IMPORTANT! Shipping Lock: The shipping lock must be removed for the robotics to work properly. A robot move error is displayed if the shipping lock is not removed. See Step 1, removing and storing the shipping lock.

WARNING! The HP StorageWorks MSL4048 Tape Library weighs a minimum of 30.2 kg (66 lb) and a maximum of 35.2 kg (77.6 lb) without media, and 46 kg (101.4 lb) with media (48 cartridges). When moving the Library, to reduce the risk of personal injury or damage to the Library: 1) observe local health and safety requirements and guidelines for manual material handing, 2) always remove all tapes to reduce the overall weight of the Library, and 3) obtain adequate assistance to lift and stabilize the Library during installation or removal.

WARNING! When placing the Tape Library into a rack, to reduce the risk of personal injury or damage to equipment:
• 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. Racks may become unstable if more than one component is extended.
• Use more than one person or a lifting device rated for at least 50 kg.

Unpacking the Tape Library
Remove the packaging, accessories and Tape Library from the box one layer at a time. Place the Library on a level work surface. Carefully remove the foam padding and then the bag from the Library. Save the packaging materials to move or ship the Tape Library in the future.

Identify product components
The Library product components found in the shipping carton will depend on the Library model.
1 Parallel SCSI cable (one per parallel SCSI drive)
2 Parallel SCSI terminator (one per parallel SCSI drive)
3 Daisy chain cable (in some parallel SCSI models)
4 SAS cable: connects up to four SAS tape drives to a SAS HBA (one per SAS Library).
5 Ethernet cable
6 Two rack rails
7 Two packets with eight M6 screws and two clip nuts each
8 Documentation kit
Optional tabletop conversion cover

CAUTION! Operating the Tape Library on a flat surface without the tabletop conversion poster may cause errors or damage to the Library.

The MSL4048 Tape Library can either be installed into a rack with the enclosed rails or installed into the optional tabletop conversion cover and set on a flat surface.

Front panel overview

1. Power button
2. Magazine and mailslot location
3. LEDs
4. LCD screen
5. Control keys
6. Air vents
7. Magazine

Back panel overview: parallel SCSI

NOTE: The Back panel overviews show sample configurations. Your Library may differ from these illustrations.

One full-height Ultrium parallel SCSI tape drive

Two half-height Ultrium parallel SCSI tape drives

Back panel overview: Fibre Channel

One full-height Ultrium 960 Fibre Channel tape drive

Back panel overview: SAS

One half-height Ultrium SAS tape drive
1  Removing and storing the shipping lock

**IMPORTANT!** The shipping lock must be removed for the robotics to work properly. A robot move error is displayed if the shipping lock is not removed.

The shipping lock prevents the robotic transport mechanism from moving during shipment, and must be removed and stored before powering on the Library. Locate the tape holding the lock at the top of the Library. Remove the tape, then remove the lock and store it as shown.

2  Optional: Installing the tabletop conversion cover

**CAUTION!** Operating the Tape Library on a flat surface without the tabletop conversion kit may cause errors or damage to the Library.

If you are installing the Library in a rack, skip this step. Place the cover on the work surface behind the Library. Slide the Library into the cover until the front panel of the Library is aligned with the cover. Tighten the four captive screws on the Library front panel until the cover is secure. Skip to Step 7.

3  Determining your rack type

You will need a #2 and a #3 Phillips screwdriver, the two rack rails, and the packet of M6 screws and clip nuts appropriate for your rack.

- The HP System/E rack has 7.1 mm round holes in the rack column. Choose the bag labeled **HP Rack System/E**.
- The HP 5000 and 10000 racks have 9.5 mm square holes in the rack column. Choose the packet labeled **HP Rack 5000, 10000**.
4 Securing the rails to the rack

After installing the rails, slide the Library onto the rails. Secure the front bezel to the rack using a #2 Phillips screwdriver placed through the small holes in the mounting bracket to tighten the captive screws on each side of the Library.

5 Installing the clip nuts

On the front of the rack, install one clip nut on each side in the location shown.

6 Installing the Tape Library

After installing the rails, slide the Library onto the rails. Secure the front bezel to the rack using a #2 Phillips screwdriver placed through the small holes in the mounting bracket to tighten the captive screws on each side of the Library.

