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LTO-3 Half-Height Tape Drive Quick Start Guide

Introduction

Quantum LTO Ultrium tape drives leverage LTO technology and Quantum-exclusive features to provide the most reliable and affordable tape data protection to medium and large businesses.

Quantum LTO-3 Half-Height Tape Drives, models TC-L32AX and TC-L32AN (internal), TC-L32BX and TC-L32BN (tabletop), and TC-L33CX and TC-L33CN (rackmount), are the most reliable Ultrium drives on the market, delivering reliability features only available from Quantum to extend media life, Variable-speed Transfer to automatically match the host's data transfer rate, and Dynamic Powerdown to protect the drive and media in the event of power loss. Combined with SmartVerify to concurrently verify all data written to the tape, these features make Quantum LTO drives a sound investment and a complete data protection solution.

Figure 1 Internal Drive



Before Installing the LTO-3 Half-Height Tape Drive

Handling Precautions and Installation Guidelines

Always observe the following precautions and guidelines when handling and installing LTO-3 Half-Height Tape Drives:

- Internal, at all times
- Tabletop, when removed from its free-standing enclosure

<p>Handling Precautions</p>	<ul style="list-style-type: none"> • Internal drives have exposed components that are sensitive to static electricity. To reduce the possibility of damage from static discharge, the drives are packaged in a protective antistatic bag. Do not remove the drive from the antistatic bag until you are ready to install it. • Wear an ESD-preventive grounding wrist strap or observe similar ESD precautions when working with the drive. Be sure the wrist strap makes good skin contact. Do not remove the wrist strap until you finish working with the drive. Also, avoid contact between the drive, other equipment, and clothing. The wrist strap only protects the equipment from ESD voltages on the body; ESD voltages on clothing can still cause damage. • Before removing the drive from the antistatic bag, touch a grounded metal surface to discharge any static electricity buildup from your body. • Handle the drive by its sides rather than by the top cover to reduce the risk of dropping the drive or damaging it during installation. • Either lay the drive on a nonconductive surface or put it back inside the protective antistatic bag to reduce the chance of damage from static discharge
<p>Installation Guidelines</p>	<ul style="list-style-type: none"> • LTO-3 Half-Height Tape Drives with the parallel SCSI interface are low voltage differential (LVD) SCSI devices. Install LVD drives only in LVD environments. Do not mix LVD and HVD devices on the same parallel SCSI bus. • Due to the high speed of the LTO-3 Half-Height Tape Drive, do not connect more than one LTO-3 drive to the same host bus adapter (HBA).

Preinstallation Requirements

Before installing the LTO-3 Half-Height Tape Drive, make sure you have:

- A host bus adapter (HBA) installed and properly configured in the host computer:
 - Parallel SCSI HBA for a parallel SCSI drive
 - Serial SCSI HBA for a SAS drive
- Interface components:
 - For a parallel SCSI drive, either internal or tabletop, a 68-pin parallel SCSI cable and terminator
 - For a SAS drive, either:
 - 7-pin 1x SATA-style interface cable for an internal drive
 - 26-pin SFF-8088 mini-SAS style interface cable for a tabletop drive
- Backup application software that supports the tape drive. For a list of the backup software applications that have been tested with the LTO-3 Half-Height Tape Drive, please visit our website at:

www.quantum.com/support

Unpacking and Inspecting the Drive

Although each LTO-3 Half-Height Tape Drive is inspected and carefully packaged at the factory, damage can occur in shipment or when the drive is being unpacked.

Observe the handling precautions in [Handling Precautions and Installation Guidelines](#), and carefully unpack and inspect the LTO-3 Half-Height Tape Drive as follows:

- 1 Visually inspect the shipping container and notify your carrier immediately of any damage.
- 2 Place the shipping container on a flat, clean, stable surface and carefully remove the contents.
- 3 Visually inspect the LTO-3 Half-Height Tape Drive and notify your Quantum representative immediately of any damage.
- 4 Always save the shipping container and packing materials for any future reshipment.

Installing the Internal LTO-3 Half-Height Tape Drive

To install the internal LTO-3 Half-Height Tape Drive, complete the following procedures in the order presented:

- 1 Depending on the interface configuration of the drive:

IF the drive interface is . . .	THEN . . .
parallel Small Computer System Interface (SCSI),	proceed to Configuring the Internal Parallel SCSI Tape Drive in the following subsection to configure the parallel SCSI ID and bus terminator power.

