reference guide

hp StorageWorks
DLT VS 40/80 GB tape drive

Second Edition (January 2003)

Part Number: 289067-002

This guide is to be used as step-by-step instructions for installation and as a reference for operation, troubleshooting, and future upgrades.

DLT VS 40/80 GB Tape Drive Reference Guide
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contents

about this guide

This reference guide provides information to help you:

- Install the DLT VS 40/80 GB tape drive
- Install the software drivers
- Operate the DLT VS 40/80 GB tape drive
- Troubleshoot the DLT VS 40/80 GB tape drive
- Update the firmware on the DLT VS 40/80 tape drive

About this Guide topics include:

Overview

This section covers the following topics:

Intended Audience

This book is intended for use by technicians who are experienced with installing and operating HP tape drives.

Prerequisites

Before you install the DLT VS 40/80 GB tape drive, make sure you consider the items below.

- Review the installation instructions and gather all required tools.
- Review the installation instructions to be sure your installation location meets the required environmental conditions.

Related Documentation

In addition to this guide, HP provides corresponding information:

- *HP StorageWorks DLT VS 40/80 GB External Tape Drive Installation Instructions*.
- *HP StorageWorks DLT VS 40/80 GB Internal Tape Drive Installation Instructions*.

Conventions

Conventions consist of the following:

- Document Conventions
- Text Symbols
- Equipment Symbols

Document Conventions

The document conventions included in Table 1 apply in most cases.

Table 1: Document Conventions

Element	Convention
Cross-reference links	Figure 1
Key and field names, menu items, buttons, and dialog box titles	**Bold**
File names, application names, and text emphasis	Italics
User input, command and directory names, and system responses (output and messages)	`Monospace font` `COMMAND NAMES` are uppercase monospace font unless they are case sensitive
Variables	*`<monospace, italic font>`*
Website addresses	Underlined sans serif font text: http://www.hp.com

Text Symbols

The following symbols may be found in the text of this guide. They have the following meanings.

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or death.

Caution: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

Note: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Equipment Symbols

The following equipment symbols may be found on hardware for which this guide pertains. They have the following meanings.

Any enclosed surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.

WARNING: To reduce the risk of personal injury from electrical shock hazards, do not open this enclosure.

Any RJ-45 receptacle marked with these symbols indicates a network interface connection.

WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. Contact with this surface could result in injury.

WARNING: To reduce the risk of personal injury from a hot component, allow the surface to cool before touching.

Power supplies or systems marked with these symbols indicate the presence of multiple sources of power.

WARNING: To reduce the risk of personal injury from electrical shock, remove all power cords to completely disconnect power from the power supplies and systems.

Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manually handling material.

Rack Stability

Rack stability protects personal and equipment.

WARNING: To reduce the risk of personal safety or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- In single rack installations, the stabilizing feet are attached to the rack.
- In multiple rack installations, the racks are coupled.
- Only one rack component is extended at any time. A rack may become unstable if more than one rack component is extended for any reason.

Getting Help

If you still have a question after reading this guide, contact an HP authorized service provider or access our website: http://www.hp.com.

HP Technical Support

In North America, call technical support at 1-800-652-6672, available 24 hours a day, 7 days a week.

Note: For continuous quality improvement, calls may be recorded or monitored.

Outside North America, call technical support at the nearest location. Telephone numbers for worldwide technical support are listed on the HP website under support: http://www.hp.com/support.html.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

HP Storage Website

The HP website has the latest information on this product, as well as the latest drivers. Access storage at: http://www.hp.com/support. From this website, select the appropriate product or solution.

HP Authorized Reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868
- Elsewhere, see the HP website for locations and telephone numbers: http://www.hp.com.

Introduction

1

The HP StorageWorks DLT VS 40/80 GB Tape Drive is a value-priced, high-capacity streaming cartridge tape drive designed for use with HP ProLiant Servers. The drive has a dual-channel read/write head, Lempel-Ziv (DLZ) high-efficiency data compression, and tape-mark directory to achieve fast data throughput and access times.

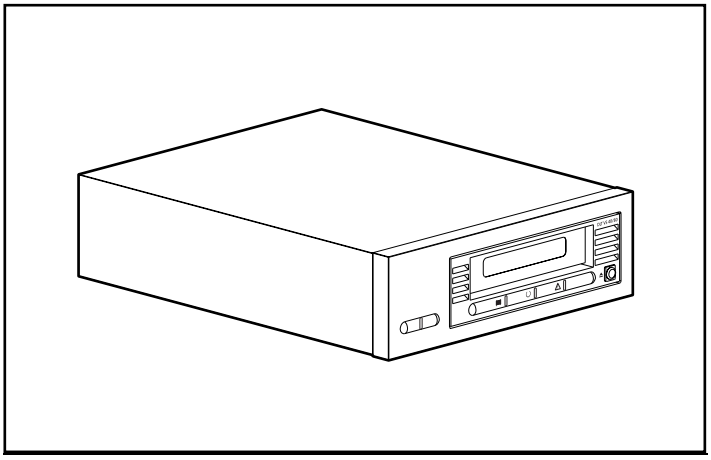

Figure 1: DLT VS 40/80 GB tape drive

Previously Recorded Media

The DLT VS 40/80 can read DLT IV media previously recorded using a DLT 20/40 format. The DLT VS 40/80 can only write to media previously recorded using a DLT I or DLT VS 40/80 GB tape drive. See “Using Cartridges” in Chapter 5 for additional information.

Software Included

The DLT VS 40/80 GB tape drive ships with a CD that contains Microsoft certified drivers that support the Microsoft Windows NT or Windows 2000 operating systems. Multiple software utilities are also available to customers through the HP website and can be downloaded free of charge.

System Requirements

Your DLT VS 40/80 GB tape drive requires a wide, SCSI-2, Low Voltage Differential (LVD) or Single-Ended (SE) SCSI bus. The following controller types are supported:

- Fast SCSI-2 (Wide)
- Wide-Ultra SCSI
- Ultra-2 SCSI

Note: The DLT VS 40/80 GB tape drive does not support High Voltage Differential (HVD) controllers.

Install and configure the controller before beginning the drive installation, using the documentation included with the controller. If you connect your DLT VS 40/80 GB tape drive to an SE SCSI bus, drive performance is limited to the maximum data transfer speed of the SE bus.

