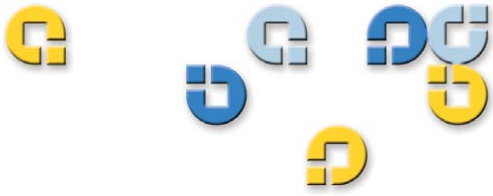
Quantum



Product Manual Product Manual Product Manual Product Manual

Tape Drive

SDLT 600A

81-81487-02 A01

SDLT 600A Product Manual, 81-81487-02 A01, December 2006, Made in USA.

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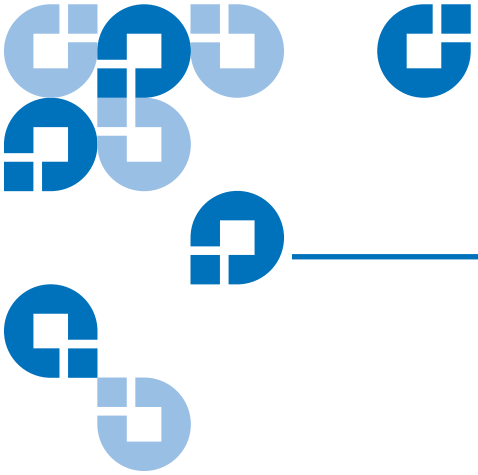

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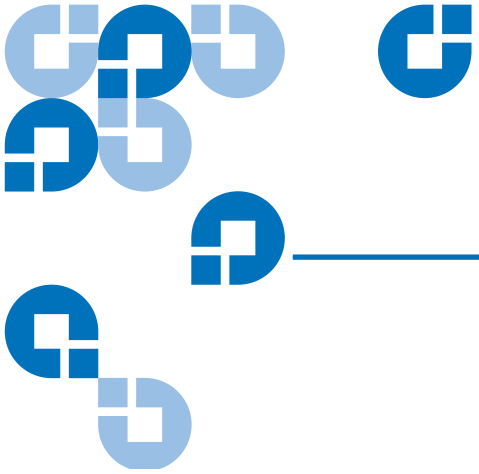

Tables

Preface

This document serves as an easy-to-use information source and product catalog to familiarize Quantum customers and systems professionals with the SDLT 600A tape drive. The SDLT 600A tape drive is an extension of the Digital Linear Tape (DLT®) product family.

Audience

The primary audience for this document consists of end users installing and using the tape drive.

Purpose

This document provides information on the SDLT 600A tape drive including:

- Product description
- Installation instructions
- Operation instructions
- Tape usage and care
- Regulatory compliance and statements

Document Organization

This document is organized as follows:

- Chapter 1, Introduction, provides an overview of the tape drive and product features.
- Chapter 2, Installing Your Tape Drive, includes information on warranty, safety, handling, and ESD precautions, pre-installation guidelines, and installation procedures.
- Chapter 3, Using Your Tape Drive, provides information that you need to use the tape drive, including front panel controls, loading the built-in FTP client, updating the firmware and software, viewing the error log, rebooting, supported FTP commands, POST, cleaning the tape drive, and general troubleshooting guidelines.
- Chapter 4, Using the FTP File Server, provides information about remote access, FTP file transfer procedures, and FTP client commands.
- Appendix A, SDLT 600A Tape Drive Specifications, provides product, functional, environmental, and recording media specifications.
- Appendix B, Super DLTtape II Data Cartridges, provides information on recognizing, handling, inspecting, write-protecting, loading, and unloading cartridges.
- Appendix C, Regulatory Compliance, provides electromagnetic field specifications, acoustic noise emissions, and environmental compliance.

This document concludes with a glossary and a detailed index.

Notational Conventions

This document uses the following conventions:

Note: Notes emphasize important information related to the main topic.

Caution: Cautions indicate potential hazards to equipment and are included to prevent damage to equipment.

Warning: Warnings indicate potential hazards to personal safety and are included to prevent injury.

This document uses the following:

- Right side of the tape drive — Refers to the right side as you face the component being described.
- Left side of the tape drive — Refers to the left side as you face the component being described.
- Power cycle — Means to turn the tape drive or system on, then turn them off (or off, then on).
- Dimensions in figures — All dimensions are shown with no units specified (Inches understood unless otherwise specified).

Related Documents

The following documents are related to the SDLT 600A tape drive:

Document No.	Document Title	Document Description
81-81488-0x	SDLT 600A Quick Start Guide	Provides "quick" instructions on how to install and run the tape drive

Contacts

Quantum company contacts are listed below.

Quantum Corporate Headquarters

To order documentation on the SDLT 600A or other Quantum products, contact:

Quantum Corporation
P.O. Box 57100
Irving, CA 92619-7100
(949) 856-7800
(800) 284-5101

Technical Publications

To comment on existing documentation send e-mail to:

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Quantum Home Page

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For further assistance, or if training is desired, contact Quantum Technical Assistance Center:

North America:	+1-800-284-5101
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For worldwide support:	www.quantum.com/contactsupport

For the most up to date information on Quantum Global Services, please visit www.quantum.com/support.

Software License

The SDLT 600A uses *edtFTPj 1.4.5* Java API which is under the GNU Lesser General Public License (LGPL) and hence can be freely used in commercial or non-commercial products.

It should be noted, however, that under the LGPL, edtFTPj must be used as a library and not directly incorporated into codebase.

- edtFTPj Web site: www.enterprisedt.com/products/edtftpj/overview.html
- GNU Lesser General Public License: www.gnu.org/licenses/lgpl.html

Chapter 1

Introduction

This chapter describes the features of the Quantum SDLT 600A tape drive and covers the following topics:

- Overview describes a basic overview of the tape drive.
- Product Features lists product features of the tape drive.

Overview

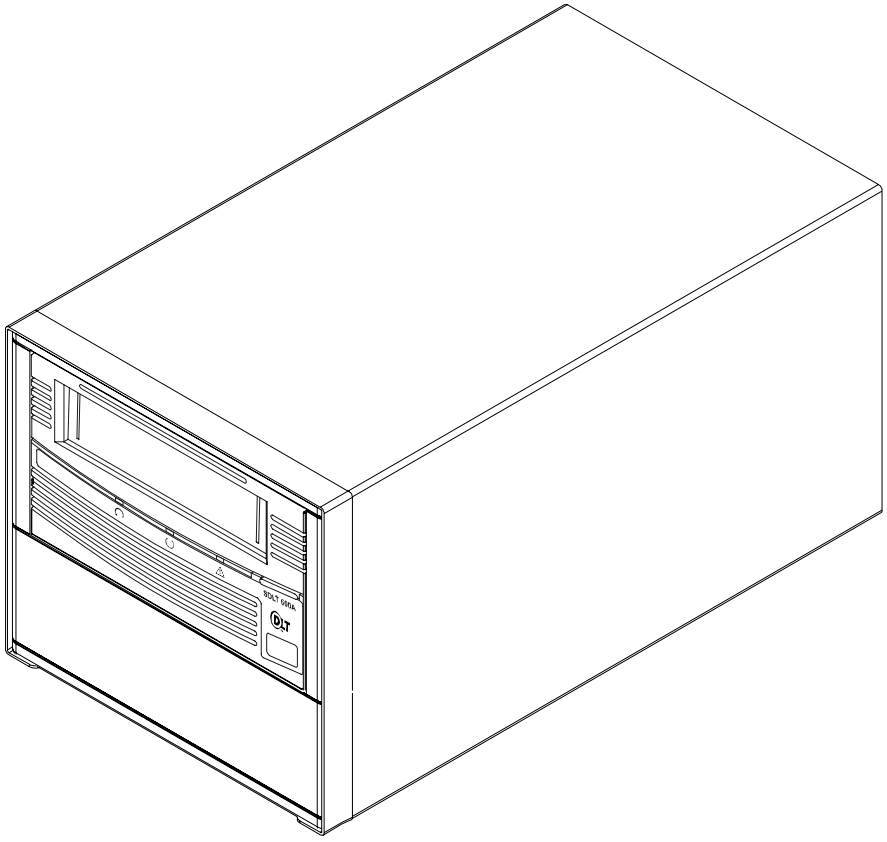
The Quantum SDLT 600A is an extension to the family of DLT products with video professionals in mind. Using the built-in FTP client in conjunction with a standard Web browser, Material Exchange Format (MXF) files can be stored and retrieved. A Gigabit Ethernet (GigE) interface allows this drive to be quickly connected and accessed on your network.

The SDLT 600A is ideal for serving a full range of video applications; from hand-carrying video content out to a truck for live production to facility-wide, long-term, secure archive.

The tape drive provides 300 Gigabytes (GB) of storage capacity with a transfer speed of up to 36 Megabytes per second (MB/sec) native. This allows for over 6 hours of HD (high definition) and over 25 hours of SD (standard definition) storage on a single cartridge.

The SDLT 600A is available in either a tabletop (as shown in figure 1) or rackmount unit.

Figure 1 SDLT 600A Tape Drive



Product Features

The SDLT 600A tape drive offers the following product features:

- Convergent technology — the benefits of file-based data tape storage and the accessibility of video tape.
- Built-in Gigabit Ethernet (GigE) interface.
- Access to metadata and clip content by timecode-indexed in and out points through a web-based interface.
- The tape drive provides 300 Gigabyte (GB) of storage capacity with a transfer speed of 36 Megabyte per second (MB/sec) native. This allows for over 6 hours of HD (high definition) and over 25 hours of SD (standard definition) storage on a single cartridge.
- A streaming tape drive that uses half-inch wide Super Digital Linear Tape (Super DLTtape II) media.
- A standard 5.25-inch full-height form factor to simplify integration into system and tape library solutions.
- iTalk (and Pocket DLTSage iTalk)—Infrared (wireless) interface that provides a remote testing base allowing customers and integrators to access system diagnostic information from the front of the tape drive.
- For more information on the SDLT tape products and other product information, go to www.dlttape.com.

  This Web page provides information that is constantly updated as needed. Refer to this Web site often to obtain the most current information.

Chapter 2

Installing Your Tape Drive

This chapter describes how to install the SDLT 600A tape drive. This includes installation instructions, power and signal cabling descriptions, and operating instructions. This chapter also includes information on configuring and connecting the tape drive into a system.

This chapter covers the following topics:

- Warranty Note provides a general reminder of certain precautions to follow so that you do not void your warranty.
- Safety, Handling, and ESD Protection describes appropriate safeguards to use when working with the tape drive.
- Pre-Installation Guidelines describes proper steps to take before installing the tape drive.
- Managing the Tape Drive provides information on how to configure and manage the tape drive from a remote workstation.

Warranty Note

See the warranty before installing your tape drive. Certain actions taken during installation could void the warranty if not properly conducted.

Generally, the Limited Product and Limited Repair Warranties are contingent upon proper use in the application for which the product is

intended; and do not cover the product if you perform any of the following actions:

- Modify the product without the manufacturer's written approval.
- Subject the product to unusual physical, environmental, or electrical stress, including damage caused by handling or shipping in unapproved containers or packaging.
- Disturb any warranty labels, or the integrity of the product in any other way.
- Remove or damage the serial number label to the extent that warranty status of the product cannot be determined.

Safety, Handling, and ESD Protection

Inappropriate or careless handling of SDLT 600A tape drives may result in damage to the product. Follow the precautions and directions to prevent damaging the tape drive. In addition, follow the steps in Pre-Installation Guidelines to ensure that you have the correct hardware for your system configuration.

Safety Precautions

For your safety, follow all safety procedures described here and in other sections of the manual.

1. Power off the system before installing or removing the tape drive to prevent the possibility of electrical shock or damage to the tape drive. Unplug the unit that contains—or is to contain—the tape drive from AC power to provide an added measure of safety.
2. Read, understand, and observe all label warnings.
3. The Pivoting Optical Servo (POS) uses a Class I laser product. This laser product complies with 29 CFR 1200 and 29 CFR 1910 as applicable on the date of manufacture.

Warning: If you open the tape drive chassis, you may become exposed to invisible laser emission which could be harmful if you are directly exposed to the beam.

Handling

Damage to the tape drive can occur as the result of careless handling, vibration, shock, or electrostatic discharge (ESD). For more details about ESD, see Electrostatic Discharge Protection.

Caution: Always handle the SDLT 600A tape drive with care to avoid damage to the precision internal components. Hold the tape drive only by its sides. Never hold either tape drive by inserting fingers into the receiver area on the front of the tape drive. Damage to the receiver area may occur if you lift or carry it in this manner.

Follow these guidelines to avoid damage to the tape drive:

- Always observe prescribed ESD precautions.
- Keep the external tape drive in its anti-static bag until ready to install.
- Always use a properly fitted wrist strap or other suitable ESD protection when handling the tape drive.
- Hold the tape drive only by its sides.
- Do not bump, jar, or drop the tape drive. Use care when transporting the tape drive.
- Always handle the tape drive carefully and gently. A drop of ¼ inch onto a bench or desktop may damage a tape drive.
- Never place the tape drive so that it rests on its front bezel. Always gently place the tape drive flat, bottom side down, on an appropriate ESD-protected work surface to avoid the tape drive being accidentally knocked over.
- Do not pack other materials with the tape drive in its anti-static bag.
- Place the tape drive in the anti-static bag before placing it in a shipping container.
- Do not stack objects on the tape drive.
- Do not expose the tape drive to moisture.
- Do not place foreign objects inside the tape drive's receiver area.

Electrostatic Discharge Protection

Several electrical components of the SDLT 600A tape drive are sensitive to static electricity and electrostatic discharge (ESD). Even a static buildup or discharge that is too slight to feel can be sufficient to destroy or degrade a component's operation.

To minimize the possibility of ESD-related damage to the system, the drive's manufacturer strongly recommends using both a workstation anti-static mat and an ESD wrist strap. When correctly installed and properly used, these devices reduce the buildup of static electricity that might harm the system.

Observe the following precautions to avoid ESD-related problems:

- Leave the tape drive in its anti-static bag until you are ready to install it in the system.
- Always use a properly fitted and grounded wrist strap or other suitable ESD protection when handling the tape drive and observe proper ESD grounding techniques.
- Hold the tape drive only by its sides.
- Place the tape drive on a properly grounded anti-static work surface pad when it is out of its protective anti-static bag.
- Do not use the bag as a substitute for the work surface anti-static pad. The outside surface of the bag may not have the same anti-static properties as the inside surface. It could actually increase the possibility of ESD problems.
- Do not remove covers to use any test equipment to check components on the PCBAs. There are no user-serviceable components on the tape drive.

Pre-Installation Guidelines

Before you begin, check the contents of the box and record the applicable numbers and confirm software and operating system compatibility. Check the tape drive to be certain it is operating properly before installing it in a system.

1. Unpack and review the contents of the box for any physical damage. If you find damaged items, contact your tape drive provider.
2. Record the model and serial number of the tape drive. These numbers provide specific information about the tape drive and will be very helpful if you must contact technical support. You can find these numbers on the bottom of the tape drive enclosure.

   The Model Number/Serial Number: _____
3. Make sure that the host computer is functioning properly and is prepared for a network.

Installing the Tape Drive

The SDLT 600A tape drive is available in a rackmount version or a tabletop version; for rackmount installation procedures, see Secure the Rackmount Tape Drive into a Rack and for tabletop installation procedures, see Connect the Power to the Tabletop Tape Drive.

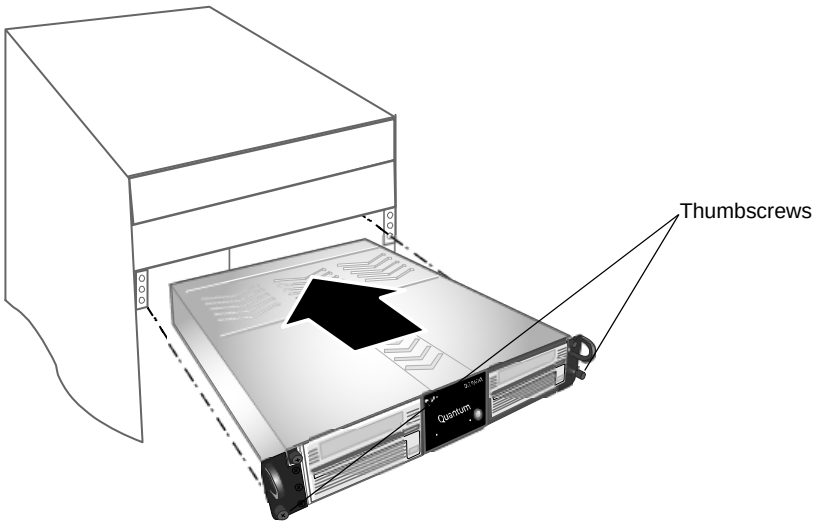
Secure the Rackmount Tape Drive into a Rack

This section describes how to secure the rackmount tape drive into a rack.

> **Note:** If you are installing a tabletop tape drive, proceed to Connect the Power to the Tabletop Tape Drive.

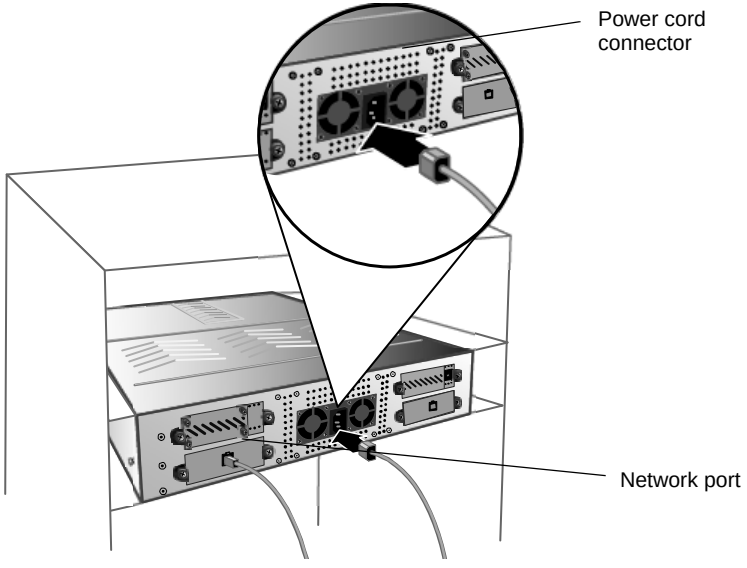
1. Slide the rackmount tape drive into the equipment rack.
2. Secure the unit to the rack with the thumbscrews. See figure 2.

Figure 2 Install the Rackmount SDLT 600A



3 Connect one end of the power cord to the power cord connector on the rear of the rackmount tape drive and the other end of the power cord to an AC outlet. See figure 3.

Figure 3 Connect the Power Cable

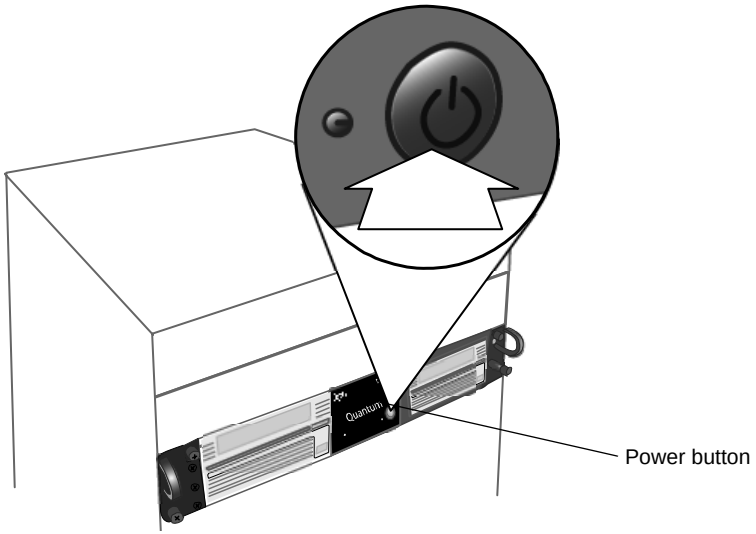


4 Connect one end of an Ethernet cable to the network port located on the rear of the tape drive and connect the other end to a network switch or router (see Connecting the SDLT 600A to the Network Port).

> **Note:** The GigE network port is backward compatible with 100BaseT and 10BaseT networks. To get the full performance of the SDLT 600A, it is advisable to use a GigE network.

5 Power on the tape drive using the switch on the front panel of the rackmount unit (see figure 4).

Figure 4 Power on the Rackmount Tape Drive



Connect the Power to the Tabletop Tape Drive

The tabletop tape drive power supply has an auto-sensing feature; it requires no adjustment or switch setting changes for different AC sources.

1 Attach the power cable to the tape drive.

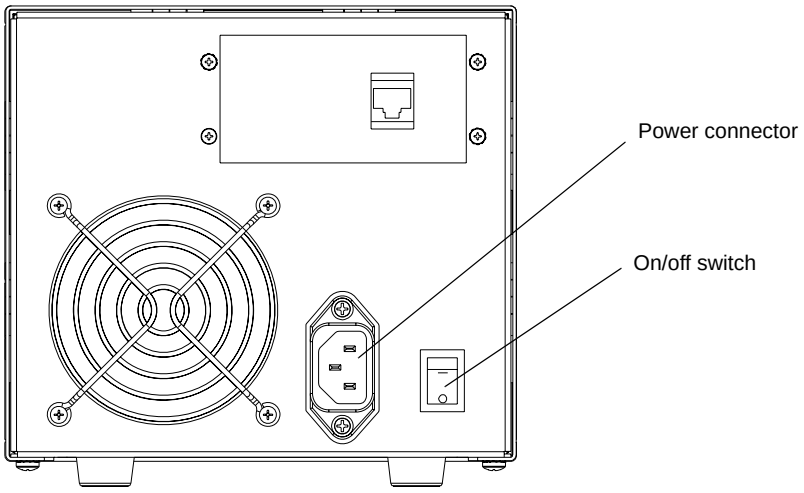
2 Connect one end of the AC cord into the power connector on the rear of the tape drive; connect the other end of the cord to the AC outlet.

3 Power on the tape drive using the switch on the rear panel (see figure 5).

4 Upon completion, proceed to the next section to confirm the installation.

Caution: Quantum recommends the use of an uninterruptible power supply (UPS). If power is interrupted while the drive is operating, all changes to an inserted cartridge will be lost.

Figure 5 Powering On the Tape Drive



Connecting the SDLT 600A to the Network Port

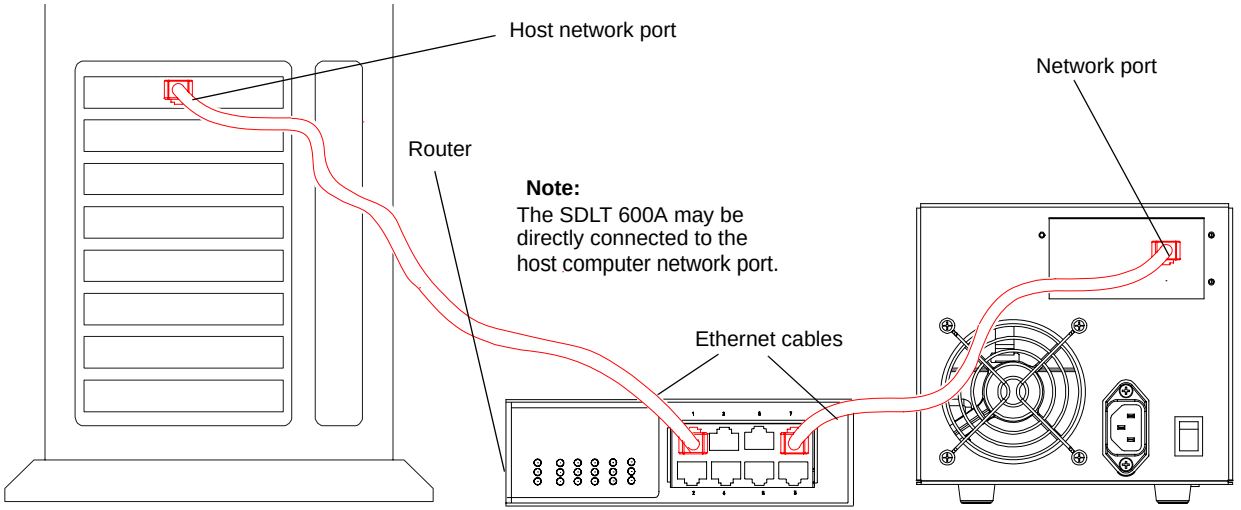
To connect to the network port:

1 Connect one end of an Ethernet cable to the network port located on the rear of the SDLT 600A tape drive and connect the other end to a network switch or router (see figure 6).

The drive may be connected directly to a computer host network port; no external network is necessary.

Note: The GigE network port is backward compatible with 100BaseT and 10BaseT networks. To get the full performance of the SDLT 600A, it is advisable to a use GigE network.

Figure 6 Connecting to the Network Port (Tabletop Tape Drive Shown)



Getting Started

The only software required on your system is the Java Plug-in. The **Java Plug-in** is the virtual machine software that allows the execution of Java applets.

The Java Plug-in

The Java FTP client needs the Java Virtual Machine to run. This **Java Plug-in** is provided by Sun Microsystems.

The Java FTP client will install immediately. When you load the Java FTP client for the first time, a display window may ask you to download and install the Java plug-in. If you need that plug-in you can just follow the instructions on the screen or go to www.java.com to download it.

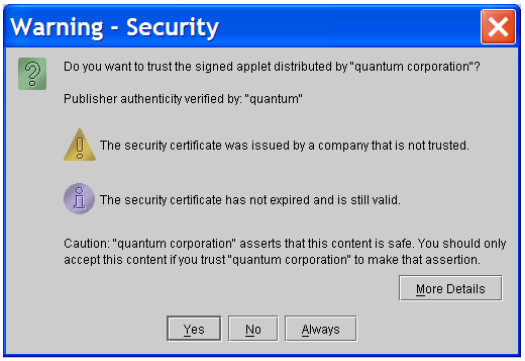
If you have **Java Plug-in** version 1.5 or later or the **Java Runtime Environment** version 1.5 or later installed on your computer, you should not need to download new software. The plug-in should activate on your

Web browser automatically once installed. For Mac OSX, the supported JRE version is 1.4.2.

Certificate of Security

Since the Java FTP client reaches the local directories of your computer, a certificate of security is required. When the Java FTP client is loaded, the **Java Plug-in** displays a window prompting you to accept our certificate of security.

