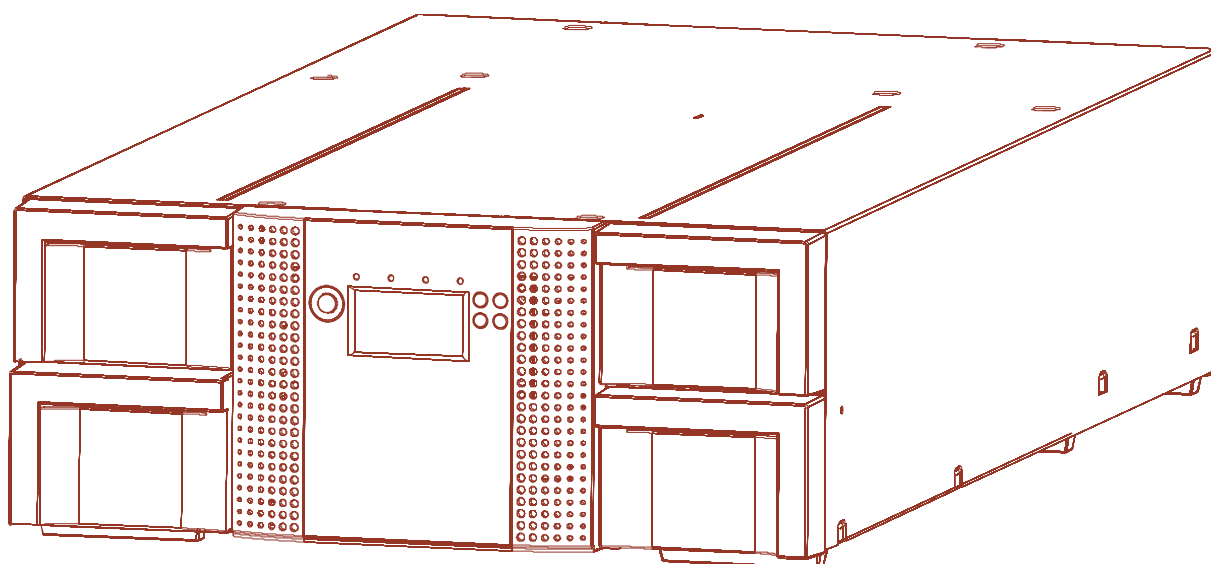




actiLib Autoloader 4U

User and Service Guide



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Revision History

Date	Issue	Revision	Description of changes
2009-21-09	Revision	1	

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About this guide

Symbol	Description
	A danger notice calls attention to a situation that is potentially lethal or extremely hazardous to people. A lightning bolt symbol always accompanies a danger notice to represent a dangerous electrical condition.
	Important
	Provides additional information

1 General Warnings



DANGER

High voltage!

Risk of electric shock.

- Do not remove cover (or back). No user-serviceable parts inside.
 - Refer servicing to qualified service personnel.
-



CAUTION

Static sensitive!

A discharge of static electricity can damage static-sensitive devices or micro circuitry. Proper packaging and grounding techniques are necessary precautions to prevent damage.

- Read this manual
- Do not open Top Cover
- No servicing expect that in manual descript
- Proper ventilation
- Keep away from heat sources
- Proper power sources
- Routed power cable

Precautions

- Do not expose the unit to moisture. The operating temperature for this unit is between 10°C (50°F) and 35°C (95°F).
- Use the unit on a firm level surface free from vibration.
- Do not place anything on top of the unit.

Product warranty Caution

The warranty for the tape Library shall not apply to failures of any unit when:

- The tape Library is repaired or modified by anyone other than the manufactures personnel or approved agent.
- The tape Library is physically abused or used in a manner that is inconsistent with the operating instructions or product specification defined by the manufacturer.
- The tape Library fails because of accident, misuse, abuse, neglect, mishandling, misapplication, alteration, faulty installation, modification, or service by anyone other than the factory service center or its approved agent.
- The tape Library is repaired by anyone, including an approved agent, in a manner that is contrary to the maintenance or installation instructions supplied by the manufacturer.
- The manufacturer's serial number tag is removed.
- The tape Library is damaged because of improper packaging on return.
- Unauthorized modifications to the unit configuration by the customer may result in loss of guarantee by the vendor.



WARNING

Weight!

To reduce the risk of personal injury or damage to equipment

- Extend leveling jacks to the floor.
 - Ensure that the full weight of the rack rests on the leveling jacks.
 - Install stabilizing feet on the rack.
 - In multiple-rack installations, secure racks together.
 - Extend only one rack component at a time.
Racks may become unstable if more than one component is extended
-

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5 Product description (overview) and features

The actiLib Library 4U provides a compact, high-capacity, low-cost solution for simple, unattended data backup. This unique design houses up to 48 tape cartridges in a compact 4U form factor with easy access to tape cartridges via two removable magazines and a mailslot. The magazines can hold up to twelve (left magazine including mail slot) and nine (right magazine) cartridges.

The library can support one to four half height tape drives, or tow full height tape drive. The library occupies one SCSI target address (for the single drive version) and uses dual LUNs for the tape drive and library robotic.

The actiLib Library 4U is compatible with most operating systems and environments that support the SCSI interface. However, the library requires either direct support from the operating system or a compatible backup application to take full advantage of its many features.

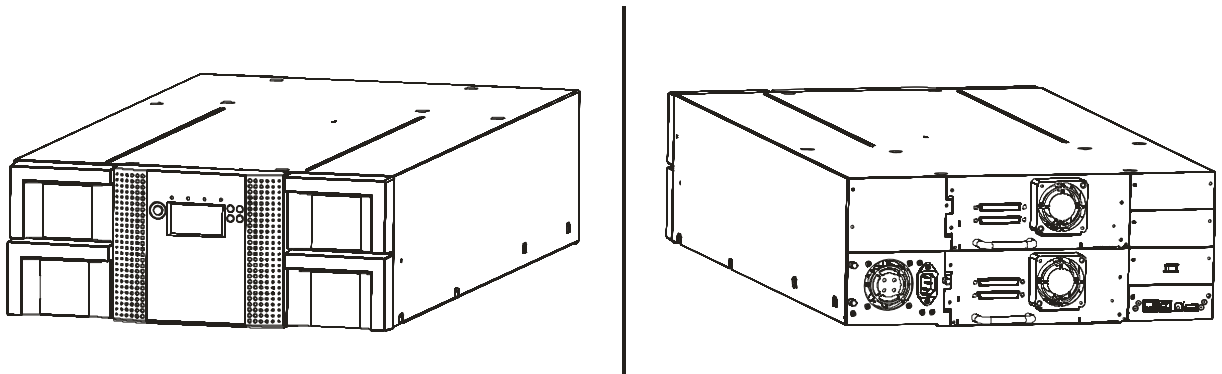


Figure 1 actiLib Library 4U front and rear view

Particular emphasis of the actiLib Library 4U family includes:

- **Platform of tape Libraries** - independent of tape and drive form factors
- **Broad level of connectivity** - SCSI, FC1, FC2, FC4, and SAS
- **Expandability** - magazines, drive sleds, and extra controller/converter cards can be added in the field as available
- **Technology upgrade** - customer can upgrade tape drive technologies (e.g. LTO5 to LTO6) in the field
- **Service friendly design** - drive, power supply and Library controller are accessible from the back of the unit allowing for quick replacement
- **Best in class cartridge and drive density** - packing in as many or more cartridges in the standard rack height 4U as most other Libraries on the market
- **Maximum up time** - through advanced error handling and recovery capability

The actiLib Library 4U includes the following features:

- Free space in the 4U to enable the inclusion of:
Customer unique to option cards, example extra Storage management, etc. iSCSI converter, 2nd SAS Port, or interface cards (future developments)
- USB interface to enable Serviceability features and/or Customized features (Storage On Demand) implementation
- Operator Control Panel simple character set can be implemented for cost / user-friendliness tradeoff
- Support different cartridge from factors LTO (future developments)
- Integral Remote management unit
- Supports industry standard management software tools such as SNMP and SMI-S (future developments)
- Mail slot
- Robotic with barcode reader

The actiLib Library 4U encompasses 4U rack formats as well as tabletop functionality. It provides cost-effective, easy to install, automated data protection for the small to medium sized business.



NOTE

Not all features will be available at initial product launch and will be added upon technology availability, anticipated market requirements, and/or Customer needs.

5.1 Front panel

The front panel of the actiLib Library 4U provides access to the power button, operator control panel (OCP), left and right magazines, LED's, and the mail slot.

The Operator panel consists of an LCD display with a 128 x 64 character matrix, 4 push button switches and a power on/off button. The circuitry to illuminate external LED's has also been incorporated into the current level of hardware

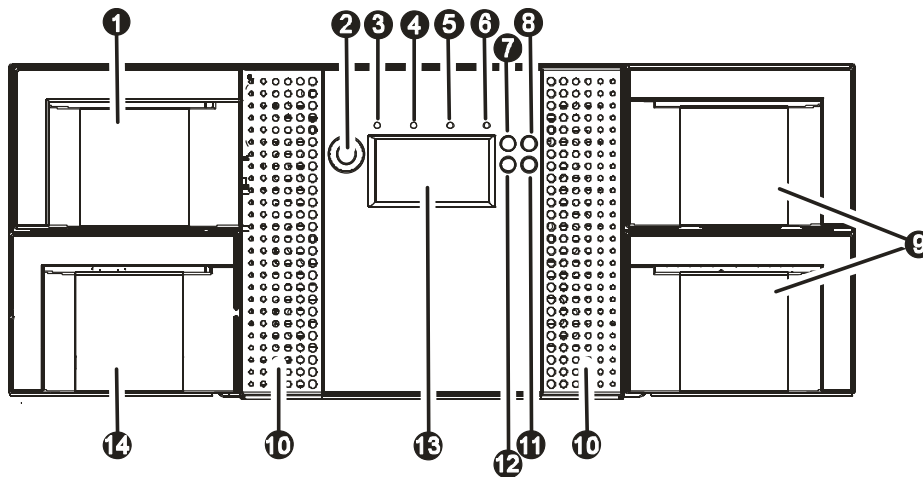


Figure 2 Front panel

Number	Description
1	Left magazine with Mail slots
2	Power button. Pressing the button will initiate a controlled Power Down of the unit (soft power down)
3	LED “ READY ” (Green). Illuminated when power is on. Blinking when there is tape or Library robotics activity.
4	LED “ CLEAN ” (Amber). Illuminated when the tape drive has determined that a cleaning cartridge should be used. Cleaning is only necessary when the Library directs you to do so. Additional cleaning is not necessary.
5	LED “ ATTENTION ” (Amber). Illuminated if the Library has detected a condition that requires attention by the operator.
6	LED “ ERROR ” (Amber). Illuminated if an unrecoverable tape drive or Library error occurs. A corresponding error message displays on the LCD screen (see for more information).
7	Control key “ CANCEL ” button [X] The CANCEL button is used to cancel a user action and return to the last menu item.
8	Control key “ DOWN ” button [<] The PREVIOUS button is used to navigate backward through menu items.
9	Right Magazines
10	Air vents
11	Control key “ ENTER ” button [↵] The ENTER button is used to go to a sub menu or execute an action.
12	Control key “ UP ” button [>] The NEXT button is used to navigate through menu items.
13	Front panel “OCP” display, consisting of 128 x 64 characters The OCP screen displays actions and status information, menu items or error messages equivalent to the operation mode.
14	Left Magazines

Table 1 Front panel overview

5.2 Rear panel

The rear panel of the tape Library provides access to SCSI, Fibre Channel (FC) and SAS connectors, tape drive bays, the power connector, Ethernet, serial and the USB port.

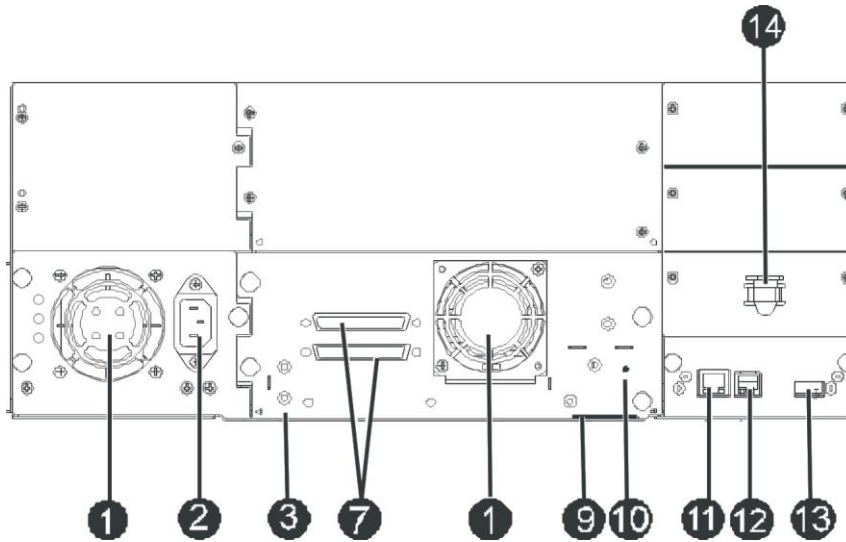


Figure 3 Rear panel with a full height drive tape

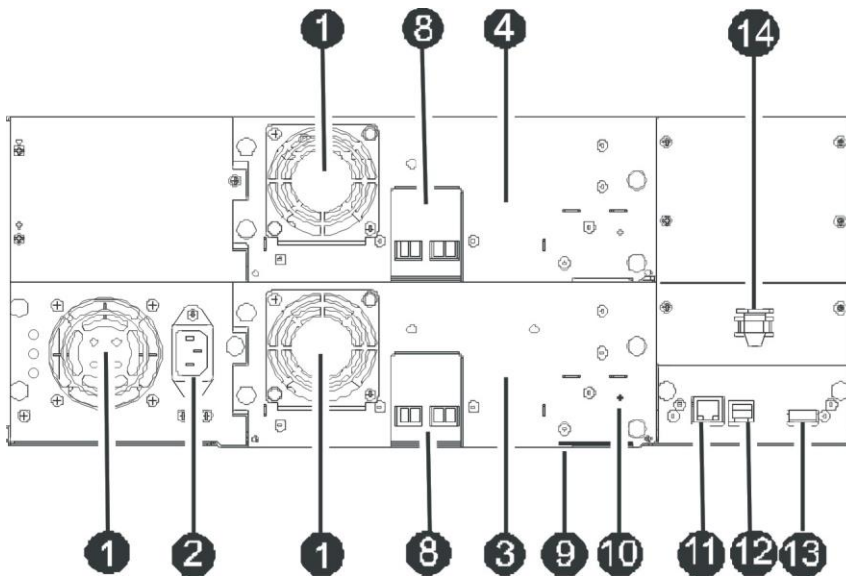


Figure 4 Rear panel with two full height FC tape drive

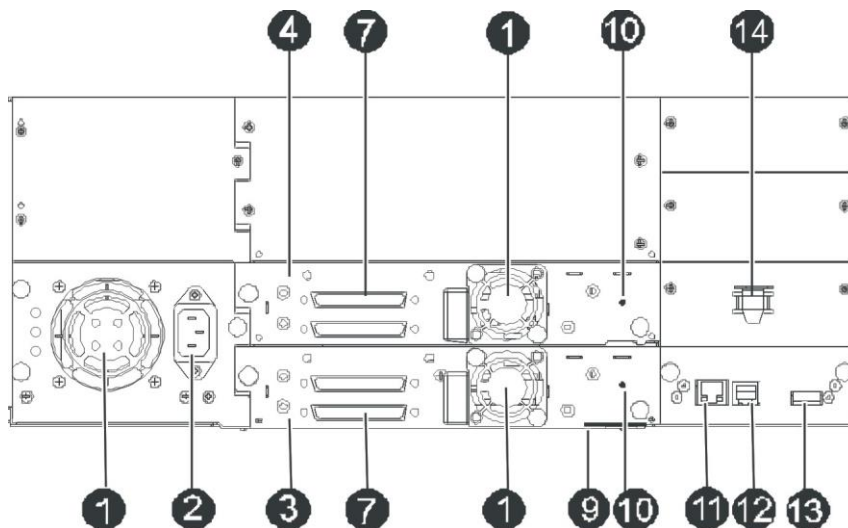


Figure 5 Rear panel with two half height tape drives

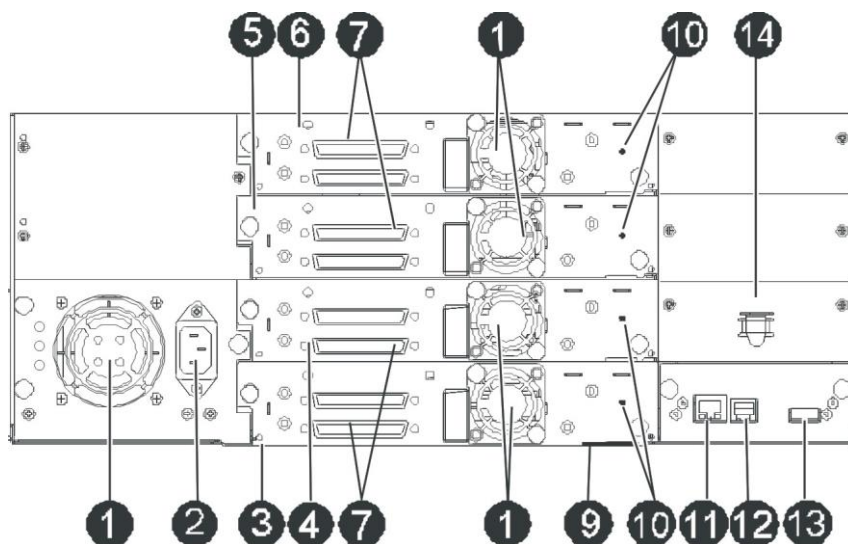


Figure 6 Rear panel with four half height tape drives

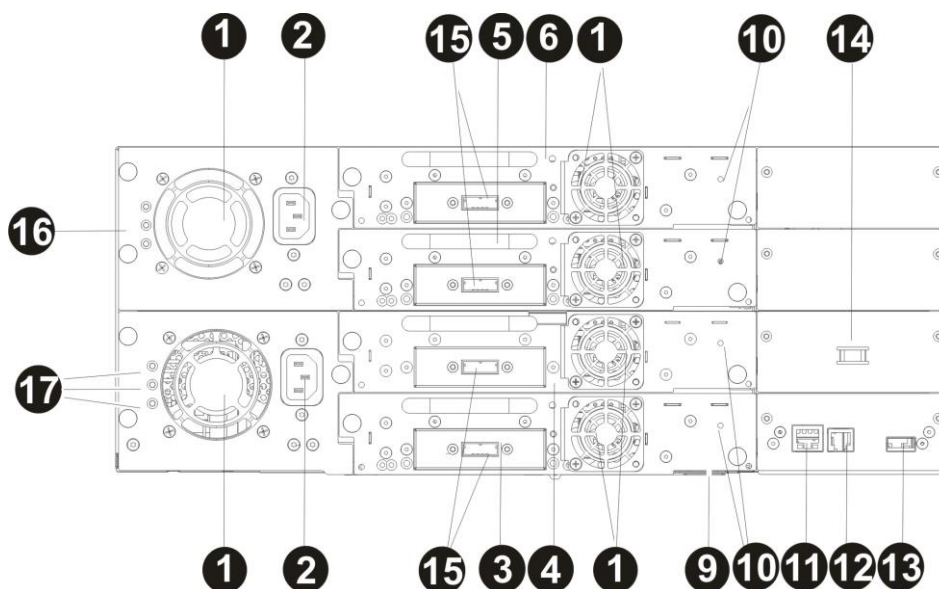


Figure 7 Rear panel with four half height SAS tape drives

Number	Description
1	Fan vent
2	Power connector: The Library requires a 110/220 volt AC power connection
3	Tape drive
4	Tape drive
5	Tape drive
6	Tape drive
7	68-pin HD SCSI connectors
8	Fiber channel connectors
9	Product label foil (see section 11)
10	Tape Drive LED
11	Ethernet port
12	Serial port
13	USB port (Host)
14	Shipping lock
15	SAS connectors
16	Redundant Power Supply
17	Power Supply LED's from top: blue LED on >> AC connected green LED on >> Power good yellow LED on >> degraded Fan

Table 2 Rear panel overview

5.3 Inside components

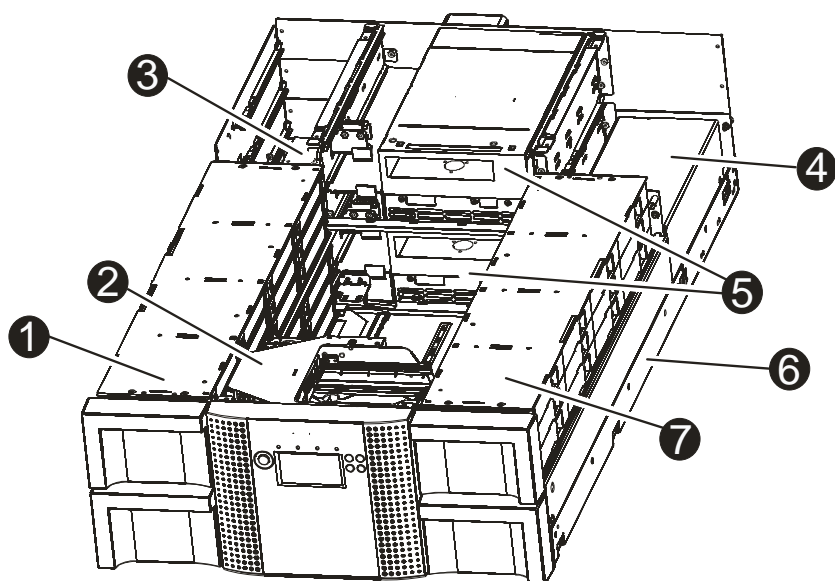


Figure 8 Inside components

Number	Description
1	Left magazine.
2	Robotic with bar code reader
3	Controller
4	Power supply
5	Drive sled
6	Chassis
7	Right magazine

Table 3 Inside components

6 Installing the actiLib Library 4U

6.1 Location requirements

Choose a location that meets the following criteria

Criteria	Definition
Rack requirements	Standard 19-inch rack with 4U of clearance
Room temperature	10-35° C (50-95° F)
Power source	AC power voltage: 100-127 VAC; 200-240 VAC Line frequency: 50-60 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.
Weight without media	Single FH drive unit: 21,3 kg Two FH drive unit: 24,3 kg Two HH drive unit: 22,2 kg Four HH drive unit 26,1 kg
Weight with media (48 LTO cartridges)	Single FH drive unit: 30,6 kg Two FH drive unit: 33,6 kg Two HH drive unit: 31,4 kg Four FH drive unit: 35,3 kg
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 tapes and tape drive.
Humidity	20-80 percent RH non-condensing
Clearance	Back: Minimum of 15.4 cm (6 inches) Front: Minimum of 30.8 cm (12 inches) – for mail slot Minimum of 60 cm to remove magazines Sides: Minimum of 5.08 cm (2 inches)

Table 4 Location requirements

6.2 SCSI requirements

The actiLib Library 4U incorporates a wide SCSI-4 Low-Voltage Differential (LVD) SCSI bus, but may also be attached to a Single-Ended (SE) SCSI bus. Make sure your SCSI host adapter or controller supports these standards. If you connect the Library to an SE SCSI bus, or if there are SE devices attached to the same SCSI bus, the Library's performance is limited to the maximum data transfer speed and maximum cable lengths of the SE bus. For these reasons, BDT strongly recommends that you do not use a SE SCSI bus with the Library.