Data Compression

The DLT VS 40/80 GB tape drive offers a formatted, native cartridge capacity of 40 GB (80 GB assuming a 2:1 compression ratio) and a sustained user data transfer rate of 3 MB/s (up to 6 MB/s with 2:1 compression).

Note: Capacity may vary based upon actual stored data. Data transfer rate can vary depending on actual data.

The DLT VS 40/80 GB tape drive ships from the factory with data compression enabled for writing. In this mode, data is always compressed when writing to the tape, but the drive is capable of reading both compressed and uncompressed tapes. For the drive to write uncompressed data, the data compression setting must be changed through the software. To change it, consult the backup application software documentation for the data compression enabling and disabling procedure.

External Tape Drive Installation

2

Installing the DLT VS 40/80 GB external tape drive requires no special tools. You will need a ballpoint pen to change the SCSI ID switch on the rear panel of the drive.

WARNING: Risk of electric shock. Do not attempt to open this product. There are no user-serviceable parts inside. Refer all service to an HP authorized service provider.

Installation Overview

1. Unpack the drive and check for shipping damage.
2. Select a location near the server that is to be the host for the DLT VS 40/80 GB tape drive.
3. Set the SCSI ID, if necessary.
4. Shut down and turn off the server that is to host the tape drive. Remove the power cable from the selected server. Turn off and remove the power cables from all devices attached to the selected server.
5. Install an LVD/SE SCSI host adapter in the server that is to be the host for the drive, if necessary.
6. Attach the SCSI cable to the tape drive and SCSI host adapter.
7. Install the terminator on the tape drive if it is the last or only device on the SCSI bus.
8. Attach the power cables to the tape drive, server, and all attached devices. Plug in the power cable to the nearest power outlet, and turn on all devices.
9. Verify that the tape drive is working properly.

Unpacking the Tape Drive

Caution: If the room where you are unpacking the drive differs from the temperature at which the tape drive was shipped or stored by 30° F (15° C) or more, let the drive acclimate to the surrounding environment for at least 12 hours before opening the shipping carton.

Unpack and inspect the tape drive for shipping damage:

1. Inspect the shipping box for damage. If you notice any damage, report it to the shipping company immediately.
2. Open the shipping box and remove the accessories package. Open the accessories package; you will need these items during installation.
3. With the drive still in the shipping box, reach under and around the drive. Carefully lift it out of the shipping box and place it on the work surface, top facing up. Do not stand the drive on either end.
4. Carefully remove the drive from the protective bag.

Note: Save the packing materials in case you need to move or ship the drive in the future. You must ship the DLT VS 40/80 GB tape drive in the original or equivalent packing materials to preserve your warranty.

Selecting an Installation Location

Select an installation location 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 external DLT VS 40/80 GB tape drive, make sure the environment is free from dust and excessive temperature and humidity. See Appendix C, “Specifications,” for acceptable operating temperature and humidity limits.

Be sure to follow these additional guidelines:

- Allow at least 6 inches (15.3 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 your drive on the floor.
- Avoid locations near generators, electric motors, audio speakers, or other sources of magnetic fields. Magnetic fields can adversely affect your drive and media.

Setting the SCSI ID

Each SCSI device attached to the server that is to be the host for the DLT VS 40/80 GB tape drive must have a unique SCSI ID. Check the SCSI IDs on all other devices attached to the selected SCSI bus, including the SCSI host adapter itself, on the selected server and select an unused SCSI ID for the tape drive. If the drive factory default SCSI ID 6 is not being used by another device on the same SCSI bus, you do not need to change the SCSI ID.

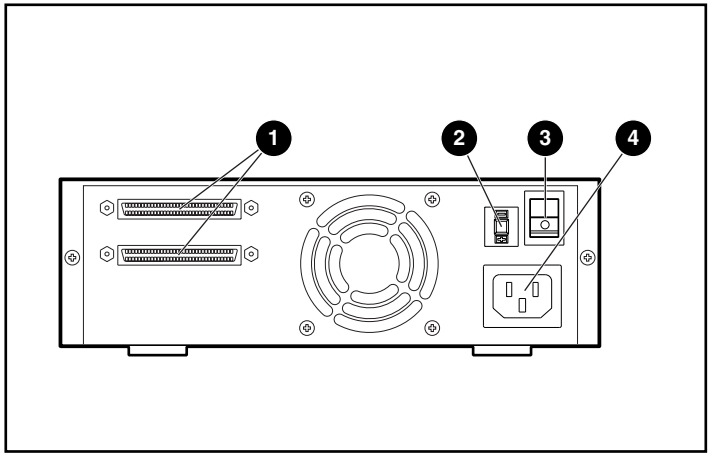

Figure 2: Rear view of tape drive

❶ 68-pin SCSI connectors
❷ SCSI ID switch
❸ Power switch
❹ Power cable connector

Note: If the tape drive is attached to a narrow SCSI bus, only IDs 0 through 7 are valid.

To set the SCSI ID use a small screwdriver or ballpoint pen to press the button above or below the SCSI ID display.

- Press the button above the SCSI ID display ❶ to select the next lower SCSI ID.
- Press the button below the SCSI ID display ❷ to select the next higher SCSI ID.

Each time you press one of these buttons, the SCSI ID decreases or increases by one. Press the appropriate button until the desired SCSI ID appears on the switch display.

Note: SCSI ID 7 is reserved for the controller. The SCSI ID can be set up to 15, but a SCSI ID above 6 is not recommended.

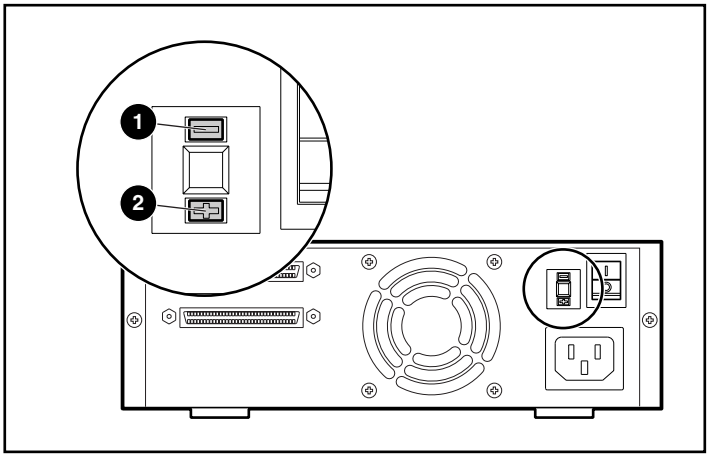

Figure 3: SCSI ID switch

Note: If the drive is powered on when you change the SCSI ID, you must power the drive off and on again for the new SCSI ID to take effect.

