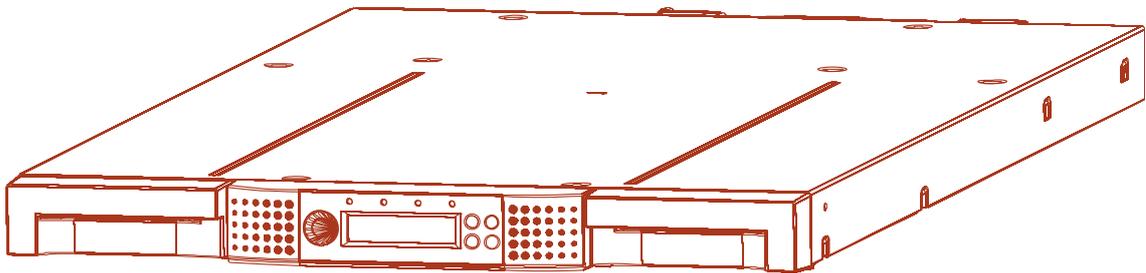




actiLib Autoloader 1U

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 except that which is described in this manual
- Ensure proper ventilation
- Keep away from heat sources
- Use proper power sources
- Properly 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 that weighs more than 15 kg.

Product warranty Caution

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

- The tape loader is repaired or modified by anyone other than the manufacturer's personnel or approved agent.
- The tape loader is physically abused or used in a manner that is inconsistent with the operating instructions or product specification defined by the manufacturer.
- The tape loader 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 loader 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 loader 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.

Rack stability



WARNING

Weight!

To reduce the risk of personal injury or damage to equipment

- Extend leveling feet to the floor.
 - Ensure that the full weight of the rack rests on the leveling feet.
 - 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 Autoloader 1U provides a compact, high-capacity, low-cost solution for simple, unattended data backup. This unique design houses up to 8 tape cartridges in a compact 1U form factor with easy access to tape cartridges via two removable magazines and a mail slot. The magazines can hold up to four (left magazine including mail slot) cartridges.

The loader can support one LTO3 or LTO4 half height tape drive. The loader occupies one SCSI target address and uses dual LUNs for the tape drive and loader robotic.

The loader can be operated via Operator Control Panel or Remote management unit.

The actiLib Autoloader 1U is compatible with most operating systems and environments that support the SCSI interface. However, the loader requires either direct support from the operating system or a compatible backup application to take full advantage of its many features.

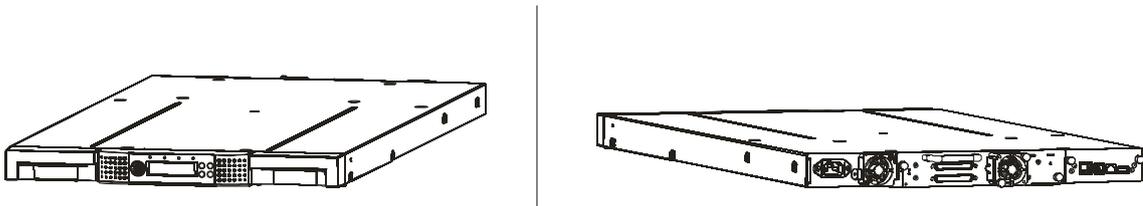


Figure 1 front and rear actiLib Autoloader 1U view

Particular emphasis of the actiLib Autoloader 1U includes:

- **Platform of 1U tape loaders** - independent of tape and drive form factors
- **Configurability** - from entry level cost optimized loader to a feature rich configuration
- **Broad level of connectivity** - SCSI , SAS and FC
- **Expandability** – magazines and drive sleds can be added in the field
- **Technology upgrade** - customer can upgrade tape drive technologies (e.g. LTO3 to LTO4) in the field
- **Service friendly design** - drive, accessible from the back of the unit allowing for quick replacement
- **Maximum up time** - through advanced error handling and recovery capability

The includes the actiLib Autoloader 1U following features:

- USB interface to enable Serviceability features and/or Customized features (Storage On Demand) implementation
- Operator Control Panel simple character set
- 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 Autoloader 1U encompasses 1U 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 of the actiLib Autoloader 1U is used to access 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 2x16 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

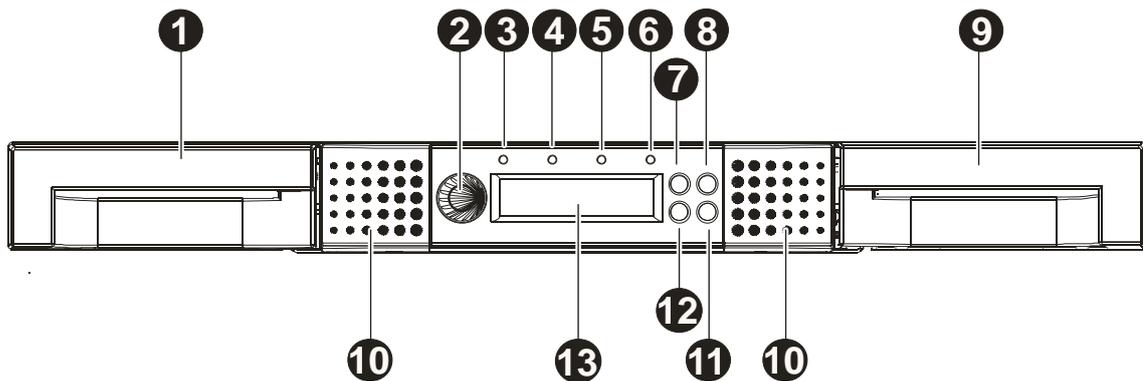


Figure 2 Front panel

Number	Description
1	Left magazine with Mail slot
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 loader 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 loader directs you to do so. Additional cleaning is not necessary.
5	LED “ ATTENTION ” (Amber). Illuminated if the loader has detected a condition that requires attention by the operator.
6	LED “ ERROR ” (Amber). Illuminated if an unrecoverable tape drive or loader error occurs. A corresponding error message displays on the LCD screen (see for more information).
7	Control key “ UP ” button The UP button is used to navigate through menu items.
8	Control key “ CANCEL ” button [X] The CANCEL button is used to cancel a user action and return to the last menu item.
9	Right Magazines
10	Air vents
11	Control key “ DOWN ” button [<] The PREVIOUS button is used to navigate backward through menu items.
12	Control key “ ENTER ” button [↵] The ENTER button is used to go to a sub menu or execute an action.
13	Front panel “OCP” display, consisting of 2x16 characters The OCP screen displays actions and status information, menu items or error messages equivalent to the operation mode.

Table 1 Front panel overview

5.2 Rear panel

The rear of the tape loader provides access to SCSI connectors, tape drive bays, the power connector, Ethernet, serial and the USB port. Figure 3 show the rear panel of a loader with a half height LTO drive.

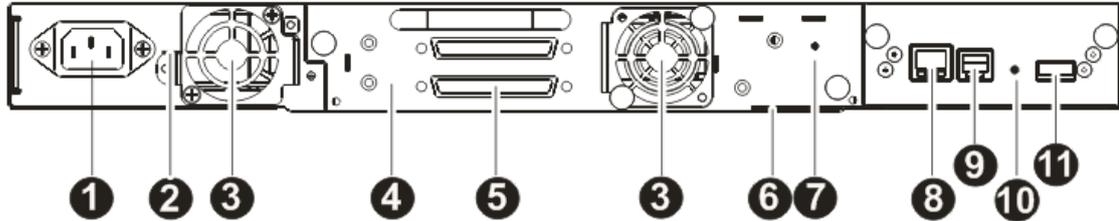


Figure 3 Rear panel with a SCSI tape drive

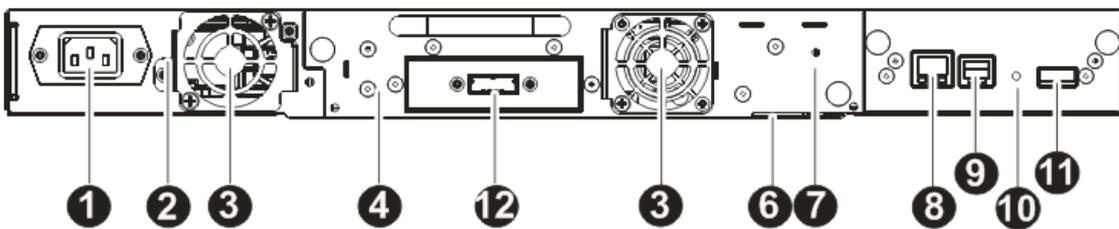


Figure 4 Rear panel with a SAS tape drive

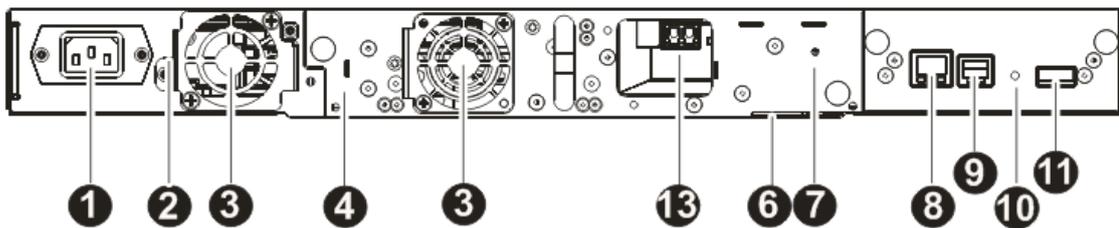


Figure 5 Rear panel with a Fibre channel tape drive

Number	Description
1	Power connector: The loader requires a 110/220 volt AC power connection
2	Shipping lock (storage location)
3	Fan vent
4	Tape drive sled
5	68-pin HD SCSI connectors
6	Product label foil (see section 10)
7	Tape Drive LED
8	Ethernet port
9	Serial port
10	Controller LED
11	USB port (Host)
12	SAS connectors
13	Fibre channel connectors

Table 2 Rear panel overview

5.3 Internal components

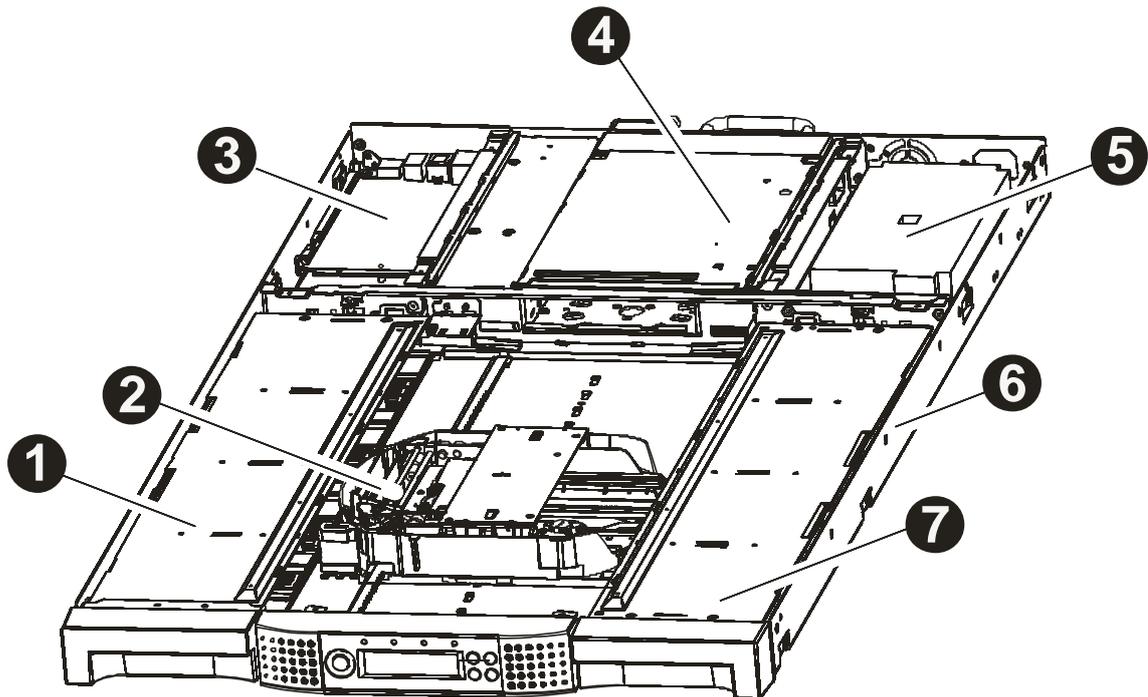


Figure 6 Internal components

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

Table 3 Internal components

6 Installing the actiLib Autoloader 1U

6.1 Location requirements

Choose a location that meets the following criteria

Criteria	Definition
Rack requirements	Standard 19-inch rack with 1U 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 loader 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	11.4 kg
Weight with media (8 LTO cartridges)	13.1 kg
Air quality	The loader 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 (24 inches) Sides: Minimum of 5.08 cm (2 inches)

Table 4 Location requirements

6.2 SCSI requirements

The actiLib Autoloader 1U incorporates a wide SCSI-2 or SCSI-3 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 loader to an SE SCSI bus, or if there are SE devices attached to the same SCSI bus, the loader's performance is limited to the maximum data transfer speed and maximum cable lengths of the SE bus. For these reasons, Actidata strongly recommends that you do not use a SE SCSI bus with the loader.



IMPORTANT

Do not connect an LTO3 device to a SE SCSI bus, as it will severely degrade performance.

**IMPORTANT**

The actiLib Autoloader 1U is NOT compatible with a standard differential (Diff) or High-Voltage Differential (HVD) SCSI bus. This loader 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 loader). These adapters are sometimes labeled high-byte termination

6.3 SCSI Host Bus Adapter (HBA)

To get optimum performance from your actiLib Autoloader 1U you need a SCSI bus that can transfer data at a rate that supports the loader's maximum burst transfer speed, see "Maximum storage capacity and data transfer rate" on page 92.

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 Autoloader 1U uses a single SCSI ID per drive to control the tape drive (LUN 0) and loader robotic (LUN 1). The loader 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 loader. It will just see the tape drive.

**IMPORTANT**

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

6.5 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 ID of the loader.

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

Ensure the loader is properly terminated. If the loader is the only SCSI device, other than the SCSI host adapter on the selected SCSI bus, it must be terminated. Likewise, if the loader 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 loader 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.

6.6 Unpacking the tape loader

Before you begin, clear a work surface to unpack the loader. Select an open 1U rack location allowing easy access to the host server and an easily accessible power outlet.



IMPORTANT

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

Unpacking the loader:

1. Before opening and removing the loader 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.
3. Carefully remove the shipping materials from the top of the loader (see Figure). Remove the accessory package (if present) and set aside.
4. Remove the two rack rails (if included) and set aside.

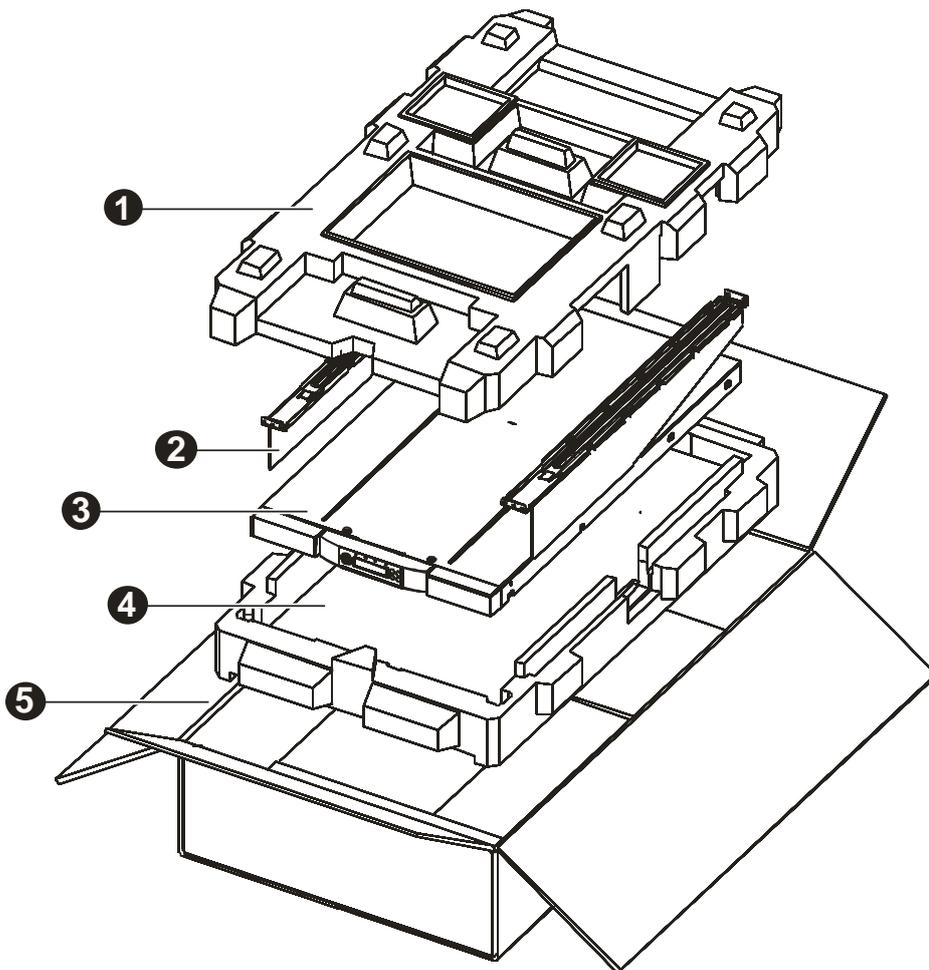


Figure 7 Unpacking the loader

Number	Description
1	Top shell
2	Rack mount Kit (optional)
3	Unit
4	Bottom shell
5	Box

Table 5 Unpacking the loader

5. Lift the loader out of the carton and remove the bag from the loader. Save the packaging materials for future use.



IMPORTANT

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

6.7 Identifying product components

Confirm that you have received the following:

- Loader
- Terminator (not in all configurations)
- SCSI cable (not in all configurations)
- Power cord (not in all configurations)
- Rack mount kit: (not in all configurations)
- Documentation CD
- Quick Start Guide

6.8 Remove the shipping lock



IMPORTANT

The shipping lock, which prevents the robotic transport mechanism from moving during shipment, must be removed before the loader is powered on.

