



User's Guide

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Quantum Scalar *i*2000 Library

Scalar *i*2000

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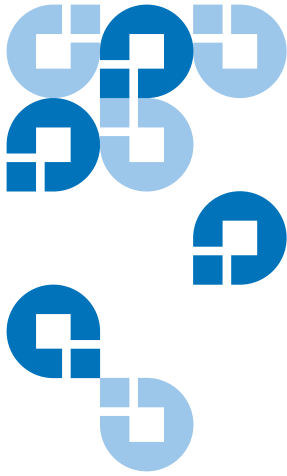
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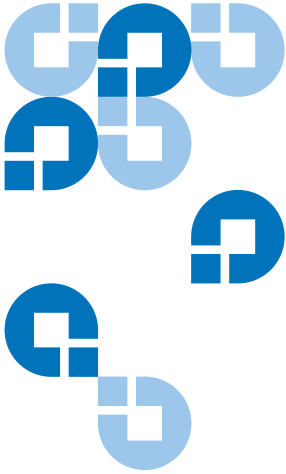
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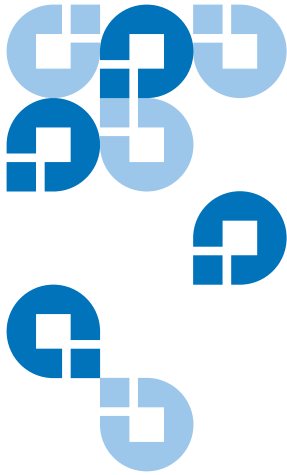
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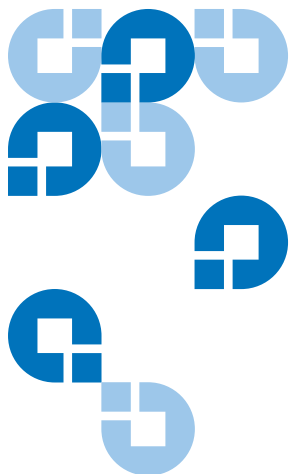


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Chapter 1

About This Guide and Your Product

This guide contains information and instructions necessary for the normal operation and management of the Scalar[®] i2000 library. This guide is intended for system administrators, operators, or anyone interested in learning about or using the Scalar i2000 library after its initial installation and configuration. Be aware that you must have administrator privileges to use many of the features that this guide describes.



CAUTION

Be sure to read all operating instructions in this manual and in the *System, Safety, and Regulatory Information Guide* before operating this product.

Product Safety Statements

This product is designed for data storage and retrieval using magnetic tape. Any other application is not considered the intended use. ADIC will not be held liable for damage arising from unauthorized use of the product. The user assumes all risk in this aspect.

This unit is engineered and manufactured to meet all safety and regulatory requirements. Be aware that improper use may result in

bodily injury, damage to the equipment, or interference with other equipment.



CAUTION

Be sure to read all operating instructions in this manual and in the *System, Safety, and Regulatory Information Guide* before operating this product.



WARNING

BEFORE POWERING ON OR USING THIS EQUIPMENT, READ THE SYSTEM, SAFETY, AND REGULATORY INFORMATION GUIDE. KEEP THE GUIDE FOR FUTURE REFERENCE.



Note

WHEN DRIVE SLED POSITIONS ARE EMPTY, DRIVE COVER PLATES MUST BE INSTALLED AND IN PLACE AT ALL TIMES TO PREVENT ACCESS INTO THE EMPTY DRIVE SLED POSITIONS.

Mechanical Locks

The access and service doors can only be opened with a key. The key should be kept by an authorized person at your company. Access to the interior of the library is both a data-integrity and safety issue.

Power Button on the Library's Indicator Panel

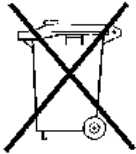
Switching off the **Power** button on the indicator panel, located on the front of the library, removes power from the electronics, which causes the picker to stop immediately. This button also removes power from the drives.



WARNING

THIS POWER BUTTON FUNCTIONS AS A POWER INTERRUPT ONLY. TO COMPLETELY REMOVE ALL POWER BEFORE SERVICING OR IN AN EMERGENCY, TURN OFF THE CIRCUIT BREAKER ON THE POWER DISTRIBUTION UNIT, AND THEN DISCONNECT THE POWER CORD FROM THE ELECTRICAL SOURCE.

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 WEBSITE AT: [HTTP://QCARE.QUANTUM.COM](http://QCARE.QUANTUM.COM) OR CONTACT YOUR LOCAL GOVERNMENT AUTHORITY, YOUR HOUSEHOLD WASTE DISPOSAL SERVICE OR THE BUSINESS FROM WHICH YOU PURCHASED THE PRODUCT.

Product Model Number

The Scalar i2000 model number is as follows: SCi2000.

Explanation of Symbols and Notes

The following symbols appear throughout this document to highlight important information.



WARNING

INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR BODILY INJURY.



CAUTION

Indicates a situation that may cause possible damage to equipment, loss of data, or interference with other equipment.



Note

Indicates important information that helps you make better use of your system.

Other Documents you Might Need

The following documents are also available for this product. These documents can be found on the product CD or at www.quantum.com/support.

- *Scalar i2000 Planning Guide (6-00418-xx)*
- *Scalar i2000 User's Guide (6-00421-xx)*
- *Scalar i2000 Maintenance Guide (6-00422-xx)*
- *ADIC Management Console User's Guide (6-00064-xx)*

- Scalar i2000 Unpacking Instructions (6-00771-xx)
- *System, Safety, and Regulatory Information Guide* (6-00618-xx)



Note

Release Notes are also available for this product. The Release Notes describe changes to your system or firmware since the last release, provide compatibility information, and discuss any known issues and workarounds. The Release Notes can be found in the product box or at www.quantum.com/support

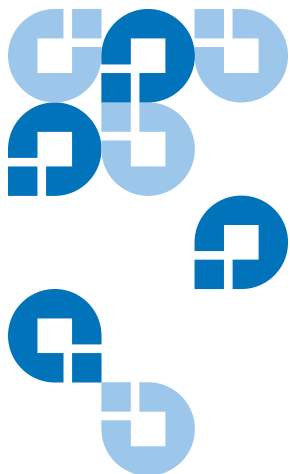
Getting More Information or Help

More information about this product is available on the Service and Support website at www.quantum.com/support. The Service and Support Website contains a collection of information, including answers to frequently asked questions (FAQs). You can also access software, firmware, and drivers through this site.

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

For additional contact information: www.quantum.com/support

To open a Service Request: www.quantum.com/esupport



Troubleshooting Your Library

This chapter describes how the library informs you of issues that it detects within its subsystems. It also provides information about working with tickets to resolve issues, running verifications tests to check whether they have been resolved, interpreting LEDs, viewing command history logs, and accessing Online Help.

This chapter consists of the following sections:

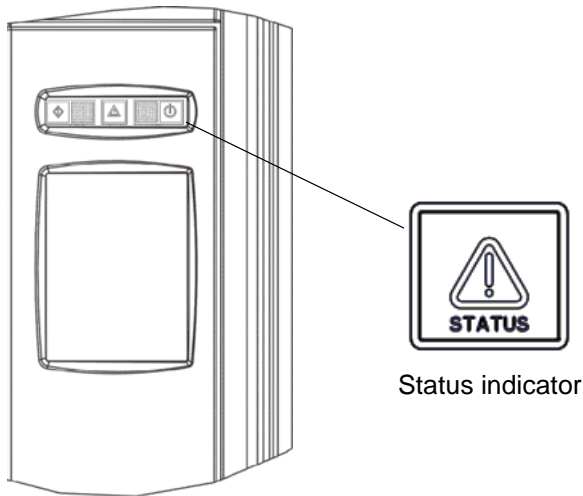
- [How Does the Library Report Issues?](#) on page 7
- [Working With Tickets](#) on page 12
- [Viewing Tape Alerts and Generating Media Integrity Analysis Reports](#) on page 31
- [Generating Media Integrity Analysis Reports](#) on page 34
- [Saving a Report Template](#) on page 39
- [Generating the Tickets Report](#) on page 45
- [Interpreting LEDs](#) on page 51
- [Interpreting LBX Terminator LEDs](#) on page 66
- [Working With Command History Logs](#) on page 71
- [Accessing Online Help](#) on page 76

How Does the Library Report Issues?

The library has advanced problem detection, reporting, and notification functionality. The library has many processors and sensors that monitor conditions and operations, such as temperatures, voltages, current, calibrations, firmware versions, and so forth.

The first indication of issues is the status indicator on the indicator panel, as shown in [Figure 1](#).

Figure 1 Status Indicator



Status indicator

- If the **Status** indicator light is solid green, the library currently has no tickets in an Open state.
- If the **Status** indicator light is flashing amber, at least one of the six subsystems has a ticket in an Open state.

When the library detects an issue, it creates a ticket for it. A ticket includes the following types of information:

- Details about the issue
- Reports that are associated with the ticket

- A repair page that provides corrective actions

In most cases, tickets isolate field replaceable units (FRUs) that you must service or replace.



Note

Tickets can indicate failures or other serious problems, but they also can indicate warning conditions that you should investigate or other helpful information. For example, opening the library's access door or changing the library's configuration causes the library to create a ticket, but these situations would not indicate serious problems. However, you should investigate the tickets.

The library assigns a severity level to each ticket that it creates, and it notifies users of the ticket. [Table 1](#) describes possible severity levels for tickets.

Table 1 Severity Levels
Assigned to Tickets

Severity Level	Description
1 (Failed)	Indicates that a failure has occurred or a different serious condition exists within a library subsystem that requires immediate corrective action. In most cases, a hardware component is no longer functioning at an acceptable level or has failed. Typical library operations are either impossible or highly unreliable. Examples of failure situations include a FRU that is not functioning, a temperature threshold that has been reached that causes unreliable operations, or a partition that the library has automatically taken offline.
2 (Degraded)	Indicates that a degraded condition exists within a library subsystem that impacts system performance or redundancy. Typical library operations can continue without immediate corrective action, but an administrator should investigate the condition and correct the problem soon. Examples of degraded situations include a redundant power supply that has failed or a connectivity problem that has caused host port failover to occur.

Table 1 Severity Levels
Assigned to Tickets

Severity Level	Description
3 (Warning)	<p>Indicates that a condition exists within a library subsystem that has little effect on system operations. Typical library operations can continue without immediate corrective action, but you should investigate the condition and correct the problem when possible. Warnings also can provide helpful information, such as indicating that a door is open.</p> <p>Examples of warning situations include a FRU that is functioning less reliably or a temperature threshold that has been reached that does not affect reliable operations.</p>

The library has two ways of notifying users that it has discovered issues and has created tickets for them:

- Status indicators on Library Management Console (LMC) system status buttons
- E-mail notifications

Understanding Indicators on System Status Buttons

System status buttons are located in the **Overall System Status** area at the bottom of the LMC display. Each button displays a status indicator for the library subsystem it represents. For more information about the buttons, see [System Status Buttons](#) on page 364. When the library creates a ticket, the status indicator button for the affected subsystem automatically changes from the following icon:



Good (green)

to one of the following icons:



Warning *or* Degraded (yellow)



Failed (flashing red)

The meanings of these status indicators correspond to the severity levels described in [table 1 on page 8](#). If a system status button indicates anything other than a Good state, clicking it displays a list of open tickets

for the subsystem. To access tickets by using the system status buttons, see [Working With Tickets](#) on page 12.

Understanding E-mail Notifications

The library collects status information on its components and, if the appropriate e-mail notifications have been set up in the LMC, the library can send notifications whenever tickets with severity levels 1, 2, or 3 are created. For information about severity levels, see [table 1 on page 8](#). The library assigns a severity level to each ticket it creates. If the ticket's severity level matches one of an e-mail address' severity codes (as set up in e-mail notifications), the library sends a notification to that particular e-mail address. The library also sends a notification if a ticket's severity level escalates to a more severe level. The library does not send one when an ticket's severity level becomes less severe.

By default, the only e-mail address to which the library sends e-mail notifications (severity level 1 issues only) is techsup@quantum.com (Quantum technical support). To set up other e-mail addresses to receive notifications, see [Configuring E-mail](#) on page 140 and [Setting Up E-mail Notifications](#) on page 142.



Note

Even though you can remove the Quantum technical support e-mail address so that Quantum does not receive severity level 1 notifications, Quantum recommends that you do not remove it. Also, do not include the Quantum technical support e-mail address for severity level 2 or 3 notifications.

The subject line of the e-mail notification indicates "Scalar i2000," the library's serial number, and the severity level of the ticket. The body of the message states that the library sent the message automatically. The message body also includes the following information, which provides details about the ticket and library conditions at the time of the event:

- Ticket summary
- Ticket details, including status information
- Firmware versions, including MCB, RCU, CMB, and drive bricks
- Physical library configuration

- Library states, such as physical library online or offline, partitions online or offline, or robotics enabled or disabled
- Time stamps of recent activity
- Report summary
- Report details for the ticket

The notification also includes a repair page attachment. This page provides a problem description and corrective actions you or a customer service engineer (CSE) can perform. For more information about repair pages, see [Viewing Repair Pages](#) on page 30.



Note

A notification e-mail contains helpful information about a ticket and how to resolve it. However, the notification represents a condition that existed at a certain time in the past. The notification might not reflect the current situation. The notification indicates a specific ticket ID, so you should find and examine that specific ticket in the LMC. The ticket reflects the real-time status of the issue. For more information about accessing tickets, see [Working With Tickets](#) on page 12.

Working With Tickets

Tickets are your primary troubleshooting tool when you experience problems with the library. A ticket provides details and reports about the issue and library conditions at the time of the event. It also provides guidance on how to resolve the issue. If you are an administrator or a service representative, you can access the tickets through the LMC. This section explains how to display ticket lists, view ticket and report details, view repair pages, and resolve and close tickets.

Ticket Guidelines

To help you quickly troubleshoot an issue by using tickets, read the following guidelines.

What is the issue and its cause?

You became aware of a library issue because either the library sent an e-mail notification, an LMC system status button indicated a subsystem status of Warning, Degraded, or Failed, or a backup/archive software application indicated a problem. Tickets include details about the issue and library conditions at the time of the event. They also include reports, any history tickets that the library has created in the past for the same FRU, and a repair page that provides a detailed description of the issue and its possible causes. The repair page also provides corrective actions that you or a CSE can perform. To use a ticket to determine an issue and its cause, you can perform the following general steps:

- 1 Display a list of tickets (see [Displaying Ticket Lists](#) on page 16).
- 2 View the details for the appropriate ticket (see [Viewing Ticket Details](#) on page 21).
- 3 View the reports that are associated with this ticket (see [Viewing Ticket Details Reports](#) on page 26).
- 4 View the ticket's repair page (see [Viewing Repair Pages](#) on page 30).

Where did the issue occur in the library?

The **Status Group** field on the **Details** tab of the **Ticket Details** dialog box indicates the library subsystem that caused the ticket. For more information about the **Details** tab, see [Viewing Ticket Details](#) on page 21. The **FRU ID** field on the **Report** tab of the **Ticket Details** dialog box indicates the type of FRU that is affected, and the **FRU Instance** field indicates the specific FRU by its location in the library. For more information about the **Report** tab, see [Viewing Ticket Details Reports](#) on page 26.

When did the issue first occur?

The **Posted** field on the **Details** tab of the **Ticket Details** dialog box indicates the date and time on which the library first reported the issue and created a ticket for it. For more information about the **Details** tab, see [Viewing Ticket Details](#) on page 21.

Has the issue occurred repeatedly?

The **Duplicates** field on the **Details** tab of the **Ticket Details** dialog box indicates how many times the library has reported the same issue while the ticket has been open. In addition, you can determine whether the same issue has occurred and been resolved in the past. The **FRU History List** area on the **Details** tab lists tickets that have been opened for the same FRU in the past, but have been resolved and are now in the Closed or Verified state. By selecting a history ticket and then clicking **Show**, you can investigate the ticket history of a particular FRU. For more information about the **Details** tab and viewing history tickets, see [Viewing Ticket Details](#) on page 21.

Has the FRU been replaced before?

You can determine whether a specific FRU has been replaced in the past by examining the **FRU SN** field on the **Details** tab of the **Ticket Details** dialog box for the open ticket and the history tickets. Because the history tickets associated with an open ticket are for the same specific instance of a FRU, and because a FRU instance is identified by its location in the library, the FRU serial number, which is uniquely assigned to each FRU, will change if the unit has been replaced in the past. For more

information about the **Details** tab and viewing history tickets, see [Viewing Ticket Details](#) on page 21.

How do I resolve the issue?

The repair page provides comprehensive, step-by-step procedures for resolving the issue. Both user and CSE procedures are provided. When the procedures require a CSE to perform them, contact technical support. For more information, see [Viewing Repair Pages](#) on page 30.

How can I know whether the issue is resolved?

Some issues require you to determine whether they are resolved and others the library will detect automatically.

- In some cases, the library can automatically detect that an issue is resolved (for example, an open door that is now shut). For these, the library automatically transitions the ticket to the Verified state.
- In other cases, the library cannot automatically detect that an issue is resolved (for example, a faulty tape cartridge). You must determine whether the issue is resolved by running a verification test or, if an applicable test does not exist, by following the repair page instructions. If you run a test and the results are all good, the library automatically transitions the ticket to the Verified state. If you cannot run a test, you should physically examine the FRU, and then manually transition the ticket to the Closed state after determining that the issue is resolved. After you close the ticket, the library transitions it to the Verified state if it is able to do so. For more information, see [Running Verification Tests to Determine Issue Resolution](#) on page 42 and [Closing Tickets](#) on page 43.

The library reopens tickets that receive failed, degraded, or warning reports within 30 minutes of transitioning to the Closed or Verified state. If a Closed or Verified ticket remains free of failed, degraded, or warning reports for 30 minutes, the library locks them from transitioning back to the Open state. A failed, degraded, or warning report that is received beyond 30 minutes causes the library to open a new ticket.

What do I do if I cannot resolve the issue?

Contact Quantum technical support. See [Getting More Information or Help](#) on page 5. Technical support personnel might ask you to send them an electronic copy of the ticket. For instructions, see [Mailing, Saving, and Printing Ticket Information](#) on page 39.

How do I view the number of tickets that occurred in a certain time range?

The Tickets Report lets you see how many tickets occurred in a particular time period. You can choose to group tickets by subsystem, module, or FRU, and the results can be presented as a rollup summary or as a trend so you can see if the number of issues is increasing or decreasing over time. Also, the report results can be presented in different chart formats, such as bar graphs or pie charts. For more information, see [Generating the Tickets Report](#) on page 45.

Displaying Ticket Lists

The LMC provides three ways to display ticket lists:

- By clicking a system status button that indicates a Warning, Degraded, or Failed state

This option displays a list of open tickets for the associated subsystem. See [Using System Status Buttons to Display Ticket Lists](#) on page 16.

- By clicking **Tools**→ **Tickets**

This option displays the **Tickets** dialog box from which you can obtain a list of all tickets or a partial list of tickets according to selection criteria. See [Using the Tickets Command or the Tickets Button to Display Ticket Lists](#) on page 19.

- By clicking the **Tickets** button on the toolbar

This option displays the same **Tickets** dialog box as the **Tools**→ **Tickets** command does. See [Using the Tickets Command or the Tickets Button to Display Ticket Lists](#) on page 19.

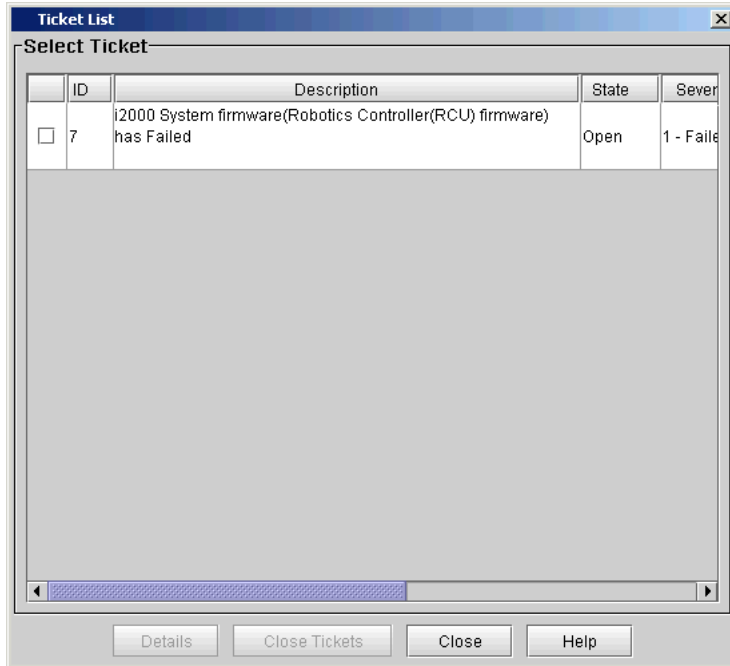
From the ticket list, you can select a ticket to view ticket details, associated reports, and a repair page.

Using System Status Buttons to Display Ticket Lists

To display a list of tickets by using a system status button, the button must indicate a Warning, Degraded, or Failed state. Clicking a system status button that indicates a Good state either displays a list of subsystem tickets that are in Closed or Verified states or informs you that no tickets exist for the subsystem.

- 1 Click the system status button that corresponds with the subsystem for which you want to display a list of open tickets.

The **Ticket List** dialog box appears with a list of open tickets for the subsystem.



The following table describes the elements on the **Ticket List** dialog box.

Element	Description
In the Select Ticket area:	
Check Box	To close multiple tickets, select each ticket you want to close by clicking the check box.
ID	The library-assigned identifier for the ticket.
Description	A summary description of the ticket. The description identifies the FRU that caused the ticket and includes reason text that describes the cause of the ticket.

Element	Description
State	<p>The current state of the ticket. Possible states are:</p> <p>Open – indicates that an issue, whether problem or warning condition, has occurred in the library that requires attention</p> <p>Closed – indicates that a user has closed the issue</p> <p>Verified – indicates that the library has successful operational results or positive data that verifies that the problem is resolved</p>
Severity	<p>The severity level of the ticket. Possible levels are:</p> <ul style="list-style-type: none"> • 1 (Failed) • 2 (Degraded) • 3 (Warning) • 5 (Good)
Serial #	<p>The serial number that the manufacturer assigns to the particular FRU.</p>
Sub-system	<p>The subsystem that caused the ticket. Possible subsystems are:</p> <ul style="list-style-type: none"> • Connectivity • Drives • Control • Power • Cooling • Robotics
Posted Date	<p>The date and time on which the library created the ticket.</p>

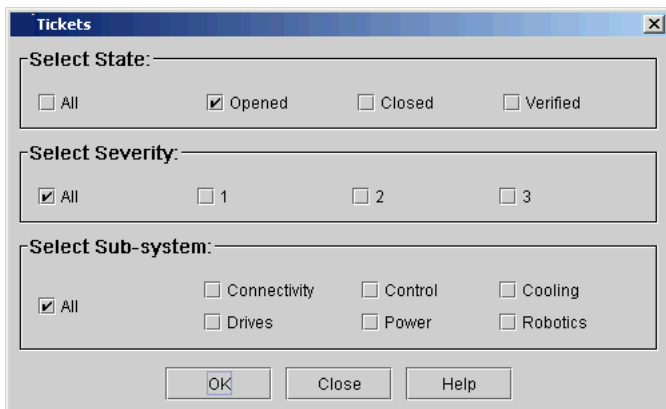
The **Details** button displays the **Ticket Details** dialog box. For more information, see [Viewing Ticket Details](#) on page 21.

- 2 By default, the ticket list is sorted by ticket ID in ascending order with the oldest ticket at the top and the newest one at the bottom. To change the sorting (for example, by state or severity), click the column heading by which you want the tickets sorted. Repeatedly clicking a column heading toggles between ascending and descending order.

Using the Tickets Command or the Tickets Button to Display Ticket Lists

- 1 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 2 Click **Tools**→ **Tickets** or click the **Tickets** button on the toolbar.

The **Tickets** dialog box appears.



This dialog box enables you to specify the kinds of tickets that will appear in the ticket list. For example, you can do the following:

- To display all tickets in the library, select **All** for state, severity, and subsystem.
- To display all open tickets with a severity level 2 status for the drives and control subsystems, select **Opened** for state, **2** for severity, and **Drives** and **Control** for subsystem.
- To display all tickets that users have manually closed for the robotics subsystem, select **Closed** for state, **All** for severity, and **Robotics** for subsystem.
- To display all tickets that the library has automatically determined as having been resolved, select **Verified** for state, **All** for severity, and **All** for subsystem.

If you select a combination that does not produce a ticket list, a **No Tickets Found** error message appears.

By default, this dialog box is set to **Opened** for state, **All** for severity level, and **All** for subsystem.

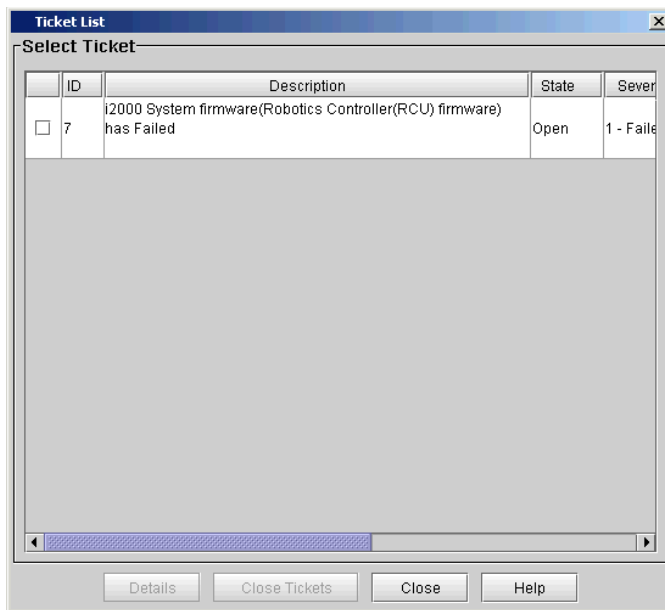


Note

Tickets that the library has automatically verified and closed are in the Verified state. Tickets that users have manually closed are in the Closed state.

- 3 Select the appropriate check boxes in the **Select State**, **Select Severity**, and **Select Sub-system** areas, and then click **OK**.

The **Ticket List** dialog box appears.



For descriptions of elements on the **Ticket List** dialog box, see [Using System Status Buttons to Display Ticket Lists](#) on page 16.

- 4 By default, the ticket list is sorted by ticket ID in ascending order with the oldest ticket at the top and the newest one at the bottom. To change the sorting (for example, by state or severity), click the column heading by which you want the tickets sorted. Repeatedly clicking a column heading toggles between ascending and descending order.

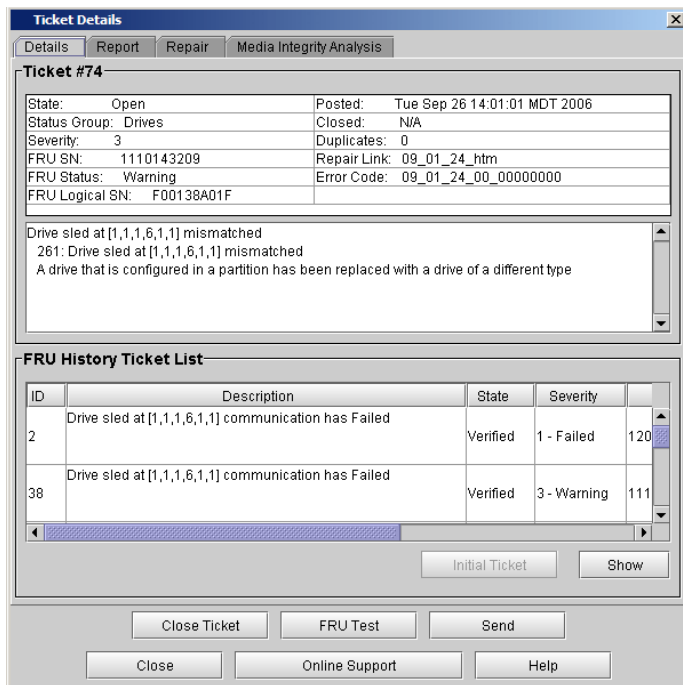
Viewing Ticket Details

Tickets provide detailed information about the ticket itself, the reports that are associated with it, and a repair page that gives guidance for resolving the issue. These tickets provide important information about library conditions from which the issue emerged and helpful information for resolving it.

To display the detailed information for a particular ticket, perform the following steps:

- 1 On the **Ticket List** dialog box in the **Select Ticket** area, click the appropriate ticket row to highlight it.
- 2 Click **Details**.

The **Ticket Details** dialog box appears with the **Details** tab displayed.



The **Ticket #** area of the **Ticket Details** dialog box displays detailed information about the ticket. The **FRU History Ticket List** area lists all tickets that were ever opened in the past and that see the same specific FRU (based on the FRU's location in the library) as the one reported by this ticket.

The following table describes the elements on the **Details** tab.

Element	Description
In the Ticket # area:	
State	<p>The current state of the ticket. Possible states are:</p> <p>Open – indicates that an issue, whether problem or warning condition, has occurred in the library that requires attention</p> <p>Closed – indicates that a user has closed the issue</p> <p>Verified – indicates that the library has successful operational results or positive data that verifies that the problem is resolved</p>
Posted	The date and time on which the library created the ticket.
Status Group	<p>The subsystem that caused the ticket. Possible subsystems are:</p> <p>Connectivity</p> <p>Drives</p> <p>Control</p> <p>Power</p> <p>Cooling</p> <p>Robotics</p>
Closed	If the ticket is closed, the date and time on which it was closed.
Severity	<p>The severity level that is associated with the status group (subsystem). Possible levels are:</p> <p>1 (Failed)</p> <p>2 (Degraded)</p> <p>3 (Warning)</p> <p>5 (Good)</p>

Element	Description
Duplicates	<p>The number of times that the library has reopened the ticket. If a ticket is in the Closed or Verified state and the identical problem occurs again within 30 minutes, the library reopens the ticket and increments the ticket's duplicate count. If the library has not reopened the ticket, the value is zero (0).</p> <p>Tickets that are in the Closed or Verified state for more than 30 minutes cannot be reopened. In this case, if the identical problem occurs again, the library creates a new ticket.</p>
FRU SN	The serial number of the particular FRU.
Repair Link	The name of the repair page that is associated with the ticket.
FRU Status	<p>The status of the FRU. Possible statuses are:</p> <ul style="list-style-type: none"> • Failed • Degraded • Warning • Good
Error Code	<p>A number that is associated with a particular issue that caused the ticket report. Because more than one issue can cause a report, an error code provides another level of detail to what the report provides. The error code maps to a portion of library firmware code, which a trained analyst can examine to determine the root cause of an issue. If the ticket is in the Closed or Verified state, this field is set to N/A. This information is for technical support use only.</p>
FRU Logical SN	<p>The logical serial number that the library assigns to a drive in a specific location. This is not the serial number of the particular FRU (see FRU SN in this table). If a drive is replaced by another drive in the same library location, the logical serial number remains the same. From the host's perspective, the replacement drive is the same as the original one. This field appears for all drive-related tickets only. If the logical serial number addressing feature is disabled for the library, Disabled appears in this field.</p>
Description area	<p>A summary description of report information that is associated with the ticket. It includes reason text that describes the cause of the ticket.</p>

Element	Description
In the FRU History Ticket List area:	
ID	The library-assigned identifier for the history ticket.
Description	A summary description of the history ticket. The description identifies the FRU that caused the ticket and includes reason text that describes the cause of the ticket. All tickets that appear on the Details tab, including the ones in the FRU History Ticket List area and the Ticket # area, see the same specific FRU.
State	The current state of the history ticket. All history tickets are in the Closed or Verified state.
Severity	The historical ticket's current severity level.
Serial #	The serial number of the particular FRU.
Sub-system	The subsystem that caused the ticket. Possible subsystems are: <ul style="list-style-type: none"> • Connectivity • Drives • Control • Power • Cooling • Robotics
Posted Date	The date and time on which the library created the ticket.

From the **Ticket Details** dialog box, you can perform the following tasks:

- Display detailed information for a history ticket by using the **Show** button, and then redisplay the original ticket details using the **Initial Ticket** button (see [Viewing History Ticket Details](#) on page 25)
- Connect to online service and support resources by clicking **Online Support**. Online service and support resources include free, secure access to KnowledgeBase articles and the Online Service Request tool. (If clicking **Online Support** does not connect you to the online service and support web site, try disabling your web browser's pop-up blocker.)

- Mail, save, or print ticket information by using the **Send** button (see [Mailing, Saving, and Printing Ticket Information](#) on page 39)
- Determine whether the issue is resolved by using the **FRU Test** button. **FRU Test** is available only if the ticket's FRU has an applicable verification test that you can run. (FRUs that belong to the Accessor, Picker, Drive, IE Assembly, or Bar Code Label categories have applicable verification tests.) When you click **FRU Test**, the **Verification Tests** dialog box appears with the appropriate verification test already selected and ready to start. If you run a verification test and the results are all good, the library automatically transitions the ticket to the Verified state. For more information, see [Working With Verification Tests](#) on page 275.



Note If the library does not have a verification test for the FRU, after you resolve the issue, you must manually transition the ticket to the Closed state by using the **Close Ticket** button. After you close the ticket, the library transitions it to the Verified state if it is able to do so. For more information about manually closing a ticket, see [Closing Tickets](#) on page 43.

- Display report information (see [Viewing Ticket Details Reports](#) on page 26)
- Display the repair page (see [Viewing Repair Pages](#) on page 30)

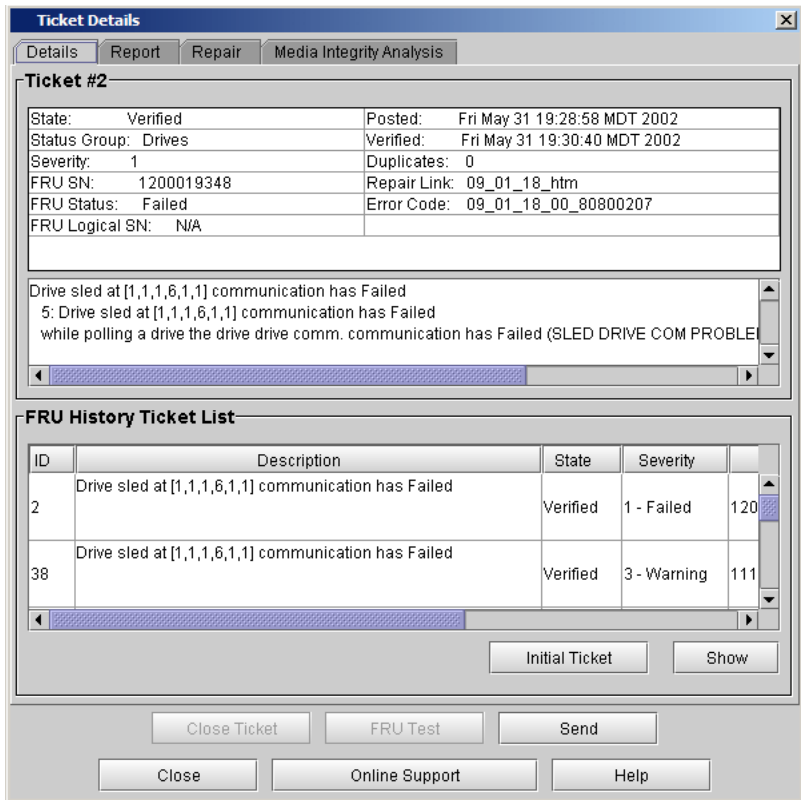
Viewing History Ticket Details

To display the detailed information for a particular history ticket, perform the following steps:

- 1 On the **Ticket List** dialog box in the **FRU History Ticket List** area of the **Details** tab, click the appropriate ticket row to highlight it.
- 2 Click **Show**.

The history ticket details appear in the **Ticket #** area. However, the list of tickets in the **FRU History Ticket List** remains the same as what the initial ticket displayed. This list does not change. The **Report** and **Repair** tabs show information that is specific to the history ticket, but the **Close Ticket** and **FRU Test** buttons at the bottom of the **Ticket Details** dialog

box are grayed out because the history ticket is in the Closed or Verified state already.

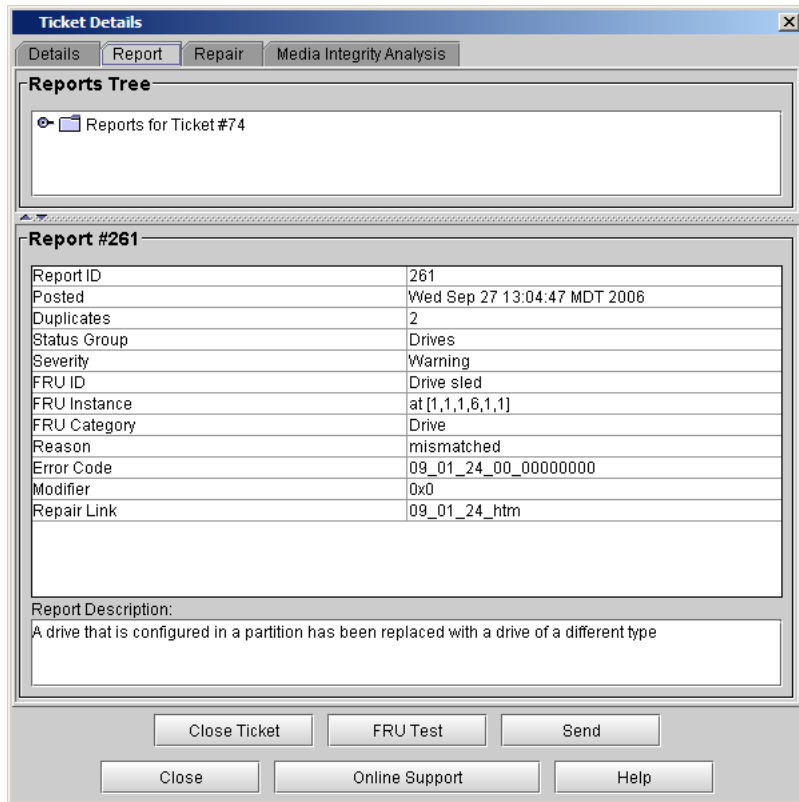


3 To return to the non-history ticket that appeared initially, click **Initial Ticket**.

Viewing Ticket Details Reports

The library creates a key report for each issue that occurs. As updates to the issue occur, the library creates subordinate reports that it associates with the key report. Typically, you should examine the key report because it represents the earliest time at which the ticket reached its highest severity level. It often isolates the most significant problem.

To display all report information that is associated with a ticket, click the **Report** tab on the **Ticket Details** dialog box.



By default, the **Report #** area displays report details for either the key report or, if subordinate reports exist, the most recent subordinate report.

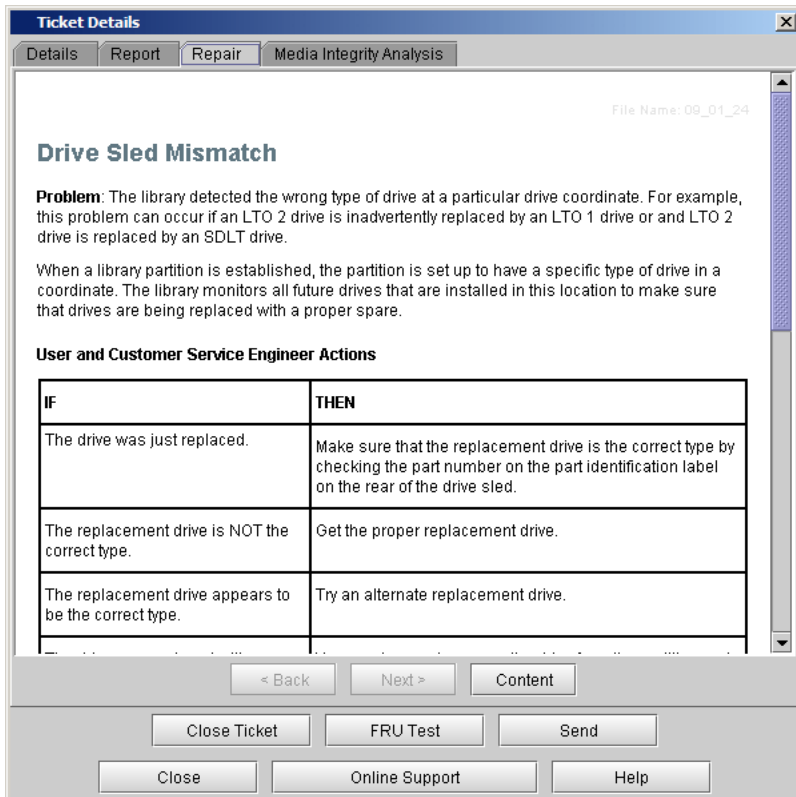
The following describes the elements on the **Report** tab:

Element	Description
In the Reports Tree area:	
Report tree area	<p>Provides a hierarchy of report information that is associated with the ticket. Descriptions includes reason text that describes the cause of the report.</p> <p>Initially, only the highest level of the report tree appears. Clicking this level (Reports for Ticket #) reveals one or more second-level reports, and clicking a second-level report reveals one or more third-level reports. Second-level reports function essentially as containers of third-level reports. A ticket in the Open state has one or more third-level reports, including one key report. The key report represents the earliest time at which the ticket reached its highest severity level. It often isolates the most significant problem. A ticket in the Closed or Verified state does not have a key report.</p>
In the Report # area:	
Report ID	The library-assigned identifier for the report.
Posted	The date and time on which the library created the report.
Duplicates	For open tickets only, the number of times that the library created the same report. If the identical issue occurs while the ticket remains open, the library creates an identical report and increments the report's duplicate count. If the library has not created duplicate reports, the value is zero (0).
Status Group	<p>The subsystem that caused the ticket. Possible subsystems are:</p> <ul style="list-style-type: none"> Connectivity Drives Control Power Cooling Robotics

Element	Description
Severity	<p>The severity level that is associated with the status group (subsystem). Possible levels are:</p> <ul style="list-style-type: none"> • Failed • Degraded • Warning • Good
FRU ID	The identifier for the FRU.
FRU Instance	<p>In libraries with multiple FRUs of the same kind, the specific FRU that caused the report. This field usually identifies a particular FRU by its location in the library (for example, [1,1,1,8,1,1] for a drive sled). If the library has only one instance of the FRU, this field is blank.</p>
FRU Category	The category to which the FRU belongs.
Reason	A brief explanation of why the FRU caused the report. Reasons describe the causes of issues.
Error Code	<p>A number that is associated with a particular issue that caused the ticket report. Because more than one issue can cause a report, an error code provides another level of detail to what the report provides. The error code maps to a portion of library firmware code, which a trained analyst can examine to determine the root cause of an issue. This information is for technical support use only.</p>
Modifier	<p>A numerical qualifier, in hexadecimal format, that provides context for an error condition. A modifier adds another level of detail to what the error code provides. If a modifier does not exist for the error condition, this field is set to "0x0". This information is for technical support use only.</p>
Repair Link	The name of the repair page that is associated with the report.
Report Description	A summary description of the report.

Viewing Repair Pages

Repair pages provide problem descriptions and corrective actions that you or a CSE can perform. To display the repair page that is associated with a ticket, click the **Repair** tab on the **Ticket Details** dialog box.



The repair page provides the following information:

- The title at the top of the repair page is a brief description of the issue.
- The **Problem** section describes the issue in more detail.
- The **User and Customer Service Engineer Actions** section provides corrective actions that the user or the CSE can perform.

- The **Customer Service Engineer Actions** section provides additional corrective actions that the CSE can perform. If you are a user, do not perform these steps. Contact technical support for assistance.



Note If you are a CSE, see the *Scalar i2000 Maintenance Guide* for detailed maintenance action plans, and removal and replacement procedures.

- The **Technical Support Information** section provides a comprehensive list of FRUs that could be involved.
- Text on the repair pages can include links to specific Online Help pages, which appear in place of the repair page when you click them. Navigation buttons near the top of the **Repair** tab enable you to access Online Help pages as follows:
- The **< Back** button returns you to the previously viewed page (either a previously viewed Online Help page or the repair page).
- The **Next >** button returns you to the page that you were viewing before you clicked the **< Back** button.
- The **Content** button displays a table of contents for the Online Help system.

Viewing Tape Alerts and Generating Media Integrity Analysis Reports

Tape alerts are issued by a drive whenever there is a problem in the drive that relates to a tape cartridge.

The problem can be with the drive or with the tape cartridge. You can view tape alerts on the **Media Integrity Analysis** tab of the **Ticket Details** dialog box or generate tape alert reports from **Reports** on the menu. See [Viewing Tape Alerts](#) on page 32 or [Generating Media Integrity Analysis Reports](#) on page 34.



Note The **Media Integrity Analysis** feature requires a license key to use. For more information, see [Enabling Licenses](#) on page 104.

You can use these reports to cross-reference tape alerts for drives and tape cartridges over a specified period of time, in order to determine if the problem belongs to the drive or to a specific tape cartridge. Typically,

tape alerts point to a drive problem if a specific drive exhibits tape alerts against multiple pieces of media. Conversely, tape alerts point to a media problem if a specific piece of media exhibits tape alerts against multiple drives. See [Generating Media Integrity Analysis Reports](#) on page 34.

Viewing Tape Alerts

To view tape alerts:

- 1 Click the **Media Integrity Analysis** tab on the **Ticket Details** dialog box.



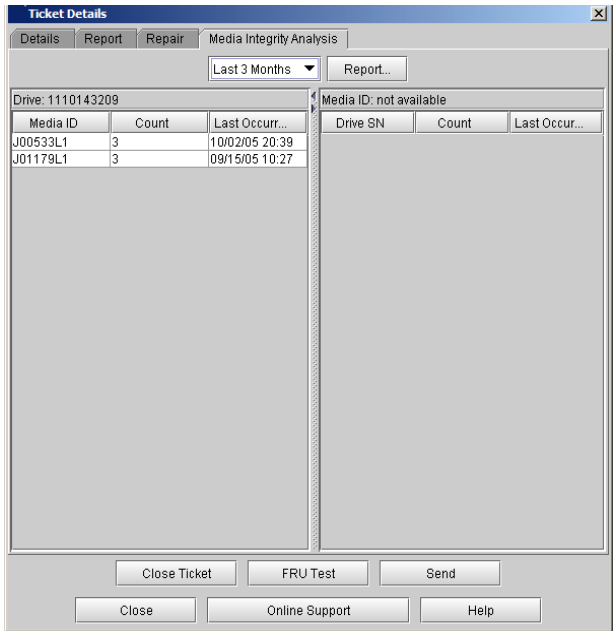
Note

The **Media Integrity Analysis** tab only appears on the **Ticket Details** dialog box for drive subsystem tickets.

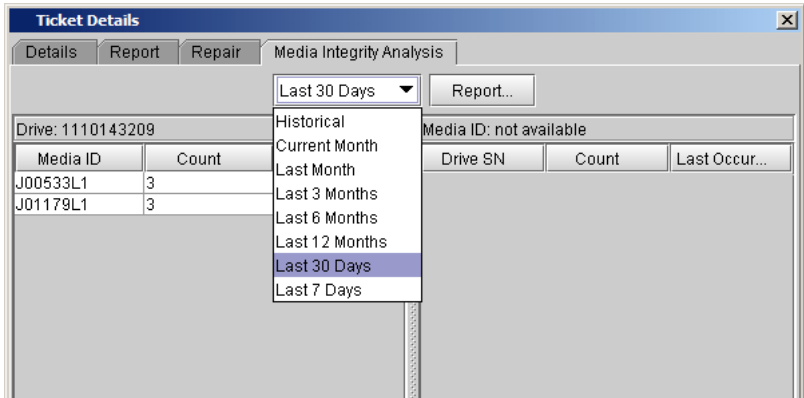
The **Media Integrity Analysis** view appears, displaying one of the following:

If the ticket contains a valid drive serial number and the drive is present in the library, the view displays a list of drive SNs in the left pane and media IDs in the right pane for which tape alerts exist for the specified date range.

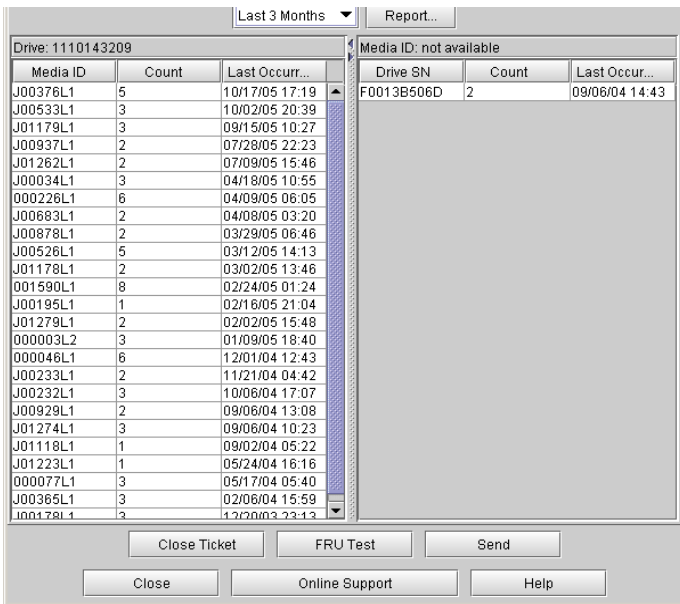
- If the drive serial number given in the ticket is invalid or if the drive is not present in the library, the view displays the message, “Invalid serial number or drive is no longer present”.



- 2 To change the date range, click the down arrow next to the date box and select the range you want.



The **Media Integrity Analysis** tab displays the tape alert information available for the selected range.



- 3 To sort the lists, click the column heading you want to sort.
- 4 Go to [Generating Media Integrity Analysis Reports](#) on page 34.

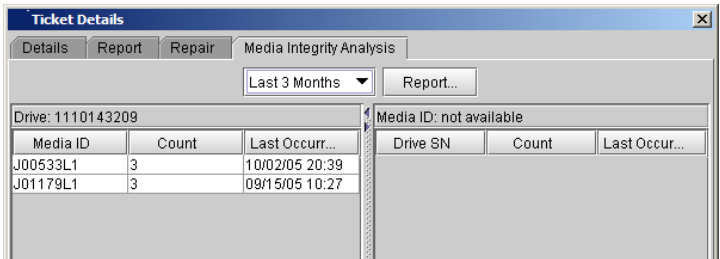
Generating Media Integrity Analysis Reports

This function allows you to generate reports using the criteria described in [table 3 on page 46](#).

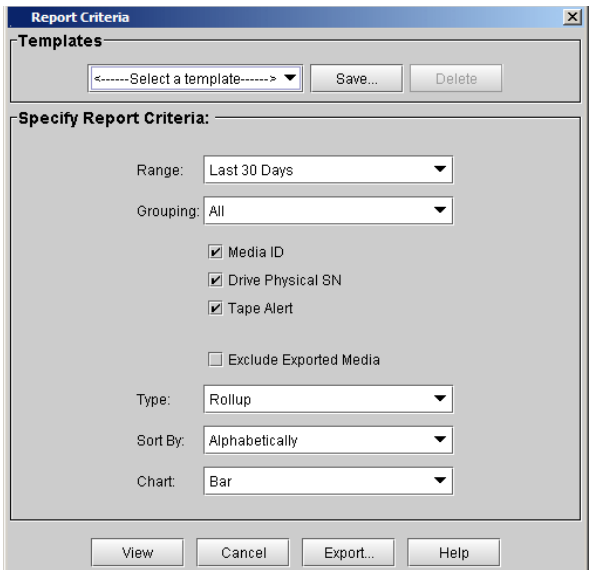
To generate tape alert reports:

- 1 Do one of the following:

On the **Media Integrity Analysis** tab of the **Ticket Details** dialog box, click **Report**.



- On the menu bar, click **Tools**→ **Reports**→ **Media Integrity Analysis**. The **Report Criteria** dialog box appears.



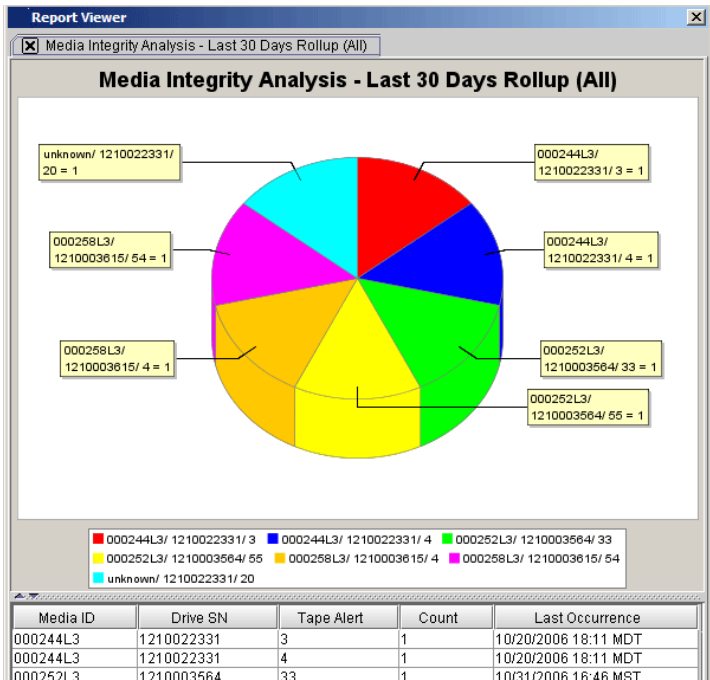
- 2 To view a report, select the report criteria described in the following and click **View**.

Table 2 Report Criteria

Element	Description
Range	<p>Specifies the range of time to cover in the report. Choices include:</p> <ul style="list-style-type: none"> • Historical • Current Month • Last Month • Last 3 Months • Last 6 Months • Last 12 Months • Last 30 Days (default) • Last 7 Days
Grouping	<p>Determines which drive or tape cartridge to base the report. Choices include:</p> <ul style="list-style-type: none"> • All (default) • Selected Drive by Physical SN – displays the Choose Drive dialog box • Selected Media by Media ID – displays the Specify Media dialog box
Media ID, Drive Physical SN, Tape Alert check boxes	<p>Selected in any combination to determine which values are included in the report. (All=default)</p>
Type	<p>Type of report. Choices include:</p> <ul style="list-style-type: none"> • Rollup – displays the values based on which of the above check boxes, Media ID, Drive Physical SN, and/or Tape Alert, that you have selected (default) • Trend – shows the occurrence of tape alerts over time
Sort By	<p>How the report is sorted. Choices include:</p> <ul style="list-style-type: none"> • Alphabetically (default) • Count • Last Occurrence

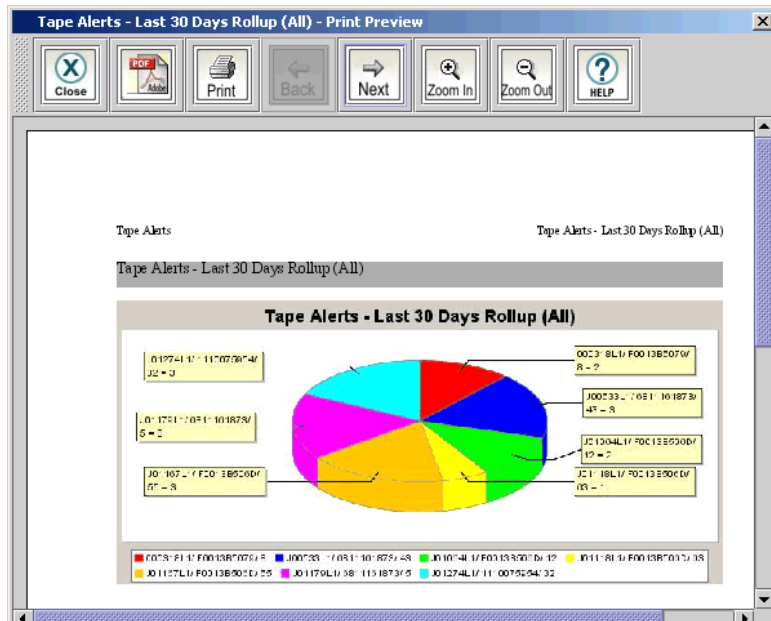
Element	Description
Chart	<p>Determines the type of chart. Choices include:</p> <ul style="list-style-type: none"> • Area • Bar • Bar 3D • Line • Stacked Area • Stacked Bar • Stacked Bar 3D • Pie • Pie 3D (default)

The **Report Viewer** dialog box appears. The content and appearance of the report varies depending on the selected criteria.



3 Click Preview.

The report appears in the **Media Integrity Analysis Print Preview** window.



4 To view the next page of the report, click the Next icon on the toolbar.

Tape Alerts - Last 30 Days Rollup (All)

Media ID	Drive SN	Tape Alert	Count	Last Occurrence
000318L1	F0013B5079	8	2	09/16/2005 01:01 MDT
000333L1	6811161873	43	3	10/02/2005 20:39 MDT
001064L1	F0013B506D	11	2	09/16/2005 15:59 MDT
001118L1	F0013B506D	63	1	09/22/2005 22:37 MDT
001167L1	F0013B506D	55	3	10/03/2005 15:30 MDT
001179L1	6811161873	5	3	09/15/2005 10:27 MDT
001274L1	1110075954	32	3	09/20/2005 11:38 MDT
Total:			17	

5 To increase or decrease the magnification of the report, click the Zoom In or Zoom Out buttons.

- 6 In the report viewer, you can perform the following tasks:
 - 1 To save the report as an Adobe® Portable Document Format (PDF) file, click the **Adobe PDF** icon on the toolbar.
 - 2 In the **Saving Report to PDF** dialog box, enter the appropriate information, and then click **Confirm** to convert the report into a PDF file.
 - 3 To print the report, click the **Print** icon on the toolbar.

Saving a Report Template

If you frequently generate the Media Integrity Analysis Report with the same set of report criteria, save the criteria as a template. Loading the template recalls the saved report criteria and lets you quickly generate a report based on the saved criteria.

- 1 On the menu bar, click **Tools**→**Reports**→**Media Integrity Analysis**. The **Report Criteria** dialog box appears.
- 2 Under **Specify Report Criteria**, click criteria options in the lists to customize the content and appearance of the Media Integrity Analysis Report.

[Table 2 on page 36](#) summarizes the available report criteria options.

- 3 Under **Templates**, click **Save**.
- 4 Type a name for the template, and then click **OK**.

The template appears in the list under **Templates**.

To load the saved report criteria at a later time, click the template in the list, and then click **View** to generate the report.

- 5 To close the **Report Criteria** dialog box, click **Cancel**.

Mailing, Saving, and Printing Ticket Information

The **Send** button on the **Ticket Details** dialog box enables you to send detailed ticket information, including all report details, to e-mail addresses. If you are accessing the LMC from a remote client, **Send** also enables you to save the information to a file or print it.



Note

You can mail, save, or print ticket information from a remote client. However, you cannot save or print the information from the library's touch screen.

Ticket information that a user sends by using the **Send** button is essentially the same as the information that the library automatically provides in e-mail notifications (see [Understanding E-mail Notifications](#) on page 10). The only differences are that the subject line states "Library RAS Information" and the body of the message does not have a "REASON FOR AUTOMATED E-MAIL" section, but it has a "REPAIR AND TROUBLESHOOTING INSTRUCTIONS ATTACHED" section.

The message body also includes the following information, which provides details about the ticket and library conditions at the time of the event:

- Ticket summary
- Ticket details, including status information
- Firmware versions, including MCB, RCU, CMB, and drive bricks
- Physical library configuration
- Library states, such as physical library online or offline, partitions online or offline, or robotics enabled or disabled
- Time stamps of recent activity
- Report summary
- Report details for the ticket

The RAS repair page attachment is in HTML format.



Note

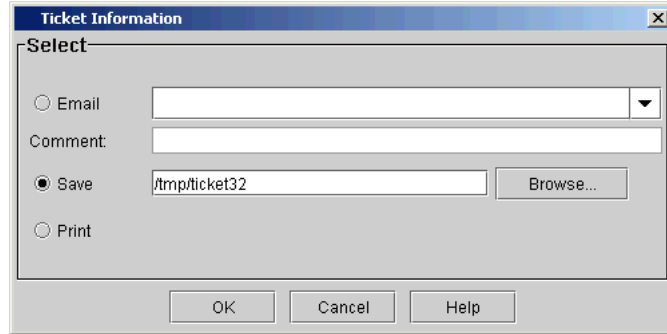
Before you perform the following procedure, you must make sure that e-mail is appropriately configured in the LMC so that the library can send ticket details to the recipient. See [Configuring E-mail](#) on page 140.

To mail, save, or print information for a particular ticket, perform the following steps:

- 1 Make sure that the **Ticket Details** dialog box displays information for the ticket that you want to send. See [Displaying Ticket Lists](#) on page 16 and [Viewing Ticket Details](#) on page 21.

2 Click **Send**.

The **Ticket Information** dialog box appears.



3 Perform one of the following tasks:

- To indicate that you want to send the information as an e-mail message to a recipient, select **Email**, and then either type an e-mail address in the **Email** text box or select an existing address from the drop-down list. You can type a comment in the **Comment** text box to send with the information.
- To indicate that you want to save the information, select **Save**, and then either type in the **Save** text box a path and a file name to which you want the information saved or click **Browse** to specify a location and a file name.



Note

The **Save** option is available to remote client users only. It appears grayed out on the touch screen.

- To indicate that you want to send the information to a printer, select **Print**.



Note

The **Print** option is available to remote client users only. It appears grayed out on the touch screen.

4 To send, click **OK**.

Running Verification Tests to Determine Issue Resolution

A ticket is always generated against a particular FRU when the library detects an issue. Therefore, the library provides FRU tests that you can run to determine whether the conditions that caused the ticket have been resolved. Running the FRU tests is an important part of ensuring that the system is working properly.

The library can detect issues under the following contexts:

- When the library polls at regular intervals, or
- When a host or user commands the library to perform an operation (such as occurs with GUI commands, host inventory, and host move media)

FRU tests are designed to help resolve issues under the second context.

During FRU testing, the library creates operational scenarios to evaluate the functionality of a FRU. FRU tests attempt to evaluate as many aspects of the FRU as possible, but they might not fully recreate the conditions that caused the original ticket. The library cannot recreate all conditions and, therefore, the library does not provide tests for some FRUs.

The instructions on the ticket's repair page direct you to run a FRU test if an applicable one exists. If you run the test and the results are all good, the library automatically transitions the ticket to the Verified state.



Note

If you cannot run a test, make sure that you complete the repair page instructions and, if needed, physically examine the FRU. After you determine that the issue is resolved, manually transition the ticket to the Closed state. See [Closing Tickets](#) on page 43. After you close the ticket, the library transitions the ticket to the Verified state if it is able to do so.

You can access the tests in two ways:

- On the main LMC display, click **Tools**→**Verification Tests**.

The **Verification Tests** dialog box appears. From this dialog box, you can choose from a variety of verification tests, including the FRU tests.

- On the **Ticket Details** dialog box, click **FRU Test**.



Note The **FRU Test** button is available only if the ticket's FRU has an applicable verification test that you can run.

The **Verification Tests** dialog box appears with the appropriate test already selected and ready to start.

For details about the verification tests and how to run them, see [Working With Verification Tests](#) on page 275.

Closing Tickets

Manually close a ticket if all of the following conditions are true:

- You have completed the repair page instructions to resolve the issue (for example, replaced a FRU).
- The **FRU Test** button on the **Ticket Details** dialog box is not available. This means that an applicable verification test does not exist for the ticket's FRU.



Note If the **FRU Test** button is available for a ticket, you should use it to access and run the verification test. You should not manually close it. The verification test determines whether the issue is resolved, and the library automatically transitions the ticket to the Verified state if the test passes without problems. See [Running Verification Tests to Determine Issue Resolution](#) on page 42.

- The issue has been resolved, but the ticket remains in an Open state (for example, when defective media has been replaced in the library).

You should manually transition a ticket to the Closed state after physically examining the FRU to make sure that the issue is resolved.

Closing Individual Tickets

To transition a ticket to the Closed state, perform the following steps:

- 1 Make sure that the **Ticket Details** dialog box displays information for the open ticket that you want to close. See [Displaying Ticket Lists](#) on page 16 and [Viewing Ticket Details](#) on page 21.
- 2 Click **Close Ticket**.

The ticket's state changes to Closed. If the library is able to do so, it automatically transitions the closed ticket to the Verified state.



Note

If the identical issue occurs again within 30 minutes after the ticket transitions to the Closed or Verified state, the library reopens the ticket and increments the ticket's duplicate count.

Tickets that are in the Closed or Verified state for more than 30 minutes cannot be reopened. In this case, if the identical problem occurs again, the library creates a new ticket.

Closing Multiple Tickets

You can use this method when you have many tickets relating to the same issue, for example, when you have many drives in a library or many tape alerts.

To transition multiple tickets to the Closed state, do the following:

- 1 On the **Ticket List** dialog box, select each ticket you want to close by clicking the check box.

See [Displaying Ticket Lists](#) on page 16 and [Viewing Ticket Details](#) on page 21.

- 2 Click **Close Tickets**.
- 3 In the **Attention** message box, click **Yes** to confirm that you want to close multiple tickets.

The tickets' state changes to Closed. If the library is able to do so, it automatically transitions the closed tickets to the Verified state.

Generating the Tickets Report

The Tickets Report lets you see how many tickets occurred in a particular time period. You can choose to group tickets by subsystem, module, or FRU, and the results can be presented as a rollup summary or as a trend so you can see if the number of issues is increasing or decreasing over time. Also, the report results can be presented in different chart formats, such as bar graphs or pie charts.

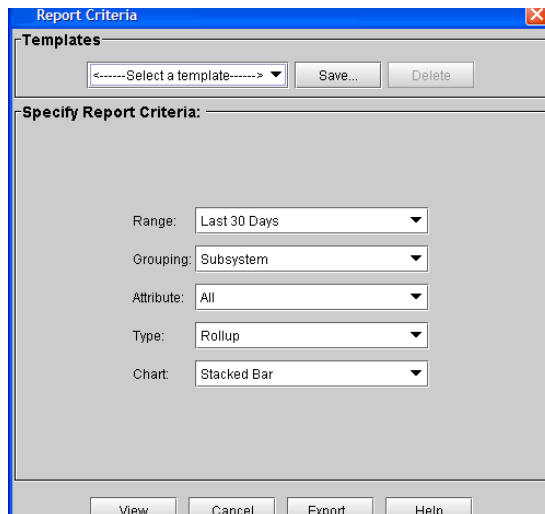
After generating a report, you can print it or save it as a PDF file. In addition, you can save a set of report criteria as a template for reports you frequently generate.

Specifying Tickets Report Criteria

To generate the Tickets Report, first specify the report criteria, and then view the report.

- 1 Log on as an administrator.
- 2 On the menu bar, click **Tools**→**Reports**→**Tickets**.

The **Report Criteria** dialog box appears.



- 3 Under **Specify Report Criteria**, click criteria options in the lists to customize the content and appearance of the Tickets Report.

[Table 3 on page 46](#) summarizes the available report criteria options.

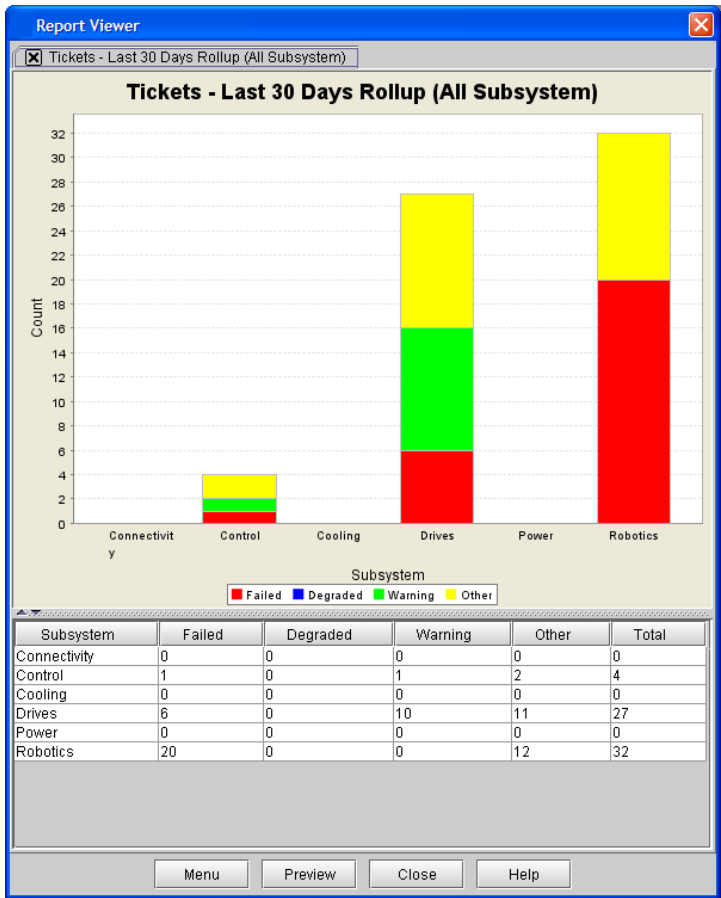
Table 3 Tickets Report Criteria Options

Criteria	Description
Range	<p>Specifies the range of time to cover in the report. Choices include:</p> <ul style="list-style-type: none"> • Historical • Current Month • Last Month • Last 3 Months • Last 6 Months • Last 12 Months • Last 30 Days (default) • Last 7 Days
Grouping	<p>Determines how tickets are grouped in the report. Choices include:</p> <ul style="list-style-type: none"> • Subsystem (default) – tickets are grouped according to subsystem • FRU Category – tickets are grouped according to FRU category • FRU Id – tickets are grouped according to FRU ID • Serial Number – tickets are grouped according to module serial number • Selected Drive by Physical SN – tickets are grouped according to drive serial number (displays the Choose Drive dialog box)
Attribute	<p>Determines how tickets are identified in the report. Choices include:</p> <ul style="list-style-type: none"> • All (default) – tickets are separated according to attribute (Failed, Degraded, Warning, or Other) • Total – tickets are not separated according to attribute
Type	<p>Specifies the type of report. Choices include:</p> <ul style="list-style-type: none"> • Rollup (default) – displays the values based on the selected grouping • Trend – shows the occurrence of tickets over time (grouping criteria is not used)

Criteria (Continued)	Description
Chart	Determines the type of chart. Choices include: <ul style="list-style-type: none">• Area• Bar• Bar 3D• Line• Stacked Area• Stacked Bar (default)• Stacked Bar 3D• Pie• Pie 3D

4 Click **View**.

The **Report Viewer** dialog box appears. The content and appearance of the report varies depending on the selected criteria.