Figure 7 Certificate of Security



Managing the Tape Drive

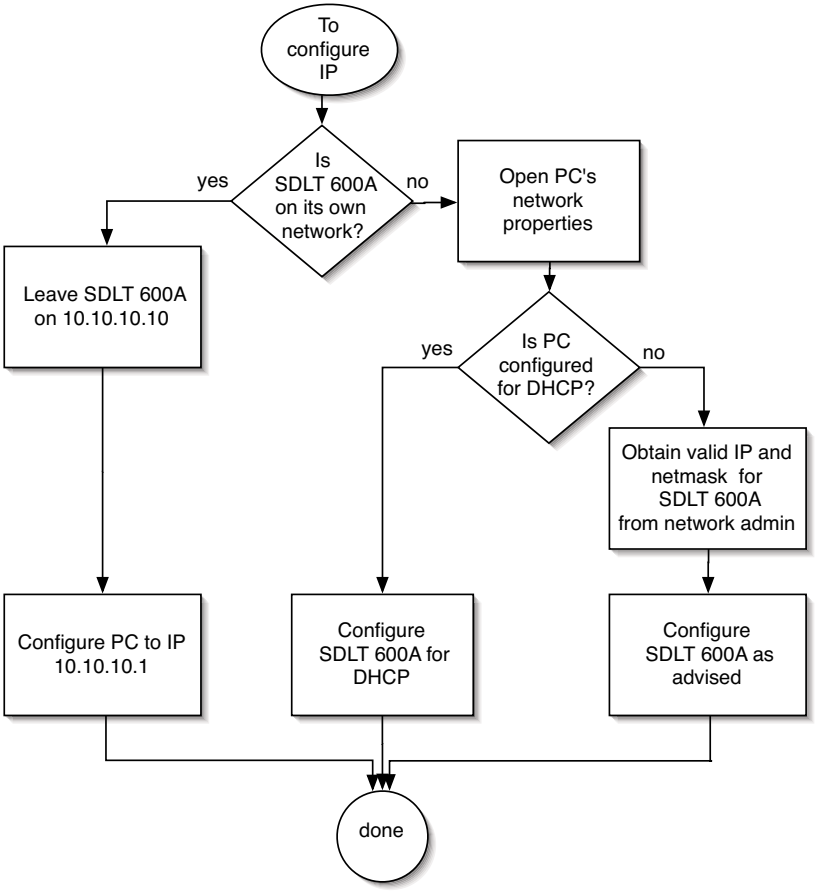
The SDLT 600A utilizes a Web-based interface allowing you to manage the tape drive from a remote workstation on the same network.

The tape drive is configured and managed through Web pages accessible by Internet browser software installed on the host computer.

Configuring the Tape Drive

There are several options available when configuring the SDLT 600A within your network. Select the best solution based on the diagram presented in figure 8.

Figure 8 IP Configuration Options



Depending upon the network and IP configuration of the host computer, it may be necessary to initially reconfigure the IP address and subnet mask of the host computer in order to communicate and recognize the SDLT 600A on a network.

Please contact your network administrator if you need further assistance in configuring the SDLT 600A for use on an internal network.

Windows Configuration

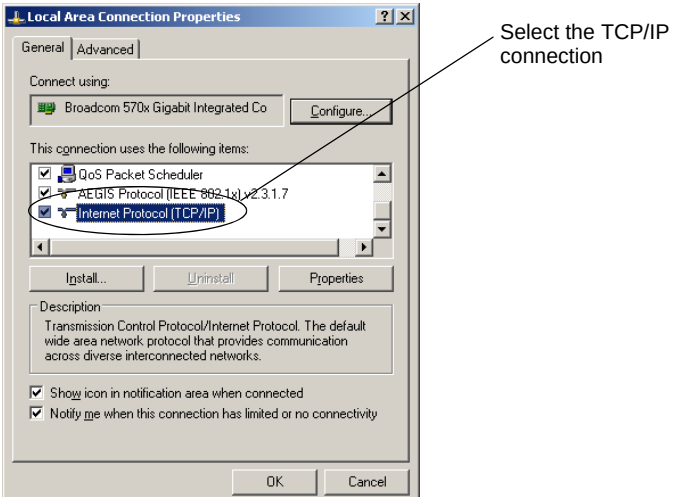
The host IP configuration may have to be modified to communicate with the drive.

> **Note:** The factory default IP address for the SDLT 600A is set to **10.10.10.10**.

The following steps can be used to setup and communicate with the SDLT 600A tape drive:

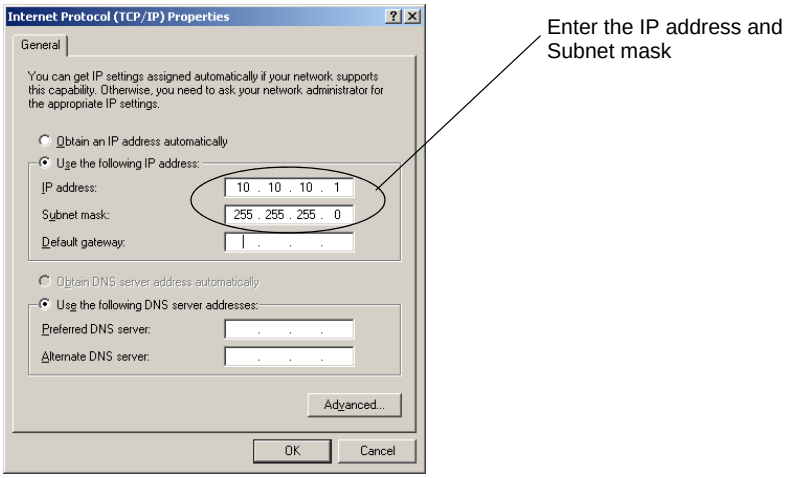
1. Go to **Network Connections** and click the **LAN** icon.
2. Go to **Internet Protocol (TCP/IP) connection** and click **Properties** (see figure 9).

Figure 9 Local Area Connection Properties



3. In the **General** dialogue box (see figure 10), select the radio button **Use the following IP address**.
   - In the **IP address** box, enter **10.10.10.1**
   - In the **Subnet mask** box, enter **255.255.255.0**
4. Click **OK**.

Figure 10 Internet Protocol (TCP/IP) Properties



5 Launch a Web browser (Internet Explorer, Netscape, or Firefox).

> **Note:** For Linux — Configure using the following:
> *ifconfig eth0:1 10.10.10.1*
> For Macintosh — Configure using **System Preferences**, **Built-In Ethernet,** and **Manually 10.10.10.10**.

For other configurations, refer to Sample Configurations for Linux and Mac OS X.

Multiuser Connection

The system allows six users to be logged on at a time to the SDLT 600A. Although six users may be logged on, only three root users can connect at a time from a single IP address. All other users are considered guests. A root user can operate all the features of the SDLT 600A, while the guest user can only read the cartridge directory (file system table of contents).

> **Note:** If you require additional assistance when changing IP settings, you may need to consult either your network administrator or an authority on IP policies and standards.

> **Note:** Any change to the IP address could result in the loss of the device. Always check that the IP address is entered correctly.

Managing the Tape Drive Using a Web Browser

The SDLT 600A main page is available by entering the drive's product IP address (or URL) in the address bar of a Web browser.

1. Type in the IP address of the drive (**http://10.10.10.10**) in the address line of the browser.
2. From the Start window, select **Login** (see figure 11).
3. When prompted for a password (see figure 12), enter **admin**.

   Once the correct password is entered, the SDLT 600A Management menu options are fully populated as shown in figure 13.
4. For network configuration settings, go to the **SDLT 600A management** sub menu **Setup** (see figure 14).

Figure 11 Start Window

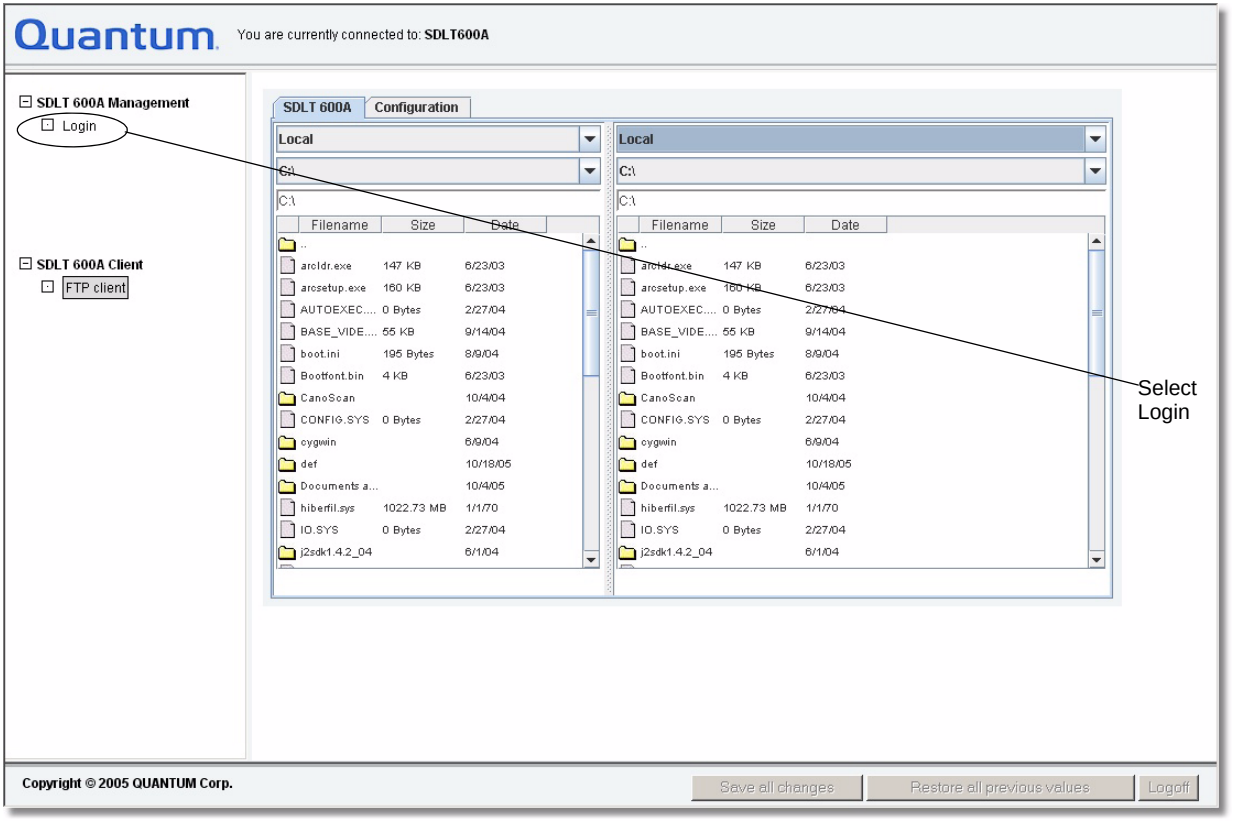


Figure 12 Login Window

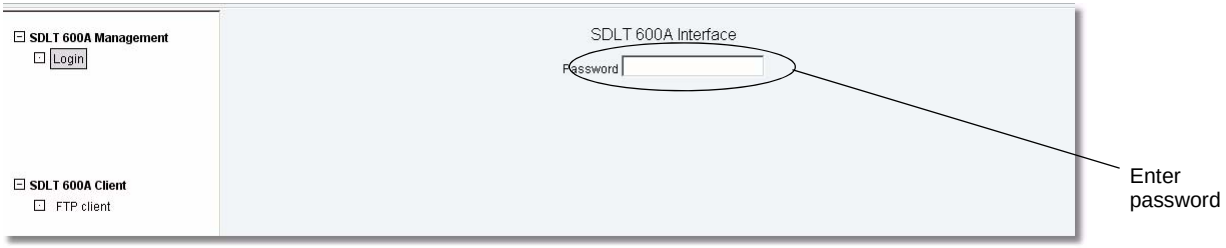


Figure 13 SDLT 600A Main Page

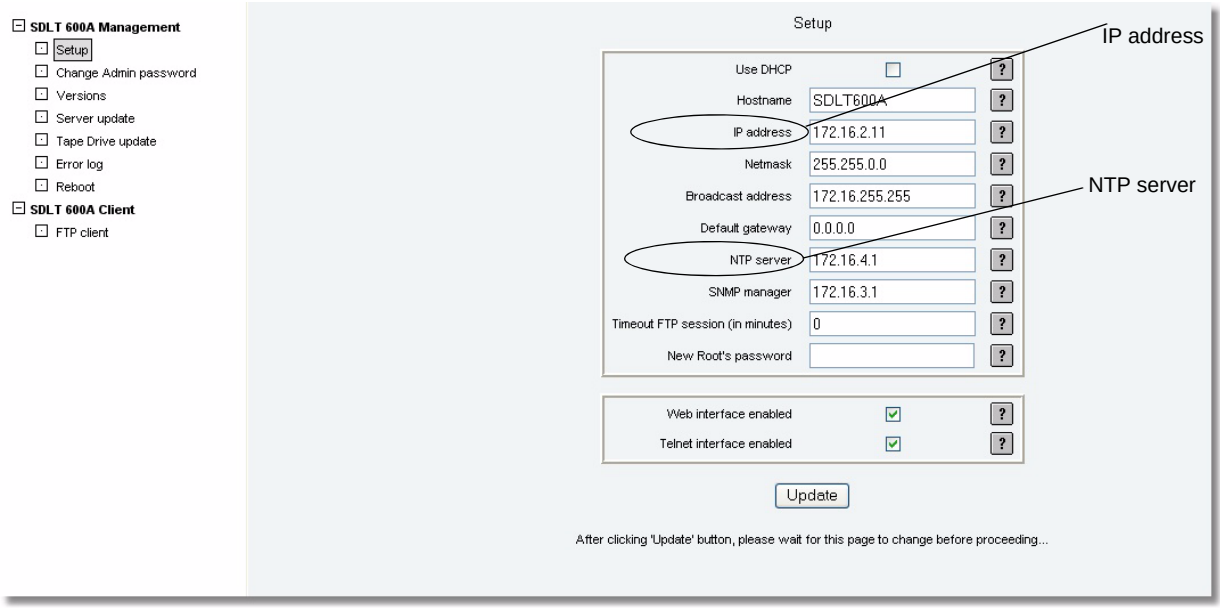
Using the Setup Menu

The values shown in the figures that follow are samples and may not represent the current values set in the SDLT 600A.

Table 1 System Defaults

Name	Password/Setting
Static IP address	10.10.10.10
Netmask	255.255.255.0
Main login	admin
Username	root
Default password	password

Figure 14 Setup Window



- **Save all changes** — saves any setup modification information.
- **Restore all previous values** — restores the previous setup information.

Use DHCP

Check this box to enable DHCP.

If enabled, the SDLT 600A attempts to get its network configuration from a DHCP server when it boots. If the device fails to connect to the network, the predefined default values are used.

Hostname

Enter a name for the tape drive (the default is **SDLT600A**). This can be a user friendly name. This appears as part of the IQN and will also be

passed to the DHCP Server for dynamic DNS updates. For more information, contact your network administrator.

> **Note:** When installing multiple drives, be sure each tape drive has a unique IP address and host name.

IP address

For a manual IP address configuration (DHCP disabled), enter a valid IP address here according to the network configuration. For more information, contact your network administrator.

> **Note:** The IP address *must* be unique; it cannot be in use by another device on the network. Select an IP address that is appropriate for your network environment.

Netmask

Enter the subnet mask for your particular network here. It is advisable to enter a fallback subnet mask when using DHCP in case the DHCP server is unavailable. For more information, contact your network administrator.

Broadcast address

Enter the broadcast address for your particular network here. It is advisable to enter a fallback broadcast address here when using DHCP just in case the DHCP server is unavailable. For more information, contact your network administrator.

Default gateway

You can enter the IP address of the default gateway for your particular network. Enter a default gateway only if you wish to connect from a network. For more information, contact your network administrator or see other third-party technical references for more details.

NTP server

Network Time Protocol (NTP) is any device that responds to NTP time requests and synchronizes the clocks of computers (clients or servers) over a network. Enter a NTP server address.

You can set the NTP server IP address in the SDLT 600A Setup page. This is required to synchronize the SDLT 600A tape drive on a network.

For example, the NTP server stamps its date and time metadata when a new file is stored on a SDLT 600A cartridge.

> **Note:** Make sure your PC's clock is accurate. Use a standard time utility to match the atomic clock value. See www.ntp.isc.org/bin/view/Servers/WebHome.

To set the IP:

1. Connect the NTP time server to your network.
2. Set the NTP server IP address in the SDLT 600A Setup page.

SNMP manager

A Simple Network Management Protocol (SNMP) Manager or SNMP Service is an application that performs the operational roles of generating requests to modify and retrieve management information, and receiving the requested information and trap-event reports that are generated by the SNMP agent. Enter an SNMP address.

SNMP traps for tape alerts are sent after each 1 GB of transfer. They are checked every 30 seconds (whether a client is connected or not) when no data is transferring.

Timeout FTP Session (in minutes)

Timeout values can be set to indicate no activity for the FTP server and the built-in FTP client.

- FTP Server

The FTP server timeout value is set here. A zero entry sets the default timeout value to 15 minutes.

In the event the FTP server times out, the error message **Software caused connection abort: socket write error** is displayed at the FTP client (see figure 16).

- FTP Client

The built-in Java FTP client timeout value is set in **Timeout (sec)** in the **Configuration** tab display (see figure 15). A zero entry sets the default timeout value to 900 seconds (15 minutes).

In the event the FTP client times out, the error message **Read timed out** is displayed at the FTP client (see figure 17).

Figure 15 Configuration Tab

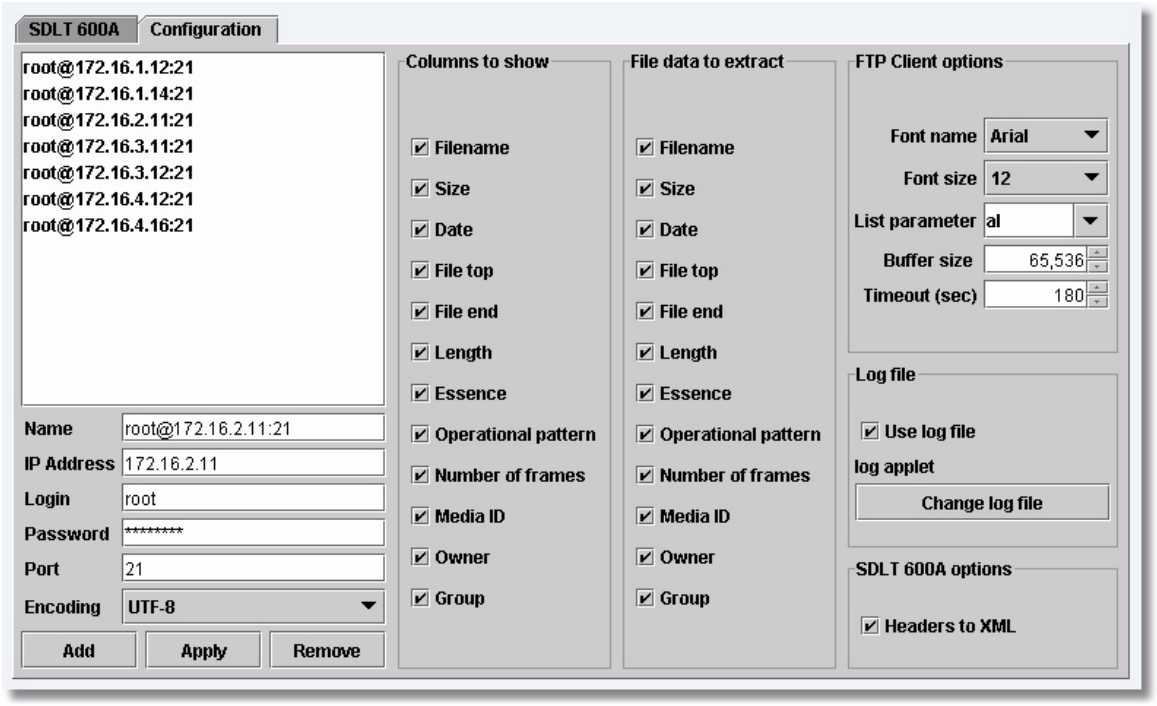


Figure 16 Connection Abort

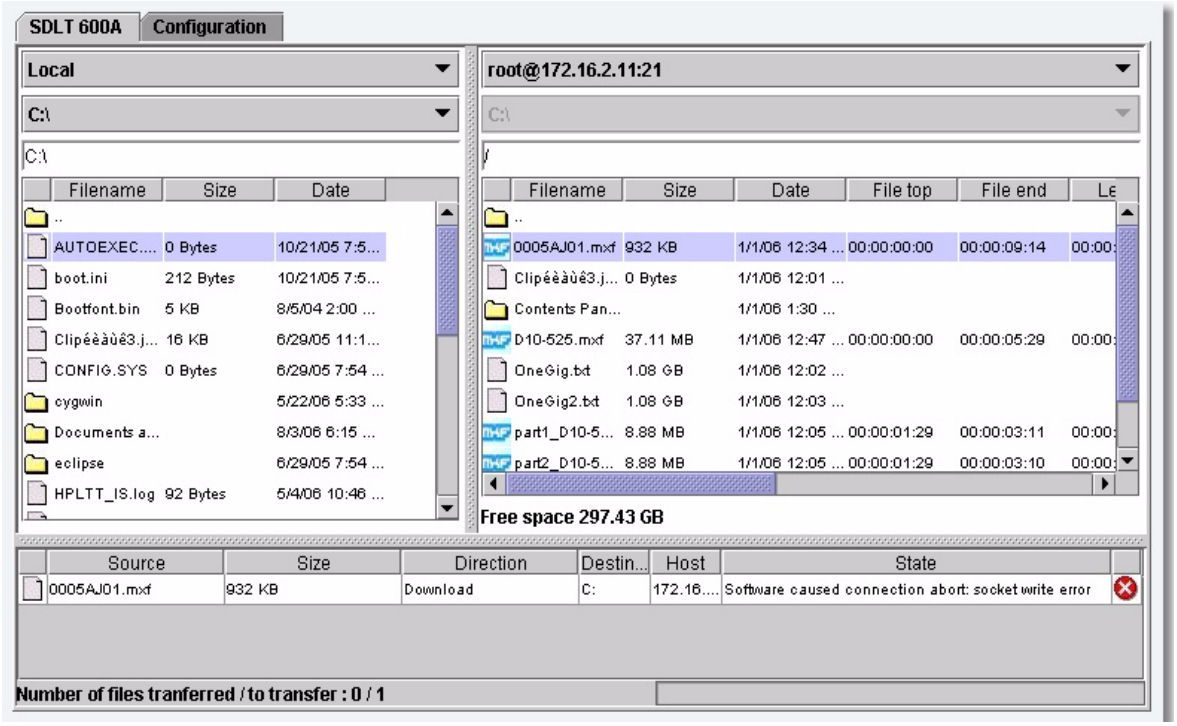
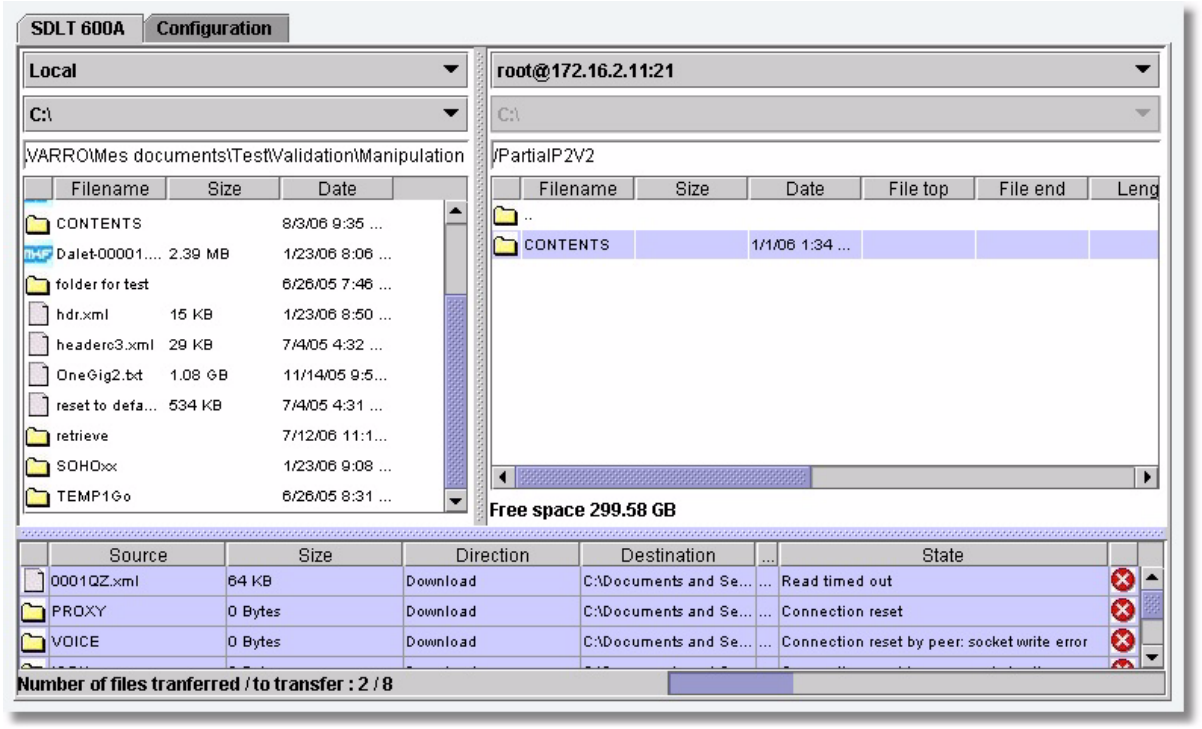


Figure 17 Read Timed Out



New Root's password

The password for a root user connection can be set using the **New Root's password**. The default login for root user connection is **root** and password is **password**. After setting it, and clicking **Update**, the SDLT 600A must reboot to change the password.

Web interface enabled

If you have a valid administrator password, checking this option will allow you to access the management functions within the server using the Web browser interface.

Note:	In order to use this function at least one of the management interface options must be enabled.

Telnet interface enabled

If you have a valid administrator password, checking this option will allow you to access the management functions within the server using a command-line (Telnet) interface.

> **Note:** In order to use this function at least one of the management interface options must be enabled.

Resetting System Defaults

As there is no access to the SDLT 600A other than the Ethernet port, a mechanism has been implemented to reset the settings to their default values. This is useful if an end user loses the IP address of the SDLT 600A. The settings can all be set up through the Web manager (i.e. IP settings, root password, ...).

To have the settings set back to their default values:

1. Switch off your SDLT 600A.
2. Disconnect the network cable from the drive.
3. Repeat the following procedure three times:
   - **a** Insert a write protected cartridge into the drive.
   - **b** Switch on the SDLT 600A.
   - **c** After approximately one minute, the cartridge will be ejected.
   - **d** Switch off the drive.
4. After the third ejection, connect your network cable and switch your cartridge write protection on or off (as you need it), then reboot the drive.