The shipping lock is held in place with a label and is located in the top center of the loader. After the shipping lock is removed, it should be stored on the rear panel right side (next to power connector) of the loader 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 loader, and then remove the lock (see Figure).

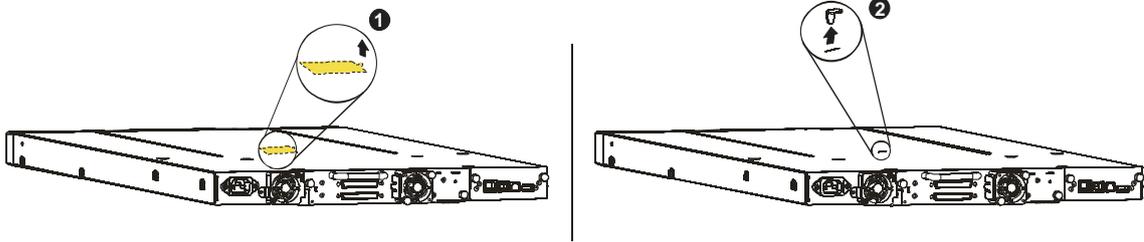


Figure 8 Shipping lock and label

2. Store the shipping lock next to power supply (see Figure).



IMPORTANT

If you need to transport the loader, it is recommended that the shipping lock and label is replaced on the top cover (see section 10).

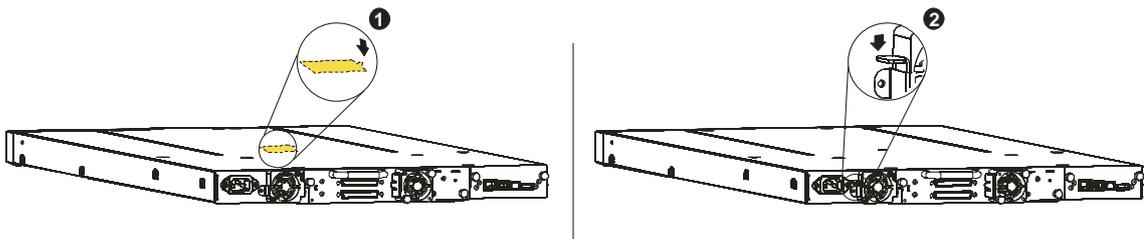


Figure 9 Shipping lock next to power supply

6.9 Rack mounting the tape loader

The loader easily installs into a standard 19" rack system taking up 1U of space.
The actiLib tape loader weighs 13.1 kg (29 lbs) with 8 cartridges



WARNING

Weight!

Risk of personal injury or damage to the loader.

- always remove all tapes to reduce the overall weight of the loader
- 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 loader.
The type of rack that you have will determine the type of M6 screw that you will use.

To install the loader:

1. Determine the location in your rack for your loader to be installed and, using a pencil, mark the location on each vertical rail in your rack.
2. 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 .

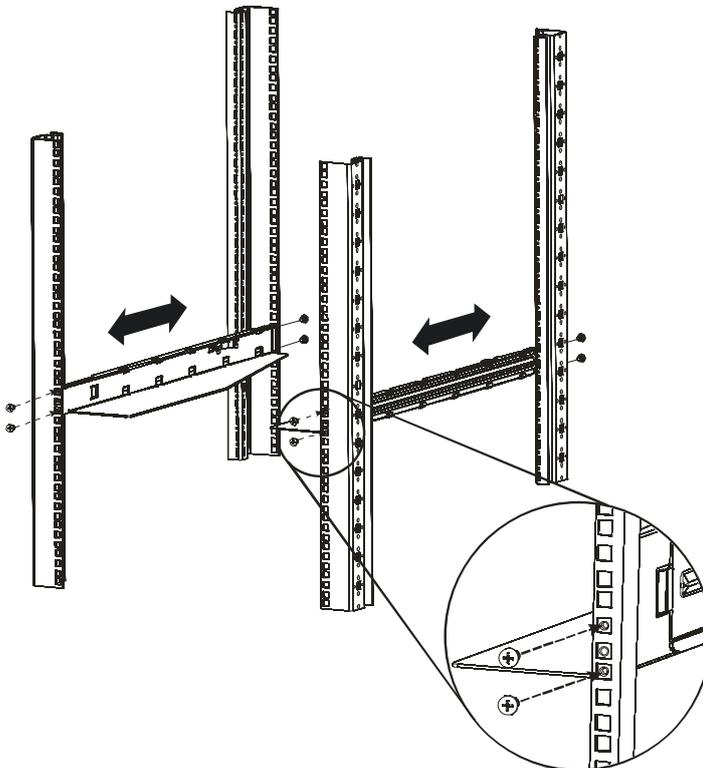


Figure 10 Installing the rails into the rack

1. Using the Torx screwdriver, remove the screw on each side of your loader. Shown in Figure step1.

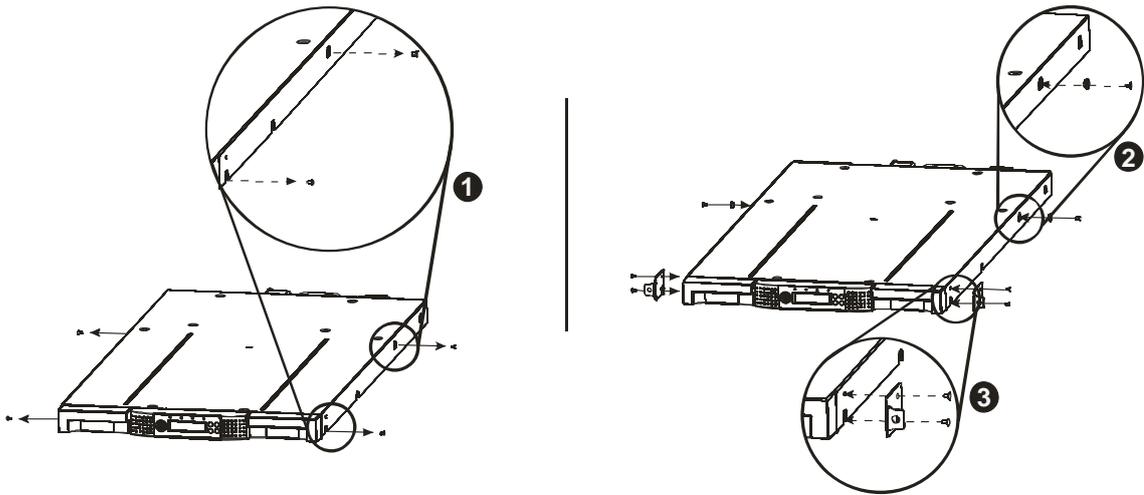


Figure 11 Installing the mounting brackets and guide pulleys

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

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

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

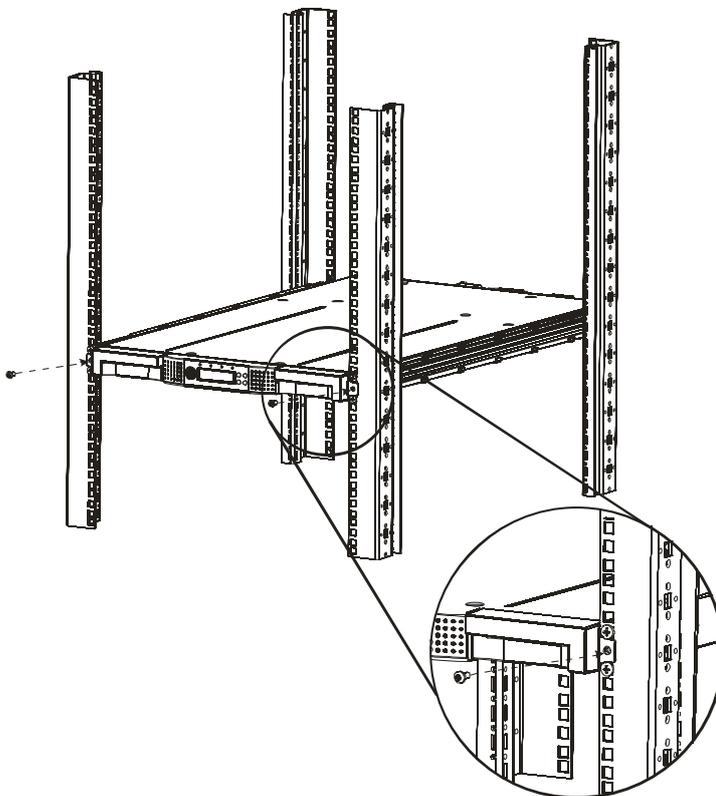


Figure 12 Securing the loader to the rack

6.10 Connecting the SCSI and power cable



INFORMATION

The LTO3 and LTO4 tape drives are Ultra 160 or 320 SCSI LVD device. Only cables and terminators specified for Ultra160 or 320 use 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 amp capacity 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.

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 when installing SCSI cables could result in damage to the loader.

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

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 loader (see Figure 6)

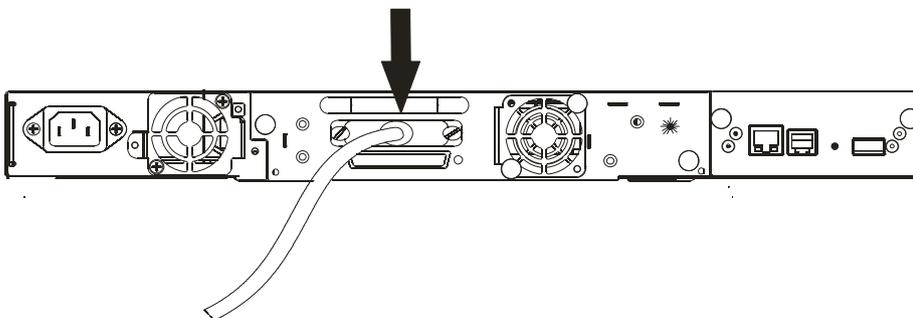


Figure 63 Attaching the SCSI cable to the drive

-
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 LTO3 tape drive to a SE SCSI bus

4. Attach the terminator to the remaining SCSI connector on the back panel of the loader; if the loader is the last or only device on the SCSI bus (see Figure). 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.

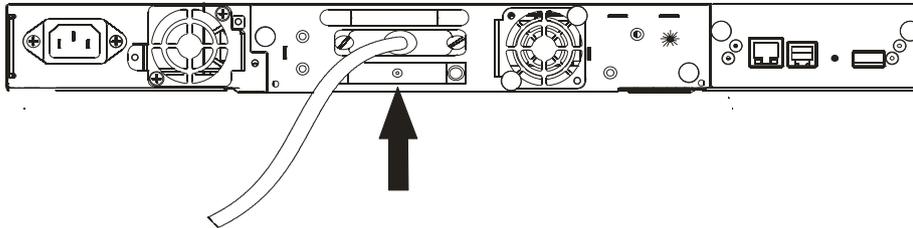


Figure 14 Attaching the terminator to the drive

5. Attach the power cable to the power connector on the back panel of the loader (see Figure 7).
6. Plug the power cable into the nearest properly grounded power outlet.

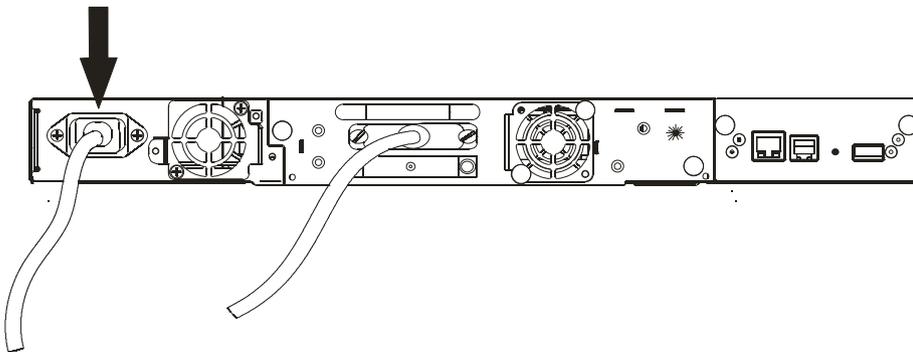


Figure 75 Attaching the power cable

**CAUTION**

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

7. Turn on the loader using the power button. Check the LCD screen to make sure the loader 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 loader

7.1 Operator Control Panel (OCP)

7.1.1 Operating modes

There are 2 basic modes for 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 loader 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 for 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 entered.

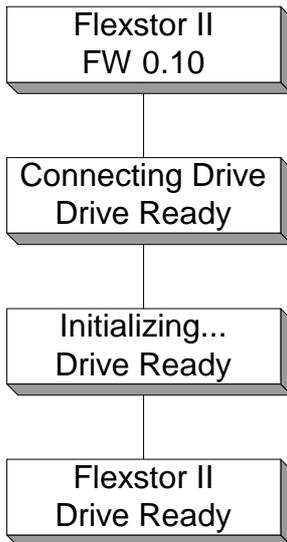
7.1.2 OCP Philosophy

During the following discussion of the OCP operation, several functional nuances may be clarified by defining several rules the OCP must abide by. 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 the 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
 - Unloading a cartridge from an empty slot
 - Moving a cartridge from any source to a full drive
 - Unloading a cartridge from an empty drive
- Any error detected by the library controller or the drive and not recoverable through predetermined firmware algorithms, will be considered as fatal. An error code will be displayed on the OCP and the error LED will become illuminated. The error code will remain on the OCP until a push button is pressed, the OCP will return to the Home Screen.
- Numeric error codes are only used for unrecoverable, fatal errors, otherwise text status messages are provided.

7.1.3 Power-Up Display

When the actiLib Autoloader 1U device powers up, or resets, it goes through several internally controlled processes that allows it to get initialized and running. This processes is called Power-On-Self-Test (POST). While the POST is happening, the OCP shall have appropriate information displayed to keep the user informed. When the loader finishes POST, it will display the Current Drive mount status in the 'Home Screen'. If the Drive is empty, the following status will be displayed.



7.1.4 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 reasonable 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. The "Magazine Status" LED's will also show the appropriate status (locked, unlocked or removed).

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. The following are additional operational details of LEDs.

7.1.5 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 like network addresses.

7.1.5.1 Selectable predefined values

After navigating to the menu item the various predefined values can be selected with the (<) and (>) key. As soon as the display shows the correct value it will be entered by pressing the ENTER key.

7.1.5.2 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 switch to the possible new state. Pressing ENTER a second time will take over this new state. This procedure works vice-versa.

7.1.5.3 Numerical values

Numerical values are needed for network addresses, PIN entries and other configuration entries. After navigating to the menu item which should be changed the actual value will be displayed and the cursor stays on the first digit. The value can be incremented / decremented with the (<) and (>) 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.

