



SPECTRA SL3 LIBRARY INSTALLATION GUIDE



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SYSTEM BIOS

Resetting the system BIOS when not authorized by Spectra Logic Technical Support invalidates the system configuration. Spectra Logic reserves the right to charge for time and materials to reconfigure and recertify the system.

Warnings

Product Weight

Each SL3 module weighs more than 20 kg (44 lbs) without drives or tapes and more than 25 kg (77 lbs) with 3 tape drives and 40 tapes.

Risk of personal injury

Before moving or lifting a module:

- Observe local health and safety requirements and guidelines for manual material handling.
- Remove all tapes to reduce the weight and to prevent cartridges from falling into the robotics path and damaging the library.
- Remove all tape drives to reduce the weight.
- Obtain adequate assistance to lift and stabilize the module during installation or removal.



WARNING

Risk of damage to devices

When placing a module into or removing the module from a rack:

- Extend the rack's leveling jacks to the floor.
- Ensure that the full weight of the rack rests on the leveling jacks.
- Install stabilizing feet on the rack.
- Extend only one rack component at a time.



WARNING

Take care when cutting the straps securing the shipping box. The straps around the packaging are secured very tightly; the tension may cause them to whip outward when cut, which could lead to personal injury.

WARNUNG Vorsicht beim Schneiden der Bänder sichern Sie den Versandkarton. Die Riemen um die Verpackung sehr fest gesichert ist; die Spannung kann bewirken, dass sie nach außen, wenn sie geschnitten Peitsche, die zu Verletzungen führen können.

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United States Headquarters	European Office
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Contents

Warnings	8
Contacting Spectra Logic	9
About This Guide	11
Intended Audience	11
Typographical Conventions	12
Preparing for Installation	13
Acclimating the Spectra SL3 Library	13
Location Requirements	13
Unpacking the Spectra SL3 Library	17
Inventorying the Components	21
Installation	23
Preparing Top and Bottom Modules	23
Rack Installation	28
Table Top Installation	31
Installing Tape Drives	31
Connecting Cables	32
Connecting the Power Cords	33
Next Steps	34

ABOUT THIS GUIDE

This guide describes the unpacking and installation of the Spectra® Spectra SL3 library. The installation begins with the SL3 Base Module with a capacity for 40 tape cartridges and 3 half-height LTO tape drives.

The Spectra SL3 is expandable, allowing a user to grow their tape storage capacity as their data requirements increase by adding more expansion modules. Each expansion module provides an additional 40 tape cartridges and supports an additional 3 half-height LTO tape drives. The library supports up to 15 expansion modules, which brings the total library capacity to 640 tape cartridges and 48 half-height LTO tape drives.

Intended Audience

This guide is intended for data center administrators and operators who maintain and operate file storage systems. The information in this guide assumes a familiarity with computing terminology, RAID technology, SAS connectivity, and Ethernet networking. You also need to be familiar with installing, configuring, and using data file storage and archival software.

Typographical Conventions

This document uses the following conventions to highlight important information:



WARNING

Read text marked by the “Warning” icon for information you must know to avoid personal injury.



CAUTION

Read text marked by the “Caution” icon for information you must know to avoid damaging the hardware or losing data.



IMPORTANT

Read text marked by the “Important” icon for information that helps you complete a procedure or avoid extra steps.

Note: Read text marked with “Note” for additional information or suggestions about the current topic.

PREPARING FOR INSTALLATION

This chapter outlines the requirements for receiving and unpacking Spectra SL3 library components. Make sure that you complete these requirements carefully.

Acclimating the Spectra SL3 Library

You must allow time for the Spectra SL3 library to acclimate to the working environment when you move it from the loading dock.



CAUTION

When the base module is moved from a cold storage environment to a warm operating environment, it must acclimate for at least 24 hours before opening its packaging to prevent serious condensation damage from occurring.

Location Requirements

The SL3 Library is designed for both rack and tabletop installations. Rack installations must use the provided rack rails. Single module tabletop installations require no additional hardware. 2 Module (base module + one expansion module) installations must use the optional table top kit.

The location must have access to the host server. Use the table below for other criteria.

Criteria	Definition
Rack Requirements	Standard 19-inch rack with a minimum depth of 3.2 ft (1 m) with an appropriate number of rack units of clearance for the planned module quantity
Rack Space Requirements	3U for the Base Module and 3U for each Expansion Module
Room Temperature	10-35° C (50-95° F)
Power Source	<ul style="list-style-type: none">• AC Power Voltage: 100-240 VAC• Line Frequency: 50-60 Hz• Library Located near AC Outlet(s) The AC power cord is the library's main AC disconnect device and must be easily accessible at all times.
Air Quality	<ul style="list-style-type: none">• Place the library 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

Criteria	Definition
	<ul style="list-style-type: none"> Excessive dust and debris can damage tapes and tape drive
Humidity	20-80% RH non-condensing



CAUTION

The rack must be located on a level, hard-surfaced floor, such as cement or tile. Do not place the rack on a carpeted floor or anywhere else that poses risk for static discharge that could damage your system or its drives.

SAS Configuration Requirements

Serial Attached SCSI (SAS) is a computer bus technology mainly used to transfer data to and from storage devices, including disk drives and tape drives. SAS is designed to transfer data at up to 6 Gbps for LTO-8 and earlier generations and up to 12 Gbps for LTO-9 and later generation drives.

SAS uses serial connections, with a direct connection between the host server and each of the storage devices. This eliminates the need to configure SCSI busses and assign SCSI IDs, as is required for parallel SCSI devices.

The host server must have a **SAS Host Bus Adapter (HBA)** with an external connector. The HBA uses multiple **Logical Unit Numbers (LUNs)** to communicate with the library. Verify that your HBA supports multiple LUNs, as most RAID controllers do not. Most SAS HBA ports have four SAS channels. A tape drive uses one channel, so each HBA port can support up to four tape drives. You can use a cable with one connector on each end, but only one channel will be used.

Supported speeds by drive generation are shown in the table below.