IF the drive interface is . . .	THEN . . .
serial-attached SCSI (SAS),	there is no need to configure the SCSI ID or bus termination, as SAS is a point-to-point architecture. Skip to Mounting the Internal Tape Drive on page 6

- 2 [Connecting the Internal Drive Interface and DC Power Cables](#) on page 8
- 3 [Restarting the Internal Tape Drive System](#) on page 9
- 4 [Installing the LTO Driver Software](#) on page 13, if required
- 5 [Registering the LTO-3 Half-Height Tape Drive](#) on page 13

Configuring the Internal Parallel SCSI Tape Drive

The factory-set default configuration of the internal parallel SCSI LTO-3 Half-Height Tape Drive is:

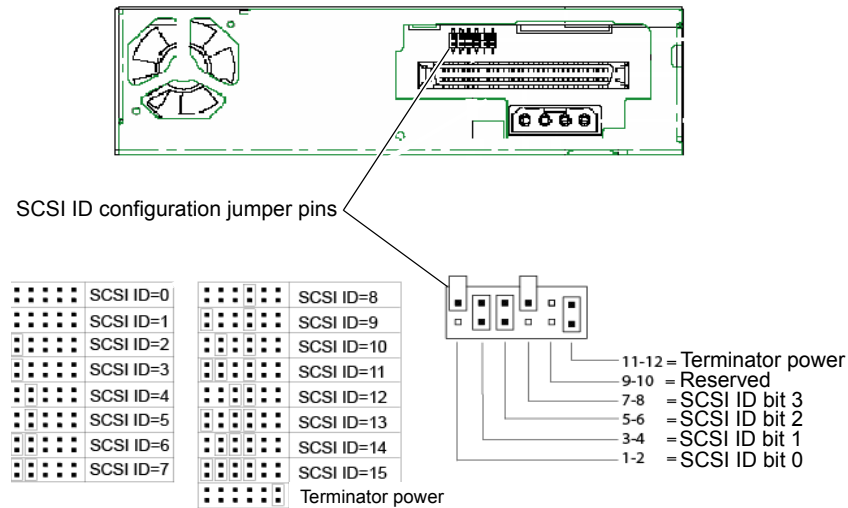
- SCSI ID: 6
- Terminator power: enabled

IF the default parallel SCSI ID configuration is . . .	THEN you can . . .
compatible with your system SCSI bus,	skip the following subsection and proceed to Configuring the Internal Parallel SCSI Terminator Power on page 5.
already assigned to another device,	change the configuration of either the other device, or the LTO-3 Half-Height Tape Drive, as described in the following subsection.

Configuring the Internal Drive Parallel SCSI ID

Each device on the parallel SCSI bus must have its own unique SCSI ID. Use SCSI configuration jumper pins 1-2, 3-4, 5-6, and 7-8 on the drive back panel to change the SCSI ID of the LTO-3 Half-Height Tape Drive (see [figure 2](#)).

Figure 2 Internal Parallel SCSI ID Configuration Jumper Pins



Note: Parallel SCSI controllers and host adapters generally use ID 7. In some systems, the boot drive uses ID 0 or ID 1. Avoid configuring the LTO-3 Half-Height Tape Drive to these SCSI IDs.