7.2 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

7.3 OCP Menu Trees

7.3.1 Symbols

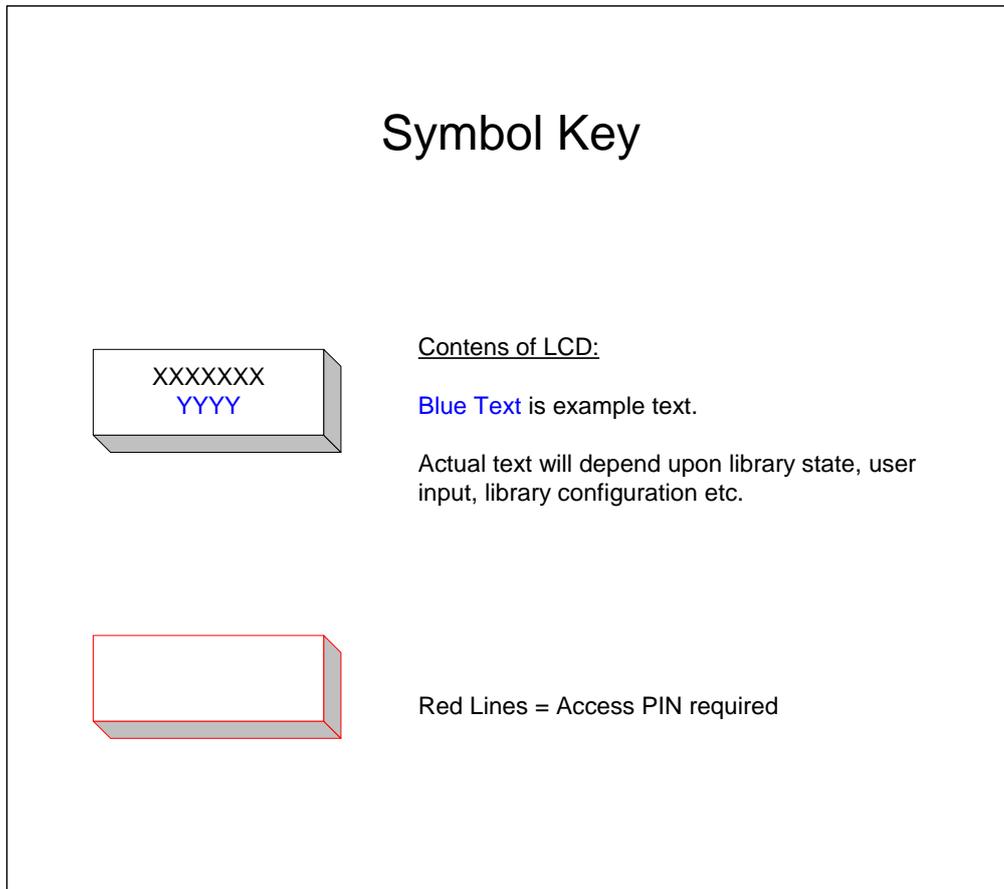


Figure 86 OCP symbols

7.3.2 OCP User Menu Flow Charts

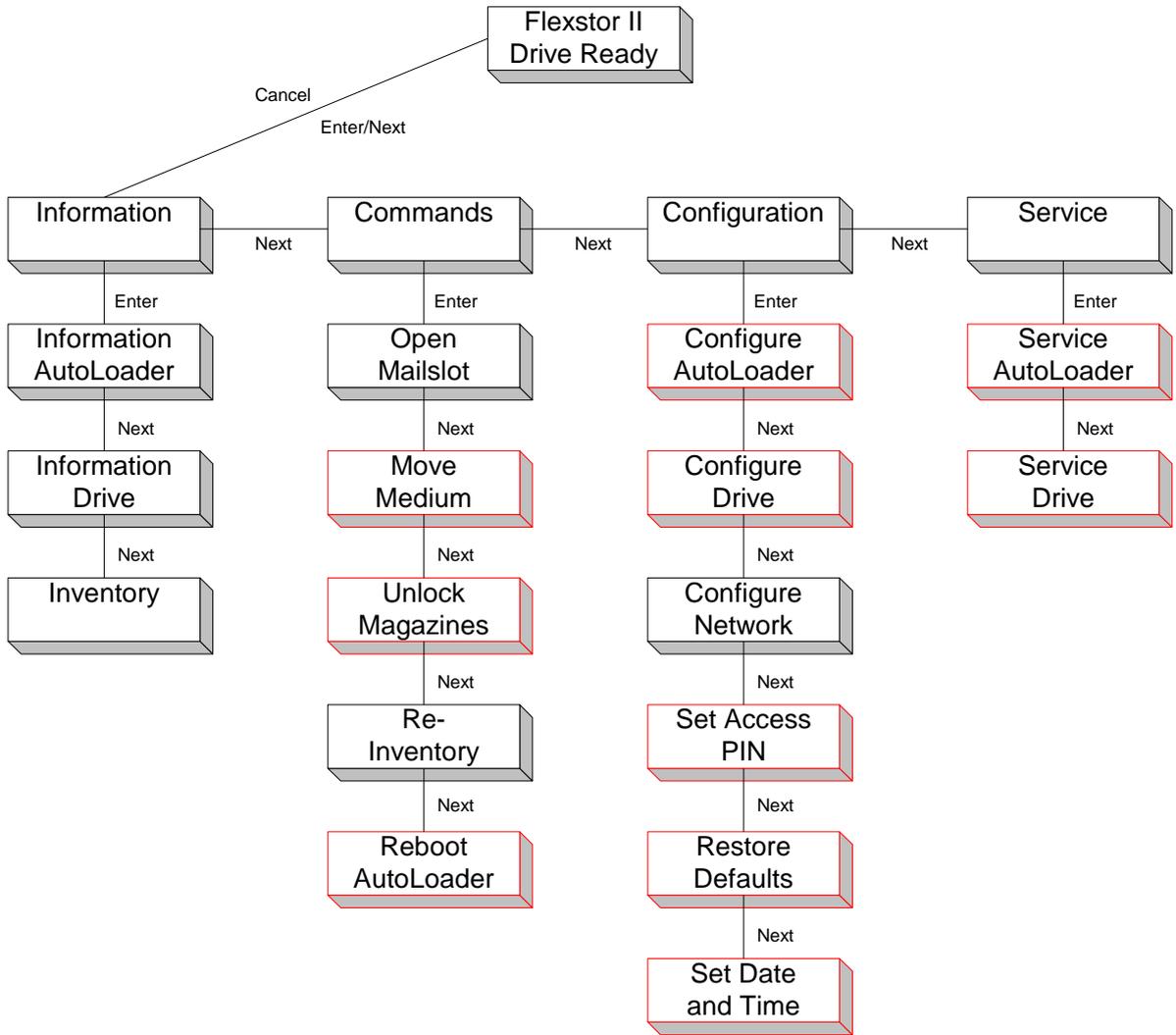


Figure 97 OCP interaction Mode

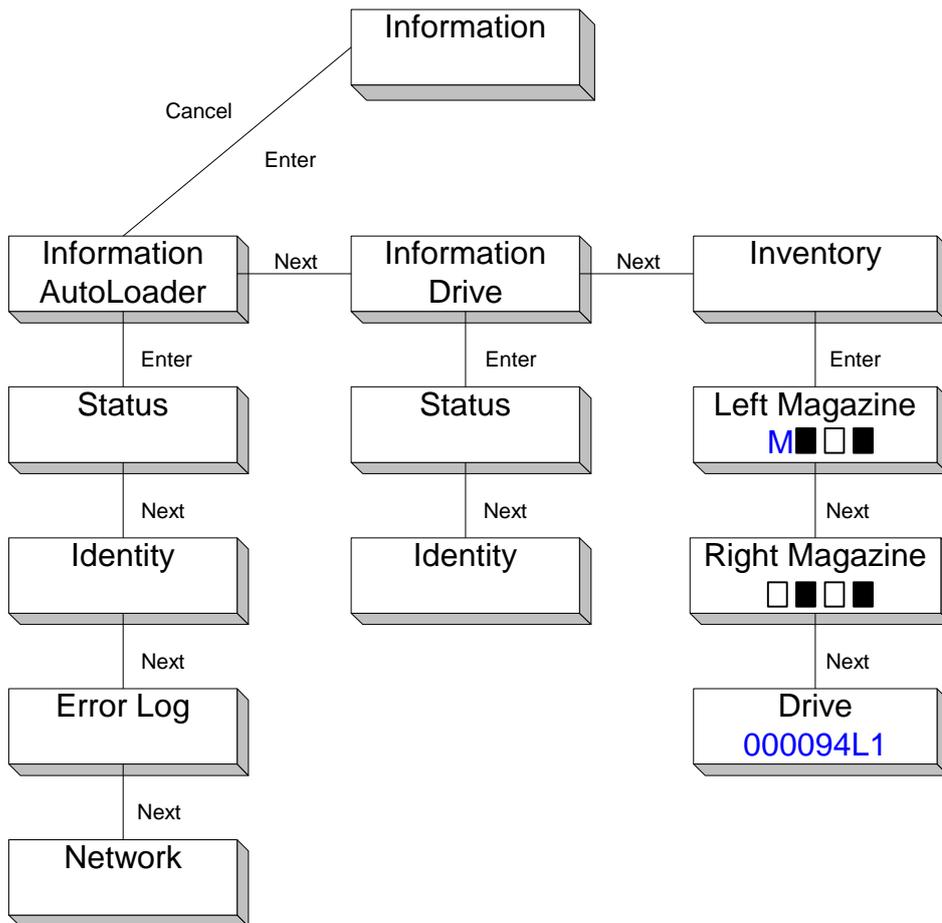
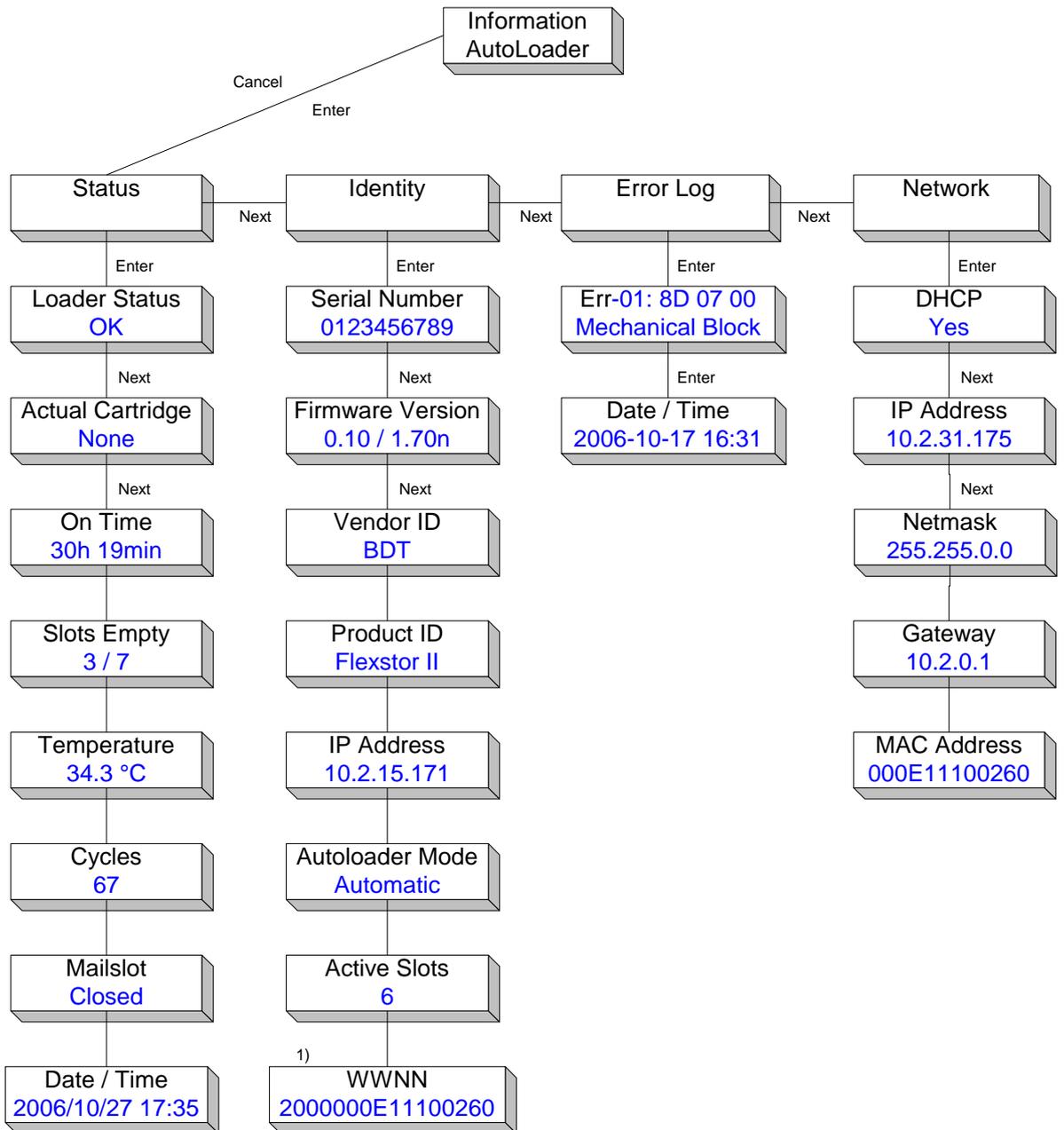
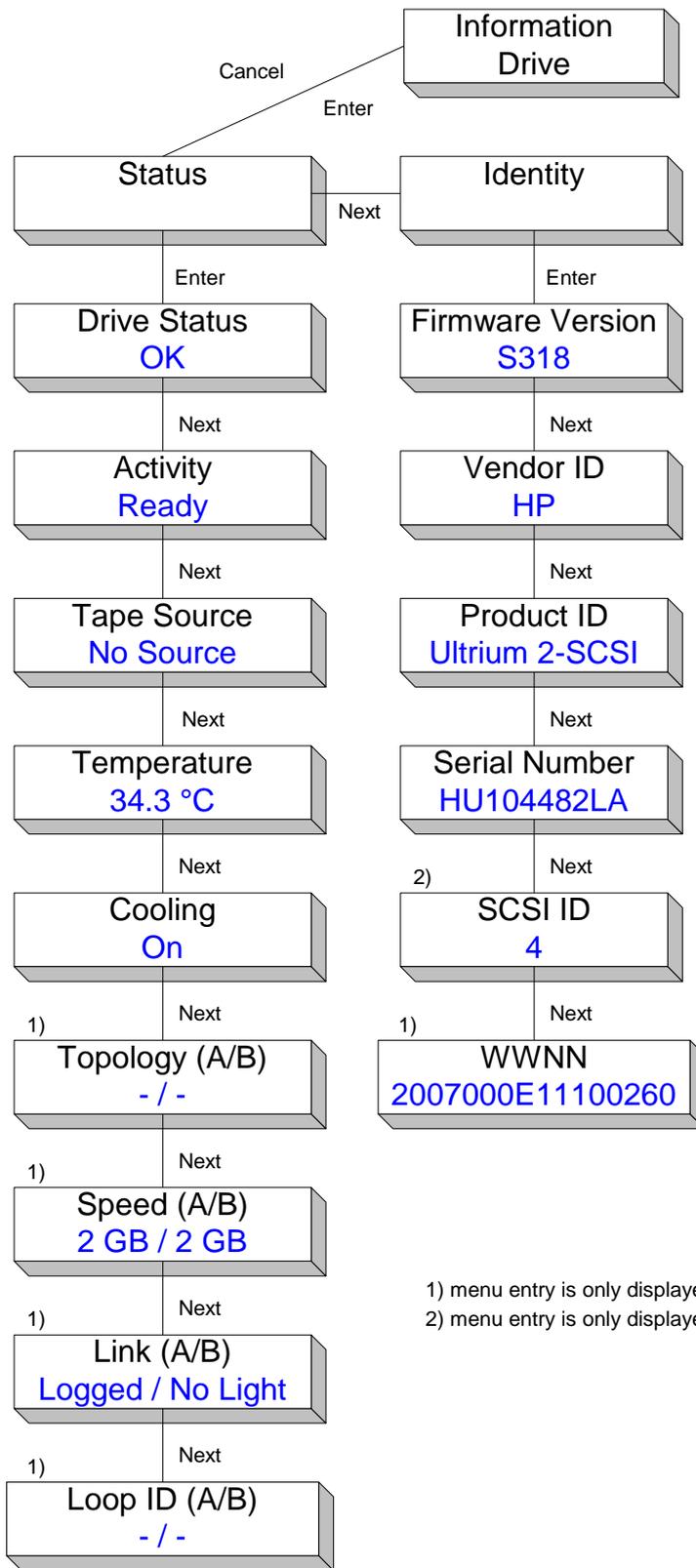


Figure 108 Interaction Mode, Information



1) menu entry is only displayed if a fiber channel drive was found

Figure 119 Interaction Mode, Information AutoLoader, continuation



1) menu entry is only displayed if a fiber channel drive was found
 2) menu entry is only displayed if a SCSI drive was found

