Overland Storage

NEO® 200s/400s Library

User Guide

Overland storage

Preface

Audience and Purpose

This guide is intended for system and network administrators charged with installing and maintaining Overland Storage® NEO 200s/400s libraries on their network. It provides information on the installation, configuration, security, and maintenance of those libraries.

It assumes you are familiar with basic functions of your computer, Serial Attached SCSI (SAS), and Fibre Channel (FC), as well as networking concepts and terminology. It also assumes you are knowledgeable about the Storage Area Network (SAN) to which your NEO S-series library is being connected.

This product is not intended to be connected directly or indirectly, by any means whatsoever, to interfaces of public telecommunications networks.

Product Documentation

NEO product documentation and additional literature are available online. Point your browser to:

http://docs.overlandstorage.com/neo

For additional assistance, search at http://support.overlandstorage.com.

Overland Technical Support

For help configuring and using your NEO 200s/400s libraries, search at:

http://support.overlandstorage.com/kb

You can email our technical support staff at techsupport@overlandstorage.com or get additional technical support information on the Contact Us web page:

http://docs.overlandstorage.com/support

For a complete list of support times depending on the type of coverage, visit our website at:

http://docs.overlandstorage.com/care

Conventions

This document exercises several alerts and typographical conventions.

Alerts

Convention	Description & Usage
IMPORTANT	An *Important* note is a type of note that provides information essential to the completion of a task or that can impact the product and its function.
CAUTION	A *Caution* contains information that the user needs to know to avoid damaging or permanently deleting data or causing physical damage to the hardware or system.
WARNING ADVERTISSEMENT	A *Warning* contains information concerning personal safety. Failure to follow directions in the warning could result in bodily harm or death. Un Canadien avertissement comme celui-ci contient des informations relatives à la sécurité personnelle. Ignorer les instructions dans l'avertissement peut entraîner des lésions corporelles ou la mort.

Typographical Conventions

Convention	Description & Usage
Button_name	Words in this special boldface font indicate command buttons found in the **Web User Interface**.
Ctrl-Alt-r	This type of format details the keys you press simultaneously. In this example, hold down the **Ctrl** and **Alt** keys and press the **r** key.
NOTE	A Note indicates neutral or positive information that emphasizes or supplements important points of the main text. A note supplies information that may apply only in special cases, for example, memory limitations or details that apply to specific program versions.
Menu Flow Indicator (**>**)	Words with a greater than sign between them indicate the flow of actions to accomplish a task. For example, **Setup > Passwords > User** indicates that you should press the **Setup** button, then the **Password** button, and finally the **User** button to accomplish a task.
Courier Italic	A variable for which you must substitute a value
Courier Bold	Commands you enter in a command-line interface (CLI)

Information contained in this guide has been reviewed for accuracy, but not for product warranty because of the various environments, operating systems, or settings involved. Information and specifications may change without notice.

Software Updates

The latest release of the NEO 200s/400s firmware can be obtained from the Downloads and Resources – NEO Series page at the Overland Storage website:

http://docs.overlandstorage.com/neo

Follow the appropriate instructions to download the **latest** software file.

For additional assistance, search at http://support.overlandstorage.com/

Finding More Information

Product documentation related to NEO 200s/400s is listed below. The current versions of all these documents are always available from the Overland Storage NEO Download and Resources website (http://docs.overlandstorage.com/neo).

Source	Location	Content
Quick Start Guide	Product Packaging and Web	Provides complete instructions for installing the server into a rack and connecting the server to the network. Also contains links to warranty registration and information.
User Guide	eDoc on Web	Provides an overview of the configuration, maintenance, and troubleshooting of the NEO 200s/400s, and detailed instructions on using the remote access Web User Interface.
Online Help	Web User Interface	Basic troubleshooting information embedded in the firmware.

Electrostatic Discharge Information

A discharge of static electricity can damage static-sensitive devices. Proper packaging and grounding techniques are necessary precautions to prevent damage. To prevent electrostatic damage, observe the following precautions:

- Transport products in static-safe containers such as conductive tubes, bags, or boxes.
- Cover the appliance with approved static-dissipating material.
- Use a wrist strap connected to the work surface and properly-grounded tools and equipment.
- Keep the work area free of non-conductive materials such as foam packing materials.
- Make sure you are always properly grounded when touching a static-sensitive component or assembly. Avoid touching pins, leads, or circuitry.

Safety and Environmental Notices

The sections that follow define each type of safety notice and give examples.

Laser Safety and Compliance

Before using the library, review the following laser safety information.

Class I Laser Product

The library may contain a laser assembly that complies with the performance standards set by the U.S. Food and Drug Administration for a Class I laser product. Class I laser products do not emit hazardous laser radiation. The library has the necessary protective housing and scanning safeguards to ensure that laser radiation is inaccessible during operation or is within Class I limits. External safety agencies have reviewed the library and have obtained approvals to the latest standards as they apply.

Cautions and Regulatory Compliance Statements for NEBS

This library is NEBS certified. This section includes the cautions and regulatory compliance statements for the Network Equipment-Building System (NEBS) certification from the Telcordia Electromagnetic Compatibility and Electrical Safety – Generic Criteria for Network Telecommunications Equipment (A Module of LSSGR, FR-64; TSGR, FR-440; and NEBSFR, FR-2063) Telcordia Technologies Generic Requirements, GR-1089-CORE, Issue 4, June 2006.

NEBS Compliance Statements

⚠️ **CAUTION:** To comply with the Telcordia GR-1089-CORE standard for electromagnetic compatibility and safety, for Ethernet RJ-45 ports, use only shielded Ethernet cables that are grounded on both ends. In a NEBS installation, all Ethernet ports are limited to intra-building wiring.

⚠️ **CAUTION:** The intra-building ports of the equipment or subassembly are only suitable for connection to intra-building or unexposed wiring or cabling. The intra-building ports of the equipment or subassembly MUST NOT be metallically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use only as intra-building interfaces (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4), and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.

An external Surge Protective Device (SPD) is not required for operating this library.

This product can be installed in a network telecommunication facility or location where the NEC applies.

Product Recycling and Disposal

This unit contains recyclable materials.

This unit must be recycled or discarded according to applicable local and national regulations. Overland Storage encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed.

This paragraph is also translated into Spanish (Español) as follows:

Esta unidad debe reciclarse o desecharse de acuerdo con lo establecido en la normativa nacional o local aplicable. Overland Storage recomienda a los propietarios de equipos de tecnología de la información (TI) que reciclen responsablemente sus equipos cuando éstos ya no les sean útiles.

Notice: This mark applies only to countries within the European Union (EU) and Norway.

Appliances are labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

Remarque: Cette marque s'applique uniquement aux pays de l'Union Européenne et à la Norvège.

L'etiquette du système respecte la Directive européenne 2002/96/EC en matière de Déchets des Equipements Electriques et Electroniques (DEEE), qui détermine les dispositions de retour et de recyclage applicables aux systèmes utilisés à travers l'Union européenne. Conformément à la directive, ladite étiquette précise que le produit sur lequel elle est apposée ne doit pas être jeté mais être récupéré en fin de vie.

注意: このマークは EU 諸国およびノルウェーにおいてのみ適用されます。

この機器には、EU 諸国に対する廃電気電子機器指令 2002/96/EC(WEEE) のラベルが貼られています。この指令は、EU 諸国に適用する使用済み機器の回収とリサイクルの骨子を定めています。このラベルは、使用済みになった時に指令に従って適正な処理をする必要があることを知らせるために種々の製品に貼られています。

In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local Overland representative.

Contents

Chapter 6 – Media

Chapter 7 – Troubleshooting

Product Description

The NEO 200s and NEO 400s tape libraries provide compact, high-capacity, low-cost solutions for simple, unattended data backup. The 4U library houses up to 48 tape cartridges (or 45 and an elective 3-tape Mail Slot) in a compact 4U form factor with easy access to cartridges via four removable magazines. The 2U library houses up to 24 tape cartridges (or 23 and an elective 1-tape Mail Slot) in a compact 2U form factor with easy access to cartridges via two removable magazines.

The NEO 200s/400s tape libraries are rack-mountable units that incorporate Ultrium 5 Half-Height or Ultrium 4 Half-Height tape drives. The drives are equipped with a SAS host adapter interface that has a data transfer rate of up to 6.0 Gbps, or a Fibre Channel interface.

Topics in Product Description:

- Physical Library
- Networking
- Ultrium Tape Drives
- Media

Physical Library

These sections describe the physical aspects of the libraries.

Front Panel

These graphics and table illustrate the front panel components:

Number	Item	Description
1	Power button	Pressing this button powers ON the library. Pressing and holding this button for 4 seconds will power OFF the unit (soft power down). No power switch or button can be found on the back panel of the library.
2	Front panel LEDs (left to right)	• **Ready/Activity** (Green LED) — It is illuminated any time the unit is powered ON and able to function. It should blink whenever there is library or drive activity, or when the library is in the process of powering up. • **Clean Drive** (Amber LED) — It is illuminated when the drive needs to be cleaned. The LED will be turned OFF after the drive is cleaned successfully. • **Attention** (Amber LED) — It is illuminated when there has been a failure that indicates a piece of media is bad, marginal, or invalid. It will be cleared when all invalid cartridges have been exported from the library. The amber LED may also be lit because a power supply or a power supply fan is failing, or a drive sled is defective, missing, or has been replaced by a different drive type. • **Error** (Amber LED) — It is illuminated when there is an unrecoverable library or drive failure. A message is displayed at the same time on the Operator Control Panel display.

3	Cartridge magazines	• The 2U library contains two cartridge magazines.
		  • The left magazine can hold up to 12 cartridges (or 11 data cartridges and the elective one-slot Mail Slot).
		  • The right magazine can hold up to 12 cartridges.
		• The 4U library contains four cartridge magazines.
		  • The upper left magazine can hold up to 12 cartridges.
		  • The lower left magazine can hold up to 12 cartridges (or 9 data cartridges and the elective three-slot Mail Slot).
		  • The upper right magazine can hold up to 12 cartridges.
		  • The lower right magazine can hold up to 12 cartridges.
		
		For more information on magazines, refer to "Cartridge Magazines" on page 4-27

4	Air vents	These vents help keep the library at a normal operating temperature.

Number	Item	Description
5	Control Key buttons	• **UP** (+) — The upper left button is used to scroll upward through menu items. • **DOWN** (-) — The lower left button is used to scroll downward through menu items. • **CANCEL** (X) — The upper right button is used to cancel a user action and return to the previous menu screen. • **SELECT** (↵) — The lower right button is used to display a sub-menu or force an accessor action.
6	Machine Type, Model Number, and Serial Number label	The machine type, model number and serial number of the library are located on this label. This serial number is the number that links the library to your warranty.
7	Operator Control Panel display	This screen is a 128 x 64 pixel monochrome graphic display.
8	Mail Slot (I/O Station)	The Mail Slot is used to import and export cartridges into and out of the library. • The 2U library has an elective 1-tape Mail Slot. • The 4U library has an elective 3-tape Mail Slot.

Rear Panel

These graphics and table illustrate the rear panel components:

Number	Item	Description
1	Power connectors	The libraries require a 110/220 volt AC power connection. • The 2U library has one power supply. • The 4U library has a minimum of one power supply, but has the capability of adding a redundant power supply.
2	Host interface connectors	The library has one or more of the following host interface connectors on the drive sled: • SFF-8088 mini-SAS connector • Fibre Channel connector
3	Tape drive sled	This library supports the Ultrium 4 and Ultrium 5 tape drives. The tape drive in the library is packaged in a container called a drive sled. Drive sleds come in a full high or Half-Height configuration. The drive sled is a customer replaceable unit (CRU), and is hot-pluggable, which is designed for easy removal and replacement.
4	Shipping lock and label storage location	The shipping lock, which secures the accessor during shipping, and associated label are stored on the rear panel of the library for future use. See Removing and Storing the Shipping Lock. ⚠️ **CAUTION:** The shipping lock must be removed before powering ON the library to allow the accessor to function properly.
5	USB port	Used to save/restore library configuration information on a USB device.
6	Library Control Board (LCC) LED	An LED showing the status of the Library Control Board. The LED flashing (1 flash per second) is normal operation.
7	Serial port	This port is used to communicate serially with the library using an RJ-11 connector. For use by Overland service personnel.

8	Ethernet port	This port is used to connect the library to a network.
		• 10/100 Link LED
		  • Description: Green; indicates link integrity
		  • Flashing: Network synchronization/negotiation
		  • Steady (On): Good connection
		  • Off: No connection between NIC and hub
		• Activity LED
		  • Description: Amber; indicates port traffic
		  • Flashing: Network traffic present
		  • Steady (On): Heavy network traffic
		  • Off: No traffic

9	Tape drive LED	This LED indicates the current status of the drive. When the LED is green, it indicates normal drive activity.
10	Machine type, Model number, and Serial Number pull-out label	The machine type, model number and serial number of the library are located on this pull-out label. This serial number is the number that links the library to your warranty.
11	Fan vents	These vents allow air to escape from the power supply and tape drive sled.
12	ESD label	The Electrostatic Discharge label is a reminder that some of the components of this library are susceptible to electrostatic discharge. See the "Preface."

Bar Code Reader

The bar code reader is an integral part of the library accessor. The bar code reader reads each cartridge bar code label that identify the types of cartridge magazines and tape drive installed in the library and provides inventory feedback to the host application, Operator Control Panel, and Web User Interface. The library stores the customized inventory data in memory. Library firmware supports a 6 or 8-character volume serial number (VOLSER) on the bar code label on the tape cartridge.

Networking

This section covers the network supported features and options.

Supported Internet Protocols

The NEO 200s/400s supports the following Internet protocols:

- IPv4
- IPv6

To learn more about IPv4, visit http://www.iana.org/. To learn more about IPv6, visit http://www.ipv6.org/.

Simple Network Management Protocol (SNMP) Messaging

Occasionally, the library may encounter a situation that you want to know about, such as an open magazine or a fault that causes the library to stop. The library provides a standard TCP/IP protocol called Simple Network Management Protocol (SNMP) to send alerts about conditions (such as need for operator intervention) over a TCP/IP LAN network to an SNMP monitoring station. These alerts are called SNMP traps. Using the information supplied in each SNMP trap, the monitoring station (together with customer-supplied software) can alert operations personnel of possible problems or operator interventions that occur.

SNMP Traps

SNMP Traps are alerts or status messages that can be collected, monitored and used to proactively manage attached libraries using SNMP protocol with the SNMP monitoring stations. In summary, each trap provides the following information:

- **Product Identification** such as product name, description, manufacturer, model number, firmware level, and the URL for which the trap is designated.
- **Product Statu**s such as the severity of the trap, status (current and previous), and the time the trap occurred.
- **Library State** (physical device status) such as identification and status of devices that are monitored. In the case of the library, it would include enclosure, power supply, controller, magazine status, drive count, cartridge slot count, and Mail Slot count. Also included would be certain library statistics, and where appropriate, the fault FSC (fault symptom code) including the severity and description of that fault.
- **Drive Status** such as the identification of each drive in the library, firmware level, serial number, and other address and status information.
- **Trap Definitions** such as library status change, open magazine, Mail Slot accessed, hard fault information, drive cleaning requests, excessive retries, and library returning to normal operations.

- **SNMP MIBs**: The library's Management Information Base (MIB) contains units of information that specifically describe an aspect of the system, such as the system name, hardware number, or communications configuration. Status and error data is also gathered by MIBs and sent to one or more IP addresses defined during the SNMP configuration operation. Download the SNMP MIB file for this library from http://docs.overlandstorage.com/neo.

SNMP Status Events

This table provides information about SNMP events and the related Trap ID.

Event	Trap ID	Definition
Status Change	1	Library status has changed.
Door Open	2	Library door has been opened.
Mail Slot Accessed	3	Library I/O Station has been accessed.
Fault Posted	4	Library has posted a hard fault/error.
Request Drive Clean	5	Drive has requested a clean.
Drive Error	6	Drive has reported an error.
Loader Retries Excessive	7	Library has reported excessive load retries.
Loader OK	8	Library has resumed normal operations.
Account Password Change	9	Account password in the library has changed.
Configuration Change	10	Library or drive configuration has changed.
Library Login	11	Someone has logged into the library via the Web User Interface.
Library Logout	12	Someone has logged out of the library via the Web User Interface.

Network Time Protocol (NTP)

NTP is an Internet standard protocol that assures accurate synchronization of computer clock times in a network of computers. Running as a continuous background client program on a computer, NTP sends periodic time requests to a server, obtaining server time stamps, and using them to adjust the client's clock.

Maximum Library Storage Capacity and Data Transfer Rate

Maximum library storage capacity and maximum data transfer rates are as follows:

Tape Drive Model	Host Interface
Ultrium 5 Half-Height drives	8 Gb/s Fibre Channel — single port 6 Gb/s SAS — dual port
Ultrium 4 Half-Height V2 drives	8Gb/s Fibre Channel — single port 6GB/s SAS — dual port

Characteristic	2U Library Specification	4U Library Specification
Maximum storage capacity — Ultrium 5 Data Cartridges	• 24 data cartridges • Native: 36 TB • Compressed: 72 TB (2:1 compression)	• 48 data cartridges • Native: 72 TB • Compressed: 144 TB (2:1 compression)
Maximum storage capacity — Ultrium 4 Data Cartridges	• 24 data cartridges • Native: 19.2 TB • Compressed: 38.4 TB (2:1 compression)	• 48 data cartridges • Native: 38.4 TB • Compressed: 75.2 TB (2:1 compression)
Sustained native data transfer rate	• LTO 5 Half-Height: 140 MB/s • LTO 4 Half-Height: 120 MB/s	

Ultrium Tape Drives

The NEO 200s/400s tape libraries support the Ultrium 4 and Ultrium 5 half-height tape drives.

Each tape drive in the library is packaged in a container called a drive sled. The drive sled is a customer replaceable unit (CRU), and is designed for quick removal and replacement of a tape drive.

Both half-height tape drives either support two SAS SFF-8088 connectors that are compatible with SAS-1 cables, or one LC Fibre Channel connector.

> **NOTE:** LTO-4 and LTO-5 SAS and Fibre Channel drives are allowed in the same physical and logical library but it is not recommended.

Speed Matching

To improve system performance, the Ultrium 4 and Ultrium 5 tape drives use a technique called speed matching to dynamically adjust its native (uncompressed) data rate to the slower data rate of the attached server.

Channel Calibration

The channel calibration feature of the Ultrium 4 and Ultrium 5 tape drives customizes each read/write data channel for optimum performance. The customization enables compensation for variations in the recording channel transfer function, media characteristics, and read/write head characteristics.

Power Management

The Ultrium 4 and Ultrium 5 tape drives feature a power management function that controls the drive's electronics so that part of the electronics completely turn OFF when circuit functions are not needed for the drive's operation.

Media

The media used by NEO 200s/400s tape libraries are Ultrium Tape Cartridges that provide up to 1500 GB native capacity (up to 3000 GB with 2:1 hardware data compression) for Ultrium 5 tape drives and 800 GB native capacity (up to 1600 GB with 2:1 hardware data compression) for Ultrium 4 tape drives.

Ultrium Tape Drive	LTO Ultrium Data Cartridges				
	1500 GB (Ultrium 5)	800 GB (Ultrium 4)	400 GB (Ultrium 3)	200GB (Ultrium 2)	100GB (Ultrium 1)
Ultrium 5	Read/Write	Read/Write	Read only	–	–
Ultrium 4	–	Read/Write	Read/Write	Read only	–
Ultrium 3	–	–	Read/Write	Read/Write	Read only
Ultrium 2	–	–	–	Read/Write	Read/Write
Ultrium 1	–	–	–	–	Read/Write

For more detailed information, see Chapter 6, "Media."

User Interfaces

The library has a local interface (Operator Control Panel), and a remote interface accessed via a web browser (Web User Interface).

The Operator Control Panel is located on the front of the library and allows users to work locally on the library. The Web User Interface allows users and administrators to view and perform some library functions from remote sites.

The Web User Interface is implemented as a Java Applet that runs in a web browser from any PC on the network. The Java Applet requires that Java 1.5.0 or higher be installed on your host computer for full functionality, and is best viewed using Internet Explorer 6.0 or higher. Internet Explorer 7.0 or higher is required for IPv6.

Topics in User Interfaces:

- Operator Control Panel
- Web User Interface

Operator Control Panel

The Operator Control Panel is located on the front bezel of the library. The Operator Control Panel displays library information and menu commands used to execute library management functions in response to the Control Keys (buttons) located on the right of the LCD display.
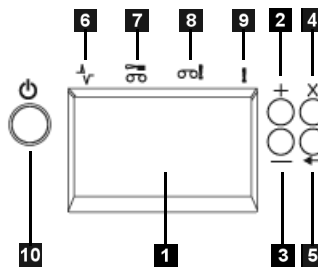
Operator Control Panel component descriptions:

Number	Component	Description
1	LCD display	16-character LCD graphic display
2	UP (+)	Button used to navigate upward (^) through the menu items
3	DOWN (−)	Button used to navigate downward (V) through the menu items
4	CANCEL (X)	Button used to cancel a user action and return to the last menu item

Number	Component	Description
5	SELECT (↵)	Button used to display a submenu or to select a user action
6	Ready/Activity LED	Green LED lit when the unit is powered ON. The LED flashes when there is any library activity or the library is offline.
7	Clean Drive LED	Amber LED lit when the drive needs cleaning. The LED turns OFF after the drive is cleaned successfully.
8	Attention LED	Amber LED lit when a cartridge is bad, marginal, or invalid. The LED turns OFF when the media is removed from the drive. The LED may also be lit when there is a power supply problem.
9	Error LED	Amber LED lit when there is an unrecoverable library or drive failure. The corresponding error message appears on the LCD display.
10	Power ON/OFF	If the library is OFF, press the button for no more than one second to start the POST process and power the library ON. If the library is ON, pressing this button for 4 seconds will initiate a controlled power down of the library (soft landing). The following operations will take place before the library shuts down completely: • The display indicates with an appropriate message that the shutdown is in progress. • The library controller finishes all ongoing library and drive activities. • The accessor is moved to its home position. • The library controller switches OFF the power supply's secondary side. NOTE: The shutdown process may be aborted by releasing the button before 4 seconds has passed.

The Operator Control Panel operates in two basic modes:

- **User Interaction mode** – Mode employed when a user is pushing keys on the Operator Control Panel.
- **System Driven mode** – Normal mode of operation where the Operator Control Panel displays status in response to commands issued from the drive's internal interface.

When an Operator Control Panel key is pressed and released, the Operator Control Panel automatically transitions to User Interaction mode. User Interaction mode will continue until 3 minutes after a user stops pushing keys, or the requested accessor action stops, whichever is longer, then the Operator Control Panel returns to System Driven mode.

If necessary, the Operator Control Panel will automatically transition to System Driven mode. When this occurs, the library remembers what the user was doing before the display mode changed. Therefore the next button pressed only transitions the Operator Control Panel to the User Interaction mode from the System Driven mode.

Any operational conflict between commands received over the host interface or the Web User Interface and those entered via the Operator Control Panel are avoided with a reservation mechanism on a first-come, first-served basis. Operator Control Panel commands are canceled by an Operator Control Panel logout or timeout.

Library firmware will not allow a user to select an impossible request. Those situations will include, but are not limited to:

- Moving a cartridge from any source to a position occupied by another cartridge
- Moving a cartridge from an empty cartridge position
- Loading a cartridge from any source to a full drive
- Unloading a cartridge from an empty drive

Any error detected by the library or drive controller and not recoverable through predetermined firmware algorithms is considered fatal. When an error occurs, an error code is displayed on the Operator Control Panel display and the error LED is ON. The error code remains on the Operator Control Panel until a key is pressed, which causes the Operator Control Panel to return to the Home Screen. Numeric error codes are used for unrecoverable fatal errors, otherwise text status messages are displayed.

When the library powers ON or resets, it goes through several internally controlled initialization processes, called the Power-On-Self-Test (POST).When the POST is finished, the library displays the Startup screen, then the Home screen.

```
            Startup

Firmware Rev:       120R
Drives:             4
Magazines:          4
I/O Station:        empty

Idle  Rand
```

⇩

```
           NEO Series
        Overland Storage

Accessor     Drive 1 2 3 4
   ✓               ✓✓✓ !

Idle  Rand
```
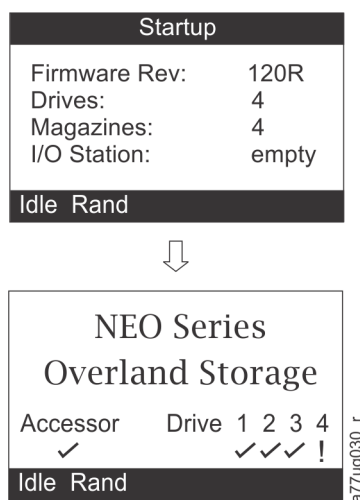
The Startup screen is the first screen that appears after powering ON the library. It contains the following information:

- **Firmware Rev**: the current level of library firmware
- **Drives**: the total number of drives that the library can support
- **Magazines**: the total number of magazines in the library
- **I/O Station**: the current status of the Mail Slot

Front Panel LEDs

All LEDs are updated during power ON and reset sequences. Upon power ON or software reset, the library illuminates all LEDs as soon as POST allows. When initialization starts, all LEDs are extinguished and the Ready/Activity LED flashes at a rate of approximately one second per cycle. When the mechanical initialization is complete, the Ready/Activity LED will stop flashing and be constantly illuminated.

If a library failure occurs, the Ready/Activity LED turns OFF and the Error LED turns ON. The Operator Control Panel also displays an appropriate error code to help identify the failure.

The following are additional operational details of LEDs:

- The **Ready/Activity** LED (6) is illuminated any time the unit is powered ON and functional. The Ready/Activity LED blinks whenever there is library or drive activity. This LED will also blink when the unit is OFFLINE.

- The **Clean** LED (7) is illuminated when either a cleaning requested or a cleaning required flag has been issued by the drive. The LED is turned off after a successful drive cleaning operation.

- The **Attention** LED (8) indicates one of the following conditions.

Problem	Action Required
Bad media	**1.** Go to **Monitor > Inventory** to locate the defective cartridge. **2.** Move the defective cartridge to the Mail Slot. (Operator Control Panel: **Control > Move Cartridges**). **3.** Open the Mail Slot to remove the defective cartridge. (Operator Control Panel: **Control > Open I/O**).
Drive sled issues	Do one of the following: • Install a different **drive sled**. • Modify or resubmit Logical Library setting (Operator Control Panel: **Configure > Logical Libraries** or Web User Interface: **Configure Library > Logical Libraries**). • Restore defaults (Operator Control Panel: **Configure > Restore Defaults** or Web User Interface: **Configure Library > Restore Defaults**).
Redundant power supply failed	Complete the following steps: **1.** Replace the failed **power supply**. **2.** Cycle library **power**.
Power supply fan failure	Replace the power supply.

- The Error LED (9) turns ON when there is an unrecoverable drive or library failure. An error message is displayed on the screen and the LED remains ON until the error state is resolved.

  NOTE: From the Operator Control Panel, run **Service > Library Verify**. If Library Verify runs without error, the Error LED turns off. If the error persists, recycle the power.

Input Modes

There are several ways to enter values in the different menu items. These values are selectable predefined values, toggle values (for example, ON/OFF) and numerical values like network addresses.

Selecting Predefined Values

1. To set the predefined values, press the **SELECT** button to select the menu item.

2. Using the UP and DOWN buttons, select one of the various **predefined values** for that item.

3. As soon as the Operator Control Panel display shows the correct value, press the **SELECT** key to apply the value.

Toggling Values

Toggle values are used to switch between two different states like ON and OFF.

1. After navigating to the menu item, press the **SELECT** key to select the menu item.

2. Using the UP and DOWN keys, select one of the various **predefined states** for that item.

3. Press the **SELECT** key to apply the new state.

Entering Numerical Values

Numerical values are needed for network addresses, password entries, and other configuration entries.

1. After navigating to the menu item, the current value is displayed and the cursor highlights the **first digit** of the value that can be changed.

2. For each **digit** to be changed in the value:

   a. Use **UP** and **DOWN** to increment or decrement the digit.

   b. Press **SELECT** to highlight the next editable digit.

3. Press **SELECT** at the last digit to apply the complete entry (or press CANCEL to cancel the whole edit process and maintain the original value).

Web User Interface

Many of the same operations performed from the Operator Control Panel can also be performed remotely using the Web User Interface.

The Web User Interface lets you monitor and control your library from any terminal connected to your network or through the World Wide Web (WWW). The Web User Interface hosts a dedicated, protected Internet site that displays a graphical representation of your library.

For static IP Addresses only: After establishing a connection to the library, open any HTML browser and enter the IP address of the library. To configure the Web User Interface, you must first set the IP address using the Operator Control Panel. Refer to "Configuring Network Settings" on page 4-13 or "Configuring Network Settings" on page 4-23.

The Web User Interface Java Applet requires Java 1.5.0 or higher be installed on your host computer for full functionality, and is best viewed using Internet Explorer 6.0 or higher. Internet Explorer 7.0 or higher is required for IPv6. If your computer does not have Java installed or you need to upgrade your installation, download the latest version of the Java Runtime Environment (JRE) for your platform from http://www.java.com/ and follow the instructions provided to enable and configure the Java Runtime Environment for your browser.

The Web User Interface can also be used to update the library and drive firmware, and to download error logs, drive dumps, and other library data from the library.

Before the NEO 200s/400s can be managed over a network using the Web User Interface, you must set up the initial network configuration of the library using the Operator Control Panel.

Login

> IMPORTANT: Some options of the Web User Interface take the library OFFLINE. This inactive mode can interfere with host-based application software, causing data loss. Make sure the library is idle before attempting to perform any remote operations that will take the library OFFLINE.

To login, select the Role type and enter the correct password. There are four levels of access:

- **User** – Normal user level. The User only has access to Monitor Library menus.
- **Superuser** – The Superuser has access to the Monitor Library and Manage Library sections.
- **Admin** – The Admin user level has access to all menus except those restricted to Service only.
- **Service** – The Service personnel user level access to this level is for Overland Authorized Service personnel only. Service personnel have access to all menus.
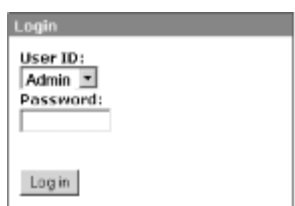
Use the default password for logging in as an Admin user is **secure**.

NOTE: Passwords are case-sensitive.

Each level affects which areas you have access to and what actions you can initiate from those areas.

For DHCP, use the Operator Control Panel to determine the IP Address assigned to your library. Navigate to **Monitor > Library > Identity**. Scroll down to IP Address and make note of the address. Enter the IP Address in your internet browser address field to access your library with the Web User Interface.

For IPv4 or Dual Stack IPv4 + IPv6, enter your library's static IP Address using the 0.0.0.0 format (four octets).

For IPv6, enter your library's static IP Address or Router Assigned IP Address using the following format: http://[0:0:0:0:0:0:0:0]. To determine your Router Assigned IP Address, navigate to **Monitor > Library > Network** on the Operator Control Panel. For the IPv6 Router Assigned Addresses to be displayed on the Operator Control Panel, the Network must be configured to IPv6 Only and the Stateless Autoconfig on the must be set to ON.

System Status

The System Status screen is always present after login giving current status of the library.

NEO 200s   **NEO 400s**
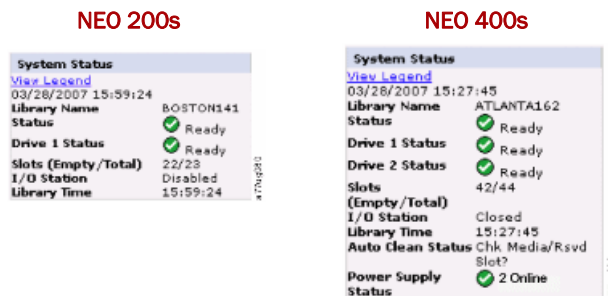
Status icons indicate the following conditions.

- The green check mark indicates that the library is fully operational and that no user intervention is required.

- The yellow exclamation point indicates that user intervention is necessary, but that the library is still capable of performing operations. This condition can be caused by a media, library, redundant power supply, power supply fan, or a drive sled problem. To determine which, view the System Status screen.

- The red X indicates that user intervention is required and that the library is not capable of performing operations.

- If Auto Clean is enabled and a cleaning cartridge is **not** present, or if a cleaning cartridge is present, but not in a reserved slot, Auto Clean status will show **Chk Media/Rsvd Slot?** and **Status** will show a green check mark and the words **Media Attention**.
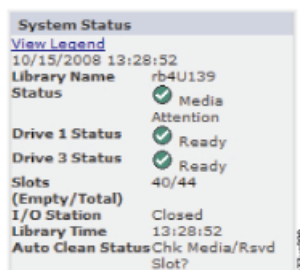
The Power Supply Status will only appear if redundant power is being utilized with a 4U library. If a redundant power supply fails, the System Status screen appears.
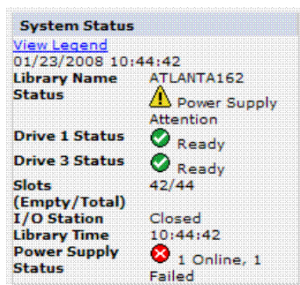
NOTE: The Green LED will be ON on both power supplies. If one Green LEDs is not ON, replace that power supply.

Web User Interface Help Pages

Each screen on the Web User Interface has an associated Help page. To access a Help page, click Help in the upper right corner of the screen. A new web page will open. Using the left navigation pane, select the desired Help page. To close the Help page, click the red X in the upper right corner of the screen.

Logging out of the Web User Interface

To log out of the Web User Interface, click **Logout** in the upper right corner of the current screen.

NOTE: If you click the **X** in the upper right corner of your internet browser window, the screen will close but you will not be logged out of the Web User Interface.

Chapter 3

Installation Planning

Before installing your library, take time to review the following information.

Topics in Installation Planning:

- Determining Number of Logical Libraries
- Library Partitioning and Element Addressing
- Using Persistent Binding
- Logical Unit Number (LUN) Scanning
- Host Interfaces

Determining Number of Logical Libraries

You can partition the library into as many logical libraries as there are drives in the library.

Basic Guidelines

- Each logical library must contain at least one drive.
- A library configuration of exactly one logical library equals the entire physical library.
- The library issues a warning to the user if media is moved across logical libraries.

Library Sharing

The library's default configuration allows a single application to operate the library through a single control path. Often, it is advantageous to be able to share a single library between heterogeneous (dissimilar) or homogeneous (similar) applications. Some applications (and some servers) do not allow for sharing a library between systems. Configurations can be created that enable the library to process commands from multiple heterogeneous applications and multiple homogeneous applications.

Configure the library so that it is partitioned into separate logical libraries that independently communicate with separate applications through separate control paths. This configuration requires no special capabilities from the server or application.

Library Partitioning and Element Addressing

A 2U or 4U library system containing more than one drive can be configured into separate logical libraries (create partitions). For the 2U library, one to two partitions are available. For the 4U library, it is possible to configure one to four partitions. Each library must contain at least one drive per partition.

Partitioning of 2U Libraries

When two half-height drives are installed in a 2U library, the library firmware supports partitioning. The first partition contains the first magazine and the first drive (called Drive 1). The second partition contains the second magazine and the second drive (called Drive 2). The Mail Slot (if configured as Mail Slot) is shared.

Partitioning of 4U Libraries

When one or more half-height drives are added to a 4U library, the library firmware supports partitioning. The first half-height drive in the bottom position is called Drive 1. The half-height drive above it is called Drive 2. And so forth up to four drives.