IMPORTANT

Do not connect an LTO device to a SE SCSI bus, as it will severely degrade performance.



IMPORTANT

The actiLib Library 4U is NOT compatible with a standard differential (Diff) or High-Voltage Differential (HVD) SCSI bus. This Library is compatible with a narrow (50-pin) SCSI bus using a 68-pin to 50-pin adapter that terminates the unused 18 pins (Not included with the Library). These adapters are sometimes labeled high-byte termination

6.3 SCSI host bus adapter

To get optimum performance from your actiLib Library 4U you need a SCSI bus that can transfer data at a rate that supports the Library's maximum burst transfer speed, see "Maximum storage capacity and data transfer rate" on page 95.

A single-ended SCSI host bus adapter will severely degrade performance and limit cable length. Also, if there is any SE devices on the same SCSI bus, the entire SCSI bus will negotiate down to SE speed, severely degrading performance.

6.4 LUN scanning

The actiLib Library 4U uses a single SCSI ID per drive to control the tape drive (LUN 0) and Library robotic (LUN 1). The Library requires an 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 just see the tape drive.



IMPORTANT

Some HBAs, such as RAID controllers, do not support LUN scanning.

6.5 Fibre Channel

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

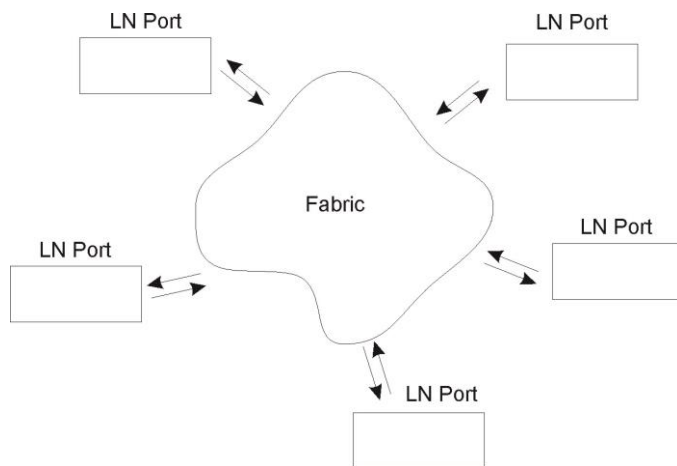


Figure 9 Fibre Channel topology LN Port

- **L Port** - arbitrated loop

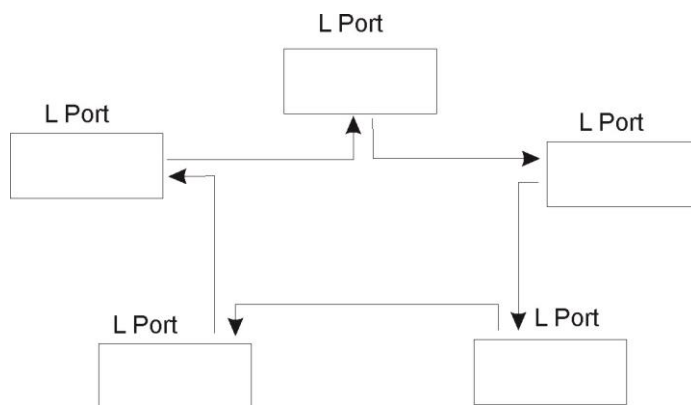


Figure 10 Fibre Channel topology L Port

- **N Port** – point to point protocol in a switched Fabric topology



Figure 11 Fibre Channel topology N Port

6.6 Preparing the host



IMPORTANT

Use proper procedures to prevent electrostatic discharge (ESD) use wrist-grounding straps and anti-static mats when handling internal components

Follow these general guidelines:

- Make sure that your backup application supports the SCSI host bus adapter.
- If the host server is connected to a network, check with the system administrator before turning off power.
- Install a suitably rated HBA. Remember that if there is any SE devices on the same SCSI bus, the entire SCSI bus will negotiate down to SE speed and severely degrade performance and limit cable length.
- Make sure that LUN scanning is enabled on the SCSI host adapter.
- Verifying the connection

Depending on the server configuration, you may need to change the SCSI IDs of the Library.

When the host server is powered on, install the software and/or driver(s) that are compatible with the Library. Backup software packages may require additional software or licensing to communicate with the Library robotics.

Ensure the Library is properly terminated. If the Library is the only SCSI device, other than the SCSI host adapter on the selected SCSI bus, it must be terminated. Likewise, if the Library is physically the last SCSI device on the SCSI bus, it must be terminated. Only the devices physically located at the beginning and end of the SCSI bus should be terminated.

Confirm the host server's operating system recognized the Library in Microsoft® In Windows® XP, Windows® Server 2003 or in Windows 2000® by going to: Settings > Control Panel > System > Hardware > Device Manager > Tape Drive and/or Media Changer.

For more information on verifying the connection of SCSI devices, consult the operating system documentation.

6.7 Unpacking the tape Library

Before you begin, clear a work surface to unpack the Library. Select an open 4U rack location allowing easy access to the host server and an easily accessible power outlet.



IMPORTANT

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.

Unpacking the Library:

1. Before opening and removing the Library from the box, inspect the container for shipping damage. If you notice any damage, report it to the shipping company immediately.
2. Open the box and remove the two rack rails (if included) and set aside.
3. Carefully remove the shipping materials from the top of the Library. Remove the accessory package and set aside.
4. Lift the Library out of the carton and remove the bag from the Library. Remove the foam cushion from the back of the Library. Save the packaging materials for future use.



IMPORTANT

Do not place the Library on either end or sides as this may damage the Library.

6.8 Identifying product components

Confirm that you have received the following:

- Library
- Terminator (not in all configurations)
- SCSI cable (not in all configurations)
- Power cord (not in all configurations)
- Rack mount kit: (not in all configurations)
 - ✓ 2 rack mount rails
 - ✓ 1 bag of eight M6 screws for the Rack (9.5 mm square holes in the rack column)
 - ✓ 1 bag of eight M6 screws for rack mounting (6.85 mm round holes in the rack column)
 - ✓ 2 mounting brackets
 - ✓ 4 M3x6 Torx screws to fix the mounting brackets
 - ✓ 2 guide pulleys
 - ✓ 2 M3x6 Torx screws to fix the guide pulleys
 - ✓ 2 M5 screws to secure the mounting brackets to the rack
- Documentation CD
- Quick Start Guide

6.9 Remove the shipping lock



IMPORTANT

The shipping lock, which prevents the robotic transport mechanism 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, it should be stored on the rear panel right side of the Library for future use.

To remove and store the shipping lock:

1. Remove the yellow label that is securing the lock to the top of the Library, and then remove the lock (see Figure 12).

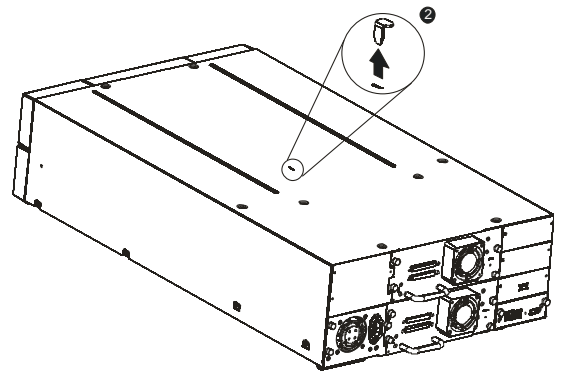
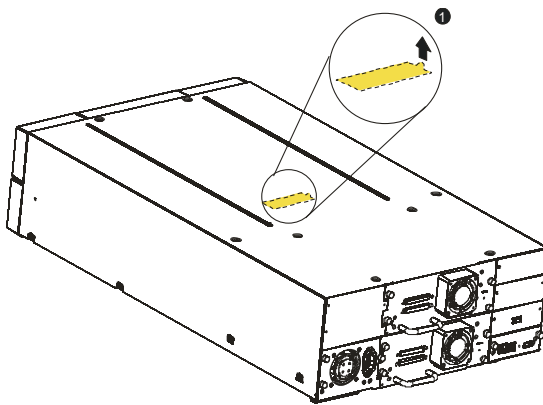


Figure 12 Shipping lock and label

2. Store the lock and label on the rear panel of the Library (see Figure 13).



IMPORTANT

If you need to transport the Library, it is recommended that the shipping lock and label is replaced on the top cover (see section 11).

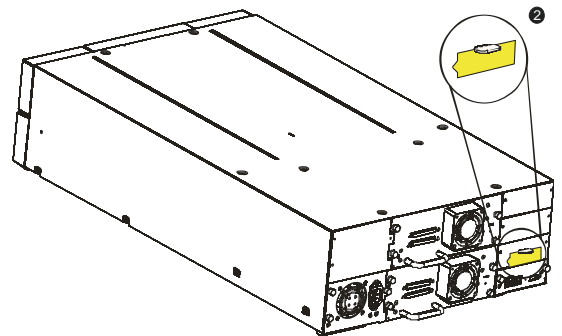
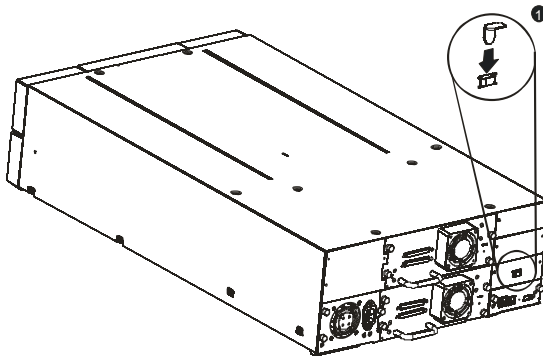


Figure 13 Shipping lock and label on the rear panel

6.10 Rack mounting the tape Library

The Library easily installs into a standard 19" rack system taking up 4U of space.
The actiLib Library 4U weighs 24,5 kg without media



WARNING

Weight!

Risk of personal injury or damage to the Library.

- always remove all tapes to reduce the overall weight of the Library
 - obtain adequate assistance to lift and stabilize the library during installation or removal
 - observe local health and safety requirements and guidelines for manual material handling
-

Required tools:

- #3 Phillips screwdriver
- T10 Torx screwdriver

There are two sets of eight M6 screws in the accessory package that came with your Library. The type of rack that you have will determine the type of M6 screw that you will use.

To install the Library:

- 3.** 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.
- 4.** Using the appropriate M6 screws for your rack type, and a #3 Phillips screwdriver, secure one rail to each side of the rack in your chosen rack location. Secure both the front and back of each rail to the rack. The rails extend to fit a variety of rack depths. The correct orientation of the left and right rails is shown in Figure 14.

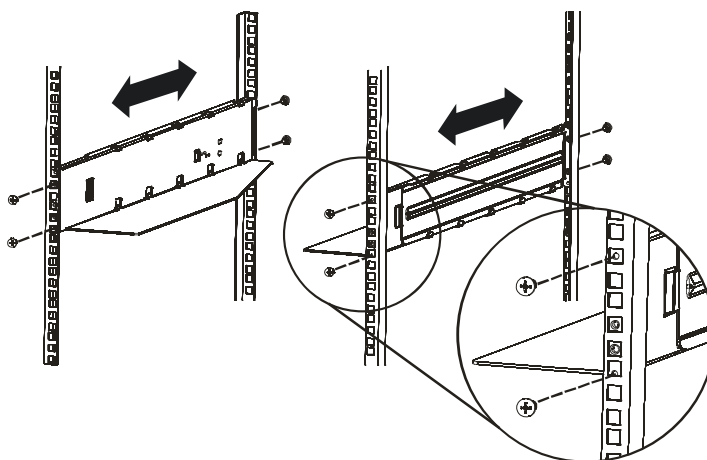


Figure 14 Installing the rails into the rack

1. Using the Torx screwdriver, remove the screw on each side of you Library. Shown in Figure 15 step1.

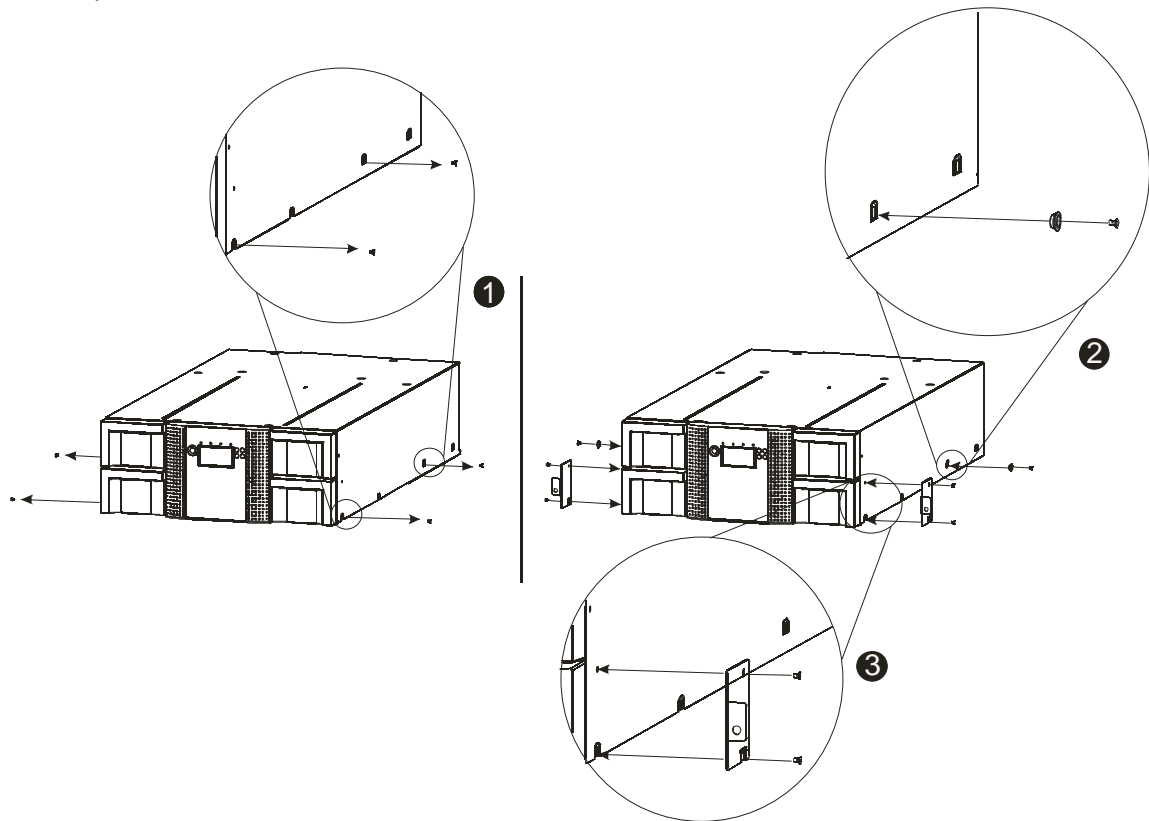


Figure 15 *Installing the mounting brackets and guide pulleys*

1. Install the Library guide pulleys on each side of the Library using the 2 Torx screws included in the rack kit (see Figure 15 step 2).

Install the mounting brackets of the Library using the 4 Torxs screws included in the rack kit. Shown in Figure 15 (step 3).

2. With Library guide pulleys and mounting brackets installed, slide the Library onto the rails.
1. Secure the Library to the rack (see Figure 16) using a 3# Phillips screwdriver placed through the small holes in the mounting bracket to tighten the M5 screw on each side of the Library.

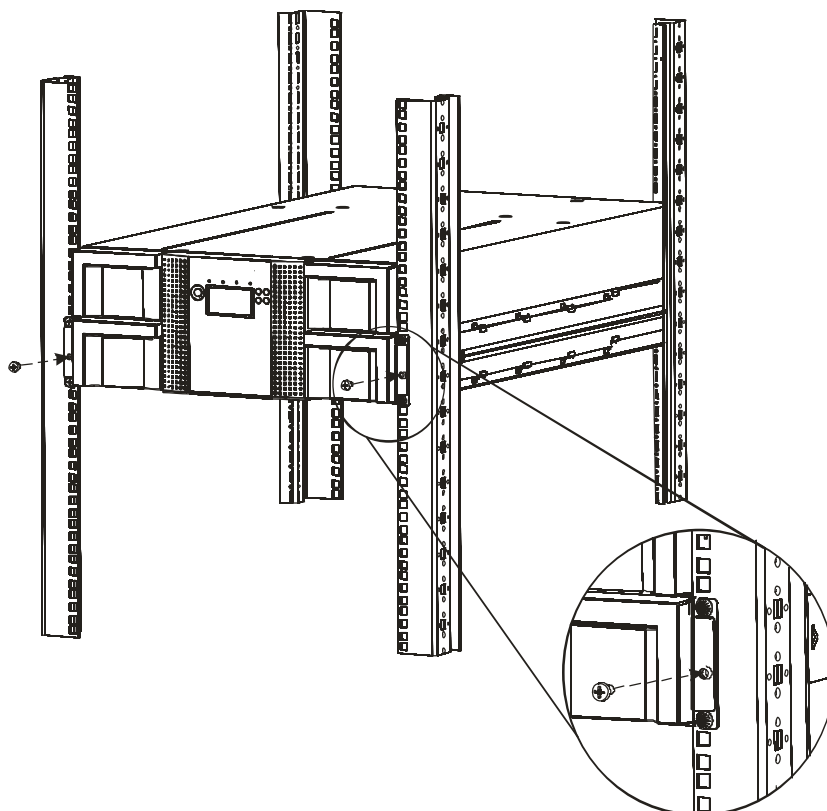


Figure 16 securing the Library to the rack

6.11 Connecting the SCSI and power cable



INFORMATION

The LTO tape drive is an Ultra 320 SCSI LVD device. Only cables and terminators specified for Ultra 320 uses or labeled as Multi Mode should be used.



WARNING

Use approved power cords!

Not doing so can result in the following:

- not meeting individual country specific safety requirements;
- insufficient conductor ampacity that could result in overheating with potential personal injury and/or property damage;
- an unapproved power cord could fracture resulting in the internal contacts being exposed, which potentially could subject the user to a shock hazard.

Manufacturer disclaims all liability in the event a non-manufacturer approved power cord is used.

**CAUTION**

Failure to remove the power cables from these devices could result in damage to the Library.

To connect the SCSI and power cable to the tape Library:

1. Shut down and turn off the selected server. Turn off all attached devices, such as printers and other SCSI devices. Remove the power cables from the server and all attached accessories.
2. Attach one end of the SCSI cable (included in the accessory package) to one of the connectors on the back panel of the Library (see Figure 17)

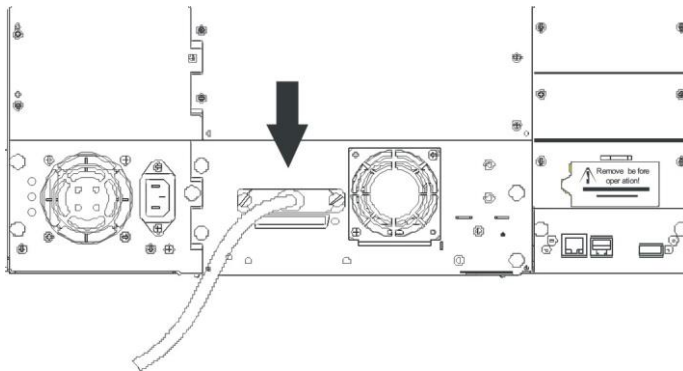


Figure 17 Attaching the SCSI cable to the drive

3. Attach the other end of the SCSI cable to the connector on the SCSI host bus adapter or to the connector on the previous device on the SCSI bus.