Figure 20 Interaction Mode, Information Drive, continuation

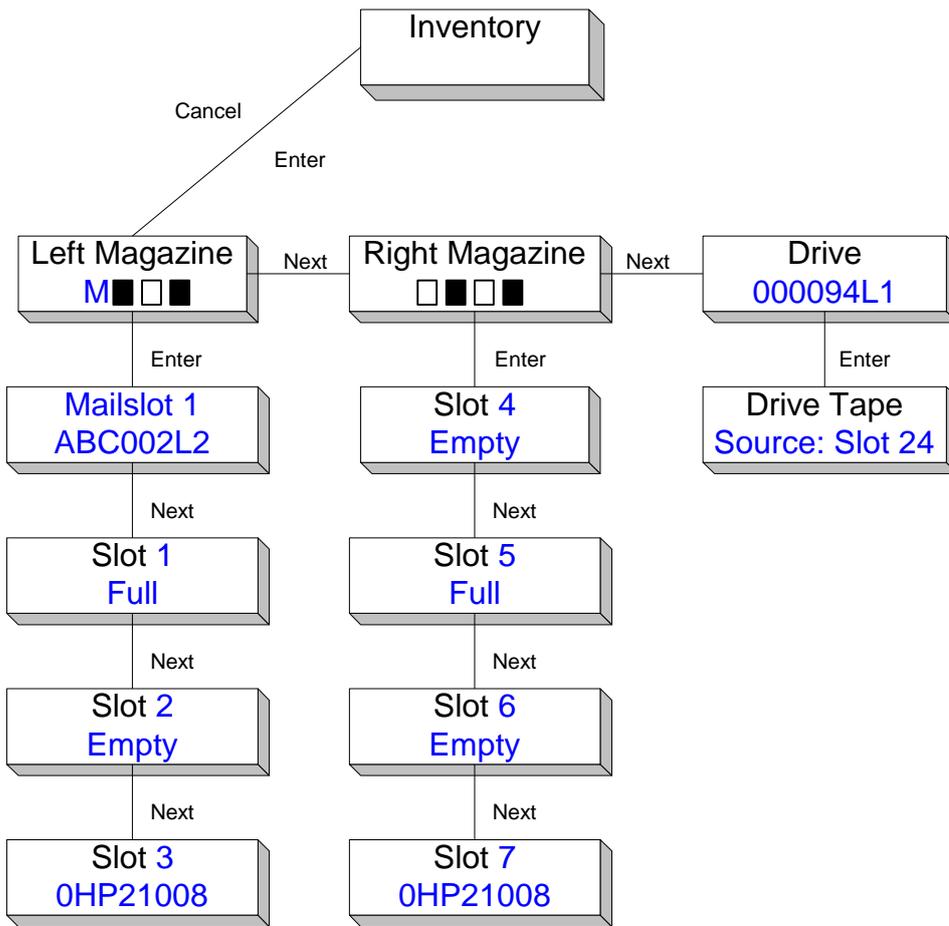


Figure 21 Interaction Mode, Inventory

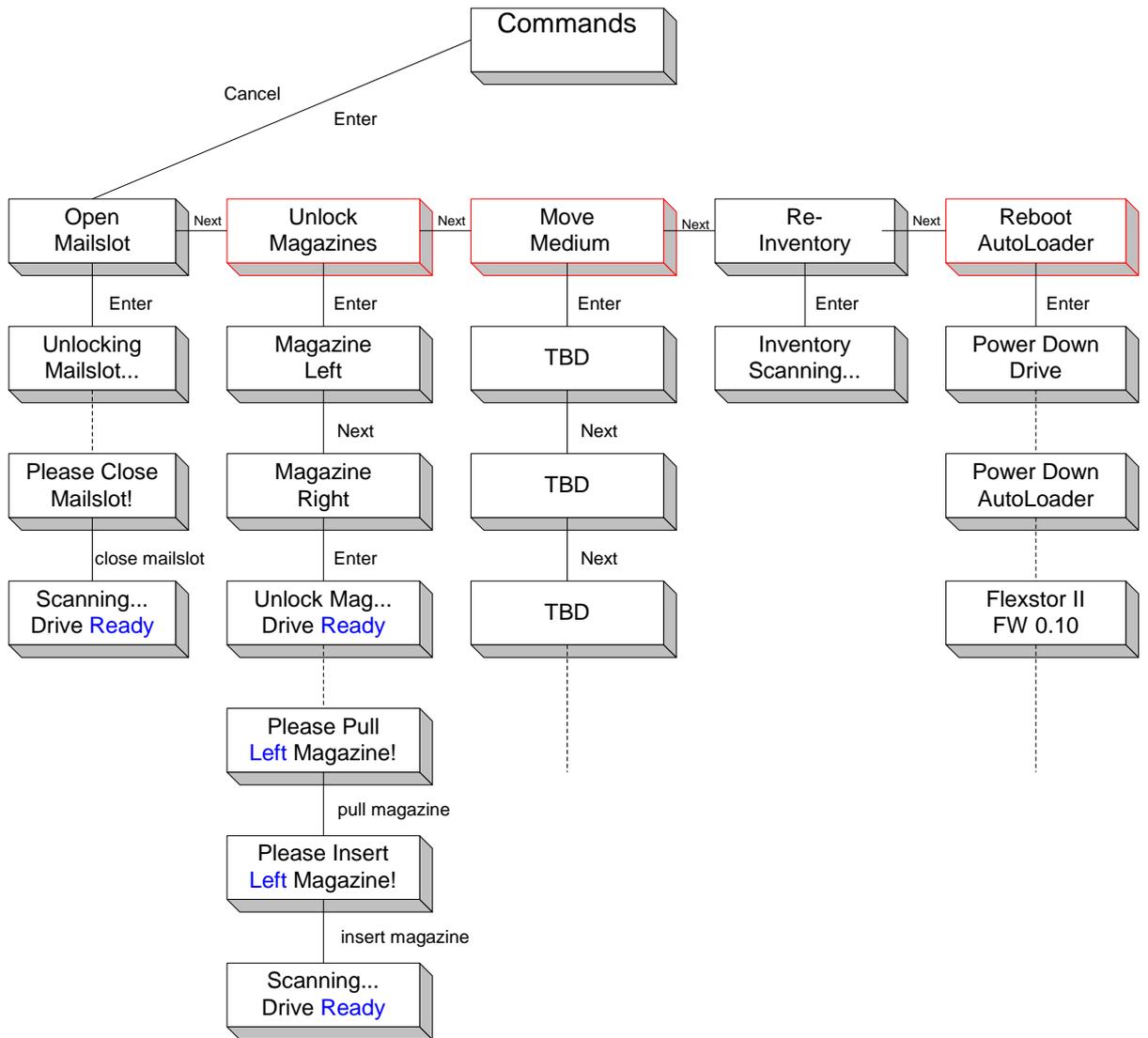
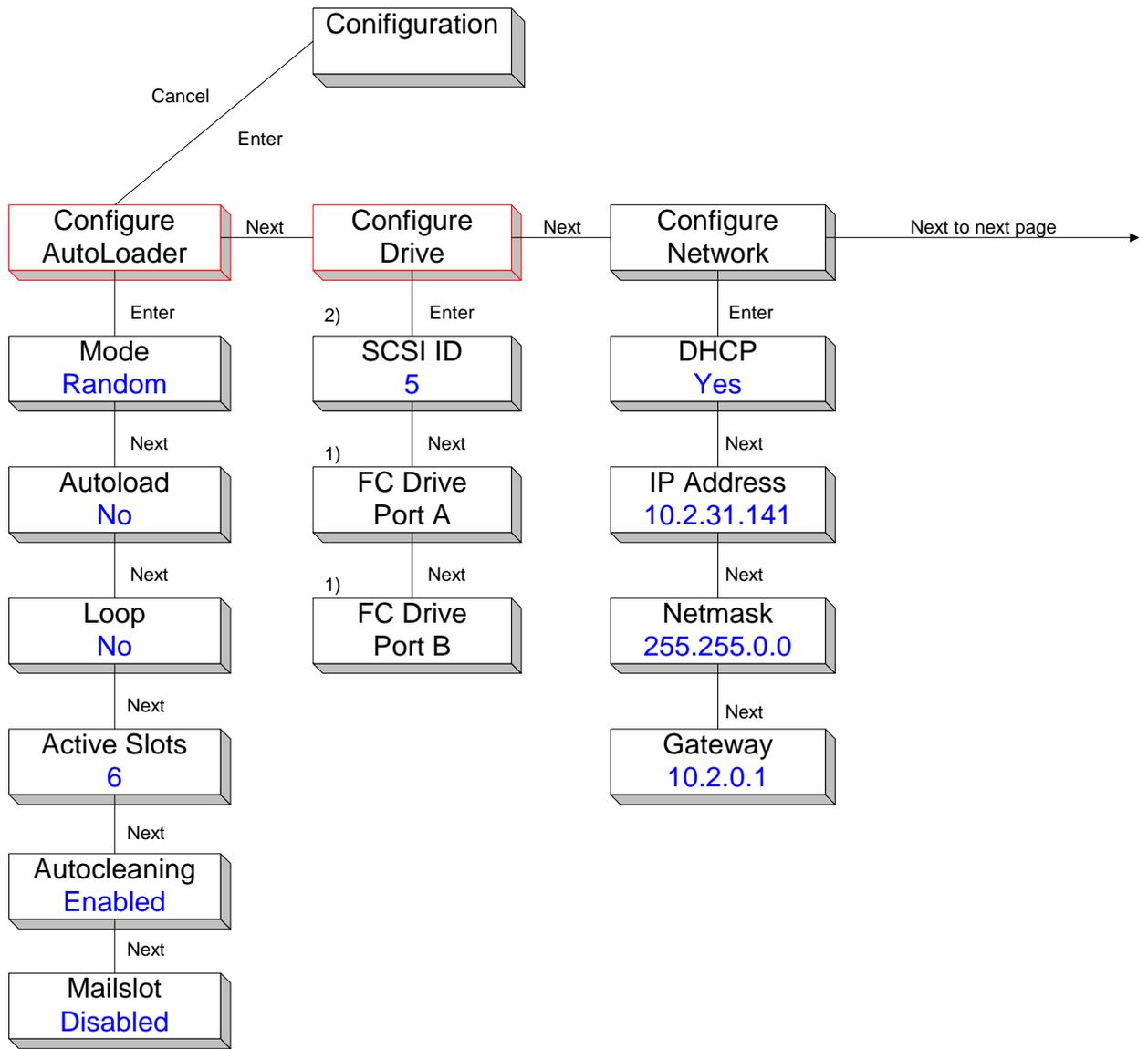


Figure 122 Interaction Mode, Commands



- 1) menu entry is only displayed if a fiber channel drive was found
- 2) menu entry is only displayed if a SCSI drive was found

Figure 133 Interaction Mode, Configuration

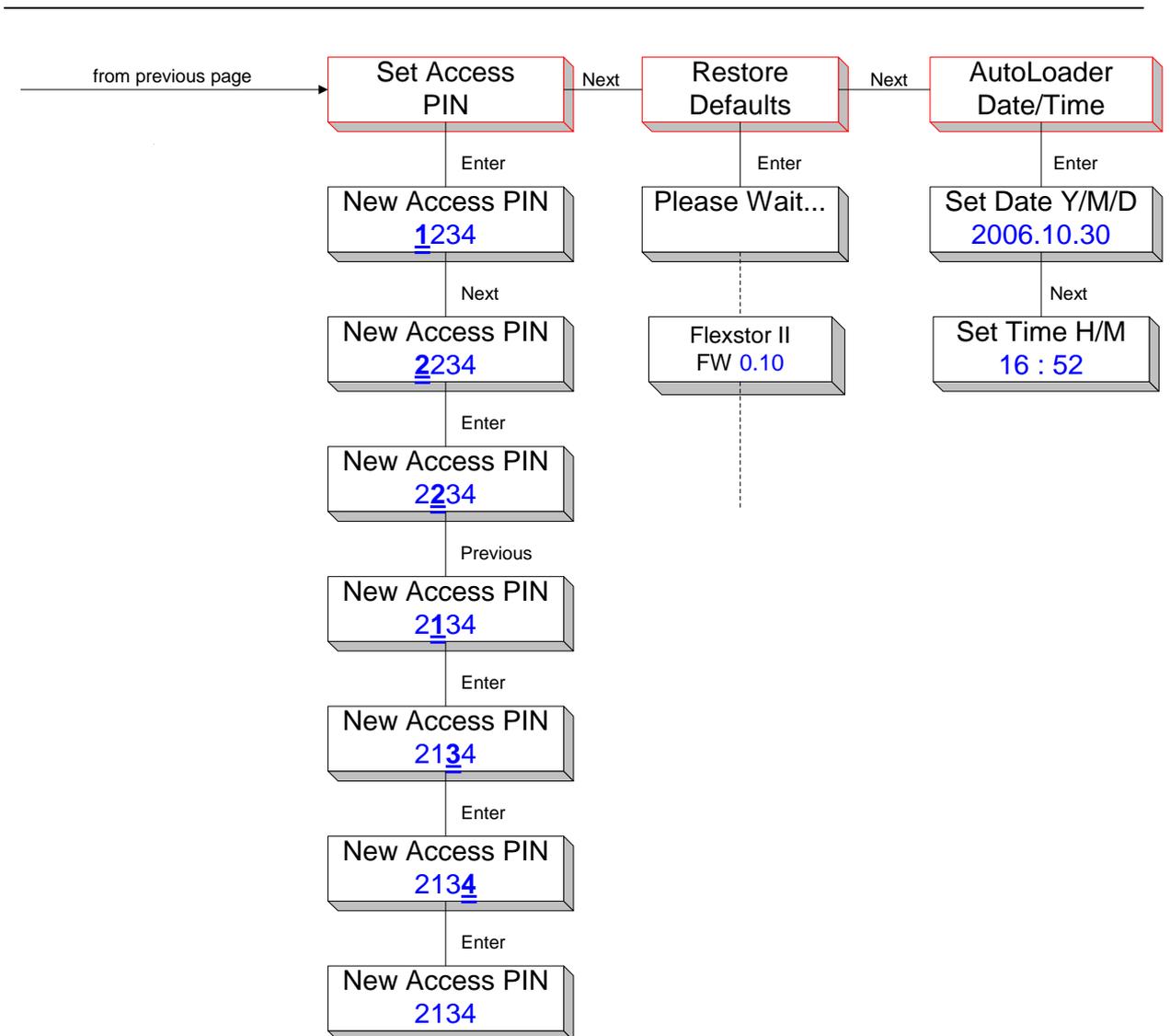
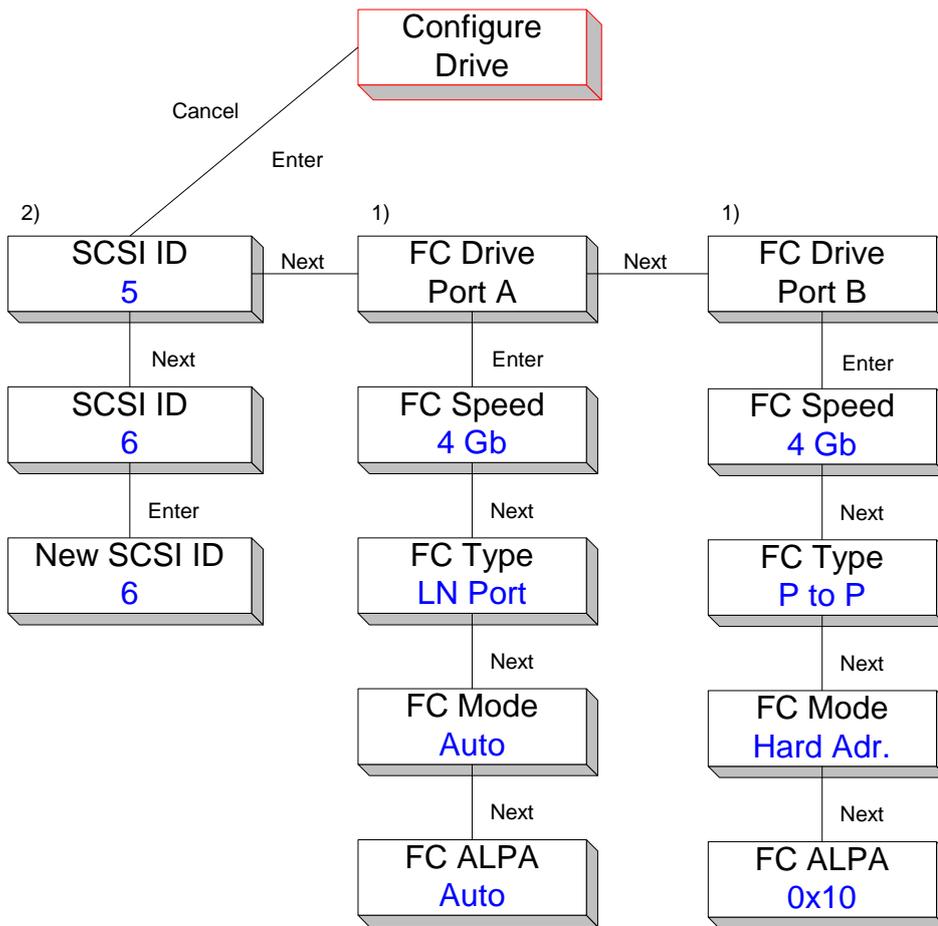


Figure 144 Interaction Mode, Configuration, continuation



- 1) menu entry is only displayed if a fiber channel drive was found
- 2) menu entry is only displayed if a SCSI drive was found