Connecting a Single Drive

If the selected server does not already have an LVD/SE SCSI host adapter installed, install one now.

To connect the SCSI and power cables:

1. Shut down the operating system and power off the selected server. Turn off all attached peripherals such as printers and other SCSI devices. Remove the power cable from the host server and all attached peripherals.

Caution: Failure to follow these instructions could result in damage to the DLT VS 40/80 GB tape drive or other devices.

2. Remove the SCSI cable from the accessories package and locate the external SCSI port on the rear of the server.

Note: The SCSI cable included with the DLT VS 40/80 GB tape drive allows connection to a 68-pin VHDCI HBA, which will accommodate most servers. If your HBA does not have a 68-pin VHDCI connector, you will need to purchase a separate cable. Refer to the Quick Specs at http://www.hp.com for cable option part numbers.

Note: Your server may differ from the following illustrations; refer to the documentation included with your server.

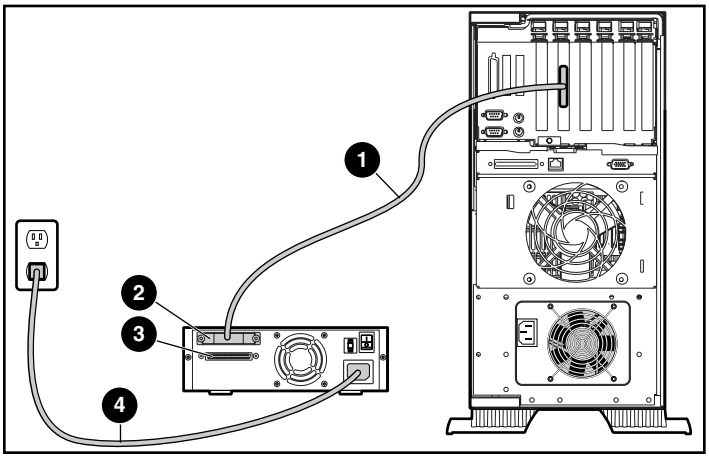

Figure 4: Connecting a single external drive

3. Attach the SCSI signal cable ❶ to the SCSI connector ❷ location on the rear panel of the DLT VS 40/80 GB tape drive and then to the external SCSI-2 port on the server.
4. Tighten the thumbscrews to secure the cable to the connector.
5. Attach the terminator (not shown) to the SCSI connector ❸.

WARNING: To reduce the risk of electric shock or damage to your equipment, do not disable the power cord grounding feature. This equipment is designed for connection to a grounded (earthed) power outlet. The grounding plug is an important safety feature.

6. Plug the drive AC power cord ❹ into the drive, then into a grounded AC outlet.
7. Plug in the AC power cords for any remaining peripheral devices and power all of them on.
8. Plug in the AC power cord for the server and power it on.

See Figure 5 if you want to daisy-chain several drives.

Note: To daisy-chain, you must purchase additional cables. Refer to the Quick Specs at http://www.hp.com for cable option part numbers.

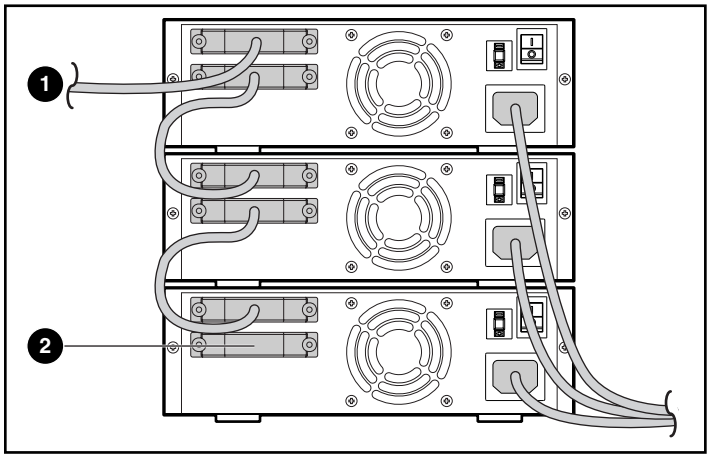

Figure 5: Daisy-chaining several external drives

❶ To SCSI host adapter
❷ Terminator

Note: Each tape drive in the daisy-chain must have a unique SCSI ID. See "Setting the SCSI ID" in this chapter.

Terminating the Tape Drive

If the DLT VS 40/80 GB tape drive is the only SCSI device – other than the SCSI host adapter – on the selected server, it must be terminated. Likewise, if the DLT VS 40/80 GB tape drive is the last device on the selected server SCSI bus, it must be terminated. If the DLT VS 40/80 GB tape drive is at the end of the SCSI cable, it is the last device on the SCSI bus.

To terminate the DLT VS 40/80 GB tape 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.

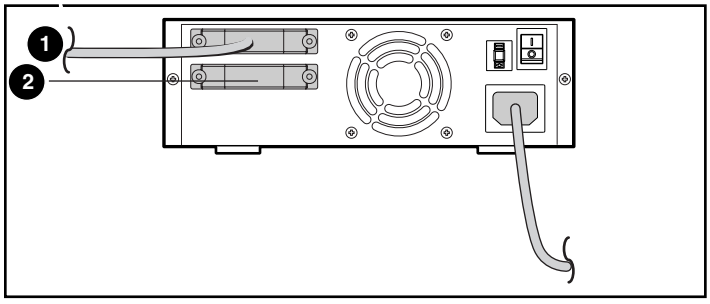

Figure 6: Terminating the tape drive

❶ To SCSI host adapter
❷ Terminator

Verifying the Installation

Every time the DLT VS 40/80 GB tape drive is powered on, it conducts a Power-On Self-Test (POST) to ensure that the drive is working properly and 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:

1. The LEDs turn on all at once and then turn off.
2. The Ready (green) LED remains illuminated after POST.
3. The drive emits a buzzing sound as the drive calibrates the read/write head's position.

POST is complete only after the buzzing sound stops. POST takes several seconds to complete, after which the drive is ready to use. See Chapter 5, “Operating the DLT VS 40/80 GB Tape Drive.”