**INFORMATION**

The host bus adapter should be LVDS. A SE SCSI host bus adapter will work, but will severely degrade performance, and limit cable length. If there are any SE devices on the same SCSI bus, the entire SCSI bus will negotiate down to SE speed and severely degrade performance. Never attach the LTO tape drive to a SE SCSI bus

4. Attach the terminator to the remaining SCSI connector on the back panel of the Library; if the Library is the last or only device on the SCSI bus (see Figure 18). Otherwise, attach one end of a SCSI cable to the remaining port and the other end to the next device on the SCSI bus. Make sure that the last device on the SCSI bus is properly terminated.

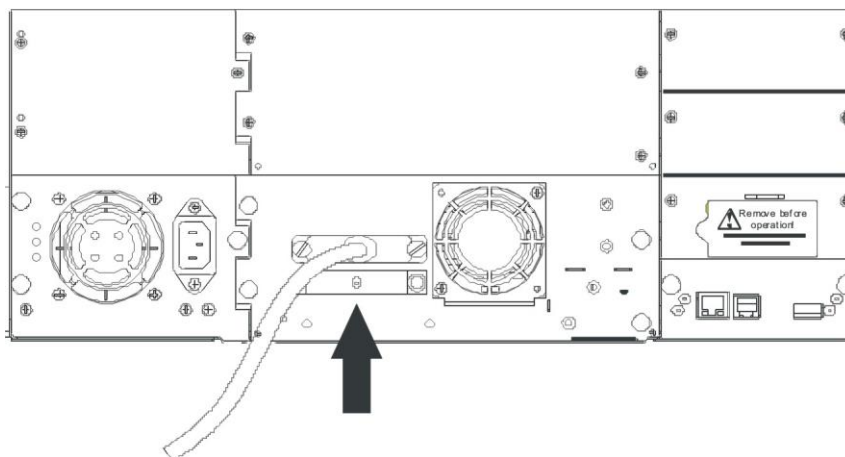


Figure 18 Attaching the terminator to the drive

5. Attach the power cable to the power connector on the back panel of the Library (see Figure 19).
6. Plug the power cable into the nearest properly grounded power outlet.

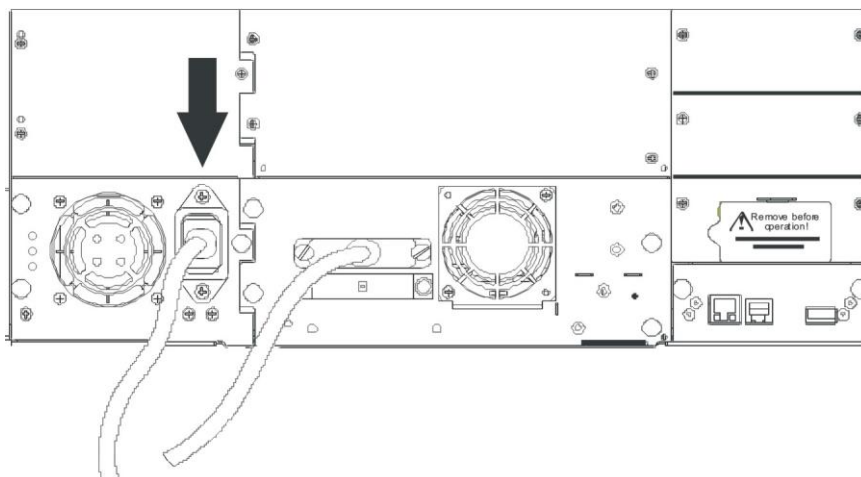


Figure 19 Attaching the power cable

**CAUTION**

To disconnect all power from the Library, remove the power cord from the outlet. The power button only puts the power on stand-by.

7. Turn on the Library using the power button. Check the LCD screen 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 will be displayed.
8. Plug in the host server or workstation and all attached devices.
9. Turn on any other devices you turned off earlier.
10. Turn on the server.

7 Operating the tape Library

7.1 Operator Control Panel (OCP)

There are 2 basic modes that Operator Control Panel (OCP). First is the User Interaction mode. This mode is employed when a user is pushing buttons on the OCP. The second mode is the System Driven mode. This is the normal mode of operation. In this mode, the OCP displays status associated with the Library actions that were caused from commands issued via the Drive's serial interface. Actions like Loading, Rewinding or Moving tape will be displayed. When an OCP button is pressed and released, the OCP automatically transitions to User Interaction mode. User Interaction mode will continue until 3 minutes after a user stops pushing buttons, or the requested robotic action stops – whichever is longer. At this time the OCP will return to System driven mode.

In case of activated User security feature the User Interaction Mode is restricted to the Information and Login menu item, until a login with correct PIN is done.

7.2 OCP Philosophy

The OCP operation obeys some basic rules. These rules of operation constitute a 'philosophy'.

- Any operational conflict between commands received over SCSI or RMU and those entered via the front panel will be avoided with a reservation mechanism on a 'first-come, first-served' basis. Any reservation by OCP is canceled by an OCP logout or the timeout, which cancels the User Interaction Mode.
- 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 full slot
 - Moving a cartridge from an empty slot
 - 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 will be considered as fatal. An error code will be displayed on the LCD and the error LED will become illuminated. The error code will remain on the OCP until a push button is pressed, which will cause the OCP to return to the Home Screen.
- Text status messages are provided with numeric error codes used for unrecoverable, fatal errors.

7.3 Power-Up Display

When the actiLib Library 4U device powers up, or resets, it goes through several internally controlled processes that allows it to get initialized and running. These processes are called Power-On-Self-Test (POST). While the POST is happening, the Op-Panel shall have appropriate information displayed to keep the user informed. When the loader finishes coming alive, it will display the current device status for a defined time or until a key is pressed.

After this initial status screen the home screen will be shown until a key is pressed. This home screen shows the overall health of the loader, indicating the status of the robotic and the connected drives.



Figure 20 Home Screen

7.4 Note about the LED's

All LEDs are updated during Power Up and Reset sequences. Upon power up or software Reset, the loader will illuminate all LEDs as soon as POST allows. This will help the User to verify if all LEDs are functional. When initialization starts, all LEDs will be extinguished and the Ready/Activity LED will flash at a rate of approximately 1-second per cycle, 50% duty cycle. When the mechanical initialization is complete, the Ready/Activity LED will stop flashing and be constantly illuminated.

If a loader failure occurs, the Ready/Activity LED will be turned off and the Error LED will be illuminated. The OCP will also display an appropriate error code to help identify the failure.

7.5 Input Modes

There are several modes to enter values in the different menu items. These values are: selectable predefined values, toggle values (e.g. On/Off) and numerical values such as network addresses.

7.5.1 Selectable predefined values

After navigating to the menu item the various predefined values can be selected with the “NEXT” and “PREVIOUS” button. As soon as the display shows the correct value it may be confirmed by pressing the “ENTER” button.

7.5.2 Toggle values

Toggle values are used to switch between two different states like *On* and *Off*. After navigating to the menu item the display shows the actual state. Pressing the “ENTER” button will toggle to the possible new state. Pressing “ENTER” a second time will take over this new state.

7.5.3 Numerical values

Numerical values are needed for network addresses, PIN entries, and other configuration entries. After navigating to the menu item to be changed, the actual value will be displayed and the cursor stays on the first digit. The value may be incremented / decremented with the “NEXT” and “PREVIOUS” button. After pressing the “ENTER” button the cursor is set to the next editable digit. It can be changed in the same way. After pressing the “ENTER” button at the last digit the complete entry will be stored. Pressing the “CANCEL” button will cancel the whole edit process and the old value is valid again.

7.6 Power ON/OFF

Part of the operator control panel is the Power On/Off button. Pressing this button will initiate a controlled Power Down of the unit (soft landing). The following operations will take place before the unit shuts down completely:

- The display indicates with an appropriate message that the shutdown is in progress
- The library controller finishes all ongoing loader and drive activities
- The robotics is moved to its home position
- The library controller switches off the power supply's secondary side
- To abort the shutdown process the user has to press Cancel within the first 3 seconds



INFORMATION

The shutdown process may be aborted by pressing Cancel within the first 3 seconds.