Supported SAS Speeds	
LTO Generation	Supported Speeds
LTO-6	1.5 Gbps, 3 Gbps, 6 Gbps
LTO-7	1.5 Gbps, 3 Gbps, 6 Gbps
LTO-8	1.5 Gbps, 3 Gbps, 6 Gbps
LTO-9	3 Gbps, 6 Gbps, 12 Gbps
LTO-10	3 Gbps, 6 Gbps, 12 Gbps



CAUTION

High quality SAS cables rated at the transfer rate the SAS drives are required. Always verify that the SAS cable you are using is rated for the data transfer speed of the interface of your components. SAS cables described as "equalized" may not support 6 Gb/s data rates and should not be used with LTO 6 or later generation tape drives unless these cables are verified for 6 Gb/s data rates.



CAUTION

The library has one or more mini-SAS connectors on each SAS tape drive. Mini-SAS connectors are keyed. Do not force a SAS cable mini-SAS connector into the tape drive as it might be keyed different.

A SAS tape drive is identified by a unique identifier called a **World Wide Name (WWN)** or **World Wide Identifier (WWID)**. The library assigns the WWID to the drive bay. When a tape drive is replaced, the WWID is re-assigned to the new tape drive.

The operating system tracks the WWID for the tape drive on each HBA channel. Each of the drive connectors on the fan-out cable is associated with an HBA channel. Once a tape drive has been plugged in, it should remain on the same channel to retain the association between the HBA channel and WWID.

Fibre Channel Configuration Requirements

The Fibre Channel (FC) tape drive can be connected directly to the server with a **Host Bus Adapter (HBA)** or through a storage area network (SAN).

The installation requires one Fibre Channel cable for each tape drive. The tape drives all utilize an LC-style connector. Some drives will have two FC ports, but only one cable connection is needed per drive. The cable can be connected to either drive FC port.

Supported speeds by drive generation are listed in the table below.

Supported FC Speeds	
LTO Generation	Supported Speeds
LTO-6	2 Gbps, 4 Gbps, 8 Gbps
LTO-7	2 Gbps, 4 Gbps, 8 Gbps
LTO-8	2 Gbps, 4 Gbps, 8 Gbps
LTO-9	2 Gbps, 4 Gbps, 8 Gbps
LTO-10	32 Gbps

Note: Use an appropriate HBA for your tape drive due to performance requirements. A lower Gbps HBA might result in performance degradation when moving highly compressible data to a higher Gb tape drive.

In a SAN installation, all switches between the host and the library must be of the appropriate type. A lower Gb switch in the path may result in performance degradation. Configure zoning so only the back up servers may access the library.

Planning Module and Rack Layout

If possible, install the base module in the middle of the rack to provide space for the permitted eight expansion modules above and seven expansion modules below the base module.

Internal IP Range Selection

For internal communication between modules the library uses an Ethernet connection with an internal IP address range. To prevent any conflict between the internal IP address range and the external IP addresses, it is required to select the internal IP range before the library is connected to the external Ethernet port.

The IP values must use the following format: **RANGE = 192.0.2.x**

Host Preparation



CAUTION

Static Sensitive

Risk of damage to devices

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

Follow these general guidelines:

- Check with a system administrator before powering off the host computer.
- For a SAS library, confirm availability or install a SAS HBA that supports multiple LUNs.
- For a direct-attach fiber Channel library, confirm availability or install a FC HBA.
- For connection of a fiber channel library through a compatible switch, verify that sufficient ports are available.

Unpacking the Spectra SL3 Library



IMPORTANT

Do not unpack a Spectra SL3 library if the shipping box shows signs of damage. Contact both the shipping company and Spectra Logic (see "[Contacting Spectra Logic](#)" on page 9) to report the problem.

The Spectra Spectra SL3 library is shipped in a cardboard box attached to a pallet. The only tool needed to unpack them is a pair of scissors.

Save the box, anti-static bags, and foam packaging in case you need to move or ship the master node later.

Prepare the Unpacking Location

Move the pallet with the boxes to the location where you plan to install the Spectra SL3 module. Make sure you have adequate clearance around and above the shipping boxes so that you can safely unpack them. Have a sturdy work surface nearby that is large enough to accommodate the components as you unpack them.



WARNING

Product Weight

Each SL3 module weighs more than 20 kg (44 lbs) without drives or tapes and more than 25 kg (77 lbs) with 3 tape drives and 40 tapes.

Risk of personal injury

Before moving or lifting a module:

-
- Observe local health and safety requirements and guidelines for manual material handling.
 - Remove all tapes to reduce the weight and to prevent cartridges from falling into the robotics path and damaging the library.
 - Remove all tape drives to reduce the weight.
 - Obtain adequate assistance to lift and stabilize the module during installation or removal.

Risk of damage to devices

When placing a module into or removing the module from a rack:

- Extend the rack's leveling jacks to the floor.
 - Ensure that the full weight of the rack rests on the leveling jacks.
 - Install stabilizing feet on the rack.
 - Extend only one rack component at a time.
-

Unpack the Components

1. Inspect the shipping box for signs of damage.
 2. Use scissors to cut the straps securing the shipping box to the pallet.
-



WARNING

Take care when cutting the straps securing the shipping box. The straps around the packaging are secured very tightly; the tension may cause them to whip outward when cut, which could lead to personal injury.

WARNUNG Vorsicht beim Schneiden der Bänder sichern Sie den Versandkarton. Die Riemen um die Verpackung sehr fest gesichert ist; die Spannung kann bewirken, dass sie nach außen, wenn sie geschnitten Peitsche, die zu Verletzungen führen können.

3. Lift the top cover off of the shipping box.



Figure 1 Lift the top cover off of the shipping box.

4. Unpack the module from the box and place it on a work table.

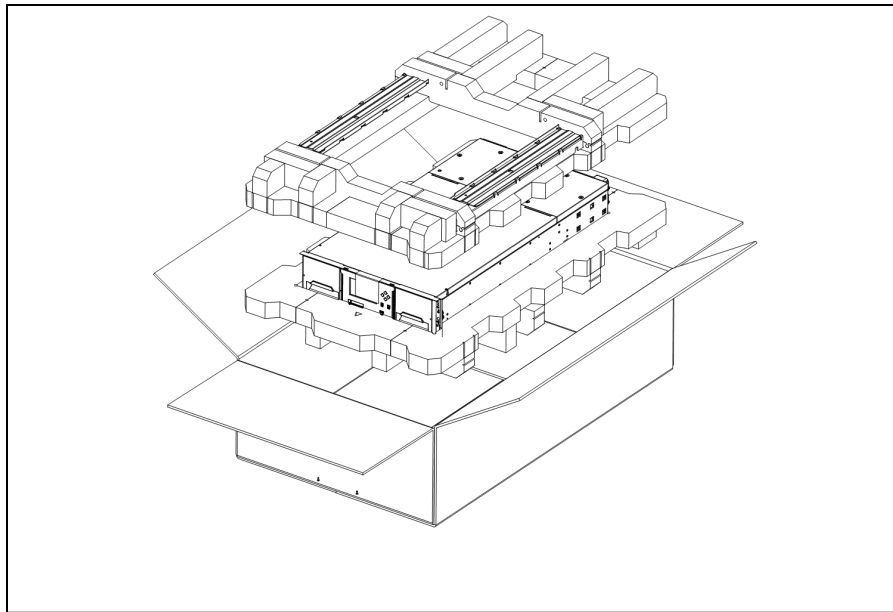


Figure 2 Remove the module.

