Dell™ PowerVault™ 110T DLT VS160 Tape Drive User's Guide

See the Dell Support website at support.dell.com if you require further help and assistance or to obtain drivers and/or firmware upgrades.

Notes, Notices, and Cautions

NOTE: A NOTE indicates important information that helps you make better use of your computer.

NOTICE: A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.

The *System Information Guide* provides important safety and regulatory information. Warranty information may be included within this document or as a separate document.

Initial release: August 2003

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Introduction: Dell™ PowerVault™ 110T DLT VS160 Tape Drive User's Guide

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Overview

The Dell™ PowerVault™ 110T DLT VS160 Tape drive is a value-priced, high-reliability, high-capacity linear streaming cartridge tape drive designed for use on entry to midrange computing platforms. With a combination of data compression and compaction, the PowerVault 110T DLT VS160 Tape drive offers a formatted cartridge capacity of 80GB (160GB assuming a 2:1 compression ratio) and a sustained user data transfer rate of 8 MB/s (up to 16 MB/s with 2:1 compression). The capacity you realize in practice depends on the data set, which affects the actual compression ratio.

The PowerVault 110T DLT VS160 Tape drive is a 5.25-inch, half-height form-factor, using a 1/2-inch tape. Its design includes a four-channel read/write head, Lempel-Ziv (DLZ) high-efficiency hardware data compression, and tape-mark directory to achieve fast data throughput and data access times.

The PowerVault 110T DLT VS160 Tape drive is read/write-compatible the DLT VS160 format using DLTtape VS1 cartridges and read compatible with the DLT1 format using DLTtape™ IV cartridges. The PowerVault 110T DLT VS160 Tape drive is an Ultra 160 SCSI device that works with any wide-ultra, Ultra2, Ultra160, or Ultra3 Low-Voltage Differential (LVD) or Single-Ended (SE), narrow or wide, SCSI bus.

Features

The PowerVault 110T DLT VS160 Tape drive has the following features:

- Supported formats: DLT VS160 (read/write using DLTtape VS1 cartridges), DLT1 (read only using DLTtape™ IV cartridges)
- Uses DLTtape VS1 cartridges
- 5.25-inch half-height form-factor
- Formatted cartridge capacity of 80GB native, 160GB compressed*
- Sustained user data transfer rate of 8 MB/s native, up to 16 MB/s with compression*
- The PowerVault 110T DLT VS160 Tape drive requires a wide-ultra, Ultra2, Ultra160, or Ultra3, Low-Voltage Differential (LVD) or Single-Ended (SE) SCSI bus

* Assumes 2:1 compression ratio. The capacity and data transfer rates realized in practice depend on the data set, which determines the actual compression ratio.

Obtaining Drivers and Firmware Upgrades

If the tape backup software does not detect the tape drive or to obtain the latest operating system drivers and/or firmware upgrades, see the Dell Support website at support.dell.com.

Tape Backup Software

Drivers

Microsoft® Windows® 2000 and Windows® Server™ 2003: QSDLT32.SYS

Native Operating System Backup Utilities

Microsoft® Windows® 2000 and Windows® Server™ 2003

- Windows Backup

Red Hat Linux versions 7.3 and 8.0 and 9.0

- Tar

Tape Backup Applications

NOTICE: See the Dell Support website at support.dell.com to obtain the latest patches and upgrades for the Tape Backup Applications noted below.

Microsoft® Windows® 2000 and Windows® Server™ 2003

- VERITAS™ BackupExec™ for Windows NT/2000 version 9.0 or later
- Yosemite Tapeware® version 7.0 or later

Novell® NetWare®

- VERITAS™ BackupExec™ for NetWare™ version 9.0 or later
- Yosemite Tapeware® version 7.0 or later

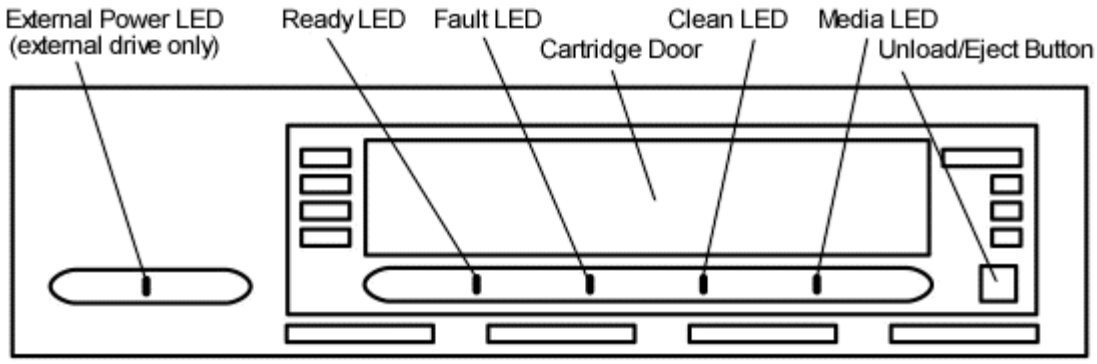
Red Hat Linux versions 7.3, 8.0, and 9.0

- Yosemite Tapeware® version 7.0 or later

Front Panel Controls and Indicators

Location of the Controls and Indicators

Figure 1. PowerVault 110T DLT VS160 Tape drive front panel



NOTE: The front panel controls and indicators are in the same locations on both the internal and external drives. The internal drive does not have a Power LED.

Indicator Activity During Power-On Self-Test (POST)

Every time you turn on or reset the drive, it conducts a Power-On Self-Test (POST). This test ensures that the drive is working properly and is ready to use. While POST is in progress, watch the front panel LEDs to see the progress and results of the test. During POST, the following actions take place:

- The LEDs illuminate one at a time, from left to right, starting with the Ready LED, next the Fault LED, and finally the Clean LED, at approximately one second intervals
- About four seconds later, the Media LED illuminates
- Each LED signals a different part of the POST process
- All LEDs then turn off momentarily
- If a cartridge is not loaded, the Ready LED illuminates and POST is complete, the entire process taking approximately eight seconds
- If a cartridge is loaded, the Ready LED flashes while the drive mounts the cartridge, a process that can take several minutes depending upon the position of the media in the tape path
- As POST completes, the drive makes a slight buzzing noise for several seconds. This noise is normal and should be ignored

The drive is now ready to use.

Indicator Activity During Normal Operation - Ready LED

When the PowerVault 110T DLT VS160 Tape drive is in use, the Ready LED indicates the three states detailed in Table 1. The Ready LED operates independently of the other three LEDs.

Table 1. Ready LED activity and drive status

Ready LED Activity	Drive Status
Off	No power to the drive
On	Power is on; no cartridge loaded or a loaded cartridge is idle with no tape motion
Blinking	The drive is loading a cartridge or a loaded cartridge has tape motion indicating read, write, seek, rewind, calibration, or other cartridge activity

Indicator Activity During Normal Operation - Fault/Clean/Media LEDs

The Fault, Clean, and Media LEDs indicate the status of the drive. Note that the LEDs can indicate more than one of the indicated operating conditions simultaneously. For example:

- If cleaning is required while a DLT1 format cartridge is loaded, both the Clean and Media LEDs are on
- If an internal write/read diagnostic fails as a result of a permanent write error, both the Fault and Clean LEDs blink slowly.

Table 2 describes what each front panel indicator means.

Table 2. Fault/Clean/Media LED activity and drive status

Indicator	Activity	Operating Condition
Fault	Slow Blink (1x per second)	User initiated write/read diagnostic failed
	Fast Blink (3x per second)	Servo or mechanism error
	On	Internal firmware error
Clean	Slow Blink (1x per second)	Calibration error or permanent write/read error
	Medium Blink (2x per second)	Cleaning in progress
	On	Cleaning required

Media	Slow Blink (1x per second)	Unsupported format, or damaged or unsupported cartridge type inserted into drive
	On	DLT1 format DLTtape™ IV cartridge loaded

See Troubleshooting the Drive in Troubleshooting for more details on error conditions.

Unload/Eject Button Features

The Unload/Eject button provides features in addition to unloading and ejecting a cartridge. To activate one of these features, press and hold the Unload/Eject button for the amount of time specified in Table 3. Release the Unload/Eject button when the desired LED sequence is displayed.

If you do nothing for 15 seconds after accessing any of the additional features that require an action, such as loading a cartridge, the drive returns to normal operating mode.

NOTICE: The Unload/Eject button features indicated by an asterisk (*) in Table 3 overwrite all data on the cartridge loaded in the drive. Use extreme caution when accessing these features to avoid loss of important data.

Table 3. Unload/Eject button features

LED Status				Button Hold Time (seconds)	Feature Description
Ready	Fault	Clean	Media		
On	N/A	N/A	N/A	0-6	Normal unload/eject function
Blinking	Off	Off	Off	6-9	Reserved
Blinking	Blinking	Blinking	Off	12-15	Reserved
Blinking	Blinking	Blinking	Blinking	15-18	Reserved
On	Off	Off	Off	18-21	Revert to normal operating mode
On	On	Off	Off	21-24	Write/read diagnostic mode*
On	On	On	Off	24-27	Reserved*
On	On	On	On	27-30	Emergency reset
Off	Off	Off	Off	30+	Revert to normal operating mode

Unload/Eject Button Feature Description

Normal Unload/Eject

When you release the button, the drive unloads and ejects the cartridge.

Write/Read Diagnostic Mode

NOTICE: This mode overwrites all data on the cartridge in the drive. Use extreme caution when using this feature to avoid loss of important data.

When you release the button, the drive initiates an internal write/read diagnostic. The diagnostic requires that you first load a cartridge that is blank or does not contain valuable data. When the diagnostic begins, the drive writes and then reads approximately 400MB of data and then unloads and ejects the cartridge. The process takes about two minutes. If the diagnostic test detects no errors, the drive returns to normal operating mode. If an error occurs, the appropriate LEDs illuminate.

Emergency Reset

When you release the button, the drive performs a hard reset, behaving as if it had been turned off and then on. A standard POST then takes place.

Revert to Normal Operating Mode

When you release the button, the drive returns to normal operation.

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Getting Started and Setup: Dell™ PowerVault™ 110T DLT VS160 Tape Drive User's Guide

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Obtaining Drivers and Firmware Upgrades

If the tape backup software does not detect the tape drive or to obtain the latest operating system drivers and/or firmware upgrades, see the Dell Support website at support.dell.com.

Dell-Installed Drives

Dell™ performs the installation and setup of tape drives that are shipped as part of a system. Dell also installs tape backup drivers and most software applications.

Installing the PowerVault 110T DLT VS160 Tape Internal Drive

SCSI Requirements

The Dell PowerVault™ 110T DLT VS160 Tape Internal drive incorporates a wide-ultra 160 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 drive to an SE SCSI bus or if there are SE devices attached to the same SCSI bus, the drive's performance is limited to the maximum data transfer speed and maximum cable lengths of the SE bus. The PowerVault 110T DLT VS160 Tape is ***not*** compatible with a standard differential (Diff) or High-Voltage Differential (HVD) SCSI bus. If you attach the drive to a narrow (50-pin) SCSI bus, you must use a customer-supplied 68-pin to 50-pin adapter that terminates the unused 18 pins. These adapters are sometimes labeled "high-byte termination."

Make sure the total length of the SCSI bus does not exceed the ANSI SCSI standard of 19 feet (6 meters) for an SE bus, 40 feet (12 meters) for an LVD SCSI bus with multiple devices, or 82 feet (25 meters) for an LVD SCSI bus with a single device.

Unpacking the Internal Drive

NOTE: If the room in which you are working differs from the temperature in which the tape drive was shipped or stored by 30 degrees F (15 degrees C) or more, let the drive acclimate to the surrounding environment for at least 12 hours before operating.

Unpack and inspect the PowerVault 110T DLT VS160 Tape Internal drive for shipping damage. If you notice any damage, report it to both Dell and the shipping company immediately.

NOTE: Save the packing materials in case you need to move or ship your drive in the future. You must ship the PowerVault 110T DLT VS160 Tape Internal drive in the original or equivalent packing materials or your warranty may be invalidated.