Figure 155 Interaction Mode, Configuration Drive, continuation

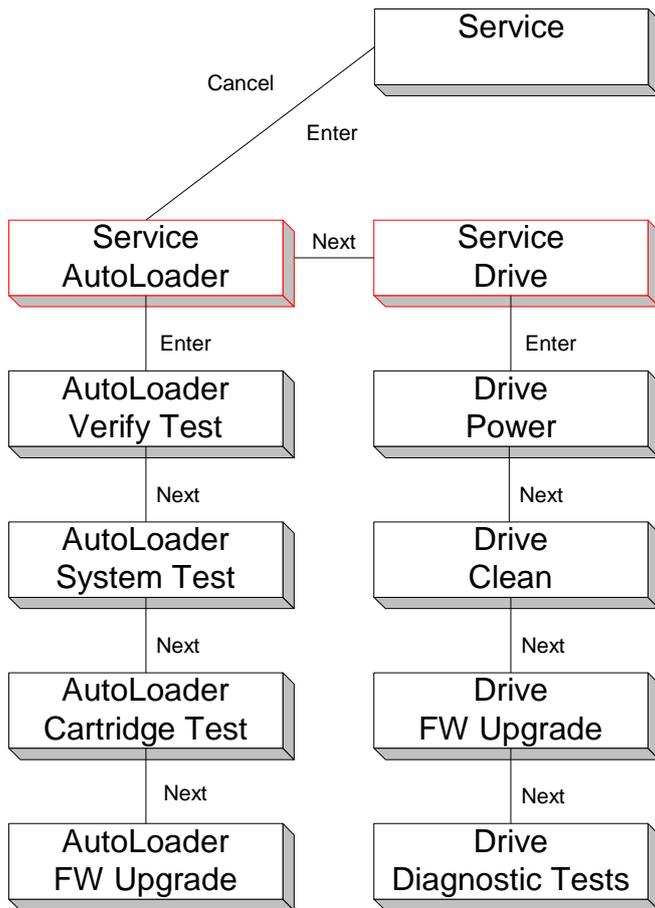
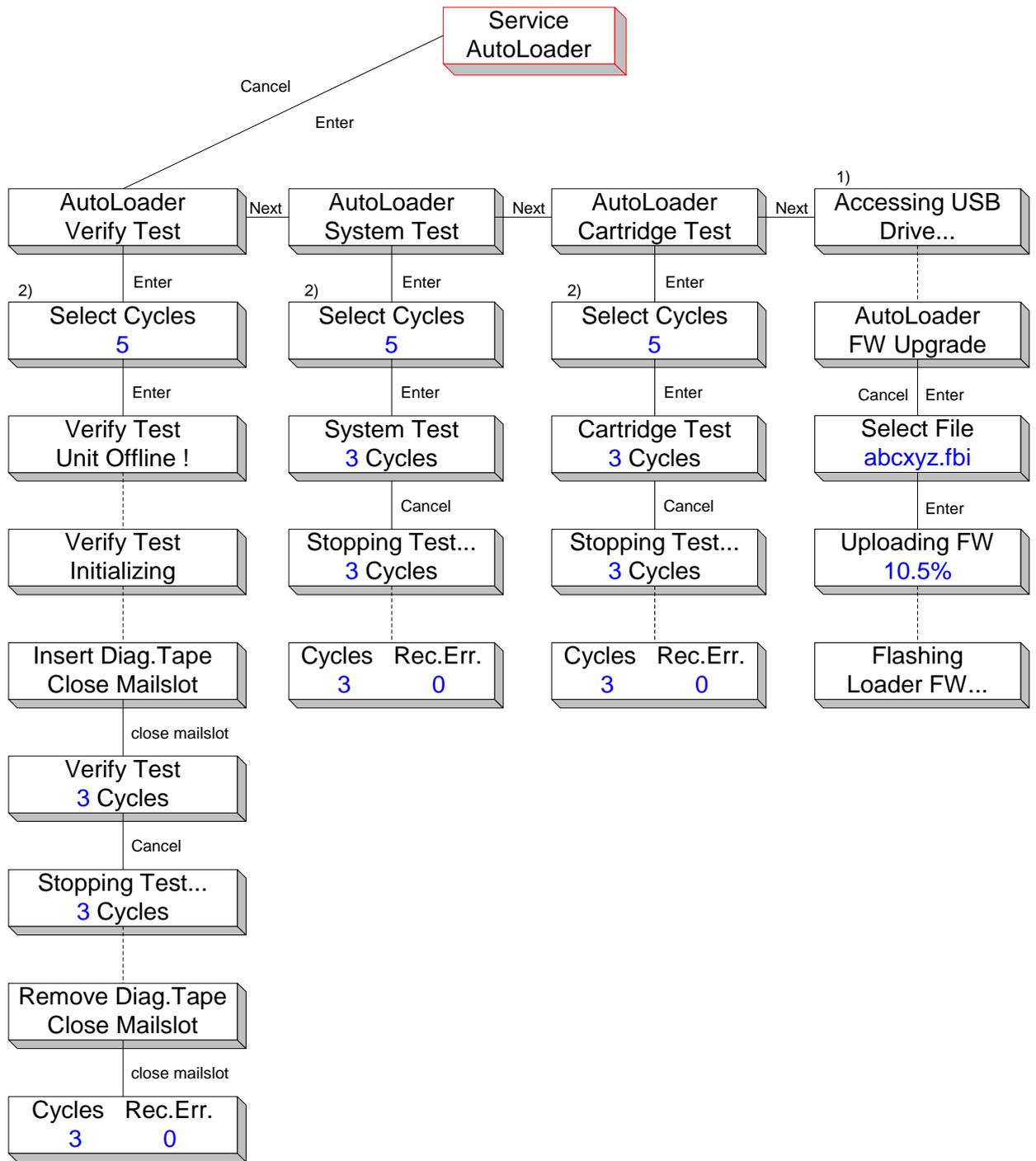
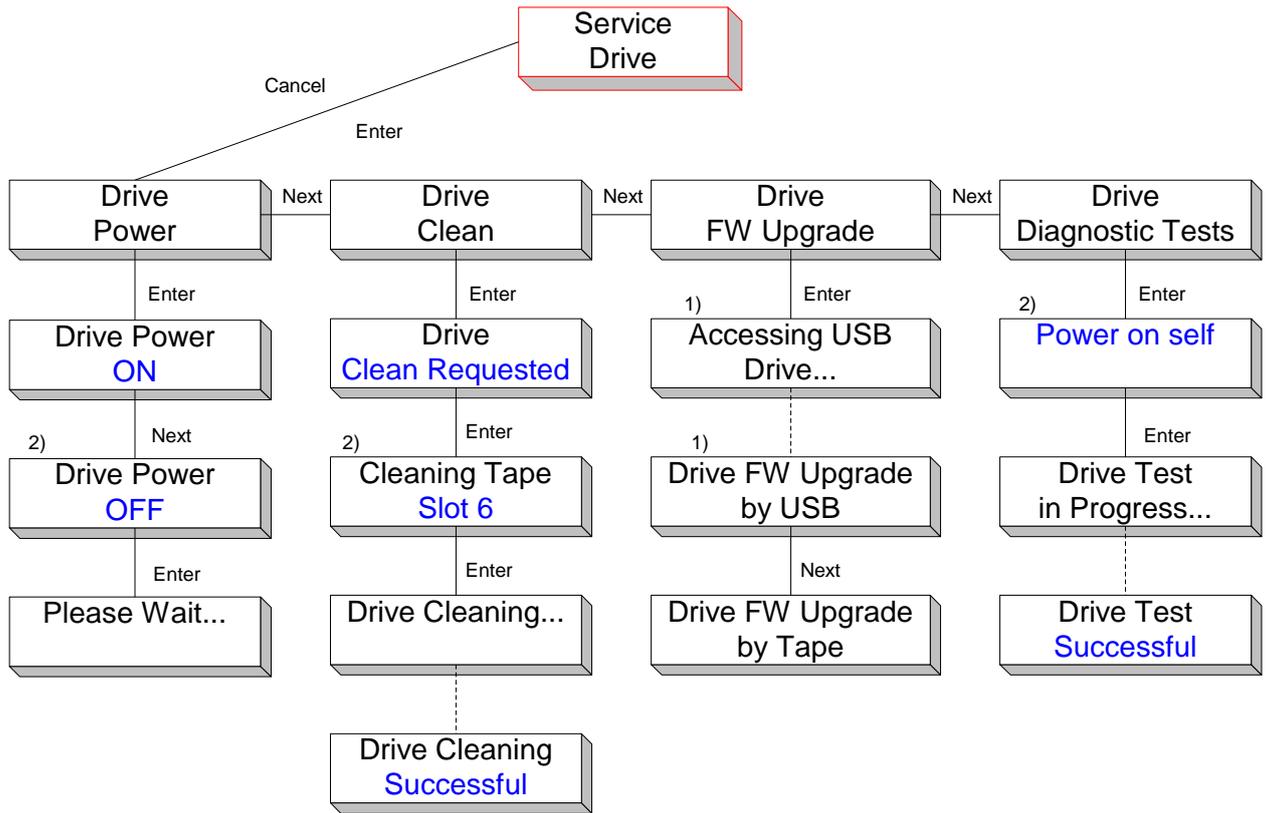


Figure 166 Interaction Mode, Service



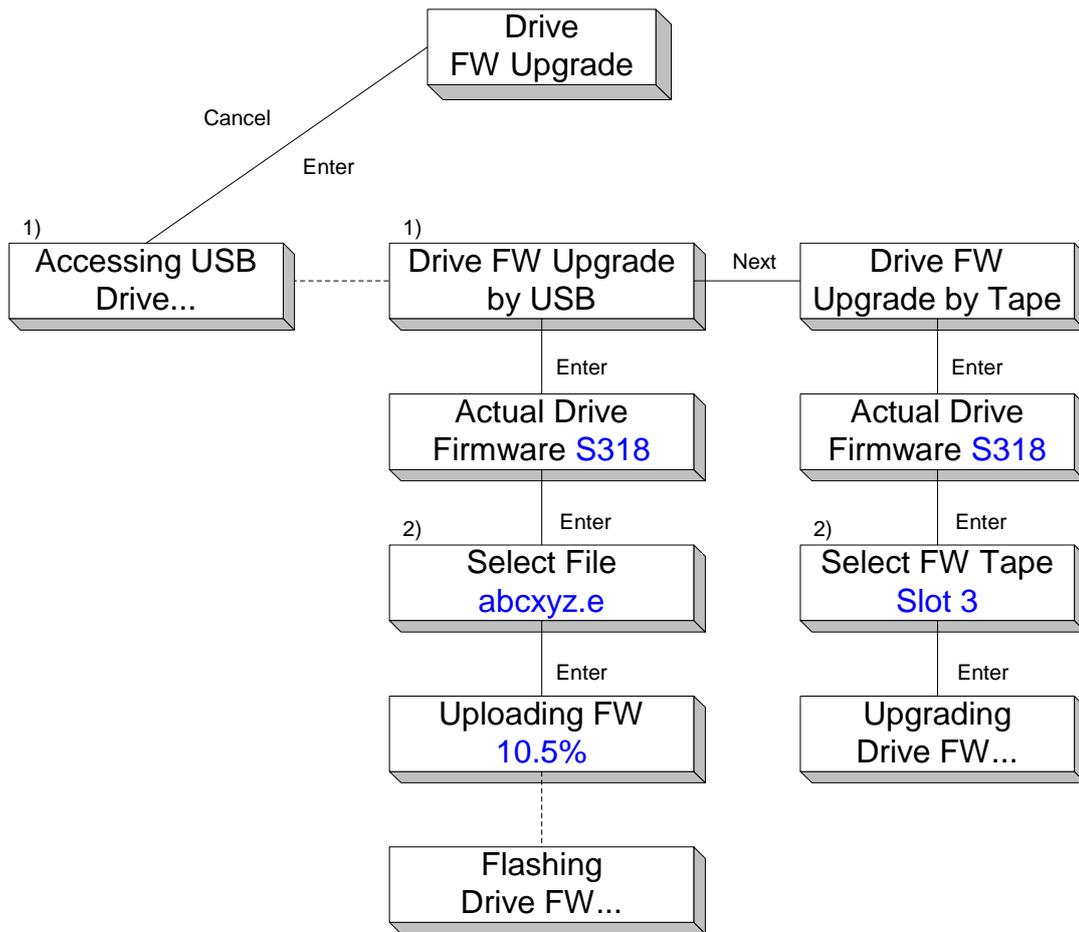
- 1) menu entry is displayed if a USB drive was found
- 2) use series of "Prev/Next's" for select

Figure 177 Interaction Mode, Service Autoloader, continuation



- 1) menu entry is only displayed if a USB drive was found
- 2) use series of "Prev/Next's" for select

Figure 188 Interaction Mode, Service Drive, continuation



1) menu entry is only displayed if a USB drive was found

2) use series of "Prev/Next's" for select

Figure 199 Interaction Mode, Service Drive FW Upgrade, continuation

7.4 Tape cartridges

Before you begin using the loader, 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 loader.

7.4.1 actiLib Autoloader 1U cartridge type

The cartridge types supported depends on the drive types installed. The loader 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

7.4.2 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 away from strong magnetic fields.

Before you use the loader, 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 loader/drive
- 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 to operating 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.

7.4.3 Labeling tape cartridges

Attaching a barcode label to each tape cartridge enables the loader 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 yourself.

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 .

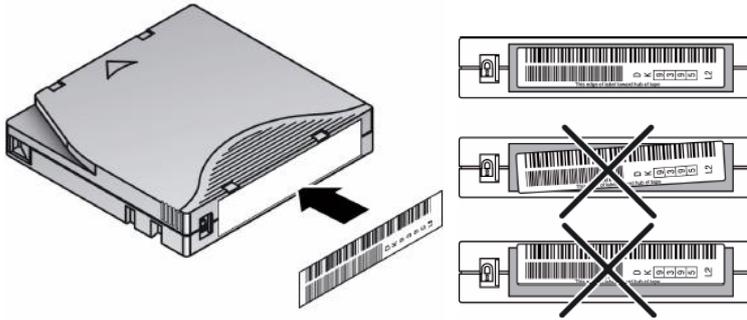


Figure 30 Ultrium tape cartridge and proper bar code label placement



IMPORTANT

The bar code label should only be applied as shown in Figure 28 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.

7.4.4 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 loader, 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).
- Slide the switch to the left to allow the loader to write data to the cartridge (see Figure).

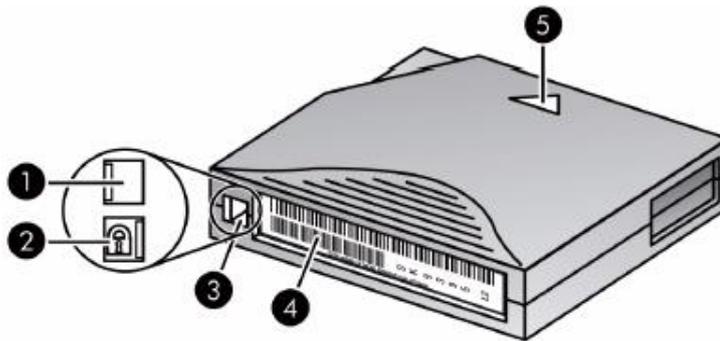


Figure 31 Write protecting the Ultrium data cartridge

Number	Description
1	Write-enabled
2	Write-protected

3	Write-protect switch
4	Barcode label
5	Insertion arrow

Table 6 Write protecting

7.4.5 Backward read compatibility

See compatibility guide of tape drives used.

7.4.6 Barcode reader

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

7.5 Magazines

Cartridges are stored in magazines. Up to 4 cartridges can be stored in each magazine. Magazines may be removed and inserted individually.

The actiLib Autoloader 1U tape loader has two removable magazines in the 1U loader (see [Figure 23](#) and [Figure 25](#)). Magazine access can be password protected. For safety reasons, the robotic motion is stopped when a magazine is removed. See section 7.6.6.4

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 loader no longer has power, a manual emergency release is available. See section 8.1.10.

7.5.1 Inserting tape cartridges into a magazine

1. Unlock the magazines and remove it from the loader
 - Use the OCP, see section 7.5.2, or
 - Use the RMU, see section 7.5.3
2. Insert cartridge in the magazines
3. Put the full magazines back to the tape loader (see Figure 20).

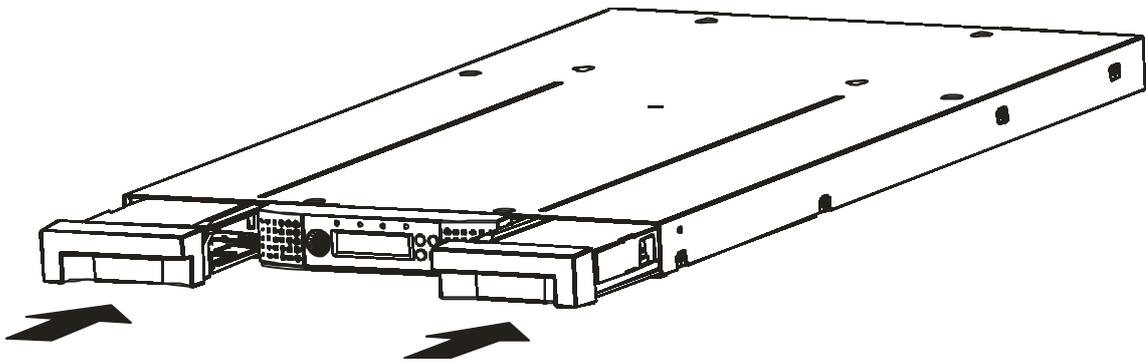


Figure 202 Insert magazines

7.5.2 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). It is recommended 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 loader 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 may require the use of the Administrative password.

To remove a magazine:

1. From the Home screen, press “Up” or “Down” 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 loader.
8. The screen will now display Insert Left Magazine, or Insert Right Magazine. The loader cannot perform any other operation until the magazine is replaced. After exchanging tapes in a magazine, slide the magazine completely into the loader. The magazine will lock into place once it is correctly installed and the loader will inventory the magazine.

7.5.3 Removing and replacing a magazine using the RMU

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

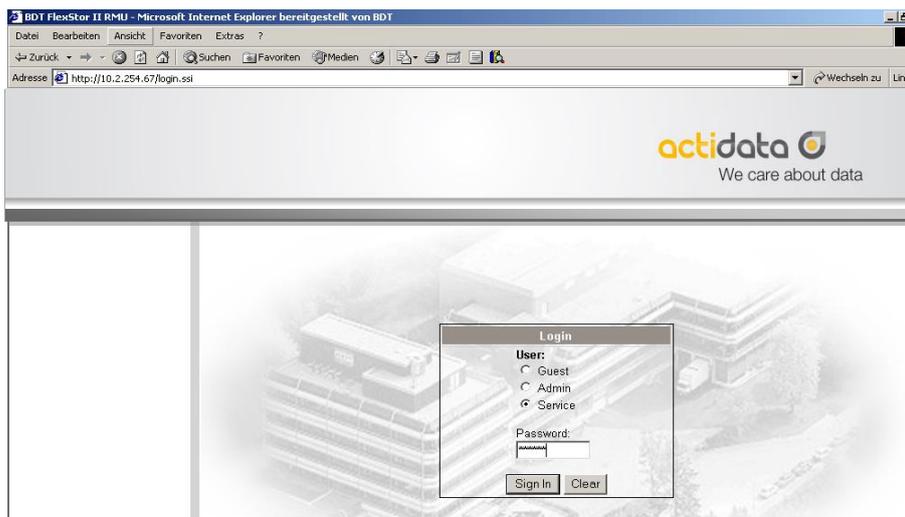


Figure 213 RMU Login page

2. Go to Operations > Magazines.
This page (see Figure 22) allows the user to release the right or left magazine from the loader.
3. Press the Release button.
4. Remove the magazine from the unit.