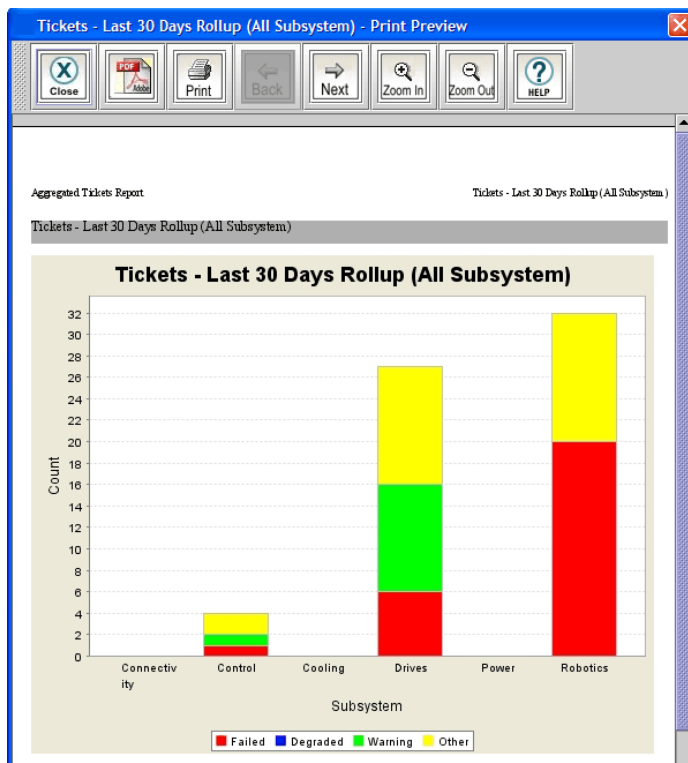
- 5 When you are finished viewing the Tickets Report, click **Close**.
- 6 To close the **Report Criteria** dialog box, click **Cancel**.

Printing or Exporting a Report to PDF

After generating the Tickets Report, you can print it or export it to a PDF file.

- 1 On the **Report Viewer** dialog box, click **Preview**.

The **Print Preview** dialog box appears.



- 2 Do one or more of the following:

- To navigate through the pages of the report, click **Back** or **Next**.
- To increase or decrease the magnification of the report, click **Zoom In** or **Zoom Out**.
- To print the report, click **Print**. Specify print options, and then click **OK**.

- To save the report as a PDF file, click **PDF**. Specify a file path and file name, and then click **Confirm**.
- 3 When you are finished working with the **Print Preview** dialog box, click **Close**.



Note

You cannot print reports or save them to a PDF file using the touch screen.

Exporting a Report to an E-mail or a Text File

Instead of viewing the report as a chart, you can e-mail the report data to an e-mail address. Or export the report data to a comma delimited text file (*.csv) for use in other programs.

- 1 On the menu bar, click **Tools**→ **Reports**→ **Tickets**.

The **Report Criteria** dialog box appears.

- 2 Under **Specify Report Criteria**, click criteria options in the lists to customize the content and appearance of the Tickets Report.

[Table 3 on page 46](#) summarizes the available report criteria options.

- 3 Click **Export**.

The **Export Raw Data** dialog box appears.

- 4 Do one of the following:
 - To send the report data to an e-mail address, click **Email**. Type or select the e-mail address, type an optional comment in the **Comment** box, and then click **OK**.
 - To save the report data to a comma delimited text file, click **Save**. Specify a file path and file name, and then click **OK**.
- 5 To close the **Report Criteria** dialog box, click **Cancel**.

Saving a Report Template

If you frequently generate the Tickets Report with the same set of report criteria, save the criteria as a template. Loading the template recalls the saved report criteria and lets you quickly generate a report based on the saved criteria.

- 1 On the menu bar, click **Tools**→**Reports**→**Tickets**.

The **Report Criteria** dialog box appears.

- 2 Under **Specify Report Criteria**, click criteria options in the lists to customize the content and appearance of the Tickets Report.

[Table 3 on page 46](#) summarizes the available report criteria options.

- 3 Under **Templates**, click **Save**.
- 4 Type a name for the template, and then click **OK**.

The template appears in the list under **Templates**.

To load the saved report criteria at a later time, click the template in the list, and then click **View** to generate the report.

- 5 To close the **Report Criteria** dialog box, click **Cancel**.

Interpreting LEDs

LEDs can help you assess the state of a library component. The primary library LEDs can be grouped as follows:

- Blade status LEDs
- Drive status LEDs
- Fibre port link LEDs (for Fibre drives and Fibre Channel I/O blades)
- MCB port LEDs
- LBX terminator LEDs
- Power supply status LEDs

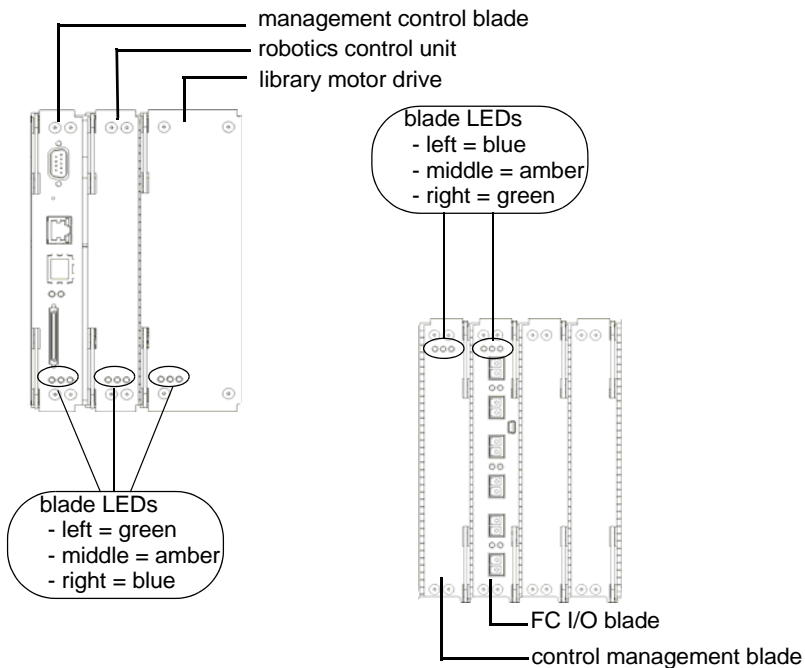
Interpreting Blade Status LEDs

Each of the following library blades has a set of green, amber, and blue LEDs that indicate blade processor status, health status, and power control status:

- Management control blade (MCB)
- Control management blade (CMB)
- I/O blade
- Robotics control unit (RCU)
- Library motor drive (LMD)

[Figure 2](#) shows the locations and colors of the status LEDs on the five blades that can be in the library.

Figure 2 Locations and Colors of Blade Status LEDs



Blade status LEDs provide troubleshooting information that you can use in conjunction with tickets that the library creates. However, the LEDs might not directly correspond to tickets. The LEDs can indicate a firmware or hardware problem so severe that the library cannot create or display a ticket. For example, if the MCB firmware becomes inoperable, the amber LED flashes at 1 Hz, but the library might not be able to display any related tickets.

For a description of each LED color and what its state might mean, see [table 4 on page 54](#). For a description of how the blade status LEDs appear under normal conditions, see [table 5 on page 55](#).

Table 4 Explanations of Blade
Status LED States

LED Color	Represents	Possible States and Explanations
Green	Processor status	<ul style="list-style-type: none"> • Solid off – blade’s main processor is not operating (or blade is booting) • Solid on – blade’s main processor is not operating (however, this does not apply to the LMD; solid on indicates that the LMD’s main processor is operating normally) • Blinks one time every second (1 Hz) – blade’s main processor is operating normally • Blinks 10 times every second (10 Hz) – identify mode • Solid on for three seconds, then blinks twice at 1 Hz, and then repeats – blade firmware is downloading
Amber	Health status	<ul style="list-style-type: none"> • Solid off – blade’s power and control subsystem is operating normally • Solid on – blade’s power and control subsystem has failed <p>Solid on also can mean that the blade’s power and control subsystem firmware is autoleveling. In conjunction with the blue amber LED blinking one time every 10 seconds, this is a normal condition. Autoleveling takes about three minutes for each blade, and blades within an I/O management unit autolevel in series. It can take as long as three minutes for the power and control subsystem to download. Never remove a blade when the amber LED is solid on unless it has been on continuously for at least 10 minutes.</p>
Blue	Power control status	<ul style="list-style-type: none"> • Solid off – blade is not receiving power • Solid on – blade is powered down; ready to be replaced (swap mode) • Blinks one time every 10 seconds (flash) – blade is powered on; operating normally

Table 5 Blade Status LED
States - Normal Conditions

LED Color	State and Explanation
Green	Blinks one time every second (1 Hz) – blade’s main processor is operating normally (however, this does not apply to the LMD; solid on indicates that the LMD’s main process is operating normally)
Amber	Solid off – no errors are detected; blade’s PIP is operating normally
Blue	Blinks one time every 10 seconds (flash) – blade is powered on; operating normally

Actions Based on LED States

When the RAS system is operating properly, service actions should be based on tickets first and foremost. However, some situations occur when the amber LED indicates problems that are not detected by the ticket system. You should always act on any amber LED that is solidly on, which indicates that the blade’s power and control subsystem has failed. In this case, replace the blade.

When you replace a blade FRU or escalate a problem based on LED states, perform the following steps:

- 1 Observe and report the timing pattern of the blue, amber, and green LED group. Spend at least 30 seconds observing the LEDs and record the results in the service request (SR) and on any equipment failure report form that you return with the part. Proper reporting of all LED states is critical for determining the root cause of the failure.
- 2 Capture a system snapshot and send it to technical support for analysis.

Interpreting Drive Status LEDs

The library reports all drive issues that can affect customer operations. In addition to examining library reports, you should observe drive sled link LED and status LED activity.

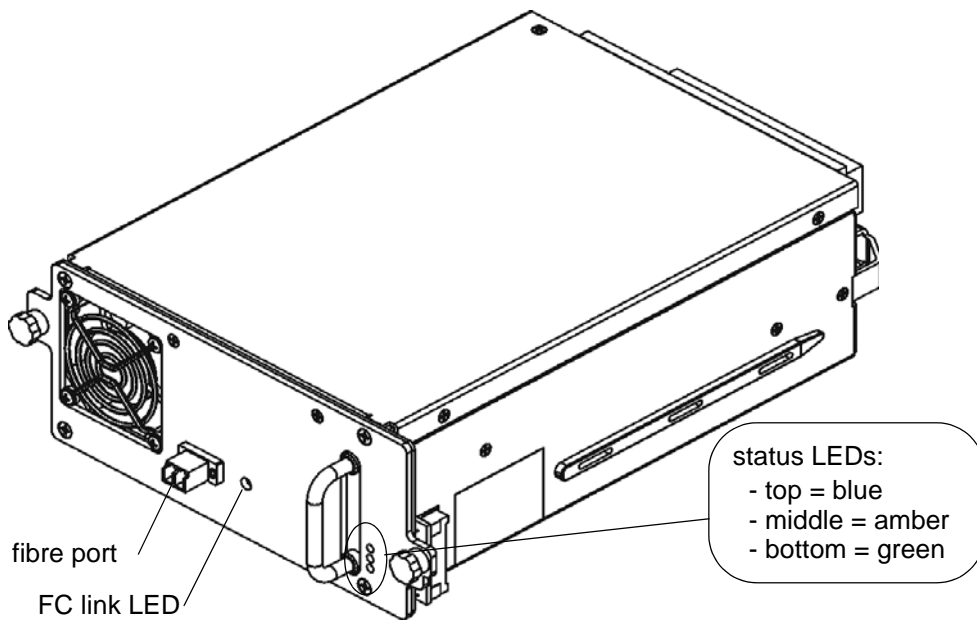


Note

The blinking codes described in [table 6 on page 58](#) on page 133 are the same for Fibre Channel and SCSI drives in the UDS-2 drive sleds.

[Figure 3](#) shows the locations of the status LEDs and the Fibre Channel link LED on the rear of a UDS-2 drive sled.

Figure 3 Rear View of Fibre Channel Drive Sled (UDS-2)

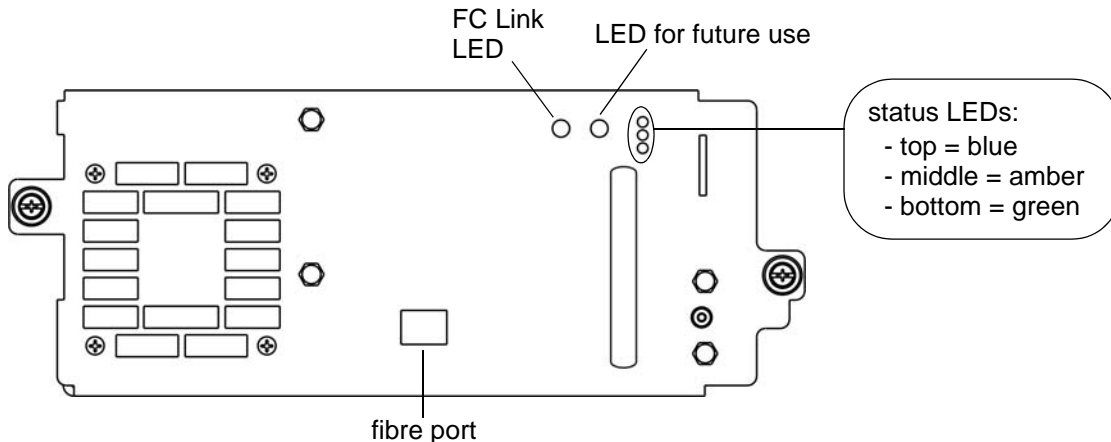


Note

SDLT-600 Fibre drives do not have a Fibre Channel link LED.

[Figure 4](#) shows the locations of the status LEDs and the Fibre Channel link LED on the rear of a UDS-3 drive sled.

Figure 4 Rear View of Fibre Channel Drive Sled (UDS-3)



[Table 6 on page 58](#) describes how to interpret the drive sled status LED activity that you might see on the rear of a UDS-2 or UDS-3 drive sled. For a description of how the blade status LEDs appear under normal conditions, see [table 7 on page 59](#). For information about interpreting the drive link LED, see [Drive Sled Fibre Channel Link LED](#) on page 59.

Table 6 Drive Sled Status LED States (UDS-2 and UDS-3)

LED Color	Represents	Possible States and Explanations
Green	Processor status	<ul style="list-style-type: none"> • Solid off – drive sled’s main processor is not operating (or blade is booting) • Solid on – drive sled’s main processor is not operating • Blinks one time every second (1 Hz) – drive sled’s main processor is operating normally • Blinks 10 times every second (10 Hz) – identify mode • Solid on for three seconds, then blinks twice at 1 Hz, and then repeats – drive sled or drive brick firmware is downloading • Blinks three times in three seconds (1 Hz), then pauses (solid off), and then repeats – drive brick is activating (varying on)
Amber	Health status	<ul style="list-style-type: none"> • Solid off – drive sled’s controller (drive DC to DC converter [DDC]) is operating normally • Solid on – drive sled’s DDC has failed
Blue	Power control status	<ul style="list-style-type: none"> • Solid off – drive sled is not receiving power • Solid on – drive brick is powered down; ready to be replaced (swap mode) or varied on • Blinks one time every 10 seconds (flash) – drive brick is powered on; operating normally

Table 7 Drive Sled Status LED States - Normal Conditions

LED Color	State and Explanation
Green	Blinks one time every second (1 Hz) – drive sled’s main processor is operating normally. The green LEDs for all drive sleds that are operating normally blink together.
Amber	Solid off – no errors are detected; drive sled’s controller is operating normally.
Blue	Blinks one time every 10 seconds (flash) – drive sled is powered on; operating normally.

Interpreting Fibre Port Link LEDs

A fibre port link LED shows the state of the Fibre Channel link and whether the link is ready to transmit commands.

Drive Sled Fibre Channel Link LED

The Fibre Channel link LED for a drive sled is located on the rear of the drive sled. [Figure 3](#) on page 56 shows the location of the Fibre Channel link LED on the rear of the UDS-2 drive sled, and [Figure 4](#) on page 57 shows the location of the Fibre Channel link LED on the rear of the UDS-3 drive sled.



Note

SDLT-600 Fibre drives do not have a Fibre Channel link LED.

[Table 8](#) describes how to interpret the Fibre Channel link LED activity that you might see on the rear of the UDS-2 drive sled. [Table 9 on page 61](#) on page 135 describes the Fibre Channel link LED activity on the rear of the UDS-3 drive sled.

Table 8 Fibre Drive Sled Link
LED States (UDS-2)

LED Color	Represents	State and Explanation
Green	LIP and activity	<ul style="list-style-type: none"> • Solid on – loop initialization protocol (LIP) has occurred. • Blinks at irregular intervals – host command/data activity is occurring.
Amber	Online and light detected	<ul style="list-style-type: none"> • Solid on – the library has enabled the drive data bus; it can detect light through a fiber optic cable.
No color		<ul style="list-style-type: none"> • Solid off – the drive brick is varied off or the drive cannot detect light through a fiber optic cable (equivalent to no fibre cable plugged in). If the drive brick is varied off, the blue status LED will be solid on.

Table 9 Fibre Drive Sled Link
LED States (UDS-3)

LED Color	Represents	State and Explanation
Green	LIP and activity	<ul style="list-style-type: none"> • Solid on – loop initialization protocol (LIP) has occurred. • Blinks at irregular intervals – host command/ data activity is occurring.
Amber	Online and light detected	<ul style="list-style-type: none"> • Solid on – the library has enabled the drive data bus; it can detect light through a fiber optic cable. • Blinks at regular intervals – the library has enabled the drive data bus, but light is not detected through the fiber optic cable.
No color		<ul style="list-style-type: none"> • Solid off – the library has not enabled the drive data bus or the drive brick is varied off. If the drive brick is varied off, the blue status LED will be solid on.



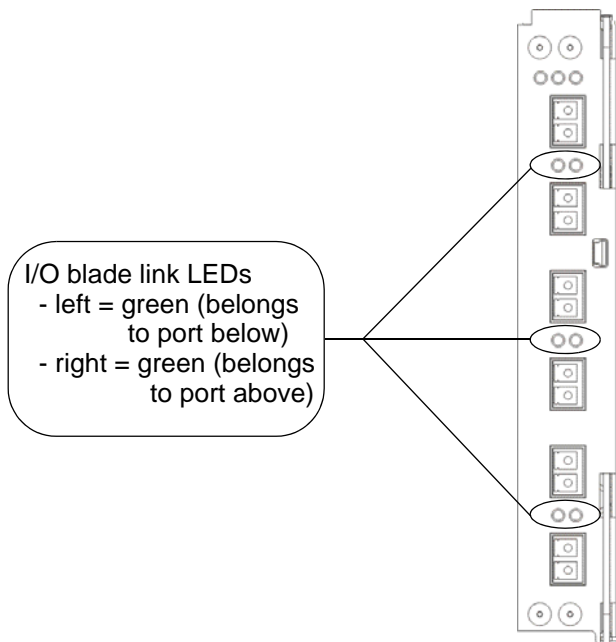
Note

A UDS-2 drive with no fiber optic cable plugged in is healthy if the link LED is solid off. A UDS-3 drive with no fiber optic cable plugged in is healthy if the LED is amber and blinking at regular intervals, indicating that the library has enabled the drive data bus, but no light is detected.

I/O Blade Fibre Port Link LED

The link LED for an I/O blade fibre port is located next to the port. On the I/O blade faceplate, black lines indicate how each link LED belongs to a port. [Figure 5](#) shows the locations of the I/O blade Fibre port link LEDs.

Figure 5 Locations - Colors of I/O Blade Fibre Port Link LEDs



[Table 10 on page 63](#) describes how to interpret the link LED activity that you might see. There are two different models of I/O blade: 6404 and 7404. LED behavior varies based on which model is installed in the library.

Table 10 I/O Blade Link LED States

Blade Model	Possible Green LED States and Explanations
6404	<ul style="list-style-type: none"> • Solid on – the I/O blade has established a proper link and is ready to use. The drive detects light through the fiber optic cable. • Blinks slowly – the link is up and currently transporting commands. • Blinks rapidly – when the I/O blade is beginning to reboot or power up, all I/O blade link LEDs, along with the I/O blade’s green status LED, blink rapidly to indicate that the blade is starting the Power On Self Test (POST). • Blinks with other link LEDs in a racetrack pattern – when all of the I/O blade link LEDs blink consecutively in a clockwise order, the blade is booting up. This pattern stops when the blade is powered and ready. If the pattern doesn’t stop, the blade is unable to completely boot up. In this situation, follow the repair page instructions. • Solid off – the I/O blade does not detect light through the fiber optic cable.
7404	<ul style="list-style-type: none"> • Solid on – the I/O blade has established a link but is not currently transporting data. • Blinks – the link is active and is currently transporting data. • Solid off – the I/O blade has not established a link OR the link is active and is currently transporting a large amount of data.



Note

For the 7404 I/O blade, fibre port LEDs are off while the blade is booting up.

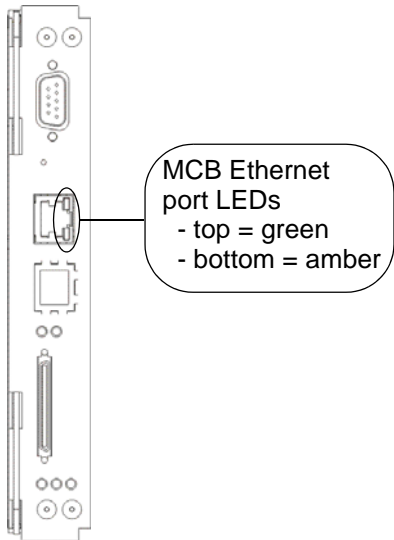
Interpreting MCB Port LEDs

The MCB has LEDs for the Ethernet, Fibre Channel, and SCSI ports.

MCB Ethernet Port LEDs

The LEDs on the MCB Ethernet port indicate status and activity. [Figure 6](#) shows the locations and colors of the MCB Ethernet port LEDs.

Figure 6 Locations - Colors of MCB Ethernet Port LEDs



[Table 11](#) describes how to interpret the Ethernet port LED activity that you might see.

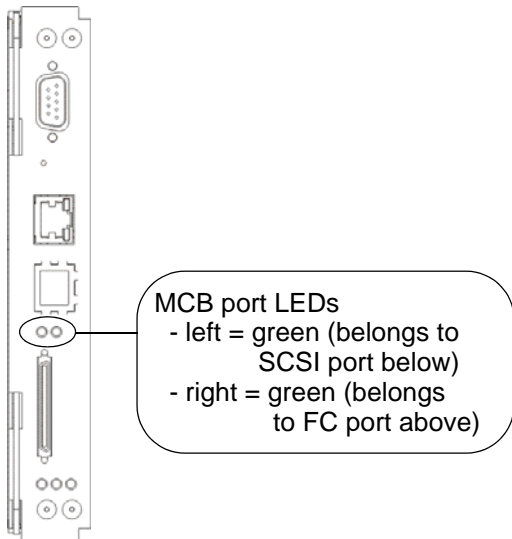
Table 11 Explanations of MCB
Ethernet Port LED States

LED Color	Possible States and Explanations
Green	<ul style="list-style-type: none"> • Solid on – the link is up; data can be sent or received through the Ethernet port • Solid off – the link is not up; data cannot be sent or received through the Ethernet port
Amber	<ul style="list-style-type: none"> • Flashes at irregular intervals – data activity is occurring through the Ethernet port • Solid off – no data activity is occurring through the Ethernet port

MCB Fibre Channel and SCSI Port LEDs

The LEDs for the MCB Fibre Channel and SCSI ports are for future use. Ignore LED behaviors that might appear. [Figure 7](#) on page 66 shows the locations and colors of the LEDs.

Figure 7 Locations - Colors
MCB FC / SCSI Port LEDs



Interpreting LBX Terminator LEDs

The LBX terminator has two versions. Version 01 has four LEDs and Version 03 has six LEDs. For more information, see the *Scalar i2000 Maintenance Guide*.

LBX Terminator Version 01 LEDs

The LBX terminator has four green LEDs that indicate the presence of modules in the library. [Figure 8](#) on page 67 shows the locations of the LEDs. [Table 12 on page 67](#) describes how to interpret LED activity on the LBX terminator.

Figure 8 Locations of LBX Terminator LEDs (Version 01)

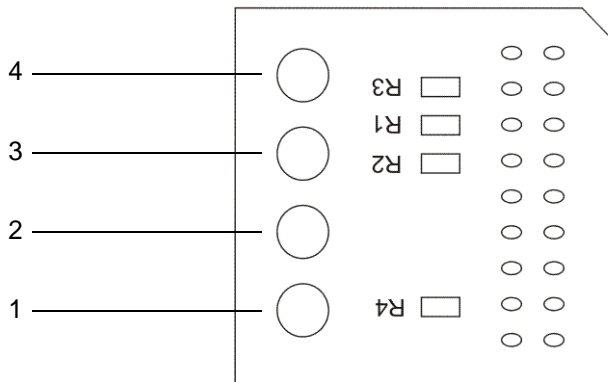


Table 12 LBX LED Version 01

LED On/Off Combinations				Explanation
1	2	3	4	
Off	Off	Off	Off	Robotics are disabled, the access door is open, or the LBX terminator is misaligned.
On	Off	Off	Off	The library has one control module and no expansion modules.
On	On	Off	Off	The library has one control module and one expansion module.
On	On	On	Off	The library has one control module and two expansion modules.
On	On	On	On	The library has one control module and three expansion modules.
On	Off	On	On	The library has one control module and four expansion modules.
On	On	Off	On	The library has one control module and five expansion modules.
On	Off	On	Off	The library has one control module and six expansion modules.
On	Off	Off	On	The library has one control module and seven expansion modules.

LBX Terminator Version 03 LEDs

The LBX terminator has six green LEDs that indicate the presence of modules in the library. [Figure 9](#) shows the locations of the LEDs. [Table 13 on page 69](#) describes how to interpret LED activity on the LBX terminator.

Figure 9 Locations of LBX Terminator LEDs (Version 03)

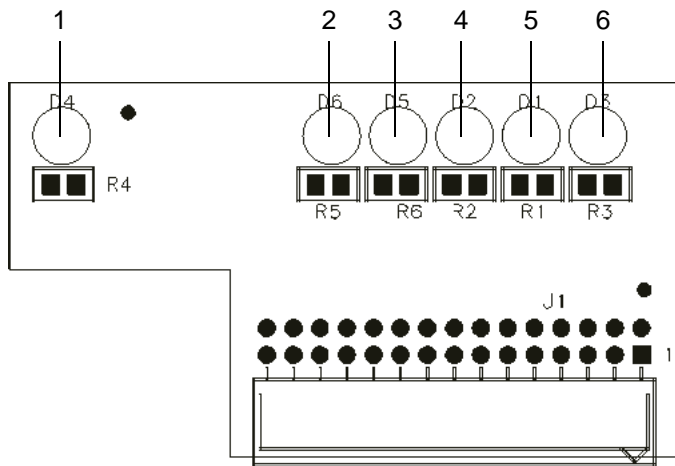


Table 13 LBX LED Version 03

LED On/Off Combinations						Explanation
1	2	3	4	5	6	
Off	Off	Off	Off	Off	Off	Robotics are disabled, the access door is open, or the LBX terminator is misaligned.
On	Off	Off	Off	Off	Off	The library has one control module and no expansion modules.
On	Off	Off	On	Off	Off	The library has one control module and one expansion module.
On	Off	Off	On	On	Off	The library has one control module and two expansion modules.
On	Off	Off	On	On	On	The library has one control module and three expansion modules.
On	Off	Off	Off	On	On	The library has one control module and four expansion modules.
On	Off	Off	On	Off	On	The library has one control module and five expansion modules.
On	Off	Off	Off	On	Off	The library has one control module and six expansion modules.
On	Off	Off	Off	Off	On	The library has one control module and seven expansion modules.

Interpreting Power Supply LEDs

Power supply problems are reported in tickets. To physically identify a power supply, note the power supply number and module number in the ticket details. Modules can have up to two power supplies each. The top supply is #1 and the bottom supply is #2.

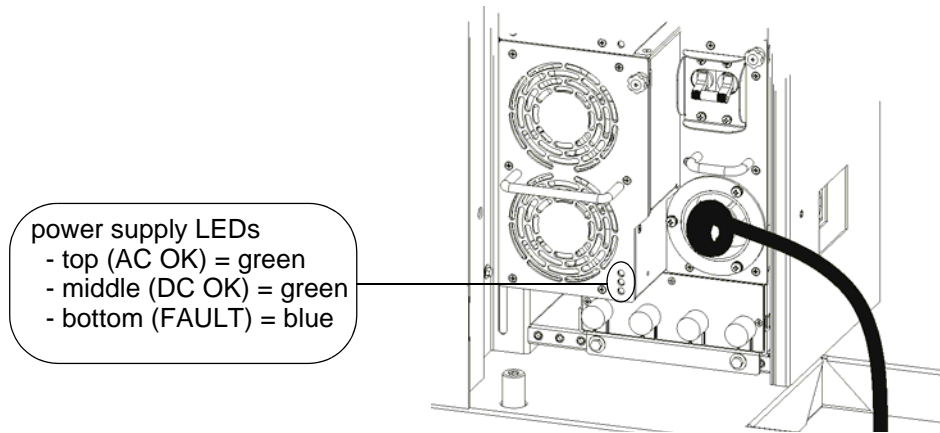


Note

The library can be physically configured to include up to seven expansion modules. If any of the expansion modules include drives, those modules also will have power supplies.

[Figure 10](#) shows the locations and colors of the power supply LEDs.

Figure 10 Locations and Colors of Power Supply LEDs



[Table 14](#) describes how to interpret LED activity that you might see.

Table 14 Explanation of Power Supply LED States

LED Color	Represents	Possible States and Explanations
Green (top LED)	AC OK	<ul style="list-style-type: none"> • Solid on – power supply’s AC input is above minimum requirements to operate • Solid off – power supply’s AC input is below minimum requirements to operate
Green (middle LED)	DC OK	<ul style="list-style-type: none"> • Solid on – power supply’s output voltage is within specifications • Solid off – power supply’s output voltage is outside of specifications

Table 14 Explanation of Power Supply LED States (Continued)

LED Color	Represents	Possible States and Explanations
Blue (bottom LED)	Fault	<ul style="list-style-type: none"> • Solid on – indicates any of the following conditions: • Power supply output is outside of specifications • Current limit has been exceeded • Temperature limit has been exceeded • Fan failed while AC input is present and above minimum operating voltage • AC input is below minimum operating voltage • PDU is on, but the Power button on the library’s indicator panel is off • Solid off – no faults are detected

Working With Command History Logs

The **Command History Log** dialog box enables you to view command and response activity that has occurred with externally addressable library devices, including the LMC, controller LUNs, partitions, and drives. This information can help you isolate the source of an issue, such as a library device or host application.



Note

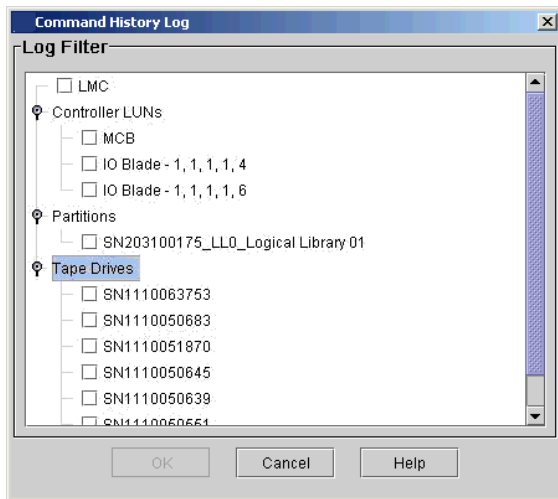
The number of selected drives affects the performance of the Command History Log. To ensure proper operations, limit drive log requests to twenty-five.

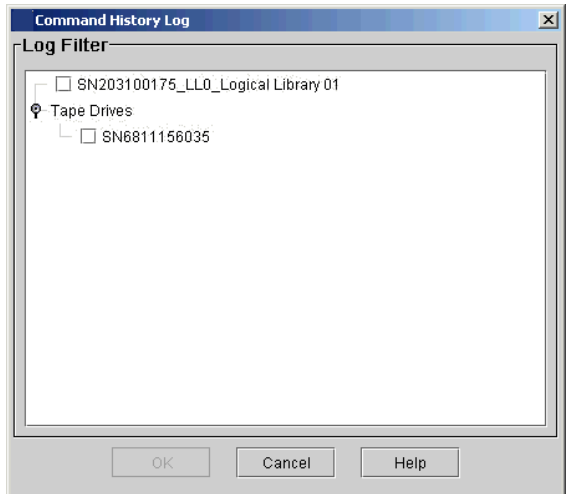
Viewing Command History Logs

- 1 Log on as an administrator.
- 2 You can perform this procedure while viewing either the physical library or a partition. From the **View** menu, click the name of the physical library or the appropriate partition.
- 3 Click **Tools**→ **Command History Log**.

The **Command History Log** dialog box appears.

The first example dialog box that follows represents the physical view, and the second one represents a partition view. These examples show expanded levels for “Controller LUNs”, “Partitions”, and “Tape Drives”. Initially, these areas are not expanded. Click the highest-level items to show next-level items.





If logical serial number addressing is enabled on the **Physical Library** dialog box (**Setup**→**Physical Library**), tape drives are listed according to their logical serial numbers. If logical serial number addressing is disabled, the drives are listed according to their physical serial numbers.

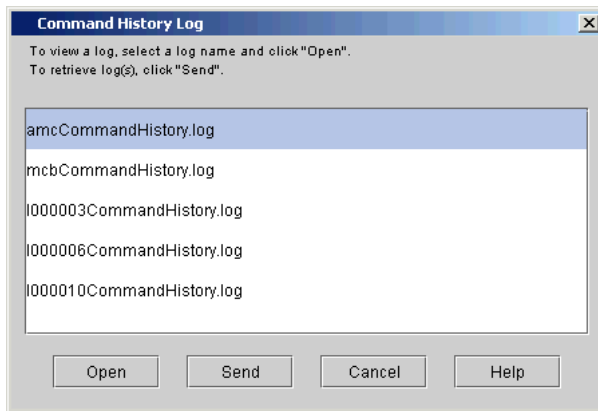
Also notice that command history logs for the LMC and the controller LUNs are available only from the physical view.



Note The library is a multi-LUN device. To meet SCSI standards, a LUN 0 is allocated as a controller LUN on each blade, including the MCB and the I/O blades. The command history log for a controller LUN includes commands intended for the blade, not a specific logical unit connected to the blade.

- 4 To access the command history logs (for LMC, controller LUNs, partitions, or tape drives), select one or more device check boxes, and then click **OK**.

A list of log files appears in the **Command History Log** dialog box.

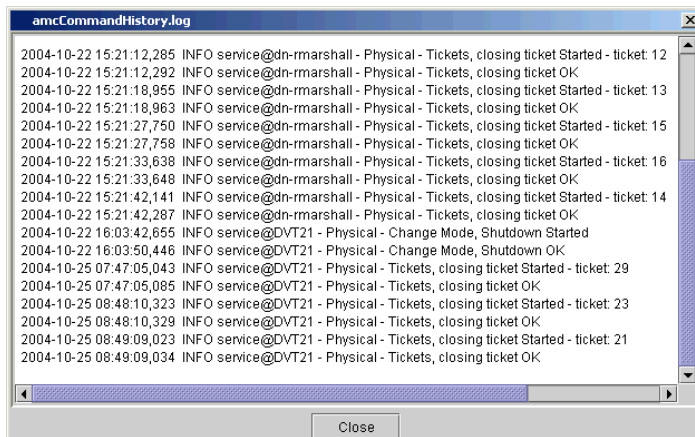


From this log-list view of the **Command History Log** dialog box, you can perform the following tasks:

- Display the contents of a log by clicking the **Open** button (proceed to the next step)
- Mail or save a log by clicking the **Send** button (see [Mailing and Saving Logs](#) on page 75)

5 Click a log file to highlight it, and then click **Open**.

The contents of the log file appear.



Mailing and Saving Logs

The **Send** button on the log-list view of the **Command History Log** dialog box enables you to send logs to e-mail addresses. If you are accessing the LMC from a remote client, **Send** also enables you to save the information to a file.

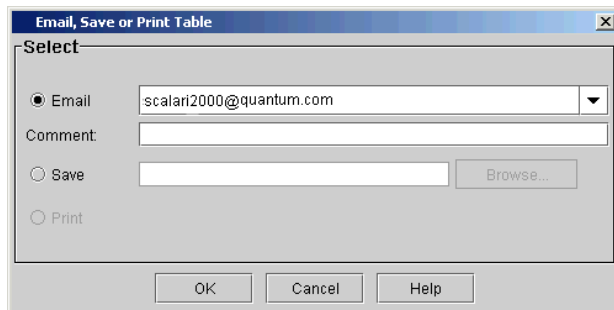


Note

- You can mail or save logs from a remote client. However, you cannot save logs from the library's touch screen.
- Before you perform the following procedure, you must make sure that e-mail is appropriately configured in the LMC so that the library can send logs to the recipient. For more information about configuring e-mail, see the *Scalar i2000 User's Guide*.

- 1 From the log-list view of the **Command History Log** dialog box, click a log file to highlight it, and then click **Send**.

The **Email, Save or Print Table** dialog box appears.



- 2 Perform one of the following tasks:
 - To indicate that you want to send the log as an e-mail message to a recipient, select **Email**, and then either type an e-mail address in the **Email** text box or select an existing address from the drop-down list. You can type a comment in the **Comment** text box to send with the log.
 - To indicate that you want to save the log, select **Save**, and then either type in the **Save** text box a path and a file name to which you want the information saved or click **Browse** to specify a location and a file name.



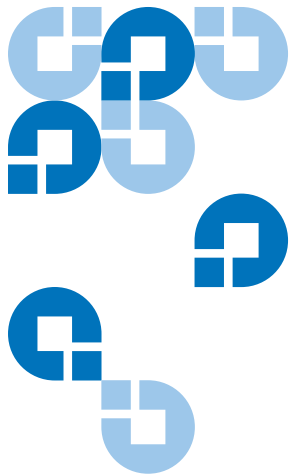
Note The **Save** option is available to remote client users only. It appears grayed out on the touch screen.

3 To send, click **OK**.

Accessing Online Help

For further help, you can access the library's Online Help system.

- To access the entire Online Help system, click **Help**→ **Content**.
- To access context-sensitive help, click the **Help** button on any dialog box.GHCGHCGHC



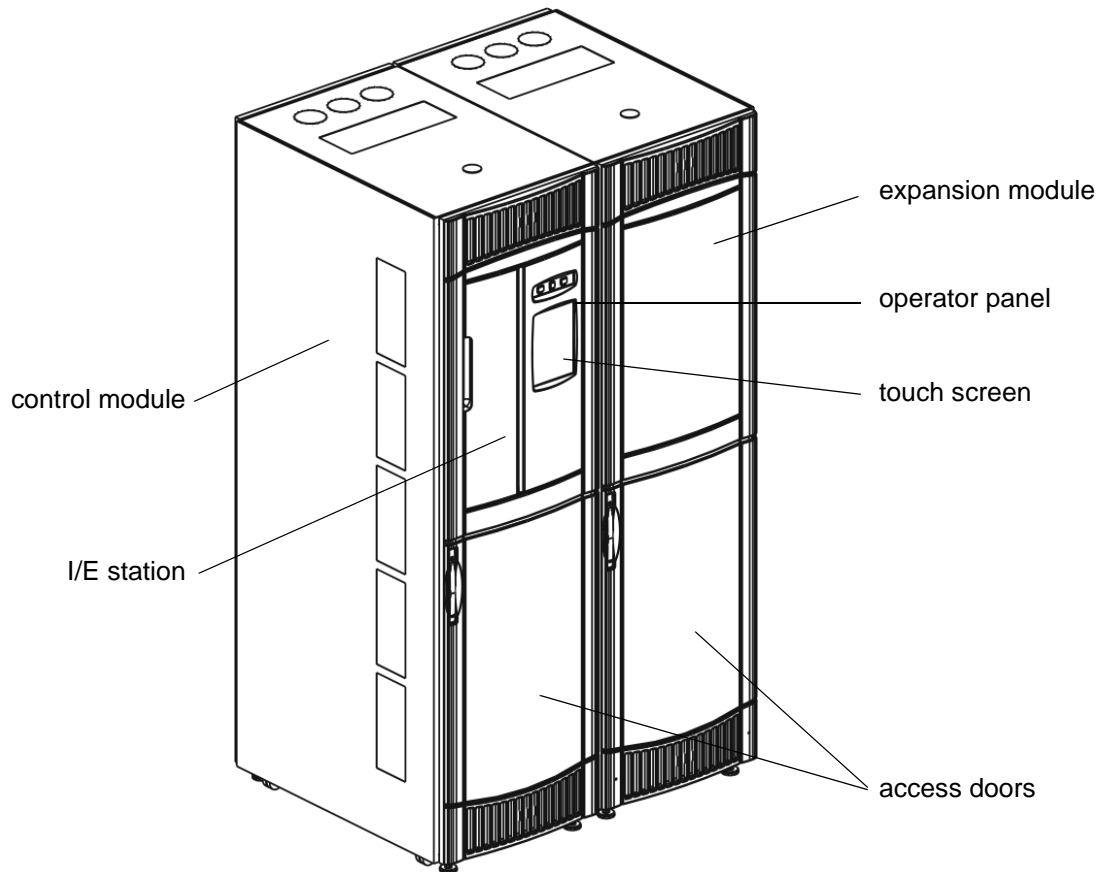
Chapter 3 Description

The Scalar i2000 library automates the retrieval, storage, and control of tape cartridges. Application software on the host can use the library's robotics to mount cartridges into tape drives and retrieve them without operator intervention.

The library can be installed on a solid or raised floor. It has a standard 19-inch rack footprint and can be placed in a standard server rack space. Because the library provides access by way of the access and service doors, the library can be placed with either side against a wall or between racks.

[Figure 11](#) on page 78 shows a front view of the library, consisting of a control module and an expansion module.

Figure 11 Front View of a Control Module and Expansion Module



The library is designed for ease of installation, configuration, and field upgrades. The minimum library configuration consists of one control module. You can add up to seven expansion modules as storage and tape drive requirements change. The maximum library configuration can accommodate from 102 to 3,492 LTO cartridges or from 100 to 2,915 DLT cartridges, from 1 to 96 tape drives, and from 1 to 8 Import/Export (I/E) stations.

This chapter includes the following sections:

- [Library Features](#) on page 79
- [Control Module](#) on page 83
- [Expansion Modules](#) on page 84
- [Library Management Module](#) on page 86
- [I/O Management Units](#) on page 87
- [Cartridge Accessor](#) on page 89
- [Import/Export Stations](#) on page 89
- [Cartridges](#) on page 91
- [Cartridge Magazines](#) on page 92
- [Tape Drives](#) on page 94
- [Mixed Media Support and Rules](#) on page 97
- [Operator Panel](#) on page 100
- [Power System](#) on page 101

Library Features

This section describes several library features.

Density

The library provides a storage density of 720 cartridges (LTO) per square meter. Each module, also referred to as a frame, has two storage racks: one on the drive side and another on the door side. A rack consists of up to 10 horizontal sections and three or four columns of magazines, depending on the rack configuration. Each magazine, located at the intersection of a particular section and a particular column, consists of five or six cartridge slots, depending on the type of media (DLT or LTO respectively).

Centralized Management

The Library Management Console (LMC) gives you a single point from which to view all library components, including robotics, drives, storage, I/E stations, and network connectivity. You can use this graphical user interface both locally from the library's touch screen and remotely from a remote client. The LMC communicates with the LMC server that runs on the library. The LMC uses a simple and intuitive graphical style that is secure and provides library managers with native partitioning ability.

Proactive Availability

The library can alert you about problems before they occur. The library checks the complete data path at user-defined intervals to make sure that it is functioning properly before backups begin. The library also monitors its six major subsystems (drives, power, robotics, cooling, connectivity, and control). You can configure the library to send notifications of problems to one or more e-mail accounts, including Quantum service personnel. For more information about the library's monitoring and reporting capabilities, see [Maintaining Your Library](#) on page 203.

Serviceability and Reliability

The library has extensive serviceability and reliability features. You can hot swap drives, power supplies (in redundant power configurations only), Input/Output (I/O) blades, and fans. Host port failover, an advanced feature that moves a host's communication stream from a failed connection to a working connection without disrupting the backup operation, maintains connectivity whether the failure occurs on the host, the switch, or the library.

Your backup system and data path are idle most of the time. When backups begin, the system is used intensively at maximum bandwidth. The library provides you with notifications and a robust ticket system that notifies you of any problems it identifies, enabling you to solve them before backups begin. For more information about the library's notification system, ticket system, and other troubleshooting help, see [Troubleshooting Your Library](#) on page 6.

Data Path Conditioning

Quantum provides an automatic means of verifying, monitoring, and protecting data path integrity between hosts and library drives. This feature is referred to as data path conditioning. Using this feature, administrators can proactively detect and resolve data path problems before they affect backups, restore operations, and other data transfer operations. Data path conditioning makes sure that data transmissions are optimized and reliable, resulting in improved system availability.

Data path conditioning occurs in two separately managed areas:

- Between host and Fibre Channel (FC) I/O blades
- Between FC I/O blades and library drives

The Host Registration Service (HRS), an optional utility that runs on the host, manages data path conditioning along the path between the host and the FC I/O blade. HRS automatically sends pulses to the I/O blade at regular, configurable intervals. The I/O blade monitors the data path for the anticipated pulses and generates a reliability, availability, and serviceability (RAS) ticket if two intervals pass without receiving a pulse from the host. This indicates a host connection failure.

The FC I/O blade manages data path conditioning along the path between itself and the library drives. Data path monitoring automatically occurs at regular, configurable intervals. The I/O blade generates a RAS ticket if monitoring tests fail for two intervals. This indicates either loss of connectivity or drive failure. The FC I/O blades include the data path conditioning feature. Administrators can use the LMC to configure data path conditioning.

SAN Backup

Storage area network (SAN) support is built into the library. Fibre Channel throughput results in huge amounts of data being stored quickly. For more information about running your library as part of a SAN environment, see the *ADIC Management Console User's Guide*.

Host Attachment

Requests issued from the host application result in cartridge movement in the library. The primary requests issued are for mounting and dismounting cartridges in and out of the tape drives and for importing and exporting cartridges in and out of the library. The library manages the physical location. In addition to requesting cartridge movement in the library, the host application can use the FC or SCSI command interface to obtain status information, configuration information, and cartridge storage information from the library.

Hosts can be attached to the library in the following ways:

- SDLT-320 SCSI-interfaced drives can be connected to the SAN when they are directly connected to an external Storage Networking Controller (SNC) 5100. There is no area provided to mount the SNC inside the library modules, so you must plan for extra rack space near the library.

- FC and SCSI drives can be directly attached to host systems or to the SAN. In these configurations, the management control blade (MCB) has one library control port (FC or SCSI) connecting to the controlling host computer.
- FC drives can be attached to FC I/O blades in the I/O management unit. There are two ports on each FC I/O blade that can be connected directly to the host or to the SAN.

Remote Management

The library can be managed locally or remotely using the LMC. Locally, the LMC is displayed on the touch screen on the front of the library. Remotely, the LMC is accessed through a client instance of the LMC software on any computer on the network. For more information about accessing [Logging On From the LMC Applet \(Web Browser\)](#) on page 340. For more information about the LMC, see [Library Management Console \(LMC\)](#) on page 349.

The LMC provides additional monitoring of a SAN-attached library over the network to a management server by using Simple Network Management Protocol (SNMP). This includes library subsystem health and status information and early fault notification. For more information, see the *Intelligent Libraries Basic SNMP Reference Guide*.

The library also supports the Common Information Model (CIM) server based on the Storage Management Initiative Specification (SMI-S) on the MCB. A CIM client can use the CIM server to monitor the SAN-attached library. For more information, see the *Intelligent Libraries SMI-S Reference Guide*.

Capacity on Demand

If you purchased capacity on demand, the library is initially licensed for a default configuration of 100 DLT or 102 LTO storage slots. The number of storage slots differs between media types because the library only supports full magazines for capacity on demand.

The library's license key must be enabled during installation to configure those parts of the library that are governed by additional licensing. Customer license keys are available from Quantum technical service.

The capacity on demand library can be expanded from a single module to up to eight modules. With capacity on demand, you can purchase enough storage to accommodate your current needs. As your storage needs change, you can add storage in blocks of 100 cartridges without being required to purchase additional hardware. Capacity on demand begins at

100 cartridges and can be increased to as many as 3,492 LTO or 2,915 DLT cartridges inside one library.

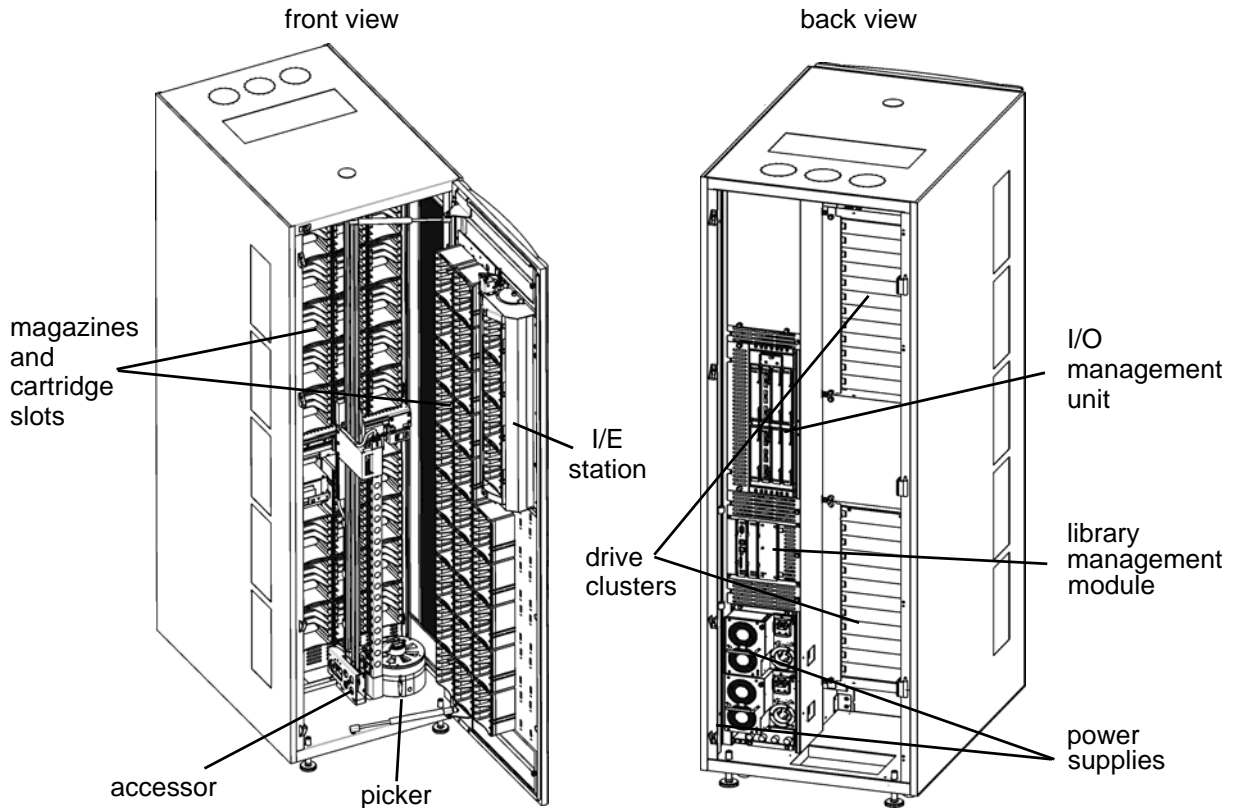
Control Module

All library configurations include the control module, which contains the following components at a minimum (see [figure 12](#) on page 84):

- Library management module (LMM)
- I/E station
- Tape drives
- Cartridge storage
- Operator panel
- Power system

The I/O management unit is optional for the control module. For more information about the I/O management unit, see [I/O Management Units](#) on page 87.

Figure 12 Front and Back View
of the Control Module



Expansion Modules

Expansion modules enable the library to expand by adding space for tape drives, I/E stations, and cartridges. Each expansion module adds 300 to 456 LTO or 250 to 380 DLT cartridge slots, depending on the number of tape drives installed and whether an I/E station is installed (see [figure 13](#) on page 85). The library's maximum configuration includes up to seven

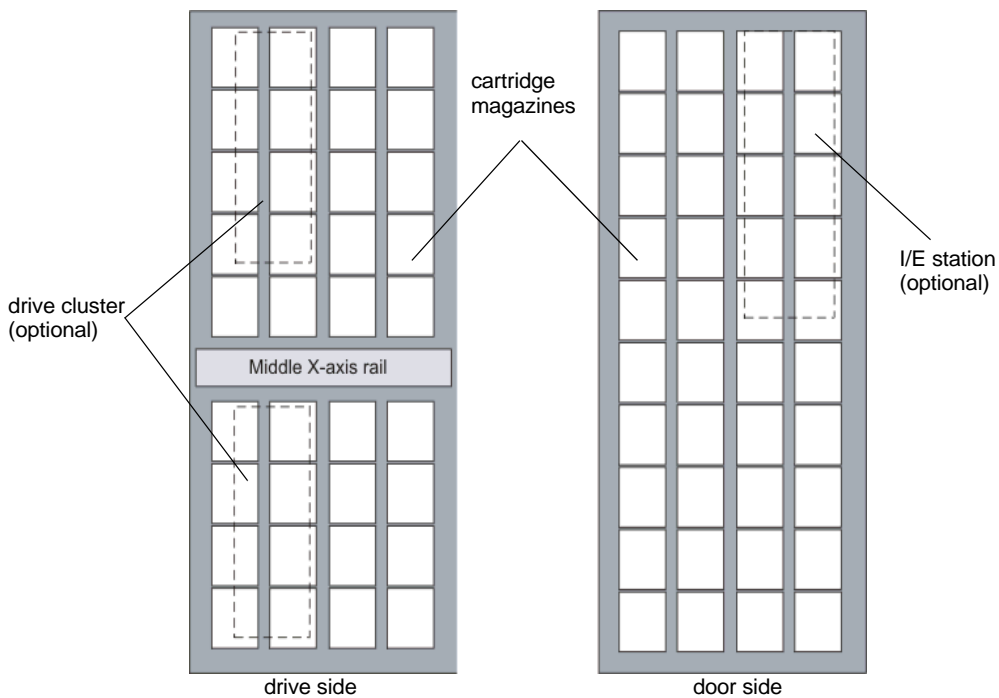
expansion modules for a total of eight modules. Expansion modules can only be added to the right of the control module.

The expansion modules can accommodate the following components:

- I/O management unit (optional)
- Tape drives (optional)
- Cartridge storage
- I/E station
- AC power compartment (required only if drives are added)

If an expansion module contains only cartridges, all power is derived from the control module.

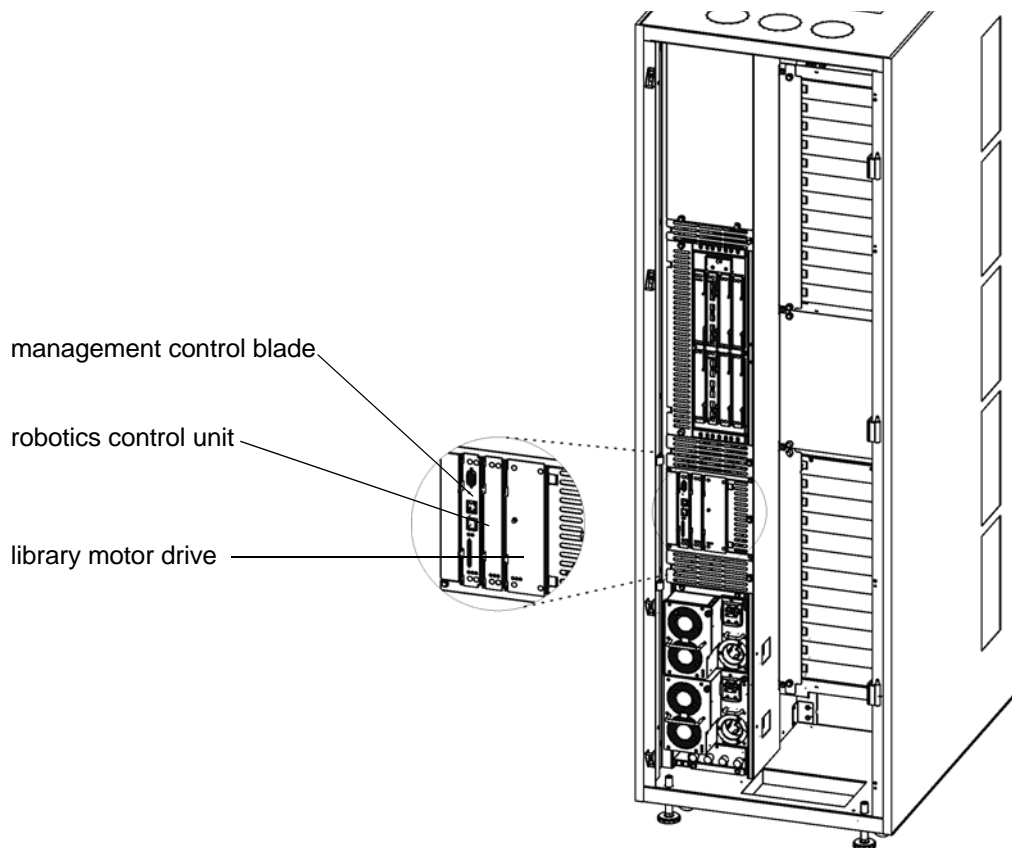
Figure 13 Expansion Module



Library Management Module

The library management module (LMM) controls and manages library hardware and software components. It enables both SAN-connected hosts and users who access the library using the operator panel to configure the library, obtain system status information, and perform various library functions. The LMM contains the management control blade (MCB), the robotics control unit (RCU), and the library motor driver (LMD), as shown in [figure 14](#).

Figure 14 Library Management Module Boards



Management Control Blade

The MCB is the primary point of intelligent management in the library. The MCB stores firmware and configuration data for itself as well as most other intelligent components in the library. It also contains the LMC, which enables local or remote users or hosts to operate, configure, and monitor the library. The MCB collects status information on other components in the library and issues notifications when problems occur.

Robotics Control Unit

The RCU provides robotics intelligence that controls accessor movements and functions, including picker, pivot, and reach actions. It receives commands from hosts or users by way of the MCB.

Library Motor Driver

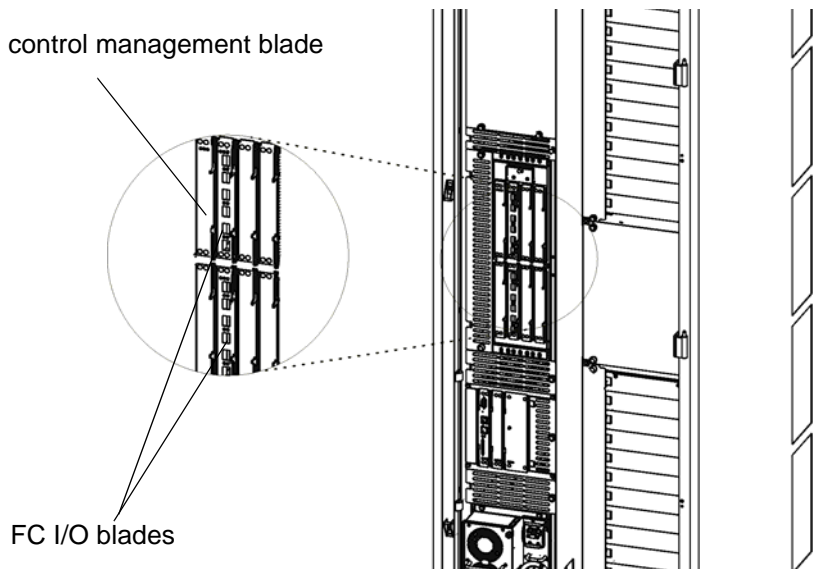
The LMD monitors wiring, fuses, and relays within the library. It regulates power levels and performs other power-related functions, such as disabling robotics when a library door opens.

I/O Management Units

The I/O management unit is an optional component that provides connectivity and data path management to a SAN fabric and the hosts. The I/O management unit houses up to six FC I/O blades, which provide FC connections for the Fibre Channel drives in the module. (The control module and each of the expansion modules can contain up to 12 FC drives.) The I/O management unit performs all tape drive and library host communication functions in a library that is attached to a SAN.

The I/O management unit supports two types of blades: the control management blade (CMB) and the FC I/O blades, as shown in [figure 15](#) on page 88.

Figure 15 I/O Management Unit



Control Management Blade

The CMB performs unit status monitoring, including power and I/O present conditions, and internal network switch functions connecting I/O blades with the LMM. The CMB stores connectivity information for the I/O blades so that if you switch out an I/O blade, you do not have to reconfigure connectivity settings to drives. The CMB also enables you to update a drive's firmware without using a firmware update (FUP) tape.

FC I/O Blades

Each FC I/O blade has an embedded controller that provides connectivity and features that enhance the performance and reliability of tape operations. Each blade has six auto-negotiating, 2 Gbps FC data ports and backplane connections. It provides two host communication ports and four connection ports to drives.



Note

Fibre Channel LTO-1, LTO-2, LTO-3, LTO-4, DLT-S4, and SDLT-600 drives can be connected to drive-aggregating Fibre Channel I/O blades or directly attached to a host, so these drives do not require an external SNC.

Cartridge Accessor

The cartridge accessor moves cartridges between storage cells, tape drives, and I/E stations. A picker is used to get or put cartridges in a storage cell or a tape drive slot. The picker moves along an X and Y axis and can pivot 180°. A barcode scanner on the picker assembly identifies cartridges located in storage cells.

Import/Export Stations

I/E stations enable you to import and export cartridges without interrupting normal library operations. The I/E station is installed on the front of the control module and, optionally, any of the seven expansion modules in larger library configurations. See [figure 11](#) on page 78 and [figure 12](#) on page 84 to see the location of the I/E station.

Each I/E station has a capacity of 24 LTO or 20 DLT cartridges located in four removable magazines.



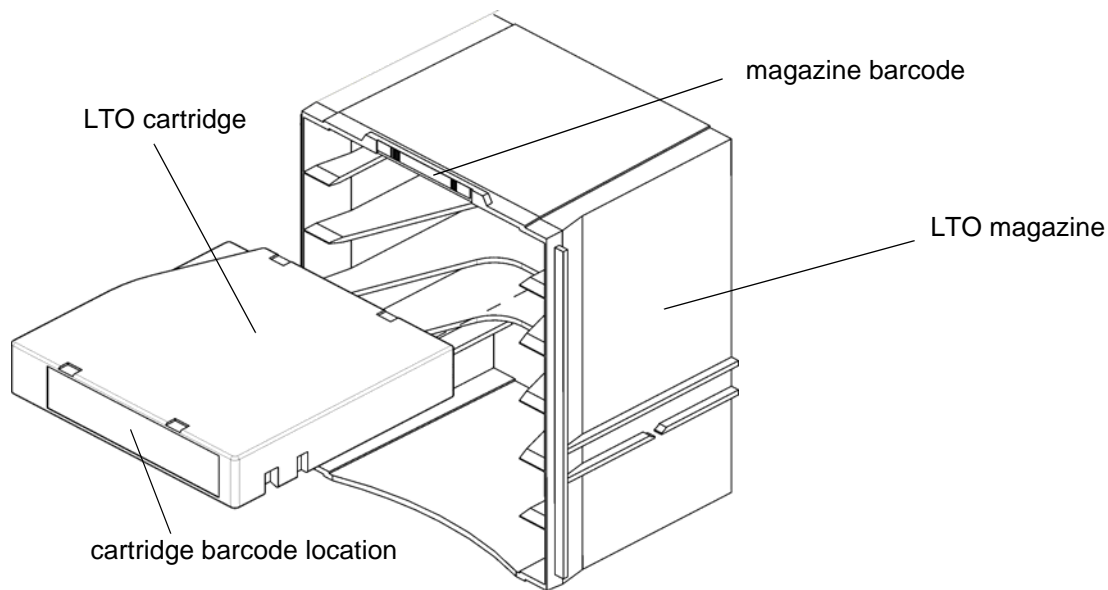
Note

The I/E station cannot be configured as a storage location, but it can be part of a logical division of library resources known as partitions. For information about partitions, see [Working With Partitions](#) on page 106.

Cartridges

Cartridges are stored in magazines within the library, as shown in [figure 16](#).

Figure 16 Example of LTO Cartridge Insertion into a Magazine

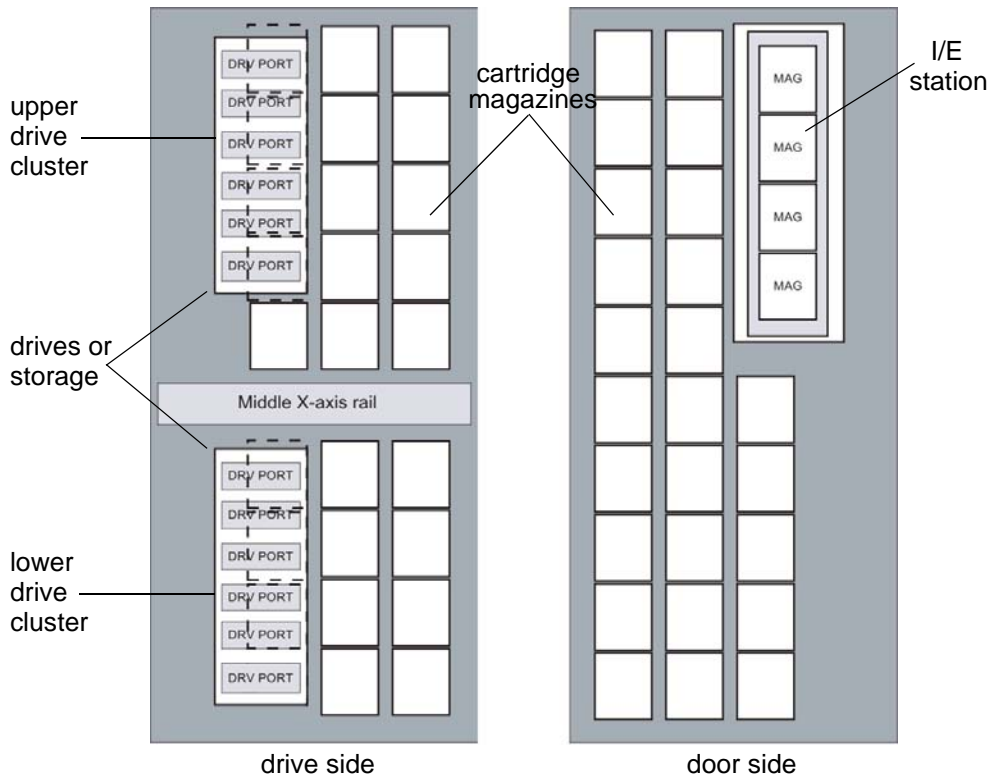


Each cartridge has an operator-attached, machine-readable barcode label on it for identification purposes. The library can dynamically support barcode labels with 1 to 14 characters plus a one-character or two-character media identifier, depending on drive type (LTO or DLT). The library currently supports Code 39 (3 of 9) type barcode labels. For more information about tape cartridges, see [Tape Drives](#) on page 94. For additional specification information, see [Barcode Requirements](#) on page 403. For details about the use of drives and cartridges, see [Mixed Media Support and Rules](#) on page 97.

Cartridge Magazines

The cartridge magazine is a storage assembly that installs on the drive side or door side of the control module or expansion module, as shown in [figure 17](#). It contains the cartridge slots and provides flexibility when adding storage cartridges to a module.

Figure 17 Magazine and Drive Locations in the Control Module



There are two types of magazines: one for DLT and another for LTO. Because the two magazines are the same size, they can be mixed in the library. DLT magazines hold five cartridges, and LTO magazines hold six cartridges.

Table 15 Cartridge Capacities
in Library Modules

Type of Cartridge	Cartridges per Magazine	Magazines per Control Module ^a	Magazines per Expansion Module ^b	Control Module Cartridge Capacity ^c	Expansion Module Cartridge Capacity ^d
DLT	5	44 min/51 max	50 min/76 max	220 min/255 max	250 min/380 max
LTO	6	44 min/51 max	50 min/76 max	264 min/306 max	300 min/456 max

a. The minimum is based on having 11 additional drives installed. The maximum is based on having one drive and one I/E station installed.

b. The minimum is based on having an I/E station and 12 drives installed. The maximum is based on having no drives or an I/E station installed.

c. The minimum is based on having 11 additional drives installed. The maximum is based on having one drive and one I/E station installed.

d. The minimum is based on having an I/E station and 12 drives installed. The maximum is based on having no drives or an I/E station installed.

Each magazine has a barcode label that the scanner reads for identification and inventory. An optional, snap-on dust cover is available for the magazines. Magazines with the dust cover have interlocked stacking that enables easier storage of the media when they are removed from the library for external storage.

Support for WORM

The Scalar i2000 library supports WORM (write once, read many) technology in LTO-3 and LTO-4 tape drives. WORM requirements include:

- Cartridges
- Firmware
- WORM-supported LTO-3 tape drives
- WORM-supported LTO-4 tape drives

WORM allows non-erasable data to be written once and provides extra data security by prohibiting accidental data erasure. When the library firmware and WORM-supported LTO-3 or LTO-4 tape drive code are installed on a library with LTO-3 or LTO-4 tape drives, the WORM feature is supported whenever the operator uses WORM cartridges.