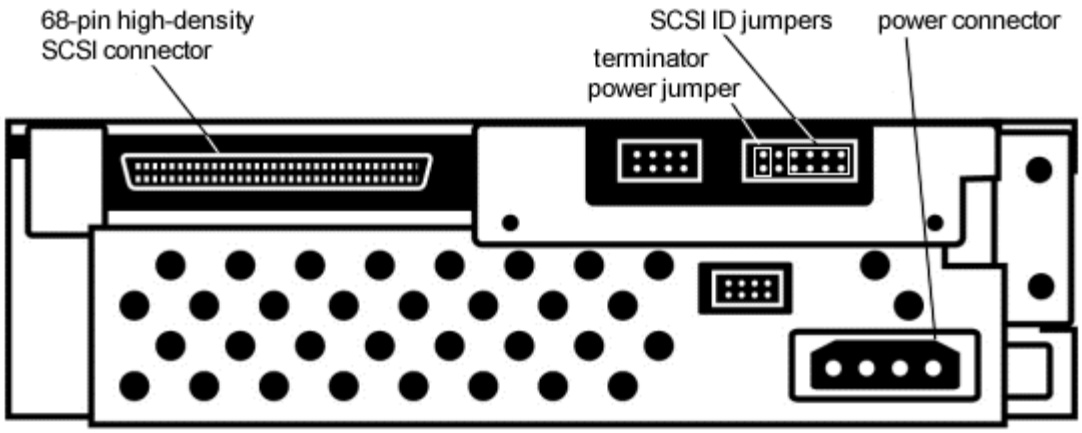
Setting the SCSI ID

Regardless of the number of SCSI devices attached to the server that is to be the host for the PowerVault 110T DLT VS160 Tape Internal drive, each must have a unique SCSI ID. Check the SCSI IDs on all other SCSI devices on the selected server, including the SCSI host adapter, and select an unused SCSI ID for the PowerVault 110T DLT VS160 Tape Internal drive. The factory default SCSI ID is 6. If another device is not already using the factory default SCSI ID, you do not need to change the drive's SCSI ID.

NOTE: If you attach the drive to a narrow (50-pin) bus, you can only use SCSI IDs 0 through 7.

Locate the SCSI ID jumpers on the rear panel of the drive as shown in Figure 1.

Figure 1. SCSI ID jumpers on rear panel of drive



To set the SCSI ID on the PowerVault 110T DLT VS160 Tape Internal drive, use the supplied jumpers to select the desired SCSI ID as shown in Table 1. After you change the SCSI ID, restart the host server to activate the new SCSI ID and to allow the server to recognize the drive at the new ID.

Table 1. SCSI ID jumper settings

SCSI ID	0	1	2	3
Jumper Block				
SCSI ID	**4**	**5**	**6 (default)**	**7**
Jumper Block				
SCSI ID	**8**	**9**	**10**	**11**
Jumper Block				
SCSI ID	**12**	**13**	**14**	**15**
Jumper Block				

When to Use Termination

If the PowerVault 110T DLT VS160 Tape Internal drive is the only SCSI device on the selected server other than the SCSI host adapter, or it is the last physical device on the SCSI bus (at the end of the SCSI cable), it must be terminated. If another SCSI device is the last device on the SCSI bus, confirm that it is properly terminated and do not terminate the PowerVault 110T DLT VS160 Tape drive. Regardless of which device is used to terminate the SCSI bus, it must have power applied and be turned on for proper termination to occur.

To terminate the PowerVault 110T DLT VS160 Tape Internal drive, install an active Low-Voltage Differential/Single-Ended (LVD/SE) cable-end or inline terminator on the SCSI cable you intend to use with the PowerVault 110T DLT VS160 Tape Internal drive. See the terminator's instructions for more information.

Terminator Power

At least one device on the SCSI bus must supply terminator power (TERMPWR). The factory default for the PowerVault 110T DLT VS160 Tape Internal drive is TERMPWR enabled, which is the recommended setting. It is acceptable for more than one device on the SCSI bus to provide TERMPWR. If you need to disable TERMPWR, remove the terminator power jumper shown in Figure 1.

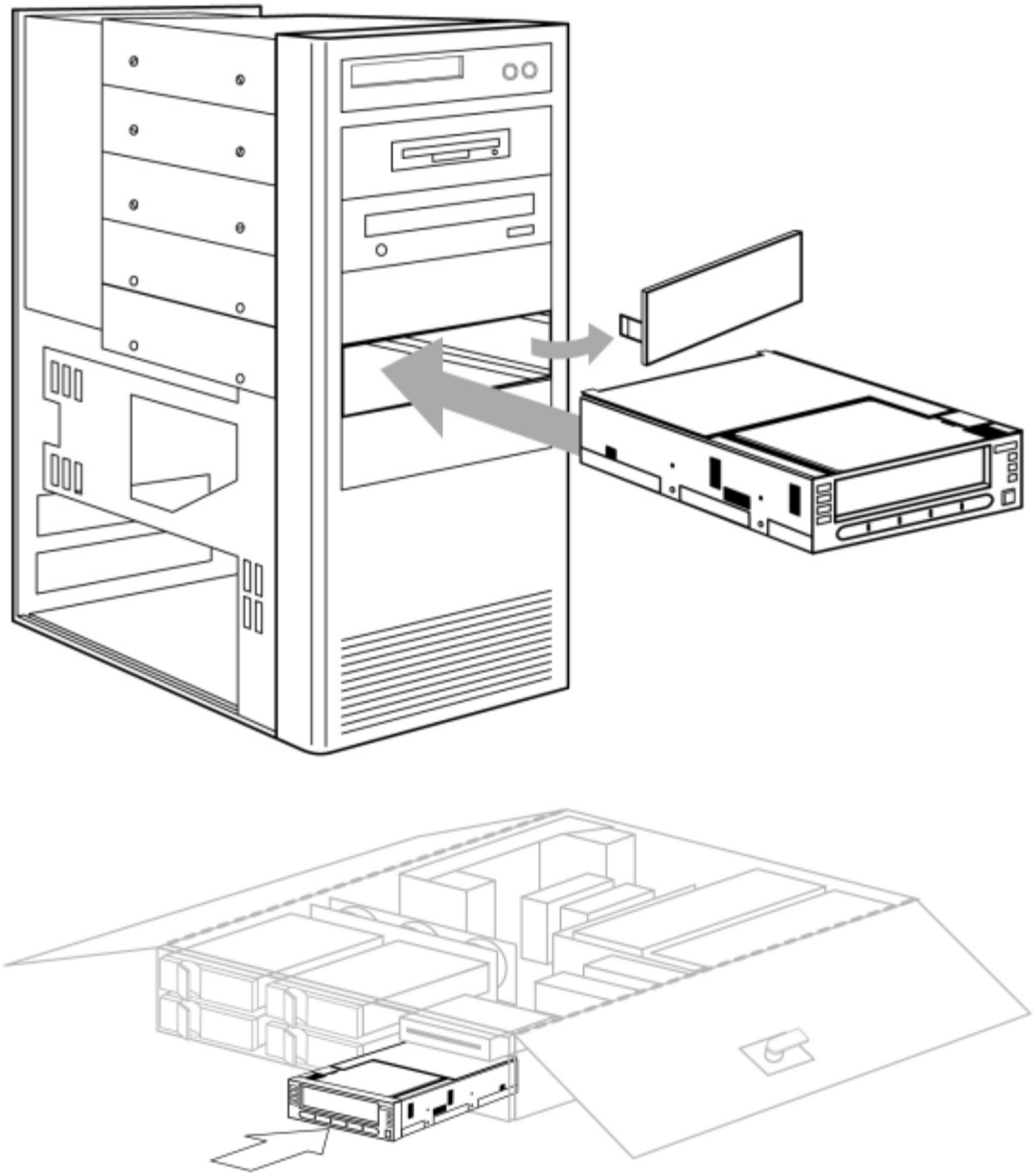
Installing the PowerVault 110T DLT VS160 Tape Internal Drive

1. Shut down the operating system and turn off the selected server. Turn off all attached accessory devices, such as printers and other SCSI devices. Remove the power cables from the host server and all attached accessories. Failure to follow these instructions may result in damage to the PowerVault 110T DLT VS160 Tape Internal drive or other devices.

CAUTION: Do not move on to step 2 until you have shut down the operating system and turned off the server that is to be the host for the PowerVault 110T DLT VS160 Tape Internal drive. Turn off all attached accessory devices, such as printers and other SCSI devices. Remove the power cables from the host server and all attached accessories.

2. Locate an available half-height, 5¼-inch drive bay and remove the front cover from the drive bay as described in the server's manuals (see Figure 2).
3. Slide the PowerVault 110T DLT VS160 Tape Internal drive into the open drive bay (see Figure 2).

Figure 2. Install Drive in an Open Half-height Bay; tower, 2U server shown

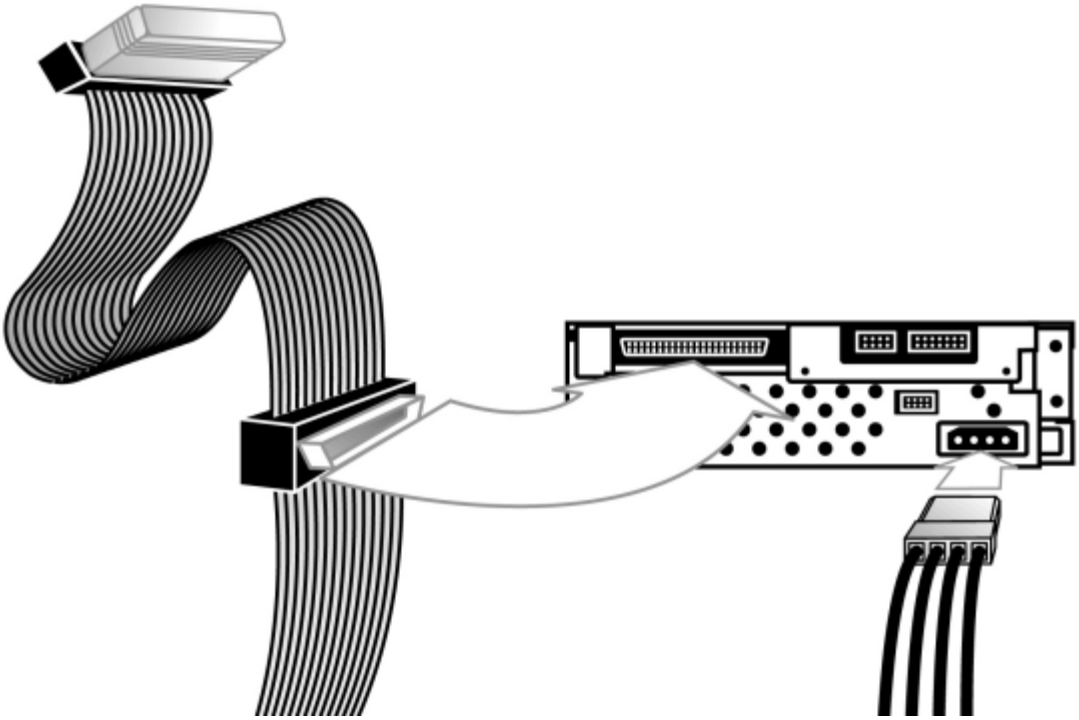


NOTE: Install a SCSI host adapter in the selected server now, if necessary.

NOTE: If your SCSI host adapter already has a ribbon cable with an open 68-pin, high-density connector, you can use the existing cable instead of the cable supplied with the PowerVault 110T DLT VS160 Tape Internal drive.