Internal Tape Drive Installation

3

The following items may be required for DLT VS 40/80 GB tape drive installation:

- Torx T-15 screwdriver
- Type 1A, Phillips screwdriver

Installation Overview

1. Unpack the drive and check for shipping damage.
2. Select a server that is to be the host for the DLT VS 40/80 GB tape drive.
3. Set the SCSI ID, if necessary.
4. Shut down and turn off the server that is to host to the tape drive. Remove the power cable from the selected server. Turn off and remove the power cables from all devices attached to the selected server.
5. Remove the cover from the selected server as explained in the server manuals.
6. Install an LVD/SE SCSI host adapter in the server that is to be the host for the drive, if necessary.
7. If necessary, attach the drive rails that ship with the drive.

Note: Your server may supply rails in the drive bay. Refer to your server user guide for information on the correct rails to use with your server.

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8. Install the DLT VS 40/80 GB tape drive into an open drive bay.
9. Attach the SCSI ribbon cable to the tape drive and SCSI host adapter.
10. If necessary, install a terminator on the SCSI ribbon cable if the tape drive is the last or only device on the SCSI bus.
11. Attach a power cable to the internal DLT VS 40/80 GB tape drive.

12. Secure the tape drive in the selected server.
13. Replace the server cover, attach power cables to all devices, power on the server and other devices.
14. Verify that the tape drive is working properly.

Unpacking the Tape Drive

Caution: If the room where you are unpacking the drive differs from the temperature at which the tape drive was shipped or stored by 30° F (15° C) or more, let the drive acclimate to the surrounding environment for at least 12 hours before opening the shipping carton.

Unpack and inspect the tape drive for shipping damage:

1. Inspect the shipping box for damage. If you notice any damage, report it to the shipping company immediately.
2. Open the shipping box and remove the accessories package. Open the accessories package; you will need these items during installation.
3. With the drive still in the shipping box, reach under and around the drive. Carefully lift it out of the shipping box and place it on the work surface, top facing up. Do not stand the drive on either end.
4. Carefully remove the drive from the protective bag.

Note: Save the packing materials in case you need to move or ship the drive in the future. You must ship the DLT VS 40/80 GB tape drive in the original or equivalent packing materials to preserve your warranty.

Setting the SCSI ID

Each SCSI device attached to the server that is to be the host for the DLT VS 40/80 GB tape drive must have a unique SCSI ID. Check the SCSI IDs on all other devices attached to the selected SCSI bus, including the SCSI host adapter itself, on the selected server and select an unused SCSI ID for the tape drive. If the drive factory default SCSI ID 6 is not being used by another device on the same SCSI bus, you do not need to change the SCSI ID.

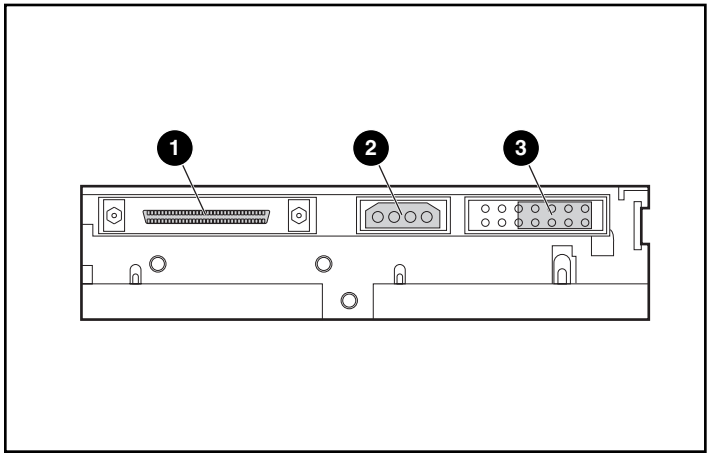

Figure 7: Rear view of internal tape drive

❶ 68-pin SCSI connector
❷ Power connector
❸ SCSI ID jumpers

Note: If the tape drive is attached to a narrow SCSI bus, only IDs 0 through 7 are valid.

Locate the SCSI ID jumpers on the rear panel of the drive as shown in Figure 7. Use Figure 8 to select the desired SCSI ID.

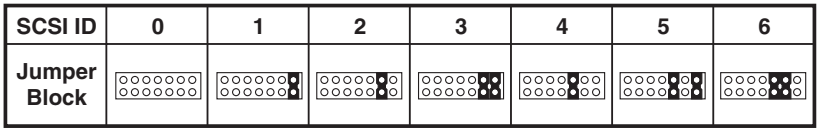

Figure 8: SCSI ID settings

Note: SCSI ID 7 is reserved for the controller. The SCSI ID can be set up to 15, but a SCSI ID above 6 is not recommended.

Terminating the Tape Drive

If the DLT VS 40/80 GB tape drive is the only SCSI device – other than the SCSI host adapter – on the selected server, it must be terminated. Likewise, if the DLT VS 40/80 GB tape drive is the last device on the selected server SCSI bus, it must be terminated.

The DLT VS 40/80 GB tape drive ships with a ribbon cable that is already terminated as shown in Figure 9. If you use a cable other than the one provided, be sure that the cable is terminated at each end.

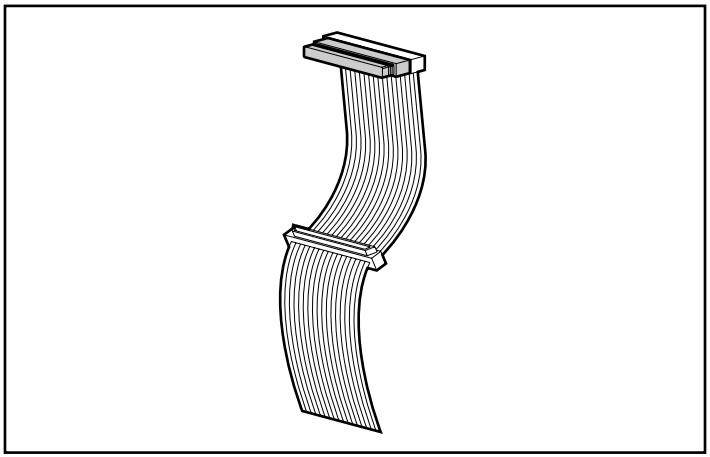

Figure 9: Ribbon cable with terminator

Installing the Internal Tape Drive

Caution: Electrostatic discharge (ESD) can damage electronic components. Be sure you are properly grounded before beginning this procedure. See Appendix B, "Electrostatic Discharge," for additional information.