Tape Drives

Tape drives are enclosed in a universal drive sled. You can hot swap and hot add all supported drives, regardless of type. The library supports the following types of tape drives:

- IBM LTO-1 or LTO-2 LVD-SCSI
- IBM LTO-1, LTO-2, LTO-3, or LTO-4 FC Multi-mode
- HP LTO-3 FC Multi-mode
- Quantum SDLT-320 LVD-SCSI
- Quantum SDLT-600 FC
- Quantum DLT-S4 FC



CAUTION

Although the physical library can contain more than one media domain or drive domain, you cannot have a mix of domain types within a partition (for example, LTO and DLT).

A single partition can have a mixture of drive types and interface types within the same domain (for example, LTO-1 and LTO-2 with SCSI or Fibre Channel interfaces).

Quantum does not support mixing IBM LTO-3 and HP LTO-3 drives within a library.

The control module and expansion modules have upper and lower drive clusters. Each library must have at least one tape drive. Each drive cluster can house up to six tape drives for a total of 12 drives. Additional drives can be added to all expansion modules in the configuration. This enables you to have a total of 96 drives.



Note

When you add drives, you lose storage slots.

Drives must be installed in bottom-to-top order in the control module before any are added to the first expansion module. There are two six-drive clusters in each of the first four modules.



Note

The term *drive cluster* defines a grouping of up to six tape drives below or above the middle X-axis rail.

[Figure 17](#) on page 92 shows the locations of drives in the control module. For details about the use of drives and cartridges, see [Mixed Media Support and Rules](#) on page 97.

Fibre Channel LTO-1, LTO-2, LTO-3, LTO-4, DLT-S4, and SDLT-600 drives can be connected to drive-aggregating Fibre Channel I/O blades or directly attached to a host, so these drives do not require an external SNC. More detailed information about LTO and SDLT drives follows.

LTO Drives

Three generations of LTO drives are supported, but they are not fully compatible as shown in [Table 16](#).

Table 16 LTO Drive and Cartridge Compatibility

	LTO-1 Cartridges	LTO-2 Cartridges	LTO-3 Cartridges	LTO-3 WORM	LTO-4 Cartridges	LTO-4 WORM
LTO-1 Drives	Reads/ Writes	Not compatible	Not compatible	Not compatible	Not compatible	Not compatible
LTO-2 Drives	Reads/ Writes ^a	Reads/ Writes	Not compatible	Not compatible	Not compatible	Not compatible
LTO-3 Drives	Reads ^b	Reads/ Writes ^c	Reads/ Writes	Write Once, Read Many ^d	Not compatible	Not compatible
LTO-4 Drives	Not compatible	Reads	Reads/ Writes	Reads/ Writes	Reads/ Writes	Write Once, Read Many ^e

a.LTO-2 drives do not reformat LTO-1 cartridges. The drives will write to the cartridges in the LTO-1 format (100 GB capacity).

b.LTO-3 drives only read LTO-1, they do not write to the LTO-1.

c.LTO-3 drives do not reformat LTO-2 cartridges to contain the same density as the LTO-3 cartridges (400 GB). The LTO-3 drives will write to the LTO-2 cartridges in the LTO-2 format (200 GB capacity).

d.LTO-3 WORM requires the installation of library firmware and WORM-supported LTO-3 tape drive code

e. LTO-4 WORM requires the installation of the library firmware and WORM-supported LTO-4 tape drive code.

All LTO cartridges are the same size, which means they use the same magazines in the library.

LTO drives can be directly attached to hosts, attached to the SAN, or connected to FC I/O blades in the I/O management unit. SCSI drives must be directly attached to hosts or to the SAN.

DLT Drives

Five generations of DLT cartridges are supported in the library, but the drives are not fully compatible as shown in [Table 17](#).

Table 17 DLT Drive and Cartridge Compatibility

	SDLT-600 Cartridges	SDLT-320 Cartridges	SDLT-220 Cartridges	SDLT-VS 160 Cartridges	DLT-S4 Cartridges
DLT-S4 Drives	Reads	Reads	Reads	Not compatible	Reads/Writes
SDLT-600 Drives	Reads/Writes	Reads	Reads	Reads	Not compatible
SDLT-320 Drives	Not compatible	Reads/Writes	Reads/Writes	Not compatible	Not compatible
DLT-S4	Read	Read	Read	Not compatible	Not compatible

The SDLT-600 tape drives support reading and writing to SDLT II cartridges. They also have a backward-read compatibility (BRC) mode. When in this mode, the SDLT-600 is capable of reading SDLT-220 and SDLT-320 tape formats in an SDLT I data cartridge, as well as the SDLT-VS160 tape format in the DLT tape VS1 data cartridge. The SDLT-600 tape drive will eject a data cartridge written in DLT formats other than DLT-VS160. All DLT cartridges are the same size, which means they will use the same magazines in the library.

The SDLT-320 SCSI tape drives are supported in the library, but they must be connected to an FC Host SAN by means of an external SNC 5100.

Mixed Media Support and Rules

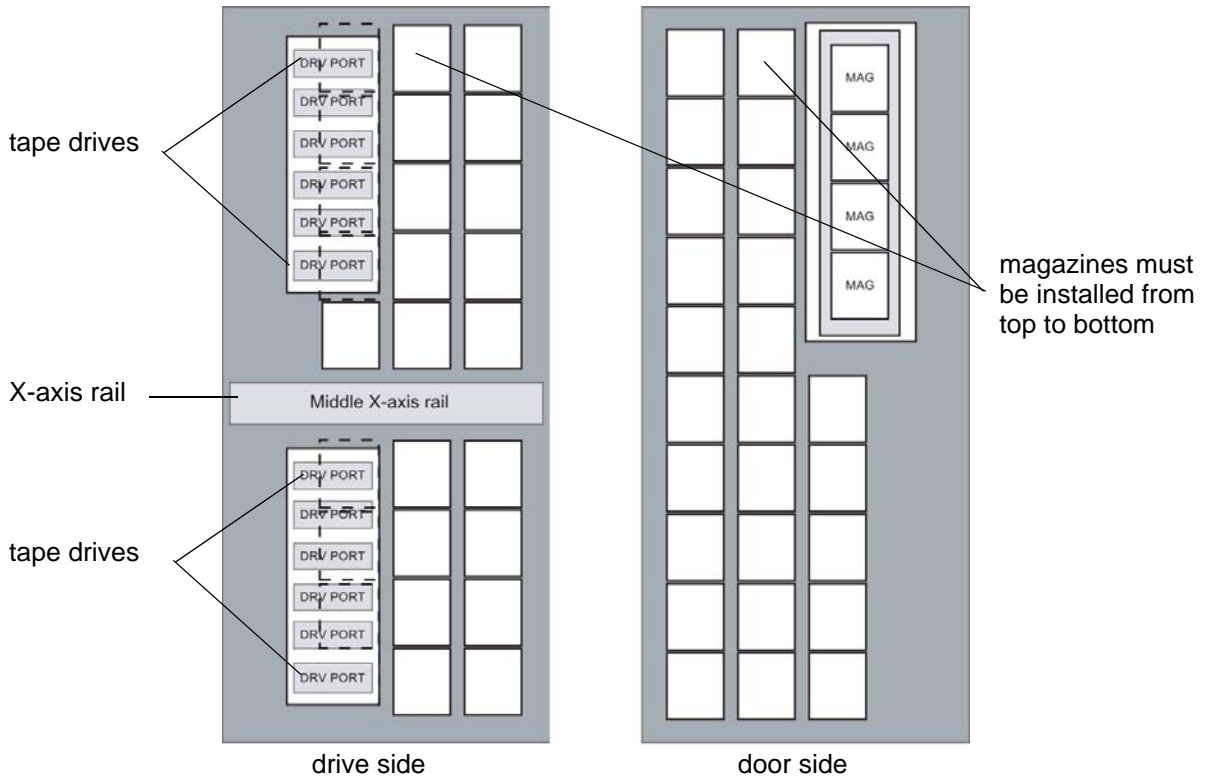
The library supports both LTO and DLT cartridges and drives in the same configuration, provided that you adhere to the following rules:

- When purchasing a library with mixed media, the new orders must specify the base system technology (either LTO or DLT) and the number of magazines, the number of drives, and the number of I/E station magazines for each media type required. The base system is considered the primary media type used in the library.
- Multiple media can be mixed at the magazine level.
- The supported multiple media are LTO-1, LTO-2, LTO-3, LTO-3 WORM, LTO-4, LTO-4 WORM, SDLT-320, SDLT-600, DLT-S4.
- If you are loading cartridges into the library by using the I/E station, you must have a magazine of each of the two types of media in the I/E station (LTO and DLT).
- Mixed media can be within the 100 slot capacity increment, with the following restrictions:
 - DLT must be ordered in multiples of five because the magazines hold five cartridges.
 - LTO must be ordered in multiples of six because the magazines hold six cartridges.
 - Regardless of the mixed quantities of each media type, the total slots licensed will still be in multiples of 100.
- Field upgrades of the library to existing single media systems must specify a mixed media picker kit if mixed media will be used in the upgraded library.
- Drive types can be installed in any order. For example, an LTO drive can occupy the first drive position, a DLT drive can occupy the second, and another LTO can occupy the third drive position.

However, drives must be installed beginning in the lower most drive slot of the control module. Once the control module has 12 drives installed from bottom to top, you must move to the bottom drive position of the first expansion module.

- The library must include at least one drive for each type of cartridge used.
- Magazines must be installed in the control module beginning with the back rack (drive side). Once the back rack (drive side) is full, you must then install magazines in the door side, starting with the top left corner. See [figure 18](#).
- The secondary media type is installed beginning at storage slot 4096 or the first media magazine. See [figure 18](#).

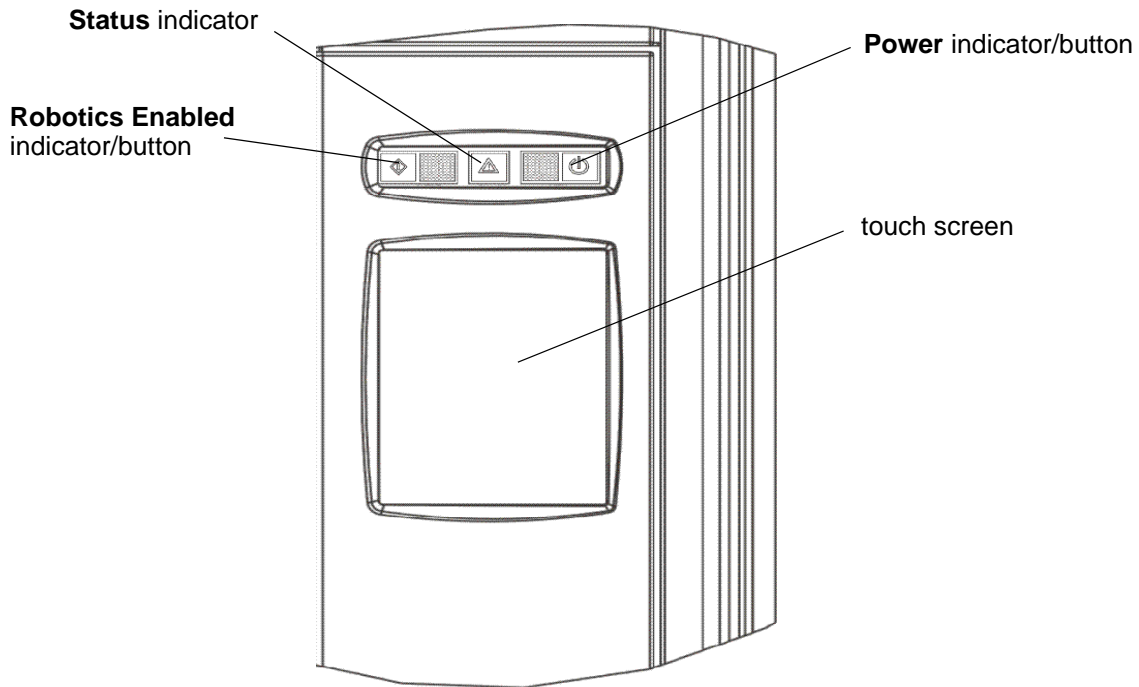
Figure 18 Magazine
Installation Order



Operator Panel

The operator panel is located on the front of the control module and consists of indicators and a touch screen (see [figure 19](#)). The buttons are for library control and power, and the indicators provide library status.

Figure 19 Operator Panel



The touch screen is the library navigation point and provides access to the LMC. For more information about the touch screen and the LMC, see [Operator Panel](#) and [Library Management Console \(LMC\)](#) on page 349.

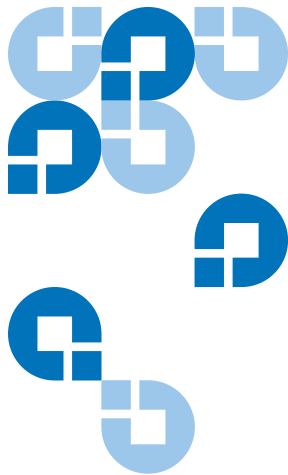
Power System

The library supports single and redundant power configurations. The single configuration has a single AC line input and single DC power supply. The redundant configuration has dual AC line input and dual DC power supplies. You can hot swap a power supply if you have a redundant power supply. You can hot add a second power supply.

The power system consists of the following:

- Power supply
- Power distribution unit (PDU)
- AC power cord

A single power switch, located on the access door, turns on and off all power for the control module and attached expansion modules. Each PDU has a second circuit breaker, located in the rear of the module, that controls the module power supply output. The power supply has three LEDs that provide status information. The power system also has four fuses for system protection.



Configuring Your Library

You can use either the local or remote versions of the Library Management Console (LMC) to modify your library's configuration. The **Setup** menu includes most of the configuration commands.

This chapter consists of the following sections:

- [Running the Setup Wizard](#) on page 103
- [Enabling Licenses](#) on page 104
- [Working With Partitions](#) on page 106
- [Setting Up the Network Configuration](#) on page 127
- [Managing Connectivity](#) on page 129
- [Setting Up Policies for the Physical Library](#) on page 136
- [Specifying the Date and Time](#) on page 138
- [Configuring E-mail](#) on page 140
- [Setting Up E-mail Notifications](#) on page 142
- [Configuring Devices](#) on page 147
- [Using the LUN Mapping Wizard](#) on page 167
- [Generating the LUN Mapping Report](#) on page 173
- [Generating the Library Configuration Report](#) on page 177
- [Configuring Drive Cleaning](#) on page 179
- [Registering SNMP Traps](#) on page 184

- [Configuring Library Security](#) on page 186
- [Using LDAP](#) on page 192
- [Configuring Screen Saver Preferences](#) on page 195
- [Working With Data Path Conditioning](#) on page 198

This chapter also includes information about installing the Host Registration Service (HRS). See [Working With Data Path Conditioning](#) on page 198.

For a brief overview of the LMC, see [Library Management Console \(LMC\)](#) on page 349.

If you are configuring your library for the first time, see the *Scalar i2000 Installation Guide* for information about performing an initial library configuration.



Note

Only one administrator can be logged on and performing library configuration at any one time. If another administrator attempts to log on, a message appears, warning that only one administrator at a time is permitted on the library. If a service user logs on while an administrator or regular users are logged on already, the library automatically logs off those users.

Running the Setup Wizard

Use the **Setup Wizard** command to initially configure important settings on a library as part of the normal installation procedure. Before you can manage your library from a remote LMC client, you must initially configure the library from its touch screen by either running the **Setup Wizard** command or using individual configuration commands from the **Setup** menu. For detailed information about initially configuring the library, see the *Scalar i2000 Installation Guide*.



CAUTION

Use the Setup Wizard only once to initially configure the library.

To access the setup wizard, log on as an administrator from the library's touch screen, make sure that you are viewing the physical library, and then click **Setup**→**Setup Wizard**.

Enabling Licenses

The following situations require you to enable license keys:

- During initial installation and configuration of the library. For more information about enabling licenses for the first time, see the *Scalar i2000 Installation Guide*.
- During a capacity on demand (COD) or feature upgrade, such as when you want to enable the Drive Resource Utilization Reporting feature.
- When you need to activate additional storage slots in your current COD configuration.

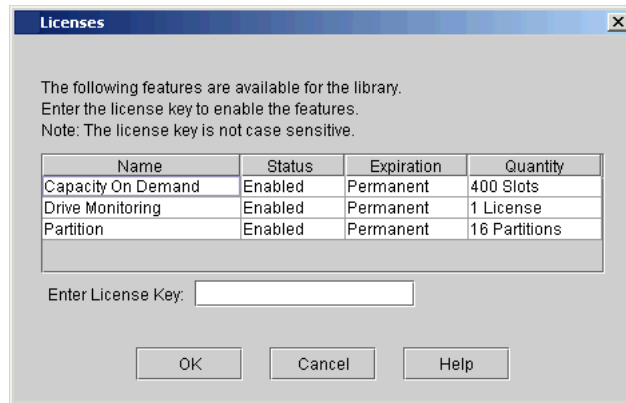


Note

Authorized service personnel are involved in the first two situations. However, any administrator can activate additional storage slots.

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→**Licenses**.

The **Licenses** dialog box appears.



This dialog box lists the licensed features for your library, including their status, expiration date, and quantity. The following guidelines apply to **Quantity**:

- The COD quantity is the number of slots licensed.
 - The partition quantity is either 1 or 16. The only possible multiple number of partitions is 16.
 - For features that are not licensed by quantity, such as the drive monitoring feature, **Quantity** is always set to 1.
- 4** In the **Enter License Key** text box, type the appropriate license key.



Note

You do not need to highlight the feature before you enter a license key.

License keys are not case-sensitive, so if you are using the library's touch screen, enter the library key from the lowercase keyboard, which gives you access to the dash (-) character.

If you cannot locate the license keys shipped with the library, you can obtain them by contacting technical support or, if you are an end user, by contacting your inside sales representative.

- 5** Click **OK**.

If you have upgraded the library's storage capacity, the extra storage slots you just added are not assigned to a partition. You can either create a new partition to include them or manually modify an existing partition to include them by using expert partitioning mode. Consult your service representative and see the *Scalar i2000 Planning Guide* before you reconfigure your partitions. For more information, see [Working With Partitions](#) on page 106.

Working With Partitions

A partition is an abstraction of a single underlying physical library that presents the appearance of multiple, separate libraries for purposes of file management, access by multiple users, or dedication to one or more host applications. For example, you can choose to run one software application in one partition, and a different software application in a second partition.

Each partition contains the following components of the physical library:

- Accessor — the robotic assembly that moves media within the library. The accessor includes the picker and reach assemblies.
- I/E station magazine — a magazine, consisting of slots for cartridges, that enables media to be moved into or removed from the physical library. The type of media determines the number of slots in the magazine. For example, an LTO magazine has six slots.
- Storage magazine — a static column location within a section of the physical library rack that holds removable media. For more about location coordinates, see [Understanding Location Coordinates](#) on page 366.
- Drive — the read/write device for removable media.

For more information about the library's physical components, see the *Scalar i2000 Maintenance Guide*. For help with planning before you configure your system, see the *Scalar i2000 Planning Guide*.

A partition consists of, at a minimum, one storage magazine and one drive. Neither the storage magazine nor the drive can be shared with another partition. Each partition is specific to a media type (for example, LTO-1, LTO-2) and a drive interface (for example, SCSI or Fibre). One I/E station can be used by up to four partitions. The maximum number of partitions is determined by the lesser of the number of drives available in the physical library (assuming there are at least as many storage slots) or 16.

Although the physical library can contain more than one media domain or drive domain, you cannot have a mix of domain types within a partition (for example, LTO and DLT). A single partition can have a mixture of drive types and interface types within the same domain (for example, LTO-1 and LTO-2 with SCSI or Fibre Channel interfaces).



Note

The library is licensed for either one partition or the maximum number of partitions, which is 16. For more information about partition licensing, see [Enabling Licenses](#) on page 104.

Configuration controls, such as **FC Host** and **SCSI Host**, provide the means to permit host access to a particular partition. Multiple hosts can share a single partition, or a partition can be restricted to one exclusive host.

Host applications control access to elements within the shared partition. When hosts are connected directly to drives, this is true exclusively. When the hosts connect through the MCB or an I/O blade, the library also has access to partition elements, such as drives and media. Each application can have a partition assigned to it. Each application uses its partition as if it were a dedicated physical library.

Understanding Partition Media Policy Settings

A partition's **Media Type Checking**, **Media Checking Policy**, and **Return Media Identifier** settings help determine how the library handles differing media types within the same library. You can configure media policy settings when you manually create or modify a partition.

The key concepts regarding partition media policies are the media domain, media type, media ID checking, and media identifier.

Media Domain

The media domain is the family of all cartridge types that can be stored in the same storage slot. Typically, a media domain represents all the generations and brands of a particular tape technology. Linear Tape Open (LTO), for example, has many generations and vendors, but all LTO cartridges are considered to exist in the same media domain.

Media Type

The media type is a particular generation of tape technology. Several media types can exist within one media domain. Using LTO again as an example, within the LTO media domain is the LTO-1 media type, the LTO-2 media type, and so forth. A media type has an identifier, chosen by the tape manufacturer or consortium, that enables users and libraries to distinguish between them. The LTO consortium uses L1, L2, L3, and L4 to identify the LTO-1, LTO-2, LTO-3, and LTO-4 media types in a volume serial number.

Although the physical library can contain more than one media domain or drive domain, you cannot have a mix of domain types within a partition (for example, LTO and DLT). A single partition can have a mixture of drive types and interface types within the same domain (for example, LTO-1 and LTO-2 with SCSI or Fibre Channel interfaces).

To create or modify a partition with mixed media, you must select **Expert** mode on the **Partitions Wizard** dialog box. You cannot create or modify partitions with mixed media while in **Automatic** mode or **Simple** mode.

Media ID Checking

Media ID checking policy restricts the movement of tape cartridges based on the media ID on the barcode label. This policy also helps you monitor the management of tapes and drives by the host applications. When you create or modify a partition, you can enable or disable the **Media Type Checking** option. If you choose to enable media type checking, you also can use the **Media Checking Policy** option to select from two modes of operation: **Required** or **Not Required**. With either mode, the library checks whether a cartridge has a valid media ID on the barcode label.

In **Required** mode, if the library does not find a valid media ID on a cartridge, the library does not allow it to be moved into or within the library. If the library finds a valid media ID, the library allows it to be moved from an I/E station into a partition that contains magazines matching the media domain of the cartridge (for example, LTO), but the library does not allow the cartridge to be moved from storage to a drive that does not have a matching type (for example, an LTO-2 cartridge will not be allowed to move to an LTO-1 drive).

In **Not Required** mode, if the library does not find a valid media ID on a cartridge, the library allows it to be moved into or within the library as long as the I/E station magazine, storage magazine, or drive matches the media domain of the cartridge. If the library finds a valid media ID, the library does not allow the cartridge to be moved from storage to a drive that does not have a matching type (for example, an LTO-2 cartridge will not be allowed to move to an LTO-1 drive).

Return Media Identifier

For the media policy settings, the library makes assumptions about a media identifier and its position in a media barcode label. To be considered a media identifier, the identifier characters must be correct for the media domain and media type. Also, the identifier, which for some media types can consist of more than one character, must be complete and in the correct location. The correct characters in the wrong position are not viewed as a media type identifier. In a physical library or partition containing mixed media, the media identifier is not required for all cartridges.

[Table 18](#) explains the media type identifiers and assumptions.

Table 18 Sampling of Media Type Identifiers

Media Domain	Media Type	Identifier
LTO	LTO-1	"L1" as the last characters in the barcode
LTO	LTO-2	"L2" as the last characters in the barcode

Table 18 Sampling of Media
Type Identifiers (Continued)

Media Domain	Media Type	Identifier
LTO	LTO-3	"L3" as the last two characters in the barcode
LTO	LTO-4	"L4" as the last two characters in the barcode
DLT	SDLT-320	"S" as the last character in the barcode
DLT	SDLT-600	"2" as the last character in the barcode
DLT	DLT-S4	"S4" as the last two characters in the barcode

With a valid media type identifier present and the **Media Type Checking** setting enabled, which is the case by default, a host is prevented from executing invalid media moves across differing media types. For example, a host can be prevented from moving LTO-2 media to an LTO-1 drive. If an invalid move is attempted, the library returns an error to the host.

Regardless of whether or not partition media policies are enabled or disabled, the library always prevents host move-media commands that cross different media domains. For example, the library never runs a host command that moves an LTO cartridge from an LTO drive to a DLT storage slot, and vice versa.

With the **Return Media Identifier** setting, you can control if and where a media type identifier appears in the volume serial number that is returned to the host.

[Table 19](#) shows an example of how the return media identifier behaves, depending on the setting you choose: **Disabled**, **Prefix**, **Suffix**, and **Pass Through**. The bold, underlined portion is the media identifier.

Table 19 Return Media Identifier Behavior Example

Setting	Volume Serial Number Returned to Host*
Disabled	ABC123
Prefix	<u>L1</u> ABC123
Suffix	ABC123 <u>L1</u>
Pass Through	ABC123 <u>L1</u>
*Based on actual LTO-1 barcode: ABC123 <u>L1</u>	

For more information about configuring the **Media Type Checking** and **Return Media Identifier** settings, see [Creating Partitions Manually](#) on page 113.

Creating Partitions

You can create library partitions in three ways:

- By using the **Setup Wizard**
- **Automatic** mode
- **Manual** mode

The method you should choose depends on the circumstance and the level of control you want in allocating resources to the partition. In **Automatic** mode, the library assigns available system resources to create the number of partitions you specify. Automatic mode is not available if a partition already exists. **Manual** mode enables you to pick specific drives, storage magazines, and magazines within an I/E station to assign to a partition.



Note

Make sure that you have adequately planned for the number of partitions that you want to configure.

Creating Partitions With the Setup Wizard

If you are performing an initial configuration of your library, you can use the **Setup Wizard** to automatically create partitions using the available system resources. Using the **Setup Wizard** is part of the normal installation procedure for a library without I/O blades.



Note

You should run the **Setup Wizard** only when you initially configure the library. At all other times, create partitions by using the **Partitions** command from the **Setup** menu.

Creating Partitions Automatically

You can use the library's **Automatic** mode to create partitions within limits based on licensing restrictions and available resources. **Automatic** mode is available only if no partitions currently exist.

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→**Partitions**.

The **Partitions** dialog box appears.

- 4 Click **Create**.

The **Partitions - Step 1:Choose Creation Mode** dialog box appears.

- 5 Select **Automatic**, and then click **Next**.

The **Partitions - Step2:Automatic Creation** dialog box appears.

- 6 In the **Partitions** column, type the number of partitions you want to create for each media/drive type.

The maximum number of partitions that you can create is determined by the number of partitions you are licensed to create and the number of drives available. See [Enabling Licenses](#) on page 104.

- 7 Click **Finish**.

The **Partitions** dialog box appears again.

- 8 Click **Close**.

Creating Partitions Manually

If one or more partitions already exist in the library, you must manually create a new partition to allocate drives, storage slots, and I/E station magazines. You have two options to allocate system resources when manually creating a new partition: **Simple** and **Expert** modes.

In **Simple** mode, you can specify the quantity of each element you want assigned to the partition. In **Expert** mode, you can indicate which specific drives, storage magazines, or I/E station magazines to assign to the partition.

Using Simple Mode

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→**Partitions**.

The **Partitions** dialog box appears, listing partitions that are currently configured within the library.



Note

If you want to cancel the partition creation process, click **Cancel**. The **Cancel** button becomes unavailable after you click **Create** later in this procedure.

- 4 Click **Create**.

The **Partitions - Step 1:Choose Creation Mode** dialog box appears.

- 5 Select **Simple**, and then click **Next**.

The **Partitions - Step 2:Choose Partition Properties** dialog box appears.

- 6 Configure the following settings:
 - In the **Name** text box, type a name that describes the new partition.
 - From the **Drive Domain** drop-down list, click the appropriate drive domain.
 - From the **Product ID** drop-down list, click the appropriate product type.

The **Product ID** setting controls the product ID string that is returned in a standard SCSI INQUIRY response. The library can report that it is a Scalar 24, Scalar 100, Scalar 1000, Scalar i2000, or Scalar 10K. This feature can enable the library to be used with host applications that do not yet include the Scalar i2000 in a list of recognized devices. In addition, the various Microsoft® Windows® operating systems maintain a list of recognized devices. If the Scalar i2000 is not in an operating system's list of recognized devices, the library will appear as an "unknown" device in device lists. You might prevent the library from being listed as "unknown" by setting **Product ID** to a library other than Scalar i2000. This setting does not cause any library operational changes other than the SCSI INQUIRY response.

7 To continue, click **Next**.

The **Partitions - Step 3:Choose Policy Settings** dialog box appears.

8 Configure the following settings:

- For **Media Type Checking**, select either **Enable** or **Disable**. This setting is enabled by default.
- From the **Media Checking Policy** drop-down list, click either **Required** or **Not Required**.
- From the **Return Media Identifier** drop-down list, click either **Suffix**, **Pass Through**, **Prefix**, or **Disabled**. Depending on which setting you choose, you can control the use of the media type identifier in the volume serial number that is returned to the host.



CAUTION

After a media volume serial number has been reported to a host, changing the **Return Media Identifier** setting could cause the host to not recognize media within the library.

For more information about how media policies work, see [Understanding Partition Media Policy Settings](#) on page 107.

- For **Automatic Drive Cleaning**, click either **Enable** or **Disable**. This setting is enabled by default.

Enabling automatic drive cleaning allows the library to initiate drive cleaning each time a drive requests a cleaning operation. For automatic drive cleaning to function, you must first configure drive cleaning for the library. For more information about configuring drive cleaning, refer [Configuring Drive Cleaning](#) on page 179.



Note

Automatic drive cleaning should be enabled for partitions only if the host application does not support the coordination of drive cleaning. If drive cleaning functionality is enabled on the host application, do *not* enable automatic drive cleaning for any partitions in the library.

9 To continue, click **Next**.

The **Partitions - Step 4: Choose Resource Quantities** dialog box appears.

10 Type the number of elements to include in the partition by specifying:

- Number of drives
- Number of storage slots
- Number of I/E magazine slots

The quantity available for each type of resource indicates resources not yet assigned to existing partitions.

11 To continue, click **Next**.

The **Partitions - Summary Information** dialog box appears.

12 Verify that the parameters you set are correct.

13 To create the partition, click **Create**.



Note

After you click **Create**, the **Cancel** button becomes unavailable.

The **Partitions - Completed** dialog box appears.

14 Review the information to make sure it is correct.

15 If you want to view the drive information after creating the partition, click **Next**.

16 Click **Finish**.

The **Partitions** dialog box appears again with the partition you just created listed.

17 Click **Close**.

Using Expert Mode

- 18 Log on as an administrator.
- 19 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.

20 Click Setup→ Partitions.

The **Partitions** dialog box displays a list of partitions currently configured within the library.



Note If you want to cancel the partition creation process, click **Cancel**. The **Cancel** button becomes unavailable after you click **Create** later in this procedure.

21 Click Create.

The **Partitions - Step 1:Choose Creation Mode** dialog box appears.

22 Select Expert, and then click Next.

The **Partitions - Step 2:Choose Partition Properties** dialog box appears.

23 Configure the following settings:

- In the **Name** text box, type a name to describe the new partition.
- From the **Drive Domain** drop-down list, click the appropriate drive type.
- From the **Product ID** drop-down list, click the appropriate product type.

The **Product ID** setting controls the product ID string that is returned in a standard SCSI INQUIRY response. The library can report that it is a Scalar 24, Scalar 100, Scalar 1000, Scalar i2000, or Scalar 10K. This feature can enable the library to be used with host applications that do not yet include the Scalar i2000 in a list of recognized devices.

In addition, the various Microsoft Windows operating systems maintain a list of recognized devices. If the Scalar i2000 is not in an operating system's list of recognized devices, the library will appear as an "unknown" device in device lists. You might prevent the library from being listed as "unknown" by setting **Product ID** to a library other than Scalar i2000. This setting does not cause any library operational changes other than the SCSI INQUIRY response.

24 To continue, click Next.

The **Partitions - Step 3:Choose Policy Settings** dialog box appears.

25 Configure the following settings:

- For **Media Type Checking**, select either **Enable** or **Disable**. This setting is enabled by default.
- From the **Media Checking Policy** drop-down list, click either **Required** or **Not Required**.
- From the **Return Media Identifier** drop-down list, click either **Suffix**, **Pass Through**, **Prefix**, or **Disabled**. Depending on which setting you choose, you can control the use of the media type identifier in the volume serial number that is returned to the host.



CAUTION

After a media volume serial number has been reported to a host, changing the **Return Media Identifier** setting could cause the host to not recognize media within the library.

For more information about how media policies work, see [Understanding Partition Media Policy Settings](#) on page 107

- For **Automatic Drive Cleaning**, click either **Enable** or **Disable**. This setting is enabled by default.

Enabling automatic drive cleaning allows the library to initiate drive cleaning each time a drive requests a cleaning operation. For automatic drive cleaning to function, you must first configure drive cleaning for the library. For more information about configuring drive cleaning, refer [Configuring Drive Cleaning](#) on page 179.



Note

Automatic drive cleaning should be enabled for partitions only if the host application does not support the coordination of drive cleaning. If drive cleaning functionality is enabled on the host application, do *not* enable automatic drive cleaning for any partitions in the library.

26 To continue, click **Next**.

The **Partitions - Step 4:Select Drives** dialog box appears.

27 Select the location of one or more drives.

Make sure that you select the appropriate module because the library can have drives in the control module and any of the seven expansion modules.

28 To assign a drive to the partition, select the appropriate check box. You can identify a drive by its serial number and location coordinates. For more information, see [Understanding Location Coordinates](#) on page 366.

29 To continue, click **Next**.

The **Partitions - Step 5:Select Storage Slots** dialog box appears.

30 Select the rack location of one or more storage magazines.

31 To assign a storage slot, select the appropriate check box. You can identify a storage slot by its location coordinates. The number of slots available is determined by the drive media type.

32 To continue, click **Next**.

The **Partitions - Step 6:Select I/E Slots** dialog box appears.

33 Select the location of one or more I/E station magazines.

Make sure that you select the appropriate module because the library can have I/E stations in the control module and expansion modules.

34 To assign an I/E station magazine, select the appropriate check box. You can identify an I/E station magazine by its location coordinates.

35 To continue, click **Next**.

The **Partitions - Summary Information** dialog box appears.

36 Verify that the parameters you set are correct.

37 To create the partition, click **Create**.



Note After you click **Create**, the **Cancel** button becomes unavailable.

The **Partitions - Completed** dialog box appears.

38 Review the information to make sure it is correct.

39 If you want to view the drive information after creating the partition, click **Next**.

40 Click **Finish**.

The **Partitions** dialog box appears again with the partition you just created listed.

41 Click **Close**.

Modifying Partitions

You can use the **Modify** process to change the allocation of drives and storage magazines in existing partitions without having to delete the entire partition and then recreate it. You also can use **Modify** to change partition properties and partition settings.



CAUTION

Modifying partitions improperly, particularly when deleting partition elements, can disrupt host applications.

Before you modify any partitions, understand the configuration changes you plan to make and the potentially disruptive effects that those changes could have on the host application(s). Be careful whenever you add or delete partition elements that include drives, storage magazines, and I/E station magazines.

For best results, follow these guidelines when adding or deleting partition elements:

- Shut down the host application.
- Update the inventory in the library.
- Reconfigure the library in the application.
- Update the inventory in the application.



Note

This procedure includes instructions for downloading new drive firmware images. You can modify partitions from either the library's touch screen or a remote client. However, if you want to download drive firmware images, you must do so from a remote client.

To modify an existing partition, perform the following steps:

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→ **Partitions**.

The **Partitions** dialog box appears.



Note If you want to cancel the partition modification process, click **Cancel**. The **Cancel** button becomes unavailable after you click **Modify** later in this procedure.

4 Select the partition you want to change, and then click **Modify**.



Note If the physical library is not offline, you receive a message that asks you whether you want to modify the partition, requiring the library to be taken offline. Click **Yes**. No host will be able to access the partition while the library is offline.

The **Partitions - Step 1:Choose Partition Properties** dialog box appears.

5 On this dialog box, you can modify the partition name and the product type.

6 To continue, click **Next**.

The **Partitions - Step 2:Choose Policy Settings** dialog box appears.

7 On this dialog box, you can modify the following settings:

- For **Media Type Checking**, select either **Enable** or **Disable**. This setting is enabled by default.
- From the **Media Checking Policy** drop-down list, click either **Required** or **Not Required**.
- From the **Return Media Identifier** drop-down list, click either **Suffix**, **Pass Through**, **Prefix**, or **Disabled**. Depending on which setting you choose, you can control the use of the media type identifier in the volume serial number that is returned to the host. When you have made your modifications, including adding or deleting elements, your proposed changes to the partition are highlighted in the **New Value** column of the table that appears on the **Partitions - Summary Information** dialog box.



CAUTION

After a media volume serial number has been reported to a host, changing the **Return Media Identifier** setting could cause the host to not recognize media within the library.

For more information about how media policies work, see [Understanding Partition Media Policy Settings](#) on page 107.

- For **Automatic Drive Cleaning**, click either **Enable** or **Disable**. This setting is enabled by default.

Enabling automatic drive cleaning allows the library to initiate drive cleaning each time a drive requests a cleaning operation. For automatic drive cleaning to function, you must first configure drive cleaning for the library. For more information about configuring drive cleaning, refer [Configuring Drive Cleaning](#) on page 179.



Note Automatic drive cleaning should be enabled for partitions only if the host application does not support the coordination of drive cleaning. If drive cleaning functionality is enabled on the host application, do *not* enable automatic drive cleaning for any partitions in the library.

8 To continue, click **Next**.

The **Partitions - Step 3:Select Drives** dialog box appears.

9 Select the location of one or more drives.

Make sure that you select the appropriate module because the library can have drives in the control module and in any of the expansion modules.

10 You can add a drive to the partition by selecting the appropriate drive check box. You can delete a drive from the partition by clearing the drive's check box. You can identify a drive by its serial number and location coordinates.

11 To continue, click **Next**.

The **Partitions - Step 4:Select Storage Slots** dialog box appears.

12 Select the rack you want to modify.

13 You can add an I/E station magazine by selecting the appropriate check box. You can delete an I/E station magazine by clearing its check box. You can identify an I/E station magazine by its location coordinates.

14 To continue, click **Next**.

The **Partitions - Step 5:Select I/E Slots** dialog box appears.

- 15 Select the location of one or more I/E station magazines.

Make sure that you select the appropriate module because the library can have I/E stations in the control module and in expansion modules.

- 16 You can add an I/E station magazine by selecting the appropriate check box. You can delete an I/E station magazine by clearing its check box. You can identify an I/E station magazine by its location coordinates.



CAUTION

If you delete magazines that contain media, the media will be inaccessible unless you reassign the magazines to another partition.

- 17 To continue, click Next.

The **Partitions - Step 6:Configure Drive Firmware Autoleveling** dialog box appears.



Note

The **Partitions - Step 6:Configure Drive Firmware Autoleveling** dialog box appears only if the library has I/O blades installed in it. If this dialog box does not appear, the **Partitions - Summary Information** dialog box appears instead. See Step 19.

The **Partitions - Step 6:Configure Drive Firmware Autoleveling** dialog box enables you to set up drives to participate in autoleveling operations. Drives are autoleveled whenever they are reset, such as when the library is power cycled or rebooted, and whenever they are added or replaced.

- 18 To enable autoleveling for the partition, perform the following steps:
 - a From the **Drive Type** drop-down list, click the type of drives that you want to list in the table. Listed drive types use the following format:

<vendor>_<product>_<interface>

Drives of the specified type within the partition appear in the table.



Note

All drives of the specified type within the partition are listed, regardless of whether they are attached to an I/O blade.

- b** If you need to download a new drive firmware image to use with drives that you want to participate in autoleveling operations, perform the procedure under [Downloading New Drive Firmware](#) on page 124, and then proceed with the next substep. Otherwise, proceed directly to the next substep.
- c** After you download a new image, the new drive firmware version is automatically added to the **Firmware Version** drop-down list.
- d** In the leftmost column of the table in the **Selected Drives will be Autoleveled** area, select one or more check boxes that correspond to drives that you want to update with the same drive firmware version, and then click the version in the **Firmware Version** drop-down list.



Note Only drives that are attached to an I/O blade can participate in drive firmware autoleveling operations. If you select drives that are not attached to I/O blades, they will not be updated during autoleveling operations.

19 To continue, click **Next**.

The **Partitions - Summary Information** dialog box appears.

20 Verify that the parameters you set are correct.

21 If the summary information is correct, click **Modify**.



Note After you click **Modify**, the **Cancel** button becomes unavailable.

The **Partitions - Completed** dialog box appears.

22 Review the information to make sure it is correct.

23 If you want to view the drive information after modifying the partition, click **Next**.

24 Click **Finish**.

The **Partitions** dialog box appears again.

25 Click **Close**.

Downloading New Drive Firmware

Before you install a new drive firmware image, you must download it to the library's management control blade (MCB) from the remote client's file system. You must perform the download from a remote client.



Note

Before you begin the following procedure, make sure that you have obtained the new drive firmware image from Quantum technical support and placed it in an accessible location on your laptop.

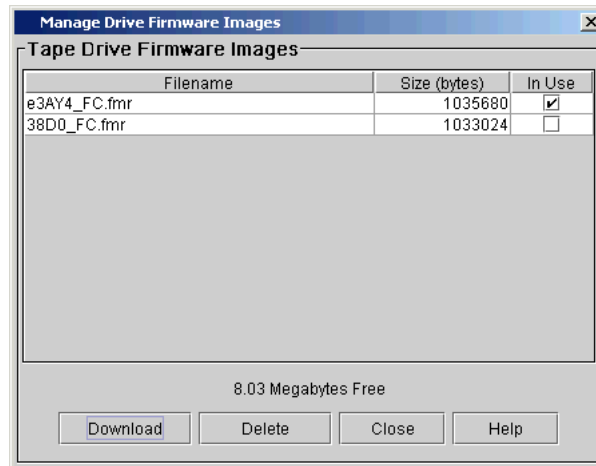


CAUTION

The drive firmware image must be compatible with the drives that you will update with it. For more information, see the Customer Service website.

- 1 On the **Partitions - Step 6:Configure Drive Firmware Autoleveling** dialog box, click **Manage Images**.

The **Manage Drive Firmware Images** dialog box appears.



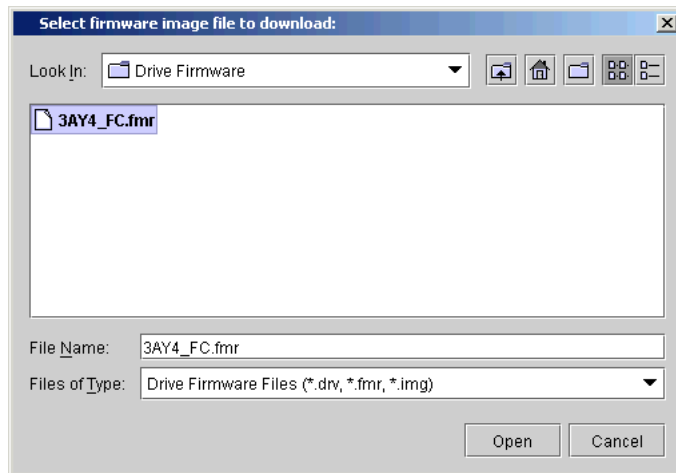
The library has enough space for 10 MB of drive firmware images. In this example, “8.03 Megabytes Free” indicates that 1.97 MB of space is currently unavailable. A check mark in the **In Use** column indicates one of the following conditions:

- An autoleveling policy exists that uses this drive firmware image
- A pending autoleveling policy exists that uses this drive firmware image
- A pending firmware update exists that uses this drive firmware image

Under these conditions, you cannot delete the drive firmware image. If the check box for a drive firmware image is clear, you can delete the image by clicking it to highlight it, and then clicking **Delete**.

2 To download a new drive firmware image, click **Download**.

The **Select firmware image file to download** dialog box appears.



3 Navigate to the location of the drive firmware image file (with either a **.drv**, **.fmr**, or **.img** extension) you want to download, and then click the image file to highlight it.

4 Click **Open**.

The download process copies the drive firmware image from the remote file system to the MCB. When the download process completes, the **Partitions - Step 6:Configure Drive Firmware Autoleveling** dialog box appears again.

Deleting Partitions



CAUTION

For the host application to have access to the written data on the partition that you want to delete, you must recreate a partition that includes the same media type, interface, I/E station magazines, and a host at the same SCSI ID and LUN.

To delete a partition, perform the following steps:

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→**Partitions**.

The **Partitions** dialog box appears.

- 4 Click the partition you want to delete.



Note You can delete only one partition at a time.

- 5 Click **Delete**.



Note If the physical library is not offline, you receive a message that asks you whether you want to take the library offline and delete the partition. Click **Yes**. If the partition is already offline, you receive a message that asks you whether you want to delete the partition. Click **Yes**.

- 6 The library deletes the selected partition. Repeat the process to delete another partition, or click **Close**.

Setting Up the Network Configuration

Make sure that your library is attached to the network before you use the **Network Configuration** command.



CAUTION

You must full understand all network issues before you change the network configuration for an already configured library. It is recommended that you consult with your network administrator before changing your network configuration.

- 1 Log on as an administrator.
- 2 If you are not already working from the physical library, select the physical library from the **View** menu.
- 3 From the menu bar, click **Setup > Network Configuration**.

The **Network Configuration** dialog box appears.

Network Configuration

If DHCP is enabled, enter only the Library Name. If DHCP is disabled, enter the appropriate addresses in standard IP format.
Take caution when changing network parameters from remote client. If the IP address changes, the application will lose connection until you restart the application.

Host Settings

DHCP: Enable Disable

Library Name:

IP Address:

Subnet Mask:

Default Gateway:

Port Settings

Auto Negotiate Enable Disable

Speed 100 10

OK Cancel Cycle Help

The following table describes the elements on the **Network Configuration** dialog box.

Element	Description
In the Host Settings area:	
DHCP	If Dynamic Host Configuration Protocol (DHCP) is enabled on your network, select Enable to have DHCP automatically configure the library network settings. Enable makes the IP Address , Subnet Mask , and Default Gateway text boxes unavailable. Select Disable to make the IP Address , Subnet Mask , and Default Gateway text boxes available for you to manually set the library network settings.
Library Name	The network name that you want to assign to the library.
IP Address	The IP address of the library. This text box is available only if DHCP is disabled.
Subnet Mask	The subnet mask. This text box is available only if DHCP is disabled.
Default Gateway	The IP address of the default gateway for your portion of the Ethernet network. This text box is available only if DHCP is disabled.
In the Port Settings area:	
Auto Negotiate	Select Enable to have the library automatically negotiate port speeds. Enable makes the Speed options unavailable. Select Disable to make the Speed options available for you to manually set the port speed.
Speed	The port speed (10 Mbps or 100 Mbps). Speed options are available only if Auto Negotiate is disabled.

The **Cycle** button enables you to cycle the external Ethernet interface without rebooting the library.

- 4 Make the appropriate network configuration changes, and then click **OK**.
- 5 A message appears that informs you that network connectivity will be lost temporarily and asks whether you want to proceed. Click **Yes**.

Managing Connectivity

The **Connectivity** command on the **Setup** menu enables you to access three connectivity-related commands for the library: **Port Configuration**, **Datapath Conditioning**, and **FC Host Port Failover**.

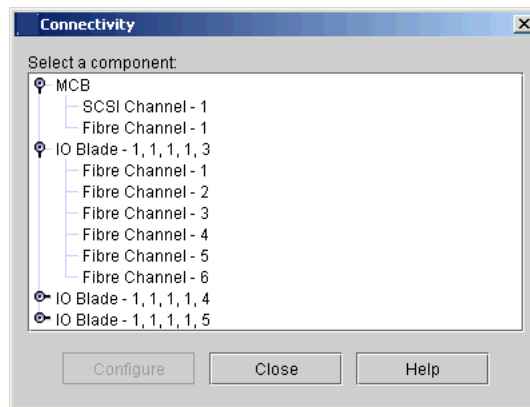
For information about configuring data path conditioning monitoring levels and intervals, see [Configuring Datapath Conditioning](#) on page 198.

Port Configuration

Use the **Port Configuration** command to view and configure connectivity parameters for FC ports. **Port Configuration** gives you access to the FC ports on the MCB and on the I/O blades.

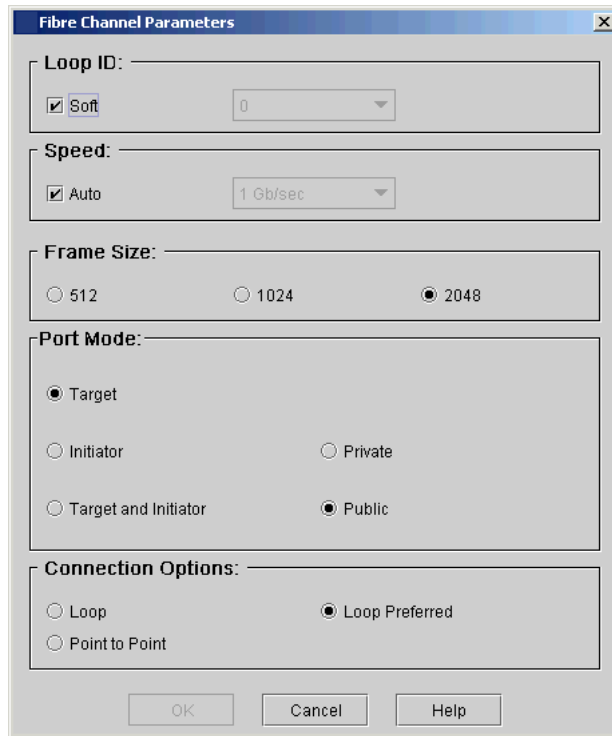
- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup** → **Connectivity** → **Port Configuration**.

The **Connectivity** dialog box appears. All components that provide FC and SCSI ports appear in the dialog box if they are detected. You cannot configure settings for the SCSI port on the MCB.



- 4 This example shows expanded levels for "MCB" and "IO Blade - 1,1,1,1,3". Click the highest-level items to show next-level items.
- 5 Click a port to highlight it, and then click **Configure**.

For an FC port on either the MCB or an I/O blade, the **Fibre Channel Parameters** dialog box appears.



You can configure two settings for an MCB connection and all settings for an I/O blade connection. The figure above shows an FC port configured for target mode and a loop preferred connection.

- a** In the **Loop ID** area of the **Fibre Channel Parameters** dialog box, repeatedly selecting **Soft** acts as a toggle, checking and clearing the box. If the box is not checked, you can click a hard loop ID (within the range from 0 to 125) from the drop-down list. Some operating systems require hard ID settings. Consult your service representative before making changes to this setting.
- b** Select **Auto** to automatically set the interface speed. To configure the speed manually, clear the **Auto** check box and use a setting from the drop-down list. Because this setting is not configurable

on the MCB, the **Speed** area does not appear on the **Fibre Channel Parameters** dialog box when configuring the MCB FC port. The MCB FC port speed is always 1 Gb/sec.

- c **FC Frame Size** is specified by each receiving node and need not match any other node. The frame size is typically set to 2048. (You can use another frame size if it is required by a particular software application.)
- d FC ports support **Private** and **Public** Fibre Channel attachments. The default port mode setting for FC ports 1 and 2 is **Target Public**, and the default port mode setting for FC ports 3 through 6 is **Initiator Public**. With **Public**, the loop is scanned for Fabric devices and allows the Fabric to have access to all available target devices that are attached to it. With **Private**, the local loop is scanned for devices except for Fabric devices. In **Target** mode, the port is set to receive connections from another FC initiator, such as a host or FC switch. In **Initiator** mode, the port scans for storage devices. In **Target and Initiator** mode, the port operates in both modes simultaneously.
- e The default connection mode for both target and initiator ports is **Loop Preferred**. For target ports, other options include **Loop** and **Point to Point**. For initiator ports, other options include **Loop** and **Loop Preferred**. If you change a target port that is set to **Point to Point** to initiator mode, the port connection type automatically changes to **Loop Preferred**. Consult your service representative before making changes to this setting.

For reference purposes, the following table shows the default FC I/O blade port settings as initially set up at installation.

Table 20 FC I/O Blade Port Settings

Port	Loop ID	Speed	Frame Size	Port Mode	Connection Option	Private/Public
FC-1	Soft	Auto	2048	Target	Loop preferred	Public
FC-2	Soft	Auto	2048	Target	Loop preferred	Public
FC-3	Soft	Auto	2048	Initiator	Loop preferred	Public
FC-4	Soft	Auto	2048	Initiator	Loop preferred	Public

Table 20 FC I/O Blade Port
Settings (Continued)

Port	Loop ID	Speed	Frame Size	Port Mode	Connection Option	Private/Public
FC-5	Soft	Auto	2048	Initiator	Loop preferred	Public
FC-6	Soft	Auto	2048	Initiator	Loop preferred	Public

- 6 After you finish selecting the port configuration settings, click **OK**.
- 7 A message appears that asks whether you want to make the change. Click **Yes**.

FC Host Port Failover

Configure the optional FC Host Port Failover (HPF) feature so that an alternate “standby” target port on an I/O blade can assume the identity and LUN mapping configuration of the primary “active” target port if the primary port fails. HPF enables the library to continue operations without requiring you to reconfigure the host or the SAN.

To enable HPF, you must make sure that two ports on the I/O blade are in target mode and point-to-point connection. Use ports 1 and 2, which are ports that are traditionally configured to be host targets. I/O blade ports are numbered from bottom to top as the blade sits in the I/O management unit.

Both ports must be attached to the same SAN fabric to provide host access. The active primary port is used for host communications, while the passive standby port is kept idle. The way that you configure the recovery settings determines how the failed port behaves after it is restored from a failed state.

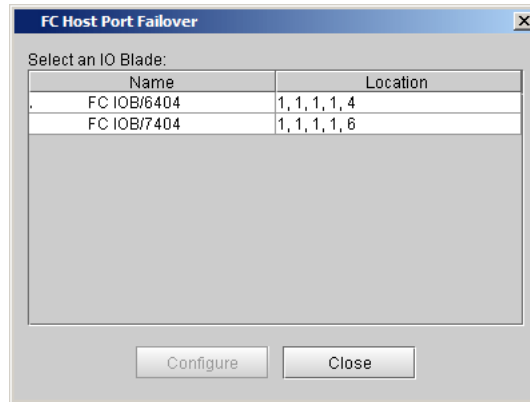
The library generates a ticket when port failover occurs. Examine the ticket and the repair page associated with the ticket to determine the reason for the failover.

To configure HPF, perform the following steps:

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Confirm that there are two ports on the I/O blade in target mode and point-to-point connection. For more information, see [FC Host](#) on page 157.

4 Click **Setup**→**Connectivity**→**FC Host Port Failover**.

The **FC Host Port Failover** dialog box appears, showing all the I/O blades found in the library. Each blade is identified by name and by location.



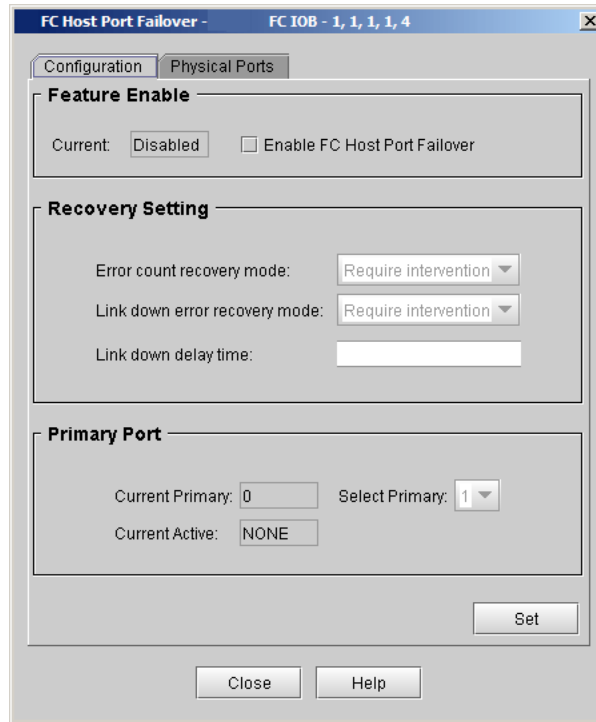
5 Click a blade to highlight it, and then click **Configure**.

The **FC Host Port Failover** dialog box appears

6 In the **Feature Enable** area, select **Enable FC Host Port Failover**, and then click **Set** to make the **Configuration** tab available.

On the **Configuration** tab, settings are unavailable if the current state of the tab is set to **Disabled**.

Be aware that there might be incompatibilities with channel zoning configuration on the I/O blade if you enable host port failover.



- 7 Accept the recovery setting default values unless an authorized representative advises you otherwise. Before you set recovery settings, understand the following elements in the **Recovery Setting** area:
- **Error count recovery mode** sets the recovery scenario for all ports when port failure is caused by excessive errors on the port. The only setting option is **Require Intervention**.
 - **Link down error recovery mode** sets the recovery scenario for all ports when port failure is caused by the port going offline for more time than the threshold specified in the **Link down delay time** text box. The only setting option is **Require Intervention**.
 - **Link down delay time** sets the timeout threshold before link down status applies. The default value is zero (0) seconds. There is no maximum value.

Require Intervention means that a user must manually use the **Physical Ports** tab to bring a failed port that has recovered back online.

- 8 Configure the **Primary Port**. Only ports that are in target mode and point-to-point connection can participate in host port failover. The primary port becomes active by default and the alternate port will go on passive standby until a failover occurs. Use the **Select Primary** drop-down list to select from the target ports that are online and available. You must select a primary port. **Current Active** indicates the currently active port.
- 9 Click **Set**. If your configuration has errors, a warning message appears.

Enabling a Target Port

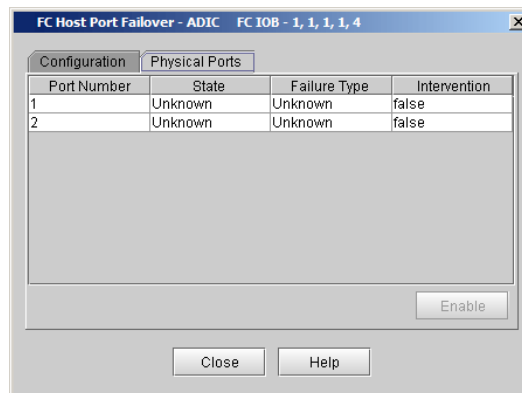
Use the **Physical Ports** tab to manually enable an online target port that was disabled because of a previous connection error. If the **Intervention** column displays "true," you must manually bring the recovered port back online using **Enable**. If the port state is "disabled," the port's connection is repaired and it is ready to be re-enabled. If the **Configuration** tab itself is disabled, the table on the **Physical Ports** tab will be empty.



Note

If the target port state is offline, the port's connection has not been repaired. The error condition that caused the port to fail still exists.

- 1 On the **FC Host Port Failover** dialog box, click the **Physical Ports** tab.



The dialog box shows you each target port on the I/O blade, the port's state, and the type of failure that has occurred, if applicable.

2 Click the port you want to enable.

3 Click **Enable**.



Note **Enable** is available only if the port is disabled.

4 To return to the main **FC Host Port Failover** dialog box, click **Close**.

Setting Up Policies for the Physical Library

The **Physical Library** dialog box enables you to configure various operating modes, including:

- Enable or disable **Automatic Teach**

Specify whether the robotic assembly should be automatically calibrated and, if necessary, configured each time the power cycles off and on or when the library door is opened and closed.

- Enable or disable **Automatic Inventory**

Specify whether the library should scan inventory automatically each time the power cycles off and on or when the library door is opened and closed.

- Enable or disable **Logical SN Addressing**

Specify whether the library should use logical serial number addressing for all drives in the library. Only CSEs can enable or disable logical serial number addressing.

- Enable **Automatic Drive Unload**

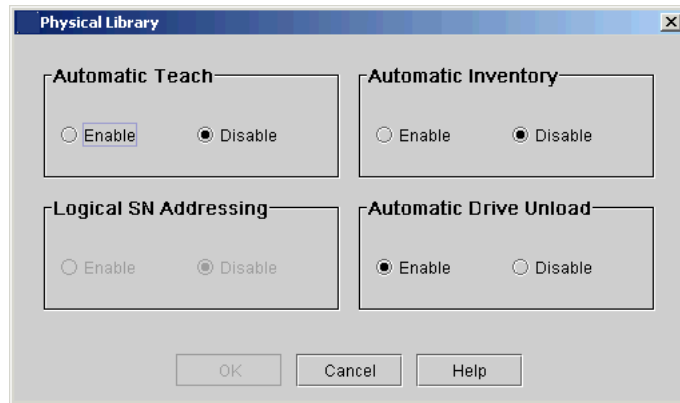
Specify whether the library should automatically eject cartridges from drives.

1 Log on as an administrator.

2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.

3 Click **Setup**→**Physical Library**.

The **Physical Library** dialog box appears.



- 4 Select **Enable** in the **Automatic Teach** area to schedule automatic calibration and configuration of the robotic assembly when the library powers up or when the library door is opened and closed.

Automatic Teach is disabled by default.

- 5 Select **Enable** in the **Automatic Inventory** area to schedule automatic inventories of library contents when the library powers up or when the library door is opened and closed.

Automatic Inventory is disabled by default.



Note

The **Logical SN Addressing** area is available only to CSEs. You cannot enable or disable logical serial number addressing for drives. If a CSE enables this feature, the library assigns logical serial numbers to all drives in the library. Specifically, the library assigns a logical serial number to a drive in a specific location. This is not the serial number of the particular drive. If a drive is replaced by another drive in the same library location, the logical serial number remains the same. From the host's perspective, the replacement drive is the same as the original one.

- 6 Select **Enable** in the **Automatic Drive Unload** area to cause the library to issue unload commands when host applications issue move media commands to the library. If you set this to **Disable**, proper library operation requires host applications to issue unload commands to the drives.

Automatic Drive Unload is enabled by default.

- 7 When finished, click **OK**.

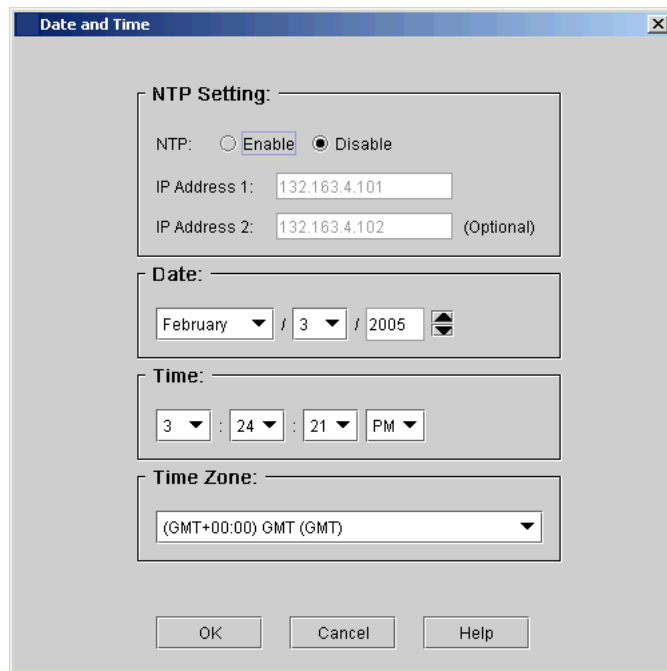
Specifying the Date and Time

You can use the **Date and Time** command to set or reset the system time. If you want to synchronize the library over a network, you can use the Network Time Protocol (**NTP**) setting. The default date and time is Greenwich Mean Time (GMT).

To set the date and time or use NTP:

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→**Date and Time**.

The **Date and Time** dialog box appears.



4 In the **Date and Time** dialog box, you can set the following parameters:

- If you want to use NTP, in the **NTP Setting** field, select **Enable**. The default is **Disable**.

If you choose to use NTP, you must provide valid IP addresses that are accessible from the library. You have the option of using one or two IP addresses.

If NTP is enabled and you no longer want to use this setting, select **Disable**.

- If you do not use NTP, you must manually set the date and time.

In the **Date** drop-down lists, click the appropriate month, date, and year.

In the **Time** drop-down lists, click the appropriate hour, minute, and **AM** or **PM**.

- 5 In the **Time Zone** drop-down list, click the appropriate time zone that you want to appear on the library information panel.



Note

The default time zone is GMT. The time zone that you select appears only on your library information panel. Regardless of your selection for the library information panel, the system operates on the GMT zone.

- 6 Click **OK**.

Configuring E-mail

The library uses the e-mail settings on the **Email Configuration** dialog box whenever library e-mail services are used, such as when you use the **Send** command to e-mail snapshots or logs and when the library automatically sends e-mail notifications of library problems.

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→**Email Configuration**.

The **Email Configuration** dialog box appears.

The screenshot shows a standard Windows-style dialog box titled "Email Configuration". It features a title bar with a close button (X) on the right. The main area contains the following fields and controls:

- SMTP Server:** A text input field.
- Authentication:** Two radio buttons, "Password" (which is selected) and "None".
- Account:** A text input field.
- Password:** A text input field.
- Sender Address:** A text input field.

At the bottom of the dialog, there are three buttons: "OK", "Cancel", and "Help".

- 4 In the **SMTP Server** text box, type the IP address of the SMTP server (for example, 192.16.96.201).



CAUTION

You must identify the SMTP server by its IP address.

- 5 If your SMTP server requires authentication of accounts and passwords, select **Password** in the **Authentication** field. If it does not, select **None**.
- 6 In the **Account** text box, type the name of a valid account on the SMTP server (for example, Jay.User).



Note

The **Account** text box is not available if **None** is selected in the **Authentication** field.

- 7 In the **Password** text box, type the password for the account that you specified in the **Account** field.



Note

The **Password** text box is not available if **None** is selected in the **Authentication** field.

- 8 In the **Sender Address** text box, type an e-mail address for the library (for example scalari2000@mycompany.com).

The library uses this address in the “From” field of e-mail messages that it sends out, indicating the originator of the message. If you type, for example, “scalari2000”, the library appends the domain information (for example, “@mycompany.com”). If you type, for example, “scalari2000@mycompany.com”, the library does not append any additional information.

- 9 To finish, click **OK**.

Setting Up E-mail Notifications

You can set up notifications in the LMC so that the library automatically sends an e-mail message to specified e-mail addresses whenever an issue of a particular severity level occurs. The information in the e-mail notification provides details about the issue and the library conditions at the time of the error.



Note

Before you set up notifications, you must configure e-mail in the LMC so that the library can send notifications to the recipients. See [Configuring E-mail](#) on page 140.

[Table 21](#) describes the severity levels for which the library can send notifications if e-mail addresses are set up appropriately to receive them.

Table 21 Severity Levels
Assigned to Issues

Severity Level	Description
1 (Failed)	<p>Indicates that a failure has occurred or a different serious condition exists within a library subsystem that requires immediate corrective action. In most cases, a hardware component is no longer functioning at an acceptable level or has failed. Typical library operations are either impossible or highly unreliable.</p> <p>Examples of failure situations include a FRU that is not functioning, a temperature threshold that has been reached that causes unreliable operations, or a partition that the library has automatically taken offline.</p>
2 (Degraded)	<p>Indicates that a degraded condition exists within a library subsystem that impacts system performance or redundancy. Typical library operations can continue without immediate corrective action, but an administrator should investigate the condition and correct the problem soon.</p> <p>Examples of degraded situations include a redundant power supply that has failed or a connectivity problem that has caused host port failover to occur.</p>

Table 21 Severity Levels
Assigned to Issues (Continued)

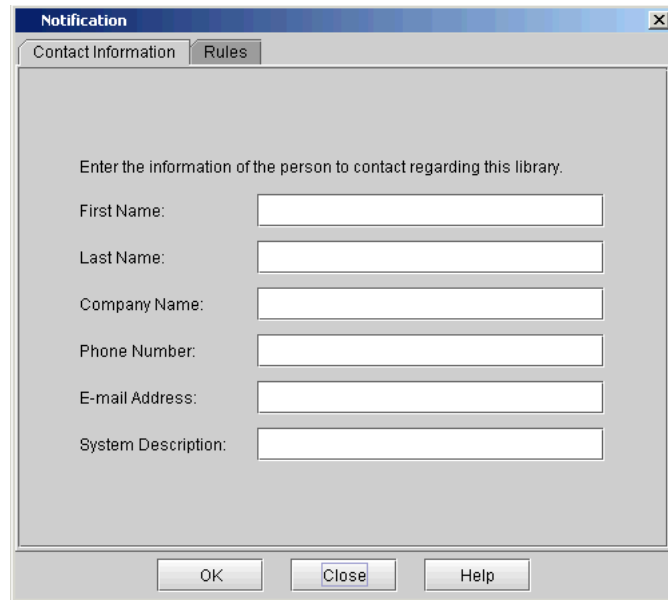
Severity Level	Description
3 (Warning)	<p>Indicates that a condition exists within a library subsystem that has little effect on system operations. Typical library operations can continue without immediate corrective action, but you should investigate the condition and correct the problem when possible. Warnings also can provide helpful information, such as indicating that a door is open.</p> <p>Examples of warning situations include a FRU that is functioning less reliably or a temperature threshold that has been reached that does not affect reliable operations.</p>

The body text in the e-mail notification provides details about the issue and library conditions at the time of the event. The e-mail notification also includes an attachment, referred to as a repair page, that provide a problem description and corrective actions you or a customer service engineer (CSE) can perform. For more information about e-mail notifications, see [Understanding E-mail Notifications](#) on page 10.

To set up e-mail recipients for notifications, perform the following steps:

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→ **Notification**.

The **Notification** dialog box appears with the **Contact Information** tab displayed.