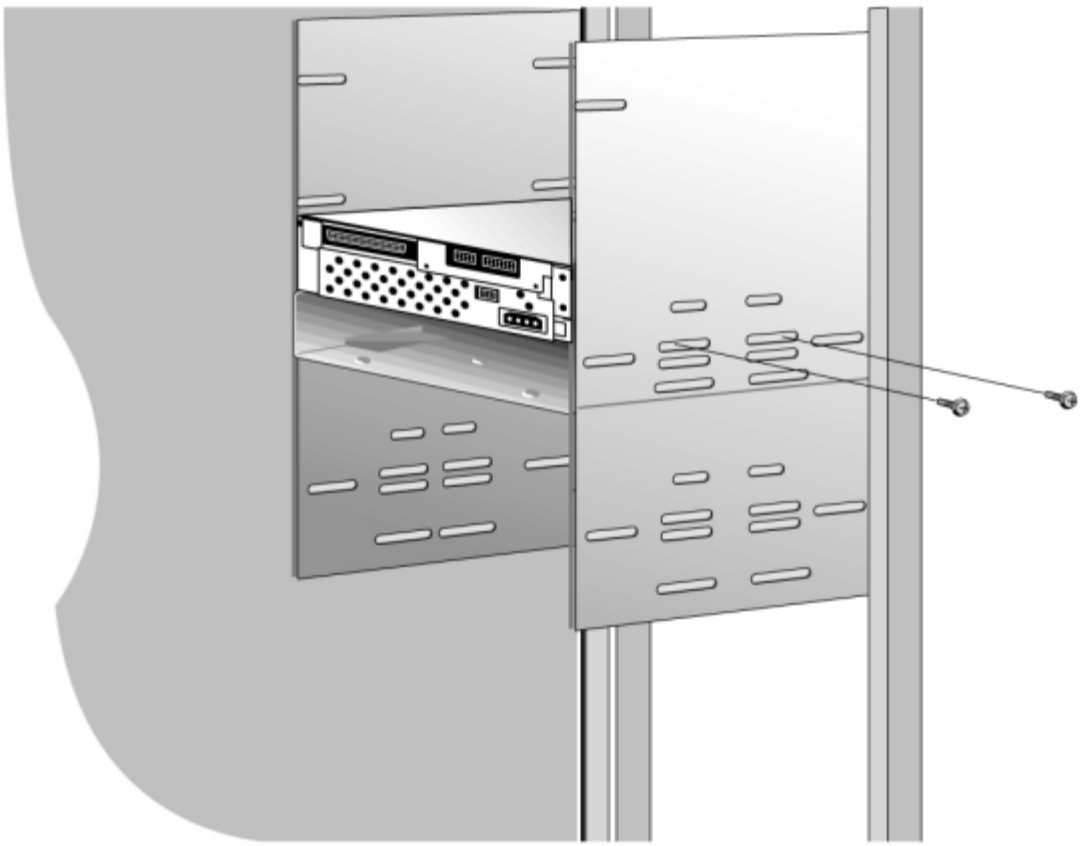
4. Locate the SCSI ribbon cable in the accessories package. Attach one end of the SCSI ribbon cable to the SCSI connector on the rear panel of the PowerVault 110T DLT VS160 Tape Internal drive. The SCSI connectors are keyed, preventing improper connection. Use a 50- to 68-pin adapter with "high-byte termination" if the existing SCSI cable uses a 50-pin connector.
5. Attach the other end of the SCSI ribbon cable to the SCSI host adapter. The SCSI connectors are keyed, preventing improper connection.
6. Locate an available power cable in the host server and attach it to the power connector on the rear panel of the PowerVault 110T DLT VS160 Tape Internal drive. The connectors are keyed, preventing improper connection.

Figure 3. Attach SCSI and power cables to drive



7. Secure the PowerVault 110T DLT VS160 Tape Internal drive with the appropriate mounting screws, either in the sides or bottom of the drive sled, as appropriate for the server chassis.

Figure 4. Secure drive in installation bay (side mounting screws shown)



NOTE: Some servers require mounting rails for internal devices. Use the supplied mounting rails as needed. See your system user manuals for information regarding the necessary mounting rails or hardware.

8. Install the cover on the server.
9. Attach the power cables to the server and all attached accessories.
10. Turn on the host server and allow its operating system to start.
11. See Installing the Device Drivers and Installing the Tape Backup Software to complete the installation.

Installing the PowerVault 110T DLT VS160 Tape External Drive

SCSI Requirements

The PowerVault 110T DLT VS160 Tape External drive incorporates a wide-ultra 160 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 drive to an SE SCSI bus or if there are SE devices attached to the same SCSI bus, the drive's performance is limited to the maximum data transfer speed and maximum cable lengths of the SE bus. The PowerVault 110T DLT VS160 Tape is ***not*** compatible with a standard differential (Diff) or High-Voltage Differential (HVD) SCSI bus. If you attach the drive to a narrow (50-pin) SCSI bus, you must use a customer-supplied 68-pin to 50-pin adapter that terminates the unused 18 pins. These adapters are sometimes labeled "high-byte termination."

Make sure the total length of the SCSI bus does not exceed the ANSI SCSI standard of 19 feet (6 meters) for an SE bus, 40 feet (12 meters) for an LVD SCSI bus with multiple devices, or 82 feet (25 meters) for an LVD SCSI bus with a single device.

Selecting a Location for the Drive

Select a location for the PowerVault 110T DLT VS160 Tape External drive that is flat, sturdy, level, and close to the host server. A desk or table top is most suitable. Regardless of the location you choose for the PowerVault 110T DLT VS160 Tape External drive, make sure the environment is free from dust and excessive temperature and humidity. See the Environmental limits in Specifications for acceptable operating humidity limits.

Be sure to follow these additional guidelines when selecting a location for the PowerVault 110T DLT VS160 Tape External drive:

- Allow at least 6 inches (15.2 cm) behind the drive for proper cooling.
- Avoid locations near printers or photocopy machines, both of which produce paper fiber and other types of dust and airborne contaminants.
- Do not place the drive on the floor.
- Avoid locations near generators, electric motors, audio speakers, or other sources of magnetic fields. Magnetic fields can adversely affect the drive and media.

Unpacking the PowerVault 110T DLT VS160 Tape External Drive

NOTE: If the room in which you are working differs from the temperature in which the tape drive was shipped or stored by 30 degrees F (15 degrees C) or more, let the drive acclimate to the surrounding environment for at least 12 hours before operating.

Unpack and inspect the PowerVault 110T DLT VS160 Tape External drive for shipping damage. If you notice any damage, report it to both Dell and the shipping company immediately.

NOTE: Save the packing materials in case you need to move or ship your drive in the future. You must ship the PowerVault 110T DLT VS160 Tape External drive in the original or equivalent packing materials or your warranty may be invalidated.

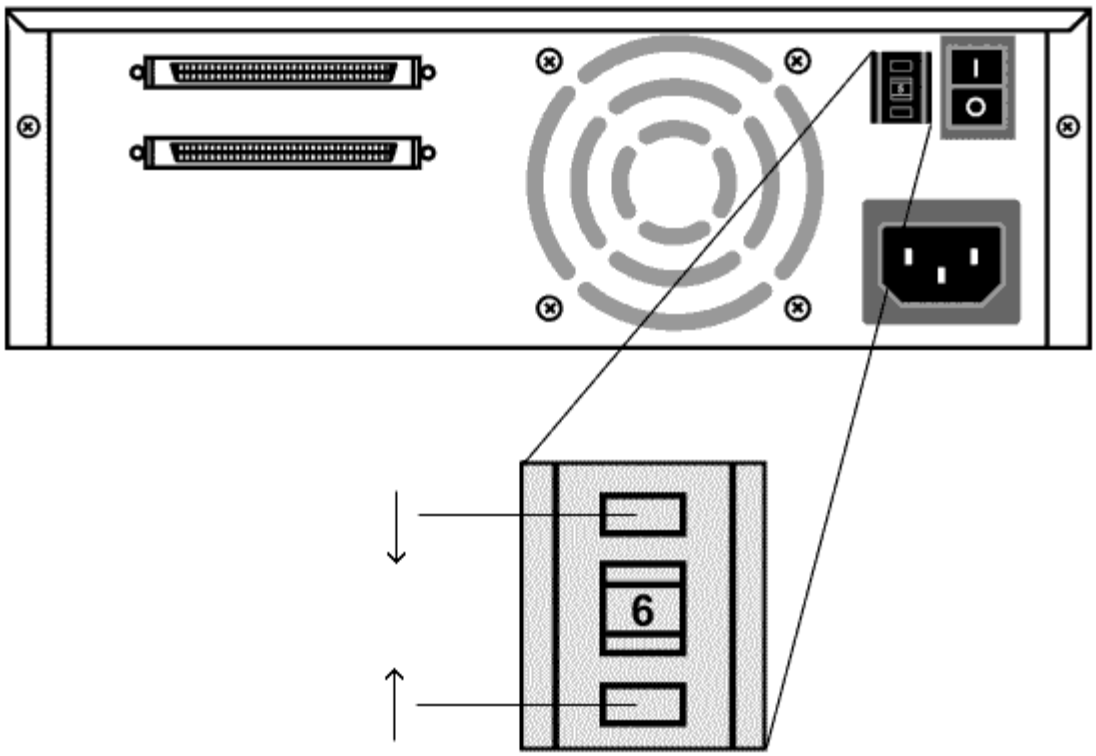
Setting the SCSI ID

Regardless of the number of SCSI devices attached to the server that is to be the host for the PowerVault 110T DLT VS160 Tape

External drive, each device must have a unique SCSI ID. Check the SCSI IDs on all other devices on the selected server, including the SCSI host adapter, and select an unused SCSI ID for the PowerVault 110T DLT VS160 Tape External drive. The factory default SCSI ID is 6. If another device is not already using the factory default SCSI ID, you do not need to change the drive's SCSI ID. Locate the SCSI ID switch on the rear panel of the drive as shown in Figure 5.

NOTE: If you attach the drive to a narrow (50-pin) bus, you can only use SCSI IDs 0 through 7.

Figure 5. PowerVault 110T DLT VS160 Tape External drive rear panel layout and SCSI ID switch



To set the SCSI ID on the PowerVault 110T DLT VS160 Tape External drive, use a small screwdriver or ball-point pen to press the button above the SCSI ID display to select the next lower SCSI ID. Press the button below the SCSI ID display to select the next higher SCSI ID. Each time you press one of these buttons, the SCSI ID increases or decreases by one. Press the appropriate button until the desired SCSI ID appears on the switch display.

After you change the SCSI ID, turn the drive off and on again to activate the new SCSI ID. Then restart the host server or rescan the SCSI bus so the server can recognize the drive at the new SCSI ID.

When to Use Termination

If the PowerVault 110T DLT VS160 Tape External drive is the only SCSI device on the selected server other than the SCSI host adapter, or it is the last physical device on the SCSI bus (at the end of the SCSI cable), it must be terminated. If another SCSI device is the last device on the SCSI bus, confirm that it is properly terminated and do not terminate the PowerVault 110T DLT VS160 Tape drive. Regardless of which device is used to terminate the SCSI bus, it must have power applied and be turned on for proper termination to occur.

To terminate the PowerVault 110T DLT VS160 Tape External drive, locate the terminator in the accessories package and press it firmly into either of the two SCSI connectors on the rear panel of the drive. Secure the terminator by tightening the screws until snug.

Terminator Power

At least one device on the SCSI bus must supply terminator power (TERMPWR). The factory default for the PowerVault 110T DLT VS160 Tape External drive is TERMPWR enabled, which is the recommended setting. It is acceptable for more than one device on

the SCSI bus to provide TERMPWR. Only an authorized service provider can disable the PowerVault 110T DLT VS160 Tape External drive TERMPWR setting.