1. Shut down the operating system and power off the selected server. Turn off all attached peripherals such as printers and other SCSI devices. Remove the power cable from the host server and all attached peripherals.

Caution: Failure to follow these instructions could result in damage to the DLT VS 40/80 GB tape drive or other devices.

2. Remove the cover from the host server to allow access to the desired drive bay.

Note: Your server may differ from the following illustrations; refer to the documentation included with your server.

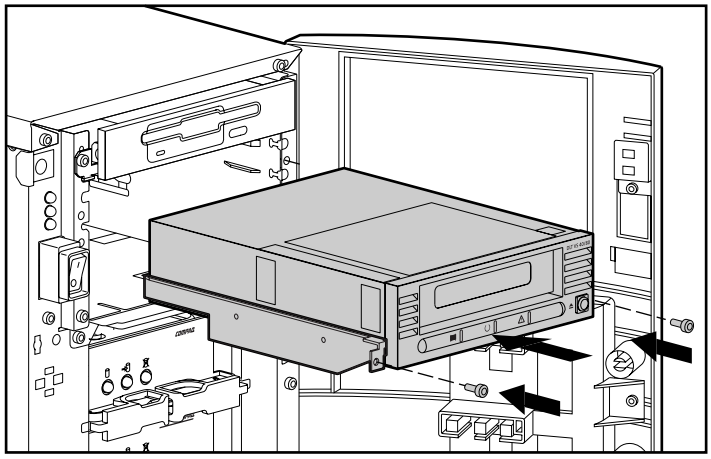

Figure 10: Installing an internal drive

3. Install an LVD/SE SCSI host adapter in the server that is to be the host for the drive, if necessary.
4. If necessary, attach the drive rails that ship with the drive.

Note: Your server may supply rails in the drive bay. Refer to your server user guide for information on the correct rails to use with your server.

5. Insert the drive into an available 5 1/4-inch drive bay.

Note: You may need to remove the front cover from the drive bay. Refer to the documentation included with your server.

6. Secure the tape drive into the server according to the documentation included with the server.
7. Connect an available power cable and the wide SCSI signal cable.

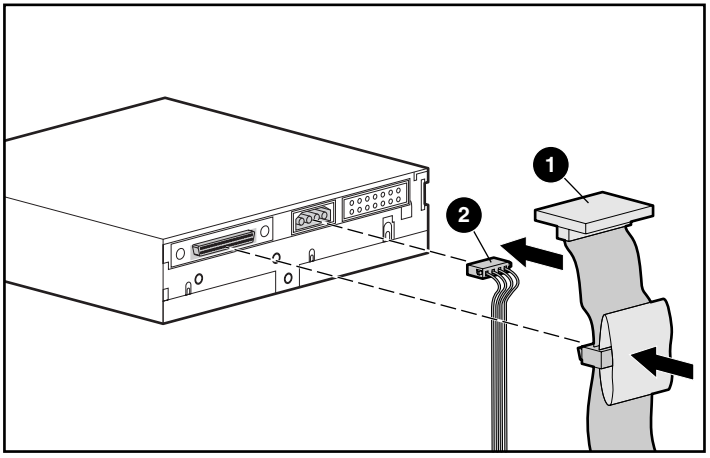

Figure 11: Connecting the power and signal cable

❶ Signal cable
❷ Power cable

8. Attach the other end of the SCSI ribbon cable to the SCSI host adapter.
9. Replace the cover on the server.
10. Plug in the AC power cords for any peripheral devices and power all of them on.
11. Plug in the AC power cord for the server and power it on.

Verifying the Installation

Every time the DLT VS 40/80 GB tape drive is powered on, it conducts a Power-On Self-Test (POST) to ensure that the drive is working properly and 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:

1. The LEDs turn on all at once and then turn off.
2. The Ready (green) LED remains illuminated after POST.
3. The drive emits a buzzing sound as the drive calibrates the read/write head's position.

POST is complete only after the buzzing sound stops. POST takes several seconds to complete, after which the drive is ready to use. See Chapter 5, “Operating the DLT VS 40/80 GB Tape Drive.”

Installing Software Drivers

4

The following operating systems support the HP StorageWorks DLT VS 40/80 GB tape drive:

- Microsoft Windows NT 4.0
- Microsoft Windows 2000

For an updated list of supported operating systems, refer to: www.hp.com

Device Drivers

Device drivers for Intel-based systems can be downloaded from the HP website:

http://wwss1pro.compaq.com/support/TSSD2/default.asp.

Under Tape Drives, select VS80.

1. Download the SoftPaq to a directory on your hard drive. The SoftPaq file that is downloaded is a self-extracting executable with a file name based on the SoftPaq Number above.
2. Execute the downloaded file and follow the on-screen instructions. Press the Space Bar to confirm the unpacking of files into the download directory.
3. After the files have been unpacked, you may delete the self-extracting SoftPaq file downloaded in step 1.
4. For installation instructions, refer to README.TXT in the created directory.
5. After the installation is completed, you may delete the files unpacked in step 2.

Installing Drivers on Windows NT 4.0 and Windows 2000

Note: Before starting the driver installation, verify that your tape drive is properly connected. Windows NT 4.0 only allows you to install tape device drivers sequentially. If you have other tape devices installed without drivers, install those drivers before attempting the following procedure, or click Cancel to bypass each tape device.

If Web access is unavailable, you can use the drivers included on the CD that shipped with your tape device. Insert the CD and follow the instructions.

Operating the DLT VS 40/80 Tape Drive

5

This chapter describes:

- Front Panel Controls and Indicators
- Using Cartridges
  - Inserting a cartridge
  - Removing a cartridge
  - Write-Protecting a cartridge
  - Caring for cartridges
  - Using the cleaning cartridge

Front Panel Controls and Indicators

Every time the DLT VS 40/80 GB tape drive is powered on, it conducts a Power-On Self-Test (POST) to ensure that the drive is working properly and 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:

1. The LEDs turn on all at once and then turn off.
2. The Ready (green) LED remains illuminated after POST.
3. The drive emits a buzzing sound as the drive calibrates the read/write head's position.

POST is complete only after the buzzing sound stops. POST takes several seconds to complete, after which the drive is ready to use.