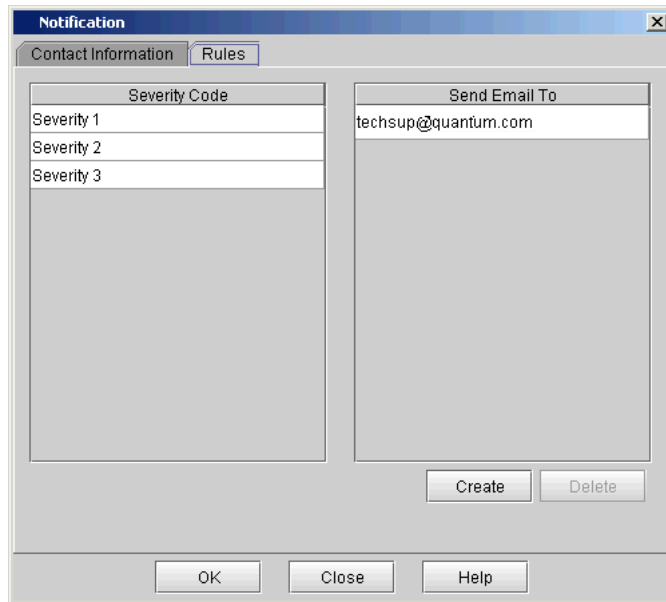


The screenshot shows a dialog box titled "Notification" with a close button (X) in the top right corner. It has two tabs: "Contact Information" (selected) and "Rules". The main area contains the instruction "Enter the information of the person to contact regarding this library." followed by six input fields: "First Name:", "Last Name:", "Company Name:", "Phone Number:", "E-mail Address:", and "System Description:". At the bottom, there are three buttons: "OK", "Close", and "Help".

Use this dialog box to enter the contact information you want included in an e-mail notification if an error occurs in the library.

- 4 After you type the information in the fields you want included in the e-mail notifications, click **OK**.

The **Notification** dialog box displays the **Rules** tab.



This dialog box shows all notification recipients that are set up currently in the LMC. By default, the only e-mail address to which the library sends e-mail notifications (severity level 1 [Failed] issues only) is techsup@quantum.com (Quantum technical support), as shown in this **Notification** dialog box example.

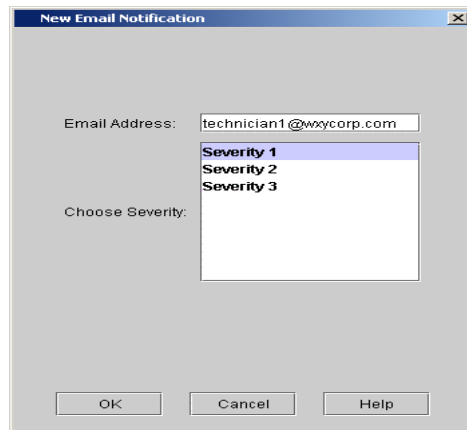


Note

Even though you can remove the Quantum technical support e-mail address so that Quantum does not receive severity level 1 notifications, Quantum recommends that you do not remove it. Also, do not include the Quantum technical support e-mail address for severity level 2 or 3 notifications.

- The remaining steps in this procedure guide you through setting up new e-mail notification recipients. To delete an existing e-mail address, click the e-mail address in the **Send Email To** column, and then click **Delete**.

5 To set up a new e-mail notification recipient, click **Create**.
The **New Email Notification** dialog box appears.



6 In the **Email Address** text box, type the e-mail address that you want to receive notifications.



Note

Do not enter more than one address in the **Email Address** text box. Continue to Step 7 and Step 8 for this address, and then repeat Step 5 through Step 8 for each additional address.

- 7 In the **Choose Severity** box, click the severity level you want to assign to this e-mail address.



Note

If you are using the remote client LMC, you can assign more than one severity level. While pressing the **CTRL** key, click the severity levels you want to assign. The touch screen on the library enables you to select only one severity level.

- 8 To accept this notification setup, click **OK**.

The **Notification** dialog box reappears.

- 9 After you finish setting up all notifications, click **OK**.

Configuring Devices

You can change the way library components appear to the hosts. The **Setup**→**Device** command enables you to change the way system components appear to the hosts.

The **Setup**→**Device**→**IDs** command is available while viewing a partition. Use this command to set the SCSI ID for a SCSI-attached drive or the Loop ID for a Fibre-attached drive. All hosts that view the drive will see the same SCSI ID associated with the drive.

The **Setup**→**Device**→**Access** command gives you access to the **Channel Zoning**, **SCSI Host**, and **FC Host** commands, which are available while viewing the physical library. Use the **Channel Zoning** command to restrict host access to particular I/O blade ports. Use the **SCSI Host** and **FC Host** commands to configure access to partition accessors and drives on a per-host basis. If you have connected your host to either the FC port or the SCSI port on the MCB, or to a port on one of the I/O blades, you must map the appropriate partitions by using either the **SCSI Host** command or the **FC Host** command. If you have connected your hosts directly to the drives, use third-party software of your choice to manage media from the host itself.

If you have not otherwise restricted access, **SCSI Host** has full control of all LUNs on all FC and SCSI channels, up to an overall system total of 2,048. SCSI hosts can configure access at the LUN-level for an overall system total of up to 2,048 LUNs.

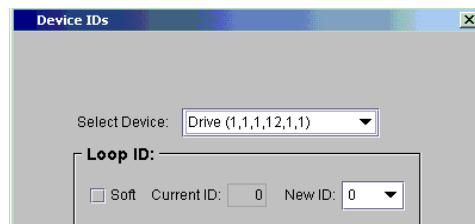
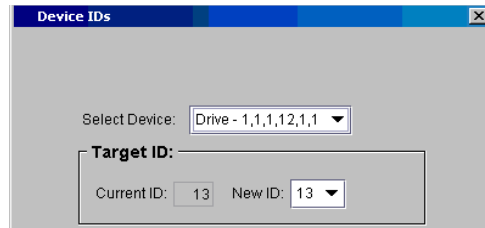
If you have not otherwise restricted access, **FC Host** has full control of all LUNs on all FC and SCSI channels. Each FC host can be configured to access a maximum of 255 LUNs, up to an overall system total of 2,048.

Device IDs

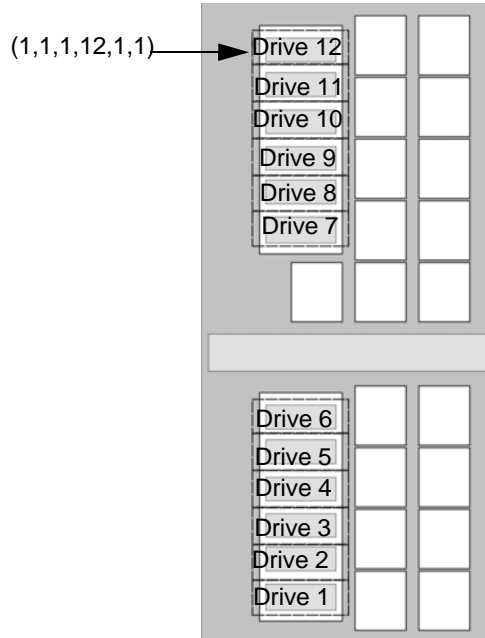
From a partition, you can change the SCSI ID for a SCSI-attached drive or the Loop ID for a Fibre-attached drive. For example, the default SCSI ID for a drive that you are installing might conflict with the assigned SCSI ID of an existing drive. You might be using an application that expects to communicate with a device at a specific SCSI ID, but that ID might already have been configured for use in another partition. Use the **Setup**→**Device**→**IDs** command to correct these situations.

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the partition that includes the drive you want to configure. From the **View** menu, click the name of the appropriate partition.
- 3 Click **Setup**→**Device**→**IDs**.

The **Device IDs** dialog box appears. (The following two examples show the SCSI version of the **Device IDs** dialog box, and then the FC version.)



The drive shown in both of these figures is in the topmost of the twelve drive bays in a control module. The following figure shows its location in the control module. For more information about location coordinates, see [Understanding Location Coordinates](#) on page 366.



- 4 To specify a particular ID for a drive, perform one of the following tasks:
 - f For a FC drive, either click a new ID number from the **New ID** drop-down list or select the **Soft** check box to automatically assign an ID.
 - g For a SCSI drive, click a new ID number from the **New ID** drop-down list.
- 5 Click **Set**.

Channel Zoning

Channel zoning, also called port zoning, is an optional feature that configures access to an entire Fibre Channel and all the LUNs on that channel for the exclusive use of a host or group of hosts on a single port. Channel zoning enables you to control access between specific target Fibre Channel (FC) ports and initiator channels on an I/O blade in your library. If you make changes to the channel zoning settings, you must reboot the I/O blade for the new settings to take effect.

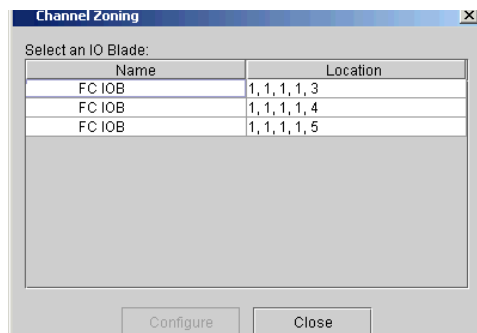


CAUTION

If you change channel zoning after host computers or applications have already discovered devices, you must make sure that device discovery occurs again. Device discovery could occur automatically when you reboot the library. Some host computers have plug and play capability, which can discover devices automatically. Host applications might discover devices automatically.

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→**Device**→**Access**→**Channel Zoning**.

The **Channel Zoning** dialog box appears.

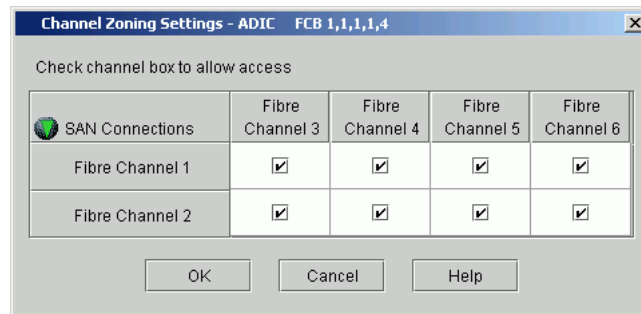


- 4 Click the I/O blade you want to configure to highlight it.

The same I/O blade could appear multiple times in the list depending on the number of hosts assigned to the I/O blade. You only need to select one instance of the blade to zone the entire blade.

5 Click Configure.

The **Channel Zoning Settings** dialog box appears for the selected I/O blade. By default, all FC ports have access to all channels.



- 6** If you want to permit access, select the check box in the cell where the target port and the initiator channel meet. If you want to restrict access, clear the check box in the cell where the target port and the initiator channel meet.

If an FC port is set to target and initiator mode, the port appears in both the horizontal row and vertical column. To prevent ghosting, the FC port is not allowed access to itself. Ghosting is a condition where hosts can see storage in two places.



Note

When you select a check box in the cell, the entire channel is zoned. This zoning affects any host that might be accessing the I/O blade. Channel zoning settings supersede any host LUN mapping on the I/O blade.

- 7** To continue, click **OK**.
- 8** You must reboot the I/O blade for the new configuration settings to take effect. In the **Attention** dialog box, click **Yes** to proceed. If you do not want to continue with the configuration, click **No**.
- 9** After you complete your configuration changes, click **Close**.

SCSI Host

During device discovery, a particular partition or drive could map to a higher LUN space than is optimal for a particular application. The **SCSI Host** command enables you to create a virtual private remapping of available LUNs for a specific SCSI channel-attached host. Use this command to make devices appear to the host as if they were at lower LUNs in order to optimize system performance.



Note

Use the **SCSI Host** command to map partitions when a SCSI channel host is connected to the MCB.

Depending on host operating system constraints, it might be necessary to reboot or reconfigure the host because of device map changes that result from using the **SCSI Host** command.



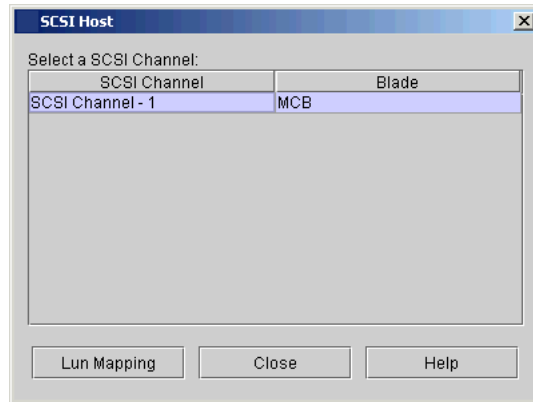
CAUTION

If you change LUN mapping after host computers or applications have already discovered devices, you must make sure that device discovery occurs again. Device discovery could occur automatically when you reboot the library. Some host computers have plug and play capability, which can discover devices automatically. Host applications might discover devices automatically.

Creating SCSI Host LUN Mapping Assignments

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→**Device**→**Access**→**SCSI Host**.

The **SCSI Host** dialog box appears.

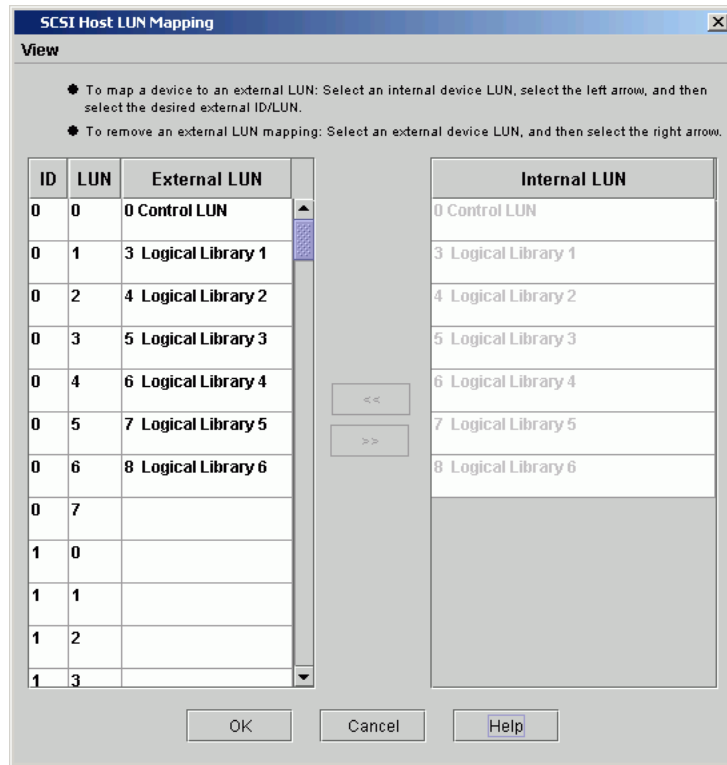


- 4 Click a SCSI port that you want to configure to highlight it.

In the **SCSI Host** dialog box shown in the example, there is only one SCSI port available, and it is on the MCB.

- 5 With the port selected, click **LUN Mapping**.

The **SCSI Host LUN Mapping** dialog box appears in its default view.



In this figure, all devices have been manually mapped. The new map locations appear in heavy black type in the **ID/LUN/External LUN** column. The previous (default) device map position of a mapped device is shown in gray type in the **Internal LUN** column.



Note

If you delete a partition that is currently displayed on the **SCSI Host LUN Mapping** dialog box, the internal LUN and any external LUN mappings for the partition will no longer appear on the dialog box.

- 6 Drag the partitions that you want the SCSI host to manage from the **Internal LUN** column to the **ID/LUN/External LUN** column.

In the default view, only partition names and the SCSI ID of the host connection are shown. In the **Show Details** view, partition name, product ID, vendor ID, and serial number of the host connection are shown.



Note

The **Product ID** setting controls the product ID string that is returned in a standard SCSI INQUIRY response. The library can report that it is a Scalar 24, Scalar 100, Scalar 1000, Scalar i2000, or Scalar 10K. This feature can enable the library to be used with host applications that do not yet include the Scalar i2000 in a list of recognized devices. In addition, the various Microsoft Windows operating systems maintain a list of recognized devices. If the Scalar i2000 is not in an operating system's list of recognized devices, the library will appear as an "unknown" device in device lists. You might prevent the library from being listed as "unknown" by setting **Product ID** to a library other than Scalar i2000. This setting does not cause any library operational changes other than the SCSI INQUIRY response.

To change the view, see [Setting the View for the SCSI Host Device Column](#) on page 156.

- 7 The right column of the SCSI host map dialog box, labeled **Internal LUN**, lists all available devices. The **ID/LUN/External LUN** column on the left provides map space for IDs 0-15 associated with the selected SCSI Channel, and LUNs 0-7 associated with each ID. Drag and drop devices from the **Internal LUN** column into the boxes associated with particular LUN assignments in the **ID/LUN/External LUN** column.

If you are working from the local touch screen, you must select an internal device LUN, select the left arrow, and then select the desired external LUN. If you are working from the remote client, you can use the select method or you can drag and drop the devices from the **Internal LUN** column to the appropriate LUN assignment in the **ID/LUN/External LUN** column.

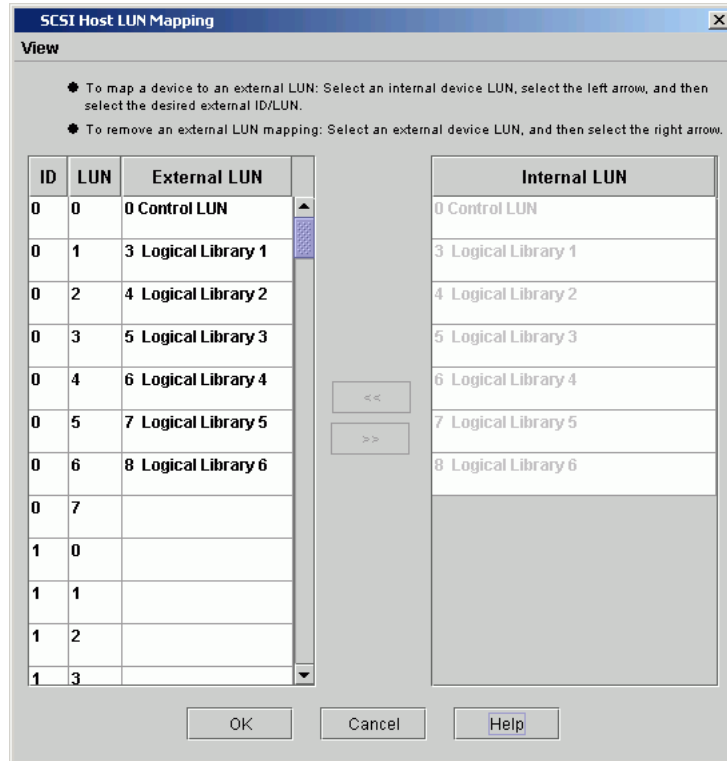
- 8 To save the mapping, click **OK**.

The SCSI host map is automatically saved as part of the configuration.

Modifying SCSI Host Mapping

When a device has been mapped, it is still listed, but unavailable, in the **Internal LUN** column.

In the following figure, no LUNs are currently available for mapping because they have been mapped into the **ID/LUN/External LUN** column already.



Drag the LUNs back into the **Device** column to make them available for re-mapping. If you are working from the local touch screen, select an external device LUN, and then select the right arrow.

Setting the View for the SCSI Host Device Column

Click **View** at the top of the **SCSI Host** dialog box. If you want to see product details, select the **Show Details** check box. If you want to see only the names of the devices available for mapping, clear the **Show Details** check box to toggle the display back to the default view.

FC Host

The **FC Host** command enables you to manually modify host information and set LUN mappings.

During device discovery, a particular partition or drive could map to a higher LUN space than is optimal for a particular application. The **FC Host** command enables you to create a virtual private remapping of available LUNs for a specific Fibre Channel-attached host. LUN mapping is required to give hosts access to partitions and devices. You also can make devices appear to the host as if they were at lower LUNs in order to optimize system performance.



Note

Use the **FC Host** command to map partitions when a Fibre Channel host is connected either to the MCB or to an I/O blade.

Depending on host operating system constraints, it might be necessary to reboot or reconfigure the host because of device map changes that result from using the **FC Host** command.



CAUTION

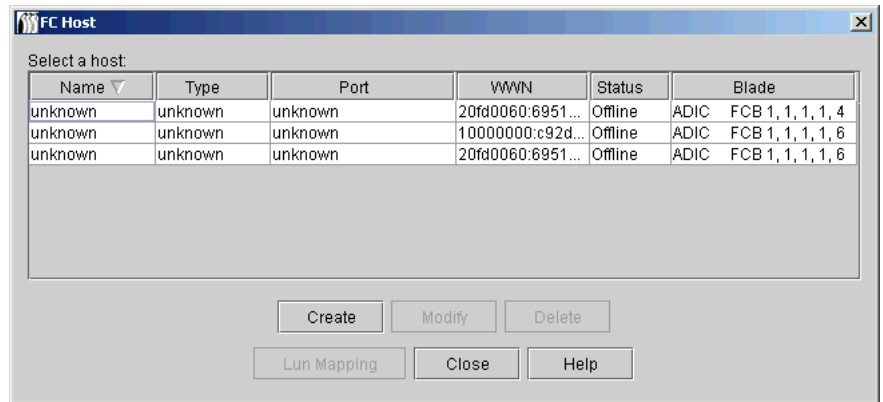
If you change LUN mapping after host computers or applications have already discovered devices, you must make sure that device discovery occurs again. Device discovery occurs automatically when you reboot the library. Some host computers have plug and play capability, which discovers devices automatically. In general, host applications do not discover devices automatically.

As an option, you can install HRS on the host(s). With HRS, you do not need to input host information, and you get the benefits of host-side data path conditioning. To install HRS on a host, see [Installing the Host Registration Service](#) on page 201.

Accessing FC Hosts

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→**Device**→**Access**→**FC Host**.

The **FC Host** dialog box appears.



Unless you have installed HRS on the host, only the host's port, blade, and World Wide Name (WWN) appear. "Online" status appears when the host initially registers, though it will not update without HRS. If HRS is installed, the host's name, operating system, and patch level also appear.

Adding, Modifying, and Deleting FC Hosts

You can add and configure FC hosts without powering down the system. Manually add an FC host if it was not already connected to the library when it was turned on.

Adding an FC Host

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→**Device**→**Access**→**FC Host**.

The **FC Host** dialog box appears.

- 4 Click **Create**.

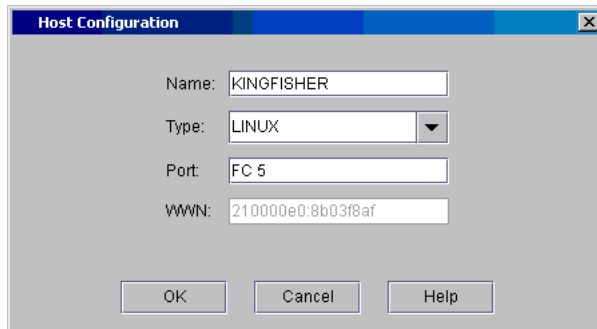
The **Add Host Data** dialog box appears.

- 5 Use the check boxes under **Select Blades** to select at least one blade that the host will access.

- 6 Using the text boxes provided, provide the following required information:
 - In the **Name** text box, type a host device name.
 - From the **Type** drop-down list, click the appropriate host type by operating system.
 - In the **Port** text box, type the host device port.
 - In the **WWN** text box, type the host device World Wide Name (WWN).
- 7 Click **OK**.

Modifying an FC Host

- 1 With the host selected in the **FC Host** dialog box, click **Modify**. The **Host Configuration** dialog box appears.



The screenshot shows a dialog box titled "Host Configuration". It has a blue title bar with a close button (X) on the right. The dialog contains four text boxes: "Name" with the value "KINGFISHER", "Type" with a dropdown menu showing "LINUX", "Port" with the value "FC 5", and "WWN" with the value "210000e0:8b03f8af". At the bottom of the dialog are three buttons: "OK", "Cancel", and "Help".

- 2 As necessary, change the information in the **Name** and **Port** text boxes, and then click the appropriate host type by operating system from the **Type** drop-down list. You cannot change the World Wide Name (WWN).



CAUTION

You also must make the necessary physical changes to the name, operating system, or port connection.

- 3 Click **OK**.

Deleting an FC Host

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→**Device**→**Access**→**FC Host**.
- 4 The **FC Host** dialog box appears.



Note FC hosts can be reconfigured without powering down the system.

- 5 Click the host from the list, and then click **Delete**.



Note The delete button is unavailable if the host is online.

- 6 A message appears that asks you whether you want to delete the host. Click **Yes**.
- 7 A message appears that indicates a successful deletion. Click **OK**.

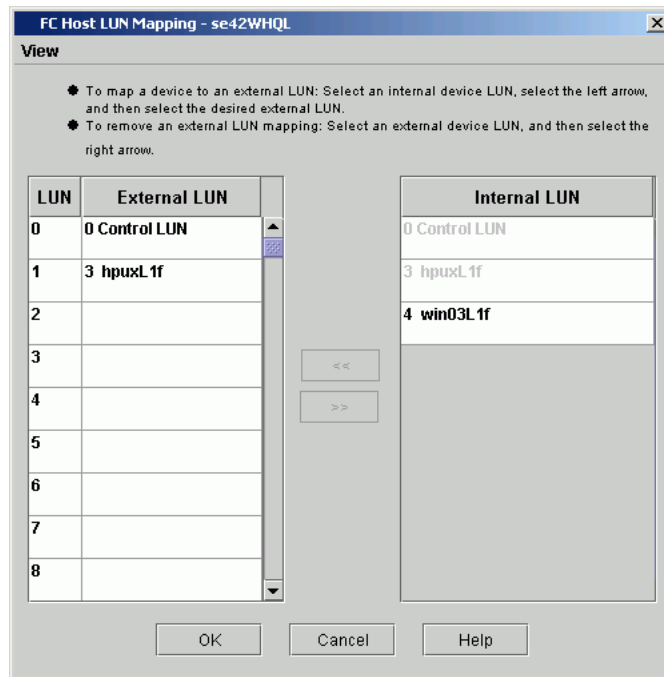
LUN Mapping

Use the **FC Host LUN Mapping** dialog box to give a selected host access to partitions and drives.

Configuring LUN Mapping

- 1 With a host selected on the **FC Host** dialog box, click **LUN Mapping**.

The **FC Host LUN Mapping** dialog box appears in its default view.



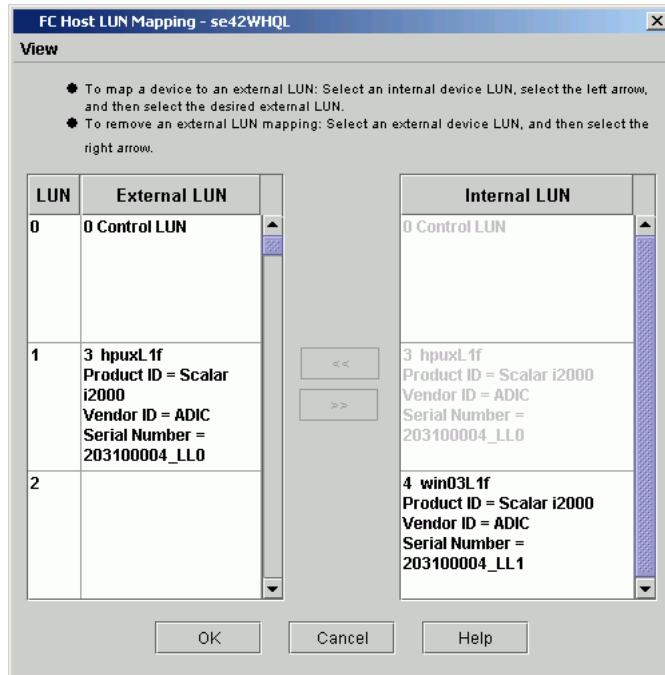
This dialog box displays all partitions and drives connected to the blade to which the host is attached.



Note

If you delete a partition that is currently displayed on the **FC Host LUN Mapping** dialog box, the internal LUN and any external LUN mappings for the partition will no longer appear on the dialog box.

Compare the default view with the **Show Details** view shown in the following figure. To change from the default view to the detailed view, see [Setting the View for the SCSI Host Device Column](#) on page 156.



In this figure, the **Internal LUN** column has been scrolled down. The **Show Details** view for partitions shows the partition name, product ID, vendor ID, and the serial number of the partition. For drives, the LMC displays the device LUN, connection type, port connection, vendor ID, serial number, and the associated partition.

The following table describes the descriptors that appear in the **Show Details** view for partitions.

Table 22 Show Details

Descriptor	Description
Partition Name	Name assigned during partition creation process.
Product ID	The Product ID setting controls the product ID string that is returned in a standard SCSI INQUIRY response. The library can report that it is a Scalar 24, Scalar 100, Scalar 1000, Scalar i2000, or Scalar 10K. This feature can enable the library to be used with host applications that do not yet include the Scalar i2000 in a list of recognized devices. In addition, the various Microsoft Windows operating systems maintain a list of recognized devices. If the Scalar i2000 is not in an operating system's list of recognized devices, the library will appear as an "unknown" device in device lists. You might prevent the library from being listed as "unknown" by setting Product ID to a library other than Scalar i2000. This setting does not cause any library operational changes other than the SCSI INQUIRY response.
Vendor ID	ADIC or Quantum
Serial Number	Partition ID, as shown by System → Monitor .

The following table describes the descriptors that appear in the **Show Details** view for drives.

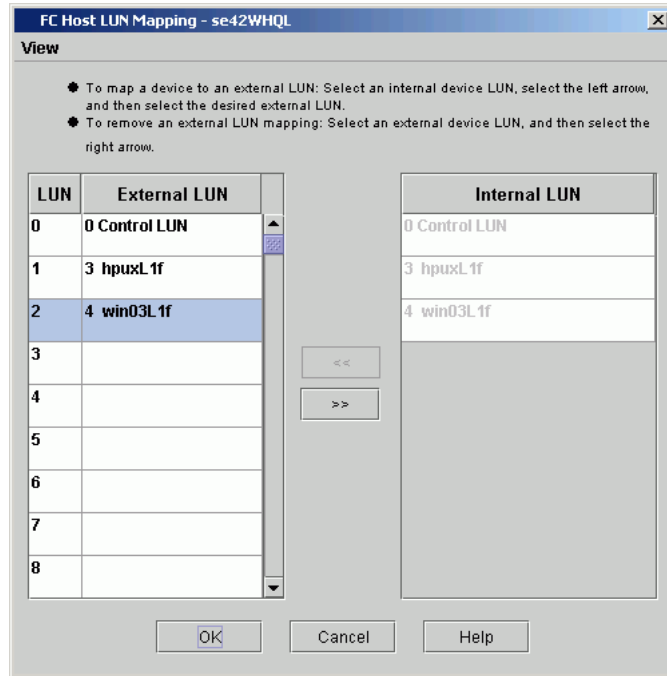
Table 23 Descriptors

Descriptor	Description
[Number] [Connection Type] [Port Connection]	[LUN] [Fibre or SCSI] [Port Number].
Vendor ID	Drive manufacturer.
Serial Number	Drive serial number.
Partition	Name of the partition with which the drive is associated.

In the default view, only the names of available partitions and the names of the devices (drives) are shown. LUN spaces from 0-255 are available. In the **Show Details** view, a partition that has not yet been manually reassigned to a new map position appears in heavy black type in the **Internal LUN** column. Partitions are treated by the system as devices. You must assign a partition to the **LUN/External LUN** column for the LMC to manage it and its media. In this example, the control LUN has already been remapped as shown in heavy black type in the **LUN/External LUN** column.

- 2 If you are working from the local touch screen, you must select an internal device LUN, select the left arrow, and then select the desired external LUN. If you are working from the remote client, you can use the select method or you can drag and drop the devices from the **Internal LUN** column to the appropriate LUN assignment in the **LUN/External LUN** column. Always use LUN 0 for command and control.

In the following figure, all devices have been mapped manually.



The new map locations appear in heavy black type in the **LUN/External LUN** column. The previous (default) device map position of a remapped device is shown in gray type in the **Internal LUN** column.

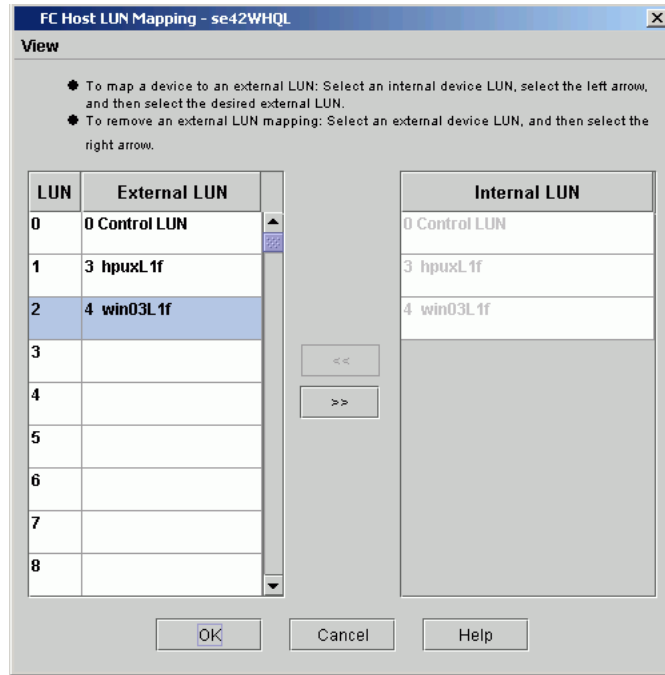
3 To save the mapping, click **OK**.

The FC host map is automatically saved as part of the configuration. For more information about device numbering in a SAN context, see the *ADIC Management Console User's Guide* or the Online Help.

Modifying FC Host mapping

When a device has been mapped, it is still listed, though unavailable, in the **Internal LUN** column.

In the following figure, the LUNs are not currently available for mapping because they have already been mapped into the **LUN/External LUN** column.



The device that was formerly found at assigned LUN 4 is now found at assigned LUN 2. Drag it back into the **Internal LUN** column to make it available for re-mapping. If you are working from the local touch screen, select an external device LUN, and then select the right arrow.

Setting the View for the FC Host Device Column

Click **View** at the top of the **FC Host LUN Mapping** dialog box. If you want to see product details, select the **Show Details** check box. If you want to see only the names of the devices available for mapping, clear the **Show Details** check box to toggle the display back to the default view.

Using the LUN Mapping Wizard

LUN mapping is required to give hosts access to partitions and devices. You can also make devices appear to the host as if they were at lower LUNs in order to optimize library performance.

The **LUN Mapping Wizard** guides you through the setup of LUN mapping for your Fibre Channel hosts.



Note

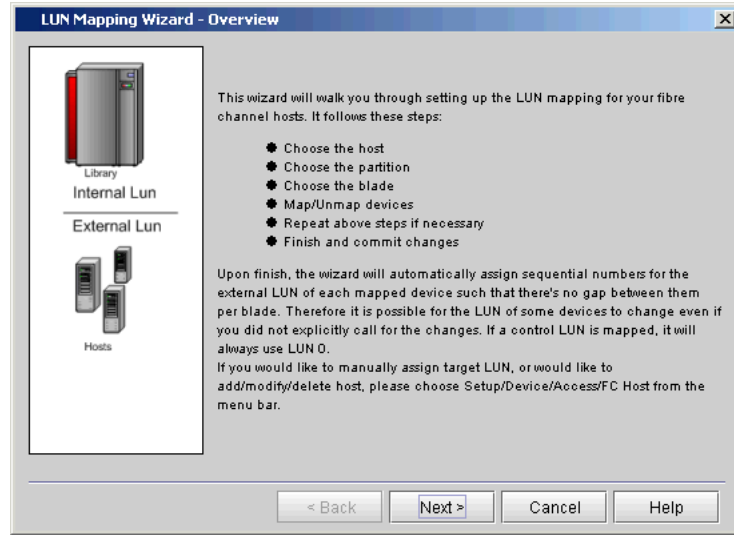
If you want to manually assign a target LUN, or want to add/modify/delete the host, select **Setup**→**Device**→**Access**→**FC Host** on the menu bar. For more information, see [FC Host](#) on page 157.

The **LUN Mapping Wizard** automatically assigns sequential numbers for the external LUN of each mapped device, without any gaps between them per blade. When using the **LUN Mapping Wizard**, the LUN for some devices may change even if you did not specify the changes. If a control LUN is mapped, it is always assigned LUN 0.

Depending upon host operating system constraints, it may be necessary to reboot or reconfigure the host as a result of device map changes resulting from the use of the **LUN Mapping Wizard**.

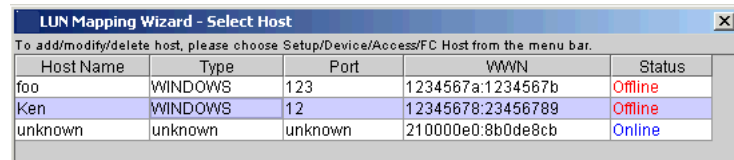
- 1 Click **Setup**→**Device**→**Access**→**LUN Mapping Wizard**.

The **LUN Mapping Wizard – Overview** dialog box appears.



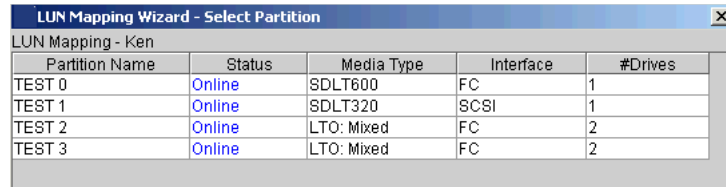
- 2 Review the **LUN Mapping Wizard Overview**, then click **Next** to continue.

The **LUN Mapping Wizard – Select Host** dialog box appears. All available hosts are listed on this dialog box.



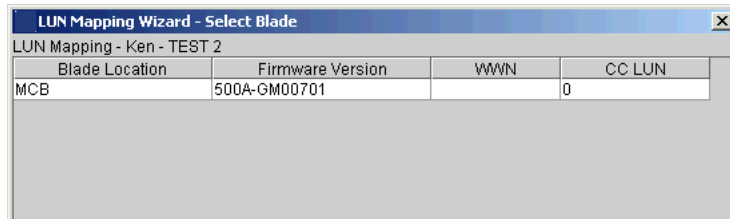
- 3 Select a host to configure and then click **Next** to continue. All available partitions on the selected host are listed on this dialog box.

The **LUN Mapping Wizard – Select Partition** dialog box appears.



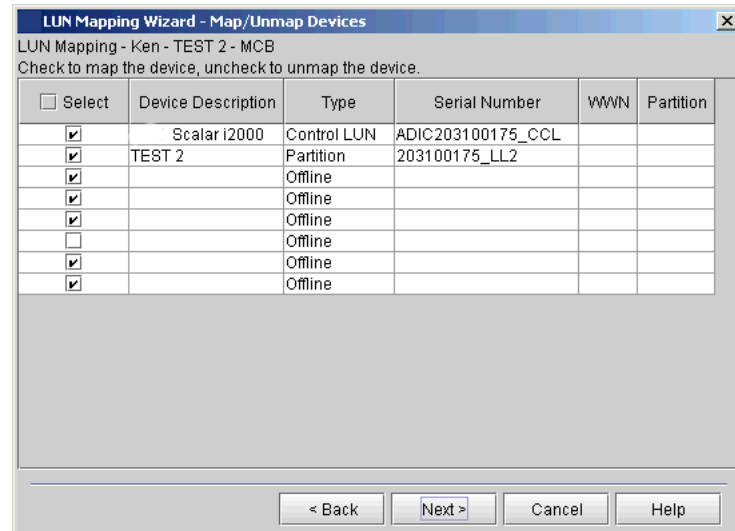
- 4 Select a partition to configure and then click **Next** to continue. All available blades on the selected partition are listed on this dialog box.

The **LUN Mapping Wizard – Select Blade** dialog box appears.



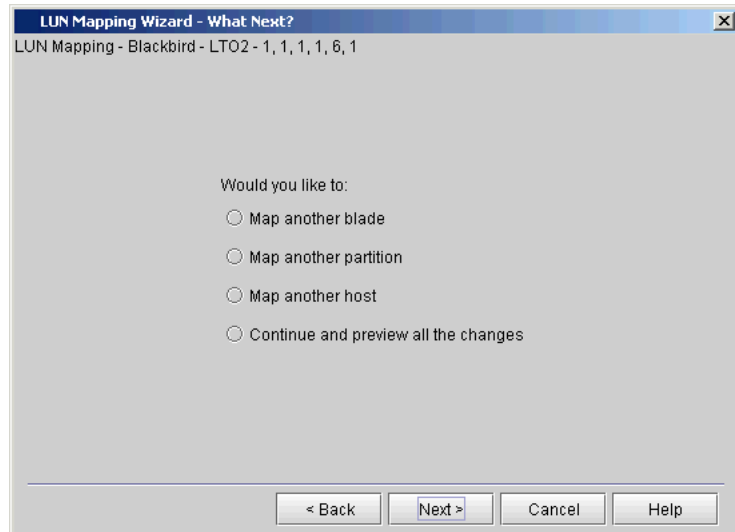
- 5 Select a blade to configure and then click **Next** to continue.

The **LUN Mapping Wizard – Map/Unmap Devices** dialog box appears.



- 6 Select the check box to map a device or clear the check box to unmap a device, then click **Next** to continue.

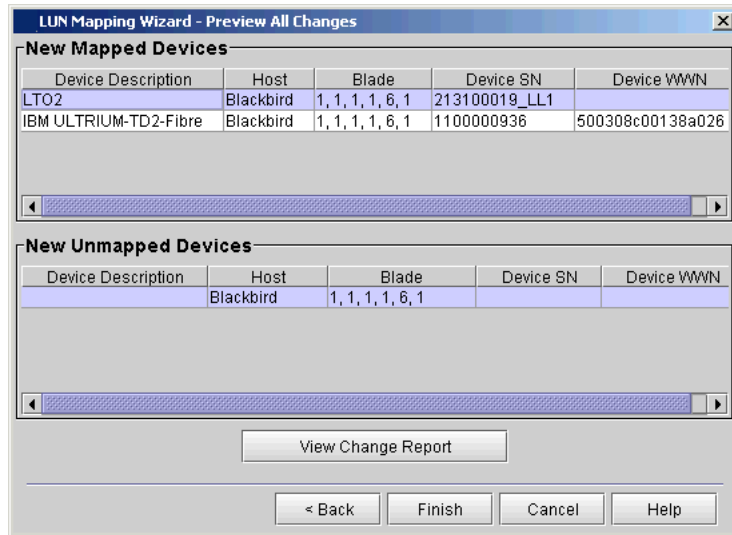
The **LUN Mapping Wizard - What Next?** dialog box appears.



- 7 Select one of the following and click **Next** to continue:
 - **Map another blade** – this allows you to map another blade on the same partition.
 - **Map another partition** – this allows you to map another partition on the same host.
 - **Map another host** – this allows you to map another host.
 - **Continue and preview all the changes** – this allows you to view an online printout of the change report which presents a preview of all changes, showing whether you added, modified or deleted any devices.

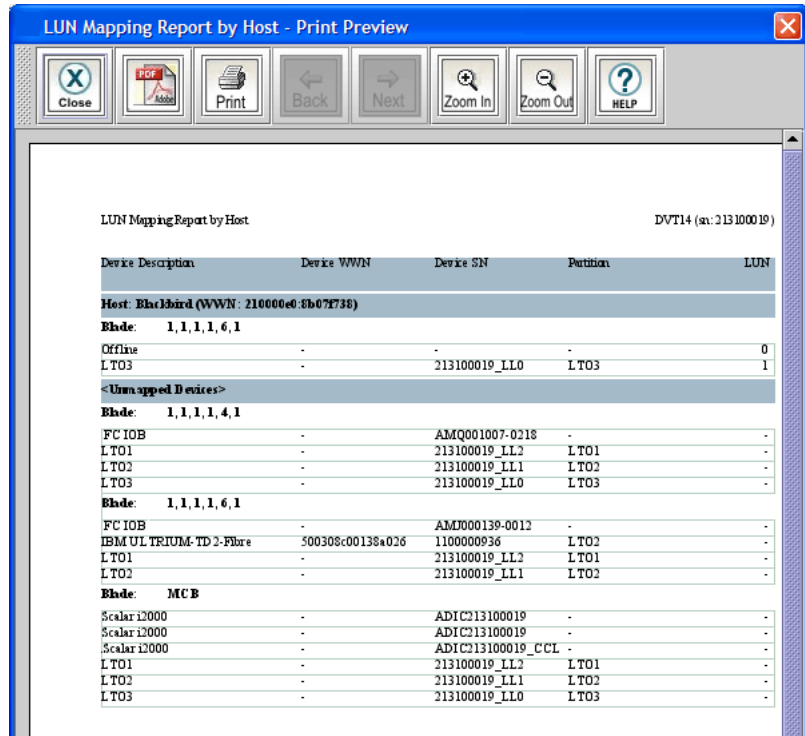
If your configurations are complete, select **Continue and preview all changes**.

The LUN Mapping Wizard – Preview All Changes dialog box appears.



- 8 Prior to finishing and saving your LUN mapping configuration changes, review your newly mapped or unmapped devices in this dialog box.
 - If you would like to create a report of your changes, click **View Change Report**.
 - If you are satisfied with your LUN mapping changes and want complete the wizard process, click **Finish**. Your LUN mapping changes are finalized, and then you have the option of viewing the LUN Mapping Report. For more information on reporting features, see the *Scalar i2000 User's Guide*.

The **LUN Mapping Change Preview Report - Print Preview** dialog box appears. This dialog box displays what types of changes were made to all devices.



The changes on the report include:

- Added Mapping - (A)
- Removed Mapping - (R)
- LUN Modified - (M)

On the **LUN Mapping Change Preview Report - Print Preview** dialog box, you can select the following:

- To save the report as a PDF file, click **PDF**. Specify a file path and file name, and then click **Confirm**.
- To print the report, click **Print**. Specify print options, and then click **OK**.

- To navigate through the pages of the report, click **Back** or **Next**.
 - To increase or decrease the magnification of the report, click **Zoom In** or **Zoom Out**.
 - To access the Online Help, click **Help**.
- 9** After you have reviewed the **LUN Mapping Change Preview Report**, click **Close** to return to the **LUN Mapping Wizard - Preview All Changes** dialog box.
 - 10** If you are satisfied with your LUN mapping changes and want to complete the wizard process, click **Finish**. Your LUN mapping changes are finalized, and then you have the option of viewing the LUN Mapping Report.

Generating the LUN Mapping Report

The LUN Mapping Report lets you view the current LUN configuration settings for the library. The report displays information about tape drives and other devices in the library, such as WWN (world wide name), LUN (logical unit number), and serial number.

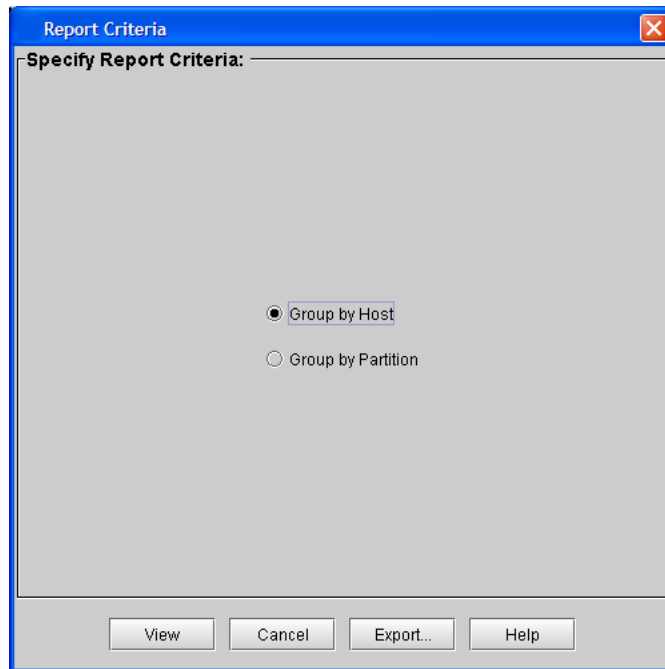
When generating the LUN Mapping Report, you can choose to group devices by the associated host or by the associated partition. For more information about configuring LUN mapping, see the *Scalar i2000 User's Guide*.

Viewing the LUN Mapping Report

To view the LUN Mapping report, first choose a grouping criteria, then view the report.

- 1** On the menu bar, click **Tools**→**Reports**→**LUN Mapping**.

The **Report Criteria** dialog box appears.



2 Under **Specify Report Criteria**, click a grouping option.

- **Group by Host** – The report lists the devices associated with each host.
- **Group by Partition** – The report lists the devices associated with each partition.

3 Click **View**.

The **Print Preview** dialog box appears.

The following figure shows an example of a LUN Mapping Report grouped by host.

LUN Mapping Report by Host Library (sn: 213100002)

Device Description	Device WWN	Device SN	Partition	LUN
Host: unknown (WWN: 210000c0:0b09ea76)				
Ehds: 1, 1, 1, 1, 4, 1				
Scalar i2000	-	AMQ002753-0051	-	0
IBM UL TRIUUM: TD 3-P fibre	500308:00138e02c	1210022331	IBM2G	1
IBM UL TRIUUM: TD 3-P fibre	500308:00138e032	1210004347	IBM2G	2
IBM UL TRIUUM: TD 3-P fibre	500308:00138e026	1210003615	IBM2G	3
IBM UL TRIUUM: TD 3-P fibre	500308:00138e038	1210003564	IBM2G	4
IBM2G	-	213100002_IL0	IBM2G	5
Host: unknown (WWN: 210100c0:0b09ea76)				
Ehds: 1, 1, 1, 1, 8, 1				
ADIC Scalar i2000	-	AMQ00571-0001	-	0
IBM4G	-	213100002_IL1	IBM4G	6
IBM UL TRIUUM: TD 3-P fibre	500308:00138e020	1210139412	IBM4G	7
IBM UL TRIUUM: TD 3-P fibre	500308:00138e00e	1200019430	IBM4G	8
IBM UL TRIUUM: TD 3-P fibre	500308:00138e014	1210115445	IBM4G	9
IBM UL TRIUUM: TD 3-P fibre	500308:00138e01a	1200019535	IBM4G	10
<Unmapped Devices>				
Ehds: 1, 1, 1, 1, 4, 1				
IBM4G	-	213100002_IL1	IBM4G	-
Ehds: 1, 1, 1, 1, 8, 1				
IBM2G	-	213100002_IL0	IBM2G	-
Ehds: MCB				
Scalar i2000	-	ADIC213100002_CCL	-	-
IBM2G	-	213100002_IL0	IBM2G	-
IBM4G	-	213100002_IL1	IBM4G	-

The following figure shows an example of a LUN Mapping Report grouped by partition.

Device Description	Device WWN	Device SN	Blade	LUN
Partition: IBM 2G				
Host: unlxswan (WWN: 210000e0-8b69e76)				
IBM ULTRIUM-TD 3-Fibre	500308:00138e02c	1210022331	1,1,1,1,4,1	1
IBM ULTRIUM-TD 3-Fibre	500308:00138e032	1210004347	1,1,1,1,4,1	2
IBM ULTRIUM-TD 3-Fibre	500308:00138e026	1210003815	1,1,1,1,4,1	3
IBM ULTRIUM-TD 3-Fibre	500308:00138e038	1210003564	1,1,1,1,4,1	4
IBM 2G	-	213100002_L10	1,1,1,1,4,1	5
<Unmapped Devices>				
IBM 2G	-	213100002_L10	1,1,1,1,8,1	-
IBM 2G	-	213100002_L10	MCB	-
Partition: IBM 4G				
Host: unlxswan (WWN: 210100e0-8ba9e76)				
IBM 4G	-	213100002_L11	1,1,1,1,8,1	6
IBM ULTRIUM-TD 3-Fibre	500308:00138e020	1210139412	1,1,1,1,8,1	7
IBM ULTRIUM-TD 3-Fibre	500308:00138e00e	1200019430	1,1,1,1,8,1	8
IBM ULTRIUM-TD 3-Fibre	500308:00138e014	1210115445	1,1,1,1,8,1	9
IBM ULTRIUM-TD 3-Fibre	500308:00138e01a	1200019535	1,1,1,1,8,1	10
<Unmapped Devices>				
IBM 4G	-	213100002_L11	1,1,1,1,4,1	-
IBM 4G	-	213100002_L11	MCB	-
Partition: <Device not associated with a partition>				
Host: unlxswan (WWN: 210000e0-8b69e76)				
Scalar i2000	-	AMQ002753-0051	1,1,1,1,4,1	0
Host: unlxswan (WWN: 210100e0-8ba9e76)				
Scalar i2000	-	AMJ000571-0001	1,1,1,1,8,1	0
<Unmapped Devices>				
Scalar i2000	-	AD1C213100002_CCL	MCB	-

- 4 Do one or more of the following:
 - To navigate through the pages of the report, click **Back** or **Next**.
 - To increase or decrease the magnification of the report, click **Zoom In** or **Zoom Out**.
 - To print the report, click **Print**. Specify print options, and then click **OK**.
 - To save the report as a PDF file, click **PDF**. Specify a file path and file name, and then click **Confirm**.
- 5 When you are finished working with the **Print Preview** dialog box, click **Close**.
- 6 To close the **Report Criteria** dialog box, click **Cancel**.



Note

You cannot print reports or save them to a PDF file using the touch screen.

Exporting a Report to an E-mail or a Text File

Instead of viewing or printing the report on the **Print Preview** dialog box, you can e-mail the report data to an e-mail address. Or export the report data to a comma delimited text file (*.csv) for use in other programs.

- 1 On the menu bar, click **Tools**→ **Reports**→ **LUN Mapping**.

The **Report Criteria** dialog box appears.

- 2 Under **Specify Report Criteria**, click a grouping option.
 - **Group by Host** – The report lists the devices associated with each host.
 - **Group by Partition** – The report lists the devices associated with each partition.
- 3 Click **Export**.

The **Export Raw Data** dialog box appears.

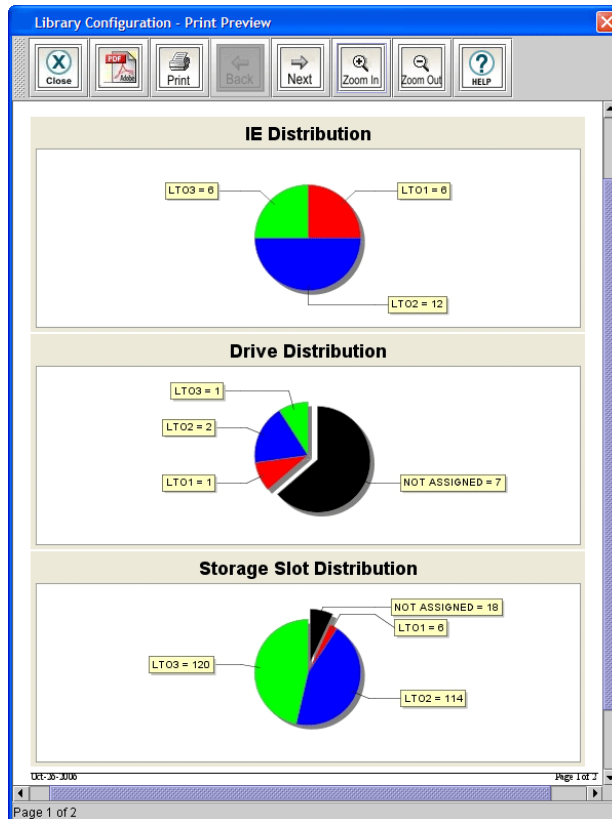
- 4 Do one of the following:
 - To send the report data to an e-mail address, click **Email**. Type or select the e-mail address, type an optional comment in the **Comment** box, and then click **OK**.
 - To save the report data to a comma delimited text file, click **Save**. Specify a file path and file name, and then click **OK**.
- 5 To close the **Report Criteria** dialog box, click **Cancel**.

Generating the Library Configuration Report

The Library Configuration report lets you view the number of I/E stations, drives, and storage slots in the library that are currently assigned to each logical partition. Generate the Library Configuration report to help make sure you are using library resources effectively.

- 1 On the menu bar, click **Tools**→ **Reports**→ **Library Configuration**.

The **Library Configuration - Print Preview** dialog box appears.



2 Do one or more of the following:

- To navigate through the pages of the report, click **Back** or **Next**.
- To increase or decrease the magnification of the report, click **Zoom In** or **Zoom Out**.
- To print the report, click **Print**. Specify print options, and then click **OK**.
- To save the report as a PDF file, click **PDF**. Specify a file path and file name, and then click **Confirm**.

3 When you are finished working with the **Library Configuration - Print Preview** dialog box, click **Close**.



Note

You cannot print reports or save them to a PDF file using the touch screen.

Configuring Drive Cleaning

When you create or modify a partition, you can specify that tape drives in that partition be automatically cleaned each time the drive requests a cleaning operation.

For automatic drive cleaning to function, you must configure drive cleaning for the library. To configure drive cleaning, first assign cleaning magazines, and then import cleaning media. Designated cleaning media can also be used when manually cleaning drives. (Cleaning magazines and media are not part of any logical partition, and so are not visible to the host application.)

If cleaning magazines are no longer needed, you can unassign them. In addition, you can export expired cleaning media to remove it from the library.



Note

Automatic drive cleaning should be enabled for partitions only if the host application does not support the coordination of drive cleaning. If drive cleaning functionality is enabled on the host application, do *not* enable automatic drive cleaning for any partitions in the library.

For more information about enabling automatic drive cleaning for a partition, see [Working With Partitions](#) on page 106 on page 171. For more information about manually cleaning drives, see [Cleaning a Drive](#) on page 246.

Assigning Cleaning Magazines and Importing Cleaning Media

To configure the library for drive cleaning, first assign one or more magazines as cleaning magazines, and then import cleaning media.



Note

At least one magazine must be assigned for cleaning before you can import cleaning media. Also, only magazines that do not belong to a partition can be assigned for cleaning.

- 1 Insert one or more pieces of cleaning media into the I/E station and close the I/E station door.

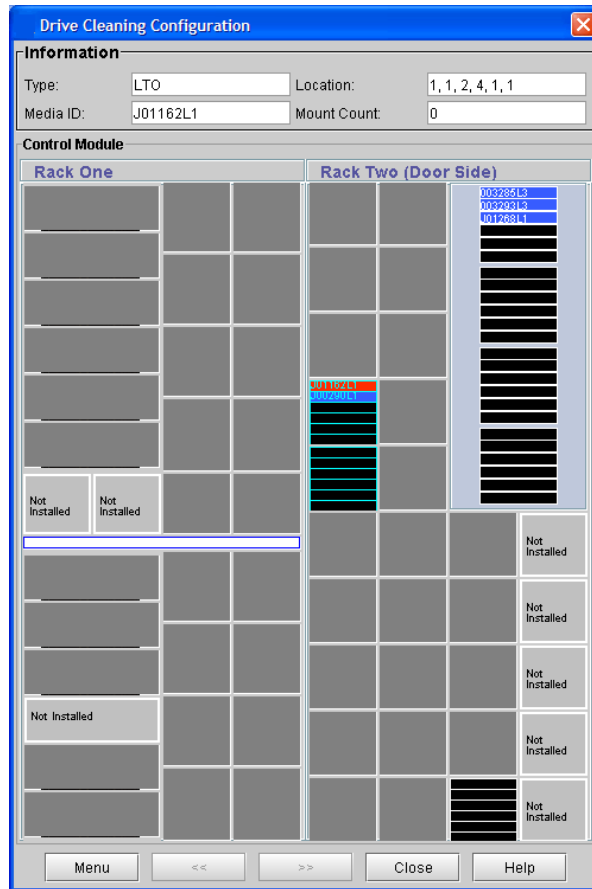
Use a standard barcode label for cleaning media. Barcode numbers do not require a specific prefix or suffix.

- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 On the menu bar, click **Setup**→**Drive Cleaning**.

The **Drive Cleaning Configuration** dialog box appears.

Click a magazine slot or a piece of media to select it. Details about the selected slot or media appear under **Information**, including the type of media, barcode number, location, and the number of times the media has been mounted in a drive.

If the library has more than one frame, click the arrow buttons to display the next or previous frame.



- 4 To assign a magazine for cleaning, click any slot in the magazine to select it. Click **Menu**, and then click **Assign magazine for cleaning**.

The magazine is assigned for cleaning. Repeat this step to assign additional cleaning magazines.

- 5 To import cleaning media, click the cleaning media in the I/E station to select it, and then do one of the following:
 - To import only the selected piece of media, click **Menu**, and then click **Import <barcode number> as cleaning media**.

- To import all media in the selected I/E station magazine, click **Menu**, and then click **Import all tapes in magazine as cleaning media**.

The cleaning media is moved to an available cleaning magazine, and can be used for automatic or manual cleaning.

- 6 Click **Close** to close the **Drive Cleaning Configuration** dialog box.



Note

If you are working on the remote LMC, you can right-click a magazine slot or a piece of cleaning media to see a menu of available options.

Exporting Cleaning Media

Cleaning media can be used a limited number of times. If a piece of media is expired, export it and remove it from the library

- 1 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 2 On the menu bar, click **Setup**→ **Drive Cleaning**.

The **Drive Cleaning Configuration** dialog box appears. If the library has more than one frame, click the arrow buttons to display the next or previous frame.

To determine if a piece of cleaning media has been used the maximum number of times, click the media to select it, and then check the **Mount Count** value under **Information**.

- 3 Click the cleaning media in a cleaning magazine to select it, and then do one of the following:
 - To export only the selected piece of media, click **Menu**, and then click **Export cleaning media <barcode number>**.
 - To export all media in the selected magazine, click **Menu**, and then click **Export all cleaning media in magazine**.

The cleaning media is moved to an available I/E station magazine.

- 4 Click **Close** to close the **Drive Cleaning Configuration** dialog box.

Unassigning a Cleaning Magazine

If a magazine is no longer needed for holding cleaning media, first export all cleaning media from the magazine, and then unassign it.

- 1 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 2 On the menu bar, click **Setup**→**Drive Cleaning**.

The **Drive Cleaning Configuration** dialog box appears. If the library has more than one frame, click the arrow buttons to display the next or previous frame.

- 3 If the magazine you want to unassign contains cleaning media, export all cleaning media to the I/E station.

For more information on exporting cleaning media, see [Exporting Cleaning Media](#) on page 182.

- 4 Click any slot in the cleaning magazine to select it.
- 5 Click **Menu**, and then click **Unassign magazine for cleaning**.

The magazine is no longer assigned for cleaning.

- 6 Click **Close** to close the **Drive Cleaning Configuration** dialog box.



Note

If you try to unassign a cleaning magazine that contains cleaning media, a message appears asking if you are sure you want to continue. If you click **Yes**, any media in the magazine is not accessible until you add the magazine to a partition or assign it again as a cleaning magazine.

Registering SNMP Traps

Because the library ignores all SNMP SET operations, external management applications cannot register themselves to receive SNMP traps from the library. The **Trap Registration** dialog box enables you to manually register external applications.

Registering an Application

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→**Trap Registration**.

The **Trap Registration** dialog box appears.

The table below contains a list of all IP addresses currently registered for traps. Please choose one of the following actions:

- To create - Enter an IP Address and UDP Port, click "Create".
- To delete - Select an IP Address, click "Delete".

IP Address	UDP Port
172.16.27.100	163

New registration

IP Address: UDP Port:

Create Delete Close Help

- 4 In the **IP Address** text box, type the IP address of the external application.

- 5 In the **UDP Port** text box, type the number of the User Datagram Protocol (UDP) port that you want to associate with the IP address.
- 6 Click **Create**.

The application's IP address and UDP port number appear in the table to indicate that the application is registered to receive SNMP traps from the library.

Removing an Application's Trap Registration

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup** → **Trap Registration**.

The **Trap Registration** dialog box appears.

- 4 Click the IP address of the application for which you want to remove trap registration to highlight it.
- 5 Click **Delete**.

Configuring Library Security

You can change the library's security settings, including enabling or disabling network services, enabling or disabling remote access to the library, setting up firewall access for server callbacks to remote clients, and enabling or disabling SNMP or SMI-S access. You can configure the library's security while viewing either the physical library or a partition.

n



Note

Changing security configuration settings using the remote client might cause a loss of connectivity. If this happens, use the local touch panel to reset the security configuration settings and restore remote connectivity.

Accessing the Security Configuration Dialog Box

The **Security Configuration** dialog box enables you to restrict external users and various remote services from accessing the library through the Ethernet port on the MCB.

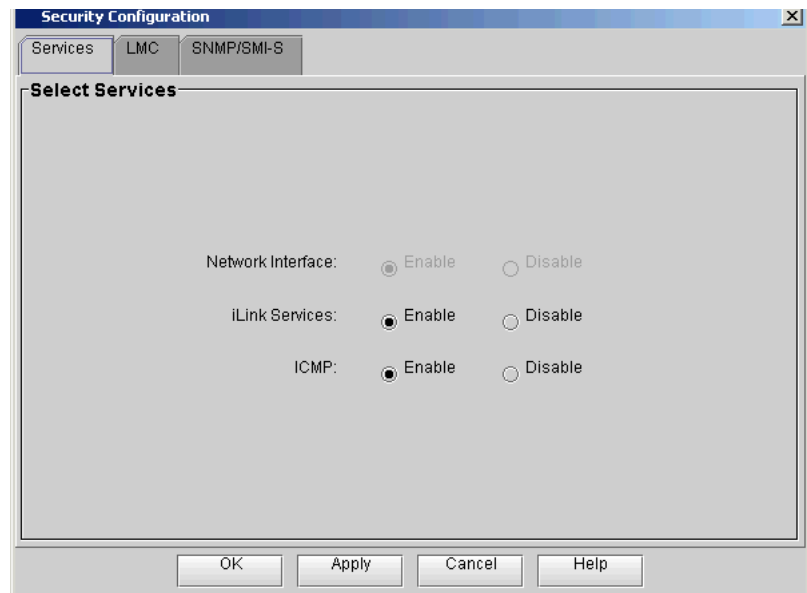
- 1 Log on as an admin user.
- 2 Click **Setup** → **Security**.

The **Security Configuration** dialog box appears with the **Services** tab displayed.

Configuring Access for Network Services

The **Services** tab on the **Security Configuration** dialog box enables you to entirely prevent all external access to the library or allow access according to other security settings on the **Security Configuration** dialog box. It also enables you to allow or prevent access by iLink services, such as Secure Shell (SSH), and to allow or prevent external attempts to discover the library by pinging it.

- 1 Click the **Services** tab on the **Security Configuration** dialog box.



- 2 You can change the security settings for any of the following items:
 - **Network Interface** – To entirely prevent all external access to the library through the MCB Ethernet port, regardless of other settings on the **Security Configuration** dialog box, select **Disable**. To allow external access to the library in accordance with other security settings on the **Security Configuration** dialog box, select **Enable**. (The **Network Interface** option is unavailable when accessing the LMC remotely.)
 - **iLink Services** – To prevent iLink services, such as Secure Shell (SSH), from accessing the library, select **Disable**. To allow them to access the library, select **Enable**. (iLink services are enabled by default.)

- **ICMP** – To prevent external attempts to discover the library by pinging it (by means of Internet Control Message Protocol [ICMP] Echo packets), select **Disable**. Using this setting can prevent denial-of-service (DoS) attacks, which can flood the library with pings and cause loss of network connectivity and services.

If Dynamic Host Configuration Protocol (DHCP) is enabled for your library on the **Network Configuration** dialog box (**Setup**→**Network Configuration**), you also should enable ICMP. This ensures that the DHCP server can determine whether the IP address that is assigned to the MCB is still valid. (ICMP is enabled by default.)

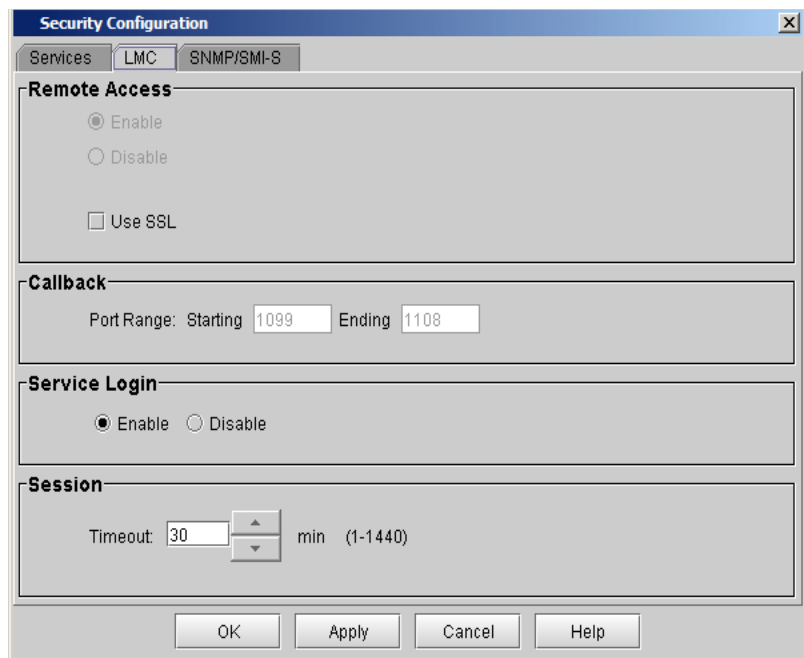
- 3 If you want to apply the changes, but you do not want to close the dialog box, click **Apply**. Otherwise, click **OK** to apply the changes and close the dialog box.

Configuring Access for Remote LMC Clients

You can use the **LMC** tab on the **Security Configuration** dialog box to configure the following options:

- To allow or prevent remote LMC client access to the library
- To set up firewall access for server callbacks to remote clients
- To enable or disable service login
- To set up the length of time before a session timeout

1 Click the **LMC** tab on the **Security Configuration** dialog box.



2 Change the security settings for any of the following items:

- **Remote Access** — To prevent all remote LMC clients from accessing the library, select **Disable**. To allow them to access the library, select **Enable**.

Select **Use SSL** to enable secure communication between the LMC client and the library.



Note Enabling SSL can impact the network performance of remote operations (for example, downloading new library software).

- **Callback Port Range** – To configure firewall access for server callbacks to remote clients, type the first port number of a range of ports that you want to be used for callbacks in the **Starting** text box, and then type the last port number in the **Ending** text box. Valid port ranges must fit within the range 1024 to 65535. Remote client service ports must be within the range of ports specified here. Otherwise, callbacks fail because the library's firewall blocks outbound packets designated for out-of-range ports.
- **Service Login** – To allow service login, select **Enable**. To prevent service login, select **Disable**. The Admin user can enable or disable the service user login on both the front panel access and the remote client access.