5. The base module robotics are protected during shipment by a foam insertion, which has to be removed prior to installation. Remove the top cover plate from the base module and unlock the top cover using two small screwdrivers.

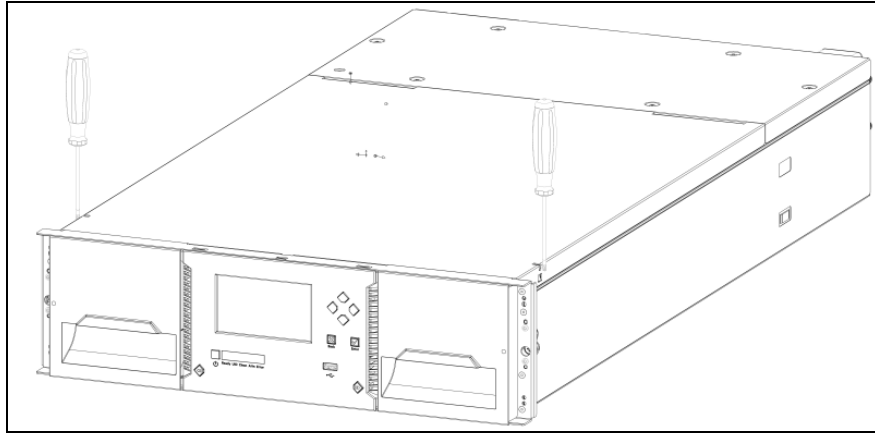


Figure 3 Unscrew the top cover place.

6. Lift the cover front end by about 4.7 in (12 cm) and pull gently forward to disengage from the pivot point at the unit center.

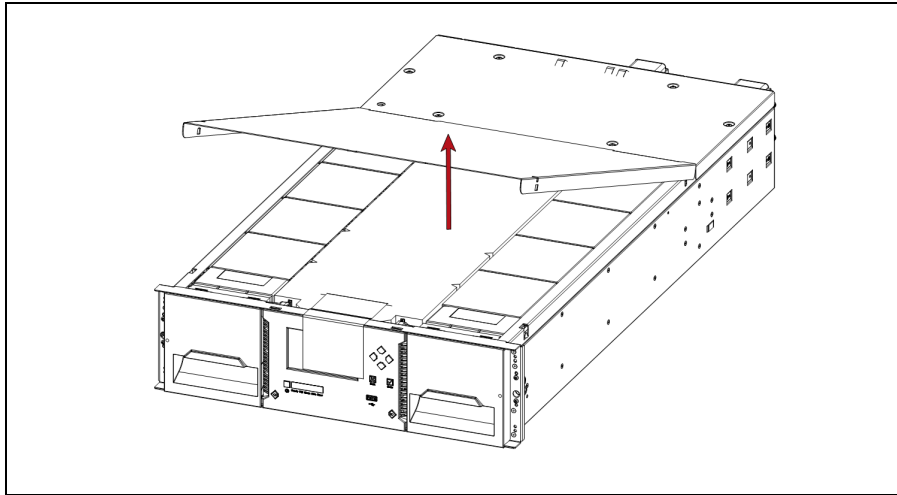


Figure 4 Lift the top cover.

7. Remove the foam insertion.

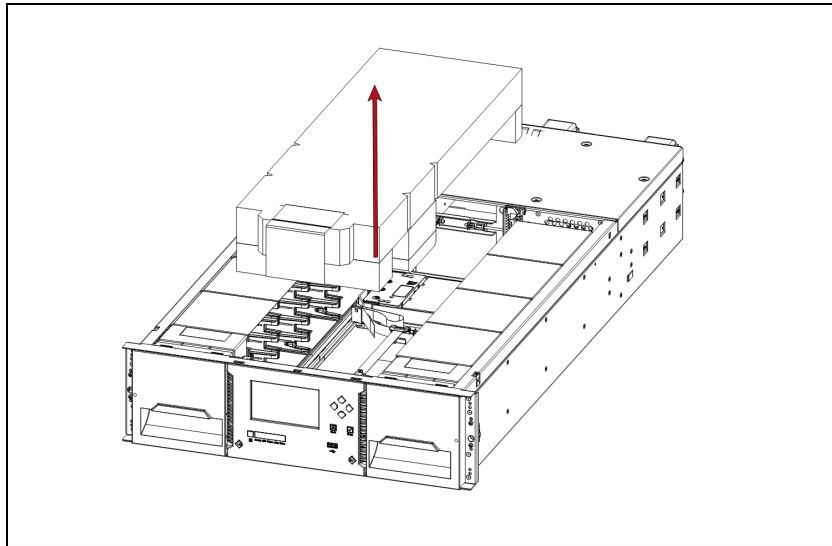


Figure 5 Remove foam insertion.

8. If you are installing a base module only, install the top cover again. If you want to install a library stack with multiple modules, see [Preparing Top and Bottom Modules](#).
9. Save the packaging materials for future use.

Inventorying the Components

Unpack and identify the components that shipped with the Spectra SL3 library module using the following table and the packing list for reference.

Base Module	
Component	Description
Base Module	The SL3 Library base module.
Two Rack Rails	Two racks rails for mounting the base module.
Accessory Kit	Includes one packet of rack mount hardware, one North American power cord, and one European power cord.
Four Module Feet	Four mounting feet for desk installations.

Expansion Module	
Component	Description
Expansion Module	The SL3 Library expansion module.