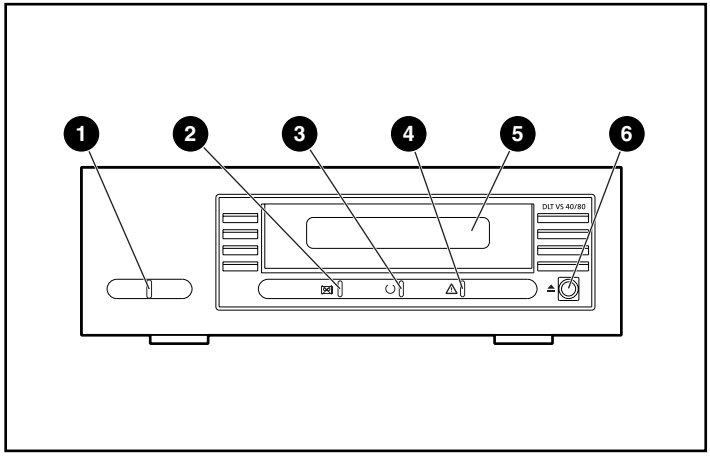

Figure 12: Front panel components

❶ External power LED
❷ Drive error LED
❸ Ready LED
❹ Clean/Media LED
❺ Cartridge door
❻ Unload button

Table 2 describes the meaning of the front panel LEDs.

Table 2: Indicator Activity

Indicator	State	Operating Condition
Drive error (amber)	Blinking	An unrecoverable drive error or a POST error has occurred. Call Technical Support.
	Off	No drive errors.
Ready (green)	On	Power to the drive.
	Off	No power to the drive.
	Blinking (constant period & duty cycle)	Tape is in motion.
	Blinking (dual period & duty cycle)	Reserved.
Clean/Media (amber)	Blinking	■ A hard read/write error that is probably recoverable has occurred. Clean the drive. The LED is off after completing a cleaning cycle with a DLT1/DLT VS Cleaning Cartridge after loading a properly formatted data cartridge into the drive. Cycling the power on the drive also turns off the LED. ■ An inappropriate tape has been loaded into the drive. The tape should automatically eject. ■ The drive has exceeded 150 tape motion hours. The drive must be cleaned. Cycling the power on the drive does not turn off the LED.
	Off	Cleaning is not required.
All three LEDs	On	POST is starting.
	Blinking	Firmware upgrade in progress.
External power LED	On	Power to the drive.
	Off	No power to the drive.

Using Cartridges

The DLT VS 40/80 GB tape drive uses only DLTtape™IV cartridges. The DLT VS 40/80 GB tape drive automatically unloads any other cartridge types and any cartridges whose format it cannot read. Make sure all cartridges that you want to use for writing are either unformatted or have been formatted with the DLT VS 40/80 GB tape drive before loading them.

The DLT VS 40/80 can use previously written media that has been degaussed. DLTtape™IV media is rated at 1850 oersteds. To completely degauss, the degausser used must be rated at 1850 oersteds, although a value two to three times 1850 oersteds is preferred.

Note: If you use an outside vendor to degauss your media, be sure their equipment meets this criteria.

The DLT VS 40/80 can read (but not write to) DLTtape™IV cartridges that have been written using a DLT 20/40 tape drive.

Table 3: Media Compatibility

Cartridge	DLT VS80 Can Read	DLT VS80 Can Write
DLTtape IV written to by DLT VS80	Yes	Yes
DLTtape IV written to by DLT1	Yes	Yes
DLTtape IV written to by DLT 40/80	Yes	No
DLTtape IV written to by DLT 35/70	No	No
DLTtape IV written to by DLT 20/40	No	No
DLTtape III	No	No

Inserting a Cartridge

To load a cartridge into the DLT VS 40/80 GB tape drive:

1. Insert the DLTtape IV cartridge into the cartridge slot after the drive completes POST. See Figure 13.
2. Gently push the cartridge into the drive until it stops.

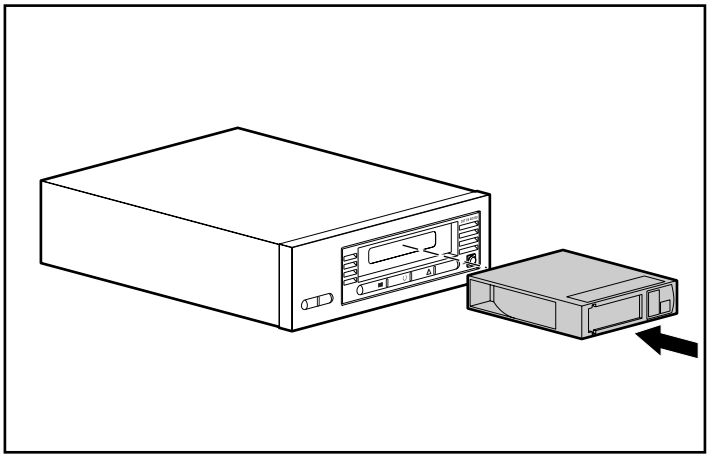

Figure 13: Inserting a DLTtape IV cartridge

Removing a Cartridge

Caution: To avoid damage to the cartridge or the tape drive, remove the cartridge from the DLT VS 40/80 GB tape drive before turning off the drive. Leaving a cartridge in the drive when power is off can result in cartridge and drive damage and may cause data loss because the header/catalog data may not be properly written before the drive loses power.

To remove a cartridge:

1. Press the Unload button or use the backup software to unload the cartridge.

   The Ready LED blinks while the drive rewinds the tape. When the drive has rewound the tape it ejects the cartridge.

2. Remove the cartridge from the drive.

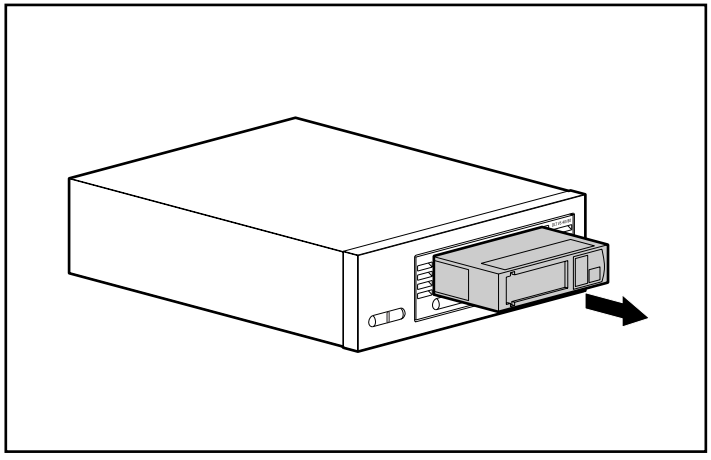

Figure 14: Removing a DLTtape IV cartridge

3. Return the cartridge to its storage case.

Write-Protecting a Cartridge

All DLTtape IV cartridges have a write-protect switch to prevent accidental erasure of data. Before loading the cartridge into the drive, position the write-protect switch on the front of the cartridge. By moving the switch to the left ❶, the cartridge is write-protected. By moving the switch to the right ❷, the cartridge is write-enabled.