Configuring the Internal Parallel SCSI Terminator Power

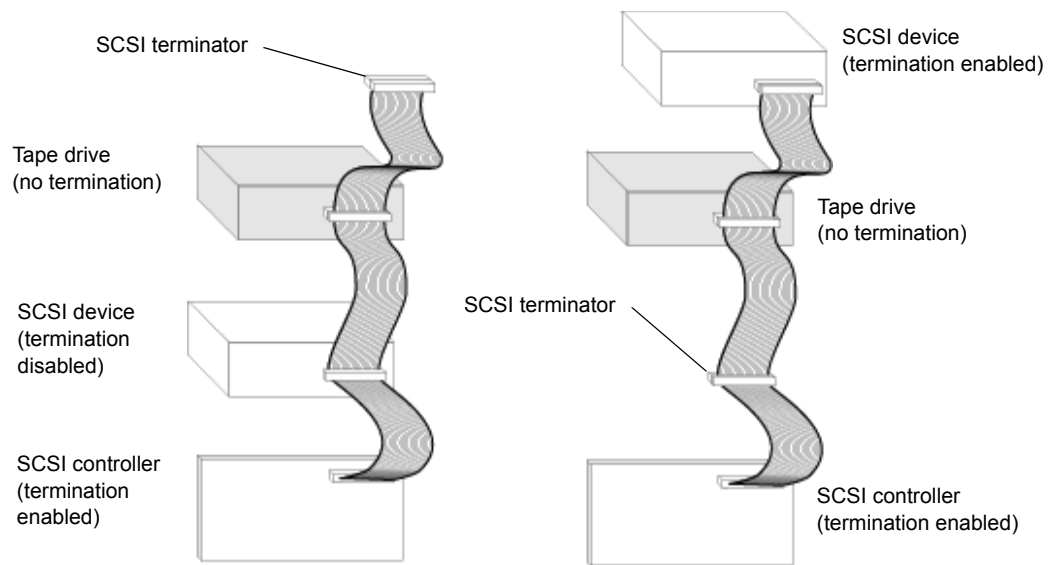
By default, terminator power is enabled on the internal parallel SCSI LTO-3 Half-Height Tape Drive. If you use this default setting, then the last device at the end of the parallel SCSI bus must have either:

- A parallel SCSI bus terminator
- Terminator power enabled

See [figure 3](#) for examples of internal parallel SCSI bus termination.

To disable terminator power, remove the jumper across pins 11 and 12 (see [figure 2](#)).

Figure 3 Internal Parallel SCSI Bus Termination Examples



Note: The internal parallel SCSI LTO-3 Half-Height Tape Drive does not provide SCSI termination. The last device at the end of the parallel SCSI bus chain must have a SCSI bus terminator.

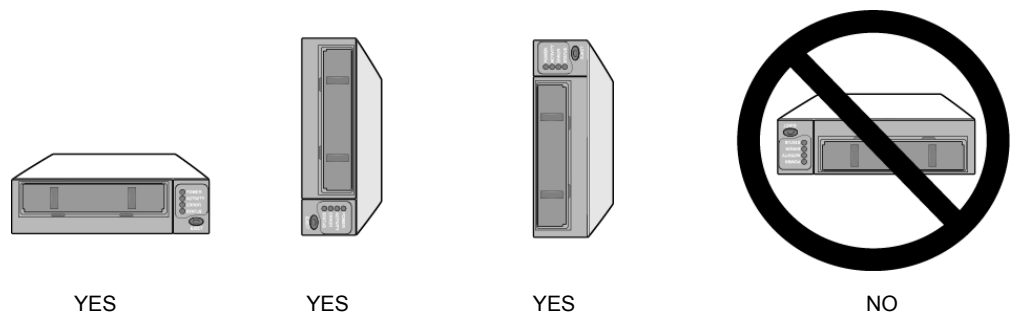
After configuring the parallel SCSI ID and bus termination power, proceed to [Mounting the Internal Tape Drive](#) in the following subsection.

Mounting the Internal Tape Drive

You can mount the internal LTO-3 Half-Height Tape Drive either horizontally or vertically, but not upside down (see [figure 4](#)).

IF you mount the drive . . .	THEN the . . .
horizontally,	base of the drive must be within 15 degrees of horizontal.
vertically,	side of the drive must be within 5 degrees of horizontal.

Figure 4 Acceptable Mounting Orientations



Mount the internal drive in a 5.25-inch, half-height drive bay as follows:

- 1 As required:
 - a Save and close your open files and terminate all running applications.
 - b Shut down the workstation or server system.
 - c Disconnect the system AC power cord from the facility AC power receptacle.
- 2 Remove the cover from the workstation or server system.