Expansion Module	
Component	Description
Two Rack Rails	Two racks rails for mounting the base module.
Accessory Kit	Includes one packet of rack mount hardware and one expansion interconnect cable

For SAS libraries, you must provide SAS cabling with the correct configuration for your HBA. For fiber channel libraries, you must provide one fiber channel cable for each tape drive.

INSTALLATION

This chapter describes the installation process for a Spectra Spectra SL3 library.

Preparing Top and Bottom Modules

Use the information in this section to prepare your Spectra SL3 library modules for a multiple module configuration. When installing expansion modules above or below the base module, move the base module top cover to the top expansion module, and move the base module bottom cover to the bottom expansion module.

Moving the Top Cover Plate

Use the following steps to move the library top cover plate from the base module to an expansion module.

1. Place the base module on a work table.
2. Unlock the top cover using a screwdriver.

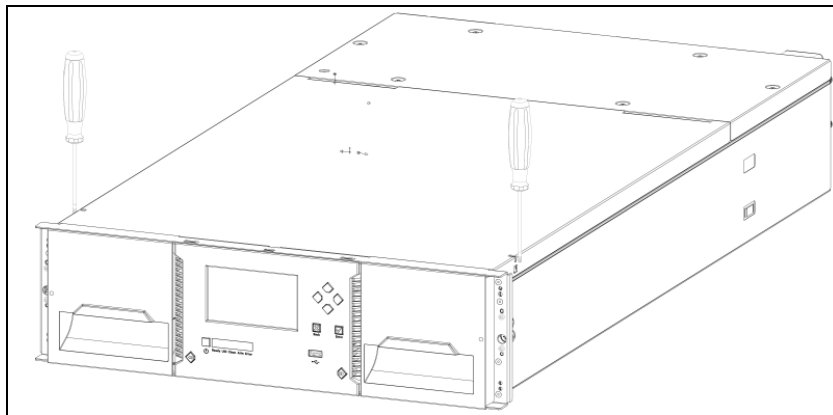


Figure 6 Unscrew the top cover.

3. Lift the cover front end (1) and pull gently forward (2).

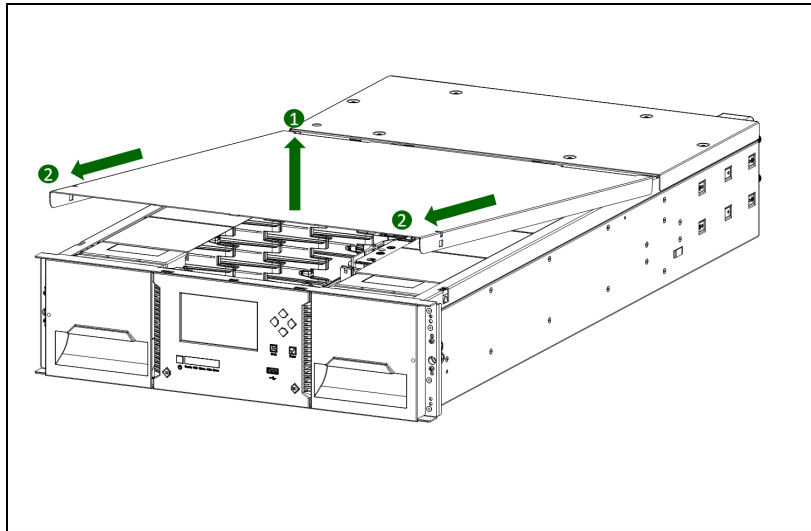


Figure 7 Remove the top cover from the base module.

4. Place the expansion module on a work table.
5. While raised, insert the top cover on the top of the expansion module, and lower the front of the top cover until the latches engage on both sides.

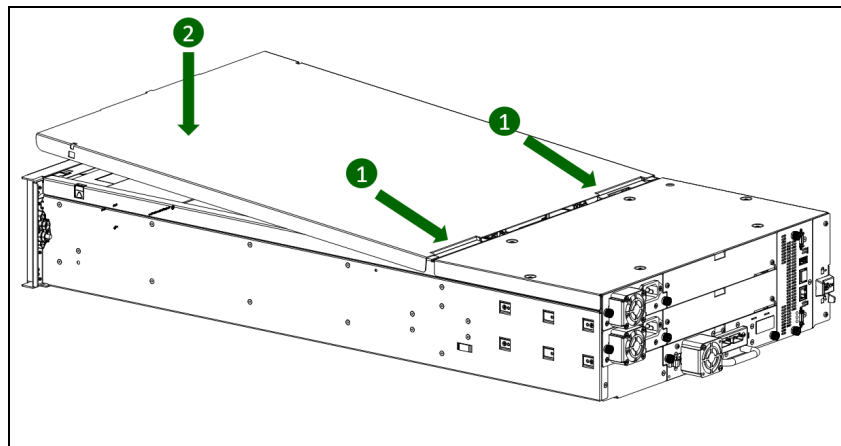


Figure 8 Insert the top cover into the expansion module.

Moving the Bottom Cover Plate

Use the following steps to move the library bottom cover plate from the base module to an expansion module.

1. Place the base module on a work table.
2. Lift the unit front end by about 6.3 in (16 cm). Unlock the bottom cover using a screwdriver.

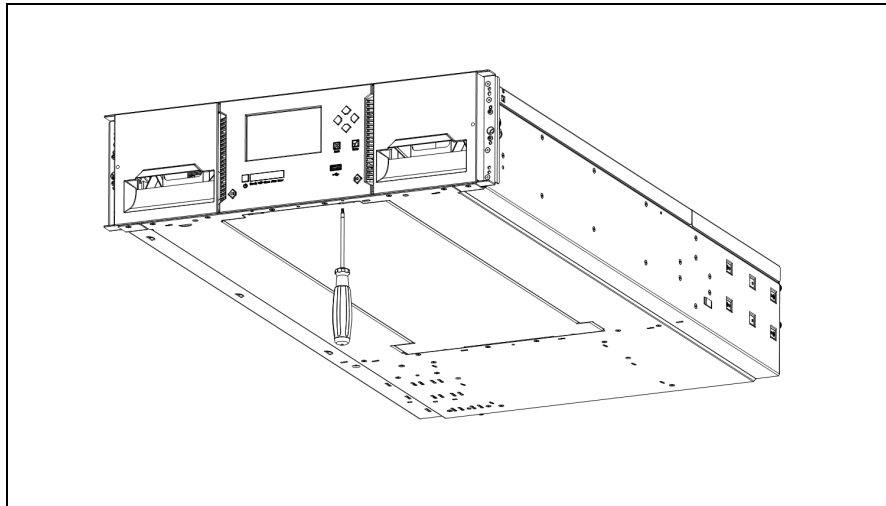


Figure 9 Unscrew the bottom cover.