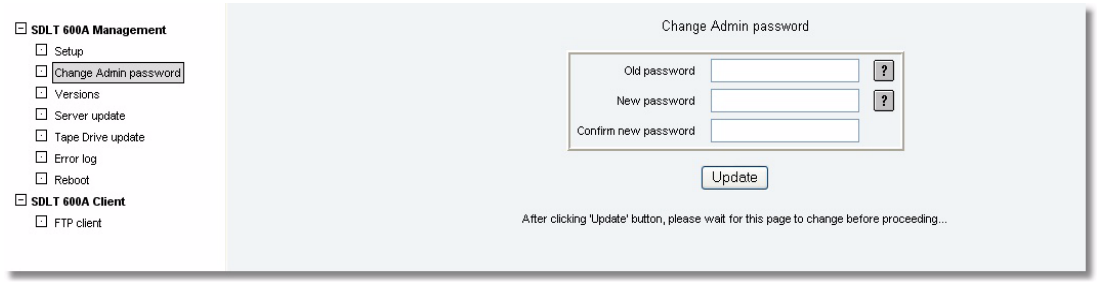
You can now set up the drive using the default IP address (10.10.10.10) as the flash memory has been erased.

Changing the Management Logon Password

In the **SDLT 600A main page**, you can access the **Change password** menu (on the left side) to change the password of the **SDLT 600A management page**.

> **Note:** This is not the password for the FTP client user connection.

Figure 18 Change Password



Sample Configurations for Linux and Mac OS X

The following examples show typical configuration settings for the Linux and Mac OS X operating systems:

Linux Configuration

The following is a sample Linux configuration.

```
[user@host ~]$ su -l
Password:
[root@host ~]# ftp 10.10.10.10
ftp: connect: Connection timed out
ftp> quit
[root@host ~]# ifconfig eth0:1 10.10.10.1 up
[root@host ~]# ftp 10.10.10.10
Connected to 10.10.10.10.
220---------- Welcome to SDLT 600A ----------
220-You are user number 1 of 1 allowed.
220-Local time is now 00:52. Server port: 21.
220 You will be disconnected after 15 minutes of
inactivity.
500 This security scheme is not implemented
500 This security scheme is not implemented
KERBEROS_V4 rejected as an authentication type
Name (10.10.10.10:root):
331 User root OK. Password required
Password: *****
230-This server supports FXP transfers
230 OK. Current directory is /
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> quit
[root@host ~]# telnet 10.10.10.10
Trying 10.10.10.10...
Connected to 10.10.10.10 (10.10.10.10).
Escape character is '^]'.
SDLT 600A Interface
Password: *****
0 SDLT 600A Management ->
1 SDLT 600A Client ->
```

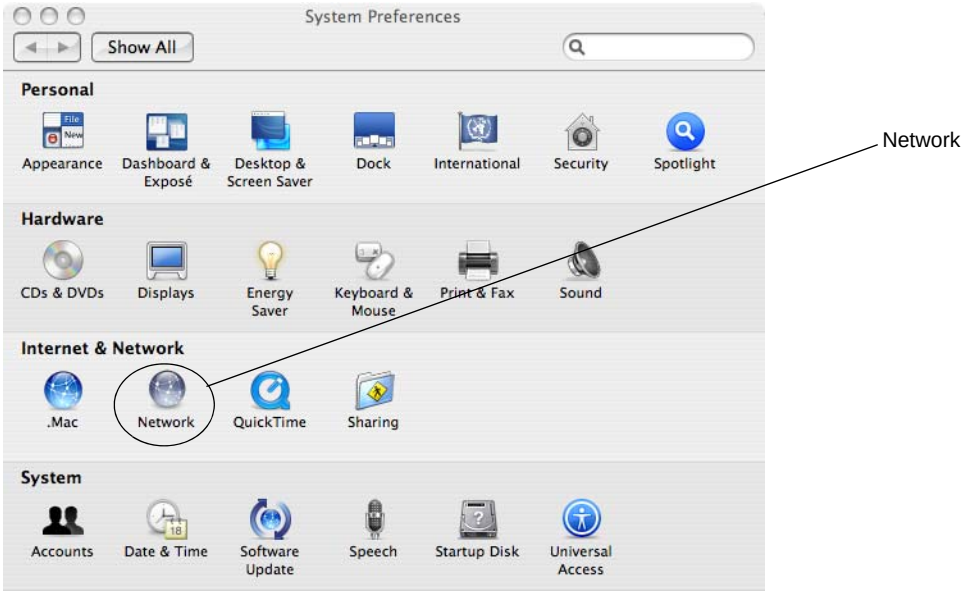
```
r Restore all previous values
s Save all changes
b Reboot
q Logoff
Enter option: q
Connection closed by foreign host.
[root@host ~]# ifconfig eth0:1 down
[root@host ~]#
```

Mac OS X Configuration

Set an IP address:

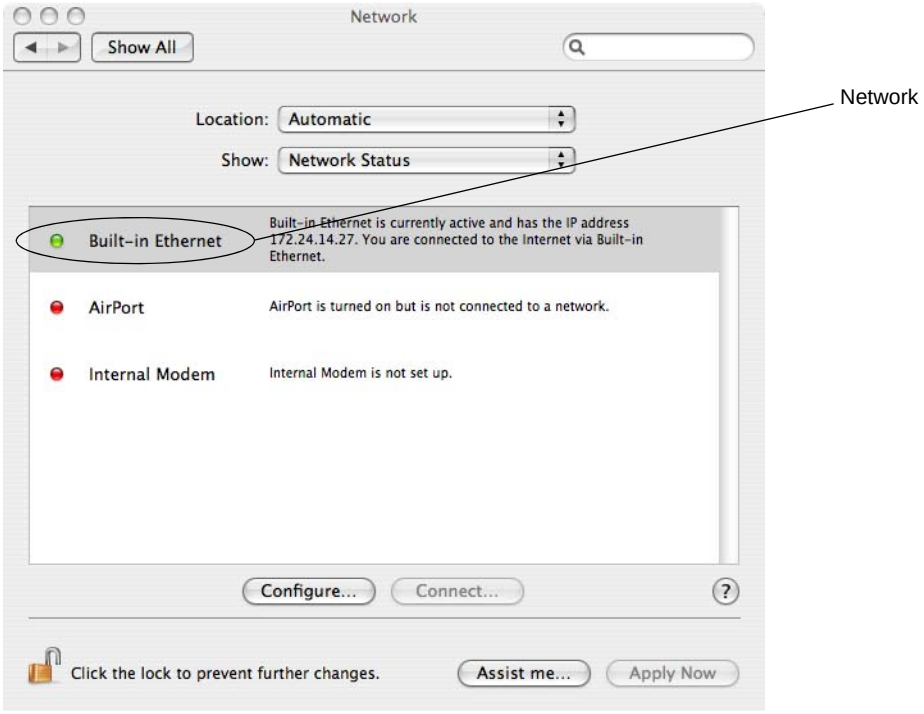
1. From the blue Apple menu, select **System Preferences**.
2. Select **Network**.

Figure 19 Mac OS X System Network



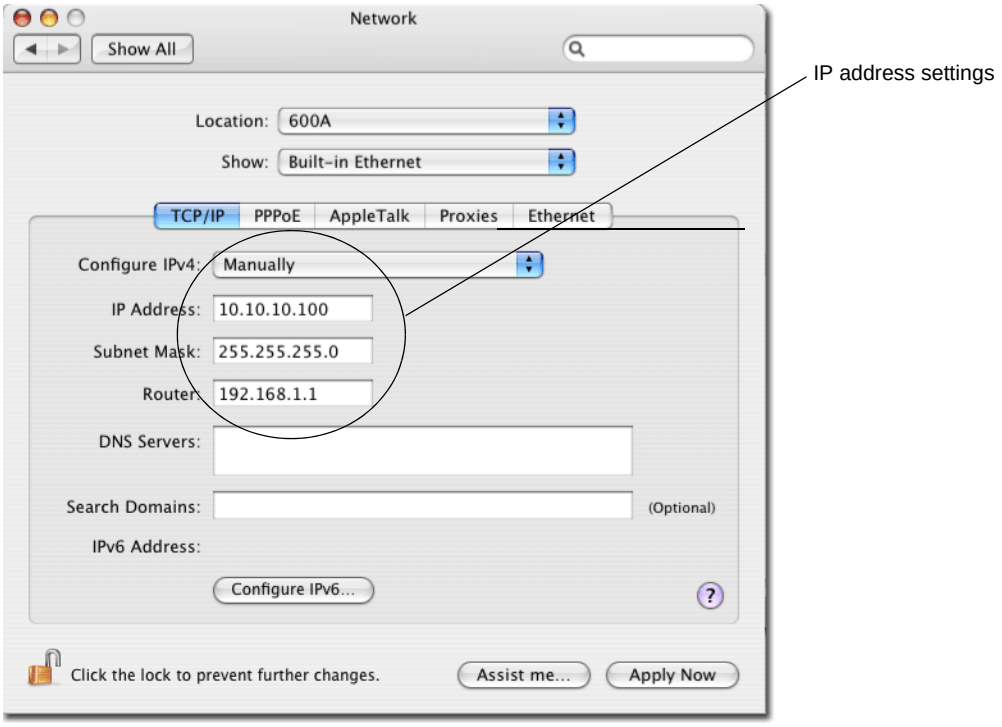
3 Highlight the **Built-in Ethernet** item and then select the **Configure** button.

Figure 20 Mac OS X System Ethernet Network



4 Select the **Manually** in the Configuration IPv4 drop-down box and enter the IP address in the **IP Address** dialogue box.

Figure 21 Mac OS X IP Address Settings



Chapter 3

Using Your Tape Drive

This chapter provides information about the LEDs and buttons on the front panel of the SDLT 600A tape system, formatting tape media cartridges, updating the firmware, cleaning the SDLT 600A tape mechanism, and troubleshooting.

Please refer to Chapter 4, Using the FTP File Server for FTP file transfer information.

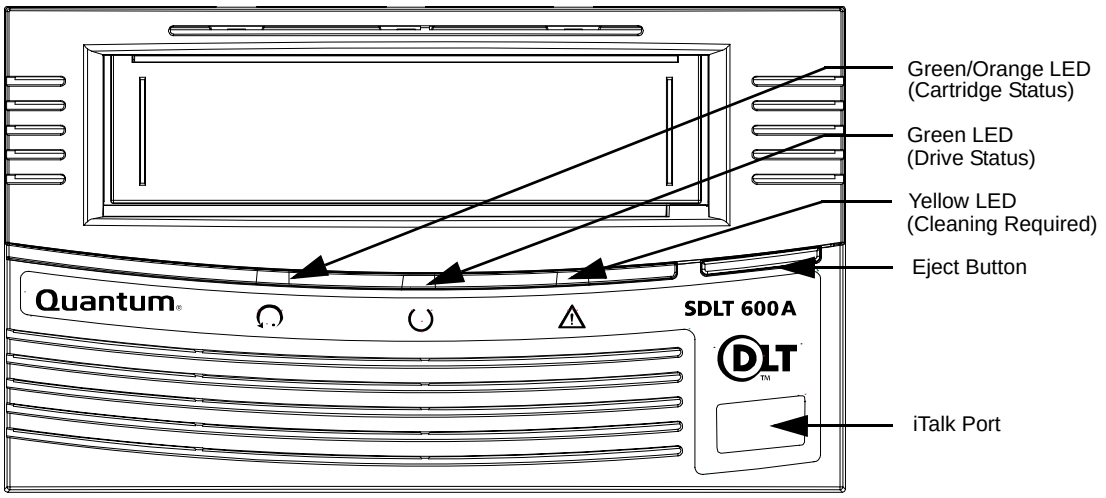
This chapter covers the following topics:

- Front Panel Controls and LEDs describes the functionality of the front panel controls and LEDs.
- Formatting Media Cartridges provides information about formatting and media cartridge compatibility.
- Updating the Firmware provides information about updating tape drive and server firmware, drive rebooting, and viewing the error log.
- Cleaning the Tape Mechanism describes the cleaning of the tape drive mechanism.
- FTP File Transfer Troubleshooting describes the FTP file transfer and the POST troubleshooting guidelines.

Front Panel Controls and LEDs

All controls and LEDs are on the front panel of the SDLT 600A tape drive. See figure 22 for details. Use these controls and LEDs to operate and monitor the activity of the tape drive. Table 2 describes control and LED functionality.

Figure 22 SDLT 600A Tape Drive Front Panel



On the SDLT 600A tape drive, the leftmost LED is dual color (green/orange) This LED is the density indicator. When you insert a Super DLTtape II data cartridge, this LED illuminates green.

Table 2 summarizes these combinations.

Table 2 Front Panel Elements

LED/Button/ Port Title	Color/ Symbol	Action	Explanation
All LEDs	All LEDs illuminate briefly and then illuminate in sequence until the reset completes		SDLT 600A tape drive reset
No LED	No LEDs illuminate		No data cartridge is inserted
Cartridge Status LED	Green 	Remains On	Super DLTtape II data cartridge ejected
		Remains On	Blank Super DLTtape II data cartridge inserted
		Remains On	SDLT 600A tape drive formatted Super DLTtape II data cartridge inserted
Cartridge Status LED	Orange 	On/Off	Incorrect cartridge inserted
Drive Status LED	Green 	Flashing	The tape drive is in use. This includes functions such as: • The tape is moving. • The tape drive is calibrating, reading, writing, or rewinding the tape. • The tape drive is loading, unloading, or rewinding.
		On	The tape drive is idle. There may or may not be a data cartridge in the tape drive.
		Off	The tape drive has not been powered on or is not plugged into a power source.

LED/Button/ Port Title	Color/ Symbol	Action	Explanation
Cleaning Required LED	Yellow 	On	Cleaning is required. See Front Panel Controls and LEDs for cleaning information.
		Off	Cleaning is not required.
Eject Button		Press	Use the **Eject** button to eject the tape data cartridge from the tape drive. When you press the button, the tape drive completes any active writing of data to the tape, then ejects the data cartridge. See the applicable data cartridge appendix for detailed data cartridge handling procedures.
Infrared Communication Port			This infrared port, also known as iTalk, provides a wireless remote testing base for customers and integrators to access system diagnostic information. See your Quantum sales representative for more information.

Note: Whenever the tape drive resets, all LEDs illuminate briefly and then illuminate in sequence until the reset completes. Whenever the tape drive encounters an error, all LEDs flash together.

Formatting Media Cartridges

1 Insert the SDLTtape II cartridge into the tape drive.

When the tape drive recognizes an unformatted or new media cartridge, a prompt appears when connected to the FTP client.

> **Caution:** When formatting with the SDLT 600A tape drive, all existing data on the media cartridge will be overwritten.

2 Click **Yes**.

3 When the tape drive does not recognize a compatible media cartridge (e.g. SDLTtape I or VS160), an error prompt appears, click **Yes**.

> **Note:** The initial formatting of a media cartridge takes approximately 30 – 40 seconds.

Figure 23 Media Error Window

> **Note:** Always remove the data cartridge from the drive prior to powering down the unit. This guarantees the update of any change, that the file system stored on the tape is consistent, and that the tape in the tape path is not damaged when the unit is powered up.

Updating the Firmware

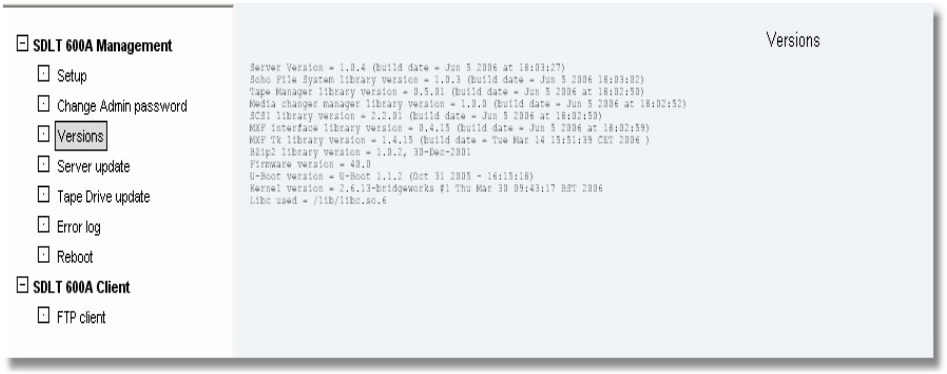
Caution: Do *not* power down the tape drive during an update. This will render the tape drive inoperable.

Versions

From the **SDLT 600A Management** page, you can access the **Versions** menu (see figure 24). to display product versions used in the SDLT 600A FTP server.

You can also access the **Contextual** menu from the **SDLT 600A Client** page and click **Licenses information**.

Figure 24 Versions Window



Updating the Server Firmware

From the **SDLT 600A Management** page, you can access the **Server update** menu (on the left side) to change the firmware of the built-in FTP server.

Note: There is no confirmation of your choice.

To acquire the firmware, go to the software download page at www.quantum.com.

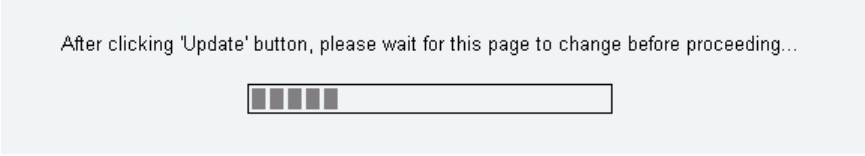
Figure 25 Server Update Window

Locate the following file to update:

SDLT600A.system.build_date (e.g. SDLT600A.system.2006-01-18-15_07)

During the update, the following progress bar appears:

Figure 26 Server Update Progress Bar



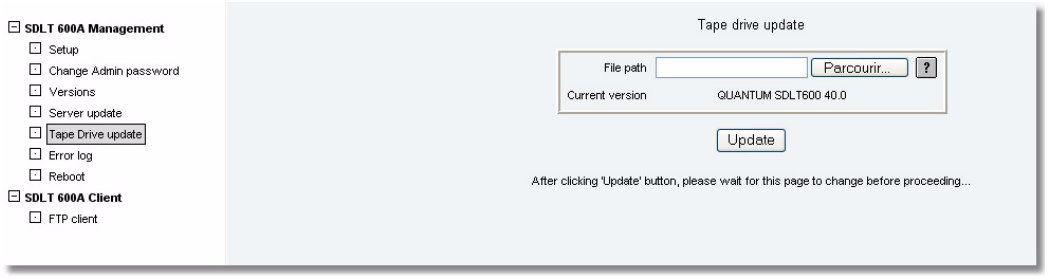
Updating the Tape Drive Firmware

From the **SDLT 600A Management** page, you can access the **Tape Drive update** menu (on the left side) to change the firmware of the tape drive.

Note:	There is no confirmation of your choice.

To acquire the firmware, go to the software download page at www.quantum.com.

Figure 27 Tape Drive Update Window

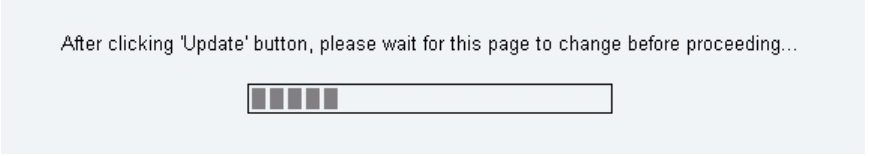


Locate the following file to update:

sdlt_Vxx_oem1.img (e.g. sdlt2_V42_oem1.img)

During the update, the following progress bar appears:

Figure 28 Tape Drive Update Progress Bar

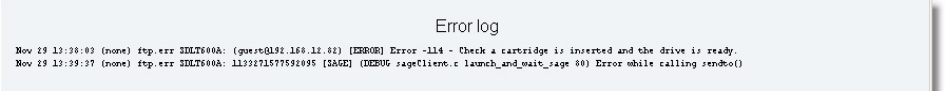


Error Log

From the **SDLT 600A main page**, you can access the **Error log** menu (a sample log shown in figure 29).

Note:	The Error log is available for HTTP Web pages only.

Figure 29 FTP Error Log



Rebooting the Tape Drive

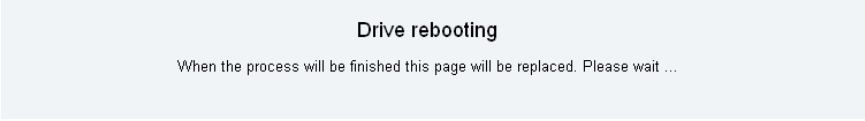
A system reset is available through a reboot command on the SDLT 600A main page.

> **Note:** Always remove the tape before turning off the SDLT 600A.
>
> A tape cartridge can be unloaded during an active FTP session only by using the built-in FTP client. Right-click within the right pane of the FTP client window to display the **Contextual** menu, then click **Eject tape**.

To reboot:

1. Click **Reboot** on the left side of the page.

Figure 30 Reboot in Progress



This will launch a configuration confirmation window.

Figure 31 Save Changes Window

2. Click **OK**.

   A restart confirmation window displays.

Figure 32 Restart Confirmation Window

3 Click **OK**.

Cleaning the Tape Mechanism

This section discusses the tape drive cleaning tape, maintenance considerations, and important compatibility issues.

Note: When the yellow LED is lit, use the SDLT CleaningTape to clean the unit. Do not clean the tape drive unless the tape drive specifically indicates cleaning is necessary.

Occasional Cleaning of Tape Head

SDLT 600A tape drives occasionally require preventive cleaning. The amount of ambient pollution and particulates in the environment, to a large degree, dictates the cleaning frequency.

Clean your tape drive only when cleaning is necessary. The yellow alert LED located on the front bezel of the tape drive will notify you when to clean the tape drive. The location of this LED (and other front bezel LEDs) is shown in figure 22 on page 32.

Clean the SDLT 600A tape drive with the SDLT CleaningTape.

Caution: Use *only* the SDLT CleaningTape. Other cleaning tapes are incompatible with the SDLT 600A tape drive heads.

When to Use the Cleaning Tape

The SDLT 600A tape drive uses a built-in tape cleaning algorithm in conjunction with a *cleaning tape*. The SDLT CleaningTape is packaged in a plastic case, and is light gray in color.

A yellow LED located on the front bezel of the SDLT 600A tape drive indicates when cleaning is needed; figure 22 on page 32 shows the location of this LED (and other front bezel LEDs).

Life Expectancy of the Cleaning Tape

Each SDLT CleaningTape is good for 20 uses. Use one of the labels that is supplied with the tape to track the number of uses. If the cleaning LED stays lit after you clean the drive, the tape life has expired. Acquire a new cleaning tape and repeat the cleaning process.

Compatibility of the Cleaning Tape

The SDLT CleaningTape is intended for use in SDLT 600A tape drives Alternatively stated, the SDLT CleaningTape only cleans the SDLT MRC heads.

Loading the Cleaning Tape Into a Tabletop Tape Drive

Follow these steps to load an SDLT CleaningTape into an SDLT 600A tape drive:

1. Insert the cleaning tape, with the Front Slide Label Slot facing outward, into the tape drive until the tape drive engages with the cleaning tape and begins to take up the cleaning media. The green **Drive Status** LED flashes and the cleaning cycle begins automatically.
2. When the cleaning cycle completes, the cleaning tape automatically ejects from the tape drive and the yellow alert LED turns off.

   Note: On the last cleaning, the cleaning tape will not eject. Use the **Eject** button on the front of the tape drive to eject the expired cleaning tape and dispose of the cleaning tape.

3. Remove the cleaning tape, place it back into its plastic case, and mark the label after each cleaning.

FTP File Transfer Troubleshooting

This section provides troubleshooting information that might be helpful with problems encountered when working with FTP file transfers using the built-in FTP client and server.

Root User

When three root users are already connected, and you try to connect as a root, you will have an FTP error window (see figure 74).

Given the time out setting of the built-in FTP client, it may need some time before the root connection becomes available.

Connecting as a guest user, it is possible to kill a root connection using a site command:

SITE KILLROOT <SP> <root password> <CRLF>

This command allows a guest user to disconnect the root user.

Caution: Before attempting such an operation, we encourage you to report your intention to the root user.

In Case of a Power Failure

A power failure will also cause also all users to be disconnected.

On any new connection after a power failure, the following window displays:

Figure 33 Power Failure Message

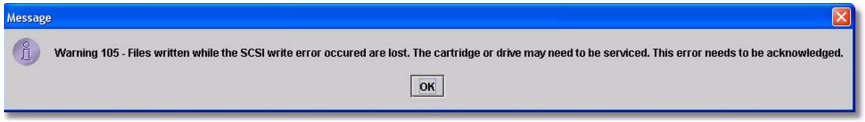
All FTP commands return an error as long as the power failure is not acknowledged by a root user using **ACKNOWLEDGE_ERROR** (see figure 34). The **Contextual** menu displays when you right-click within the FTP client pane.

Figure 34 Acknowledge Error

In Case of a Write Error

Any write error will cause all users to be disconnected. On any new connection after a write error, the following window displays (see figure 35):

Figure 35 Write Error Window



All FTP commands return an error as long as the write error is not acknowledged by a root user using **ACKNOWLEDGE_ERROR** (see figure 34).

Write Protect Cartridge

When the table of contents of the file system is modified before the cartridge is protected (protection is made when the cartridge is inside the

drive), these modifications will not be saved in the eMAM when a user ejects the tape or disconnects its FTP client.

MXF Troubleshooting

Two MXF Files with Same UMID

It is possible that two MXF files have the same UMID when the MXF header metadata file is reingested into the SDLT 600A. On a partial restore operation, the FTP server searches for the file according to the UMID. This way it can find the good file and bad file if there are two (the header metadatafile).

Cannot Display MXF Properties

When storing MXF files, MXF metadata are extracted. MXF files are converted to regular files if MXF metadata cannot be retrieved (but are not renamed).

This solves issues such as the following:

- Creating a partial file without MXF metadata
- Restarting the transfer of an MXF file after an abort
- Listing MXF information (SITE MXFNFO) from aborted MXF files

MXF Interoperability with Avid Files

Storing Avid native files may cause an error message (**bad mxf file format**) if not compliant to the MXF standard.

Network Drive Limitation

When the SDLT 600A is mapped as a network drive using ftp://root@Ip, Windows XP/2000 opens two connections. However, it closes only one connection when the File Explorer window is closed. After three connections, there are three root users (maximum allowed) pending on the FTP server side. To avoid this issue, the network drive must be mapped using ftp://root:password@Ip. The drawback is that the password can be read from the network drive properties.

Built-in FTP Client Troubleshooting

Certificate of Security Out of Date

Since the built-in FTP client (Java applet) reaches the local directories of your computer, a certificate of security is required. When the applet is loaded, the Java plug in prompts you to accept our certificate of security.

Java Run-time Environment (JRE)

The JRE may be installed under the operating system without support for oriental or occidental scripts. That is, certain coding schemes do not appear in the built-in FTP client combo box.To add them with Windows XP, you must select the JRE used by the system. Click **Start, Settings, Add or Remove Programs, JRE, Modify**. Follow the wizard to download appropriate files for oriental languages.

File Transfer Stops

A file transfer using the built-in FTP client stops if the file is reserved by the FTP client file system (workstation) or the file name contains characters not in the supported character list.

Internet Explorer Cache

Before loading a new FTP server image (the Java FTP client is built in) you should clean your Internet Explorer environment. This avoids any side effects, such as Internet Explorer loading a previous version of the built-in FTP client.

From Internet Explorer, go to your **Tools/Internet Options** and clear the following:

- Cookies
- Temporary files
- History

Close all Internet Explorer sessions.