7.7 OCP Menu Flow Charts

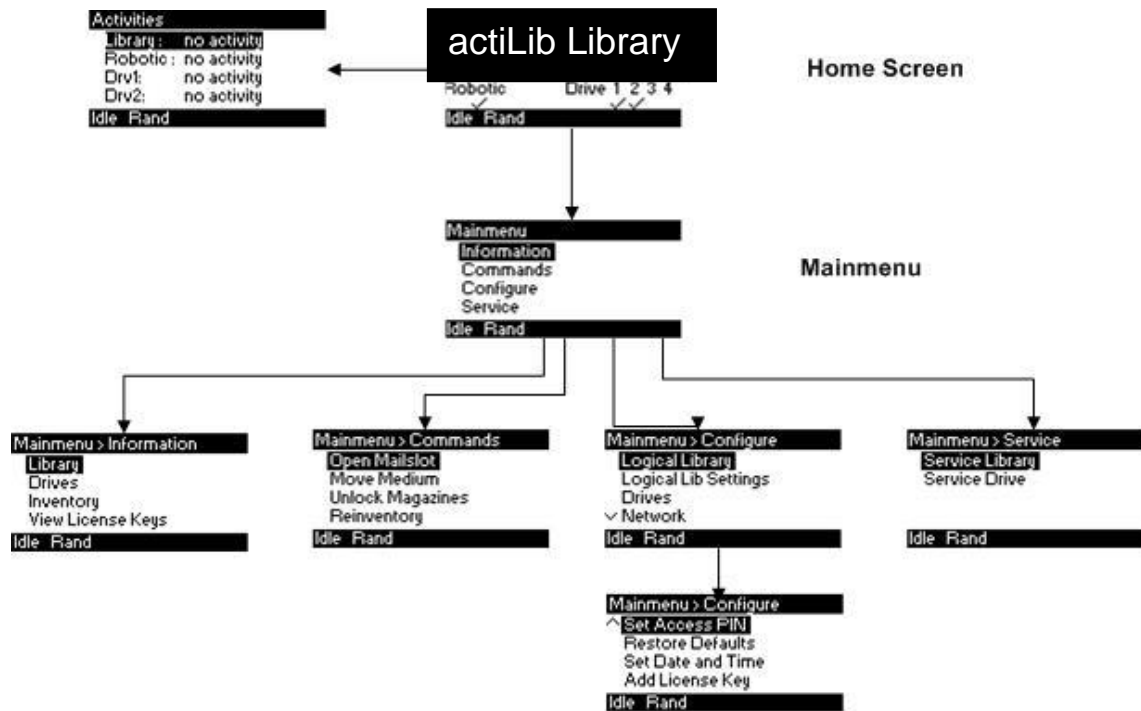


Figure 21 OCP User interaction Mode

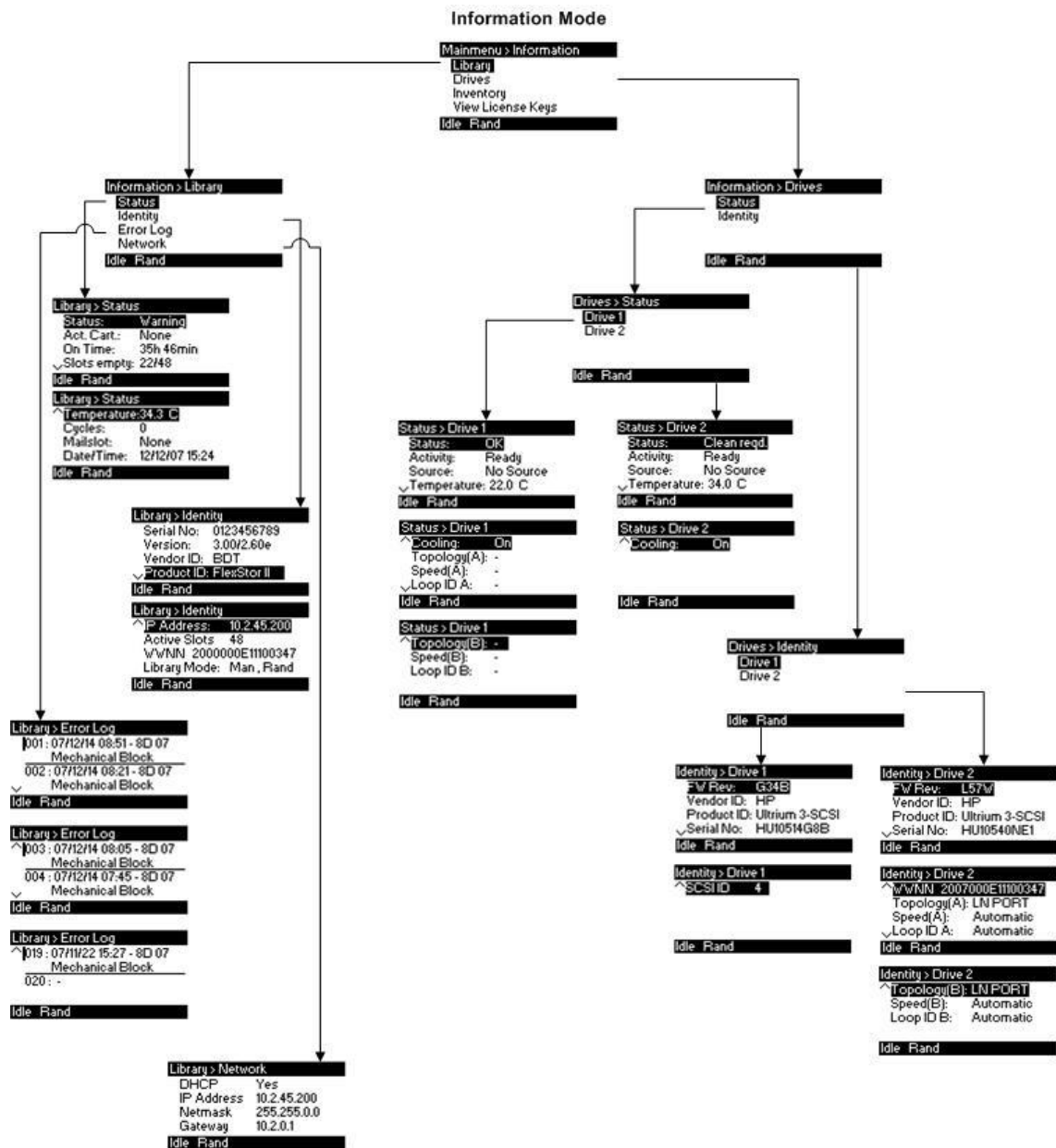


Figure 22 Interaction Mode, Information

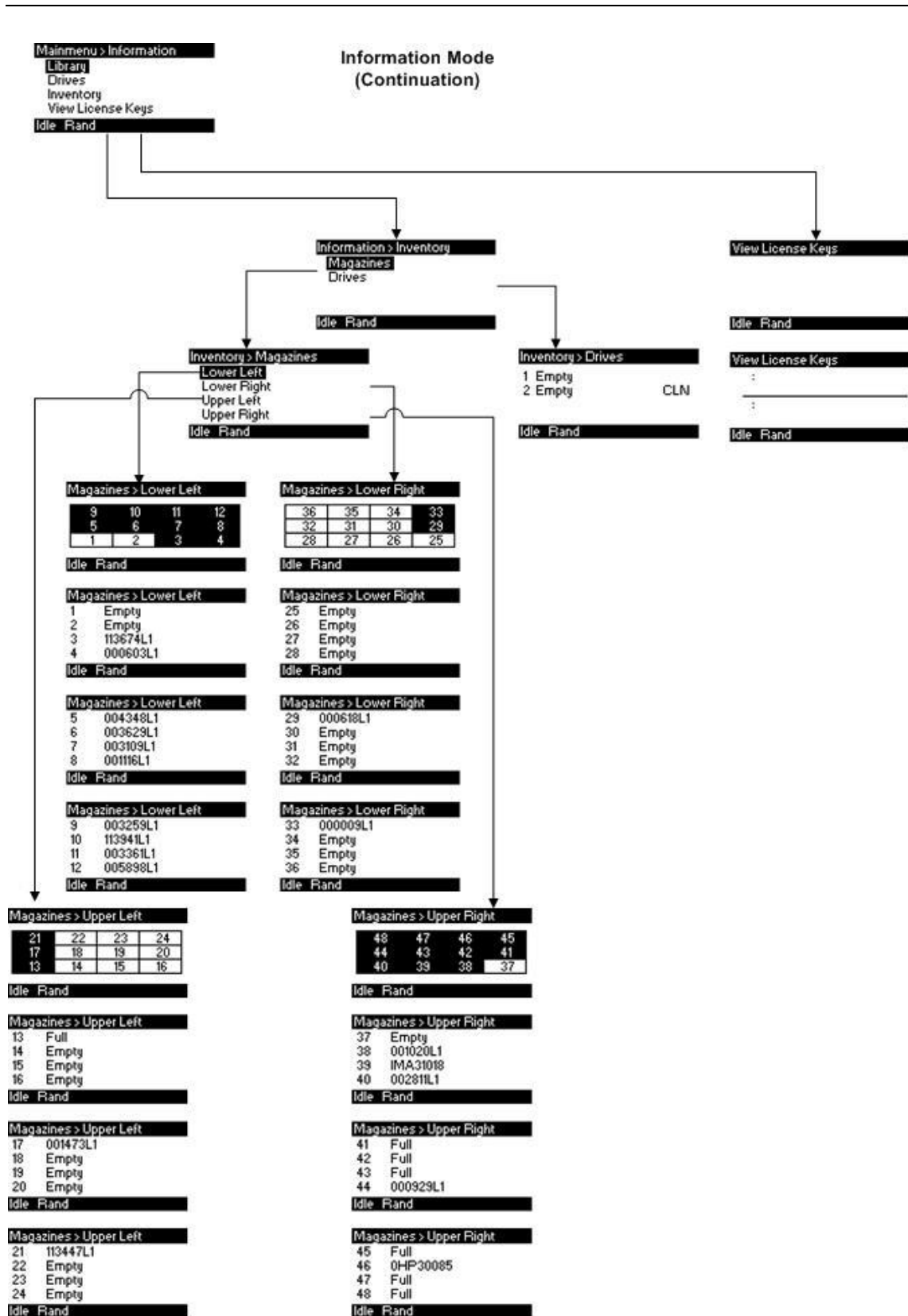


Figure 23 Interaction Mode, Information continuation

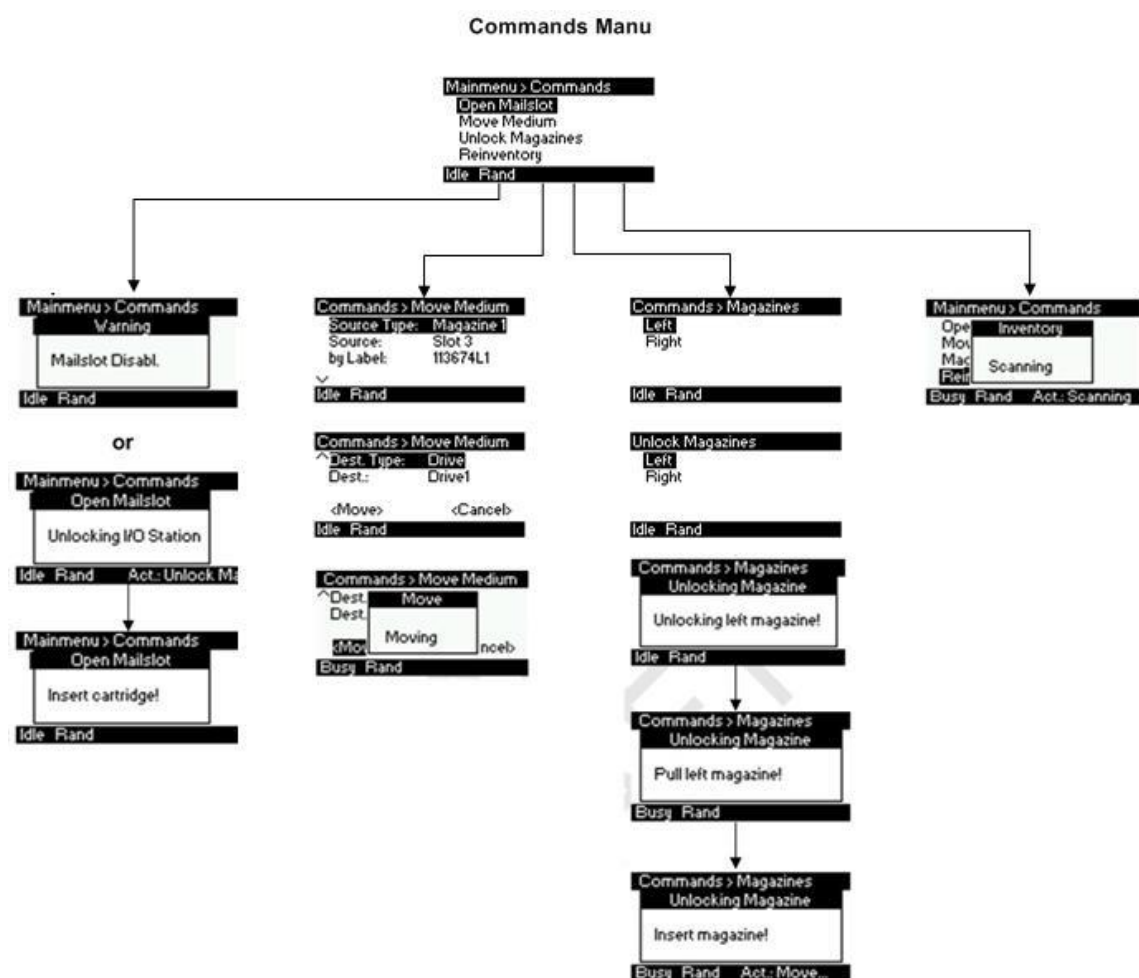


Figure 24 Interaction Mode, Commands


```

graph TD
    MainMenu[Main menu > Configure] --> LogicalLib1[Configuration > Logical Library  
# of Logical Libraries 1]
    MainMenu --> LogicalLibSettings[Logical Lib Settings  
General  
Logical Lib 1  
Logical Lib 2]
    MainMenu --> Drives[Configuration > Drives  
Drive Interface]
    
    LogicalLib1 --> SaveCancel1[<Save> <Cancel>  
Idle Rand]
    SaveCancel1 --> LogicalLib2[Configuration > Logical Library  
# of Logical Libraries 2]
    LogicalLib2 --> SaveCancel2[<Save> <Cancel>  
Idle Rand]
    SaveCancel2 --> ConfigLib1[Configure > Library 1  
Mode Random  
Autoload N/A  
Loop N/A  
Active Slots 48  
Idle Rand]
    ConfigLib1 --> AutoClean1[Configure > Library 1  
Autocleaning disabled  
Mailslot(s) disabled  
Idle Rand]
    AutoClean1 --> SaveCancel3[<Save> <Cancel>  
Idle Rand]
    
    LogicalLibSettings --> Lib1Settings[Logical Lib Settings > Library 1  
Autocleaning disabled  
Mailslot(s) disabled  
Idle Rand]
    Lib1Settings --> SaveCancel4[<Save> <Cancel>  
Idle Rand]
    SaveCancel4 --> Lib1Config[Logical Lib Settings > Library 1  
Mode Random  
Autoload N/A  
Loop N/A  
Active Slots 24  
Idle Rand]
    Lib1Config --> Lib1AutoClean[Logical Lib Settings > Library 1  
Autocleaning disabled  
Mailslot(s) disabled  
Idle Rand]
    Lib1AutoClean --> SaveCancel5[<Save> <Cancel>  
Idle Rand]
    
    LogicalLibSettings --> Lib2Settings[Logical Lib Settings > Library 2  
Mode Random  
Autoload N/A  
Loop N/A  
Active Slots 24  
Idle Rand]
    Lib2Settings --> Lib2AutoClean[Logical Lib Settings > Library 2  
Autocleaning disabled  
Mailslot(s) disabled  
Idle Rand]
    Lib2AutoClean --> SaveCancel6[<Save> <Cancel>  
Idle Rand]
    
    Drives --> IdleRand1[Idle Rand]
    IdleRand1 --> DriveInterface[Drives > Drive Interface  
Drive 1: SAS  
Drive 2: SAS  
Idle Rand]
    DriveInterface --> Drive1Config[Drive Interface > Drive 1  
Port A Speed Automatic  
Port A Type LNPORT  
Port A Mode Automatic  
Port A ALPA Automatic  
Idle Rand]
    Drive1Config --> Drive1PortB[Drive Interface > Drive 1  
Port B Speed Automatic  
Port B Type LNPORT  
Port B Mode Automatic  
Port B ALPA Automatic  
Idle Rand]
    Drive1PortB --> Drive1Save[Drive Interface > Drive 1  
Save Cancel]
    Drive1Save --> IdleRand2[Idle Rand]
    IdleRand2 --> Drive1SCSI[Drive Interface > Drive 1  
SCSI ID 4  
Save Cancel]
    Drive1SCSI --> SaveCancel7[Save Cancel]
    
    DriveInterface --> Drive2Config[Drive Interface > Drive 2  
Port A Speed Automatic  
Port A Type LNPORT  
Port A Mode Automatic  
Port A ALPA Automatic  
Idle Rand]
    Drive2Config --> Drive2PortB[Drive Interface > Drive 2  
Port B Speed Automatic  
Port B Type LNPORT  
Port B Mode Automatic  
Port B ALPA Automatic  
Idle Rand]
    Drive2PortB --> Drive2Save[Drive Interface > Drive 2  
Save Cancel]
    Drive2Save --> IdleRand3[Idle Rand]
    IdleRand3 --> Drive2SCSI[Drive Interface > Drive 2  
SCSI ID 5  
Save Cancel]
    Drive2SCSI --> SaveCancel8[Save Cancel]
  
```

actiLib Library 4U – User and Service Guide

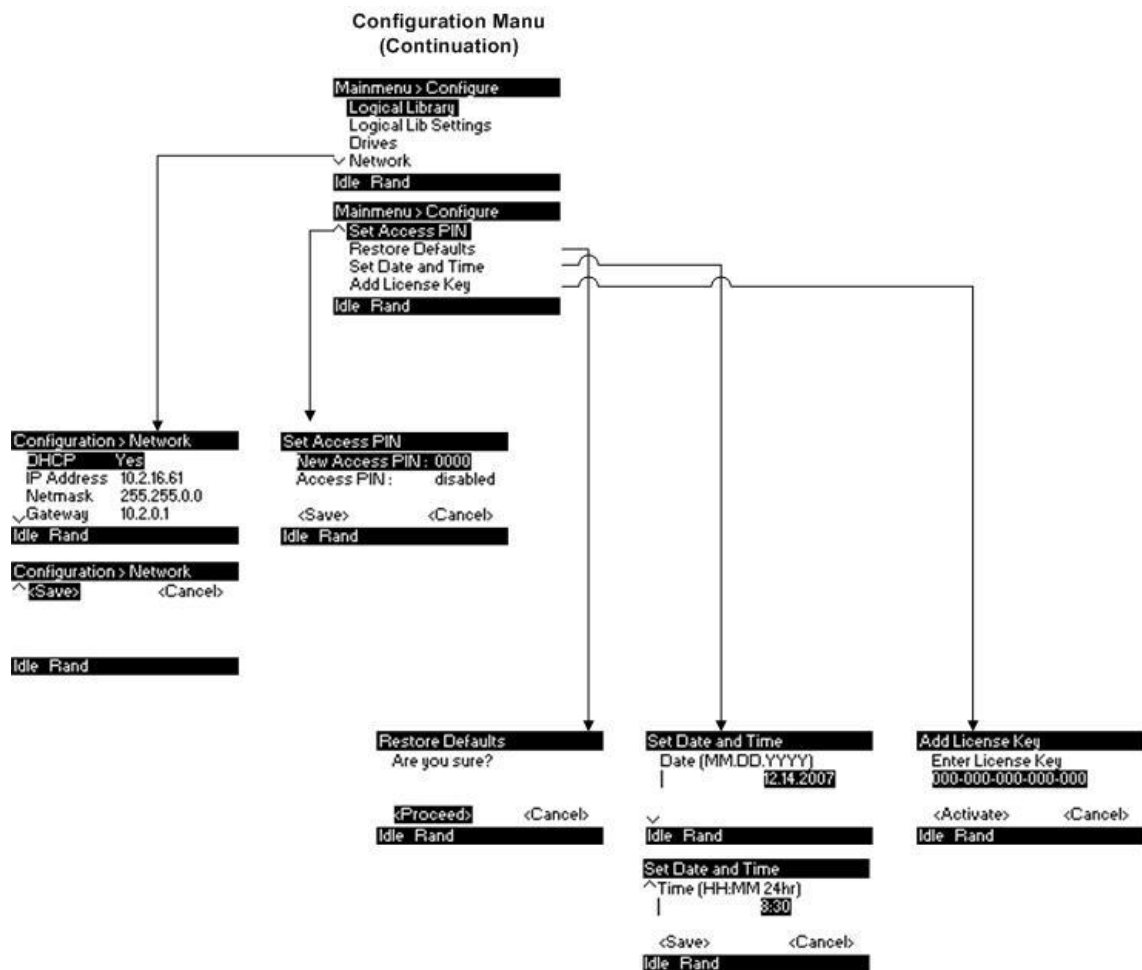


Figure 26 Interaction Mode, Configuration continuation

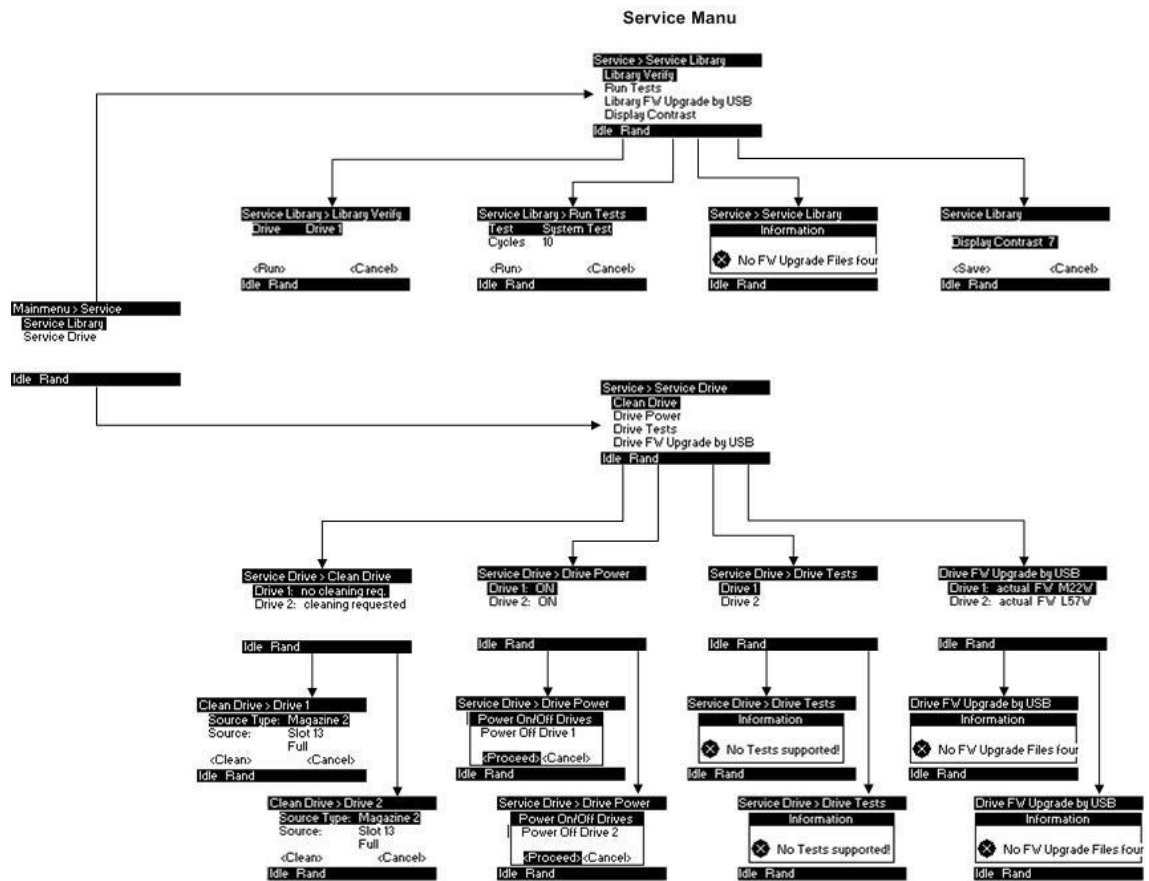


Figure 27 Interaction Mode, Service

7.8 Partitioning the Library

Depending on the height, the number of drives and used drive types it's possible to create up to 4 logical libraries (partitions). The logical libraries also magazine related, this means the number of available slots are aligned to the magazine borders.

When two half-high drives are installed in a 2U library, the library firmware will support partitioning in the same way that the 4U supports partitioning with two full-high drives today. 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 between the logical libraries.

7.8.1 Drive naming

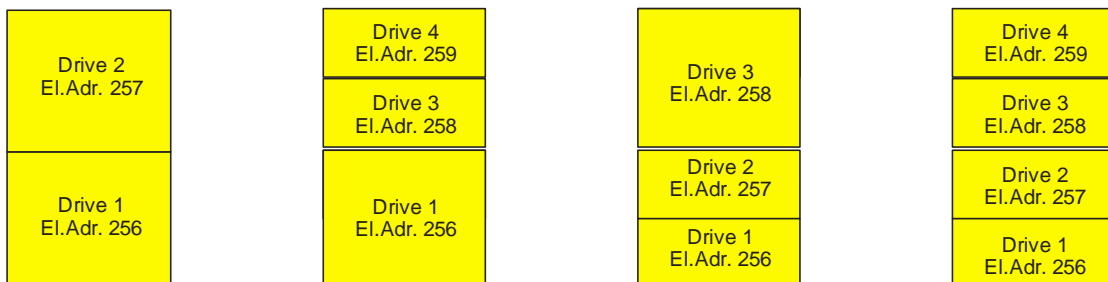
When one or more half-high drives are added to a 4U library, the drive naming will change. Currently, the first full-high drive is "Drive 1" and the second full-high drive is "Drive 2". When you consider that each full-high drive slot may contain one or two half-high drives, there are four potential drives in the space that used to occupy two. As a result, the first half-high drive position, or the first full-high drive position, will be called "Drive 1". The second half-high drive position will be called "Drive 2". The third half-high drive position, or the second full-high drive position, will be called "Drive 3". The fourth half-high drive position will be called "Drive 4".

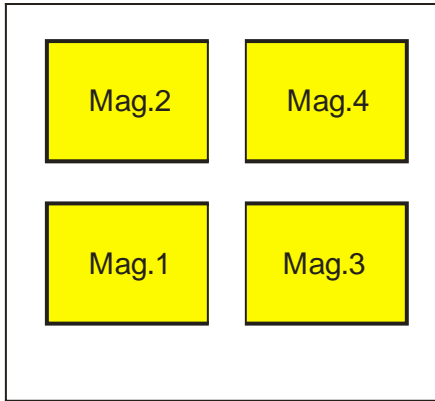
7.8.2 Mixing of drives

The 4U library will support a mix of full-high and half-high drives in the same physical library and the same logical library. They will support a mix of Gen from different generations (LTO2, LTO3, LTO4, LTO5, LTO6) in the same physical library and the same logical library. They will also support a mix of SCSI, SAS, and Fibre Channel in the same physical library and the same logical library.

Configuration of a 1-Partition-System

Contains any drives present in any drive positions, and it will contain all four magazines. This is not different than today.

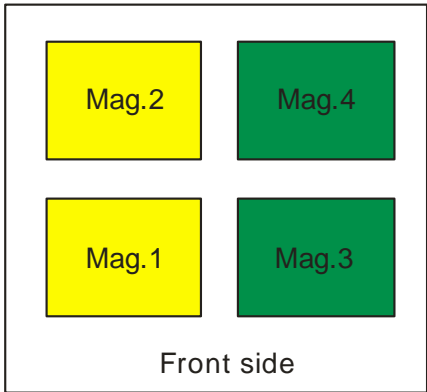
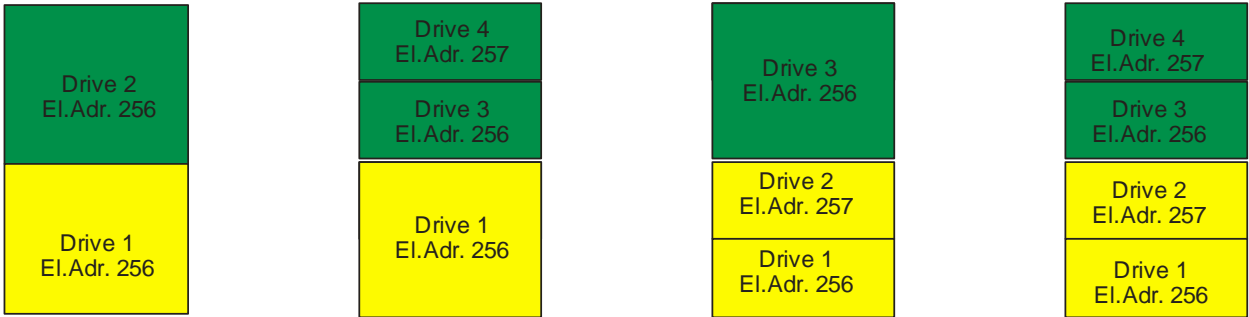




Showing Drive numbers (1, 2, 3, 4), SCSI Element Addresses (El.Adr.) and correlated magazines (same color)

Configuration of a 2-Partiton-System

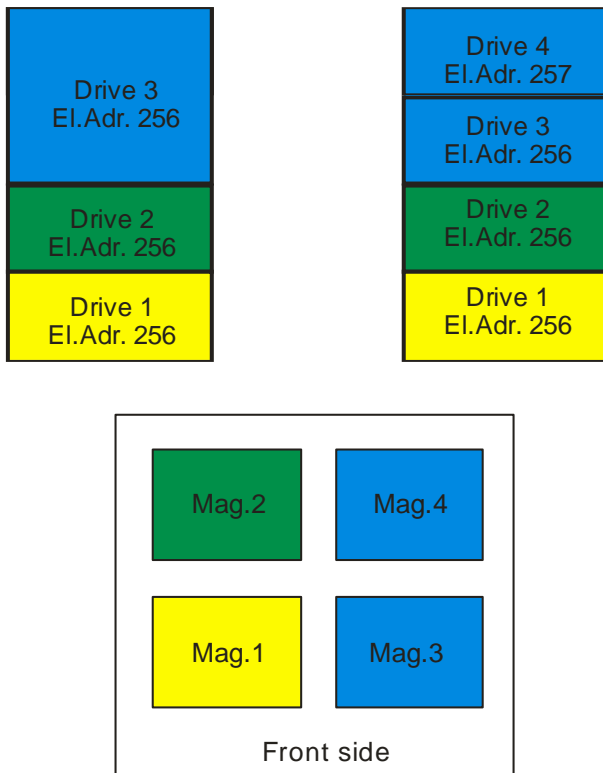
Must have at least two drives installed. One drive must be installed in either drive position 1 or drive position 2, and another drive must be installed in either drive position 3 or drive position 4. Partition 1 will contain any drives in drive position 1 and drive position 2. Partition 1 will also 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.



Showing Drive numbers (1, 2, 3, 4), SCSI Element Addresses (El.Adr.) and correlated magazines (same color)

Configuration of a 3-Partition-System

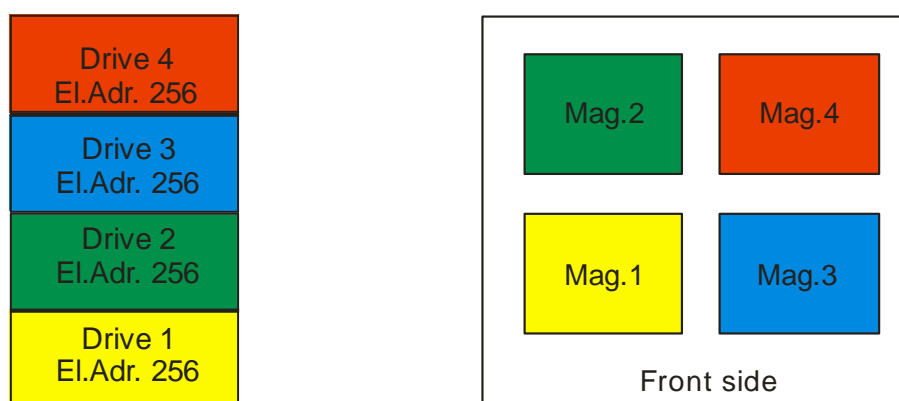
Must have at least three drives installed. A drive must be installed in drive position 1, another drive must be installed in drive position 2, and another drive must be installed in either drive position 3 or drive position 4. Partition 1 will contain the first drive and the first magazine. Partition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



Showing Drive numbers (1, 2, 3, 4), SCSI Element Addresses (El.Adr.) and correlated magazines (same color)

Configuration of a 4-Partition-System

Must have four drives. Each partition will contain one drive and one magazine.



Showing Drive numbers (1, 2, 3, 4), SCSI Element Addresses (El.Adr.) and correlated magazines (same color)

7.8.3 SCSI Element Addressing

7.8.3.1 General Addressing Scheme

Every logical library starts at the first drive slot with the current assigned element start address (default value 256). It will be incremented from bottom to the top slots for every drive slot.



INFORMATION

The addresses used in the samples are the default addresses which are valid after manufacturing or after a "Reset to Default". The described behavior and algorithms are also valid for different SCSI base addresses which can be changed by SCSI SMC command.

4U Unit with only FH drives (1 Logical Library)

SCSI Element	Slot
2	4
	3
1	2
	1

4U Unit with FH & HH drives (1 Logical Library)

SCSI Element	Slot
3	4
	3
2	2
1	1

7.8.4 Element Reporting

The SCSI specification does not allow gaps in the SCSI element addressing. There is a special handling needed for drive slots which are empty to fulfill the specification. Also drives which are temporary removed needs to be handled correct to not confuse the attached host and host application.