3. Lower the cover (1) and pull gently forward (2).

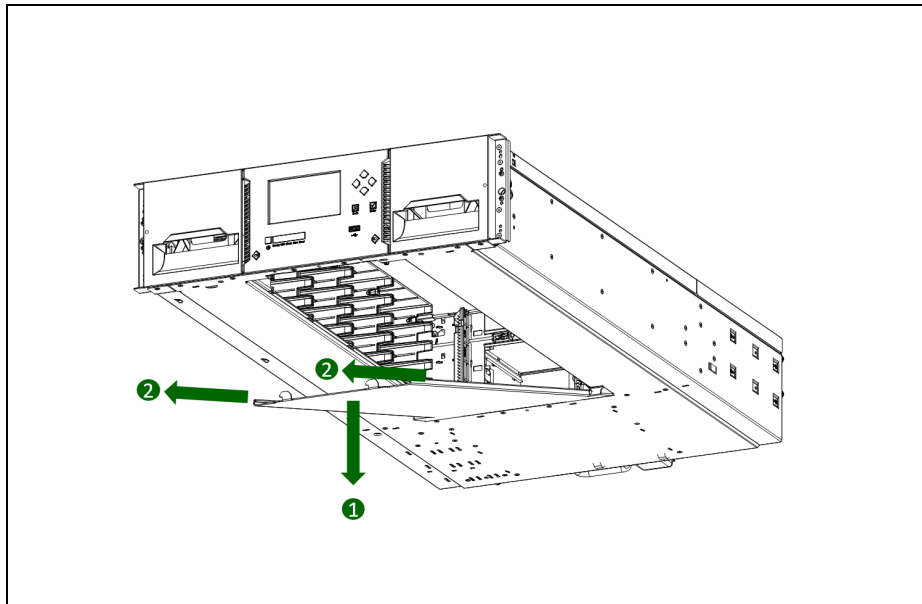


Figure 10 Remove the bottom cover from the base module.

4. Place the expansion module on a work table.
5. Lift the unit and insert the bottom cover on the bottom of the expansion module (1), and raise the front of the bottom cover until the cover locks in at the unit front (2).

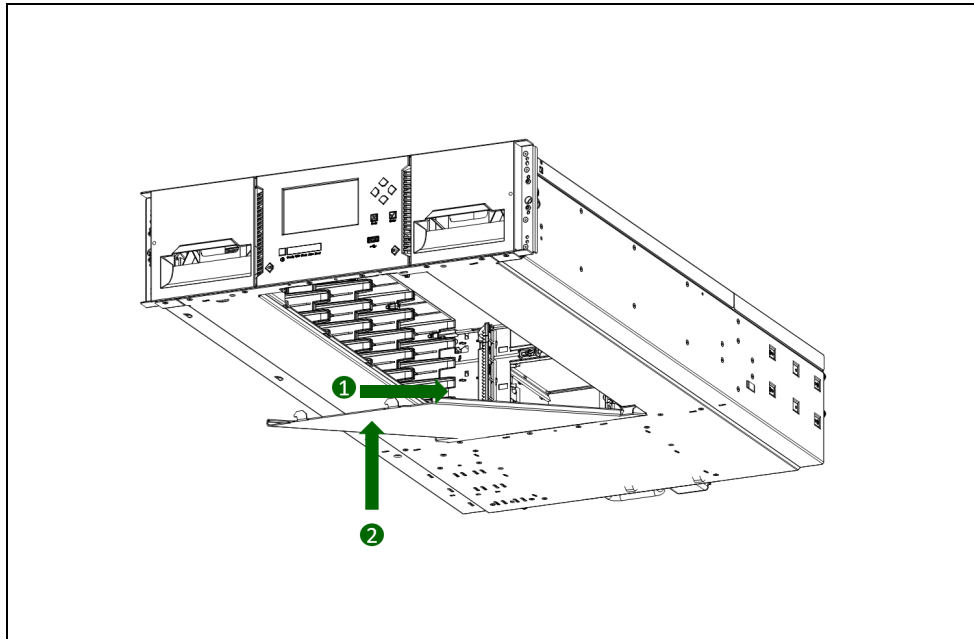


Figure 11 Insert the bottom cover into the expansion module.

Unlocking the Robotics

Use the following steps to unlock the robotics in the base module.



CAUTION

- Failing to unlock the robotics prior to use may result in serious damage to the library.
- Ensure all expansion modules below the base module are installed prior to unlocking the robotics. Failure may result in serious damage to the library.

1. Remove the top cover of the base module.
2. Locate the blue robotic lock lever near the back of the front panel.

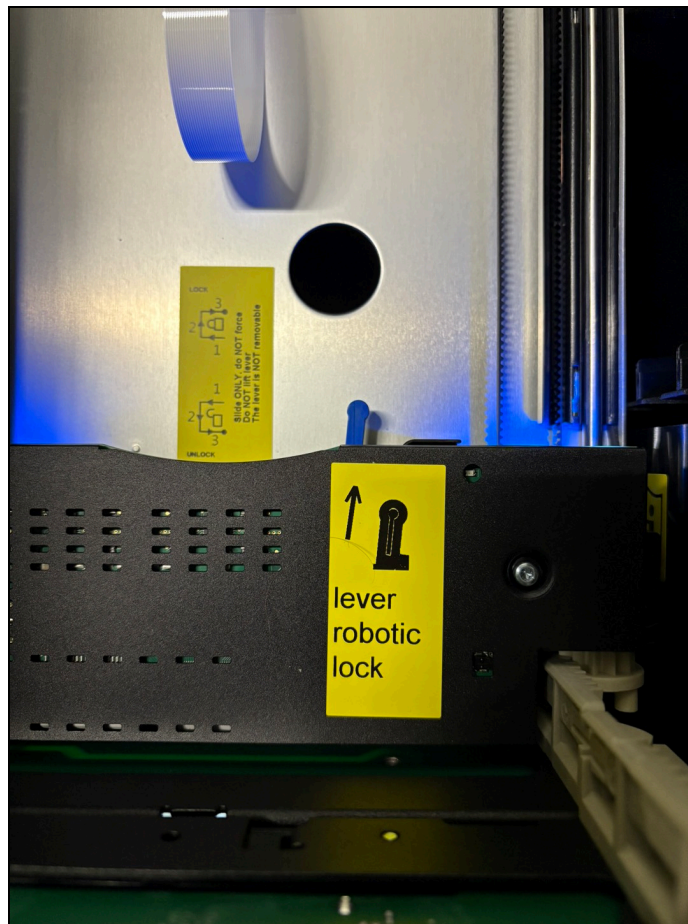


Figure 12 The robotic lock lever and interior instruction sticker.