Connecting the Cables

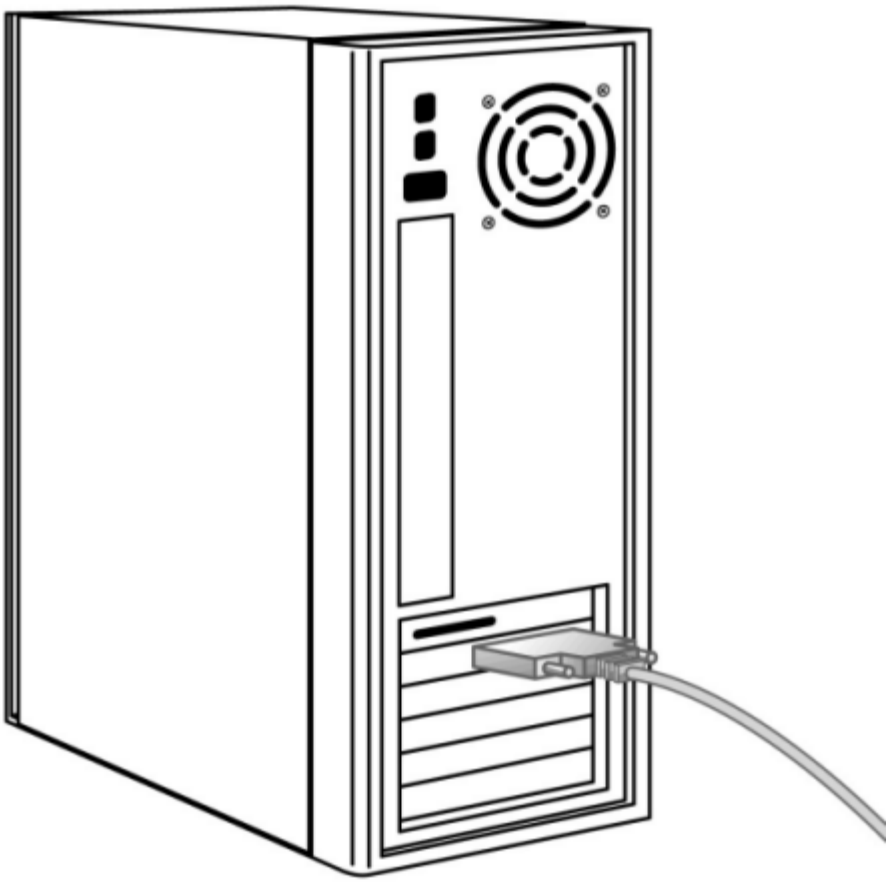
1. Shut down the operating system and turn off the selected server. Turn off all attached accessory devices, such as printers and other SCSI devices. Remove the power cable from the host server and all attached accessory devices. Failure to follow these instructions may result in damage to the PowerVault 110T DLT VS160 Tape External drive or other devices.

CAUTION: Do not move on to step 2 until you have shut down the operating system and turned off the server that is to be the host for the PowerVault 110T DLT VS160 Tape External drive. Turn off all attached accessory devices, such as printers and other SCSI devices. Remove the power cables from the host server and all attached accessory devices.

NOTE: If the selected server does not already have an installed SCSI host adapter, install one now.

2. Locate the SCSI cable in the accessories package.
3. Attach one end of the SCSI cable to one of the connectors on the rear panel of the PowerVault 110T DLT VS160 Tape External drive (see Figure 7).
4. Attach the other end of the SCSI cable to the connector on your SCSI host adapter (see Figure 6).
5. Attach the supplied terminator to the remaining connector on the rear panel of the PowerVault 110T DLT VS160 Tape External drive (see Figure 7).

Figure 6. Attach SCSI cable to server



6. Secure the SCSI cable connectors by tightening the screws until snug.

NOTE: If the supplied SCSI cable does not fit the connector on your SCSI host adapter, you either have an incompatible SCSI host adapter or you need to purchase a cable adapter. Contact the SCSI host adapter manufacturer

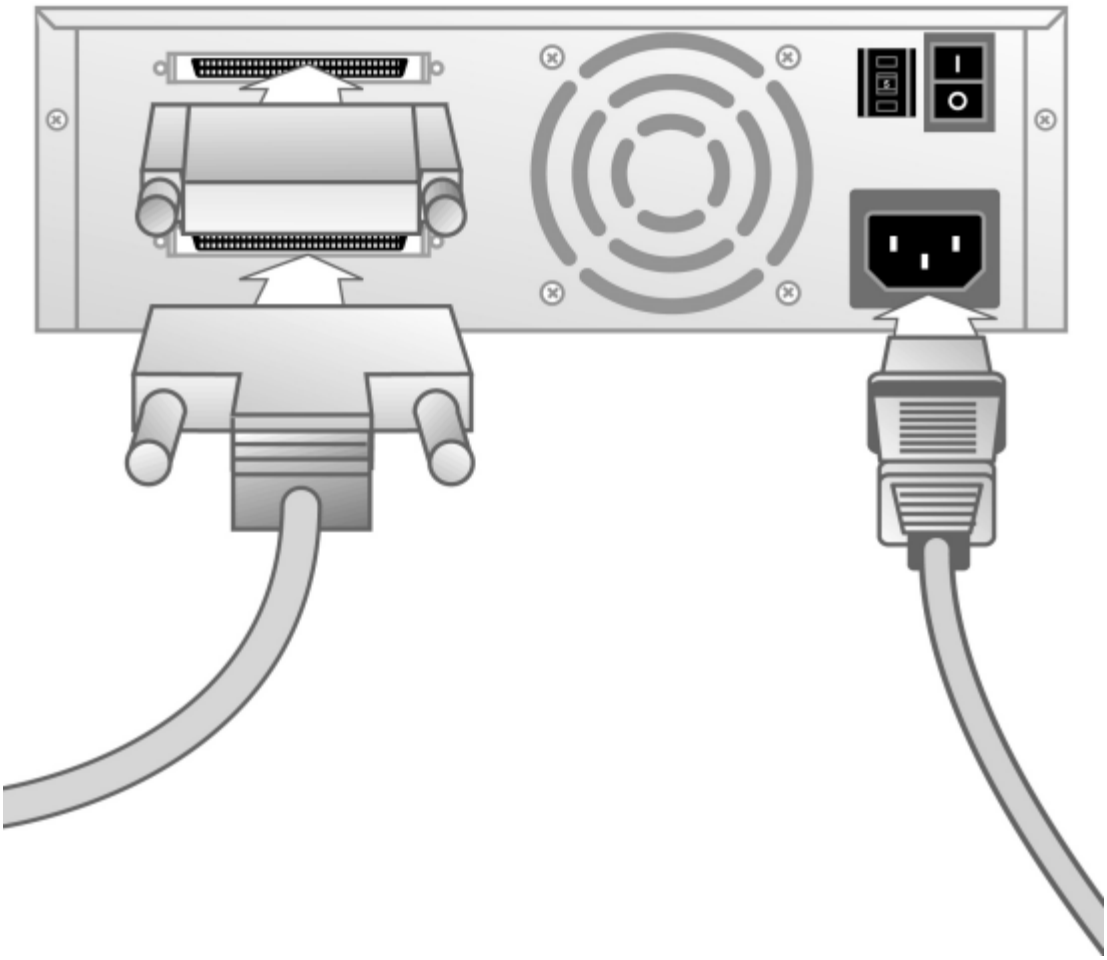
for information.

7. Make sure the power switch on the rear panel of the PowerVault 110T DLT VS160 Tape External drive is in the OFF position. Attach the female connector on the power cable to the power connector on the rear panel of the drive.

CAUTION: Use caution when plugging the power cord into an electrical outlet. Hazardous voltages are present in the sockets of the outlet.

8. Plug in the power cable to a nearby power outlet.

Figure 7. Attach terminator, SCSI, and power cables to the drive



9. Attach the power cables to the host server and all attached devices.
10. Turn on the PowerVault 110T DLT VS160 Tape External drive and any other devices you turned off earlier.
11. Turn on the host server and allow its operating system to start.
12. See Installing the Device Drivers and Installing the Tape Backup Software to complete the installation.

Installing the Device Drivers

NOTE: The device drivers supplied on the Dell PowerVault 110T DLT VS160 Tape Drive User's Manual and Drivers CD are required if you intend to use native operating system backup applications. Commercial backup applications generally provide all necessary device driver support. See Installing the Tape Backup Software for a list of compatible backup applications.

Microsoft® Windows® 2000:

1. Make sure that you are logged on to the host server with Administrator privileges.
2. Insert the Dell PowerVault 110T DLT VS160 Tape Drive User's Manual and Drivers CD into the CD drive on the host server.
3. Right-click the **My Computer** icon on the Windows desktop, click **Manage**, then click **Device Manager**.
   The PowerVault 110T DLT VS160 Tape drive should be listed under the "? Other Devices" item as "QUANTUM VS160 SCSI Sequential Device."
4. Right-click the **QUANTUM VS160 SCSI Sequential Device** listing, click **Uninstall**, and then click the **OK** button to confirm that you want to remove the device.
5. Click the **Action** button in the upper-left corner of the Computer Management dialog box or right-click anywhere in the right-hand pane of the dialog box.
6. Click **Scan for Hardware Changes**. Windows 2000 now scans for the PowerVault 110T DLT VS160 Tape drive. The PowerVault 110T DLT VS160 Tape drive appears under "? Other Devices" again.
7. Right-click the **QUANTUM VS160 SCSI Sequential Device** listing and click **Properties**.
8. Click the **Reinstall Driver** button.
9. When the Upgrade Device Driver Wizard appears, click the **Next** button.
10. Click **Display a list...** and then click the **Next** button.
11. Click the **Tape Drives** item in the list. You may have to scroll down to see this item.
12. Click the **Have Disk** button, type ***d:*\Drivers\W2K**, replacing *d:* with the drive letter for the CD drive into which you inserted the Dell PowerVault 110T DLT VS160 Tape Drive User's Manual and Drivers CD, and click the **OK** button.
13. Click the **DLT VS Tape Drive** entry and click the **Next** button.
14. Click the **Next** button to install the driver.
15. Click the **Finish** button.
16. Close the Device Properties dialog box.

The drive now appears in Device Manager under Tape Drives, listed as "DLT VS Tape Drive," and is ready to use.

Microsoft® Windows® Server™ 2003:

1. Make sure that you are logged on to the host server with Administrator privileges.
2. Insert the Dell PowerVault 110T DLT VS160 Tape Drive User's Manual and Drivers CD into the CD drive on the host server.
3. Click the **Start** button on the Windows taskbar, point to **Programs**, click **Administrative Tools**, and click **Computer Management**.
4. Click **Device Manager**.
   The PowerVault 110T DLT VS160 Tape drive should be listed under the "? Other Devices" item as "QUANTUM VS160 SCSI Sequential Device."
5. Right-click the **QUANTUM VS160 SCSI Sequential Device** listing, click **Uninstall**, and then click the **OK** button to confirm that you want to remove the device.
6. Click the **Action** button in the upper-left corner of the Computer Management dialog box or right-click anywhere in the right-hand pane of the dialog box.
7. Click **Scan for Hardware Changes**. Windows Server 2003 now scans for the PowerVault 110T DLT VS160 Tape drive. The PowerVault 110T DLT VS160 Tape drive appears under "? Other Devices" again.
8. Right-click the **QUANTUM VS160 SCSI Sequential Device** listing and click **Properties**.
9. Click the **Driver** tab, then click the **Update Driver...** button.
10. When the Hardware Update Wizard appears, click the **Next** button.
11. Click the **Finish** button.
12. Click the **Close** button to close the Device Properties dialog box.

The drive now appears in Device Manager under Tape Drives, listed as "Dell(TM) PowerVault(TM) VS160," and is ready to use.

Installing the Tape Backup Software

See the instructions supplied with the tape backup software.

Drivers

Microsoft® Windows® 2000 and Windows® Server™ 2003: QSDLT32.SYS

Native Operating System Backup Utilities

Microsoft® Windows® 2000 and Windows® Server™ 2003

- Windows Backup

Red Hat Linux versions 7.3 and 8.0 and 9.0

- Tar

Tape Backup Applications

NOTICE: See the Dell Support website at support.dell.com to obtain the latest patches and upgrades for the Tape Backup Applications noted below.

Microsoft® Windows® 2000 and Windows® Server™ 2003

- VERITAS™ BackupExec™ for Windows NT/2000 version 9.0 or later
- Yosemite Tapeware® version 7.0 or later

Novell® NetWare®

- VERITAS™ BackupExec™ for NetWare™ version 9.0 or later
- Yosemite Tapeware® version 7.0 or later

Red Hat Linux versions 7.3, 8.0, and 9.0

- Yosemite Tapeware® version 7.0 or later

Installing the Dell PowerVault Tools Diagnostic Package

Requirements

- Microsoft® Windows® 2000
- PowerVault 110T DLT1, PowerVault 110T DLT VS80, or PowerVault 110T DLT VS160 Tape drive

Before Installing the Diagnostic Package

1. Make sure the tape drive is powered on and that the SCSI bus is in an idle state (stop and/or hold all backup applications).
2. Print these instructions. In the event the server needs to be restarted, you can resume where you left off.