7.8.4.1 General Reporting

Generally only drives are reported which are currently physically available or “temporary” removed.

Empty slots which are located at an edge should not be reported, with an exception in case of a “removed” condition.

4U Unit with 3 HH drives

SCSI Element	Slot
	4
3	3
2	2
1	1

7.8.4.2 Gaps

A drive slot which does not contain a drive and has a position between used slots will not be reported.

4U Unit with 3 HH drives

SCSI Element	Slot
3	4
	3
2	2
1	1

In case of installing a drive in a gap the SCSI elemnts will be renumbered in contiguous order without a gap.

4U Unit with 3 HH drives

SCSI Element	Slot
4	4
3	3
2	2
1	1

7.8.4.3 Removed Drives

Removed drives have to be reported as an SCSI element which is not accessible until one of the following conditions occurs:

- A drive is inserted again in the drive slot

After this happens, the SCSI element will be reported again as accessible

- A “Reset to Default” from any UI occurs
- The Logical Library configuration changes (adding / removing of libraries)

After these conditions the slots will be handled as empty slots all data of removed drives are cleared.

7.9 Tape cartridges

Before you begin using the Library, an understanding of the media type, use, maintenance, and how to properly label and write-protect your tape cartridges will help you to prolong the life of your tape cartridges as well as the tape Library.

7.9.1 actiLib Library 4U cartridge type

The cartridge types supported depends on the drive types installed. The Library will support any type of data cartridge and cleaning cartridge the drive will support.



INFORMATION

Some tape drives includes support for both rewriteable and WORM data cartridges. Write-Once, Read-Many (WORM) data cartridges provide an enhanced level of data security against accidental or malicious alteration of data on the tape cartridge. The WORM data cartridge can be appended to maximize the full capacity of the tape cartridge, but the user will be unable to erase or overwrite data on the cartridge

7.9.2 Using and maintaining tape cartridges

Do not degauss Ultrium LTO data cartridges! These data cartridges are pre-recorded with a magnetic servo signal. This signal is required in order to use the cartridge with Ultrium LTO tape drives. Keep Ultrium LTO cartridges separate from strong magnetic fields.

Before you use the Library to ensure the longest possible life for your data cartridges, follow these guidelines:

- Use only the data cartridges that are designated for your model of Library
- Clean the tape drive when the Clean Drive LED is illuminated. Be sure to use only Ultrium Universal cleaning cartridges.
- Do not drop a cartridge. Excessive shock can damage the internal contents of the cartridge, or the cartridge case itself, making that cartridge unusable.
- Do not expose your data cartridges to direct sunlight or sources of heat, including portable heaters and heating ducts.
- The operating temperature range for your data cartridges is 10 to 35° C. The storage temperature range is -40 to +60° C in a dust-free environment in which relative humidity is always between 20 percent and 80 percent (non-condensing).
- If the data cartridge has been exposed to temperatures outside the ranges specified above, stabilize the cartridge at room temperature for the same amount of time it was exposed to extreme temperatures or 24 hours, whichever is less.
- Do not place data cartridges near sources of electromagnetic energy or strong magnetic fields such as computer monitors, electric motors, speakers, or X-ray equipment. Exposure to electromagnetic energy or magnetic fields can destroy data and the embedded servo code written on the media by the cartridge manufacturer, which can render the cartridge unusable.
- Place identification labels only in the designated area on the cartridge.

7.9.3 Labeling tape cartridges

Attaching a barcode label to each tape cartridge enables the Library and application software to identify the cartridge quickly, thereby speeding up inventory time. Make it a practice to use bar code labels on your tape cartridges. Your host software may need to keep track of the following information via the associated barcode:

Date of format or initialization

Tape's media pool

Data residing on the tape

Age of the backup

Errors encountered while using the tape (to determine if the tape is faulty).



IMPORTANT

The misuse and misunderstanding of bar code technology can result in backup and restore failures. To ensure that your bar codes meet manufactures quality standards, always purchase them from an approved supplier and never print bar code labels your self.

Ultrium tape cartridges have a recessed area located on the front of the cartridge next to the write-protect switch. Use this area for attaching the adhesive-backed bar code label. Only apply labels as designated in Figure 28.

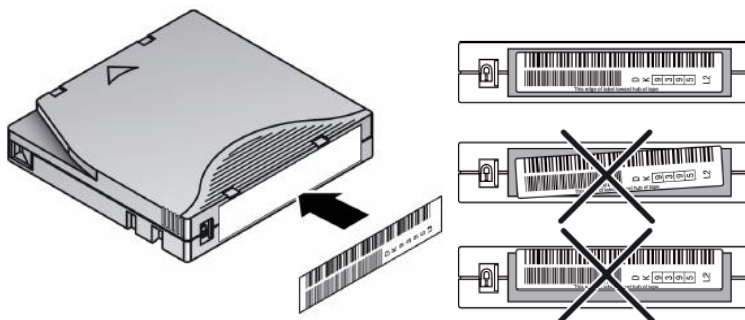


Figure 28 Ultrium tape cartridge and proper bar code label placement



IMPORTANT

The bar code label should only be applied as shown in Figure 26 with the alphanumeric portion facing the hub side of the tape cartridge. Never apply multiple labels onto a cartridge, as extra labels can cause the cartridge to jam in a tape drive.

7.9.4 Write-protecting tape cartridges

All rewritable data cartridges have a write-protect switch to prevent accidental erasure or overwriting of data. Before loading a cartridge into the Library, make sure the write-protect switch on the front of the cartridge is in the desired position.

- Slide the switch to the right to write-protect the cartridge. A small pad-lock is visible indicating that the cartridge is write-protected (see Figure 29).
- Slide the switch to the left to allow the Library to write data to the cartridge (see Figure 29).

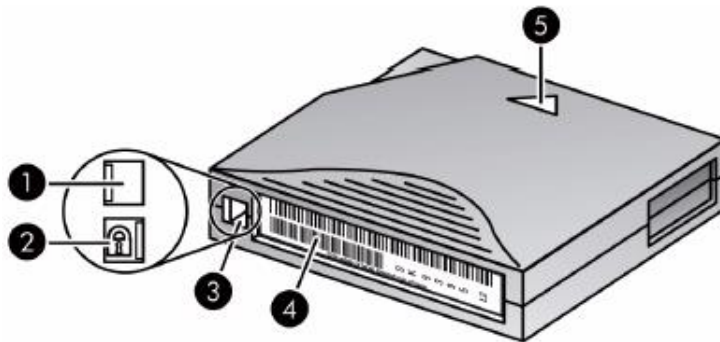


Figure 29 Write protecting the Ultrium data cartridge

Number	Description
1	Write-enabled
2	Write-protected
3	Write-protect switch
4	Barcode label
5	Insertion arrow

Table 5 Write protecting

7.9.5 Backward read compatibility

See compatibility guide of tape drives used.

7.9.6 Barcode reader

The barcode reader provides inventory feedback to the host application and/or LCD screen by reading the cartridge barcode labels. The Library stores the customized inventory data in memory.

7.10 Magazines

Cartridges are stored in magazines. Up to 12 cartridges can be stored in each magazine. Magazines may be removed and inserted individually.

The actiLib Library 4U has two removable magazines in the 4U Library (see Figure 30 and Figure 31). Magazine access can password protected. For safety reasons, the robotic motion is stopped when a magazine is removed. See section 7.11.6.6

The magazines can be released using the Operator Control Panel (OCP) or the Remote Management Unit (RMU).

In case the OCP or RMU initiated process has failed or the Library no longer has power a manual emergency release is available. See section 8.2.2.

7.10.1 Inserting tape cartridges into a magazine

The slot numbering scheme is shown in Figure 30 for the left magazine and Figure 31 for the right magazine.

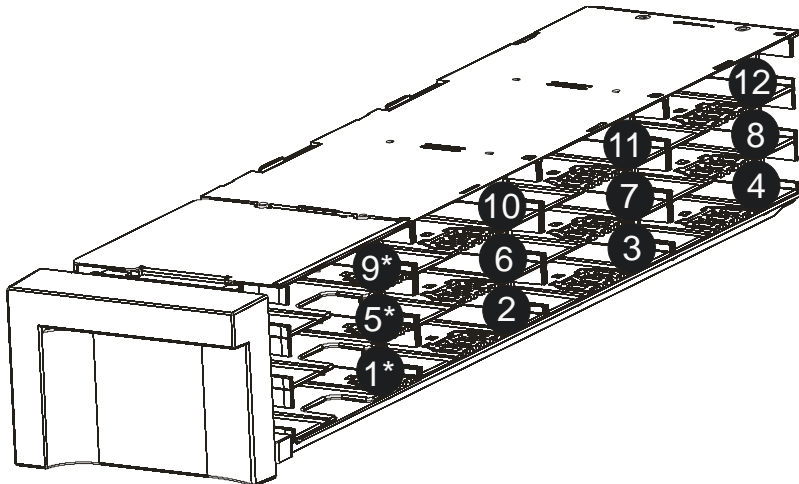


Figure 30 Slot numbering left magazine with mail slot

Number	Description
1*,5*,9*	Mail slot
2÷24	Slot

Table 6 Slot numbering, left magazine

1. Unlock the magazines and remove it from the Library
 - Use the OCP, see section 9.7, or
 - use the RMU, see section 9.8
2. Insert cartridge in the magazines
3. Put the magazines back to the tape Library.

7.10.2 Mail slot

Mail slots are used to import/export individual cartridges without interrupting Library operation. The command to open the mail slot may be denied if the robotics is busy with some operation. In that case „Busy“ is displayed and the command has to be repeated once the robotics operation is finished.

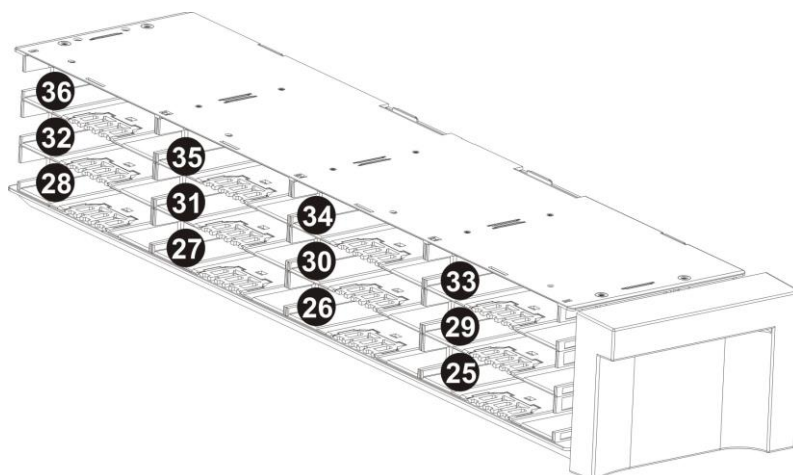


Figure 31 Slot numbering right magazine

Number	Description
25÷48	Slot

Table 7 Slot numbering, right magazine

7.11 Remote Management Unit (RMU)

7.11.1 Overview

Many of the same operations performed from the operator control panel can also be performed remotely using the Remote Management Interface

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

After establishing a connection to the Library, open any HTML browser and enter the IP address of the Library. To configure the RMU, you must set the IP address at OCP or DHCP.

7.11.2 Library status icons

Status icons indicate the following conditions.




Symbol	Description
	The green Status Ok icon indicates that the Library is fully operational and that no user intervention is required.
	The yellow exclamation point for Status Warning indicates that user intervention is necessary, but that the Library is still capable of performing operations.
	The red X Status Error indicates that user intervention is required and that the Library is not capable of performing operations.

Table 8 Status icons

7.11.3 Login



CAUTION

Some options of the RMU 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 access type and enter the correct password. There are three levels of access:

Standard user level

Admin user level

Service personnel user level. Access to this level is by Service personnel only.

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

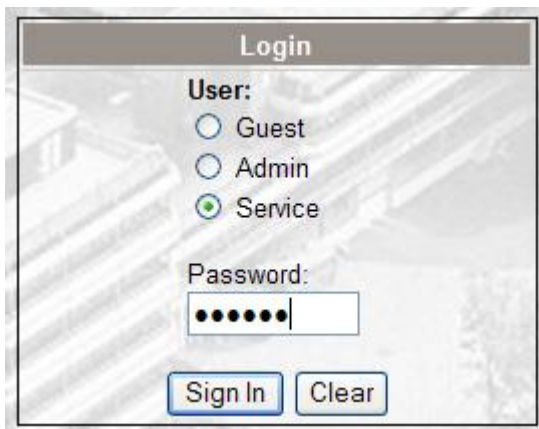


Figure 32 RMU Login page

7.11.4 Identity

7.11.4.1 Viewing static Library information

This page provides access to the static information about the system.

The following information can be found, although no changes can be made from this page:

Serial Number

Product ID

Currently Installed Library Firmware

Boot code Firmware Revision

IP Address

Library Mode

If the unit has more than one partition the properties of all logical libraries are displayed.


 We care about data				
Identity	Status	Configuration	Operations	Service
<i>Library</i>	<i>Drive</i>			
Library Information				
Serial Number	0123456789			
Product ID	FlexStor II			
Currently Installed Library Firmware	0.22 / 1.30e			
Bootcode Firmware Revision	0.50			
IP Address	10.2.254.67			
Library Mode	Manual, Random			

Figure 33 Identity, Library page

7.11.4.2 Viewing static drive information

This page provides detailed information about the drive. No changes can be made from this page.


 We care about data	
Identity	Status
Configuration	Operations
Service	
Library	Drive
Drive Information	1
Vendor ID	HP
Product ID	Ultrium 2-SCSI
Serial Number	HU10539F41
Firmware Revision	008.962
SCSI ID	4
Physical Drive Number	1
SCSI Element Address	1
Library Master Drive	Yes

Figure 34 Identity, drive page

7.11.5 Status

7.11.5.1 Viewing dynamic Library information

This page displays the dynamic information about the Library, such as the current status of the components. The following information can be found on this page:

Status
Cartridge in Operation
Odometer
Total Power On Time
Robotic Status
Magazine Left
Magazine Right
Mail slot


 We care about data	
Identity	Status
Configuration	Operations
Service	
Library	Drive
Inventory	
Library Status As Of 17:59:19 Library Time	
Status	✓ Ready
Cartridge In Transport	None
Number Of Moves	0
Total Power On Time	7h 53min
Robotic Status	Ready
Left Magazine	Present
Right Magazine	Present
Refresh	

Figure 35 Status, Library page

7.11.5.2 Viewing dynamic drive information

This page provides detailed information about all drives that are present in the Library.

actidata
We care about data

Identity

Status

Configuration

Operations

Service

Library

Drive

Inventory

Drive 1 Status As Of 18:00:02 Library Time

Status	✓ Ready
Cartridge In Drive	None
Drive Error Code	No Error
Drive Temperature (normal range: 15 °C - 55 °C)	34.0 °C
Cooling Fan Active	On
Drive Activity	Ready

Refresh

Figure 36 Status, Drive page

7.11.5.3 Viewing the tape cartridge inventory

This page provides detailed information about the tape inventory in the Library. A summary of each magazine is shown. To get detailed information, click on the + button. This will expand the display for the specified magazine.

actidata
We care about data

Identity

Status

Configuration

Operations

Service

Library

Drive

Inventory

Inventory As Of 18:00:37 Library Time

8	3	10	11	+
4	5	6	7	
Mails 0:	1	2	3	

Drive inventory

Drive	Status	Label	Source
1	Empty	-----	

Refresh

Figure 37 Status, Inventory page

7.11.6 Configuration

7.11.6.1 Changing the system configuration

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 the user of the impact of their proposed change. In some cases a pop-up screen will ask the operator to confirm their change. Many changes will also require a reboot.

Changes that can be made are:

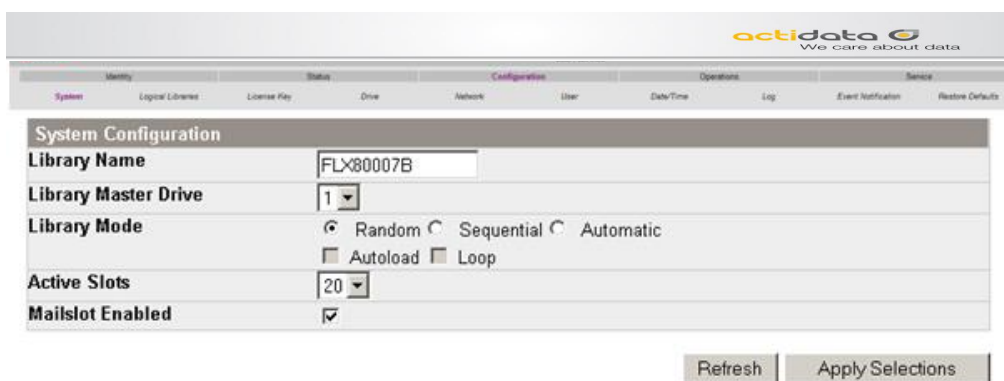
Library Name

Library LUN Hosted by Drive

Library Mode: Random, Sequential, Automatic Auto load, Loop

Active Slots

Mail slot Enabled



The screenshot shows the 'actidata' web interface with the 'System Configuration' tab selected. The 'System Configuration' section includes the following fields and options:

- Library Name:** Text input field containing 'FLX80007B'.
- Library Master Drive:** Dropdown menu showing '1'.
- Library Mode:** Radio buttons for 'Random' (selected), 'Sequential', and 'Automatic'. Below these are checkboxes for 'Autoload' and 'Loop'.
- Active Slots:** Dropdown menu showing '20'.
- Mailslot Enabled:** Checkmark box that is checked.

At the bottom right of the configuration section are two buttons: 'Refresh' and 'Apply Selections'.

Figure 38 Configuration, System page

7.11.6.2 Changing the logical libraries

This page allows the user to create up to 4 logical libraries within the physical 4U library.



The screenshot shows the 'actidata' web interface with the 'Logical Libraries' tab selected. The 'Logical Libraries' section includes the following elements:

- Logical Libraries:** A section header.
- Select Mode:** A dropdown menu showing '2' and a status indicator 'Currently configured: 2'.

At the bottom right of the section are two buttons: 'Refresh' and 'Submit'.

Figure 39 Configuration, logical libraries

7.11.6.3 Changing the license key

This page (if present) allows the user to add additional functionality to the unit by entering license key information. Please contact your supplier to see if this function is available in your model.

actidata

We care about data

Identity

Status

Configuration

Operations

Service

System

Logical Libraries

License Key

Drive

Network

User

Date/Time

Log

Event Notification

Restore Defaults

License Key

Add new License Key

Description

Status

License Key

Expiration

Refresh

Submit

Figure 40 Configuration, license key

7.11.6.4 Changing the drive configuration

This page shows the current configuration of all drives in the Library and allows modification to the configuration. The user is also able to select Power on through this page while activates the drive.

Identity	Status	Configuration	Operations	Service
System	Logical Libraries	License Key	Drive	Network

Drive Configuration	
Drive 1 SCSI ID	4
	<input checked="" type="checkbox"/> Power On

Refresh Submit

Figure 41 Configuration, Drive page

7.11.6.5 Changing the network configuration

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 will ask to confirm the changes. A list of changes that can be made are:

DHCP Address – checked on or unchecked

IP Address

Network Mask

Gateway Address

Identity	Status	Configuration	Operations	Service
System	Logical Libraries	License Key	Drive	Network

Network Configuration	
DHCP Address	<input checked="" type="checkbox"/> On
IP Address	10.2.254.67
Network Mask	255.255.0.0
Gateway Address	10.2.0.1

Refresh Submit

Figure 42 Configuration, Network page

7.11.6.6 Changing the administrative password

This page allows the user to add and modify user accounts.

Access Level – Choose from 1 (Standard), 2 (Admin), or 3 (Service).

Access Level Name – the name associated with the chosen Access Level

New Password – The password can be a maximum of ten characters.

Repeat Password – Enter the new password again.

OCP Access PIN Enabled – Select this item, if you would like the Operator Control Panel display to be password protected.

OCP Access PIN Code – the password for accessing the OCP when the OCP Access PIN is enabled.

Repeat OCP Access PIN Code – Enter the OCP Access PIN Code again.

Support Name – the name of the individual within your company to contact for RMU or Library support

Support Phone – the phone number of the individual within your company to contact for RMU or Library support

Support Email – the email address of the individual within your company to contact for RMU or Library support

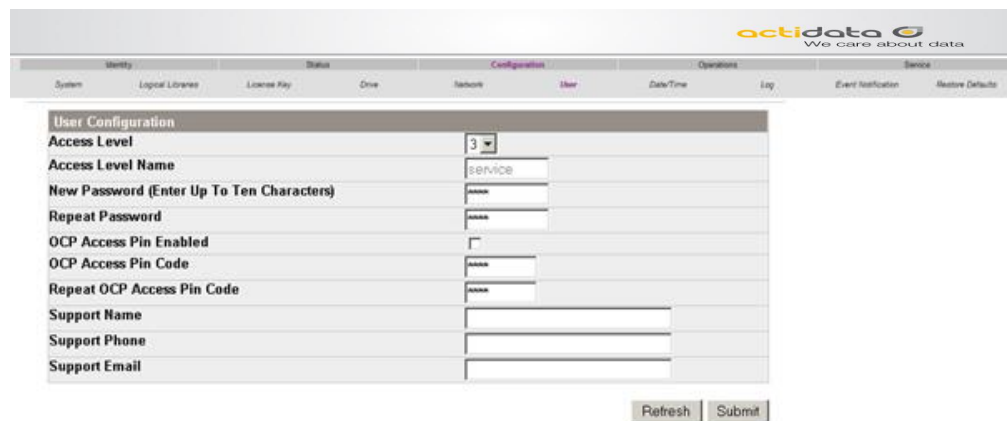


Figure 43 Configuration, User page

7.11.6.7 Setting date/time

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



Figure 44 Configuration, Date/Time page

7.11.6.8 Setting error log mode

This page allows service personal to set the error log mode to **Off**, **Continuous**, or to **stop trace at first error**.