FTP Error Window

On occasion, a FTP error window requiring acknowledgement may be hidden behind a main window. As a result, all operations are disabled until the error is acknowledged. Use <Alt+Tab> to bring the error window to the front.

Deleted File Removal

When you type <Ctrl+A> in a root folder for file selection and then delete the selection, the files are definitively removed from the file system.

Drag and Drop

Drag and drop does not work as it does in Microsoft Windows. You must first select the item before doing this operation.

Communication Problem with Windows Server 2000

There is an incompatibilty issue only with the RETR operation (not with STOR). As soon as the FTP server responds with **150**, an error may rise locally on the client system indicating a communication buffer problem.

A work around for the built-in FTP client is to change the buffer size in the configuration menu.

FTP Server Troubleshooting

Encoding Modification Not Taken Into Account

After any encoding modification, the client has to reconnect the server to take it into account.

Encoding Modification Side Effects

Before changing the FTP server encoding, it is safer to erase the tape to avoid any side effects. For example, files transferred with filenames set to

a specific character set may not be listed into another encoding character set and may not be available for FTP operations.

Anonymous Connection Not Supported

A SDLT 600A FTP server does not support anonymous connection. Any attempt to connect with anonymous connection causes the following error message:

Unable to connect to remote server and unable to setup a secure anonymous FTP

Remember, only root (password is **password**) and guest (password is **guest**) connections are supported.

When the login is set to anonymous at the first try to connect to the built-in Java client, then the following tries will keep the same login anonymous. If you do not enter a login and password, the Java FTP client always tries to connect as anonymous.

To work around this problem, type OK to exit the error message window and go to the Configuration page. Select the connection that has been automatically named as @x.x.x.x:21 (where x.x.x.x is the IP address) and set the login and password correctly. Then select **Apply**.

Text Data Transfer Mode Not Allowed

Because the SDLT 600A does not support ASCII data transfer, a user has to set the mode for the put (upload) and get (download) operations of text files into its FTP client (if not the Java FTP client). Set the mode from AUTOMATIC to BINARY, exit the FTP client, and reload it.

Frequent FTP Client Timeouts

An FTP client timeout occurs when the FTP server does not answer an FTP command within the allocated time.

A client timeout may occur on long tape operations such as a locate. A work around for the built-in FTP client is to increase the timeout value.

> **Note:** There is no timeout in effect during a data transfer phase. Following the locate operation on tape, the FTP server returns **150 Connecting to port xxx** to the client and starts transferring data.

Resume is Disabled

Resume on store and retrieve operations is disabled for graphical clients, including the built-in FTP client.

Abort Transfer

The **ABORT** command during a FTP transfer is not supported.

Power-On Self-Test (POST) Troubleshooting

This section provides troubleshooting information that might be helpful should the system fail its Power-On Self-Test (POST).

See the data cartridge appendices in this document (Super DLTtape II Data Cartridges on page 119) for complete visual inspection instructions for Super DLTtape II data cartridges.

The Web site www.dlttape.com also includes valuable information about SDLT systems.

POST Operation

The SDLT 600A tape drive performs a Power-On Self-Test (POST) each time the tape drive is powered on. POST normally completes in 10 to 15 seconds—when a data cartridge is not in the tape drive— when the unit is powered on. However, if a data cartridge is in the tape drive when the unit is powered on, POST duration is longer, depending on how much tape in the data cartridge may be loaded in the tape drive.

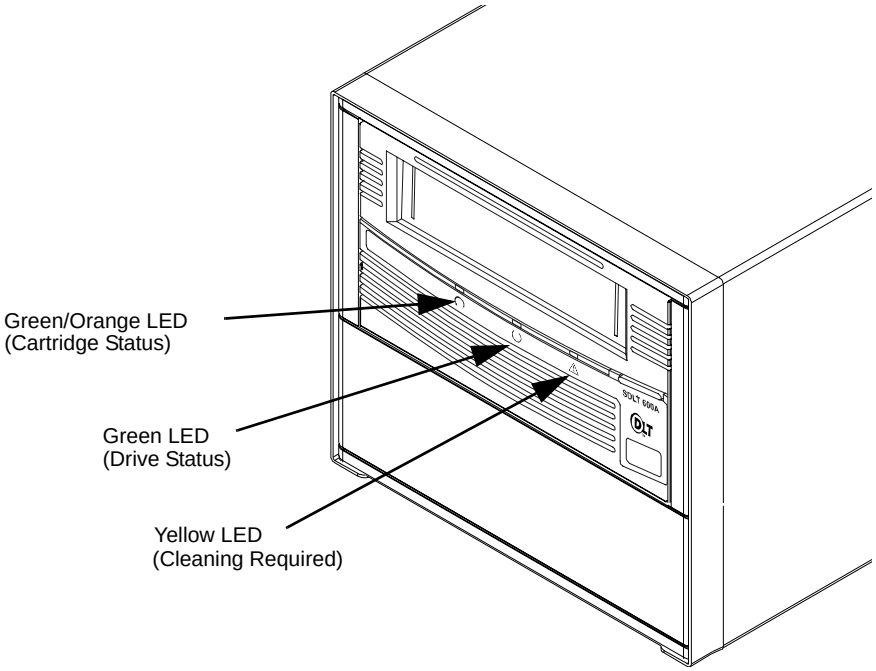
See figure 36 to help familiarize yourself with the LEDs on the front panel. Stage 3 in the following table provides the sequence of operations to expect when power is turned on.

Table 3 LED Lighting Pattern During Power-On Self-Test (POST)

Stage	What You Observe
1 (Power On)	All LEDs illuminate for approximately one second.
2	The LEDs flash on, then off in a progressing pattern from left to right. Stages 1 and 2 generally complete within approximately five seconds.
3	The right LEDs remain off, the left LED illuminates steadily, and the middle LED flashes until POST completes. This stage typically lasts for 5 to 10 seconds.
4	When POST is complete, the middle LED stops flashing and remains illuminated; the left LED turns off, and right LED remains off.
POST Failure	If POST fails, the middle and right LEDs illuminate steadily and the left LED flashes.

Note: If a data cartridge is in place when power is turned on, all stages remain the same except stage 3. It may take a considerably longer time for stage 3 to complete due to tape rewind and searching operations that occur during that stage.

Figure 36 SDLT 600A Tape Drive Front Panel LEDs



POST Troubleshooting Tips

Table 4 provides troubleshooting tips that you will find useful in the event that your tape drive fails its POST.

If, after attempting the recommended actions listed in the table, the problem still exists or recurs, a hardware failure may be the cause. Contact your service representative.

Table 4 Troubleshooting Chart

If…	Then…	You should…
The system does not recognize the tape drive.	Host computer may not be configured to recognize the network.	Configure system to recognize the tape drive's ID.
	Network/IP parameters may not be correct.	Configure network/IP parameters.
	Network cable may be loose.	Ensure that the network cable is fully seated at each connector end.
The tape drive does not power on.	No power is reaching the tape drive.	Check the tape drive's power cable connection at the back of the system.
You are experiencing reduced drive transfer rates.	Check your operating environment (host PC) and cabling.	Update the cable to CAT-5E or CAT-6. If the problem persists, please contact customer support.

Over Temperature Condition

The tape drive has a thermal sensor located in the tape path. This sensor, which is used to accurately monitor the air temperature in the tape path, issues a TapeAlert warning at 47 degrees C, and detects an overtemp condition when the temperature in the tape path reaches 50 degrees C. When the tape path temperature sensor detects an overtemp condition, the tape rewinds, unloads, and ejects from the tape drive. (As long as the tape drive is not mounted in a tape automation library, the tape ejects.)

If the tape drive is mounted in a tape automation library, the data cartridge rewinds to BOT and unbuckles in preparation for unloading, but does not automatically eject.

Frequently Asked Questions

For the latest FAQs, go to www.quantum.com and click **Knowledgebase/ FAQs** under **Service and Support**.

Chapter 4

Using the FTP File Server

This chapter describes how to use your SDLT 600A tape drive for FTP file transfers and provides information about the FTP client commands.

Getting Started

The only software required on your system is the Java Plug-in. The **Java Plug-in** is the virtual machine software that allows the execution of Java applets.

The Java Plug-in

The Java FTP client needs the Java Virtual Machine to run. This **Java Plug-in** is provided by Sun Microsystems.

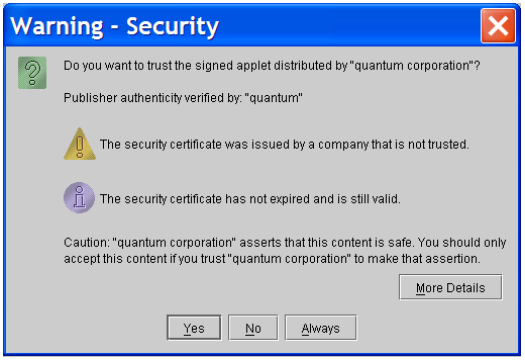
The Java FTP client will install immediately. When you load the Java FTP client for the first time, a display window may ask you to download and install the Java plug-in. If you need that plug-in you can just follow the instructions on the screen or go to www.java.com to download it.

If you have **Java Plug-in** version 1.4.2_xx or later, or the **Java Runtime Environment** version 1.4.2_xx or later installed on your computer, you should not need to download new software. The plug-in should activate on your Web browser automatically once installed.

Certificate of Security

Since the Java FTP client reaches the local directories of your computer, a certificate of security is required. When the Java FTP client is loaded, the **Java Plug-in** displays a window prompting you to accept our certificate of security.

Figure 37 Certificate of Security



FTP File Transfers

The FTP Client GUI of the SDLT 600A is composed of two views, which allows you to select from the corresponding tabs:

- SDLT 600A Tab — Main view allows you to explore local and remote systems and make transfers
- Configuration Tab — Shows a list of servers and the specifications of the FTP communication within the application

FTP Client Tool

If several connections are configured within the configuration tab, the following window appears when restarting the FTP client.

Figure 38 Choosing an FTP Connection

When selecting the FTP client, the Java Virtual Machine is first loaded (see figure 39).

Figure 39 Java Virtual Machine Plug-in

If the cartridge is not inserted, the following window appears (see figure 40).

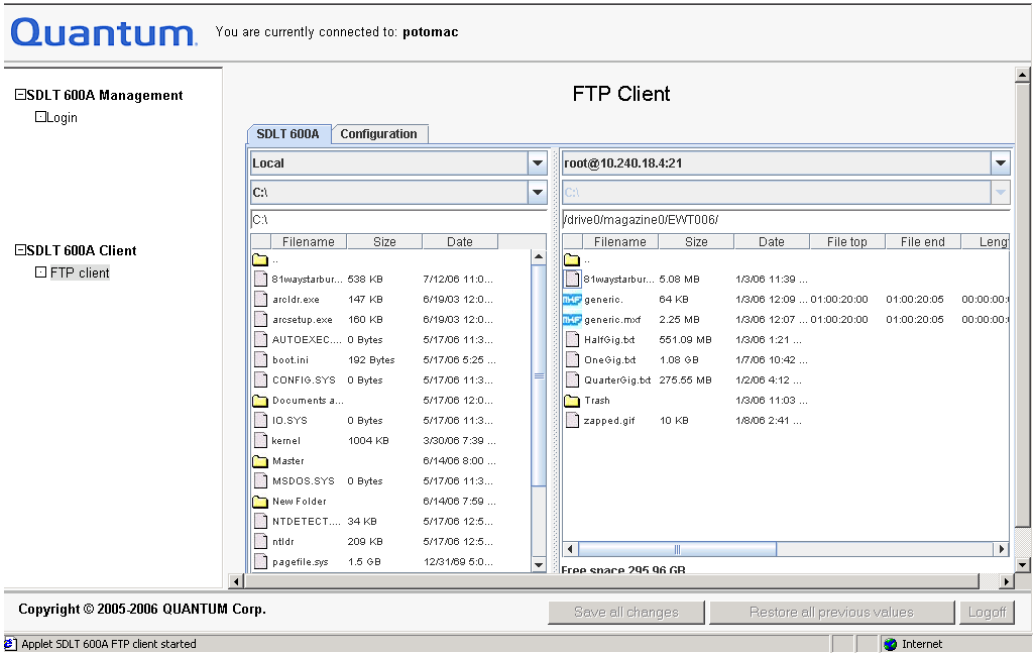
Figure 40 FTP Error Window

SDLT 600A Client/FTP Client

The SDLT 600A Client/FTP client allows you to transfer files to and from the tape drive, partially restore MXF files, and view the MXF metadata.

In the SDLT 600A main page, click **SDLT 600A Client,** then **FTP client**.

Figure 41 SDLT 600A/FTP Client



SDLT 600A Tab

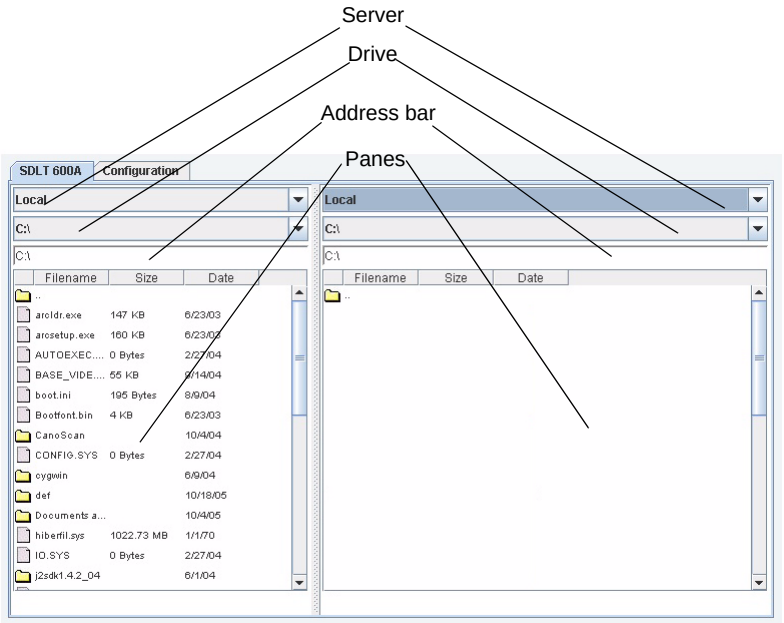
SDLT 600A is the main tab view with a standard FTP client interface, providing two file panes.

When loaded, the FTP client connects you to the SDLT 600A server when the login name and password are correctly entered. If not, correct the information in the configuration menu.

Once connected, you can choose **Local** instead of the SDLT 600A server to disconnect the FTP client.

Figure 42 Local Selection Window

Figure 43 SDLT 600A Tab Display



File Panes

On the top of each pane, there are three text zones:

- The first zone allows you to select the system or server.
- The second zone allows you to select the drive (only available on **Local**).
- The third zone displays the currently navigated path and allows you to type the path within the address bar.

The panes can be local view or remote view and you can interact with the system as follows:

- Double-click a folder to expand it to view the enclosed folders and files
- Double-click a folder at the top followed by leader dots that lead toward the parent folder
- Click an item (file or folder) to select it
- Use **<Ctrl>** for non-continuous and **<Shift>** for continuous item selection
- Use **<Ctrl + A>** to select all files and folders
- Use **F2** is supported (allows you to edit the name of the selected file)
- Right-click to see the **Contextual** menu (**<Ctrl>+**right-click under Mac OSX)
- Click the column headings to change the sorting order

File Transfers

The SDLT 600A FTP client allows you to transfer files from a:

- Local PC to/from a SDLT 600A server
- Local PC to/from a non-SDLT 600A server (e.g. Filezilla)
- SDLT 600A server to/from a non-SDLT 600A server
- SDLT 600A server to/from another SDLT 600A server (FXP transfer)

To transfer files, select one or more items in one pane, then drag and drop them to the other pane. You can also transfer files within folders of the same pane, local or remote (e.g. into the SDLT 600A FTP server or into another FTP server).

When transferring files of 4 MB and larger, transfer rates up to 36 MB/sec native may be achieved. When transferring files of less than 4 MB, you may see degraded drive transfer rates.

Note: The maximum storage capacity of the SuperDLTtape II data cartridge is 300GB.

Once a transfer is initiated, the bars show the transfer progress—when the indicator is moving back and forth, the tape is seeking, and once data copying actually begins the bar shows the progress.

The queue lists the files to transfer as well as the status of the transfer. By selecting a file from the list and then right-clicking it, you can:

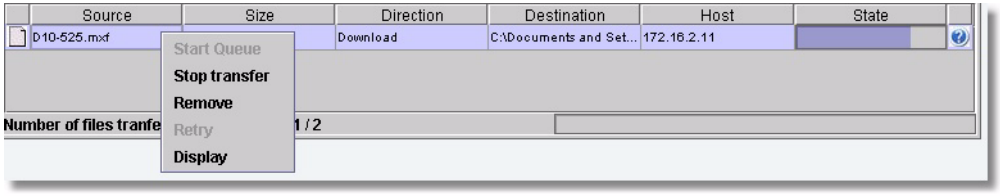
- Start the transfer queue
- Stop the file transfer
- Remove the file from the list
- Retry the operation
- Display the file transfer properties

> **Note:** Canceling a transfer aborts it. Skipping a transfer cancels the current file transfer. The sequence of file transfers continues if there are other files in the transfer queue.

File Transfer Stopped

A sequence of file transfers stops when a file is reserved by the FTP client system or the file name contains characters not supported.

Figure 44 Stop Transfer Selection



When a transfer is stopped, the following window informs you that the file system is refreshing:

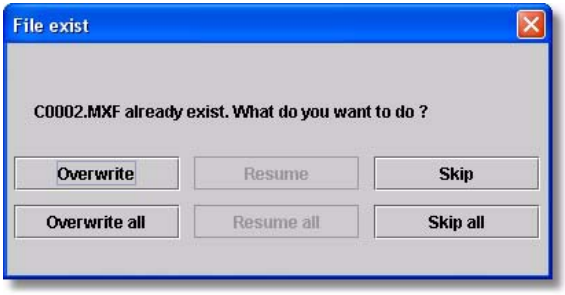
Figure 45 System Refresh Window

Note: When you perform a transfer between two remote servers (a procedure called **Server to server** or **File eXchange Protocol** (FXP), data is transferred directly from/to the source remote server to/from the target remote server, without routing this data through the client's workstation. The client has no indication of the exact progression.

Duplicate File Name

When you transfer a file, if there is already a file with the same name in the destination, there is a conflict and the following window appears:

Figure 46 File Exist Window



- **Overwrite/Overwrite all** — Erases the file already on the target and copies the new file in its place.

Note: When you overwrite a file, it is not erased from the tape, because the tape drive appends data only (unless the file to overwrite is the last file stored on the tape). However it is not possible to access the overwritten file (unless the file to overwrite is the last file stored on the tape).

Note: The SDLT 600A does not support **Resume**.

- **Skip/Skip all** — Continues the transfer for other selected files without overwriting the specified file(s). The source files must be selected (highlighted in blue) prior to attempting the drag and drop procedure.

Information Within the Panes

In addition to the information about a file (size, date, and so forth), metadata information relative to the MXF files (file top, file end, essence, and so forth) is provided within the pane.

The figure 47 shows the metadata columns of the MXF files.

> **Note:** You can select which metadata columns to display in the **Configuration** tab.

Figure 47 MXF Files and Metadata

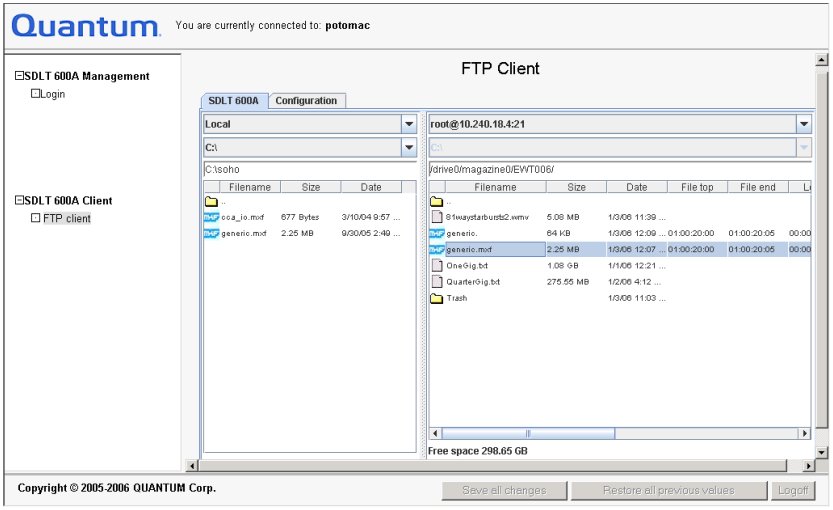
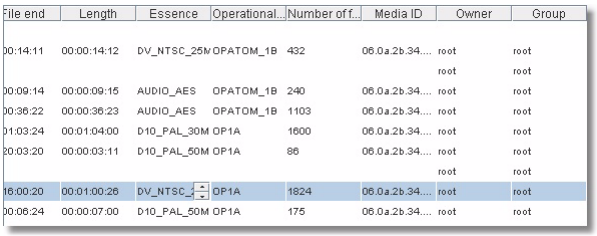


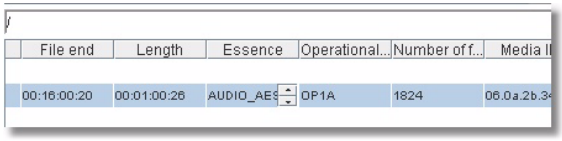
Figure 48 shows additional metadata columns which can be viewed by moving the slider at the bottom of the pane to the right.

Figure 48 Additional Metadata Columns



Each MXF file's metadata may contain information for several essence types (e.g. video essence, audio essence) and you can display the associated metadata by clicking the selector within the **Essence** column, as indicated in figure 48 and figure 49.

Figure 49 Audio Essence Metadata

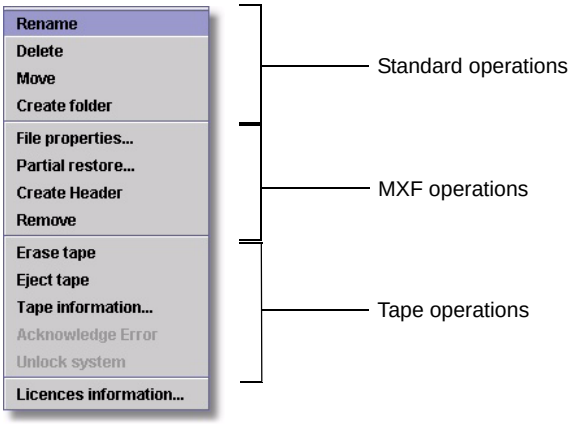


Contextual Menu

A **Contextual** menu allows you to control operations on the selected items. This menu appears when you right-click within the pane or on an icon.

The zone on top of the **Contextual** menu (see figure 50) is for standard operations available on all systems (local, standard server, application, and so forth). The other two zones present operations that are only available on the application (MXF operations, tape operations).

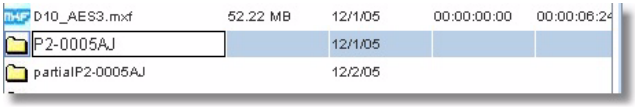
Figure 50 Contextual Menu



Standard Operations

- From the **Contextual** menu, the **Rename** selection allows you to rename the selected folder. Enter the new name (see figure 51). To cancel the procedure, type **<Esc>**.

Figure 51 Renaming Files or Folders



- From the **Contextual** menu, the **Delete** selection opens a window (see figure 52) to confirm the deletion of files. Once the deletion is confirmed, the deleted file or folder is moved into the **Trash** folder. The **Trash** folder is a system folder located at the root of the file system (i.e. /Trash). It cannot be deleted. Deleting a folder will delete all the files within the folder as well as any subfolders and their corresponding files. Folders are not stored in the **Trash**, and therefore cannot be undeleted.
- From the **Contextual** menu, the **Remove** selection opens a window (see figure 54) to confirm file removal. Once the remove is confirmed, the removed file or folder is definitely erased and not moved into the **Trash** folder. Removing an MXF file erases all its associated files; all

the virtual files resulting from a partial restore or create header commands. Removing a folder will delete all the files within the folder as well as any subfolders and their corresponding files.

Figure 52 Delete Window

> **Note:** The **Trash** folder (see figure 53) shows the list of files that you have deleted. When you delete a file, it is not entirely deleted from the tape, but rather, it is moved to the **Trash** folder. Therefore, it is possible to "undelete" files from the **Trash** folder by moving the file back to its original location.

When a file is deleted and the same file is already located in the **Trash** folder, the second instance of file is renamed with **<filename>xyz.extension** (*xyz* starting with 000).

Since the maximum number of characters of the filename is 97 (including the extension), if the deleted filename is greater than 94 characters long, the second instance of file is renamed with **<truncated filename>xyz.extension** (**<truncated filename>** means the last three characters of the filename are truncated).

Figure 53 Retrieving Files from the Trash Folder

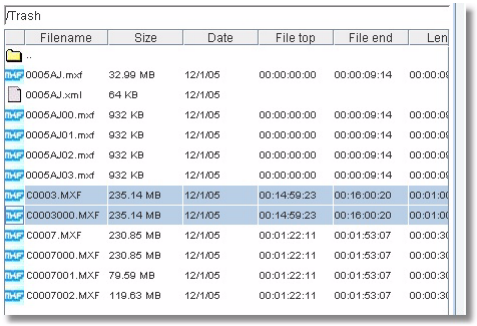
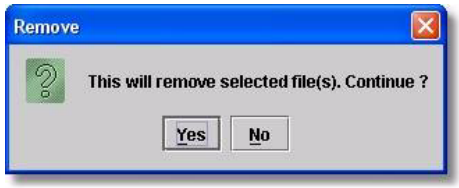


Figure 54 Remove Window



- From the Contextual menu, the **Move** selection opens a window (see figure 55) to specify the destination of the file or folder. The **Move** selection supports an absolute pathname, that is, you can enter a full pathname in the dialog box to set the destination of the file or folder.

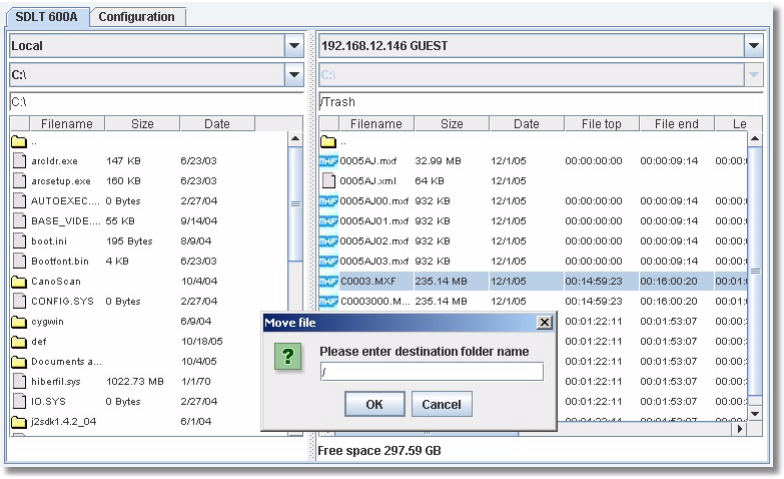
Note:	The **Trash** folder cannot be moved.