Mixing of Drives

The libraries support a mix of Ultrium 4 and 5 drives in the same physical library and the same logical library.

> NOTE: While the libraries also support a mix of SAS and Fibre Channel drives in the same physical library and same logical library, mixing drive interface types in the same logical library is **not** recommended.

Configuration of a One-Partition System

A single-partition system configured for a 4U library contains any and all drives present in any drive positions, and all four magazines. When configured with one logical partition, the Element Address assignments will be as follows for the Data Transfer (Drive) Element (DTE) and the Storage Elements (STE):

DTE assignments:
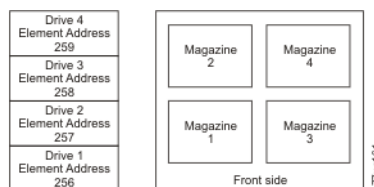
STE assignments:

- Logical Library 1: Slot 1 through 23, 4096 (0x1000) through 4118 (0x1016).

Configuration of a Two-Partition System

A two-partition system must have at least two drives installed. One drive must be installed in either drive position 1 or drive position 2, and another drive must be installed in either drive position 3 or drive position 4. Partition 1 contains any drives in drive position 1 and drive position 2. Partition 1 will also contain magazine 1 and magazine 2. Partition 2 contains any drives in drive position 3 and drive position 4. Partition 2 will also contain magazine 3 and magazine 4.

When configured with two logical partitions, the Element Address assignments will be as follows:

DTE assignments:

STE assignments:

- Logical Library 1: Slot 1 through slot 21, 4096 (x1000) through 4116 (0x1014)
- Logical Library 2: Slot 22 through slot 45, 4096 (x1000) through 4019 (0x1017)

Configuration of a Three-Partition System

A three-partition system must have at least three drives installed. A drive must be installed in drive position 1, another drive must be installed in drive position 2, and another drive must be installed in either drive position 3 or drive position 4. Partition 1 will contain the first drive and the first magazine. Partition 2 will contain the second drive and the second magazine. Partition 3 will contain any drives in drive position 3 and drive position 4. Partition 3 will also contain magazine 3 and magazine 4.

DTE assignments:
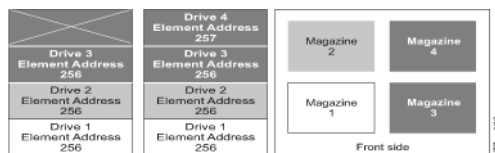
STE assignments:

- Logical Library 1: Slot 1 through slot 9, 4096 (x1000) through 4104 (0x1008)
- Logical Library 2: Slot 10 through slot 21, 4096 (x1000) through 4107 (0x100B)
- Logical Library 3: Slot 22 through slot 45, 4096 (x1000) through 4119 (0x1017)

Configuration of a Four-Partition System

A four partition system must have four drives. Each partition contains one drive and one magazine. When configured with four logical partitions, the Element Address assignments will be as follows:
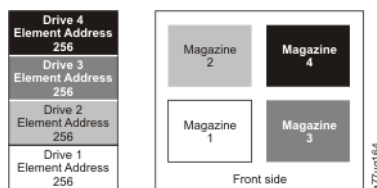
DTE assignments:

STE assignments:

- Logical Library 1: Slot 1 through slot 9, 4096 (x1000) through 4104 (0x1008)
- Logical Library 2: Slot 10 through slot 21, 4096 (x1000) through 4107 (0x100B)
- Logical Library 3: Slot 22 through slot 33, 4096 (x1000) through 4107 (0x100B)

- Logical Library 4: Slot 34 through slot 45, 4096 (x1000) through 4107 (0x100B)

Using Persistent Binding

Persistent binding is an HBA function that allows a subset of discovered targets to be bound between a server and device. Consult your HBA user guide for further information.

Logical Unit Number (LUN) Scanning

The library uses a single SCSI or Loop ID per drive and dual LUNs to control the tape drive (LUN 0) and library accessor (LUN 1). The library requires a Host Bus Adapter (HBA) that supports LUN scanning. If it is not enabled, your host system will not scan beyond LUN 0 and will fail to discover the library. It will only see the tape drive.

> **NOTE:** Some HBAs, such as RAID controllers, do not support LUN scanning.

Host Interfaces

The 2U library and the 4U library can be attached to servers using the following interfaces:

- Serial Attached SCSI (SAS)
- Fibre Channel (FC)

Drive Type	SAS Support	FC Support
Ultrium 4 Half-Height	X	X
Ultrium 5 Half-Height	X	X

SAS Interface

A drive sled with a SAS interface can be linked directly to controllers. SAS is a performance improvement over traditional SCSI because SAS enables multiple devices (up to 128) of different sizes and types to be connected simultaneously with thinner and longer cables; its full-duplex signal transmission supports up to 6.0 Gb/s. The SFF-8088 SAS connectors on the Ultrium 5 tape drives are compatible with SAS-1 or SAS-2 cables. The SFF-8088 SAS connectors on the Ultrium 4 tape drives are compatible with SAS-1 cables. In addition, all SAS drives can be hot-plugged.

SAS drives will auto-negotiate speed. There are no configurable topologies thus no feature switches associated with SAS. The SAS Ultrium 4 half-height drive sleds are single ported and can only be attached to one host. LAN-free drive sharing is not supported. Ultrium 4 SAS drive sleds use the SFF-8088 connection at the drive sled end and SFF-8088 or SFF-8470 at the host adapter end.

Fibre Channel Interface

Fibre Channel allows for an active intelligent interconnection scheme, called a Fabric, to connect devices. Everything between the ports on Fibre Channel is called the Fabric. The Fabric is most often a switch or series of switches that takes the responsibility for routing.

The library allows the selection of the following Fibre channel port behaviors:

- LN Port: (default setting) – an automatic configuration that tries arbitrated loop first, then switched fabric
- L Port – arbitrated loop
- N Port – point to point protocol in a switched fabric topology

Cables and Speeds

Ultrium 4 and Ultrium 5 Fibre Channel tape drives use LC duplex fiber optics cables.

The maximum distances that the library supports on a Fibre Channel link is determined by the link speed, the type of fiber (50-micron or 62.5-micron), and the device to which the library is attached.

If the library attaches to an HBA (Host Bus Adapter), refer to the distances that are supported by the HBA. If the library attaches to a switch, the supported distances are:

- For a multi-mode 50-micron cable:
  - 1-Gbit link speed = up to 500 m (1640 ft.)
  - 2-Gbit link speed = up to 300 m (984 ft.)
  - 4-Gbit link speed = up to 175 m (574 ft.)
  - 8-Gbit link speed = up to 150 m (492 ft.)
- For a multi-mode 62.5-micron cable:
  - 1-Gbit link speed = up to 300 m (984 ft.)
  - 2-Gbit link speed = up to 90 m (295 ft.)
  - 4-Gbit link speed = up to 50 m (164 ft.)
  - 8-Gbit link speed = up to 21 m (68 ft.)

NOTE: Minimum distance for both 50 micron and 62.5 micron is 2 m (6 ft.).

Using Zoning to Isolate Devices and Enhance Security

For security reasons, it is important to limit the devices that a server or servers can recognize or access. Also, some performance configurations and SAN configurations can result in a device being seen multiple times from the same server. For example, if you have two HBAs from the same server connected to an Ultrium Tape Drive in the library, the drive will be detected and appear as two logical devices. That is, there will be two special files for one physical device. Zoning can address these issues.

Zoning allows you to partition your SAN into logical groupings of devices so that each group is isolated from the other and can only access the devices in its own group. Two types of zoning exist: hardware zoning and software zoning. Hardware zoning is based on physical fabric port number. Software zoning is defined with a World Wide Node Name (WWNN) or World Wide Port Name (WWPN). While zoning can be reconfigured without causing an outage, some zoning configurations can become complicated. The advantage of the library's WWNN implementation is that you can avoid the exposure of introducing zoning errors because you do not have to change the zoning configuration if a drive needs service or replacement.

IMPORTANT: It is recommended that tape storage devices be connected on a separate HBA from disk storage devices to avoid potential configuration incompatibilities.

Fibre Channel Host Environment

The library is supported by a wide variety of servers (hosts), operating systems, and adapters. These attachments can change throughout the product's life cycle. To determine the latest supported attachments, visit the Overland NEO web site.

Sharing on a Storage Area Network

With Storage Area Network (SAN) components, the possibilities for connecting multiple systems and multiple drives have increased. Not all software and systems are designed to share drives. Before you install a drive that would allow two systems to share it, check that the systems and their software support sharing. If your software does not support sharing, note that Fibre Channel switches have a zoning capability to form a SAN partition. For systems that do not cooperate, use zoning to prevent the systems from sharing the same drive. You can remove zoned partitions as you upgrade software and system levels.

Installation & Configuration

To install and configure a NEO 200s/400s library, perform the procedures in this chapter in the order they are presented.

Topics in Installation & Configuration:

- Choosing a Location
- Installing in a Rack
- Configure Library Settings
- Configuring Your Library – Web User Interface
- Configuring Your Library – Operator Control Panel
- Preparing the Host
- Verifying the Connection
- Cartridge Magazines
- Populating the Library with Data Cartridges
- Inserting the Cleaning Cartridge
- Registering for Support Notification

Choosing a Location

Choose a location that meets the following criteria:

Criteria	Definition
Room Temperature	16 to 32°C (60 to 90°F)
Power Source	AC Power Voltage: 100 to 240 Vac. (4.0 to 1.5 A)
	NOTE: The 4U library requires two separate power sources to implement redundant power.
	Line Frequency: 50 to 60 Hz
	Place the library near an AC outlet. The AC power cord is the product's main AC disconnect device and must be easily accessible at all times. Two separate power sources must be available for redundant power.
Air Quality	The library should be placed in an area with minimal sources of particulate contamination. Avoid areas near frequently used doors and walkways, stacks of supplies that collect dust, printers, and smoke-filled rooms. Excessive dust and debris can damage cartridges and the tape drive.

Criteria	Definition
Relative Humidity	15 to 80% non-condensing
Clearance	• Back: Minimum of 15.4 cm (6 in.) • Front: Minimum of 30.8 cm (12 in.) • Sides: Minimum of 5 cm (2 in.)
Rack Requirements	Standard 19-inch rack with: • 2U (88.90 mm/3.5 in.) of clearance for a 2U library • 4U (177.8 mm/7 in.) of clearance for a 4U library

Installing in a Rack

NOTE: If the temperature in the room where the library will be installed varies by 15° C (30° F) from the room where the library was stored, allow the library to acclimate to the surrounding environment for at least 12 hours before unpacking it from the shipping container.

Register to Activate Your Warranty

It is **essential** that you activate your warranty. Technical and warranty support are **not available** until the warranty is active:

1. Go to http://www.overlandstorage.com/ and select **Service & Support > My Products**.

2. At the Site Login, enter your **e-mail address** and **password**, and click **GO**.

3. Click **Register New Product**.

4. Fill in the information (including serial number) and click **Submit**.

E-mail:	**Enter**
Password:	**Enter**
	☐ Remember Me
GO ›	
Forgot your password?	New member?

Your warranty certificate will be emailed to you. Follow the instructions included in the email to complete the registration process.

Remove the Shipping Lock

⚠ WARNING: Due to the weight of the appliance, it is recommended that at least two people be used to lift the unit out of the box to prevent injury.

AVERTISSEMENT: En raison du poids de l'appareil, il est recommande d'utiliser deux personnes au moins pour soulever l'appareil hors de la boîte pour éviter les blessures.

➡ IMPORTANT: The shipping lock, which prevents the library accessor from moving during shipment, must be removed before the library is powered ON.

The shipping lock is held in place with a label and is located in the top center of the library. After the shipping lock is removed, store it on the right side of the back panel for future use.

1. Using two people, remove the **library** from its box and set it on a secure surface.

2. Remove blue securing **label** (**1**).
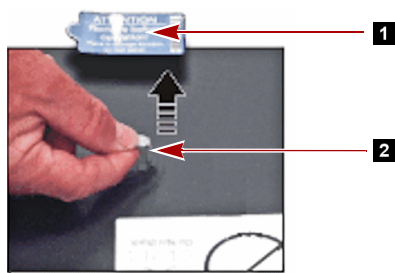
3. Lift and remove the **shipping lock** (**2**).

4. Store the shipping lock and blue label at the top right (**3**) of the rear panel of the library.
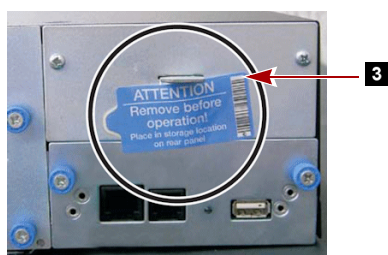
Slide the lock into the slot with the bottom of the lock showing below the slot. Press the label over the flat part of the lock.

Rack Installation

The NEO 200s/400s libraries each come with a rack shelf kit for easy installation and securing of the library into a 19-inch (EIA-310) rack.

> **IMPORTANT:** Two-post telco-style or other racks less than 29 inches in depth will NOT support this unit.

Install the Rack Rails

1. Determine the location in your rack for your library to be installed and, using a pencil, mark the location on each vertical rail in your rack.

   NOTE: A 2U library requires 2U (3.5 in.) of rack space. A 4U library requires 4U (7 in.) of rack space.
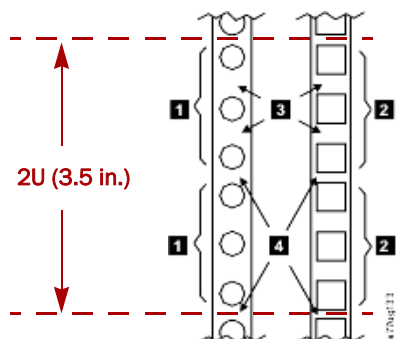
1 & 2	Two EIA units (2U) needed for round hole and square hole rail installation	3	Wide Gaps within the EIA unit
		4	Narrow Gaps between EIA units

2. Ensuring that the flange on each rail points toward each other to form a shelf, secure one rail to **each side** of the rack in your chosen rack location:

   NOTE: Use the screws for your rack type (labeled for round holes or square holes) and a #2 Phillips screwdriver to install the rails.

   a. **Extend the rails** to fit your particular rack depth.

      The two alignment pins go into the first and second holes from the bottom of the 2U space. The extension sections should be at the rear.

   b. With the large **black screws**, secure the front and back of each rail to the rack.

      The screw securing the rack goes into the fourth hole from the bottom in the front and the middle hole in the rear.
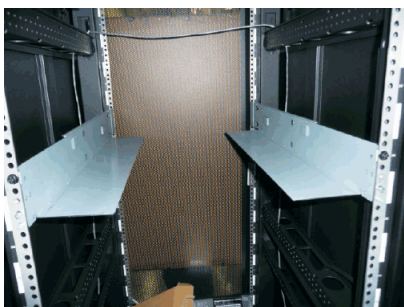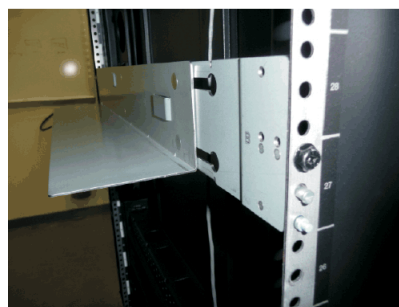
   Front View   Rear View

   NOTE: The rails must be fastened with the bottom of the each rail parallel to floor and at the same level.

Attach the Rail Brackets

1. Using the Torx wrench included in your shipment, remove the two screws (**1**) noted from both sides of the library.

   Screw locations on the 4U library are similar.

2. Install the library rack anchor "donuts" (**2**) on each side of your library using the **M3 x 6** counter-sunk screws included in the rack kit.

M3 x 6a with "Donut"

"Donut"

M3 x 4

Previously Removed Screw

a77ug277
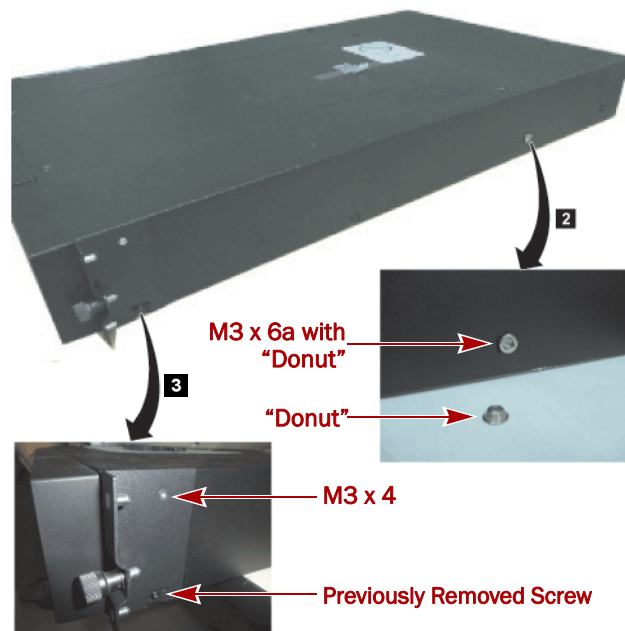
3. Install the library mounting brackets (**3**) as shown on each side of the 2U library using the screw that was removed from your library and an additional **M3 x 4** counter-sunk screw included in the rack kit.

The 4U rack anchors and mounting brackets are similar.

Insert the Library in Rack

⚠️ **WARNING:** It is recommended that a mechanical lifter (or at least two people) be used to raise and align the unit to prevent injury during installation. Use care when inserting or removing a unit into or out of a rack to prevent the accidental tipping of the rack, causing damage or personal injury.

AVERTISSEMENT: Afin d'éviter des blessures pendant l'installation, il est recommande d'utiliser un monte-charge (ou au moins deux personnes) pour élever ou aligner l'appareil. Faites attention lorsque vous insérez ou retirez l'appareil d'un support, pour empêcher le déversement accidentel de la crémaillère causant des dommages et des blessures.

1. Using the mechanical lifter, position the **library** in front of the rack, aligned with the rails.

2. Slide the library onto the **rails** until the mounting brackets are up against the vertical rack rails.

    The "donuts" on the side of the library should be under the side bump-out slots at the rear of the rails.

3. Secure it to the rack with the **captive screws**.

Install Any Add-on Components

The NEO 200s/400s libraries are expandable and accept add-on components to enhance performance:

- Additional tape drives can be installed in the empty bays. On the NEO 400s, always install the drives from the bottom up.
- Redundant (second) power supply is available for the NEO 400s.

Once the library is secure in the rack, the additional items should then be installed before hooking up the system. Follow the instructions enclosed with each component.

Cable Attachment

⚠️ **CAUTION:** It is recommended that you shut down and turn OFF the associated server. Turn OFF all attached devices. Remove the power cables from the server and all attached accessories. Failure to remove the power cords from these devices before connecting the host interface cable could result in damage to the library.

All cabling, power connections, and cooling are located on the NEO rear panel.

1 - AC Power Socket   3 - Ethernet Port   5 - USB Connection
2 - SAS HBA Ports   4 - Serial Port
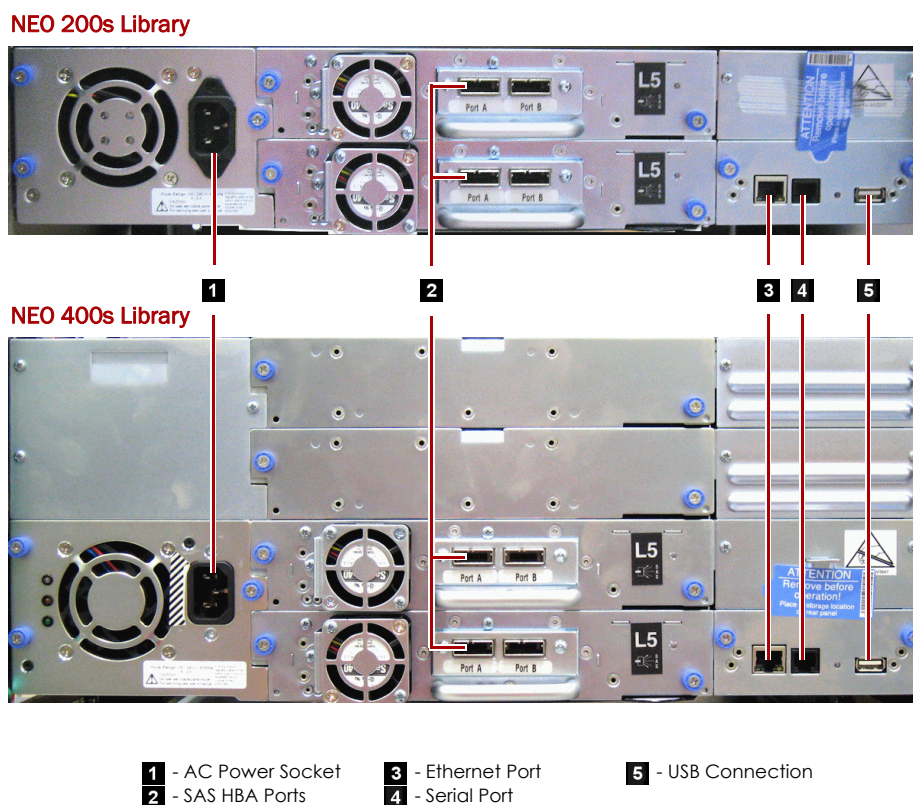
1. Attach one end of the **host interface cable** to the library:
   - For a SAS connected library, attach one end of the SAS cable to Port A (left) SAS HBA (**2**) on the drive.
   - For a Fibre Channel (FC) library, attach one end of the fibre cable to Port 0 (left) connector on the drive (not shown).

2. Attach the **other end** of the host interface cable as follows:
   - For a SAS library, connect the host interface cable to the host HBA, using a direct SFF-8088 connection, or an interposer as required. Unused SAS connectors do not need termination.
   - For a Fibre Channel library, connect the fibre cable to the host or to a switch. If an SC-to-LC interposer is required, refer to Installing a Fibre Channel Interposer.

3. Plug the **network Ethernet (management) cable** into the Ethernet port on the back panel of the library. If the Ethernet connection is directly attached to a server or laptop, a crossover Ethernet cable may be required.

   NOTE: It is the customer's responsibility to supply the crossover cable if one is required.

Installing a Fibre Channel Interposer

To install the FC interposer:
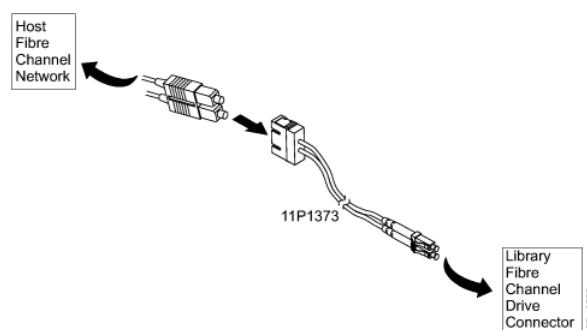
1. Connect the host **SC fibre cable** to the matching side of the interposer.

2. Connect the drive **LC fibre side** of the interposer to the drive/library.

Power Cord Attachment

WARNING: This device has more than one power cord. Disconnect ALL power supply cords before servicing.

AVERTISSEMENT: Cet appareil a plus d'une cordon d'alimentation. Débranchez TOUTES les cordons d'alimentation avant l'entretien.

1. Remove the **protective label** from the power receptacle on your library.
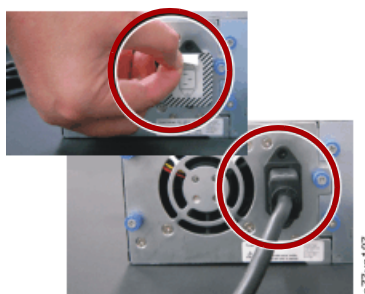
2. Plug one end of each **power cord** into each power supply connector on the back panel of the library.

3. Plug the other end of each power cord into the nearest **properly grounded power outlet**. Use separate power sources for each power supply for redundant power.

4. Turn ON the library using the **Power** button.

   Check the Operator Control Panel display to make sure the library is receiving power. If it is not, check the power connections and your power source. During the Power-On Self Test (POST), all four LEDs are illuminated briefly, followed by a flashing Ready LED. When the initialization sequence is complete, the Home screen is displayed.

Configure Library Settings

The library can be configured using the Web User Interface and/or the Operator Control Panel. The recommended method for configuring your library is using the Web User Interface. See "Configuring Your Library – Web User Interface" on page 4-8 and "Configuring Your Library – Operator Control Panel" on page 4-19.

For complete detailed information on all of the functions available on the library using both the Operator Control Panel and the Web User Interface, see Chapter 5, "Operations."

Using Factory Defaults as Your Configuration

The table below shows the main default library settings. If you wish to use the defaults, no other changes need to be made before using your library.

Item	Default Setting
Logical Libraries	1
Active Slots	Maximum
I/O Slots	Enabled
DHCP	Enabled
Internet Protocol	IPv4 Only
Bar Code Label Length	8
Library Mode	Random
Auto Clean	Disabled
IPv6 Stateless Autoconfig	Enabled

For a full list of factory defaults, see "Configuring Save/Restore Settings" on page 4-25.

Configuring Your Library – Web User Interface

If you choose to use the Web User Interface to configure your library, first enter your library network settings using the Operator Panel (see "Configuring Network Settings" on page 4-23).

> **NOTE:** To access the Web User Interface, be sure Java 1.5.0 or higher is installed on your host computer. Download the latest version of the Java Runtime Environment (JRE) for your platform from http://www.java.com/.

Topics in Configuring Your Library – Web User Interface:

- Establishing Remote Access to Your Library
- Logging in to the Web User Interface
- Checking Firmware Level
- Configuring Library Settings
- Drive Interface Identification and Settings
- Configuring Network Settings
- Configuring User Access

- Configuring Date and Time Settings
- Configuring Logs and Traces
- Configuring Email Notifications
- Configuring SMNP Settings
- Restoring Factory Default Settings
- Logging Out

Establishing Remote Access to Your Library

Static library network settings must be entered using the Operator Control Panel before the library can be accessed remotely using the Web User Interface. If your system is serviced by DHCP (Dynamic Host Configuration Protocol) server, the network parameters will be automatically set. Once remote access has been established, you can complete the configuration of your library using the Web User Interface.

1. Using the Operator Control Panel, at the **Home** screen, select the **Configure** menu.

2. Go to **Network > IP STACK** and select the **Internet Protocol**.

3. If you select IPv6 protocol, the Configure Network menu will include **options** for Stateless Autoconfig and Prefix length.
   - Select the **Stateless Autoconfig** option desired.
   - Select the **Prefix Length**.

4. If desired, select **DHCP** as your library network setting:
   a. Select the **DHCP** field.
   b. Press the DOWN button to select **ON**.
   c. Press the **SELECT** button to apply your selection.

   Skip to Step 7.

5. Press the DOWN button to select a **static IP Address**.
   For IPv4, enter only an IPv4 address. For IPv6, enter only an IPv6 address. For both IPv4 & IPv6, enter an IPv4 address and an IPv6 address.
   a. Press the **SELECT** button to highlight the IP Address field.
   b. Press the **UP** or **DOWN** button to select the digits in the **first octet** of the IP Address, and press SELECT.
   c. Repeat Step b for the **remaining** octets.
   d. Press the **SELECT** button to apply your entries.

6. Repeat Step 5 for **each** of the following:
   - Netmask
   - Gateway

7. Press the DOWN button to select **Ethernet** and change the setting.

8. Highlight **SAVE** and press the SELECT button to apply your new configuration.
   If changes were made to the Network settings, a pop-up menu will display the option to reboot the library or cancel the reboot. If you select CANCEL in the pop-up menu, you will need to power cycle the library for the network changes to be applied.

   NOTE: Instead of SAVE, you can select CANCEL to cancel all of your entries and return to the Configure menu.

Logging in to the Web User Interface

To log in to the Web User Interface:

1. On your host computer, open an Internet **browser**.

2. In the browser address field, enter your library's **IP Address**.
   - For DHCP and/or Stateless Autoconfig, use the Operator Control Panel to determine the IP Address assigned to your library. Navigate to **Monitor > Library > Network**. Scroll down to the library address information and make note of the address. Enter the IP Address in your internet browser address field to access your library with the Web User Interface. The library address information may include one or more of the following address types:
     - IP Address (IPv4 static or DHCP)
     - Static IPv6 Address
     - Link Local IPv6 Address
     - Assigned IPv6 address (DHCP or Stateless Autoconfig)
   - For IPv4, enter your library's IP Address using the 0.0.0.0 format (four octets).
   - For IPv6, enter your library's IP Address using the following format: http://[0:0:0:0:0:0:0:0].
   - For Dual Stack IPv4 + IPv6, enter your library's IP Address for either IPv4 or IPv6.

3. When the login screen appears, select **admin** for a User ID and enter **secure** (or your new password) for a Password.
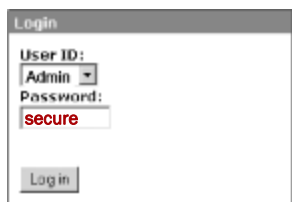
> **IMPORTANT:** For security purposes, Overland recommends that you change the default password.

Checking Firmware Level

It is important to run the latest level of firmware. To ensure that you are running the latest levels of library firmware, drive firmware, and SNMP MIB (Management Information Base) file, complete this procedure:

1. Verify the **SNMP MIB file** currently installed on your SNMP server.

2. Verify the levels of library and drive **firmware** currently installed on your library by completing the following steps:

   a. Expand **Monitor Library** in the left navigation pane of the Web User Interface.

   b. Click **Library Identity** and make note of the library firmware revision.

   c. Click **Drive Identity** and make note of the drive firmware revision.

   d. **Log out** of the Web User Interface.

3. Download the latest library firmware, drive firmware, and SNMP MIB (Management Information Base) file from the **Overland NEO website**.

   a. Go to http://docs.overlandstorage.com/neo.

   b. Compare the firmware **level** available on the web to those that you made note of in Step 1.

   • If you are running the **latest levels** of library and drive firmware, proceed to Step 5.

   • If you are **not** running the latest levels of library and drive firmware, download the firmware that needs to be updated to your library host (Step 4).

4. If necessary, update library and drive firmware on your **library**:

   a. Go to http://docs.overlandstorage.com/neo.

   b. On the page, locate the latest **firmware updates**.

   c. Click the firmware link and follow the instructions to download the **file**.

   Do this for both library and drive firmware, if necessary.

5. Install the **MIB file** on your SNMP server. Refer to your server application documentation for instructions.

Update the library firmware before normal operation starts. Refer to the Technical Bulletin located with firmware on installation instructions.

Configuring Library Settings

Use the following procedures to configure either the logical or physical library settings.

> **NOTE:** If your library contains only one drive or logical library, both general and specific settings will be combined into one table.

General Library Settings

1. Expand **Configure Library** in the left navigation pane of the Web User Interface.

2. Click **General** and enter the following:

   • **Library Name** – Enter a name for your library.

   • **Library Mode** (select one of the following per logical library):

   • **Random**: In random mode, the library allows the server's (host's) application software to select any data cartridge in any order.

   • **Sequential**: In sequential mode, the library's firmware predefines the selection of the cartridges. After initialization, the firmware causes the library to select the first available cartridge found (counting from the Mail Slots through the last slot in your library) for loading into the drive.

   > **NOTE:** If a Logical Library in Sequential Mode contains more than one drive, only the first drive in the Logical Library will be utilized.

   • **Autoload**: Sequential mode with autoload mode ON loads the first available cartridge (slot with the lowest numerical value that contains a cartridge) automatically if the library powers ON with an empty drive.

   • **Loop**: Sequential mode with loop mode ON loads the cartridge in the lowest numerical slot after the cartridge in the highest numerical slot has been filled and sent back to its home slot. This allows endless backup operations without user interaction.

- **Active Slots** – Select the number of active slots you would like to assign in your library. This item will affect the number of Res. (Reserved) Slots in your library. For more information refer to "Configuring Mail Slots and Reserving Slots" on page 5-32.

  NOTE: Slots can be reserved so that they are invisible to the host. It may be necessary to reserve slots in order to match the number of available slots to the ISV software licensing. Slots will be reserved starting with the highest element address. If your library does not have a dedicated cleaning cartridge slot, and you desire to enable Auto Clean, you must designate a reserved slot which can be used to hold the cleaning cartridge.

- **I/O Station Enabled** – If checked, the Mail Slots are enabled. If not, the first three slots in a 4U library or the first slot in a 2U library are configured as normal storage. See "Configure Library: General" on page 5-18.

- **Auto Clean Enabled** – Automatically cleans drive when drive requests cleaning and cleaning cartridge is present in a reserved slot. All cleaning cartridges must have CLN as part of the bar code. The Universal Cleaning Cartridge has the bar code label CLNUxxLx.

- **Bar Code Label Length Reported to Host** – Choose between 6 and 8. With 6, the first six characters of the cartridge VOLSER (Volume Serial Numbers) will be reported to the host. With 8, All characters in the VOLSER (first six characters plus the two character media type identifier) will be reported to the host. For more information on bar code labels, see Bar Code Label.

3. Click one of the following:

   - **Refresh** – Click this button to update the current screen.

   - **Apply Selections** – Click this button to submit the changes made to the screen.

Logical Library Settings (Partitions)

One cartridge magazine cannot be assigned to two logical libraries. If you partition a multi-drive library, each of the magazines must be assigned to a logical library on a magazine boundary. The entire magazine must be part of one logical library only.

NOTE: If you have a 2U library with two drives, you have the capability to have two logical libraries (partitions).

In a fully populated 4U library with four half-height drives and four logical libraries, resource assignments are as follows:

- Logical Library 1 will contain Drive 1 and the lower left cartridge magazine.
- Logical Library 2 will contain Drive 2 and the upper left cartridge magazine.

   • Logical Library 3 will contain Drive 3 and the lower right cartridge magazine.
   • Logical Library 4 will contain Drive 4 and the upper right cartridge magazine.

   NOTE: For more information about various configurations, see "Library Partitioning and Element Addressing" on page 3-1.

The Mail Slot and slots reserved for cleaning cartridges, if any, are shared among all logical libraries.

To configure the library access mode settings for the logical library:

   1. Click **Configure Library > Logical Libraries** in the left navigation pane.

   2. Select the **number** of logical libraries you would like to create in your library.

   3. Click **Submit** to create the logical libraries.

Drive Interface Identification and Settings

   1. Click **Configure Library > Drives** in the left navigation pane.

   2. Select the desired settings for **each drive** listed (either SAS or Fibre Channel).

   NOTE: If you have a Fiber Channel Drive connected to an AS/400 Host, direct attached to the Fiber HBA, set the Port Type to L-Port.

   3. Click one of the following:
      • **Refresh** – to update the current screen
      • **Submit** – to apply the changes made to the screen

Configuring Network Settings

This page shows the current network configuration of the library and allows modification to the configuration. When a change is requested, a pop-up box confirms the request.

   1. Click **Configure Library > Network** in the left navigation pane, to display the Network page.

IMPORTANT: Do not click the Submit button until all changes have been made to the Network page. Once the Submit button has been clicked, no other changes can be made until after the library has applied the current changes. After the Submit button has been clicked, depending on the changes made, you will either be disconnected and need to login again or reboot the library. Clicking the Refresh button will refresh the page and any changes made will not be retained.

2. Choose your **general** network settings:

    • Select a **Protocol Stack** – Choose IPv4 only, IPv6 only, or Dual Stack IPv4 & IPv6.

      If you choose Dual Stack IPv4 & IPv6, you must be prepared to enter both IPv4 and IPv6 IP addresses. The sections below will gray out depending on the choices made here.

    • Enter the **Host Name**.

    • Enter the **Domain Name**.

    • **DNS Primary** – Enter the IP address of your primary DNS server.

    • **DNS Secondary** – Enter the IP address of your secondary DNS server.