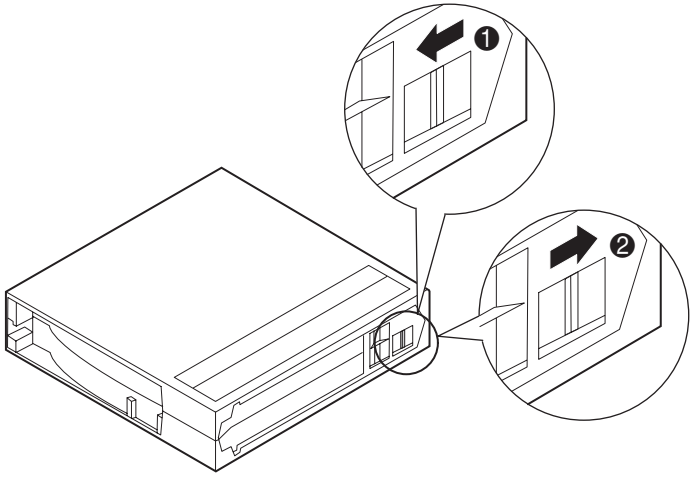

Figure 15: Cartridge write-protect switch

Caring for Cartridges

To ensure longer life of recorded or unrecorded cartridges, follow these guidelines:

- Use cartridges in temperatures between 16ºC and 32ºC (60.8ºF to 89.6ºF). When stored at these conditions cartridges have a life expectancy of 20 years.
- Do not expose cartridges to direct sunlight or sources of heat, including portable heaters and heating ducts.
- If the cartridge has been exposed to extreme heat or cold, stabilize the cartridge at room temperature for the same amount of time it was exposed — up to 24 hours.
- Do not place cartridges near electromagnetic interference sources, such as terminals, motors, and video or X-ray equipment. Data on the cartridge can be altered.

- Store cartridges in a dust-free environment where the relative humidity is between 20% and 80% (noncondensing). For longer cartridge life, store the cartridge at 20% to 80% relative humidity.
- Store cartridges in their storage cases.
- Do not drop or strike a cartridge. Excessive shock can displace the tape leader, making the cartridge unusable and possibly damaging your DLT VS 40/80 GB tape drive.
- Place identification labels only in the slide-in slot on the front of the cartridge.
- Never use any type of adhesive labels on the cartridges.
- Never stack cartridges more than five high.

Condensation

Condensation can be a problem for tape drives and cartridges. To minimize the chance of condensation, stay within the specifications above for using and storing cartridges and observe the following guidelines:

- Position the drive where the temperature is relatively stable - away from open windows, heat sources, and doors.
- Avoid leaving cartridges in severe temperature conditions, for example, in a car standing in bright sunlight.
- Avoid transferring data (reading from and writing to cartridges) when the temperature is changing by more than 10ºC (18ºF) per hour.
- If you bring a cold tape drive or cartridge into a warm room, allow time for it to warm to room temperature before using it. For example, if you have moved the drive from a cold car to a warm room, allow time for the drive to reach room temperature (up to 24 hours if the temperature change is extreme.)

Using the Cleaning Cartridge

When the Clean/Media LED is on, the DLT VS 40/80 GB tape drive read/write head may need to be cleaned.

Insert the cleaning cartridge as you would a data cartridge. See "Inserting a Cartridge." Cleaning typically takes several minutes during which the Ready LED blinks.

You should only use DLT 1/DLT VS Cleaning Cartridges, which are a smoky-gray color. Inappropriate cleaning tapes are immediately ejected.

Caution: **Do not** use a DLT Cleaning Tape III, which is a cream color (p/n 199704-001 or C5142A).

Use **only** HP-approved DLT 1/DLT VS Cleaning Cartridges (p/n 279839-B21 or C7998A). Use of any other type of cleaning cartridge can damage the tape drive read/write head.

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/Media LED turns off and the drive ejects the cleaning cartridge.

Note: If any LEDs blink or if the Clean/Media LED is illuminated again when you insert another cartridge immediately after cleaning, see Table 2 for more information.

Troubleshooting and Upgrading the Firmware

6

Troubleshooting

Use Table 4 to locate drive problems and the suggested solutions.

Table 4: Troubleshooting

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.
All of the LEDs on the front panel blink continually.	An internal drive fault has occurred.	1. Press and hold the Unload button for 6 seconds or until all three LEDs are illuminated to reset the drive. Release the Unload button when the reset process begins. 2. Turn the drive off and then on again. If it is an internal drive, shut down and turn off the host server, then turn it back on and allow it to boot. 3. Call technical support if POST continues to fail.

Table 4: Troubleshooting

Symptom	Problem	Solution
The host server does not recognize your DLT VS 40/80 GB tape drive.	The drive SCSI ID might not be unique.	1. Change the drive's SCSI ID. Shut down and turn off the host server; turn off the desktop drive. Change the drive SCSI ID. Turn on the host server and desktop drive. 2. Ensure that all devices on the SCSI bus are SE or LVD.
	The SCSI host adapter might be incorrectly configured.	Check the SCSI host adapter configuration. Refer to the SCSI host adapter documentation for instructions.
	The SCSI cable might be loose.	Check both ends of the SCSI cable, both for external and internal drives.
	The SCSI terminator might be loose or missing.	1. Make sure the terminator is properly seated on the open SCSI connector on the rear panel of the desktop drive or on the last device on the SCSI bus. 2. Make sure an LVD/SE terminator is in place on the end of the SCSI ribbon cable for the internal drive.

Table 4: Troubleshooting

Symptom	Problem	Solution
The host server does not recognize your DLT VS 40/80 GB tape drive. (continued)	The SCSI bus might be improperly terminated.	1. If the DLT VS 40/80 GB tape drive is the last or only device on the SCSI bus, make sure the drive is properly terminated. 2. If the DLT VS 40/80 GB 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 each end of the SCSI bus is terminated. The SCSI host adapter must usually be terminated.
	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 – one at the host adapter and one on the last device on the bus, both internal and external.
	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 40 feet (12.2 meters) for an LVD SCSI bus with multiple devices, 82 feet (25 meters) for an LVD SCSI bus with a single device, or 10 feet (3.05 meters) for a Fast SCSI-2 or Ultra SCSI-1SE bus.

