configurations and is available with either single-ended or differential SCSI interfaces.

Features

The library provides the following features:

- Automatic tape operations
- Library status display via the operator control panel (OCP):
  - Tape drive status and activity
  - Tape drive error status
  - Magazine slot status
  - Loaded tape cartridge conditions
- Mode control:
  - Automatic random access to all tape cartridges
  - Sequential access to tape cartridges in a single cycle
  - Sequential access to tape cartridges in circular cycles
  - Optional bar code reader reads the tape cartridge label bar codes
  - Optional auto clean mode automatically cleans drives when required
- User selection of cartridges to be loaded into the tape drive
- SCSI ID selection via the OCP
- Tape drive microcode updates via the SCSI bus or cartridge
- Library code or firmware updates via SCSI bus
- Display device microcode and hardware revision numbers
- User directed tests for the library
- Embedded diagnostic software displays status for head cleaning, library operation, and tape drive operations

Library Components

The library consists of these major components:

- OCP
- Library door
- Back panel
- Bar code reader (optional)
- Cartridge handling mechanism (CHM) (also referred to as the loader, elevator, or medium changer)
- Tape drive
- 6-cartridge removable magazine
- 2-cartridge fixed internal magazine

Caution: Do not attempt to remove components or perform maintenance procedures on the library. Maintenance procedures are performed by field service technicians.

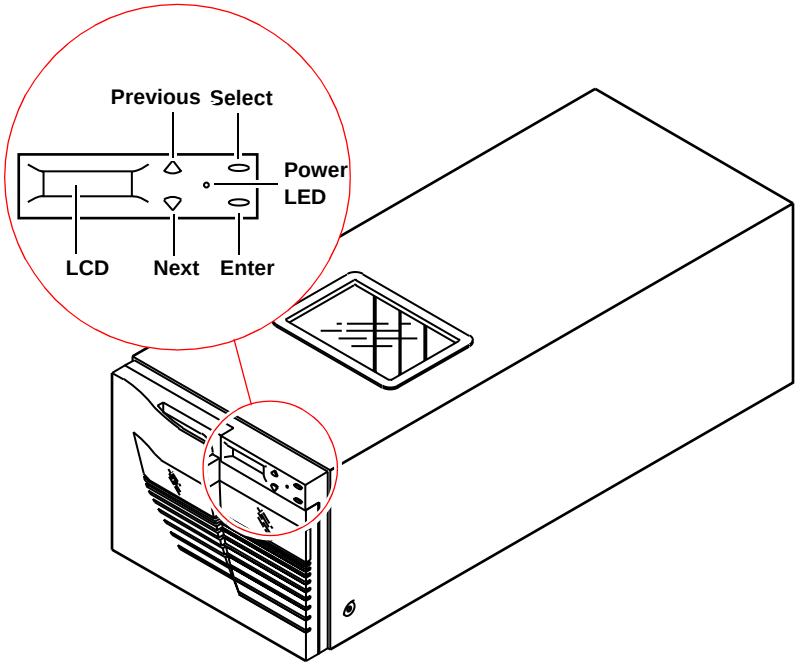
Operator Control Panel (OCP)

The OCP is located on the front panel of the library (see figure 1) and controls all library local functions. The OCP consists of:

- A liquid crystal display (LCD)
- A power indicator light-emitting diode (LED)
- Four buttons: Previous, Next, Select, and Enter

The LCD displays up to two lines of characters that contain a mixture of messages and field codes (see figure 1).

Figure 1 OCP



Using the OCP, you can:

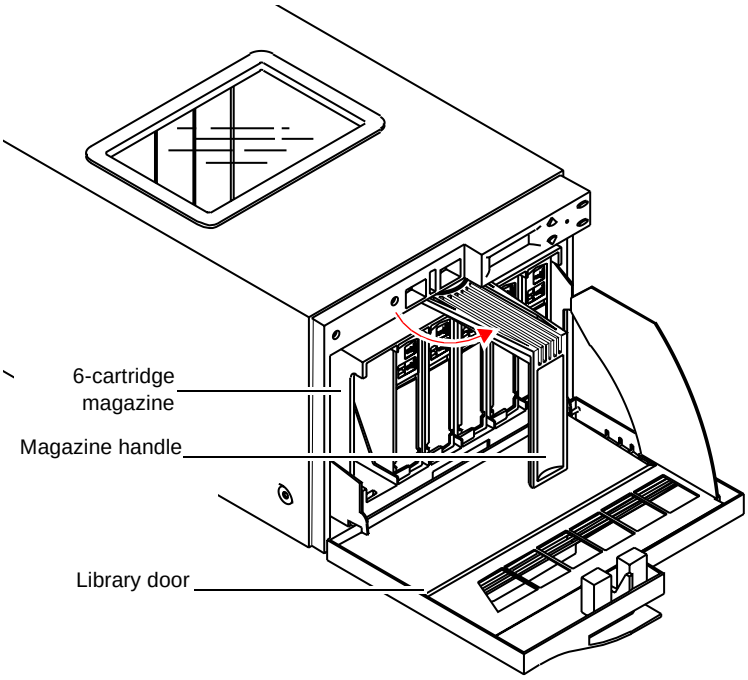
- View tape drive status and activity
- View error messages
- View magazine slot status
- View the drive and loader controller configuration
- Set the SCSI ID for the drive and loader controller
- Lock or unlock the magazine door
- Exercise and test the CHM

See chapter 3, Operator Control Panel for more information on the OCP.

Library Door

The library door provides access to a 6-cartridge removable magazine, and a 2-cartridge internal fixed magazine. See Opening the Library Door on page 41 for more information on opening the library door.

Figure 2 Library Door

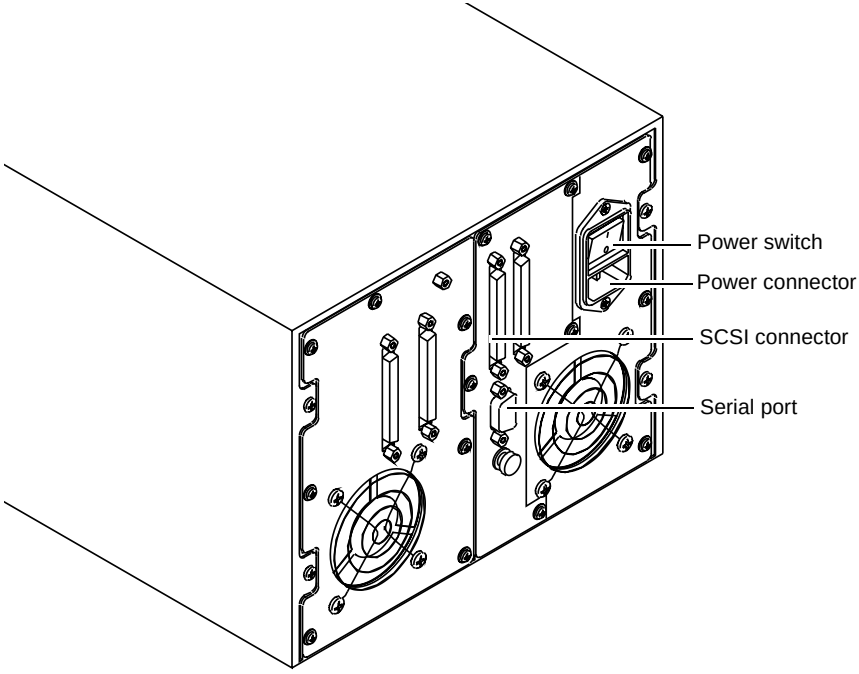


Back Panel

The back panel of the library (see figure 3) contains:

- Power switch and connector
- SCSI connectors
- Power supply
- Serial port (only for use by a service representative)

Figure 3 Back Panel

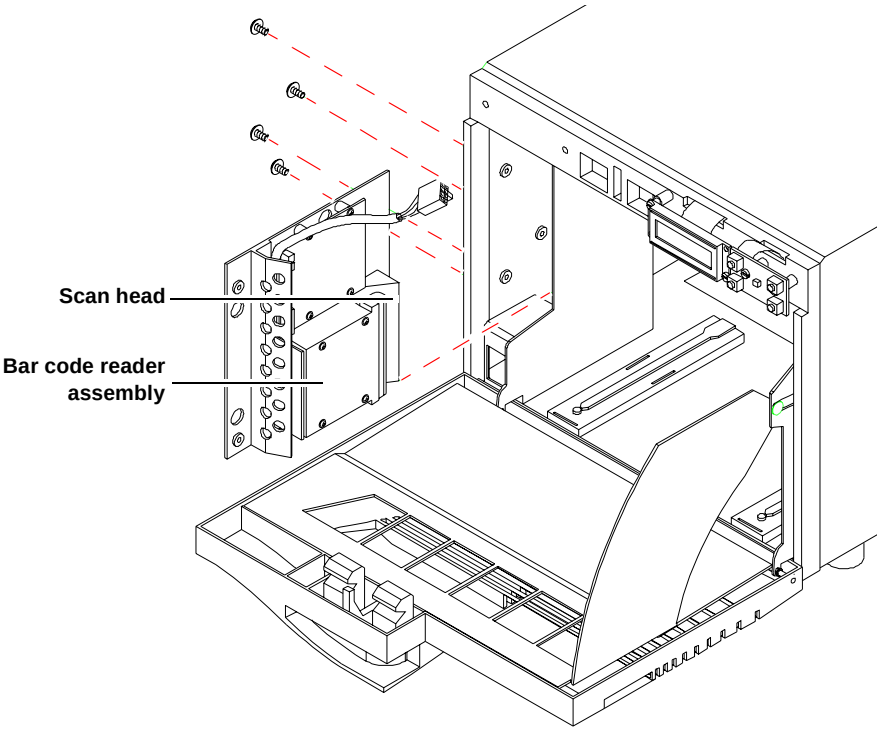


Optional Bar Code Reader

The optional bar code reader performs cartridge inventories in less than three minutes. When installed, it occupies a narrow space inside the library, to the left of the tape cartridge magazine (see figure 4).

The bar code reader assembly contains a scan head that communicates with the library controller card over an RS-422 communications link. During a cartridge inventory, the scan head illuminates and reads the bar code labels on the cartridges and transmits the results to the library controller card.

Figure 4 Bar Code Reader



Cartridge Handling Mechanism

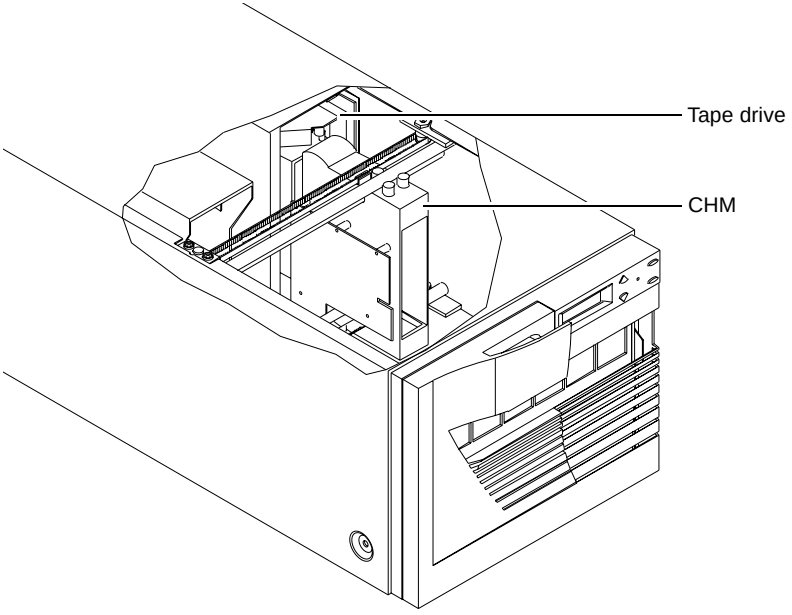
The cartridge handling mechanism (CHM) is a compact, bidirectional roller system that enables simple horizontal movement between the magazine and the tape drive (see figure 5).

This design allows you to add and remove cartridges from the front of the magazine.

Note: If the CHM, or elevator, is positioned so that it blocks the rear of the slot where the cartridge is to be loaded or unloaded, it is not possible to perform a load or unload operation. The cartridge cannot be pushed far enough into the slot so that it locks or unlocks into or out of its position in the magazine. In this instance, the magazine will have to be removed in order to load or unload that particular magazine slot.

The CHM contains sensors that monitor cartridge location, gripper location and timing information. These sensors allow the library to operate as a random access system that provides direct, quick access to any of the cartridges in the storage array.