    • **Enable SSL for Web** – If you desire to have SSL (Secure Sockets Layer) enabled, place a check in this box.

      NOTE: If you get a security certificate alert when logging in to the Web User Interface, you can install the certificate or allow an exception (depending on the internet browser you are using). SSL is enabled when the URL begins with https:// and some browsers will show a lock.

    • **Ethernet Settings** – Ethernet Settings choices are: Auto (the default), 10 Mbit/Half, 10 Mbit/Full, 100 Mbit/Half, 100 Mbit/Full.

3. Enter **IPv4** settings (if applicable).

    • **Enable DHCP** – Click this item ON to have the IP Address of your library automatically set by the DHCP server.

    • **Static Address** – Enter the assigned IPv4 address. The format of an IPv4 IP address is a 32-bit numeric address written as four numbers separated by periods.

- **Network Mask** – Enter the assigned IPv4 Network Mask.
- **Gateway address** – Enter the assigned IPv4 Gateway address. This address allows access outside the local network.

4. Enter **IPv6** settings (if applicable).

- **Enable DHCP** – Click this item ON to have the IP Address of your library automatically set by the DHCP server.
- **Enable Stateless Auto Config** – Click this item ON to have the IP Address of your library automatically set by the network router.
- **Static Address** – Enter the assigned IPv6 address. The format of an IPv6 IP address is a 128-bit numeric address written as 8 groups of four numbers separated by colons.
- **Prefix length** – The default prefix length is set to 64, but can be set to any length, depending upon the address used.
- **Gateway address** – Enter the assigned IPv6 Gateway address. This address allows access outside the local network.

5. Click one of the following:

- **Refresh** – to cancel the changes made to the screen.
- **Submit** – to apply the changes made to the screen.

NOTE: Depending on the changes made, you will either be disconnected and need to login again, or reboot the library. If a reboot is required, a Warning message will appear after the Submit button is clicked. The library must be rebooted or the changes will not take place.

Configuring User Access

The User Access page is only accessible to the Admin and Service login. Access is denied to User and Superuser logins.

- The Admin login has access to all library functions except **Service Library > Advance Diagnostics**.
- The Service login has access to all library functions including **Service Library > Advance Diagnostics**.

To configure access:

1. Click **Configure Library > User Access** in the left navigation pane.

2. Check the **Disable Superuser** box to disable the Superuser role for this library. Check the **Disable User** box to disable the User role for this library. Uncheck these boxes to allow these roles access to your library.

3. Choose a **Role**.

> NOTE: Admin can select User, Superuser, and Admin roles. Service can select User, Superuser, Admin, and Service roles.

- User (if enabled)
- Superuser (if enabled)
- Admin
- Service

> NOTE: Only one password can be set for each Role.

4. Enter the **New Password** (up to 10 alphanumeric characters).

5. In **Repeat Password**, enter the new password again.

6. In **Support Name**, enter the name of the person that will be able to offer the user help with the library.

> NOTE: Only one support person can be configured for the entire tape library. The support person may or may not be one of the user, superuser, or admin account holders.

7. In **Support Phone**, enter the phone number of the person that will be able to offer the user help with the library.

8. In **Support Email**, enter the email address of the person that will be able to offer the user help with the library.

9. Click one of the following:
- **Refresh** – to cancel the changes made to the screen.
- **Submit** – to apply the changes made to the screen.

Configuring Date and Time Settings

1. Click **Configure Library > Date & Time** in the left navigation pane.

2. Enter the current **Time** using the HH:MM:SS 24-hour format.

3. Enter the current **Date** using the MMDDYYYY format.

4. Click one of the following:
- **Refresh** – to cancel the changes made to the screen.
- **Submit** – to apply the changes made to the screen.

Configuring Logs and Traces

> NOTE: This function is not available on the Operator Control Panel.

1. Click **Configure Library > Logs & Traces** in the left navigation pane.

2. For Error Log Mode, select **Continuous** so all information for logs and traces will be captured.

3. **Trace Level** and **Trace Filter** options can be changed by Service personnel only.

4. Click one of the following:
   • **Refresh** – to cancel the changes made to the screen.
   • **Submit** – to apply the changes made to the screen.

Configuring Email Notifications

NOTE: This function is not available on the Operator Control Panel.

Use this menu item to set up email notification of library errors and warnings.

1. Click **Configure Library > Email Notification** in the left navigation pane.

2. If you would like to be notified when an error occurs, select **Notify Errors**.

3. If you would like to be notified when a warning occurs, select **Notify Warnings**.

4. In To Email Address, enter the **email address** to which the information will be sent.

5. In SMTP Server Address (IPv4 or IPv6), enter the **IP Address** of the SMTP server associated with the email address.

6. Enter the **Domain Name** for your library. This field cannot be blank when using event notification.

   NOTE: If you attempt to enter a blank value for the Domain Name, a warning message will appear. It will say If you are using Event Notification then a value is required for the Domain Name.

7. Click one of the following:
   • **Refresh** – to cancel the changes made to the screen.
   • **Submit** – to apply the changes made to the screen.

Configuring SMNP Settings

This page shows the current SNMP configuration of the library and allows modification to the configuration. When a change is requested, a pop-up box checks to confirm the changes.

1. Click **SNMP** in the left navigation pane, to display the SNMP page.

2. Enter SNMP **settings**:

   - **Enabled** – Check this box to have SNMP traps sent to a SNMP Management consoles.
   - **Target 1-IP Address** – If SNMP traps are enabled, enter an IP address where SNMP traps are to be sent.
   - **Target 2-IP Address** – Enter an optional 2nd IP address where SNMP traps are to be sent, or leave as 0.0.0.0.
   - **Target 3-IP Address** – Enter an optional 3rd IP address where SNMP traps are to be sent, or leave as 0.0.0.0.
   - **Version** – The library offers three versions of the SNMP protocol; v1, v2 and v3. Select a version for each Target IP Address.
   - **Community Name** – An SNMP community name is a text string that acts as a password to authenticate messages sent between the SNMP remote management application and the library. Enter your preferred name, or leave as public.
   - **Audit Logging** – If SNMP is enabled and Audit Logging is enabled, the library will send SNMP traps to an SNMP Management consoles when the library or tape drive configuration has changed.

   NOTE: This option is only available if the library firmware is 9.00 or higher, and the latest library MIB file has been added to the SNMP Management console.

3. Click **one** of the following:

   - **Refresh** – to cancel the changes made to the screen.
   - **Submit** – to apply the changes made to the screen.

Restoring Factory Default Settings

If you would like to erase your current configuration and restore factory default settings, do so by selecting **Restore Factory Defaults** in the **Configure Library > Save/Restore** menu. See the factory default settings are listed in "Configuring Save/Restore Settings" on page 4-25.

Logging Out

To log out of the Web User Interface, click Logout in the upper right corner of the current screen.

NOTE: If you click the X in the upper right corner of your internet browser window, you will not log out of the Web User Interface.

Configuring Your Library – Operator Control Panel

To configure your library using the Operator Panel, complete these procedures.

Topics in Configuring Your Library – Operator Control Panel:

- Logging in to the Operator Control Panel
- Configuring Logical Libraries
- Configuring Library Settings
- Configuring Drives
- Configuring Network Settings
- Configuring the Access PIN
- Configuring Save/Restore Settings
- Configuring Date and Time

Logging in to the Operator Control Panel

To change the default network settings using the Operator Control Panel, log in using the following procedure:

1. When the library is initialized, press the **SELECT** key to move to the Password screen.

2. Enter **0000**, the default PIN. The top menu screen appears.

3. When finished using the Operator Control Panel, press **CANCEL** to return to the top menu screen.

4. When finished, press the **DOWN** key to select Logout, and press **SELECT**.

Configuring Logical Libraries

Use this menu item to select the number of logical libraries.

NOTE: The **Currently Configured–x** section shows the number of logical libraries currently configured.

NEO 400s Only
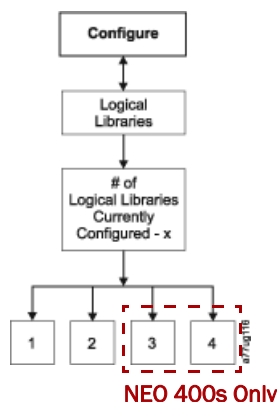
NOTE: The maximum number of Logical Libraries in a 2U is two. This menu is only available on libraries with two or more drives.

Configuring Library Settings

The following library configuration items are in this menu:
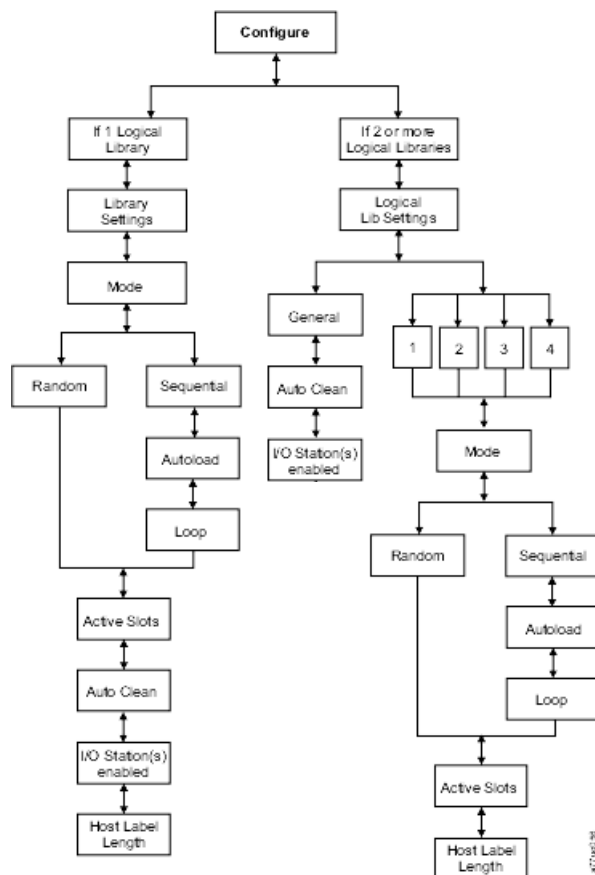
- **Mode** options:
  - **Random** – In random mode, the library allows the server's (host's) application software to select any data cartridge in any order.
  - **Sequential** – In sequential mode, the library's firmware predefines the selection of the cartridges. After initialization, the firmware causes the library to select the first available cartridge found (counting from the Mail Slots through slot 23) for loading into the drive.

    IMPORTANT: If a Logical Library in Sequential Mode contains more than one drive, only the first drive in the Logical Library will be utilized.

  - **Autoload** – Sequential mode with autoload mode ON loads the first available cartridge (slot with the lowest numerical value that contains a cartridge) automatically if the library powers ON with an empty drive.
  - **Loop** – Sequential mode with loop mode ON loads the cartridge in the lowest numerical slot after the cartridge in the highest numerical slot has been filled and sent back to its home slot. This allows endless backup operations without user interaction.

- **Starting Sequential Mode** – If the Autoload option is set to ON (Configure > Library Settings > Autoload), the accessor will load the first cartridge (cartridge located in the slot with the lowest numeric value) found in the storage inventory area into the drive upon power ON of the library. If the library powers on with a cartridge already in the drive, sequential mode will start with that cartridge unless the host issues a rewind and unload command to the drive. In that case, the next cartridge in sequence will be loaded into the drive.

  If the Autoload Option if OFF, sequential mode must be started by selecting the Move Cartridges option (Control > Move Cartridges) to load the first cartridge (or any cartridge) into the drive. Whatever cartridge is loaded into the drive, that is where the sequence starts from. For example, if a cartridge from the fifth lowest numeric storage slot containing a cartridge is loaded using the Move Cartridges option, after the host issues a rewind/unload command, the next cartridge loaded will be the cartridge from the next higher numeric slot. Cartridges need not be in contiguous slots.

  If the Loop option is set to ON (Configure > Library Settings > > Loop), when the last cartridge (cartridge in the highest numeric slot) is unloaded and placed back into storage, the accessor will immediately start over again loading the first cartridge into the drive.

- **Stopping Sequential Mode** – To stop sequential mode, use the Move Cartridges option from the Control menu (Control > Move Cartridges) to unload the drive. the next sequential cartridge will NOT be loaded. To restart sequential mode, use the same Control menu command to load a cartridge. The loading sequence will resume from that numeric slot in the cartridge inventory.

- **Active Slots** – the number of active slots in each logical library.

  NOTE: Slots can be reserved so that they are invisible to the host. It may be necessary to set the number of Active Slots to match the number of slots that are available to the ISV software. Reserved slots are created by reducing the number of active slots.

- **Auto Clean** – Use this menu item to enable the Auto Clean function. All cleaning cartridges must have **CLNxxxLx** as part of the bar code. With Auto Clean disabled, the cleaning tape can be stored in any data slot if you wish to manually clean the drives. This is not recommended. With Auto Clean disabled, the cleaning tape can be stored in any data slot if it was put there under Backup Application control. In other words, the Backup Application is controlling the cleaning of the tape drives and the cleaning tape would be imported into this library under its control.

  NOTE: The universal cleaning cartridge has a bar code CLNUxxLx. This cleaning cartridge is used to clean all LTO generation tape drives.

For Auto Clean to function, the following criteria must be met:

- A storage slot must be reserved (*Res*) for the cleaning cartridge by reducing the active slot count by one.

- A cleaning cartridge (CLNxxxLx) must be placed or moved into the reserved slot.

- Auto Clean must be enabled.

  NOTE: Cleaning cartridges must be replaced after 50 cleanings. The Web User Interface inventory screen will show the number of times the media has been loaded, not the number of cleaning sessions remaining. Subtract this number from 50 to determine the number of cleanings remaining.

- **I/O Stations enabled** – The Mail Slots can be enabled (the default), or disabled so the stations can be utilized as storage slots.
- **Host Label Length** – The Host Label Length is related to the Bar Code Labels appearing on the media being used. The default value is 8, but 6 can also be chosen.

Configuring Drives
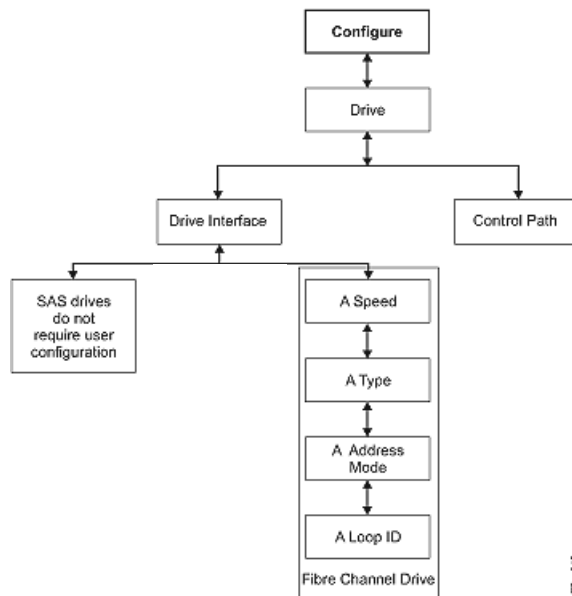
The following items are in this menu:

- **Drive Interface** – use this to assign a Port Speed, Port Type, and Loop ID to a Fibre Channel drive. SAS drives do not require user configuration. For more information on drive interfaces, refer to "Host Interfaces" on page 3-4.
- **Control Paths** – use this to enable the drive as a control path drive. Each logical library must have a control path drive.

Configuring Network Settings
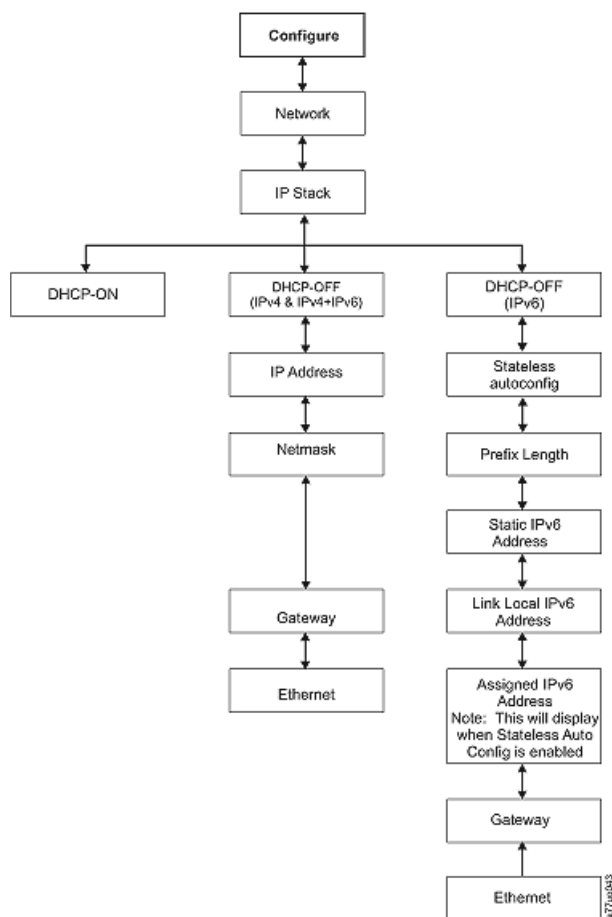
Use these menu items to change the current network settings which allow you to access the library remotely via a web browser.

- **IP Stack** – Choose IPv4 only, IPv6 only, or IPv4 & IPv6.
- **IPv6 Only** and **Dual Stack IPv4 & IPv6** – Choose Enable Stateless Auto Config Address (Web User Interface) or Stateless Autoconfig (Operator Control Panel) if assigned IPv6 IP addresses are desired. To view the assigned IPv6 addresses after enabling Stateless Auto Config Address, do the following:

  Operator Control Panel (IPv6 Only): Monitor > Library > Network

  NOTE: If you choose Dual Stack IPv4 & IPv6, you must be prepared to enter both IPv4 and IPv6 IP addresses.

- **DHCP** – (Dynamic Host Configuration Protocol) If this is enabled, your library host will negotiate the connection with the library. If DHCP is disabled, the following information is necessary to establish the remote access.
- **IP Address** – the IP address of the library
- **Netmask** – the Network Mask address of the library
- **IP Stack** – the IP Stack manages static IP addresses
- **Stateless Autoconfig** – allows IPv6 hosts to be configured automatically when connected to a routed IPv6 network
- **Prefix length** – the length of the IP address prefix

- **Static IPv6 address** – a static IPv6 address that has been assigned to the library
- **Link Local IPv6 address** – an IPv6 address having link-only scope that can be used to reach neighboring nodes attached to the same link
- **Assigned IPv6 addres**s – an IPv6 address assigned by a router
- **Gateway** – the Gateway address of the library
- **Ethernet** – the current speed setting of the Ethernet interface
- **DNS Server 1** – the first DNS server address
- **DNS Server 2** – the second DNS server address

NOTE: If a host and domain name are entered instead of an address, the IPv4 or IPv6 address will be resolved from the DNS using that name. That address will be stored in the library rather than the name. Therefore, if the address changes, the name or a new address will have to be entered.

Configuring the Access PIN

Use this menu item to enable/disable, set or change the Access PIN (personal identification number) which is used to restrict access to the Control, Configure, and Service menus.
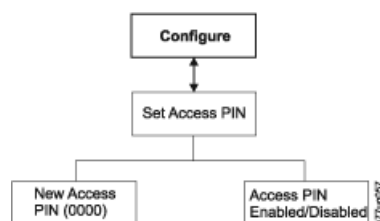
NOTE: Record the Access PIN and store this in a secure location for future reference. Library configuration files, saved with the Save Library Config menu, do not include the Access PIN.

1. Navigate to **Configure > Set Access PIN**.
2. Press the **SELECT** button to highlight the first digit of the 4-digit Access PIN.
3. Use the UP and DOWN buttons to select **each digit**.
4. Press the **SELECT** button to move to the next digit.
5. Repeat these steps for repeating the **Access PIN**.
6. After entering the final digit, press the DOWN button and select one of the following:
   - **Save** – to apply your settings.
   - **Cancel** – to delete your settings.

In the following figure, menus with the pound sign (#) are the only menus accessible when the Access PIN is enabled, but entered incorrectly or before it is entered. To gain access to all menus, disable the Access PIN or enter the correct PIN number when requested.
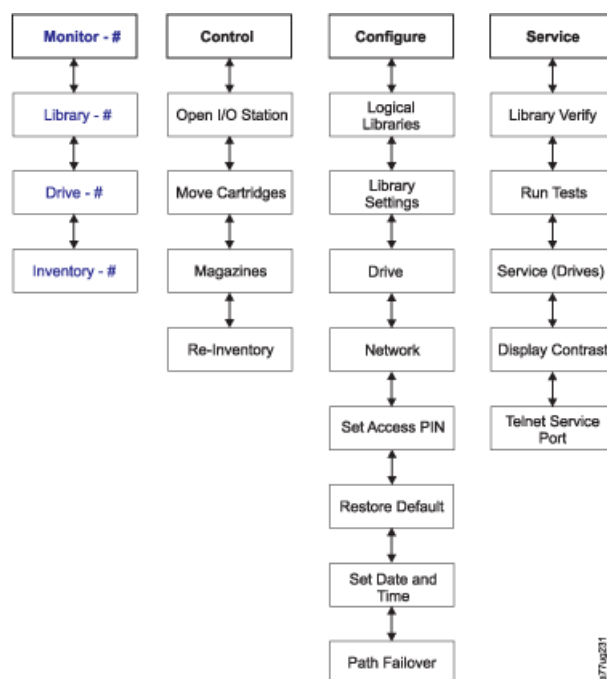
Configuring Save/Restore Settings

Use this menu item to restore a saved configuration or the factory default settings.
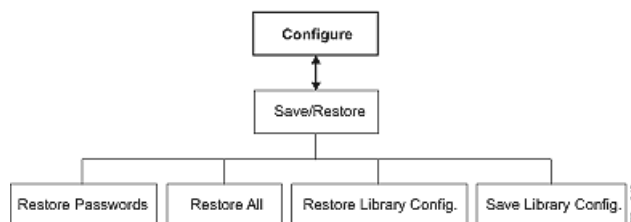
- **Restore Passwords** – This menu item restores the factory default RMU Admin user access password.

- **Restore All** – This menu item restores all factory default settings.

- **Restore Library Config** – This menu item restores your saved library configuration from a USB device. If you have more than one saved configuration file (.dbb) on your USB device, press Select, then use the up and down keys to move between the different files. When the correct configuration file is displayed, press Select again.

- **Save Library Config** – This menu item saves your library configuration to a USB device.

    NOTE: Ensure the USB device is formatted for FAT12, FAT16, or FAT32 and does not use autorun files.

Configuration files saved with one version of library firmware may not be compatible with other versions of firmware. It is recommended to save a configuration file each time the library firmware is upgraded. Restore the library using a configuration file that was saved with the same version of firmware currently installed in the library.

⚠️ **CAUTION:** Restoring factory defaults will wipe out all the previous configuration data.

Restored Item	Default Setting	Comments
Auto Clean	Disabled	
Logical Libraries	1	
Active Slots	Maximum number of slots in library minus Mail Slots	2U library has one Mail Slot and the 4U library has three Mail Slots.
Mail Slots (I/O Station)	Enabled	2U library has one Mail Slot and the 4U library has three Mail Slots.
Ethernet Setting	Auto	
DHCP	Enabled	**NOTE:** DNS server addresses, if available, will be automatically assigned. If the DHCP server does not find any DNS server, the DNS fields will be set to 0.0.0.0.
Network IP Mode	IPv4 Only	
Bar Code Label Length Reported to Host	8	
SNMP	Disabled	
Email Notifications	Disabled	
User Access		Restore from Operator Control Panel or Web User Interface
Admin	secure	(default)
Library Mode	Random	
Library Name	(Blank)	
Host Name		(Depends on MAC Address)
Logs & Traces Error Log Mode	Continuous	
OCP Access PIN	Disabled	If OCP Access PIN has been enabled the default PIN is **0000**. **NOTE:** The initial Factory Default setting is disabled. If the OCP Access PIN setting is changed, executing Restore Defaults will not change the setting.
SSL for Web	Disabled	
Drives		
Power	Power On	(All drives)
Control Path Drive	Drive 1 only	
Speed	Auto	FC Drives (all)
Topology	LN-Port	FC Drives (all)
IPv6 Stateless Autoconfig	Enabled	

In some cases, (such as Library Mode), the entry of one option precludes any other options from being selected. In such cases, the details of the non-applicable options are not shown.

Configuring Date and Time

Use this menu item to set the current date and time in your library.
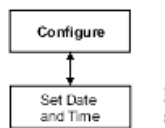
Preparing the Host

Follow these general guidelines:

- Make sure that your backup application supports the SAS or Fibre Channel Host Bus Adapter (HBA).
- If the host server is connected to a network, check with the system administrator before turning host power OFF.

Verifying the Connection

1. Confirm that the host server operating system recognized the library. In Microsoft Windows XP, Windows Server 2003, or in Windows 2000 you can verify this by going to: **Settings > Control Panel > System > Hardware > Device Manager > Tape Drive and/or Medium Changer**.

2. When the host server is powered ON, after the host server detects the drives and library, install the software and/or drivers that are compatible with the library. Backup software packages may require additional software or licensing to communicate with the library.

Cartridge Magazines

The library has removable magazines. Magazine access is password protected. For safety reasons, the accessor motion is stopped when a magazine is removed.

The magazines can be released using the Operator Control Panel or the Web User Interface. In case the Operator Control Panel or Web User Interface initiated process has failed or the library no longer has power, a manual emergency release is available.

NOTE: To manually release a magazine, see "Releasing the Magazines Manually" on page 9-1. This manual process should only be used if the magazine cannot be released using the Operator Control Panel or the Web User Interface.

2U Library Cartridge Magazines

The 2U library has two cartridge magazines. The left cartridge magazine has eleven storage slots and houses the elective one-slot Mail Slot. The right magazine has twelve storage slots. For information about element addressing and slot numbering, see Appendix B, "Physical Configurations."

2U library left magazine:
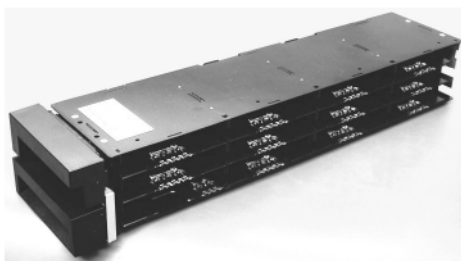
2U library right magazine:

2U Library Mail Slot (I/O Station)

The Mail Slot in a 2U library is part of the left magazine. To open the Mail Slot, select **Control > Open I/O Station**. The Mail Slot will pop open. To close the Mail Slot, gently push it back into the left magazine.

Mail Slot in the left magazine:
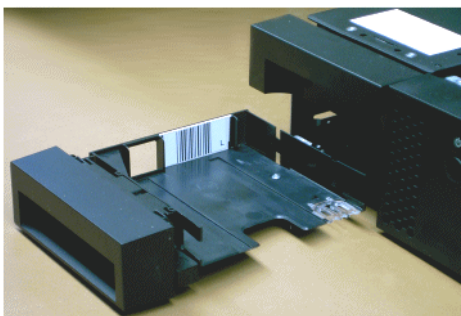
4U Library Cartridge Magazines

The 4U library has four cartridge magazines, two on each side. The upper-left magazine has twelve storage slots. The lower-left magazine has nine storage slots and houses the elective 3-cartridge Mail Slot. The upper-right and lower-right magazines each have twelve storage slots. For information on element addressing and slot numbering, see Appendix B, "Physical Configurations."

4U library left magazines:
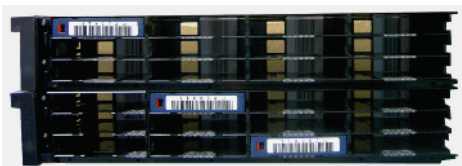
4U library right magazines:

4U Library Mail Slots (I/O Station)

The Mail Slots in a 4U library are part of the lower left magazine. To open the Mail Slots, select **Control > Open I/O Station**. The Mail Slots will pop open. To close the Mail Slots, gently push it back into the lower left magazine.

There are finger holes (**5**) on the back side of the Mail Slots that allow the user to push the cartridges out of the Mail Slots.
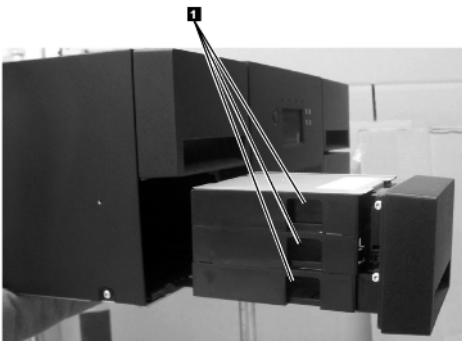
Populating the Library with Data Cartridges

> **NOTE:** Cartridges placed in the library must be labeled with the correct bar code labels. For additional information, see Chapter 6, "Media."

For information on working with the cartridge magazines, see "Cartridge Magazines" on page 4-27.

1. Properly **label** the data cartridges.

2. Unlock the **cartridge magazines**.
   - Using the **Operator Control Panel: Control > Magazines**, select Left or Right.
   - Using the **Web User Interface: Manage Library > Release Magazine**, select Left or Right.

   > **NOTE:** The magazines will relock after 15 seconds if they have not been removed.

3. Remove the selected magazines from the **library**.

4. Insert **cartridges** in the magazines.

   Do not store cartridges in the Mail Slot or in the reserved (*Res*) cleaning cartridge slot. For information on determining slot locations, see Appendix B, "Physical Configurations."

5. Put **magazines** back into the library.

   The library will automatically start up and perform an inventory check.

Inserting the Cleaning Cartridge

> **NOTE:** Cleaning cartridges placed in the library must be labeled with the correct bar code labels. For additional information, see Chapter 6, "Media."

The following criteria must be followed for Auto Clean to function:

1. A storage slot must be **reserved** (*Res*).

   Reserving a slot is accomplished by reducing the Active Slot count in any particular logical library. A reserved slot (or slots) is always the last slot in the last magazine of any particular logical library. A cleaning cartridge that is in a reserved slot is available to any logical library drive even if the reserved slot is not in that particular logical library. If the library contains multiple logical libraries, typically, the last logical library is chosen to be the reserved slot containing the cleaning cartridge. As with a library with a single logical library, this slot is the last physical slot in the library (top right magazine, uppermost rear slot).

2. The Auto Clean function must be **Enabled**.
   - At the Operator Control Panel, select **Configure > Library Settings > Auto Clean: Enabled**
   - At the Web User Interface, select **Configure Library > General** and check the **Auto Clean Enabled** box.

   > **NOTE:** Enabling Auto Clean without first reserving a slot for the cleaning cartridge will result in a message reminding you to reserve a slot and load a cleaning cartridge.

3. To install a **cleaning cartridge** in the 2U or 4U library:

    a. Properly **label** the cleaning cartridge (CLNxxxLx).

    b. Place the cleaning cartridge in the library using the same procedure described in "Populating the Library with Data Cartridges" on page 4-30. Ensure the cleaning cartridge is placed in a reserved slot (*Res*).

    c. If the cleaning cartridge is not in a **reserved slot**, use the Operator Control Panel: **Control > Move Cartridge** or the Web User Interface: **Manage Library > Move Media** to move the cleaning cartridge into the reserved slot.

4. Replace the **cleaning cartridge**, if needed.

- A cleaning cartridge must be replaced after 50 uses. To determine the number of cleaning uses remaining, in the Web User Interface, select **Monitor Library > Inventory**.

- Click the plus sign (+) located under that magazine presentation to expand the detail of resident cartridges.

- Cleaning cartridges are labeled as CLNxxxLx. Observe the information displayed for the slots containing a cleaning cartridge. The number of Media Loads represent how many times the cleaning cartridge has been used. The number 50, minus that Media Load number represents the number of uses remaining.

Registering for Support Notification

Support Notification registration provides email notification when new firmware levels have been updated and are available for download and installation. Refer to Step 1 of the *NEO 200s/400s Library Quick Start Guide* for the registration process.

> **IMPORTANT:** Library firmware and tape drive firmware are verified and released together. When updating to the latest firmware, verify that all installed components such as the tape drive and library are at the latest levels noted on the Support website. Mixing different levels of library and tape drive firmware is not supported and may cause unpredictable results.

Overland Storage recommends that you update library and drive firmware when new levels become available. For instructions on updating library and drive firmware, see the Technical Bulletin available with the firmware on the Support website.

You are now ready to use your library.

Operations

To install and configure a NEO 200s/400s library, perform the procedures in this chapter in the order they are presented.

Topics in Operations:

- Operator Control Panel Navigation
- Operator Control Panel Menus
- Web User Interface Menus
- Import and Export Media during Normal Library Operation
- Configuring Mail Slots and Reserving Slots

Operator Control Panel Navigation

The four Control Keys (buttons) on the front of a NEO S-series library enable the user to navigate through the library settings and make changes as needed to configure the library.
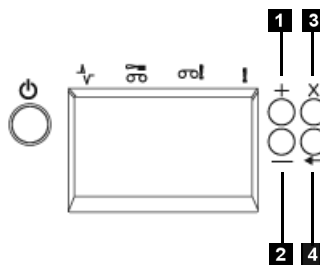
Operator Control Panel components:

Number	Component	Description
1	UP (+)	Button used to navigate upward (^) through the menu items.
2	DOWN (−)	Button used to navigate downward (v) through the menu items.
3	CANCEL (X)	Button used to cancel a user action and return to the last menu item.
4	SELECT (↵)	Button used to display a submenu or to select a user action.

Press the UP (**1**) or DOWN (**2**) buttons to enter Interaction Mode. The Main Selection Menu appears. The Main Selection screen shows Monitor, Control, Configure, and Service.

Scroll to your selection, then press the SELECT (**4**) button. The sub-menu for the selected menu item appears.

Use the UP (**1**) or DOWN (**2**) and SELECT (**4**) buttons to scroll until you get to the area/screen to be configured.

Use the CANCEL (**3**) button to move back up through the menu selections.

Operator Control Panel Menus

The Operator Control Panel main menu is made up of the following items:

- Monitor Menu
- Control Menu
- Configure Menu
- Service Menu

The table below shows each main menu item and the associated sub menu items.
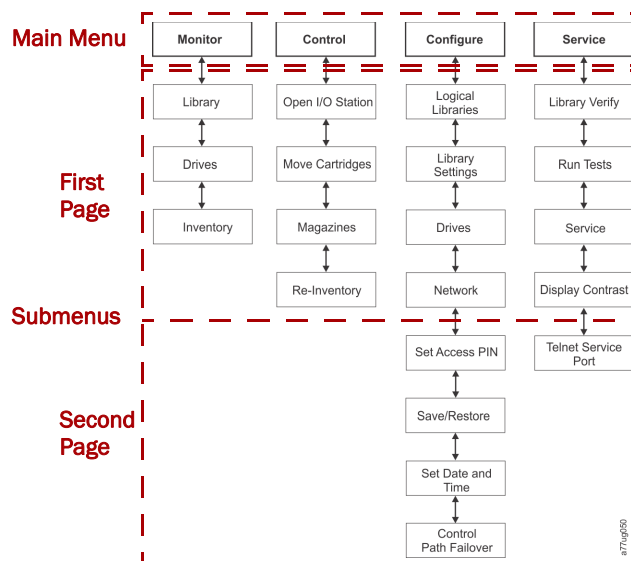
NOTE: Depending on the version of library firmware, there may be differences between the Menu Tree description in this document and the OCP Menu Tree on your library.