7 Optional: Adding tape drives

With the tape drive upgrade kits, the Tape Library can hold up to four half-height tape drives or two full-height tape drives.

Add the new tape drive directly above the currently installed tape drives. Remove one drive bay cover for a half-height drive or two drive bay covers for a full-height drive. Slide the tape drive into the bay until it is firmly seated. Tighten the blue thumb screws to secure the drive to the Library.

8a Planning the parallel SCSI configuration: parallel SCSI

If you are unfamiliar with configuring parallel SCSI devices, read the parallel SCSI configuration information in the User and Service Guide on the documentation CD. Follow these general guidelines when planning the parallel SCSI configuration:

- The Ultrium 960 and 920 tape drives are Ultra320 SCSI devices. Only one Ultrium 960 or 920 tape drive should be put on an Ultra320 SCSI bus. Putting an Ultrium 960 or 920 tape drive on a slower bus or putting two drives on the same bus may degrade performance.
- The Ultrium 448 tape drive is an Ultra160 SCSI device. Only one Ultrium 448 tape drive should be put on an Ultra160 bus. Up to two Ultrium 448 tape drives can be on an Ultra320 bus.
- Avoid putting the Library on the same SCSI bus as a disk drive or SE device.
• The Library has an LVDS SCSI bus. It is NOT compatible with a standard differential (Diff) or High-Voltage (HVD) SCSI bus.
• The default SCSI ID for all full-height tape drives is 4.
• The default SCSI ID for half-height drives is 4 or 5, depending on the drive bay as shown below.

8c Planning the SAS configuration: SAS

The server must have a SAS HBA with an external connector. Most SAS RAID controllers do not support multiple LUNs, which are needed to communicate with the Library robotic.

WARNING! Do not connect the Library to a SAS RAID controller unless the EBS compatibility matrix shows that the controller is qualified with the Library. The server might not be able to boot when the Library is connected to a non-supported SAS RAID controller. Check the EBS matrix at http://www.hp.com/go/ebs to find a SAS HBA that is supported on your server and qualified with the Library.

8b Planning the Fiber Channel configuration: Fibre Channel

You must provide a Fibre Channel cable for each tape drive in the Library. Each Fibre Channel tape drive has two Fibre Channel ports. Only one port may be used at a time, but both ports can be connected for path failover if your application supports path failover.

Direct connection
You will need a 2 Gb or 4 Gb Fibre Channel HBA.

SAN connection
All switches between the host and the Library must be of the appropriate type. A 2 Gb switch in the path may result in performance degradation when backing up highly compressible data to a 4 Gb tape drive. Configure zoning on the fibre switch so only the backup servers can access the Library.

9 Changing the SCSI ID

If you need to change the SCSI ID for any of the tape drives, do so before connecting the Library to the host computer.

1. Attach the power cord to the Library.

2. Power on the Library from the front panel.

3. Check the LCD screen to make sure the Library is receiving power.

4. Use the control keys below the LCD screen to highlight Configuration > Drives > Drive #, where # is the number of the drive whose SCSI ID you need to change. Press the OK key.

5. Press OK to select the editable block. Use the Up and Down control keys to change the SCSI ID. Press OK to select the value.

6. Highlight Save and press OK to save the SCSI ID. Power off the Library.
10 Preparing the host

If necessary, install software, a host bus adapter (HBA), and compatible drivers in the host computer.

Ensure that your HBA supports multiple LUNs. For parallel SCSI devices, verify that multiple LUN support is enabled for the HBA and operating system.

HP recommends that the host server be powered down before attaching new devices.

11a Connecting the Tape Library: parallel SCSI

1. Attach one end of the SCSI cable to one of the connectors on the drive. Attach the other end of the parallel SCSI cable to the parallel SCSI host bus adapter (HBA), or to the connector on the previous device on the SCSI bus.

2. If the tape drive is the last or only device on the SCSI bus, attach a terminator to the remaining SCSI connector on the drive. Otherwise, attach a SCSI cable to the next device on the SCSI bus. Make sure that the last device on the SCSI bus is properly terminated.

3. Repeat Steps 1 and 2 until all drives are cabled and/or terminated.

NOTE: A parallel SCSI Ultrium 920 or 960 drive should be the only device on the bus. A maximum of two Ultrium 448 drives should be on a single SCSI 320 bus.