Figure 5 Cartridge Handling Mechanism



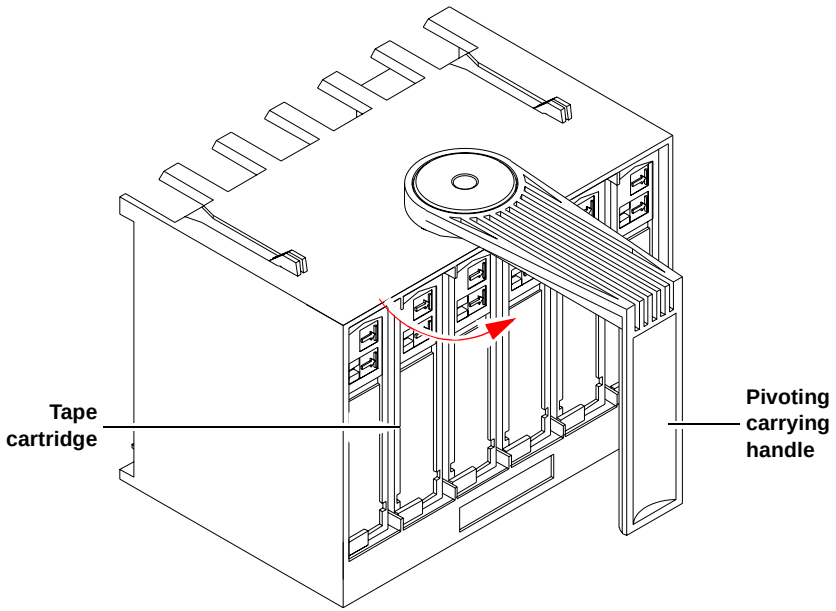
Tape Drive

The tape drive is mounted to a sturdy metal bracket assembly which includes a built-in fan unit and SCSI data connectors. It affords easy access in the event that the drive requires replacement.

6-Cartridge Magazine

The includes one 6-cartridge tape magazine (see figure 6) that is accessed from the door on the front of the unit. The magazine stores up to six data cartridges. The magazine can also be removed and used for off-site storage.

Figure 6 Library Magazine (Loaded)



The magazine is keyed to prevent improper cartridge insertion and locks each cartridge in place once inserted. A push on a cartridge releases it for removal without the need to remove the entire magazine.

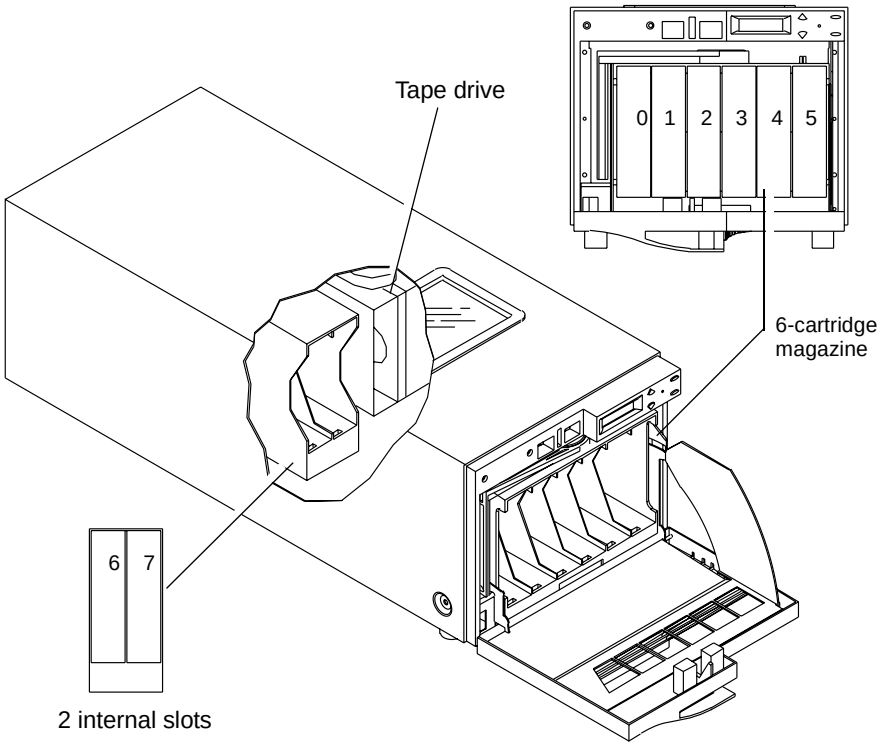
Note: If the CHM, or elevator, is positioned so that it blocks the rear of a slot where a cartridge is to be loaded or unloaded, it is not possible to perform the load or unload operation. The cartridge cannot be pushed far enough into the slot so that it locks or unlocks into or out of its position in the magazine. In this instance, the magazine will have to be removed in order to load or unload that particular magazine slot.

Element Numbering Convention

The storage array (see figure 7) includes:

- One 6-cartridge magazine
- Two internal storage slots
- One tape drive

Figure 7 Storage Array



Chapter 2

Installing the Library

This chapter contains information needed to install, configure and operate the library. The installation procedure is divided into the following general tasks:

- Selecting an Installation Location
- Receiving the Library
- Rack Mount Kit Installation
- Running the Power-on Self-test
- Configuring the Library
- Selecting an Installation Location

Selecting an Installation Location

When selecting an installation location for the library, consider:

- Space requirements
- Installation surface strength and inclination
- Power and grounding
- Environmental specifications

Space Requirements

The library requires 6 inches space behind it for cables and connections. The library also requires 6 inches in front of it for opening and closing the library door. No extra space is required to either side of the library. To remove and replace the library enclosure, you need an overhead clearance slightly greater than the height of the library (see Physical Specifications on page 62).

Surface Strength and Inclination

Place the library on a clean, level surface. If the library is placed on a desk or table, make sure it is sturdy enough to support the library's weight, 37 pounds (17 kilograms) (empty).

Power and Grounding

The electrical ratings for the library are 100 to 120 / 200 to 240 VAC, 50 / 60 Hertz.

Power Cord

A 110 / 120 VAC power cord is supplied with your library. If your locale does not use 110 / 120 VAC, the power cord used with this equipment must meet this criteria:

- A minimum of 18 / 3 AWG, 60°C, Type SJT
- UL and CSA certified cordage rated for use at 250 VAC with a current rating that is at least 125% of the current rating of the product (in Europe, the cordage must have the HAR mark)

- The AC plug must be terminated in a grounding-type male plug designed for use in your country and it must also have marks showing certification by an agency acceptable in the country
- The connector at the product end must be an IEC 320 type C13 female connector
- The cord must be no longer than 14.5 feet (4.5 meters)

Warning: Do not attempt to modify or use an external 110/120 VAC power cord for 220/240 VAC input power. Modifying the power cord can cause personal injury and severe equipment damage.

Environmental Specifications

The installation location should meet the following environmental specifications for operating the Powerstor library:

- **Temperature:** 50°F to 104°F (10°C to 40°C)
- **Relative humidity:** 20% to 80% noncondensing
- **Humidity gradient:** 10% per hour
- **Dry bulb temperature:** 50°F to 104°F (10°C to 40°C)
- **Wet bulb temperature:** 77°F (25°C)
- **Temperature gradient:** 19.8°F (11°C) per hour across the range
- **Temperature shock:** 18°F (10°C) over two minutes
- **Altitude:** -500 feet to 10,000 feet (-150 meters to 3000 meters)
- **Air:** Free of airborne contaminates (for example dust, paper particles, fibers, and so on)

Receiving the Library

When receiving the library from the shipper, unpack the library as close to the installation location as possible.

Inspect the shipping pallet and carton for damage that may have occurred during shipment and immediately report any damage to the shipper.

Warning: The library weighs 37 lbs (17 kg). Two people should perform any procedure that involves lifting or moving the library.

Caution: If you are installing the rack mount version of the library, use the *PowerStor Rack Mount Installation Kit*. This kit provides necessary support brackets.

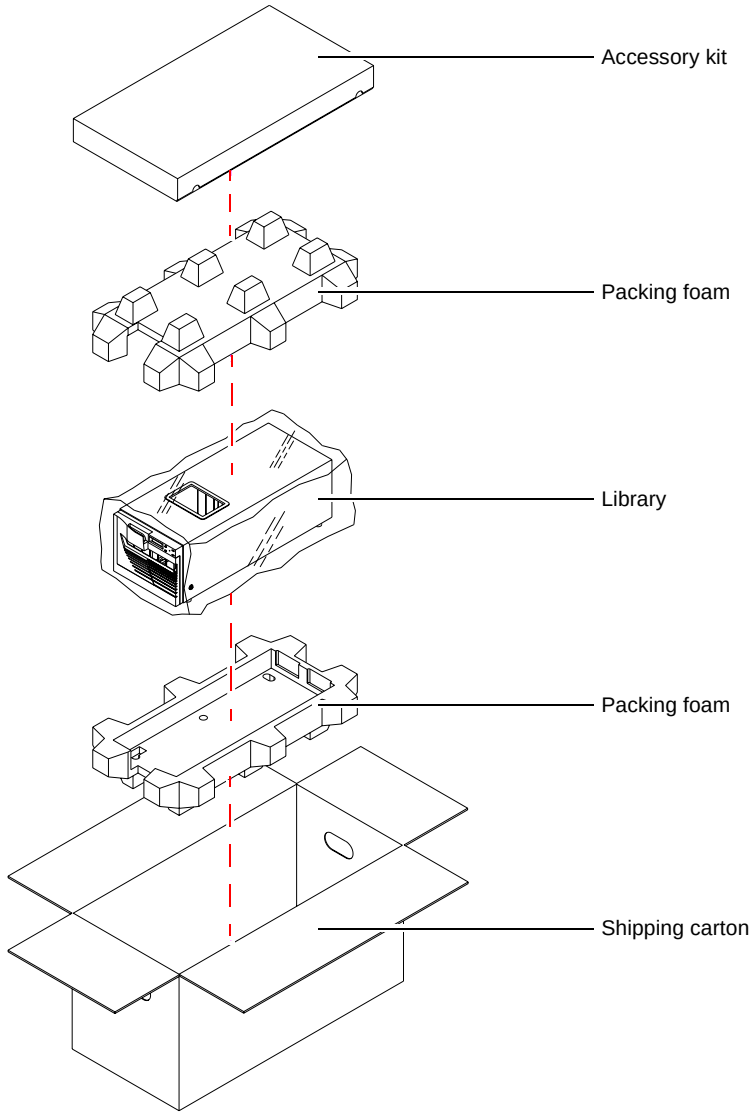
The unpacking instructions vary depending upon whether it is a desktop or rack mount library. If it is a desktop library, you should have only one shipping carton. If it is a rack mount library, you will have two shipping cartons. The larger carton contains the library, and the smaller carton contains the rack mount kit.

Unpacking the Library

To unpack the library (see figure 8):

1. Remove the accessory kit.
2. Remove the packing foam from the top of the library.
3. Remove the library from the shipping carton.
4. Remove the library from the shipping bag.
5. Place the library in the installation location. If it is a rack mount library, refer to the instructions supplied with the *PowerStor Rack Mount Kit*.
6. Save the box and its packing materials in case the library requires shipment at a later date.

Figure 8 Unpacking the Library



Rack Mount Kit Installation

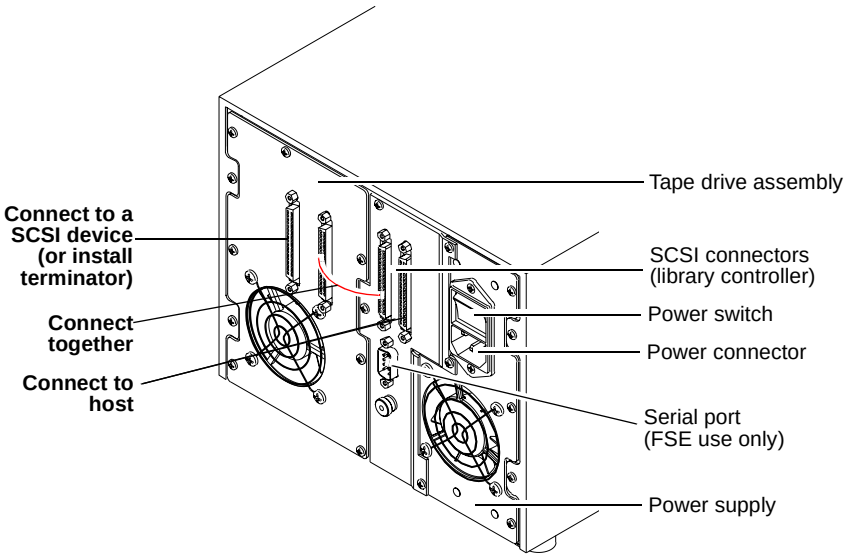
Before installing the rack mount kit in the rack, compare the contents of the carton with the packing list inside the shipping carton. To install the rack mount kit in the rack, refer to the instructions provided in the smaller shipping carton.

Connecting the Library

Complete the following procedure to connect the power cord and SCSI cables to the library (see figure 9).

Caution: Verify that the library controller is connected to the same type of SCSI bus as the drive on that bus. For example, connecting a single-ended SCSI library to a differential SCSI adapter will cause a host system malfunction.