Installing the Diagnostic Package

1. Decide where on the server you plan to install the PowerVault Tools application and related files. You can place the application on your desktop, in an existing folder, or you can create a new folder for this purpose. Note that when the application runs, it creates a log file, which also resides in the designated folder. As a result, you should not run the application directly from the CD as this prevents the application from creating the log file. The log file is useful for Technical Support in the event that troubleshooting the drive becomes necessary.
2. Insert the Dell PowerVault 110T DLT VS160 Tape Drive User's Manual and Drivers CD into the CD drive.
3. Open the folder ***d:*\Diags** on the Dell PowerVault 110T DLT VS160 Tape Drive User's Manual and Drivers CD, where *d:* is the drive letter of the CD drive.
4. Drag or copy the **PowerVault Tools** application to the location chosen in step 1.
5. Browse to the folder chosen in step 1 and double-click the **PowerVault Tools** icon to run the diagnostic application. You can run the diagnostic application at any time by double-clicking the **PowerVault Tools** icon.
6. From the folder ***d:*\Diags** on the Dell PowerVault 110T DLT VS160 Tape Drive User's Manual and Drivers CD, where *d:* is the drive letter of the CD drive, view the README file for usage instructions, explanation of options, and troubleshooting guidelines for the PowerVault Tools application. You may want to copy this README file to the location chosen in step 1 for future use.

NOTE: In some cases, the server may need to restart at this time. If you are prompted to do so, restart the server now.

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Using the Tape Drive: Dell™ PowerVault™ 110T DLT VS160 Tape Drive User's Guide

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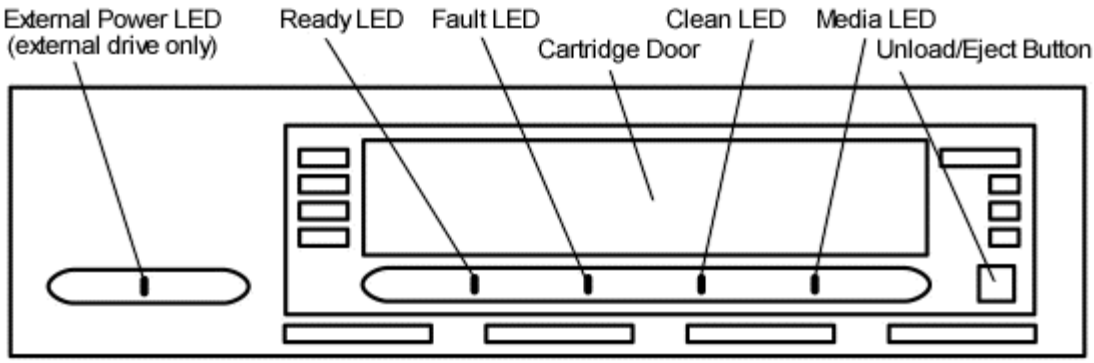
Operating the Tape Drive

Location of the Controls and Indicators

Figure 1. PowerVault 110T DLT VS160 Tape drive front panel



NOTE: The front panel controls and indicators are in the same locations on both the internal and external drives. The internal drive does not have a Power LED.

Indicator Activity During Power-On Self-Test (POST)

Every time you turn on or reset the drive, it conducts a Power-On Self-Test (POST). This test ensures that the drive is working properly and is ready to use. While POST is in progress, watch the front panel LEDs to see the progress and results of the test. During POST, the following actions take place:

- The LEDs illuminate one at a time, from left to right, starting with the Ready LED, next the Fault LED, and finally the Clean LED, at approximately one second intervals
- About four seconds later, the Media LED illuminates
- Each LED signals a different part of the POST process
- All LEDs then turn off momentarily
- If a cartridge is not loaded, the Ready LED illuminates and POST is complete, the entire process taking approximately eight seconds
- If a cartridge is loaded, the Ready LED flashes while the drive mounts the cartridge, a process that can take several minutes depending upon the position of the media in the tape path
- As POST completes, the drive makes a slight buzzing noise for several seconds. This noise is normal and should be ignored

The drive is now ready to use.

Indicator Activity During Normal Operation - Ready LED

When the PowerVault 110T DLT VS160 Tape drive is in use, the Ready LED indicates the three states detailed in Table 1. The Ready LED operates independently of the other three LEDs.

Table 1. Ready LED activity and drive status

Ready LED Activity	Drive Status
Off	No power to the drive
On	Power is on; no cartridge loaded or a loaded cartridge is idle with no tape motion
Blinking	The drive is loading a cartridge or a loaded cartridge has tape motion indicating read, write, seek, rewind, calibration, or other cartridge activity

Indicator Activity During Normal Operation - Fault/Clean/Media LEDs

The Fault, Clean, and Media LEDs indicate the status of the drive. Note that the LEDs can indicate more than one of the indicated operating conditions simultaneously. For example:

- If cleaning is required while a DLT1 format cartridge is loaded, both the Clean and Media LEDs are on
- If an internal write/read diagnostic fails as a result of a permanent write error, both the Fault and Clean LEDs blink slowly.

Table 2 describes what each front panel indicator means.

Table 2. Fault/Clean/Media LED activity and drive status

Indicator	Activity	Operating Condition
Fault	Slow Blink (1x per second)	User initiated write/read diagnostic failed
	Fast Blink (3x per second)	Servo or mechanism error
	On	Internal firmware error
Clean	Slow Blink (1x per second)	Calibration error or permanent write/read error
	Medium Blink (2x per second)	Cleaning in progress
	On	Cleaning required
Media	Slow Blink (1x per second)	Unsupported format, or damaged or unsupported cartridge type inserted into drive
	On	DLT1 format DLTtape™ IV cartridge loaded

See Troubleshooting the Drive in Troubleshooting for more details on error conditions.

Unload/Eject Button Features

The Unload/Eject button provides features in addition to unloading and ejecting a cartridge. To activate one of these features, press and hold the Unload/Eject button for the amount of time specified in Table 3. Release the Unload/Eject button when the desired LED sequence is displayed.

If you do nothing for 15 seconds after accessing any of the additional features that require an action, such as loading a cartridge, the drive returns to normal operating mode.

NOTICE: The Unload/Eject button features indicated by an asterisk (*) in Table 3 overwrite all data on the cartridge loaded in the drive. Use extreme caution when accessing these features to avoid loss of important

data.

Table 3. Unload/Eject button features

LED Status				Button Hold Time (seconds)	Feature Description
Ready	Fault	Clean	Media		
On	N/A	N/A	N/A	0-6	Normal unload/eject function
Blinking	Off	Off	Off	6-9	Reserved
Blinking	Blinking	Blinking	Off	12-15	Reserved
Blinking	Blinking	Blinking	Blinking	15-18	Reserved
On	Off	Off	Off	18-21	Revert to normal operating mode
On	On	Off	Off	21-24	Write/read diagnostic mode*
On	On	On	Off	24-27	Reserved*
On	On	On	On	27-30	Emergency reset
Off	Off	Off	Off	30+	Revert to normal operating mode

Unload/Eject Button Feature Description

Normal Unload/Eject

When you release the button, the drive unloads and ejects the cartridge.

Write/Read Diagnostic Mode

NOTICE: This mode overwrites all data on the cartridge in the drive. Use extreme caution when using this feature to avoid loss of important data.

When you release the button, the drive initiates an internal write/read diagnostic. The diagnostic requires that you first load a cartridge that is blank or does not contain valuable data. When the diagnostic begins, the drive writes and then reads approximately 400MB of data and then unloads and ejects the cartridge. The process takes about two minutes. If the diagnostic test detects no errors, the drive returns to normal operating mode. If an error occurs, the appropriate LEDs illuminate.

Emergency Reset

When you release the button, the drive performs a hard reset, behaving as if it had been turned off and then on. A standard POST then takes place.

Revert to Normal Operating Mode

When you release the button, the drive returns to normal operation.

Loading a Tape Cartridge

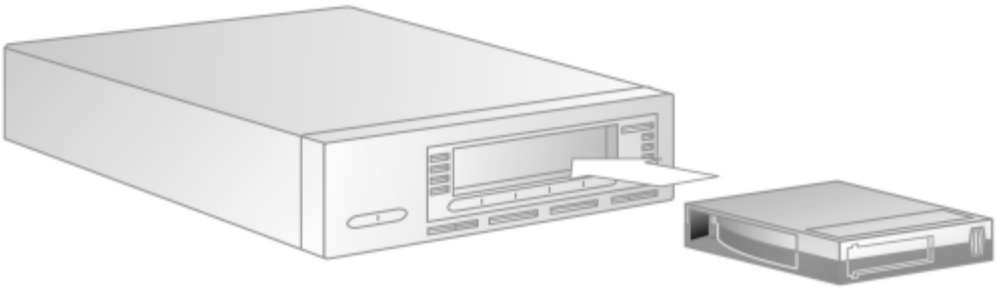
The PowerVault 110T DLT VS160 Tape drive reads and writes DLTtape VS1 cartridges. The PowerVault 110T DLT VS160 Tape drive can read - but not write - DLTtape™ IV cartridges written using the DLT1/VS80 format.

NOTE: The PowerVault 110T DLT VS160 Tape drive automatically ejects any other cartridge types and any cartridges whose format it cannot read. Make sure all cartridges that you want to use for writing are DLTtape VS1 cartridges.

Loading a cartridge into the PowerVault 110T DLT VS160 Tape drive is fast and easy. After the drive completes POST, insert the

DLTtape VS1 cartridge into the cartridge slot, oriented as shown in Figure 2, and push the cartridge gently into the drive until it stops.

Figure 2. Loading a tape cartridge



The Ready LED blinks while the drive loads the cartridge. When the cartridge is ready to use, the Ready LED is steadily illuminated. If the cartridge is a DLTtape™IV written using the DLT1/VS80 format, the Media LED is also steadily illuminated.

Unloading a Tape Cartridge

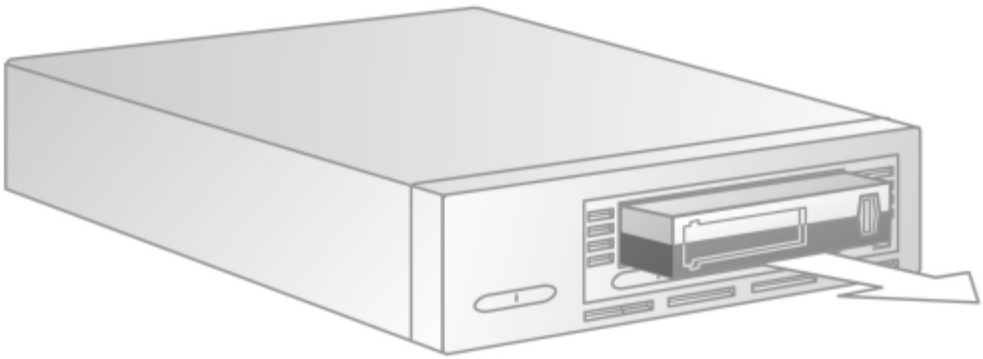
NOTICE: Do not remove a tape cartridge while the Ready LED is blinking.

NOTICE: Remove the cartridge from the PowerVault 110T DLT VS160 Tape drive before turning off the external drive or the host server for an internal drive. Leaving a cartridge in the drive when power is off can result in cartridge and drive damage. When you remove the cartridge from the drive, return the cartridge to its storage case to prolong cartridge life.

To eject a cartridge from the PowerVault 110T DLT VS160 Tape drive, follow these steps:

1. Press the **Unload** button or use your backup software to eject the cartridge. The Ready LED blinks while the drive rewinds the tape.
2. When the drive has rewound the tape, it ejects the cartridge.