Figure 224 Operations, Magazine page

7.5.4 Slot numbering

The slot numbering scheme is shown in Figure 23 for the left magazine and Figure 25 for the right magazine.

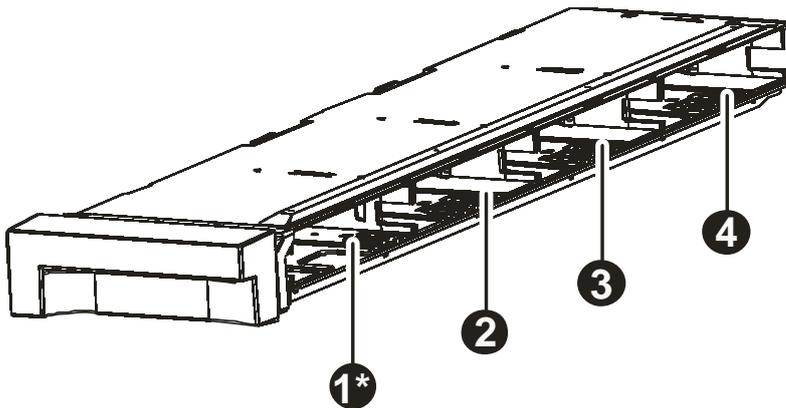


Figure 235 Slot numbering left magazine with mail slot

Number	Description
1*	Mail slot
2	LTO Slot
3	LTO Slot
4	LTO Slot

Table 7 Slot numbering, left magazine

7.5.5 Mail slot

Mail slots are used to import/export individual cartridges without interrupting loader 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.(See Figure 24)

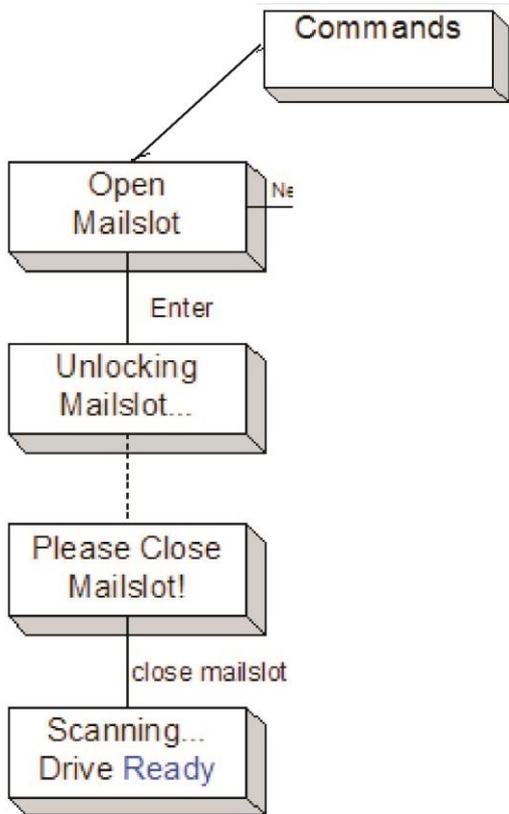


Figure 246 Handling mail Slot

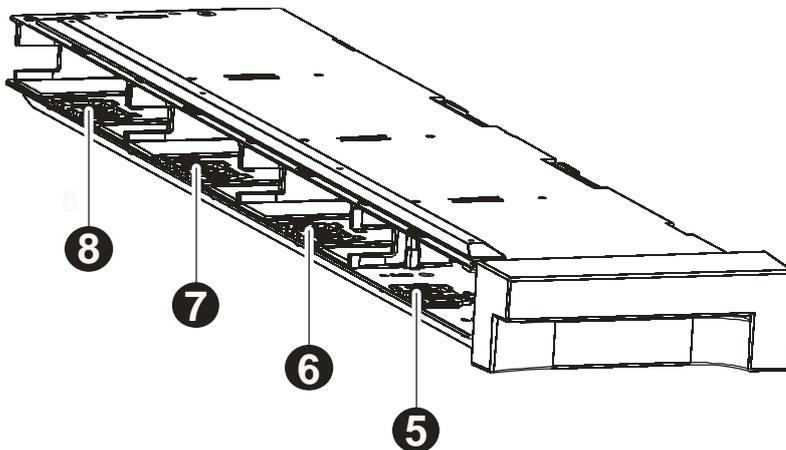


Figure 257 Slot numbering right magazine

Number	Description
5	LTO Slot
6	LTO Slot
7	LTO Slot

8	LTO Slot
---	----------

Table 8 Slot numbering, right magazine

7.6 Remote management unit (RMU)

7.6.1 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 loader 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 loader.

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

7.6.2 Loader status icons

Status icons indicate the following conditions.

Symbol	Description
	The green Status Ok icon indicates that the loader 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 loader is still capable of performing operations.
	The red X Status Error indicates that user intervention is required and that the loader is not capable of performing operations.

Table 9 Status icons

7.6.3 Login



CAUTION

Some options of the RMU take the loader offline. This inactive mode can interfere with host-based application software, causing data loss. Make sure the loader is idle before attempting to perform any remote operations that will take the loader 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.

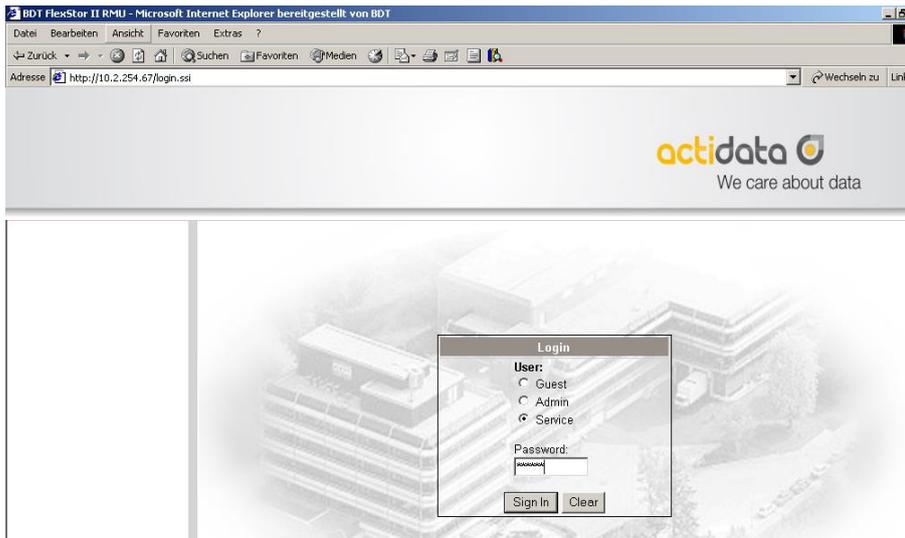


Figure 268 RMU Login page

7.6.4 Identity

7.6.4.1 Viewing static loader 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 loader Firmware
- Boot code Firmware Revision
- IP Address
- Loader Mode

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

System Status	
View Legend	
29-11-05 17:58:08	
Library Name	FLX80007B
Status	✓ Ready
Drive 1 Status	✓ Ready
Slots (Free/Total)	11/20
Mailslot	Closed
Library Time	17:58:08

Quick Links

- Support
- Help
- Logout

Figure 279 Identity, loader page

7.6.4.2 Viewing static drive information

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

The screenshot shows the actidata web interface. At the top right is the actidata logo with the tagline "We care about data". Below the logo is a navigation bar with tabs for Identity, Status, Configuration, Operations, and Service. Under the Identity tab, there are sub-tabs for Library and Drive. The main content area is divided into two columns. The left column contains a table of drive information, and the right column contains system status information. At the bottom right, there is a "Quick Links" section with links for Support, Help, and Logout.

Drive Information	
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

System Status	
View Legend	
29-11-05 17:58:39	
Library Name	FLX80007B
Status	✓ Ready
Drive 1 Status	✓ Ready
Slots (Free/Total)	11/20
Mailslot	Closed
Library Time	17:58:39

Quick Links

- Support
- Help
- Logout

Figure 40 Identity, drive page

7.6.5 Status

7.6.5.1 Viewing dynamic loader information

This page displays the dynamic information about the loader, 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

actidata
We care about data

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

System Status

[View Legend](#)

29-11-05 17:59:11

Library Name FLY80007B

Status ✓ Ready

Drive 1 Status ✓ Ready

Slots (Free/Total) 11/20

Mailslot Closed

Library Time 17:59:11

Quick Links

Support

Help

Logout

Figure 41 Status, loader page

7.6.5.2 Viewing dynamic drive information

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

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

System Status

[View Legend](#)

29-11-05 17:59:58

Library Name FLY80007B

Status ✓ Ready

Drive 1 Status ✓ Ready

Slots (Free/Total) 11/20

Mailslot Closed

Library Time 17:59:58

Quick Links

Support

Help

Logout

Figure 282 Status, Drive page

7.6.5.3 Viewing the tape cartridge inventory

This page provides detailed information about the tape inventory in the loader. 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

Mailslot	1	2	3

Drive	Status	Label	Source
1	Empty	-----	

Mailslot	7	6	5	4

Refresh

System Status

[View Legend](#)

29-11-05 18:00:29

Library Name FL/80007B

Status ✓ Ready

Drive 1 Status ✓ Ready

Slots (Free/Total) 11/20

Mailslot Closed

Library Time 18:00:29

Quick Links

[Support](#)

[Help](#)

[Logout](#)

Figure 293 Status, Inventory page

7.6.6 Configuration

7.6.6.1 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:

Loader Name

Loader LUN Hosted by Drive

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

Active Slots

Mail slot Enabled

Identity	Status	Configuration	Operations	Service
System	Drive	Network	User	Date/Time
Log	Event Notification	Restore Defaults		

System Configuration	
Library Name	FLX80007B
Library Master Drive	1
Library Mode	<input checked="" type="radio"/> Random <input type="radio"/> Sequential <input type="radio"/> Automatic
	<input type="checkbox"/> Autoload <input type="checkbox"/> Loop
Active Slots	20
Mailslot Enabled	<input checked="" type="checkbox"/>

Refresh Apply Selections

System Status	
View Legend	
29-11-05 17:19:06	
Library Name	FLX80007B
Status	Ready
Drive 1 Status	Ready
Slots (Free/Total)	11/20
Mailslot	Closed
Library Time	17:19:06

Quick Links	
Support	
Help	
Logout	

Figure 304 Configuration, System page

7.6.6.2 Changing the drive configuration

This page shows the current configuration of all drives in the loader 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	Drive	Network	User	Date/Time
Log	Event Notification	Restore Defaults		

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

Refresh Submit

System Status	
View Legend	
29-11-05 17:20:25	
Library Name	FLX80007B
Status	Ready
Drive 1 Status	Ready
Slots (Free/Total)	11/20
Mailslot	Closed
Library Time	17:20:25

Quick Links	
Support	
Help	
Logout	

Figure 315 Configuration, Drive page

7.6.6.3 Changing the network configuration

This page shows the current network configuration of the loader 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	Drive	Network	User	Date/Time
			Log	Event Notification
				Restore Defaults

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

System Status	
View Legend	
29-11-05 17:24:22	
Library Name	FLY80007B
Status	✓ Ready
Drive 1 Status	✓ Ready
Slots (Free/Total)	11/20
Mailslot	Closed
Library Time	17:24:22

Quick Links	
Support	
Help	
Logout	

Figure 326 Configuration, Network page

7.6.6.4 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 loader support

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

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

actidata
We care about data

Identity	Status	Configuration	Operations	Service
System	Drive	Network	User	Date/Time
			Log	Event Notification
				Restore Defaults

User Configuration

Access Level: 3

Access Level Name: service

New Password (Enter Up To Ten Characters):

Repeat Password:

OCP Access Pin Enabled:

OCP Access Pin Code:

Repeat OCP Access Pin Code:

Support Name:

Support Phone:

Support Email:

Refresh Submit

System Status

[View Legend](#)

29-11-05 17:29:35

Library Name: FL80007B

Status: Ready

Drive 1 Status: Ready

Slots (Free/Total): 11/20

Maislot: Closed

Library Time: 17:29:35

Quick Links

Support

Help

Logout

Figure 337 Configuration, User page

7.6.6.5 Setting date/time

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

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Identity	Status	Configuration	Operations	Service
System	Drive	Network	User	Date/Time
			Log	Event Notification
				Restore Defaults

Clock Configuration

Time (24H): 17 : 35 : 47

Date: Day: 29 Month: 11 Year: 2005

Refresh Submit

System Status

[View Legend](#)

29-11-05 17:35:50

Library Name: FL80007B

Status: Ready

Drive 1 Status: Ready

Slots (Free/Total): 11/20

Maislot: Closed

Library Time: 17:35:50

Quick Links

Support

Help

Logout

Figure 348 Configuration, Date/Time page

7.6.6.6 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**.

The screenshot shows the actidata configuration interface. The top navigation bar includes tabs for Identity, Status, Configuration (selected), Operations, and Service. Below this, there are sub-tabs for System, Drive, Network, User, Date/Time, Log (selected), Event Notification, and Restore Defaults. The main content area is divided into two columns. The left column is titled 'Log Configuration' and contains three sections: 'Error Log Mode' with radio buttons for Off, Continuous (selected), and Stop Trace At First Error; 'Trace Level' with checkboxes for Cmd, Response, Event, Trace Data, Low Level Trace, Recovered Error, and Hard Error; and 'Trace Filter' with checkboxes for Main, Drive, CDB Interpreter, Robotic, Trace, OCP Input, OCP Output, SCSI Module, and SDCI Module. There are 'Refresh' and 'Submit' buttons at the bottom of this section. The right column is titled 'System Status' and displays a 'View Legend' link, a timestamp '29-11-05 17:36:37', 'Library Name' 'FLX80007B', 'Status' 'Ready' with a green checkmark, 'Drive 1 Status' 'Ready' with a green checkmark, 'Slots (Free/Total)' '11/20', 'Mailslot' 'Closed', and 'Library Time' '17:36:37'. At the bottom right, there is a 'Quick Links' section with links for Support, Help, and Logout.

Figure 359 Configuration, Log page



INFORMATION

The trace level and trace filter selection options can be set by Service personnel.

7.6.6.7 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 loader errors via email

Notify Warnings – Select this item to be warnings of loader 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 the mail server of the individual you would like to receive the errors and/or warnings

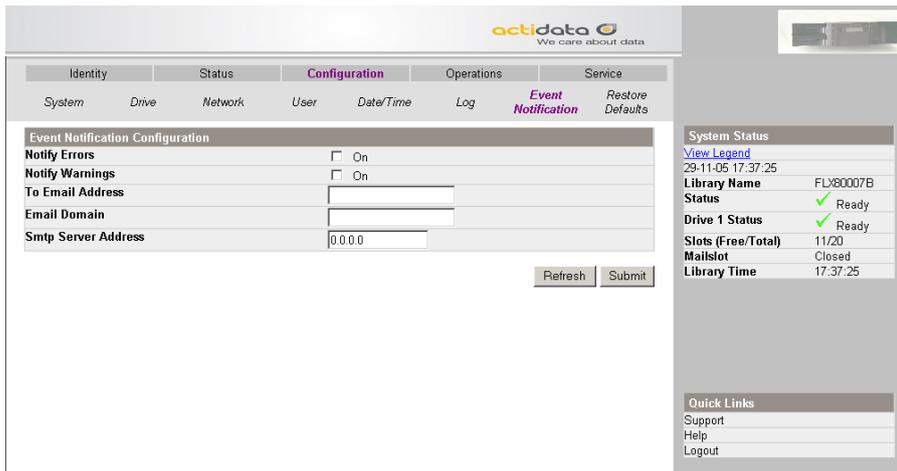


Figure 50 Configuration, Event notification page

7.6.6.8 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.

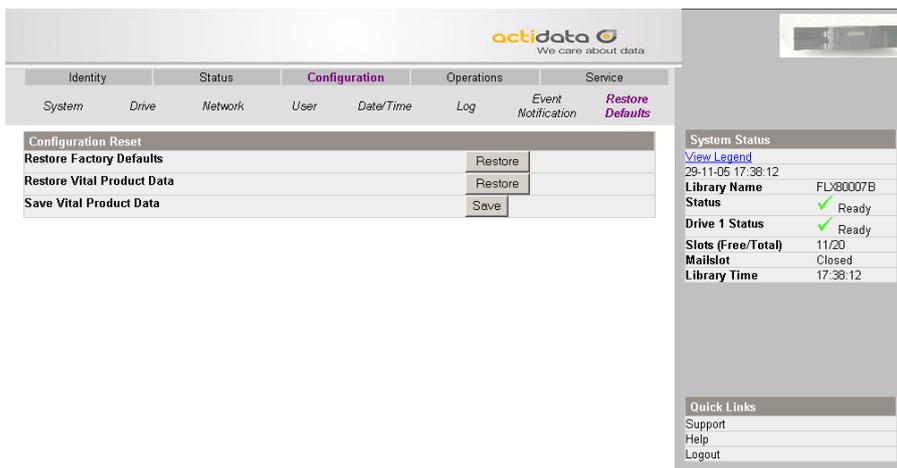


Figure 51 Configuration, Restore defaults page

7.6.7 Operations

7.6.7.1 Moving media within the loader

This page allows the user to move tape cartridges within the loader. The source and destination are selected and then the move button in the center of the screen is clicked to activate the move.