Log Configuration		
Error Log Mode	<input type="radio"/> Off <input checked="" type="radio"/> Continuous <input type="radio"/> Stop Trace At First Error	
Trace Level	<input checked="" type="checkbox"/> Cmd	<input checked="" type="checkbox"/> Response
	<input checked="" type="checkbox"/> Trace Data	<input checked="" type="checkbox"/> Low Level Trace
	<input checked="" type="checkbox"/> Hard Error	<input checked="" type="checkbox"/> Event
	<input checked="" type="checkbox"/> Recovered Error	
Trace Filter	<input checked="" type="checkbox"/> Main	<input checked="" type="checkbox"/> Drive
	<input checked="" type="checkbox"/> Robotic	<input checked="" type="checkbox"/> Trace
	<input checked="" type="checkbox"/> OCP Output	<input checked="" type="checkbox"/> SCSI Module
	<input checked="" type="checkbox"/> SDCI Module	<input checked="" type="checkbox"/> CDB Interpreter

Refresh Submit

Figure 45 Configuration, Log page



INFORMATION

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

7.11.6.9 Setting event notification parameters

This page allows the user to set event notification to On.

Choices for event notification are:

Notify Errors – Select this item to be notified of Library errors via email

Notify Warnings – Select this item to be warnings of Library errors via email

To E-mail Address – Enter the email address of the individual you would like to receive the errors and/or warnings

E-mail Domain – Enter the email domain name of the individual you would like to receive the errors and/or warnings

SMTP Server Address – Enter the address of thee mail server of the individual you would like to receive the errors and/or warnings

Event Notification Configuration	
Notify Errors	<input type="checkbox"/> On
Notify Warnings	<input type="checkbox"/> On
To Email Address	<input type="text"/>
Email Domain	<input type="text"/>
Smtp Server Address	<input type="text" value="0.0.0.0"/>

Refresh Submit

Figure 46 Configuration, Event notification page

7.11.6.10 Restoring factory defaults

This page allows the user to reset the configuration to the factory defaults, restore vital product data, and save vital product data.



Figure 47 Configuration, Restore defaults page

7.11.7 Operations

7.11.7.1 Moving media within the Library

This page allows the user to move tape 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.

	Element	Status	Information
<input type="radio"/>	Slot 2	Full	0HP30017
<input type="radio"/>	Slot 3	Full	FUY30014
<input type="radio"/>	Slot 6	Full	FUY30015
<input type="radio"/>	Slot 12	Full	001270L1
<input type="radio"/>	Slot 13	Full	FUY30013
<input type="radio"/>	Slot 14	Full	3DW361LT
<input type="radio"/>	Slot 16	Full	100102L1
<input type="radio"/>	Slot 17	Full	0HP30019
<input type="radio"/>	Slot 20	Full	FUY30016

Move >

	Element	Status	Information
<input type="radio"/>	Drive1	Empty	
<input type="radio"/>	Mailslot	Empty	
<input type="radio"/>	Slot 1	Empty	
<input type="radio"/>	Slot 4	Empty	
<input type="radio"/>	Slot 5	Empty	
<input type="radio"/>	Slot 7	Empty	
<input type="radio"/>	Slot 8	Empty	
<input type="radio"/>	Slot 9	Empty	
<input type="radio"/>	Slot 10	Empty	
<input type="radio"/>	Slot 11	Empty	
<input type="radio"/>	Slot 15	Empty	
<input type="radio"/>	Slot 18	Empty	
<input type="radio"/>	Slot 19	Empty	

Figure 48 Operations, Move Media page

7.11.7.2 Determining current media inventory

This page provides the user with a means to re-scan the Library to determine the current media inventory.

Rescan Inventory
<input type="button" value="Rescan"/>

Figure 49 Operations, Inventory page

7.11.7.3 Releasing and replacing magazines

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

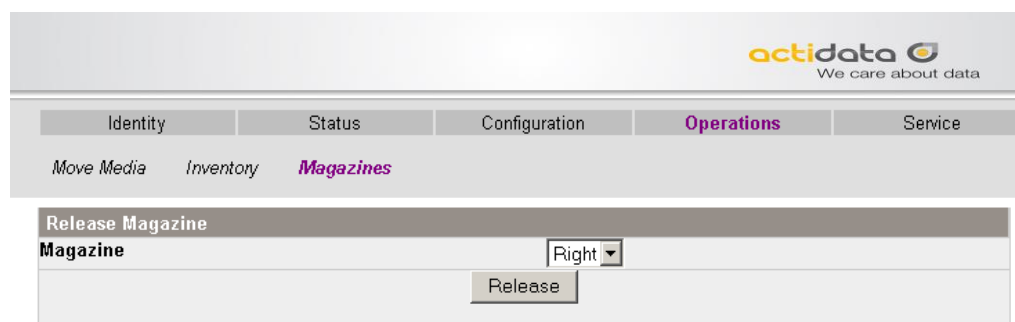


Figure 50 Operations, Magazine page



INFORMATION

To manually release a magazine, see "Magazine emergency release" section 8.2.2
However, this manual process should only be used if the magazine cannot be released using the Operator Control Panel or the Remote Management Interface

7.11.8 Service

7.11.8.1 Performing general Library diagnostics

This page provides the system administrator with general tests to verify the usability and reliability of the Library. The user selects the number of test cycles before starting the test. To cancel the test before it completes the cycles, select the Stop button.

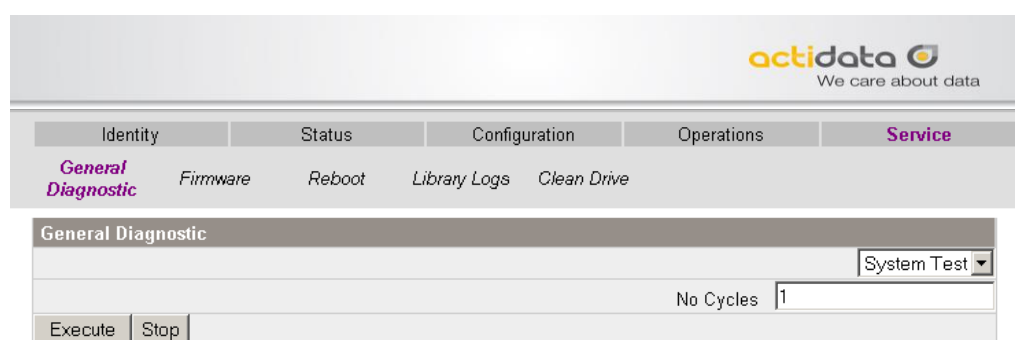


Figure 51 Service, General Diagnostic page

7.11.8.2 Determining and updating firmware

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



CAUTION After a Library upgrade the system restarts automatic.

actidata
We care about data

Identity	Status	Configuration	Operations	Service
General Diagnostic	Firmware	Reboot	Library Logs	Clean Drive

Upgrade Library Firmware

Currently Installed Library 0.22
Firmware

Library Firmware File

Upgrade Drive 1 Firmware

Drive Product Revision S39VW
Drive Firmware Revision 008.962

Drive Firmware File

Figure 52 Service, Firmware page

7.11.8.3 Rebooting the Library



CAUTION

Some options of the RMU 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 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.

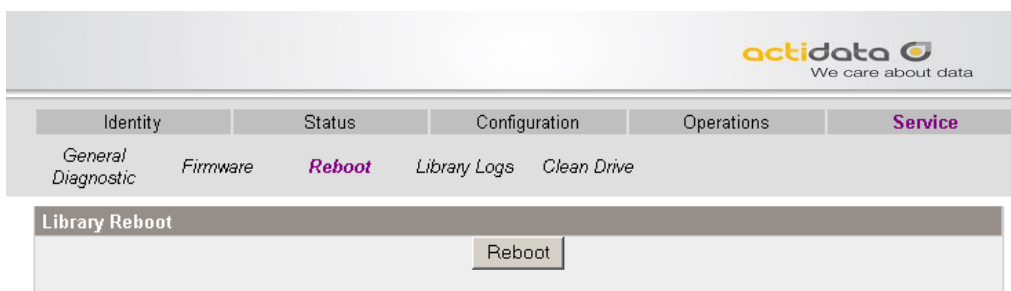


Figure 53 Service, Reboot page

7.11.8.4 Viewing Library logs

This page allows the user to view the Library logs after entering the following:

Log Type

Total Number of Entries


Start Entry

Number of Entries per Page

Update

Clear Log

Dump Log



 We care about data

Identity	Status	Configuration	Operations	Service
General Diagnostic	Firmware	Reboot	Library Logs	Clean Drive

Logs

Log Type ☒ Error ☐ Trace

Total Number Of Entries 5

Start Entry

Number Of Entries Per Page

Update

Clear Log

Dump Log


```

05.11.29 10:19:37.59 LIB/ERR<80 D7 00 29
-- System Error
05.11.28 12:03:24.93 LIB/ERR<80 B5 0A 00
-- Rob. Comm.-Error
05.11.28 10:43:01.15 LIB/ERR<80 B5 11 00
-- Rob. Comm.-Error
05.11.28 10:04:57.30 LIB/ERR<80 B2 03 00
-- Rob. Comm.-Error
05.11.25 16:05:12.46 LIB/ERR<80 B2 06 00
-- Rob. Comm.-Error
          
```

Figure 54 Service, Library Logs page

7.11.8.5 Cleaning tape drive

This page allows the user to clean the tape drive.



 We care about data

Identity	Status	Configuration	Operations	Service
General Diagnostic	Firmware	Reboot	Library Logs	Clean Drive

Clean Drive

Slot #

Drive

Figure 55 Service, Clean drive page

8 Troubleshooting

8.1 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:

8.1.1 SCSI ID

The Library uses a single SCSI ID. Depending on other devices attached to the same SCSI bus and their SCSI IDs, you may need to change the SCSI ID of the Library or tape drive before you can use the Library. Review the manuals for the other devices on the SCSI bus or your operating system to determine which SCSI IDs are currently in use.

8.1.2 LUN scanning

Use dual LUNs to control the tape drive (LUN 0) and Library robotic (LUN 1). These models require an HBA that supports LUN scanning and LUN scanning must be enabled.

8.1.3 SCSI Cabling

Verify that all SCSI cables are securely connected at both ends. Check the length and integrity of your SCSI cabling. Check the SCSI connector for bent pins. The length of the internal SCSI cabling inside the Library is 2 feet (60 cm). This length must be included in any calculations of cable length.

- For LVD SCSI the maximum length for a single device is 82 feet (25 meters). For multiple devices, the maximum combined internal/external length is 40 feet (12 meters).
- If you have a combination of LVD and SE devices on the bus, the maximum cable length reverts to the SE specification, which for Ultra devices is 10 feet (3 meters) for four or fewer devices, and 5 feet (1.5 meters) for more than four devices.

8.1.4 Termination

If the Library is the only SCSI device — other than the SCSI host adapter — on the selected SCSI bus, it must be terminated. Likewise, if the Library is physically the last SCSI device on the SCSI bus, it must be terminated. Only the devices physically located at the beginning and end of the SCSI bus should be terminated. Refer to the manuals supplied with other devices on the SCSI bus for information on enabling or disabling termination on those devices.

- To terminate the Library, locate the terminator in the accessories package and press it firmly into either of the two SCSI connectors on the back panel of the Library. Secure the terminator by tightening the finger-screws until snug. The supplied terminator is “dual mode” and will work on both Low-Voltage Differential (LVD) and Single Ended (SE) SCSI buses. Check all SCSI and power connections and confirm that the unit is attached to a valid SCSI SE or LVDS bus.

8.1.5 Compatibility

Ensure that the Library is compatible with the SCSI host adapter and backup application you plan to use. For a list of compatible SCSI adapters and application software, check with your SCSI host adapter manufacturer or backup application vendor.



INFORMATION

The host bus adapter for the Library should be SCSI-3 LVDS. A single-ended SCSI host bus adapter will severely degrade performance. Also, if there is any SE devices on the same SCSI bus, the entire SCSI bus will negotiate down to SE speed and severely degrade performance.

8.1.6 SCSI Host Adapter Installation

Verify that your SCSI host adapter is installed correctly. Refer to the manual that came with your SCSI host adapter for installation and troubleshooting instructions. Pay particular attention to any steps describing the settings of various jumpers and/or switches on the host adapter, if applicable. Make sure that the host adapter is properly seated in the motherboard slot and the operating system correctly detects the host adapter. Make sure that the proper device driver is installed for the SCSI host adapter.

8.1.7 Backup Application Installation

Refer to the documentation included with your backup application for instructions on how to verify proper installation. Some backup software packages require an additional module to communicate with the Library robotics.

8.1.8 Device Driver Installation

Make sure that the proper device driver, if applicable, is installed for the Library. Contact your support representative for more information.



INFORMATION

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.

8.2 Troubleshooting table

Problem	Solution
Power	
Library does not power on	<ul style="list-style-type: none">■ Check all power cord connections.■ Make sure the power switch on the front panel is in the ON position.■ Make sure there is power to the outlet. Try another working outlet.■ Replace the power cord.■ Contact your service representative.
No display messages appear	<ul style="list-style-type: none">■ Make sure the power cord is connected.■ Make sure the power switch is on.■ Power cycle the Library.■ Download Library firmware.■ Contact your service representative.
Tape Movement	
Tape stuck in drive	<ul style="list-style-type: none">■ Power cycle the Library, allow it to complete initialization, which in rare cases can take as long as 10 minutes, and then retry unloading the tape using the Library operator control panel.■ Allow the tape drive to complete all operations. This may take as long as ten minutes if you reset or cycle power on the Library while the cartridge is positioned at the physical end of the media.■ Make sure that the backup software is not reserving the slot or preventing the tape drive from ejecting the cartridge. The backup software needs to cancel the reservation and any hold it has on the tape drive. Temporarily disconnecting the Library from the host server and power cycling eliminates the host and its software as a problem source.■ Contact your service representative.
Tape stuck in storage slot	See "Removing stuck tapes from slots" on page 76.

Media	
Cleaning or data cartridge incompatible with drive.	<p>Make sure you are using data and cleaning cartridges that are compatible with the drive and model of your Library. The Library automatically unloads incompatible cartridges, the Media Attention LED flashes, and an exclamation mark (!) is displayed in the inventory display for the indicated slot number.</p> <p>Export the media in order to clean the state.</p>
Cannot write to or read from tape.	<ul style="list-style-type: none"> ■ Make sure that the cartridge is write enabled (move the write-protect switch to the enabled position). ■ Make sure you have the appropriate data cartridge for your Library model. ■ Make sure you are using an Ultrium cartridge that has not been degaussed. Do not degauss Ultrium cartridges. ■ Make sure that the cartridge has not been exposed to harsh environmental or electrical conditions and is not physically damaged in any way. ■ 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, format, or label operation on the cartridge. ■ Make sure 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. ■ Retry the operation with a different, known good tape. ■ Clean the tape drive. See „Cleaning the tape drive” on page 69.
Cleaning	
Cannot load the cleaning cartridge	<ul style="list-style-type: none"> ■ Make sure you are using an Ultrium universal cleaning cartridge. (See “Cleaning the tape drive” on page 69.) ■ Contact your service representative.
Errors Displayed on Operator Control Panel	
“!” in Library operator panel inventory display	See “Operator control panel (OCP) overview” on page 54 for more information.
There is an error code on the LCD	Look up the error code, try to resolve the failure, and power cycle (see “Tape Library error codes” on page 79).

SCSI ID	
Changed drive SCSI ID, but the host server does not recognize the new ID	<ul style="list-style-type: none"> ■ Make sure that all SCSI devices on the same bus have unique ID numbers. ■ If the SCSI bus is narrow (50-pin) only SCSI IDs 0 through 7 are available. ■ Make sure that you cycle power on the Library after changing the SCSI ID. ■ Reboot the host server. Tape Library Performance The Library is not efficiently backing up data. ■ Make sure 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. ■ Make sure the Library is connected to a LVDS SCSI bus and there are no SE devices on the same bus, because this will cause the entire bus to negotiate down to SE speed. ■ Use an Ultra320 SCSI bus and high-quality cabling with the Library. ■ Do not connect the Library to a narrow SCSI bus.
Bad performance	
	<ul style="list-style-type: none"> ■ Try a new cartridge. A marginal cartridge can cause performance problems due to bad spots on the tape requiring retries. ■ Backing up data that compresses poorly or is already compressed will lower performance. ■ Check the size of the files. Small file size can impact performance. ■ Confirm that the backup application is utilizing block sizes of at least 32KB, preferably 64KB. Refer to the backup application documentation for details. ■ Check the network bandwidth from the host computer. If you are backing up data over a network, consider comparing to a local-only backup. ■ Make sure the backup server has enough memory to handle the bandwidth of the backup or restore. ■ Clean the tape drive. See "Cleaning the tape drive" on page 69 for instructions.

Media Attention LED Issues	
Contamination by loose debris.	Avoid contamination by ensuring that the Library is installed in a clean, contamination-free environment. Cartridges should be stored vertically in their plastic cases. Continue cleaning the tape drive as needed.
Non-acclimated media	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.
Cartridge is incompatible	<p>Use only cartridges that are compatible with the drive type.</p> <ul style="list-style-type: none"> ■ Make sure you are using an Ultrium universal cleaning cartridge. (See "Cleaning the tape drive" on page 69.)
Expired cleaning cartridge	A cleaning cartridge is good for Ultrium universal libraries: 50 cleans
Bad/defective/contaminated media	<p>If the Media Attention LED is cleared and –although the drive has been cleaned - immediately re-displays each time a particular cartridge is reloaded that cartridge should be suspected as being defective.</p> <ul style="list-style-type: none"> ■ Export the cartridge and load a known good cartridge. In some cases, a cartridge can be worn out, have a defective Cartridge Memory, or have been formatted as a Firmware Upgrade Cartridge. ■ Any cartridge that is suspected of being defective or contaminated should NOT be reused in any drive.
Device Not Detected on SCSI Bus	
Connected to a high voltage differential SCSI bus/host adapter	<ul style="list-style-type: none"> ■ Attach device to a LVDS SCSI host adapter/bus. ■ SCSI cable length exceeded, use shorter cable, or remove other devices from the bus. ■ Check for conflicting SCSI IDs. ■ Check that the HBA supports LUN scanning and this feature is enabled. ■ Device not properly terminated. See "Installation problems" on page 70. ■ Power on device before powering on the host computer. ■ Check that the device has been powered on and is not in an error state. ■ Check the SCSI connector for bent pins.

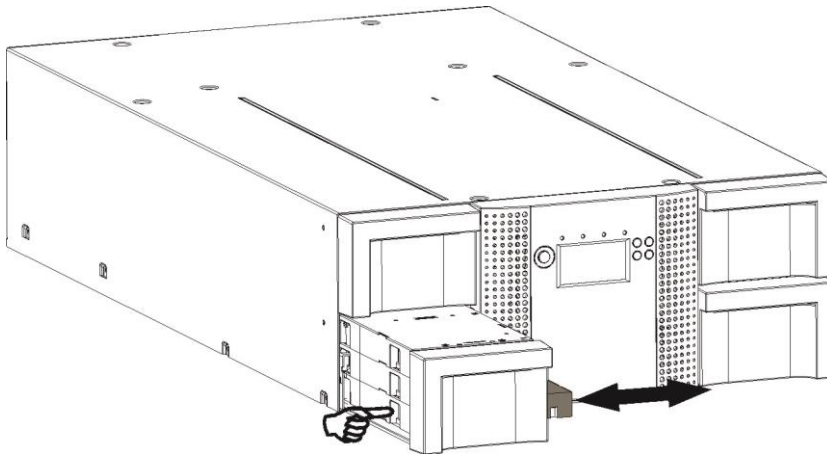
Table 9 Troubleshooting table

8.2.1 Removing stuck tapes from slots

1. Unlock the magazine and remove it from the Library
 - Use the OCP, see section 9.7, or
 - use the RMU, see section 9.8
2. The finger holes on the back side of the magazines (see Figure 56) allow the user to pull the cartridges out of the slot. Remove and insert the cartridge mechanically. Repeat the process ten times.

Figure 56 Removing stuck tapes from slot

3. During this process the burr will be removing.
4. Insert cartridge in the magazine
5. Put the magazine back to the tape Library.



8.2.2 Magazine does not unlock via OCP or RMU (Emergency release)

If you are not able to remove the magazines using OCP and RMU, an emergency release mechanism is available.



WARNING Use only in emergency fall!