11b Connecting the Tape Library: Fibre Channel

1. Remove the FC port cap from Port A. Attach one end of the FC cable to Port A on the tape drive. Attach the other end of the FC cable to a switch or HBA.

2. Repeat for the other drive.

11c Connecting the Tape Library: SAS

The SAS cable supplied with the Library has a SAS 4x (IB) connector on the HBA end and four Mini SAS connectors on the tape drive end. This cable can be used to connect up to four tape drives to a SAS HBA. Any of the four connectors can be used for any tape drive.

SAS signal rates require clean connections and a minimum number of connections between the HBA and the Library. Do not use adapters or converters between the HBA and the Library. HP recommends a maximum SAS cable length of six meters.

1. Attach the HBA end of the cable to the SAS HBA.

2. Attach a connector to each tape drive.

The unused ends are single channel and not suitable for use with disk arrays. Use the other ends to connect tape drives, or coil and secure them to the rack to minimize stress on the connectors.
12 Powering on the Library

Plug one end of the Ethernet cable into the Ethernet port on the back of the Library. Plug the other end of the cable into an Ethernet LAN port.

Attach the power cable to the power connector and plug the Library into a power outlet. Power on the Library using the power button located at the front of the Library. Check the LCD screen to make sure the Library is receiving power.

Power on the host server and all devices you powered off earlier.

13 Setting the administrator password

Setting an administrator password provides access to the administrator functions with the remote management interface (RMI) and restricts access to administrator functions on the front panel from people who do not know the administrator password.

Passwords must be exactly 8 digits consisting of the numbers 0 through 9.

To assign a password through the Operator Control Panel:

1. Use the Control Keys below the LCD screen to highlight Configuration > Set Admin Password, press OK.

2. Press OK to select the editable block. The Left and Right Control Keys allow you to move between the digits in the password field. Use the Up and Down Control Keys to change the value of the highlighted digit. Press OK to set the value.

14 Setting date and time

This option sets the date and time used by the Library to record events and should be set during the initial installation process. Access to this feature requires the administrator password, if set.

Using the operator control panel:

1. Highlight Configuration > Set Date and Time, press OK.

2. Enter the administrator password if prompted.

3. Press OK to select the first block that can be edited. Use the Left and Right arrows to move between digits in the Date and Time fields. Use the Up and Down arrows to change the value of the highlighted digit. When the screen shows the desired value, press OK.

NOTE: When setting the hours, the time is based on a 24-hour clock. There is no AM or PM designation. For example, 1:00 PM is 13:00.

15 Configuring the networking

Configuring the networking enables you to monitor, configure, and control most Library functions from the remote management interface (RMI). By default, the Library will obtain an IP address from a DHCP server. You can configure the Library to use a static IP address. Once the Library has an IP address, you can change the network configuration from the OCP or RMI.

To see the IP address obtained from a DHCP server, go to the Info > Network option. To configure a static IP address, go to the Configuration > Network option.
16 Configuring the Fibre Channel ports: Fibre Channel

HP recommends leaving the Fibre Channel ports at the default settings of **Port Speed: Automatic** and **Port Type: Auto Detect**. With these settings, the tape drive will choose the appropriate configuration. See the *User and Service Guide* on the documentation CD for instructions on changing the Fibre Channel configuration.

17 Verify the installation

1. Use the HP StorageWorks Library & Tape Tools (L&TT) to verify the installation and check the Library and drive firmware.
2. Use the L&TT to update the firmware if necessary.

You can download the latest L&TT from [http://www.hp.com/support/tapetools](http://www.hp.com/support/tapetools).

18 Labeling tape cartridges

Attaching a bar code label to each tape cartridge enables the Library and application software to identify the cartridge quickly, thereby speeding up inventory time. Make it a practice to use bar code labels on your tape cartridges.

**IMPORTANT!** The misuse and misunderstanding of bar code technology can result in backup and restore failures. To ensure that your bar codes meet HP’s quality standards, always purchase them from an approved supplier and never print bar code labels yourself. For more information, refer to the Bar Code Label Requirements, Compatibility and Usage white paper available from [http://www.hp.com/support](http://www.hp.com/support).

Ultrium tape cartridges have a recessed area located on the face 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.
Loading the tape cartridges

Use the OCP Operations > Unlock Left Magazines option to release the left magazines. Pull both left magazines straight out of the Library.