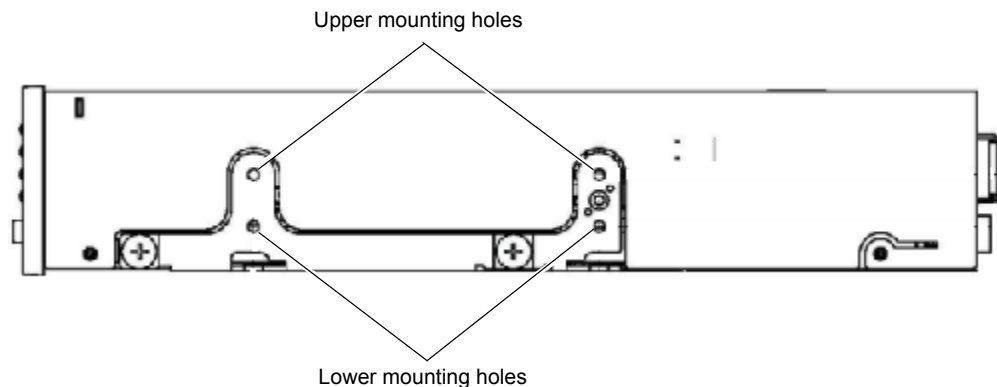
Note: See your computer manufacturer's instructions for the proper procedures to remove the cover.

- 3 Select an available 5.25-inch half-height bay and, if required, remove the bay cover.
- 4 Position the drive in the bay and align either the upper or lower mounting holes – whichever is appropriate – with the holes in the chassis (see [figure 5](#)).
- 5 Secure the drive using two M3.0 X 4 metric screws on each side

Caution: Using screws longer than 4 mm can damage the drive.
Do not use screws longer than 4 mm to secure the internal LTO-3 Half-Height Tape Drive.

After mounting the internal LTO-3 Half-Height Tape Drive, proceed to [Connecting the Internal Drive Interface and DC Power Cables](#) in the following subsection.

Figure 5 Internal Tape Drive Mounting Hole Locations



Connecting the Internal Drive Interface and DC Power Cables

As shown in [figure 6](#) and [figure 7](#), the rear panels of the internal LTO-3 Half-Height Tape Drives have connectors for:

- Either a 68-pin parallel SCSI or a 7-pin 1x SATA-style serial-attached SCSI (SAS) interface cable
- A serial library interface cable
- The internal drive DC power cable

Figure 6 Internal SCSI Drive Interface and DC Power Connectors

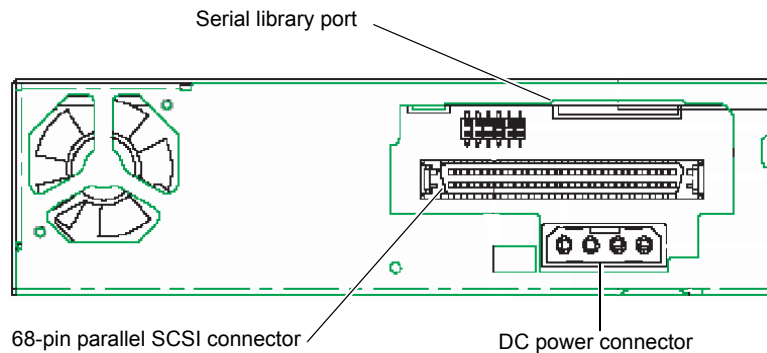
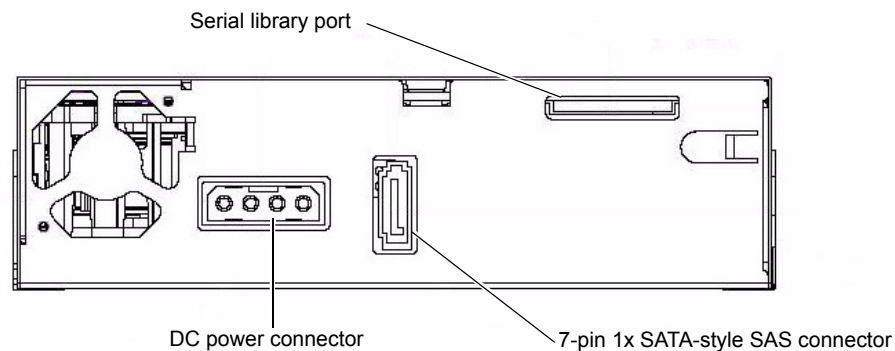


Figure 7 Internal SAS Drive Interface and DC Power Connectors



Connect the interface and DC power cables to the internal drive as follows:

- 1 Verify that the system is shut down and the AC power cord is disconnected from the facility AC power receptacle.
- 2 Depending on the interface configuration of your internal drive:
 - a For the parallel SCSI internal drive:
 - Attach the internal SCSI interface cable to the 68-pin parallel SCSI connector on the back of the drive.