Figure 9 Rear Panel Cable Connectors



To connect the library:

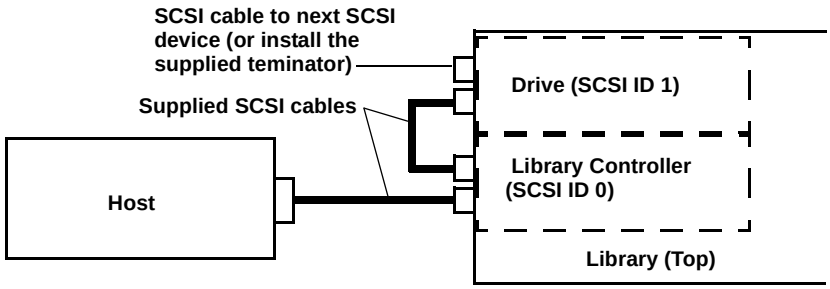
1. Verify that the library's power switch is in the off position. It is not necessary to power down the host.
2. Connect one end of the short SCSI cable supplied with the to the library controller's SCSI connector closest to the tape drive (see figure 10).

3 Connect the other end of the short SCSI cable to the tape drive SCSI connector closest to library controller.

4 If the is a stand-alone external SCSI device, install the SCSI terminator in the connector at the far left (looking at the back of the library). Verify that the SCSI bus is terminated properly.

> **Note:** Depending on the system configuration, the SCSI bus initiates at the host, connects to the library controller, then to the tape drive, and then to any other SCSI devices on the bus. It must be terminated at the last SCSI device on the bus (see figure 10).

Figure 10 SCSI Cabling stand-alone Connection Scenario



5 Connect one end of the long SCSI cable supplied with the library to the SCSI connector closest to the power switch on the back of the library. Connect the other end of this cable to the host's SCSI adapter connector.

6 Secure the cables, using the wire cable clamps or screws provided.

7 Connect the power cord to the power connector on the back of the library (see figure 9).

8 Connect the other end of the power cord to the site power.

Running the Power-on Self-test

Run the power-on self-test (POST) to verify proper system installation.

Turn on the library using the power switch on the back of the library. The POST runs automatically. The following message is displayed:

```
PowerStor POST
```

Table 1 lists the tests that are run during POST along with the OCP pass or error messages associated with these tests.

Table 1 POST Pass/ Error Messages

POST Test (Description)	Messages	
	Pass	**Error**
ROM EDC (flash ROM EDC)	PowerStor POST 1 EDC	POST Error in ROM EDC
Micro RAM (microprocessor local RAM test)	PowerStor POST 2 Micro RAM	POST Error in Micro RAM
UART (QUART test)	PowerStor POST 3 UART	POST Error in UART
Other	PowerStor POST 4 Other	POST Error in Other

Next the drive and the library are initialized. If the optional bar code reader is present (and the bar code enable mode is set), the cartridge bar code labels are read. The OCP buttons are not active until the `Library Idle` message is displayed on the library OCP.

The following messages are displayed:

```
Library INIT
Library Idle
```

If all the POST tests are completed successfully, and the drive and library are initialized, the library is ready for operation. If the tests did not complete, run the POST again; if the tests are still not complete, the library needs service.

> **Note:** To rerun the POST, turn off the library. Wait ten seconds, then turn the library power on again.

Configuring the Library

Configuration consists of verifying that the library and the internal drive have the correct SCSI ID settings. The system uses SCSI IDs to identify or address devices, such as the library controller and the tape drive on the SCSI bus.

If the library is one of multiple SCSI devices on the bus, be sure to use a SCSI ID that is unique from any other device or system ID on the SCSI bus (see table 2).

Table 2 SCSI ID Default Settings

SCSI ID	Device
1	Tape drive
0	Library controller

Verifying the SCSI Settings

To view the current SCSI ID settings using the OCP (see figure 1):

1. Press **`Select`** until the message `SCSI ID?` is displayed.
2. Press **`Next`** to enter the SCSI ID menu and display the message `View ID?.`
3. Press **`Enter`** to view all the SCSI IDs.

4 If the SCSI IDs listed are correct for the system configuration, press **Select** to return to the main menu.

If the SCSI IDs are incorrect for the system configuration, change the tape drive, or library controller SCSI ID setting (see Changing the SCSI ID Settings on page 30).

Chapter 3

Operator Control Panel

This chapter describes the overall menu structure of the operator control panel (OCP). The following functions are described:

- OCP Functions
- Status
- Eject / Unlock
- SCSI ID
- Mode
- Information
- Code Update
- Tests

Caution: Before executing a menu function command from the OCP, verify that there is no SCSI bus activity to the library or drives. Executing commands via the OCP and SCSI bus simultaneously may result in operation failure and / or drive unavailability.

OCP Functions

The OCP is located on the front panel of the library and controls all library local functions.

The OCP consists of an LCD, a power LED, and four buttons:

- **Previous**—return to a previous option
- **Next**—advance through each option
- **Select**—return to the main menu options
- **Enter**—enter and execute commands in the current option

OCP Menus

The LCD displays two lines of characters. Either line can contain a mixture of messages and / or field codes (see table 3).

Table 3 OCP LCD Menu Structure

OCP Menu	OCP Submenu	Description
Status?	**Library Init/ Active/Idle**	At POST
	Slot Status 0-7	Displays status of all slots
	Drv 0	Displays tape drive status
	DRIVE EMPTY	
EJECT/ UNLOCK? (Pre-v34 firmware)	**Eject Cartridge?**	Unloads cartridge from the drive
	Eject Drive?	Ejects cartridge from the drive and returns it to its respective slot (if a drive has a cartridge in it)
	Unlock Door	Unlocks the door after the tape is ejected from the drive and returned to its respective magazine slot

OCP Menu	OCP Submenu	Description
EJECT/ UNLOCK? (v34+ firmware)	**Eject Cartridge?**	Unloads cartridge from the drive if cartridge is present. If cartridge is not present, `Drive is Empty` is displayed
	Eject Drive?	Ejects the cartridge from the drive and returns it to its slot
	Unlock Door	Unlocks the door after the cartridge is ejected from the drive (if `Mode/ SetUnloadCart` is enabled), or without unloading the cartridge from the drive (if `Mode/SetUnloadCart` is disabled)
LOAD?	**From Slot #**	Loads cartridge from selected slot
SCSI ID?	**Set SCSI IDs** if selected, then: **Library ? Drive 0 ?** Press **Select** to change	

OCP Menu	OCP Submenu	Description
MODE?	**Random**	Load any cartridge from any magazine slot
	Sequential	Autoloads cartridge from low to high magazine slot once
	Sequential Circ	Autoloads cartridge from low to high magazine slot repeatedly
	Autoload Cart (Y/N)	Enable for Seq/SeqCirc modes
	EnableBarcode (Y/N)	
	AutoClean (Y/N)	
	SetUnloadCart (Y/N) (Requires V34+ firmware)	**Y** (default) to unload tape drives and return cartridges to respective bins when **Unlock Door?** command is given. **N** to leave cartridge in tape drive when **Unlock Door?** command is given
Information?	**Loader HW Rev**	Device revision level in decimal
	Loader FW Rev	Firmware revision level in decimal
	Loader Mech Rev	Library revision in decimal
	Library HW Rev	Device revision level in decimal
	Library FW Rev	Firmware revision level in decimal

OCP Menu	OCP Submenu	Description
Information? (continued)	**Drive Rev**	Drive firmware revision level in hex
	Loader Life Cycle	Count from completion of library 1 POST
	Current Cycles	From completion of POST
	LDR ERR: ##	
Code Update	**Drive**	Displays drive and library microcode levels
	Update Drive	Installs microcode from code update tape into drive
Tests	**Elevator Test**	
	Short Load/ Unload Test	
	Long Ld/Unload Test	

Status

The **STATUS?** option displays tape drive and magazine slot status. When the library is turned on, it conducts an automatic power-on self-test (POST). Upon completion of the POST, the drives and the library are initialized. The OCP buttons are not active during initialization. Once the drives are initialized, the main menu **STATUS?** options are described as library options. The following messages are displayed:

- `Library Init`
- `Library Active`
- `Library Idle`

If either status message, `Library Init` or `Library Active`, appears on the OCP, the library is in the process of completing an activity. Wait until `Library Idle` appears before entering any commands.

Press **`Next`** to get status.

> **Note:** The STATUS? option gives status information only and there are no commands to be issued, so the **ENTER** button is not functional.

Table 4 lists possible `Status?` options and their respective messages.

Table 4 Status Options

Description	Messages	Notes
Slot 01234567 Bar Code ___		
Displays specific slot status	In drive number: • `Empty` • `Full` • `In transit`	If applicable, the second line of this message displays a bar code label entry
Slot Status		
Displays status of all magazine slots	Cartridge Status: • `Box Filled` (cartridge present) • `0` (cartridge in drive 0) • `-` (empty slot) • `T` (in transit)	The physical locations are labeled as Slots 1 through 8.

Description	Messages	Notes
Drive Status		
Displays tape drive status including tape drive error conditions and cartridge conditions	Status: • EMPTY • InFlux (drive is in the process of becoming ready) • Cln (cleaning required) • Code Update (drive is currently updating its firmware) • Calibrating • Unloading • Loading • Cleaning • Erasing • Writing • Reading • Seeking • Rewinding • Idle	Comp (If the last read or write operation was data compressed, Comp is displayed in addition to the status message)
	Error: • Hardware Error • Comm Error • Library Error • Drive Empty	Cln (If the tape drive head requires cleaning, Cln is displayed in addition to the status message)

When using an unrecorded tape, the tape drive defaults to native tape density mode.

If you execute a write from the beginning of tape (BOT) when using an unrecorded tape, the tape drive defaults to native tape density.

If you execute a write from the BOT when using a recorded tape, all pre-recorded data (and density changes) are lost. This includes density changes because they are established when writing from the BOT.

Eject/Unlock

The **Eject/Unlock?** option unlocks the library door and ejects a cartridge from the tape drive. See Opening the Library Door on page 41 for more information about opening the library door.

Caution: Do not press **Previous**, **Next**, **Select** or **Enter** until the backup or other tape operations are stopped at the host. Pressing these buttons while other operations are executing may result in operation or drive failure.

Table 5 lists possible **Eject/Unlock?** options and their respective messages.

Table 5 Eject/Unlock Options

Description	Messages	Notes
Eject Cartridge?		
Unloads the cartridge from the tape drive and reports on drive status	• Eject Drive? • Drv to Slot # • Library Idle • Drive Empty	The eject function unloads the cartridge from the tape drive
Unlock Door?		
Ejects any cartridge that is in the drive, then unlocks the library door	• Open Door! • Door Unlocked!	The library door is unlocked

SCSI ID

The **SCSI ID?** option displays the SCSI IDs for all devices in the library and allows existing SCSI IDs to be changed.

Make sure all devices on the same SCSI bus have different SCSI ID assignments. SCSI ID defaults for the library are:

- **Library controller:** SCSI ID 0
- **Drive:** SCSI ID 1

Table 6 lists possible SCSI ID options and their respective messages.

> **Note:** When changing a SCSI ID, wait at least 30 seconds before checking the ID. The library may not show the changed ID until the tape drive ID has been reset.

Table 6 SCSI ID Options

Description	Messages	Notes
View ID?		
Lists the SCSI IDs for the library and drive	`Lib 0` `Drv 1`	This example shows the library: `Lib`: SCSI ID 0 `Drv`: SCSI ID 1
Set ID?		
Select a device and change the SCSI ID setting	`Set ID?`	The system is set to change the device ID
	`Library?` `#?`	Displays and selects the library and corresponding SCSI ID to be changed
	`Drive?` `#?`	Displays and selects the device and corresponding SCSI ID to be changed

> **Note:** EEROM is maintained through power cycles. SCSI ID information that is stored in nonvolatile RAM is saved until you manually change it. SCSI IDs do not automatically revert to their defaults.

Viewing the SCSI ID Settings

To view the current SCSI ID settings:

1. Press **Select** until the message `SCSI ID?` is displayed.
2. Press **Next** to enter the SCSI ID menu and display the message `View ID?.`
3. Press **Enter** to view all the SCSI IDs.
4. Press **Select** to return to the main menu.

Changing the SCSI ID Settings

To change the SCSI ID for the library controller:

1. Press **Select** until the message `SCSI ID?` is displayed.
2. Press **Next** to display the message `Set ID?.`
3. Press **Next** to display the message `Set ID? Library?.`
4. Press **Enter** to display the SCSI ID selections (0-15).
5. Press **Previous** or **Next** until the desired SCSI ID is displayed.
6. Press **Enter** to select the SCSI ID setting.
7. Press **Select** to return to the main menu.

To change the SCSI ID settings for the tape drive:

1. Press **Select** until the message `SCSI ID?` is displayed.
2. Press **Next** to display the message `Set ID?.`
3. Press **Next** to display the message `Set ID? Library?.`
4. Press **Next** to display the message `Drive ID?`.
5. Press **Enter** to display the SCSI ID selections (0-15).