1. Unplug the power cord from the Library.
2. Find the access holes for the right and left magazines (see Figure 57).

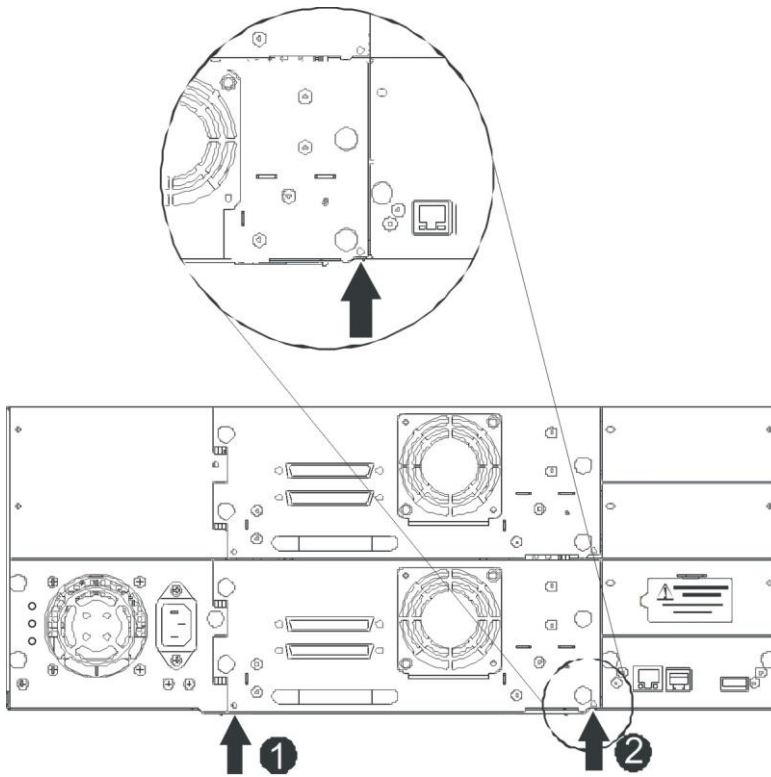


Figure 57 Access holes for the left and right magazine

Number	Description
1	Right magazine release
2	Left magazine release

Table 10 Access to manually release a magazine

-
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. See Figure 58

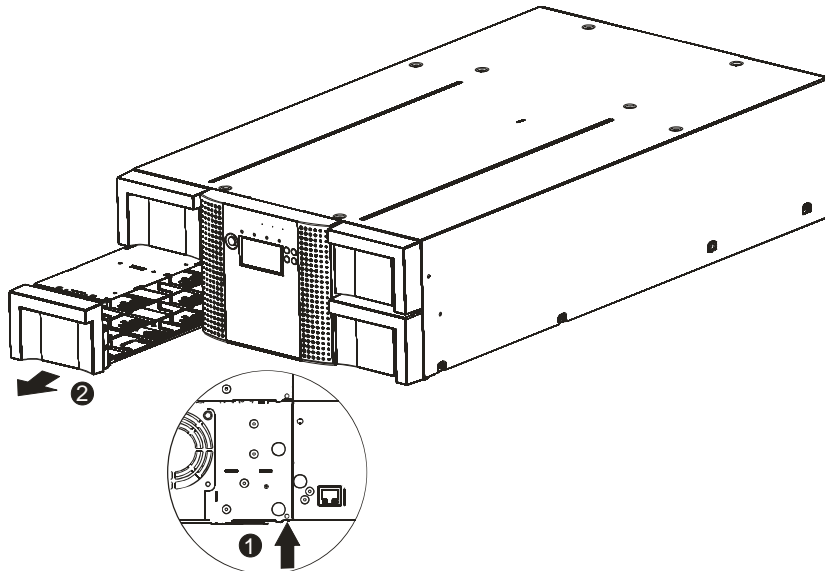


Figure 58 Remove the left magazine

Step	Process
1	Insert pin into access hole
2	Release and remove magazine

Table 11 Removing the left magazine

If there are additional tapes still in the Library, or if you were unable to manually remove the magazines and drive, please contact service for further instructions.

8.3 Tape Library 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 Table 11 on page 84, try to resolve the error by cycling power to the Library and retrying the last operation. If the error persists, contact support personnel Support menu tree.

8.3.1 Example error code

EVENT -6

A5 F1

Where:

- Sequence number –6 indicates the position in sequence list, 0 being the most recent.
- Log shows a load error (code A5 = fan error, sub code F1 = caused by the fan at the back connector plate).

The event log with the Library also includes a date stamp for each event. Press Enter to display the associated timestamp in the following format:

ddd:hh:mm:ss:HH

where:

ddd: days

hh: hours

mm: minutes

ss: seconds

HH: 1/100 second

A description of each error code and possible solution is provided in the following table.

Error Code	Description	User Action
80	Barcode Reader Error, cannot initialize BCR	Retry operation; after several occurrences contact technical support
81	Barcode Reader Error, no response from BCR	Retry operation; after several occurrences contact technical support
82	EEPROM Error, no response from EEPROM (located on robotic controller)	Retry operation; after several occurrences contact technical support
83	Robotic controller generic problem	Reset the unit and retry operation. After several occurrences contact technical support
84	Setting of gripper motor parameters failed	Reset the unit and retry operation. After several occurrences contact technical support
85	Setting of slider motor parameters failed	Reset the unit and retry operation. After several occurrences contact technical support

86	Setting of elevator motor parameters failed	Reset the unit and retry operation. After several occurrences contact technical support
87	Setting of rotation motor parameters failed	Reset the unit and retry operation. After several occurrences contact technical support
88	Setting of sled motor parameters failed	Reset the unit and retry operation. After several occurrences contact technical support
89	Gripper blocked	Run 'Library Health Check', after several occurrences contact technical support
8A	Slider blocked	Run 'Library Health Check', after several occurrences contact technical support
8B	Elevator blocked	Run 'Library Health Check', after several occurrences contact technical support
8C	Rotation blocked	Run 'Library Health Check', after several occurrences contact technical support
8D	Sled blocked	Run 'Library Health Check', after several occurrences contact technical support
8E	Cannot find gripper block within the expected range	Run 'Library Health Check', after several occurrences contact technical support
8F	Cannot find slider block within the expected range	Run 'Library Health Check', after several occurrences contact technical support
90	Cannot find elevator block within the expected range	Run 'Library Health Check', after several occurrences contact technical support
91	Cannot find rotation block within the expected range	Run 'Library Health Check', after several occurrences contact technical support
92	Cannot find sled block within the expected range	Run 'Library Health Check', after several occurrences contact technical support
93	Gripper outside range, Gripper has reached a position beyond the expected range	Run 'Library Health Check', after several occurrences contact technical support
94	Slider outside range, Slider has reached a position beyond the expected range	Run 'Library Health Check', after several occurrences contact technical support

95	Elevator outside range, Elevator has reached a position beyond the expected range	Run 'Library Health Check', after several occurrences contact technical support
96	Rotation outside range, Rotation has reached a position beyond the expected range	Run 'Library Health Check', after several occurrences contact technical support
97	Sled outside range, Sled has reached a position beyond the expected range	Run 'Library Health Check', after several occurrences contact technical support
98	Cartridge present sensor not found	Run 'Library Health Check', after several occurrences contact technical support
99	Sled home sensor not found	Run 'Library Health Check', after several occurrences contact technical support
9A	Rotation home sensor not found	Run 'Library Health Check', after several occurrences contact technical support
9B	Sled position sensor (prism sensor) not found,	Run 'Library Health Check', after several occurrences contact technical support
9C	Gripper range out of specification	Run 'Library Health Check', after several occurrences contact technical support
9D	Slider range out of specification	Run 'Library Health Check', after several occurrences contact technical support
9E	Elevator range out of specification	Run 'Library Health Check', after several occurrences contact technical support
9F	Rotation range out of specification	Run 'Library Health Check', after several occurrences contact technical support
A0	Sled range out of specification	Run 'Library Health Check', after several occurrences contact technical support
A1	Open Mail Slot (Import/Export Element) failed	Retry operation, after several occurrences contact technical support
B0	Robotic controller response timeout. A command did not complete in the required amount of time.	Reset the unit and retry operation. After several occurrences contact technical support
B1	NACK received from robotic controller	Reset the unit and retry operation. After several occurrences contact technical support

B2	Robotic controller communication failed	Reset the unit and retry operation. After several occurrences contact technical support
B3	Robotic controller urgent stop due to a released magazine	Check if magazine are completely inserted and retry operation. After several occurrences contact technical support
B4	Cartridge did not transport completely Gripper could not pick cartridge and CP sensor not present After pushing the cart CP sensor still present	
B5	Robotic controller doesn't respond on command	Reset the unit and retry operation. After several occurrences contact technical support
C0	Network initialization failed	Check network cable and network configuration. If the error recurs, contact technical support
C1	Telnet Interface initialization failed	Check network cable and network configuration. If the error recurs, contact technical support
C2	Webserver initialization failed	Check network cable and network configuration. If the error recurs, contact technical support
C6	Ping command did not reached target	Check network cable and network configuration. If the error recurs, contact technical support
C7	Cannot Upgrade from USB	Retry of Firmware upgrade, if not successful contact technical support
D0	ROM error. ROM checksum incorrect	Retry of Firmware upgrade, if not successful contact technical support
D1	RAM error. Power on Self Test (POST) has failed,	Retry operation; after several occurrences contact technical support
D2	NVRAM error. R/W operation to NVRAM has failed	Retry operation; after several occurrences contact technical support
D3	CTC Error.	Retry operation; after

	Timer unit has failed during POST.	several occurrences contact technical support
D4	UART Error. Frame overrun or Parity Error on serial Interface.	Retry operation; after several occurrences contact technical support
D5	Display Error Communication to display failed	Retry operation; after several occurrences contact technical support
D6	Memory Error, Stack and heap overflow.	Retry operation; after several occurrences contact technical support
D7	Fatal system error	Retry operation; after several occurrences contact technical support
D8	Data base error	Retry operation; after several occurrences contact technical support
D9	No SCSI IC detected	Retry operation; after several occurrences contact technical support
DA	In Library Verify Test the barcode reader has read different barcode data for the same cartridge label	Check barcode label on scratch cartridge and run Library Verify Test again. If the error recurs, contact technical support
DB	Warning event! See section below	
DC	I ² C Bus Failure	Retry operation; after several occurrences contact technical support
DD	Warning event! See section below	
DE	Warning event! See section below	
DF	Warning event! See section below	
E0	Incompatible magazine detected	Check type of lowest left magazine
F0	Drive Overtemperature Condition The subcode indicates which drive is affected <u>Example:</u> Subcode 01: drive #1	Check ambient temperature conditions and check all fans, after several occurrences contact technical support

F1	Drive Communication Error, Library controller has lost communication to drive The subcode indicates which drive is affected <u>Example:</u> Subcode 01: drive #1	Retry operation; if not successful contact technical support
F2	Drive Sled not present The subcode indicates which drive sled is affected <u>Example:</u> Subcode 01: drive sled #1	Retry operation; if not successful contact technical support
F3	Drive Hardware Error The subcode indicates which drive is affected <u>Example:</u> Subcode 01: drive #1	Cycle Power, after several occurrences contact technical support
F4	Drive Load Timeout Drive has run in a timeout while loading a tape The subcode indicates which drive is affected	Retry operation; if not successful contact technical support
F5	Drive Unload Timeout Drive has run in a timeout while unloading a tape The subcode indicates which drive is affected	Retry operation; if not successful contact technical support

Table 12 Main error codes

9 Servicing

9.1 Possible tools needed

To service a Library you may need one or more of the following tools:

- Flat-blade screwdrivers (large and small)
- #3 Phillips screwdriver
- Cross-slot screwdriver
- Ground strap

9.2 Electrostatic Discharge



CAUTION

Static sensitive!

A discharge of static electricity can damage static-sensitive devices or micro circuitry. 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.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.
- Cover the Library with approved static-dissipating material. Provide a wrist strap connected to the work surface and properly grounded tools and equipment.
- Keep the work area free of nonconducting materials, such as ordinary plastic assembly aids and foam packing.
- Make sure you are always properly grounded when touching a static-sensitive component or assembly.
- Avoid touching pins, leads, or circuitry.
- Use conductive field service tools

9.3 Removing and replacing a tape drive

Tape drives are installed at the back of the Library.

When replacing one drive in a two drive configuration, you can power down the drive that you are replacing without interrupting power to the rest of the Library.



INFORMATION

This part is hot pluggable. It is not mandatory to power down the Library to replace a drive.

To remove a tape drive:

1. Using your Remote Management Unit or the Operator Control Panel, unload the tape cartridge(s) from the drive to be removed.

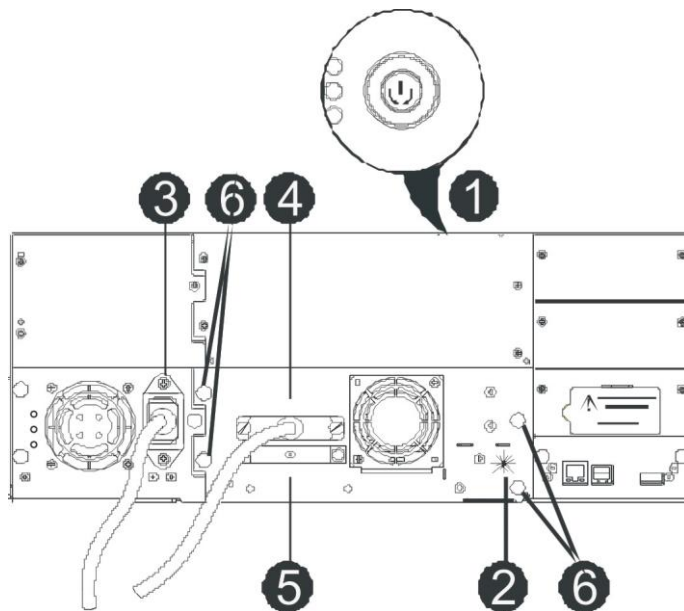


Figure 59 Drive sled components of rear panel

Steps	Description
1	Power down the Library using the power button on the front pan.
2	The LED on the tape drive being removed is off.
3, 4, 5	Remove the power cable, SCSI cable and terminator if applicable, from the tape drive being removed.
6	Loosen the captive thumbscrews on the drive

Table 13 Description for Figure 56



IMPORTANT

Before pulling the lower drive sled please pull forward the product ID slide located below the drive sled (see Figure 60 detail 1). Otherwise the slide or the attached label could be damaged.

2. Pull straight back on the tape drive handle to remove it from the Library. Take care to slightly push down the product ID slide so it does not interfere with the drive sled (see Figure 60).

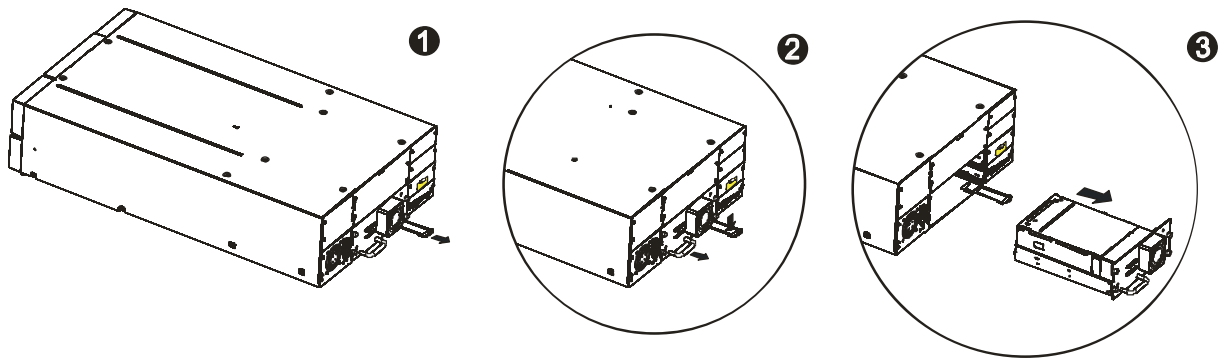


Figure 60 Tape drive removal

To replace a tape drive:

1. Before installing the new drive inspect the connectors on the tape drive. Ensure that the connectors are intact, free of any foreign objects, and have no cracks or deformed or bent contacts.
2. Slowly insert the new tape drive into the drive bay, and align the connectors on the Library while supporting the drive assembly (see Figure 61).

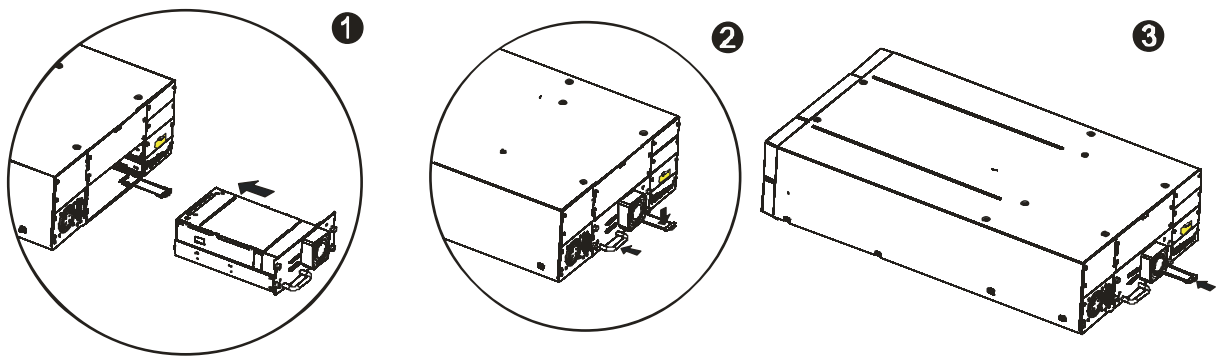


Figure 61 Installing a tape drive

3. Push the tape drive slowly into the drive bay until the drive seats itself against the back of the Library.



INFORMATION

If you are adding an additional tape drive to your Library, or if you are upgrading an existing drive, be sure to use supported cabling configurations.

4. Push the Product ID Foil back underneath the drive sled. When inserted properly, only the handle of the Foil will be visible.
5. Tighten the captive thumbscrews until the drive is secure.
6. Connecting the power cable, SCSI cable and terminator.
7. Power on the Library (or power on the drive refer to "Changing the drive configuration" using the power button on the front panel).
8. Run the Library Verify test.

9.4 Removing and replacing the Library controller

To remove a Library controller:

Library controller is installed at the back of the Library. Before you remove the Library controller:

1. Turn off power to the Library (power button on the front panel).
2. Remove the power cord cable.
3. Loosen the two captive thumbscrews on the Library controller (see Figure 62).

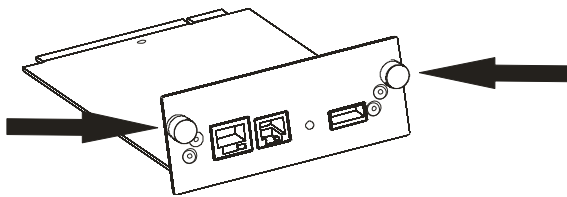


Figure 62 Position of the thumbscrews

4. Pull straight back on the Library controller to remove it from the Library (see Figure 63).

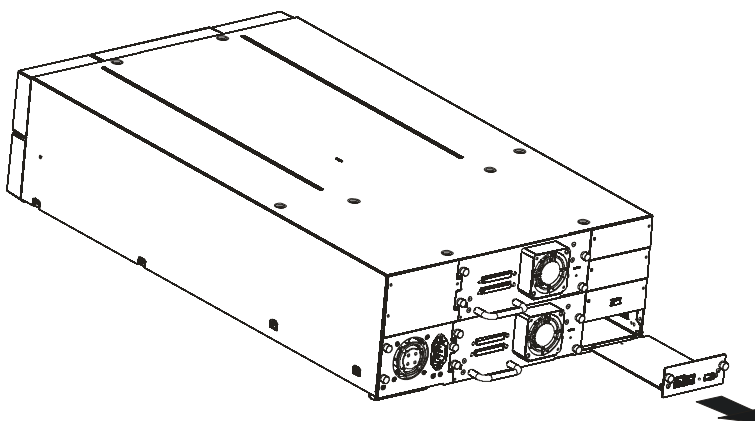


Figure 63 Library controller removal

Replacing the Library controller:

1. Unpack the new Library controller from its package.
2. Slowly insert the new Library controller into the bay, and align the connectors on the Library while supporting the controller assembly.
3. Tighten the captive thumbscrews until the Library controller is secure.
4. Replace the power cord cable.
5. Switch on power to the Library (power button on the front panel).

The Library maintains a backup of all Critical and Configuration Data separate from the Library controller, so that when replacing the Library controller, the Critical and Configuration data can be maintained and will not have to be entered manually again. When replacing a Library controller, or a chassis FRU, there will be a mismatch between the data on the Library controller and the backup data. When such a mismatch is detected, the user will be requested to determine which set of data is correct. If the Library controller has been replaced, then select “Identity data mismatch” to copy the backup data onto the Library controller. If the chassis FRU or Robotics FRU has been replaced (maintaining the original Library controller), then select “Replace backup data”

9.5 Removing and replacing a power supply

To remove a power supply:

Power supply is installed at the back of the library. Before you remove the power supply:

1. Turn off power to the library (power button on the front panel).
2. Remove the power cord cable.
3. Loosen the three captive thumbscrews on the power supply (see Figure 61).