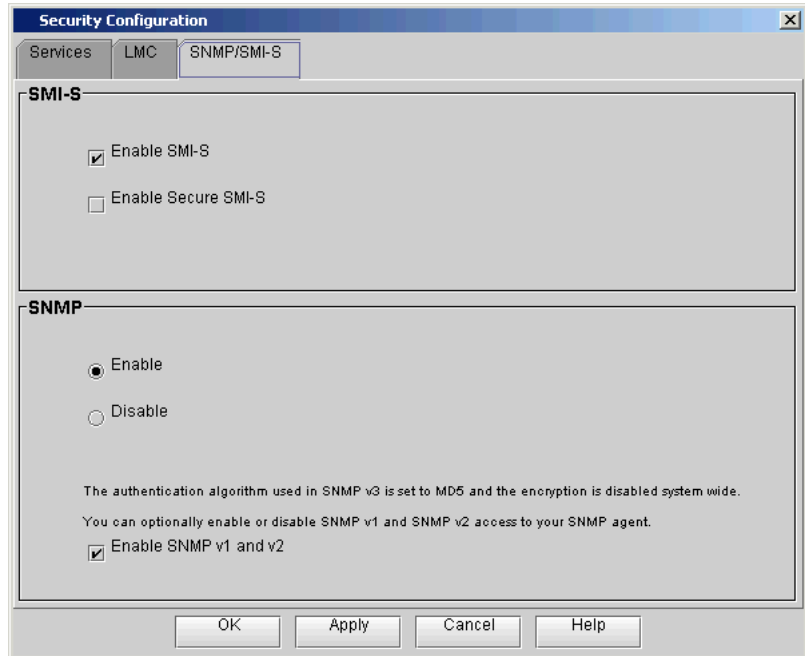
Note The default service login through the service port is still available for use. For security purposes, the service port can be physically locked down by locking the back door of the i2000.

- **Session** – To configure the length of the session's timeout, type or use the arrow buttons to specify the length of a session before it times out. Valid session timeouts are 1-1440 minutes (1 minute - 24 hours), where the default is 30 minutes.
- 3** If you want to apply the changes, but you do not want to close the dialog box, click **Apply**. Otherwise, click **OK** to apply the changes and close the dialog box.

Configuring Access for SNMP and SMI-S

The **SNMP/SMI-S** tab on the **Security Configuration** dialog box enables you to allow or prevent SNMP or SMI-S traffic across the MCB Ethernet port.

- 1 Click the **SNMP/SMI-S** tab on the **Security Configuration** dialog box.



- 2 You can change the security settings for any of the following items:
 - **SMI-S** – To prevent SMI-S traffic (port 5988), select the **Enable SMI-S** check box. To allow encryption of SMI-S traffic (SSL, port 5989), select the **Enable Secure SMI-S** check box.



Note

Port 427 is used for Service Location Protocol (SLP), which is used along with the Common Information Model (CIM) server.

- **SNMP** – To prevent all SNMP traffic across the MCB Ethernet port, select **Disable**. To allow SNMP GET operations, select **Enable**.

If SNMP traffic is allowed, then SNMP v3 is always available. If you want to permit less secure SNMP access, select **Enable SNMP v1 and v2**. If you decide you do not want to use SNMP v1 and v2, clear the **Enable SNMP v1 and v2** check box.

The library ignores all remotely issued SNMP SET operations under any circumstance, which means that external applications cannot register themselves to receive SNMP traps from the library. However, the **Trap Registration** dialog box (**Setup**→**Trap Registration**) enables you to perform this registration yourself by entering the necessary IP and port information. For more information about the **Trap Registration** dialog box, see [Registering SNMP Traps](#) on page 184.

- 3 If you want to apply the changes, but you do not want to close the dialog box, click **Apply**. Otherwise, click **OK** to apply the changes and close the dialog box.

Using LDAP

Lightweight Directory Access Protocol (LDAP) is the industry standard Internet protocol that provides centralized user account management. This library supports the Microsoft® Active Directory® LDAP server and user account information in the schema defined by RFC 2307. User password schemes must be encrypted using UNIX® crypt.



Note

When setting up a user account in Microsoft Active Directory, make sure to populate the UNIX attributes with information. This requires all Active Directory users to be part of an NIS Domain, or have NIS Domain information entered.

Enabling LDAP allows existing user accounts residing on an LDAP server to be integrated into the library's current user account management subsystem. User account information is centralized and shared by different applications, simplifying user account management tasks. For information about local user accounts, see [Working With Local User Accounts](#) on page 383.

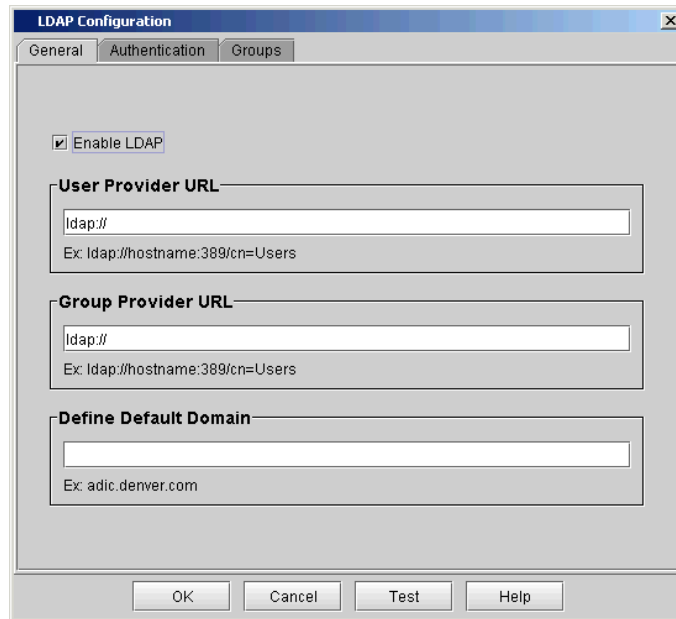
The remote client and operator panel do not allow you to create, modify, or delete user account information on an LDAP server. This must be done by the directory service provider.

You can configure LDAP settings any time after the initial library configuration. Before configuring LDAP, obtain the following LDAP parameters from your network administrator:

- User provider – the LDAP server URL, where user account information is stored
- Group provider – the LDAP server URL, where group information is stored. If the group information is stored in the same location as the user account information, use the user provider URL.
- Default domain – the domain that is populated on the login screen by default
- Principle authentication – the login used to gain access to the directory service
- Credential authentication – the password for the principal authentication login
- Library user group – the name of the group you want to associate with the library. A user that belongs to the Library User Group is granted permission to access the library, and by default, is assigned user level privilege. Any member of this group can manage this library.
- Admin group – the name of the group associated with the library administrator, equivalent to the local administrative user privilege level. Any member of this group has administrative privileges.

Configuring LDAP

- 1 From the **Setup** menu, click **LDAP**.
The **LDAP Configuration** dialog box displays with the **General** tab displayed.



- 2 In the **General** tab, you can enable or disable LDAP functionality:
 - To enable LDAP, select **Enable LDAP**.
 - To disable LDAP, clear the **Enable LDAP** check box.
If you disable LDAP, single sign-on functionality will not be available on the library.
- 3 To configure or modify LDAP, set the following configurations using the appropriate tabs:
 - General configuration tab
 - User Provider
 - Group Provider
 - Define Default Domain

- Authentication configuration tab
 - Principal
 - Credential
 - Groups configuration tab
 - Library User Group
 - Library Admin Group
- 4 After you have entered the LDAP configurations, click **Test** to verify the LDAP connection.
A message box displays indicating that the success or failure of the LDAP connection.
 - If the connection failed, the error message contains information that you can use to resolve the issue. Click **OK** to return to the LDAP Configuration dialog box.
 - If the connection was successful, in the message box, click **OK** and continue with step 4.
 - 5 To accept and save the library configuration, in the LDAP Configuration dialog box, click **OK**.

Configuring Screen Saver Preferences

Use the **Screen Saver** preferences tab to customize the images that display on the LMC screen when the library is not in use. The screen saver starts automatically if the library is idle for a specified amount of time.

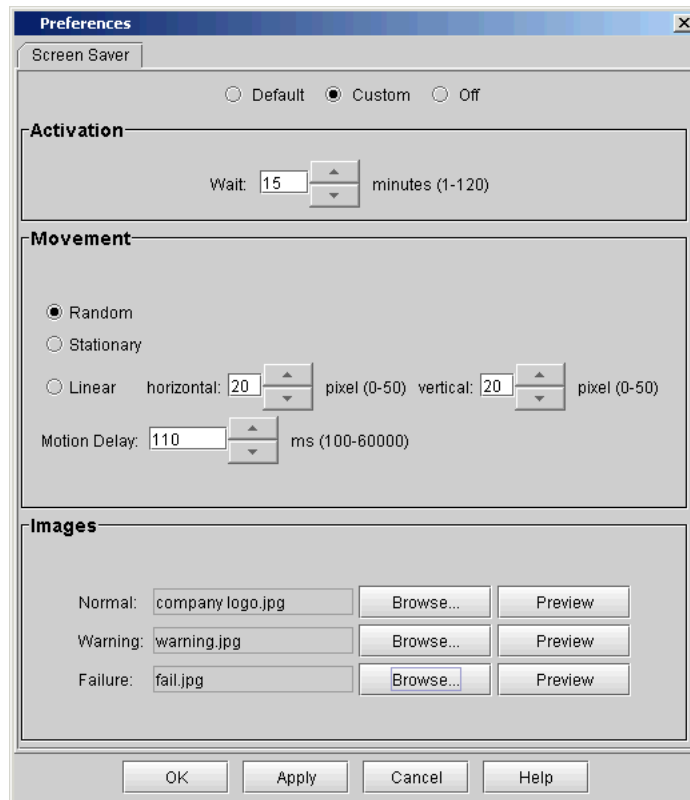


Note

Screen saver preferences can only be configured remotely, not using the touch panel.

- 1 From the menu bar, click **Setup**→**Preferences**.

The **Preferences** dialog box appears with the **Screen Saver** tab displayed.



2 Do one of the following:

- Select **Default** to use the default Quantum screen saver with standard settings.
- Select **Custom** to change screen saver settings such as activation, movement, or images.
- Select **Off** to disable the screen saver. (The current settings are cleared.)

If you selected **Custom**, go to Step 3. Otherwise, go to Step 6.

3 Under **Activation**, enter a value in the **Wait** box to specify how much idle time must pass before the screen saver is activated.

The activation wait time can be 1-120 minutes.

- 4 Under **Movement**, specify the position and the motion of the screen saver image on the screen.
 - Select **Random** to display the screen saver image in a variety of positions.
 - Select **Stationary** to display a static screen saver image that does not move.
 - Select **Linear** to display the screen saver image as a floating image.

Enter values in the **horizontal** and **vertical** boxes to specify the movement of the screen saver image in pixels.

Enter a value in the **Motion Delay** box to specify the movement speed of the screen saver image.

- 5 Under **Images**, specify the image files to display for normal functions, warning notices, and failure notices. You must select image files for all three functions.

To specify an image file, click **Browse**. Select the image file and then click **Open**. The image file must be in GIF, JPEG, or PNG format, and cannot be larger than 1 MB. In addition, image resolution is limited to 600 x 800 pixels.

Click **Preview** to preview an image file.

- 6 Click **OK** to save the settings and close the **Preferences** dialog box.

Or click **Apply** to save the settings without closing the **Preferences** dialog box.

- 7 Because you made system configuration changes, you are prompted to save the configuration changes. For more information, see [Saving and Restoring Library Configuration](#) on page 256.

Working With Data Path Conditioning

The Scalar i2000 provides an automatic means of verifying, monitoring, and protecting data path integrity between hosts and library drives. This feature is referred to as data path conditioning. Using this feature, administrators can proactively detect and resolve data path problems before they affect backup, restore, and other data transfer operations. Data path conditioning ensures that data transmissions are optimized and reliable, resulting in improved system availability.

Data path conditioning occurs in two separately managed areas:

- Between host and FC I/O blades
- Between FC I/O blades and library drives

The Host Registration Service (HRS), an optional utility that runs on the host, manages data path conditioning along the path between the host and FC I/O blade. HRS automatically sends pulses to the I/O blade at regular, configurable intervals. The I/O blade monitors the path for the anticipated pulses and generates a Reliability, Availability, and Serviceability (RAS) ticket if two intervals pass without receiving a pulse from the host. This indicates a host connection failure.

The FC I/O blade manages data path conditioning along the path between itself and the library drives. Data path monitoring automatically occurs at regular, configurable intervals. The I/O blade generates a RAS ticket if monitoring tests fail for two intervals. This indicates either loss of connectivity or drive failure. The FC I/O blades include the data path conditioning feature, and administrators can configure it using the LMC.

Configuring Datapath Conditioning

For the library, target-side data path monitoring is performed automatically and proactively. The **Datapath Conditioning** dialog box enables you to set the level at which the data path is monitored between an I/O blade and the drive(s) connected to it. You also can set the time interval between monitoring checks (up to 48 hours).

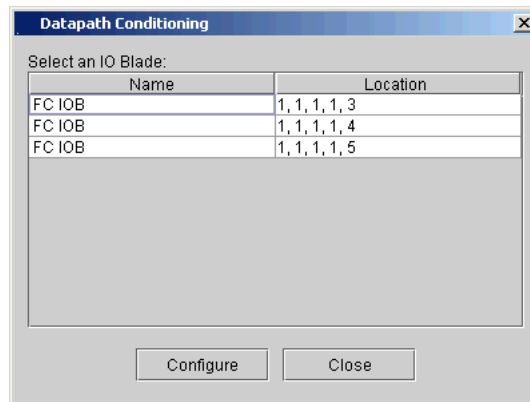


Note

I/O blades must be present to access the **Datapath Conditioning** dialog box.

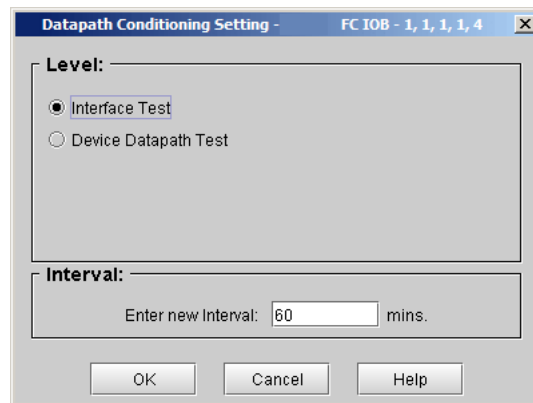
- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→**Connectivity**→**Datapath Conditioning**.

The **Datapath Conditioning** dialog box appears, showing all the I/O blades found in the library. Each blade is identified by name and by geographic location.



- 4 Click a blade to highlight it, and then click **Configure**.

The **Datapath Conditioning Setting** dialog box appears.



- 5 In the **Level** area, select the appropriate level. The default level is **Interface Test**. To enable data path monitoring tickets, set the level to **Device Datapath Test**.

The following table describes the functionality for each data path monitoring level.

Level Name	Functionality Description
Interface Test	Performs tests to verify that Fibre Channel controllers on I/O blades are responsive to commands.
Device Datapath Test	Performs tests at the Interface Test level, and also performs a device inquiry on each target device.

- 6 In the **Enter new Interval** text box, type the amount of time that should elapse between automatic monitoring checks. The interval can range from 1 to 2,880 minutes (48 hours). The default interval is 60 minutes.



Note

The data path from I/O blade to the drive must experience problems for two period intervals before a problem is detected and a ticket is generated.

- The datapath conditioning time interval you configure in the LMC, which is from an I/O blade to drive, is not the same as the data path check that occurs between the I/O blade and a host. The latter time interval is configured by means of HRS and it is hard coded. The default time interval for Windows is five minutes. You must disconnect the drive for at least five minutes to know you have triggered the ticket. For more information, see [Installing the Host Registration Service](#) on page 201.

- 7 To save your configuration and return to the **Datapath Conditioning** dialog box, click **OK**.

Installing the Host Registration Service

The host registration service (HRS) is a daemon that simplifies security configuration and enables libraries to monitor host connections to the library. HRS sends a periodic data pulse through the host's Fibre Channel host bus adapter (HBA) to the library. The pulse contains the host's World Wide Name (WWN), host name, HBA type, and host port connection.

When the library senses the HRS pulse from a host, the data path to the host registers as "Good." This information is sent periodically over the host Fibre Channel connection.

The default HRS setting re-registers the host every 5 minutes. You can change the re-registration period to any value between 1 and 255 minutes.



Note

The data path monitored by HRS must experience problems for two period intervals before a problem is detected and a ticket is generated.

There is no Help system for HRS.



Note

If you plan to use the **FC Host** command, install HRS on the appropriate hosts. If you do not plan to use the **FC Host** command, you can manage your library without installing HRS. However, HRS makes sure that data path conditioning includes the host portion of the data path.

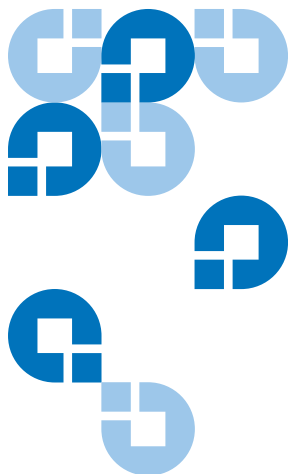
The HRS software is available from the Quantum customer service web site or from your service representative.

Installing the Host Registration Service for Windows

Install this software on a host computer that runs the Windows operating system and is attached to the library. On a Windows system, the re-registration period cannot be changed because HRS runs as a service rather than as an independent program.

- 1 Verify that the Windows host you are configuring has an installed host bus adapter (HBA).
- 2 Load the CD that contains the **HstRegSrv.exe** executable file.

- 3** Click the Windows **Start** button, and then click **Run**.
- 4** Type:
`HstRegSrv.exe`
- 5** Click **OK**.
- 6** After the installation process completes, reboot the system.
HRS executes as a service that launches at boot time.
- 7** Proceed to [SCSI Host](#) on page 152 or [FC Host](#) on page 157.



Maintaining Your Library

The library includes advanced system monitoring and alerting mechanisms that inform you of library status and issues. It provides you with status information about various library subsystems and components. It also notifies you of issues it detects and guides you through diagnosing and correcting issues before problems interfere with backups.

This chapter describes commands that you can select from the **Monitor** and **Tools** menus to monitor the library, configure and test drives, work with connectivity, capture snapshots, update library software and drive firmware, run the Teach feature to calibrate and configure the robot, save and restore library configurations, and run tests to verify successful FRU removals and replacements and verify successful library installations and configurations.



Note

The **Tickets** command on the **Tools** menu displays tickets that the library created when it detected issues within its subsystems. For more information about tickets, see [Troubleshooting Your Library](#) on page 6.

This chapter consists of the following sections:

- [Monitoring the Library](#) on page 204
- [Maintenance Actions](#) on page 232
 - [Using Library Explorer](#) on page 234
 - [Configuring and Testing Drives](#) on page 238

- [Cleaning a Drive](#) on page 246
- [Working With Connectivity](#) on page 248
- [Capturing Snapshots](#) on page 250
- [Teaching the Library \(Configuration and Calibration\)](#) on page 253
- [Saving and Restoring Library Configuration](#) on page 256
- [Viewing the Drive Resource Utilization Reports](#) on page 265
- [Setting Up Advanced Reporting Options](#) on page 269
- [Working With Verification Tests](#) on page 275
 - [Verification Test Graphical Reports](#) on page 284
 - [Verification Test Logs](#) on page 302
 - [Running the Verification Tests](#) on page 304
- [Using the Partitions Defragmentation Tool](#) on page 328
- [Cycling Library Power](#) on page 332
- [Removing a Cartridge From a Drive](#) on page 332

Monitoring the Library

The library can provide detailed information about the status of the library and its various components. You also can access statistics about the library and other helpful information, such as library and component serial numbers, port numbers, World Wide Names (WWNs), IDs, and firmware versions.

This section explains how to use **Monitor** menu commands to display status information for the following general areas:

- System
- Drives
- Connectivity
- I/E stations

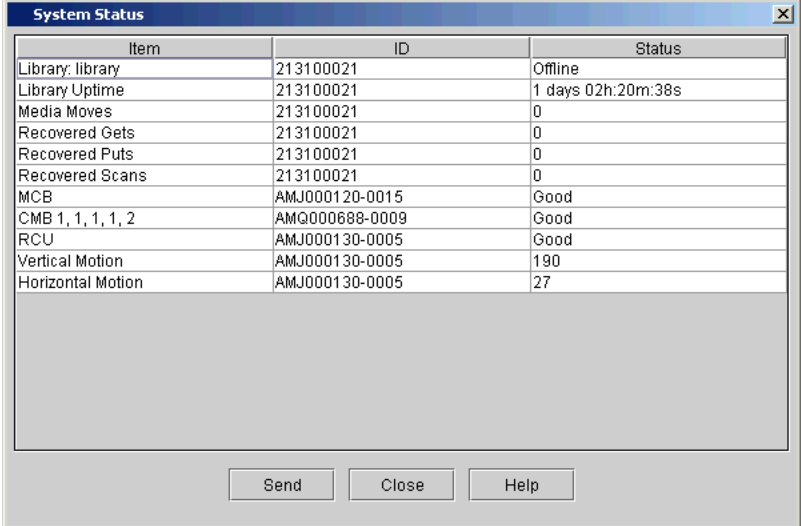
- Slots
- Media
- Sensors
- Users
- Partitions

Monitoring System Status

The **System Status** dialog box displays status information for various library entities (hardware or system metrics). You can perform this procedure while viewing either the physical library or a partition.

1 Click **Monitor**→**System**.

The **System Status** dialog box appears.



Item	ID	Status
Library: library	213100021	Offline
Library Uptime	213100021	1 days 02h:20m:38s
Media Moves	213100021	0
Recovered Gets	213100021	0
Recovered Puts	213100021	0
Recovered Scans	213100021	0
MCB	AMJ000120-0015	Good
CMB 1, 1, 1, 1, 2	AMQ000688-0009	Good
RCU	AMJ000130-0005	Good
Vertical Motion	AMJ000130-0005	190
Horizontal Motion	AMJ000130-0005	27

Buttons: Send, Close, Help

The following table describes the elements on the **System Status** dialog box.

Element	Description
Item	A system item for which status information is available (hardware or system metric).
ID	If applicable or available, the serial number or other identifying number of the system item.
Status	Status information for the system item.

The following table describes the items that can appear in the status list.

Item	ID	Status Description
Library	The library serial number	The status of the library (Online or Offline).
Library Uptime	The library serial number	The amount of time that the library has been up (in days, hours, minutes, and seconds).
Media Moves	The library serial number	The number of media moves during the library's history.
Recovered Gets	The library serial number	The number of recovered gets during the library's history.
Recovered Puts	The library serial number	The number of recovered puts during the library's history.
Recovered Scans	The library serial number	The number of recovered scans during the library's history.
MCB	The MCB serial number	The current status of the MCB (Good, Degraded, or Failed).
CMB	The CMB serial number	For each CMB that is present, the current status of the CMB (Good, Degraded, or Failed).

Item (Continued)	ID	Status Description
RCU	The RCU serial number	The current status of the RCU (Good, Degraded, or Failed).
Vertical Motion	The RCU serial number	The number of meters vertically traveled during the library's history.
Horizontal Motion	The RCU serial number	The number of meters horizontally traveled during the library's history.

2 From the **System Status** dialog box, you can perform the following tasks:

- Change the sorting of system items in the status list (for example, by item or ID) by clicking the column heading by which you want the system items sorted. Repeatedly clicking a column heading toggles between ascending and descending order.
- Mail, save, or print status information by using the **Send** button (see [Mailing, Saving, and Printing Status Information](#) on page 230).

Monitoring Drive Status

The **Drive Status** dialog box displays status information for tape drives in the currently selected partition. If you are working in the physical library, status information for all drives appears. You can perform this procedure while viewing either the physical library or a partition.

- 1 Click **Monitor** → **Drives**.

The **Drive Status** dialog box appears.

Type	WWN	SCSI ID	RAS	Firmware level	Media ID	Location	Physical SN	Logical SN	Vendor	IO Blade	Partition Na...
LTO2 - FC	500308c001400002	N/A	Good	37RG	J00597L1	1, 1, 1, 1, 1, 1	1110063753	Disabled	IBM	1, 1, 1, 1, 4	Logical Library 02
LTO2 - FC	500308c00140000e	N/A	Good	37RG	J00031L1	1, 1, 1, 3, 1, 1	1110050683	Disabled	IBM		
LTO2 - FC	500308c001400014	N/A	Good	37RG	J00435L1	1, 1, 1, 4, 1, 1	1110051870	Disabled	IBM	1, 1, 1, 1, 4	Logical Library 02
LTO2 - FC	500308c00140001a	N/A	Good	37RG	J00302L1	1, 1, 1, 5, 1, 1	1110050645	Disabled	IBM	1, 1, 1, 1, 4	Logical Library 02
LTO2 - FC	500308c001400020	N/A	Good	37RG	J00296L1	1, 1, 1, 6, 1, 1	1110050639	Disabled	IBM	1, 1, 1, 1, 4	Logical Library 02
LTO2 - FC	500308c001400026	N/A	Good	37RG	J00361L1	1, 1, 1, 7, 1, 1	1110050551	Disabled	IBM	1, 1, 1, 1, 3	Logical Library 02
LTO2 - FC	500308c00140002c	N/A	Good	38D0	J00635L1	1, 1, 1, 8, 1, 1	1110051285	Disabled	IBM	1, 1, 1, 1, 3	Logical Library 02
LTO2 - FC	500308c001400038	N/A	Good	37RG	J00006L1	1, 1, 1, 10, 1, 1	1110051329	Disabled	IBM	1, 1, 1, 1, 3	Logical Library 02
LTO1 - FC	500308c00140003e	N/A	Good	36U3		1, 1, 1, 11, 1, 1	6811156035	Disabled	IBM	1, 1, 1, 1, 3	Logical Library 01

Buttons: Send, Close, Help

The following table describes the elements on the **Drive Status** dialog box.

Element	Description
Type	The type of drive.
WWN	For a Fibre drive only, the World Wide Name of the drive.
SCSI ID	For a SCSI drive only, the SCSI ID of the drive.
RAS	The status of the drive as reported by the RAS system (for example, Good or Failed).
Firmware level	The firmware level of the drive.
Media ID	The barcode of the loaded cartridge.

Element	Description
Location	The location of the drive by means of a coordinate system. For information about location coordinates, see Understanding Location Coordinates on page 366.
Physical SN	The serial number of the particular drive.
Logical SN	The logical serial number that the library assigns to a drive in a specific location. This is not the serial number of the particular drive (see Physical SN in this table). If a drive is replaced by another drive in the same library location, the logical serial number remains the same. From the host's perspective, the replacement drive is the same as the original one. If the logical serial number addressing feature is disabled for the library, Disabled appears in this field.
Vendor	The name of the drive vendor.
IO Blade	The location of the I/O blade to which the drive is attached. Locations are indicated by means of a coordinate system. For information about location coordinates, see Understanding Location Coordinates on page 366.
Partition Name	The name of the partition to which the drive is assigned.


2 From the **Drive Status** dialog box, you can perform the following tasks:

- Change the sorting of drives in the status list (for example, by type or location) by clicking the column heading by which you want the drives sorted. Repeatedly clicking a column heading toggles between ascending and descending order.
- Mail, save, or print status information by using the **Send** button (see [Mailing, Saving, and Printing Status Information](#) on page 230).

Monitoring Connectivity Status

The following dialog boxes display status information about connectivity:

- The **IO Blade Status** dialog box displays information about the I/O blades.

 **Note** If the library does not detect at least one chassis management blade (CMB) in the library, the **IO Blade** command does not appear on the menu.

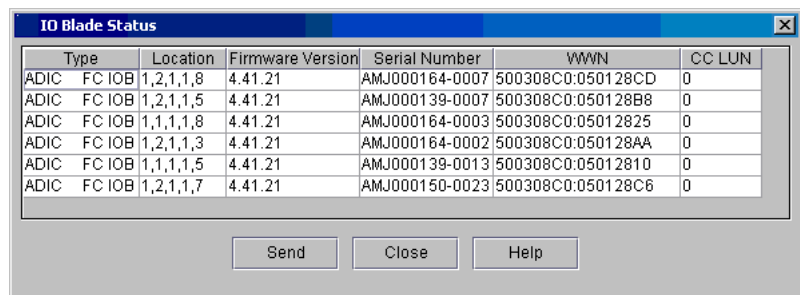
- The **SCSI Channel Status** dialog box displays information about the SCSI connection on the MCB.
- The **Fibre Channel Status** dialog box displays information about the FC connections on the MCB and the I/O blades (if any exist).

You must perform the following procedures while viewing the physical library.

Viewing I/O Blade Status Information

- 1 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 2 Click **Monitor**→**Connectivity**→**IO Blade**.

The **IO Blade Status** dialog box appears.



Type	Location	Firmware Version	Serial Number	WWN	CC LUN
ADIC FC IOB	1,2,1,1,8	4.41.21	AMJ000164-0007	500308C0:050128CD	0
ADIC FC IOB	1,2,1,1,5	4.41.21	AMJ000139-0007	500308C0:050128B8	0
ADIC FC IOB	1,1,1,1,8	4.41.21	AMJ000164-0003	500308C0:05012825	0
ADIC FC IOB	1,2,1,1,3	4.41.21	AMJ000164-0002	500308C0:050128AA	0
ADIC FC IOB	1,1,1,1,5	4.41.21	AMJ000139-0013	500308C0:05012810	0
ADIC FC IOB	1,2,1,1,7	4.41.21	AMJ000150-0023	500308C0:050128C6	0

Buttons: Send, Close, Help

The following table describes the elements on the **IO Blade Status** dialog box.

Element	Description
Type	The type of I/O blade (“FC IOB” indicates an I/O blade).

Element	Description
Location	The location of the blade (see I/O Blade Locations on page 376).
Firmware Version	The firmware version of the blade.
Serial Number	The serial number of the blade.
WWN	The World Wide Name of the blade.
CC LUN	The Command and Control LUN (typically, the CC LUN is mapped to LUN 0).

3 From the **IO Blade Status** dialog box, you can perform the following tasks:

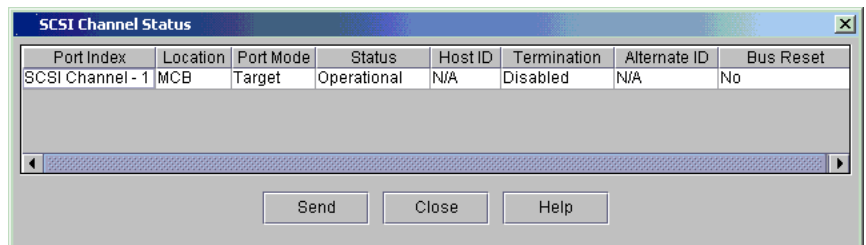
- Change the sorting of I/O blades in the status list (for example, by type or location) by clicking the column heading by which you want the I/O blades sorted. Repeatedly clicking a column heading toggles between ascending and descending order.
- Mail, save, or print status information by using the **Send** button (see [Mailing, Saving, and Printing Status Information](#) on page 230).

Viewing SCSI Channel Status Information

1 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.

2 Click **Monitor**→**Connectivity**→**SCSI Channel**.

The **SCSI Channel Status** dialog box appears.



The following table describes the elements on the **SCSI Channel Status** dialog box.

Element	Description
Port Index	The port number.
Location	The location of the port (for example, MCB).
Port Mode	The mode of the port (Target or Initiator).
Status	The status of the SCSI Channel (Operational or Lost Sync).
Host ID	The SCSI ID.
Termination	Terminated or Not Terminated.
Alternate ID	The alternate SCSI ID.
Bus Reset	Indicates whether the bus is configured to reset when library power is turned on (Yes or No).

3 From the **IO Blade Status** dialog box, you can perform the following tasks:

- Change the sorting of SCSI connections in the status list (for example, by type or location) by clicking the column heading by which you want the connections sorted. Repeatedly clicking a column heading toggles between ascending and descending order.
- Mail, save, or print status information by using the **Send** button (see [Mailing, Saving, and Printing Status Information](#) on page 230).

Viewing Fibre Channel Status Information

- 1 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 2 Click **Monitor**→**Connectivity**→**Fibre Channel**.

The **Fibre Channel Status** dialog box appears.

Port Index	Location	Port Mode	Status	WWPN	Loop ID	Connection	Speed
Fibre Channel - 1	MCB	Target (public)	Lost Sync	500308c00138b801	-1	Loop	N/A
Fibre Channel - 1	1, 1, 1, 1, 4	Target (public)	Ready	500308C0:0138B80A	0	Loop	2 Gb/sec
Fibre Channel - 2	1, 1, 1, 1, 4	Target (public)	Lost Sync	500308C0:0138B80B	126	Loop	Unknown
Fibre Channel - 3	1, 1, 1, 1, 4	Target (public)	Lost Sync	500308C0:0138B80C	126	Loop	Unknown
Fibre Channel - 4	1, 1, 1, 1, 4	Target (public)	Lost Sync	500308C0:0138B80D	126	Loop	Unknown
Fibre Channel - 5	1, 1, 1, 1, 4	Target (public)	Lost Sync	500308C0:0138B80E	126	Loop	Unknown
Fibre Channel - 6	1, 1, 1, 1, 4	Target (public)	Lost Sync	500308C0:0138B80F	126	Loop	Unknown
Fibre Channel - 1	1, 1, 1, 1, 6	Target (public)	Ready	500308C0:0138B818	0	Loop	2 Gb/sec
Fibre Channel - 2	1, 1, 1, 1, 6	Target (public)	Lost Sync	500308C0:0138B819	126	Loop	Unknown
Fibre Channel - 3	1, 1, 1, 1, 6	Target (public)	Lost Sync	500308C0:0138B81A	126	Loop	Unknown
Fibre Channel - 4	1, 1, 1, 1, 6	Target (public)	Ready	500308C0:0138B81B	1	Loop	1 Gb/sec
Fibre Channel - 5	1, 1, 1, 1, 6	Target (public)	Ready	500308C0:0138B81C	1	Loop	1 Gb/sec
Fibre Channel - 6	1, 1, 1, 1, 6	Target (public)	Ready	500308C0:0138B81D	1	Loop	1 Gb/sec
Fibre Channel - 1	1, 1, 1, 1, 8	Target (public)	Lost Sync	500308C0:0138B826	126	Point to Point	Unknown
Fibre Channel - 2	1, 1, 1, 1, 8	Target (public)	Lost Sync	500308C0:0138B827	126	Point to Point	Unknown
Fibre Channel - 3	1, 1, 1, 1, 8	Target (public)	Ready	500308C0:0138B828	1	Loop	1 Gb/sec
Fibre Channel - 4	1, 1, 1, 1, 8	Target (public)	Lost Sync	500308C0:0138B829	126	Loop	Unknown
Fibre Channel - 5	1, 1, 1, 1, 8	Target (public)	Ready	500308C0:0138B82A	1	Loop	2 Gb/sec

The following table describes the elements on the **Fibre Channel Status** dialog box.

Element	Description
Port Index	The port number.
Location	The location of the port (for example, MCB).
Port Mode	The mode of the port (Target or Initiator).
Status	The status of the Fibre Channel (Operational, Lost Sync).
WWPN	The World Wide Port Name.

Element	Description
Loop ID	For arbitrated loops only, the loop ID. “-1” indicates that Soft is selected on the Fibre Channel Parameters dialog box (see Port Configuration on page 129).
Connection	The type of connection (Loop, Point to Point, Loop Preferred).
Speed	The speed in gigabits per second (1 Gb/s, 2 Gb/s, or Auto). “Unknown” appears in this field when the Fibre Channel link is not up and ready (“Lost Sync” status).

3 From the **Fibre Channel Status** dialog box, you can perform the following tasks:

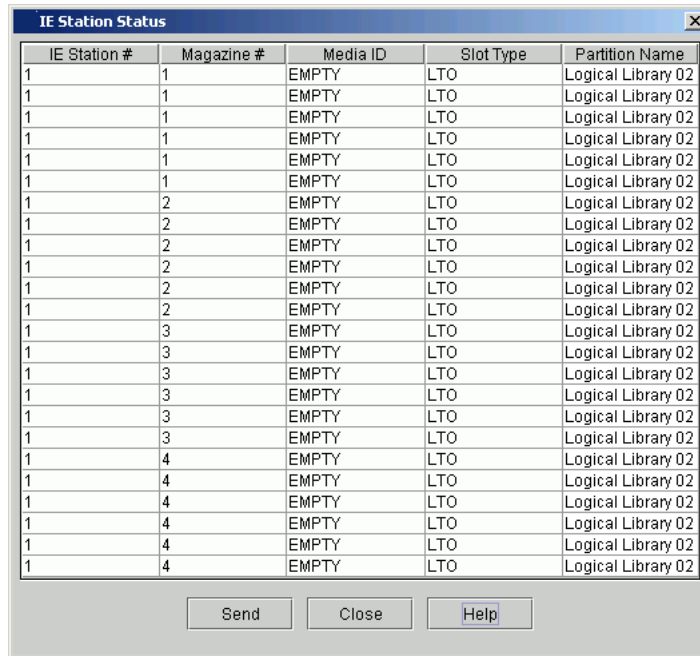
- Change the sorting of Fibre Channel connections in the status list (for example, by type or location) by clicking the column heading by which you want the connections sorted. Repeatedly clicking a column heading toggles between ascending and descending order.
- Mail, save, or print status information by using the **Send** button (see [Mailing, Saving, and Printing Status Information](#) on page 230).

Monitoring I/E Station Status

The **IE Station Status** dialog box displays detailed information about the magazine slots in the I/E stations within the currently selected partition. If you are working in the physical library, status information appears for all magazine slots in all I/E stations. You can perform this procedure while viewing either the physical library or a partition.

1 Click **Monitor**→ **IE Station** or use the **I/E** toolbar button.

The **IE Station Status** dialog box appears.



The following table describes the elements on the **IE Station Status** dialog box.

Element	Description
IE Station #	The number of the I/E station, which is the same as the control module or expansion module that contains it.
Magazine #	The number of the I/E station magazine (numbered from top to bottom in the I/E station).
Media ID	The cartridge barcode or the word EMPTY.
Slot Type	The media type (for example, LTO).
Partition Name	The name of the partition to which the I/E station is assigned.

2 From the **IE Station Status** dialog box, you can perform the following tasks:

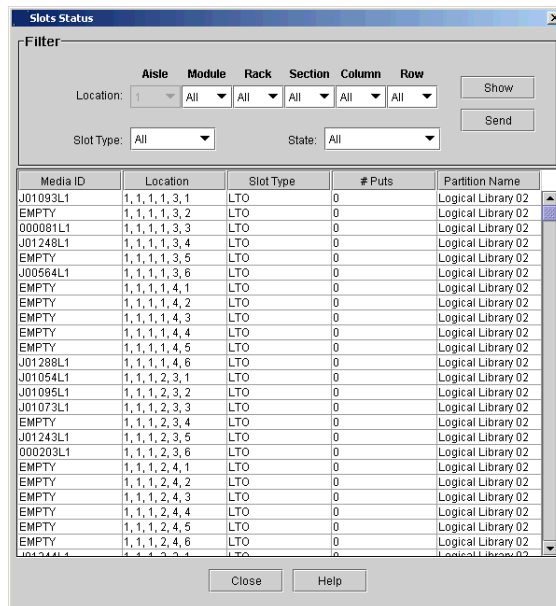
- Change the sorting of magazine slots in the status list (for example, by I/E station number or partition name) by clicking the column heading by which you want the magazine slots sorted. Repeatedly clicking a column heading toggles between ascending and descending order.
- Mail, save, or print ticket information by using the **Send** button (see [Mailing, Saving, and Printing Status Information](#) on page 230).

Monitoring Slot Status

The **Slots Status** dialog box displays detailed information about the slots in the currently selected partition. If you are working in the physical library, you can view status information for all slots. Because the number of slots in a physical or partition can be quite large, you can select a subset of the available slots. You can perform this procedure while viewing either the physical library or a partition.

1 Click **Monitor**→**Slots**.

The **Slots Status** dialog box appears.



The following table describes the elements on the **Slots Status** dialog box.

Element	Description
In the Filter area:	
Location: Aisle	The location of slots by aisle number.
Location: Module	The location of slots by module number.
Location: Rack	The location of slots by rack number.
Location: Section	The location of slots by section number.
Location: Column	The location of slots by column number.
Location: Row	The location of slots by row number.
In the status list area:	
Media ID	The slot barcode.
Location	The location of the slot (see Understanding Location Coordinates on page 366).
Slot Type	The type of slot media (for example, LTO).
# Puts	The number of puts during the library's history.
Partition Name	The name of the partition to which the slot is assigned.

2 From the **Slots Status** dialog box, you can perform the following tasks:

- Change the sorting of slots in the status list (for example, by location or slot type) by clicking the column heading by which you want the slots sorted. Repeatedly clicking a column heading toggles between ascending and descending order.
- Use filtering criteria to select the slots that you want to appear in the status list on the dialog box (see [Filtering Slots From the Status List](#) on page 218).

- Mail, save, or print status information by using the **Send** button (see [Mailing, Saving, and Printing Status Information](#) on page 230).

Filtering Slots From the Status List

You can specify the slots that you want to appear in the status list by selecting location, slot type, and state criteria from the **Filter** area of the **Slots Status** dialog box.

- 1 Use one or more of the following drop-down lists to specify the slots that you want to appear in the status list:
 - To specify slots by location, click the appropriate option from each of the **Location** drop-down lists: **Aisle**, **Module**, **Rack**, **Section**, **Column**, and **Row**. The defaults are set to **All** unless a drop-down list does not have more than one option. For example, the **Aisle** drop-down list is always set to **1** by default because only one aisle exists in the library. Therefore, the drop-down list also is grayed out and selections cannot be made from it.

These selections correspond to location coordinates for the physical library. For example, to select all slots in the drive-side rack of the control module, click **1** for module, **1** for rack, **All** for section, **All** for column, and **All** for row. For more information about location coordinates, see [Understanding Location Coordinates](#) on page 366.

- To specify slots by media type, click **All** or a specific media type, such as **LTO**, from the **Slot Type** drop-down list. Only media types that are currently used in the library appear in the drop-down list. The default is set to **All**.
- To specify slots by slot state, click **All**, **Occupied**, or **Empty** from the **State** drop-down list. The default is set to **All**.

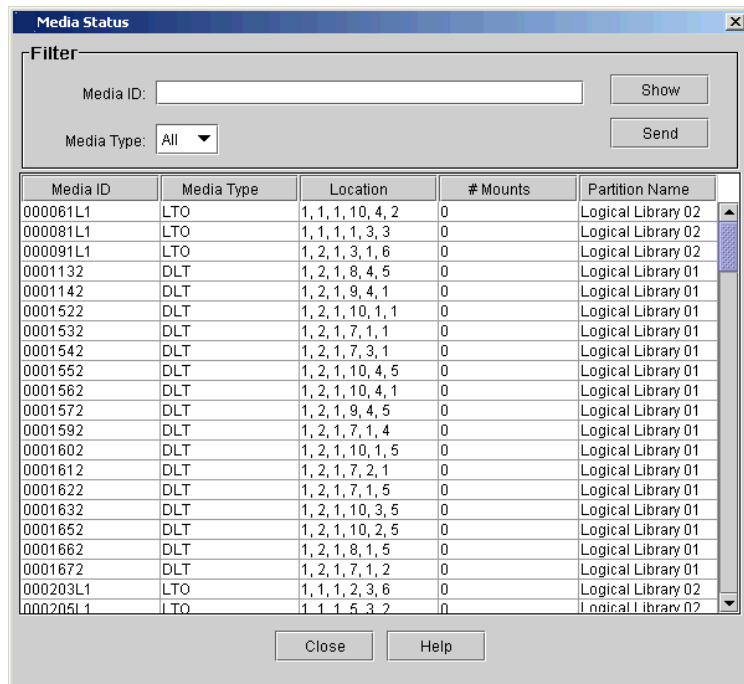
- 2 Click **Show**.

Monitoring Media Status

The **Media Status** dialog box displays detailed information about the media in the currently selected partition. If you are working in the physical library, you can view status information for all media. Because the number of media in a physical or partition can be quite large, you can select a subset of the available slots. You can perform this procedure while viewing either the physical library or a partition.

1 Click **Monitor**→**Media**.

The **Media Status** dialog box appears.



The following table describes the elements on the **Media Status** dialog box.

Element	Description
In the Filter area:	
Media ID	The cartridge barcode (allows the asterisk [*] wildcard character).
Media Type	The type of cartridge (for example, LTO).
In the status list area:	
Media ID	The cartridge barcode.
Media Type	The type of cartridge (for example, LTO).
Location	The location of the cartridge (see Understanding Location Coordinates on page 366).
# Mounts	The number of mounts within the history of the library.
Partition Name	The name of the partition to which the cartridge is assigned.

2 From the **Media Status** dialog box, you can perform the following tasks:

- Change the sorting of media in the status list (for example, by location or media type) by clicking the column heading by which you want the media sorted. Repeatedly clicking a column heading toggles between ascending and descending order.
- Use filtering criteria to select the media that you want to appear in the status list on the dialog box (see [Filtering Media From the Status List](#) on page 221).
- Mail, save, or print status information by using the **Send** button (see [Mailing, Saving, and Printing Status Information](#) on page 230).

Filtering Media From the Status List

You can specify the media that you want to appear in the status list by selecting media ID and media type criteria from the **Filter** area of the **Media Status** dialog box.

- 1 Use one or both of the following elements to specify the media that you want to appear in the status list:
 - To specify a media item by media ID, type the exact barcode that is associated with a particular cartridge in the **Media ID** text box. You also can use the asterisk (*) as a wildcard character to represent one or more characters in the media ID. This will list all media for IDs that match the designated pattern. For example, if you set the **Media ID** value to "J00*", any media with IDs that start with "J00" will appear in the status list.
 - To specify media by media type, click **All** or a specific media type, such as **LTO**, from the **Slot Type** drop-down list. Only media types that are currently used in the library appear in the drop-down list. The default is set to **All**.
- 2 Click **Show**.

Monitoring Sensor Status

The **Sensor Status** dialog box displays detailed information about the library's power and cooling systems, such as operational statuses, temperatures, voltages or wattages, and fan speeds in rotations per minute (RPM). You can perform the following procedures while viewing either the physical library or a partition.

Accessing the Sensor Status Dialog Box

- Click **Monitor**→**Sensor**.

The **Sensor Status** dialog box appears with the **Cooling Fan** tab displayed.

Displaying Cooling Fan Information

- 1 To display detailed information about the library's cooling fans, click the **Cooling Fan** tab on the **Sensor Status** dialog box.

Name	Status	RPM	Location
CMB Cooling fan #1	● Nominal	4066	1,1,1,1,2
CMB Cooling fan #2	● Nominal	4440	1,1,1,1,2
RCS FAN1	● Nominal	5818	Library (LMD) Cooling Fan #1
RCS FAN2	● Nominal	5720	Library (LMD) Cooling Fan #2
DDC Fan Speed	● Nominal	7650	[1,1,1,1,1,1]
DDC Fan Speed	● Nominal	7650	[1,1,1,2,1,1]
DDC Fan Speed	● Nominal	6720	[1,1,1,4,1,1]
DDC Fan Speed	● Nominal	6720	[1,1,1,5,1,1]
DDC Fan Speed	● Nominal	7650	[1,1,1,7,1,1]
DDC Fan Speed	● Nominal	6720	[1,1,1,10,1,1]
DDC Fan Speed	● Nominal	7560	[1,1,1,11,1,1]
DDC Fan Speed	● Nominal	7650	[1,1,1,12,1,1]

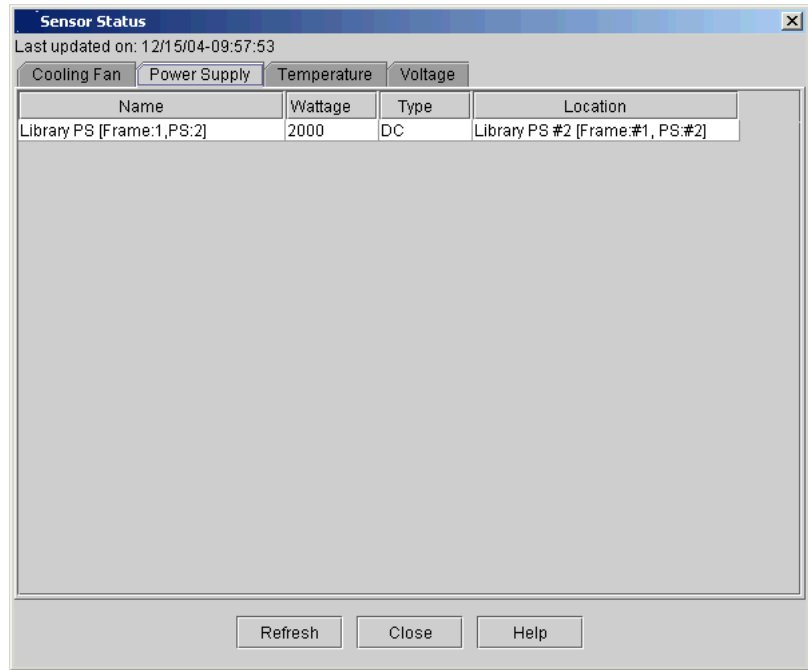
The following table describes the elements on the **Cooling Fan** tab.

Element	Description
Name	The name of the cooling fan sensor.
Status	The status of the cooling fan. If the fan speed is within normal operating limits, the status is nominal. Otherwise, a warning or alarm is indicated.
RPM	The current speed of the fan in rotations per minute (RPM).
Location	The location of the cooling fan within the library. Locations of cooling fans for control management blades (CMBs) are indicated by means of a coordinate system. For information about location coordinates, see Understanding Location Coordinates on page 366.

- 2 To view current information, click **Refresh**.

Displaying Power Supply Information

- 1 To display detailed information about the library's power supplies, click the **Power Supply** tab on the **Sensor Status** dialog box.



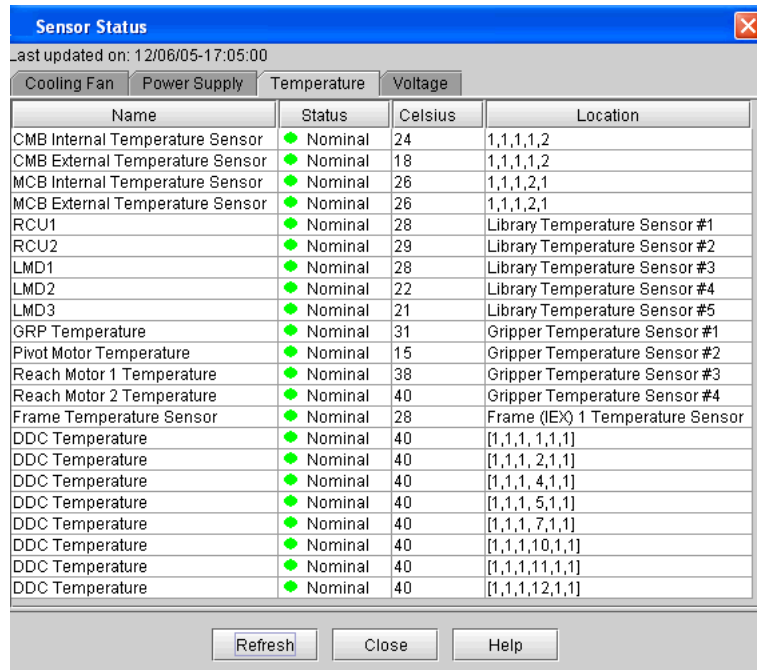
The following table describes the elements on the **Power Supply** tab.

Element	Description
Name	The name of the power supply sensor.
Wattage	The amount of power in watts.
Type	The type of power (AC or DC).
Location	The location of the power supply within the library.

- 2 To view current information, click **Refresh**.

Displaying Temperature Information

- 1 To display temperature status information for various library components, click the **Temperature** tab on the **Sensor Status** dialog box.



The following table describes the elements on the **Temperature** tab.

Element	Description
Name	The name of the temperature sensor.
Status	The temperature status in the vicinity of the sensor. If the temperature is within normal operational limits, the status is nominal. Otherwise, a warning or alarm is indicated.
Celsius	The sensor's temperature reading in degrees Celsius.

Element	Description
Location	The location of the temperature sensor within the library. Control management blade (CMB) locations are indicated by means of a coordinate system. For information about location coordinates, see Understanding Location Coordinates on page 366.

2 To view current information, click **Refresh**.

Displaying Voltage Information

- 1 To display voltage status information for various library components, click the **Voltage** tab on the **Sensor Status** dialog box.

Name	Status	Millivolts	Type	Location
CMB 1.8 Volt Sensor	Nominal	1804	DC	1,1,1,1,2
CMB 2.5 Volt Sensor	Nominal	2483	DC	1,1,1,1,2
CMB 3.3 Volt Sensor	Nominal	3285	DC	1,1,1,1,2
CMB 5 Volt Sensor	Nominal	4966	DC	1,1,1,1,2
CMB 12 Volt Sensor	Nominal	12500	DC	1,1,1,1,2
LMD 3.3 Volts	Nominal	3254	DC	Library Voltage Sensor #1
LMD 5.0 Volts	Nominal	4974	DC	Library Voltage Sensor #2
LMD VCC	Nominal	3250	DC	Library Voltage Sensor #3
LMD 12 Volts	Nominal	12042	DC	Library Voltage Sensor #4
LMD 42 Volts	Nominal	41338	DC	Library Voltage Sensor #5
LMD 48 Volts	Nominal	52020	DC	Library Voltage Sensor #6
RCU 2.5 Volts	Nominal	2496	DC	Library Voltage Sensor #7
RCU 3.3 Volts	Nominal	3299	DC	Library Voltage Sensor #8
RCU 5.0 Volts	Nominal	5122	DC	Library Voltage Sensor #9
RCU VCC	Nominal	3268	DC	Library Voltage Sensor #10
RCU 12 Volts	Nominal	12000	DC	Library Voltage Sensor #11
RCU 48 Volts	Nominal	51250	DC	Library Voltage Sensor #12
GRP Supply Voltage	Nominal	41248	DC	Gripper Voltage Sensor #1
GRP Logic Voltage	Nominal	4947	DC	Gripper Voltage Sensor #2
IEX 5 Volts	Nominal	5300	DC	IEX Voltage Sensor #1
DDC Supply Voltage	Nominal	53319	DC	[1,1,1,1,1,1], Sensor #1
DDC Supply Voltage	Nominal	12250	DC	[1,1,1,1,1,1], Sensor #2
DDC Supply Voltage	Nominal	53461	DC	[1,1,1,2,1,1], Sensor #1
DDC Supply Voltage	Nominal	12345	DC	[1,1,1,2,1,1], Sensor #2

The following table describes the elements on the **Voltage** tab.

Element	Description
Name	The name of the voltage sensor.
Status	The voltage status at the location of the sensor. If the voltage is within normal operational limits, the status is nominal. Otherwise, a warning or alarm is indicated.
Millivolts	The sensor's voltage reading in millivolts.
Type	The type of power at the location of the sensor (AC or DC).
Location	The location of the voltage sensor within the library. Control management blade (CMB) locations are indicated by means of a coordinate system. For information about location coordinates, see Understanding Location Coordinates on page 366.

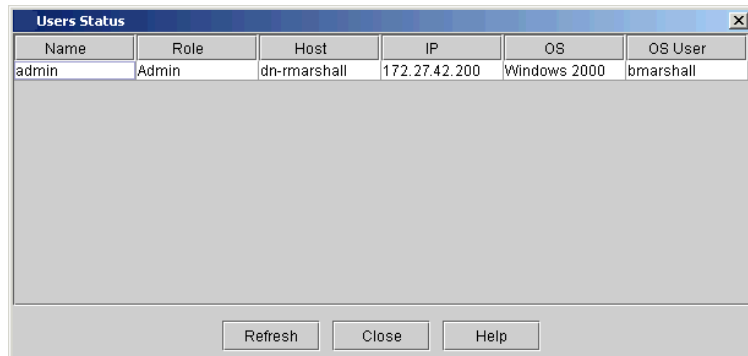
- 2 To view current information, click **Refresh**.

Monitoring Users Status

The **Users Status** dialog box displays detailed information about users who are currently logged on to the library. You can perform this procedure while viewing either the physical library or a partition.

1 Click **Monitor** → **Users**.

The **Users Status** dialog box appears.



The following table describes the elements on the **Users Status** dialog box.

Element	Description
Name	The name of the user who is currently logged on to the library.
Role	The type of user (for example, User or Admin).
Host	The name of the host computer from which the user is connected to the library.
IP	The IP address of the host computer.
OS	The host computer's operating system.
OS User	The name of the user who is currently logged on to the host computer.

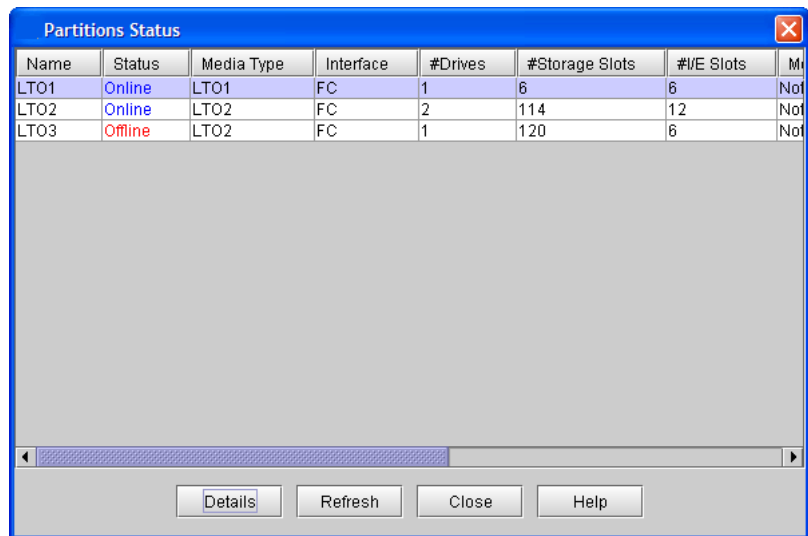
2 To view current information, click **Refresh**.

Monitoring Partitions Status

If you want to see settings and information for a partition but do not need to make changes, view partition details. Unlike modifying a partition, viewing details does not require you to take a partition offline.

- 1 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 2 On the menu bar, click **Monitor**→ **Partitions**.

The **Partitions Status** dialog box appears with a list of all logical partitions in the library and information about each partition.



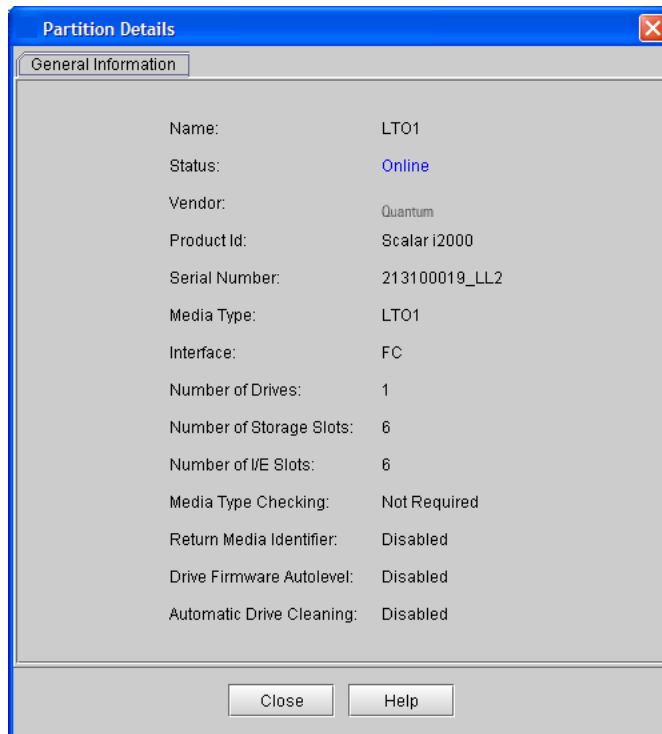
The following table describes the elements on the **Partitions Status** dialog box.

Element	Description
Name	The name of the partition.
Status	The status of the partition (Online or Offline).

Element (Continued)	Description
Media Type	The type of media used in the partition (LTO-1, LTO-2, LTO-3, LTO-4, or DLT).
Interface	The type of interface used to connect to the host (FC or SCSI).
#Drives	The number of tapes drives in the partition.
#Storage Slots	The number of storage slots in the partition.
#I/E Slots	The number of I/E station slots in the partition.
Media Type Checking	The current setting for media type checking (Required, Not Required, or Disabled).
Media Identifier	The current setting for return media identifier (Suffix, Pass Through, Prefix, or Disabled).
Drive Autolevel	The current setting for drive firmware autoleveling (Enabled or Disabled).
Auto Drive Clean	The current setting for automatic drive cleaning (Enabled or Disabled).

- 3 To see additional details for a partition, click the partition in the list, and then click **Details**.

The **Partition Details** dialog box appears. This window shows additional information about the partition, such as vendor, product ID, and serial number.



- 4 Click **Close** to close the **Partition Details** dialog box.
- 5 Click **Close** to return to the **Partitions Status** dialog box.

Mailing, Saving, and Printing Status Information

The **Send** button on each of the following status dialog boxes enables you to send status information to e-mail addresses:

- System Status
- Drive Status
- IO Blade Status
- SCSI Channel Status

- Fibre Channel Status
- IE Station Status
- Slots Status
- Media Status

If you are accessing the LMC from a remote client, **Send** also enables you to save the information to a file or print it.



Note

You can mail, save, or print status information from a remote client. However, you cannot save or print the information from the library's touch screen.

The information that is sent will be the same as what the status dialog box displays at the time that you click **Send**.

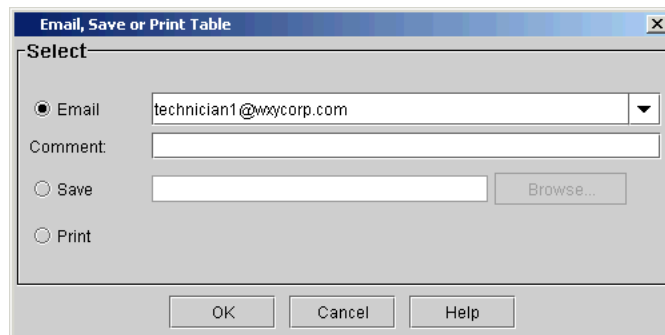


Note

Before you perform the following procedure, you must make sure that e-mail is appropriately configured in the LMC so that the library can send information to the recipient. See [Configuring E-mail](#) on page 140.

- 1 Make sure that the status dialog box displays the status information that you want to send.
- 2 Click **Send**.

The **Email, Save or Print Table** dialog box appears.



3 Perform one of the following tasks:

- To indicate that you want to send the information as an e-mail message to a recipient, select **Email**, and then either type an e-mail address in the **Email** text box or select an existing address from the drop-down list. You can type a comment in the **Comment** text box to send with the information.
- To indicate that you want to save the information, select **Save**, and then either type in the **Save** text box a path and a file name to which you want the information saved or click **Browse** to specify a location and a file name.



Note The **Save** option is available to remote client users only. It appears grayed out on the touch screen.

- To indicate that you want to send the information to a printer, select **Print**.



Note The **Print** option is available to remote client users only. It appears grayed out on the touch screen.

4 To send, click **OK**.

Maintenance Actions

If you are experiencing system problems, make a quick check of subsystems and components before looking for a service ticket or contacting technical support. Your service representative might ask you to check these things or, if you are an administrator, you might be asked to run a diagnostic procedure or upload new firmware.

Administrative users have access to all the commands on the **Tools** menu. Use this menu to test the drives, as well as to capture a snapshot, to update firmware, and to use the **Teach** tool. The **Tickets** command on the **Tools** menu displays tickets that the library creates when it detects issues within its subsystems. For more information about the Tickets command, see [Troubleshooting Your Library](#) on page 6. For a summary of user privileges defined by physical library, partition, and command menu, see [table 28](#) on page 354.

Is the Access Door Closed?

Library operations are taken offline when the access door is opened. If library operations have stopped, check whether the access door is shut and the **Robotics Enabled** indicator is solid green.

Is a Cartridge Old?

Cartridges can become old and less dependable. If you experience problems reading, writing, or otherwise using a cartridge, try the following courses of action:

- Use the **Monitor**→**Media** command to determine the number of mounts for the cartridge, and then compare that number to other cartridges in the system. If the cartridge has been used excessively, replace it with a new cartridge.
- Ask an administrator to put the cartridge in a different drive, and then use the **Tools**→**Drives** command to check the error count. If the error count continues to increase, replace the old cartridge with a new cartridge.
- If you have received a message about read/write failures, first copy the data from the failing cartridge, and then replace it with a new cartridge.

Using Library Explorer

You can use the **Library Explorer** feature to view a graphical presentation of all the drives, cartridges, and slots in the library. The **Library Explorer** can display all library elements according to physical location in any configuration, from one module to eight modules, and one drive up to the maximum number of 96 drives.

The **Library Explorer** features are available to administrator and service users, along with non-administrative users who have limited access to library functions. Users who do not have administrative privileges can perform all Operations options available to non-administrative users directly from the **Library Explorer** dialog boxes.

You can use the Library Explorer to directly perform the following tasks:

- Locate an element by entering its address
- Locate a cartridge by entering the media barcode
- Load and unload drives
- Move cartridges
- Perform inventory
- Import and export
- View drive details
- Perform all drive related functions

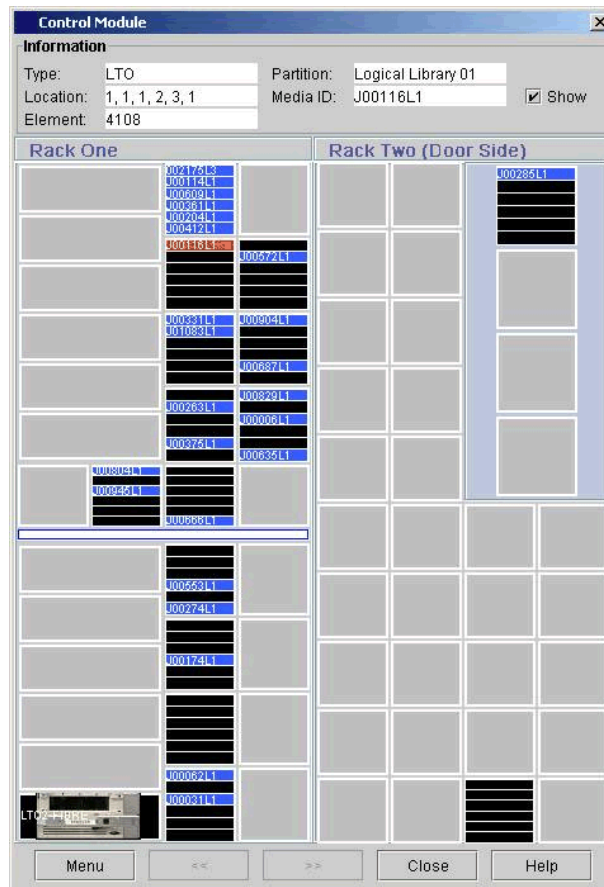
1 From the **Tools** menu, click **Library Explorer**.

The **Library Explorer** dialog box appears.



- 2 You can display library data using either the **Select Filter** options or clicking on a particular module in the **Select Module** area.
 - In the **Select Filter** area, you can search for and display specific criteria according to device type and location coordinates, or by **Media ID**.
 - Select the **Device Type** filter, and then from the **Type** drop-down list, click the appropriate device type: IE (I/E Station), Storage, or Drive. Click **Show**. The **Module** dialog box displays a graphical view of the library elements according to your **Type** filter choices.
 - To search for a specific cartridge according to the cartridge's barcode, select the **Media ID** filter, type the barcode in the **Media ID** field, and then click **Show**. The **Module** dialog box displays the specific cartridge highlighted in red within the module where it is located.

- In the **Select Module** area, you can select a specific module in your library to view. On a multi-module library, all modules are represented.
 - In the **Select Module** area, click on the module you want to view. The **Module** dialog box displays the current configuration of Rack one and Rack two according to the module you chose.
- 3** If you chose to search for an element by its address, or chose to locate a cartridge by its media barcode, your search result appears in red in the **Library Explorer Module** dialog box.



Understanding the Graphical Display

You can access Library Explorer Module from both the physical and partition views, but the functionality in the physical view is limited. If you are in a partition view, you can view slots and drives pertaining to that particular partition.

- The **Library Explorer Module** dialog box displays the current configuration of Rack one and Rack two according to the module you chose.
- Slots containing cartridges are blue. Empty slots are black. Your search result appears in red.
- Details concerning the particular cartridge, drive, or slot appear in the Information area.

The **Information** area displays the following details:

- Type
- Location
- Element
- Partition
- Media ID
- Barcode numbers appear on slots containing cartridges. If you do not want to view the barcode information, clear the Show check box.
- If you click on a specific slot or drive, that slot or drive is highlighted in red, and details about the slot or drive appear in the Information area.
- If you hover your mouse over a specific segment in the module a tool tip appears, displaying the coordinates of that particular segment.
- To move from one module to another, click on the arrows at the bottom of the dialog box.

Performing Library Operations

To access available library operations for a specific drive or slot, you can either click on Menu or right click on the drive or slot. You can perform the following operations, depending on what library view you are using. See *Selecting a Library or Partition* if you need more information on viewing the library.

- Drive Details
- Inventory
- Loading Drives
- Unloading Drives
- Move Media
- Importing Cartridges
- Exporting Cartridges

4 To return to the **Library Explorer** dialog box, click **Close**.

The **Library Explorer** dialog box appears.