6 Press **Previous** or **Next** until the desired SCSI ID is displayed.

7 Press **Enter** to select the SCSI ID setting.

8 Press **Select** to return to the main menu.

Note: The host (such as a PC) must be rebooted for any library SCSI ID change to take affect. Turn off the host's power, wait ten seconds, then turn the power on again.

Mode

The **Mode?** option controls how the library accesses cartridges.

The **Enter** button executes the Selected mode and toggles all other modes to Not Selected. The **Enter** button also toggles the **Yes** and **No** options (see table 7).

Warning: The optional bar code reader contains a Class 1 LED. Do not look at the LED for extended periods of time; prolonged exposure may be harmful to your eyes.

Table 7 Mode Options

Description	Messages	Notes
Random		
Automatically load any cartridge from any magazine in the load cycle	• Selected • NOT Selected	

Description	Messages	Notes
Sequential		
Load cartridges sequentially from the lowest magazine address and the lowest loaded slot position in that magazine.	• Selected • NOT Selected	The loading and unloading of cartridges sequentially progresses to the last cartridge, then the library stops. To reinitiate this process, load a cartridge into the drive via the OCP or via a SCSI Command. Works in conjunction with **AutoloadCart** command. If the library freezes when this option is selected, power down the library, wait at least 10 seconds, then turn on the power.
Sequential Circular		
Primarily designed for testing purposes	• Selected • NOT Selected	
Autoload Cart		
Loads cartridges following an open / close door operation	• Y • N	Functions only with **Sequential** or **Sequential Circ** modes.
Enable Bar Code (optional)		
Bar code reader scans the cartridge bar code labels on power-up and when the doors are closed	• Y • N	The bar code labels are read via the OCP Status display or a SCSI **Read Element** status command.

Description	Messages	Notes
Autoclean (optional)		
Toggles whether or not the library will automatically cleans drives when required	• N • Y • CLN Slot Empty! • NOT a CLN Tape • CLN Tape Expired • Completes Successfully	See Optional Autoclean Mode.
SetAutoUnloadCart (toggle)		
Toggles whether or not the library will unload tape drives before unlocking door	• Y • N	Requires v34+ firmware **Y** (default) will unload tape drives at the **Unlock Door?** command **N** will allow tape cartridges to remain in tape drives at the **Unlock Door?** command

Viewing a Mode

To view the current library modes:

1. Press **Select** until the message Mode? is displayed.
2. Press **Enter** to display the message Random Selected.
3. Repeatedly press **Next** to display more modes.
4. Press **Select** to return to the main menu.

Setting a Mode

To set the current library modes:

1. Press **Select** until the message Mode? is displayed.
2. Press **Enter** to display the message Random Selected.
3. Press **Next**. Each mode option and status is displayed:

- Sequential NOT Selected
- Sequential Circ NOT Selected
- Autoload Cart: N
- Enable Barcode: N
- AutoClean: N

4 Press **Enter** to toggle the mode options.

Enter executes the Selected mode and toggles all other modes to NOT Selected.

For example, if you toggle the **Sequential** mode to Selected, the **Random** and **Sequential Circ** modes are automatically toggled to NOT Selected. **Enter** also toggles each of the **Y** and **N** options.

5 Press **Select** to return to the main menu.

Optional Autoclean Mode

If the optional autoclean is enabled, the time that a SCSI **`Move Media`** command takes to complete increases from approximately 20 seconds to 60 seconds because the library must wait until calibration is complete. If cleaning is required, the typical time increases to a maximum of 10 minutes while the drive is cleaned.

To use:

1 Load the cleaning cartridge into slot 7.

2 Press **Enter** to enable AutoClean: Y.

When AutoClean is enabled, the status of slot 7 becomes unviewable. The OCP cannot be used to load a cleaning cartridge.

After the manual cleaning cycle is complete, the second line of the OCP will display an idle message. Turn off the library. Wait at least ten seconds. Turn on the library. After the initialization process is complete, set the AutoClean parameter to **`N`**. The cleaning cartridge may then be ejected.

Firmware Updates

Following a library firmware code update, the mode settings will revert to their defaults:

Random Access: Selected
Bar Code Read: N
Sequential Access: Not Selected
Autoload Cart: N
Sequential Circ: Not Selected
AutoClean: N
Set Auto Unload Cart: Y

Information

The **`Information?`** option displays the device revision number, software revision number, library cycle count and library error count (see table 8).

Table 8 Information Messages

Information Type	Message	Notes
`Ldr Hw Rev`	##	Device hardware revision level†
`Ldr Rw Rev`	##	Device firmware revision level†
`Ldr Mech Rev`	##	Library revision level†
`Lib Hw Rev`	##	Library hardware revision level†
`Lib Fw Rev`	##	Library firmware revision level†
`Drive Rev`	##	Drive firmware revision level‡
`Library Life Cycle Count`	##	Count starts from completion of first POST†

† decimal format
‡ hex format

Information Type	Message	Notes
Current Cycles	##	Count starts from completion of most recent POST†
Ldr Err:	##	Library error count†

† decimal format
‡ hex format

Code Update

The **Code Update?** option displays what tape drive is installed and installs new microcode for the tape drive through the cartridge or the host (see table 9).

Table 9 Code Update Messages

Option	Message	Note
Update Drive #	Update Drive 0	Press **ENTER** to start the automated code updating process for the selected drive
(.)	T (test) V (release)	Revision level is in decimal format
(h)	T (test) V (release)	Revision level is in hex format.

Installing New Drive Microcode

For detailed microcode update procedures, contact Quantum | ATL Customer Support or your service representative.

Tests

The **TESTS?** option controls the library internal self-test functions.

To move through the **Tests?** option:

- If **Previous** or **Next** is pressed during a test, the next message test is displayed along with the message:

  A Test is Active

  When the original test is completed the next test will start.
- If **Enter** is pressed during a test in progress, the test will be terminated. Press **Enter** to restart a test from the beginning, once the termination process completes (see table 10).

Table 10 Tests Options

Description	Messages	Notes
Elevator Test		
Tests the library elevator function. This is a one cycle test.	`Active or Aborted`	The CHM is positioned to each available data transfer element (drive) or data storage element (magazine slot). If the magazine is not present, the CHM cannot be positioned to those slots. This test is functionally equivalent to SCSI **`Position to Element`** commands.
Load/Unload Test		
Randomly loads and unloads cartridges into the tape drive. This is a one cycle test.	`Active or Aborted`	Unloads any cartridge in the drive, inserts a cartridge in the drive, and replaces the cartridges in their slots. The drive is left empty.

Description	Messages	Notes
Long Ld/ Unld Test		
Randomly loads and unloads cartridges into the tape drive repeatedly, until the test is aborted by pressing the **Enter** button on the OCP.	`Active or Aborted`	Loads and unloads the drive with cartridges from random slots.

Chapter 4

Using the Library

This chapter describes how to use the library:

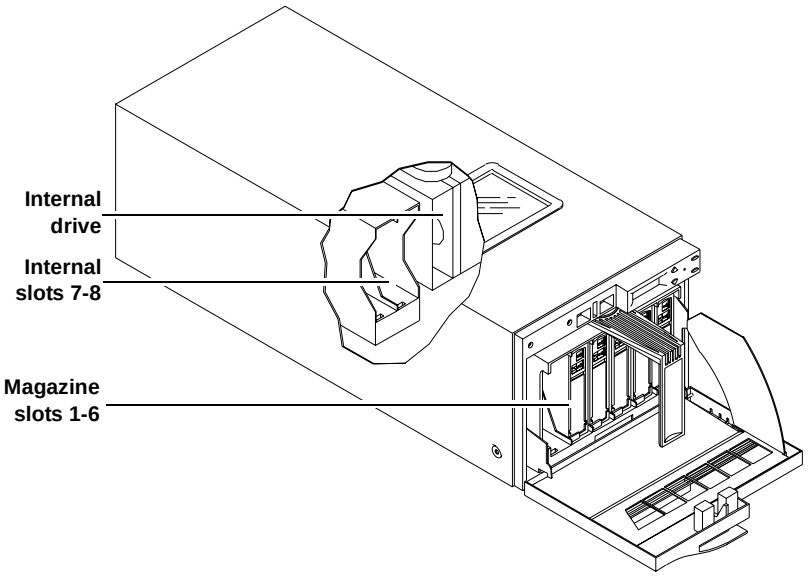
- Using the Library Door
- Using Tape Cartridges
- Using the Cartridge Magazine

Using the Library Door

The library holds one removable 6-cartridge magazine. Slots are labeled 1 through 6. The library recognizes these slots as cartridges 0-5 (see figure 11).

The remaining two slots (7 and 8) are fixed and internal. The library recognizes these slots as 6 and 7. They are located behind the removable magazine, to the left of the tape drive.

Figure 11 Slot Locations



Caution: To prevent cartridge jams, use the space on the front of the cartridge for labels. Do not put labels on any other location.

Caution: Never attempt to move the CHM manually. Damage to the library may occur if the CHM is blocking access to the fixed cartridge slot. Recycle power and wait until `Library Idle` is displayed on the OCP. The CHM will then be in its home position.

Note: Use physical slot 1 (OCP slot 0) when performing a drive microcode update; use physical slot 8 (OCP slot 7) when using the optional AutoClean mode.

Note: Insert and remove all cartridges from the *front* of the magazine.

Opening the Library Door

To open the magazine door, using the OCP:

1. Press **Select** until the message EJECT/UNLOCK? is displayed.
2. Press **Next** to display the message Eject Cartridge?.
3. Press **Next** to display the message Unlock Doors?.
4. Press **Enter** to display the message Are you sure?.
5. Press **Enter** to remove any cartridge from the drive and display the message Open Doors!.

   This activity can take up to three minutes if the cartridge is to be removed from the drive and the end of data is at the end of the tape spool. Press any other button to stop the operation.
6. Open the door using the handle.

> **Note:** When the door is unlocked, the message Door Unlocked! is always displayed. The only way to restore library operation is to open and close the library door.

Closing the Library Door

To close the library door, push the door until it latches.

The door automatically locks after approximately five seconds. The library automatically executes a scan magazine function.

When the scan magazine function is complete, the message Eject/Unlock? is displayed on the OCP. If the optional bar code reader is present, the cartridge label bar codes are read.

Using Tape Cartridges

This section contains information on:

- Loading and unloading data cartridges
- Using cleaning cartridges
- Bar code labels

Inserting a Cartridge

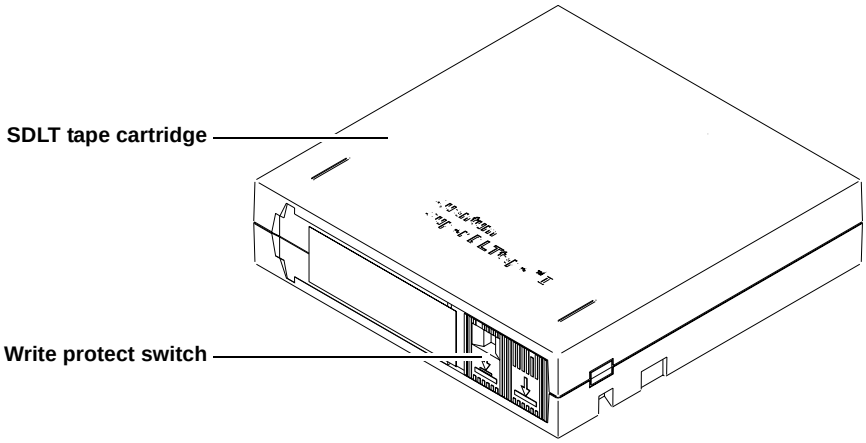
To insert a tape cartridge into the magazine:

1. Open the library door.
2. Verify that all library SCSI library activity has stopped (the message `Library Idle` will be displayed on the OCP).
3. Set the write-protect switch on the tape cartridge to the desired position (see figure 12).

> **Note:** The cartridge is *write-protected* if the orange indicator is visible. The cartridge is *write-enabled* if the orange indicator is not visible.