Table 4: Troubleshooting

Symptom	Problem	Solution
There are fatal or non-fatal errors for which you cannot find the cause.	The SCSI bus might be improperly terminated.	1. If the DLT VS 40/80 GB 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 DLT VS 40/80 GB 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.
	The AC power source may not be properly grounded (external drive only).	1. Plug the tape drive power cable into a power outlet on the same circuit as the host server. 2. Plug the DLT VS 40/80 GB external tape drive power cable into a different power outlet.
Drive will not read or write to media.	Media or format not supported by tape drive.	1. DLT IV cartridge contains data written by a DLT 20/40 drive. Tape drive cannot overwrite tape with DLT 20/40 data. You must degauss the media to be able to write VS 40/80 formatted data onto tape. See Table 3 for media compatibility. 2. DLT IV cartridge contains format that cannot be read by the VS 40/80 drive. See Table 3 for media compatibility.

Table 4: Troubleshooting

Symptom	Problem	Solution
Drive will not eject a DLTtape IV cartridge	Drive has malfunctioned or the cartridge is physically stuck.	1. Allow sufficient time for the drive to complete any operations such as POST, reset, load, unload, rewind, and so on. For example, when powering up the drive with the tape positioned at Physical End of Media, recovery could take up to ten minutes. 2. Allow sufficient time for the backup applications to release any hold it may have on the drive. This could take up to ten minutes. 3. Try a software eject (via the backup application) as well as a hardware eject (manually press the eject button) allowing sufficient time for the command to execute. Depending on where the media is positioned, either of these actions could take up to ten minutes. 4. If the tape still will not eject, 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 come to read. Try a hardware eject, allowing sufficient time (up to ten minutes) for the command to execute. 5. If the tape is not successfully ejected using these steps, contact HP technical support.

Upgrading the Firmware

The HP Library and Tape Tool (LTT) is a tape management and diagnostic tool to help you install and support your HP storage product. In addition to the diagnostic and troubleshooting ability of LTT, it offers useful information about your products and provides automated firmware update checks from the Internet, with the ability to retrieve the latest firmware versions.

Complete instructions and download of LTT are available at:

www.hp.com/support/tapetools

Regulatory Compliance Notices

A

Federal Communications Commission Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (personal computers, for example). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

The rating label on the device shows which class (A or B) the equipment falls into. Class B devices have an FCC logo or FCC ID on the label. Class A devices do not have an FCC logo or FCC ID on the label. Once the class of the device is determined, refer to the following corresponding statement.

Class A Equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Class B Equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hewlett-Packard Company may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

Declaration of Conformity for products marked with the FCC logo - United States only

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions regarding your product, contact:

Hewlett-Packard Company

P. O. Box 692000, Mail Stop 530113

Houston, Texas 77269-2000

Or, call

1-800- 652-6672

For questions regarding this FCC declaration, contact:

Hewlett-Packard Company

P. O. Box 692000, Mail Stop 510101

Houston, Texas 77269-2000

Or, call

(281) 514-3333

To identify this product, refer to the Part, Series, or Model number found on the product.

Canadian Notice (Avis Canadien)

Class A Equipment

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Class B Equipment

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice

Products bearing the CE marking comply with the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community and if this product has telecommunication functionality, the R&TTE Directive (1999/5/EC).

Compliance with these directives implies conformity to the following European Norms (in parentheses are the equivalent international standards and regulations):

- EN 55022 (CISPR 22) - Electromagnetic Interference
- EN55024 (IEC61000-4-2, 3, 4, 5, 6, 8, 11) - Electromagnetic Immunity
- EN61000-3-2 (IEC61000-3-2) - Power Line Harmonics
- EN61000-3-3 (IEC61000-3-3) - Power Line Flicker
- EN 60950 (IEC 60950) - Product Safety

China Taiwan Notice

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Japanese Notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文をお読み下さい。

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取扱説明書に従って正しい取り扱いをして下さい。

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Electrostatic Discharge

B

To prevent damage to the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper grounding, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

Note: For more information on static electricity, or for assistance with product installation, contact your authorized reseller.

Specifications

C

Dimensions and Weight

Table 5: Dimensions and Weight

Dimension	Internal Drive	External Drive
Height	1.725 in (43.82 mm) with bezel 1.625 in (41.28 mm) without bezel	2.608 in (66.25 mm)
Width	5.750 in (146.05 mm) behind bezel 5.834 in (148.19 mm) with bezel	8.352 in (212.15 mm)
Length	8.509 in (216.13 mm) measured from back of front bezel 8.699 in (220.96 mm) including the bezel	10.728 in (272.50 mm)
Weight	3.2 lbs (1.46 kg)	7.67 lbs (3.48 kg)
Shipping Weight	4.59 lbs (2.09 kg) depending on configuration	11.48 lbs (5.21 kg) depending on configuration

Altitude

Table 6: Altitude

Action	Feet
Operating	-500 to 30,000 feet

Acoustic Emissions

Acoustic - declared values per ISO9296 and ISO 7779/EN27779.

Table 7: Acoustic Emissions

Sound Power Level LwA,B		Sound Pressure Level LpAm, dBA (bystander position)	
Idle	Operate	Idle	Operate
N/A	5.3	N/A	46

Temperature and Humidity Ranges

Table 8: Temperature and Humidity Ranges

Actions	Temperatures	Humidity
Operating	50° to 104° F (10° to 40° C)	20% to 80% RH, noncondensing Maximum wet bulb temperature = 25° C (77° F)
Non-operating (mech.)	50° to 104° F (10° to 40° C)	10% to 95% RH, noncondensing Maximum wet bulb temperature = 46° C (115° F)

Power Requirements

Table 9: Power Requirements - Internal Drives

Voltage	Typical	Maximum
+5 V (+/-5%) bus*	1.6 A	1.9 A
+12 V (+/-5%) bus*	0.65 A	3.5 A
* Voltage is measured at the power bus connector pins.		

Table 10: Power Requirements - External Drive

Voltage	Maximum Power
100-240V VAC	Less than 35 W

Airflow Requirement

Table 11: Airflow Requirements

Airflow Velocity
Greater than 2.0 CFM

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