Caution: The LTO-3 Half-Height Tape Drive with the parallel SCSI interface is a low voltage differential (LVD) SCSI device. Install it only in LVD environments. Plugging an LVD drive into a high voltage differential (HVD) bus makes the entire bus nonfunctional and may permanently damage the drive or other SCSI devices on the bus.

- See the internal parallel SCSI bus termination examples in [figure 3](#) on page 6 to check/verify the system SCSI bus configuration and install a 68-pin LVD SCSI bus terminator, as required.
- b For the SAS internal drive, attach the internal SAS interface cable to the 7-pin 1x SATA-style SAS connector on the back of the drive.
- 3 If you are installing the internal LTO-3 Half-Height Tape Drive in a tape library system, connect the RS-422 serial interface cable to the serial library port on the back of the drive. (The serial library port is not used on workstation or server systems.)
 - 4 Connect the internal drive DC power cable to the DC power connector on the back of the drive.
 - 5 Reinstall the system cover.
 - 6 Reconnect the system AC power cord to the facility AC power receptacle.

After connecting the internal drive interface and DC power cables, proceed to [Restarting the Internal Tape Drive System](#) in the following subsection.

Restarting the Internal Tape Drive System

After connecting the internal drive interface and DC power cables:

- 1 Restart the workstation or server system.
- 2 Verify that the internal LTO-3 Half-Height Tape Drive comes on and completes the Power On Self Test (POST) functions.
- 3 As required, proceed to either:
 - [Installing the LTO Driver Software](#) on page 13
 - [Registering the LTO-3 Half-Height Tape Drive](#) on page 13

Installing the Tabletop LTO-3 Half-Height Tape Drive

To install the tabletop LTO-3 Half-Height Tape Drive, complete the following procedures in the order presented:

- 1 Depending on the interface configuration of the drive:

IF the drive interface is . . .	THEN . . .
parallel Small Computer System Interface (SCSI),	proceed to Configuring the Tabletop Parallel SCSI Tape Drive in the following subsection to configure the SCSI ID.
serial-attached SCSI (SAS),	there is no need to configure the SCSI ID, as SAS is a point-to-point architecture. Skip to Connecting the Tabletop Drive Interface and AC Power Cables on page 11.

- 2 [Connecting the Tabletop Drive Interface and AC Power Cables](#)
- 3 [Restarting the Tabletop Tape Drive System](#) on page 13
- 4 [Installing the LTO Driver Software](#) on page 13, if required
- 5 [Registering the LTO-3 Half-Height Tape Drive](#) on page 13

Configuring the Tabletop Parallel SCSI Tape Drive

The factory-set default configuration of the tabletop parallel SCSI LTO-3 Half-Height Tape Drive is:

- SCSI ID: 6
- Terminator power: enabled

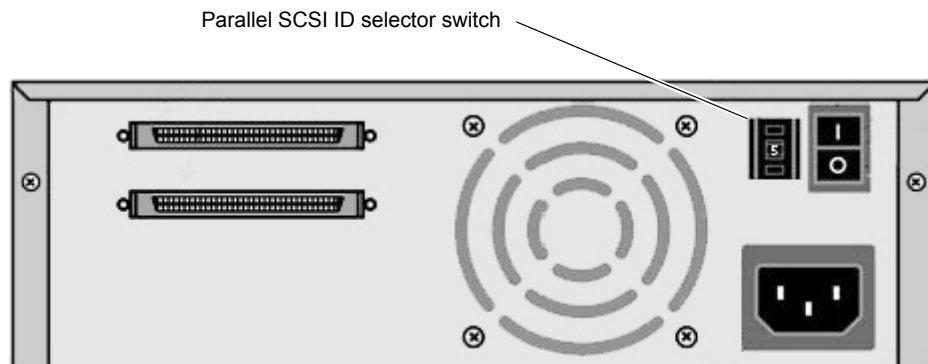
IF the default parallel SCSI ID configuration is . . .	THEN you can . . .
compatible with your system SCSI bus,	skip the following subsection and proceed to Connecting the Tabletop Drive Interface and AC Power Cables on page 11.
already assigned to another device,	change the configuration of either the other device, or the LTO-3 Half-Height Tape Drive, as described in the following subsection.