Figure 55 Move File Window

Note:	This operation can be useful to undelete a file.

Enter the destination folder name (see figure 56).

Figure 56 Move File Window — Destination Folder



- From the **Contextual** menu, the **Create Folder** selection opens a window (see figure 57) to specify the new folder. The **Create Folder** selection supports an absolute pathname, that is, you can enter a full pathname in the dialog box to set the destination of the file or folder.

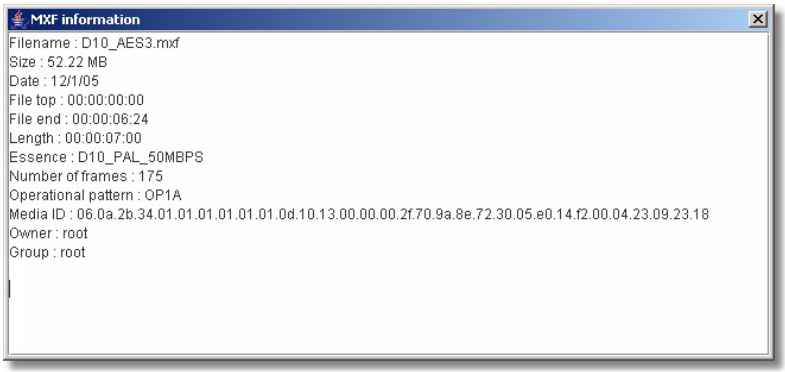
Figure 57 Create Folder Window

- From the **Contextual** menu, the **File properties** selection (see figure 58) opens a window showing the metadata of all MXF files selected:
  - Filename
  - Filesize
  - Last modification date
  - Starting time code
  - Ending time code
  - Duration in time codes
  - Video essence type(s)

- Number of video frames
- MXF Operational pattern
- MXF Unique Media Identifier (UMID)
- Owner
- Group

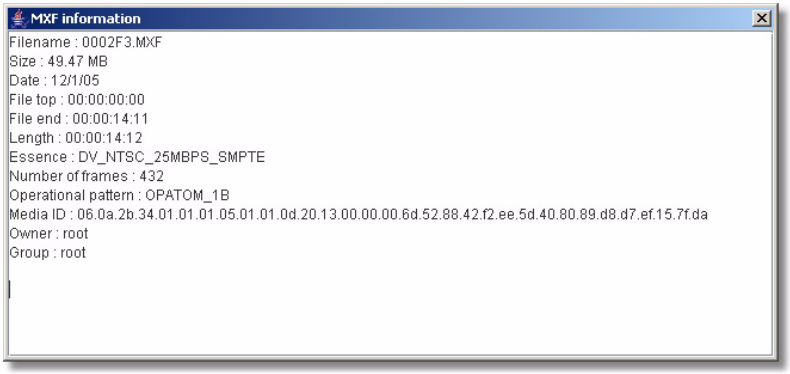
Note: Multiple file selection is supported.

Figure 58 MXF Information of D10 PAL Essence



Note: The SDLT 600A supports different video essences (see figure 59) and MXF operational patterns.

Figure 59 MXF Information of DV NTSC Essence



- From the **Contextual** menu, the **Partial restore...** selection opens a window to do a **partial restore** of a selected MXF file.

Partial Restore

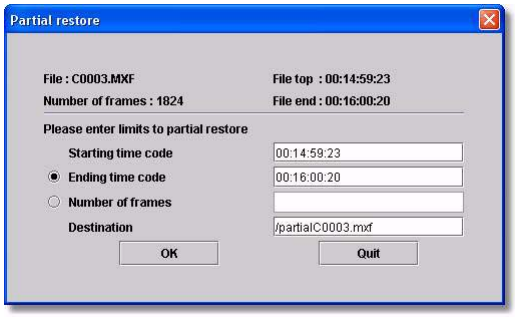
Partial restore allows you to get a part of an MXF AV file (subclip access by timecode) stored on the tape, that can be defined by the **Starting time code** and **Ending time code** or **Starting time code** and **Number of frames**.

The **Partial restore** feature is currently only supported for MXF OP1A and OPATOM operational patterns and only with Iframe-only video essences. Partial restore of other video essences is not frame accurate. The **Partial restore** procedure for OP1A and OPATOM MXF files differs slightly from other partial restore operations due to the fact that OP1A has only one video essence and one audio essence embedded into a single file, while OPATOM is composed of a directory containing at least one video file and several audio files and possibly other directories such as **Video**, **Audio**, **Clip**, etc. The operational differences between the Partial restore operation of OP1A and OPATOM is that the procedure for OP1A defines the destination file and the procedure for OPATOM defines the destination directory. At the time of this publishing, the SDLT 600A has support for OP1A and OPATOM operational patterns procedures only. Other operational patterns procedures are planned on future firmware releases.

Partial Restore of MXF OP1A

The **Destination** file name is the name of the virtual file. The edit box for **Destination** is empty by default and you can enter a relative or absolute path.

Figure 60 Partial Restore OP1A Window



When you click **OK**, and then **Quit** in the **Partial Restore** dialog, the **Partial restore** command creates a corresponding file into the current folder. The file is referred to as a *virtual* file as it contains no data but is actually a directory entry which points to the designated sub clip in the original file.

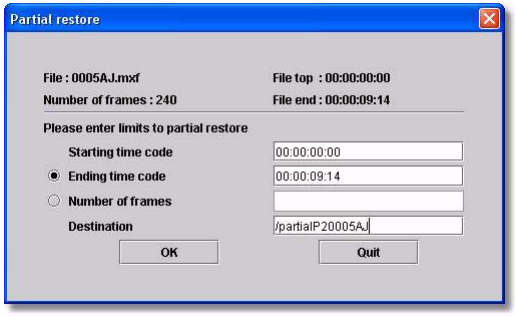
> **Note:** The .mxf extension is a required part of the destination file name, but will not be added automatically. Add the extension to the file name within the **Destination** file name box.

> **Note:** The partial restore of OP1A is not successful if the destination file name already exists.

Partial Restore of MXF OPATOM

The **Destination** file name is the name of the directory where the virtual files will be stored. There is one virtual file per AV source file. The edit box for **Destination** is empty by default and you can enter a relative or absolute path.

Figure 61 Partial Restore OPATOM Window

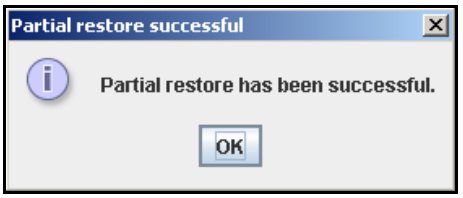


Note that in this case, the **Destination** field defines the directory where the OPATOM subdirectories and files will be created. When you click **OK**, and then **Quit** in the **Partial Restore** dialog, the virtual files are created into the current folder when the OPATOM or video audio MXF files are complete.

> **Note:** The partial restore of OPATOM is not successful if the destination directory already exists.

Once the virtual file is created, a window displays.

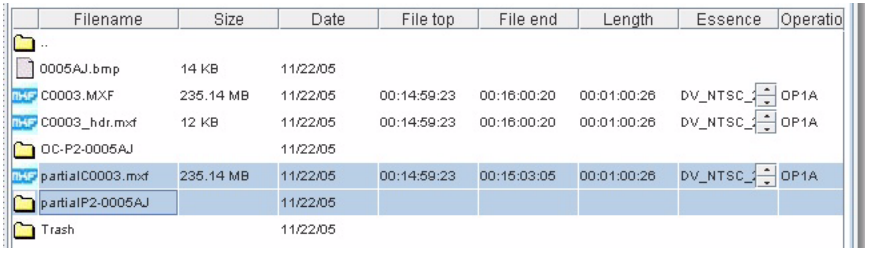
Figure 62 Partial Restore Successful Window



When you click **OK**, the complete partial restore list displays.

Once the partial restore has been successfully completed, the virtual file(s) are listed in the directory. Since there is only one virtual file for OP1A but several for OPATOM, when OPATOM virtual files are listed in the directory, they appear within subdirectories as shown in figure 63.

Figure 63 Partial File List



Filename	Size	Date	File top	File end	Length	Essence	Operatio
..							
0005AJ.bmp	14 KB	11/22/05					
C0003.MXF	235.14 MB	11/22/05	00:14:59:23	00:16:00:20	00:01:00:26	DV_NTSC_	OP1A
C0003_hdr.mxf	12 KB	11/22/05	00:14:59:23	00:16:00:20	00:01:00:26	DV_NTSC_	OP1A
OC-P2-0005AJ		11/22/05					
partialC0003.mxf	235.14 MB	11/22/05	00:14:59:23	00:15:03:05	00:01:00:26	DV_NTSC_	OP1A
partialP2-0005AJ		11/22/05					
Trash		11/22/05					

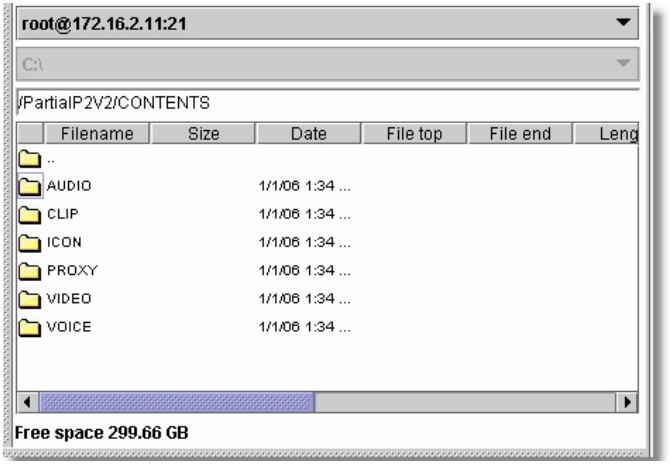
In OPATOM, all of the files are organized the same as on a P2 Solid State Media (SSM) Card in a directory, which contains the clip metadata directory, video essence directory, and the audio essence directory, which are mandatory. The **Clip** directory contains a clip metadata virtual file which stores the clip structural and descriptive metadata and is located under the **Destination** file name directory. The **Video** directory contains the video virtual file and is located under the **Destination** file name directory. The **Audio** directory contains all audio virtual file files and is located under the **Destination** file name directory.

> **Note:** Video, audio, and clip file name syntax must be compliant with P2 SSM version 1 or 2. Occasionally, you may need to add additional directories (not mandatory) for an OPATOM player as there is no automatic updating feature for this within **Partial restore...** The result of the partial restore is compliant with PS2 SSM version 2.

Other directories are not mandatory and are described with the **SITE** command (see the **PARTIAL** command on page 94).

Figure 64 shows the resulting subdirectories created from the OPATOM partial restore operation (i.e., this is what would be seen if you double-clicked the folder identified as *partialP2-0005AJ* in figure 63).

Figure 64 Partial File List in OPATOM



The result of the partial restore command is a virtual file. This file must be retrieved to be completed on the local hard disk.

Retrieve a Virtual File

After a successfully completed partial restore (for both OP1A and OPATOM), you can retrieve the virtual file to the local hard disk.

Note:	The destination of the virtual *must be* set to the local hard disk.

Once transferred, a MXF-compliant file is saved to its destination location.

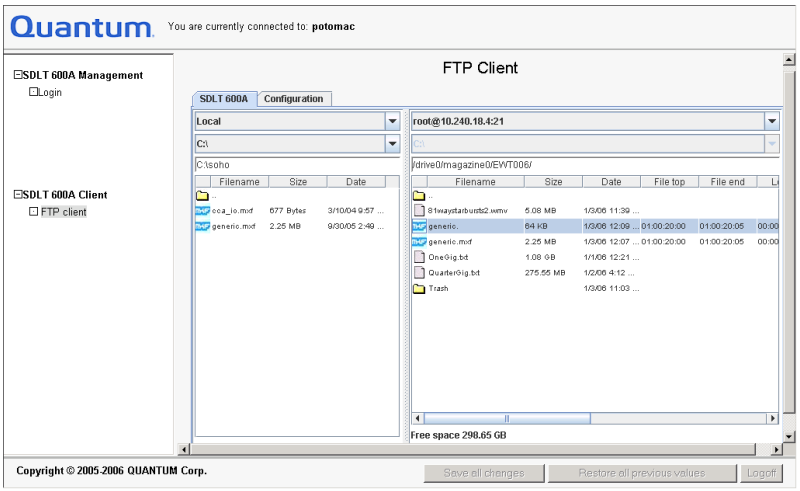
- From the **Contextual** menu, the **Create Header** selection opens a window (see figure 65) to create an MXF header metadata file. The **Create Header** selection supports an absolute pathname, that is, you can enter a full pathname in the dialog box to set the destination of the file or folder.This action is used to extract any MXF file's header metadata into a separate file. This separate file is user specified to contain binary or XML data as configured (see SDLT 600A options on page 79). Select the MXF file for which metadata is to be extracted

and then select the **Create Header** item from the **Contextual** menu. The result of this command is a virtual file. In XML, its size is always 65536 (64 KB).

Figure 65 Create Header Window

Choose the appropriate extension as configured (see figure 66).

Figure 66 Metadata Header — Virtual File



This file must be retrieved to be completed. This file can be in text format (XML) or binary format depending on the setup option (see SDLT 600A options on page 79). Once the file is transferred, the MXF header file is saved to your local disk.

Note: Since the MXF header in binary format has the same UMID as the original MXF file, storing it may cause problems during a **Partial restore** operation as the file system will find several files previously allocated to the UMID.

Enter the new header name with any extension you want. You can choose the appropriate extension as configured into **Configuration** tab display (see figure 72 on page 75). Figure 66 shows the new header file.

Tape Operations

- From the **Contextual** menu, click **Erase tape**. This will open a window (see figure 67) to erase the entire tape after your confirmation.

> **Caution:** All existing data on the file system will be overwritten when you click **Erase tape**.

Figure 67 Erase Tape Window

- From the **Contextual** menu, click **Eject tape**. This will open a window (see figure 68) to eject the loaded tape and disconnect the user.

> **Note:** If the file system table of content has been modified before the tape is set to write protected, these modification will not be saved to tape.

- From the **Contextual** menu, click **Acknowledge error**. This command is necessary on occurrence of a write error or a power failure:

  Any write error caught will cause all users to be disconnected. A power failure will also cause all users to be disconnected.

  On any new connection after a write error or a power failure, all FTP commands return an error when the write error is not acknowledged by a root user using the SITE command **ACKNOWLEDGE_ERROR** or by disconnecting and reconnecting again. When a write error is detected, the file system table of content is not written to tape in order to prevent a full eMAM data corruption (because of the write error). All modifications during the connection session are lost.

  When a power failure is detected, the file system table of content is not written to tape. All modifications during the connection session are lost.

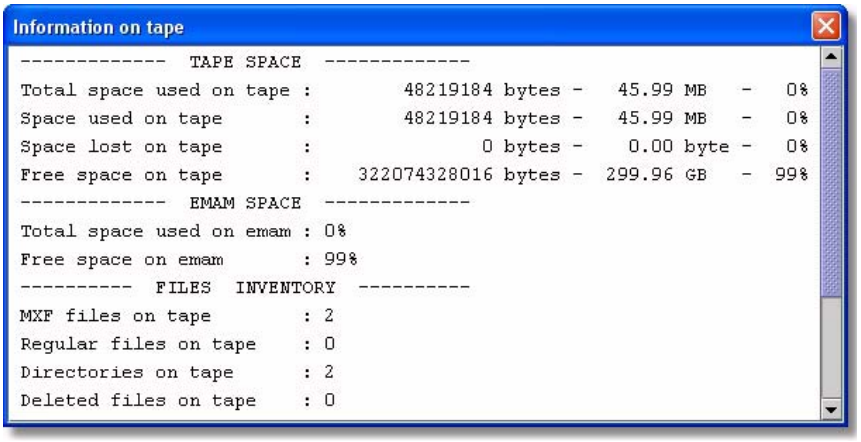
Figure 68 Eject Tape Window

Note: You cannot eject the tape without root privileges (see figure 69).

Figure 69 Eject Tape Error Window

- From the **Contextual** menu, click **Tape info...**. This will open an information window (figure 70) about the tape identifier and how space is utilized on the tape as follows.
  - **Tape space —** This indicates the total space used on the tape and the total free space available on it (the native capacity after an erase operation is 300 GB).
  - **eMAM space —** This indicates the total space used on eMAM (total number of entries used in the file system) and the total free space available on eMAM.
  - **Files inventory —** This indicates the number of entries in the file system for each file type; MXF files, regular files, directories, deleted files, virtual files (virtual files are created by a **partial restore** command or by a **create header** command). A virtual file exists only in the file system and is not stored on tape. The number of directories takes into account the two system folders: / and **/Trash**.
  - **Medium ID** — This is a unique 8-digit ID assigned to the medium.
  - **User Medium ID** — An **eMAM** attribute - up to 160 ASCII bytes for the user to describe the medium.
  - **Manufacturer Medium ID** — A combination of the **Medium ID** and the drive serial number to make a completely unique ID to assign to the medium.

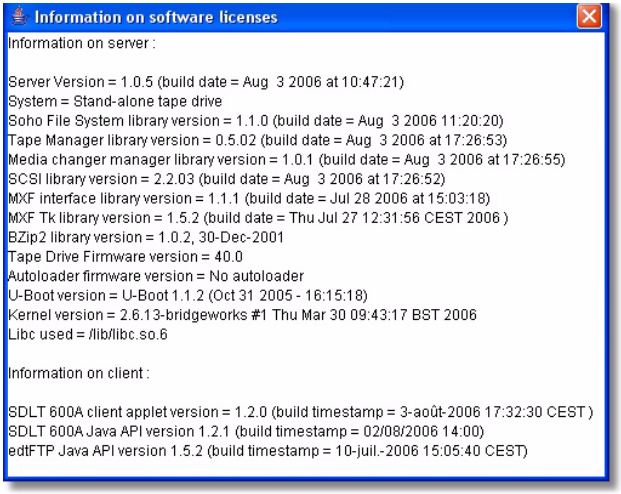
Figure 70 Tape Information



- From the **Contextual** menu, click **Licenses information...** opens a window about product versions and licenses of the SDLT 600A server and FTP client. The first version number listed is the version of the server firmware.

> **Note:** From the **Contectual** menu, **Unlock system...** is disabled for the standalone SDLT 600A tape drive. It is available when using the Quantum SuperLoader 3A. This autoloader is configured with the SDLT 600A tape drive.

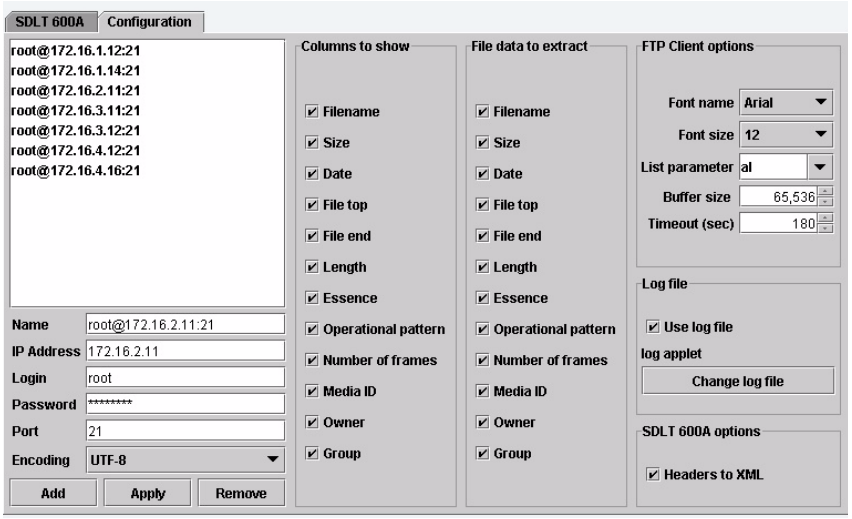
Figure 71 Information on Software Licenses Window



Configuration Tab

The **Configuration** tab contains four columns (see figure 72). The left column allows you to manage the list of servers. The next three columns (**Columns to show**, **File data to extract**, and **FTP Client options**) are configuration options for metadata and FTP client parameters.

Figure 72 Configuration Tab Display



List of Servers Management

While loading, the SDLT 600A client prompts you for the login and password to connect to the FTP server.

Root User Connection

The default login for root user connection is **root** and password is **password**. This server is the first added in the list of servers. The password for root user connection can be set in the **Setup** page using the **New root's password**. After setting it, and clicking **Update**, the SDLT 600A must reboot to change the password.

Guest User Connection

The login for guest user connection is **guest** and password is **guest**. The password for guest user cannot be set in the Setup page.

> **Note:** The built-in SDLT 600A FTP server does not support anonymous connections. Only a root user (password is **password**) and up to five guest users (password is **guest**) are supported.

Prior to Connecting to a New Server

Before connecting to a new server, you need to update the list with its information: its IP address, login and password; then click **Add**. To remove a server of the list, select it and click **Remove**.

Within the **SDLT 600A client** tab, choose the name of the server you want in the combo box on the top of a pane.

> **Note:** Your list of servers is saved locally on your computer.

If a remote server cannot be connected, the following window appears.

Figure 73 FTP Server Connect Error Window

Multiuser Connection

The system allows six users to be logged on at a time to the SDLT 600A. Although six users may be logged on, only three root users can connect at a time from a single IP address. All other users are considered guests.

A root user can operate all the features of the SDLT 600A, while the guest user can only read the cartridge directory (file system table of contents).

When a disconnection of all the root connections from the SDLT 600A is required (e.g. by ejecting the tape or by disconnecting), the tape rewinds if the file system table of contents has been modified since the last

connection. Therefore, a user cannot reconnect the root as long as the tape is not rewound. However, a guest connection is allowed.

Several FTP commands are not allowed for a:

- Guest connection
  - **ACKNOWLEDGE ERROR, DELE, MKD, RMD, RETR, STOR, RNTO, SITE DELE, SITE EJECT, SITE ERASE, SITE HEADER, SITE PARTIAL, SITE RELEASEMEDIA, SETMEDIUMID**
- Root connection while another root transfers on the same path
  - **DELE, RMD, RETR, STOR, RNTO, SITE DELE, SITE EJECT, SITE ERASE, SITE RELEASEMEDIA, SITE SETMEDIUMID**

.

Note: When several root users are connected, be aware that all operations are not allowed in parallel at the same time.

Note: If three root users are already connected, and you try to connect as a root, you will have the following **FTP error** window (see figure 74).

Figure 74 FTP Server Root User Connect Error Window

System and MXF Files

The application is designed to connect to a FTP server and to transfer MXF files (see figure 72). You can set up several FTP servers. The FTP server can be a SDLT 600A or any other FTP server.

Configuration

Name — identifier of the FTP server

IP Address — network IP address of the FTP server

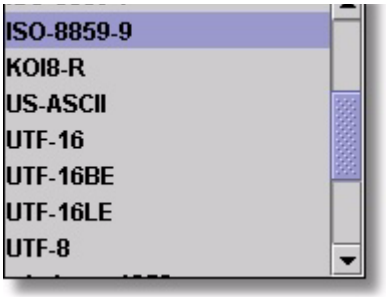
Login — login to the FTP server

Password —password to the FTP server

Port — port of the FTP server

Encoding — Specifies the encoding scheme of a connection in order to support FXP transfers between two servers with different encoding schemes. All encoding schemes available from the Java Runtime Environment (JRE) — even those that do not work with the SDLT 600A FTP server — are displayed in order to work with servers that would support them (see figure 75). The default is **US_ASCII**.

Figure 75 Encoding Schemes



Columns to show

These checkboxes specify what you want to see in the columns of the panes (**SDLT 600A client** tab) in the list of files.

> **Note:** You can dynamically change the order of the columns in the pane using the mouse by simply moving one column to another place.

File data to extract

These check boxes specify what information you want to extract when you select **File properties** on the MXF files. You can click **File properties** in the **Contextual** menu.

FTP Client Options

Font name — Specifies the character policy. The default is Arial (this font does not allow for display of Japanese charcters).

Font size — Specifies the font size of the character policy. The default is 12.

List parameter — Specifies the format of the **LIST** command. The default is **al**. This long format shows all files, including hidden files, and allows for full compatibility with FTP servers.

You can set two connection specifications:

- **Buffer size** — Specifies the size in bytes of the buffers used by the FTP client to send or receive data on the network. **65536 bytes** is selected by default. You can modify the buffer size by entering a new value after selecting the current value in the dialog box.

  > **Note:** This option has no effect on other servers not using this application.

  The optimal file size is 65,536 bytes, but you may also have to configure the settings on your network card to forward blocks of 65,536 bytes on the network. Ensuring that these two settings are set is the only way to have the best transfer rate.

- **Timeout (sec)** — Specifies the timeout of the built-in FTP client session in seconds. The default value is **900** seconds (15 minutes). The session is disconnected after the timeout occurs.

SDLT 600A options

Headers to XML — Allows you to retrieve the header files of MXF files in the XML text format (default) or in MXF binary format.

File System Limitations

The following list summarizes a number of file system limitations.

File Names and Entries

- The maximum file name length is 97 characters, including the file name extension.
- This space character is supported within a file name provided the file name is delimited by double quotes (for example, “filename with space”). Double quotes are not allowed within a file name.
- The maximum number of entries (files and folders) depends upon the eMAM size and the compression rate of the file system and MXF data.

FTP Server Encoding Scheme Limitations

- The FTP server accepts all bytes except NULL (0x00), LF (0x0A), CR (0x0D), “ (0x22), / (0x2F), and \ (0x5C).
- The FTP server is fully compatible with any NVT-ASCII character encoding scheme. This includes ASCII, ISO 8859-x suite (Latin-1 to 9, Cyrillic, Arabic, Greek, Hebrew, Thai), Japanese JISX0201, JISX0208, JISX 0212, EUC, S-JIS, and UTF-8.
- UTF16, UCS-2, UTF32, and UCS-4 are not supported because they fill unused bytes with the NULL value.
- The total number of bytes to code a character of a filename depends on the encoding character set. For example, UTF-8 characters are triple bytes, EUC-JP characters are double bytes, and US-ASCII characters are single bytes. Therefore, the maximum number of characters per filename depends on its character encoding.

FTP Server and FTP Client Character Set Handling

- Java encodes everything in UTF16. The built-in FTP client has no specific function to convert the S-JIS character set to EUC.
- When using the FTP client, any connection to a FTP server requires a name, IP address, login, password, port, and an encoding scheme (character set). These parameters are entered via text areas and combo boxes located on the **Configuration** tab of the FTP client.