Figure 3. Unloading a tape cartridge

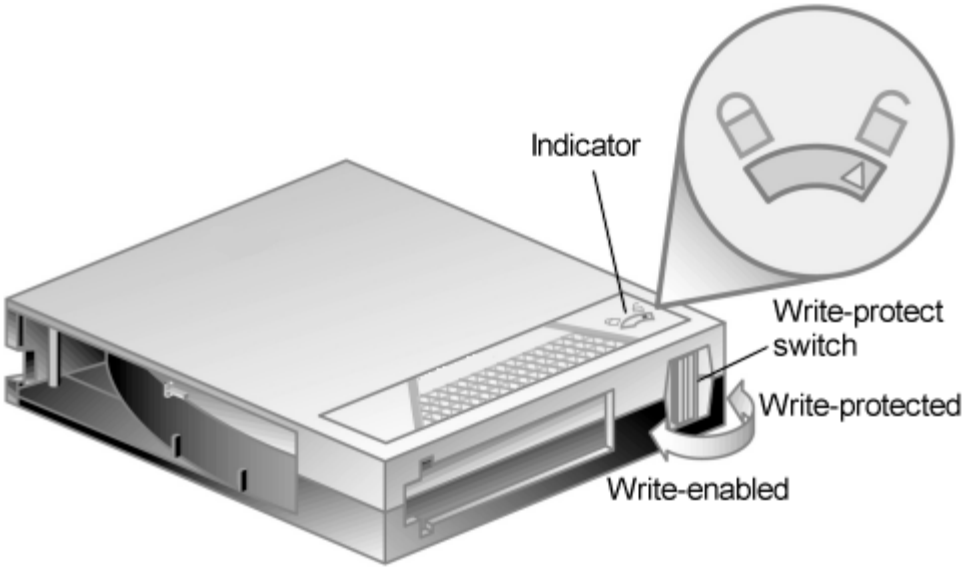


3. Remove the cartridge from the drive.
4. Return the cartridge to its storage case to prolong cartridge life.

Setting the Write-Protect Switch on Tape Cartridges

All Tape cartridges have a write-protect switch to prevent accidental erasure of data. Before loading a tape cartridge into the PowerVault 110T DLT VS160 Tape drive, make sure the write-protect switch on the front of the cartridge is positioned as desired.

Figure 4. DLTtape VS1 cartridge write-protect switch



Slide the switch to the right to write-protect the cartridge. The "locked" icon appears on the switch indicating that the cartridge is write-protected. Slide the switch to the left to allow the PowerVault 110T DLT VS160 Tape drive to write data to the cartridge. The "unlocked" icon appears on the switch. The indicator on the top of the cartridge also points to the appropriate icon, indicating the write-protect status of the cartridge.

Caring for Tape Cartridges

To ensure the longest possible life for all of your tape cartridges, follow these guidelines:

- Do not drop or strike a cartridge. Excessive shock can displace the tape leader, making the cartridge unusable and possibly damaging the PowerVault 110T DLT VS160 Tape drive.
- Store tape cartridges in their storage cases.
- Do not expose tape cartridges to direct sunlight or sources of heat, including portable heaters and heating ducts.
- The operating temperature range for tape cartridges is 50° F to 104° F (10° C to 40° C). The storage temperature range is 60° F to 90° F (16° C to 32° C).
- If a tape cartridge has been exposed to temperatures outside the ranges specified above, stabilize the cartridge at room temperature for the same amount of time it was exposed to extreme temperatures, up to 24 hours.
- Store tape cartridges in a dust-free environment in which relative humidity is always between 20% and 80% (noncondensing). The ideal storage relative humidity is 40%, ± 20%.
- Do not place tape 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 on cartridges.
- Place identification labels only in the slide-in slot on the front of the cartridge.
- Never use any type of adhesive labels on tape cartridges.

Cleaning the Tape Mechanism

When the Clean LED is on, the PowerVault 110T DLT VS160 Tape drive's read/write head needs to be cleaned. See Troubleshooting the Drive in Troubleshooting for other conditions that may indicate drive cleaning is necessary.

See Loading a Tape Cartridge to load the cleaning cartridge. Cleaning typically takes several minutes, during which the Clean LED blinks.

NOTICE: Use only Dell approved cleaning cartridges in the PowerVault 110T DLT VS160 Tape drive. See Recommended Tapes in Specifications for a list of approved cleaning cartridges. Use of any other type of cleaning cartridge could damage the read/write head in your drive. If you attempt to load any other type of cleaning cartridge, the PowerVault 110T DLT VS160 Tape drive prevents damage by ejecting the cartridge after approximately 25 seconds without allowing the cleaning tape to come into contact with the read/write head.

Figure 5. DLTtape VS1 cleaning cartridge

Each cleaning cartridge has a useful life of 20 cleanings. The cleaning cartridge includes a label with 20 small boxes printed on it. Always place a check mark in a box each time you use the cartridge to clean the drive. Replace the cleaning cartridge when all boxes are checked.

When the cleaning cartridge has cleaned the read/write head, the Clean LED turns off and the drive ejects the cleaning cartridge.

NOTE: If the previous error condition occurs again with the next data tape, see Troubleshooting the Drive in Troubleshooting for more information.

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Using the Tape Backup Software: Dell™ PowerVault™ 110T DLT VS160 Tape Drive User's Guide

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See the User's Operating Guide supplied with your Tape Backup software application. If the tape backup software does not detect the tape drive or to obtain the latest operating system drivers and/or firmware upgrades, see the Dell Support website at support.dell.com.

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Troubleshooting: Dell™ PowerVault™ 110T DLT VS160 Tape Drive User's Guide

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Obtaining Drivers and Firmware Upgrades

If the tape backup software does not detect the tape drive or to obtain the latest operating system drivers and/or firmware upgrades, see the Dell Support website at support.dell.com.

Troubleshooting the Drive

Power-On Self-Test (POST) and Drive Connectivity Failures

Every time you turn on or reset the drive, it conducts a Power-On Self-Test (POST). This test ensures that the drive is working properly and is ready to use. While POST is in progress, watch the front panel LEDs to see the progress and results of the test. See Operating the Tape Drive in Using the Tape Drive for details on normal LED activity during during POST.

A successful POST will always finish with a solid Ready LED. POST takes approximately eight seconds with no tape loaded and up to several minutes with a tape loaded, depending on the position of the media in the tape path. When a tape is loaded, other expected LED indications may exist. See Operating the Tape Drive in Using the Tape Drive for details. Any unexpected LED indications during POST may indicate a failure. Use the information in Table 1 to troubleshoot the drive. If the condition persists, contact Technical Support.

Table 1. Troubleshooting errors indicated by front panel LEDs

Symptom	Problem	Solution
None of the drive's LEDs illuminate.	The drive is not receiving power.	Check the drive's power cable. If an external drive, check the power cable connections. Plug the power cable into a different power outlet.
Media LED: Slow blink	Unsupported format, unsupported cartridge type, or damaged cartridge.	Loading an unsupported cartridge, such as a DLTtape™III, an SDLT cartridge, or an incompatible cleaning cartridge, damaged media, a DLTtape™ IV cartridge that is either blank or was written using an unsupported format such as DLT4000, DLT7000 or DLT8000, or an unsuccessful buckle operation causes this condition. The drive ejects the cartridge. Inspect cartridge and confirm format, type, and integrity. If repeatable with a known-good cartridge, replace drive or call Technical Support.
Media LED:	A DLT1 (DLT VS80) format	The PowerVault 110T DLT VS160 Tape drive can read, but not write, this

Illuminated	DLTtape™ IV cartridge is loaded.	cartridge. If attempting to read, no action is required. Because this cartridge cannot be written, if you attempt a write operation, your backup application should return a "Write Protected" message.
Clean LED: Slow blink	Calibration error or permanent write/read error.	The drive cannot read the calibration tracks on the tape or has encountered a permanent write or read error. If the failure is the result of a calibration error, the drive ejects the cartridge. If the failure is the result of a permanent read/write error, the drive does not eject the cartridge. Try a known-good cartridge. If condition persists with a particular cartridge, discard or degauss that cartridge. If repeatable with a known-good cartridge, try cleaning the drive. If cleaning does not help, replace the drive or contact Technical Support.
Clean LED: Illuminated	Cleaning required.	Drive continues to function, although increased soft error rates may be encountered. Clean the drive at your earliest convenience. LED indication remains until drive is cleaned.
Fault LED: Slow blink	User initiated write/read diagnostic failed.	Eject tape, power cycle or reset drive. Try diagnostic again with a different, known-good tape. **NOTICE: This feature overwrites any data currently on the cartridge. Confirm that the selected cartridge does not contain important data.** If this condition persists with a known-good cartridge, contact Technical Support.
Fault LED: Fast blink	Servo or mechanical error.	Power cycle or reset the drive. Try the operation again with a known-good cartridge. If condition persists, contact Technical Support.
Fault LED: Illuminated	Internal firmware error.	Power cycle or reset the drive. Try the operation again with a known-good cartridge. If condition persists, contact Technical Support.
Other LED Indications	Unspecified.	If you encounter any LED indications that are not covered in this manual, contact Technical Support. See Front Panel Controls and Indicators in Introduction for a complete LED indicator reference.

Table 2 helps you troubleshoot other drive and connectivity problems.

Table 2. Drive and connectivity troubleshooting

Symptom	Problem	Solution
The host server does not recognize the drive.	The drive's SCSI ID might not be unique.	Regardless of the number of SCSI devices attached to the server that is to be the host for the PowerVault 110T DLT VS160 Tape Internal drive, each must have a unique SCSI ID. Check the SCSI IDs on all other SCSI devices on the selected server, including the SCSI host adapter, and select an unused SCSI ID for the PowerVault 110T DLT VS160 Tape Internal drive. *NOTE: If you attach the drive to a narrow (50-pin) bus, you can only use SCSI IDs 0 through 7.*
	The SCSI host adapter might be incorrectly configured.	Check the SCSI host adapter configuration. Refer to the SCSI host adapter manuals for instructions.
	The SCSI cable might be loose.	Check both ends of the SCSI cable, both for the external and internal drives.
	The SCSI terminator might be loose or missing.	1. Make sure an active Low-Voltage Differential/Single-Ended (LVD/SE) terminator is properly seated on the open SCSI connector on the rear panel of the external drive or on the last device on the SCSI bus.

		2. Make sure an active LVD/SE terminator is in place on the SCSI ribbon cable for the internal drive.
	The SCSI bus might be improperly terminated.	1. If the PowerVault 110T DLT VS160 Tape drive is the last or only device on the SCSI bus, make sure the drive is properly terminated. 2. If the PowerVault 110T DLT VS160 Tape drive is not the last or only device on the SCSI bus, check all SCSI cable connections and make sure the last device on the SCSI bus is terminated. 3. Make sure termination is set properly on the SCSI host adapter. 4. If you attach the drive to a narrow (50-pin) SCSI bus, you must use a customer-supplied 68-pin to 50-pin adapter that terminates the unused 18 pins. These adapters are sometimes labeled "high-byte termination." 5. Regardless of which device is used to terminate the SCSI bus, it must have power applied and be turned on for proper termination to occur.
	The SCSI terminator might not be at the end of the SCSI bus or more than two terminators might be present on the SCSI bus.	Make sure the terminators are placed only at each end of the SCSI bus — normally one at the host adapter and one on the last device on the bus. However, if both internal and external devices are attached to the same SCSI host adapter, the adapter may be positioned in the middle of the SCSI bus and should not be terminated. In that case, the SCSI devices on each end of the bus must be terminated.
	The SCSI host adapter might be in a defective expansion slot.	Move the SCSI host adapter to a different expansion slot.
	The SCSI bus might be too long.	Make sure the total length of the SCSI bus does not exceed the ANSI SCSI standard of 19 feet (6 meters) for a Single-Ended (SE) bus, 40 feet (12 meters) for a Low-Voltage Differential (LVD) SCSI bus with multiple devices, or 82 feet (25 meters) for an LVD SCSI bus with a single device. If you attach the drive to an SE bus or if there are any SE devices attached to the bus, the bus is limited to the maximum cable lengths of an SE bus.
There are fatal or nonfatal errors for which you cannot find the cause.	The SCSI bus might be improperly terminated.	1. If the PowerVault 110T DLT VS160 Tape drive is the last or only device on the SCSI bus, make sure the drive is properly terminated. Make sure only the last device is terminated. 2. If the PowerVault 110T DLT VS160 Tape drive is not the last or only device on the SCSI bus, check all SCSI cable connections and make sure the last device on the SCSI bus is terminated. 3. Make sure termination is set properly on the SCSI host adapter. 4. If you attach the drive to a narrow (50-pin) SCSI bus, you must use a customer-supplied 68-pin to 50-pin adapter that terminates the unused 18 pins. These adapters are sometimes labeled "high-byte termination." 5. Regardless of which device is used to terminate the SCSI bus, it must have power applied and be turned on for proper termination to occur.
	The AC power source may not be properly grounded (PowerVault 110T DLT VS160 Tape External drive only).	1. Plug the PowerVault 110T DLT VS160 Tape External drive's power cable into a power outlet on the same circuit as the host server. 2. Plug the PowerVault 110T DLT VS160 Tape External drive’s power cable into a different power outlet.
The backup application does	Application not compatible or improper device drivers installed.	If the operating system recognizes the drive, but not the backup application, confirm that you are using a compatible backup