Figure 362 Operations, Move Media page

7.6.7.2 Determining current media inventory

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

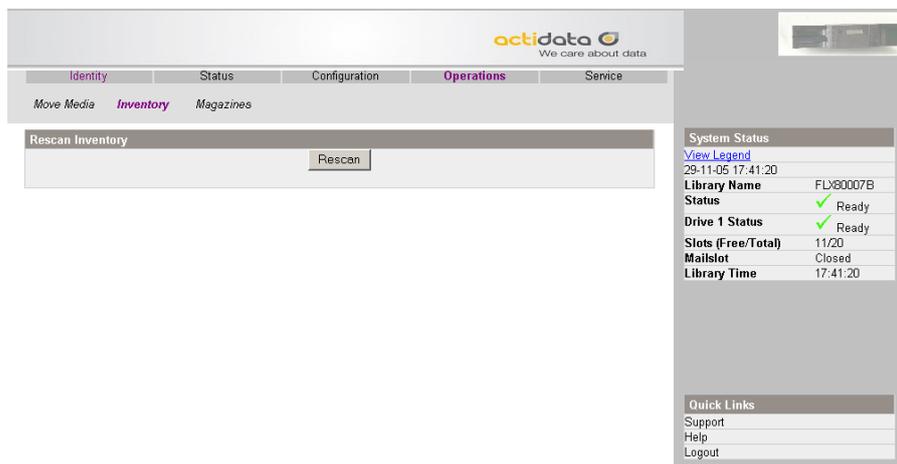


Figure 373 Operations, Inventory page

7.6.7.3 Releasing and replacing magazines

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

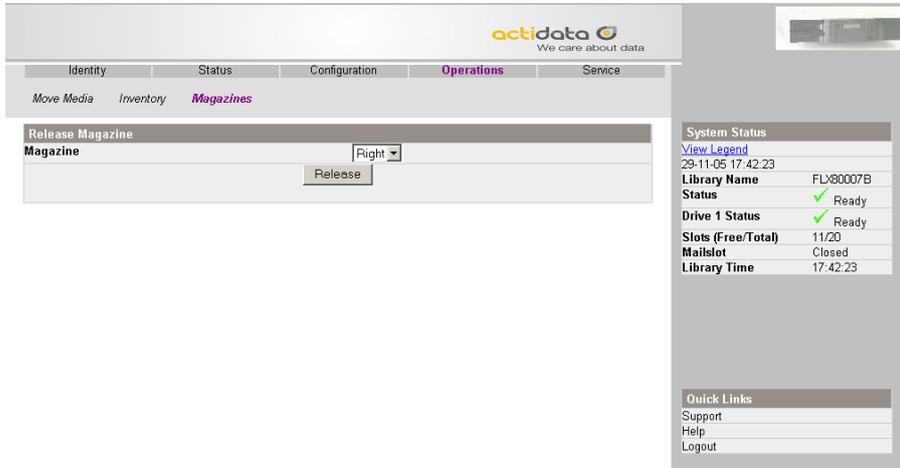


Figure 384 Operations, Magazine page



INFORMATION

To manually release a magazine, see "Magazine emergency release" section 8.1.10

However, this manual process should only be used if the magazine cannot be released using the Operator Control Panel or the Remote Management Interface

7.6.8 Service

7.6.8.1 Performing general loader diagnostics

This page provides the system administrator with general tests to verify the usability and reliability of the loader. 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.

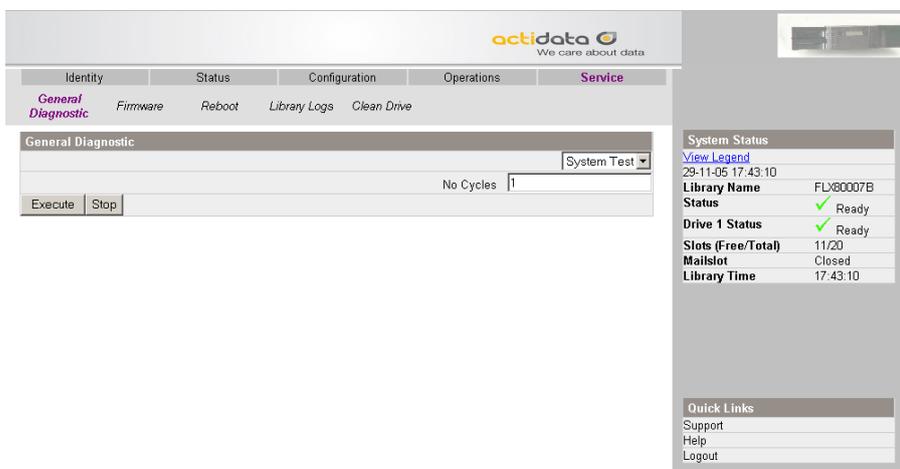


Figure 39 Service, General Diagnostic page

7.6.8.2 Determining and updating firmware

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



CAUTION

After a loader upgrade the system restarts automatic

The screenshot displays the 'Service' page for firmware management. It includes sections for 'Upgrade Library Firmware' and 'Upgrade Drive 1 Firmware', each with a file upload field and buttons for 'Durchsuchen...' and 'Upload'. The right sidebar provides system status information, including a 'View Legend' link, library name, status, drive 1 status, slots, mailslot, and library time. Quick links for support, help, and logout are also present.

Figure 406 Service, Firmware page

7.6.8.3 Rebooting the loader



CAUTION

Some options of the RMU take the loader offline. This inactive mode can interfere with host-based application software, causing data loss. Ensure that the loader is idle before attempting to perform any remote operations that will take the loader offline.

This page is used to perform a loader 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 loader may be lost. If the connection is lost, the user will have to reload the page manually.

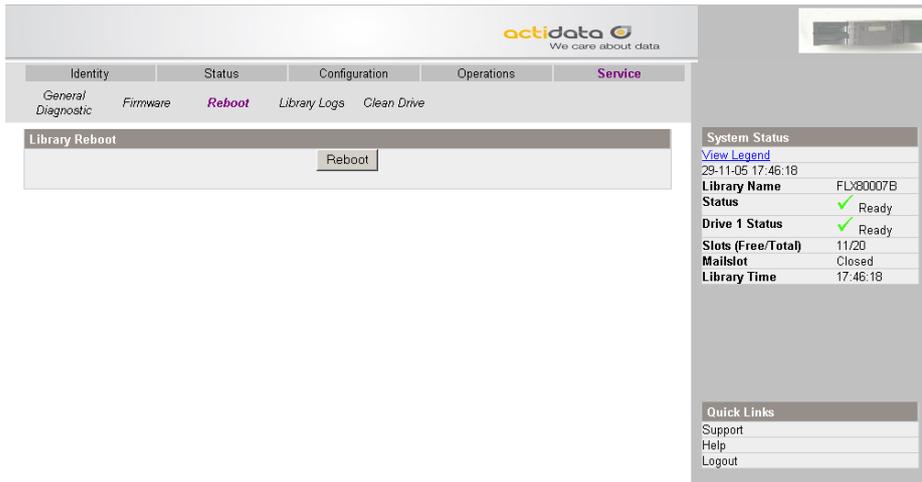


Figure 417 Service, Reboot page

7.6.8.4 Viewing loader logs

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

- Log Type
- Total Number of Entries
- Start Entry
- Number of Entries per Page
- Update
- Clear Log
- Dump Log

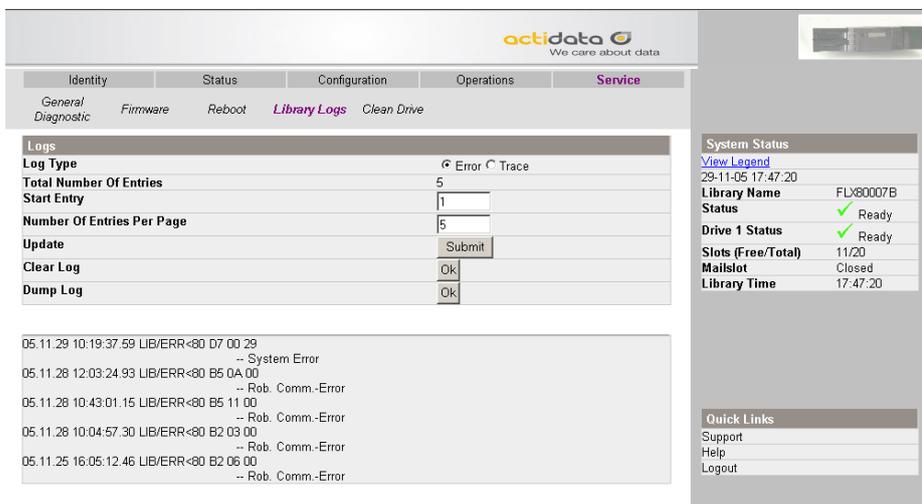


Figure 428 Service, Loader Logs page

7.6.8.5 Cleaning tape drive

This page allows the user to clean the tape drive.

The screenshot displays the actidata web interface for cleaning a tape drive. The top navigation bar includes 'Identity', 'Status', 'Configuration', 'Operations', and 'Service' (highlighted). Below this, a sub-menu shows 'General Diagnostic', 'Firmware', 'Reboot', 'Library Logs', and 'Clean Drive' (highlighted). The main content area is titled 'Clean Drive' and contains a form with two dropdown menus: 'Slot #' and 'Drive', both currently set to '1'. A 'Clean' button is positioned below the 'Drive' dropdown. To the right of the form is a 'System Status' section with a 'View Legend' link and the following data:

29-11-05 17:48:39	
Library Name	FLU80007B
Status	✓ Ready
Drive 1 Status	✓ Ready
Slots (Free/Total)	11/20
Mailslot	Closed
Library Time	17:48:39

At the bottom right, a 'Quick Links' section provides links for 'Support', 'Help', and 'Logout'.

Figure 439 Service, Clean drive page

8 Troubleshooting

8.1 Installation problems

Problems encountered during the installation of the loader 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 loader after installation, check the following:

8.1.1 SCSI ID

The loader 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 loader or tape drive before you can use the loader. 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 loader 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 loader 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 loader is the only SCSI device — other than the SCSI host adapter — on the selected SCSI bus, it must be terminated. Likewise, if the loader 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 loader, locate the terminator in the accessories package and press it firmly into either of the two SCSI connectors on the back panel of the loader. 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 loader 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 loader 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 loader robotics.

8.1.8 Device Driver Installation

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



INFORMATION

Many backup applications use their own drivers for the loader and drive. Before installing a driver, make sure it will not be in conflict with the software.

Troubleshooting table

Problem	Solution
Power	
Loader 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 loader. ■ Download loader firmware. ■ Contact your service representative.
Tape Movement	
Tape stuck in drive	<ul style="list-style-type: none"> ■ Power cycle the loader, allow it to complete initialization, which in rare cases can take as long as 10 minutes, and then retry unloading the tape using the loader 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 loader 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 loader 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 75.

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 loader. The loader 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 loader 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 loader 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 loader error codes” on page 79).

SCSI ID	
<p>Changed drive SCSI ID, but the host server does not recognize the new ID</p>	<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 loader after changing the SCSI ID. ■ Reboot the host server. Tape loader Performance The loader is not efficiently backing up data. ■ Make sure the loader 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 loader 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 loader. ■ Do not connect the loader 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 loader 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 loader.
Cartridge is incompatible	Use only cartridges that are compatible with the drive type. <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	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. <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 10 Troubleshooting table

8.1.9 Removing stuck tapes from slots

1. Unlock the magazine and remove it from the loader

-
- Use the OCP, see section 7.5.2, or
 - use the RMU, see section 7.5.3
2. The finger holes on the back side of the magazines (see Figure) allow the user to pull the cartridges out of the slot. Remove and insert the cartridge mechanically. Repeat the process ten times.

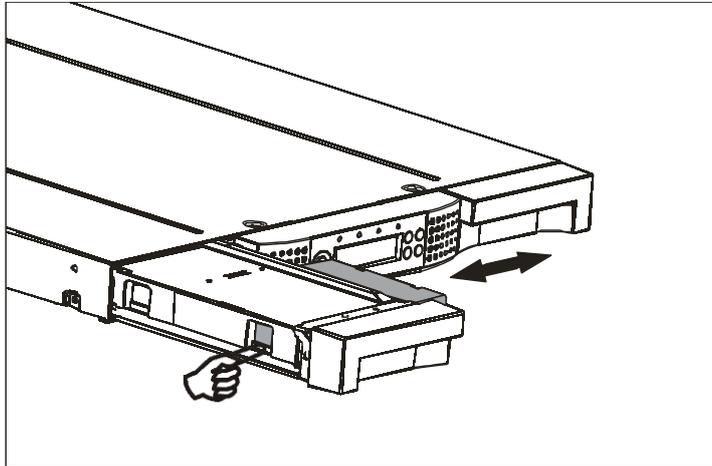


Figure 60 Removing stuck tapes from slot

3. During this process any burr on the cartridges will be removed.
4. Insert cartridge in the magazine
5. Put the magazine back to the tape loader.

8.1.10 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 loader.
2. Find the access holes for the right and left magazines (see Figure).

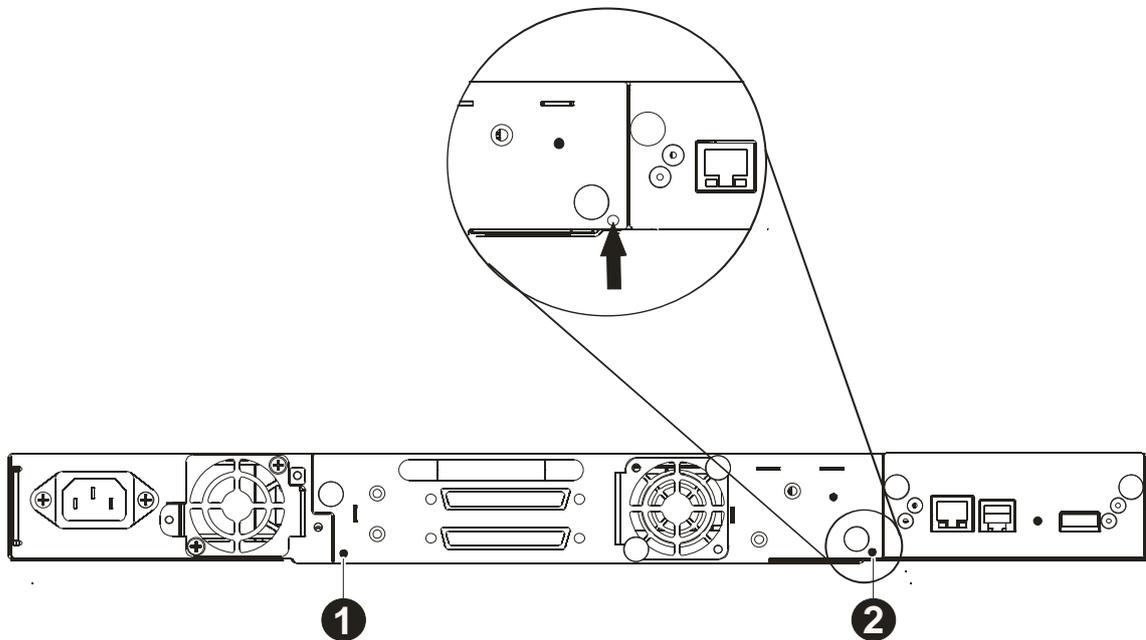


Figure 61 Access holes for the left and right magazine

Number	Description
1	Right magazine release
2	Left magazine release

Table 11 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 loader. While holding the paper clip, have a second person pull the magazine out of the front of the unit. See Figure 44

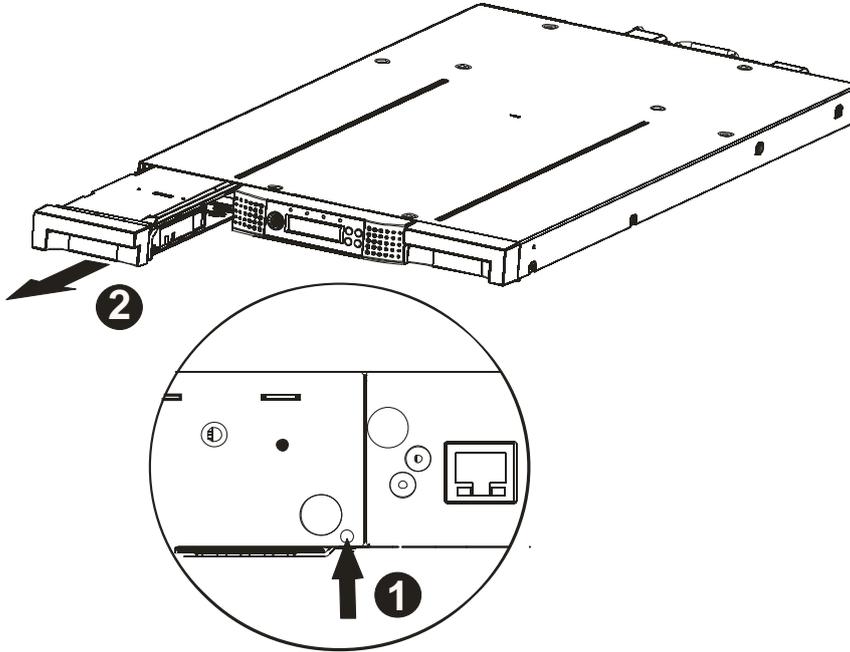


Figure 442 Remove the left magazine

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

Table 12 Removing the left magazine

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

8.2 Tape loader error codes

If an error occurs during operation of the loader, the loader stops the current operation and displays an error code on the LCD screen. Unless otherwise noted in Table 11 on page 85, try to resolve the error by cycling power to the loader and retrying the last operation. If the error persists, contact support personnel Support menu tree.