3. Slide the latch to the left, pull the latch toward the front of the chassis, then slide the latch to the right.

Rack Installation

Use the information in this section to install a Spectra SL3 library module in a rack , or if you need to move and reinstall the module. The SL3 modules are easy to install in racks compliant to the EIA 310A Standard when at least one meter deep. You will need a #2 Phillips screwdriver for this process.

To locate the rail locations when installing multiple modules:

- Locate the bottom of the lowest full U where the lowest module will be installed.
- Continue identifying the locations for any additional module 3U higher.

To install the rails into the rack, starting from the lowest rack location:

1. Locate all four adapter blocks, four Phillips screws, and two rackmount rails (LH and RH).
2. On the front of the rack, mount an adapter block at the appropriate height to the right and left rack posts. Mount them in the middle square hole of the height unit (the middle of a height unit is the hole between two wide and neighboring division bars).

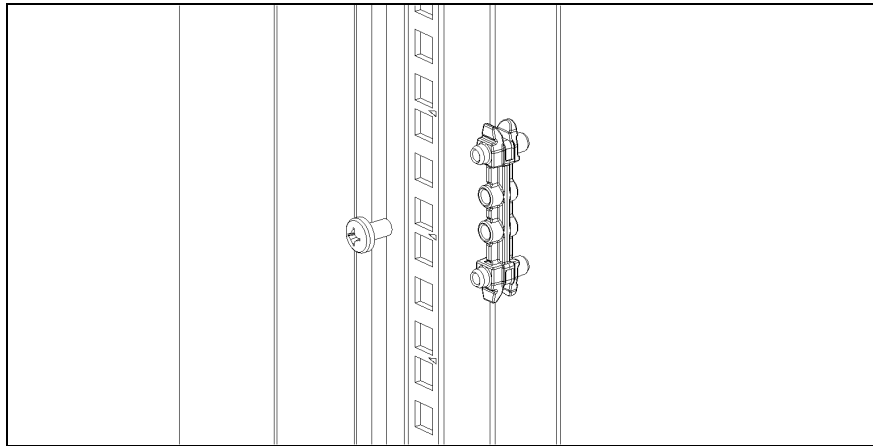


Figure 13 Mount the adapter block.

3. Repeat step 2 on the right and left rack posts in the rear of the rack.
4. Mount the LH rackmount rail to the adapter block, then mount the RH rackmount rail to the adapter block.

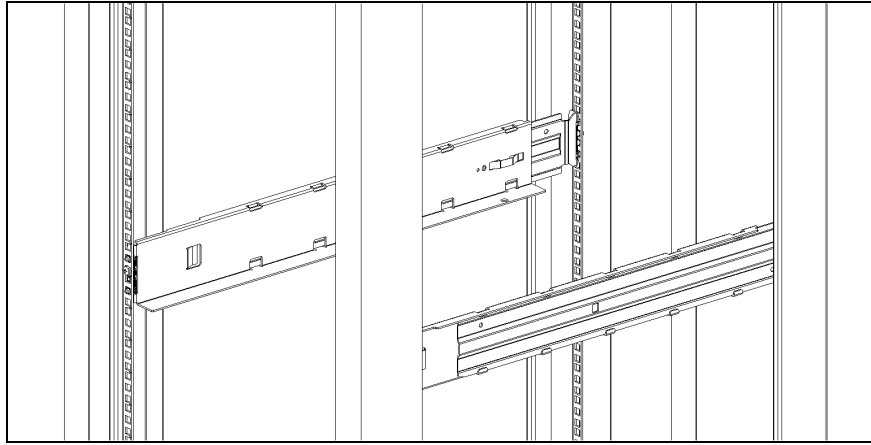


Figure 14 Mount the rackmount rails.

5. Place the module at the front of the rack on the support angles of the sliding rails and fully push the module into the rack.

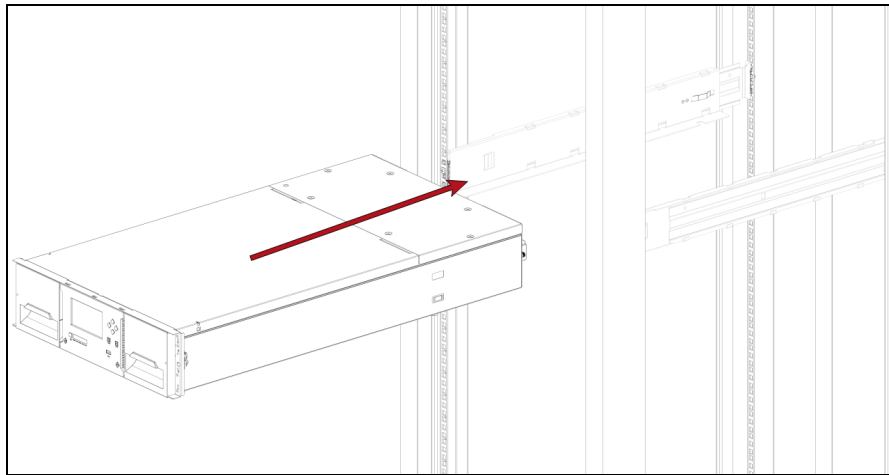


Figure 15 Push the module into the rack.

6. If you are installing multiple modules, verify that this module has been installed directly above or below its adjacent module and is contained within the correct 3U volume. The gap between modules must be less than 4 mm.
7. Use the screwdriver to tighten the screws on each side of the module.
8. Repeat these steps to install all modules into the rack.

Aligning and Connecting Modules

For SL3 libraries containing multiple modules, the library will not operate unless the alignment mechanism is locked in position. Aligning the modules ensures that the robot can move freely between the modules. Use the following steps to align and connect your modules.