Monitor Menu

The Monitor menu contains information about the following sub menu items:

- Library
- Drive
- Inventory

Monitor: Library

This menu item displays current library information and settings.
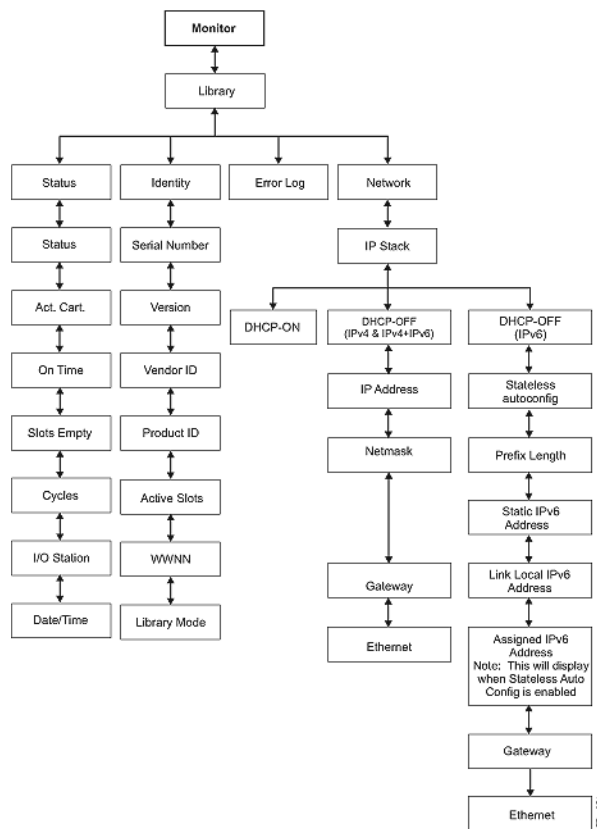
Under **Monitor > Library** are the following items:

- Status
- Identity
- Error Log
- Network

Under **Monitor > Library > Status** are the following items:

- **Status** – current status of the library
- **Act. Cart** – the serial number of the cartridge currently active in the library
- **On Time** – the amount of time the library has been powered ON
- **Slots Empty** – the number of empty slots in the library/total number of active slots in the library
- **Cycles** – the total number of cartridge moves carried out by the library accessor
- **I/O Station** – indicates whether the Mail Slot is open or closed
- **Date/Time** – gives the current date and time set in the library

Under **Monitor > Library > Identity** are the following items:

- **Serial Number** – the serial number of the library
- **Version** – the current level of library firmware installed
- **Vendor ID** – IBM

- **Product ID** – library inquiry string
- **Active Slots** – number of active slots in each logical library
- **WWNN** – World Wide Node Name of the library
- **Library Mode** – current library mode (Random or Sequential)

Under **Monitor > Library > Error Log**, you will have a list of errors logged by the library. The errors will be displayed beginning with the most recent error.

Under **Monitor > Library > Network** are the following items:

- **IP Stack** – the internet protocol currently being used by the library
- **DHCP** (Dynamic Host Configuration Protocol) – records whether DHCP is ON or OFF
- **IP Addresses** – the internet addresses of the library
- **Netmask** – the Network Mask Address of the library
- **Gateway** – the Gateway Address of the library
- **Ethernet** – the speed of the Ethernet interface
- **Stateless Auto Configuration** – indicates whether or not stateless auto configuration is enabled
- **Prefix Length** – the length of the IP Address prefix
- **Static IPv6 Address** – the static IPv6 address of the library
- **Link Local IPv6 Address** – local link-only IPv6 address of the library
- **Router Assigned IPv6 Address** – IPv6 address(es) discovered by the network router

Monitor: Drive

This menu item displays drive information and settings.
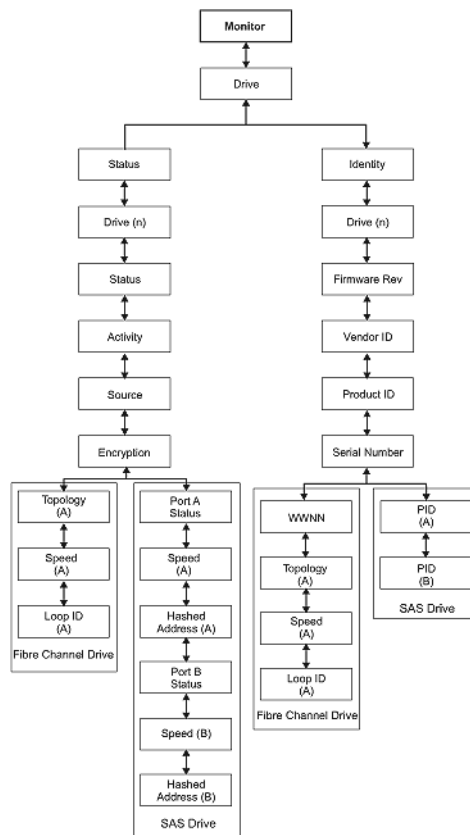
Under **Status > Drive (n)** are the following items:

- **Status** – the current status of the drive
- **Activity** – the current action being performed by the drive
- **Source** – the serial number of the cartridge currently in the drive
- **Topology** – the topology chosen for a fibre library (see "Fibre Channel Interface" on page 3-4)
- **Speed** – indicates the speed of the fibre channel (fibre library)
- **Link** – indicates the status of the fibre channel (fibre library)
- **Hashed Address** – an address calculated from the WWID

Under **Identity > Drive (n)** are the following items:

- **Firmware Rev** – the current level of drive firmware
- **Vendor ID** – Overland
- **Product ID** – drive inquiry string
- **Serial Number** – the drive serial number
- **WWNN** – the fibre channel drive's World Wide Node Name
- **Topology** – the topology chosen for the fibre channel drive
- **Speed** – indicates the speed of the fibre channel tape drive
- **Loop ID** – unique identifier assigned to a fibre channel tape drive

- **PID** – port identification (SAS only)

Monitor: Inventory

This menu item displays the current library inventory options. These are the options of a 4U library:
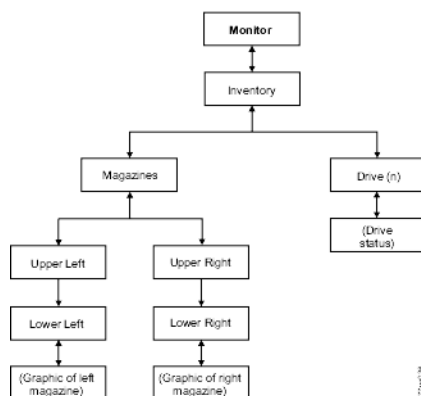
NOTE: 2U library has a single magazine on the left and right sides.

Under Magazines, select a magazine to see a graphical representation of the cartridges in the magazine. Slots containing cartridges are highlighted.

The black boxes are inventoried cartridges. Press the UP (+) and DOWN (–) buttons to scroll. Mail Slots can be changed to storage slots if needed. See "Configuring Mail Slots and Reserving Slots" on page 5-32.
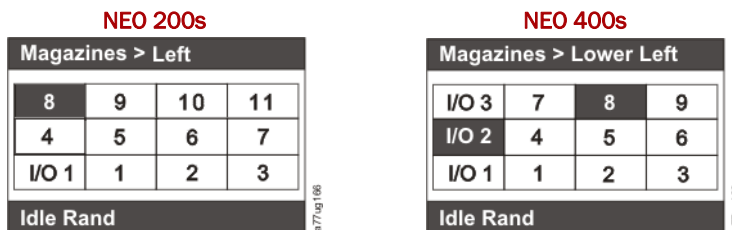
NOTE: Left magazine of a 2U Library has a 1-slot Mail Slot (I/O Station) while the bottom-left magazine of a 4U library has a 3-slot Mail Slot (I/O Station).

Press SELECT (↵) to display all empty slots and cartridge serial numbers in the associated magazine as a list.
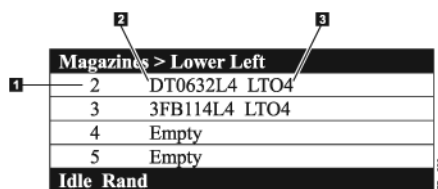
1 Magazine slot number

2 Cartridge volume serial number or **Empty** (meaning no cartridge currently in the slot)

3 Media type (generation of cartridge)

Control Menu

The Control Menu contains the following items:

- Open I/O Station (Mail Slot)
- Move Cartridges
- Magazine
- Re-Inventory

Control: Open I/O Station (Mail Slot)

Use this menu item to open the Mail Slot.
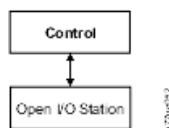
> **NOTE:** After closing the Mail Slot, you must wait for the library to complete its inventory before proceeding with normal library operations.

Control: Move Cartridges

Use this menu item to move cartridges in the library.
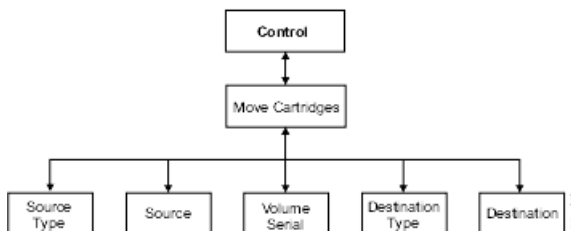
To move a cartridge from point A to point B, you must make the following choices:

- **Source Typ**e – Drive, Mail Slot, or magazine. Only the source types that contain cartridges will be listed.
- **Source** – The choices start with the choice made in the preceding item and then advances through all available choices.

  > **NOTE:** If the Attention LED is ON due to a suspect cartridge, that cartridge will be identified by an exclamation point (!) when scrolling through the source cartridges.

- **Volume Serial** – The bar code number of the cartridge
- **Destination Type** – The destination Drive, Mail Slot, or magazine
- **Destination** – The choices start with the choice made in the preceding item and then advances through all available choices.

Control: Magazine

Use this menu item to unlock the cartridge magazines.

Choose **Left** or **Right** to unlock the corresponding cartridge magazines. The magazines can now be removed from the library by gently pulling each magazine out of the library. To replace a magazine, insert the back of the magazine into the front of the library and gently push the magazine into the library. The magazine will lock when inserted into the library.

> NOTE: After inserting the magazines into the library, you must wait for the library to complete its inventory before proceeding with normal library operations.

If the magazines are not pulled out of the library within 15 seconds after they are unlocked, the command will cancel and you will have to repeat the process to unlock the magazines.

Control: Re-Inventory

Use this menu item to initiate a scan of the cartridges currently in the library.
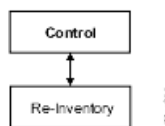
> NOTE: It may take up to five minutes to complete the library inventory.

Configure Menu

If you choose to use the Operator Control Panel for configuring your library, go to "Configuring Your Library – Operator Control Panel" on page 4-19 for information on configuring the following items:

- Logical Libraries
- Library Settings
- Drives
- Network
- Set Access PIN
- Set Date and Time

Service Menu

> IMPORTANT: These options are for use only by Authorized Overland Technical Support representatives.

The 2U/4U library is always online, except for when the user enters the Service Library area. A warning message appears stating that the library should be taken offline from the host before performing any Service functions. It is up to the operator to ensure that it is

taken offline by phoning the host operator or other means of communication. Before performing any service functions, ensure the host is not performing any data writing or retrieval.

The Service Menu contains the following items:

- **Library Verify** – an overall library diagnostic
- **Run Tests** – other library diagnostics
- **Service** – diagnostics and procedures for servicing the drive
- **Display Contrast** – setting the display from light to dark
- **Telnet Service Port** – technical support use only

Service: Library Verify

This is an overall diagnostic that exercises all library components. To run the Library Verify test, complete the following procedure.
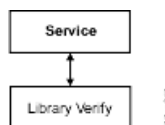
1. On the Operator Control Panel, navigate to **Service > Library Verify** and start diagnostic.

    a. Push SELECT to highlight the drive field. Use UP and DOWN to select the drive. Push SELECT to complete the selection.

    b. Push DOWN to highlight **Run**.

    c. Push SELECT to execute Library Verify.

2. When prompted by the Operator Control Panel display and the Mail Slot opens, insert a blank or scratch data cartridge.

3. Close the Mail Slot by pushing it back into the library.

4. While the test is running, the Operator Control Panel will display library status.

    - If the test **PASSES**, resume normal library operations.
    - If the test **FAILS**, an error code will be displayed. Make note of the error, then refer to Chapter 7, "Troubleshooting."

5. When prompted by the Operator Control Panel display and the Mail Slot opens, remove the cartridge used in the test.

6. Close the Mail Slot by pushing it back into the library.

7. Use UP and DOWN to highlight **Cancel**. Press SELECT to exit Library Verify.

Service: Run Tests
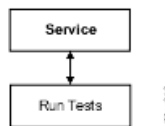
The following library diagnostics are available in this menu:

- **System Test** – this test exercises library components by moving customer data cartridges from slots to drives and back to slots. No data is written or read from the customer tapes. To run this test successfully, the library must contain at least one data cartridge for every drive present in the library.

- **Slot to Slot Test** – The Slot To Slot test moves each resident data cartridge from one slot to another, for each test cycle requested. When completing the Slot To Slot test, you need to inventory your library before placing it back online, since this test scrambles the cartridge slot locations.

  NOTE: After running the System Test or the Slot to Slot Test, the library will need to be re-inventoried.

Service: Service (*Drives*)
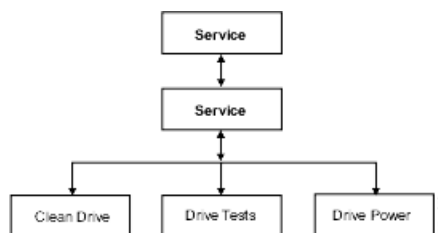
The following drive diagnostics and service procedures are available in this menu:

- **Clean Drive** – The accessor takes the cleaning cartridge from the previously reserved slot (*Res*) and inserts it into the drive. After the cleaning is complete, the accessor removes the cleaning cartridge from the drive and returns it to the reserved slot.

- **Drive Tests** – Includes Power On Self Test (POST), Wrap Test, Normal Read/Write Test, Head Test, and Media Test.

  NOTE: The Operator Control Panel will display **Wrap Test** for libraries containing Fibre Channel tape drives. **Wrap A Test** and **Wrap B Test** will be displayed for libraries containing SAS tape drives. Run only **Wrap A Test** on SAS half-height tape drives as they only have one SAS port.

- **Drive Power** – use this item to turn drive power ON and OFF.

To run the **Drive Tests**:

1. Navigate to the desired **test** (**Service > Service > Drive Tests**). Choose the drive if more than one is installed.

2. If required by the instructions displayed on the Operator Control Panel, insert a **blank or scratch cartridge** into the Mail Slot when requested. All wrap tests require a wrap tool to perform the diagnostic.

3. Follow the instructions to **execute the test**.
   - If the test PASSES, resume normal library operations.
   - If the test FAILS, an error will be displayed. Make note of the error, then refer to "Isolating Drive Sled Problems" on page 7-9.

4. Remove the **cartridge** from the Mail Slot, if needed, then close the Mail Slot.

5. Press **CANCEL** (X) to exit the screen.

Service: Display Contrast
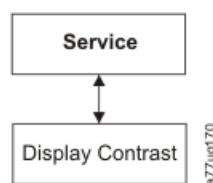
The display contrast settings (1 through 10 with 1 being the brightest) are available in this menu. Use the UP and DOWN buttons to select a new setting.

Service: Telnet Service Port

The Telnet Service Port menu item is to be used under the direction of the Overland Storage Support Center.

Web User Interface Menus

NOTE: Depending on the version of library firmware, there may be differences between the Menu description in this document and the web user interface menus on your library.

The following menus are available on the Web User Interface:

Main Menu	Sub-Menus	
Monitor Library Menu	• Library Identity • Drives Identity • Library Status	• Drives Status • Inventory
Manage Library Menu	• Move Media • Perform Inventory	• Release Magazine
Configure Library Menu	• General • Logical Libraries • Drives • Network	• User Access • Date & Time • Logs & Traces • Email Notification • SNMP • Save/Restore
Service Library Menu	• Clean Drive • Advanced Diagnostics (for Service Personnel only) • View Logs • View Drive Logs	• Save Drive Dump • Perform Diagnostics • Key Path Diagnostics • Upgrade Firmware • Reboot

Monitor Library Menu

The Monitor Library menu contains the following sub-menu items.

• Monitor Library: Library Identity

• Monitor Library: Drive Identity

• Monitor Library: Library Status

• Monitor Library: Drive Status

- Monitor Library: Inventory

Monitor Library: Library Identity

This page provides access to the static information about the library. No changes can be made from this page.

NOTE: This view is correct for a library with multiple logical partitions. The Library Identify screen will be different for a library with a single logical partition.

The following table lists all available elements on the Library Identity page. An X indicates that the element displays the item for the specified library type.

Menu Item	Description	2U	4U
Serial Number	This is the unique identification number assigned by the manufacturer.	X	X
Product ID	This is the SCSI inquiry string of the library	X	X
Currently Installed Library Firmware	This is the current level of firmware installed on the library. To ensure you are running the latest version of firmware, visit http://docs.overlandstorage.com/neo. For information on updating your firmware, refer to "Service Library: Upgrade Firmware" on page 5-29.	X	X
Boot Code Firmware Revision	This is the level of boot code firmware currently installed on the library. Boot code is the firmware that allows the library to begin initialization when it is powered ON.	X	X
Bar Code Reader	This is the version of bar code reader in the library.	X	X
IPv4 Address	This is the Internet Protocol v4 Address assigned to your library.	X	X
Link local IPv6 address	This is the local IPv6 address assigned to your library.	X	X
IPv6 static assigned address	This is your library's IPv6 static assigned address.	X	X
Router discovery IPv6 address	This is the IPv6 router discovery address assigned to your library.	X	X
MAC Address	This is the machine's access code assigned to your library.	X	X
WWide Node Name	This is the Worldwide Node Name assigned to your library.	X	X
Logical Library x Library Mode	The Extended Logical Libraries Information table displays information about the logical libraries currently assigned in your library. For each logical library in your library, either Random or Sequential Loop Autoload will be displayed.	X	X

Monitor Library: Drive Identity

This page provides the following detailed information about the drive. No changes can be made from this page. The displayed information will vary depending on the library model and drive type (SAS or Fibre Channel).

The following table lists all available elements on the Drive Identity page. An **X** indicates that the element displays for the specified drive type.

Menu Item	Description	Fibre	SAS
Vendor ID	This identifies the manufacturer of the tape drive.	X	X
Product ID	This is the SCSI inquiry string of the tape drive.	X	X
Serial Number	This is the unique identification number of the tape drive that was assigned by the manufacturer.	X	X
Firmware Revision	This is the current level of firmware installed on the drive. To ensure you are running the latest version of firmware, visit http://docs.overlandstorage.com/neo. For information on updating your firmware, refer to "Service Library: Upgrade Firmware" on page 5-29.	X	X
Element Address	This is the unique identifier assigned to the drive that allows the host to recognize and communicate with the drive.	X	X
Control Path Drive	If the drive communicates all messages from the host to the library, then it is considered the control path drive. If the drive is the control path drive, this element displays Yes. If not, this element displays No. All drives in a logical library may be a control path drive.	X	X
Data Compression	If the drive is compressing data, this element displays Yes. If not, this element displays No.	X	X
Interface Type	This identifies the drive host interface.	X	X
Node Name	This is the Worldwide node Name assigned to a Fibre drive.	X	
Worldwide ID	This is the Worldwide ID assigned to a SAS drive. (Ports A and B)		X
Port A	This provides information about Port A.	X	
Port Name	This is the name assigned to a Fibre channel port that is enabled.	X	
Topology	This is the type of connection to the host.	X	
FC-AL Loop ID	This is the Fibre Channel-Arbitrated Loop ID of the drive.	X	

Menu Item	Description	Fibre	SAS
Speed	This is the current speed setting of the drive. Choices are Auto (where the drive will automatically negotiate the speed of the drive to match that of the server), 1Gb/s, 2Gb/s or 4 Gb/s.	X	
Port B	This provides information about Port B.		X

Monitor Library: Library Status

This page displays the dynamic information about the library, such as the current status of the components. No changes can be made from this page.

The following table lists all available elements on the Library Identity page. An X indicates that the element displays for the specified library type.

Menu Item	Description	2U	4U
Status	Library status is displayed using icons with text. A check mark with the word **Ready** indicates the library is functioning properly. An exclamation point with the word **Caution** indicates the library can function, but is experiencing a problems. An X with the word **Error** indicates the library is not functioning because of a serious problem.	X	X
Cartridge in Transport	This identifies a cartridge that is currently being moved by the accessor. **None** is displayed if no cartridge is being moved.	X	X
Number of Moves	This is the number of times the accessor has moved a cartridge from Point A to Point B (for example, from a storage slot to a drive).	X	X
Total Power On Time	This is the total amount of time that the library has been powered ON.	X	X
Accessor Status	This is the current status of the accessor.	X	X

Menu Item	Description	2U	4U
Left Magazine	This displays whether the left magazine is **Present** or **Not Present**.	X	
Right Magazine	This displays whether the right magazine is **Present** or **Not Present**.	X	
1. Left Magazine	This displays whether the lower left magazine is **Present** or **Not Present**.		X
1. Right Magazine	This displays whether the lower right magazine is **Present** or **Not Present**.		X
2. Left Magazine	This displays whether the upper left magazine is **Present** or **Not Present**.		X
2. Right Magazine	This displays whether the upper right magazine is **Present** or **Not Present**.		X

Monitor Library: Drive Status

This page provides the following detailed dynamic information about the drive in the library. No changes can be made from this page. The displayed information will vary depending on the library model and drive type (SAS or Fibre Channel).

The following table lists all available elements on the Drive Status page. An X indicates that the element displays for the specified drive type.

Menu Item	Description	Fibre	SAS
Status	This is the current status of the drive. A check mark indicates that the drive is operating properly. An exclamation point indicates that the drive is operating but has a problem. An X indicates that the drive is not operational because of a serious problem.	X	X
Cartridge in Drive	This is the serial number of the cartridge currently in the drive. If the drive does not contain a cartridge, **None** is displayed.	X	X
Drive Error Code	If the drive has generated an error code, it is displayed here. If the drive has not generated an error, **No Error** will be displayed.	X	X
Cooling Fan Active	This displays whether the drive's cooling fan is ON (checked) or OFF.	X	X
Drive Activity	This indicates whether or not the drive is operating.	X	X
Port A Status	This indicates whether Port A is logged on or out.	X	

Menu Item	Description	Fibre	SAS
Port B Status	This indicates whether Port B is logged on or out.		X
Port Name	This is the name assigned to the Port on the drive.	X	
Speed	This is the current speed setting of the drive. Choices are Auto (where the drive will automatically negotiate the speed of the drive to match that of the server), 1Gb/s, 2Gb/s, 4Gb/s, or 8GB/s.	X	X
Topology	This is the type of connection to the host. N-Port ID	X	
Hashed SAS Address	The Hashed SAS address is a value which is calculated from the WWID for use on the SAS interface		X
FC-AL Loop ID	This is the loop position number if the drive is in an arbitrated loop configuration.	X	

Monitor Library: Inventory

This page provides detailed information about the tape inventory in the library. A summary of each magazine is shown. To get detailed information about the cartridges that reside in a magazine, click the + button. This will expand the display for the magazine. To determine whether a cartridge is encrypted, refer to the Comments column in the Cartridge Details screen.

Manage Library Menu

The Manage Library menu contains the following sub-menu items.

- Manage Library: Move Media
- Manage Library: Perform Inventory
- Manage Library: Release Magazine

Manage Library: Move Media

This page allows the user to move cartridges within the library. The source and destination are selected and then the MOVE button in the center of the screen is clicked to activate the move.
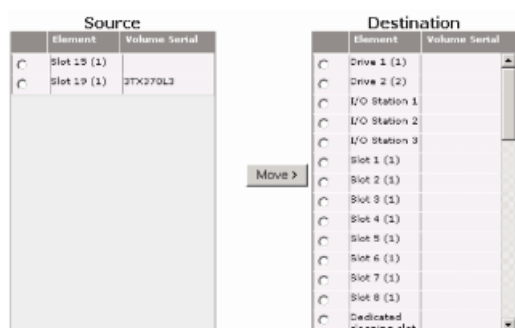
The following elements appear in the Source and Destination screens.

- **Element** – In the Source screen, this identifies the library element that contains a cartridge. In the Destination screen, this identifies the library element that is empty and can receive a cartridge.
- **Volume Serial** – In the Source screen, this element displays the bar code number of the cartridge. In the Destination screen, this element contains no information.

Manage Library: Perform Inventory

This page allows the library to be re-scanned to determine the current media inventory.

Manage Library: Release Magazine

This page allows the user to release the right or left magazine from the library.

> **NOTE:** To manually release a magazine, see Releasing the Magazines Manually. However, this manual process should only be used if the magazine cannot be released using the Operator Control Panel or the Web User Interface.

Configure Library Menu

The Configure Library menu contains the following submenu items:

- Configure Library: General
- Configure Library: Logical Libraries
- Configure Library: Drives
- Configure Library: Network
- Configure Library: User Access
- Configure Library: Date & Time

- Configure Library: Logs & Traces
- Configure Library: Email Notification
- Configure Library: SNMP
- Configure Library: Save/Restore

Configure Library: General

This page allows you to make changes to general library configuration elements. As changes are made, they will only be applied after the Apply Selections or the Submit button is selected. After making the selection, a warning page will inform you of the impact of the proposed change. In some cases a pop-up screen will ask for confirmation. Many changes will also require a library reboot.

This table shows the general page elements:

Menu Item	Description	2U	4U
Library Name	Enter the name of the library.	X	X
I/O Station Enabled (Mail Slot)	The Mail Slot defaults to enabled. Choosing disabled (no check mark) adds one more storage slot to the 2U library, and 3 more storage slots to the 4U library. When the Mail Slot is disabled, removing or adding media to the library must be performed by releasing the left and/or right magazines.	X	X
Auto Clean Enabled	Auto Clean defaults to Disabled. For Auto Clean to function, a cleaning cartridge (CLNxxxLx) must be resident in a reserved library slot and Auto Clean must be enabled (turned on). NOTE: If Auto Clean is enabled, and a cleaning cartridge is not resident in a reserved slot, the Auto Clean Status field in the web System Status screen will post a **Chk Media/Rsvd Slot** message.	X	
Bar Code Label Length Reported To Host	The default bar code label length is 8, but can be set to 6. The bar code label length is a reported length. This setting will cause the host computer to only see the first 6 characters of the label or all 8 characters. This setting does not affect the bar code label that is shown on any of the library user interfaces (always shows all 8 characters).	X	X

This table covers the specific page elements:

Menu Item	Description	2U	4U
Library Mode	Choices are Random and Sequential. If you choose Sequential, you may also activate Autoload and/or Loop. If there is more than one logical library, there is a Library Mode entry for each logical library. NOTE: If a Logical Library in Sequential Mode contains more than one drive, only the first drive in the Logical Library will be utilized.	X	X
Active Slots	It may be necessary to modify the number of active slots to agree with the number of slots allowed by your host software. To modify the number of active slots in your library, click the drop down list and select the number of slots you want active in your library. Also, the Auto Clean function requires the cleaning cartridge to be in a reserved slot. Reserved slots are created by reducing the number of active slots.	X	X

Configure Library: Logical Libraries

To partition your multi-drive library, select the number of logical libraries you would like to create in your library, then click Submit.
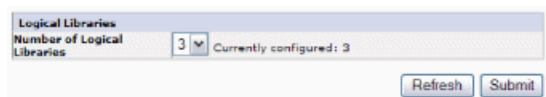
One cartridge magazine cannot be assigned to two logical libraries. If you partition a multi-drive library, each of the magazines must be assigned to a logical library on a magazine boundary. The entire magazine must be part of one logical library only. In a fully populated 4U library with four logical libraries, resource assignments will be as follows:

- Logical Library 1 will contain Drive 1 and the lower-left cartridge magazines.
- Logical Library 2 will contain Drive 2 and the upper-left cartridge magazines.
- Logical Library 3 will contain Drive 3 and the lower-right cartridge magazine.
- Logical Library 4 will contain Drive 4 and the upper-right cartridge magazine.

The Mail Slot and the reserved slot are shared among all logical libraries.

NOTE: When reducing the number of drives in your library, update the Logical Library configuration. This will remove the Attention LED on the front panel and the exclamation mark on the Home screen indicating that a drive is missing.

Updating the Logical Library configuration will also update the drive element addressing and drive numbering. See "Configure Library: Save/Restore" on page 5-25.

Configure Library: Drives

This page allows you to modify the current ID assigned to a Fibre Channel drive.

NEO 200s

NEO 400s

This page allows any drive in the library to be powered off by de-selecting the check mark in the Power On box. The displayed information will vary depending on the library model and drive type (SAS or Fibre Channel).

This table lists all available elements on this page. An X indicates that the element displays for the specified drive type.

Menu Item	Description	Fibre	SAS
Power On	For each drive, click in the box to power ON the selected drive.	X	X
Control Path	The control path drive communicates messages from the host to the library. Select this option for each drive that you want to be a control path drive. At least one drive in each logical library must be designated as a control path drive.	X	X
Port A* Configuration:			
Speed	For each Fibre Channel drive, click the drop down list and select Automatic, 1Gb/s, 2Gb/s, 4 Gb/s, or 8 Gb/s. Selecting Automatic will allow library speed to automatically negotiate to the current server speed.	X	
Topology	For each Fibre Channel drive, click LN-Port, L-Port, or N-Port.	X	
FC-AL Loop ID	This is the loop position number if the drive is in an arbitrated loop configuration.	X	

* Port B Configuration is not used in this library.

Configure Library: Network

This page shows the current network configuration of the library and allows modification to the configuration. When a change is requested, a pop-up box checks confirms the request.

1. Click **Network** in the left navigation pane to display the Network page.

> **IMPORTANT:** Do not click the Submit button until all changes have been made to the Network page. Once the Submit button has been clicked, no other changes can be made until after the library has applied the current changes. After the Submit button has been clicked, depending on the changes made, you will either be disconnected and need to login again or reboot the library. Clicking the Refresh button will refresh the page and any changes made will not be retained.

2. Choose the Network settings:
   - **Protocol Stack** – Choose IPv4 only, IPv6 only, or Dual Stack IPv4 & IPv6.

     If you choose Dual Stack IPv4 & IPv6, you must be prepared to enter both IPv4 and IPv6 IP addresses. The sections below will gray out depending on the choices made here.
   - **Host Name**.
   - **Domain Name**.
   - **DNS Primary** – Enter the IP address of your primary DNS server.
   - **DNS Secondary** – Enter the IP address of your secondary DNS server.
   - **Enable SSL for Web** – If you desire to have SSL (Secure Sockets Layer) enabled, place a check in this box.

     > **NOTE:** If you get a security certificate alert when logging in to the Web User Interface, you can install the certificate or allow an exception (depending on the internet browser you are using). SSL is enabled when the URL begins with https:// and some browsers will show a lock.

   Ethernet Settings – Ethernet Settings choices are: Auto (the default), 10 Mbit/Half, 10 Mbit/Full, 100 Mbit/Half, 100 Mbit/Full.

3. Enter **IPv4** settings (if applicable):
   - **Enable DHCP** – Click this item ON to have the IP Address of your library automatically set by the DHCP server.
   - **Static Address** – Enter the assigned IPv4 address. The format of an IPv4 IP address is a 32-bit numeric address written as four numbers separated by periods.

- • **Network Mask** – Enter the assigned IPv4 Network Mask.
- • **Gateway Address** – Enter the assigned IPv4 Gateway address. This address allows access outside the local network.

4. Enter **IPv6** settings (if applicable).

- • **Enable DHCP** – Click this item ON to have the IP Address of your library automatically set by the DHCP server.
- • **Enable Stateless Auto Config** – Click this item ON to have the IP Address of your library automatically set by the network router.
- • **Static Address** – Enter the assigned IPv6 address. The format of an IPv6 IP address is a 128-bit numeric address written as 8 groups of four numbers separated by colons.
- • **Prefix Length** – The default prefix length is set to 64, but can be set to any length, depending upon the address used.
- • **Gateway Address** – Enter the assigned IPv6 Gateway address. This address allows access outside the local network.

5. Click **one** of the following:

- • **Refresh** – to cancel the changes made to the screen.
- • **Submit** – to apply the changes made to the screen.

NOTE: Depending on the changes made, you will either be disconnected and need to login again, or reboot the library. If a reboot is required, a Warning message appears after the Submit button is clicked.

Configure Library: User Access

This page allows the user to add and modify user accounts. See "Login" on page 2-6 for information on user types.

The **Configure Library: User Access** page is only accessible to the Admin and Service login. Access is denied to User and Superuser logins.

- • The **Admin** login has access to all library functions except **Service Library > Advance Diagnostics**.
- • The **Service** login has access to all library functions including **Service Library > Advance Diagnostics**.

The following elements are displayed on the User Access page:

- **Role** – The name associated with the chosen Access Level.

  Admin can select User, Superuser, and Admin roles. Service can select User, Superuser, Admin, and Service roles.

  Check the Disable Superuser checkbox if you do not want Superuser to be listed on the Role drop-down list (prohibits Superuser login). Check the Disable User checkbox if you do not want User to be listed on the Role drop-down list (i.e. prohibits User login). Uncheck the checkbox(es) to allow Superuser or User login.

- **New Password** – The password must be a maximum of ten characters.
- **Repeat Password** – Enter the New Password again.
- **Support Name** – The name of the individual within your company to contact for Web User Interface or library support.

  Only one support person can be configured for the entire tape library. The support person may or may not be one of the user, superuser, or admin account holders.

- **Support Phone** – The phone number of the individual within your company to contact for Web User Interface or library support.
- **Support Email** – The email address of the individual within your company to contact for Web User Interface or library support.

Click one of the following:

- **Refresh** – to cancel the changes made to the screen.
- **Submit** – to apply the changes made to the screen.

Configure Library: Date & Time

This page allows the user to set the time and date, and how it will be displayed.

- **Time (24H)** – Using a 24-hour format, enter the current hour, minutes, and seconds.
- **Date** – Enter the current month, day, and year.

Click one of the following:

- **Refresh** – to cancel the changes made to the screen.
- **Submit** – to apply the changes made to the screen.

Configure Library: Logs & Traces

This page allows service personnel to set the Error Log Mode to Continuous or to Stop trace at first error.

It is recommended that you select **Continuous** for the Error Log Mode so that all information for logs and traces will be captured.

Click one of the following:

- **Refresh** – to cancel the changes made to the screen.
- **Submit** – to apply the changes made to the screen.

NOTE: The trace level and trace filter selection options are only changeable by Service personnel.

Configure Library: Email Notification

This page allows the user to enter information for email notification. When set up correctly, Email Notification allows the library to send an email to a designated individual when the library is experiencing a problem.

The following elements are displayed on the Email Notification page.

- **Notify Errors** – Select this item to be notified of library errors via email.
- **Notify Warnings** – Select this item to be notified of library warnings via email.
- **To Email Address** – Enter the email address of the individual you would like to receive the errors and/or warnings.
- **SMTP Server Address** (IPv4 or IPv6) – Enter the address of the email server of the individual you would like to receive the errors and/or warnings. This can be an IPv4 or IPv6 address, or a host name and domain. If a host name and domain is listed, the IPv4 or IPv6 address will be resolved from the DNS using that name, and the address will be stored rather than the name. If the address changes, a new name or a new address will need to be entered.
- **Domain Name** – Enter the Domain Name for your library. This field cannot be blank when using email notification.

NOTE: If you attempt to enter a blank value for the Domain Name, a warning message appears that says if you are using Email Notification, then a value is required for the Domain Name.

Click one of the following:

- **Refresh** – to cancel the changes made to the screen.
- **Submit** – to apply the changes made to the screen.

Configure Library: SNMP

This page shows the current SNMP configuration of the library and allows modification to the configuration. When a change is requested, a pop-up box checks to confirm the changes.