not recognize the drive.		application. Also confirm that you have the proper device drivers, if necessary, installed. See the Dell Support website at support.dell.com to obtain the latest operating system drivers and/or firmware upgrades.
The drive cannot write data to or read data from a cartridge.	Cartridge or drive problem.	1. Make sure that the cartridge is write-enabled. Move the write-protect switch to the write-enabled position. See Setting the Write-Protect Switch on Tape Cartridges in Using the Tape Drive for detailed instructions. 2. If you are attempting to write data, make sure you are using a DLTtape VS1 cartridge. 3. Make sure that the cartridge has not been exposed to harsh environmental or electrical conditions and is not physically damaged in any way. 4. 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 using your backup application. 5. Make sure you understand any data protection or overwrite protection schemes that your backup application may be using, any of which could prevent you from writing to a given cartridge. 6. Retry the operation with a different, known-good cartridge. 7. Clean the tape drive. See Cleaning the Tape Mechanism in Using the Tape Drive for detailed instructions.
The drive is not backing up data efficiently.	Network, cartridge, SCSI bus, backup data set, or backup application problem.	1. Check the network bandwidth from the host server. If you are backing up data over a network, compare to a local-only backup for relative backup speed indication. 2. Make sure that the drive is on its own SCSI bus and not daisy-chained to another tape drive or to the hard drive being backed up. 3. Clean the tape drive. See Cleaning the Tape Mechanism in Using the Tape Drive for detailed instructions. 4. Try a new cartridge. A marginal cartridge can cause performance problems due to bad spots on the tape requiring retries. 5. Make sure that the data is being compressed. See your backup application user documentation for details. 6. Check the size of the files in the backup set. Small file size can impact performance. 7. Confirm that the backup application is using block sizes of at least 32KB, and preferably 64KB. See your backup application user documentation for details.
The drive does not eject a cartridge.	Timing or drive problem.	1. Allow sufficient time for the drive to complete any operations, such as POST, reset, load, unload, rewind, etc. Worst case is when powering up or resetting the drive with the tape positioned at the physical end of the media. Recovery from this state could take several minutes. 2. Allow sufficient time for the backup application to release any hold it may have on the drive. Worst case could be several minutes. Confirm that the backup application is not set to prevent media removal. 3. Try a software eject, using your backup application, allowing sufficient time for the command to execute. 4. If the drive still does not eject the cartridge, power down the drive and remove all connectors except power from the rear of the tape drive. Apply power to the drive and allow it to complete POST. Press the Unload/Eject button, allowing sufficient time for the command to execute. See Unload/Eject Button Features in Using the Tape Drive for detailed instructions.

		5. See If the Drive Becomes Unresponsive for instructions on performing an emergency reset to eject the cartridge. 6. If the drive still does not eject the cartridge, contact Technical Support.
The drive repeatedly rejects a cartridge.	Cartridge or drive problem.	The PowerVault 110T DLT VS160 Tape Drive rejects any unsupported cartridge, such as a DLTtape™ III, an SDLT cartridge, an incompatible cleaning cartridge, damaged media, a DLTtape™ IV cartridge that is either blank or was written using an unsupported format such as DLT4000, DLT7000 or DLT8000, as well as any cartridge that causes an unsuccessful buckle operation. Inspect the cartridge and confirm format, type, and integrity. If repeatable with a known-good cartridge, try cleaning the drive. If cleaning does not help, replace the drive or call Technical Support.

If the Drive Becomes Unresponsive

On rare occasions, the drive may become unresponsive. If this should happen, use this procedure to reset the drive and unload the cartridge:

1. Press and hold the **Unload/Eject** button for approximately 27 seconds until all four LEDs are steadily illuminated (not blinking).
2. Release the **Unload/Eject** button while all four LEDs are steadily illuminated. The drive initiates a device reset, then performs a POST. See Indicator Activity During Power-On Self-Test (POST) in Introduction for information on normal POST LED activity.
3. Upon completion of POST, press and release the **Unload/Eject** button as soon as the Ready LED begins to blink and/or you hear tape motion. The drive attempts to eject the cartridge as soon as the device reset is complete and the drive completes a mid-tape load. This may take several minutes, depending on the where the media is positioned in the tape path.
4. If you do not press the **Unload/Eject** button again as indicated in Step 3, the cartridge in the drive is ready to use after the drive resets and loads the cartridge.

See Unload/Eject Button Features in Using the Tape Drive for further instructions on initiating an emergency reset. See Front Panel Controls and Indicators in Introduction for complete information on LED activity during a reset and POST.

Running the Dell PowerVault Tools Diagnostic Package

NOTE: See Installing the Dell PowerVault Tools Diagnostic Package in Getting Started and Setup for installation instructions.

Requirements

- Microsoft® Windows® 2000
- PowerVault 110T DLT1, PowerVault 110T DLT VS80, or PowerVault 110T DLT VS160 Tape drive

Before Running the Diagnostic Application

- Make sure the tape drive is powered on and that the SCSI bus is in an idle state (stop and/or hold all backup applications).

Running the Diagnostic Application

1. Browse to the folder to which you copied the PowerVault Tools application. See step 1 under Installing the Dell PowerVault Tools Diagnostic Package in Getting Started and Setup for more information.
2. Double-click the **PowerVault Tools** icon to run the diagnostic application. Note that when the application runs, it creates a

log file in the application folder. As a result, you should not run the application directly from the CD as this prevents the application from creating the log file. The log file is useful for Technical Support in the event that troubleshooting the drive becomes necessary.

3. The diagnostic application searches for attached PowerVault 110T DLT1, PowerVault 110T DLT VS80, or PowerVault 110T DLT VS160 Tape drives, which it then displays on the left pane of the application main window.
4. Click the drive on which you want to run diagnostics.
5. Select the **Test** tab.
6. Choose the test you want to run on the selected drive from the pull-down menu under **Select Test To Run**. View the README file in the folder ***d:*\Diags**, where ***d:*** is the drive letter of the CD drive, on the Dell PowerVault 110T DLT VS160 Tape Drive User's Manual and Drivers CD for details on each available test.
7. Click the **Run Test** button.

For more detailed instructions on using the diagnostic application, view the README file in the folder ***d:*\Diags**, where ***d:*** is the drive letter of the CD drive, on the Dell PowerVault 110T DLT VS160 Tape Drive User's Manual and Drivers CD.

Reinstalling the Tape Backup Software

See the User's Operating Guide supplied with your Tape Backup software application.

Reinstalling Drivers for Windows 2000/Server 2003

NOTE: The device drivers supplied on the Dell PowerVault 110T DLT VS160 Tape Drive User's Manual and Drivers CD are required if you intend to use native operating system backup applications. Commercial backup applications provide all necessary device driver support. See Installing the Tape Backup Software in Getting Started and Setup for a list of compatible backup applications.

Microsoft® Windows® 2000:

1. Make sure that you are logged on to the host server with Administrator privileges.
2. Insert the Dell PowerVault 110T DLT VS160 Tape Drive User's Manual and Drivers CD into the CD drive on the host server.
3. Right-click the **My Computer** icon on the Windows desktop, click **Manage**, then click **Device Manager**.
   The PowerVault 110T DLT VS160 Tape drive should be listed under the "? Other Devices" item as "QUANTUM VS160 SCSI Sequential Device."
4. Right-click the **QUANTUM VS160 SCSI Sequential Device** listing, click **Uninstall**, and then click the **OK** button to confirm that you want to remove the device.
5. Click the **Action** button in the upper-left corner of the Computer Management dialog box or right-click anywhere in the right-hand pane of the dialog box.
6. Click **Scan for Hardware Changes**. Windows 2000 now scans for the PowerVault 110T DLT VS160 Tape drive. The PowerVault 110T DLT VS160 Tape drive appears under "? Other Devices" again.
7. Right-click the **QUANTUM VS160 SCSI Sequential Device** listing and click **Properties**.
8. Click the **Reinstall Driver** button.
9. When the Upgrade Device Driver Wizard appears, click the **Next** button.
10. Click **Display a list...** and then click the **Next** button.
11. Click the **Tape Drives** item in the list. You may have to scroll down to see this item.
12. Click the **Have Disk** button, type ***d:*\Drivers\W2K**, replacing *d:* with the drive letter for the CD drive into which you inserted the Dell PowerVault 110T DLT VS160 Tape Drive User's Manual and Drivers CD, and click the **OK** button.
13. Click the **DLT VS Tape Drive** entry and click the **Next** button.
14. Click the **Next** button to install the driver.
15. Click the **Finish** button.
16. Close the Device Properties dialog box.

The drive now appears in Device Manager under Tape Drives, listed as "DLT VS Tape Drive," and is ready to use.

Microsoft® Windows® Server™ 2003:

1. Make sure that you are logged on to the host server with Administrator privileges.
2. Insert the Dell PowerVault 110T DLT VS160 Tape Drive User's Manual and Drivers CD into the CD drive on the host server.

3. Click the **Start** button on the Windows taskbar, point to **Programs**, click **Administrative Tools**, and click **Computer Management**.
4. Click **Device Manager**.
   The PowerVault 110T DLT VS160 Tape drive should be listed under the "? Other Devices" item as "QUANTUM VS160 SCSI Sequential Device."
5. Right-click the **QUANTUM VS160 SCSI Sequential Device** listing, click **Uninstall**, and then click the **OK** button to confirm that you want to remove the device.
6. Click the **Action** button in the upper-left corner of the Computer Management dialog box or right-click anywhere in the right-hand pane of the dialog box.
7. Click **Scan for Hardware Changes**. Windows Server 2003 now scans for the PowerVault 110T DLT VS160 Tape drive. The PowerVault 110T DLT VS160 Tape drive appears under "? Other Devices" again.
8. Right-click the **QUANTUM VS160 SCSI Sequential Device** listing and click **Properties**.
9. Click the **Driver** tab, then click the **Update Driver...** button.
10. When the Hardware Update Wizard appears, click the **Next** button.
11. Click the **Finish** button.
12. Click the **Close** button to close the Device Properties dialog box.

The drive now appears in Device Manager under Tape Drives, listed as "Dell(TM) PowerVault(TM) VS160," and is ready to use.

Drive Makes Noises During System Startup

During system startup, the computer accesses the tape drive and retensions any tape cartridge in the drive to prepare the drive for operation. The noise and vibration associated with this activity are normal for this technology and do not indicate a problem with the drive.

Drive Failures During Backup or Restore Operations

- Make sure you are using the correct type of tape cartridge.
- Make sure tape cartridge is not write-protected.
- Remove and reinsert the tape cartridge.
- Try a different tape cartridge, preferably a new one.
- Clean the tape drive read/write head.
- Verify drive settings in the system setup program.
- Check all cable connections.

Tape-Backup Software Errors

- DMA conflicts during backup or compare operations.
- Media unreadable.
- See the User's Operating Guide supplied with your Tape Backup software application for more information.

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Specifications: Dell™ PowerVault™ 110T DLT VS160 Tape Drive User's Guide

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General

Manufacturer	Manufactured for Dell
Model number	PowerVault 110T DLT VS160
Interface type	16-bit Wide-Ultra 160 SCSI Low-Voltage Differential (LVD). Also compatible with a Single-Ended (SE) bus

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Performance

Formatted capacity, without data compression	80GB of User Data
Formatted capacity, with data compression	160GB of User Data assuming 2:1 compression
Type of compression	Hardware DLZ
Effective backup rate	8.0MB/second without data compression Up to 16.0MB/second with data compression, 2:1 compression ratio typical
Raw data transfer rate	>8.0MB/second (includes format data, user data, post amble, etc.)
Tape speed, Read/write	122 inches per second
Tape speed, Search/rewind	160 inches per second
Load time from BOT for previously recorded cartridge	80 seconds
Recording method	PRML
Recording media	DLTtape VS1
Cartridge size	4.1 inch x 4.1 inch x 1.0 inch
Data density	175 Kbpi (linear bit density)
Tracks	60 Logical Tracks, 240 physical tracks

Reliability

Recording unrecoverable errors	1 in 10^{17}
MTBF	250,000 hours Dell Computer Corporation does not warrant that predicted MTBF is representative of any particular unit installed for customer use. Actual figures vary from unit to unit. (MTBF is measured at 100% duty cycle, excluding head life.)