4. Orient the tape cartridge with the write-protect switch at the top (see figure 12).

Figure 12 Cartridge Write-Protect Switch



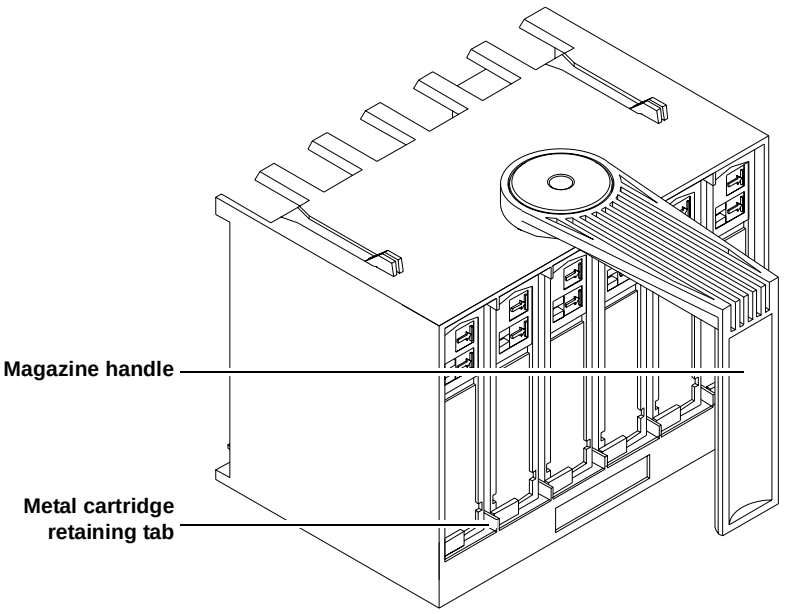
5 Insert the cartridge into the magazine:

a Push the tape cartridge into the slot until it latches.

b Verify the small metal retaining tab pops out at the opening of the magazine slot, holding the cartridge in place (see figure 13).

Caution: Do not press the metal tab.

Figure 13 Cartridge Retaining Tab



Removing a Cartridge

To remove a cartridge from the magazine:

1. Press on the tape cartridge until you hear a click.
2. Release the cartridge.
3. The slot has a spring-release action and will partially eject the cartridge for ease of removal.

Caution: When a tape cartridge is inserted in a magazine slot, a metal retaining tab pops up from the front edge of the slot to retain the cartridge. Do not press on the metal retaining tab. Always use the press-and-release technique to remove cartridges from the magazine.

Loading a Cartridge

To load a cartridge from a magazine slot into the tape drive:

1. Press **Select** until the message Load? is displayed.
2. Press **Enter** to display the message Load Slot 0?.
3. Press **Next** until the desired slot number is displayed.
4. Press **Enter** to select the slot number.
5. Press **Enter** to display one of the following messages:
   - Drive is Full

     A cartridge is already installed in the drive. To continue, unload the cartridge from the full drive (see Unloading a Cartridge on page 46), then perform the load function again.
   - Slot x is Empty

     There is no cartridge available in the selected slot. To continue, select a slot that contains the cartridge using the **Next** or **Previous** buttons, or insert a cartridge into the empty slot.
   - LOADING or UNLOADING or CALIBRATING COMP

     The library is in the process of completing an activity. When the activity is completed, Library Idle is displayed on the OCP.
   - IDLE COMP

     The load function is complete.
6. Take the action appropriate for the message.

   During the loading process, the CHM performs several functions and displays several messages.

   After the tape cartridge is loaded, Library Idle is displayed on the OCP.
7. Press **Select** to return to the main menu.

Unloading a Cartridge

To unload a cartridge from the tape drive:

1. Press **Select** until the message EJECT / UNLOCK? is displayed.
2. Press **Next** to display the message Eject Cartridge?.
3. Press **Enter** to display the message Eject Cartridge? Eject Drive?.
4. Press **Enter** to display one of the following messages:
   - Drive is Empty (there is no cartridge to unload in the drive)
   - Drive NOT Present (there is no cartridge to unload in the drive)
   - Eject to Slot 0?
5. Press **Enter** to unload the cartridge.

   The library returns the tape cartridge to its original slot. You cannot choose to send the cartridge to a different slot.

   After the tape cartridge is unloaded, Library Idle is displayed on the OCP.
6. Press **Select** to return to the main menu.

Using the Cleaning Cartridge

If the tape drive detects a failure during the calibration routine or if an unrecoverable hard error occurs while writing or reading a tape, the message `Cln` is displayed on the OCP. This message indicates that the drive head may be contaminated and in need of cleaning.

> **Note:** Always use the cleaning cartridge to clean the drive. Do not use cleaning solvents or attempt to service the tape drive head.

To use a cleaning cartridge on a non-SDLT type tape drive:

1. Open the library door (see Opening the Library Door on page 41).
2. Remove the 6-cartridge magazine.
3. Insert the cleaning cartridge into slot 7 (see figure 11).
4. Replace the 6-cartridge magazine.
5. Close the library door (see Closing the Library Door).
6. Load the cleaning cartridge into the drive:
   a. Press **Select** until the message LOAD? is displayed.
   b. Press **Enter** to display the message From Slot #?.
   c. Select **7** and press **Enter** to display the message To Drive.
   d. Press **Enter** to automatically begin the cleaning routine.
7. When the cleaning routine is complete, unload the cleaning cartridge into its original slot (see Unloading a Cartridge).

The cleaning cartridge can be used 20 times. When the drive detects that a cleaning cartridge has expired, the drive rewinds and unloads the cartridge. If the cleaning routine is run on a cleaning cartridge that has not expired, Cln is cleared from the OCP after the tape rewinds and unloads. The Cln message is cleared when the tape drive successfully completes a cartridge calibration routine after a retry.

Handling and Storing Cleaning Cartridges

To limit use of a cleaning cartridge:

- Avoid touching leaders and media with bare fingers. Oils and grease from the skin are especially damaging and may cause drive failures that require drive replacement.
- Maintain a clean work area to ensure drive reliability.
- Select a site away from line printers, cardboard boxes, or other sources of dust and debris.
- Follow handling and storage guidelines.

Cln Message

The `Cln` message may have indicate several problems (see table 11).

Table 11 Cln Message Indications

Condition	Possible Problem	Recommended Action
`Cln` message is displayed on the OCP	The drive head may be contaminated	If it is non-SDLT type tape drive, clean the drive head (see Using the Cleaning Cartridge).
Repeated `Cln` messages with different data cartridges	May indicate a drive failure	Call your Quantum | ATL service representative
`Cln` message is displayed with a particular cartridge	May indicate a media problem in the data cartridge	Replace the data cartridge

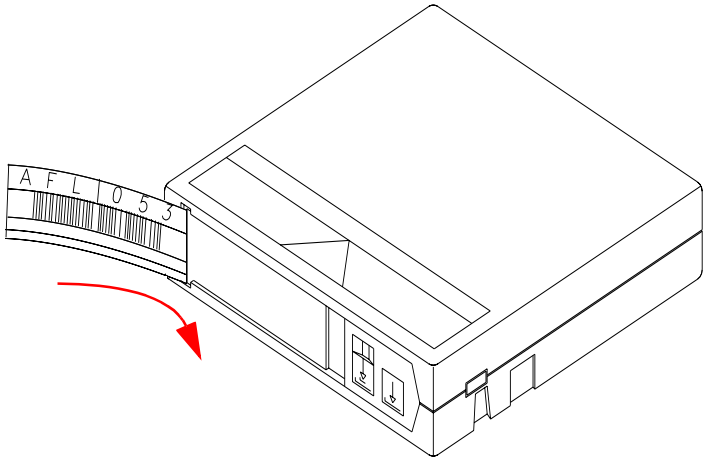
Inserting Bar Code Labels

The library is shipped with bar code labels that can be inserted into the front slide slot (see figure 14):

1. Orient the bar code label so that the numbers are on top, and the writing faces outward.
2. Slide the label into the slot on the front of the tape cartridge.

> **Note:** Be sure to use a cleaning label if it is a cleaning cartridge.

Figure 14 Bar Code Label Insertion



To obtain additional labels, contact your Quantum | ATL sales representative.

Using the Cartridge Magazine

This section contains information on using the cartridge magazine.

Inserting the Magazine

To insert the magazine into the library (see figure 15):

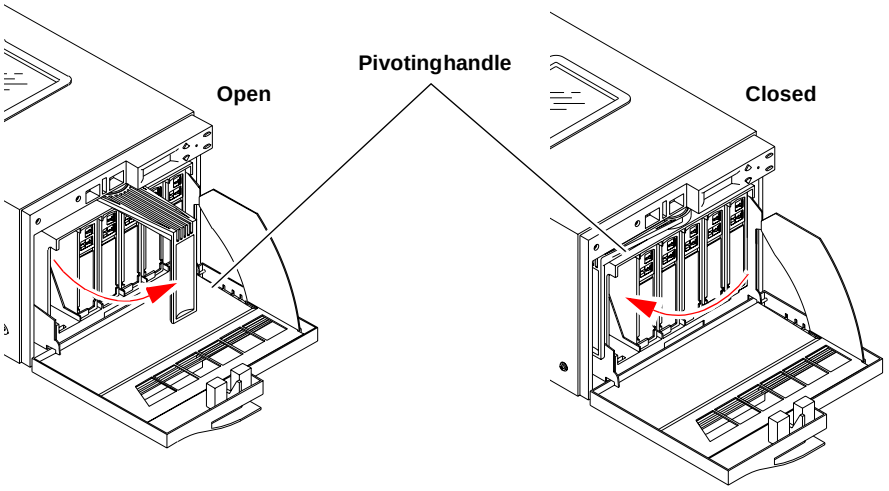
1. Open the library door (see Opening the Library Door on page 41).
1. Pivot the magazine handle out.
2. Place the magazine on the library door.
3. Push the magazine into the library until it clicks.

> **Note:** Do not push on the cartridges when inserting the magazine into the library.

4. Pivot the magazine handle all the way to the left.

5 Close the library door (see Closing the Library Door on page 41).

Figure 15 Cartridge Magazine



Removing the Magazine

To remove the magazine from the library:

1 Open the library door (see Opening the Library Door on page 41).

2 Pivot the magazine's handle out from its closed position

3 Pull the magazine out of the library.

4 Close the library door (see Closing the Library Door on page 41).

Chapter 5

SCSI Interface

This chapter details the SCSI protocol features for the library. These features include:

- General SCSI Bus Operation
- SCSI Message System

General SCSI Bus Operation

This section discusses general SCSI bus operation. The SCSI specification refers to tape libraries as *medium changers*.

> **Note:** Tape drive commands are not discussed in this document but can be found in the SCSI Interface chapter of the specific product manual.

Data Transfer

The library supports asynchronous and synchronous data transfers. The product has both differential and single-ended SCSI interfaces. Odd parity is generated during all information transfer phases where the device writes data to the SCSI bus, and checked during all information transfer phases where data is read from the bus.

During operations that take significant amounts of time, such as Move Media commands, the device disconnects from the SCSI bus, allowing other devices to access the bus. This disconnection is configurable through the Disconnect-Reconnect Mode Parameters page.

Initiator/Target Operation

The library does not act as an initiator on the SCSI bus and will not:

- Generate unsolicited interrupts to the host
- Initiate its own SCSI commands
- Assert bus reset

SCSI IDs and LUNs

The library always appears as logical unit number (LUN) LUN 0.

If the LUN specified in the Identify message is invalid, the library will accept the Command Descriptor Block (CDB). There are three cases in which this happens:

- If the command is **Inquiry**, the target will return the inquiry data with the peripheral qualifier set to 011, indicating that the target will never support the LUN in question.
- If the command is **Request Sense**, the target will return sense data. The sense key will be Illegal Request, with an additional sense code of Invalid LUN.
- For any other command, the target will terminate the command with a Check Condition status, and generates the sense data.

Unit Attention Condition

Queued unit attentions are implemented on this device, and are maintained separately for each Initiator. Unit attentions are created in the following circumstances:

- Power on
- Bus reset
- Bus device reset message
- Asynchronous media change
- Another initiator changed the mode parameters

It is not unusual for a firmware (microcode) update to complete two queued unit attentions. Due to a limited number of unit attention buffers, if an initiator does not clear unit attentions queued for it, at some point the library stops generating new unit attentions for that initiator-LUN (I-L) combination. Existing ones are left queued.

Behavior Around Power-On and SCSI Bus Reset

All device SCSI lines go to a high-impedance state when the library is turned off.

The library does not generate any spurious signals on the SCSI bus when it is turned on.

Within 5 seconds of being turned on, and within 250 milliseconds (typically under 4 ms) after a bus reset, the library responds to SCSI bus selections and returns appropriate, normal, responses. Tape motion commands are returned with a `Check Condition` status, `Sense Key Not Ready`, until the media has been made ready.

The hard bus reset option is implemented.

The library recognizes multiple bus resets in succession and bus resets of arbitrarily long duration. It recovers within the time limits specified above, following the last bus reset.

Other SCSI Functionality

Linked commands and untagged queuing are supported.

Bus Phases

The library conforms to the bus state transition table shown in the SCSI-2 Standard, *Phase Sequences*. The information in the following sections also applies.

Attention Signal Response

The library responds to an attention (ATN) condition at every phase transition, as long as the initiator sets the ATN bit before the target deasserts the request (REQ) for the last byte of the previous phase. Generally, ATN is recognized immediately by the library, and it changes the bus phase to **`Message Out`**.

SCSI Message System

This section discusses status phases, messages, and bus parity errors.

Status Phase

The library enters the status phase just once per command, unless the initiator requests a retry. The only exception is during error cases when the device goes immediately to BUS FREE, as defined in the SCSI-2 standard. The library can return a variety of status bytes (see table 12).