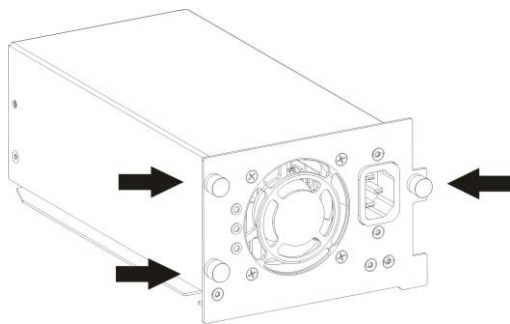


Figure 64 Position of the three thumbscrews

4. Pull straight back on the power supply to remove it from the library (see Figure 62).

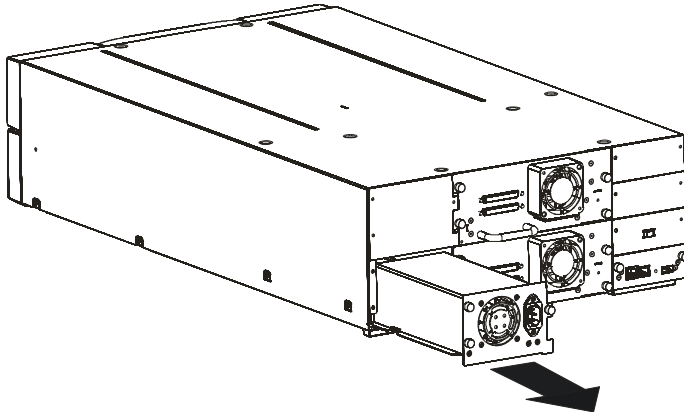


Figure 65 Power supply removal

Replacing the power supply:

1. Unpack the new power supply from its package.
2. Slowly insert the new power supply into the bay, and align the connectors on the library while supporting the power supply assembly.
3. Tighten the captive thumbscrews until the power supply is secure.
4. Replace the power cord cable.
5. Switch on power to the library (power button on the front panel).

9.6 Replacing a redundant power supply



INFORMATION

The second power supply can be installed without powering down the library.

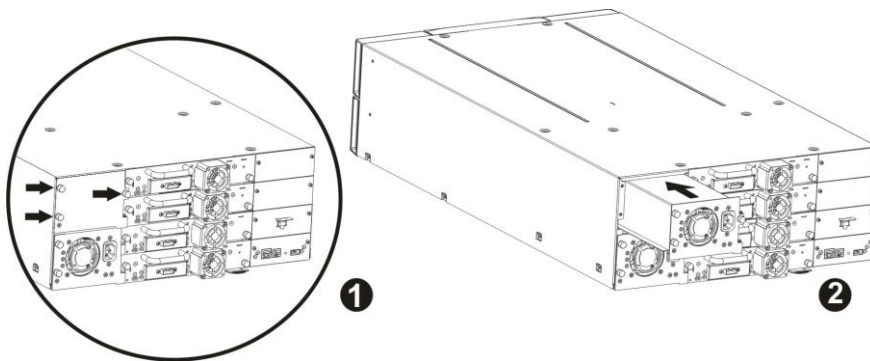
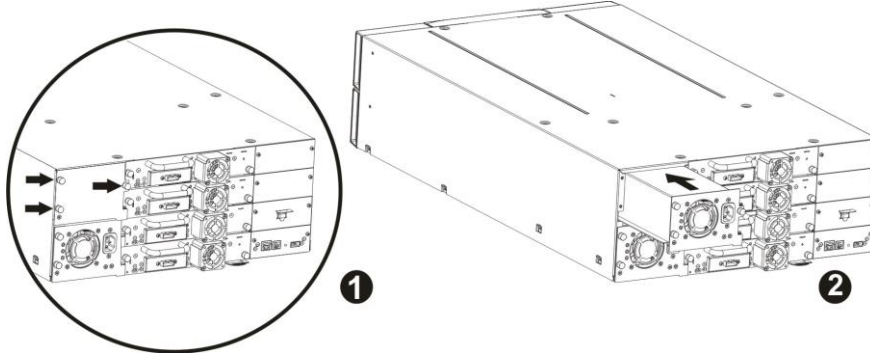
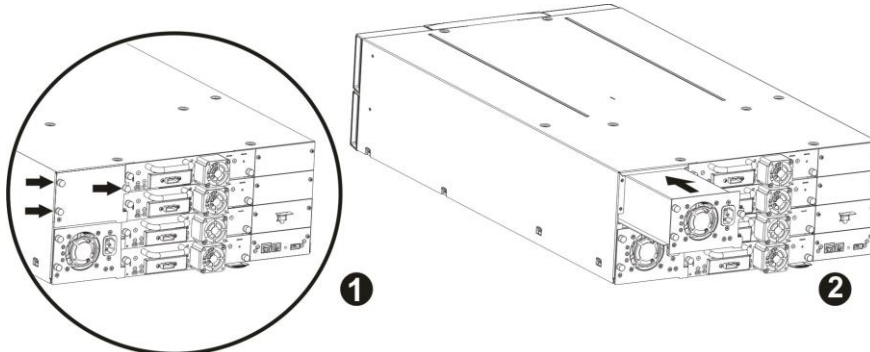


Figure 66 Replacing a redundant power Supply

-
1. Loosen the three screws on the library (see



2. Figure 66, step 1).
3. Unpack the redundant power supply from its package.
4. Slowly insert the new power supply into the bay (see



5. Figure 66, step 2), and align the connectors on the library while supporting the power supply assembly.
6. Tighten the captive thumbscrews until the power supply is secure.

9.7 Removing and replacing a magazine using the OCP



CAUTION

The magazine must only be removed manually in an emergency. Failure to follow normal procedure can cause data loss and equipment damage.

The magazines should be released using the Operator Control Panel (OCP) or the Remote Management Unit (RMU). Recommends that you release the magazine using the OCP or RMU, however, if the OCP process fails, or if the magazine needs to be removed when the power to the tape Library is off, you can manually release the magazines.

This OCP option lets you gain access to the left and right magazine. Access to the magazines requires the use of the Administrative password.

To remove a magazine:

1. From the Home screen, press "Previous" or "Next" on the OCP until the screen displays Operations.
2. Press "Enter" to select.
3. Press "Up" or "Down" until the screen displays either Unlock Left Magazine, or Unlock Right Magazine.
4. Press "Enter" to select the desired magazine to unlock.
5. "Enter" the Administrative password if requested.
6. The display will read Left Magazine Unlocked, or Right Magazine Unlocked.
7. Pull the released magazine out of the Library.
8. The screen will now display Insert Left Magazine, or Insert Right Magazine. The Library cannot perform any other operation until the magazine is replaced. After exchanging tapes in a magazine, slide the magazine completely into the Library. The magazine will lock into place once it is correctly installed and the Library will inventory the magazine.

9.8 Removing and replacing a magazine using the RMU

1. To login, enter the correct password, and press Enter.

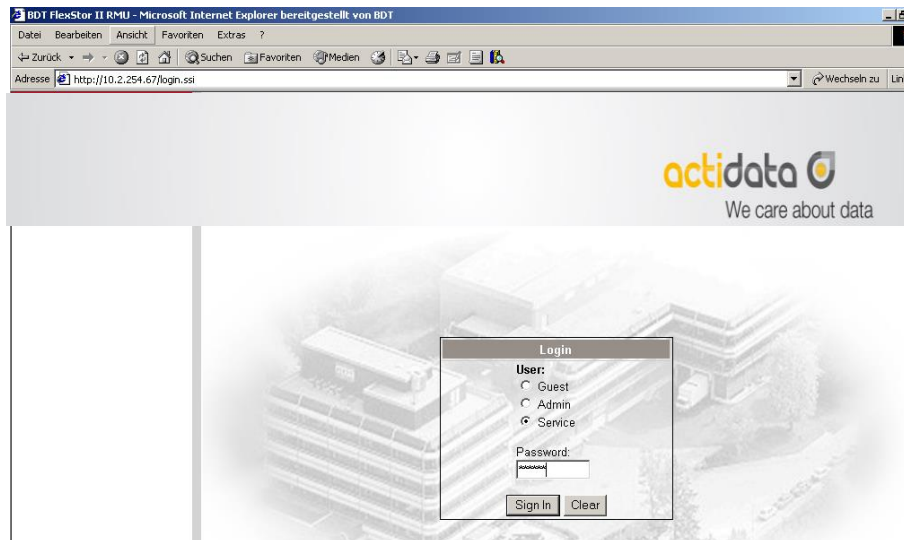


Figure 67 RMU Login page

2. Go to Operations > Magazines.
- This page (see Figure 68) allows the user to release the right or left magazine from the Library.
3. Press the Release button.

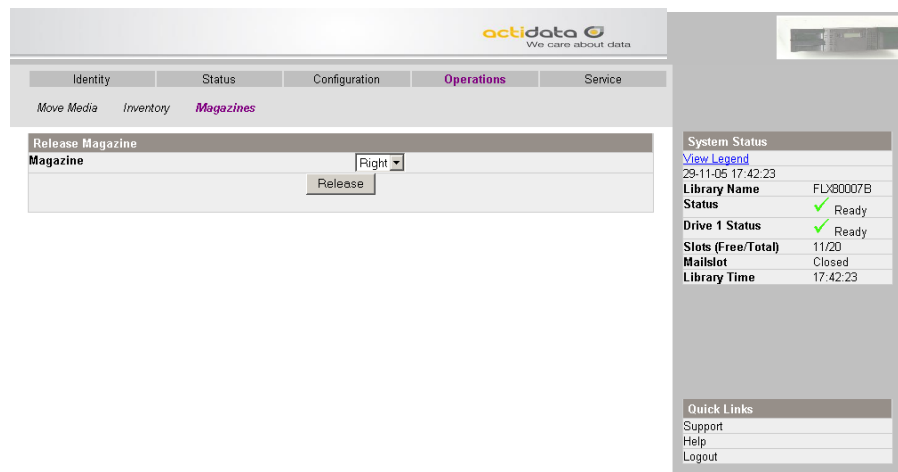


Figure 68 Operations, Magazine page

9.9 Removing and replacing the base chassis

You will need a #3 Phillips screwdriver to remove and replace the base chassis assembly. Before beginning, be sure the tape drive or drives do not contain a tape cartridge. To remove a cartridge, see "Moving tapes in the Library" on page 65.

To remove the components in the base chassis and the base chassis from the rack:

- 1.** Obtain adequate assistance to lift and stabilize the Library during removal and replacement.
- 2.** Remove the magazines from the Library.
- 3.** Turn off power to the Library and disconnect all cables.
- 4.** From the front of the Library loosen the two screws anchoring the mounting brackets on the Library to the rack. These are captive screws and cannot be removed.
- 5.** Remove your Library from the rack.
- 6.** Remove the replacement Library enclosure from the packing materials.
- 7.** Place the replacement Library enclosure on a solid surface in preparation for installation in to the rack.
- 8.** Remove the mounting brackets and guide pulleys from your Library and install them on the replacement Library.
- 9.** Loosen the blue thumbscrews on the power supply, and pull the power supply from your Library.
- 10.** Install the power supply in your replacement Library.
- 11.** Loosen the blue thumbscrews on the tape drive, and pull the tape drive handle while supporting the bottom of the drive to remove from your Library.
- 12.** Install your drive in the replacement Library enclosure.
- 13.** Loosen the blue thumbscrews on the Library controller and remove the controller from the Library.
- 14.** Install the Library controller in your replacement Library.
- 15.** Remove the lock on the rear panel.
- 16.** Store the lock and label to the top cover (see Figure 69).
- 17.** Slide the replacement Library enclosure onto the metal rails that are already in position in the rack.
- 18.** Tighten the mounting bracket screws to anchor the replacement Library enclosure to the rack.
- 19.** Plug in the power cord and host interface cable into the replacement Library enclosure.
- 20.** Power on the Library.
- 21.** Run the Library Verify test (refer to OCP "Service: Library Verify").
- 22.** Securely package the Library enclosure that was replaced, and return to repair center (see section 11)

10 Technical actiLib Library 4U specifications

10.1 Physical specifications

Characteristics	Product alone	Packaged
Height	175,2 mm	330 mm
Width	447.5 mm	585 mm
Depth	740 mm	990 mm (max.)
Weight	Appr. 24,5 kg (2 full height drive)	33,2 kg (2 full height drive, accessories: power cord, CD, Quick Start Guide)

Table 14 actiLib Library 4U physical specification

10.2 Maximum storage capacity and data transfer rate

Characteristics	Specification
actiLib Library 4U with LTO half height SCSI drive	
Maximum storage capacity (48 data cartridges)	Native 38,4 TB Compressed: 76,8 TB (2:1 compression)
Maximum data transfer rate	Native: 80 MB/s (288 GB/hr.) Compressed: 160 MB/s (576 GB/hr.)
Drive type	LTO half height SCSI drive (1 to 4 in 4U)
Number of slots	48 (including mailslots)
MSBF w/o drive	500 000 swaps
Interface	Ultra320 SCSI Wide
actiLib Library 4U with LTO half height FC drive	
Maximum storage capacity (48 data cartridges)	Native 38,4 TB Compressed: 76,8 TB (2:1 compression)
Maximum data transfer rate	Native: 80 MB/s (288 GB/hr.) Compressed: 160 MB/s (576 GB/hr.)
Drive type	LTO half height FC drive (1 to 4 in 4U)
Number of slots	48 (including mailslots)
MSBF w/o drive	500 000 swaps
Interface	Fibre Chanel (FC) 4 Gb/s
actiLib Library 4U with LTO half height SAS drive	
Maximum storage capacity (48 data cartridges)	Native 38,4 TB Compressed: 76,8 TB (2:1 compression)
Maximum data transfer rate	Native: 80 MB/s (288 GB/hr.) Compressed: 160 MB/s (576 GB/hr.)
Drive type	LTO half height SAS drive (1 to 4 in 4U)
Number of slots	48 (including mailslots)
MSBF w/o drive	500 000 swaps
Interface	SAS 3GB

Table 15 Maximum storage capacity

10.3 Environmental specifications

Characteristic	Specification
Temperature	
Operating	10° to 35° C
Non-operating	-30° to 60° C
Temperature shock immunity - maximum rate of change	10° C per hour
Humidity	
Operating	20% to 80% RH non-condensing
Non-operating	20% to 80% RH non-condensing

Table 16 Environmental specification

11 Packaging before transportation



IMPORTANT

If you need to transport the Library, it is recommended that the shipping lock and label is replaced on the top cover (see Figure 69).

1. Please disconnect the Library.
 2. Remove the yellow label and the shipping lock. The shipping lock is store on the rear panel (see Figure 69).
 3. Store the lock and the label on the top cover.
- The shipping lock which prevents the robotic mechanism, from moving during shipment.

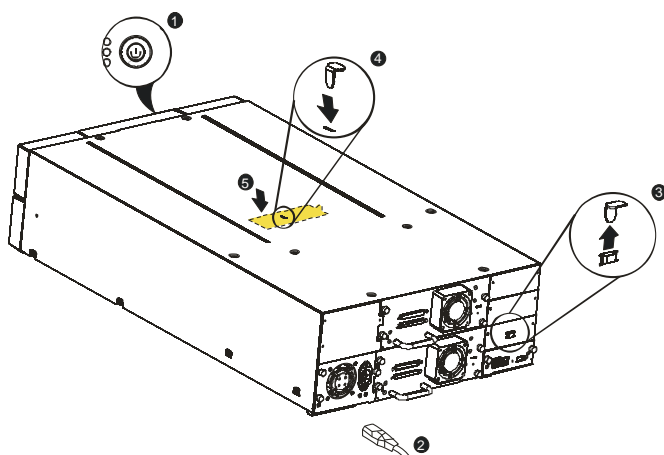


Figure 69 Replacing Shipping lock before transportation

4. Before you sending the defect Library back, please contact the service department to give the information's of the Part and Serial Numbers (see Figure 70).

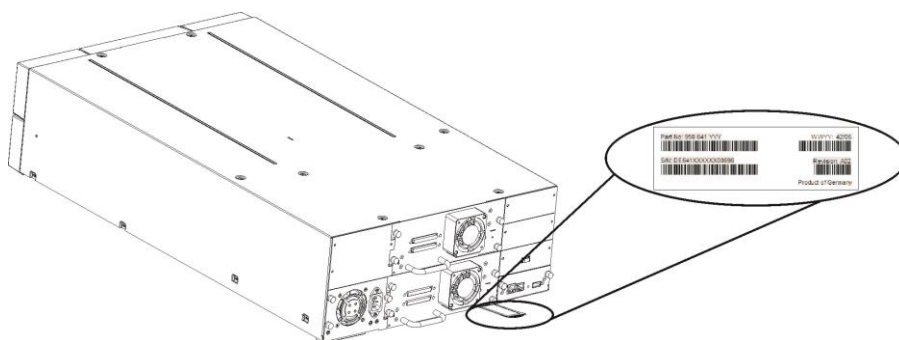


Figure 70 Product Label

5. Packaging the tape Library. Please use this reason original Box (see Figure 71).
6. Sending the Library to the service center.

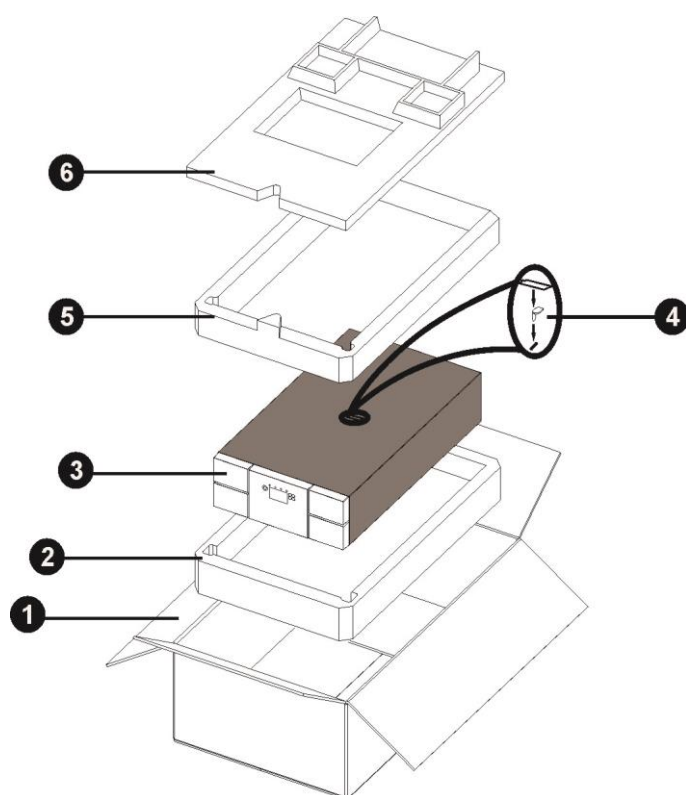


Figure 71 Re-Packaging the Library

Number	Description
1	Box
2	Bottom shell
3	Unit
4	Shipping lock
5	Middle shell
6	Top shell

Table 17 Re-Packaging description

12 Recycling and disposal



INFORMATION

Disposal of Waste Equipment by Users in Private Household in the European Union and Norway

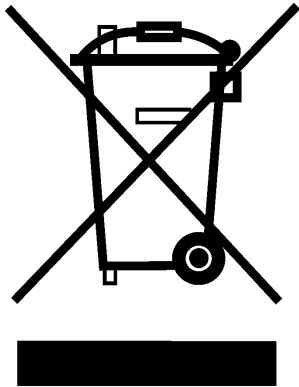


Figure 72 WEEE Symbol

This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at this time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

13 Regulatory information

This section describes the tape Library compliance with safety and regulatory agency standards:



INFORMATION

To comply with the following regulations and standards, the tape Library must be properly installed in an office or industrial environment with shielded cables and adequate grounding of the SCSI bus and the input power.

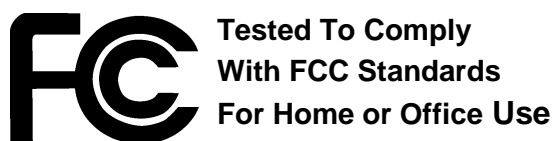
13.1 Device Standards

- ANSI Small Computer System Interface-2 (SCSI-2), X3.131 – 1994
- ANSI SCSI-3 Primary Commands, X3.301 - 1997
- ANSI Information and Technology. SCSI-3 Medium Changer Commands (SMC), NCITS.314:1998
- ANSI SCSI Parallel Interface-2 (SIP-2), X3.302:1998
- IEC 60297 Rack Standards

Countries	Standard (by BDT)	European Union CE USA/Canada FCC, ETL Germany GS Semco

13.2 FCC (United States)

The computer equipment described in this manual generates and uses radio frequency (RF) energy. If the equipment is not installed and operated in strict accordance with the manufacturer's instructions, interference to radio and television reception might result.



This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Part 15, Class A, of the FCC Rules, is designed to provide reasonable protection against radio and television interference in a residential installation. Although the equipment has been tested and found to comply with the allowed RF emission limits, as specified in the above cited Rules, there is no guarantee that interference will not occur in a particular installation. Interference can be determined by turning the equipment off and on while monitoring radio or television reception. The user may be able to eliminate any interference by implementing one or more of the following measures:

- Reorient the affected device and/or its receiving antenna.
- Increase the distance between the affected device and the computer equipment.
- Plug the computer and its peripherals into a different branch circuit from that used by the affected device.
- If necessary, consult an experienced radio/television technician for additional suggestions.

13.3 Canadian Verification

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations (ICES-003, Class A).

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