8.2.1 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 loader 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 'Loader Health Check', after several occurrences contact technical support
8A	Slider blocked	Run 'Loader Health Check', after several occurrences contact technical support
8B	Elevator blocked	Run 'Loader Health Check', after several occurrences contact technical support
8C	Rotation blocked	Run 'Loader Health Check', after several occurrences contact technical support
8D	Sled blocked	Run 'Loader Health Check', after several occurrences contact technical support
8E	Cannot find gripper block within the expected range	Run 'Loader Health Check', after several occurrences contact technical support

8F	Cannot find slider block within the expected range	Run 'Loader Health Check', after several occurrences contact technical support
90	Cannot find elevator block within the expected range	Run 'Loader Health Check', after several occurrences contact technical support
91	Cannot find rotation block within the expected range	Run 'Loader Health Check', after several occurrences contact technical support
92	Cannot find sled block within the expected range	Run 'Loader Health Check', after several occurrences contact technical support
93	Gripper outside range, Gripper has reached a position beyond the expected range	Run 'Loader Health Check', after several occurrences contact technical support
94	Slider outside range, Slider has reached a position beyond the expected range	Run 'Loader Health Check', after several occurrences contact technical support
95	Elevator outside range, Elevator has reached a position beyond the expected range	Run 'Loader Health Check', after several occurrences contact technical support
96	Rotation outside range, Rotation has reached a position beyond the expected range	Run 'Loader Health Check', after several occurrences contact technical support
97	Sled outside range, Sled has reached a position beyond the expected range	Run 'Loader Health Check', after several occurrences contact technical support
98	Cartridge present sensor not found	Run 'Loader Health Check', after several occurrences contact technical support

99	Slider home sensor not found	Run 'Loader Health Check', after several occurrences contact technical support
9A	Rotation home sensor not found	Run 'Loader Health Check', after several occurrences contact technical support
9B	Sled position sensor not found	Run 'Loader Health Check', after several occurrences contact technical support
9C	Gripper range out of specification	Run 'Loader Health Check', after several occurrences contact technical support
9D	Slider range out of specification	Run 'Loader Health Check', after several occurrences contact technical support
9E	Elevator range out of specification	Run 'Loader Health Check', after several occurrences contact technical support
9F	Rotation range out of specification	Run 'Loader Health Check', after several occurrences contact technical support
A0	Sled range out of specification	Run 'Loader 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 does 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	Web server 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
D5	Display Error Communication to display failed	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 SCSIIC detected	Retry operation; after several occurrences contact technical support
DA	In Wellness Test the barcode reader has read different barcode data for the same cartridge label	Check barcode on scratch cartridge and run 'LoaderHealth Check' again. If the error recurs, contact technical support
DB	External cooling fan error (fan motion has stopped). The sub code indicates which drive sled fan is affected	Check if the indicated fan is operational and not obstructed. If the error persists, contact technical support
F0	Drive Over temperature Condition Sub code 00: drive sled #1 Sub code 01: drive sled #2	Check ambient temperature conditions and check all fans, after several occurrences contact technical support
F1	Drive Communication Error, Loader controller has lost communication to drive	Retry operation; if not successful contact technical support

	Sub code 00: drive sled #1 Sub code 01: drive sled #2	
F2	Drive Sled not present Sub code 00: drive sled #1 Sub code 01: drive sled #2	Retry operation; if not successful contact technical support
F3	Drive Hardware Error	Cycle Power, after several occurrences contact technical support
F4	Drive Load Timeout Drive has run in a timeout while loading a tape	Retry operation; if not successful contact technical support
F5	Drive Unload Timeout Drive has run in a timeout while unloading a tape	Retry operation; if not successful contact technical support

Table 13 Main error codes

9 Servicing

9.1 Possible tools needed

To service a loader 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 loader 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 non-conducting 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 drive is installed at the back of the loader.

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 loader.



INFORMATION

This part is hot pluggable. It is not mandatory to power down the loader 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.

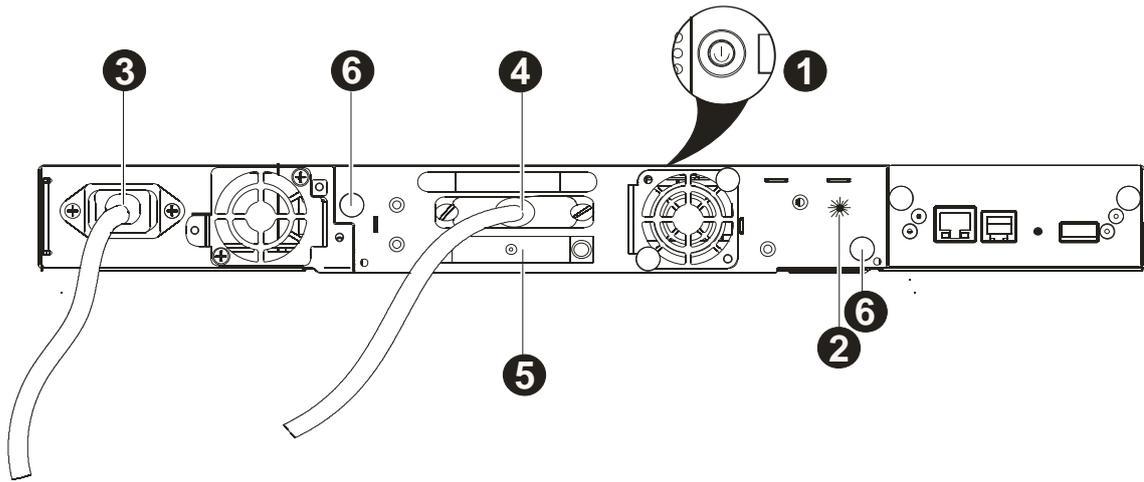


Figure 453 Drive sled components of rear panel

Steps	Description
1	Power down the loader 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 14 Description for Figure 45



IMPORTANT

Before pulling the drive sled out, please pull forward the product ID tag located below the drive sled (see figure 53 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 loader. Take care to slightly push down the product ID slide so it does not interfere with the drive sled (see Figure 46).

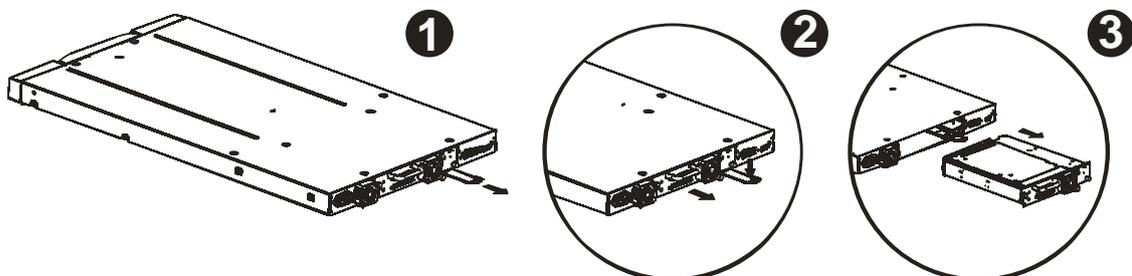


Figure 464 Tape drive removal

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 loader while supporting the drive assembly (see Figure 47).
3. Push the Product ID tag slide down slightly to prevent damage.

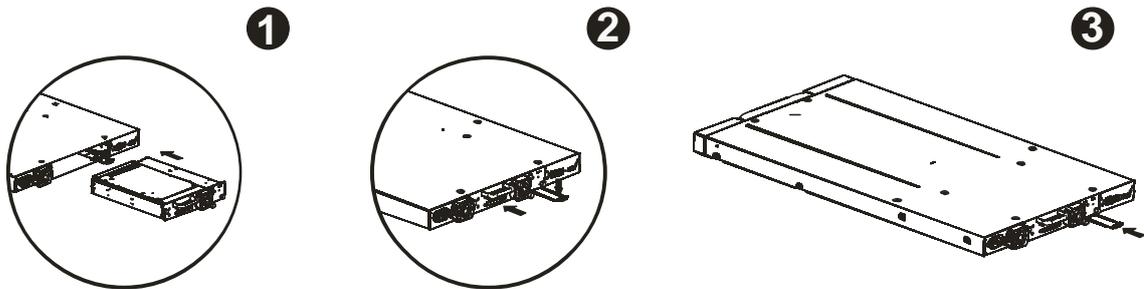


Figure 475 Installing a tape drive

4. Push the tape drive slowly into the drive bay until the drive seats itself against the back of the loader.



INFORMATION

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

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

9.4 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 does not contain a tape cartridge. To remove a cartridge, see “Moving tapes in the loader” 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 loader during removal and replacement.
2. Remove the magazines from the loader.
3. Turn off power to the loader and disconnect all cables.
4. From the front of the loader loosen the two screws anchoring the mounting brackets on the loader to the rack. These are captive screws and cannot be removed.
5. Remove your loader from the rack.
6. Remove the replacement loader enclosure from the packing materials.

-
7. Place the replacement loader enclosure on a solid surface in preparation for installation in to the rack.
 8. Remove the mounting brackets and guide pulleys from your loader and install them on the replacement loader.
 9. 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 loader.
 10. Install your drive in the replacement loader enclosure.
 11. Remove the shipping lock on the rear panel.
 12. Store the lock and label to the top cover (see [Figure 48](#)).
 13. Slide the replacement loader enclosure onto the metal rails that are already in position in the rack.
 14. Tighten the mounting bracket screws to anchor the replacement loader enclosure to the rack.
 15. Plug in the power cord and host interface cable into the replacement loader enclosure.
 16. Power on the loader.
 17. Run the Loader Verify test (refer to OCP “Service: Loader Verify”).
 18. Securely package the loader enclosure that was replaced, and return to repair center (see section 10)

10 Packaging before transportation



IMPORTANT

If you need to transport the loader, it is recommended that the shipping lock and label is replaced on the top cover (see Figure 48).

1. Please disconnect the loader.
 2. Remove the yellow label and the shipping lock. The shipping lock is store on the rear panel (see Figure 48).
 3. Store the lock and the label on the top cover.
- The shipping lock which prevents the robotic mechanism from moving during shipment.

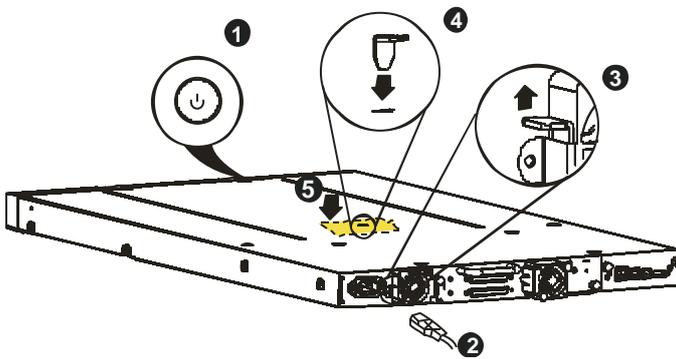


Figure 486 Replacing Shipping lock before transportation

4. Before sending the defect loader back, please contact the service department to give the information's of the Part and Serial Numbers (see Figure 49).

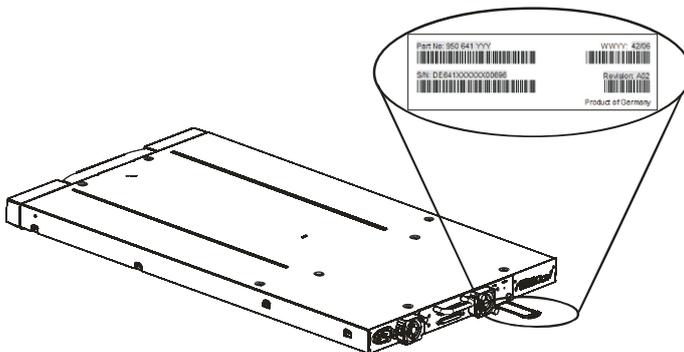


Figure 497 Product Label

5. Packaging the tape loader. Please use this reason original Box (see Figure 50).
6. Sending the loader to the service center.

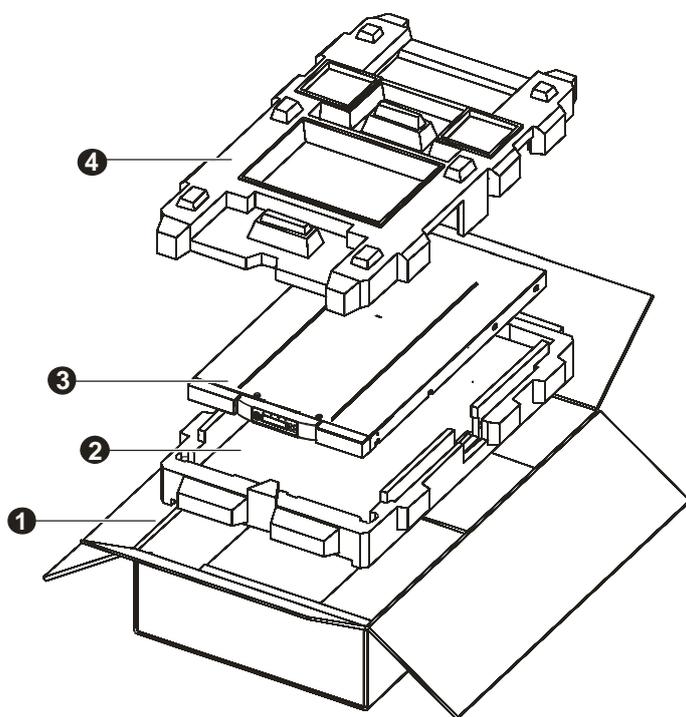


Figure 508 Re-Packaging the loader

Number	Description
1	Box
2	Bottom shell
3	Unit
4	Top shell

Table 15 Re-Packaging description

11 Technical actiLib Autoloader 1U specifications

11.1 Physical specifications

Characteristics	Product alone	Packaged
Height	45.6 mm (1.8")	235 mm (max.) (9.25")
Width	444.5 mm (17.5")	589 mm (23")
Depth	789.5 mm (31")	989 mm (39")
Weight	App.11.4 kg (including drive) (25 lbs)	19.5 kg (including: drive accessories: power cord, CD, Quick Start Guide) (43 lbs)

Table 16 actiLib Autoloader 1U physical specification

11.2 Maximum storage capacity and data transfer rate

Characteristics	Specification
actiLib Autoloader 1U with LTO3 half height drive	
Maximum storage capacity (8 data cartridges)	Native: 3.2 TB Compressed: 6.4 TB (assuming 2:1 compression)
Maximum data transfer rate per drive	Native: 60 MB/s (108 GB/hr.) Compressed: 120 MB/s (216 GB/hr.) (assuming 2:1 compression)
Drive type	LTO1, LTO2, LTO3 half height drive
Number of slots	8 (including mail slot)
MSBF	500,000 swaps
Interface	SCSI LVD/SE and SAS
Interface	Ultra160 and 3Gb/s

Characteristics	Specification
actiLib Autoloader 1U with LTO4 half height drive	
Maximum storage capacity (8 data cartridges)	Native: 6.4 TB Compressed: 12.8 TB (assuming 2:1 compression)
Maximum data transfer rate per drive	Native: 60 MB/s (108 GB/hr.) Compressed: 120 MB/s (216 GB/hr.) (assuming 2:1 compression)
Drive type	LTO2, LTO3 half height drive
Number of slots	8 (including mail slot)
MSBF	500,000 swaps
Interface	SCSI LVD/SE and SAS
Interface	Ultra320 and 3Gb/s

Table 17 Maximum storage capacity

11.3 Environmental specifications

Characteristic	Specification
Temperature	
Operating	10° to 35° C (50°-95° F)
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 18 Environmental specification

12 Recycling and disposal



INFORMATION

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

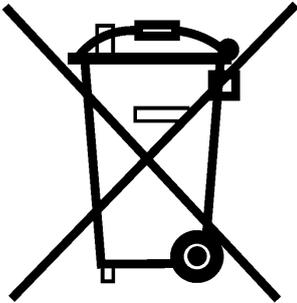


Figure 519 WEEE Symbol

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 loader compliance with safety and regulatory agency standards:



INFORMATION Use only approved SCSI and power cables

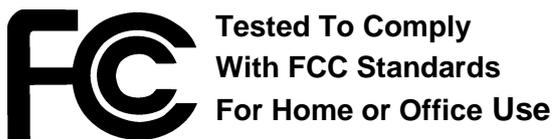
13.1 Device Standards

- 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	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 Certification

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

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