Table 12 Status Bytes

Status Byte	Description
GOOD (00)	This status indicates the library successfully completed the command.
CHECK CONDITION (02)	A contingent allegiance condition occurred. The REQUEST SENSE command should be sent following this status to determine the nature of the event.
BUSY (08)	The target is busy. This status is returned whenever the device is unable to accept a command from an otherwise acceptable initiator. The initiator should reissue the command at a later time.
INTERMEDIATE GOOD (10h)	This status is returned instead of GOOD status for commands issued with the LINK bit set. Following the return of this status, the library will proceed to the COMMAND phase for the transfer of the next linked command.
RESERVATION CONFLICT (18h	This status is returned by the library whenever a SCSI device attempts to access the library when it has been reserved for another initiator with a RESERVE UNIT command.
COMMAND TERMINATED (22h)	This is the status returned for a command that was terminated by a TERMINATE I/O PROCESS message. This status also indicates that a contingent allegiance condition has occurred.

The **Test Unit Ready** command is used to determine whether the library would accept, for example, a **Move Medium** or **Position** command without returning a CHECK CONDITION status.

Bus Free

There are several situations when the device will go to BUS FREE unexpectedly, as defined in the SCSI-2 standard (see sections 4.1.1 and 4.3):

- An internal hardware or firmware fault that makes it unsafe for the device to continue operation without a full reset (similar to a power-up reset).
- ATN asserted or bus parity error detected during non-tape data transfers.

Bus Parity Errors

Bus parity errors (single bit errors) are very serious. They imply the possibility of undetected double-bit errors on the bus. Most likely these result in undetected data corruption. On properly configured SCSI buses, parity errors are extremely rare. If any are detected, they should be addressed quickly by improving the configuration of the SCSI bus. A well-configured SCSI system in a normal environment should be virtually free of bus parity errors.

Bus parity errors cause the library to either retry the operation, go to Status phase, or go to BUS FREE and prepare sense data. Retrying of parity errors during the data out phase is normally not done, but can be enabled by changing the **EnaParErrRetry** parameter in the **Vendor Unique (VU) EEROM** mode page. This feature is disabled by default because of negative impacts on device performance. Additionally, the data stream on writes cannot be pipelined.

Chapter 6

Troubleshooting Guidelines

This chapter contains descriptions of operational problems that may be encountered and guidelines for dealing with them. Wherever applicable, corrective information has also been provided to assist in problem resolution.

Several library problems produce error messages that are displayed on the OCP. See appendix B, Error Messages and Definitions for more information.

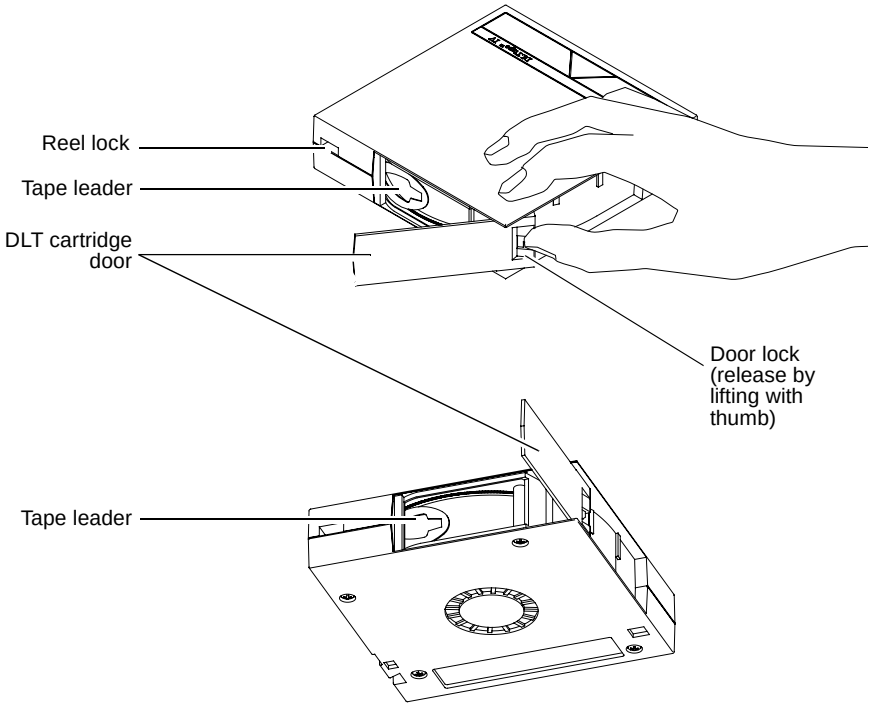
Basic Library Operation

When operating the library:

- Check the tape leader in the cartridge by lifting the cartridge latch that opens the door, exposing the leader. Be sure the leader is in the correct position (see figure 16).
- Verify that the cartridge door is fully closed and the current slot is correct for the starting cartridge.

Caution: Do not touch the exposed magnetic tape. If the tape leader is not in the correct position, use a new cartridge.

Figure 16 Opening the Cartridge Door



Operation Failure

Use the following guidelines if operation failure occurs.

Write-Operation Failure

Some manual operations, if not performed correctly, may cause write operations to fail.

For example:

- Loading any write-protected tape cartridges when executing write operations
- Selecting the incorrect cartridge slot from which to initialize operations

If an error does occur, read the OCP display to determine the problem or call your Quantum | ATL Customer Support representative.

Error Conditions

Depending on the error, the OCP may display an error message. See appendix B, Error Messages and Definitions for more information.

If unable to determine the cause of the problem, call your Quantum | ATL customer support representative.

Power Problems

If the OCP display is not active or your system does not recognize the library:

- Verify that the power plug is secure
- Verify with your system manager that the library configuration is correct

If the library power is disconnected when a cartridge is in transit between the elevator and magazine, the cartridge is moved into the magazine slot when power is restored.

Appendix A

Specifications

This appendix provides specifications on the library:

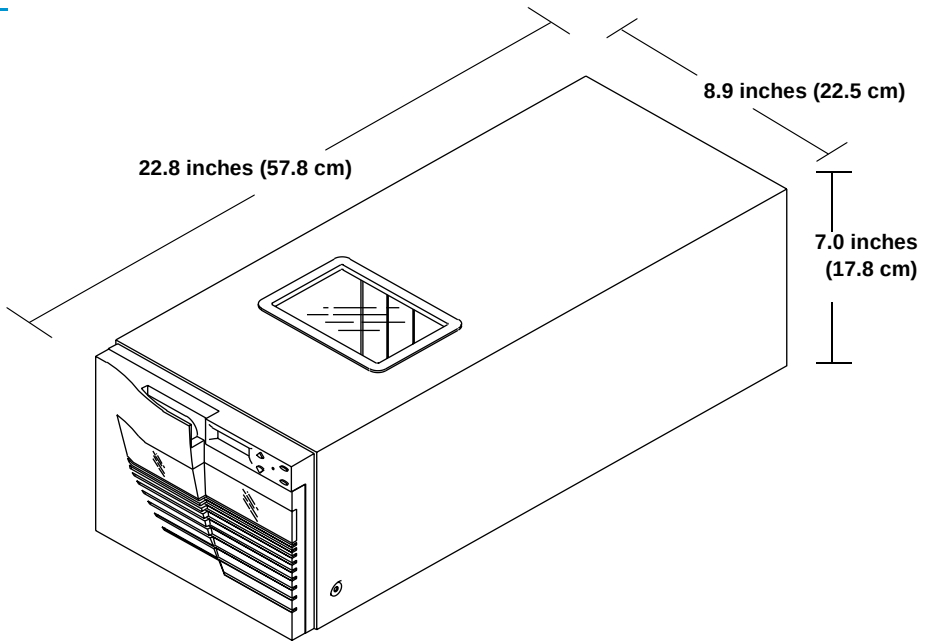
Physical Specifications

This section includes library dimensions (see table 13) and desktop configuration information (see figure 17).

Table 13 Library Dimensions

Description	Rack-Mount	Desktop
Height, without feet	6.9 in. (17.5 cm)	7.0 in. (17.8 cm)
Height, with feet, cover	n/a	7.6 in. (20.3 cm)
Width	8.6 in. (21.9 cm)	8.9 in. (22.5 cm)
Depth	22.8 in. (57.8 cm)	22.8 in. (57.8 cm)
Weight, with drive (without media)	33.3 lbs. (15.1 kg)	37 lbs. (16.8 kg)

Figure 17 Library Dimensions



Performance Specifications

Performance specifications for the library depend on:

- Data type
- SCSI bus limitations
- System configuration

For drive performance specifications, refer to your specific tape drive product manual.

Power Specifications

This section includes power specifications for the library.

Table 14 Power Specifications

Description	Range
Voltage	100-120 VAC / 200-240 VAC
Frequency	50 / 60 Hz
Amperage	1.0 A / 0.55 A
Power Consumption	60 Watts

Environmental Specifications

This section includes environmental specifications for the library.

Table 15 Environmental Specifications

Description	Range
Specifications at Power-On†	
Relative humidity	10% to 90% noncondensing
Humidity gradient	10% per hour
Temperature gradient	27°F per hour (15°C per hour) across the range
Operating Specifications	
Temperature	50°F to 104°F (10°C to 40°C)
Relative humidity	20% to 80% noncondensing
Humidity gradient	10% per hour
Dry bulb	50°F to 104°F (10°C to 40°C)
Wet bulb	77°F (25°C)
Temperature gradient	19.8 °F per hour (11°C per hour) across the range
Temperature shock	18°F (10°C) over two minutes
Altitude	-500 to 10,000 ft. (-150 to 3000 m)
Non-Operating Specifications	
Temperature	-40°F to 150.8°F (-40°C to 66°C)
Relative humidity	10% to 90% noncondensing
Humidity gradient	10% per hour

† ***Unpacked for 72 hours with no media in library***

Description	Range
Dry bulb temperature	-40°F to 151°F (-40°C to 66°C)
Wet bulb temperature	115°F (46°C)
Temperature gradient	36°F per hour with 9° margin (20°C per hour with 5° margin) across the range
Temperature shock	27°F with 9° margin (15°C with 5° margin) over two minutes
Altitude	-500 to 30,000 ft. (-150 to 9100 m)

† Unpacked for 72 hours with no media in library

Operating Vibration Specifications

This section includes operating vibration specifications for the library.

Table 16 Operating Vibration Specifications

Vibration Type	Sine	Sweep
Frequency range	5-500-5 Hz	Upward and downward sweep
Acceleration level	0.25 G	Between 22.14 and 500 Hz
	0.010 in. DA	Between 5 and 22.14 Hz (crossover)
Application	X, Y, and Z axis	Sweep rate 1 octave per minute

Operating Shock Specifications

This section includes operating shock specifications for the library.

Table 17 Operating Shock Specifications

Item	Specification
Pulse shape	Half sine
Peak acceleration	5 G
Duration	10 ms
Application	Two pulses ± per axis; X, Y, Z

Non-Operating Vibration Specifications

This section provides non-operating sine and sweep vibration specifications for the library.

Note: Non-operating specifications do not include tape or magazine components.

Table 18 Non-Operating Vibration Specifications

Vibration Type	Sine	Sweep
Unpackaged Specifications		
Frequency range	10-500-10 Hz	Upward and downward sweep
Acceleration level	1 G	10-500-10 Hz
Application	X, Y, and Z axis	Sweep rate; 1/2 octave per minute

Table 19 Random Vibration Specifications

Vibration Type	Description
Unpackaged Specifications	
Frequency range	10-500 H (X, Y, and Z axes)
Acceleration level	2 G rms (X, Y, and Z axes)
PSD envelope	0.008 G^2/Hz
Packaged Specifications	
Frequency range	5 to 300 Hz, vertical (Z axis); 5Hz to 200 Hz horizontal (X and Y axes)
Vibration levels	1.0 G rms (X, Y, and Z axes)

Non-Operating Shock Specifications

This section includes non-operating shock specifications for the library.

Table 20 Non-Operating Shock Specifications

Description	Half Sine
Unpackaged Specifications	
Peak acceleration	30 G
Duration	3 milliseconds
Application	Two pulses ± per axis (X, Z axes)
Repetitive/Packaged Specifications	
Excitation type	Synchronous vertical motion (1 inexcursion)
Shock (bounce) cycles	14,200 total

Description	Half Sine
Application	Half cycles each (X, Y axes); 7100 cycles (normal shipping orientation), 3500 cycles (Z axis)
Drop/Packaged Specifications	
Test type	Drop shock
Drop height	24 inches
Application	16 drops total (3 edges, 1 corner)

Electromagnetic Interference (EMI) Susceptibility

This section includes emission standards and limits for the library.

EMI Emissions

The library meets the following international EMI standards:

- FCC Part 15B, Class B (US / Canada)
- EN55022, Class B / EN50082-1 (CE Mark)
- VCCI, Class B (Japan)
- AS / NZS 3548, Class B (Australia / New Zealand)

Conducted Emissions

This subsection includes conducted emission limits.