1. Click **SNMP** in the left navigation pane, to display the SNMP page.
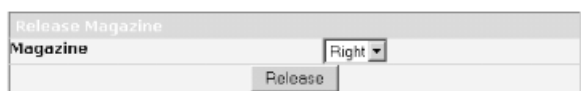
2. Enter SNMP **settings**.

   NOTE: For more information on SNMP, refer to "Simple Network Management Protocol (SNMP) Messaging" on page 1-5.

   - **Enabled** – Check this box to have SNMP traps sent to a SNMP Management consoles.
   - **Target 1-IP Address** – If SNMP traps are enabled, enter an IP address where SNMP traps are to be sent.
   - **Target 2-IP Address** – Enter an optional 2nd IP address where SNMP traps are to be sent, or leave as 0.0.0.0.
   - **Target 3-IP Address** – Enter an optional 3rd IP address where SNMP traps are to be sent, or leave as 0.0.0.0.
   - **Version** – The library offers three versions of the SNMP protocol; v1, v2 and v3. Select a version for each Target IP Address.
   - **Community Name** – An SNMP community name is a text string that acts as a password to authenticate messages sent between the SNMP remote management application and the library. Enter your preferred name, or leave as public.
   - **Audit Logging** – If SNMP is enabled and Audit Logging is enabled, the library will send SNMP traps to an SNMP Management consoles when the library or tape drive configuration has changed.

   NOTE: This option is only available if the library firmware is 9.00 or higher, and the latest library MIB file has been added to the SNMP Management console.

Click **one** of the following:

- **Refresh** – to cancel the changes made to the screen.
- **Submit** – to apply the changes made to the screen.

Configure Library: Save/Restore

This page allows the library configuration to be reset to the factory defaults.

For information on factory default settings, see "Configure Library: Save/Restore" on page 5-25.

⚠ **CAUTION:** Be aware that when you restore your library to factory defaults, all configuration data in the library will be lost and will need to be reestablished. Feature Activation Keys will be retained.

NOTE: Configuration files saved with one version of library firmware may not be compatible with other versions of firmware. It is recommended to save a configuration file each time the library firmware is upgraded. Restore the library using a configuration file that was saved with the same version of firmware currently installed in the library.

Since the Web User Interface can be accessed remotely, its implementation will save/restore the configuration data to/from a file on the host site. When entering commands on the OCP, the unit is accessed directly. For this reason the OCP implementation will save/restore the configuration data to/from a USB memory stick that is inserted into the USB connector on the library controller.

Service Library Menu

➡ **IMPORTANT:** Some Service Library functions will post a warning message stating that the library should be taken offline from the host before performing any Service functions. It is up to the operator to ensure that it is taken offline at the host. Before performing any service functions, ensure the host is not performing any data writing or retrieval.

The Service Library menu contains the following submenu items:

- Service Library: Clean Drive
- Service Library: Advanced Diagnostics (for Service Personnel Only)
- Service Library: View Logs
- Service Library: View Drive Logs
- Service Library: Save Drive Dump
- Service Library: Perform Diagnostics
- Service Library: Upgrade Firmware
- Service Library: Reboot

Service Library: Clean Drive

If the library is not configured for Auto Clean, this page allows the user to manually clean the tape drive.

A drive cleaning should only be performed after the library/drive has posted a status message indicating Cleaning Required.

To manually perform a drive cleaning, perform the following steps:

1. Select a **cleaning cartridge** listed in the Slot # field.

2. Select a **drive** listed in the Drive field.

3. Click the **Clean** button.

Drives that **do not require a cleaning** are labeled with No Cleaning Required.

If there is **no cleaning cartridge** in the library, the Clean button can not be selected and the Slot # will display N.A.

NOTE: If the library is configured for Auto Clean, and a cleaning cartridge is resident in a reserved slot, the library will automatically load the drive with a cleaning cartridge. The drive will perform a cleaning and the library will return the cleaning cartridge to the reserved slot. If Auto Clean is enabled and a cleaning cartridge is not present in a reserved slot, Auto Clean status on the Web User Interface Status screen will show Chk Media/Rsvd Slot.

Service Library: Advanced Diagnostics (for Service Personnel Only)

This menu is for use by Overland Storage Authorized Service Personnel only.

Service Library: View Logs

This page allows the library logs to be viewed after entering the following:

- **Log Type**:
  - **Error Trace** – Logs all the error messages.
  - **Informational Trace** – Logs all the informational messages created as the library operates.
  - **Warning Trace** – Logs all warning messages created by the library. Warning messages will not stop a library's operation but does remind the user of issues that may become a problem. Example: Invalid Media.
  - **Configuration Change Trace** – Logs any configuration changes made, such as changing/adding partitions.
  - **Standard Trace** – Logs all library operations.

NOTE: Ensure that all the pop-up facilities on the web browser are set to enable pop-up boxes to appear. For example, on Microsoft Internet Explorer, under Tools, ensure that the Pop-up Blocker is turned OFF and **Internet Options > Security > Custom Level > Downloads > Automatic Prompting** for file Downloads and File Downloads are both Enabled.

- **Total Number of Entries** – Number of entries in a specified trace/log.
- **Start Entry** – Where you start viewing the log (default = 1).
- **Number of Entries per Page** – Limits the number of entries on a page.
- **View Button** – Select to display the output to the screen.
- **Clear Log Button** – Clears the log you are viewing.
- **Dump Log Button** – Dumps the log you are viewing.
- **Save Service Dump Button** – Creates a DPA (Dump All) log output that can be viewed or saved to a file.

If the number of logs entries exceeds the number of entries per page, **<Prev | Next>** appears on the page. Click **Prev** or **Next** to index through the log entries. The **Next** button will not be displayed if the log has more fewer entries than the **# of entries per page** setting. After clicking **Next** on the first page, **Prev** is displayed. Upon reaching the last page, the Next is no longer shown. If the log entries fit on a single page the buttons do not appear.

Service Library: View Drive Logs

This page allows the drive logs to be viewed after selecting the following:

- **Log Type**
  - **Error** – Logs drive error code information.
  - **SCSI** – Logs ASC/ASCQ and FSC information.
- **Additional Sense Code** (ASC)
- **Additional Sense Code Qualifier** (ASCQ)
- **Fault Symptom Code** (FSC)

Service Library: Save Drive Dump

This menu item allows a drive dump to be saved to the host computer.

Select the drive. Then click Save Drive Dump. Once the Save Drive Dump button is clicked, the user will have the option of saving the drive dump to their hard drive. The progress status for the drive dump is shown on the System Status screen to the right of the main Web User Interface screen.

NOTE: Ensure that all the pop-up facilities on the web browser are set to enable pop-up boxes to appear. For example on the Microsoft Internet Explorer, under Tools, ensure that the Pop-up Blocker is turned OFF and **Internet Options > Security > Custom Level > Downloads > Automatic Prompting** for file Downloads and File Downloads are both Enabled.

Once saved on the hard drive, it can be emailed to Tech Support for analysis, if needed.

NOTE: The dump may take as long as 20 minutes to complete. The System Status portion of the screen shows **Drive Dump in Progress** with the number of kilobytes transferred.

Service Library: Perform Diagnostics

NOTE: When running the **System Test**, the library must contain at least the same number of data cartridges as there are drives in that library. For example, if your library has 4 drives installed, you must have 4 or more data cartridges in the library prior to the start of the test. If there are fewer data cartridges than drives in the library, an error message **Slot Empty** will occur, and the test will not complete successfully. The media type must be compatible with the drive type. Otherwise, an error message **Incompatible Media** will occur and the test will fail.

This page provides the system administrator with general tests to verify the usability and reliability of the library.
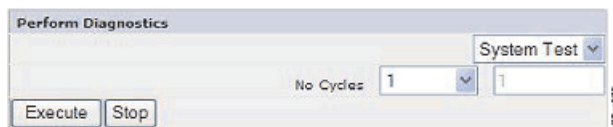
- The **System Test** uses resident data cartridges to test the load and unload capability of the drives, and ensure that the library mechanics are working satisfactorily. No data will be written to the cartridges and the cartridges will be returned to their normal slot location.
- The **Slot To Slot** test will move each resident data cartridge from one slot to another, for each test cycle requested. When completing the Slot To Slot test, you need to inventory your library before placing it back online, since this test scrambles the cartridge slot locations.

The user selects the number of test cycles before starting the test from the EXECUTE button. To cancel the test before it completes the cycles, select the STOP button.

NOTE: The Web User Interface System Status screen will indicate progress and completion of the activity.

The first field can be modified to set the number of cycles. The second field displays the cycles completed.

Service Library: Upgrade Firmware

NOTE: Library firmware and tape drive firmware are verified and released together. When updating to the latest firmware, verify that all installed tape drives and the library are at the latest levels. Mixing different levels of library and tape drive firmware is not supported and may cause unpredictable results.

This page displays the current library and drive firmware versions. Firmware can be downloaded to the host then uploaded to the drive or library by using this page.

Click **Browse** to choose the firmware file you have downloaded from the Overland NEO web site (the web site is http://docs.overlandstorage.com/neo) for the library or drive you want to update. (You can update only one device at a time). Be sure you choose the correct firmware for the library or drive type. Click the Update button to initiate the file transfer and firmware update.

> NOTE: During the update no host drive action is possible. The drive update takes approximately five minutes. The system status panel (in the right of the browser window) will change from **Update** to **Ready** when done.

If incompatible firmware is transferred to the library or drive the Update function will terminate with a message indicating incompatible firmware.

To ensure that the drive is being updated with the correct firmware refer to the drive identification information provided in the Upgrade Library Firmware banner. Ensure the drive firmware is for the correct drive type (such as Half-Height), correct protocol (such as SAS or Fibre Channel) and correct version (V2). Drive code for V2 drives is not compatible with drives that are not V2.

V2 Drive Firmware Compatibility:
- ULT3580-HH4 drives
  - Firmware for the LTO4 HH drive is not compatible with the LTO4 HH V2 drive
  - Firmware for the LTO4 HH V2 drive is not compatible with the LTO4 HH drive

- ULT3580-HH5 drives
  - The latest firmware for the LTO5 HH drive is compatible with all LTO5 HH drives. Upgrade the drive with the latest firmware if the drive Update function terminates with a message indicating incompatible firmware.

Service Library: Reboot

⚠ **CAUTION:** Some options of the Web User Interface take the library OFFLINE. This inactive mode can interfere with host-based application software, causing data loss. Ensure that the library is idle before attempting to perform any remote operations that will take the library OFFLINE.

This page is used to perform a library reboot.
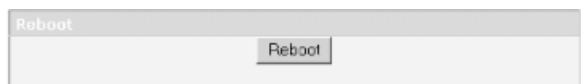
There is a default time delay when the Web User Interface page refreshes itself. This time should be sufficient to reload the page. However, during a reboot, the connection to the library may be lost. If the connection is lost, the user will have to reload the page manually.

Click the **Reboot** button to initiate the reboot.

Import and Export Media during Normal Library Operation

Import Media

Data cartridges can be inserted and taken out of a magazine while the library is in operation. If the library contains an Mail Slot, and you wish to import media, follow these steps:

1. From the OCP Main Menu, select **Control > Open I/O Station**.
   The Mail Slot will unlock itself.

2. Pull out the magazine and insert a **data cartridges** into the Mail Slot.
   - On a 2U library, only one cartridge can be inserted at a time.
   - On the 4U library, three cartridges can be inserted at one time.

3. Close the **door** of the Mail Slot.
   The library will automatically start an inventory. The cartridges in the Mail Slot will be counted but unassigned until they are moved into storage slots.

4. From the OCP Main Menu, select **Control > Move Cartridges** and move the data cartridges into the desired data slots.
   See or for more information.

If the library is not configured for an Mail Slot (all slots are assigned to storage), and you wish to import media, you need to release a magazine and insert the cartridges manually following these steps:

1. From the OCP Main Menu, select **Control > Magazine**.

2. Choose the desired magazine to **unlock/remove**.

3. Pull out the magazine and insert a **data cartridges** into the empty slots.

4. Push the **magazine** back into the library.

The library will automatically start an inventory.

5. To move cartridges in the magazine once they are inserted, from the OCP Main Menu, select **Control > Move Cartridges** and move the data cartridges into the desired slots.

See "Control: Move Cartridges" on page 5-7 or "Manage Library: Move Media" on page 5-17 for more information.

NOTE: If you run a library configuration backup program on your host computer, use the program to run an audit of the library after new cartridges have been added to update the backup program.

Export Media

To remove cartridges from your library using your Mail Slot, follow these steps:

1. From the OCP Main Menu, select **Control > Move Cartridges** and move the data cartridges into the Mail Slot.

See "Control: Move Cartridges" on page 5-7 or "Manage Library: Move Media" on page 5-17 for more information.

2. From the OCP Main Menu, select **Control > Open I/O Station**.

The Mail Slot will unlock itself

3. Pull out the magazine and take the **data cartridges** out of the Mail Slot.

4. Push the **magazine** back into the library.

The library will automatically start an inventory of the Mail Slot.

If the library is not configured for an Mail Slot (all slots are assigned to storage), and wish to export media, you need to release a magazine and take out the cartridges manually following these steps:

1. From the OCP Main Menu, select **Control > Magazine**.

2. Choose the magazine you wish to **unlock/remove**.

3. Pull out the magazine and remove the desired **data cartridges**.

4. Push the **magazine** back into the library.

The library will automatically start an inventory.

NOTE: If you run a library configuration backup program on your host computer, use the program to run an audit of the library after cartridges have been removed to update the backup program.

Configuring Mail Slots and Reserving Slots

Mail Slot Configuration

NEO 200s libraries have one slot for an Mail Slot, while NEO 400s libraries have three slots assigned as an Mail Slot. These slots can be configured as storage if needed.

To configure the Mail Slot using the Web User Interface, follow these steps:

1. Go to **Configure Library > General**.

2. To enable the Mail Slot, place a check mark in the **I/O Station Enabled** box.

If it is checked as enabled, the first three physical slots in the lower left magazine in a 4U library are configured as Mail Slots. For the 2U library, the first physical slot in the left magazine is configured as a Mail Slot. If the I/O Station Enabled box is not checked, the magazine slots are configured as normal tape storage.

Reserving Slots

Reserving a slot is accomplished by reducing the **Active Slot** count in any particular logical library. Slots are reserved beginning with the last available slot in the last magazine of the library. A cleaning cartridge in a reserved slot is available to any logical library drive even if the reserved slot is not in that logical library. Typically, if the library contains multiple logical libraries, the last logical library is chosen for the reserved slot containing the cleaning cartridge. As with a library with a single logical library, this slot is the last physical slot in the library (top right magazine, uppermost rear slot).

NOTE: Configure the required number of reserved slots prior to enabling Auto Clean.

To reserve slots in your library, go to the "Configuring Library Settings" on page 4-20 for the Operator Control Panel or the "Configuring Library Settings" on page 4-11 for the Web User Interface to get directions on reducing the Active slot count.

Media

This figure shows the LTO Ultrium 1500 GB Data Cartridge and its components used as media in the NEO S-series libraries:
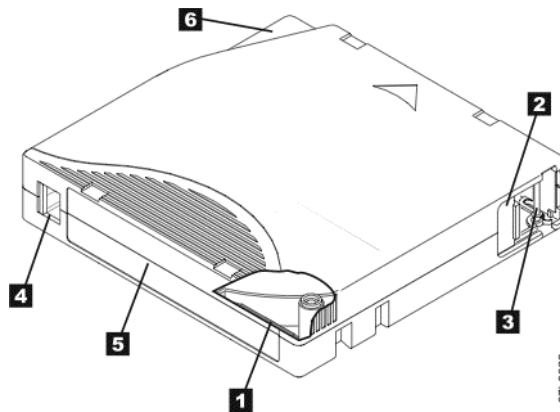
1	LTO Cartridge Memory	**4**	Write-protect Switch
2	Cartridge Door	**5**	Label Area
3	Leader Pin	**6**	Insertion Guide

NOTE: The same components are on all the other LTO Ultrium Data Cartridges.

The cartridge door (**2**) protects the tape from contamination when the cartridge is out of the drive. The tape is attached to a leader pin (**3**), behind the door. When the cartridge is inserted into the drive, a threading mechanism pulls the pin (and tape) out of the cartridge, across the drive head, and onto a non-removable take-up reel. The head can then read or write data from or to the tape.

The write-protect switch (**4**) prevents data from being written to the tape cartridge. For more information, see "Write-Protect Switch" on page 6-7.

The label area (**5**) provides a location to place a label. For more information, see "Bar Code Labels" on page 6-5.

The insertion guide (**6**) is a large, notched area that prevents the cartridge from being inserted incorrectly.

Topics in Media:

- Data Cartridges
- Write Once, Read Many (WORM)
- Cleaning Cartridge
- Cartridge Memory Chip (LTO-CM)

- Bar Code Labels
- Write-Protect Switch
- Cartridge Care and Handling
- Environmental and Shipping Specifications for Tape Cartridges
- Disposing of Tape Cartridges
- Ordering Media Supplies

Data Cartridges

When processing tape in the cartridges, Ultrium Tape Drives use a linear, serpentine recording format. The native data capacity and recording format of Ultrium data cartridges is as follows:

Type	Native Data Capacity	Recording Format
Ultrium 5	1500 GB (3000 GB at 2:1 compression)	Reads and writes data on 1280 tracks, sixteen tracks at a time
Ultrium 4	800 GB (1600 GB at 2:1 compression)	Reads and writes data on 896 tracks, sixteen tracks at a time.
Ultrium 3	400 GB (800 GB at 2:1 compression)	Reads and writes data on 704 tracks, sixteen tracks at a time
Ultrium 2	200 GB (400 GB at 2:1 compression)	Reads and writes data on 512 tracks, eight tracks at a time
Ultrium 1	100 GB (200 GB at 2:1 compression)	Reads and writes data on 384 tracks, eight tracks at a time

The first set of tracks (sixteen for Ultrium 5, 4 and 3) is written from near the beginning of the tape to near the end of the tape. The head then repositions to the next set of tracks for the return pass. This process continues until all tracks are written and the cartridge is full, or until all data is written.

This table lists the Nominal Cartridge Life: Load/Unload Cycles:

Type	Load/Unload Cycles
Ultrium 5	20,000 (20k)
Ultrium 4	20,000 (20k)
Ultrium 3	20,000 (20k)
Ultrium 2	10,000 (10k)
Ultrium 1	5000 (5k)

All generations contain 1/2-inch, dual-coat, metal-particle tape.

Cartridge Compatibility

This table shows Ultrium data and cleaning cartridge compatibility with Ultrium tape drive:

Ultrium Tape Drive	LTO Ultrium Data Cartridges				
	1500 GB (Ultrium 5)	800 GB (Ultrium 4)	400 GB (Ultrium 3)	200GB (Ultrium 2)	100GB (Ultrium 1)
Ultrium 5	Read/Write	Read/Write	Read only	–	–
Ultrium 4	–	Read/Write	Read/Write	Read only	–
Ultrium 3	–	–	Read/Write	Read/Write	Read only
Ultrium 2	–	–	–	Read/Write	Read/Write
Ultrium 1	–	–	–	–	Read/Write

NOTE: The NEO 200s/400s tape libraries support only the Ultrium 4 and Ultrium 5 tape drives.

Capacity Scaling

To control the capacity of the cartridge (for example, to obtain a faster seek time) issue the SCSI command SET CAPACITY.

Write Once, Read Many (WORM)

Certain records retention and data security applications require a Write Once, Read Many (WORM) method for storing data on tape. The LTO Ultrium generation 5, 4, and 3 drives enable WORM support when a WORM tape cartridge is loaded into the drive.

WORM Media

Because standard read/write media are incompatible with the WORM feature, a specially formatted WORM tape cartridge is required.

Each WORM cartridge has a unique, worldwide cartridge identifier (WWCID), which comprises the unique CM chip serial number and the unique tape media serial number. See "Ordering Media Supplies" on page 6-11 for information on how to choose and purchase the appropriate WORM tape cartridges for your library.

Data Security on WORM Media

Certain built-in security measures help ensure that the data written on a WORM cartridge does not become compromised, for example:

• The format of an Ultrium 5 1500 GB, Ultrium 4 800 GB, or Ultrium 3 400 GB WORM Tape Cartridge is unlike that of standard read/write media. This unique format prevents a drive that lacks WORM-capable firmware from writing on a WORM tape cartridge.

• When the drive senses a WORM cartridge, the firmware prohibits the changing or altering of user data already written on the tape. The firmware keeps track of the last appendable point on the tape.

WORM Media Errors

The following conditions cause WORM media errors to occur:

- Information in the servo manufacturer's word (SMW) on the tape must match information from the cartridge memory (CM) module in the cartridge. If it does not match, a media Error Code 7 will post on the drive's single-character display (SCD). An error will also be displayed on the Operator Panel.

- Inserting a WORM tape cartridge into a drive that is not WORM capable causes the cartridge to be treated as an unsupported medium. The drive will report a media Error Code 7. Upgrading the drive firmware to the correct code level will resolve the problem.

Requirements for WORM Capability

To use the WORM capability of your LTO Ultrium generation 4 or 5 drive, you need to use a compatible WORM tape cartridge.

Cleaning Cartridge

An LTO Ultrium Universal Cleaning Cartridge is required to clean the tape drive. The drive itself determines when it needs to be cleaned and notifies the library. When notified, the library indicates that the drive needs cleaning by turning ON the Clean Drive amber LED on the front panel of the library and posting a message on the library display.

A tape drive within a library requires the use of a library menu function to either automatically or manually clean the tape drive. See Chapter 5, "Operations."

> **IMPORTANT:** It is recommended that the drive be cleaned only when it is requested by the drive.

The Ultrium Universal Cleaning Cartridge is valid for 50 uses. The cartridge's LTO-CM (Cartridge Memory) chip tracks the number of times that the cartridge is used.

> **NOTE:** The drive will automatically eject an expired cleaning cartridge.

Cartridge Memory Chip (LTO-CM)

All generations of the LTO Ultrium Data Cartridges include a Linear Tape-Open Cartridge Memory (LTO-CM) chip (**1**), that contains information about the cartridge and the tape (such as the name of the manufacturer that created the tape), as well as statistical information about the cartridge's use. The LTO-CM enhances the efficiency of the cartridge. For example, the LTO-CM stores the end-of-data location which, when the next time this cartridge is inserted and the Write command is issued, enables the drive to quickly locate the recording area and begin recording. The LTO-CM also aids in determining the reliability of the cartridge by storing data about its age, how many times it has been loaded, and how many errors it has accumulated. Whenever a tape cartridge is unloaded, the tape drive writes any pertinent information to the cartridge memory.

The storage capacity of the LTO Generation 5 and 4 LTO-CM is 8160 bytes. LTO Generations 3, 2, and 1 have an LTO-CM capacity of 4096 bytes.

Bar Code Labels

A bar code label contains:

- A volume serial number (VOLSER) that is human-readable
- A bar code that the library can read

> **NOTE:** The tape drive does not require bar code labels, but you should use labels for tape cartridge identification purposes.

When read by a library's bar code reader (accessor), the bar code identifies the cartridge's VOLSER to the library. The bar code also tells the library whether the cartridge is a data cartridge or cleaning cartridge. In addition, the bar code includes the two-character media-type identifier Lx, where x equals 1, 2, 3, 4, or 5. L identifies the cartridge as an LTO cartridge and the number represents the generation of cartridge for that cartridge type.

Tape cartridges can be ordered with the labels included or with custom labels. To order tape cartridges and bar code labels, see . The bar code for usage in the LTO tape library must meet predefined specifications. They include, but are not limited to:

- Six or eight (the default) uppercase alphanumeric characters, where the last two characters must be L5, L4, L3, L2, or L1
- Label and printing to be non-glossy
- Nominal narrow line or space width of 0.423 mm (0.017 in.)
- Wide to narrow ratio of 2.75:1
- Minimum bar length of 11.1 mm (0.44 in.)

This table shows which cartridges and VOLSERs are compatible with the Ultrium 3, 4, and 5 tape cartridges:

Tape Drive Cartridges	VOLSER
Ultrium 5 Data Cartridge	xxxxxxL5
Ultrium 5 WORM Cartridge	xxxxxxLV
Ultrium 4 Data Cartridge	xxxxxxL4
Ultrium 4 WORM Cartridge	xxxxxxLU
Ultrium 3 Data Cartridge	xxxxxxL3
Ultrium 3 WORM Cartridge [*]	xxxxxxLT
Ultrium 2 Data Cartridge	xxxxxxL2
Ultrium 1 Data Cartridge	xxxxxxL1
LTO Ultrium Cleaning Cartridge	CLNxxxLx

[*] An Ultrium 3 Tape Drive must have a minimum firmware level of 54xx for it to be compatible with the WORM cartridge.

When attaching a bar code label to a tape cartridge, place the label only in the recessed label area. A label that extends outside of the recessed area can cause loading problems in the drive.

> **NOTE:** Do not place any type of mark on the white space at either end of the bar code. A mark in this area may prevent the library from reading the label.
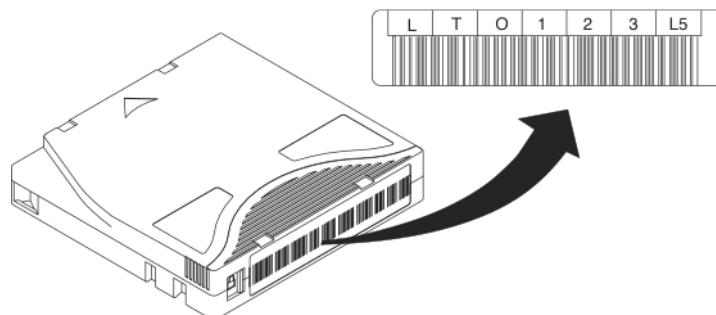
The volume serial number (LTO123), cartridge type (L5), and bar code are printed on the label.

Guidelines for Using Bar Code Labels

Apply the following guidelines whenever using bar code labels:

- Use only Overland-approved bar code labels on cartridges to be used in a NEO tape library.

- Do not reuse a label or reapply a used label over an existing label.

- Before you apply a new label, remove the old label by slowly pulling it at a right angle to the cartridge case.

- Use peel-clean labels that do not leave a residue after being removed. If there is glue residue on the cartridge, remove it by gently rubbing it with your finger. Do not use a sharp object, water, or a chemical to clean the label area.

- Examine the label before applying it to the cartridge. Do not use the label if it has voids or smears in the printed characters or bar code (a library's inventory operation will take much longer if the bar code label is not readable).

- Remove the label from the label sheet carefully. Do not stretch the label or cause the edges to curl.

- Position the label within the recessed label area (**5**).

- With light finger pressure, smooth the label so that no wrinkles or bubbles exist on its surface.

- Verify that the label is smooth and parallel, and has no roll-up or roll-over. The label must be flat to within 0.5 mm (0.02 in.) over the length of the label and have no folds, missing pieces, or smudges.

- Do not place other machine-readable labels on other surfaces of the cartridge. They may interfere with the ability of the drive to load the cartridge.

Write-Protect Switch
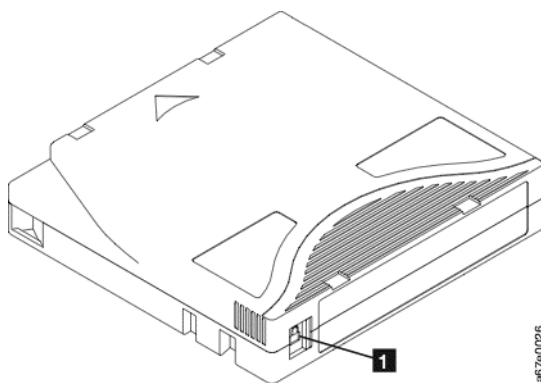
The position of the write-protect switch on the tape cartridge (**1**) determines whether you can write to the tape. If the switch is set to:

- The locked position (solid red), data cannot be written to the tape.
- The unlocked position (black void), data can be written to the tape.

If possible, use your server's application software to write-protect your cartridges (rather than manually setting the write-protect switch). This allows the software to identify a cartridge that no longer contains current data and is eligible to become a scratch (blank) data cartridge. Do not write-protect scratch (blank) cartridges; the tape drive will not be able to write new data to them.

If you must manually set the write-protect switch, slide it left or right to the desired position.

Cartridge Care and Handling

NOTE: Do not insert a damaged tape cartridge into the drive. A damaged cartridge can interfere with the reliability of a drive and may void the warranties of the drive and the cartridge. Before inserting a tape cartridge, inspect the cartridge case, cartridge door, and write-protect switch for breaks.

Incorrect handling or an incorrect environment can damage cartridges or their magnetic tape. To avoid damage to your tape cartridges and to ensure the continued high reliability of your LTO Ultrium Tape Drives, use the guidelines in the following sections.

Provide Training

- Post procedures that describe proper media handling in places where people gather.
- Ensure that anyone who handles tape has been properly trained in handling and shipping procedures. This includes operators, users, programmers, archival services, and shipping personnel.
- Ensure that any service or contract personnel who perform archiving are properly trained in media-handling procedures.
- Include media-handling procedures as part of any services contract.
- Define and make personnel aware of data recovery procedures.

Ensure Proper Packaging

- When shipping a cartridge, use the original or better packaging.

- Always ship or store a cartridge in a jewel case.

- Use only a recommended shipping container that securely holds the cartridge in its jewel case during transportation. Ultrium Turtlecases (by Perm-A-Store) have been tested and found to be satisfactory. They are available at www.turtlecase.com.

- Never ship a cartridge in a commercial shipping envelope. Always place it in a box or package.

- If you ship the cartridge in a cardboard box or a box of a sturdy material, ensure the following:

  - Place the cartridge in polyethylene plastic wrap or bags to protect it from dust, moisture, and other contaminants.

  - Pack the cartridge snugly; do not allow it to move around.

  - Double-box the cartridge (place it inside a box, then place that box inside the shipping box) and add padding between the two boxes.

Provide Proper Acclimation and Environmental Conditions

- Before you use a tape cartridge, acclimate it to the operating environment for 24 hours or the time necessary to prevent condensation in the drive (the time will vary, depending on the environmental extremes to which the cartridge was exposed).

- Ensure that all surfaces of a cartridge are dry before inserting it.

- Do not expose the cartridge to moisture or direct sunlight.
- Do not expose recorded or blank cartridges to stray magnetic fields of greater than 100 oersteds (for example, terminals, motors, video equipment, X-ray equipment, or fields that exist near high-current cables or power supplies). Such exposure can cause the loss of recorded data or make the blank cartridge unusable.
- Maintain the conditions that are described in "Environmental and Shipping Specifications for Tape Cartridges" on page 6-10.

Perform a Thorough Inspection

After purchasing a cartridge and before using it, perform the following steps:

Inspect the cartridge's packaging to determine potential rough handling.

When inspecting a cartridge, open only the cartridge door. Do not open any other part of the cartridge case. The upper and lower parts of the case are held together with screws; separating them destroys the usefulness of the cartridge.

Inspect the cartridge for damage before using or storing it.

Inspect the rear of the cartridge (the part that loads first into the tape load compartment) and ensure that there are no gaps in the seam of the cartridge case (**1**). If there are gaps in the seam, the leader pin may be dislodged.
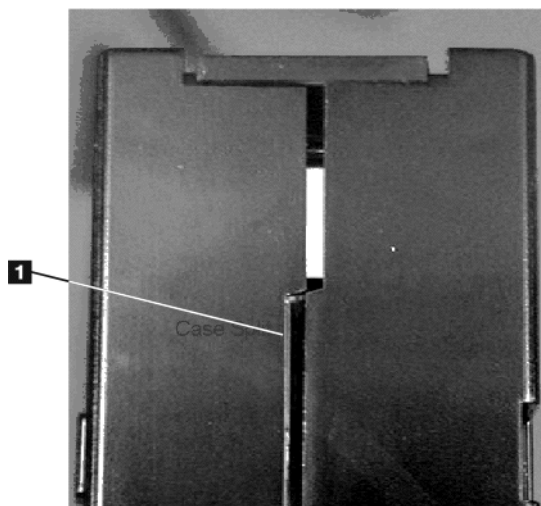
- Check that the leader pin is properly seated (**2**).
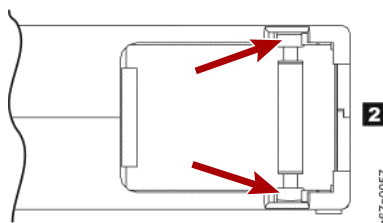
- If you suspect that the cartridge has been mishandled but it appears usable, copy any data onto a good cartridge immediately for possible data recovery. Discard the mishandled cartridge.
- Review handling and shipping procedures.

Handle the Cartridge Carefully

- Do not drop the cartridge. If the cartridge drops, slide the cartridge door back and ensure that the leader pin is properly seated in the pin-retaining spring clips.
- Do not handle tape that is outside the cartridge. Handling the tape can damage the tape's surface or edges, which may interfere with read or write reliability. Pulling on tape that is outside the cartridge can damage the tape and the brake mechanism in the cartridge.
- Do not stack more than six cartridges.
- Do not degauss a cartridge that you intend to reuse. Degaussing makes the tape unusable.

Environmental and Shipping Specifications for Tape Cartridges

Before you use a tape cartridge, acclimate it to the operating environment for 24 hours or the time necessary to prevent condensation in the drive (the time will vary, depending on the environmental extremes to which the cartridge was exposed).

The best storage container for the cartridges (until they are opened) is the original shipping container. The plastic wrapping prevents dirt from accumulating on the cartridges and partially protects them from humidity changes.

When you ship a cartridge, place it in its jewel case or in a sealed, moisture-proof bag to protect it from moisture, contaminants, and physical damage. Ship the cartridge in a shipping container that has enough packing material to cushion the cartridge and prevent it from moving within the container.

The following table gives the environment for operating, storing, and shipping LTO Ultrium Tape Cartridges.

Environmental Factor	Environmental Specifications			
	Operating	Operational Storage[*]	Archival Storage[†]	Shipping
Temperature	10 to 45°C (50 to 113°F)	16 to 32°C (61 to 90°F)	16 to 25°C (61 to 77°F)	-23 to 49°C (-9 to 120°F)
Relative humidity (non-condensing)	10 to 80%	20 to 80%	20 to 50%	5 to 80%
Maximum wet bulb temperature	26°C (79°F)	26°C (79°F)	26°C (79°F)	26°C (79°F)

    * The short term or operational storage environment is for storage durations of up to six months.

    † The long term or archival storage environment is for durations of six months up to ten years.

Disposing of Tape Cartridges

Under the current rules of the U.S. Environmental Protection Agency (EPA), regulation 40CFR261, the LTO Ultrium Tape Cartridge is classified as non-hazardous waste. As such, it may be disposed of in the same way as normal office trash. These regulations are amended from time to time, and you should review them at the time of disposal.

If your local, state, country (non-U.S.A.), or regional regulations are more restrictive than EPA 40CFR261, you must review them before you dispose of a cartridge. Contact your account representative for information about the materials that are in the cartridge.

If a tape cartridge must be disposed of in a secure manner, you can erase the data on the cartridge by using a high-energy ac degausser (use a minimum of 4000 oersted peak field over the entire space that the cartridge occupies). The tape should make two passes through the field at 90 degree orientation change for each pass to achieve complete erasure. Some commercial degaussers have two magnetic field regions offset 90 degrees from each other to accomplish complete erasure in one pass for higher throughput. Degaussing makes the cartridge unusable.

If you burn the cartridge and tape, ensure that the incineration complies with all applicable regulations.

Ordering Media Supplies

Extra tape cartridges and bar code labels can be obtained from Overland Storage.