Configuring and Testing Drives

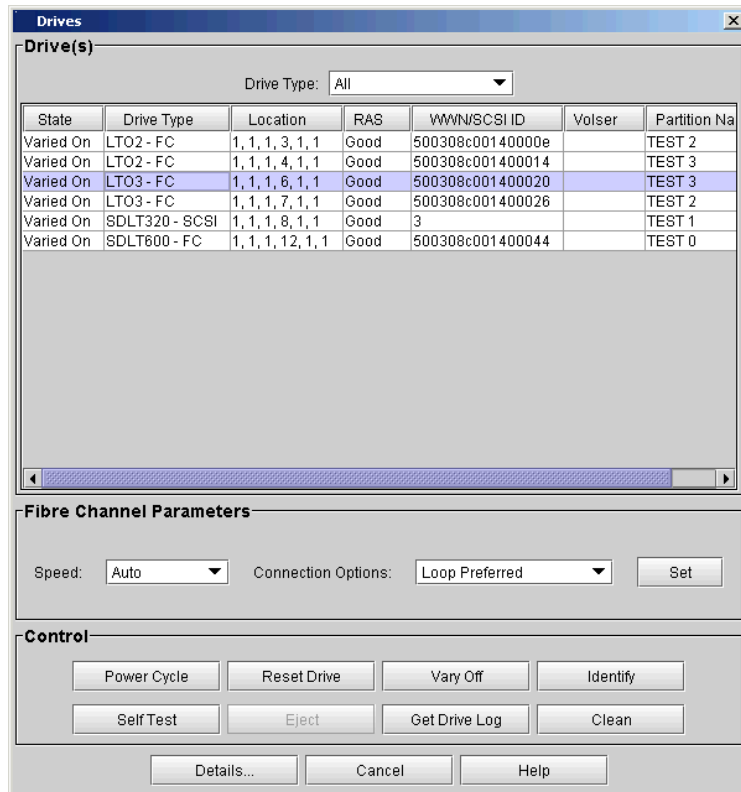
The **Drives** dialog box enables you to do the following:

- Set speed and connection parameters
- Reset drives
- Cycle power to drives
- Take drives online or offline
- Identify drives
- Run a pass/fail test for LTO-type drives
- Eject tape cartridges from drives
- Send the logs by e-mail or save drive logs
- Clean drives

Drive information on this dialog box is automatically refreshed whenever a drive is added or removed.

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Tools**→ **Drives**.

The **Drives** dialog box appears.



The following table describes the elements on the **Drives** dialog box.

Element	Description
In the Drive(s) area:	
Drive Type drop-down list	Enables you to select the type of drives you want to list on the Drives dialog box (for example, LTO1 for LTO-1 tape drives). All lists every drive in the library.
State	The state of the drive (Varied On or Varied Off).
Drive Type	The type of drive (for example, LTO2 - FC).
Location	The location of the drive by means of a coordinate system. For information about location coordinates, see Understanding Location Coordinates on page 366.
RAS	The status of the drive as reported by the RAS system (for example, Good or Failed).
WWN/SCSI ID	Indicates either: <ul style="list-style-type: none"> • For Fibre drives only, the World Wide Name of the drive, or • For SCSI drives only, the SCSI ID of the drive
Volser	If a cartridge is loaded in the specified drive, the volume serial number of the cartridge.
Partition Name	The name of the partition to which the drive is assigned.
In the Fibre Channel Parameters area:	
Speed drop-down list	Configures the speed of the specified drive. Possible speed settings are: <ul style="list-style-type: none"> • Auto (default) • 1-Gb/s • 2-Gb/s • 4-Gb/s

Element	Description
Connection Options drop-down list	<p>Configures the type of connection for the specified drive. This setting is not available for libraries in advanced configuration. Possible connection types are:</p> <ul style="list-style-type: none"> • Loop Preferred • Point to Point • Loop
Set button	<p>Applies the selections you made in the Fibre Channel Parameters area to the specified drive.</p>
In the Control area:	
Power Cycle button	<p>Cycles power to the specified drive by removing the power and then restoring it. In general, you should try to reset drives before you cycle power to them.</p>
Reset Drive button	<p>Resets the specified drive without cycling the power.</p>
Vary Off or Vary On button	<p>Varies off or varies on the specified drive. The label of the button toggles between Vary Off and Vary On. Each use of this button updates the drive information in the Drive(s) area. Use this button when you hot swap drives.</p>
Identify button	<p>Causes status LEDs on the back of the specified drive to blink rapidly so that you can identify it. When you click Identify, a message appears that informs you that you can now identify the drive by the rapidly blinking LED on the back of it. After you find the drive, click OK to stop the rapid blinking.</p>
Self Test button	<p>For LTO-type drives only, runs a pass/fail test on the specified drive. This button is available only when you select an LTO-type drive.</p>
Eject button	<p>Ejects any currently loaded tape from the specified drive.</p>
Get Drive Log button	<p>Enables you to mail or save the log of a Fibre drive that is attached to an I/O blade (see Mailing, Saving, and Printing Test Logs on page 313). This button is available only for I/O blade-attached Fibre drives that are properly connected and configured. If the button is not available for a Fibre drive, verify that it is properly connected to the I/O blade and that communication is established between them.</p>
Clean	<p>Enables the drive cleaning process (see Cleaning a Drive on page 246).</p>

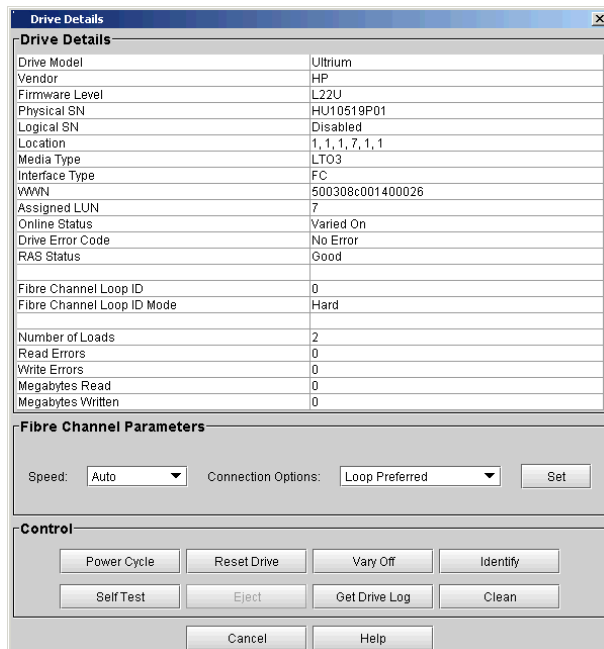
The **Details** button displays the **Drive Details** dialog box. For more information, see [Viewing Drive Details](#) on page 242.

- 4 In the **Drive(s)** area, click the appropriate drive row to highlight it.
- 5 Perform operations in either the **Fibre Channel Parameters** area or the **Control** area of the **Drives** dialog box.

Viewing Drive Details

- 1 On the **Drives** dialog box in the **Drive(s)** area, click the appropriate drive row to highlight it.
- 2 Click **Details**.

The **Drive Details** dialog box appears.



The **Drive Details** area of the **Drive Details** dialog box displays detailed information about the selected drive.

The following table describes the elements that appear in this area. For descriptions of elements in the **Fibre Channel Parameters** and **Control** areas, see [Configuring and Testing Drives](#) on page 238.

Element	Description
Drive Model	The brand name of the drive model.
Vendor	The drive vendor.
Firmware Level	The firmware version that is currently installed on the drive.
Physical SN	The serial number of the particular drive.
Logical SN	The logical serial number that the library assigns to a drive in a specific location. This is not the serial number of the particular drive (see Physical SN in this table). If a drive is replaced by another drive in the same library location, the logical serial number remains the same. From the host's perspective, the replacement drive is the same as the original one. If the logical serial number addressing feature is disabled for the library, Disabled appears in this field.
Location	The location of the drive by means of a coordinate system. For information about location coordinates, see the <i>Scalar i2000 User's Guide</i> .
Media Type	The type of drive (for example, LTO2 for LTO-2 tape drives).
Interface Type	The type of interface (FC or SCSI).
WWN	For Fibre drives only, the World Wide Name of the drive. This field does not appear for SCSI drives.
SCSI ID	For SCSI drives only, the SCSI ID of the drive. This field does not appear for Fibre drives.
Assigned LUN	The assigned logical unit number.
Volser	If a cartridge is loaded in the specified drive, the volume serial number of the cartridge.
Online Status	The status of the drive (Varied On or Varied Off).

Element	Description
Drive Error Code	For LTO drives only, the drive brick error code. This field does not appear for Fibre drives. If the drive currently has no errors, "No Error" appears in this field. If the library is unable to acquire a drive error code, such as when the robotics are disabled, "Unavailable" appears in this field.
RAS Status	The status of the drive as reported by the RAS system (for example, Good or Failed).
Fibre Channel Loop ID	For Fibre drives only, the loop ID assigned to the drive.
Fibre Channel Loop ID Mode	For Fibre drives only, the way in which the loop ID is assigned to the drive (Hard or Soft).
Number of Loads	The number of loads during the drive's history in this library.
Read Errors	The number of read errors that have occurred during the drive's history in this library.
Write Errors	The number of write errors that have occurred during the drive's history in this library.
Megabytes Read	The amount of data in megabytes that the drive has read during its history in this library.
Megabytes Written	The amount of data in megabytes that the drive has written during its history in this library.

3 To return to the **Drives** dialog box, click **Cancel**.

Mailing and Saving Drive Logs

The **Get Drive Log** button on the **Drives** dialog box enables you to send drive logs to e-mail addresses. If you are accessing the LMC from a remote client, **Get Drive Log** also enables you to save the information to a file.



Note

You can mail or save logs from a remote client. However, you cannot save logs from the library's touch screen.

Before you perform the following procedure, you must make sure that e-mail is appropriately configured in the LMC so that the library can send logs to the recipient. For more information about configuring e-mail, see [Configuring E-mail](#) on page 140.

- 1 From the **Drives** dialog box, click **Get Drive Log**.

The **Email or Save Drive Log** dialog box appears.

The screenshot shows a dialog box titled "Email or Save Drive Log". It contains a "Select" section with three radio buttons: "Email" (selected), "Save", and "Print". The "Email" option is selected, and its corresponding text box contains "scalari2000@quantum.com". Below the "Email" text box is a "Comment:" text box. The "Save" option has a corresponding text box and a "Browse..." button. At the bottom of the dialog are three buttons: "OK", "Cancel", and "Help".

- 2 Perform one of the following tasks:

- To indicate that you want to send the log as an e-mail message to a recipient, select **Email**, and then either type an e-mail address in the **Email** text box or select an existing address from the drop-down list. You can type a comment in the **Comment** text box to send with the log.

- To indicate that you want to save the log, select **Save**, and then either type in the **Save** text box a path and a file name to which you want the information saved or click **Browse** to specify a location and a file name.



Note The **Save** option is available to remote client users only. It appears grayed out on the touch screen.

3 To send, click **OK**.

Cleaning a Drive

Use the **Drives** dialog box to manually initiate a drive cleaning operation. When cleaning a drive, you can use cleaning media inserted in the I/E station or media in an assigned cleaning magazine.



Note If the host application coordinates drive cleaning, or if automatic drive cleaning is enabled for the partition, you do not need to manually initiate a drive cleaning operation to perform routine cleaning tasks. In these cases, routine cleaning is handled by the host application or the library, and you should manually initiate a drive cleaning operation only as part of a troubleshooting procedure.

Before you manually initiate a drive cleaning operation, you must add cleaning media to the library. (The cleaning media must be appropriate for the type of drive being cleaned, for example, LTO or DLT.)

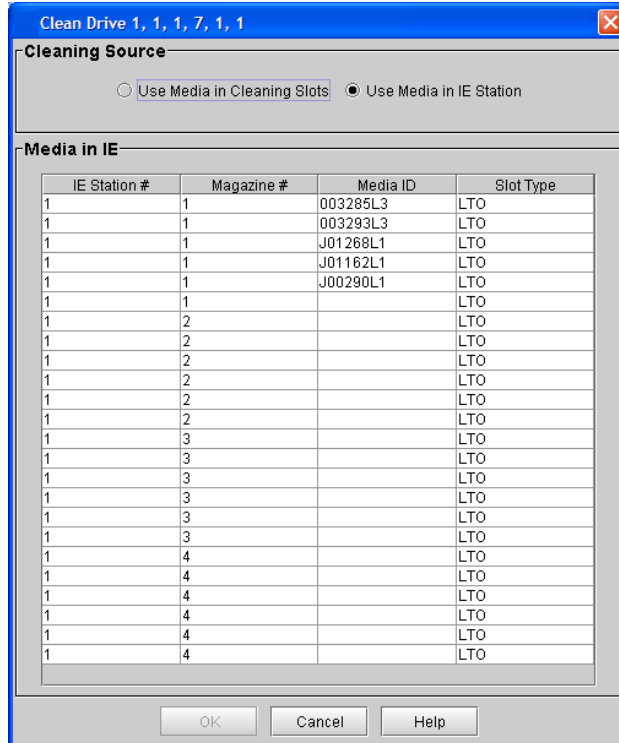
There are two ways to add cleaning media to the library:

- Insert cleaning media into the I/E station and close the I/E station door.
- Configure drive cleaning by assigning cleaning magazines and importing cleaning media. (For more information on configuring drive cleaning, see [Configuring Drive Cleaning](#) on page 179.)

After adding cleaning media to the library, manually initiate a drive cleaning operation.

- 1 On the menu bar, click **Tools**→ **Drives** to display the **Drives** dialog box.
- 2 Click a drive in the list, and then click **Clean**.

The **Clean Drive** dialog box appears.



- 3 Under **Cleaning Source**, click an option:
 - To use cleaning media inserted in the I/E station, click **Use Media in IE Station**, and then click a piece of cleaning media in the list.
 - To use cleaning media in an assigned cleaning magazine, click **Use Media in Cleaning Slots**.
- 4 Click **OK**.

The drive cleaning operation is initiated, and the **Clean Drive** dialog box closes. Once the cleaning operation completes, the cleaning media is returned to the I/E station or assigned cleaning magazine.



Note

The system does not display a message when the cleaning operation is completed.

**Working With
Connectivity**

The **Connectivity** dialog box enables you to do the following:

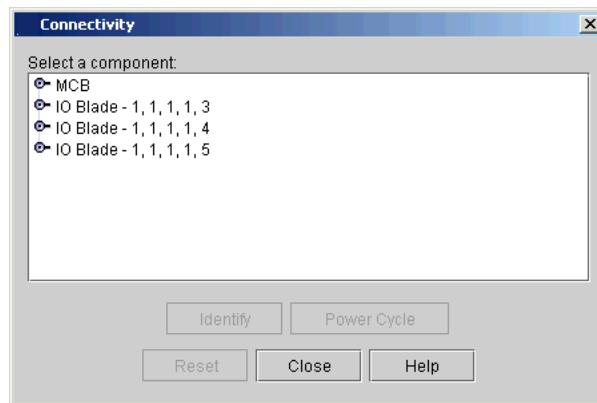
- Reset an I/O blade
 - Reset the Fibre Channel port on the MCB or a Fibre Channel port on an I/O blade
 - Power cycle an I/O blade
 - Visually locate a specific I/O blade in the library
- 1 Log on as an administrator.
 - 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
 - 3 Click **Tools**→**Connectivity**.



Note

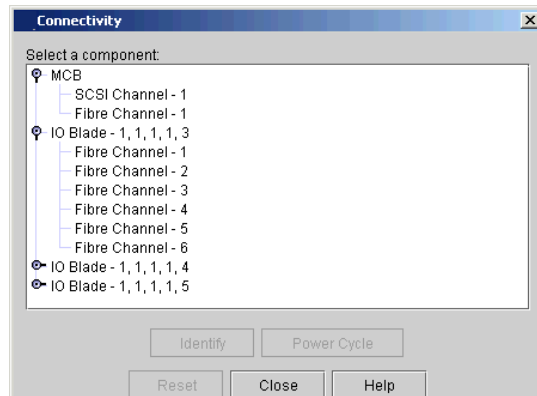
If the physical library is not offline, you receive a message that asks you whether you want to take it offline. Click **Yes**.

The **Connectivity** dialog box appears with the MCB and all I/O blades in the library listed.



- 4 To display the ports for a specific blade, click the name of the blade (MCB or one of the I/O blades).

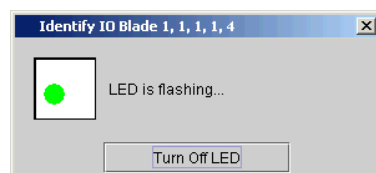
The following example shows the ports for the MCB and the I/O blade at location 1,1,1,1,4. (For information about location coordinates, see the *Scalar i2000 User's Guide*.)



- 5 Perform one of the following tasks:

- To reset either an entire I/O blade, an individual Fibre Channel port on an I/O blade, or the Fibre Channel port on the MCB, click the I/O blade or the port to highlight it, and then click **Reset**.
- To cycle the power for an I/O blade, click the I/O blade to highlight it, and then click **Power Cycle**.
- To cause the LEDs on an I/O blade to blink rapidly so that you can easily find it in the library, click the I/O blade to highlight it, and then click **Identify**.

When you click **Identify**, the following dialog box appears.



After you find the I/O blade, click **Turn Off LED**.

Capturing Snapshots

The **Capture Snapshot** command enables you to capture detailed information about the entire library in a single file and save it to disk or mail it to technical support. The captured information consists of configuration data, status information, and trace logs for library components, including the LMC, the MCB, the CMB, the robotics control subsystem (RCS), and the I/O blades.

Trace logs collect problem data for up to 72 hours of continuous library operation. They provide Quantum engineering personnel with vital library information for troubleshooting and solving problems. You should capture snapshots when technical support requests them.



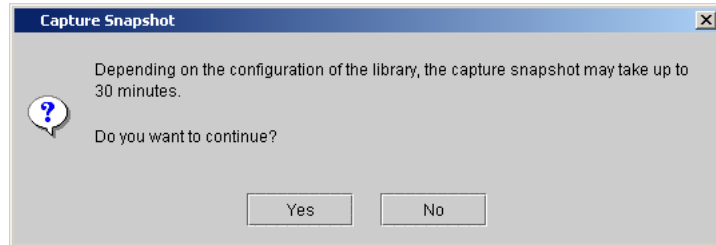
Note

- Because the snapshot requires analysis by trained Quantum personnel, send captured snapshots to www.quantum.com/osr when Quantum requests them.
- Depending on the library configuration, capturing a snapshot can take as long as 30 minutes and the resulting file size can be large. Firewall file size limitations could prohibit you from mailing it.
- You can mail or save snapshots from a remote client. However, you cannot save snapshots from the library's touch screen. You cannot print snapshots from either the remote client or the touch screen.
- Because snapshots do not contain binary data, secure sites allow them to be sent offsite.
- If you want to mail snapshots to e-mail addresses, you must make sure that e-mail is appropriately configured in the LMC before you perform the following procedure so that the library can send snapshots to the recipient. See [Configuring E-mail](#) on page 140.

- 1 Log on as an administrator.
- 2 Make sure that applications are not attempting to access the library.
- 3 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.

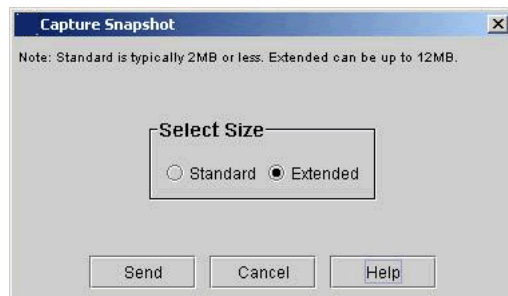
4 Click **Tools**→**Capture Snapshot**.

The following message appears.



5 If you want to continue, click **Yes**.

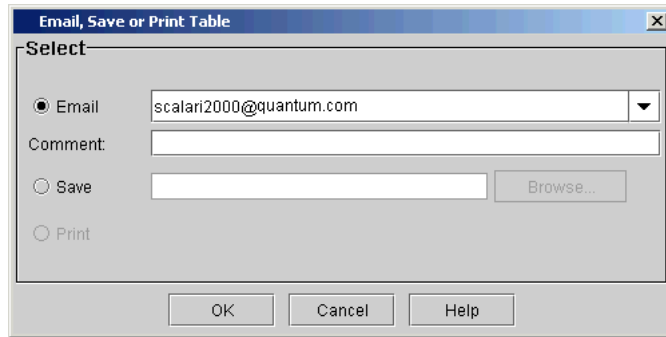
The **Capture Snapshot** dialog box appears.



The **Standard** option captures information about all library components. The **Extended** option captures a greater amount of detailed information.

6 Select **Standard** or **Extended**, and then click **Send**.

The **Email, Save or Print Table** dialog box appears.



7 Perform one of the following tasks:

- To indicate that you want to send the snapshot as an e-mail message to a recipient, select **Email**, and then either type an e-mail address in the **Email** text box or select an existing e-mail address from the **Email** drop-down list. You can type a comment in the **Comment** text box to send with the snapshot.



Note

Typically, you should send the snapshot to Quantum technical support (www.quantum.com/support) when requested to do so.

- To indicate that you want to save the snapshot, select **Save**, and then either type in the **Save** text box a path and a file name to which you want the snapshot saved or click **Browse** to specify a location and a file name.



Note

The **Save** option is available to remote client users only. It appears grayed out on the touch screen.

8 To send, click **OK**.

Teaching the Library (Configuration and Calibration)

The **Teach** command enables you to update the library's stored configuration and calibration information. Use this command after you replace a library component or whenever you need to assess the library's physical configuration (such as the number of modules and I/E stations, the locations of storage magazines and drives, and the types of media used in the library) or the position and alignment of library components.

You can configure the library to automatically perform the full teach routine (configuration and calibration) whenever the library's power is cycled. For more information, see [Setting Up Policies for the Physical Library](#) on page 136.

Running Configuration Teach

Starting the configuration teach process causes the library to assess its contents, gathering information as follows:

- Number of modules
- Types of media
- Storage magazine locations
- Number of I/E stations and magazine type
- Types of drives
- Drive locations

If you change the library's physical configuration in any of these areas, you should initiate the configuration teach process (for example, when you add or remove storage, remove storage to add another component, or add an expansion module).



Note

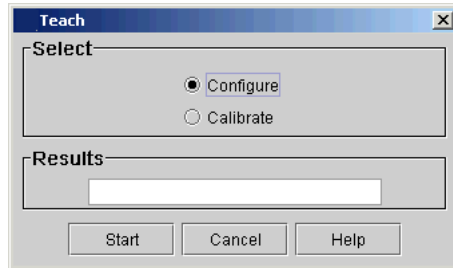
The library automatically performs an inventory after it completes the configuration teach process.

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Tools** → **Teach**.



Note If the physical library is not offline, you receive a message that asks you whether you want to take it offline. Click **Yes**.

The **Teach** dialog box appears.



Configure is already selected by default.

4 Click **Start**.

During the configuration teach process, the picker moves to each storage magazine, I/E magazine, and drive in the library and stores information about them. Teach results appear in the **Results** text box when the process completes. If the configuration teach process completes successfully, the **Teach** dialog box could close automatically.

Running Calibration Teach

Starting the calibration teach process causes the library to assess the position and alignment of various library components through the use of calibration targets. Use this process to avoid cartridge-handling problems caused by rack, drive, or I/E station misalignments.

Rack alignment calibration targets are tabs that are located on two special magazines in each drive-side and door-side storage rack. I/E station targets are small square holes that are located at the top and bottom of the I/E station. Whenever you perform work on the library that could affect the position of rack, drive, or I/E station calibration targets, even slightly, you should initiate the calibration teach process.



Note

When the library reaches 20,000 moves after the last calibration occurred, and if then the library is rebooted or an access door is closed, the library automatically recalibrates itself.

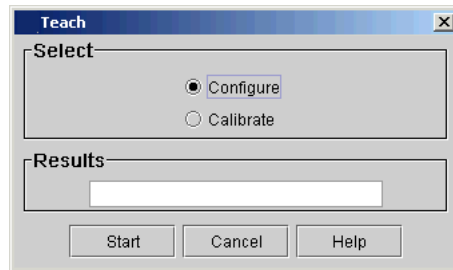
- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Tools**→**Teach**.



Note

If the physical library is not offline, you receive a message that asks you whether you want to take it offline. Click **Yes**.

The **Teach** dialog box appears with **Configure** selected by default.



- 4 Select **Calibrate**.
- 5 Click **Start**.

During the calibration teach process, the picker moves to the home position, which is X-Y coordinate position 0,0. Then, for each rack of each module, the picker moves to a magazine at the top and one at the bottom and stores those positions in coordinates relative to the 0,0 position. Teach results appear in the **Results** area when the process completes. If the calibration teach process completes successfully, the **Teach** dialog box could close automatically.



Note

Use the **Physical Library** command on the **Setup** menu to disable or enable automatic inventory after a calibration teach. For more information about this command, see [Setting Up Policies for the Physical Library](#) on page 136.

Saving and Restoring Library Configuration

The library's save and restore capabilities enable you to save a remote or local copy of configuration settings for the library's drives, I/O blades, and partitions, including the allocation of drives, storage magazines, and I/E station magazines to each partition. If the library's current configuration becomes lost or unstable, you can use the LMC to apply the locally or remotely saved configuration image, which eliminates the need to reconfigure the entire library to bring it back to its original state.

The **Save and Restore Library Configuration** dialog box enables you to:

- Save a library's configuration settings as a remotely or locally stored image
- Restore, revert, or rescue the library by applying a remotely or locally stored image of a library's configuration settings



CAUTION

As a result of restore, rescue, or revert operations, the library shuts down. You must have physical access to the library to bring the library back up. If you are performing a restore, rescue, or revert operation using remote access, the library will remain shut down until the library is directly powered back on.

Types of Configuration Image Files

There are three types of configuration images that correspond to the **Restore**, **Rescue**, and **Revert** commands:

- The restore image is stored on a remote file system and is created any time you use the **Save** command. You might restore the library's configuration, for example, if the library's locally saved configuration is lost because the compact flash memory on the Management

Control Blade (MCB) is replaced. Because of the image's remote location, the **Save** and **Restore** commands are available only through the remote client.

- The rescue image is stored locally on the library's file system and is created any time you use the **Save Rescue** command. You might rescue the library's configuration, for example, if the library becomes unstable due to a configuration change and you want to roll back the library's configuration settings to a previous state. The **Save Rescue** and **Rescue** commands are available from both the remote client and the library's touch screen. You also have the option to save the rescue image when you save the remote restore image.
- The revert image is automatically created and stored locally as the first step of any restore or rescue operation. The **Revert** command is available from both the remote client and the local touch screen.

When to Save the Library Configuration

Even though you can choose to save the library configuration at any time, the library prompts you to save in certain situations. Specifically, the library prompts you to save whenever you change configuration settings in the following areas:

- User accounts
- RAS event notifications
- E-mail setup

Other configuration changes that the library detects cause the library to generate warning tickets for the Control subsystem. This causes a warning icon to appear on the **Control** system status button. Be aware that if a more serious unresolved ticket already exists in that status group, the warning ticket is generated, but no notification is sent until the more serious problem ticket is resolved or closed.



CAUTION

Changes to hardware, such as removing drives or I/O blades, do not prompt you to save, either by means of messages or warning tickets. Therefore, it is important to save the configuration image after a hardware configuration change.

Saving a Remote Restore Image

Use the **Save** command to save a library configuration restore image on a remote file system. To make sure that the image captures all library configuration changes, save the image often.

- 1 Log on as an administrator from the remote client. The **Save** command is not available from the library's touch screen.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Tools**→ **Save/Restore**.

The **Save and Restore Library Configuration** dialog box appears.



- 4 Click **Save**.
- 5 Using the file chooser dialog box, specify a path to a directory on your remote file system in which to save the restore image. You only need to specify the path because the MCB determines the image file name.
- 6 To proceed, click **Open**.
- 7 The library prompts you to decide whether you want to write over the current rescue image that is stored locally on the library. Click **Yes**. The rescue image timestamp that appears on the **Save and Restore Library Configuration** dialog box will be updated to indicate that the file has changed.

If no rescue image exists, the library prompts you to decide if you want to generate one.

If the save operation succeeds, a message appears that indicates the name of the image file that was saved to the remote file system. If the save operation does not succeed, a message appears that describes the error that occurred.

Saving a Local Rescue Image

Use the **Save Rescue** command to save a library configuration rescue image locally on the library's file system. To make sure that the image captures all library configuration changes, you should save the image often.

- 1** Log on as an administrator from the remote client or from the library's touch screen.
- 2** Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3** Click **Tools**→ **Save/Restore**.

The **Save and Restore Library Configuration** dialog box appears.

- 4** Click **Save Rescue**.

The save rescue operation starts.

If the save rescue image operation succeeds, a message appears that indicates that the rescue image file was saved to the library file system. The rescue image timestamp displayed on the **Save and Restore Library Configuration** dialog box will be updated to indicate that the file has changed.

If the save rescue operation does not succeed, a message appears that describes the error that occurred.

Restoring Library Configuration

Use the **Restore** command to restore a library using a configuration image that is saved on a remote file system.

If library configuration has occurred since the last time the image was saved, those changes will be lost when the older configuration is restored. The restore operation will succeed, but you will then need to reconfigure the library, including the partitions and mappings. Therefore, it is important to save the local rescue and/or remote restore image periodically, especially following hardware configuration changes.



CAUTION

Be cautious if you plan to use a saved library configuration image that is out of date. You might restore configuration information that you do not want, such as former passwords, partitions, mappings, and hardware configurations.

- 1 Log on as an administrator from the remote client. The **Restore** command is not available from the library's touch screen.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Tools**→ **Save/Restore**.

The **Save and Restore Library Configuration** dialog box appears.



- 4 Click **Restore**.



Note

If the library is not offline, you receive a message that asks you whether you want to take it offline. Click **Yes**.

- 5 Using the file chooser dialog box, locate the restore image file on the remote file system.
- 6 When you have located the file and are ready to proceed, click **Open**.



Note

Because the management control blade (MCB) determines the name of the restore image file, you might not know the file name when you are searching for it on the remote file system. The file name always includes the library serial number, date stamp, and time stamp, in that order and separated by underscores.

An example file name might look like this:

213100020_2004-02-18_13.23.47.tar.gz

The serial number encoded in the image file must match the library serial number. A serial number mismatch will result in an message and the operation will not continue.

When image file compatibility has been established, the library reboots itself and continues with restoring the configuration. The reset operation could take minutes to complete. If you are near the library and can see the library's touch screen, normal behavior is when two "working" messages appear and the touch screen goes dark when the LMC server restarts. From the remote client, a message appears that indicates that the LMC server is reconnecting to the client. After it reconnects, the LMC server performs a discovery.

If the restore operation succeeds, a message appears that indicates that the operation succeeded.

If the restore operation fails at any point, the library generates a RAS ticket that contains details about the failure. Perform a revert or rescue operation to return the library to a stable configuration.

- 7** After the restore operation has completed on the library, close and restart the remote client.
- 8** If you have not done so already, make sure that the robotics are enabled and bring the library back online so that data input and output can continue.

Rescuing Library Configuration

Use the **Rescue** command to restore a library using the configuration rescue image that is saved locally on the library's file system.



CAUTION

Be cautious if you plan to use a saved library configuration image that is out of date. You might restore configuration information that you do not want, such as former passwords, partitions, mappings, and hardware configurations.

If library configuration has occurred since the last time the image was saved, those changes will be lost when the older configuration is restored. The restore operation will succeed, but you will then need to reconfigure the library, including the partitions and mappings. Therefore, it is important to save the local rescue and/or remote restore image periodically, especially following hardware configuration changes.

- 1 Log on as an administrator from the remote client. The **Restore** command is not available from the library's touch screen.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Tools**→ **Save/Restore**.

The **Save and Restore Library Configuration** dialog box appears.



- 4 Click **Rescue**.



Note If the library is not offline, you receive a message that asks you whether you want to take it offline. Click **Yes**.

- 5** At the prompt, make sure that all data input and output has stopped. Click **Yes** to continue.

When the system determines that it can reconfigure the library using the saved image, a message dialog box appears that informs you that the library will reboot itself. The reset could take minutes to complete. If you are near the library and can see the library's touch screen, normal behavior is when two "working" messages appear and the touch screen goes dark when the LMC server restarts. From the remote client, a message appears that indicates that the LMC server is reconnecting to the client. After it reconnects, the LMC server performs a discovery.

As the MCB reboots, the I/O blades, MCB, LMC server, and robotics control unit (RCU) change to the configuration settings stored in the rescue image. Each I/O blade is also reset.

When the LMC has restarted, reconnected, and completed its discovery operation, a message appears that indicates that the library has been restored to its previous configuration.

If the operation succeeds, a message appears that indicates that the operation completed successfully.

If the operation fails at any point, the library generates a RAS ticket that contains details about the failure. Perform a revert or rescue operation to return the library to a stable configuration.

- 6** If you have not done so already, make sure that the robotics are enabled and bring the library back online so that data input and output can recommence.

Reverting Library Configuration

In the event that either a restore or rescue operation fails before completion and the library becomes unstable, the **Revert** command provides a way to roll back any library configuration changes that might have occurred during the operation. The **Revert** command is unavailable if no revert image is saved. On a new library, no revert image exists until a restore or rescue operation is attempted for the first time.

- 1 Log on as an administrator from the remote client or from the library's touch screen.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Tools** → **Save/Restore**.

The **Save and Restore Library Configuration** dialog box appears.

- 4 Click **Revert**.



Note If the library is not offline, you receive a message that asks you whether you want to take it offline. Click **Yes**.

- 5 At the prompt, check whether all library data input and output has stopped. To continue, click **Yes**.

When the system determines that it can reconfigure the library using the saved image, a message dialog box appears that informs you that the library will reboot itself. The reset could take minutes to complete. If you are near the library and can see the library's touch screen, normal behavior is when two "working" messages appear and the touch screen goes dark when the LMC server restarts.

As the MCB reboots, the I/O blades, MCB, LMC server, and robotics control unit (RCU) change to the configuration settings stored in the rescue image. Each I/O blade is also reset.

When the LMC has restarted, reconnected, and completed its discovery operation, a message appears that indicates that the library has been restored to its previous configuration.

If the operation succeeds, a message appears that indicates that the library has been restored to its previous configuration.

If the operation fails at any point, the library generates a RAS ticket that provides that contains details about the failure. Perform a revert or rescue to return the library to a stable configuration.

- 6 If you have not done so already, make sure that the robotics are enabled and bring the library back online so that data input and output can recommence.

Viewing the Drive Resource Utilization Reports

The Drive Resource Utilization Reporting (DRUR) feature enables you to view and manage your tape drive resources. The data provided through DRUR can help you determine the proper work load distribution between the drives in your library. DRUR provides you with up to twelve months of historical data for each SN drive installed, and includes MB read and written, mounts, and media motion time.



Note

The DRUR feature requires a license key to use. For more information, see [Enabling Licenses](#) on page 104.

You can view the DRUR data in summary reports and graphs, which you can then export from the library into a PDF document. You also can export and save the data as comma delimited text files (.csv). A .csv file is a plain text file that stores basic database-style information in a simple format, with one record on each line, and each field within that record separated by a comma.

DRUR data is based on the actual drive serial number (SN), not the logical drive serial number. The data tracked and reported through the DRUR feature is data that has been accumulated while the drive SN has been installed in the library.

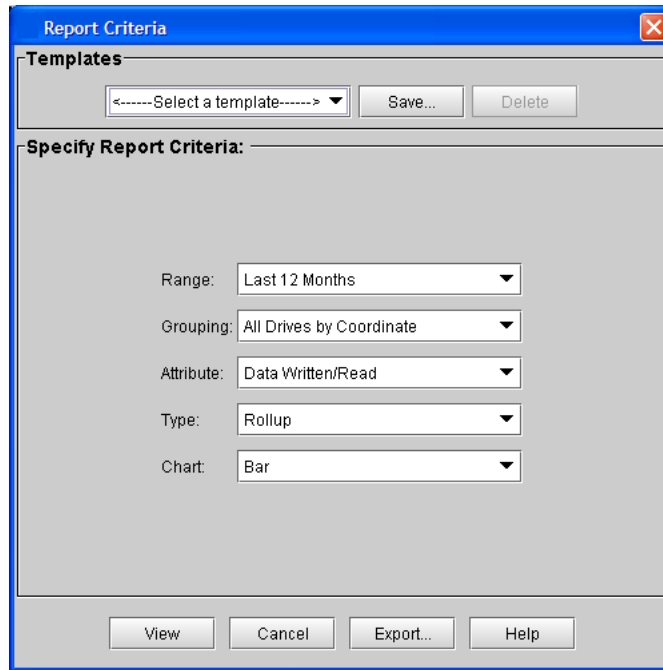


Note

You can e-mail, save, or print reports from a remote client. However, you cannot save or print reports from the library's touch screen.

- 1 Log on as administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 From the **Tools** menu, click **Reports**→ **Drive Utilization**.

The **Report Criteria** dialog box appears.



4 In the **Report Criteria** dialog box, you can use the following criteria filters to view and export specific data:

- Range
 - Current Month
 - Last Month
 - Last 3 Months
 - Last 6 Months
 - Last 12 months
- Grouping
 - All Drives by Coordinate: Presents the sum total of all attributes for all drives in the library.
 - All Drives by Physical SN: Presents the sum total of all attributes for all drives according to the physical drive SN.

- All Partitions: Presents a comparison of all drives grouped by partition in the physical library.
- Selected Drive by Coordinate: Graph is based on an individual drive according to the library system coordinates. For example, 1,1,1,1,1,1.
- Selected Drive by Physical SN: Graph is based on an individual physical drive SN.
- Selected Partition: Graph is based on an individual partition in the physical library.
- Attribute
 - Data Written/Read
 - Mount Count
 - Media Motion Hours
 - Total Read and Write
- Type
 - Rollup: A device x-axis for the display of attributes by drive or library.
 - Trend: A time scale x-axis for the display of the trend of the particular attribute.
- Chart

Choose from the following charts to visually display your data:

- Bar
- Bar 3D
- Line
- Stacked Area
- Stacked Bar
- Stacked Bar 3D

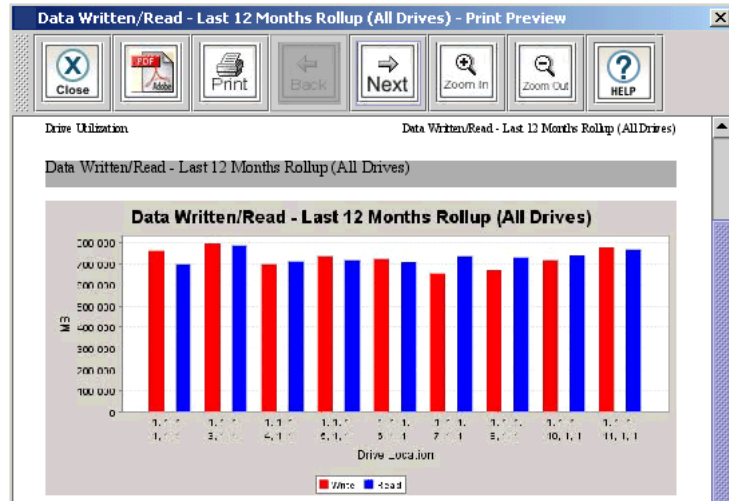
5 To directly send or save the data, click **Export**.

- To export data, in the **Export Raw Data** dialog box, select **E-mail** to send the data in .csv file format.
- To save the data, select **Save**. In the **Save** text box, type the path and file name, or click **Browse** to select a save location.

6 Click OK.

7 To view a report according to the criteria selected, click **View**.

The report appears graphically according to the type of chart you selected.



8 To view the next page of the report, click the **Next** icon on the toolbar.

Drive Location	Data Read	Data Written	Media Motion Hours	Mount Count
1,1,1,1,1,1	695,934	762,911	10,406	147
1,1,1,3,1,1	786,563	793,827	11,192	153
1,1,1,4,1,1	714,042	698,831	8,380	130
1,1,1,5,1,1	716,290	735,150	9,409	145
1,1,1,6,1,1	709,081	720,255	9,425	141
1,1,1,7,1,1	735,676	657,108	9,411	138
1,1,1,8,1,1	730,774	671,807	9,549	141
1,1,1,10,1,1	737,562	718,734	9,449	135
1,1,1,11,1,1	765,331	776,293	10,624	151
Total:	6,591,253	6,534,916	87,845	1,281

- 9 In the report viewer, you can perform the following tasks:
 - a To save the report as an Adobe® Portable Document Format (PDF) file, click the **Adobe PDF** icon on the toolbar.
 - b In the **Saving Report to PDF** dialog box, enter the appropriate information, and then click **Confirm** to convert the report into a PDF file.
 - c To print the report, click the **Print** icon on the toolbar.

Saving a Report Template

If you frequently generate the Drive Resource Utilization Report with the same set of report criteria, save the criteria as a template. Loading the template recalls the saved report criteria and lets you quickly generate a report based on the saved criteria.

- 1 On the menu bar, click **Tools**→**Reports**→**Drive Utilization**.

The **Report Criteria** dialog box appears.

- 2 Under **Specify Report Criteria**, click criteria options in the lists to customize the content and appearance of the Drive Resource Utilization Report.

Step 4 on page 329 summarizes the available report criteria options.

- 3 Under **Templates**, click **Save**.
- 4 Type a name for the template, and then click **OK**.

The template appears in the list under **Templates**.

To load the saved report criteria at a later time, click the template in the list, and then click **View** to generate the report.

- 5 To close the **Report Criteria** dialog box, click **Cancel**.

Setting Up Advanced Reporting Options

Reports let you see information about your library at a glance, and help you identify trends and changes over time. You can manually generate reports as needed. In addition, if the advanced reporting options feature is licensed for your library, the LMC can automatically generate reports and e-mail them to designated recipients at specified times.

The LMC can automatically generate and e-mail the following reports:

- Drive Utilization Report

- Media Integrity Analysis Report
- Tickets Report

To automatically generate reports, set up one or more scheduled jobs using advanced reporting options. You can specify when and how often the report is generated, what report templates are used, and which e-mail recipients receive the report. You can also edit and delete scheduled jobs.



Note

To automatically send reports to recipients, the library must be configured for sending e-mail. For more information, see [Configuring E-mail](#) on page 140.

Saving Report Criteria Templates

To schedule a job for a report, that report must have at least one template. A template is a saved set of report criteria that customize the content and appearance of a report.

Before setting up advanced reporting options, use the **Report Criteria** dialog box to save one or more templates for each report you want to automatically generate.

- 1** On the menu bar, click **Tools**→**Reports**, and then click **Drive Utilization**, **Media Integrity Analysis**, or **Tickets**.

The **Report Criteria** dialog box appears.

- 2** Under **Specify Report Criteria**, click criteria options in the lists to customize the content and appearance of the report.

For more information about choosing report criteria, see [Generating Media Integrity Analysis Reports](#) on page 34, [Generating the Tickets Report](#) on page 45, or [Viewing the Drive Resource Utilization Reports](#) on page 265.

- 3** Under **Templates**, click **Save**.
- 4** Type a name for the template, and then click **OK**.

The template appears in the list under **Templates**.

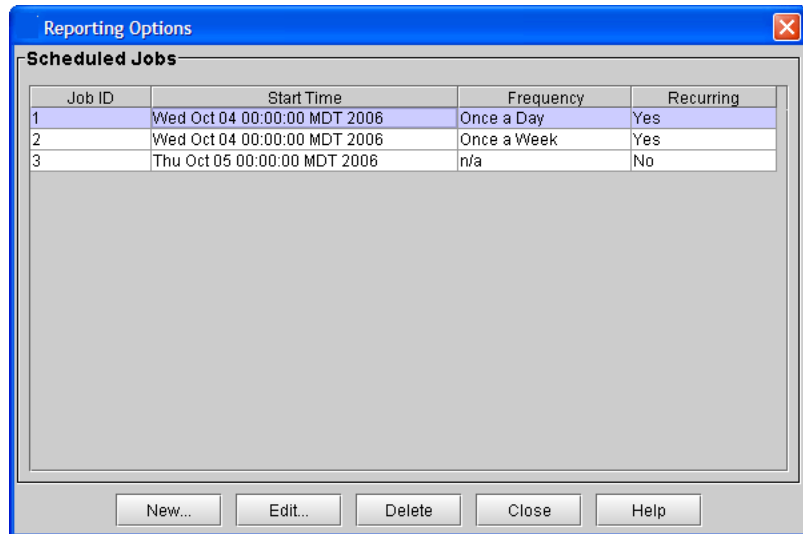
- 5** To close the **Report Criteria** dialog box, click **Cancel**.

Scheduling a New Job

To set up a report to be automatically generated, first schedule a new job, and then set job options.

- 1 On the menu bar, click **Tools**→**Reports**→**Reporting Options**.

The **Reporting Options** dialog box appears.



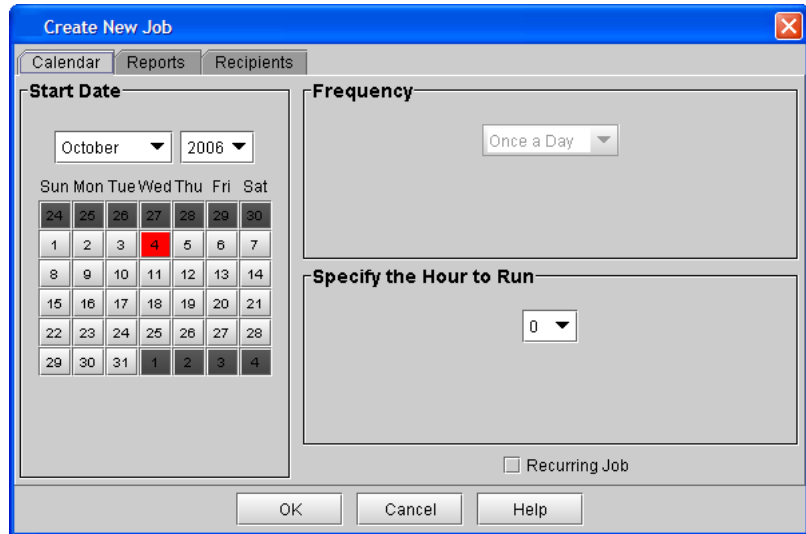
- 2 Click **New**.

The **Create New Job** dialog box appears with the **Calendar** tab selected.

- 3 Specify time and recurrence options:

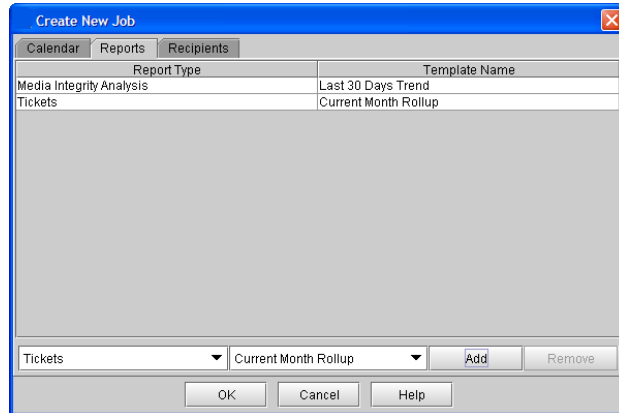
- Under **Start Date**, click the day, month, and year when you want the report to be generated for the first time. (The current date is selected by default.)
- Under **Specify the Hour to Run**, click the value that corresponds to the time of day when you want the report to be generated. (The values in the list correspond to a 24-hour clock. For example, **0** is midnight, **10** is 10:00 a.m., and **20** is 8:00 p.m.)

- (Optional) Select the **Recurring Job** check box, and then under **Frequency** click how often you want the report to be generated.

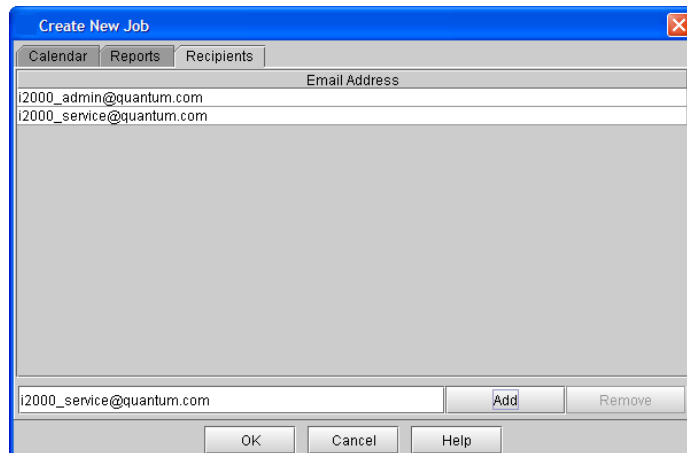


- 4 Click the **Reports** tab, and then add one or more reports to the job.
 - To add a report, click a report in the reports list, and then click a template in the templates list. Click **Add** to add the report to the job. (You can add more than one report to a job.)
 - If you need to remove a report from a job, click the report, and then click **Remove**.

- If there are no templates available for the report you choose, you need to save a template for the report before you can schedule a job. For more information on saving a template, see [Saving Report Criteria Templates](#) on page 270.



- 5 Click the **Recipients** tab, and then add one or more e-mail recipients to the job.
 - To add a recipient, type an e-mail address in the box, and then click **Add**. (You can add more than one recipient to a job.)
 - If you need to remove a recipient from a job, click the recipient, and then click **Remove**.



6 Click **OK**.

The new job appears in the list of scheduled jobs. The LMC will generate the report at the specified time and send it to the designated e-mail recipients.



Note

If a yellow caution icon appears next to a scheduled job on the **Reporting Options** dialog box, it means there is a problem with the job. For example, the date for the job might be in the past. To correct the problem, edit the job to change job options. For more information about editing scheduled jobs, see [Editing Scheduled Jobs](#) on page 274.

7 Click **Close** to close the **Reporting Options** dialog box.

Editing Scheduled Jobs

If you need to make changes to a scheduled job, edit it to change job options. You can change any job options, such as the date, time, report template, or e-mail recipients.

1 On the menu bar, click **Tools**→**Reports**→**Reporting Options**.

The **Reporting Options** dialog box appears.

2 Under **Scheduled Jobs**, click the job you want to change, and then click **Edit**.

The **Edit Job** dialog box appears.

3 Change job options as needed on the **Calendar**, **Reports**, and **Recipients** tabs.

4 Click **OK**.

5 Click **Close** to close the **Reporting Options** dialog box.



Note

If the start date for a scheduled job is in the past, and it is not a recurring job, the report will not be generated. To correct this problem, edit the scheduled job and choose a start date that is in the future.

Deleting Scheduled Jobs

If you no longer need a scheduled job, delete it.

- 1 On the menu bar, click **Tools**→ **Reports**→ **Reporting Options**.

The **Reporting Options** dialog box appears.

- 2 Under **Scheduled Jobs**, click the job you want to delete, and then click **Delete**.

A dialog box appears asking if you are sure you want to delete the selected job.

- 3 Click **Yes**.

The job is deleted from the list of scheduled jobs.

- 4 Click **Close** to close the **Reporting Options** dialog box.

Working With Verification Tests

A collection of verification tests are available to assist you or a customer service engineer (CSE) in determining whether the library is properly installed, configured, and operational. Running the tests is an important part of ensuring that the system is working correctly.



Note

Because resolving an issue often involves complex technical procedures, such as removing and replacing FRUs, and because verification tests often require preparation and trained interpretation of results, it is recommended that a CSE perform the tests.

There are three types of verification test that help diagnose problems with the library:

- Installation verification test
- Partial system tests
- FRU operation tests
- The verification tests provide the following:
 - Fully automated tests
 - Tests to determine marginality of installation
 - Detailed problem analysis

- Full system tests or individual field replaceable unit (FRU) tests
- Logs of installation and configuration tests
- Graphical reports showing passed, marginal, and failed results
- No affect to integrity of data

To perform these tests, the accessor assembly must be ready and functional, and the library must be powered on. In addition, the library must be in an offline state, and at least one scratch tape must be inserted in the I/E station.

Test Descriptions

This section describes the verification tests that are available.

Installation Verification Test

The installation verification test enables you to verify that the library's installation and configuration is complete and functioning correctly. The installation verification test runs the following individual tests:

- Library alignment test
- Picker assembly test
- I/E station assembly test
- Get/put test
- Scanner fiducial test

The smaller library configuration will require about 1 hour and the larger configurations will require as long as 4 hours to run the installation verification test. The time to complete individual tests on an eight-frame configuration is approximately:

- Library alignment test - 30 minutes
- Picker assembly test - 1 minute
- I/E station assembly test - 5 minutes for each I/E station
- Get/put test - 120 minutes
- Scanner fiducial test - 75 minutes



Note

These times do not include debug or repair time.

Partial System Tests

The partial system tests perform the selected subtests to test an area or range of the library configuration. The selectable tests include:

- Frame test - This test includes the same individual tests as the installation verification test, but enables you to specify a range of modules rather than testing all modules.
- Configuration test - This test includes the picker assembly and scanner fiducial tests.

Both tests enable you to select a range of modules and racks to test. For example, if you have a four-module library, you can select to test only modules 3 and 4. The frame test performs the same operations as the installation verification test, except there are frame and rack range parameters available.

FRU Operational Tests

The FRU operational tests enable you to verify the replacement of a FRU. When the FRU test is selected, you can select any of the following individual tests:

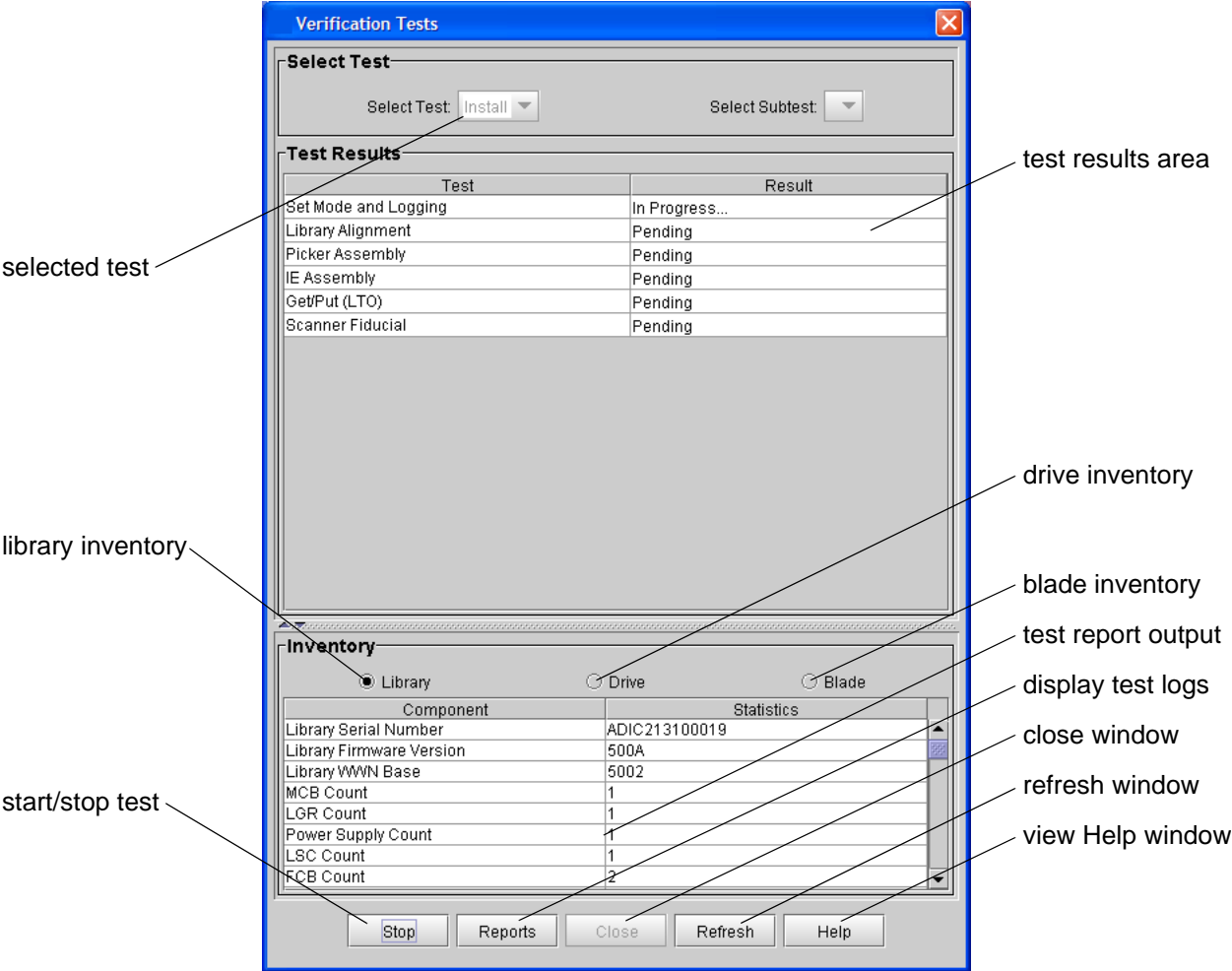
- Accessor assembly
- Picker assembly
- Drive sled assembly
- I/E station assembly
- Scan barcode

When one of the subtests is selected, you may be prompted to enter additional information. For example, the **Select FRU** dialog box has tabs along the top to select individual drives, I/E stations, and scratch tapes.

Verification Test Functions

Use the **Verification Tests** dialog box to run tests and view results. [Figure 20](#) shows the parts of the **Verification Tests** dialog box. To display the dialog box, click **Tools**→ **Verification Tests**.

Figure 20 Verification Tests Dialog Box



Library Alignment Test

The library alignment test performs the following tasks:

- Performs accessor X-axis and Y-axis travel test (also calls the FRU accessor assembly test)
- Calibrates library and checks calibration offsets by comparing them to the default values for the drives and I/E stations
- Checks magazine offsets
- Checks collected offset alignments for magazines, I/E stations, and drive sleds
- Checks joint alignment quality

Get/Put Test

The get/put test performs the following tasks:

- Performs a get/put of a scratch tape in the top and bottom slots of each magazine that supports the scratch tape's media
- Performs a get/put of existing media if no scratch tape is found or if the top or bottom is occupied
- Moves a scratch tape to one row in each frame to test cross-frame alignment
- Uses a scratch tape to perform a get/put in each compatible drive

Accessor Assembly Test

The accessor assembly test performs the following tasks:

- Checks for the module terminator (the terminator on the LBX board in the last expansion module)
- Checks the joint alignment (makes sure all the joints on the X-axis are flush)
- Performs two passes around the library to ensure the X-axis and Y-axis encoders are reading correctly and the belts are not slipping
- Tests the calibration sensor
- Checks the alignment of the accessor to the control module

Picker Assembly Test

The picker assembly test performs the following tasks:

- Performs pivot left and right check
- Performs reach and retract five times
- If the LMC gets its side done, performs a get/put of the selected cell
- Scans the control module serial number to make sure the scanner is reading properly

Drive Sled Assembly Test

The drive sled assembly test performs the following tasks:

- Calibrates the drive sled
- Checks the quality of the sled's fiducial
- Performs get/put to the drive

Scan Barcode Test The scan barcode test performs the following tasks:

- Moves to selected cell coordinate and scans the barcode label
- Checks to ensure the label reads the same from top to bottom
- Verifies the quality of the barcode labels and checks to make sure barcode labels are in a readable position

I/E Station Assembly Test The I/E station assembly test performs the following tasks:

- Locks and unlocks the I/E station
- Calibrates the I/E station and check offsets collected
- Checks each magazine's fiducial in the I/E station
- Performs get/put tests on all the I/E station cells

Scanner Fiducial Test

The scanner fiducial test performs the following tasks:

- Scans and checks each magazine fiducial
- Scans and checks each drive sled fiducial
- Tests the calibration sensor
- Calibrates and checks repeatability, up to three times for marginal and failed calibration targets

Understanding the Verification Test Inventory

The verification tests generate inventory lists that provide specific information about the library's configurations. Inventory lists for the library, drives, and blades are available. On the **Verification Test** dialog box, select the type of inventory list that you want to see (**Library**, **Drive**, or **Blade**).

Library Inventory

This inventory list provides the following statistical information:

- Frame card serial numbers
- Power supply serial numbers
- Number of cartridges in the library
- Controller serial number and firmware information for the following:
 - Management control blade
 - Control management blade
 - Robotic control unit or RCU
 - Picker
 - I/E stations

Drive Inventory

This inventory list provides the following information about each drive:

- Drive sled locations
- Drive sled controller serial numbers
- Drive sled controller boot and application firmware versions
- Drive brick serial numbers and firmware versions
- Drive logical serial number if the library is configured for logical serial number addressing

Blade Inventory

This inventory list provides the following information about each Fibre Channel I/O blade:

- Location of each blade
- Serial number of the blades

Test Results

The results of all subtests are displayed on the **Verification Tests** dialog box after each individual test is completed. See [table 24](#) for an explanation of test results.

Table 24 Test Results

Test Results	Explanation
PASSED	Completed the test without reported errors.
MARGINAL	Completed the test, but the system had to retry or had to skip part of the test. A MARGINAL result is considered PASSED, but the log should be checked to see if the marginality can be corrected.
FAILED	An error has been found and needs to be corrected. A fatal error, or an error that causes a part of the system to become disabled, will halt the test.
INCOMPLETE	This portion of a test was incomplete due to an interruption or a portion of the test was run (for example, no scratch tape was used so must only use existing tapes). An incomplete will occur when the door is opened, an abort command is issued, or when the Robotics Enable button is pressed.
SKIPPED	This portion of the test was skipped. The cause is that either a scratch tape was not present or the library was not configured for the test.
WARNING	A warning is additional information about the test that the user should know. For example, if a calibration failed, but the stored offsets are analyzed, a warning should be posted that states that the offset check might not be accurate.
STOPPED	The test was interrupted. The log will show the result to provide a record of test interruption.



Note

A single problem in the library can cause failed results in multiple tests. After taking action to correct a failed result, run tests that yielded marginal or failed results again.

Verification Test Graphical Reports

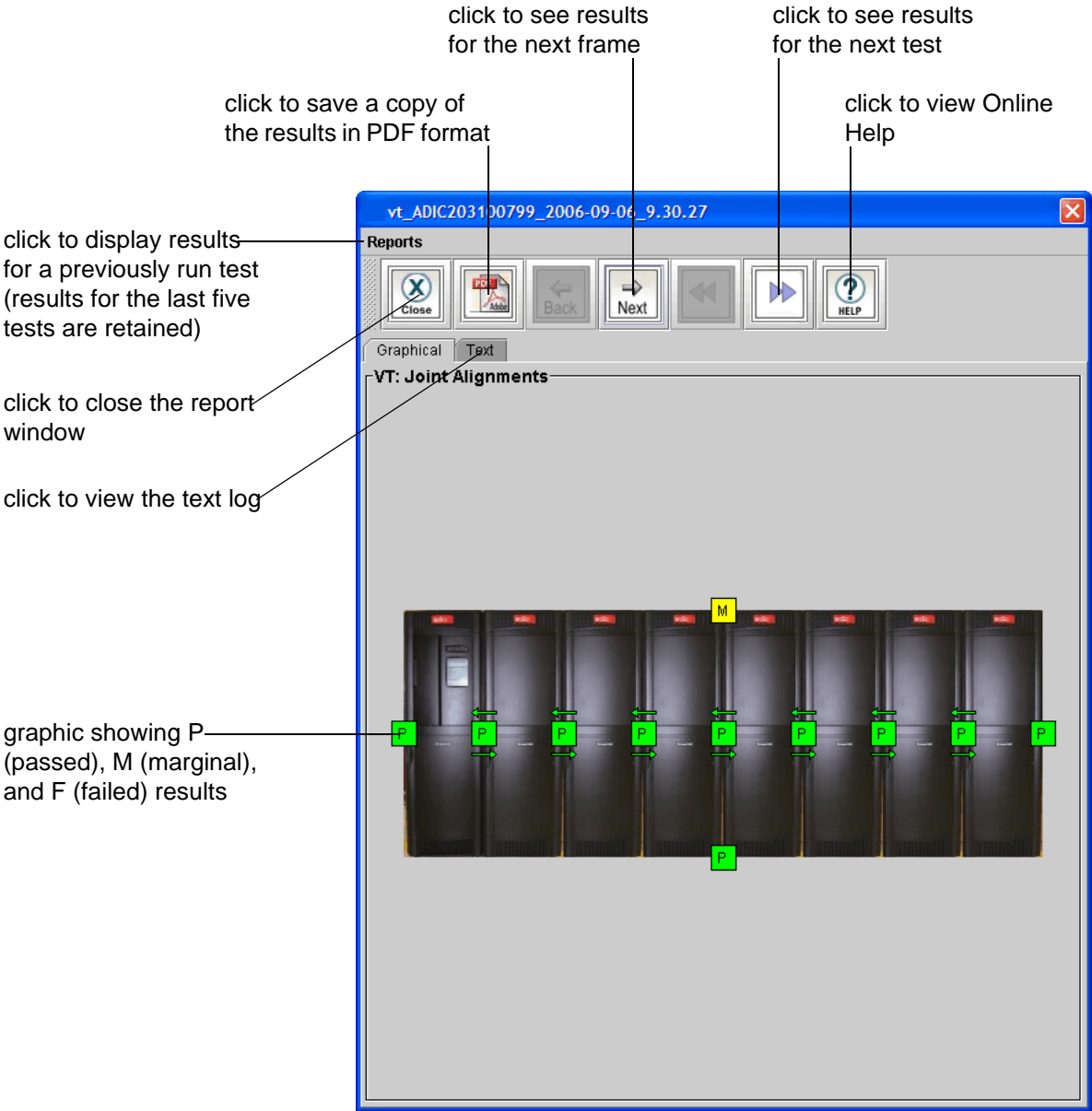
Some verification tests produce graphical reports that let you easily see if the test generated passed, marginal, or failed results. Each result is shown in a different color:

- P - passed (green)
- M - marginal (yellow)
- F - failed (red)

There are eight types of graphical reports. Each individual test generates two or more graphical reports (except for the scan barcode test, which does not generate graphical reports). The following sections show an example of each type of graphical report and actions to take to correct a marginal or failed result.

To view the graphical reports for a test, click **Reports** on the **Verification Tests** dialog box. [Figure 21](#) on page 285 shows the parts of the report window.

Figure 21 Report Window



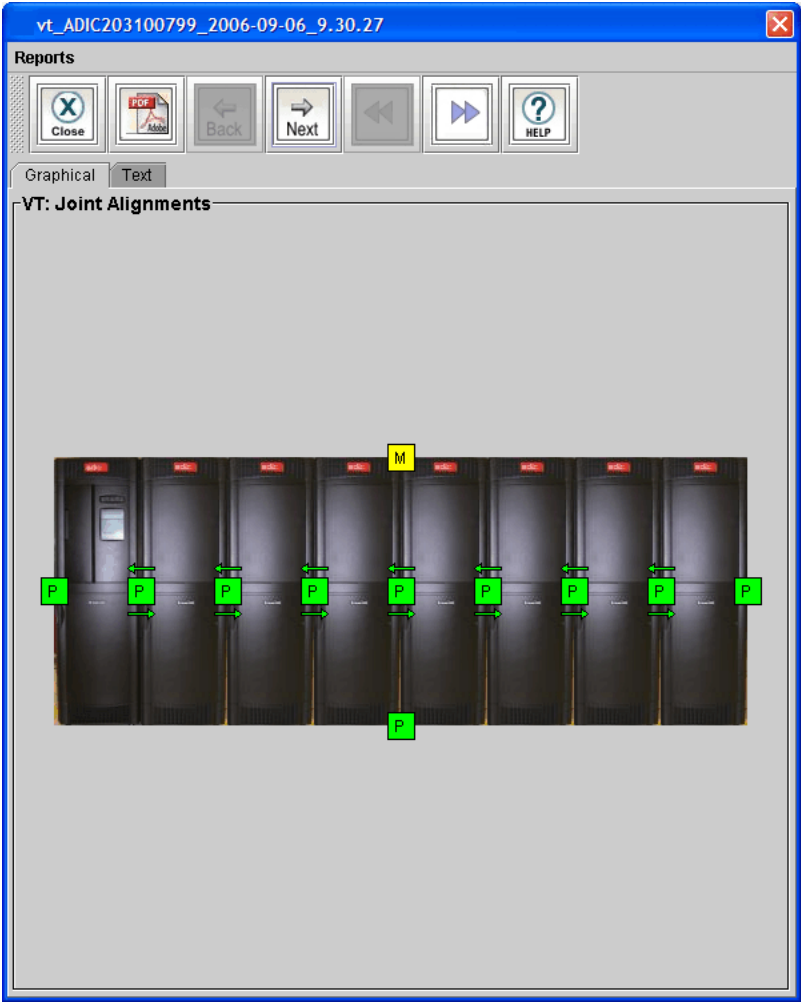
Joint Alignments

The joint alignment graphical report shows the results for tests of alignment between frames. It also shows the results for tests of accessor travel to all corners of the library.

- If the graphical report shows one or more failed results for joint alignment, realign the middle X-axis rail and check the alignment of the top and bottom X-axis rails at the location of the failure.
- If all the joints passed testing but accessor movement failed, manually move the accessor down the aisle in each direction to locate any places where motion of the accessor is not smooth or is restricted. Then realign the middle X-axis rail and check the alignment of the top and bottom X-axis rails at the location of the failure.

See [figure 22](#) on page 287.