Recommended Tapes

Type of Tape	Manufacturer
DLTtape VS1	Dell branded media
Cleaning	Dell branded

Physical

Specification	PowerVault 110T DLT VS160 Tape Internal	PowerVault 110T DLT VS160 Tape External
Height	1.618 in (41.1 mm) without bezel 1.656 in (42.06 mm) with bezel	2.608 in (66.24 mm)
Width	5.748 in (146 mm) behind bezel 5.807 in (147.5 mm) with bezel	8.352 in (212.13 mm)
Depth	8.571 in (217.7 mm) measured from back of front bezel 8.770 in (222.76 mm) including the bezel	10.728 in (272.49 mm)
Weight	3.0 lbs (1.36 Kg)	8.0 lbs (3.63 Kg)

Power

Specification	PowerVault 110T DLT VS160 Tape Internal	PowerVault 110T DLT VS160 Tape External
Voltage	+5VDC, +12VDC	100-240VAC (auto-ranging), 50/60Hz
Voltage tolerance	± 5%	N/A
Operational current	1.2A Typical @ +5VDC 0.5A Typical @ +12VDC	0.9A
Peak	1.9A @ +5VDC, ~300ms duration 2.7A @ +12VDC, ~300ms duration	N/A
Power use (nominal)	DC 11.5W steady state, > 14W maximum	> 35W

Environmental

Specification	Operating	Storage
Temperature	10 to 40 degrees C	-40 to 66 degrees C
Thermal gradient	11 degrees C/h (across range)	20 degrees C/h with 5 degree margin (across range)
Relative humidity	20% to 80% noncondensing	10% to 95% noncondensing
Maximum wet bulb temperature	25 degrees C	46 degrees C
Altitude	-500 to 30,000 feet	-500 to 30,000 feet
Shock	5g @ 11 ms, 62g @ 2 ms	142g @ 2 ms

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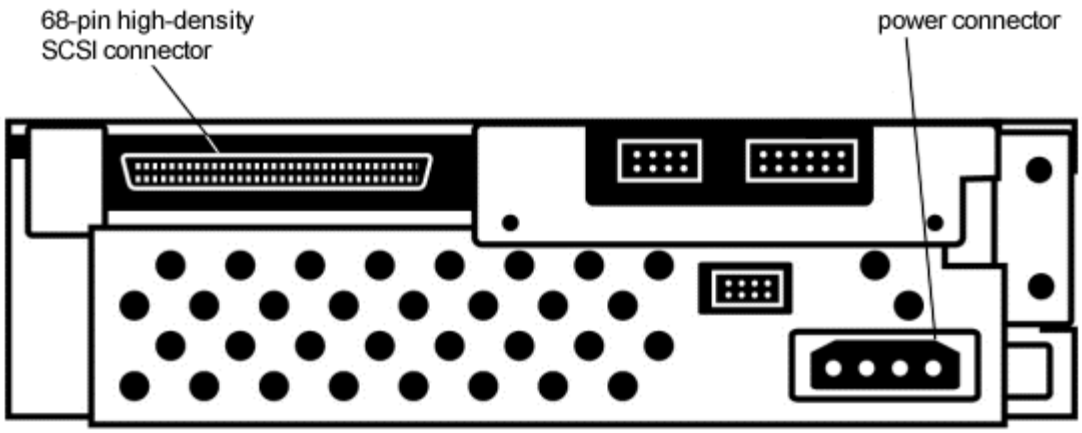
Drive Connectors: Dell™ PowerVault™ 110T DLT VS160 Tape Drive User's Guide

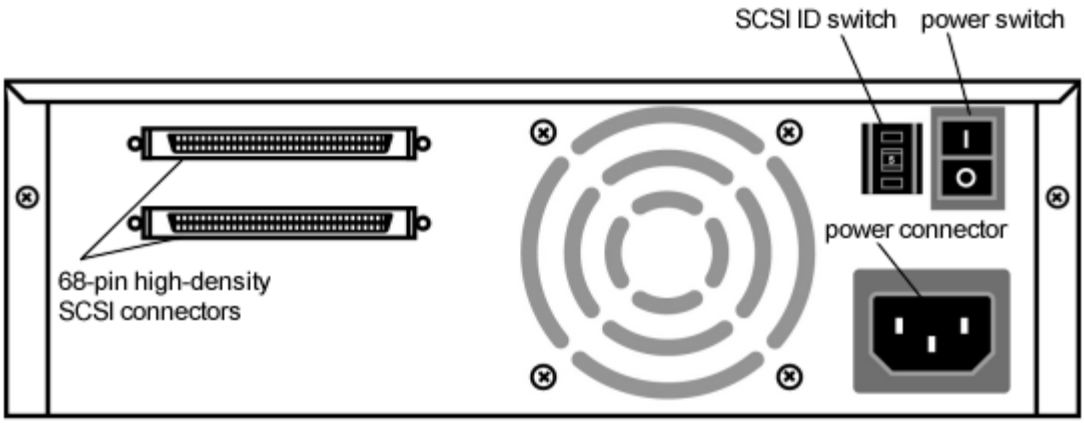
PowerVault 110T DLT VS160 Tape Internal Drive

Figure 1. PowerVault 110T DLT VS160 Tape Internal drive connectors



PowerVault 110T DLT VS160 Tape External Drive

Figure 2. PowerVault 110T DLT VS160 Tape External drive connectors



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Jumpers: Dell™ PowerVault™ 110T DLT VS160 Tape Drive User's Guide

PowerVault 110T DLT VS160 Tape Internal Drive

Figure 1. SCSI jumper block settings

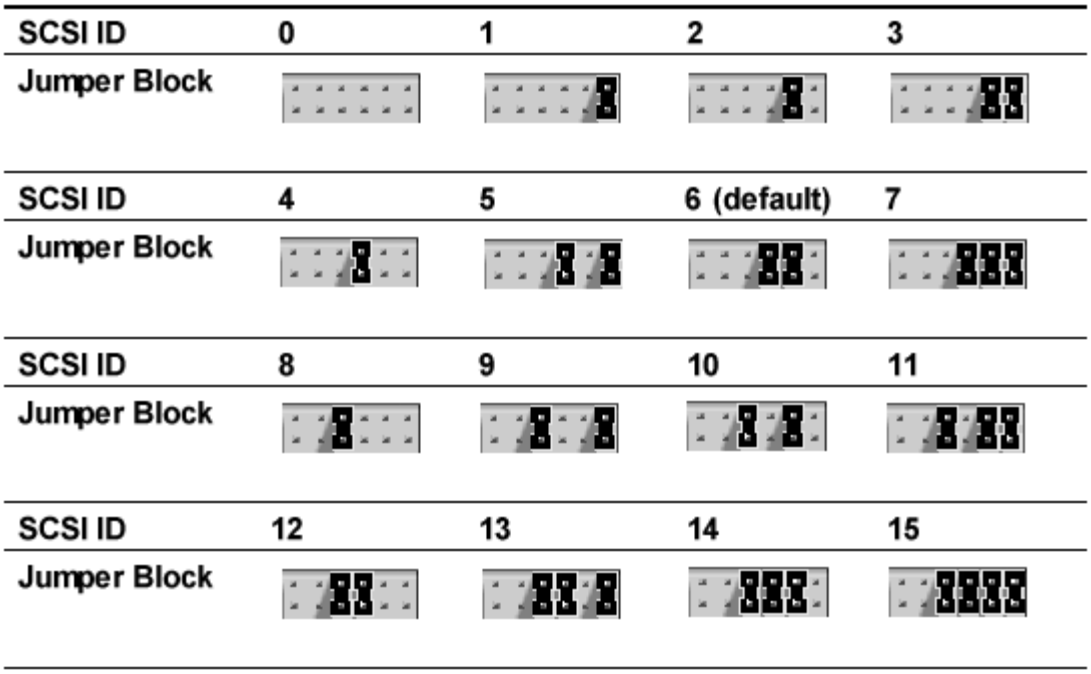
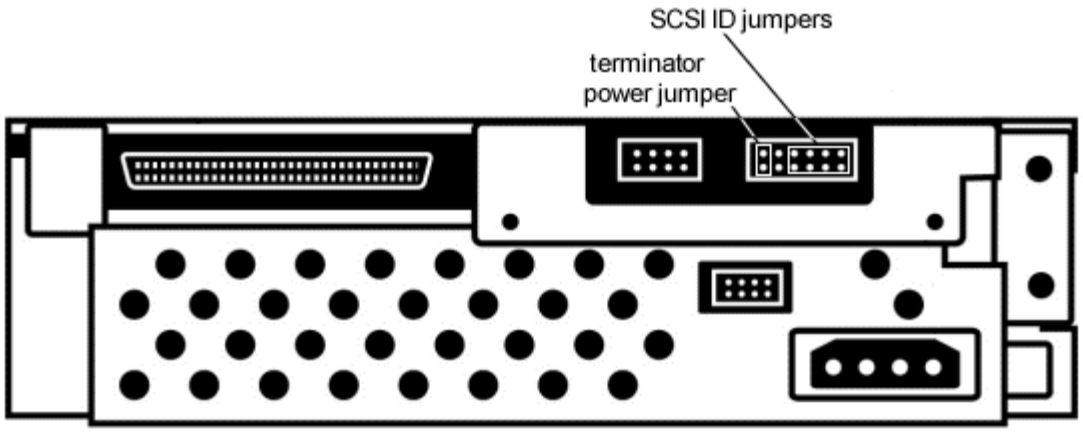


Figure 2. SCSI jumper block location



PowerVault 110T DLT VS160 Tape External Drive

Figure 3. SCSI ID switch (default = ID 6)

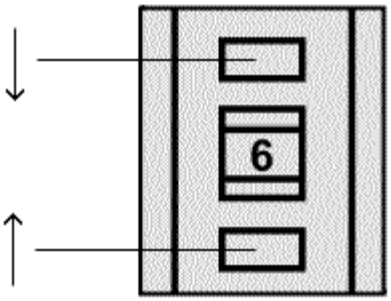
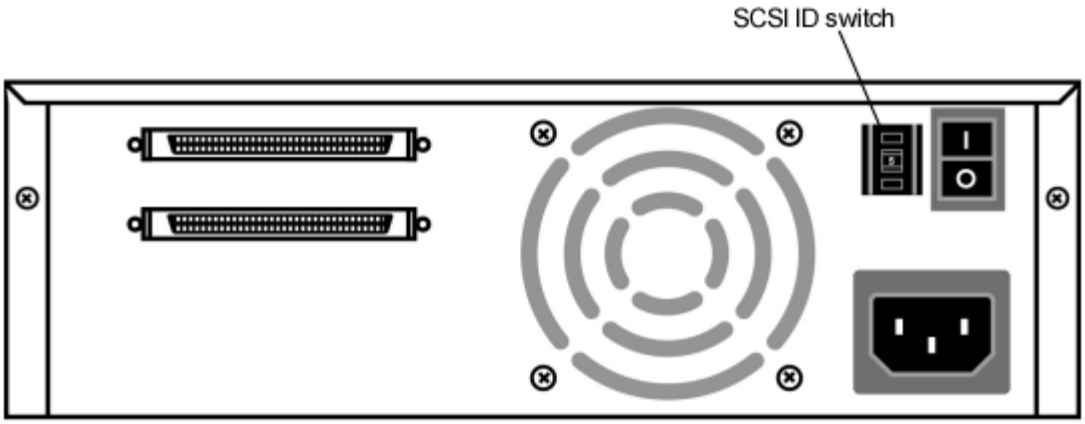


Figure 4. SCSI ID switch location



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