Troubleshooting

The 2U and 4U libraries feature the following Customer Replaceable Units (CRUs):

- Controller Card (electronics, processor, memory, etc.)
- Power Supply
- Drive Sled (drive plus drive-to-library connectivity)
- Library Enclosure (chassis including accessor, Operator Control Panel display, etc.)
- Cartridge Magazines
- Rail Kit

Topics in Troubleshooting:

Troubleshooting Table

> **IMPORTANT:** Before replacing any CRU and after finding the problem and performing any listed actions listed in the Troubleshooting Table below, be sure to review the "Procedures for Isolating CRU Problems" on page 7-7 to help confirm the failing CRU.

The following table is the starting point for all service issues. Find the reason which closest resembles the problem you are experiencing and perform the listed action. If you are unable to correct the problem, create a prioritized list of replacement parts required. Select only one CRU at a time starting with the most likely based on the "Procedures for Isolating CRU Problems" on page 7-7 and/or the error code listing. After exhausting all troubleshooting efforts, refer to "Contacting Overland Technical Support" on page 7-13.

After correcting the problem, run Library Verify (Operator Control Panel: **Service > Library Verify**) to ensure that all library components are functioning properly before resuming normal library operations.

Problem	Solution
INSTALLATION/CONFIGURATION	
Installation and Configuration	Refer to "Installation Problems" on page 7-6.
POWER	
Library does not power ON	Perform "Isolating a Power Supply Problem" on page 7-7.
The Operator Control Panel is blank or frozen	**1.** Power cycle the library. **2.** If possible, log on to the Web User Interface and check the error log (**Service Library > View Logs**). Look up the error code and try to resolve (see Chapter 8, "Error Codes"). **3.** Upgrade/reinstall the latest library firmware. To download the latest library firmware, go to http://docs.overlandstorage.com/neo. • If the problem is corrected, run Library Verify before resuming normal library operations. • If the problem persists, contact Overland Technical Support.
ERROR CODES	
There is an error code in the error log.	Most library or drive errors will result in an error code or error message on the Operator Control Panel display. An error code history is maintained in the library or drive error log. See "Service Library: View Logs" on page 5-27, "Service Library: View Drive Logs" on page 5-28, and Chapter 8, "Error Codes."
FRONT PANEL LEDs	
Attention LED	To determine why the Attention LED is turned ON, log in to the Web User Interface and select **Service Library > View Logs > Warning Trace**. **Drive Sled Issues:** • Refer to "Isolating Drive Sled Problems" on page 7-9. • Restore factory defaults (Operator Control Panel: Configure > Save/Restore and select Restore All, or Web User Interface: Configure Library > Save/Restore and select Restore). **Media Issues:** • Avoid contamination by ensuring that the library is installed in a clean, contamination-free environment. Continue cleaning the tape drive as needed. Refer to "Choosing a Location" on page 4-1. • A cartridge should be acclimated for at least 24 hours before being used, particularly if it has been stored at a substantially different temperature or level of humidity than the library. • Any cartridge that is suspected of being defective or contaminated should NOT be reused, in any drive. **Power Supply or Fan Issues:** Check the power supply (or redundant power supply) for failure, and also check any power supply fans. Replace any defective units. Refer to "System Status" on page 2-6 for a redundant power supply failure on a 4U library and "Isolating a Power Supply Problem" on page 7-7.

Problem	Solution
Clean Drive LED	• Ensure that you are using an Ultrium universal cleaning cartridge (see "Cleaning Cartridge" on page 6-4).
	• Ensure that the cleaning cartridge has not expired. A drive will automatically eject an expired cleaning cartridge. A cleaning cartridge is good for 50 cleans. If your cleaning cartridge has expired, refer to "Ordering Media Supplies" on page 6-11 for information on ordering a new cleaning cartridge.
	• If the problem still exists, contact Overland Technical Support.
Error LED	If the Error LED remains ON after completing any user action listed for the error code in Chapter 8, "Error Codes," run Library verify (Operator Control Panel: **Service > Library Verify**).
	• If the test passes, the Error LED will turn OFF.
	• If the test fails, cycle library power to turn the Error LED OFF.
	To check the library error logs, log on to the Web User Interface and click **Service Library > View Logs**.If the Operator Control Panel displays **WARNING: Unit Busy**, click OK to turn the error LED OFF.
	FIRMWARE
Determining current firmware levels	Many problems can be resolved by a firmware upgrade. Ensure that both the library and drive firmware are at the latest levels available. Compare the firmware levels on the Operator Control Panel with the latest levels shown at http://docs.overlandstorage.com/neo.
	• **Library firmware: Monitor > Library > Identity > Version**
	• **Drive firmware: Monitor > Drives > Identity (select a drive) > Firmware Rev**
Update library firmware	Refer to "Service Library: Upgrade Firmware" on page 5-29.
Update drive firmware	Refer to "Service: Service (Drives)" on page 5-10 or "Service Library: Upgrade Firmware" on page 5-29.
	CARTRIDGE MOVEMENT PROBLEMS
Cartridge placement problems	Magazine slot prism fiducials NOT seated properly can result in gripper or slider error codes due to the fiducial interfering with the back edge of the cartridge. Release and pull magazines out of the library for inspection. To release the magazines using the Operator Control Panel, navigate to **Control > Magazine** and select **Left** or **Right**. To release the magazines using the Web User Interface, navigate to **Manage Library > Release Magazines**.
	Inspect the light pipe fiducials on each slot of the magazine for proper seating. If necessary, replace the magazine.

Problem	Solution
Cartridge will not eject from drive	1. Power cycle the library, allow it to complete initialization, which can take up to 1 hour depending on the type of cartridge (LTO 4, LTO 5, etc.) and how much of the tape has been spooled out of the cartridge. Retry unloading the cartridge using the library Operator Control Panel. Refer to "Control: Move Cartridges" on page 5-7. 2. Allow the drive to complete all operations. This may take as long as 1 hour if you reset or cycle power on the library while the cartridge is positioned at the physical end of the media. 3. Ensure that the backup software is not reserving the slot or preventing the drive from ejecting the cartridge. The backup software needs to cancel the reservation and any hold it has on the drive. Temporarily disconnecting the library from the host server and power cycling eliminates the host and its software as a problem source. 4. If the problem still exists, contact Overland Technical Support.
Cartridge can not be removed from storage slot	See "Removing Cartridges from Magazine Slots" on page 9-1.
Extended library recovery time	1. Release both left and right magazines (Operator Control Panel: **Control > Magazine** and select **Left** or **Right**; Web User Interface: **Manage Library > Release Magazine** and select **Left** or **Right**) and inspect for both the presence and conditions of the cell prism fiducials. Each cell should contain a correctly installed prism with no visible damage. Replace any missing or damaged prism fiducials. If necessary, replace the magazine. 2. An error code that will often surface after completing an inventory request or a diagnostic request such as the system Test will be 9B 37....Sled position sensor not found. The OCP Error LED will be lit and the Library Status on the Web User Interface will show a Robotic Failure. During the extended recovery process, by viewing the Standard Trace under the Web User Interface (**Service Library > View Logs**), the same Robotic Failure entries into this log can be viewed as the library enters recovery mode for failure to sense a particular fiducial. Proceed to the next step for failure isolation suggestions. 3. If there are no prism integrity issues and the library continues to post extended recovery time, refer to "Library Recovery Problem Determination" on page 7-7 and "Isolating a Library Controller Card vs. Accessor Enclosure Problem" on page 7-10.
	MEDIA
Cleaning or data cartridge incompatible with drive.	Ensure that you are using data and cleaning cartridges that are compatible with the drive and model of your library. The library automatically unloads incompatible cartridges and the Media Attention LED flashes. Export the media in order to clear the state. Refer to "Cartridge Compatibility" on page 6-3.

Problem	Solution
Cannot write to or read from tape.	1. Ensure that the cartridge write-protect switch is in the write enabled position (see "Write-Protect Switch" on page 6-7).
	2. Ensure that you have the appropriate data cartridge for your library model (see "Cartridge Compatibility" on page 6-3).
	3. Ensure that you are using an Ultrium cartridge that has not been degaussed. Do not degauss Ultrium cartridges.
	4. Ensure that the cartridge has not been exposed to harsh environmental or electrical conditions and is not physically damaged in any way.
	5. Many backup applications do not read or write to cartridges that were created using a different backup application. In this case, you may have to perform an erase, reformat, or label replacement operation on the cartridge.
	6. Ensure that you understand any data protection or overwrite protection schemes that your backup application may be using, which could prevent you from writing to a given cartridge.
	7. Retry the operation with a different, known good cartridge.
	8. Clean the drive. See "Service Library: Clean Drive" on page 5-26.
Cartridge VOLSER (bar code) is reported as Unknown	Probable cause: cartridge with no label or damaged label.
	Ensure that cartridge is properly labelled. If cartridge is properly labelled, unload the cartridge from drive and perform an inventory (OCP: **Control > Re-Inventory**; Web: **Manage Library > Perform Inventory**). If VOLSER is again reported as Unknown, run Library Verify (**Service > Library Verify**).
DRIVE ID (SAS OR FIBRE CHANNEL LOOP)	
Changed drive ID, but the host server does not recognize the new ID	1. Ensure that all devices on the same bus/network have unique ID numbers.
	2. Ensure that you cycle power on the library after changing the ID.
	3. Reboot the host server.
Tape library performance: The library is not efficiently backing up data	1. Check the network bandwidth from the host computer. If you are backing up data over a network, consider comparing to a local-only backup.
	2. Ensure that the library and tape drive are on their own SCSI bus and not daisy-chained to another tape drive or to the hard drive being backed up.
	3. Ensure that the library is connected to a LVDS SCSI bus and there are no single-ended (SE) devices on the same bus, because this will cause the entire bus to negotiate down to SE speed.
	4. Use an Ultra160 SCSI bus and high-quality cabling with the library.
CUSTOMER REPLACEABLE UNITS (CRU)	
Drive Sled	See "Isolating Drive Sled Problems" on page 7-9.
Power Supply	See "System Status" on page 2-6 and "Isolating a Power Supply Problem" on page 7-7.
Library Controller Card	See "Isolating a Library Controller Card vs. Accessor Enclosure Problem" on page 7-10.

Problem	Solution
Library Enclosure	See "Isolating a Library Controller Card vs. Accessor Enclosure Problem" on page 7-10.
ITDT	
Performance Test duration varies	Items affecting the duration of the test are: • The level of adapter device driver • Your adapter model and type
OTHER PROBLEMS	
Web User Interface problems	See "Isolating Web User Interface Problems" on page 7-11.
Bar code scanner problems	See "Isolating Bar Code Scanner Problems" on page 7-12.
Host Attachment Interface problems	See "Isolating Host Attachment Interface Problems" on page 7-12.
Need help with a library password	Contact Overland Technical Support.
Key path diagnostic not working	This diagnostic is available with library firmware level greater than 6.xx. Determine the level of firmware on your library. If necessary, visit http://docs.overlandstorage.com/neo to download the latest levels of firmware for your library.
Auto Clean status displayed as **Chk Media/Rsvd Slot?** on the Web User Interface System Status screen.	If **Auto Clean** is enabled and a cleaning cartridge is not present, or if a cleaning cartridge is present but not in the reserved slot, Auto Clean status will show **Chk Media/Rsvd Slot?** and Status will show a green check mark and the words **Media Attention**.

Installation Problems

Problems encountered during the installation of the library are usually caused by improper SCSI bus configuration, application software configuration errors, or an incorrectly configured operating system. If the application software that you are using is not communicating with the library after installation, check the following:

- **Picker Ship Lock Key:**

  Ensure that the Picker Ship Lock Key on the top cover has been removed before powering on the library.

- **Drive/Library SCSI or Loop ID:**

  Ensure that the SAS or Fibre Channel Loop ID is correct and not the same as other devices that may be on the same bus.

- **Host Bus Adapter (HBA) Compatibility:**

  Ensure that the library is compatible with the HBA. For best performance, the HBA used for this library should be SCSI-3 LVDS. Pay particular attention to any steps describing settings of various jumpers and/or switches.

- **HBA LUN 0/1 Support:**

  A single ID will address both drive and library since the drive is LUN 0 and the library is LUN 1. These models require an HBA that supports LUN scanning which must be enabled at the HBA.

- **Cable Connections:**

  Ensure that there are no bent pins on cables and that all connections are securely fastened.

- **Fibre Channel Tape Support:**

  Make sure that Fibre Channel Tape Support is enabled on the HBA if you are installing a library with a Fibre Channel drive.

- **Backup Application Installation:**

  Refer to the documentation included with your backup application software instructions on how to verify proper installation.

- **Device Driver Installation:**

  Make sure that the proper device driver, if applicable, is installed for the library.

NOTE: Many backup applications use their own drivers for the library and drive. Before installing a driver, make sure it will not be in conflict with the software. Contact your Backup Application vendor for this information.

Library Recovery Problem Determination

The 2U and 4U library firmware will generally retry failed operations up to three times before posting a failure to complete the operation, or, in some situations, proceeding with an operation that can be completed in an alternative manner. Of course, if the operation is successful within the allotted retry count, the appropriate retry counter is updated and recorded in the retry log and the next library operation will commence.

For example, failure to pick or place a cartridge from or to a designated cell or drive location after exhausting the retry count will result in a failed operation with the appropriate error code. However, failure to detect a particular cell location by sensing the prism fiducial located on the cell shelf because it is missing or damaged will eventually result in the cell location being located by the gripper, bar code reader, and positional emitter pulse count after the prism detection retry count is exhausted. If several prisms are missing or damaged or if the accessor prism sensor/emitter is inoperable, initialization and/or inventory functions can take a prolonged amount of time to complete due to the lengthy retry recovery procedure.

If the library is taking an extended amount of time to initialize, to perform an inventory or even move a cartridge within the library, the magazines prism integrity should be verified prior to exchanging a library component. This situation can be noted by the ACTIVITY line on the Operator Panel posting Recovery. Prism integrity verification can be done by releasing the magazines and inspecting the cell prisms. Normal initialization or inventory time for a 2U library once the picker mechanism starts its operation should be approximately 1 to 2 minutes. For a 4U library, 2 to 3 minutes. A single missing or damaged prism can add 1 to 2 minutes. If the accessor tray sensor/emitter is inoperable, or several prisms are missing or damaged, initialization or inventory could exceed 30 minutes or longer.

Procedures for Isolating CRU Problems

Isolating a Power Supply Problem

NOTE: Not all power supplies have LEDs. The original power supply for the 2U library did not have LEDs though any power supplies replaced will likely have LEDs. The 4U library has power supplies with LEDs.

A **250w** power supply with LEDs:
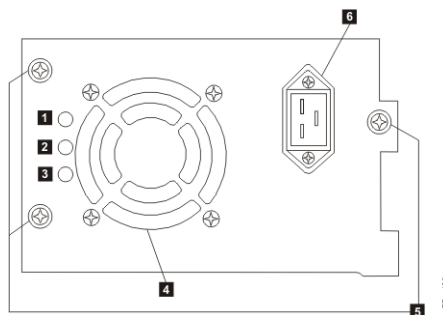
A **80w** power supply without LEDs:
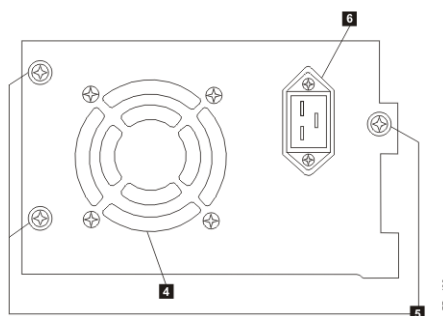
Power supply LED definitions:

1	If the blue LED is lit, AC voltage is available.	**4**	Cooling Fan Grill
2	If the amber LED is lit, there is a possible fan problem or other power supply issue. The power supply will need replacement.	**5**	Thumbscrews
3	If the green LED is lit, DC power is OK and active.	**6**	Power Receptacle

If the Library does not power on:

1. With library power OFF and the power cord unplugged, loosen the three thumbscrews (**5**), grasp two of the thumbscrews, pull the power supply out half way, reseat the power supply, and tighten the three thumbscrews.

2. Ensure the power cord is plugged in at the power supply socket (**6**) and at the electrical outlet, then turn library power ON.
   - For power supplies with LED's, the Blue LED will be lit if AC power is good.
   - If your power supply does not have LED's, feel for air flowing out of the cooling fan grill (**4**) on the rear of the library. AC is good if air is flowing from the cooling fan grill.

3. If no power to the library:
   a. Plug the power cord into another electrical outlet.
   b. If power is still missing, plug another device into the outlet to test.
   c. If the outlet tests OK, try another power cord with the library.

4. For power supplies with LED's, if the Amber LED is lit, replace the power supply.

5. If your power supply has no LED's, and you have verified that the electrical outlet works properly, but the power supply is still failing, replace it.

6. If the power supply seems to be delivering power to the library (Operator Control Panel and front panel LED's may be functioning); however, air does not flow from the power supply cooling fan grill on the rear of the library, replace the power supply.

7. If the power supply seems to be delivering power to the library (Operator Control Panel and front panel LED's may be functioning), and air is flowing from the power supply cooling fan grill on the rear of the library, observe the Green LED (lowest of the three). If it is lit, the power supply is OK.

   NOTE: If your library has -04 level redundant power supplies (see label on top of power supply), it is normal for the one in Standby mode to turn its Green LED off. You can test this power supply by pulling the power connector from the other Active power supply. The power supply that was in Standby mode will now become Active, and its Green LED should light. If it doesn't, replace it.

   If your library has -05 level redundant power supplies, the Green LED will be ON on both power supplies. If both Green LEDs are not ON, replace the failed power supply.

8. If the Green LED is not lit, and it is the only one in the Library, replace the power supply.

Isolating Drive Sled Problems

Prior to replacing a drive sled CRU, verify that the following activities have been performed:

   IMPORTANT: BEFORE POWERING OFF THE LIBRARY, write the drive dump to a flash drive. It is important to preserve the drive dump on the drive for analysis by Overland Technical Support.

If you are instructed by Overland Technical Support to copy the drive dump to your host computer, use one of the following methods:

- **Web User Interface**: Refer to "Service Library: Save Drive Dump" on page 5-28.
- **ITDT**: Refer to TotalStorage Tape Diagnostic Tool (ITDT) instructions.

1. Ensure that the drive firmware is at the latest level.

   To determine current library and drive firmware version using the Operator Control Panel:

   - **Library firmware: Monitor > Library > Identity**
   - **Drive firmware: Monitor > Drives > Identity (select a drive)**; drive firmware is identified in the **FW Rev field**.

2. Try reseating the **drive sled**.

   NOTE: The drive sled is hot-pluggable so it is not necessary to power off the library.

3. Cycle **power** to the library.

4. If air does not flow from the drive sled cooling fan grill on the rear of the library, replace the drive sled. Several library error codes also point to cooling problems.

5. If the drive is experiencing permanent or temporary errors or if the amber Clean LED is lit on the front panel of the library, select Clean Drive from the Operator Control Panel Service Menu (**Service > Service > Clean Drive**) and clean the drive. Use only an approved cleaning cartridge (see "Cleaning Cartridge" on page 6-4).

6. Run the **Library Verify Diagnostic** which includes a drive performance Read/Write test. Be sure to use a known good scratch or blank data cartridge.

   If the drive test **fails**, replace the drive sled.

7. If the drive diagnostics **pass**, run the drive wrap test from the Operator Control Panel:

   a. Press **Service > Service** and select a drive.

   b. Press SELECT to highlight the test options field, and press UP and DOWN to select **Wrap Test** them press SELECT.

   c. Highlight **Run** and press SELECT.

   d. When prompted, connect the Wrap Test Adapter and select **OK**.

   e. If the wrap test fails, verify that you are using a wrap tool and not a terminator. If you are using the correct wrap tool, then replace the drive sled.

8. Using the host interface test tool, ITDT, run the Scan functions to verify that the host application interface (SAS or Fibre Channel) can detect the drive (LUN 0) and the library (LUN 1). To further test the interface communication path, run the Test Device function (t), if available, after selecting the drive. This function will write/read data across the interface as well as sending a command to the drive to run the internal performance Read/Write test.

9. If the host tool, ITDT, cannot detect the drive or library, look for problems with the host interface cabling, the HBA, the device driver, or the backup application software.

10. If the drive passes all the tests, inspect the **media** to ensure the media is compatible with the drive and not causing drive errors. Refer to Chapter 6, "Media."

Isolating a Library Controller Card vs. Accessor Enclosure Problem

1. If possible, ensure that the **library firmware** is at the latest level, check the current library firmware level using the Operator Control Panel (**Monitor > Library > Identity > Version**) or the Web User Interface (**Monitor Library > Library Identity**).

2. Observe the Library Controller Card **LED**.
   - **LED On** (solid) – LCC failed or in a hang condition.
   - **LED Off** – LCC not fully inserted, or LCC failed, or library not connected to power source, or Power Supply defect.
   - **LED flashing** (1 flash per second) – normal operation.
   - **LED flashing slow** (slower than once per second) – normal operation.
   - **LED flashing fast** (faster than once per second) – LCC failed.

3. With library power OFF, loosen the two thumbscrews which secure the **controller card** to the library enclosure and slide it out.
   - Inspect the card for any broken components or other anomalies.
   - If the card appears to have no abnormalities, reseat the card back in the library, tighten the thumbscrews, and turn library power ON.

4. If both the Operator Control Panel and Web User Interfaces are **inoperable or frozen** and the latest firmware has been installed, the controller card CRU electronics is the most likely failure. If only the Web User Interface has failed, please see "Isolating Web User Interface Problems" on page 7-11 before replacing any CRUs.

5. If a control card error code has been obtained and reseating, power cycling, and updating the library firmware did not fix the problem, the library controller card is most likely failing and should be replaced.

6. If an error code indicates an accessor type error (such as slider, elevator, or drive sled), release and remove both magazines and examine the accessor path for any obvious obstruction or problems. Resolve any observed problem if possible. Execute a Library System Test. If the problem is persistent, replace the library chassis.

7. If the problem is **intermittent** or if a particular electronic or mechanical function of the library is not working properly as evidenced through observation or by error code, the library chassis is the most likely failing component. Execute a Library System Test. See "Service Library: Perform Diagnostics" on page 5-29 for the Web User Interface or "Service: Run Tests" on page 5-9 for the Operator Control Panel. If the problem is persistent, replace the library chassis.

8. If the library is taking an **extended amount of time** in recovery to complete initialization, perform an inventory, or executing a cartridge movement within the library, and, after finding the magazine cell fiducials to be present with no visible damage and correctly installed, suspect the sensor/emitter on the accessor mechanism to be inoperable. Execute a Library System Test. See "Service Library: Perform Diagnostics" on page 5-29 for the Web User Interface or "Service: Run Tests" on page 5-9 for the Operator Control Panel. If the problem is persistent, replace the library chassis.

Isolating Web User Interface Problems

If the Web User Interface is not functioning at all or if it is intermittently functioning, review the following steps to ensure that it is properly configured, or, to help determine which CRU or part needs to be replaced. The complete Web User Interface electronics reside on the library controller card CRU.

1. Ensure that the **Ethernet cable** is securely plugged in the rear of the library at the Ethernet port.

2. Ensure that the correct **IP**, **Netmask**, and **Gateway** addresses are keyed into the network parameters. From the Operator Control Panel, navigate to **Configure > Network**.

3. Ensure that the correct **IP address** is being used on the web browser.

   If you get a security certificate alert when logging in to the Web User Interface, you can install the certificate or allow an exception (depending on the Internet browser you are using). Even though with some browsers you will still receive a security certificate warning/error each time you log in to the Web User Interface, your transmission is secure. SSL is enabled when the URL to your library begins with https:// and some browsers will show a lock.

4. If the Ethernet connection is a direct connection between the PC and the library, a special "**crossover**" Ethernet cable needs to be used.

   NOTE: On newer PCs, either straight through or crossover Ethernet cables may be used since the crossover requirement is provided internally.

5. Check the **Ethernet cable** carefully (or try another cable) and, if the cable is connected to a network hub or switch, try a different port.

6. If the Web User Interface is still malfunctioning, replace the **library controller card**.

Isolating Bar Code Scanner Problems

If the server has reported inventory problems relating to inability to read bar code labels, or, if some or all of the cartridge labels are not being displayed on the Web User Interface, use the following procedure to determine if the bar code scanner needs to be replaced (by replacing the library chassis CRU).

1. Ensure that supported **bar code labels** are being used. Also, check for damaged labels.

2. With library power OFF, reseat the **library controller card**, and then switch library power ON.

3. Perform a **re-inventory** via the Operator Control Panel (**Control > Re-Inventory**) and view the inventory via the Web User Interface (**Monitor Library > Inventory**) to determine if the labels are now being read.

4. If the labels are still not being read properly, replace the **library chassis**.

Isolating Host Attachment Interface Problems

After successfully exercising "Isolating Drive Sled Problems" on page 7-9, and more specifically the **Library Verify** diagnostic on the Operator Control Panel (**Service > Library Verify**) which includes a drive read/write diagnostic, the following steps are suggested to help isolate the failure to properly establish connectivity to the Host Bus Adapter (HBA).

1. If not already performed, exercise the **drive interface wrap test** on the Operator Control Panel (**Service > Service > Drive Tests**). The test will require that a proper Wrap Tool be installed at some point during the test procedure.
   - If the wrap test **fails**, replace the drive sled, and skip to Step 4.
   - If the wrap test **passes**, continue with Step 2.

2. Using the **ITDI utility**, evaluate connectivity from the HBA through the cabling to the drives.

   ITDT does not require separate device drivers, thus the Operating System has the ability to scan and find all the LTO devices that are attached. See "TotalStorage Tape Diagnostic Tool (ITDT)" on page 9-2 for a brief description of ITDT and instructions on how to download the tool from the Overland web site.
   - If ITDT **cannot** successfully locate the LTO drive, suspect that there are cabling or HBA problems, and skip to Step 4.
   - If ITDT successfully **located** the LTO drive, proceed to Step 3.

3. Verify that the correct application device **drivers** and backup application **software** is properly installed.

4. Ensure that all the required or latest available Operating System **files and/or updates** (DLL's, PTF's, and so forth) have been installed and applied.

Identifying a Suspect Cartridge

The amber **Attention** LED will be lit on the front panel of the library when there has been a failure that indicates a piece of media is bad, marginal, or invalid. It will be cleared when all invalid cartridges have been exported from the library.

NOTE: The Attention LED may also be lit because a power supply, or a power supply fan is failing. Refer to "Isolating a Power Supply Problem" on page 7-7.

1. Identify the **media** using the Web User Interface (**Monitor Library > Inventory**).

   Expand the cartridge details for each magazine and look for media status in the **Attn** column of the inventory table.

2. Make note of the cartridge location (**Slot #**) and VOLSER (**Label**) from the inventory table.

3. To remove the **cartridge** from the library:

   a. If the cartridge is not in a **Mail Slot**, using the Web User Interface, select **Manage Library > Move Media**, and select a Mail Slot as the destination.

   b. Using the **OCP**, select **Control > Open I/O Station** (Mail Slot).

   c. Remove **cartridge**.

      If cartridge was reported as **Bad**, properly dispose the cartridge.

4. Close the **Mail Slot**.

   If the amber LED was lit because of bad media, the Attention LED will turn OFF.

   NOTE: If the amber LED is **still on**, check the power supply or the power supply fans. See "Isolating a Power Supply Problem" on page 7-7.

Contacting Overland Technical Support

For help with your NEO 200s/400s library, search at:

http://support.overlandstorage.com/kb

You can email our technical support staff at techsupport@overlandstorage.com or get additional technical support information on the Contact Us web page:

http://docs.overlandstorage.com/support

For a complete list of support times depending on the type of coverage, visit our website at:

http://docs.overlandstorage.com/care

Error Codes

If an error occurs during operation of the library, the library stops the current operation and displays an error code on the LCD screen. Unless otherwise noted in Error Codes, try to resolve the error by cycling power to the library and retrying the last operation. If the error persists, contact Overland Technical Support.

Example Error Code:

The OCP shows the following:

> EVENT -6
>
> 8D 07

Where:

- "-6" indicates the position in sequence list, 0 being the most recent.
- "8D 07" indicates the error. (code 8D = sled blocked).

The event log with the library also includes a date stamp for each event. Press SELECT to display the associated time stamp in the following format:

> yy.mm.dd hh:mm:ss:HH

Where:

- yy is the year
- mm is the month
- dd is the current day
- hh is hours
- mm is minutes
- ss is seconds
- HH is 1/100 second

The time stamp is set to zero at system start.

Topics in Error Codes:

- Preparing to Resolve an Error Code
- Error Codes
- Sub Error Codes
- Warning Events

Preparing to Resolve an Error Code

1. Record the **error information** that is displayed on the Operator Control Panel display or Web User Interface screen.

2. If possible, **cycle library power** and retry operation.

- If the error reoccurs, refer to Error Codes for information on resolving the error.

- If the error does not reoccur, run Library Verify before continuing with normal library operation.

NOTE: Complete these steps before completing the User Action listed in Error Codes.

Error Codes

Errors described in this section are hard errors. If such an error occurs the library stops all operations and the Error LED starts blinking. An appropriate message will be posted on the Operator Control Panel and the Web User Interface. These errors are also reported via email notification, if enabled. To enable email notifications, refer to "Configure Library: Email Notification" on page 5-24.

Error Code	Description	User Action
80	Bar code reader error, cannot initialize BCR	
81	Bar code reader error, no response from BCR	
82	EEPROM (Electrically Erasable Programmable Read-Only Memory) error, no response from EEPROM (located on accessor controller)	Error Code 80 01 may be posted if the library has a BCR (Bar Code Reader) that requires a minimum level of library firmware. Update the library firmware to 9.00 or higher. If the problem still exists, refer to "Isolating a Library Controller Card vs. Accessor Enclosure Problem" on page 7-10. Possible Replacement CRUs: • Primary: Library Chassis • Secondary: Library Controller Card
83	Accessor controller generic problem	
84	Setting of gripper motor parameters failed	
85	Setting of slider motor parameters failed	
86	Setting of elevator motor parameters failed	
87	Setting of rotation motor parameters failed	
88	Setting of sled motor parameters failed	

89	Gripper blocked	1. If this is the first time the library has been powered ON or if it has been moved to a new location, ensure that the shipping lock has been removed. The lock is located on the top of the library (see Removing and Storing the Shipping Lock).
		2. Refer to "Isolating a Library Controller Card vs. Accessor Enclosure Problem" on page 7-10. Possible Replacement CRUs:
		  • Primary: Library Chassis
		  • Secondary: Library Controller Card

8A	Slider blocked	
8B	Elevator blocked	
8C	Rotation blocked	
8D	Sled blocked	

Error Code	Description	User Action
8E	Cannot find gripper block within the expected range	
8F	Cannot find slider block within the expected range	
90	Cannot find elevator block within the expected range	
91	Cannot find rotation block within the expected range	
92	Cannot find sled block within the expected range	
93	Gripper outside range; Gripper has reached a position beyond the expected range	
94	Slider outside range; Slider has reached a position beyond the expected range	
95	Elevator outside range; Elevator has reached a position beyond the expected range	
96	Rotation outside range; Rotation has reached a position beyond the expected range	Refer to "Isolating a Library Controller Card vs. Accessor Enclosure Problem" on page 7-10.
97	Sled outside range; Sled has reached a position beyond the expected range	Possible Replacement CRUs: • Primary: Library Chassis • Secondary: Library Controller Card
98	Cartridge present sensor not found	
99	Slider home sensor not found	
9A	Rotation home sensor not found	
9B	Sled position sensor (fiducial sensor) not found	
9C	Gripper range out of specification	
9D	Slider range out of specification	
9E	Elevator range out of specification	
9F	Rotation range out of specification	
A0	Sled range out of specification	
A1	Open I/O Station (Mail Slot) failed	
A2	Error during elevator locking	
A6	No elevator home sensor found	
B0	Robotic controller response timeout. A command did not complete in the required amount of time.	
B1	NACK (not acknowledged) received from robotic controller	
B2	Accessor controller communication failed	

Error Code	Description	User Action
B3	Accessor controller urgent stop due to a released magazine	1. Verify that the left and right magazines are completely inserted, then retry operation.
B4	Cartridge did not transport completely	2. Refer to "Isolating a Library Controller Card vs. Accessor Enclosure Problem" on page 7-10. Possible Replacement CRUs:
B5	Accessor controller does not respond on command	• Primary: Library Chassis
		• Secondary: Library Controller Card
C0	Network initialization failed	
C1	Telnet Interface initialization failed	1. Refer to "Isolating Web User Interface Problems" on page 7-11.
C2	Web server initialization failed	2. If the error recurs, contact Overland Technical Support.
C6	Ping command did not reach target	
C7	Cannot Upgrade from USB	Not supported.
C8	Cannot Upgrade from FTP	1. Retry the firmware upgrade.
C9	Cannot Upgrade Robotic from Flash	2. If the error recurs, contact Overland Technical Support.
D0	ROM error. ROM checksum incorrect.	
D1	RAM error. Power on Self Test (POST) has failed.	Refer to "Isolating a Library Controller Card vs. Accessor Enclosure Problem" on page 7-10. Possible Replacement CRUs:
D2	NVRAM (Non-Volatile Random Access Memory) error. Read/Write operation to NVRAM has failed.	• Primary: Library Controller Card • Secondary: Library Chassis *D7 – Fatal System error can occur due to an over-temperature condition. Ensure the environment meets the Environmental Specifications (refer to "Choosing a Location" on page 4-1).
D3	CTC (Channel to Channel) error. Timer unit has failed during POST.	
D4	UART (Universal Asynchronous Receiver Transmitter) error. Frame overrun or Parity error on serial interface.	**If you receive a D8 error while restoring your library configuration from the OCP or Web UI, verify that your file extension is ".dbb". If the extension is correct, your file may have been corrupted during the save. Reconfigure, then save your library configuration.
D5	Display error. Communication to display failed.	NOTE: Configuration files saved with one version of library firmware may not be compatible with other versions of firmware. It is recommended to save a configuration file each time the library firmware is upgraded. Restore the library using a configuration file that was saved with the same version of firmware currently installed in the library.
D6	Memory error. Stack and heap overflow.	
D7	Fatal system error.*	
D8	Data base error.**	
D9	No SCSI IC detected.	
DA	While running the Library Verify Test, the bar code reader read different bar code data for the same customer-supplied scratch cartridge label.	1. Check the bar code label on the scratch cartridge and run the Library Verify test again. 2. If the error recurs, contact Overland Technical Support.
DB	Warning Event!	See "Warning Events" on page 8-9.
DC	I^{2}C Bus Failure	1. Retry the operation. 2. After several occurrences, contact Overland Technical Support.
DD	Warning Event!	
DE	Warning Event!	See "Warning Events" on page 8-9.
DF	Warning Event!	

Error Code	Description	User Action
E0	Incompatible magazine detected	1. Remove magazine from library. 2. Reinsert the magazine in the library. 3. If error recurs, contact Overland Technical Support.
E2	New hardware found. Library firmware upgrade required.	Upgrade library firmware to the latest version.
EB	Power supply health check failed due to a power supply failure.	Refer to "Isolating a Power Supply Problem" on page 7-7.
F0	Drive over-temperature condition. The subcode indicates which drive is affected. For example, subcode "02" indicates Drive 2.	1. Check the ambient temperature conditions, and check all fans. 2. Refer to Isolating Drive Sled Problems.
F1	Drive Communication Error: Library controller has lost communication to drive. The subcode indicates which drive is affected. For example, subcode "02" indicates Drive 2.	Refer to "Isolating Drive Sled Problems" on page 7-9.
F2	Drive Sled not present. The subcode indicates which drive is affected. For example, subcode "02" indicates Drive 2.	
F3	Drive Hardware Error The subcode indicates the type of error and which drive is affected. For example, "F3 *xy*" where *x* (single character display) refers to the hardware drive error code and *y* refers to the drive position in the library. **x values**: • 4 – firmware or hardware error • 5 – hardware error • 6 – hardware or media error • A – recoverable hardware error	
F4	Drive Load Timeout (while loading a tape) The subcode indicates which drive is affected. For example, subcode "02" indicates Drive 2.	
F5	Drive Unload Timeout (while unloading a tape). The subcode indicates which drive is affected. For example, subcode "02" indicates Drive 2.	