The lower left magazine, which is designated by a white dot on the lower right corner, has a 3-slot mailslot in the front of the magazine. Leave these slots empty if you plan to enable the mailslot.

Insert tape cartridges in the magazines.
Replace the magazines in the Library.
Repeat for the right magazines.

Mailslot

The mailslot in the left magazine allows you to insert and remove tapes without removing the magazine. You can open the mailslot from the front panel or with host software that supports this function.

Register your Tape Library

Register your Tape Library online at www.register.hp.com. HP customers who register join a select group to receive technical support updates and special HP offers.

When the mailslot is disabled, M1 becomes slot 1, M2 becomes slot 5, M3 becomes slot 9, and all of the other slots are renumbered.
Using the operator control panel (OCP)

With the RMI, you can monitor the Library’s status, configure it, and control most of its functions from a web browser or terminal. SNMP can only be configured with the RMI.

Login
Using the OCP, find the Library’s IP address from the Info > Network screen. Open any HTML web browser and enter the Library’s IP address. Select the user level. For the administrator level you must also enter the administrator password. Click Sign In.

Once signed in, click Help in the upper right hand corner for more information about the fields and information in the RMI.

NOTE: You must set the Administrator password with the OCP before you can use the RMI’s administrator functions.

Status icons
- The green Status OK icon indicates that the Library is fully operational and that no user interaction is required.
- The blue exclamation point Status Warning icon indicates that user intervention is necessary, but that the device can still perform operations.
- The red X Status Error icon indicates that user intervention is required and that the Library is not capable of performing operations.

LED indicators
The OCP has four LEDs that provide a variety of information.

- Ready – Green when power is on, blinking with tape drive or Library robotics activity
- Clean – Amber when a cleaning cartridge should be used
- Attention – Amber if the Library has detected a condition that requires attention
- Error – Amber if an unrecoverable tape drive or Library error occurs. A corresponding error message displays on the LCD screen

Using the remote management interface (RMI)

The OCP displays a scrolling menu that lets you access information and execute commands using the five control keys: Up, Down, Left, Right, and OK.

Control keys
The operator control panel menu

HOME

Info

Status

Identity

Inventory

Network

Configuration

Library

Drives

Network

Barcode Reporting

Set Admin Password

Restore Defaults

Set Date and Time

Display Contrast

Operations

Open Mailslot(s)

Unlock Left Magazines

Unlock Right Magazines

Move Media

Inventory

Enable Password Locks

Support

Power On/Off Drives

Clean Drive

Run Tests

View Logs

Drive FW Upgrade by Tape

Force Drive Eject

Reboot

HP Service

Requires administrator password

Requires HP Service password
Helpful websites

For other product information, see the following HP websites:
http://www.hp.com
http://www.hp.com/go/storage
http://www.hp.com/support/
http://www.docs.hp.com
http://www.hp.com/go/ebs
http://www.hp.com/support/TapeTools
http://www.hp.com/go/media

Related documentation

In addition to this installation poster, the HP StorageWorks MSL2024, MSL4048, and MSL8096 User and Service Guide can be found on the documentation CD. The Guide will further explain the installation, configuration, and upgrade of the HP StorageWorks MSL4048 Tape Library.

These and other HP documents can be found on the HP documents website: http://www.hp.com/support/.

Ordering media

Use HP storage media to prolong the life of the Library and tape drives. To learn more about, or to purchase HP media, visit http://www.hp.com/go/storagemedia.

HP Ultrium 800 GB data cartridge Ultrium 3
Part number: C7973A

HP Ultrium 800 GB WORM data cartridge Ultrium 3
Part number: C7973W

HP Ultrium universal cleaning cartridge (50 cleans)
Part number: C7978A

HP technical support

Telephone numbers for worldwide technical support are listed on the HP support website: http://www.hp.com/support/.

Collect the following information before calling:
- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions
- For continuous quality improvement, calls may be recorded or monitored.

HP strongly recommends that customers sign up online using the Subscriber’s choice website: http://www.hp.com/go/e-updates.

Subscribing to this service provides you with e-mail updates on the latest product enhancements, newest versions of drivers, and firmware documentation updates as well as instant access to numerous other product resources.

After signing up, you can quickly locate your products by selecting Business support and then Storage under Product Category.