Note: You cannot disable terminator power on a tabletop parallel SCSI drive.

Configuring the Tabletop Drive Parallel SCSI ID

Each device on the parallel SCSI bus must have its own unique SCSI ID. Use the push-button SCSI ID selector switch on the drive back panel to change the SCSI ID of the tabletop LTO-3 Half-Height Tape Drive (see [figure 8](#)).

Figure 8 Tabletop Parallel SCSI ID Selector Switch



Note: Parallel SCSI controllers and host adapters generally use ID 7. In some systems, the boot drive uses ID 0 or ID 1. Avoid configuring the LTO-3 Half-Height Tape Drive to these SCSI IDs.

After configuring the parallel SCSI ID, proceed to [Connecting the Tabletop Drive Interface and AC Power Cables](#) in the following subsection.

Connecting the Tabletop Drive Interface and AC Power Cables

As shown in [figure 9](#) and [figure 10](#), the rear panels of the tabletop LTO-3 Half-Height Tape Drives have connectors for:

- Either a 68-pin parallel SCSI cable (two connectors), or a 26-pin SFF-8088 mini-SAS style interface cable
- The AC power cable

For the tabletop parallel SCSI drive, either SCSI connector can be used as a SCSI IN or SCSI OUT connection. This means you can use either connector to attach the drive to a host computer or to another parallel SCSI device.

Figure 9 Tabletop SCSI Drive Interface and AC Power Connectors

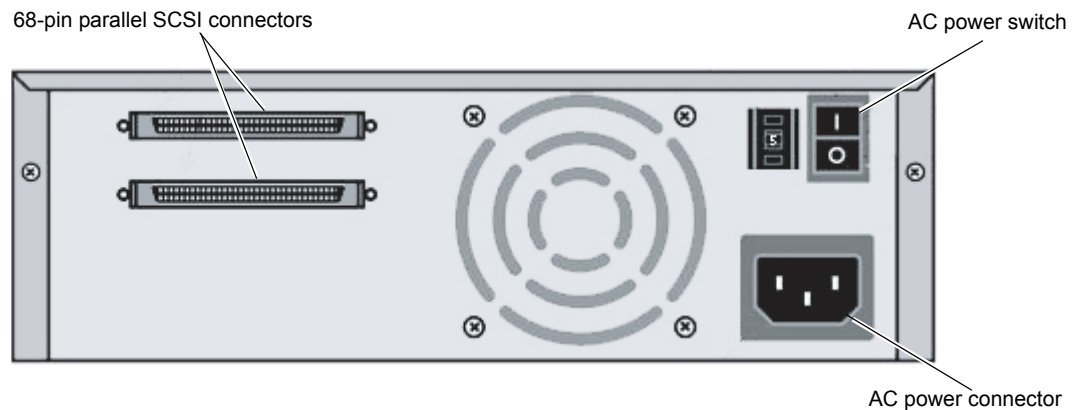
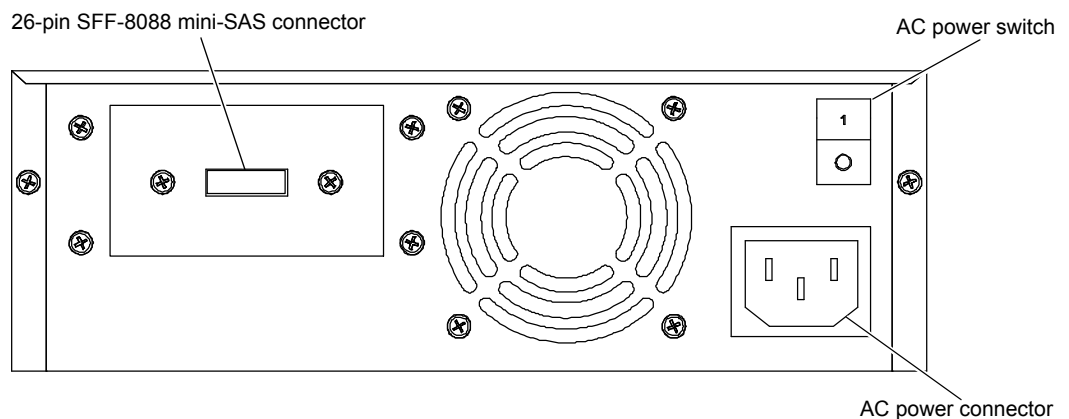


Figure 10 Tabletop SAS Drive Interface and AC Power Connectors



Connect the interface and AC power cables to the tabletop drive as follows:

- 1 As required:
 - a Save and close your open files and terminate all running applications.
 - b Shut down the workstation or server system.
 - c Disconnect the system AC power cord from the facility AC power receptacle.