Table 21 Conducted Emission Limits

Frequency Range (0.15 to 30 MHz)	Limits dB Quasipeak	Average
0.15 to 0.050	66 to 56[†]	56 to 46
0.50 to 5	56	46
5 to 30	60	50

[†] ***The limit decreases with the logarithm of the frequency***

Radiated Emissions

This section lists the limits of radiated interference field strength, in the frequency range from 30 MHz to 1000 MHz at a test distance of 10 meters, for Class B equipment.

Table 22 Radiated Emissions (30 MHz to 1000 MHz)

Frequency Range = 30 MHz to 1000 MHz	Quasi-Peak Limit dB (uV/m) @ 10 meters
30 MHz to 230 MHz	30
230 MHz to 1000 MHz	37
Above 1000 MHz	Not applicable

Radiated Susceptibility

The radiated susceptibility limits for high frequency electric fields (26 MHz to 1000 MHz) are:

- 3 V/m (rms) 80% modulated 1 kHz
- No errors, no screen distortion (S/W recoverable errors)
- No hardware failure

Conducted Susceptibility

The transient voltage is the actual peak voltage above the normal AC voltage from the power source.

The voltage limits for power and data cables are:

- 2 kV S/W recoverable errors
- No hardware failures

The power cable voltage limits are:

- 2.0 kV common mode (no errors allowed)
- 1.0 kV differential mode (S/W recoverable errors, no hardware failure)

> **Note:** Maximum energy in a single pulse from the transient generator must be limited to 2.5 W.

ESD Failure Level Limits

This section lists the ESD failure level limits for normal operator access areas.

Table 23 ESD Failure Level Limits

Failure Type	Equipment	Failure Level	Allowable Errors
Hardware	Office	to 12 kV	No operator intervention (soft recoverable errors allowed)
Hardware	Office	to 15 kV	No component damage - operator intervention allowed (soft and hard errors allowed)

Acoustic Noise Emissions

This section lists the acoustic noise emission levels in English. The same information is provided in German (see table 25).

Table 24 Acoustic Noise Emissions (English)

Acoustic - Declared values per ISO9296 and ISO 7779/EN27779				
	Sound Power Level LwAd, B		Sound Pressure Level LpAm, dBa (bystander position)	
Product	**Idle**	**Operating (Streaming)**	**Idle**	**Operating (Streaming)**
Library	5.8	5.8	47.9	48.2

Current values for specific configurations are available from Quantum\|ATL representatives. 1B = 10 dBA

Table 25 Acoustic Noise Emissions (German)

Schallemissionswerte - VorläufigeWerteangaben nach ISO 9296 und ISO 7779/DIN EN27779				
	Schalleistungspegel LwAd, B		Schalldruckpegel LpAm, dBa (Zuschauerpositionen)	
Gerfdt	**Leerauf**	**Betrieb (Streaming)**	**Leerauf**	**Betrieb (Streaming)**
Library	5,8	5,8	47,9	48,2

Aktuelle Werte für Ausrüstungsstufen sind über die Quantum\|ATL Equipment Vertretungen erh™ltlich. 1 B = 10 dBA

Drive Reliability Factors

The mean interval between failures of the library unit (less the tape drives) is:

- 185,000 power-on hours (POH) mean time between failures (MTBF)

  or

- 1,000,000 mean load / unload cycles between failures (MCBF), where a failure is charged against one or the other, but not both

Quantum | ATL does not warrant that predicted mean interval between failures is representative of any particular library installed for customer use. Actual figures vary from library to library.

Appendix B

Error Messages and Definitions

This appendix lists error messages, descriptions, and recommended operator actions for the library.

Error Messages

This section lists error messages displayed on the OCP.

Table 26 OCP Error Messages

OCP Display	Description	Recommended Operator Action
`Drive Stuck in Flux`	This indicates that the drive exceeded the timeout allowed for that operation. The drive was still in the flux state when the timeout occurred.	Cycle the library power and retry the operation. If the operation fails again, contact an authorized field service engineer.
`Cartridge Fault Door Unlocked`	The initial scan of the magazine slots and the tape drive indicates that there are more cartridges in the system than there are slots to store them.	Remove excess cartridges.

OCP Display	Description	Recommended Operator Action
Prepare slot <n> to receive cart	There are too many cartridges in the library.	Open the door and empty a magazine slot by removing a cartridge.
Cartridge fault Rem Extra carts		
Cartridge fault Homeless	No slot available for a cartridge in the drive.	
Cart fault Homeless		
Drv <n> In Flux	These error messages appear when the OCP is used to initiate a system test routine. Each message indicates a reason why the test can not be initiated.	Correct problem and retry.
Drv <n> HwError		
Door Unlocked!		
LDR ERR: <x>	The error code was returned by the loader process.	Error code descriptions are listed in Library Error Definitions on page 76.
DLC ERR: <x>		
DRIVE ERROR!	An error occured communicating with the tape drive.	
LoadFirstCart FAILED	Occurs when the **Autoload Cart** command is set and there is no cartridge to load.	
Cleaning FAILED	The attempted cleaning cycle failed.	Check for: • A valid cleaning cartridge is in the required slot • The cleaning cartridge has not expired
CLN slot Empty	A cleaning cartridge was not found in the required slot 7.	Insert cleaning cartridge in slot 7 and retry the operation.
CLN Tape Expired	The cleaning cycle was not completed because the cleaning cartridge has expired.	Replace the cleaning cartridge.
NOT a CLN Tape	The cartridge in the cleaning slot is not a cleaning cartridge.	Insert a cleaning cartridge in the cleaning slot.

OCP Display	Description	Recommended Operator Action
CUP FAILED! CUP Timeout	The requested code update operation failed and the unit timed out during the code update process.	Retry the operation. If the operation fails again, contact an authorized field service engineer.
CUP FAILED Incidental	The requested code update operation was aborted due to a failure of a preliminary operation:drive communication failure or timeout.	
	CHM failed to move the cartridge into the drive.	
	Drive failed to load the cartridge.	
Ldr/Drv Timeout In Retry	The command aborted after the maximum number of retries was exceeded.	Cycle the library power and try the operation again. If the operation fails again, contact an authorized field service engineer.
Loader Timeout In Retry		
Prepos Timeout In Retry	The command aborted after maximum number of retries was exceeded trying to preposition the CHM.	
** Ldr Err<xx>*** Attention Needed	An error code xx was returned from the loader. If the command was severe, the doors will unlock and Attention Needed is appended to the error message.	Error code descriptions are listed in Library Error Definitions on page 76.
Elevator Move Failed	Unable to preposition elevator at drive during an unload cartridge operation.	Retry the operation. If the operation fails again, contact an authorized field service engineer.
Cart Failed to Eject	Drive did not eject cartridge when commanded to do so.	

Error Definitions

This section lists the error code, error type, and descriptions for the library.

> **Note:** If an unrecoverable error occurs, the error message will remain on the OCP until another button is pushed.

Table 27 Library Error Definitions

Error Code	Error Type	Description
80H	Non-error	This status indicates no error has occurred.
81H	Fatal	Invalid command error: indicates that the loader received an undefined command or an invalid parameter to a command.
82H	Fatal	Undefined error codes
83H	Fatal	
84H	Not Fatal	A cartridge is in transit after a reset or power up. This error will occur whenever a power-cycle or reset occurs during a move. The loader controller will insure that the cartridge is fully loaded onto the CHM and then will proceed with power-on self-tests. The library controller will be responsible for moving the cartridge either to its home location, if known, or to the drive before issuing the **Extended Scan Magazine** command.
85H	Fatal	Did not find pusher home position during mechanical initialization.
86H	Fatal	Did not find PUSHPOS 1 during mechanical initialization.
87H	Fatal	Time-out while moving a cartridge onto or off of the CHM during mechanical initialization.
88H	Fatal	Time-out finding CHM home position during mechanical initialization.
89H	Fatal	Time-out while trying to find PUSHPOS 2 during mechanical initialization.

† Retry: the command should be reissued or retried
‡ See description for more details on the cause for this error, and how to recover from the error

Error Code	Error Type	Description
8AH	Fatal	Did not leave DRIVPOS during mechanical initialization.
8BH	Fatal	No drive handle installed, or time-out while closing the drives handle during mechanical initialization.
8CH	Fatal	Time-out during pusher test (did not leave home position).
8DH	Fatal	Time-out during pusher test finding pusher home position.
8EH	Fatal	Time-out during pusher test or during CHM home position leaving pusher home position while moving, towards PUSHPOS2.
8FH	Fatal	Undefined error code
90H	Fatal	No cartridge was present in the drive during a cartridge unload.
91H	Retry†	Time-out while attempting to find PUSHPOS 1. Position in front of the drive before unloading a cartridge from drive onto the CHM.
92H	Retry†	Time-out opening drive handle during cartridge unloads. The library controller determines if the drive is still in unloaded state after receiving this error code. If the drive is still in the unloaded state, reissue the command. If the drive is not still in the unloaded state, then another unload command must be issued to the drive prior to retrying this command.
93H	Retry†	Time-out attempting to find the pusher home position during a cartridge unload.
94H	Retry†	Time-out while moving a cartridge from the drive onto the CHM. If this error occurs, the loader controller will try to move the cartridge back into the drive. The receipt of this error code implies the cartridge has been put back into the drive.
95H	Retry†	Time-out while moving the CHM from the drive load position to the slot position during a cartridge unloads. Reissue **Scan Magazine**, followed by **Unload**.
96H	Retry†	Time-out finding PUSHPOS 1 during a cartridge unload.

† Retry: the command should be reissued or retried
‡ See description for more details on the cause for this error, and how to recover from the error

Error Code	Error Type	Description
97H	See description‡	Time-out occured during **Unload** command, while unloading a cartridge into a slot during a cartridge unload. Reissue command. This error can also occur during an **Extended Scan Magazine** command, which means a cartridge (that was in the magazine) is now on the CHM. Reissue **Scan Magazine**, followed by **Unload**.
98H	See description‡	Time-out while attempting to find the pusher home position during a cartridge unload. (This error actually occurred after the cartridge was successfully placed back into the magazine so the move is effectively completed.) Reissue **Scan Magazine**.
99H	Retry†	Time-out while moving the CHM to DRIVPOS during a cartridge unload. Reissue **Scan Magazine**, followed by **Unload**.
9AH	Retry†	Time-out finding PUSHPOS 2 during a cartridge unload.
9BH	Retry†	Could not unlock the door during an **Unlock Door**.
9CH	Retry†	Did not find all valid slot positions during a **Scan Magazine**.
9DH	Retry†	Time-out did not leave cartridge type window during a **Scan Magazine**.
9EH	Retry†	Time-out leaving DRIVPOS during a **Scan Magazine**.
9FH	Retry†	Could not lock the door during a **Door Lock** command, or during a **Scan** command if door is unlocked.
A0H	Fatal	Cartridge already in drive during a **Load Cartridge**.
A1H	Fatal	No cartridge in the selected slot during a **Load Cartridge**.
A2H	See description‡	Time-out while moving CHM to slot position during a **Load Cartridge**. Reissue **Scan Magazine**, followed by **Load Cartridge**.
A3H	Retry†	Time-out attempting to find the PUSHPOS 1 during a **Load Cartridge**.
A4H	Retry†	Time-out moving cartridge from the slot onto the CHM during a **Load Cartridge**.