1. From the front of the library, loosen the screens on each of the modules two full turns.

2. From the back of the library, beginning with the bottom pair of modules, align each module with the module below. Repeat for each pair of modules.
3. Move the alignment lever to the lock position. If you encounter resistance, adjust the position of the upper module so the pin in the alignment mechanism moves into the mating hole in the lower module.

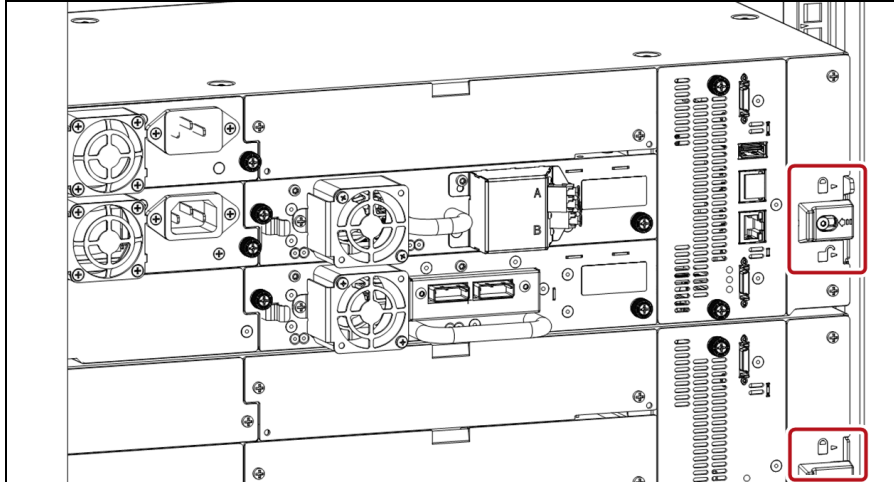


Figure 16 Lock the alignment lever.

4. Verify the lowest module in the library has the alignment mechanism in the unlocked position.
5. From the front of the library, tighten the screws on each of the modules to secure them to the rack.
6. From the back of the library, connect the modules of each pair to the adjacent module using the expansion interconnect cable.

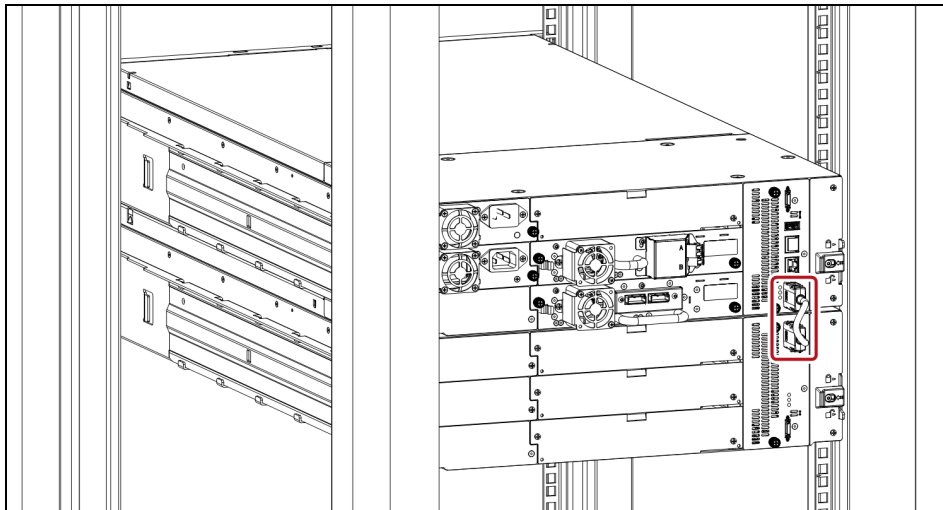


Figure 17 Connect the expansion interconnect cable.

Table Top Installation

Use this section to install a base module as a table top library.

Place the four feet on the bottom of the module as indicated in the figure below.

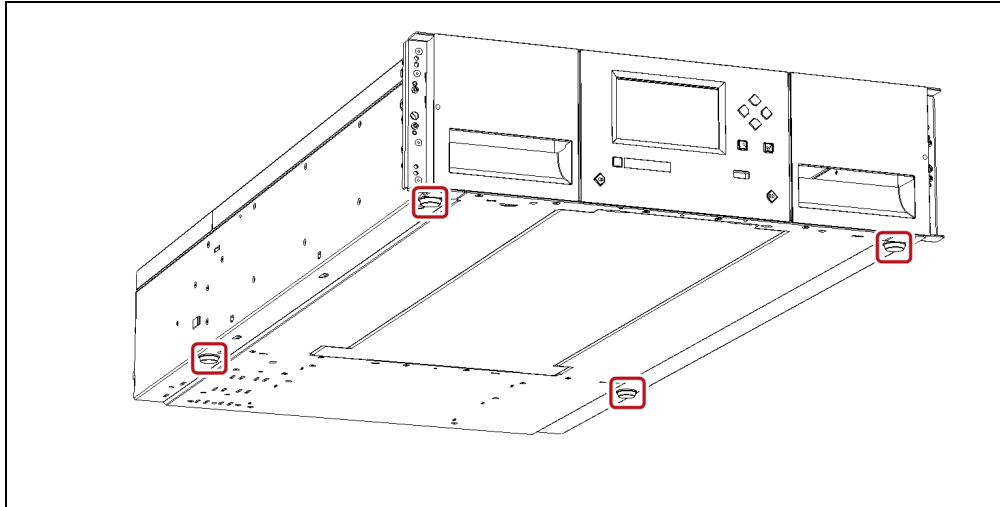


Figure 18 Place the feet in the bottom corners of the module.

Installing Tape Drives



CAUTION

Any damage to a Spectra SL3 library caused by failure to protect it from electrostatic discharge (ESD) voids the products's warranty. To protect the drives from damage:

- Wear an anti-static wristband, properly grounded, throughout the procedure. If a wristband is not available, touch a known grounded surface, such as the unpainted metal chassis.
- Leave the drive in its anti-static bag until you are ready to install it.
- Do not place a drive that is not in an anti-static bag, on any metal surfaces.

Use the following steps to install a tape drive.