- The encoding scheme of a local PC is the default encoding of your operating system (OS).
- When you transfer files from a local PC (OS set to S-JIS) to a FTP server set to EUC, then:
  - When the FTP client lists the files from the local PC, Java encodes the S-JIS file names to UTF16.
  - When the FTP client lists the file names from the remote server, Java encodes the EUC file names to UTF16.
  - When you transfer a file from a local PC to a FTP server, S-JIS file names are converted to EUC file names via UTF16.

When you transfer files from a FTP server to a local PC, EUC file names are converted to S-JIS file names via UTF16.

Supported FTP Commands

To take full advantage of the SDLT 600A tape drive capabilities, you must have an FTP client that allows you to send SITE commands.

The following FTP commands are supported by the SDLT 600A:

- Standard Commands (RFC959): **ABOR, CDUP, CWD, DELE, HELP, LIST, MKD, MODE, NLST, NOOP, PASS, PASV, PORT, PWD, QUIT, REST, RETR, RMD, RNFR, RNTO, SITE, STOR, STRU, SYST, TYPE, and USE**R
- RFC775 Commands: **XCUP, XCWD, XMKD, XPWD, and XRMD**
- SITE Commands: **ACKNOWLEDGE_ERROR, DELE, EJECT, ERASE, ESSTYP, FREE, FSIZ, FTYP, GETMEDIUMID, HELP, HDR2XML, HEADER, IDLE, MEID, MXFNFO, PARTIAL, RELEASEMEDIA, SETMEDIUMID, TC, TIME, and VERSION**
- Commands Not Normalized (Internet Draft): **FEAT and SIZE**

Standard Commands (RFC959)

The following RFC959 standard commands are supported:

Command	**ABOR**
Syntax	abor <CRLF>
Parameters	N/A
Purpose	aborts a file transfer (STOR or RETR).
Command	**CDUP**
Syntax	cdup <CRLF>
Parameters	N/A
Purpose	equivalent to "cwd .."
Command	**CWD**
Syntax	cwd <SP> <pathname> <CRLF>
Parameters	- <pathname>: an existing relative or absolute directory.
Purpose	This command allows the user to work with a different directory.

Command	**DELE (*)**
Syntax	dele <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute pathname.
Purpose	This command allows the user to send a file to the Trash. RMD must be used instead of DELE to delete a directory.
Command	**HELP**
Syntax	help [<SP> <command>] <CRLF>
Parameters	<command>: a FTP command.
Purpose	Without parameters, this command lists in alphabetic order the standard commands. When <command> is a valid standard command, HELP provides the syntax of <command>.
Command	**LIST**
Syntax	list [<SP> <options>] [<SP> <pathname>] <CRLF>
Parameters	• <options>: same format as ls UNIX command. '-a' and '-l' are currently supported. If no options, it is equivalent to a "ls -l" UNIX command. • <pathname>: the directory or the filename that will be listed. A null argument implies the current working directory.
Purpose	This command lists directory or file contents the same way the UNIX command 'ls -l' does. Contents will be sent to the passive DTP. The client must have previously set TYPE to ASCII.
Command	**MKD (*)**
Syntax	mkd <SP> <pathname> <CRLF>
Parameters	<pathname>: a relative or absolute pathname.
Purpose	This command causes the directory specified in the pathname to be created as a directory.
Command	**MODE**
Syntax	mode <SP> <mode-code> <CRLF>
Parameters	<mode-code>::= S | B | C. Transfer mode. Only 'S' (Stream) is supported.
Purpose	This command allows the client to change the transfer mode. The only available transfer mode is Stream ('S').

Command	**NLST**
Syntax	nlst [<SP> <options>] [<SP> <pathname>] <CRLF>
Parameters	• <options>: same format as ls UNIX command. '-a' and '-l' are currently supported. If no options, it is equivalent to a "ls" UNIX command. • <pathname>: the directory or the filename that will be listed. A null argument implies the current working directory.
Purpose	This command lists directory or file contents the same way the UNIX command "ls" does. Contents will be sent to the passive DTP. The client must have previously set TYPE to ASCII.
Command	**NOOP**
Syntax	noop <CRLF>
Parameters	N/A
Purpose	This command does not affect any parameters or previously entered commands. It specifies no action other than that the server send an OK reply.
Command	**PASS**
Syntax	pass <SP> <string> <CRLF>
Parameters	<string>: the user's password.
Purpose	This command must be immediately preceded by the USER command. Any attempt to use this command when connected will be refused.
Command	**PASV**
Syntax	pasv <CRLF>
Parameters	N/A
Purpose	This command requests the server-DTP to "listen" on a data port (which is not its default data port) and to wait for a connection rather than initiate one upon receipt of a transfer command. The response to this command includes the host and port address this server is listening on.

Command	**PORT**
Syntax	port <SP> <host-port> <CRLF>
Parameters	- <host-port>: the concatenation of a 32-bit IP address and a 16-bit TCP port address. <host-port> ::= <host-number>,<port-number> <host-number> ::= <number>,<number>,<number>,<number> <port-number> ::= <number>,<number> <number> ::= any decimal integer 1 through 255
Purpose	This command changes the default data port value.
Command	**PWD**
Syntax	pwd <CRLF>
Parameters	N/A
Purpose	This command causes the name of the current working directory to be returned in the reply.
Command	**QUIT**
Syntax	quit <CRLF>
Parameters	N/A
Purpose	This command closes the control connection opened with the sequence USER+PASS, if a file transfer is not in progress. If file transfer is in progress, the client should send an ABOR command before a QUIT.
Command	**REST**
Syntax	rest <SP> <marker> <CRLF>
Parameters	<marker>: offset in the file (in bytes) at which the transfer will be restarted.
Purpose	This command is useful to restart an interrupted transfer. It gives to the server the byte position in the file at which the transfer will restart. It must be immediately followed by a STOR or RETR command which shall cause file transfer to resume.
Command	**RETR (*)**
Syntax	retr <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute pathname.

Purpose	This command causes the server-DTP to transfer a copy of the file, specified in the pathname, to the server DTP at the other end of the data connection.
Command	**RMD (*)**
Syntax	rmd <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute directory.
Purpose	This command allows the user to remove a directory from the file system. It cannot be used in the following cases: • remove Trash or Root • remove a file • remove a directory which contains data.
Command	**RNFR**
Syntax	rnfr <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute pathname.
Purpose	This command specifies the old pathname of the file which is to be renamed. This command must be immediately followed by a RNTO command specifying the new file pathname.
Command	**RNTO (*)**
Syntax	rnto <SP> <pathname> <CRLF>
Parameters	<pathname>: a relative or absolute directory that does not exist yet.
Purpose	This command specifies the new pathname of the file specified in the immediately preceding RNFR command. Together the two commands cause a file to be renamed. Can be used to move a file.
Command	**SITE**
Syntax	site <SP> <command> : an existing SITE command.
Parameters	<some optional arguments...>: cf. each SITE command for details.
Purpose	This command is used to implement custom FTP commands.
Command	**STOR (*)**
Syntax	stor <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute pathname.

Purpose	This command causes the server-DTP to accept the data transferred via the data connection and to store the data as a file at the server site. If the file specified in the pathname exists at the server site, then its contents shall be replaced by the data being transferred. A new file is created at the server site if the file specified in the pathname does not already exist.
Command	**STRU**
Syntax	stru <SP> <structure-code> <CRLF>
Parameters	<structure-code>: file structure. Only 'F' (File) is supported.
Purpose	This command allows the client to change the file structure. The only available transfer mode is 'File' ('F').
Command	**SYST**
Syntax	syst <CRLF>
Parameters	N/A
Purpose	This command is used to find out the type of operating system at the server. Its successful answer is "UNIX Type : L8".
Command	**TYPE**
Syntax	type <SP> <type-code> <CRLF>
Parameters	- <type-code> ::= A [<sp> <form-code>] | E [<sp> <form-code>] | I | L <sp> <byte-size> <form-code> ::= N | T | C
Purpose	changes data Representation and Storage type. Supported types: 'A'(ASCII), and 'I' or 'L 8' (8-bit binary).
Command	**USER**
Syntax	user <SP> <string> <CRLF>
Parameters	<string> : user name.

Purpose	This command allows the client to be identified by the server. It will be the first command transmitted by the user after the control connections are made. It must be immediately followed by the PASS command. The command sequence USER+PASS is necessary to access to the server file system. Any attempt to use this command when connected will be refused.

Note: (*) = Commands requiring the ROOT privilege.

RFC775 Commands

The following RFC775 commands are supported:

Command	**XCUP**
Syntax	
Parameters	
Purpose	see CDUP
Command	**XCWD**
Syntax	
Parameters	
Purpose	see CWD
Command	**XMKD (*)**
Syntax	
Parameters	
Purpose	see MKD
Command	**XPWD**
Syntax	
Parameters	
Purpose	see PWD
Command	**XRMD (*)**
Syntax	
Parameters	
Purpose	see RMD

Note: (*) = Commands requiring the ROOT privilege.

SITE Commands

The following SITE commands are supported:

Command	**ACKNOWLEDGE_ERROR (*)**
Syntax	site acknowledge_error <CRLF>
Parameters	N/A
Purpose	This command acknowledges an error which may have caused data loss, such as a write error or power failure.
Command	**DELE (*)**
Syntax	site dele <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute pathname.
Purpose	This command definitively erases a file or a directory in the file system. The targets that cannot be deleted are: • a directory which contains data • Trash • Root
Command	**EJECT (*)**
Syntax	site eject <CRLF>
Parameters	N/A
Purpose	This command ejects the cartridge then disconnects all users.
Command	**ERASE (*)**
Syntax	site erase <CRLF>
Parameters	N/A
Purpose	This command erases the EMAM. It also creates two directories on the tape: a root and a Trash.
Command	**ESSTYP**
Syntax	site esstyp <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute MXF file name or directory.

Purpose	This command sends to the FTP client the type of the essence(s) contained in the MXF file specified in the pathname. If the pathname is a directory, the command will do it for all the MXF files contained in the directory.
Command	**FREE**
Syntax	site free <CRLF>
Parameters	N/A
Purpose	This command returns some useful information about Tape Space, eMAM space, and a file inventory.
Command	**FSIZ**
Syntax	site fsiz <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute MXF file name or directory.
Purpose	This command sends to the FTP client the number of frames contained in the MXF file specified in the pathname. If the pathname is a directory, the command will do it for all the MXF files contained in the directory.
Command	**FTYP**
Syntax	site ftyp <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute MXF file name or directory.
Purpose	This command sends to the FTP client the operational pattern of the MXF file specified in the pathname. If the pathname is a directory, the command will do it for all the MXF files contained in the directory.
Command	**GETMEDIUMID**
Syntax	site getmediumid <SP> <type> <CRLF>
Parameters	<type>: a string that can be equal to “manufacturer” or “user” (not case sensitive)
Purpose	This command returns the manufacturer or user medium ID.

Command	**HELP**
Syntax	site help [<SP> <command>] <CRLF>
Parameters	<command>: a FTP SITE command.
Purpose	Without parameters, this command lists in alphabetic order the implemented SITE commands. When <command> is a valid SITE command, HELP provides the syntax of <command>.
Command	**HDR2XML**
Syntax	site hdr2xml <SP> <switch> <CRLF>
Parameters	<switch> : a string that can be equal to 'on' or 'off' (case insensitive).
Purpose	Enable (switch='on') or disable (switch='off') XML mode for MXF header files. Side effects in XML mode: - RETR: the header files are generated in XML before being sent to the client.
Command	**HEADER (*)**
Syntax	site header ["]<in-filename>["] <SP> ["]<out-filename>["] <CRLF>
Parameters	• <in-filename>: a relative or absolute pathname of a MXF file. The user must use <"source name"> if there is space in that name. • <out-filename>: the desired relative or absolute header path name. It must be located in an existing folder. The user must use <"source name"> if there is space in that name.
Purpose	This command extracts the header of a MXF file and creates a corresponding entry in the file system.
Command	**IDLE**
Syntax	site idle <SP> <time> <CRLF>
Parameters	<time>: timeout value in seconds. <time> may also be equal to the string "DEFAULT" (case insensitive). In this case the timeout is reset to its default value.
Purpose	This command changes the default value of the idle time. If the server does not detect any activity of a client for <time> seconds, it disconnects it.

Command	**MEID**
Syntax	site meid [<SP> <pathname>]<CRLF>
Parameters	<pathname>: an existing relative or absolute MXF file name or directory.
Purpose	This command sends to the FTP client the UMID of the MXF file specified in the pathname. If <pathname> is a directory, the command will do it for all the MXF files contained in the directory.
Command	**MXFNFO**
Syntax	site mxfnfo <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute MXF file name or directory.
Purpose	This command sends to the FTP client a list of information relative of the MXF file specified in the pathname: • operational pattern (FTYP) • number of frames (FSIZ) • UMID (MEID) • essence(s) type (ESSTYP) • timecodes (TC) If <pathname> is a directory, the command will do it for all the MXF files contained in the directory. It will also add the name of the file at the beginning of the list.

Command	**PARTIAL (*)**
Syntax	site partial <SP> <tcin> <SP> <tcout or number of frames> <SP> ["]<in-filename>["] <SP> ["]<out-filename>["] <CRLF>
Parameters	• <Tcin>: time code XX:XX:XX:XX • <Tcout>: time code XX:XX:XX:XX or a number of frame 0 to 2147483647. • <in-filename>: a file name in the current folder or a path/filename. The user must use <"source name"> if there is space in that name. • <out-filename>: a file name in the current folder or a path/filename. Except in case of OPATOM file, in this case the output must be an existing folder. The user must use <"output name"> if there is space in that name.
Purpose	Create partial MXF file(s). Expected results: • Source is one OP1A file: A file named <output name> is created in the current folder or in the target folder if specified in <output name>. • Source is one file of a complete OPATOM P2 set of files: A folder named CONTENTS/ is created in the folder <output name>. This folder will be composed of six subfolders: • AUDIO/ that contains MXF audio files. • VIDEO/ that contains MXF video file. • CLIP/ that contains the XML file. • ICON, VOICE, PROXY / these folders are non-mandatory and are necessary to import third-party applications. No operation is provided by the SDLT 600A on the original content of these folders. The target files will have the same names than there corresponding sources. • Source is one file of an OPATOM set of files: A folder named <output name> is created that contain targeted files, all with the same names than there corresponding sources.
Command	**RELEASEMEDIA**
Syntax	site releasemedia <CRLF>
Parameters	N/A

Purpose	This command saves all file systems (eMAM is written to tape) that are not yet up to date. It also disconnects all users and allows for media removal.
Command	**SETMEDIUMID**
Syntax	site setmediumid <SP> <type> <CRLF>
Parameters	<type>: a string that can be equal to "user" (not case sensitive)
Purpose	This command sets the user medium ID.
Command	**TC**
Syntax	site tc <SP> <pathname> <CRLF>
Parameters	<pathname>: an existing relative or absolute MXF file name or directory.
Purpose	This command sends to the FTP client the Timecodes of the MXF file specified in the pathname. If the pathname is a directory, the command will do it for all the MXF files contained in the directory.
Command	**TIME**
Syntax	site time <CRLF>
Parameters	N/A
Purpose	This command sends to the FTP client the current date and time of the system.
Command	**VERSION**
Syntax	site version <CRLF>
Parameters	N/A

Purpose	This command sends to the FTP client the following list of versions: • Server version and build date • System type (stand-alone tape drive or autoloader) • File system library version and build date • Tape manager library version and build date • Media changer manager library and build date • SCSI library version and build date • MXF interface library version and build date • MXF Tk library version and build date • BZip2 library version and build date • Tape drive firmware version • Autoloader firmware version • U-boot version • Kernel version and build date • Libc used

Note: (*) = Commands requiring the ROOT privilege.

Commands Not Normalized (Internet Draft)

Command	FEAT
Syntax	feat <CRLF>
Parameters	N/A
Purpose	This command lists all the supported extended commands. The server currently supports only the SIZE extended command (from the draft "draft-ietf-ftpext-mlst-16.txt")..
Command	**SIZE**
Syntax	size <SP> <pathname> <CRLF>
Parameters	N/A
Purpose	This command is used to obtain the transfer size of a file from the server-FTP process. This size is the exact number of bytes that would be sent over the data connection if that file were transmitted in BINARY mode. A SIZE command on a directory will fail.

Appendix A

SDLT 600A Tape Drive Specifications

This chapter describes the technology behind the drive as well as the various specifications that apply to the Quantum SDLT 600A tape drive.

Tape Drive Technology

The SDLT 600A tape drive incorporates various new state-of-the-art technologies that contribute to the SDLT architecture. Some of these ideas are trademarked, others are patented. The following subsections introduce the important technologies that together, comprise the SDLT 600A tape drive.

Gigabit Ethernet (GigE) Interface

A Gigabit Ethernet interface allows the drive to be quickly connected and accessed on your network.

Material Exchange Format (MXF) Aware

The built-in FTP client or a standard FTP client can be used to store and retrieve MXF files to (and from) tape.

Laser Guided Magnetic Recording

The SDLT 600A tape drives are based on Laser Guided Magnetic Recording (LGMR) technology. LGMR provides a unique combination of the best optical and magnetic technologies, which results in dramatically higher capacities by substantially increasing the number of recording tracks on the data-bearing surface of the media. By recording data magnetically on the data-bearing side of the media and using servo movement optically on the backside, LGMR optimizes highly proven technologies to deliver the most efficient, reliable, and scalable data retrieval solution to the mid-range market.

Pivoting Optical Servo

Pivoting Optical Servo (POS) is an a Quantum-invented, optically-encoded servo system, that combines high-density magnetic read/write data recording with laser servo guiding. The POS provides high-duty-cycle applications, which decreases cost and increases user convenience. The POS enables the head to track dynamic variations in tape motion. which allows Quantum to provide a track count with an order of magnitude increase over previous products.

Magneto Resistive Cluster Heads

Magneto Resistive Cluster (MRC) heads are a densely packed array of small, cost-effective Magneto Resistive (MR) tape heads precisely positioned using advanced thin-film processing technology. SDLT MRC heads provide high wafer usage efficiency resulting in low head costs, are less susceptible to variations in tape speed, yield higher track density and capacity, and provide a multi-channel architecture for increased transfer rate and performance.

Advanced Partial Response Maximum Likelihood

Improving on Partial Response Maximum Likelihood (PRML) technology traditionally used in disk drives and communication systems, advanced PRML channel technology,, co-developed with Lucent Technologies, brings new levels of performance and capacity to high-performance linear tape products. This provides high-encoding efficiency recording densities for greater capacity and performance that enables SDLT to increase transfer rates and capacity substantially.

Advanced Metal Powder Media

Advanced Metal Powder (AMP) media is a state-of-the-art media using durable metal powder technology for recording very high densities of

data. The back side of the AMP media receives a specially formulated coating to accept the optical servo tracks. Because the servo information is on the back side of the media, the entire data-bearing side of the media is available for recording data and eliminates the need for pre-formatting. In addition, AMP media meets the needs of multiple generations of the SDLT technology.

Positive Engagement Tape Leader Buckling Mechanism

The positive engagement tape leader buckling mechanism is a highly robust mechanism that increases data cartridge life and supports the extensive duty-cycle environments found in high-end and automation environments.

This mechanism engages the tape leader upon data cartridge load and disengages it upon data cartridge unload. It uses a solid metal pin attached to the drive leader to link with molded clips permanently attached to the tape leader inside the data cartridge. The Positive Leader Link design makes the buckling of Super DLTtape media a totally reliable mechanical process.

Modular Design

The SDLT 600A tape drive is designed as a total system. The system includes a complex interaction of a number of important components including such items as the tape path, tape heads, media, data cartridge, and host interface.

As shown in figure 76, the SDLT 600A tape drive consists of five distinct modules:

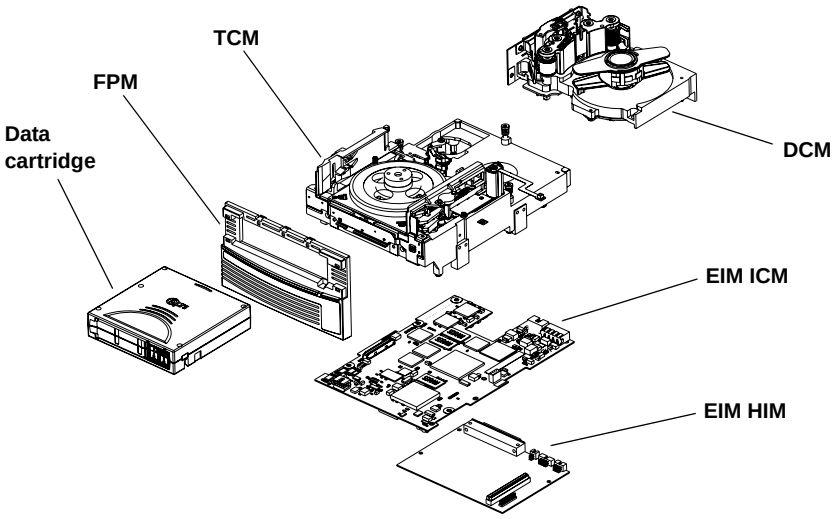
- Data Control Module (DCM)
- Tape Control Module (TCM)
- Front Panel Module (FPM)
- Electronic Interface Module (EIM)
- Super DLTtape II Data Cartridge (Data Cartridge).

The modular concept makes the SDLT 600A tape drive easy to manufacture and configure. Each module is optimized to perform a

specific set of functions and designed to interface with the other modules in a well defined and flexible manner.

The following subsections provide a brief overview of each module.

Figure 76 SDLT 600A Tape Drive Modular Design



Note: Despite the deliberate modularity of each module, with the exception of the FPM, individual users should not **swap** modules. The FPM is the only module that is field replaceable. Customer adjustments to the TCM, DCM, or EIM will void the tape drive's warranty.

Data Control Module

The Data Control Module (DCM) contains several of the functions and features of LGMR technology, which is at the heart of the SDLT technology. Of the five technologies that constitute the LGMR technology, two are in the DCM. These are the POS and the MRC heads.

The main functions of the DCM are to provide the path and guides for all tape motion inside the tape drive and to write data to and read data from the tape. In addition to the POS and MRC heads described in Pivoting Optical Servo and Magneto Resistive Cluster Heads, the DCM contains a

number of components that interact to perform these functions. These components include:

- Advanced head guide assembly
- Take-up reel
- Drive motor
- Optical servo system
- Tape heads.

In addition to its mechanical components, the DCM also contains printed circuit boards that control the functions of the DCM and the tape heads.

Tape Control Module

The Tape Control Module (TCM) implements the functions required to buckle and unbuckle the tape and control the tape motion. The TCM consists of a variety of components:

- TCM Printed Circuit Board Assembly (PCBA)
- Base Plate
- Data Cartridge Receiver
- Positive Engagement Tape Leader Buckling Mechanism
- Tape supply motor assembly
- Floor plate assembly.

TCM PCBA

The TCM has its own PCBA that controls the functions of the TCM and interfaces with the main controller board in the EIM. By designing the TCM as a distinct module, it allows manufacturing and testing the TCM as a stand-alone module, simplifying the design, manufacturing, and troubleshooting processes.

Base Plate

The SDLT 600A tape drive base plate is an aluminum die casting with precisely machined surfaces. The casting acts as the support platform for the other modules and for the tape drive enclosure. The base plate also includes the precision mounting holes used to install SDLT 600A tape

drives into a server or tape library. The SDLT 600A tape drive base plate, and therefore the entire SDLT 600A tape drive, conforms to the 5.25 inch, full-height form factor.

Data Cartridge Receiver

On tape insertion, the data cartridge receiver assembly guides the tape into its operating position, opens the data cartridge door, unlocks the data cartridge brakes, engages the data cartridge drive motor, and secures the tape for operation. On tape ejection, the data cartridge receiver assembly reverses the process and automatically ejects the tape a fixed distance from the front of the tape drive.

Positive Engagement Tape Leader Buckling Mechanism

The buckling mechanism is responsible for engaging the tape leader upon data cartridge load and disengaging it on data cartridge unload. See Positive Engagement Tape Leader Buckling Mechanism on page 100 for more information.

Front Panel Module

The Front Panel Module (FPM) of the system (sometimes referred to as the bezel) performs a number of functions:

- Protecting the front of the TCM from physical damage
- Channeling airflow through the system
- Aligning the data cartridge when it is inserted into the system
- Providing system status and information through LEDs
- Enabling data cartridge ejection
- Delivering the overall cosmetic look of the system.

The FPM is a single module with lenses for the system's LEDs and a button to activate the drive eject switch. The SDLT 600A tape drive front panel contains no electronics.

Electronic Interface Module

The Electronic Interface Module (EIM) is the electronic heart of the tape drive. It provides the main control function for the system and the

interface from the system to the host computer, library, or autoloader. The EIM provides the Advanced PRML feature of theQuantum's SDLT technology. See Advanced Partial Response Maximum Likelihood on page 99 for a brief description of PRML.

The EIM consists of two major boards: the Integrated Controller Module (ICM), and a separate Host Interface Module (HIM), see figure 76. The ICM contains the main controller and servo microprocessor, the custom-designed SDLT ASICs, and the cache memory while the HIM implements the interface between the host system and the tape drive. This allows easy configuration of the tape drive to match different host interfaces by simply substituting the appropriate HIM card.

As with the other major modules of the SDLT technology, the EIM is manufactured and tested as a distinct module.

Super DLTtape II Data Cartridge

As with all tape technologies, the Super DLTtape II data cartridge is a key part of the overall system. The main function of the data cartridge is to provide the magnetic recording media used by the system to store customer information. The data cartridge also provides the protective casing that allows safe media movement and storage.

From the outside, the Super DLTtape II data cartridge looks very similar to the Super DLTtape I and DLTtape VS1 data cartridges. The basic geometry, write protection switch, and label space are the same. This simplifies the integration of the SDLT 600A tape drive into existing operating environments and into automated tape libraries. The Super DLTtape II data cartridge is easy to recognize; it has a different color than the Super DLTtape I and DLTtape VS1 data cartridges, and contains a distinctive pattern molded into the shell. The DLTtape logo and the product name are also molded into the shell, which ensure you have a genuine Quantum Super DLTtape II data cartridge.

Product Specifications

The following subsections contain product specifications for the Quantum SDLT 600A tape drive.

Positive Engagement Tape Leader Buckling Mechanism

This buckling mechanism engages the tape leaders upon data cartridge load and disengages them upon data cartridge unload.

Component level tests of buckle arm components have shown at least 250,000 cycles on the tape drive without failure, breakage, or binding; this includes the take-up leader, the supply leader, and the media itself.

Functional Specifications

The following subsections contain functional specifications for the SDLT 600A tape drive.

Performance Data

Table 5 provides performance data for the tape drive.