Figure 22 Joint Alignments
Graphical Report



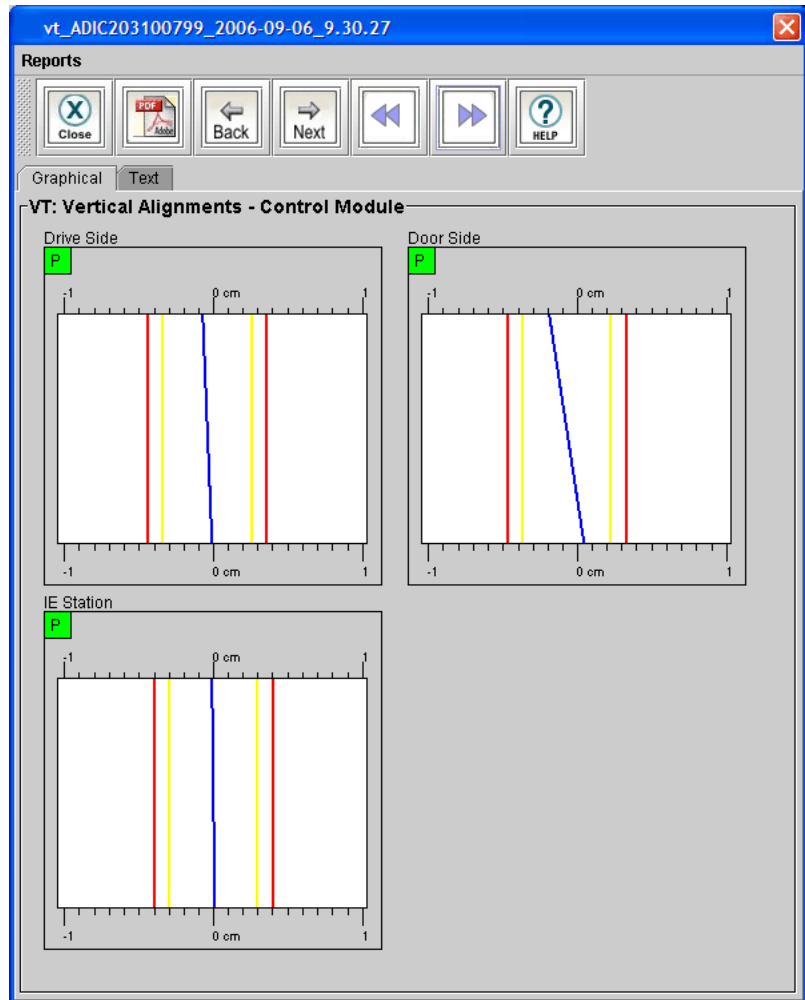
Vertical Alignments

The vertical alignments graphical report shows the results for test of vertical alignment of tape magazines on the drive-side and door-side of each frame, and for vertical alignment of each I/E station.

- If the graphical report shows a failed result for the drive-side or door-side, make sure that all tape magazines are installed properly on that side and that the calibration targets are correctly snapped on to the magazines.
- If the graphical report shows a failed result for the I/E station, make sure the I/E station and front door are completely shut.
- If running the test again still generates failed results, realign the middle X-axis rail and check the alignment of the top and bottom X-axis rails at the location of the failure.

See [figure 23](#) on page 289.

Figure 23 Vertical Alignments
Graphical Report



Horizontal Alignments The horizontal alignments graphical report shows the results for tests of horizontal alignment of tape magazines on the drive-side and door-side across frames, and for horizontal alignment of I/E stations across frames.



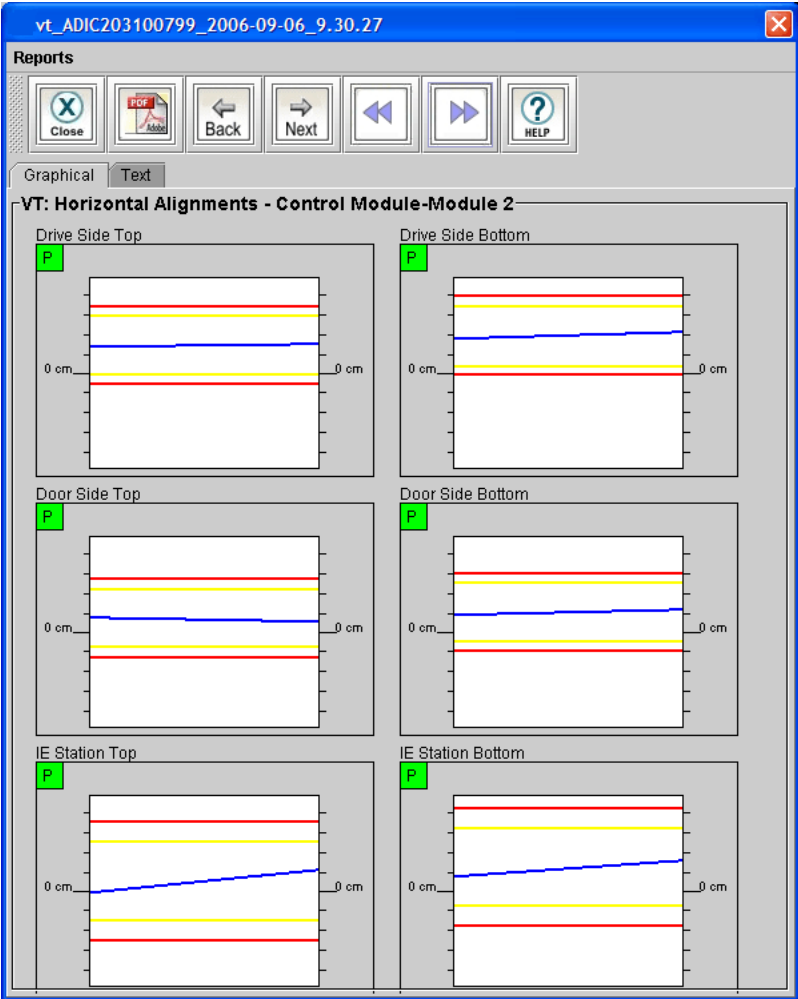
Note

This graphical report is not generated for libraries with only one frame.

- If the graphical report shows a failed result for the drive-side or door-side, make sure that all tape magazines are installed properly on that side and that the calibration targets are correctly snapped on to the magazines.
- If the graphical report shows a failed result for the I/E station, make sure the I/E station and front door are completely shut.
- If running the test again still generates failed results, realign the middle X-axis rail and check the alignment of the top and bottom X-axis rails at the location of the failure.

See [figure 24](#) on page 291.

Figure 24 Horizontal
Alignments Graphical Report



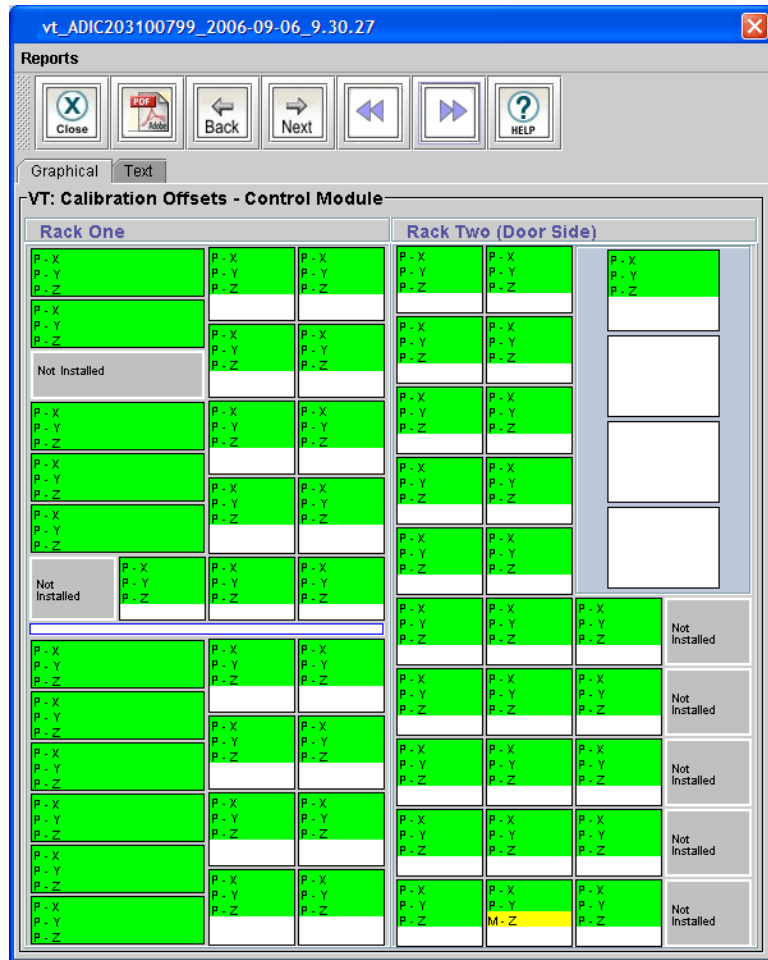
Calibration Offsets

The calibration offsets graphical report shows the results for tests of tape magazine, drive sled, and I/E station offsets compared to predefined tolerances. Reports are generated for drive-side and door-side for all frames.

- If the graphical report shows a failed result for one or more tape magazines, make sure the magazines at the location of the failure are installed properly and that the calibration targets are correctly snapped on to the magazines.
- If the graphical report shows a failed result for the I/E station, make sure the I/E station and front door are completely shut.
- If running the test again still generates failed results, realign the middle X-axis rail and check the alignment of the top and bottom X-axis rails at the location of the failure.

See [figure 25](#) on page 293.

Figure 25 Calibration Offsets
Graphical Report



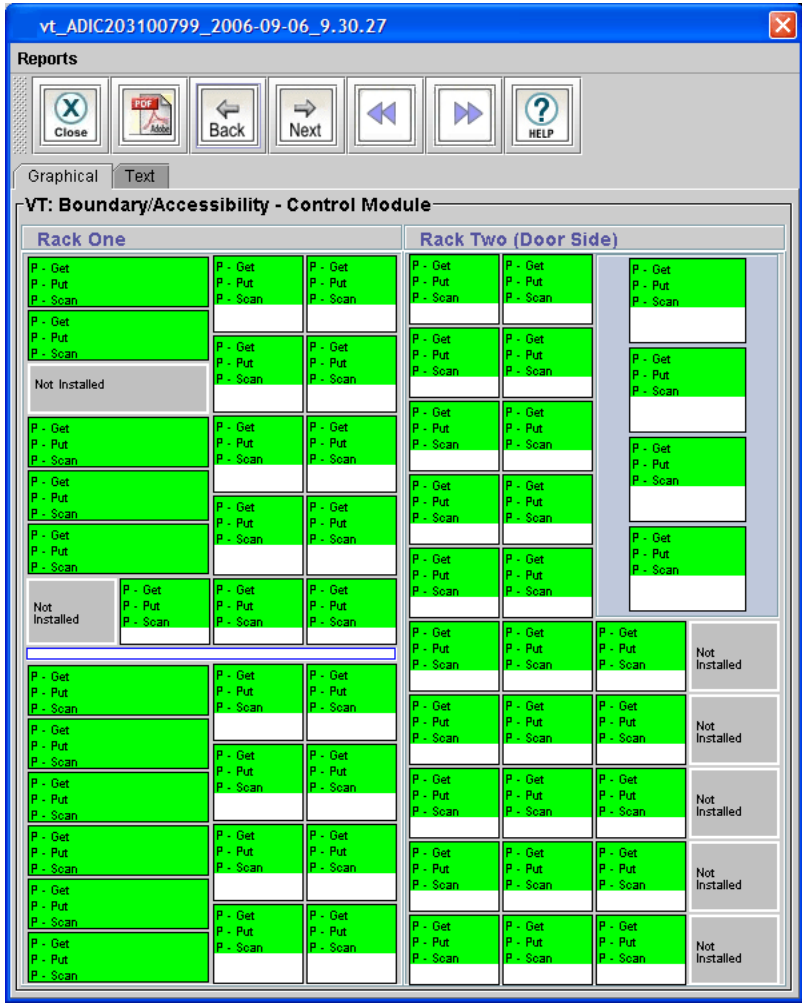
Boundary/Accessibility

The boundary/accessibility graphical report shows the results for tests of the accessor while performing get, put, and scan functions for all tape magazines and drive sleds. (This tests whether magazines and sleds are within the maximum allowable movement range of the accessor.)

- If the graphical report shows a failed result for one or more tape magazines, make sure the magazines at the location of the failure are installed properly and that the calibration targets are correctly snapped on to the magazines.
- If the graphical report shows a failed result for the I/E station, make sure the I/E station and front door are completely shut.
- If running the test again still generates failed results, realign the middle X-axis rail and check the alignment of the top and bottom X-axis rails at the location of the failure.

See [figure 26](#) on page 295.

Figure 26 Boundary/
Accessibility Graphical Report



Get/Put The get/put graphical report shows the results for tests of the picker assembly while performing one get and one put function for each tape magazine. The picker will use the selected scratch tape or the existing tape if it finds one at the target.

- If the graphical report shows a failed result for one or more tape magazines, make sure the magazines at the location of the failure are installed properly.
- If there are multiple marginal results in an area, review the area to make sure it is not prone to problems. Also run the library alignment test (part of the installation verification or partial frame test) to make sure the library is level.
- If there are a large number of issues, use rubbing alcohol to clean the picker fingers and the detents in the side of the tapes.
- If the problems persist, you may need to replace the picker assembly.

See [figure 27](#) on page 297.

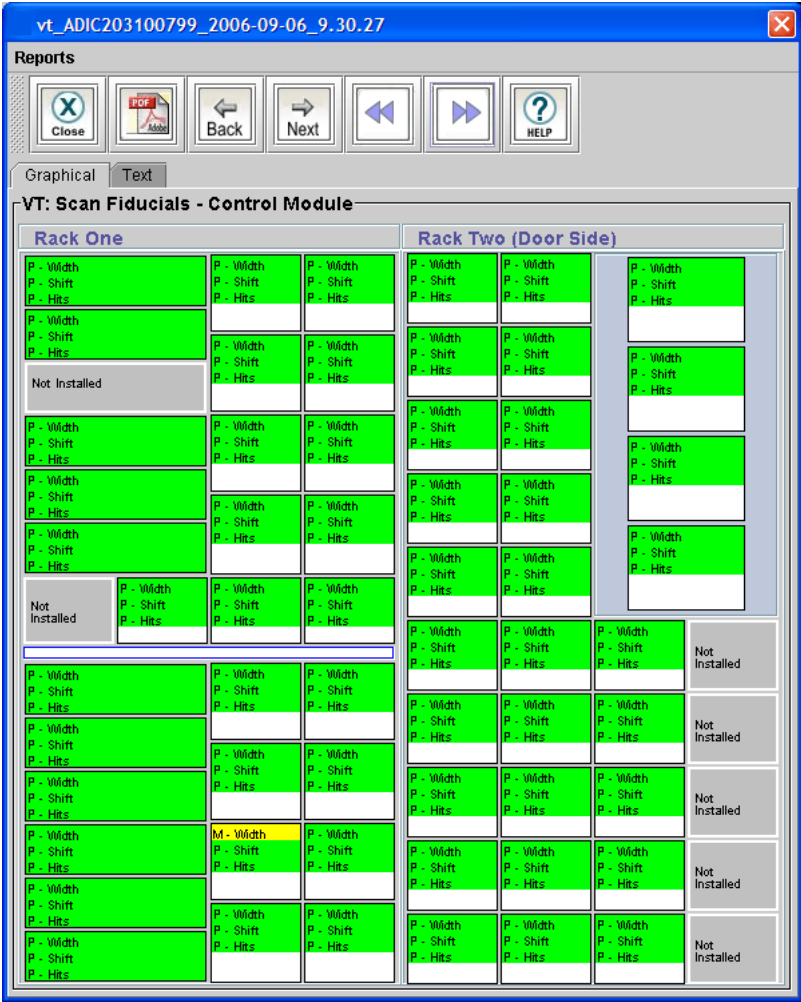
Scan Fiducials

The scan fiducials graphical report shows the results for tests of the fiducial barcode on each tape magazine and drive sled, including the width, expected Y position (shift), and the number of hits the scanner receives while traveling up and down. (Only known magazines are tested.)

- If the graphical report shows a failed result for one or more tape magazines, replace the affected magazines.
- If there are multiple marginal or failed results, run the library alignment test (part of the installation verification or partial frame test) to make sure the library is level.
- If the library is level and there are multiple marginal or failed results, the scanner should be inspected and replaced if necessary.

See [figure 28](#) on page 299.

Figure 28 Scan Fiducials
Graphical Report



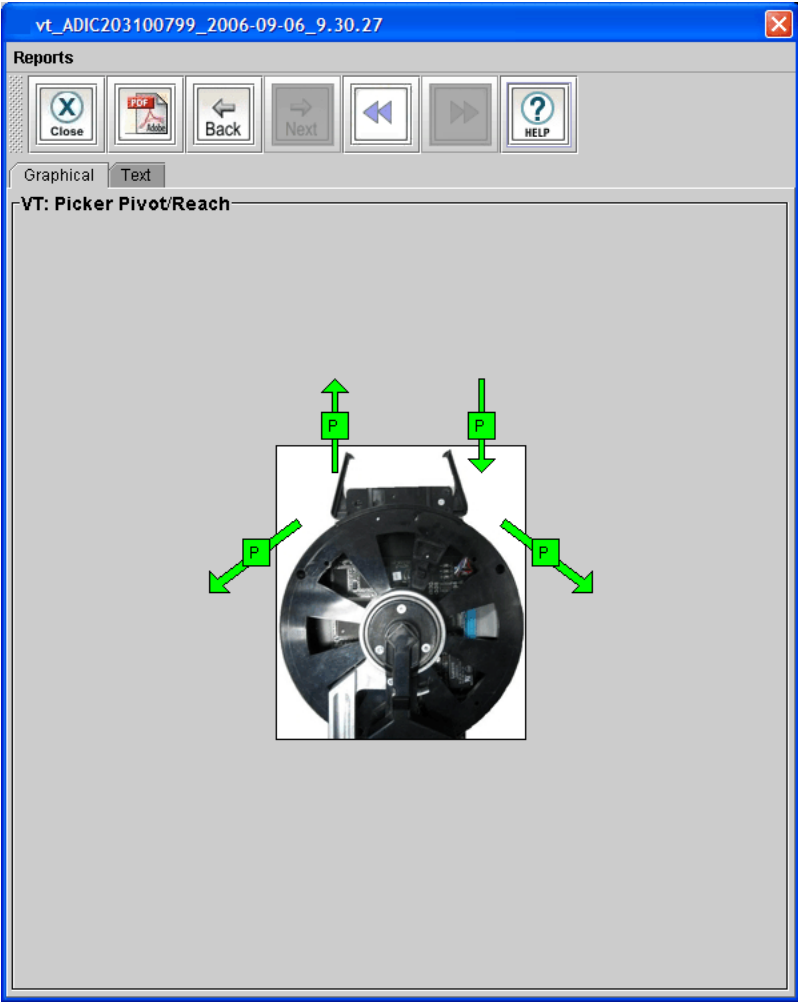
Picker Pivot/Reach

The picker pivot/reach graphical report shows the results for tests of the picker while performing rotation and reach/retract actions.

- If the graphical report shows one or more marginal or failed results, inspect the picker. It should rotate easily by hand, and the fingers should spring into a clamped position. Make sure both rotation axis belts are free of debris. Also make sure that the storage is correctly seated in the I/E station and that the I/E station and front door are completely shut.
- If the problems persist, you may need to replace the picker assembly.

See [figure 29](#) on page 301.

Figure 29 Picker Pivot/Reach
Graphical Report



Verification Test Logs

Each verification test produces a test log that details all information and results from the individual tests and subtests. In addition, the log includes information to help you understand the test results and to help resolve any problems encountered. To view a test log, click **Reports** on the **Verification Tests** dialog box to display the report window, and then click the **Text** tab.

You can view results for the five most recent tests. Click **Reports**, and then click the test results you want to view.

This log file is appended with data as each test finishes. You can repeat the test if any problems are found and fixed. If the **Verification Tests** dialog box was not closed during the retesting, all results are contained in one log file.

To save the information that the test generates, click **Send**. If you are using the remote LMC client, you can choose to save the log to your hard drive. If you choose to save directly to your hard drive, the report listing and test log are combined into one text file.

[Figure 30](#) on page 303 shows an example of a test log. It provides the following information:

- The test output is from the library alignment test.
- The test title is always shown between rows of equal signs.
- A brief guide for understanding coordinates and offsets used in the test results is provided near the beginning of the log.
- The X-axis and Y-axis limits applied by this test are shown. MARGINAL output is placed between parentheses, and FAILED output is placed between brackets; for example, (30) and [45].
- The results of the subtest are displayed between dashed lines.
- Coordinates are represented as A (aisle), F (frame), R (rack), S (section), C (column), and R (row).
- All location values are in 0.1 mm.
- All results that you should review are identified with four arrows (>>>>) in the column to the left of the detailed results.
- At the end of every test, summary results of every subtest are given. The overall test result is displayed between asterisk lines, and a summary of subtest results follows. See [figure 30](#) on page 303.

Figure 30 Example Test Log Output

```

-----|
TEST ACCESSOR LIBRARY ALIGNMENT|
-----|
|
GUIDE TO VERTICALION TEST LOG|
|
COORDINATES|
A X Y Z OR - aisle, frame, rack, section, column, row.|
Index - internal ROC number for a location|
OFFSETS|
Marginal offsets appear in (), failed appear in []|
Projected X Offset is the average of the previous frame's X offsets.|
This number is used to check the offset found against the tolerance.|
-----|
Checking Accessor Positioning (0.1mm) and Timing (ms) per Square...|
|
Limits: | X | Y | Time |
Marginal | ( 5) | ( 5) | (200) |
Failed | ( 10) | ( 10) | (200) |
|
Result | Move Square 1 | Move Square 2 |
| X Z Time | X Z Time |
PASSED | 90362 33452 20910 | 50382 33492 20950 |
|
FAILED -- ACCESSOR XZ TRAVEL|
-----|
Calibrating Magazine Targets...|
|
From Datasets - Bottom Cal. Tab, To Offsets - Top Cal. Tab.|
|
Limits: | X | Y | Time | Pass |
Marginal | ( 20) | ( 20) | ( 10) | ( 50) |
Failed | ( 45) | ( 45) | ( 20) | ( 70) |
|
Result | From Coord | To Coord | [Stat] | X Offsets | Y Offsets |
| M P R S C R | M P R S C R | [X Off] | X Y S | X Y S |
-----|-----|-----|-----|-----|-----|
PASSED | 1 1 1 10 2 L | 1 1 1 1 2 L | C | -7 25 11 | -4 25 15 |
FAILED | 1 1 2 10 3 L | 1 1 2 1 3 L | C | 1 2 35 | 9 23 29 |
PASSED | 1 2 1 10 3 L | 1 2 1 1 3 L | -* | 0 22 10 | -3 18 19 |
PASSED | 1 2 2 10 2 L | 1 2 2 1 2 L | -S | -5 25 20 | -20 25 21 |
FAILED | 1 2 1 10 3 L | 1 2 1 1 3 L | SE | 11 23 13 | 0 21 16 |
PASSED | 1 2 2 10 2 L | 1 2 2 1 2 L | -1* | -7 2 28 | 2 26 26 |
PASSED | 1 4 1 10 2 L | 1 4 1 1 2 L | -S | 1 25 25 | -24 25 27 |
--> MARGINAL | 1 4 2 10 2 L | 1 4 2 1 2 L | S | (11) 25 (30) (2) 27 |
|
-----|
FAILED -- TEST ACCESSOR LIBRARY ALIGNMENT|
-----|
Summary of Test Results:|
PARAMETERS PASSED ( 17/21h, 1)|
ACCESSOR PARTITION X MARGINAL ( 18/25h, 20)|
ACCESSOR PARTITION Y PASSED ( 19/27h, 13)|
ACCESSOR Y FOLLOW ERR PASSED ( 17/27h, 13)|
ACCESSOR X FOLLOW ERR FAILED ( 46/27h, 30)|
ACCESSOR GUIDE ALIGNMENT FAILED ( 40/27h, 41)|
|

```

main test division

key to test log data

limits used by a subtest

subtest results

data outside of specifications is displayed in parentheses

arrows on left side point to areas of interest

test results displayed between asterisk lines

test summary

Running the Verification Tests

This section provides instructions for starting the installation verification test, partial tests, and FRU operational tests.

To stop a test, disable the robotics by pressing the **Robotics Enable** button on the operator panel or by clicking **Stop** on the **Verification Tests** dialog box. Control will be returned to you as soon as the current command is completed.

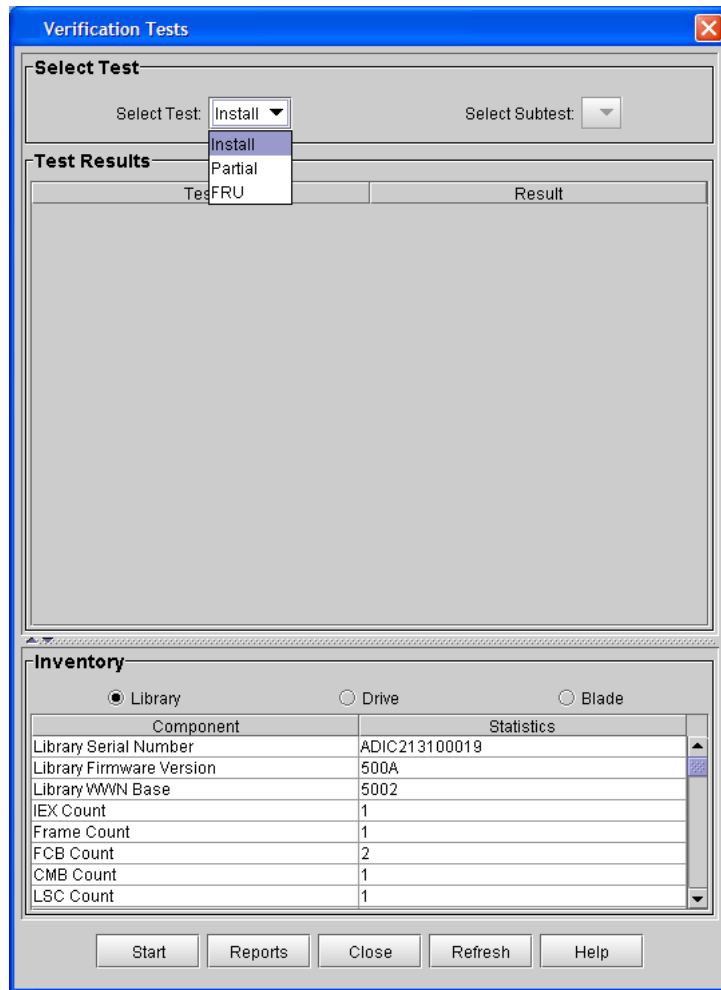
The test results appear after the tests complete. The different reports (**Library Report**, **Drive Report**, and **Blade Report**) will be generated and viewable in the **Reports** area of the **Verification Tests** dialog box.

If a typical user logs on while an administrator is logged on and running a verification test, testing will continue unaffected. Only one administrator can be logged on at any given time.

Installation Verification Test When the installation verification test is running, no one else can log on to the library. The message, "Verification Test is Running," is displayed in the **Activity** area of the main LMC display.

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Tools**→ **Verification Tests**.

The **Verification Tests** dialog box appears.



- 4 From the **Select Test** drop-down list, click **Install**.
- 5 Click **Start**.
- 6 If prompted to take the library offline, click **Yes**.

The IVT Pre-Test Questionnaire appears.

The screenshot shows a dialog box titled "Attention" with a close button (X) in the top right corner. The main content area is titled "IVT Pre-Test Questionnaire" and contains a list of 13 questions, each with an unchecked checkbox:

- Has the library been leveled to 0.00 +/-0.30 using the digital level?
- Are the X and Y-axis belt tensioners set within 5 mm?
- Are all drives installed in the correct drive sled position?
- Are all the thumb screws that retain the drive sleds tightened?
- Are all blades inserted into the correct bays and locked into place?
- Is the LBX frame terminator installed on the last frame?
- Is the I/E station on each frame closed?
- Has a full inventory from the physical view been performed?
- Do all the drives have a blinking green status LED?
- Are all the green tape drive LEDs synchronized?
- Are all magazines seated correctly?
- Has teach configuration been performed?

At the bottom of the dialog box, there is a yellow warning triangle icon followed by the text: "Press Cancel and perform Inventory if configuration has changed". Below this text are five buttons: "Back", "Next", "Finish", "Cancel", and "Help".

7 Complete the pre-test questionnaire by clicking inside the box next to the questions.

You cannot continue with the installation verification test until you have completed and verified the question requests on this questionnaire.

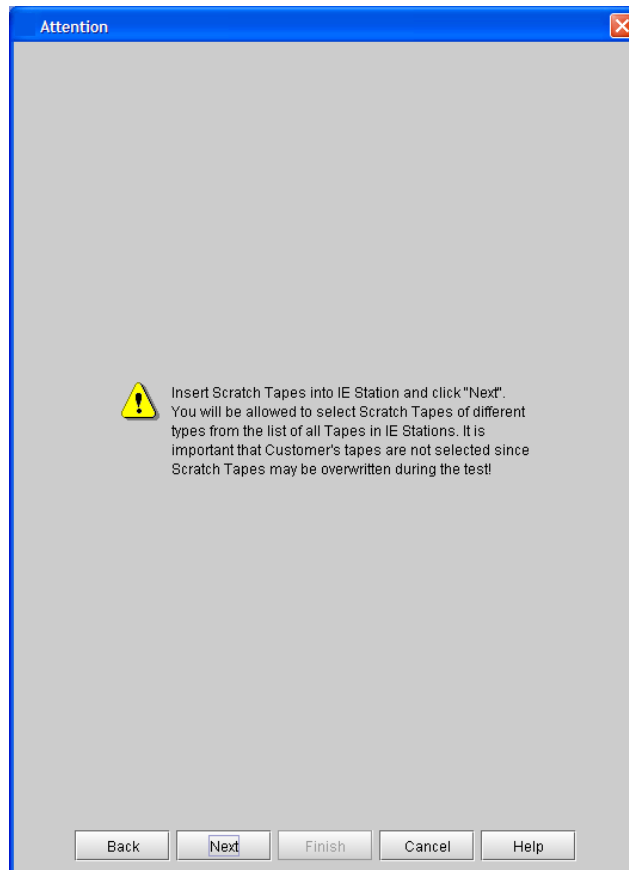


Note

Make sure you physically verify each of the questions on the questionnaire. Each of the items listed can cause the installation verification test to have unexpected behavior and unreliable results. The tests must be re-run if they fail.

8 After you complete the questionnaire, click **Next**.

The following dialog box appears.



9 Insert a “scratch” cartridge into the I/E station, and then click **Next**.



Note

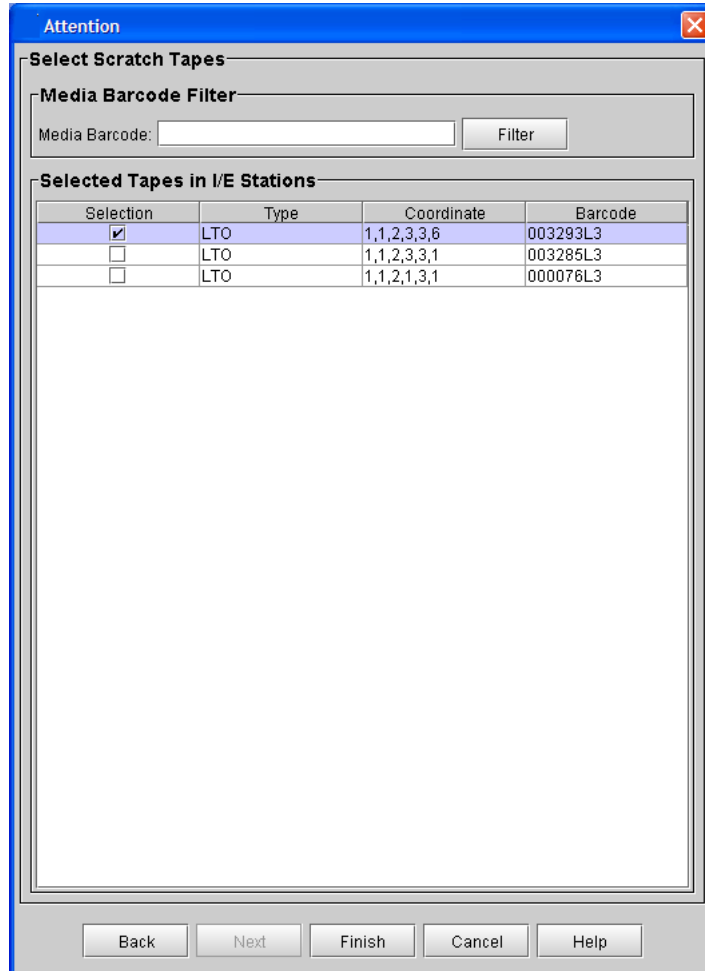
- Make sure that your scratch tapes are formatted and contain no data that cannot be overwritten. Scratch tapes must have barcode labels with valid volume serial (volser) numbers on them. Also, you might find it useful to write down the volser number so that you can identify your scratch tapes.
- This procedure will not damage any cartridges that are already installed in the library. You can load both LTO and DLT scratch cartridges if your library has mixed media.
- If the scratch cartridge becomes lodged in a drive or magazine, it must be manually removed from the library. If not removed, the cartridge will become part of the partition the next time the accessor assembly is enabled.

The I/E station will be locked until the inventory is complete.

- 10** Select a “scratch” cartridge of each media type listed on the following dialog box.

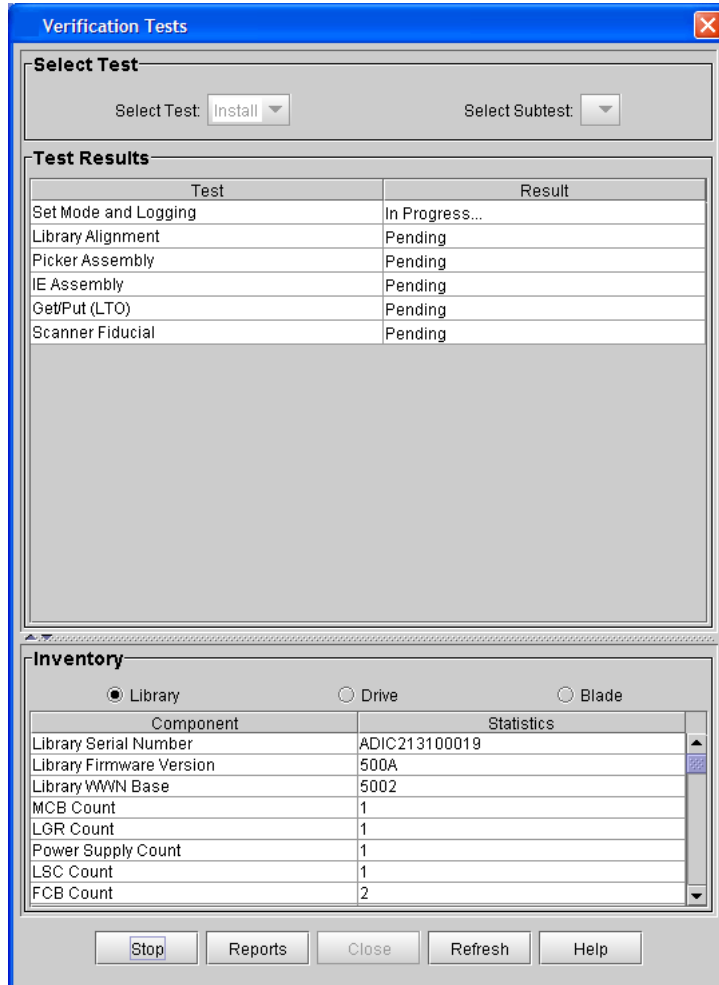


Note You can select one “scratch” cartridge per media type. Each test that requires a scratch cartridge will call the media types as needed.



11 After you select the cartridges, click **Finish**.

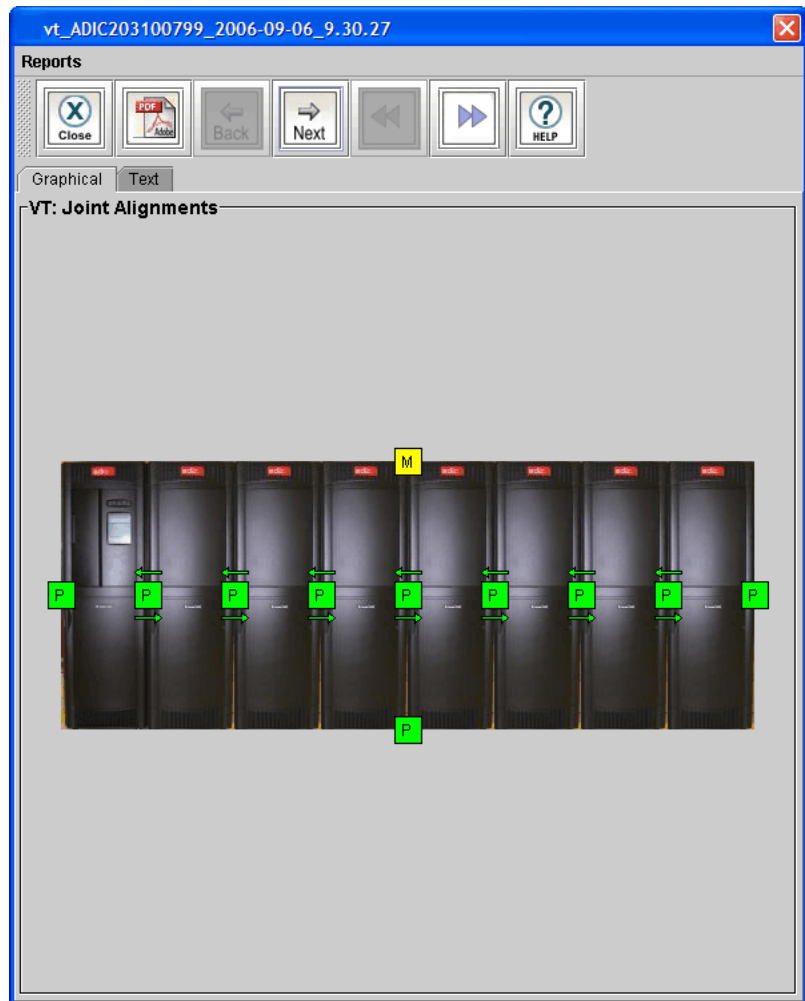
As the tests run, the library will generate RAS tickets if problems are discovered. You must close the **Verification Tests** dialog box to view those tickets. Return to the **Verification Tests** dialog box to view test results.



12 After the test is complete, click **Reports** to view the test results.

The report window appears with the **Graphical** tab displayed. Use the **Graphical** tab to view graphical reports and to quickly identify areas where marginal or failed results occurred.

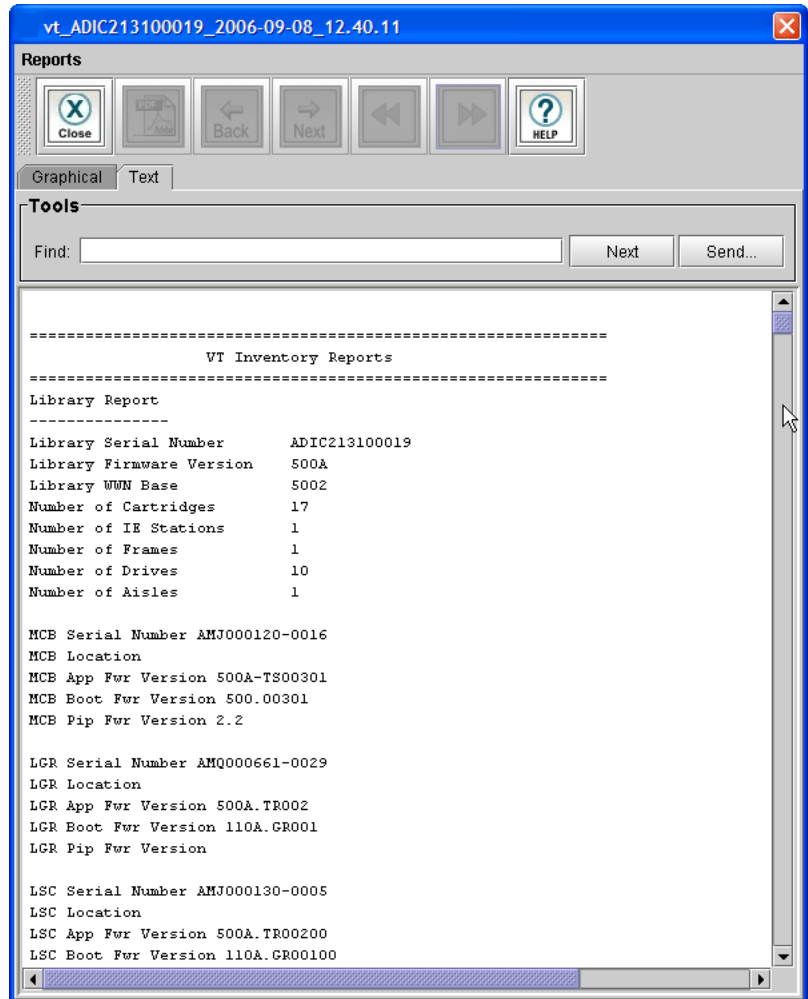
Use the toolbar to navigate between graphical reports or to save the results in PDF format. For more information about how to work with graphical reports, see [Verification Test Graphical Reports](#) on page 284.



13 For more detailed test results, click the **Text** tab to view the test log generated by the LMC.

Review the test log to find marginal or failed test results, and to see troubleshooting information. For information about how to interpret test logs, see [Verification Test Logs](#) on page 302.

To e-mail the test log, print it, or save it as a text file, click **Send** and then specify the output location. For more information, see [Mailing, Saving, and Printing Status Information](#) on page 230.



- 14 To see the results for a previous test, click **Reports**, and then click a test. The LMC saves the most recent five test results.

- 15 When you are done working with the test results, click **Close** to close the result window.

If you are done performing verification tests, click **Close** to close the **Verification Tests** dialog box.

Mailing, Saving, and Printing Test Logs The **Send** button on the **Text** tab on the report window enables you to send a verification test log to e-mail addresses. If you are accessing the LMC from a remote client, **Send** also enables you to save the log to a file or print it.



Note

You can mail, save, or print verification test logs from a remote client. However, you cannot save or print logs from the library's touch screen.

The information that is sent will be the same as what the **Text** tab displays at the time that you click **Send**.

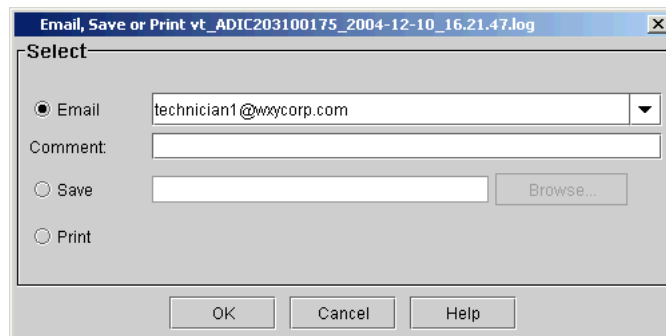


Note

Before you perform the following procedure, you must make sure that e-mail is appropriately configured in the LMC so that the library can send logs to the recipient. See [Configuring E-mail](#) on page 140.

- 1 Make sure that the **Text** tab on the report window displays the log that you want to send.
- 2 Click **Send**.

The **Email, Save or Print** dialog box appears.



3 Perform one of the following tasks:

- To indicate that you want to send the log as an e-mail message to a recipient, select **Email**, and then either type an e-mail address in the **Email** text box or select an existing address from the drop-down list. You can type a comment in the **Comment** text box to send with the log.
- To indicate that you want to save the log, select **Save**, and then either type in the **Save** text box a path and a file name to which you want the log saved or click **Browse** to specify a location and a file name.



Note The **Save** option is available to remote client users only. It appears grayed out on the touch screen.

- To indicate that you want to send the log to a printer, select **Print**.



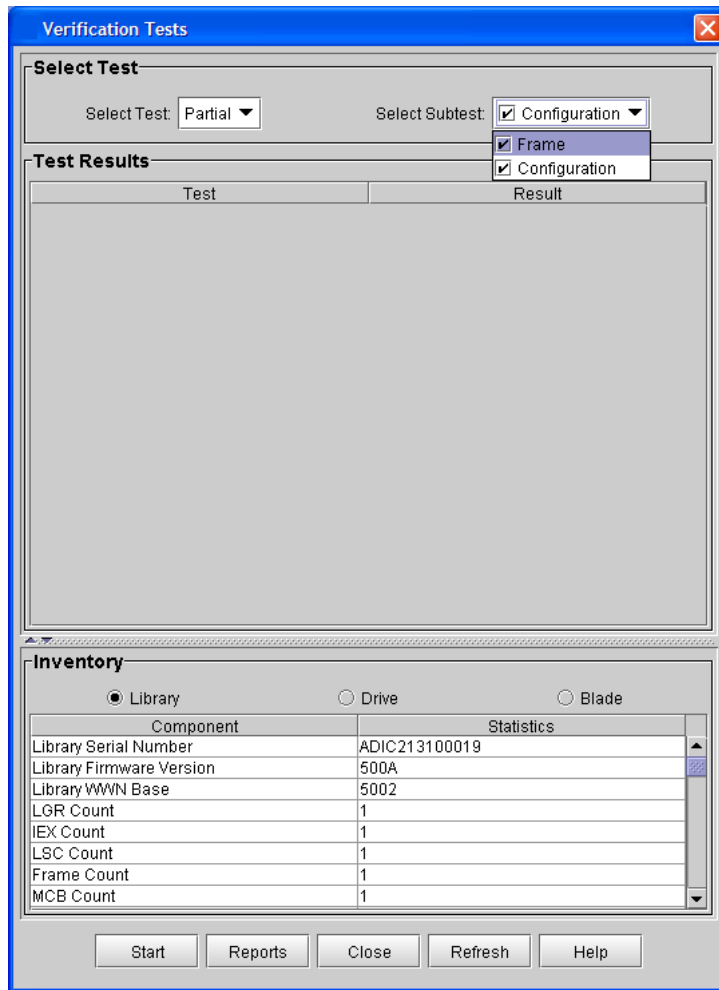
Note The **Print** option is available to remote client users only. It appears grayed out on the touch screen.

4 To send, click **OK**.

Partial Tests

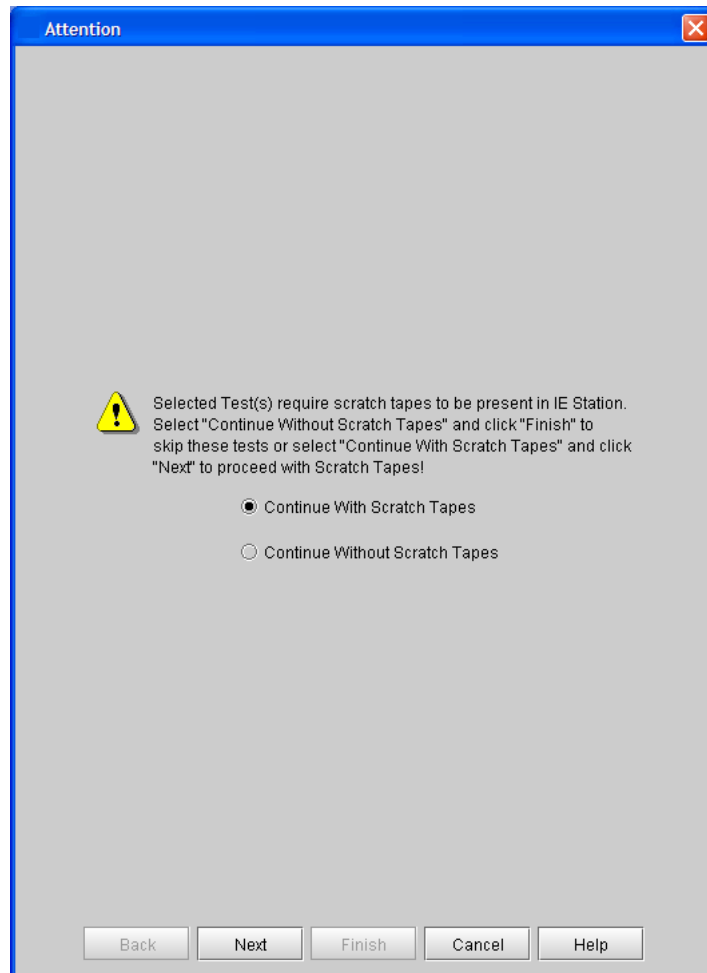
- 1** Log on as an administrator.
- 1** Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 2** Click **Tools**→ **Verification Tests**.

The **Verification Tests** dialog box appears.



- 3 From the **Select Test** drop-down list, click **Partial**.
- 4 From the **Select Subtest** drop-down list, click either **Frame** or **Configuration** or both. A check mark indicates the test is selected.
- 5 Click **Start**.
- 6 If prompted to take the library offline, click **Yes**.

- 7 The following dialog box appears. Select either **Continue With Scratch Tapes** or **Continue Without Scratch Tapes**, and then click **Next**.



- 8 If you selected **Continue With Scratch Tapes**, insert a “scratch” cartridge into the I/E station, and then click **Next**.



Note

- Make sure that your scratch tapes are formatted and contain no data that cannot be overwritten. Scratch tapes must have barcode labels with valid volume serial (volser) numbers on them. Also, you might find it useful to write down the volser number so that you can identify your scratch tapes.
- This procedure will not damage any cartridges that are already installed in the library. You can load both LTO and DLT scratch cartridges if your library has mixed media.
- If the scratch cartridge becomes lodged in a drive or magazine, it must be manually removed from the library. If not removed, the cartridge will become part of the partition the next time the accessor assembly is enabled.

The I/E station will be locked until the inventory is complete.

- 9 Select a “scratch” cartridge of each media type listed on the following dialog box, and then click **Next**.



Note You can select one “scratch” cartridge per media type. Each test that requires a scratch cartridge will call the media types as needed.

Attention ✖

Select Scratch Tapes

Media Barcode Filter

Media Barcode:

Selected Tapes in I/E Stations

Selection	Type	Coordinate	Barcode
<input checked="" type="checkbox"/>	LTO	1,1,2,3,3,6	003293L3
<input type="checkbox"/>	LTO	1,1,2,3,3,1	003285L3
<input type="checkbox"/>	LTO	1,1,2,1,3,1	000076L3

- 10 Select the number of the frame and racks where the tests are to be performed. The following example shows both the frame and configuration tests because both were selected.

The screenshot shows a dialog box titled "Attention" with a close button in the top right corner. The dialog is divided into two main sections: "Frame Test" and "Configuration Test".

Frame Test Section:

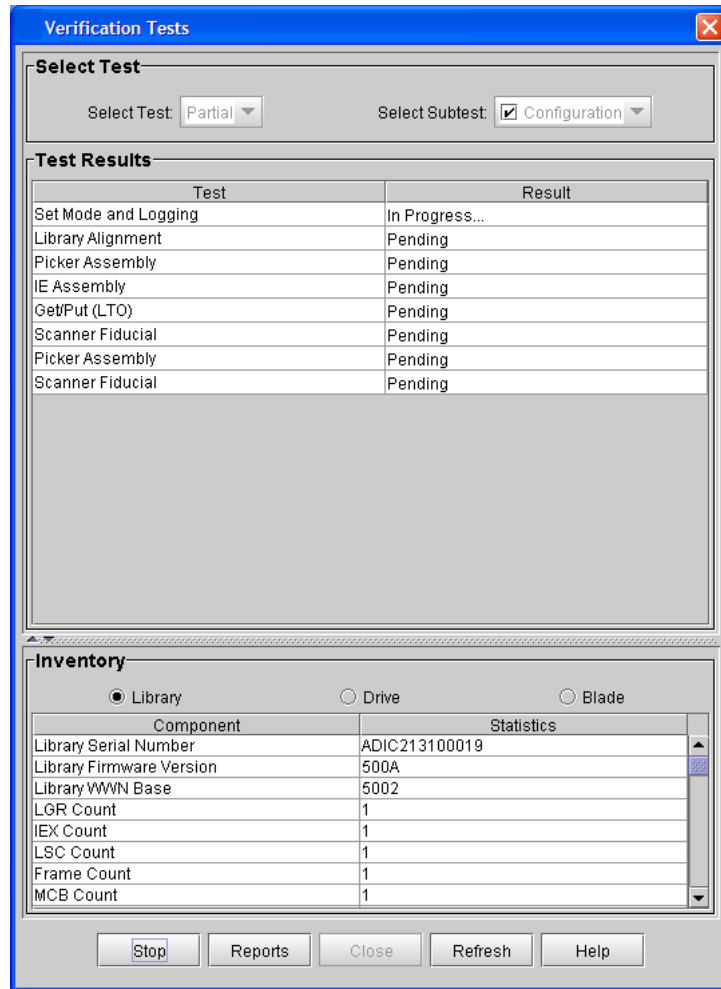
- Module Rack:** "From:" and "To:" labels, each followed by two dropdown menus. The first dropdown in each pair is labeled "Module" and the second is labeled "Rack". Both "From:" and "To:" pairs have "1" selected in both dropdowns.
- IE Station:** "From:" and "To:" labels, each followed by a single dropdown menu labeled "IE Station". Both "From:" and "To:" dropdowns have "1" selected.

Configuration Test Section:

- Module Rack:** "From:" and "To:" labels, each followed by two dropdown menus labeled "Module" and "Rack". Both "From:" and "To:" pairs have "1" selected in both dropdowns.

At the bottom of the dialog, there are five buttons: "Back", "Next", "Finish", "Cancel", and "Help".

11 Test progress is shown in the **Verification Tests** dialog box.



12 After the test is complete, click **Reports** to view the test results.

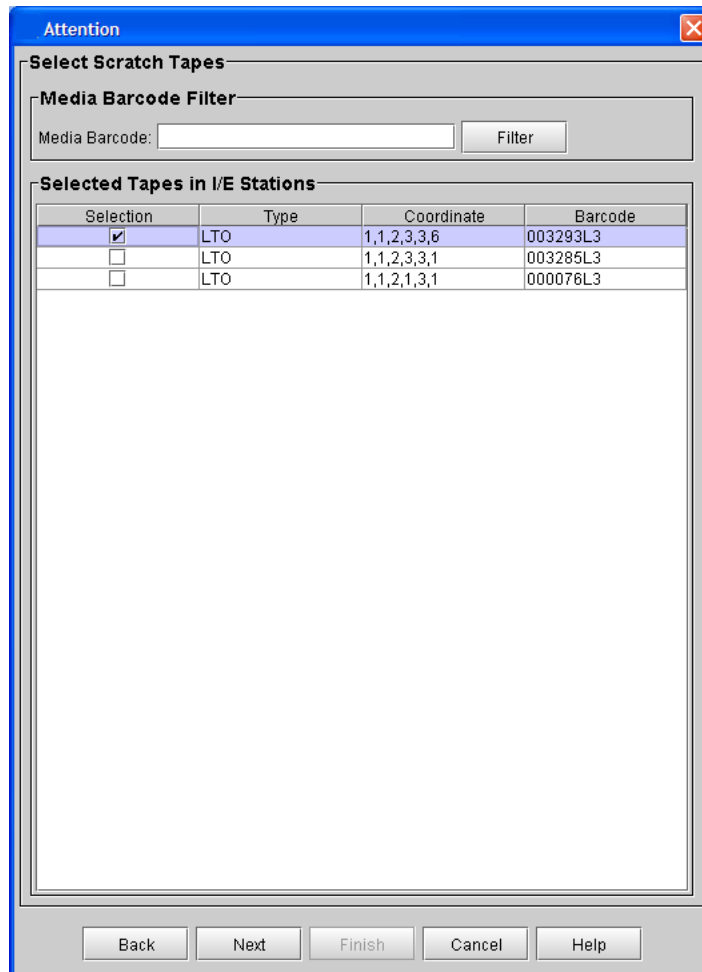
For more information about how to work with graphical reports, see [Verification Test Graphical Reports](#) on page 284.

For information about how to interpret test logs, see [Verification Test Logs](#) on page 302.

For information how to e-mail, print, or save text logs, see [Mailing, Saving, and Printing Test Logs](#) on page 313.

FRU Operational Tests There are two ways to run the FRU operational tests. You can select the FRU test from the **Verification Tests** dialog box. Alternatively, you can run the test from the **Ticket Details** dialog box if that FRU is supported by the verification tests.

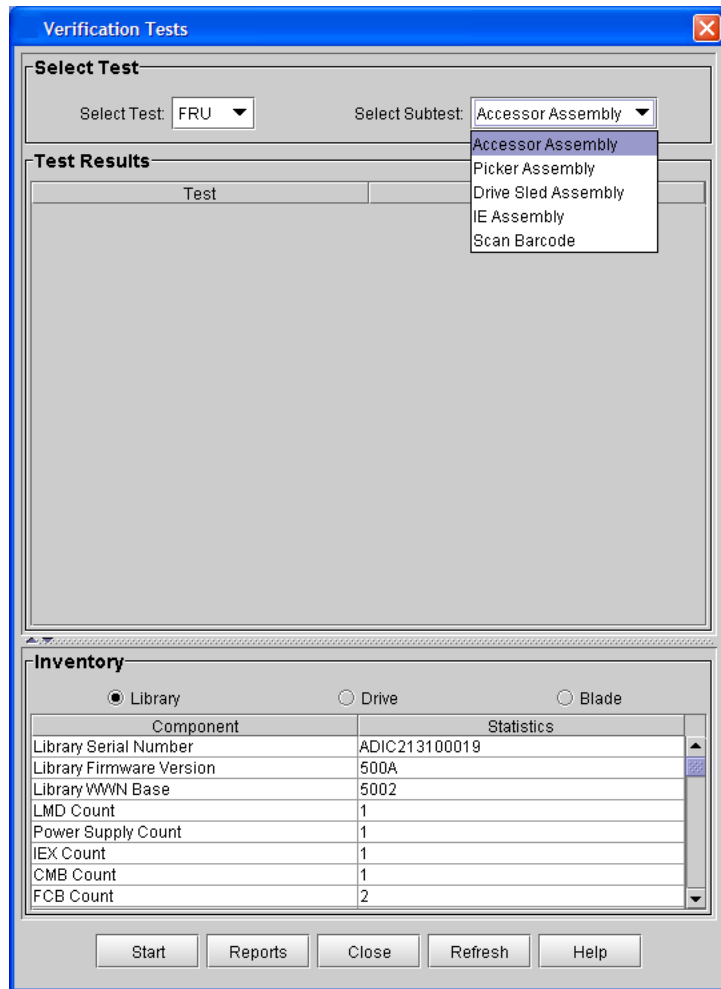
The screens displayed by the FRU operational tests vary, depending on which subtest was selected. For example, if you click **Picker Assembly**, **IE Assembly**, or **Drive Sled Assembly**, the following dialog box appears for selecting a scratch tape.



To run FRU operational tests from the **Verification Tests** dialog box:

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Tools**→ **Verification Tests**.

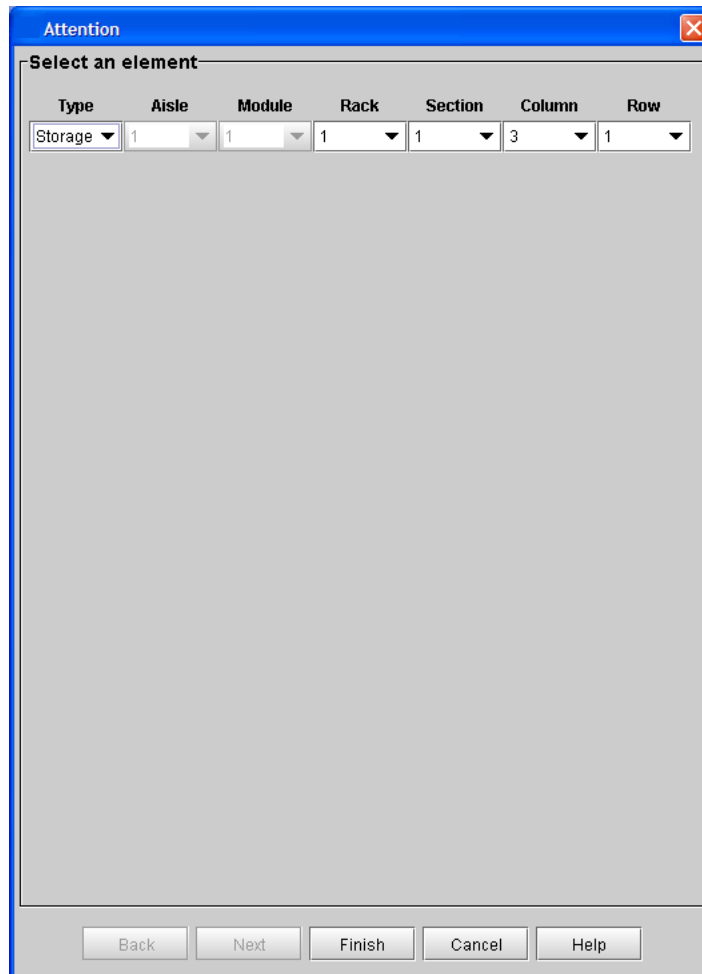
The **Verification Tests** dialog box appears.



FRU tests are available for the **Accessor Assembly**, **Picker Assembly**, **Drive Sled Assembly**, **IE Assembly**, and **Scan Barcode**. You can only test one FRU at a time. The following steps provide instructions for running the **Scan Barcode** test. The other tests provide similar windows and functionality for the other FRUs.

- 4** From the **Select Test** drop-down list, click **FRU**.
- 5** From the **Select Subtest** drop-down list, click **Scan Barcode**.
- 6** Click **Start**.
- 7** If prompted to take the library offline, click **Yes**.

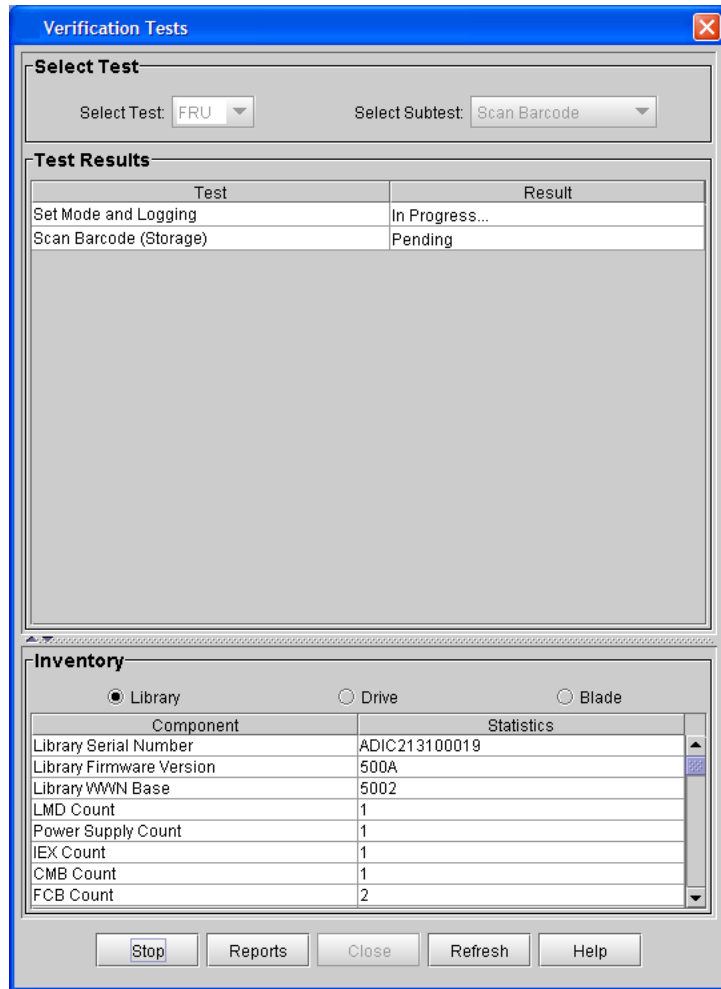
The following dialog box appears.



This dialog box enables you to enter any coordinate address in the library (aisle, module, rack, section, column, and row). The address does not need to be occupied by a drive or cartridge.

8 Click **Finish**.

Test progress is shown in the **Verification Tests** dialog box.



9 After the test is complete, click **Reports** to view the test results.

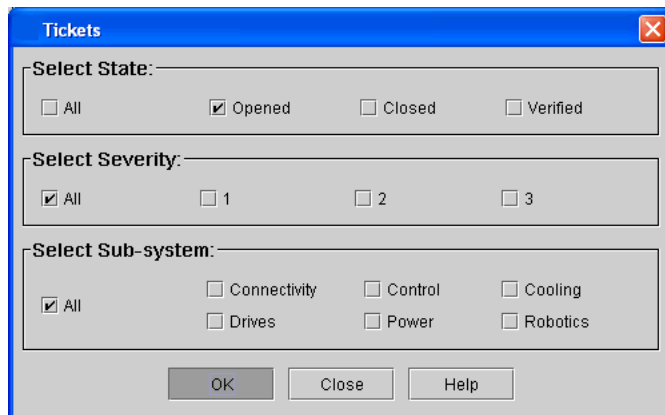
For more information about how to work with graphical reports, see [Verification Test Graphical Reports](#) on page 284.

For information about how to interpret test logs, see [Verification Test Logs](#) on page 302.

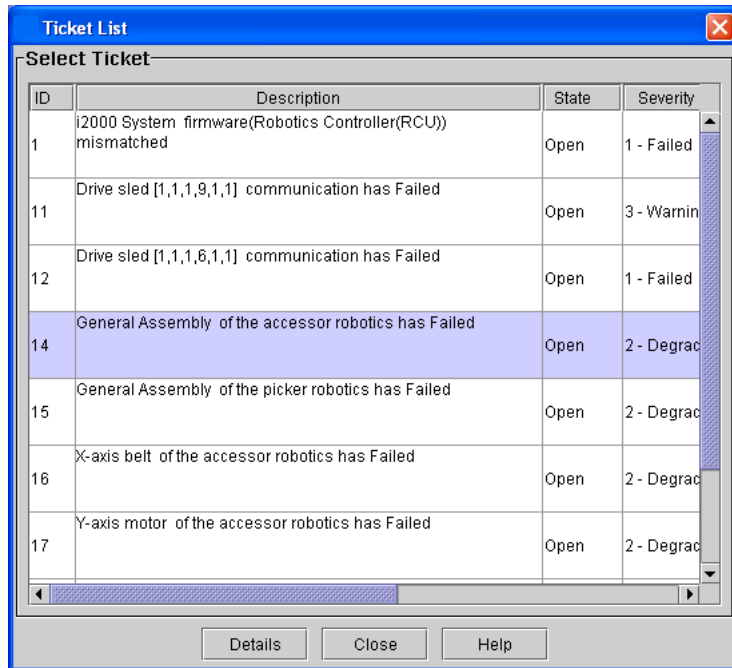
For information how to e-mail, print, or save text logs, see [Mailing, Saving, and Printing Test Logs](#) on page 313.

To run FRU operational tests from the **Ticket Details** dialog box:

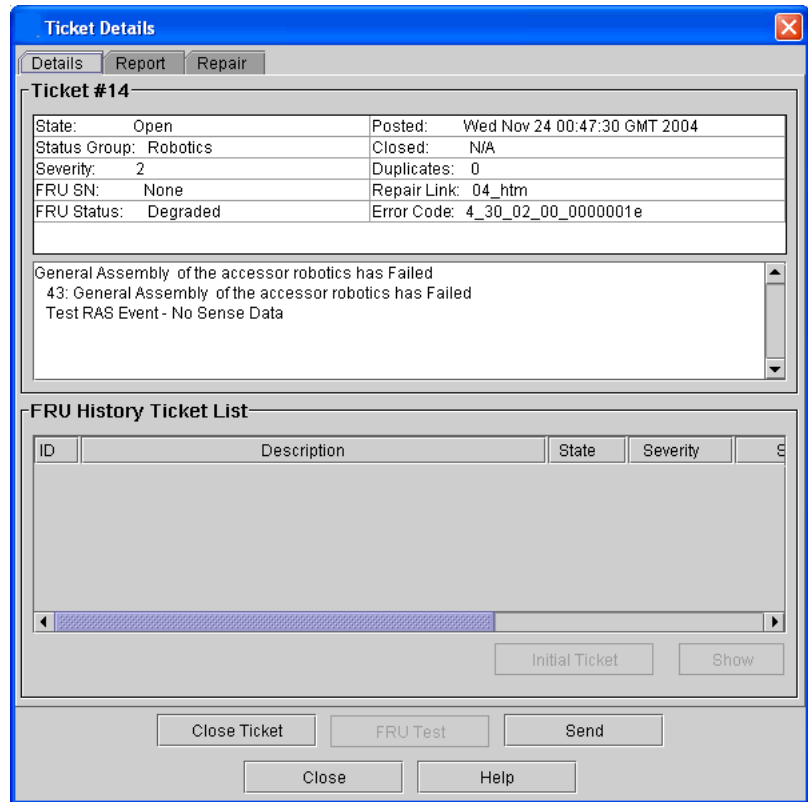
- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Tools**→**Tickets**.
- 4 From the **Tickets** dialog box, click the categories of the tickets you want to view.



5 Click a ticket to highlight it, and then click **Details**.



6 From the **Ticket Details** dialog box, click **FRU Test**.



7 After the FRU test successfully verifies that the FRU has PASSED or is MARGINAL, all tickets associated with the failure are transitioned to the Verify state.

**Using the Partitions
Defragmentation Tool**

Typically, partitions in a library are physically contiguous. That is, all tape slots that belong to a partition are adjacent to one another in the library. However, if a partition is enlarged, or if an expansion module is added to a library, it is possible that some or all partitions in the library will no longer be physically contiguous. In this case, the slots that belong to a partition are not all adjacent to one other, and the partition is fragmented. Fragmentation can make bulk loading media more difficult.

Defragmenting partitions reassigns slots in the library so that all slots in each partition are physically contiguous with one another. In addition, media is moved as needed to make sure it resides in the correct partition. In the process, tapes are first moved from their old location to the I/E station, and then are moved to their new location in the library.



Note

Only partitions that contain an I/E station can be defragmented. Also, at least one magazine in the I/E station must be empty. Partitions that do not contain an I/E station cannot be defragmented and will be skipped.