1. Put on an anti-static wristband and attach it to an anti-static mat or an unpainted metallic surface. Continue to wear the wristband throughout the entire procedure.
2. Locate the empty drive bays where you want to install the drives.
3. Remove the face plate covering the drive bay by removing the screws holding it in place. Only remove drive bay covers for one drive at a time.

Install the Drives

1. Holding the tape drive by the handle and supporting it from the bottom, slide the tape drive along the alignment rails into the drive bay until it is flush with the back of the library.
2. Tighten the blue captive screws with your fingers to secure the tape drive to the library. If the thumbscrews cannot be tightened, verify that the tape drive is aligned properly.

Connecting Fiber Channel Cables

Use the following steps to connect fiber channel cables to tape drives.

1. Remove the FC port caps and attach one end of the FC cable to port A on the tape drive.

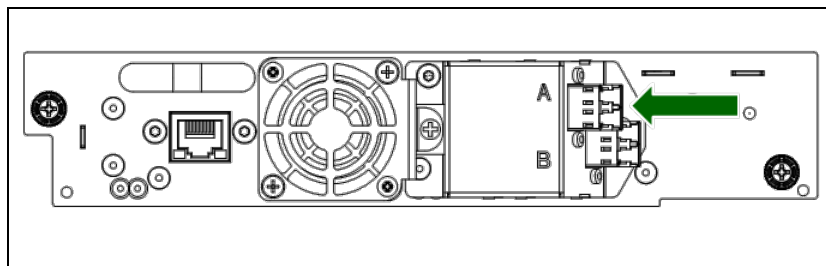


Figure 19 Connect the FC cable to port A.

2. Attach the other end of the FC cable to a switch or HBA.

Connecting SAS Cables

1. Attach the HBA end of the SAS cable to the HBA. If you are using a SAS fanout/Hydra cable, the end of the cable with only one connector should be plugged into the HBA.
2. Connect the drive end of the cable to port A.

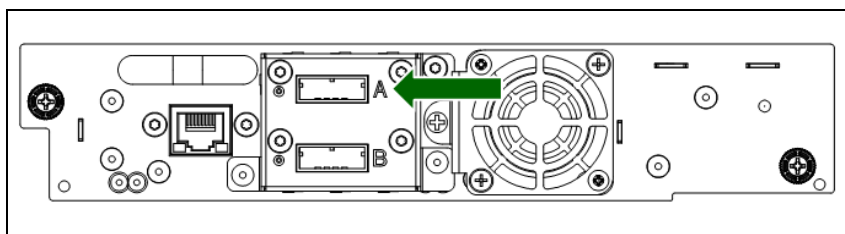


Figure 20 Connect the SAS cable to port A.

Connecting Cables

Fiber Channel Cables

Use the following steps to connect fiber channel cables to the SL3 library module.

1. Connect a Category 5 Ethernet cable to the Spectra SL3 library management port on the rear panel. Connect the other end of the cable to an active network over which a computer can access the system. This connection is used to access the web interface.

Note: The Spectra SL3 library management port is used to access the web interface and cannot be used for data transfer. Use a separate Ethernet port for data traffic.

2. Connect an Ethernet cable from your network switch to the appropriate connector (10GBase-T or 10 GigE) on the rear panel of the master node. This connection provides host access to the RAID storage on the master node. If you plan to configure link aggregation, connect additional cables as needed.
3. If your configuration includes a Spectra SL3 library 44-bay expansion node, connect an included SAS cable from any port on the four port SAS card in the Spectra SL3 library master node, to the **Front Primary In** connector on the expansion node. Connect a second cable from the master node to the **Rear Primary In** connector on the expansion node.

Connecting the Power Cords

Use the following steps to connect the power cords to the Spectra SL3 library base module.

1. Connect a power cord to each of the power supply connectors.

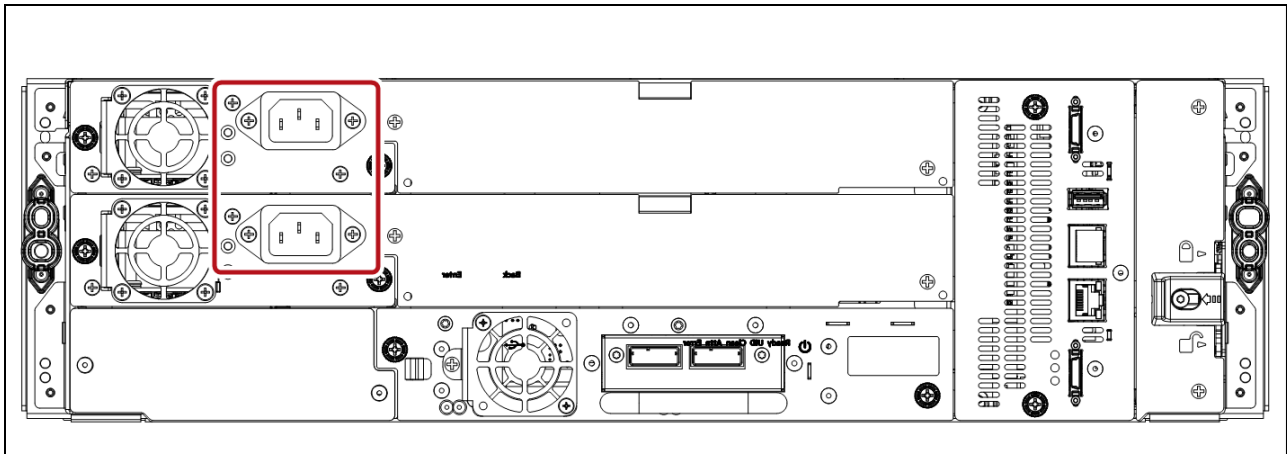


Figure 21 Connect the power cords to the power supplies.

2. Plug the other end of each cord into an AC power outlet. Spectra Logic recommends connecting the cords to separate electrical circuits for power redundancy.
3. To use the RMI, connect an Ethernet cable from the bottom Ethernet ports on the base module controller to your network.
4. Power on the library by pressing the power button on the base module just below the OCP. A green light will illuminate. When the library is powered on, it inventories the tape cartridges in the magazines, checks the firmware version on all modules, configures the tape drives, confirms the presence of the existing modules, and searches for any new modules.

Next Steps

Your Spectra SL3 library is now installed. For information about configuring and using the system, read the user guide on the [*Spectra Logic Technical Support website*](#).