Table 5 SDLT 600A Tape Drive Performance Data

Item	Specification
Drive Read/Write Transfer Rate*	36 MB/second, native
Maximum Thoughput*	11 MB/second, native
Tracks	40 logical tracks 640 physical tracks
Track Density	1502 tracks per inch (tpi)
Linear Bit Density	233 Kbits per inch (Kbpi)
Read/Write Tape Speed	108 inches per second (ips)
Rewind Tape Speed	160 ips
Linear Search Tape Speed	160 ips
Average Rewind Time**	77 seconds
Maximum Rewind Time**	156 seconds

Item	Specification
Average Access Time** (from BOT)	79 seconds
Maximum Access Time** (from BOT)	190 seconds
Load to BOT**	18 seconds (typical) 63 seconds (unformatted tape)
Unload from BOT**	19 seconds
Nominal Tape Tension	Stationary: 3.0 ± 0.5 oz Operating Speed: 3.5 ± 0.5 oz

* Depending on data type and Ethernet network connection configuration. GigE is required for 36 MB/s.

** Note that data is typical; times may be longer if error recovery time is necessary, or if the command times out for any reason.

Shock and Vibration Specifications

The following tables provide non-operating and operating shock and vibration specifications for the SDLT 600 tape drive.

Table 6 Non-operating Shock Specifications (Unpackaged)

Shock (Unpackaged)		
Pulse Shape	**Square wave**	**½ sine pulse**
Peak Acceleration	40 G	140 G
Duration	10 ms (180 inches/ second)	2 ms
Application	X,Y,Z axes, twice in each axis (once in each direction)	

Table 7 Non-Operating Shock Specifications (Packaged, Drop)

Shock (Packaged, Drop)	Height of Drop	Number of Drops	Package Weight
Drop	42 inches	16 drops total	0 lbs. < package weight ≤ 20 lbs.
	36 inches	16 drops total	20 lbs. < package weight ≤ 50 lbs.

Table 8 Non-Operating Vibration Specifications (Unpackaged)

Vibration (Unpackaged)		
Type	**Sine**	**Sweep**
Frequency Range	5 to 500 to 5 Hz	Upward and downward sweep
Acceleration Level	0.02" DA 1.0 G	Between 5 and 31 Hz (crossover) Between 31 and 500 Hz (crossover)
Application	X,Y,Z axes	Sweep rate = ½ octave/minute

Vibration (Unpackaged)		
Type	**Random**	
Frequency Range	10 to 500 Hz	
Acceleration Level	2.0 G	
PSD Envelope	0.008 G^2/Hz	
Application	X,Y,Z axes	Sweep rate = 60 minutes/axis

Table 9 Non-Operating Vibration Specifications (Packaged)

Vibration (Packaged)	
Type	**Random**
Frequency Range	Truck Profile* (0.5 Grms) Air Profile* (1.0 Grms)
Application	X,Y,Z axes (30 minutes, each profile and each axis, for a total of 3 hours)
Type	**Sine, Sweep, and Dwell**
Frequency Range	5 to 150 to 5 Hz; 0.5 octave/minute, 0.5 G
Application	X,Y,Z axes; dwell at lowest resonant frequency in axis for 30 minutes. Additional 30 minutes for each additional resonance; up to 4 resonances total.

* Air and truck profiles are specified in ASTM D4728, Standard Test Method for Random Vibration Testing of Shipping Containers.

Table 10 Operating Shock and Vibration Specifications

Shock	
Pulse Shape	**½ sine pulse**
Peak Acceleration	10 G
Duration	10 ms

Shock	
Application	X,Y,Z axes, twice in each axis (once in each direction)

Vibration		
Type	**Sine**	**Sweep**
Frequency Range	5 to 500 to 5 Hz	Upward and downward sweep
Acceleration Level	0.25 G 0.010" DA	Between 22 and 500 Hz Between 5 and 22 Hz (crossover)
Application	X,Y,Z axes	Sweep rate = 1.0 octave/ minute

Current and Power Requirements

The tape drive draws the highest current (and power) during the native write modes. *Standby* is measured with the tape loaded and tensioned or untensioned, and *Idle* is measured with power on with no tape loaded. (The power drawn in these two modes is similar enough that they are listed together.)

Note: In table 11, the current and DC power values pertain to the internal tape drive, while the AC power values apply to the tabletop tape drive.

Table 11 Current Requirements — SCSI Interface

Mode	5 V Current (A) MaxPk[1] MaxMean[2] Typ[3]			12 V Current (A) MaxPk[1] MaxMean[2] Typ[3]			DC Power (W) Max[4] Typ[5]		AC Power (W) Max[6] Typ[7]	
Standby/Idle	2.5	2.5	2.5	0.7	0.7	0.7	2.5	2.5	2.5	0.7
Media Loading/ Unloading	3.8	3.8	3.4	2.2	2.1	1.7	3.8	3.8	3.4	2.2
600A Write – Motor Start[8]	3.4	3.4	3.3	2.0	1.2	1.1	3.4	3.4	3.3	2.0
600A Write – Streaming	3.7	3.7	3.5	2.0	1.1	1.1	3.7	3.7	3.5	2.0

Mode	5 V Current (A) MaxPk[1] MaxMean[2] Typ[3]			12 V Current (A) MaxPk[1] MaxMean[2] Typ[3]			DC Power (W) Max[4] Typ[5]		AC Power (W) Max[6] Typ[7]	
Max for SDLT 600A tape drive Modes[9]	N/A	3.8	N/A	N/A	2.1	N/A	N/A	3.8	N/A	N/A

1. The Max-Peak value represents short current spikes drawn for durations of < 50ms. On the 12V supply, the peaks correspond to the pulse-width-modulated switching of the motors. These values are calculated from the average of Peak-ripple-current + 2 sigma, measured at nominal DC voltage.
2. The Max-Mean value is the average of the maximum RMS current drawn during this operating mode. These values are calculated from the average of RMS current + 3 sigma, measured at nominal DC voltage.
3. The typical current is calculated from the average of all RMS current drawn during this operating mode, measured at nominal DC voltage.
4. The Max DC power is calculated from the typical DC power + 3 sigma, measured at nominal DC voltage. This value takes into account that the peak currents on the 5V and 12V do not occur at the same time.
5. The Typical DC power is calculated from the average RMS DC power drawn during this operating mode, measured at nominal DC voltage. This value also takes into account that the peak currents on the 5V and 12V do not occur at the same time.
6. The Max AC power is calculated from the typical AC power in tabletop tape drives + 3 sigma.
7. The Typical AC power is calculated from the average of AC power drawn in tabletop tape drives.
8. These events last < 1 second and occur at a duty cycle of less than 25%.
9. The Max values for each mode are based on the Max-Mean values, since the peak values are of very short duration.

(**Common Notes**)

(**1**) Voltage tolerance: 5V ±5%, 12V ±5%; Room temperature 24 °C. AC power measured at 117 V, 60 Hz.

(**2**) DC Current, MaxMean, and DC/AC Power Max refer to the statistically calculated maximum average requirement based on a sample population of tape drives. These values do not reflect the peak current or power requirement; this amount is given by the DC MaxPk current.

(**3**) These results were from the DVT data taken by Percept Technology. Reference the "Power Consumption & Characterization Test Report" dated 11/28/2005.

(**4**) Test data set included 12 measurements: 3 measurements of 4 drives.

(**5**) The 5V "MaxPK" calculated to less than MaxRMS, which does not at first glance make sense. (MaxPK is calculated at 5.25V, and the switching power supplies need less input current to the same input current.) Instead, the MaxRMS value was substituted.

Table 12 Power Requirements — SCSI Interface

Mode	DC Power MaxPk[1] Typ[2]		AC Power (W) Max[3] Typ[4]	
Standby/Idle	21	21	51	46
Media Loading/Unloading	43	37	83	73
600A Write – Motor Start[5]	32	29	78	71
600A Write – Streaming	32	31	73	64
Max for SDLT 600A tape drive Modes[6]	43	N/A	83	N/A

1. The Max-Peak value represents short current spikes drawn for durations of < 50ms. On the 12V supply, the peaks correspond to the pulse-width-modulated switching of the motors. These values are calculated from the average of Peak-ripple-current + 2 sigma, measured at nominal DC voltage.
2. The typical current is calculated from the average of all RMS current drawn during this operating mode, measured at nominal DC voltage.
3. The Max AC power is calculated from the typical AC power in tabletop tape drives + 3 sigma.
4. The Typical AC power is calculated from the average of AC power drawn in tabletop tape drives.
5. These events last < 1 second and occur at a duty cycle of less than 25%.
6. The Max values for each mode are based on the Max-Mean values, since the peak values are of very short duration.

(**Common Notes**)

(**1**) Voltage tolerance: 5V ±5%, 12V ±5%; Room temperature 24 °C. AC power measured at 117 V, 60 Hz.

(**2**) DC Current, MaxMean, and DC/AC Power Max refer to the statistically calculated maximum average requirement based on a sample population of tape drives. These values do not reflect the peak current or power requirement; this amount is given by the DC MaxPk current.

(**3**) These results were from the DVT data taken by Percept Technology. Reference the "Power Consumption & Characterization Test Report" dated 11/28/2005.

(**4**) Test data set included 12 measurements: 3 measurements of 4 drives.

(**5**) The 5V "MaxPK" calculated to less than MaxRMS, which does not at first glance make sense. (MaxPK is calculated at 5.25V, and the switching power supplies need less input current to the same input current.) Instead, the MaxRMS value was substituted.

SDLT 600A Tape Drive Recording Method

The SDLT 600A tape drive uses the Partial Response Maximum Likelihood (PRML) 32/33 encoding method for reading/writing SDLT 600A tape drive format. It uses the same algorithmm for reading SDLT 220, SDLT 320, and the DLT VS160 tape drive formats.

Environmental Specifications

The SDLT 600A tape drive operates in environments that include general offices and work spaces with systems capable of maintaining standard comfort levels.

The following subsections provide the environmental specifications for the SDLT 600A tape drives (both the internal and the tabletop configurations). For long-term trouble-free operation, the manufacturer strongly recommends that SDLT 600A tape drives be used in a clean, smoke-free environment.

Air Flow Requirements

The internal tape drive requires adequate air flow to dissipate the heat resulting from continuous drive operation. Specifically, the air flow must be sufficient to keep the tape path temperature below 50 °C.

To allow enough air into the tape drive to keep the tape path below this temperature, it is important to keep the cooling holes in the rear and the grill in the front of the tape drive clear of any obstructions that may hinder the air flow.

Note: It is also important to limit the ambient air temperature to no greater than 40 °C.

Temperature and Humidity

The ambient operating environment for the tape drive may not exceed the limits shown in table 13.

Table 13 Temperature and Humidity Specification

Specification	Operating Limits	Non-Operating Limits (Power On, No Tape Loaded)
Wet Bulb Temperature	25 °C (77 °F)	25 °C (77 °F)
Dry Bulb Temperature Range	10 °C to 40 °C (50 °F to 104 °F)	10 °C to 40 °C (50 °F to 104 °F)
Temperature Gradient	11 °C (20 °F)/hour (across range)	15 °C (27 °F)/hour (across range)
Relative Humidity	20% to 80% (non-condensing)	10% to 90% (non-condensing)
Humidity Gradient	10%/hour	10%/hour

Storage and Shipment

The ambient storage and shipment environment for the tape drive may not exceed the limits shown in table 14.

Table 14 Tape Drive Storage and Shipment Specifications

Specification*	Storage (Unpacked or Packed)	Shipping
Wet Bulb Temperature	46 °C (114 °F)	46 °C (114 °F)
Dry Bulb Temperature	–40 °C to 66 °C (–40 °F to 150 °F)	–40 °C to 66 °C (–40 °F to 150 °F)
Temperature Gradient	20 °C (36 °F)/hour (across range)	20 °C (36 °F)/hour (across range)
Relative Humidity	10 to 95% (non-condensing)	10 to 95% (non-condensing)

Humidity Gradient	10%/hour	10%/hour

Note: These specifications apply to the tape drive only. Media specifications are listed in Recording Media Specifications on page 115.

Altitude

Both the internal and tabletop tape drives operate in normal pressures from –500 to 10,000 feet when operated within the ambient operating environments specified in Temperature and Humidity on page 114.

The SDLT 600A tape drive will operate to 30,000 feet for temperatures within 15 ± 5 °C.

Recording Media Specifications

Super DLTtape II media differs slightly from previous generations of Super DLTtape media. Table 15 shows overall specifications for Super DLTtape II media.

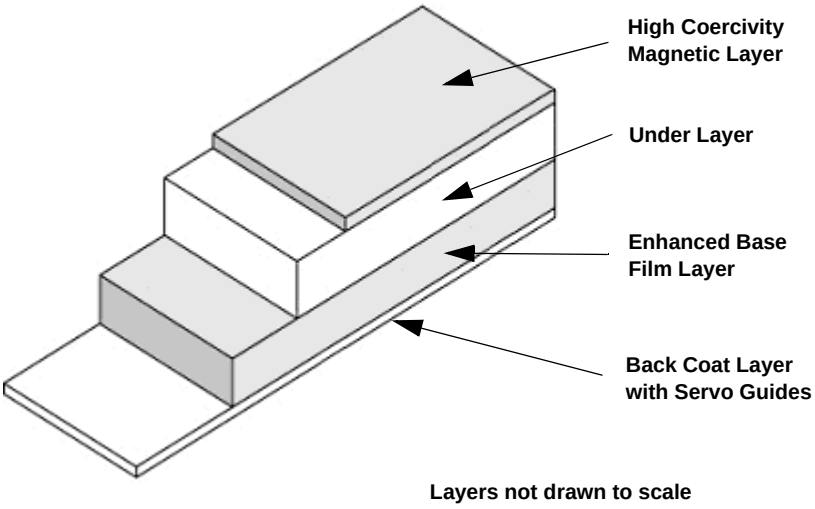
Table 15 Super DLTtape II Media Specifications

Characteristic	Specification
Overall tape thickness	8.0 µm
Media length, total	2066 feet
Media length, usable	1957 feet

Media Structure

Super DLTtape II media comprises several layers, as shown in figure 77.

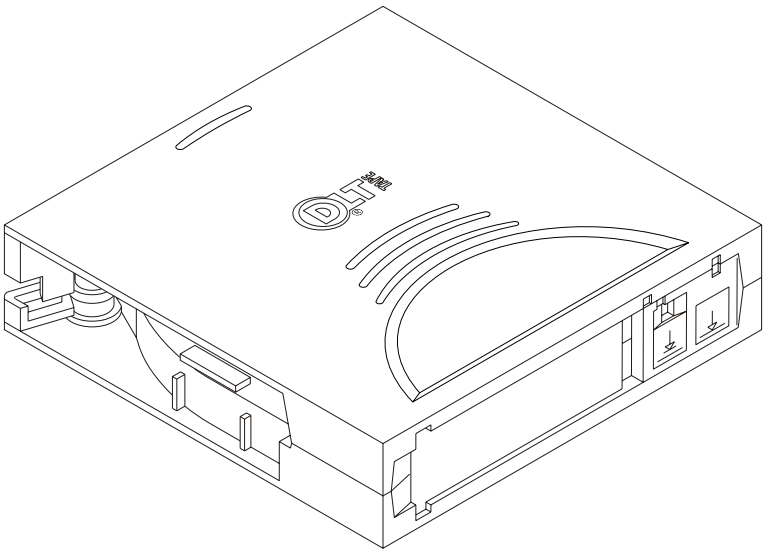
Figure 77 Multiple Layers Comprise Super DLTtape II Media



Physical Data Cartridge

A durable plastic case encloses the Super DLTtape II media, as shown in figure 78.

Figure 78 Super DLTtape II Data Cartridge



Media Shipping, Operating, and Storage Specifications

The optimum media shipping conditions are described in table 79.

Figure 79 Super DLTtape II Media Shipping Limits

Shipping Conditions	
Temperature	–18 °C to 49 °C (0 °F to 120 °F)
Relative Humidity	20 to 80% (non-condensing)
Maximum Wet Bulb Temperature	26 °C (79 °F)
Maximum Dew Point	2 °C (36 °F)

Table 16 Super DLTtape II Media Operating Limits

Operating Conditions	
Temperature	10 ° to 40 °C (50 ° to 104 °F)
Relative Humidity	20% to 80% (non-condensing)

Table 17 describes the optimum media storage conditions.

Table 17 Super DLTtape II Media Storage Limits (Continued)

Storage Conditions	Archival	Non Archival
Temperature	18 ° to 28 °C (64 ° to 82 °F)	16 ° to 32 °C (60 ° to 90 °F)
Relative Humidity	40% to60% (non-condensing)	20% to 80% (non-condensing)

Appendix B

Super DLTtape II Data Cartridges

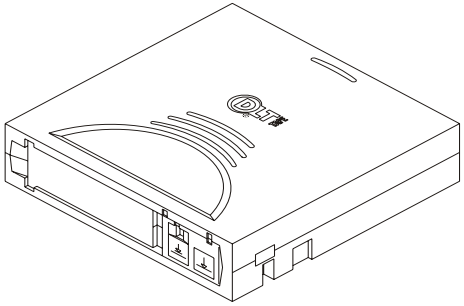
This appendix discusses Super DLTtape II data cartridge information. Information in this appendix includes the following topics:

- Recognizing Quantum Super DLTtape I and II Data Cartridges
- Data Cartridge Handling Guidelines
- Data Cartridge Inspection Procedure
- Data Cartridge Write-protect Switch
- Loading a Data Cartridge
- Unloading a Data Cartridge.

Recognizing Quantum Super DLTtape I and II Data Cartridges

The Super DLTtape II data cartridge is dark blue and has a keying feature that prevent insertion into the older generation DLT tape drives, as shown in figure 80.

Figure 80 Super DLTtape II Data Cartridge



Note: The Super DLTtape II data cartridge has a keying feature to ensure you cannot load it into a previous generation DLT tape drives.

Data Cartridge Handling Guidelines

By following general handling procedures, conducting careful visual inspections of data cartridges on a regular, ongoing basis, and being certain to store data cartridges within their environmental limits, you will greatly reduce any chance that you will experience problems with your data cartridges or cause damage to your Super DLTtape system. **Respect your media as much as you do your data**.

Following these general handling guidelines:

- Always keep each data cartridge in its protective plastic case when it is not in the tape drive.
- When carrying data cartridges in their cases, always orient the cases so that the grooves in the cases interlock. This prevents the cases from slipping apart and falling.
- Never stack the data cartridges in a stack of more than five.
- When placing data cartridges in archival storage, be certain you stand each data cartridge vertically.

- Do not carry data cartridges loosely in a box or any other container. Allowing data cartridges to jostle together exposes them to unnecessary physical shock.
- Always observe the proper environmental conditions for storing data cartridges. Refer to the data cartridge reference card supplied with each data cartridge. The ambient operating environment for the data cartridge is

Temperature	10 °C to 40 °C (50 °F to 104 °F)
Relative Humidity	20% to 80% (non-condensing)

> **Note:** If storage or transportation of a data cartridge has exposed it to conditions outside the ambient values shown above, you should **condition** the data cartridge to its operating environment for a 24-hour period.

- Maintain clean and smoke-free operating and storage environments.
- Never expose the data cartridge to moisture or direct sunlight.
- Do not place data cartridges on or near devices that may produce magnetic fields, such as computer monitors, motors, or video equipment. Such exposure can alter or erase data on the media.
- Avoid unnecessary opening of the data cartridge door; this may expose the media to contamination or physical damage.
- Do not touch or allow direct contact with the media or tape leader. Dust or natural skin oils can contaminate the data cartridge and impact media performance.
- A dropped data cartridge may have dislodged, loosened, or damaged internal components. If you drop a data cartridge, give it a thorough visual inspection, as described in Data Cartridge Inspection Procedure.
- Never apply adhesive labels or “sticky” notes on the top, side, or bottom of your Super DLTtape II data cartridge. Only use the slide-in type label provided with each data cartridge and slide it into the label slot on the data cartridge.
- Do not use graphite pencils, water-soluble felt pens, or other debris-producing writing instruments on your labels. Never erase a label—replace it.

- Be certain you place the unused data cartridge labels in the protective box so that you do not inadvertently pick them up along with the data cartridge during subsequent usage. A static electricity charge on a data cartridge may cause a label to cling to the data cartridge. A label that is accidentally inserted into the tape drive along with a data cartridge can prevent the hub reel and drive gear from meshing.
- Follow all data cartridge handling instructions that accompany your data cartridges or tape drive.

> **Note:** Always remove the data cartridge from the drive prior to powering down the drive. This ensures that the file system stored on the tape is consistent and that the tape in the tape path is not damaged when the unit is powered up.

Data Cartridge Inspection Procedure

Follow the Visual Mechanical Inspection (VMI) procedures described in this subsection. These steps will help you identify any potential data cartridge problems, and will prevent accidental loss of data or damage to your tape drive.

You should do an inspection if any of these conditions occur:

- As a general practice whenever you change or load a new data cartridge.
- If a data cartridge is dropped or subjected to some hard physical shock.
- If the SDLT 600A tape drive becomes inoperable after loading a data cartridge.
- If you receive a shipment of data cartridges that show any sign of shipping damage.

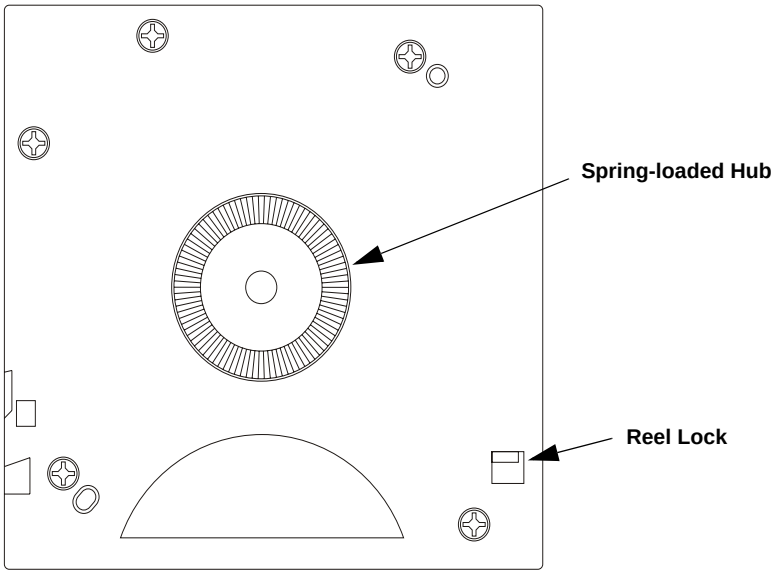
Follow these steps to visually inspect a Super DLTtape II data cartridge:

1. Remove the data cartridge from its protective plastic case.
2. Check for loose debris attached to the shell, and for other contamination (oily, slimy, or sticky substances) that may have built up on the surface of the shell.

3 Check the data cartridge for any obvious cracks or other physical damage to the shell. Rotate the data cartridge in your hands, looking for broken or missing parts.

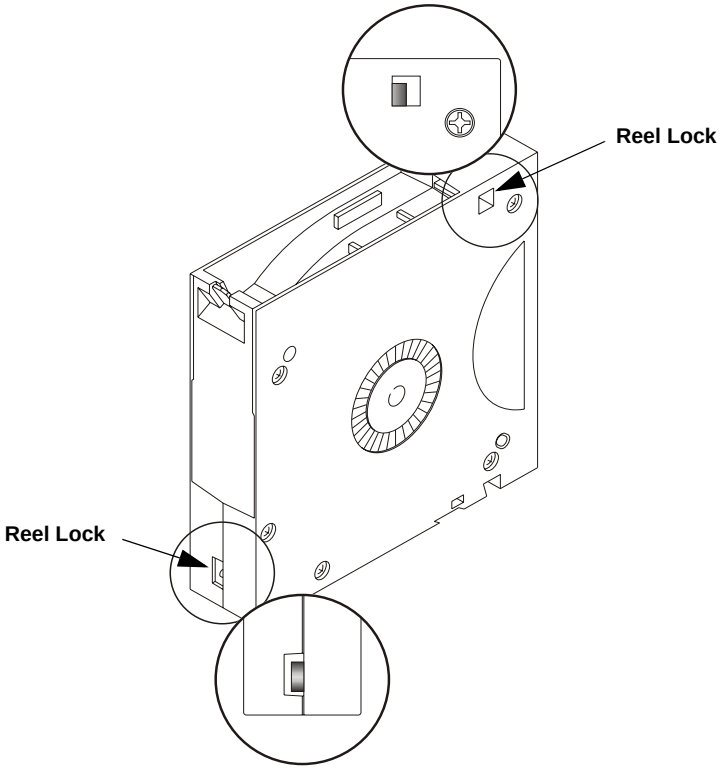
4 Grasp the data cartridge to view the bottom as shown in figure 81. (The media access door is on the top edge and the write protect switches are on the bottom edge.)

Figure 81 Bottom View of Super DLTtape II Data Cartridge



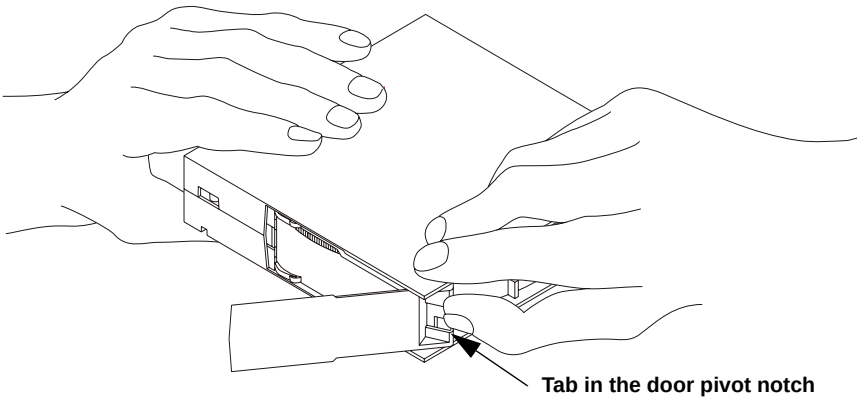
5 See figure 82 and check the reel lock openings to ensure the small plastic tabs inside are partially visible. The reel locks are black. The reel locks can break if you drop the data cartridge. *If the reel lock tabs are not visible, do not use the data cartridge*.

Figure 82 Super DLTtape II Data Cartridge Reel Locks



6 Once again, look at the end of the data cartridge, holding it as shown in figure 83.

Figure 83 Opening the Super DLTtape II Data Cartridge Door

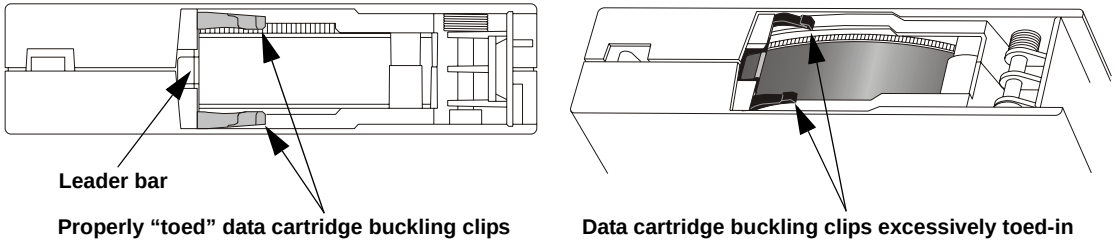


7 Open the data cartridge door by pressing on the tab in the door pivot notch as shown in figure 83. Use care that you do not touch the tape leader.