- 2 Depending on the interface configuration of your tabletop drive:
 - a For the parallel SCSI tabletop drive:
 - Attach the SCSI IN interface cable to one of the 68-pin parallel SCSI interface connectors on the back of the drive.
 - Attach either the SCSI OUT interface cable or a SCSI terminator to the other parallel SCSI interface connector on the back of the drive.

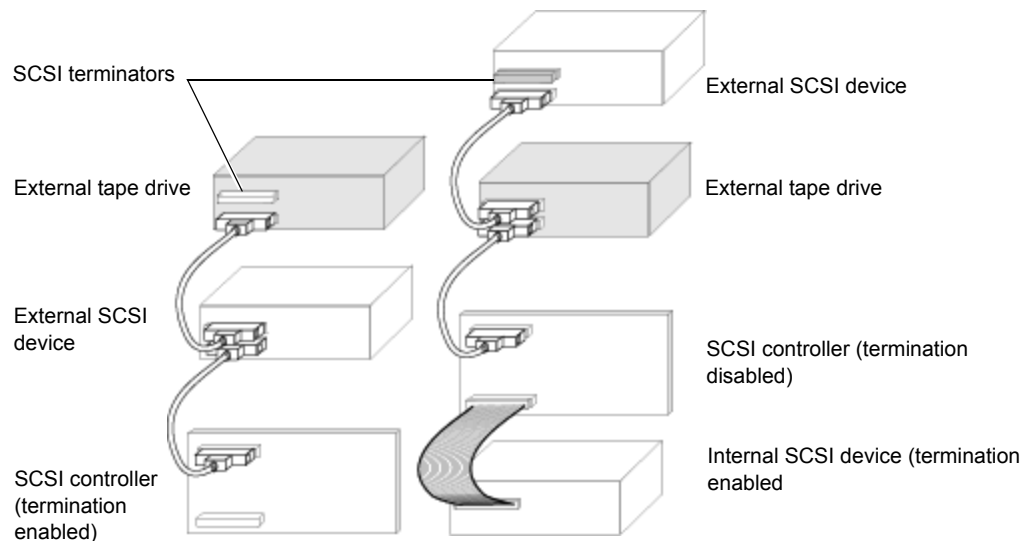
If the tabletop LTO-3 Half-Height Tape Drive is the last or only device in a SCSI chain, you must install a 68-pin low voltage differential (LVD) terminating plug on the unused parallel SCSI connector.

See [figure 11](#) for tabletop parallel SCSI bus termination examples.

Caution: The LTO-3 Half-Height Tape Drive with the parallel SCSI interface is a low voltage differential (LVD) SCSI device. Install it only in LVD environments. Plugging an LVD drive into a high voltage differential (HVD) bus makes the entire bus nonfunctional and may permanently damage the drive or other SCSI devices on the bus.

- b For the SAS tabletop drive, attach the external SAS interface cable to the 26-pin SFF-8088 mini-SAS connector on the back of the drive.

Figure 11 Tabletop Parallel SCSI Bus Termination Examples



Example 1: SCSI termination in a system that has only external SCSI devices.

Example 2: SCSI termination in a system that has both internal and external SCSI devices.

- 3 Verify that the tabletop LTO-3 Half-Height Tape Drive AC power switch is set to the off position, and connect the AC power cord to the power connector on the back of the drive.
- 4 Connect the drive AC power cord to the facility AC power receptacle.

- 5 Reconnect the workstation or server system AC power cord to the facility AC power receptacle.

After connecting the tabletop drive interface and AC power cables, proceed to [Restarting the Tabletop Tape Drive System](#) in the following subsection.