Error Code	Description	User Action
F6	No drive installed. A drive has never been installed.	
F7	Support ticket download from drive not possible.	
F8	Invalid drive command	
F9	Invalid drive parameter	Refer to "Isolating Drive Sled Problems" on page 7-9.
FA	SDCI microcode error	
FB	Drive logged out	
FC	Internal SCSI command failed with check condition	
FD	Internal SCSI command timeout	

Sub Error Codes

Error Code	Description
	ROBOTICS
00	No sub error code
01	Mechanical initialization failure
02	Connection to slave robotic failed
03	Error motor initialization
04	Error during gripper close
05	Error slider home positioning
06	Error elevator home movement
07	Error during sled movement to rotation position
08	Error during rotation initialization, get range failed
09	Error elevator initialization
0A	Error during rotation to far position
0B	Error first sled initialization, move to sensor failed
0C	Error during sled movement to rotation position
0D	Error during rotation to drive position
0E	Error slider initialization, get range failed
0F	Error during slider forward movement
10	Error gripper initialization, get range failed
11	Error during slider home movement
12	Error during rotation to FAR position
13	Error sled initialization, move to sensor failed
14	Error during sled movement; check shipping lock
20	Error Inventory scan

Error Code	Description
21	Error during gripper close
22	Error slider home movement
23	Error during move gripper to scan position
24	Error reading bar code label
25	Error during move sled to scan position
26	Error during move elevator to scan position
27	Error during sled preposition movement
28	Error Extra inventory scan
29	Error during closing gripper
2A	Error slider preposition movement
2B	Error during opening gripper
2C	Error during sled movement up to sensor
2D	Error slider preposition backwards movement
30	Error slot preposition
31	Error during sled movement in FLMoveRotation function
32	Command sending to robotic failed
33	Error during elevator movement in FLMoveRotation function
34	Error during rotation in FLMoveRotation function
35	Error during elevator movement in FLMoveSled function
36	Error during sled movement in FLMoveSled function
37	Error during sled positioning to sensor in FLMoveSled function
38	Error during sled positioning to mail slot in FLMoveSled function
39	Error during sled positioning without sensor
3A	Error during elevator movement without sensor
3B	Error slot position sensor not found
40	Movement to/from slot failed
41	Error during first slider movement
42	Error during first gripper movement
43	Error during second slider movement
44	Error during second gripper movement, get range failed
45	Error during third slider movement, move home failed
46	Error during set hold current to avoid torsion
47	Negative direction blocked
48	Positive direction blocked
49	Possible motor defect, because both directions blocked
4A	Cartridge present sensor defect
4B	Inventory lost, because destination possibly full
4C	Inventory lost, because source may be empty
4D	Could not pull tape out of slot from magazine

Error Code	Description
4E	Unexpected tape on elevator, possible inventory lost
50	Preposition to drive failed
51	Elevator movement to home sensor failed.
52	Sled movement to home sensor failed.
53	Error during sled movement to drive position.
54	Error during rotation to drive position.
55	Error during elevator movement in drive position.
56	Error during sled movement to rotation position.
57	Error during rotation to end position.
60	Move from/to drive failed.
61	Error during first slider movement.
62	Error during first gripper movement.
63	Error during second slider movement.
64	Error during second gripper movement, get range failed.
65	Error during third slider movement, move home failed.
70	Release magazine failed.
71	Error during sled movement to rotation position.
72	Error during rotation to unlock position.
73	Error during move sled to block.
80	Opening I/O slot failed.
81	Error during movement to I/O slot open position.
82	Error during moving back-sensor was found.
90	Movement to home position failed.
91	Elevator movement to home position failed.
92	Error during sled movement to rotation position.
93	Error during rotation to home or far position.
94	Sled movement to home sensor position failed.
95	Sled movement to transport position failed.
A0	Movement of I/O slot failed.
A1	Sled movement to sensor failed.
A2	Sled movement to rotation position failed.
A3	Elevator movement to home position failed.
A4	Error during rotation to far position.
A5	Sled movement to I/O slot position failed.
A6	Error during elevator movement to position
A7	Error during Mail Slot detection
B0	EEPROM on robotics controller not accessible or error during Read/Write operation
B1	Save/restore configuration settings: not enough internal memory available for creating the file and restoring the file respectively

Error Code	Description
B2	Save/restore configuration settings: restore buffer corrupted, checksum calculation failed
B3	Save/restore configuration settings: data base field corrupted
B4	Save/restore configuration settings: invalid personality
B5	Save/restore configuration settings: invalid file
	LIBRARY
81	Drive wake up failed
88	Error accessing slot status
90	Accessor load not reached Cartridge Present sensor
91	No activity after Load command
92	Timeout while loading tape
93	No activity after load command
94	Timeout drive unload
95	Drive terminated unsuccessfully
96	Tape not ejected at robot unload
97	Slot not free at robot unload
98	Cartridge not seated in load phase

Warning Events

Warning events described in this section are reported via email notification. The Attention LED will blink when warning events for the following occur:

- Media
- Fan
- Redundant power supply

An appropriate message will be posted on the Operator Control Panel and the Web User Interface.

Error Code	Description	User Action
30	SCSI: transport element full	
31	SCSI: all slots empty	
32	SCSI: invalid opcode	
33	SCSI: invalid element address	
34	SCSI: invalid field in CDB	Refer to your host application documentation for problem determination information.
35	SCSI: Invalid drive specified	
36	SCSI: SEND DIAGNOSTIC command: invalid test number	
37	SCSI: invalid LUN	
38	SCSI: parameter list length error	

Error Code	Description	User Action
39	SCSI: parameter list error: invalid field	Refer to your host application documentation for problem determination information.
3A	SCSI: parameter list error: parameter not supported	
3B	SCSI: parameter value invalid	
3C	SCSI: saving parameters not supported	
3D	SCSI: invalid ID message	
3E	SCSI: destination element full	
3F	SCSI: source slot or drive empty	
40	SCSI: wrong checksum	
41	SCSI: command sequence error	
42	SCSI: drive disabled	Check your configuration settings.
43	SCSI: I/O Station (Mail Slot) disabled	
44	SCSI: flash image does not fit boot code	Refer to your host application documentation for problem determination information.
45	SCSI: media removal prevented by drive	
46	SCSI: media removal prevented by library	
47	SCSI: flash image does not fit personality	Check the version of firmware used for the upgrade.
48	SCSI: drive type not supported in this library	Check whether a version of firmware is available which supports this drive type. For a list of supported drives, refer to Ultrium Tape Drives.
49	SCSI: incompatible magazine, magazine not accessible	Check your configuration settings.
4A	SCSI: source not ready	Complete move process and retry operation.
4B	SCSI: destination source not ready	
4C	SCSI: library controller busy	Complete process and retry operation.
4D	SCSI: cannot make reservation	Refer to your host application documentation for problem determination information.
4E	SCSI: invalid slave robotic controller request	
4F	SCSI: robotic axes/motors aren't initialized	Check robotics status. Refer to Isolating a Library Controller Card vs. Accessor Enclosure Problem.
50	SCSI: cartridge belongs to another partition	Refer to your host application documentation for problem determination information.
55	SCSI: invalid license key entered	Re-enter license key. If problem persists, contact Overland Technical Support.
58	Recovered Error: SCSI parity error	No user action is required.
59	Recovered Error: Error log overflow	
5B	Incompatible medium generation	Replace incorrect cartridges.
5C	Illegal request, downgrade prohibited because of incompatible network stack	Change network settings to IPv4 only before downgrading firmware.
5D	Illegal request, wrong drive FW for drive	Obtain correct drive firmware image.
5E	Full high drive in illegal position	Check correct Drive position.

Error Code	Description	User Action
60	Cleaning cartridge installed	Complete the cleaning process and retry the operation.
61	Cleaning failure. Cleaning process could not be performed	1. Verify that auto clean is enabled. 2. Check for an expired cleaning cartridge and replace if necessary. 3. Refer to "Configuring Mail Slots and Reserving Slots" on page 5-32.
62	Cleaning cartridge expired	Replace cleaning cartridge.
63	Invalid cartridge. Drive has rejected the data cartridge as invalid	1. Verify that the correct cartridge is being used. 2. Refer to "Cartridge Compatibility" on page 6-3. Refer to "Identifying a Suspect Cartridge" on page 7-12.
64	Invalid cleaning cartridge. Drive has rejected the cleaning cartridge as invalid	
65	Invalid upgrade cartridge. Drive has rejected the upgrade cartridge as invalid	Not supported.
66	Medium error; diagnostic tape write protected	Ensure diagnostic tape is not write protected.
67	Medium error, incompatible medium for write operation	Replace incorrect cartridges.
70	Currently not used	—
71	Currently not used	—
72	Currently not used	—
73	SCSI: overlapped command attempt	Refer to your host application documentation for problem determination information.
74	SCSI: echo buffer overwritten	
80	Movement Retry.	—
81	Fan Alert.	—
82	Clean request from drive.	—
83	Media Attention.	—
84	Drive reported warning or critical tape alert flag.	—
85	Network problem.	Check network connections, configuration, and settings.
86	Not enough cleaning cartridges present to auto clean.	Insert additional cleaning cartridges to the empty reserved slots.
87	Drive disabled because it is not supported for use in this library.	Check drive type and install only supported drives.
88	Drive firmware unchanged after upgrade.	This is normal if the old and new drive firmware are the same version.
89	Power Supply Fan operation warning.	Check the power supply status.
8A	Power Supply has failed.	Check the power supply status and replace the failed power supply.
8B	Power supply has failed.	Check the power supply status and replace the failed power supply.
8C	Invalid Robotic Code.	Install the latest version of library firmware.
8E	Cleaning tape nearly expired.	Continue using cleaning cartridge until it is expired, then replace the expired cleaning cartridge with a new cleaning cartridge.
8F	I^2C bus recovery.	Run library System Test.

Error Code	Description	User Action
92	VPD data have been restored from EEPROM.	This is normal when the VPD has been restored EEPROM.
DB	External cooling fan error (fan motion has stopped). The subcode indicates which drive sled fan is affected: • Subcode 01: drive sled #1(bottom). • Subcode 02: drive sled #2.	Refer to "Isolating Drive Sled Problems" on page 7-9.
DC	I^{2}C Bus Failure	
DD	Power Supply x fan has failed; Redundancy may be at risk. The subcode indicates which power supply fan is affected: • Subcode 01: 1st PS fan from bottom. • Subcode 02: 2nd PS fan from bottom.	Refer to "Isolating a Power Supply Problem" on page 7-7.
DF	Power Good signal changed from 2 to 1 Power Supplies.	
F6	No drive installed. A drive has never been installed.	Install at least one drive.

Service Procedures

These tasks help you handle simple service issues that may arise.

Topics in Service Procedures:

- Removing Cartridges from Magazine Slots
- Releasing the Magazines Manually
- TotalStorage Tape Diagnostic Tool (ITDT)
- Contacting Overland Technical Support

Removing Cartridges from Magazine Slots

In the event of a mechanical problem with the library or if circumstances require you to remove tape cartridges and the Operator Control Panel or the Web User Interface is still operational, do the following:

1. Move the tapes from the drives to the magazines using the Move Media command. See "Manage Library: Move Media" on page 5-17.

> NOTE: Contact Overland Technical Support if a cartridge will not eject from the drive.

2. Use the normal **magazine removal process** to release the magazine and remove it from the library.

- To use the **Operator Control Panel**, see "Control: Magazine" on page 5-7.
- To use the **Web User Interface**, see "Manage Library: Release Magazine" on page 5-17.

If neither one of these processes works, see "Releasing the Magazines Manually."

Releasing the Magazines Manually

If the directions in "Removing Cartridges from Magazine Slots" do not allow you to remove the tapes, do the following:

1. Unplug the **power cord** from the library.

2. At the rear, locate the **access holes** for the right and left magazines.

Right Magazine Release
(next to Power Supply)

Left Magazine Release
(next to Port Panel)

3. To manually release the magazines, push the end of a **straightened paper clip** into the access hole for each magazine at the back of the library. While holding the paper clip, have a second person pull the magazine out of the front of the unit. DO NOT push the paper clip in more than 1/2 inch.

2U Left Magazine Pulled Out

4U Magazines Pulled Out

4. If there are **additional tapes** still in the library, or if you were unable to manually remove the magazines and drive, contact Overland Technical Support for further instructions.

TotalStorage Tape Diagnostic Tool (ITDT)

The TotalStorage Tape Diagnostic Tool (ITDT):

- Runs quick or extended diagnostics on tape drives. If the library is online to the server/host where the tool resides, ITDT will communicate with the drive through the library to load and unload a test cartridge thereby exercising some library functions.

- Retrieves firmware dumps from tape drives and libraries.

- Performs a firmware update on tape drives or libraries. See note below regarding library firmware update.

- Tests the performance of the environment by completely writing a cartridge and measuring performance.

- Retrieves and displays cartridge information.

- Verifies the encryption environment.

- Does not require special device drivers.
- Is available for most major platforms.
- Scans the host interface and will find and display for selection all IBM LTO devices. The tool will not display non-IBM devices.

The ITDT v4.1 is available as a command line utility and a graphical user interface (GUI) version.

- To use it as a command line utility, invoke it by entering the executable from the directory where the tool is located. The Help feature gives a brief explanation of each function and shows the required syntax.
- To use it as a GUI version for Microsoft Windows, click the ITDT icon in the ITDT group to launch the tool. Only Microsoft Windows XP and Microsoft Windows Server 2003 (IX86, 32-bit) are supported.

NOTE: ITDT v4.1 or higher is required for Ultrium 5 tape drives. Before using ITDT, verify that your library host operating system is at the latest released level. This will ensure optimum read/write operations for diagnostics.

To download the ITDT tool and instructions for using the tool, visit:

http://docs.overlandstorage.com/neo

Contacting Overland Technical Support

> IMPORTANT: The NEO 200s and 400s tape libraries are customer-installed units. The customer is responsible for the setup and maintenance of the tape library. The customer will be charged for service if a service contract is not in place.

If you need to contact Overland Technical Support, refer to that section in the "Preface."

Physical Specifications

Parameter	NEO 200s	NEO 400s
Width	447.5 mm (17.6 in.)	447.5 mm (17.6 in.)
Depth	740 mm (29.13 in)	740 mm (29.13 in)
Height	87.6 mm (3.44 in.) (2U)	175.2 mm (6.9 in.) (4U)
Weight (library and 1 drive)	15.59 kg (34.37 lbs.)	21.32 kg (47 lbs.)
Weight (with media)	20.67 kg (45.57 lbs.)	31.71 kg (69.9 lbs.)

Electrical Specifications

Parameter	Measurement
Voltage	100 to 127; 200 to 240 VAC (4.0 to 2.0 A)
Frequency	50 to 60 Hz
Power consumption	110 W

For additional information about installation specifications, see "Choosing a Location" on page 4-1.

Environmental Specifications

Temperature	
Operating	10° to 35° C (50° to 95° F)
Storage, without cartridges	-30° to 60° C (-22° to 140° F)
Wet bulb, operating	26° C (79.0° F) maximum
Temperature shock immunity — maximum rate of change	10° C (18° F) per hour
Miscellaneous	
Dust concentration	less than 200 microgram/cubic meter
Altitude (operating)	2500 meters (8200 ft.) at 25°C ambient
Acoustical noise sound power levels LwAd in bels (1 bel = 10 dB)	Idling = 6.6/Maximum = 6.8

Humidity	
Operating	15% to 80% RH non-condensing
Storage, without cartridges	10% to 90% RH non-condensing

Operational Specifications

Library with Ultrium 5 drives	2U Library	4U Library
Maximum storage capacity	Maximum number of data cartridges: 24 Native: 36 TB Compressed: 72 TB (2:1 compression)	Maximum number of data cartridges: 48 Native: 72 TB Compressed: 144 TB (2:1 compression)
Number of slots	24 (including Mail Slots)	48 (Including 3x Mail Slots)
Sustained native data transfer rate*	Ultrium 5 Half-Height Drive: 140 MB/s	
Drive types	Fibre Channel, SAS	
Interfaces	8 Gb/s Fibre Channel 6 Gb/s SAS	

$*$ Host Interface Drive Transfer Rates may vary depending on host usage and interface utilization

Library with Ultrium 4 drives	2U Library	4U Library
Maximum storage capacity	Maximum number of data cartridges: 24 Native: 19.2 TB Compressed: 38.4 TB (2:1 compression)	Maximum number of data cartridges: 48 Native: 38.4TB Compressed: 75.2 TB (2:1 compression)
Number of slots	24 (including Mail Slots)	48 (Including 3x Mail Slots)
Sustained native data transfer rate*	Ultrium 4 Half-Height Drive: 120 MB/s	
Drive types	Fibre Channel, SAS	
Interfaces	V2 Fibre Channel Drive: 8 Gb/s 6 Gb/s Fibre Channel 3 Gb/s SAS	

$*$ Host Interface Drive Transfer Rates may vary depending on host usage and interface utilization

Product Environment

The NEO 200s/400s tape libraries are designed to operate in a general business environment.

The library meets the acoustical requirements for general business area category 2D. Category 2D states that the library should be installed a minimum of 4 m (13 ft.) from a permanent work station.

To allow for service access, install the library a minimum of 0.9 m (3 ft.) from all obstacles.

The library is a precision computer peripheral. To ensure maximum longevity of your library, locate the library away from dust, dirt, and airborne particulates, as follows:

- Keep the library away from high-traffic areas, especially if the floor is carpeted. Carpeting harbors dust and people walking on the carpet can cause the carpet fibers and the dust to become airborne.
- Keep the library out of printer and copier rooms because of toner and paper dust. Additionally, do not store paper supplies next to the library.
- Keep the library away from moving air caused by doorways, open windows, fans, and air conditioners.

Ensure that the machine covers are always kept closed to minimize any contamination from airborne particles.

Supported Device Drivers

Device drivers enable the drive to interact with a variety of servers. To properly install a device driver (if required), refer to the Technical Bulletin located with the drivers. For applications that use other device drivers, see the application's documentation to determine which drivers to use.

Overland Storage maintains the levels of device drivers and driver documentation for the tape drives on the Internet. You can access this material at the web site:

http://docs.overlandstorage.com/neo

Physical Configurations

This section addresses SCSI element types, SCSI addresses, and physical configurations of the NEO 200s/400s libraries.

For an overview of library partitioning and element addressing, see "Library Partitioning and Element Addressing" on page B-3.

The following tables contain element addresses for the 2U library and the 4U library.

2U library SCSI element types and element addresses:

Element Type	Element Address Range
Media Transport (Accessor) Element (MTE)	1 (0x01)
Mail Slot Element (IEE)	16 (0x10)
Data Transfer (Drive) Element (DTE)	256 (0x100), 257 (0x101)
Storage Elements (STE)	4096 (0x1000) − 4118 (0x1016)

4U library SCSI element types and element addresses:

Element Type	Element Address Range
Media Transport (Accessor) Element (MTE)	1 (0x01)
Mail Slot Elements (IEE)	16 (0x10), 17 (0x11), 18 (0x12)
Data Transfer (Drives) Elements (DTE)	256 (0x100), 257 (0x101), 258 (0x102, 259 (0x103)
Storage Elements (STE)	4096 (0x1000) − 4140 (0x102C)

Topics in Physical Configurations:

- 2U Library Physical Configuration
- 4U Library Physical Configuration
- Library Partitioning and Element Addressing

2U Library Physical Configuration

This section covers the 2U Library Mail Slot, storage slots and drive slot element addresses, and physical locations.

For an overview of library partitioning and element addressing, see "Library Partitioning and Element Addressing" on page B-3.

The table below contains the physical location and SCSI element address (decimal and hexadecimal) of the Mail Slot, storage slots, and drive slot in the 2U library configured with one drive and one logical partition. If a second drive were installed, it would be located at address 257 (0x101).

Left Magazine (Front of 2U Library)				(Rear of 2U Library)	Right Magazine (Front of 2U Library)			
Slot 8 4103 (0x1007)	Slot 9 4104 (0x1008)	Slot 10 4105 (0x1009)	Slot 11 4106 (0x100A)		Slot 23 4118 (0x1016)	Slot 22 4117 (0x1015)	Slot 21 4116 (0x1014)	Slot 20 4115 (0x1013)
Slot 4 4099 (0x1003)	Slot 5 4100 (0x1004)	Slot 6 4101 (0x1005)	Slot 7 4102 (0x1006)	Drive 1 256 (0x100)	Slot 19 4114 (0x1012)	Slot 18 4113 (0x1011)	Slot 17 4112 (0x1010)	Slot 16 4111 (0x100F)
Mail Slot 16 (0x10)	Slot 1 4096 (0x1000)	Slot 2 4097 (0x1001)	Slot 3 4098 (0x1002)		Slot 15 4110 (0x100E)	Slot 14 4109 (0x100D)	Slot 13 4108 (0x100C)	Slot 12 4107 (0x100B)

With two drives installed, the library can be configured as one partition (with two drives) or as two partitions (with one drive per partition).

- When configured with two drives and one logical partition, the Element Address assignments will be as follows:
  - DTE assignments:
    - Drive 1: 256 (0x100)
    - Drive 2: 257 (0x101)
  - The STE assignments will be as shown in the table.
- When configured with two drives and one logical partition, the Element Address assignments will be as follows:
  - DTE assignments:
    - Logical Library 1: Drive 1: 256 (0x100)
    - Logical Library 2: Drive 2: 256 (0x100)
  - STE assignments:
    - Logical Library 1: Slot 1 through slot 11 4096 (x1000) through 4106 (0x100A)
    - Logical Library 2: Slot 12 through slot 23 4096 (x1000) through 4107 (0x100B)

4U Library Physical Configuration

This section covers the 4U Library Mail Slot, storage slots and drive slot element addresses, and physical locations.

For an overview of library partitioning and element addressing, see "Library Partitioning and Element Addressing" on page B-3.

The following table contains the physical location (Slot *x*) and SCSI element address in decimal (4*xxx*) and in hexadecimal (0*x*10*xx*) of the Mail Slots, storage slots, and drive slots in the 4U library containing only two drive sleds.

In 4U libraries with a slot reserved (*Res*) for a cleaning cartridge, the information shown in reserved slot moves to the next slot and so forth through the remaining magazine slots. The final slot becomes slot 44 (instead of slot 45 for libraries without a reserved slot).

Upper Left Magazine (Front of 4U Library)				(Rear of 4U Library)	Upper Right Magazine (Front of 4U Library)			
Slot 18 4113 (0x1011)	Slot 19 4114 (0x1012)	Slot 20 4115 (0x1013)	Slot 21 4116 (0x1014)	Drive 2 257 (0x101)	Slot 45 4140 (0x102C)	Slot 44 4139 (0x102B)	Slot 43 4138 (0x102A)	Slot 42 4137 (0x1029)
Slot 14 4009 (0x100D)	Slot 15 4110 (0x100E)	Slot 16 4111 (0x100F)	Slot 17 4112 (0x1010)		Slot 41 4136 (0x1028)	Slot 40 4135 (0x1027)	Slot 39 4134 (0x1026)	Slot 38 4133 (0x1025)
Slot 10 4105 (0x1009)	Slot 11 4106 (0x100A)	Slot 12 4107 (0x100B)	Slot 13 4108 (0x100C)		Slot 37 4132 (0x1024)	Slot 36 4131 (0x1023)	Slot 35 4130 (0x1022)	Slot 34 4129 (0x1021)
Lower Left Magazine					Lower Right Magazine			
Mail Slot 3 4103 (0x12)	Slot 7 4102 (0x1006)	Slot 8 4103 (0x1007)	Slot 9 4104 (0x1008)	Drive 1 256 (0x100)	Slot 33 4128 (0x1020)	Slot 32 4127 (0x101F)	Slot 31 4126 (0x101E)	Slot 30 4125 (0x101D)
Mail Slot 2 4099 (0x11)	Slot 4 4099 (0x1003)	Slot 5 4100 (0x1004)	Slot 6 4101 (0x1005)		Slot 29 4124 (0x101C)	Slot 28 4123 (0x101B)	Slot 27 4122 (0x101A)	Slot 26 4121 (0x1019)
Mail Slot 1 16 (0x10)	Slot 1 4096 (0x1000)	Slot 2 4097 (0x1001)	Slot 3 4098 (0x1002)		Slot 25 4120 (0x1018)	Slot 24 4119 (0x1017)	Slot 23 4118 (0x1016)	Slot 22 4117 (0x1015)

Library Partitioning and Element Addressing

Library 4U systems with firmware versions of 1.70 and higher, and containing at least 2 drives, have the ability to be configured into logical libraries (create partitions). It is possible to configure 1, 2, 3, or 4 partitions in the 4U library. Additionally the 2U library with two drives can be configured into one or two partitions. Each library must contain at least one drive per logical library (partition).

Partitioning of 2U Libraries

When two half-height drives are installed in a 2U library, the library firmware will support partitioning. The first partition will contain the first magazine and the first drive. The second partition will contain the second magazine and the second drive. The Mail Slot (if configured as I/O) will be shared.

Partitioning of 4U Libraries

When one or more half-height drives are added to a 4U library, the library firmware will support partitioning. The first drive is Drive 1, the drive above it is called Drive 2, and so forth.

Configuration of a One-Partition System

A one-partition system configured for a 4U library contains any and all drives present in any drive positions, and it will contain all four magazines. When configured with one logical partition, the Element Address assignments will be as follows:

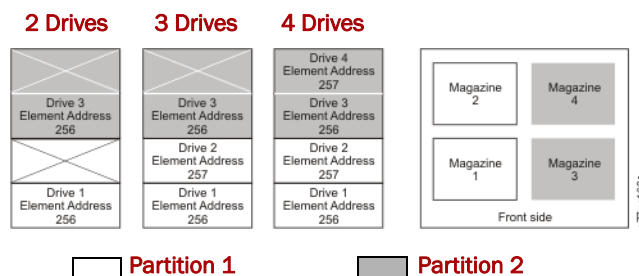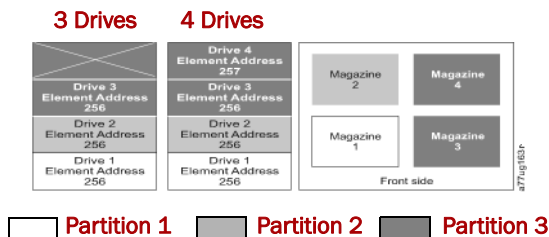- DTE assignments will be as shown in the figure below.
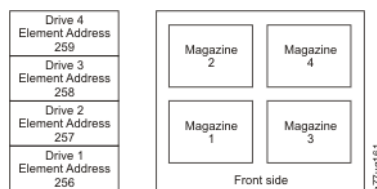
- STE assignments:
  - Logical Library 1 – Slot1 through 23 4096 (0x1000) through 4118 (0x1016)

Configuration of a Two-Partition System

A two-partition system must have a minimum of two drives, but may have three or four drives. Partition 1 will contain any drives in drive position 1 and drive position 2. Partition 1 will also contain magazine 1 and magazine 2. Partition 2 will contain any drives in drive position 3 and drive position 4. Partition 2 will also contain magazine 3 and magazine 4.

When configured with two logical partitions, the Element Address assignments will be as follows:

- DTE assignments will be as shown in the figure below.

- STE assignments:
  - Logical Library 1: Slot 1 through slot 21 4096 (x1000) through 4116 (0x1014)
  - Logical Library 2: Slot 22 through slot 45 4096 (x1000) through 4019 (0x1017)

Configuration of a Three-Partition System

A three partition system must have at least three drives installed. A drive must be installed in drive position 1, another drive must be installed in drive position 2, and another drive must be installed in either drive position 3 or drive position 4. Partition 1 will contain the first drive and the first magazine. Partition 2 will contain the second drive and the second magazine. Partition 3 will contain any drives in drive position 3 and drive position 4. Partition 3 will also contain magazine 3 and magazine 4.
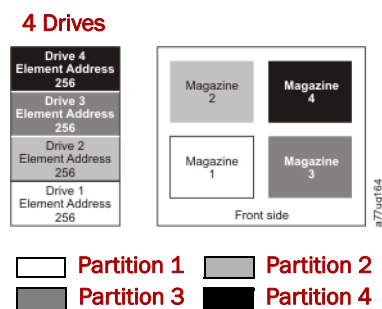
- STE assignments:
  - Logical Library 1: Slot 1 through slot 9 4096 (x1000) through 4104 (0x1008)
  - Logical Library 2: Slot 10 through slot 21 4096 (x1000) through 4107 (0x100B)
  - Logical Library 3: Slot 22 through slot 45 4096 (x1000) through 4119 (0x1017)

3 Drives   4 Drives

Partition 1   Partition 2   Partition 3

Configuration of a Four-Partition System

A four-partition system must have four drives. Each partition will contain one drive and one magazine. When configured with four logical partitions, the Element Address assignments will be as follows:

- DTE assignments will be as shown in the figure below.

4 Drives

Partition 1   Partition 2
Partition 3   Partition 4

- STE assignments:
    - Logical Library 1: Slot 1 through slot 9 4096 (x1000) through 4104 (0x1008)
    - Logical Library 2: Slot 10 through slot 21 4096 (x1000) through 4107 (0x100B)
    - Logical Library 3: Slot 22 through slot 33 4096 (x1000) through 4107 (0x100B)
    - Logical Library 4: Slot 34 through slot 45 4096 (x1000) through 4107 (0x100B)

SCSI Element Addressing

Every logical library starts at the first drive slot with the current assigned element start address (default value 256). It will be incremented from the bottom to the top slots for every drive slot.

The SCSI specification does not allow gaps in the SCSI element addressing. Special handling is needed for empty drive slots to fulfill the specification. Also temporarily removed drives need to have their addresses preserved to not confuse the attached host and host application. Generally only drives which are currently physically available or temporarily removed are reported. Empty (unused) slots located at the bottom or the top should not be reported, with an exception in case of a **Removed** condition. A drive slot which does not contain a drive, and has a position between used slots, needs to be reported as a SCSI element. To signal the host application that this slot is not usable, its ACCESS bit will be disabled.

NOTE: When reducing the number of drives in your library, update the Logical Library configuration. This will remove the Attention LED on the front panel and the exclamation mark on the Home screen indicating that a drive is missing.

TapeAlert Flags

This appendix is intended to provide additional information to the reader about the tape library and tape drive. All error code and diagnostic information contained in this chapter cannot be accessed from the Operator Control Panel of the Library. The Operator Control Panel will, however, display other library error codes and drive error codes when problems occur. For a listing of Operator Control Panel error messages, see Chapter 8, "Error Codes."

TapeAlert is a standard that defines status conditions and problems experienced by devices such as tape drives, autoloaders, and libraries. The standard enables a server to read TapeAlert messages (called flags) from a tape drive. The server reads the flags from Log Sense Page 0x2E.

This library is compatible with TapeAlert technology, which provides error and diagnostic information about the drives and the library to the server. Because library and drive firmware may change periodically, the SNMP interface in the library does not require code changes if devices add additional TapeAlerts that are not supported today. However, should this occur the Management Information Block (MIB) is written to minimize impact to the SNMP monitoring station. At the time of this writing, the TapeAlert flags in this appendix correctly represent TapeAlerts that will be sent. The MIB file should not be taken to mean that all traps that are defined in the MIB will be sent by the library or that they will be sent in the future.

Topics in TapeAlert Flags:

- Library Supported TapeAlert Flags
- Tape Drive Supported TapeAlert Flags

Library Supported TapeAlert Flags

Flag Number	Flag Name	Type*	Description	Action Required
01	Library Hardware A	C	The library mechanism is having trouble communicating with the tape drive.	1. Cycle the power supply and try again. 2. If the problem persists, contact Overland Technical Support.
02	Library Hardware B	W	The media changer mechanism has a hardware fault.	
03	Library Hardware C	C	The media changer mechanism has a hardware fault that requires a reset to recover.	1. Make sure the media changer and drives are not being used by any host, then reset the library from the front panel. 2. If the problem persists, contact Overland Technical Support.

Flag Number	Flag Name	Type*	Description	Action Required
04	Library Hardware D	C	The library mechanism has a hardware fault that is not mechanism related, or requires power cycle to recover.	1. Cycle the power supply and try again. 2. If the problem persists, contact Overland Technical Support.
06	Library Interface	C	The library has identified an interface fault.	1. Check all cables and cable connections. 2. Restart the operation. 3. If the problem persists, contact Overland Technical Support.
08	Library Maintenance	W	Library preventative maintenance required.	Preventative maintenance of the library is required. Consult the library user's manual for device-specific preventative maintenance tasks.
12	Library Stray Tape	C	A cartridge has been left in the drive inside the library by a previous hardware fault.	1. Try unloading the cartridge from the drive using the Operator Panel or Web User Interface. • If the cartridge unloads, move the cartridge from the drive to the Mail Slot. Remove the cartridge and inspect for damage. If not damaged, return the cartridge to the library. Run Library Verify before resuming normal library operations. • If the cartridge did not unload from the drive, cycle the power supply and try again. 2. If the problem persists, contact Overland Technical Support.
13	Library Pick Retry	W	There is a potential problem with the cartridge loader picking a cartridge from a drive or slot.	
14	Library Place Retry	W	There is a potential problem with the cartridge loader placing a cartridge into a slot.	No action is required. This flag is cleared when the next move command is received.
15	Drive Load Retry	W	There is a potential problem with the cartridge loader or drive when placing a cartridge into a drive.	
16	Library Door	W	The operation has failed because the library door is open.	Clear any obstructions from the library door. Close the library door. This flag is cleared when the door is closed.
17	Library Mail Slot	C	Mechanical problem with the Mail Slot.	There is a mechanical problem with the library Mail Slot.
18	Library Magazine	C	Library magazine not present.	The library cannot operate without the magazine. 1. Insert the magazine into the library. 2. Restart the operation.
19	Library Security	W	Library security has been compromised.	The door was opened then closed during an operation.

Flag Number	Flag Name	Type*	Description	Action Required
21	Library Offline	I	Library manually turned offline.	The library has been manually turned offline and is unavailable for use.
22	Library Drive Offline	I	Library turned internal drive offline.	The drive inside the library has been taken offline. This is for information purposes only. No action is required.
23	Library Scan Retry	W	There is a potential problem with the bar code label of the scanner hardware in the library mechanism.	No action is required.
24	Library Inventory	C	The library has detected an inconsistency in its inventory	• Redo the library inventory to correct inconsistency. • Restart the operation.
27	Cooling Fan Failure	W	One or more fans inside the library have failed.	This flag is cleared when all fans are working again.
28	Power Supply	W	PSU failure inside the library subsystem.	The power supply has failed inside the library. Contact Overland Technical Support.
32	Unreadable Bar Code Labels	I	The library was unable to read the bar code on a cartridge.	Check the labels for damage.

* **C** = Critical: Needs immediate action. **W** = Warning: Action to be taken. **I** = Information: Information for user.