† Retry: the command should be reissued or retried
‡ See description for more details on the cause for this error, and how to recover from the error

Error Code	Error Type	Description
A5H	Retry†	Time-out finding pusher home position during a **Load Cartridge**.
A6H	See description‡	Time-out moving CHM to drive-load position during a **Load Cartridge**. Reissue **Scan Magazine**, followed by **Load Cartridge**.
A7H	Retry†	Time-out while opening the drives handle during a **Load Cartridge**.
A8H	See description‡	Time-out moving cartridge from the CHM into the drive during a **Load Cartridge**. If this occurs as the only error, then retry the command. The drive controller must unload the cartridge from the drive before it can retry. If this error occurs as the second error after either a 94H or an A9H error, it is considered fatal.
A9H	Retry†	Time-out while attempting to find PUSHPOS 2 to push cartridge completely into the drive during a **Load Cartridge**.
AAH	Non-error	This code is not an error and will never be returned in the status error bytes. It is utilized in the error trace buffer as an indicator every time a thousand cycles has occurred.
ABH	See description‡	Time-out finding PUSHPOS 1 (rack waiting position in front of the drive). The library controller must unload the cartridge from the drive before it can retry.
ACH	Retry†	Time-out closing drive handle. This error can occur during a **Load Cartridge**, or after error 94 if the loader controller tries to move the cartridge back into the drive.
ADH	Fatal	Time-out leaving drive load position to move to drive park position.
AEH	Fatal	Time-out while moving a cartridge back into a slot after error A4. This error only happens if the loader controller tries to move a cartridge from the slot onto the CHM and fails. The loader controller would then try to move the cartridge back into the slot. If that fails, this error is generated.
AFH	Fatal	Undefined error codes
B0H	Fatal	

† Retry: the command should be reissued or retried
‡ See description for more details on the cause for this error, and how to recover from the error

Error Code	Error Type	Description
B1H	Fatal	Stand-alone mode
B2H	Non-error	Door open without getting a command. After power-up, this command can occur as the loader remembers the state of the door. This is an informational error message and does not require recovery.
B3H	Non-error	Unit was reset or powered up. This is an informational error message and does not require recovery.
B4H	See description‡	Time-out while prepositioning the CHM during a prepositioning command. Reissue **Scan Magazine**, followed by **Preposition**.
B5H	See description‡	Did not find all expected slots during an CHM movement. This error can occur during a load or unload of a cartridge or a **Preposition** command. Reissue **Scan Magazine**, followed by the original command.
B6H	Retry†	Time-out while opening the drive handle, after operate handle command was received.
B7H	Fatal	UART test failure
B8H	Retry†	Time-out while closing the drive handle after operate handle command was received.
B9H	Fatal	Undefined error codes
BAH	Fatal	
BBH	Fatal	RAM error
BCH	Fatal	ROM error
BDH	Fatal	CTC error
BEH	Fatal	Undefined error codes
BFH	Fatal	

† Retry: the command should be reissued or retried
‡ See description for more details on the cause for this error, and how to recover from the error

Appendix C

Regulatory Statements

FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Industry Canada (Digital Apparatus)

Referemce: *Interference-Causing Equipment Standard*, ICES-003 Issue 2

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Reglément sur le matériel brouilleur du Canada.

CISPR-22 WARNING!

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

ACHTUNG!

Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmassnahmen verantwortlich ist.

ATTENTION!

Ceci est un produit de classe A. Dans un environment domestique, ce produit peut causer des interférences radioélectriques. Il appartient alors à l'utilisateur de prendre les mesures appropriées.

Notice for USA and Canada Only

If shipped to USA, use the UL LISTED power cord specified below for 100-120 V operation. If shipped to Canada, use the CSA CERTIFIED power cord specified below for 100-120V operation.

Plug Cap	Parallel blade with ground pin (NEMA 5-15P configuration)
Cord	Type: SJT, three 16 AWG (1.5 mm^2) or 18 AWG (1.0 mm^2) wires
Length	Maximum 15 feet (4.5m)
Rating	Minimum 10 A, 125 V

ATTENTION

LIRE LA REMARQUE DANS LE MODE D'EMPLOI.

REMARQUE

CETTE REMARQUE NE CONCERNE QUE LES ÉTATS-UNIS ET LE CANADA.

En cas d'envoi aux États-Unis, utiliser le cordon d'alimentation CERTIFIÉ UL et convenant pour 100-120 V.

En cas d'envoi au Canada, utiliser le cordon d'alimentation CERTIFIÉ CSA et convenant pour 100-120 V.

Fiche	Broches parallèles avec une broche de mise à la terre (configuration NEMA 5-15P)
Cordon	Type: SJT, trifilaire 16 AWG (1.5 mm^2) ou 18 AWG (1.0 mm^2)
Longeur	Maximum 15 pieds (4.5m)
Capacité	Minimum 10 A, 125 V

Laser Statement

Class 1 Laser Product

CAUTION: With all panels and enclosures in place, this product is rated as a Class I laser product. The bar code scanner inside this product, however, is a Class II laser. Avoid exposure to the laser light emitted from the bar code scanner. Do not stare into the beam.

CAUTION: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous exposure.

Laser Klasse 1

VORSICHT: Dieses Produkt Enthält Einen Laser der Kategorie II. Laserstrahlen - Der Strichcode-scanner Gibt Laserstrahlen aus. VERMEIDEN SIE jeden Blickkontakt und direkten körperlichen Kontakt mit diesen Strahlen.

VORSICHT: Ein nicht ordnungsgemäßer (siehe hier enthaltene Anweisungen) Einsatz bzw. Änderungen der Betriebsleistung können einen Gesundheit gefährdenden Kontakt zur Folge haben.

Appareil à Laser de Classe 1

ATTENTION: Ce produit émet de la classe laser II. Rayonnement laser - NE PAS fixer des yeux le rayon. Éviter les expositions - Le rayonnement laser est émis à partir du lecteur optique de code barre.

ATTENTION: L'utilisation de contrôles ou d'ajustements de performance des procédures autres que ceux indiqués ici peut entraîner une exposition dangereuse.

Producto Láser de Clase 1

¡ATENCIÓN! Este producto contiene laser de clase II. Luz de laser - NO mire el rayo. Evite el contacto con la luz: la luz de laser se emite desde el explorador de código de barras.

¡ATENCIÓN! El uso de los controles o ajustes para realizar procedimientos que no son especificados puede provocar una situación peligrosa.

Luokan 1 Laserlaite

ATTENZIONE: Questo prodotto emette una luce laser di Classe II. NON guardare il facsio di luce ed evitare di esporsi alla fonte del laser. Il fascio di luce laser h emesso dal dispositivo di scansione del codice a barre.

ATTENZIONE: L'uso di comandi o regolazioni per eseguire le procedure che non siano quelli specificati in questa documentazione pur causare rischi all 'incolumit' delle persone.

Battery Statement

CAUTION

This product contains a Lithium battery. The Dallas Semiconductor DS12B887 on the motherboard contains a Lithium battery. Lithium may be considered a hazardous material. Dispose of this battery in accordance with local, state, and federal laws.

LET OP

Dit product bevat een lithiumbatterij. De DS12B887-chip van Dallas Semiconductor op het moederbord bevat een lithiumbatterij. Lithium kan als gevaarlijk materiaal worden beschouwd. Werp de batterij weg in overeenstemming met de plaatselijke en landelijke milieuwetgeving.

VAROITUS

Tässä tuotteessa on litiumparisto. Emolevyllä oleva Dallas Semiconductor DS12B887 sisältää litiumpariston. Litium saattaa olla luokiteltu vaaralliseksi aineeksi. Hävitä tämä paristo paikallisten lakien ja määräysten mukaisesti.

ATTENTION

Ce produit contient une batterie au lithium. Le composant Dallas DS12B887 de la carte mère contient une batterie au lithium. Le lithium peut être considéré comme un produit dangereux. Rejetez cette batterie selon les règlements locaux, régionaux ou fédéraux.

ACHTUNG

Dieses Produkt enthält eine Lithium-Batterie. Der Dallas Halbleiter DS12B887 auf der Hauptplatine enthält eine Lithium-Batterie. Lithium gilt als speziell zu entsorgender Sondermüll. Bei der Entsorgung dieser Batterie müssen die entsprechenden lokalen, länder- und bundesweiten Gesetze und Regelungen betreffend Sammel- und Rückgabestellen beachtet werden.

Attenzione

Questo prodotto contiene una batteria al litio. Il modulo Dallas Semiconductor DS12B887 contiene una batteria al litio sulla scheda madre. Il litio può essere considerato un materiale pericoloso. Utilizzare questo tipo di batterie in accordo con le normative vigenti.

PRECAUCIÓN

Este producto contiene una batería de litio. El modelo Dallas Semiconductor DS12B887 de la placa base contiene una batería de litio. El litio puede ser considerado un material peligroso. Deseche la batería conforme a la normativa vigente de aplicación.

VARNING!

Denna produkt innehåller ett litiumbatteri. Dallas Semiconductor DS12B887 på moderkortet innehåller ett litiumbatteri. Litium kan betraktas som ett miljöfarligt ämne. När batteriet förbrukats, ska de lagar som gäller för miljöfarligt avfall respekteras.

Glossary

A

Abort To cancel or terminate a program or process abnormally and usually suddenly while in process.

Access time The average time interval between the time a request to read or write is received by the drive and the time the task is complete.

Arrow buttons Buttons found on the control panel used to scroll through lists.

Autoclean A user-defined mode in which the library automatically performs drive cleaning tasks as needed.

Automated library An enclosed data storage system consisting of storage elements, data transfer elements, DLTtape cartridges, and robotic gripping mechanism used to identify, handle, and move cartridges from one element to another.

B

Bar code A printed pattern of vertical bars of varying widths used for computerized inventory control.

Bar code label The identification label on DLT tape cartridges.

Bar code scanner A device that is mounted on the extension axis that reads the cartridge bar code labels.

Bit The basic unit of information in a binary numbering system (*bi*nary digi*t*) representing either 1 or 0. Eight bits make up each byte.

BOT Beginning of tape.

Bus A communication channel carrying signals from any device used by the computer or library to another device. For example, data being transferred from the computer to the library travels on a bus.

Byte The basic unit of computer memory, large enough to hold one character. A byte is composed of eight bits.

C

cartridge A case containing a supply reel with magnetic tape used as media for reading and writing computer data.

CHM Cartridge handling mechanism. A compact, bi-directional roller system that enables simple horizontal movement between the magazine and DLT drive.

command A user-initiated signal given to a computer program that initiates, terminates, or otherwise controls the execution of a specific operation. In a menu-driven system such as the library control panel, you choose commands by pressing on-screen buttons.

control panel The panel on the front of the library which provides screens with buttons, indicators and report screens, used to control the functions and settings of the library.

D

DLT Digital linear tape—A high-grade, metal-particle magnetic tape medium. DLT technology is the intellectual property of Quantum Corporation.

E

EIA/TIA-574 A serial communications cabling and protocol standard for 9-pin connectors, sometimes referred to as RS-232. The diagnostic port (DIAG), on the rear of the library, uses this protocol.

EOT End of tape.

element A SCSI designation for any device or bin in the library that can hold a DLT cartridge. SCSI elements include storage bins, tape drives, load port bins, and the gripper.

error message A message appearing on the host computer or library control panel screen informing you that the program was unable to carry out the desired operation.

execute To carry out the instructions in a computer program.

F

FCC Class A Standard established by the U.S. Federal Communications Commission governing electromagnetic emissions in a commercial environment.

FRU Field-replaceable unit—A term given to parts of the library that are designed to be replaced onsite.

FSE Field Service Engineer.

H

Host *or* host computer The computer that issues SCSI commands to control the library robotics and tape drives.

HVD High-voltage differential—A standard method of driving SCSI cables that has been in use for years.

I

inventory An operation in which the library determines the identity and location of all tape cartridges and SCSI elements.

K

KB Kilobyte—A standard unit of measure for computer memory equal to 1,024 bytes. For example, 8 KB is equal to 8,192 bytes.

L

LCD Liquid crystal display—An electro-optical device used to display digits, characters or images, commonly used in digital watches, calculators, and portable computers.

LED Light-emitting diode—a type of diode that emits light when current passes through it. LEDs are used as indicator lights.

LVD Low-voltage differential — a method of driving SCSI cables which uses less power than HVD and will allow higher transfer speeds.

M

MB Megabyte—A standard unit of measure for computer memory equal to 1,024 kilobytes. For example, 16 MB is equal to 16,384 KB.

MTBF Mean time between failures—The average time (usually expressed in hours) that a component works without failure.

MTTR Mean time to recovery—The average time that a device will take to recover from a non-terminal failure. The MTTR would usually be part of a maintenance contract.

magazine A 6-bin, removable, storage magazine for DLT cartridges that fits inside the library.

N

Native mode The uncompressed storage capacity of a tape subsystem.

O

OCP The OCP (operator control panel) on the front of the library serves as the operator's interface with the library. It provides a screen with buttons allowing the operator to change and configure the library.

P

PROM Programmable read-only memory.

R

RAM Random access memory—A portion of the system's memory that is designed as temporary storage of data and programs.

rear panel The rear cosmetic panel of the library that contains the AC power switch, AC power receptacle and connectors for attaching external cabling to the library.

S

Scalability The capability provided by the DLTtape drive family to read tapes from previous generations of drives. Allows users to upgrade to a faster, higher capacity DLTtape drive, yet still be able to read tape recorded on an older system. Often referred to as *backward compatibility*.

SCSI Small computer system interface, a communications standard for attaching peripheral equipment to computers.

SCSI device A computer or computer peripheral connected to a SCSI bus. SCSI devices include the library robotics, host computers, library tape drives, and hard disk drives.

SCSI ID number A unique address assigned to each device on a SCSI bus.

SDA Status display area—A 16-character, 2-line LCD display that shows status messages describing the operating state of the library. It is also used for displaying menu options while the library is in the menu mode.

SDLT Super digital linear tape—A high-grade, metal-particle magnetic tape medium. SDLT technology is the intellectual property of Quantum Corporation.

Self-cleaning head All DLTtape drives have self-cleaning heads that continuously wipe the tape clean as it passes over the head.

T

Tape drive The mechanism that reads and writes data from and to a tape cartridge.

U

UL Underwriters Laboratories.

W

write-enable To set a tape cartridge so that data can be written to it or erased from it.

write-protect To set a tape cartridge so that data cannot be written to it or erased from it.

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