Restarting the Tabletop Tape Drive System

After connecting the tabletop drive interface and AC power cables:

- 1 Set the tabletop drive AC power switch to the on position.
- 2 Restart the workstation or server system.
- 3 Verify that the tabletop LTO-3 Half-Height Tape Drive comes on and completes the Power On Self Test (POST) functions.

As required, proceed to either:

- [Installing the LTO Driver Software](#)
- [Registering the LTO-3 Half-Height Tape Drive](#)

Installing the LTO Driver Software

If you intend to use the LTO-3 Half-Height Tape Drive with the Microsoft® native backup applet on a Windows 2000, Windows Server® 2003, Windows XP®, or Windows Vista operating system, install the appropriate version of the LTO driver software. (See the Downloads page for LTO-3 drivers under Standalone Tape Drives on the Quantum support website at: www.quantum.com/support.)

Note: The LTO driver software is not necessary with commercial backup application software.

Registering the LTO-3 Half-Height Tape Drive

After installing the LTO-3 Half-Height Tape Drive, be sure to register it via the Quantum website at:

www.quantum.com/registration

Registering the drive ensures that you will receive the latest technical information about the drive, as well as other product, service, and support information.

Safety Compliances

The LTO-3 Half-Height Tape Drives are safety compliant with the following regulatory organizations and codes in the countries indicated:

Country	Regulatory Organization	Compliant to:
Canada	Canadian Standards Association (CSA)	UL/CSA 60950-1
EU member nations	Comité Européen de Normalisation Electrotechnique – the European Committee for Electrotechnical Standardization (CENELEC)	EN 60950-1, 1st edition
IECEE member nations*	IECEE International Electrotechnical Commission on Electrical Equipment (IECEE) for Mutual Recognition of Test Certificates for Electrical Equipment “CB Scheme”	CB Scheme per IEC 60950-1 with details and exceptions for each member country
Israel	SII	CB Scheme
Taiwan	BSMI	BSMI certification, CNS 14336
United States	Underwriters Laboratories (UL)	UL/CSA 60950-1

* IECEE member nations include: Argentina, Austria, Australia, Belgium, Brazil, Canada, China (PR), Czech Republic, Denmark, Finland, France, Germany, Hungary, India, Ireland, Israel, Italy, Japan, (South) Korea, Montenegro, Netherlands, Norway, Poland, Russian Federation, Serbia, Singapore, Slovakia, Slovenia, South Africa, Spain, Switzerland, Turkey, United Kingdom, and USA.

Electromagnetic Compatibility (EMC) Compliances

The LTO-3 Half-Height Tape Drives are EMC compliant with the following regulatory organizations and codes in the countries indicated:

Country	Regulatory Organization	Compliant to:
Australia	Australian Communications and Media Authority (ACMA)	AS/NZS 3548 (same as CISPR 22)
Canada	Industry Canada Digital Apparatus - Interference-Causing Equipment Standard (ICES-003)	ICES-003 Digital Apparatus
EU member nations	CE	Emissions per CISPR 22, EN55022 and Immunity per CISPR 24, EN55024
Israel	SII	CISPR 22 and CISPR 24
Japan	Voluntary Control Council for Interface (VCCI)	VCCI
New Zealand	Australian Communications and Media Authority (ACMA)	AS/NZS 3548 (same as CISPR 22)
South Korea	MIC	CISPR 22 and CISPR 24
Taiwan	Bureau of Commodity Inspection and Quarantine (BSMI)	BSMI EMC certification, CNS 14338
United States	Federal Communications Commission (FCC)	Title 47: Code of Federal Regulations, Part 15, Subpart B (47CFR15B),

Note: Use these drives only in equipment where the combination has been determined to be suitable by an appropriate certification organization (for example, Underwriters Laboratories Inc. or the Canadian Standards Association in North America).

You should also consider the following safety points:

- Install the drive in an enclosure that limits the user's access to live parts, gives adequate system stability, and provides the necessary grounding for the drive.
- Provide the correct voltages (+5 VDC and +12 VDC) based on the regulation applied – Extra Low Voltage (SEC) for UL and CSA, and Safety Extra Low Voltage for BSI and VDE (if applicable).



For assistance contact Quantum Technical Assistance center:
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UK, France, and Germany **00800 4 QUANTUM**
EMEA **+44 1256 848 766**

For worldwide support: www.quantum.com/contactsupport

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