Tape Drive Supported TapeAlert Flags

Flag Number	Flag Name	Description	Action Required
3	Hard error	Set for any unrecoverable read, write, or positioning error (this flag is set in conjunction with flags 4, 5, or 6).	See the action required for Flag Number 4, 5, or 6, if set, in this table.
4	Media	Set for any unrecoverable read, write, or positioning error that is due to a faulty tape cartridge.	Replace the tape cartridge.
5	Read failure	Set for any unrecoverable read error where the isolation is uncertain and failure could be due to a faulty tape cartridge or drive hardware.	If Flag Number 4 is also set, the tape cartridge is defective. Replace the tape cartridge.
6	Write failure	Set for any unrecoverable write or positioning error where isolation is uncertain and failure could be due to a faulty tape cartridge.	If Flag Number 9 is also set, make sure that the write-protect switch is set so that data can be written to the tape. See Write-Protect Switch. If Flag Number 4 is also set, the tape cartridge is defective. Replace the tape cartridge.
7	Media life	Set when the tape cartridge reaches its end of life (EOL).	1. Copy the data to another tap cartridge. 2. Discard the old (EOL) tape.
8	Not data grade	Set when the tape cartridge is not data-grade. Any data that you back up to the tape is at risk.	Replace the tape cartridge with a data-grade tape cartridge.

Flag Number	Flag Name	Description	Action Required
9	Write protect	Set when the tape drive detects that the tape cartridge is write-protected.	Ensure that the cartridge's write-protect switch is set so that data can be written to the tape. See "Write-Protect Switch" on page 6-7.
10	No removal	Set when the tape drive receives an UNLOAD command after the server prevented the tape cartridge from being removed.	Refer to the documentation for your server's operating system.
11	Cleaning media	Set when a cleaning tape is loaded into the drive.	No action required. Status only.
12	Unsupported format	Set when a non-supported cartridge type is loaded into the drive or when the cartridge format has been corrupted.	Replace the invalid cartridge with a supported tape cartridge.
14	Unrecoverable snapped tape	Set when the operation failed because the tape in the drive snapped.	Do not attempt to extract the tape cartridge. Contact Overland Technical Support.
15	Cartridge memory chip failure	Set when a cartridge memory (CM) failure is detected on the loaded tape cartridge.	Replace the tape cartridge.
16	Forced eject	Set when a tape cartridge was unloaded manually while the drive was reading or writing.	No action required. Status only.
17	Media loaded is Read-only format	Set when a cartridge marked as read-only is loaded into the drive. The flag is cleared when the cartridge is ejected.	No action required. Status only.
18	Tape directory corrupted in cartridge memory	Set when the tape drive detects that the tape directory in the cartridge memory has been corrupted.	Re-read all data from the tape to rebuild the tape directory.
19	Nearing media life	Set when the tape cartridge is nearing its specified end of life. It is cleared when the cartridge is removed from the drive.	1. Copy the data to another tape cartridge. 2. Replace the tape cartridge.
20	Clean now	Set when the tape drive detects that it needs cleaning.	Clean the tape drive.
21	Clean periodic	Set when the tape drive detects that it needs routine cleaning.	Clean the tape drive as soon as possible. The drive can continue to operate, but requires cleaning soon.
22	Expired cleaning media	Set when the tape drive detects a cleaning cartridge that has expired.	Replace the cleaning cartridge.
23	Invalid cleaning cartridge	Set when the drive expects a cleaning cartridge to be loaded and the loaded cartridge is not a cleaning cartridge.	Use a valid cleaning cartridge.
30	Hardware A	Set when a hardware failure occurs that requires that you reset the tape drive to recover.	Contact Overland Technical Support.

Flag Number	Flag Name	Description	Action Required
31	Hardware B	Set when the tape drive fails its internal Power-On Self-Tests (POSTs).	Note the error code on the single-character display and contact Overland Technical Support.
32	Interface	Set when the tape drive detects a problem with the host interface.	Contact Overland Technical Support.
33	Eject media	Set when a failure occurs that requires the tape cartridge to be unloaded from the drive.	Unload the tape cartridge, then reinsert and restart the operation. If this fails, use different media.
34	Download fail	Set when an FMR image is unsuccessfully downloaded to the tape drive via the SAS interface.	Check the FMR image is correct. If necessary, download the correct FMR image.
36	Drive temperature	Set when the drive temperature sensor indicates that the drive's temperature exceeds the recommended temperature of the library.	Contact Overland Technical Support.
37	Drive voltage	Set when the drive detects power supply voltages that approach or exceed the specified voltage limits.	Contact Overland Technical Support.
38	Predictive failure of drive hardware	Set when a hardware failure of the tape drive is predicted.	Contact Overland Technical Support.
39	Diagnostics required	Set when the tape drive detects a failure that requires diagnostics for isolation.	Contact Overland Technical Support.
51	Tape directory invalid at unload	Set when the tape directory on the tape cartridge that was previously unloaded is corrupted. The file-search performance is degraded.	Use your backup software to rebuild the tape directory by reading all the data.
52	Tape system area write failure	Set when the tape cartridge that was previously unloaded could not write its system area successfully.	Copy the data to another tape cartridge, then discard the old tape cartridge.
53	Tape system area read failure	Set when the tape system area could not be read successfully at load time.	Copy the data to another tape cartridge, then discard the old tape cartridge.
55	Load failure	Set when a hardware malfunction prevents the tape cartridge from being loaded into the drive, or when a tape cartridge is stuck in the drive.	If the tape cartridge will not load in the drive: 1. Remove the tape cartridge from the library and inspect it for damage. If damaged, discard it. 2. Insert another tape cartridge into the tape drive. 3. If the problem persists, contact Overland Technical Support. If the tape cartridge is stuck in the drive: 1. Attempt to unload the tape from the drive using the host backup application that is currently using the drive, or via the remote or local UI. 2. If the cartridge will still not unload, contact Overland Technical Support.

Flag Number	Flag Name	Description	Action Required
56	Unload failure	Set when a drive hardware error prevents the tape cartridge from being unloaded from the tape drive, or when the tape cartridge is stuck in the drive.	1. Unload the cartridge from the drive using the Operator Panel or the Web User Interface. 2. Try a power cycle of the entire library. This causes the drive to reset and attempt to rewind and unload when power is restored. If the cartridge unloads, remove it from the library and inspect it. If damaged, discard it. 3. Try to unload the cartridge from the drive again using the Operator Panel or the Web User Interface. 4. If the cartridge will still not unload from the drive, contact Overland Technical Support.
59	WORM Media integrity check failed	Set when the drive determines that the data on the tape is suspect from a WORM point of view.	1. Copy the data to another WORM tape cartridge. 2. Discard the old WORM tape.
60	WORM Media overwrite attempted	Set when the drive rejects a write operation because the rules for allowing WORM writes have not been met. Data can only be appended to WORM media. Overwrites to WORM media are not allowed.	Append the information on a WORM tape cartridge or write the data to a non-WORM cartridge.

Master Glossary & Acronym List

NOTE: This is a general Overland Storage glossary and acronym list. Not all items may be found in this document or be used by this product.

1000BASE-T

1000BASE-T (also known as IEEE 802.3ab) is a standard for gigabit Ethernet over copper wiring. It requires, at a minimum, Category 5 cable (the same as 100BASE-TX), but Category 5e (Category 5 enhanced) and Category 6 cable may also be used and are often recommended. 1000BASE-T requires all four pairs to be present and is far less tolerant of poorly installed wiring than 100BASE-TX.

Address

An address is a data structure or logical convention used to identify a unique entity, such as a particular process or network device.

ADI

Short for *Automation Drive Interface*. Media changer (automation) devices use a private communication link for monitoring and controlling removable medium devices (drives). The standard specifies a protocol for transporting commands, data, and status between automation devices and the drives.

Algorithm

A sequence of steps designed to solve a problem or execute a process.

ATA

Short for *Advanced Technology Attachment*. A standard interface for connecting storage devices to a PC.

Auto Balance

A feature that automatically balances preferred paths evenly among all available host ports and controller ports. Auto balancing spreads I/O load by utilizing as many host ports and controller ports as possible.

Authentication

The validation of a user's identity by requiring the user to provide a registered login name and corresponding password.

Autonegotiation

An Ethernet feature that automatically negotiates the fastest Ethernet speed and duplex setting between a port and a hub or switch. This is the default setting and is recommended.

Autosensing

An Ethernet feature that automatically senses the current Ethernet speed setting.

Back-end

Front-end and back-end are terms used to characterize program interfaces and services relative to the initial user, human or program, of these interfaces and services. A "front-end" application is one that application users interact with directly. A "back-end" application or program serves indirectly in support of the front-end services, usually by being closer to the required resource or having the capability to communicate with the required resource. The back-end application may interact directly with the front-end or, perhaps more typically, is a program called from an intermediate program that mediates front-end and back-end activities.

Bar Code

The machine-readable representation of a product code. Bar codes are read by a scanner that passes over the code and registers the product code. The width of black lines and white spaces between varies. Combinations of lines and spaces represent characters. Overland uses 3-of-9 code (Code 39) where each character is represented by 9 bars, 3 of which are wide.

Bridging

Devices that connect and pass packets between two network segments that use different communications protocol.

Bus or Channel

A common physical path composed of wires or other media, across which signals are sent from one part of a computer to another. A channel is a means of transferring data between modules and adapters, or between an adapter and SCSI devices. A channel topology network consists of a single cable trunk that connects one workstation to the next in a daisy-chain configuration. All nodes share the same medium, and only one node can broadcast messages at a time.

CA

Short for *Certificate Authority*. A trusted third-party in a network that issues and manages security credentials.

Cat 5 Cable

Short for *Category 5*, it is network cabling that consists of four twisted pairs of copper wire terminated by 8P8C modular connectors. CAT 5 cabling supports frequencies up to 100 MHz and speeds up to 100 Mbps. It can be used for ATM, token ring, 100BASE-T, and 10BASE-T networking.

Cat 5 is based on the EIA/TIA 568 Commercial Building Telecommunications Wiring Standard developed by the Electronics Industries Association as requested by the Computer Communications Industry Association in 1985.

Cat 6 Cable

Short for *Category 6*, it is network cabling that consists of four twisted pairs of copper wire terminated by 8P8C modular connectors made to higher standards that help reduce noise caused by crosstalk and system noise. The ANSI/TIA-568-B.2-1 specification states the cable may be made with 22 to 24 AWG gauge wire, so long as the cable meets the specified testing standards.

It is designed for Gigabit Ethernet that is backward compatible with the Category 5/5e and Category 3 cable standards. Cat 6 features more stringent specifications for crosstalk and system noise. The cable standard provides performance of up to 250 MHz and is suitable for 10BASE-T / 100BASE-TX and 1000BASE-T (Gigabit Ethernet).

Channel

A communications path between two computers or devices.

Checksum

The result of adding a group of data items that are used for checking the group. The data items can be either numerals or other character strings treated as numerals during the checksum calculation. The checksum value verifies that communication between two devices is successful.

CIFS

Short for *Common Internet Filesystem.* Also know as SMB. The default Windows protocol for communication between computers. A specification for an Internet file access protocol that complements HTTP and FTP and reduces access time.

daemon

A process that runs in the background.

default gateway

The router used when there is otherwise no known route to a given subnet.

DHCP

Short for *Dynamic Host Configuration Protocol*. A communications protocol that lets network administrators centrally manage and automate the assignment of IP addresses on a computer network. Each system that connects to the Internet/intranet needs a unique IP address.

Disaster Recovery

A strategy that allows a company to return to normal activities after a catastrophic interruption. Through failover to a parallel system or by restoration of the failed system, disaster recovery restores the system to its normal operating mode.

Disk Roaming

This is the process of removing a disk drive from a controller and putting it back later, either on the same controller, or a different one, and having it recognized as the same disk drive. The disks may be can be attached to different ports than they were originally attached to, without harm to the data. The disks may be attached to the same ports or different ports on the controller.

DNS

Short for *Domain Name Service*. A network service that translates domain names into IP addresses using a server that maintains a mapping of all host names and IP addresses. Normally, this mapping is maintained by the system administrator, but some servers support dynamic mappings.

Domain

> A set of network resources in Windows 2000/2003/2008, such as users and groups of users. A domain may also include multiple servers on the network. To gain access to these network resources, the user logs into the domain.

Domain Name

> The ASCII name that identifies the domain for a group of computers within a network.

Ethernet

> The most widely installed LAN technology. 100BASE-T Ethernet provides transmission speeds of up to 100 Mbps. Fast Ethernet or 1000BASE-T provides transmission speeds up to 1000 Mbps and is typically used for LAN backbone systems, supporting workstations with 100BASE-T cards. Gigabit Ethernet (GbE) provides an even higher level of backbone support at 1000 Mbps (one Gigabit or one billion bits per second).

Ethernet Address

> The unique six-digit hexadecimal (0-9, A-F) number that identifies the Ethernet interface.

Ethernet Port

> The port on a network card to provide Ethernet access to the computer.

Event

> Any significant occurrence or error in the system that may require notifying a system administrator or adding an entry to a log.

Expansion Slot

> Area in a computer that accepts additional input/output boards to increase the capability of the computer.

F_port

> A *Fabric* port within a Fibre Channel switch that provides a point-to-point link attachment to a single N_Port. F_Ports are intermediate ports in virtual point-to-point links between end ports, for example N_Port to F_Port to F_Port to N_Port using a single Fibre Channel fabric switch.

Failback

> Failback occurs when a path with a higher priority than the currently active path is restored. In this case, I/O will "fail back" to the higher priority path once it is available again.

Failover

> A strategy that enables one Ethernet port to assume the role of another port if the first port fails. When the port comes back online, the original identities are restored. Failover is possible only in a multi-Ethernet configuration.

Failover/Failback

> A combination of Failover and Failback. When a preferred path becomes unavailable, another path is used to route I/O until the preferred path is restored. In this case I/O will "fail back" to the preferred path once it is available again.

FC-AL

Short for *Fibre Channel Arbitrated Loop*. An FC-AL is a Fibre Channel network in which up to 126 systems and devices are connected in a loop topology, with each transmitter connecting to the receiver of the device on its logical right. The Fibre Channel Arbitrated Loop protocol used for transmission is different from Fibre Channel switched and point-to-point protocols. Multiple FC-AL loops can be connected via a fabric switch to extend the network.

Fibre Channel

Fibre Channel (FC) is a gigabit-speed network technology which transports SCSI commands over Fibre Channel networks. Fibre Channel was primarily concerned with simplifying the connections and increasing distances, but later designers added the goals of connecting SCSI disk storage, providing higher speeds and far greater numbers of connected devices.

Firmware

Software stored in read-only memory (ROM) or programmable ROM (PROM). Firmware is often responsible for the behavior of a system when it is first switched on.

FL_port

A *Fabric Loop* port within a Fibre Channel switch that is capable of Fibre Channel Arbitrated Loop operations and is connected to one or more NL_Ports via a Fibre Channel Arbitrated Loop. An FL_Port becomes a shared entry point for public NL_Port devices to a Fibre Channel fabric. FL_Ports are intermediate ports in virtual point-to-point links between end ports that do not reside on the same loop, for example NL_Port to FL_Port to F_Port to N_Port through a single Fibre Channel fabric switch.

Front-end

See Back-end.

FTP

Short for *File Transfer Protocol*. A standard Internet protocol that provides a way to exchange files between computers on the Internet.

Full-duplex

A type of transmission that allows communicating systems to both transmit and receive data simultaneously.

Gateway

The hardware or software that bridges the gap between two network subnets. It allows data to be transferred among computers that are on different subnets.

Gigabit Ethernet

Also known as GigE or GbE, this Ethernet standard uses a one Gigahertz (1000 Hz) clock rate to move data.

HBA

Short for *Host Bus Adapter*. An HBA is an I/O adapter that sits between the host computer's bus and the Fibre Channel loop and manages the transfer of information between the two channels. In order to minimize the impact on host processor performance, the HBA performs many low-level interface functions automatically or with minimal processor involvement.

Half-duplex

A type of transmission that transfers data in one way at a time.

Hidden Share

A share that restricts the display of the share via the Windows (SMB), Web View (HTTP/HTTPS), FTP, and AFP protocols. See also SMB.

Host Bus Adapter

Connects a host system (such as a NEO) to other network and storage devices.

Host Name

The unique name by which a computer is known on a network. It is used to identify the computer in electronic information interchange.

Hot Swapping

The ability to remove and add disk drives to a system without the need to power down or interrupt client access to filesystems. Not all components are hot-swappable. Please read installation and maintenance instructions carefully.

HTTP

Short for *Hypertext Transfer Protocol.* An application protocol for transferring files (text, graphic images, sound, video, and other multimedia files) over TCP/IP on the World Wide Web.

HTTPS

Short for *Hypertext Transfer Protocol Secure.* The HTTP protocol using a Secure Sockets Layer (SSL). SSL provides data encryption, server authentication, message integrity, and client authentication for any TCP/IP connection.

IDE

Short for *Integrated Drive Electronics*. A standard interface for connecting storage devices to a PC.

I/E Element

See Mail Slot.

Inheritance

In Windows permissions, inheritance is the concept that when permissions for a folder are defined, any subfolders within the defined folder inherit its permissions. This means an administrator need not assign permissions for subfolders as long as identical permissions are desired. Inheritance greatly reduces administrative overhead and also results in greater consistency in access permission management.

Initiator Device

A system component that originates an I/O command over an I/O bus or network. An initiator issues the commands; a *target* receives them.

An initiator normally runs on a host computer. It may be either a software driver or a hardware plug-in card, often called a Host Bus Adapter (HBA). A software initiator uses one of the computer's Ethernet ports for its physical connection, whereas the HBA will have its own dedicated port.

Software initiators are readily available for most host operating systems. Hardware initiators are not widely used, although they may be useful in very high performance applications or if 10 Gigabit Ethernet support is required.

Internet

A global network of networks used to exchange information using the TCP/IP protocol. It allows for electronic mail and the accessing ad retrieval of information from remote sources.

I/O (Input/Output)

The operation of transferring data to or from a device, typically through an interface protocol like CIFS, NFS, or HTTP.

IP

Short for *Internet Protocol*. The unique 32-bit value that identifies the location of the server. This address consists of a network address, optional subnetwork address, and host address. It displays as four addresses ranging from 1 to 255 separated by periods.

IQN

Short for *iSCSI Qualified Name*. A name format used in the iSCSI protocol.Initiators and targets have IP addresses, just like any other network entity. They are also identified using an iSCSI name, called the iSCSI Qualified Name (IQN). The IQN should be unique worldwide. It is made up of a number of components, specifying the date, identifying the vendor in reverse format, and then uniquely identifying the initiator or target. An example of an IQN is:

```
iqn.2001-04.com.example:storage:diskarray-sn-123456789
```

Since these IQNs are rather unwieldy, initiators and targets also use short, user friendly names (sometimes called alias names or just aliases).

iSCSI

Short for *Internet SCSI*. iSCSI is an IP-based storage networking standard for linking data storage facilities. iSCSI is a standard that defines the encapsulation of SCSI packets in TCP and then routing it using IP. It allows block-level storage data to be transported over widely used IP networks.

iSNS Server

Short for *Internet Storage Name Service* Server. A protocol enabling the automatic discovery, configuration, and management of iSCSI devices on a TCP/IP network.

Kerberos

A secure method for authenticating a request for a service used by ADS. Kerberos lets a user request an encrypted "ticket" from an authentication process that can then be used to request a service from a server. The user credentials are always encrypted before they are transmitted over the network.

In Windows 2000/XP, the domain controller is the Kerberos server. The Kerberos key distribution center (KDC) and the origin of group policies are applied to the domain.

LAN

Short for *Local Area Network*. A network connecting computers in a relatively small area such as a building.

LCD

Short for *Liquid Crystal Display*. An electronic device that uses liquid crystal to display messages.

LED

Short for *Light-Emitting Diode*. An LED is a type of diode that emits light when current passes through it. Visible LEDs are used as indicator lights on electronic devices.

Linux

A Unix-like operating system that was designed to provide personal computer users a free or very low-cost operating system comparable to traditional and usually more expensive Unix systems.

Load Balancing

A process available only in multi-Ethernet configurations. The Ethernet port transmission load is distributed among two or more network ports (assuming the cards are configured for load balancing). An intelligent software adaptive agent repeatedly analyzes the traffic flow from the server and distributes the packets based on destination addresses.

Local Group/Local User

A group/user defined locally on a SnapServer using the **Web User Interface**. The local user is defined by the server administrator. Windows domain, ADS, and NIS users are not considered local.

LTO

Short for *Linear Tape-Open*, a technology that was developed jointly by HP, IBM, and Certance (Seagate) as an open standards. It is ideally suited for backup, restore, and archive applications, and provides reliability in both stand-alone and automated environments. The tape cartridges go by the label "Ultrium."

- Ultrium generation 3 (LTO-3) cartridge – up to 800 GB capacity (2:1 compression) and an uncompressed transfer rate of 80 MB/s.
- Ultrium generation 4 (LTO-4) cartridge – up to 1.6 TB capacity (2:1 compression) and an uncompressed transfer rate of 120 MB/s.
- Ultrium generation 5 (LTO-5) cartridge – up to 3.0 TB capacity (2:1 compression) and an uncompressed transfer rate of 140 MB/s.

LUN

Short for *Logical Unit Number*. A SCSI or Fibre Channel device identifier. LUN is a subdivision of a SCSI target.

LVD

Short for *Low Voltage Differential*. LVD is a method of powering SCSI cables that will be formalized in the SCSI-3 specifications. LVD uses less power than the current differential drive (HVD), is less expensive, and allows for higher speeds such as those of Ultra-2 SCSI. LVD requires 3.3 volts (versus 5 volts for HVD).

MAC Address

Short for *Media Access Control address*, a hardware address that uniquely identifies each node of a network. In the Open Systems Interconnection (OSI) model, one of two sublayers of the Data Link Control layer concerned with sharing the physical connection to the network among several computers. Each Ethernet port has a unique MAC address.

Mail Slot

A configurable import/export slot or magazine to provide a means of exchanging tape media while the unit is still operating.

Mapping table

A table indexed by sequential LUN values, indicating the selected BUS:TARGET:LUN devices. Mapping tables are used by routers and bridges like the GEOi to perform Ethernet-to-SCSI pathing.

MD5 Algorithm

MD5 is a way to verify data integrity, and is much more reliable than checksum and many other commonly used methods.

MIB

Short for *Management Information Base*. A formal description of a set of network objects that can be managed using the Simple Network Management Protocol (SNMP). The format of the MIB is defined as part of SNMP.

Mirroring

Used in RAID 1 and 10, a process of storing data on one disk and copying it to one or more disks, creating a redundant storage solution. RAID 1 is the most secure method of storing mission-critical data.

Mounted

A filesystem that is available.

MPIO

Short for *Multipath Input/Output*. A multipath solution built into Microsoft server-grade operating systems. It requires the DSM to work with RAID storage array hardware.

MTU

Short for *Maximum Transfer Unit*. It is the largest size packet or frame, specified in octets (eight-bit bytes), that can be sent in a packet- or frame-based network.

N_port

A *Node* port connects via a point-to-point link to either a single N_Port or a single F_Port. N_Ports handle creation, detection, and flow of message units to and from the connected systems. N_Ports are end ports in virtual point-to-point links through a fabric, for example N_Port to F_Port to F_Port to N_Port using a single Fibre Channel fabric switch.

NAT

Short for *Network Address Translation*. A technique for passing network traffic through a router whereby one set of IP addresses is used on one side of the router and another set of addresses is used on the other side. This is done to avoid address conflicts and to increase the address space of the internal network.

NDMP

Short for *Network Data Management Protocol*. A protocol standard used by some Network Attached Storage systems to provide an industry standard means to do backup and restores of the NAS system without the need for 3rd party agents to be installed on the NAS device. Also see NDMP.org for further details.

NIC

Short for *Network Interface Card.* A board that provides network communication capabilities to and from a computer.

NIS

Short for *Network Information Service.* A network naming and administration system for smaller networks that was developed by Sun Microsystems. NIS+ is a later version that provides additional security and other facilities.

NL_port

A *Node Loop* port is capable of arbitrated loop functions and protocols. An NL_Port connects via an arbitrated loop to other NL_Port and at most a single FL_Port. NL_Ports handle creation, detection, and flow of message units to and from the connected systems. NL_Ports are end ports in virtual point-to-point links through a fabric, for example NL_Port to F_Port to F_Port to N_Port using a single Fibre Channel fabric switch. In the absence of a fabric switch FL_Port, NL_Ports can communicate with other NL_Ports in virtual point-to-point links through a FC-AL open loop circuit often through FC-AL (Arbitrated Loop) hub or loop switch devices.

Node

Any device, including servers, workstations, or tape devices, that are connected to a network; also the point where devices are connected.

Node Name

This is an eight-byte, 16-character hexadecimal number, uniquely identifying a single fibre device. It incorporates the World Wide Name and two additional bytes that are used to specify the format. In a host system with multiple FC ports, all adapters typically use the same Node Name, but unique Port Names.

NTFS

Short for *New Technology File System*. The standard file system used by Windows NT and later versions of the Windows operating system.

NTP

Short for *Network Time Protocol*. A protocol for synchronizing the system clocks of computers over a packet-switched network.

NVRAM

Abbreviation of *Non-Volatile Random Access Memory*, a type of memory that retains its contents when power is turned off.

OCP

Short for *Operator Control Panel*. The OCP touch screen is a 2.5" x 1.25" (6.4cm x 3.2cm) pressure-sensitive blue and light-gray screen that provides an easy way to directly communicate with the unit. It provides text and graphic messages and, through the use of virtual buttons and sliders, allows users to make changes to current settings.

Permissions

A security category, such as no access, read-only, or read-write, that determines what operations a user or group can perform on folders or files.

PoP

Short for *Proof of Purchase*. The number used to obtain a license key for an upgrade to third-party applications.

Port Name

This is an eight-byte hexadecimal number, uniquely identifying a single host HBA port. It incorporates the World Wide Name and two additional bytes that are used to specify the format and indicate the port number.

Portal

A target's IP address together with its TCP port number.

POSIX

Short for *Portable Operating System Interface.* A set of standard operating system interfaces based on the Unix operating system. The need for standardization arose because enterprises using computers wanted to develop programs that could run on multiple platforms without the need to recode.

Preferred Path

The preferred path is the default path. When the path selection policy is set to Failover/Failback, the preferred path is always used if it is available. If the preferred path fails, I/O switches to another path. If it is later restored, I/O switches back to the preferred path.

Protocol

A standardized set of rules that specifies the format, timing, sequencing, and/or error checking for data transmissions.

PTP

Short for *Point-to-Point*. PTP is the common mode of attachment to a single host. PTP is sometimes used to attach to a Fibre Channel switch for SAN connectivity.

Public Access Share

A share that allows all users read/write access to the filesystem.

Quiesce

The pausing or altering the state of running processes on a computer, particularly those that might modify information stored on disk during a backup, in order to guarantee a consistent and usable backup. This generally requires flushing any outstanding writes.

Quota

A limit on the amount of storage space on a volume that a specific user or NIS group can consume.

Restrict Anonymous

A Windows feature in which anonymous users cannot list domain user names and enumerate share names. Microsoft has provided a mechanism in the Registry called restrict anonymous for administrators to restrict the ability for anonymous logon users (also known as NULL session connections) to list account names and enumerate share names.

RETMA

Short for *Radio-Electronics-Television Manufacturers' Association*. It is the common name given for a 19-inch distribution frame rack for mounting components.

RMU

Short for *Remote Management Utility*. It is an interface built into the unit that provides remote access to and configuration of the library through an Ethernet port. It hosts a dedicated, protected website that can be accessed by a web browser using the IP address assigned. See Web User Interface.

Round Robin

The Round Robin path selection policy causes all healthy paths to be used for I/O. Paths are used in a round-robin order.

Router

A router is a device that enables connectivity between Ethernet network segments.

SAN

Short for *Storage Area Network*. Data storage connected to a network that provides network clients access to data using block level protocols. To the clients, the data storage devices appear local rather than remote. An iSCSI SAN is sometimes referred to as an IP-SAN.

SAS

Short for *Serial Attached SCSI*. It is a point-to-point serial protocol that replaces parallel SCSI bus technology (multidrop) and uses the standard SCSI command set. It has no termination issues, supports up to 16,384 devices (using expanders), and eliminates clock skew. It consists of an Initiator that originates device service requests, a Target containing logical units that receives device service requests, and a Service Delivery Subsystem that transmits information between the Initiator and the Target.

SCSI

Short for *Small Computer System Interface*. SCSI is an industry standard for connecting peripheral devices and their controllers to an initiator. Storage devices are daisy-chained together and connected to a host adapter. The host adapter provides a shared bus that attached peripherals use to pass data to and from the host system. Examples of devices attached to the adapter include disk drives, CD-ROM discs, optical disks, and tape drives. In theory, any SCSI device can be plugged into any SCSI controller.

SCSI addressing

Each device supported by a SCSI adapter has its own unique SCSI address, which dictates the device's priority when arbitrating for access to the SCSI bus. A SCSI address of 7 has the highest priority. For a fast/wide SCSI adapter that supports up to 16 devices, the next highest priority address is 6, then 5, 4, 3, 2, 1, 0, 15, 14, 13, 12, 11, 10, 9, and 8. The narrow SCSI adapter supports up to eight devices, including itself. The SCSI address 7 has the highest priority, followed by 6, 5, 4, 3, 2, 1, and 0.

SCSI bus

A SCSI bus provides a means of transferring data between SCSI devices. A SCSI bus is either an 8- or 16-bit bus that supports up to 8 or 16 devices, including itself. The bus can consist of any mix of initiators and targets, with the requirement that at least one initiator and one target must be present.

SCSI device

A SCSI device is a single unit on a SCSI bus that originates or services SCSI commands. A SCSI device is identified by a unique SCSI address. SCSI devices can act as initiators or targets.

SCSI port

A SCSI port is an opening at the back of a router that provides connection between the SCSI adapter and SCSI bus.

Serial Number

The ten-character alphanumeric number assigned by the manufacturer at the factory.

Session

When an initiator wants to establish a connection with a target, it establishes what is known as an iSCSI session. A session consists of one or more TCP/IP connections between an initiator and a target. Sessions are normally established (or re-established) automatically when the host computer starts up, although they also can be established (and broken) manually.

SMB

Short for *Server Message Block*. A protocol for Windows clients. SMB uses the TCP/IP protocol. It is viewed as a complement to the existing Internet application protocols such as FTP and HTTP. With SMB, you can access local server files, obtain read-write privileges to local server files, share files with other clients, and restore connections automatically if the network fails.

SMS

Short for *Short Message Service*. Is a means of sending short text messages to a mobile phone.

SMTP

Short for *Simple Mail Transfer Protocol*. A TCP/IP protocol used for sending and receiving email.

SNMP

Short for *Simple Network Management Protocol*. A system to monitor and manage network devices such as computers, routers, bridges, and hubs. SNMP views a network as a collection of cooperating, communicating devices, consisting of managers and agents.

SSH

Short for *Secure Shell*. A service that provides a remote console for special system administration and customer support access to the server. SSH is similar to telnet but more secure, providing strong encryption so that no passwords cross the network in clear text.

SSL

Short for *Secure Sockets Layer*. A protocol for managing the security of a message sent on the Internet. It is a type of technology that provides data encryption, server authentication, message integrity, and client authentication for any TCP/IP connection.

Standalone

A network bonding mode which treats each port as a separate interface. This configuration should be used only in multihomed environments in which network storage resources must reside on two separate subnets.

Static IP Address

An IP address defined by the system administrator rather than by an automated system, such as DHCP.

Storage Area Network

See SAN.

Subnet Mask

A portion of a network that shares a common address component. On TCP/IP networks, subnets are all devices with IP addresses that have the same prefix.

Tape Cartridge

A magnetically coated strip of plastic in a plastic housing on which data can be encoded. Storing data on tapes is considerably cheaper than storing data on disks. Tapes also have large storage capacities, ranging from a few hundred kilobytes to several gigabytes. They are generally used for long-term storage and backup, or for transporting large amounts of data. Tapes come in a variety of sizes and formats.

Tape Drive

A device, that reads data from and writes it onto a tape.

Target

A target is a device (peripheral) that responds to an operation requested by an initiator (host system). Although peripherals are generally targets, a peripheral may be required to act temporarily as an initiator for some commands (for example, SCSI COPY command).

Targets are embedded in iSCSI storage controllers. They are the software that makes the RAID storage available to host computers, making it appear just like any other sort of disk drive.

TCP/IP

Short for *Transmission Control Protocol/Internet Protocol*. The basic protocol used for data transmission over the Internet.

Telco

Short for *Telephone Company*. When used in reference to a rack, it refers to the two-posted, light-weight rack for center-mounted appliances.

Telnet

A terminal emulation program for TCP/IP networks such as the Internet. The Telnet program runs on a computer and connects it to a server on the network. You enter commands through the Telnet program and they will be executed as if you were entering them directly on the server console. This enables you to control the server and communicate with other servers on the network. To start a Telnet session, you must log in to a server by entering a valid user name and password. Telnet is a common way to remotely control Web servers.

Terminator

A terminator refers to the electrical connection at each end of a SCSI bus. The terminator is composed of a set of resisters, or possibly other components. The function of a terminator is to provide a pull-up for open collector drivers on the bus, and also impedance matching to prevent signal reflections at the ends of the cable. SCSI buses require that a terminator be placed on the SCSI connector on the last SCSI peripheral. Data errors may occur in a SCSI bus that is not terminated.

TOE (TCP Offload Engine)

Short for *TCP Offload Engine*. TOE is a technology used in network interface cards to offload processing of the entire TCP/IP stack to the network controller. It is primarily used with high-speed network interfaces, such as gigabit Ethernet and 10 gigabit Ethernet, where processing overhead of the network stack becomes significant.

Topology

Logical layout of the parts of a computer system or network and their interconnections. There are two types of topology: physical and logical. The physical topology of a network refers to the configuration of cables, computers, and other peripherals. Logical topology is the method used to pass the information between workstations.

Trap

A signal from a device informing an SNMP management program that an event has occurred.

U

A standard unit of measure for designating the height in computer enclosures and rack cabinets. One U equals 1.75 inches. For example, a 3U server chassis is 5.25 inches high.

UDP

Short for *User Datagram Protocol*. A communications protocol for sending messages between computers in a network that uses the Internet Protocol (IP). UDP is an alternative to the Transmission Control Protocol but, unlike TCP, does not guarantee reliability or ordering of data packets.

UNC

Short for *Universal Naming Convention*. In a network, a way to identify a shared file in a computer without having to specify (or know) the storage device it is on. In the Windows OS, the UNC name format is as follows:

```
\\server_name\share_name\path\file_name
```

UPS

Short for *Uninterruptible Power Supply*. A device that allows a computer to keep running for a short time when the primary power source is lost. It also provides protection from power surges. A UPS device contains a battery that starts when the device senses a loss of power from the primary source.

URL

Short for *Uniform Resource Locator*. A Web address.

USB Port

USB is short for *Universal Serial Bus*. A USB port is a hardware interface for low-speed peripherals such as the keyboard, mouse, joystick, scanner, printer, and telephony devices.

VLAN

Short for *Virtual LAN*. It consists of a network of computers that behave as if they are connected to the same wire – even though they may actually be physically connected to different segments of a LAN.

Web User Interface

A Web-based utility used for configuration and ongoing maintenance, such as monitoring server conditions, configuring email alerts for key events, or for SNMP management.

Windows Domain Authentication

Windows-based networks use a domain controller to store user credentials. The domain controller can validate all authentication requests on behalf of other systems in the domain. The domain controller can also generate encrypted challenges to test the validity of user credentials. Other systems use encrypted challenges to respond to CIFS/SMB clients that request access to a share.

WINS

Short for *Windows Internet Naming Service*. The server that locates network resources in a TCP/IP-based Windows network by automatically configuring and maintaining the name and IP address mapping tables.

Workgroup

A collection of computers that are grouped for sharing resources such as data and peripherals over a LAN. Each workgroup is identified by a unique name.