8 Compare what you see inside the data cartridge door to figure 84. Look for damage to the data cartridge clips, including:

- Bent or towed-in appearance on one or both clips
- Improper seating (clips should be fully retracted towards the left side of the opening)
- Bending of the leader bar that supports the clips.

Figure 84 Problems to Look for Inside the Data Cartridge Door



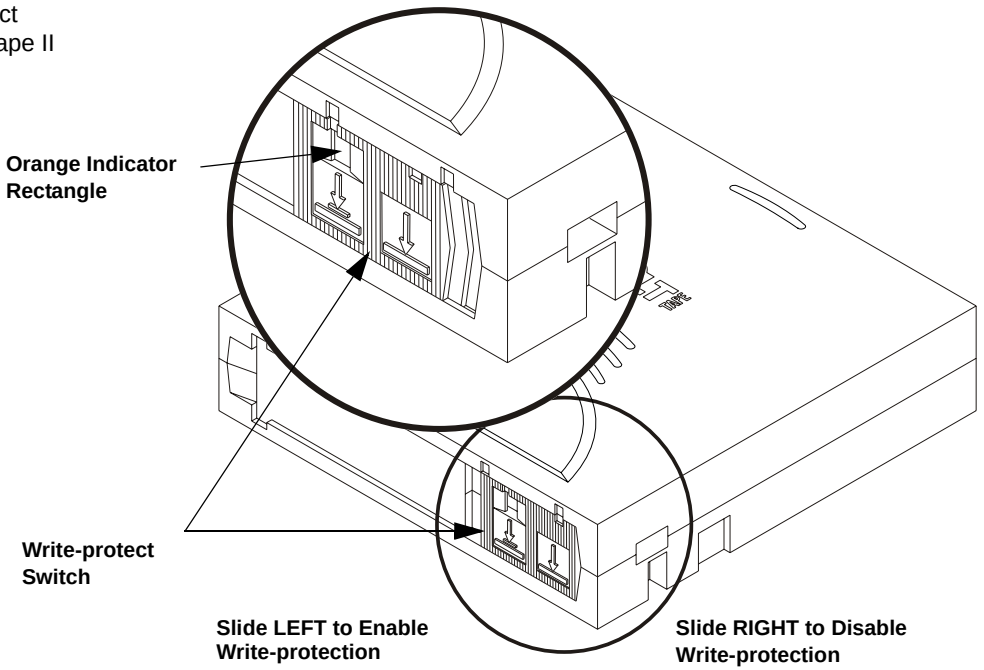
9 Examine the visible tape leader for excessive debris, oily or sticky residue, condensed droplets of moisture, or any other signs of contamination.

10 Finally, check for proper operation of the data cartridge's write-protect switch (see figure 85). This sliding switch, located on the end of the data cartridge used for the label, should snap smartly back and forth, and the orange tab should be visible when the data cartridge is set to provide write protection (you cannot write over the data already on the media).

Data Cartridge Write-protect Switch

Each data cartridge has a write-protect switch that you can use to prevent accidental erasure of data. Before inserting the data cartridge into the tape drive, position the write-protect switch on the front of the data cartridge (figure 85) according to the type of operations you expect to perform.

Figure 85 Write-Protect Switch on Super DLTtape II Data Cartridge



- Slide the write-protect switch to the left to **enable** write protection (you can read existing data; however, you cannot write over existing data on the media, nor append additional data to the media). When you move the write-protect switch to the left, a small orange rectangle is visible. This is your visual reminder that you cannot write data to the media.

- Slide the write-protect switch to the right to **disable** write protection (you can write over existing data on the media, and you can append additional data to the media unless the data cartridge is write-protected via firmware). When write-protection is disabled, no orange rectangle is visible.

  For more details about the write-protect switch, see table 18.

Table 18 Write-Protect Switch Positions

Write-protect Switch Position	Orange Write-protect Indicator	Result
Before Loading the Data Cartridge		
Enabled (Slide switch to left)	Visible	You cannot write data to3 the media. You cannot overwrite existing data on the media. You cannot append additional data to the media.
Disabled (Slide switch to right)	Not Visible	Unless the data cartridge is write-protected via firmware: - You can write data to the media. - You can overwrite existing data on the media. - You can append additional data to the media.
After Loading the Data Cartridge and During Operation		
If you move the write-protect switch from its right (disabled) position to its left (enabled) position	Visible	If the tape drive is currently writing to a data cartridge, the write-protect feature does not take effect until *after* the current write operation completes.

Write-protect Switch Position	Orange Write-protect Indicator	Result
If you move the write-protect switch from its left (enabled) position to its right (disabled) position	Not Visible	The data cartridge becomes write-enabled *after* a variable amount of seconds.

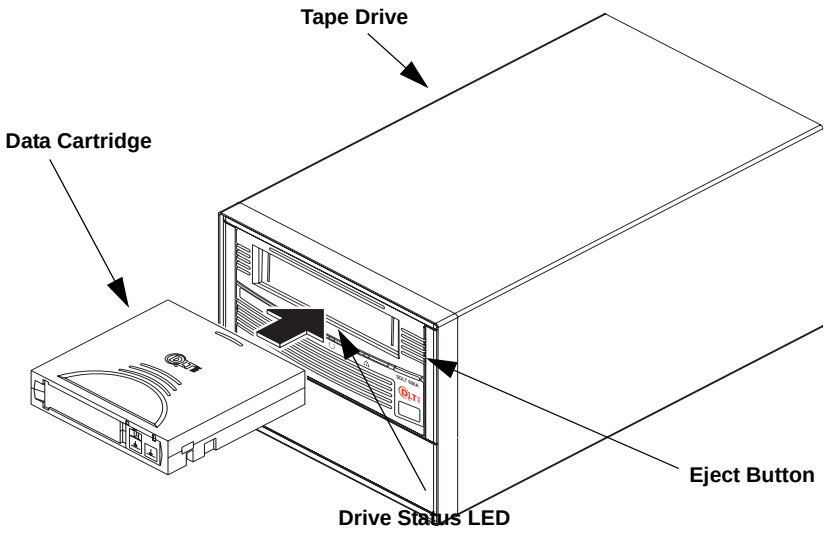
Loading a Data Cartridge

Complete this subsection to load a data cartridge into the front of the tape drive; see figure 86 as needed.

1. Insert the data cartridge into the front of the tape drive, as shown in figure 86.
2. Push the data cartridge fully into the tape drive.

   The **Drive Status** LED flashes to show that the media is loading. When the media reaches the Beginning of Tape (BOT) marker, the LED lights steadily. The data cartridge is now ready for use.

Figure 86 Loading a Super DLTtape II Data Cartridge



Unloading a Data Cartridge

Note: A tape cartridge can be unloaded during an active FTP session only by using the built-in FTP client. Right-click within the right pane of the FTP client window to display the **Contextual** menu, then click **Eject tape**.

Follow these steps to unload a data cartridge; see figure 86 as needed.

Caution: Remove the data cartridge from the tape drive *before* turning off host power. Failure to remove a data cartridge may result in data cartridge or tape drive damage.

Do *not* rush removal of the data cartridge. Wait until the tape drive ejects the data cartridge and the **Drive Status** LED lights steady before removing the data cartridge.

1. Press the **Eject** button (or issue an appropriate system software command); the tape drive completes any active writing of data to the media, then rewinds. The **Drive Status** LED flashes as the media rewinds.

   When the media is finished rewinding, the tape drive ejects the data cartridge and the **Drive Status** LED lights steadily.

2. Remove the data cartridge from the tape drive and return the data cartridge to its plastic case to protect it from damage.

Appendix C

Regulatory Compliance

This chapter describes various regulations that apply to the SDLT 600A tape drive:

- Safety Regulations describes compliance with various standards published by international safety organizations.
- Electromagnetic Field Specifications describes the susceptibility of the SDLT 600A tape drive to ambient electromagnetic fields, and describes the susceptibility of the system to unexpected electrostatic discharge.
- Acoustic Noise Emissions describes compliance with various acoustic standards.

Safety Regulations

This section lists the safety regulations that the SDLT 600A tape drive meets or exceeds.

Safety Certifications

The SDLT 600A tape drive meets or exceeds the following safely requirements:

- UL 60950: Information Technology Including Electrical Business Equipment (USA)
- EN60950/IEC 950: Information Technology Including Electrical Business Equipment (Europe)
    - EN60825-1 Information Technology Equipment

The SDLT 600A tape drive is also certified to bear the GS mark.

The SDLT 600A tape drive is a Class I laser product that complies with 21 CFR 1040.10 as applicable on the date of manufacture.

Electromagnetic Field Specifications

SDLT 600A tape drives are electrical devices; as such, this equipment generates, uses, and may emit radio frequency energy. The tape drives may emit energy in other frequencies, as well, as discussed in the following subsections.

Electromagnetic Emissions

The internal version of the SDLT 600A tape drive complies with FCC Class A limits in a standard enclosure; the tabletop version also complies with FCC Class A limits.

Electromagnetic Interference Susceptibility

Table 19 provides regulations and certifications held by the SDLT 600A tape drive for Electromagnetic Interference (EMI).

Table 19 EMI Regulations and Certifications

Type	Regulation/Certification
EEC Directive 89/336 CE	EN55022 (EU) EN55024 (EU)
CFR 47/ICES-003	FCC Rules Part 15B Class A
ICES-003	Canada

Immunity and ESD Limits

Table 20 lists the immunity and ESD failure level limits to which the SDLT 600A tape drive has been tested.

Table 20 Immunity and ESD Failure Level Limits

Test Name	Test Specification	Required Performance
EN55022: 1998 Radiated and Conducted Emissions		
Radiated Electromagnetic Emissions	EN55022: 1998	Class A
Conducted Electromagnetic Emissions		
Current Harmonics and Flicker Emissions Tests		
AC Power Supply Harmonic Emissions	EN61000-3-2	As per the standard
AC Power Supply Voltage Flicker	EN61000-3-3	As per the standard
EN55024: 1998 Immunity Tests		
Electrostatic Discharge Immunity	EN61000-4-2	Criteria A

Test Name	Test Specification	Required Performance
Radiated Electromagnetic Immunity	EN61000-4-3	Criteria A
Electrical Fast Transient / Burst Immunity	EN61000-4-4	Criteria B
Electrical Surge Immunity	EN61000-4-5	Criteria B
Conducted Electromagnetic Immunity	EN61000-4-6	Criteria A
Power Frequency Magnetic Field Immunity	EN61000-4-8	Criteria A
AC Voltage Dips and Interrupts Immunity	EN61000-4-11	Criteria B

Acoustic Noise Emissions

Table 21 lists acoustic noise emission levels, both as noise power and sound pressure, for the SDLT 600A tape drive. The table provides the preliminary declared values per ISO 9296 and ISO 7779/EN27779.

Table 21 Acoustic Noise Emissions, Nominal

Mode	Noise Power Emission Level (LNPEc)		Sound Pressure Level (LPAc)*	
	Internal	Tabletop	Internal	Tabletop
Idle	Not applicable	5.4 Bel	Not applicable	42 dB
Streaming	5.9 Bel	5.9 Bel	47 dB	53 dB

* Sound pressure level measured at front of tape drive.

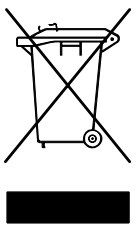
Environmental Compliance

Quantum is committed to providing quality products in an environmentally sound manner and to comply with all applicable environmental laws, rules and regulations.

This product was designed, manufactured and made available with consideration to worldwide laws, rules and regulations applicable to the product and the electronics industry including the European Union Directives 2002/95/EC & 2002/96/EC (RoHS and WEEE).

For further information on Quantum's Environmental Compliance and Global Citizenship, please consult the following Web site at http://qcare.quantum.com.

Disposal of Electrical and Electronic Equipment



This symbol on the product or on its packaging indicates that this product should not be disposed of with your other waste. Instead, it should be handed over to a designated collection point for the recycling of electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please visit our Web site at http://qcare.quantum.com or contact your local government authority, your household waste disposal service or the business from which you purchased the product.

Glossary

The following is an alphabetical list of specialized words and technical terms with their definitions, commonly used in the tape drive and tape media industry.

A

Access (v.) To read, write, or update information on a storage medium, such as magnetic media. (n.) The operation of reading, writing, or updating stored information.

Access Time The interval between the time a request for data is made by the system and the time the data is available from the tape drive.

Advanced PRML Advanced Partial Response Maximum Likelihood. The advanced PRML channel technology provides high-encoding efficiency recording densities for greater capacity and performance.

Allocation The process of assigning particular areas of the media to particular data or instructions.

AMP Media Advanced Metal Powder Media. A state-of-the-art media first designed for Super DLTtape. It incorporates durable metal powder technology for high-density data storage and embedded non-magnetic information for head tracking.

API Application Programming Interface.

Applet Java applets are small Java programs that get downloaded to the client computer and then run from a web browser when a web page that uses Java is loaded.

Archiving The removal or copying of data from the computer system onto secondary storage media that is safely stored away.

ASIC Application Specific Integrated Circuit.

ASTM American Society for Testing and Materials.

A/V A/V or Audio/Video is a generic term used to describe products and services associated with audio and video.

B

Bad Data Block A block that cannot reliably hold data because of a media flaw or damaged format markings.

Base Plate An aluminum die casting that acts as the support platform for the other modules and for the tape drive enclosure. The base plate includes the precision mounting holes used to install SDLT tape drives into a server or tape library.

Bezel (Also known as the faceplate.) A plastic panel that extends the face of a tape drive so that it covers a computer's tape drive bay opening. The internal model of SDLT 600A has two bezels: a library bezel and an internal bezel.

BIOS Basic Input/Output System. A set of routines that work closely with the hardware to support the transfer of information between various elements of the system, such as memory, disks, and peripheral devices.

Block A sector or group of sectors. SDLT 600A supports block sizes up to 16 MB.

BOM or BOT Beginning of Media or Beginning of Tape. The physical beginning of the media.

BSMI Bureau of Standards, Metrology, and Inspection (Taiwan).

Buckling Mechanism The buckling mechanism engages the media leaders on cartridge load and disengages them on cartridge unload.

Buffer An area of RAM reserved for temporary storage of data that is waiting to be sent to a device. The data is usually on its way to or from the tape drive or some other peripheral device.

C

C The degree Celsius (°C) is a unit of temperature.

Cache Specialized RAM used as a buffer between a fast CPU or I/O channel and storage which has a relatively slow access time (for example, cartridge or diskette), to avoid slowing down the former.

Cartridge Tape cartridge. Super DLT tape II or SDLTtape 600A.

Cartridge Receiver At media insertion, the cartridge receiver assembly is responsible for guiding the media into its operating position, opening the door, unlocking the cartridge brakes, and securing the media for operation. At media ejection, the cartridge receiver assembly reverses the process and automatically ejects the cartridge a fixed distance from the front of the tape drive.

CE Council of Europe.

CFR Code of Federal Regulations (United States).

Client This could be a standard FTP client or the built-in FTP client embedded in the SDLT 600A firmware.

CSA Canadian Standards Association, also known as CSA International.

CTM Cartridge Tape Module. The main function of the CTM is to provide the magnetic recording media used by the tape drive to store customer information. The CTM also provides the protective cartridge, which allows the media to be removed and stored safely.

CUP Code Update (a firmware update).

D

Data Compression A process that reduces the amount of storage space required to hold a particular block of data. Data transfer speed and total media capacity are affected by the data compression achieved. In accordance with industry practice, a typical compression ratio is 2:1 of data storage. Actual compression ratios achieved depend on the redundancy of data files being written.

dB A Decibel is a logarithmic unit of sound intensity; 10 times the logarithm of the ratio of the sound intensity to some reference intensity.

DC Direct Current is the continuous flow of electricity through a conductor such as a wire from high to low potential.

DCM The Data Control Module provides the path and guides for all media motion inside the tape drive and to write data to and read data from the media.

Device Driver A low-level (usually kernel-mode) operating system component that enables a PC to communicate with peripheral devices such as printers, CD-ROMs, and tape drives. Each kind of device requires a different driver.

DHCP Dynamic Host Configuration Protocol – This is a protocol that lets network administrators centrally manage and automate the assignment of IP Addresses on the corporate network.

DLT Digital Linear Tape.

DLT*Ice* Quantum's firmware compliance management function of DLTSage, which provides secure archival functionality to the SDLT 600A tape drive and DLTtape II cartridges.

DLTSage Quantum's suite of preventative maintenance diagnostic software tools that enables users to more simply mange tape storage environments.

DLZ Digital Lempel-Ziv 1 Algorithm is named after Abraham Lempel and Jacob Ziv. It is a data compression technique used in all SDLT tape drives.

E

EEC European Economic Community.

EEPROM Electronically Erasable Programmable Read-Only Memory. An integrated circuit memory chip that can store programs and data in a non-volatile state. These devices store firmware in DLT and SDLT tape drives, and can be erased and reprogrammed with new data.

EIM The Electronic Interface Module provides the main control function for the system and the interface from the system to the host computer, library, or autoloader.

eMAM Enhanced Media Auxiliary Memory - The memory on a cartridge associated with the file system table of contents.

EMC Electromagnetic Compatibility.

EMI Electromagnetic Interference.

EN EN standards are voluntary technical standards of the European Union and European Economic Area.

Encoding (n.) Characters (or bytes) of information converted to magnetic patterns on the media. (v.) The process of converting to the desired pattern.

EOD End of Data. Location on media where the last session stopped.

EOM or EOT End of Media or End of Tape. Logical EOM allows space to complete a write operation; physical EOM signifies that the media is completely used.

Erase The removal of data from media.

Error A message that occurs when there is a loss of ability to interpret recorded data; usually because of magnetic issues or defects in or on the media.

ESD An Electrostatic Discharge is a sudden flow of electric current through a material that is normally an insulator.

ETH Ethernet 1Gb; GigE; Gigabit Ethernet

EU European Union.

F

F Fahrenheit is a temperature scale where a degree Fahrenheit (°F) is 5/9ths of a kelvin (or of a degree Celsius).

FCC Federal Communications Commission (United States).

Fibre Channel A high-speed serial architecture that allows either optical or electrical connections at data rates from 265 MB to 2 Gb per second. Fibre Channel is sometimes abbreviated FC.

File system This is the file system embedded in the SDLT 600A firmware. File system information is saved into a table of contents and also into the eMAM.

Firmware Permanent or semi-permanent instructions and data programmed directly into the circuitry of a programmable read-only memory or electronically erasable programmable read-only memory chips. Used for controlling the operation of the computer or tape drive. Distinct from software, which is stored in random access memory and can be altered with ease.

FPM The Front Panel Module (also known as the bezel) is a plastic panel that extends the face of a tape drive so that it covers a computer's tape drive bay opening.

FTP File Transfer Protocol - A way of transferring files over the Internet from one computer to another.

FUP Firmware Update.

G

GB Gigabyte
SI — 1,000,000,000 bytes or 10^9. This is the International System of Units (SI) definition commonly used by telecommunications and storage manufacturers.
GiB — 1,073,741,824 bytes, equal to 1024^3, or 2^{30}. This is the definition often used in computer science, computer programming, and in the majority of computer operating systems documentation. This measurement can be abbreviated as GiB (gibibyte) to avoid ambiguity, as defined in IEC 60027-2.
Note: For the purpose of this document, SI is used.

GS German Safety.

H

Head The tiny electromagnetic coil and metal pole used to create and read back the magnetic patterns on the media. Also known as the read/write head.

HiFN An ASIC (Application Specific Integrated Circuit) for the SDLT that handles data compression.

HIM The Host Interface Module implements the interface between the host system and the tape drive.

HRE Hard Read Error.

HTTP HyperText Transfer Protocol - The protocol for moving hypertext files across the Internet. Requires a HTTP client program on one end, and an HTTP server program on the other end. HTTP is the most used protocol on the Internet.

HWE Hard Write Error.

I

ICM The Integrated Controller Module contains the main controller and servo microprocessor, the custom-designed SDLT ASICs, and the cache memory.

IEC The International Electrotechnical Commission is a standards organization that prepares and publishes international standards for all electrical, electronic, and related technologies.

IEEE Institute of Electrical and Electronics Engineers

Interface A hardware or software protocol—contained in the electronics of the media controller and tape drive—that manages the exchange of data between the tape drive and computer.

IP Internet Protocol.

ISO The International Organization for Standardization is an international non-governmental standard-setting body made up of representatives from national standards bodies.

ISV Independent Software Vendor.

K

KB A kilobyte is a unit of measure equal to 1 thousand (1024) bytes. SI — 1 000 000 bytes or 10^6 bytes. Computer usage — 1024 bytes.

L

LED Light Emitting Diode.

LGMR Laser Guided Magnetic Recording.

M

µM A Micrometer is an SI unit of length. It is defined as one millionth of a metre (1×10^{-6} m), equivalent to one thousandth of a millimeter.

MAM Medium Auxiliary Memory (MAM) is an SDLT 600A tape drive feature that provides information on the status and prior use history of a Super DLTtape cartridge.

MB Megabyte
SI — 1 000 000 bytes or 10^6 bytes. This is the International System of Units (SI) definition used by telecommunications engineers and storage manufacturers.
1 048 576 bytes - 1024^2, or 2^{20}. This definition is often used in computer science and computer programming, when talking about the size of files or computer memory. The reason is that computers use the binary numeral system internally.
Note: For the purpose of this document, SI is used.

MRC Heads Magneto Resistive Cluster Heads. A cluster of small, cost-effective Magneto Resistive (MR) media heads packed densely together.

ms A Millisecond is equal to one thousandth of a second.

MTBF Mean Time Between Failures.

MXF Material eXchange Format, is a file format designed to improve data and metadata exchange. The targeted objective is the

interoperability between content creation mainframes, work stations and peripherals.

This wrapper file format was designed to make use of current and forthcoming data formats. It also permits conveyance of metadata following standardized schemes. This metadata is used first to describe the structure of the file and its play out *structural metadata* but also to let the user specify its own metadata annotating the content of the file *descriptive metadata*.

This format is also designed to ensure the interchange of data in a streaming environment such as data tape storage or networked communications.

N

Native Capacity The capacity of a given media product in its basic recording format (without the use of data compression).

Native Mode Refers to the uncompressed storage capacity of a media subsystem. (See Native Capacity.)

O

Op1a The simplest and most common *operational pattern* containing a single *source package* which is played as is by the unique *material package*. Files produced by the Evtr from Sony are an extension of the *Op1a*.

OpAtom This *operational pattern* embeds a single *source package* which consists in a single source (only video or audio). However, the *material package* may allow building complex editing (*Op1a*, *Op1b*, *Op2a, and Op2b*) by referencing *source packages* from other *OpAtom* files.

Operational Pattern This term is used to designate the complexity of an MXF file. It describes the possibilities for building the *material packages*.

P

Parity A method of generating redundant information that can be used to detect errors in stored or transmitted data.

Peripheral A device added to a system as a complement to the basic central processing unit (CPU), such as a disk drive, tape drive, or printer.

Positive Engagement Buckling Mechanism A highly robust, solidly engineered media leader-buckling mechanism for heavy-duty-cycle automated environments.

POST Power-on Self-Test. When power is applied to the tape drive, it performs a POST.

PRML Partial Response Maximum Likelihood is a method for converting the weak analog signal from the head of a magnetic disk drive into a digital signal. Also see Advanced PRML.

PWA Printed Wiring Assembly - Commonly known as PCB(A) for Printed Circuit Board (Assembly).

Q

QEZ An Application Specific Integrated Circuit (ASIC) for the tape drive.

R

Restore To replace data on the hard drive with data obtained from another media device.

RoHS Restrictions on Hazardous Substances is an EU directive that restricts, and in some cases bans, the use of certain compounds in the manufacture of electronic equipment. RoHS mandates that new electrical and electronic equipment put on the market does not contain lead, mercury, cadmium, hexavalent chromium, poly-brominated biphenyls (PBB), or poly-brominated diphenyl ethers (PBDE).

S

SAN Storage Area Network.

SDLT Super Digital Linear Tape.

Seek The movement of a read/write head to a specific data track.

Server This is a FTP server embedded in the SDLT 600A firmware.

Shelf Life The length of time that media can be stored without losing its magnetic strength. For Super DLTtape II media, this period is 30 years or more.

SI The International System of Units.

SITE This command is used for site-specific commands. Compliant to FTP norm.

SRAM Static RAM. A memory chip that requires power to hold its content.

T

Take-up Reel The reel inside every tape drive onto which DLTtape or Super DLTtape media is wound. The in-the-tape drive take-up reel enables DLTtape and Super DLTtape systems to operate using a single-reel cartridge and thereby pack more media and data into every cartridge.

Tape Tape cartridge.

TapeAlert™ A firmware feature that monitors and returns the results of the tape drive's on-going self-diagnosis activity.

Tape Path The path through which media moves from the cartridge, past the read/write head, and onto the take-up reel.

TCM The Tape Control Module implements the functions required to buckle and unbuckle the media and control the media motion.

Timecode Timecode information can be recorded within an MXF file. Given that an MXF file can have several outputs (MXF terminology: *material package*), each of them can be set to a different timecode.

TOC Table Of Contents - Contains file system information.

Track A linear or angled pattern of data written on a media surface. SDLT tape drives write information on multiple tracks simultaneously.

Transfer Rate The speed at which the data moves between a host (that is, tape drive) and a recorded device. Usually expressed as bytes/sec or bits/sec.

TUR Test Unit Ready (see also Take-up Reel).

U

UL Underwriters Laboratories is a testing laboratory, which develops standards for consumer products, chiefly dealing with product safety.

Unformatted Capacity The total number of usable byes on the media, including the space that will be required later to record location, boundary definitions, and timing information. (See also Native Capacity.)

URL Uniform Resource Locator - The address of a site on the Internet.

USB Universal Serial Bus is a serial bus standard for connecting devices to a computer.

V

V A Volt is the potential difference across a conductor when a current of one ampere dissipates one watt of power.

VCCI Voluntary Control Council for Interference by Information Technology Equipment (Japan).

Virtual file A kind of edit list used only for the partial restore of .mxf files. Storing a file means creating a copy of a file from your local disk and transferring it to tape. Retrieving a file is the reverse operation. A transfer can be a store or a retrieve.

W

W The Watt is the SI derived unit of power.

Web server A computer that stores Web documents and makes them available to other computers via a web browser. A server may be dedicated, meaning its sole purpose is to be a Web server, or non-dedicated, meaning it can be used for basic computing in addition to acting as a server.

WEEE Waste Electronic and Electrical Equipment is an EU directive that mandates that producers of electronic goods assume the responsibility of recycling WEEE and create sustainable development programs to design more easily reusable and recyclable products.

WORM Write Once Read Many is a functionality, which provides secure archived records needed for government compliance.

X

XEZ An Application Specific Integrated Circuit (ASIC) used in SuperDLT tape drives.

XML eXtensible Markup Language.