CAUTION

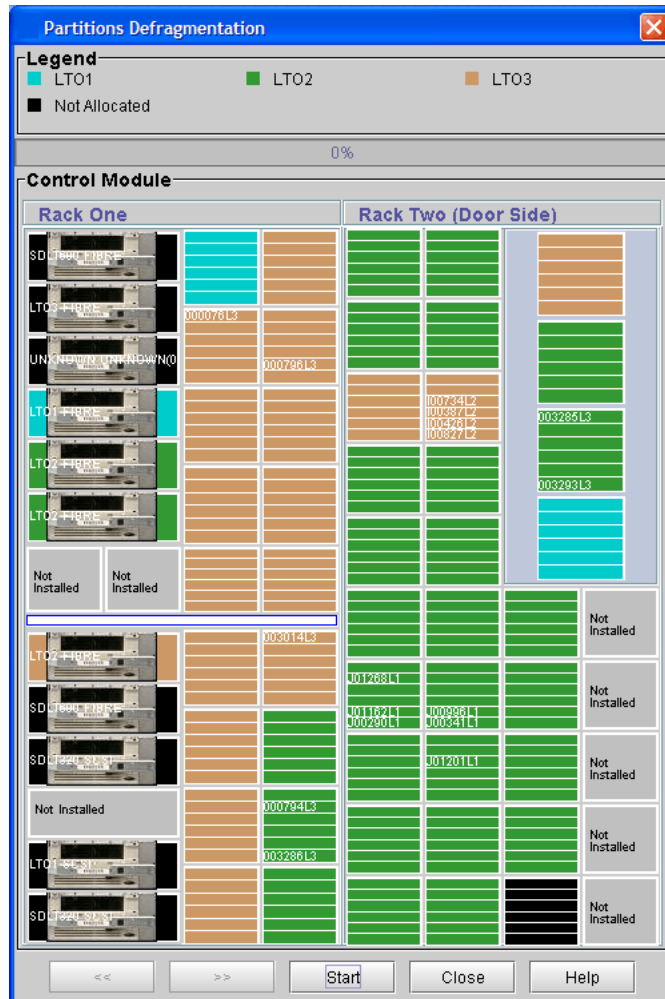
Depending on the size of the library, defragmenting partitions can be a time-consuming process.

Defragmenting Partitions

After enlarging a partition or adding an expansion module to the library, check for partition fragmentation, and then defragment partitions if necessary.

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Tools**→ **Partitions Defragmentation**.

The **Partitions Defragmentation** dialog box appears. This dialog box shows a graphical representation of the tape magazines in the library. Magazines are color-coded to indicate which partition they belong to. If the library has more than one frame, click the arrow buttons to display the next or previous frame. If one or more partitions are fragmented, you can defragment them.



4 To begin defragmenting partitions, click **Start**.

A dialog box appears notifying you that partitions that do not have a free I/E station slot cannot be defragmented and will be skipped.

- 5 Verify that the I/E station in each partition has at least one free slot, and then click **Yes**.

A dialog box appears notifying you that all partitions must be taken offline before defragmenting can begin.

- 6 Click **Yes** to take all partitions offline.

The partitions defragmentation operation starts. A progress bar at the top of the **Partitions Defragmentation** dialog box displays the percentage complete for the operation.

When defragmenting is complete, a dialog box appears prompting you to take all partitions online.

- 7 Click **Yes** to take all partitions online.

- 8 Click **Close** to close the **Partitions Defragmentation** dialog box.

Canceling Defragmentation

Depending on the size of the library, defragmenting partitions can be a time-consuming process. If needed, you can click **Abort** on the **Partitions Defragmentation** dialog box to cancel the defragmentation operation at any time. When prompted, click **Yes** to confirm the action.

After you cancel defragmentation, the library finishes moving the current magazine (and any media it contains), then defragmentation stops. If you cancel defragmentation, no tapes will be stranded, and all media will still be assigned to the correct partition. You can resume defragmentation at a later time by clicking **Start** on the **Partitions Defragmentation** dialog box.

Recovering After Defragmentation is Interrupted

If a defragmentation operation fails (for example, if a power interruption occurs or the robotics go offline), no tapes will be stranded, and all media will still be assigned to the correct partition. However, it is possible that some media which was in the process of being moved will remain in the I/E station.

In this case, simply import the media into the library. The media will automatically be moved to a magazine in the correct partition. For more information about importing media, see [Importing Cartridges Into Partitions](#) on page 408.

Cycling Library Power

If library firmware seems to be at fault, or the robot will not move, or a circuit board has gone down, try recycling power to the library. Cycling library power involves shutting down the library, powering it off, and then powering it on. For more information, see [Shutting Down/Rebooting the Library](#) on page 393, [Powering On the Library](#) on page 395, and [Powering On the Library](#) on page 395.



CAUTION

Do not cycle library power for a drive problem. Use Tools→ Drives to power cycle the individual drive.

Removing Lodged Cartridges

It is very unlikely that a cartridge will become lodged in the robot. If this happens, contact technical support. It also is very unlikely that a cartridge will become lodged in a drive. If this happens, it is not difficult to remove it.

Removing a Cartridge From a Drive

Required tools: None

- 1 On the operator panel, press the **Robotics Enabled** button to turn off power to the picker and return it to the home position.

The power is on to all other components.

- 2 Open the access door.

Aisle power is disabled.

- 3 On the drive, press the **Eject** button, and then remove the cartridge.
- 4 Close the access door.

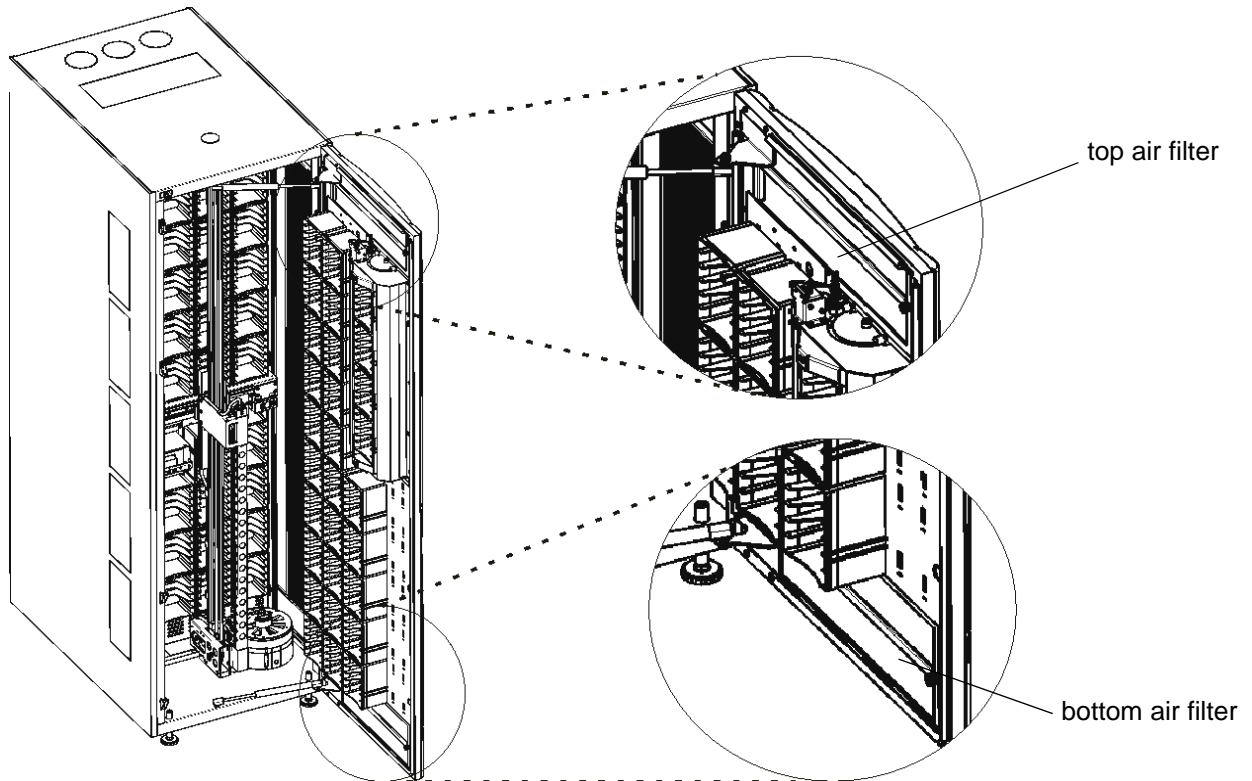
The power is on.

- 5 On the operator panel, press the **Robotics Enabled** button to enable the picker.

Maintaining the Air Filters

The access door of each control and expansion module has two air filters: one located at the top, and the other located at the bottom, as shown in [figure 31](#).

Figure 31 Top and Bottom Air Filters



Many factors exist that contribute to the need to regularly service the air filters. For example, the total number of tape drives and the operating environment greatly affect the rate at which debris accumulates in the air filters.

With the maximum number of tape drives operating in a normal data center environment, you should check the filters every two years. If you see dust and debris on the inlet side of the filters, remove the filters and use water and a mild soap to clean them. The materials in the filters should last for the life of the product. However, if abnormal contamination occurs, you should replace them. To order filters, contact your service representative.

Removing an Air Filter

Use these instructions to remove either a top or bottom air filter.

Required tools: #1 Phillips screwdriver
FRU ID: 1001 (air filter)

- 1 Take the library offline.

For information about taking the library offline, see [Changing the Library's State](#) on page 380.

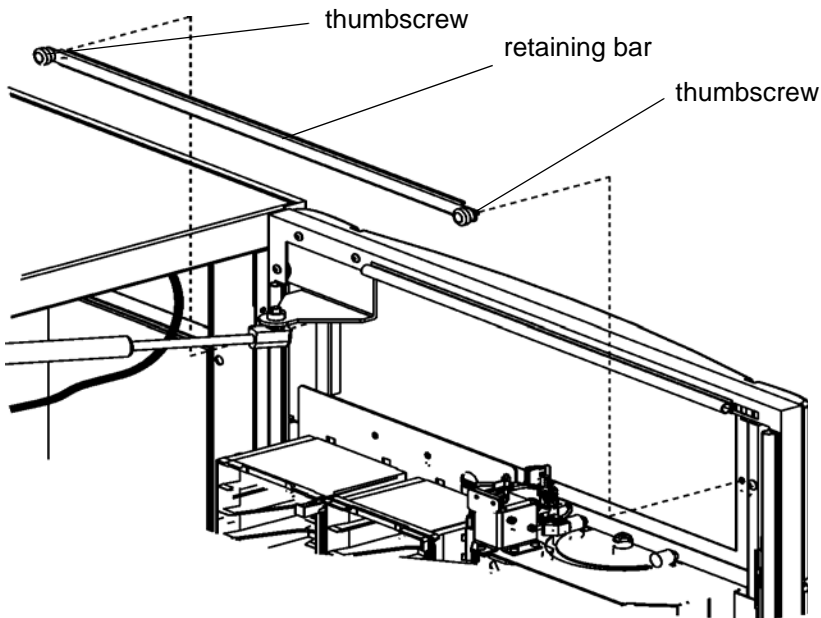
- 2 On the operator panel, press **Robotics Enabled** to turn off power to the picker and return it to the home position.

The power is on to all other components.

- 3 Open the access door.

Aisle power is disabled.

- 4 Use the Phillips screwdriver to unscrew the two retaining thumbscrews. The screws remain attached to the retaining bar.



- 5 Remove the air filter.
- 6 Use water and a mild soap to clean the air filter.
- 7 Allow them to dry.

Replacing an Air Filter

Use these instructions to replace either a top or bottom air filter.



Note

Make sure that the air filter is completely dry before placing it back in the access door.

Required tools: #1 Phillips screwdriver
FRU ID: 1001 (air filter)

- 1 Take the library offline.

For information about taking the library offline, see [Changing the Library's State](#) on page 380.

- 2 On the operator panel, press **Robotics Enabled** to turn off power to the picker and return it to the home position.

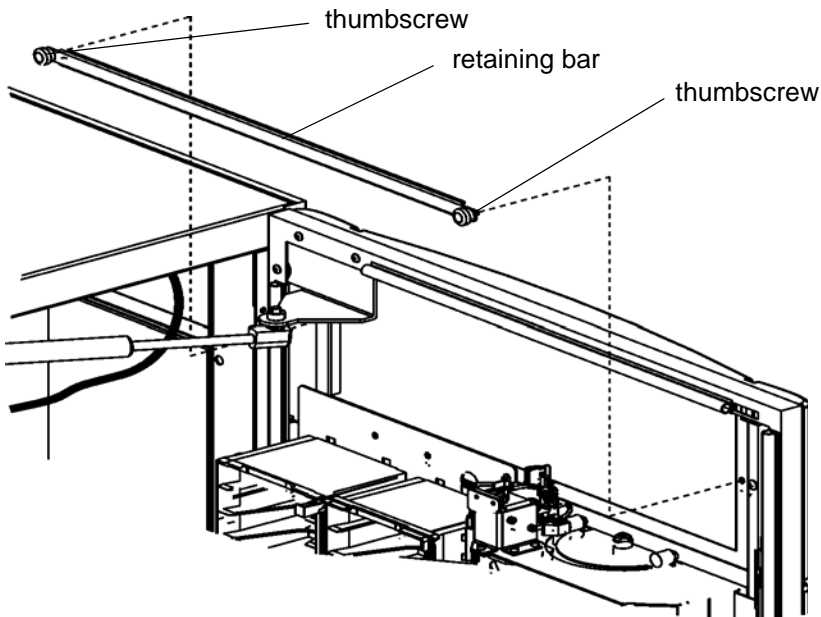
The power is on to all other components.

- 3 Open the access door.

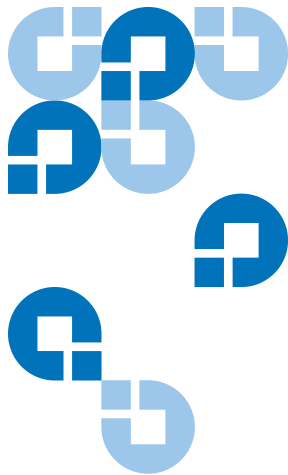
Aisle power is disabled.

- 4 Place the filter in the opening.

- 5 Place the retaining bar over the filter to hold it in place. Use the Phillips screwdriver to tighten the two retaining thumbscrews.



- 6 Close the access door.
- 7 On the operator panel, press **Robotics Enabled** to enable the picker.
- 8 Bring the library online. See [Changing the Library's State](#) on page 380.



Chapter 6

Running Your Library

This chapter includes the following sections, which explain how to access and operate your library:

- [Logging On and Off](#) on page 338
- [Logging On From the LMC Applet \(Web Browser\)](#) on page 340
- [Connecting to Multiple Libraries](#) on page 345
- [Operator Panel](#) on page 347
- [Library Management Console \(LMC\)](#) on page 349
- [Understanding Location Coordinates](#) on page 366
- [Viewing the Library \(Physical or Partition\)](#) on page 378
- [Changing the Library's State](#) on page 380
- [Online and Offline Functionality](#) on page 381
- [Working With Local User Accounts](#) on page 383
- [Viewing Local User Account Permissions](#) on page 391
- [Shutting Down/Rebooting the Library](#) on page 393
- [Powering Off the Library](#) on page 394
- [Powering On the Library](#) on page 395
- [Locking/Unlocking the I/E Station](#) on page 395
- [When Robotics Are Not Ready](#) on page 397

Logging On and Off

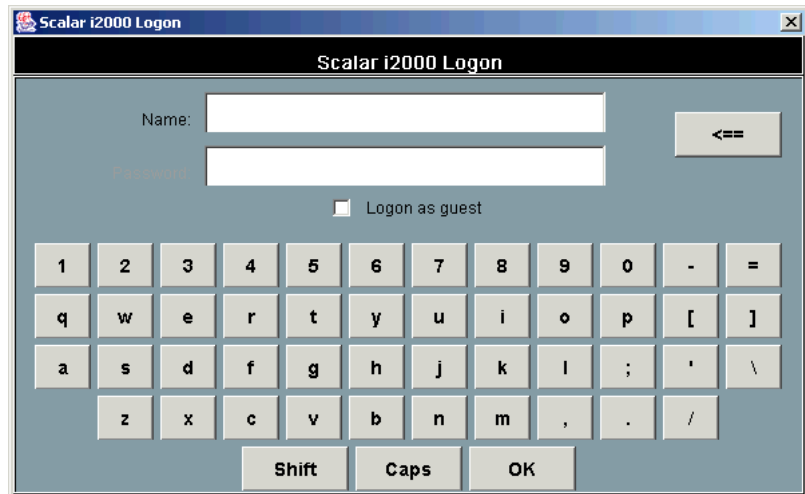
You can log on and off locally by using the library's touch screen. Or you can log on and off remotely by using a web browser to access the LMC applet on a host computer.

You also can log on and off remotely if a remote client application installed on a host computer and the library is configured to communicate on the network. For information about installing a remote client, see [Installing a Remote Client](#) on page 426.

Logging On From the Touch Screen (Local Client)

- 1 If the **Scalar i2000 Logon** dialog box is not already displayed on the library's touch screen because the screen saver is displayed, tap the touch screen.

The **Scalar i2000 Logon** dialog box appears.



- 2 In the **Name** text box, type the name of the user or administrator account with which you want to log on. If you want to log on with the default administrator account, type admin.



Note

User names and passwords are case-sensitive. Select the **Shift** key to display uppercase letters and special characters. This enables you to type one uppercase letter or special character before the **Scalar i2000 Logon** dialog box returns to displaying lowercase characters. To type more than one uppercase character or special character, select the **Caps** key. The **Caps** key toggles between displaying uppercase and lowercase characters.

Only one administrator at any given time can be logged on to the library.

If you want to log on using the default administrator account (admin), and you do not remember the password, contact technical support to reset the password.

- 3 Position the cursor in the text box below the **Name** text box by tapping it, and then type the password for the user or administrator account.



Note

If you are logging on to the library for the first time using the default administrator account (admin), type password. After you log on, the library prompts you to change the default admin password. You must enter and confirm a new password. Passwords that are most secure include a combination of letters, numbers, and non-alphanumeric characters. Passwords must be eight or more characters in length. The word “password” is not available for use.

- 4 After you type a user name and password, select **OK**.

Logging Off From the Touch Screen (Local Client)

- 1 Select **Operations**→ **Log Off** or select the **Log Off** button on the toolbar.
- 2 A message appears that asks you whether you are sure that you want to log off. Select **Yes**.

The **Scalar i2000 Logon** dialog box appears.

Logging On From the LMC Applet (Web Browser)

The LMC Java applet lets you access all features of the LMC from a host computer using a standard web browser. To use the LMC applet, the host computer must have network access to the library, and you must know the IP address of the library.



Note

If you do not know the IP address of the library, log on to the library using the touch screen. Click **Setup**→ **Network Configuration**, and then write down the value in the **IP Address** field.

Software Requirements

Before logging on from the LMC applet, make sure the host computer meets the following software requirements:

- **Web Browser** – Microsoft Internet Explorer 6.0 or higher, Mozilla Firefox 1.0.6 or higher
- **Java Plug-in** – Java Plug-in 1.4 or higher

For information on downloading the Java Plug-in contact:

www.quantum.com/support

Accessing the LMC Applet

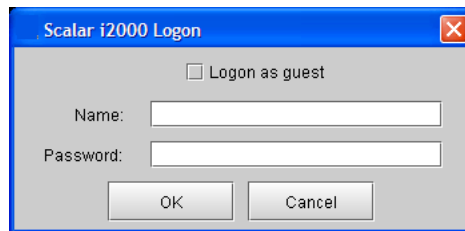
After verifying that the host computer meets the software requirements and has network access to the library, access the LMC applet and log on.

- 1 On the host computer, point your web browser to the IP address of the library.

The first time you access the LMC applet it is downloaded to the host computer. Downloading the applet can take several minutes depending on the speed of the network. Once the applet is downloaded, it is stored on the host computer and does not need to be downloaded again.

If a security warning appears asking if you are sure you want to run the applet, click **Run** or **Yes**.

The Scalar i2000 Logon dialog box appears.



- 2 In the **Name** text box, type the name of the user or administrator account with which you want to log on. If you want to log on with the default administrator account, type admin.



Note

- User names and passwords are case-sensitive.
- Only one administrator at any given time can be logged on to the library.
- If you want to log on using the default administrator account (admin), and you do not remember the password, contact technical support to reset the password.

- 3 In the **Password** text box, type the password for the user or administrator account.



Note

If you are logging on to the library for the first time using the default administrator account (admin), type `password`. After you log on, the library prompts you to change the default admin password. You must enter and confirm a new password. Passwords that are most secure include a combination of letters, numbers, and non-alphanumeric characters. Passwords must be eight or more characters in length. The word “password” is not available for use.

- 4 Click **OK**.



Note

After logging on, do not close the web browser window or use it to navigate to another URL. Doing so will close the LMC applet but might leave the current session active.

Logging Off From the LMC Applet (Web Browser)

- 1 Click **Operations**→ **Log Off**, or click the **Log Off** button on the toolbar.

A message appears asking if you are sure you want to log off.

- 2 Click **Yes**.

The **Scalar i2000 Logon** dialog box appears.

- 3 To close the LMC applet, click **Cancel**.

Logging On From a Remote Client

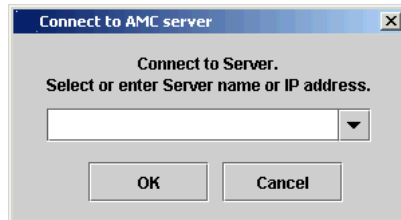
- 1 On the Windows taskbar on the host computer, click the **Start** button, and then click **Programs**→ **ADIC Management Console**→ **Client**.



Note

If you did not accept the default location when you installed the client, navigate to the location you chose.

The **Connect to AMC Server** dialog box appears.



- 2 Type the name or IP address of the library to which you want to connect, and then click **OK**.



Note

If the host computer contacts the library successfully, but the library fails to perform callback, a message appears that indicates that the library failed to register the client. Click **OK**. The **Connect to AMC Server** dialog box appears again with an additional button (**Config**). Clicking **Config** displays the **Connection Configuration** dialog box from which you can indicate a proxy server IP address so that the host computer can work across a firewall that is configured for network address translation (NAT).

If you again fail to connect after indicating a proxy server IP address, verify your firewall settings. One possible cause is that the library is not able to send data to the host computer because the callback port for the host computer is not within the range of callback ports indicated on the **LMC** tab of the **Security Configuration** dialog box (**Setup**→**Security** from the library's touch screen). For more information about setting up callback port ranges, see [Configuring Access for Remote LMC Clients](#) on page 189.

After you successfully establish a connection to the library, the **Scalar i2000 Logon** dialog box appears.



Note

The **Login as guest** option is available unless you disable the guest login privileges in the User Account setup. For more information concerning setting up user accounts, see [Working With Local User Accounts](#) on page 383. For a list of commands that are available to users logging on to the library as a guest, see [table 28](#) on page 354.

The image shows a dialog box titled "Scalar i2000 Logon". At the top, there is a checkbox labeled "Logon as guest" which is currently unchecked. Below this, there are two text input fields: one labeled "Name:" and another labeled "Password:". At the bottom of the dialog, there are two buttons: "OK" and "Cancel".

- 3 In the **Name** text box, type the name of the user or administrator account with which you want to log on. If you want to log on with the default administrator account, type admin.



Note

- User names and passwords are case-sensitive.
- Only one administrator at any given time can be logged on to the library.
- If you want to log on using the default administrator account (admin), and you do not remember the password, contact technical support to reset the password.

- 4 In the **Password** text box, type the password for the user or administrator account.



Note

If you are logging on to the library for the first time using the default administrator account (admin), type `password`. After you log on, the library prompts you to change the default admin password. You must enter and confirm a new password. Passwords that are most secure include a combination of letters, numbers, and non-alphanumeric characters. Passwords must be eight or more characters in length. The word “password” is not available for use.

- 5 Click **OK**.

Logging Off From a Remote Client

- 1 Click **Operations**→ **Log Off** or click the **Log Off** button on the toolbar.
- 2 A message appears that asks you whether you are sure that you want to log off. Click **Yes**.

The **Scalar i2000 Logon** dialog box appears.

- 3 If you want to close the remote LMC client application, click **Cancel**.



Note

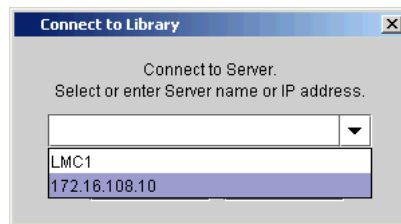
For information about installing a remote client, see [Installing a Remote Client](#) on page 426.

Connecting to Multiple Libraries

This feature allows you log in to multiple libraries, and switch from one library console to another without logging off.

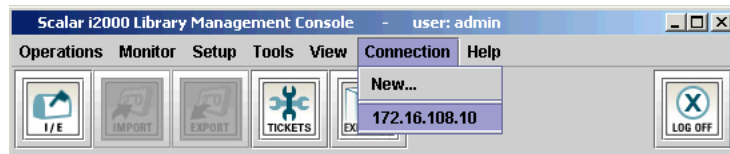
- 1 From the LMC menu, click **Connection**→ **New**.

The **Connect to Library** dialog box displays.



- 1 Type or select the library server name or library IP address, and click **OK**.

Once you have connected to additional libraries, you can choose any of those libraries from the **Connection** drop-down list.



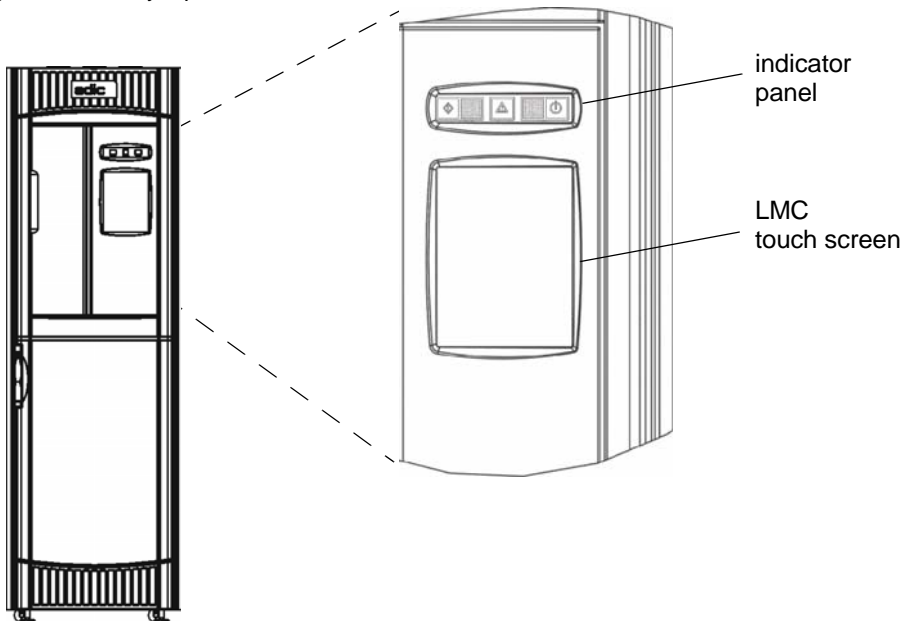
Note

To log off when connected to multiple libraries, first log off from one of the connected libraries. To do this, select the library on the **Connection** menu, click **Operations**→ **Log Off**, and then click **Yes**. When the **Scalar i2000 Logon** dialog box appears, click **Cancel**. You can then repeat this process to log off from additional libraries.

Operator Panel

The operator panel on the library includes an indicator panel and a touch screen, as shown in [Library Op Panel](#) on page 347

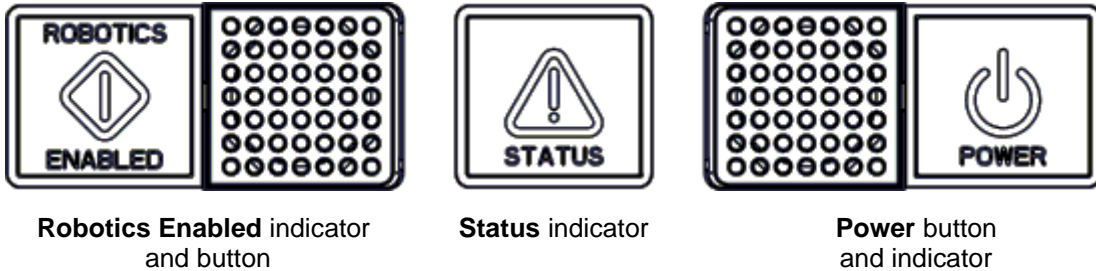
Figure 32 Library Op Panel



The indicator panel includes a **Robotics Enabled** button with its associated indicator, a **Status** indicator, and a **Power** button with its associated indicator. The Library Management Console (LMC) appears on the touch screen. For more information about indicator panel functions, see [table 6](#) on page 348. For a brief overview of the LMC, see [Library Management Console \(LMC\)](#) on page 349.

Indicator Panel

The **Robotics Enabled** indicator and the **Power** indicator each include a button. The **Status** indicator is not a button. These indicators do not report the status of communications with a host.



The following tables describe the indicators in detail.

Table 25 Robotics Enabled
Indicator

Indicator	State and Explanation
Green	<p>Solid on – robotics are enabled and ready to process commands or are actively processing commands from the library controller. No attention required. Do not open the access door.</p> <p>Blinking – a change of robotics state is pending, either from the enabled state to the not enabled state or from the not enabled state to the enabled state. No attention required. Do not open the access door.</p>
No color	<p>Solid off – either robotics are not ready, the doors might be open, or the library might be powered off. Attention required. The operator should close the doors and press the Robotics Enabled button to return robotics to the enabled state.</p>

 **Note**

The enabled state does not mean that robotics are communicating with the host. It means that the robotics are communicating with the library controller.

Table 26 Status Indicator

Indicator	State and Explanation
Green	Solid on – normal. No attention required.
Amber	Blinking or solid on – fault. Attention required. Monitor the system status buttons. To determine whether the library has created any tickets, click Tools → Tickets .
No color	Solid off – no power. Attention required. To operate the library, turn on the power by pressing the Power button.

Table 27 Power Indicator

Indicator	Operational Status
Green	Solid on – power on. No attention required.
No color	Solid off – power off. Attention required. To operate the library, you must turn on the power. Press the Power button.

Library Management Console (LMC)

You can view the LMC from either the library’s touch screen or a remote computer. If you use the touch screen, you do not need to install the LMC because it is already installed on the library. To install the LMC on a remote computer, see [Installing a Remote Client](#) on page 426. To access the LMC using a web browser, see [Logging On From the LMC Applet \(Web Browser\)](#) on page 340.



Note

To manage your library from a remote client, you must set up the library’s initial network configuration from the touch screen. For more information, see [Setting Up the Network Configuration](#) on page 127.

The main LMC display consists of five areas:

- The title bar on the touch screen view of the LMC displays the words “Scalar i2000 Library Management Console.” The title bar appears slightly different on the remote client view of the LMC. Compare [figure 33](#) to [figure 34](#).
- The menu bar provides access to all menu commands used to manage library functions.
- The toolbar displays icons that represent the most commonly run commands.
- The library information panel fills most of the main LMC display, presenting operational data from the current library, whether physical or partition.
- The system status buttons provide current status information for the six subsystems of the physical library.

Figure 33 LMC (Local Touch Screen - Physical Library View)

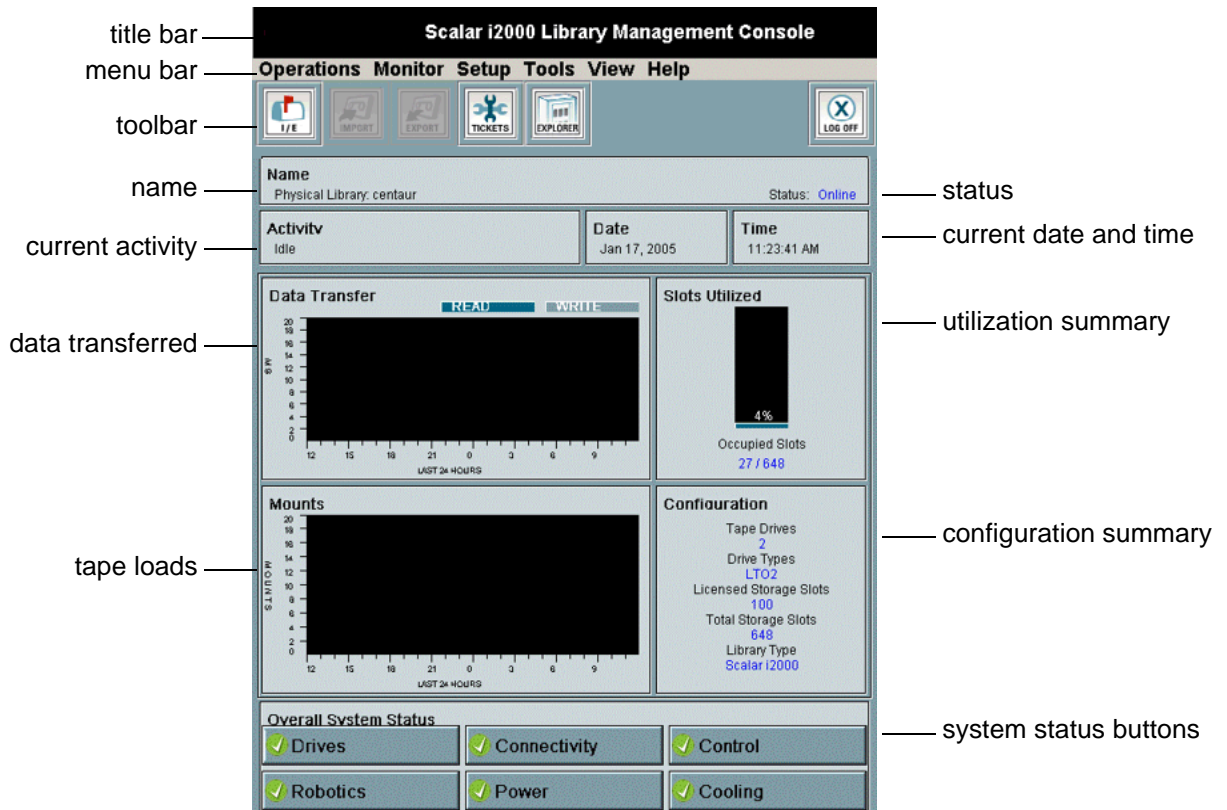
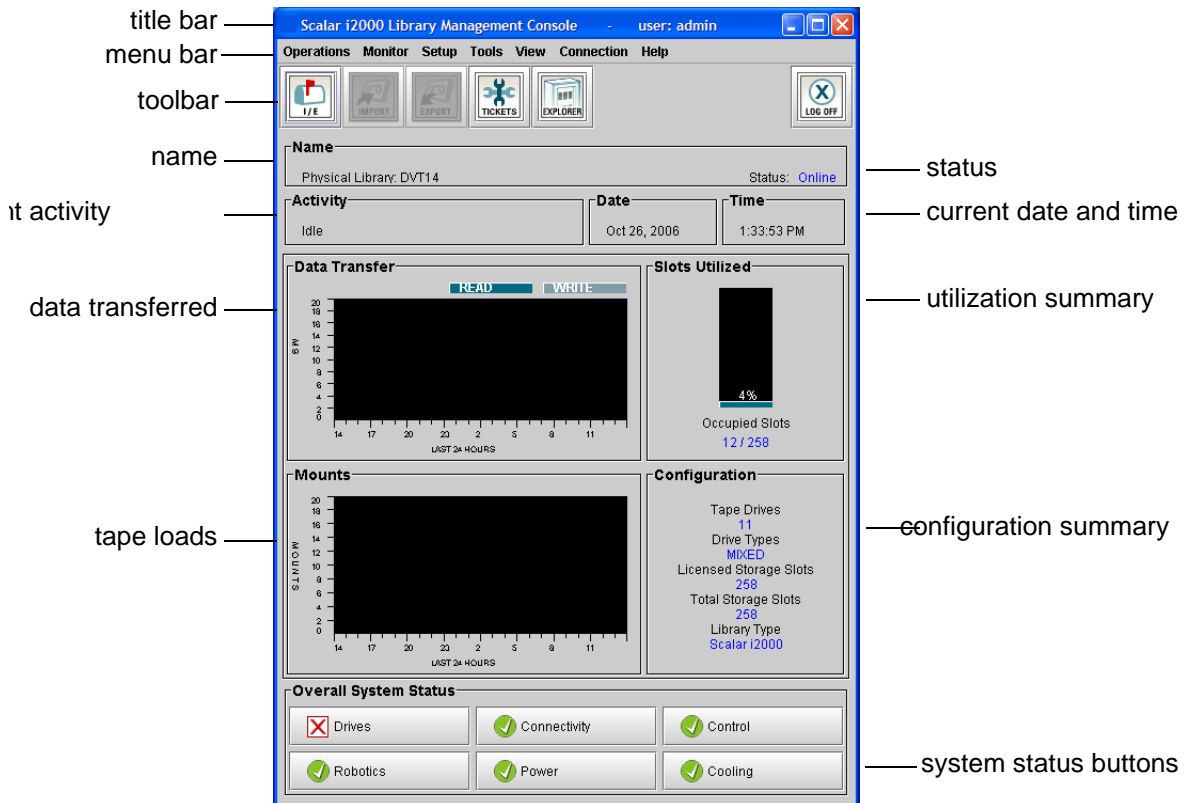


Figure 34 LMC (Remote Client
With Partition View Shown)



Menus

The following seven LMC menus organize commands into logical groupings:

- The **Operations** menu consists of commands, such as changing the library's mode of operation, importing and exporting cartridges, loading and unloading drives, moving media, performing inventory, and logging off.
- The **Monitor** menu consists of commands that you can use to obtain status information about various aspects of the library, including system, drives, connectivity, I/E stations, storage slots, media, sensors, and users.

- The **Setup** menu consists of commands that you can use to set up and configure various aspects of the library, including partitions, devices, connectivity, network, physical library, users, notifications, date and time, licenses, e-mail, and SNMP trap registration.
- The **Tools** menu consists of commands that you can use to maintain and troubleshoot the library. These tools enable you to work with RAS tickets, drives, and connectivity. They also enable you to capture snapshots, update software, teach the library, save and restore library configurations, run verification tests, and obtain drive resource utilization reports.
- The **View** menu enables you to select the library (either the physical library or a partition) that you want currently displayed on the main LMC display. Some LMC menu commands require you to be in either a physical library or partition view to run them.
- The **Help** menu provides you with access to Online Help as well as information about the library, such as copyright information, the product version, firmware version, and build information for various library components (LMC server, LMC client, MCB, CMB, and RCU).
- The **Connection** menu enables you to log on to multiple libraries and switch between consoles for different libraries without logging off.

[Table 28](#) on page 354 summarizes all available commands, including required user privilege levels and required library environments (touch screen or remote client). The LMC prompts you to take the library offline or to select either the physical library or a partition if the command you request requires you to change library mode.

System status buttons are located at the bottom of the library information panel. If the touch screen remains unused after a period of time, the library screen saver appears. The color of the screen saver image reflects the status of the library as indicated by the system status buttons. For example, if system status buttons show a mix of green (Good), yellow (Warning or Degraded), and red (Failed) states, the color of the screen saver image will be red.

Table 28 Menu Commands:
Privileges and Environments

Menu Command	Privilege Level	Physical Library View	Partition View	Touch Screen	Remote Client
On the Operations menu:					
Change Mode	Admin, User ¹	X	X	X ²	X ³
Import ⁴	Admin, User ¹		X	X	X
Export ⁴	Admin, User ¹		X	X	X
Drives ⁴	Admin, User ¹		X	X	X
Load ⁴	Admin, User ¹		X	X	X
Unload ⁴	Admin, User ¹		X	X	X
Move Media	Admin, User ¹		X	X	X
Inventory	Admin, User ¹	X ⁵	X ^{4, 6}	X	X
System Shutdown	Admin				
Log Off	Admin, User, Guest	X	X	X	X
On the Monitor menu:					
System	Admin, User ¹	X	X	X	X
Drives	Admin, User ¹	X	X	X	X
Connectivity	Admin, User ¹	X		X	X
<p>1 Users can use this command only from partitions to which they have privileges. 2 Shutdown is available to administrators only. 3 Affected partition must be offline. 4 Physical library must be offline. 5 Physical library must be online. 6 Feature is configurable from the library's touch screen only, but the configuration is viewable from the touch screen or remote client. 7 Appears on the library's touch screen only. 8 Depending on operation, physical library or relevant partition must be offline. 9 Available only on libraries with I/O blades installed in it. 11 Guest can view the main LMC display, but cannot obtain more details or perform operations.</p>					

Table 28 Menu Commands:
Privileges and Environments

Menu Command (Continued)	Privilege Level	Physical Library View	Partition View	Touch Screen	Remote Client
IO Blade	Admin, User ¹	X		X	X
SCSI Channel	Admin, User ¹	X		X	X
Fibre Channel	Admin, User ¹	X		X	X
IE Station	Admin, User ¹	X	X	X	X
Slot	Admin, User ¹	X	X	X	X
Media	Admin, User ¹	X	X	X	X
Sensor	Admin, User ¹	X	X	X	X
Users	Admin, User ¹	X	X	X	X
<p>1 Users can use this command only from partitions to which they have privileges. 2 Shutdown is available to administrators only. 3 Affected partition must be offline. 4 Physical library must be offline. 5 Physical library must be online. 6 Feature is configurable from the library's touch screen only, but the configuration is viewable from the touch screen or remote client. 7 Appears on the library's touch screen only. 8 Depending on operation, physical library or relevant partition must be offline. 9 Available only on libraries with I/O blades installed in it. 11 Guest can view the main LMC display, but cannot obtain more details or perform operations.</p>					

Table 28 Menu Commands:
Privileges and Environments

Menu Command (Continued)	Privilege Level	Physical Library View	Partition View	Touch Screen	Remote Client
On the Setup menu:					
Setup Wizard	Admin	X		X	X
Partitions ⁵	Admin	X		X	X
Device	Admin, User ¹	X	X	X	X
IDs ⁴	Admin, User ¹		X	X	X
Access	Admin	X		X	X
Channel Zoning	Admin	X		X	X
SCSI Host	Admin	X		X	X
FC Host	Admin	X		X	X
Connectivity	Admin	X		X	X
Port Configuration	Admin	X		X	X
Datapath Conditioning	Admin	X		X	X
FC Host Port Failover	Admin	X		X	X
Network Configuration ⁷	Admin	X		X	
Physical Library	Admin	X		X	X
Users	Admin	X		X	X
Notification	Admin	X		X	X
<p>1 Users can use this command only from partitions to which they have privileges. 2 Shutdown is available to administrators only. 3 Affected partition must be offline. 4 Physical library must be offline. 5 Physical library must be online. 6 Feature is configurable from the library's touch screen only, but the configuration is viewable from the touch screen or remote client. 7 Appears on the library's touch screen only. 8 Depending on operation, physical library or relevant partition must be offline. 9 Available only on libraries with I/O blades installed in it. 11 Guest can view the main LMC display, but cannot obtain more details or perform operations.</p>					

Table 28 Menu Commands:
Privileges and Environments

Menu Command (Continued)	Privilege Level	Physical Library View	Partition View	Touch Screen	Remote Client
Date and Time	Admin	X		X	X
Licenses	Admin	X		X	X
Email Configuration	Admin	X		X	X
Trap Registration	Admin	X		X	X
Security ⁸	Admin	X	X	X	
<p>1 Users can use this command only from partitions to which they have privileges. 2 Shutdown is available to administrators only. 3 Affected partition must be offline. 4 Physical library must be offline. 5 Physical library must be online. 6 Feature is configurable from the library's touch screen only, but the configuration is viewable from the touch screen or remote client. 7 Appears on the library's touch screen only. 8 Depending on operation, physical library or relevant partition must be offline. 9 Available only on libraries with I/O blades installed in it. 11 Guest can view the main LMC display, but cannot obtain more details or perform operations.</p>					

Table 28 Menu Commands:
Privileges and Environments

Menu Command (Continued)	Privilege Level	Physical Library View	Partition View	Touch Screen	Remote Client
On the Tools menu:					
Tickets	Admin	X		X	X
Drives ⁵	Admin	X		X	X
Connectivity	Admin	X		X	X
Capture Snapshot	Admin	X		X	X
Update Software ⁹	Admin	X	X	X	X
Rollback	Admin	X		X	X
Download	Admin	X			X
Install	Admin	X		X	X
Reinstall	Admin	X		X	X
Autoleveling Policy ¹⁰	Admin	X	X	X	X
Update Drive Firmware Using I/O Blades ¹⁰	Admin	X	X	X	X
Update Drive Firmware	Admin	X	X	X	X
Teach ⁵	Admin	X		X	X
Configuration	Admin	X		X	X
Calibration	Admin	X		X	X
<p>1 Users can use this command only from partitions to which they have privileges. 2 Shutdown is available to administrators only. 3 Affected partition must be offline. 4 Physical library must be offline. 5 Physical library must be online. 6 Feature is configurable from the library's touch screen only, but the configuration is viewable from the touch screen or remote client. 7 Appears on the library's touch screen only. 8 Depending on operation, physical library or relevant partition must be offline. 9 Available only on libraries with I/O blades installed in it. 11 Guest can view the main LMC display, but cannot obtain more details or perform operations.</p>					

Table 28 Menu Commands:
Privileges and Environments

Menu Command (Continued)	Privilege Level	Physical Library View	Partition View	Touch Screen	Remote Client
Save/Restore ⁵	Admin	X		X	X
Save (for configuration restore images)	Admin	X			X
Save Rescue	Admin	X		X	X
Restore	Admin	X			X
Revert	Admin	X		X	X
Rescue	Admin	X		X	X
Verification Tests	Admin	X		X	X
Reports	Admin	X		X	X
Drive Utilization	Admin	X		X	X
Library Explorer	Admin, User ¹				
Command History Log	Admin	X	X	X	X
On the View menu:					
[physical library name] (Physical)	Admin, User, Guest ¹¹	X	X	X	X
[partition name] (Partition)	Admin, User, Guest ¹¹	X	X	X	X
Views	Admin, User, Guest ¹¹	X	X	X	X
<p>1 Users can use this command only from partitions to which they have privileges. 2 Shutdown is available to administrators only. 3 Affected partition must be offline. 4 Physical library must be offline. 5 Physical library must be online. 6 Feature is configurable from the library's touch screen only, but the configuration is viewable from the touch screen or remote client. 7 Appears on the library's touch screen only. 8 Depending on operation, physical library or relevant partition must be offline. 9 Available only on libraries with I/O blades installed in it. 11 Guest can view the main LMC display, but cannot obtain more details or perform operations.</p>					

Table 28 Menu Commands:
Privileges and Environments

Menu Command (Continued)	Privilege Level	Physical Library View	Partition View	Touch Screen	Remote Client
On the Connection menu:					
New	Admin, User, Guest	X	X		X
[library IP address]	Admin, User, Guest	X	X		X
On the Help menu:					
Content	Admin, User	X	X	X	X
About	Admin, User, Guest	X	X	X	X
<p>1 Users can use this command only from partitions to which they have privileges. 2 Shutdown is available to administrators only. 3 Affected partition must be offline. 4 Physical library must be offline. 5 Physical library must be online. 6 Feature is configurable from the library's touch screen only, but the configuration is viewable from the touch screen or remote client. 7 Appears on the library's touch screen only. 8 Depending on operation, physical library or relevant partition must be offline. 9 Available only on libraries with I/O blades installed in it. 11 Guest can view the main LMC display, but cannot obtain more details or perform operations.</p>					

Toolbar

The toolbar consists of icons that represent commonly used commands that also are available on the menus.

The **I/E** button displays a table of the current contents of the I/E station. You also can display the table by clicking **Monitor**→**IE Station**. For more information, see [Monitoring I/E Station Status](#) on page 214.

The **Import** button launches the import of cartridges if the current library is a partition. You also can request an import operation by clicking **Operations**→**Import**. For more information, see [Importing Cartridges Into Partitions](#) on page 408.

The **Export** button launches the export of cartridges if the current library is a partition. You also can request an export operation by clicking **Operations**→**Export**. For more information, see [Exporting Cartridges From Partitions](#) on page 410.

The **Tickets** button displays tickets that the library created when it detected issues within its subsystems. You also can display tickets by clicking **Tools**→**Tickets**. For more information, see [Troubleshooting Your Library](#) on page 6.

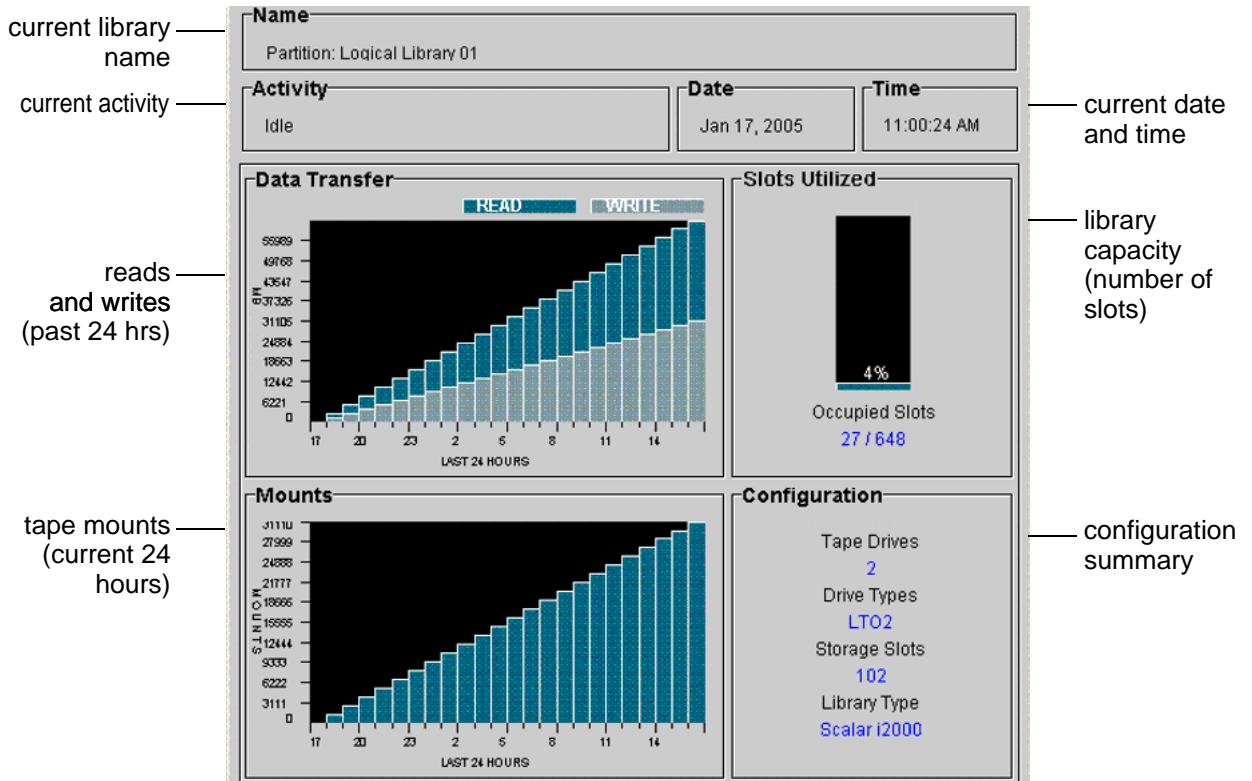
The **Log Off** button logs off the current user after confirming the logoff request. You also can log off by clicking **Operations**→**Log Off**. For more information, see [Logging On and Off](#) on page 338.

The **Library Explorer** button provides a graphical presentation of all the drives, cartridges, and slots in the library. The Library Explorer can display all library elements according to physical location in any configuration, from one module to eight modules, and one drive up to the maximum number of 96 drives.

Reading the Library Information Panel

The library information panel, shown in [Figure 35](#), occupies the central portion of the main LMC display. It provides you with a significant amount of dynamically updated status information.

Figure 35 LMC (Remote Client With Partition View Shown)



[Table 29](#) describes the areas on the library information panel.

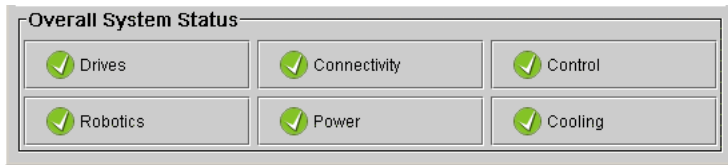
Table 29 Areas on the Library
Information Panel

Area	Description
Name	The name of the current library. The type of library appears first (Physical Library or Partition), followed by the name of the library.
Activity	The current activity for the current library.
Date	The current date. The date that appears reflects user settings, but the system operates according to Greenwich Mean Time (GMT).
Time	The current time. The time that appears reflects user settings, but the system operates according to GMT.
Data Transfer	The bar graph compares the amount of data read and written over the past 24 hours. The library compiles and displays the data when a cartridge is ejected. The units reported appear beside the graph.
Slots Utilized	This graph shows the percentage of occupied media slots in the library or partition, depending on the current view. The number of used media slots appears beneath the graph (occupied slots/total number of storage slots).
Mounts	The bar graph reports mount statistics compiled during the past 24 hours. The library updates this information every five minutes.
Configuration	<p>Information in this area includes:</p> <ul style="list-style-type: none"> • Number of tape drives in the physical library or partition, depending on the current view • Types of drives (for example, LTO2) in the physical library or partition, depending on the current view • Total number of licensed storage slots (appears only in the physical library view) • Total number of storage slots in the physical library or partition, depending on the current view • Library type (Scalar i2000)

System Status Buttons

System status buttons are located in the **Overall System Status** area at the bottom of the LMC display (see [figure 36](#)).

Figure 36 System Status Buttons in Good Status



Each button represents a subsystem. [Table 30](#) shows the library subsystems and some of the components that each subsystem represents. Each field replaceable unit (FRU) in the library belongs to one of the subsystems.




Table 30 Subsystems and Their Components

Subsystem	Components
Drives	Drives and media, such as brick firmware, drive bricks, drive sleds, cartridges, and magazines
Connectivity	Host connectivity components, such as I/O management units, I/O blades, and the chassis management blade (CMB)
Control	Main processor cards and related hardware and software, such as system firmware, the management control blade (MCB), the robotics control unit (RCU), the library motor drive (LMD), and the operator panel
Robotics	Assemblies and processors involved in the movement and handling of library media, such as the IEX board, I/E stations, the pivot and reach assemblies, system barcode labels, doors, filters, the accessor, drive mounts, rails, and carriages
Power	Power supplies and related hardware, such as the power distribution unit (PDU), power chassis, and fuses

Table 30 Subsystems and
Their Components (Continued)

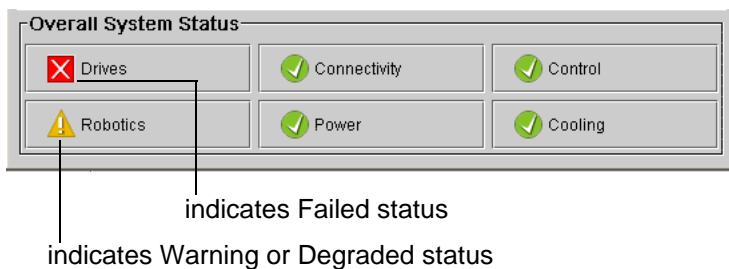
Subsystem	Components
Cooling	Cooling system components, such as fans for the library management module (LMM) and the I/O management unit

Each button displays a status indicator that reveals a Good, Warning, Degraded, or Failed state as follows:

-  Good (green)
-  Warning or Degraded (yellow)
-  Failed (flashing red)

For example, the buttons shown in [figure 36](#) indicate that all subsystems are functioning normally (Good), while those shown in [figure 37](#) indicate that issues exist in the Drives and Robotics subsystems.

Figure 37 Status Buttons -
Drives and Robotics Issues



You can click system status buttons to display additional information about the subsystems. The information that appears depends on the status shown on the button:

- Good – either a message appears informing you that no tickets exist for the subsystem or a list of subsystem tickets appears that are in Closed or Verified states
- Warning, Degraded, or Failed – a list of open tickets for the subsystem appears

Tickets provide information about issues that the library has detected. For more information, see [Using System Status Buttons to Display Ticket Lists](#) on page 16.

Understanding Location Coordinates

This section describes the coordinate addressing system that the library uses to indicate the location of cartridges, drives, and I/O blades in the library.

You can use the **Library Explorer** feature to view a graphical presentation of all the drives, cartridges, and slots in the library. The **Library Explorer** can display all library elements according to physical location in any configuration, from one module to eight modules, and one drive up to the maximum number of 96 drives. For more information on **Library Explorer**, see [Using Library Explorer](#) on page 234.

Cartridge Locations

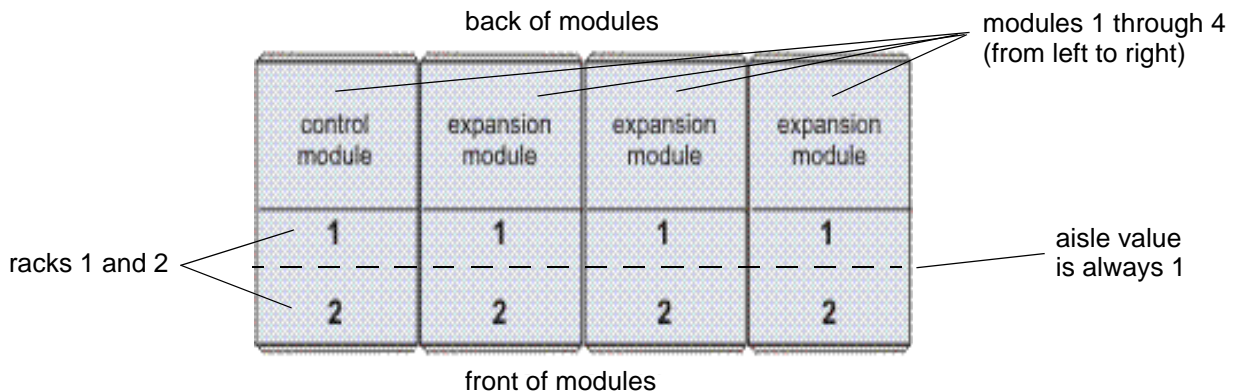
The library uses a coordinate addressing system that indicates the location of cartridges using six coordinates. The coordinates are represented by the library in a comma separated list. For example:

1,1,1,1,2,1 = aisle 1, module 1, rack 1, section 1, column 2, row 1

The following list explains each location variable:

- **Aisle** – there is only one aisle in the library. This value will always be 1.
- **Module** – there are from one to eight modules (the control module and up to seven expansion modules). The value will be between 1 and 8.
- **Rack** – there are two rack designations inside each module. These will always be either 1 or 2, with 2 being the inside of the access door.

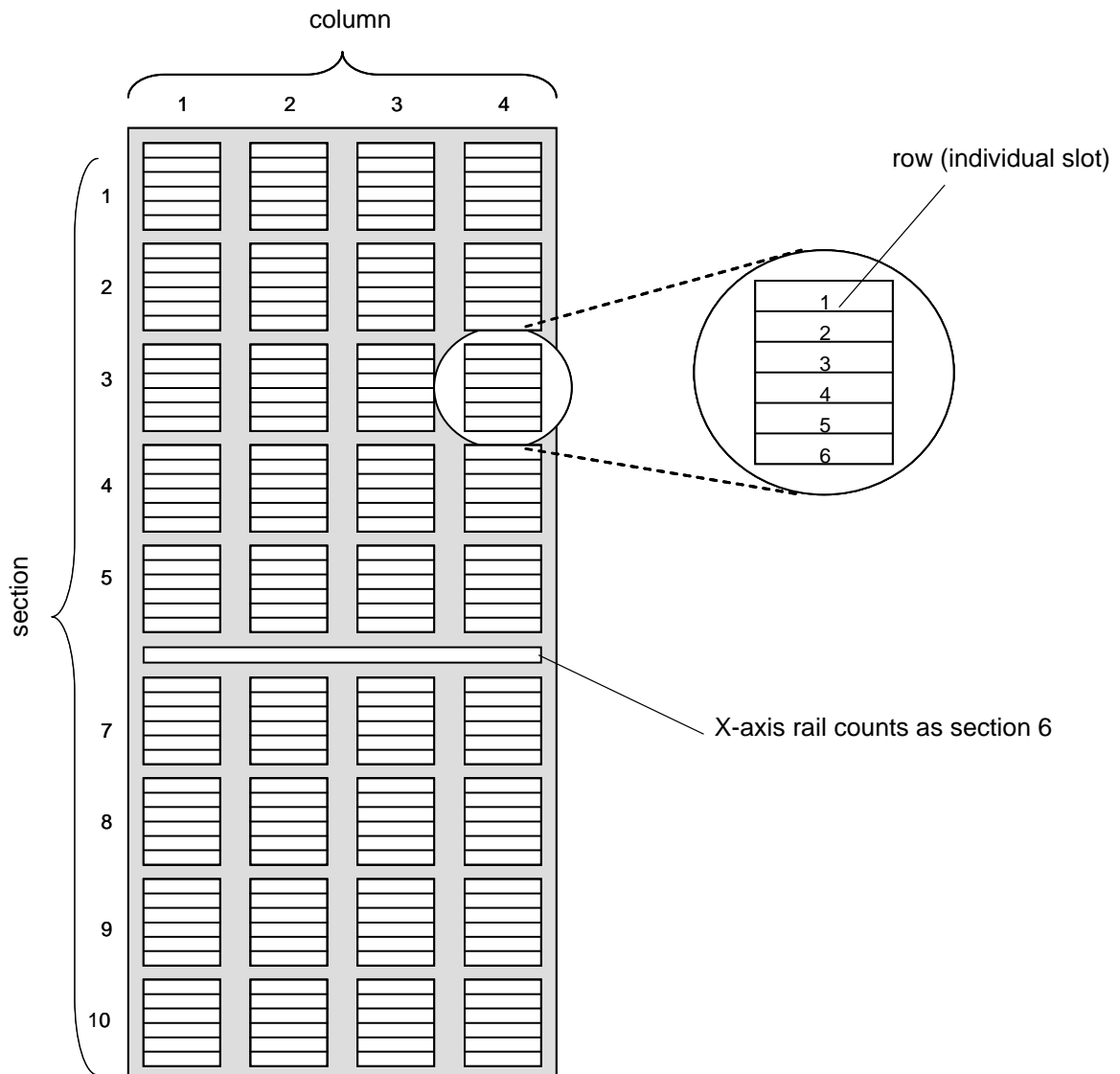
Figure 38 Aisle, Module, and Rack Numbering Locations



- **Section** – there are 10 sections in a rack, numbered from top to bottom as you face the rack.
- **Column** – there are four columns in a rack, numbered from left to right as you face the rack. These are numbered between 1 and 4.
- **Row** – this is equal to one cartridge slot. The number of rows per section can vary depending on the size of the cartridge. The rows are numbered between 1 and 6 for LTO cartridges and between 1 and 5 for DLT cartridges.

[Figure 38](#) shows the section, column and row numbering for rack 1 of a library that contains LTO cartridges. See [figure 39](#) on page 368 to review rack numbering.

Figure 39 Section, Column,
and Row Numbering for Rack 1
- LTO Cartridges





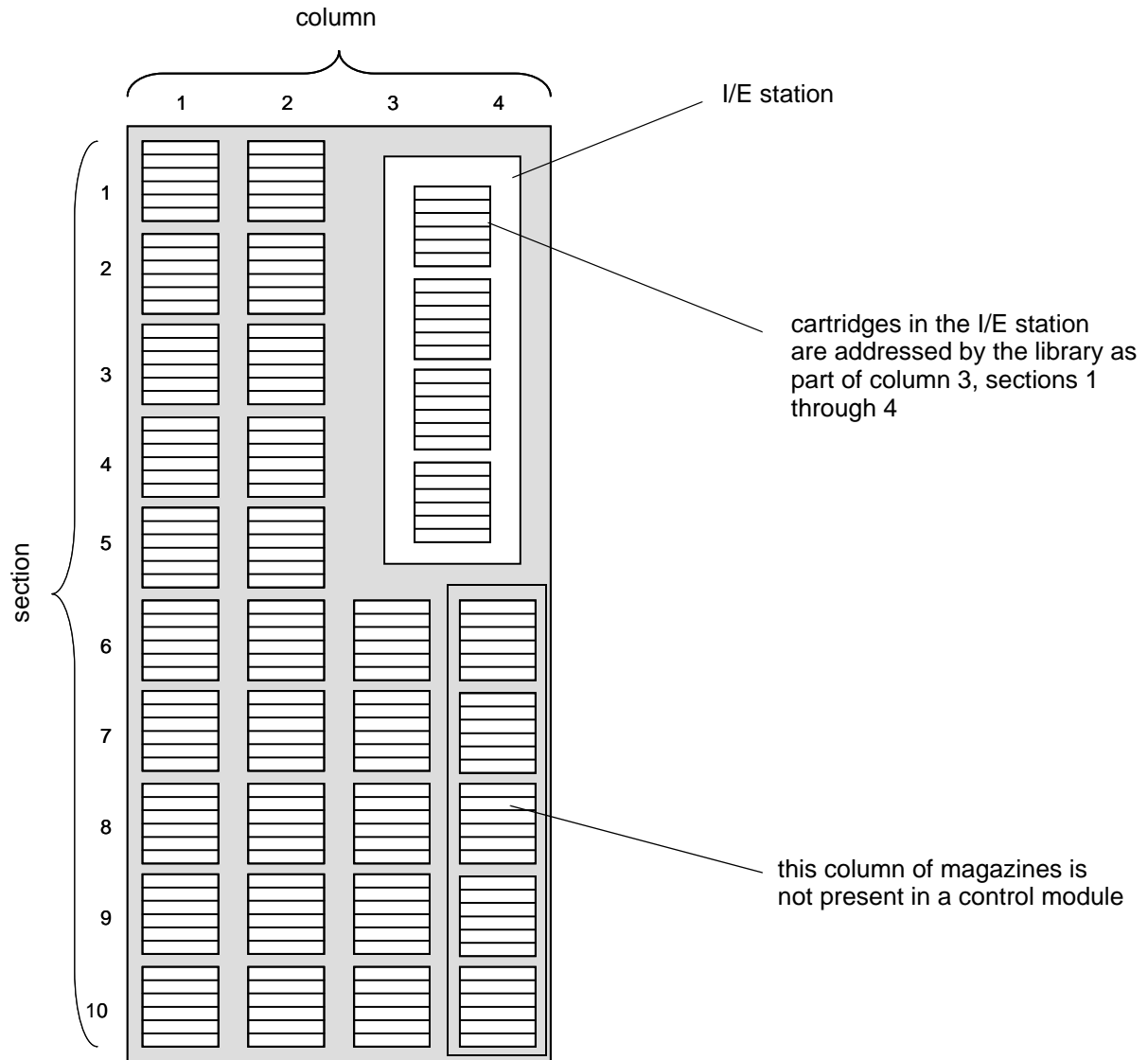
- Tape drives that are installed in rack 1 of a control module or an expansion module replace storage in columns 1 and 2. Because drives are installed from the bottom to the top, you lose the storage starting in section 10 first. You do not lose the magazine in columns 1 and 2 of section 5.
- Column 1 never contains storage in the control module.

[Figure 40](#) on page 370 shows the section, column, and row numbering for rack 2 of a library that contains LTO cartridges. See [figure 38](#) on page 367 to review rack numbering.



The cartridges in the I/E station are addressed as part of column 3 and are in sections 1 through 4 (top to bottom). When you have an I/E station installed on rack 2, there are no cartridges in columns 3 and 4 of section 5. See [figure 40](#) on page 370.

Figure 40 Section, Column,
and Row Numbering for Rack 2
- LTO Cartridges



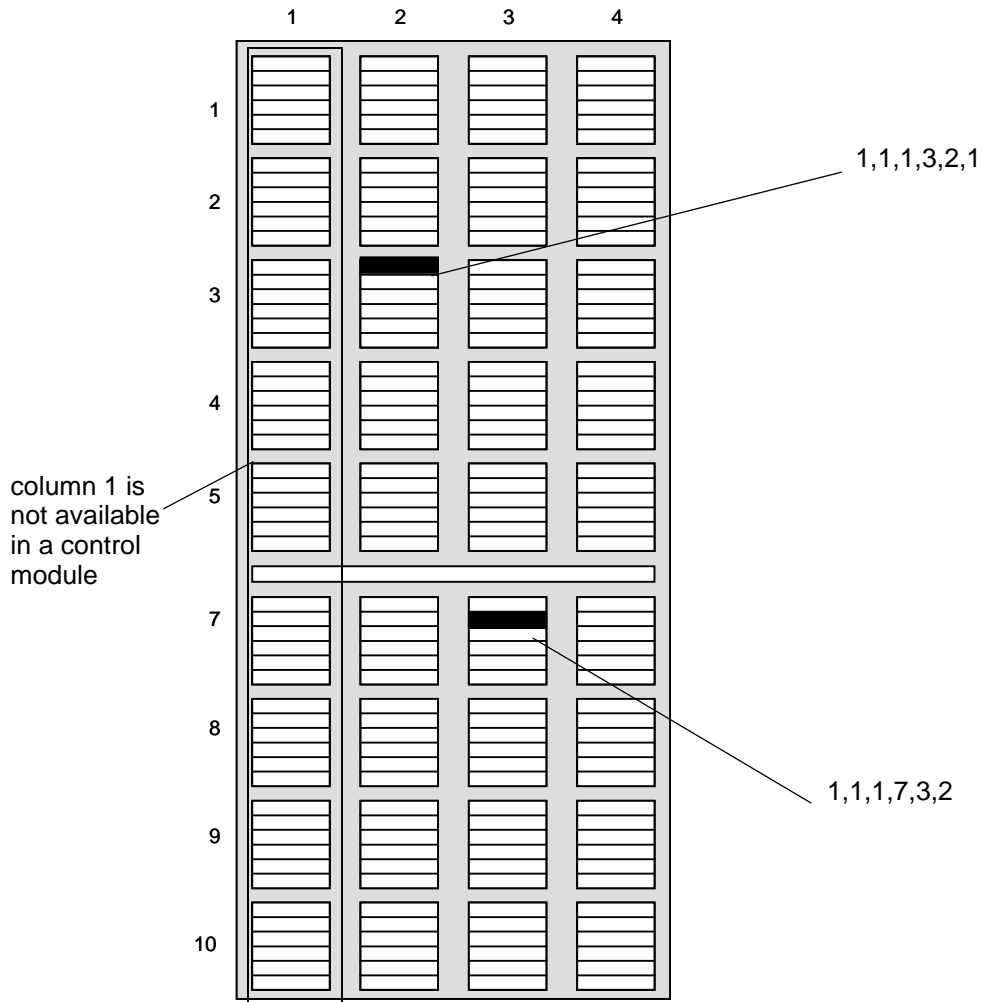


Note

In [figure 40](#) on page 370, the five magazines shown in column 4, sections 6-10 do not exist in a control module. However, these magazines exist in expansion modules.

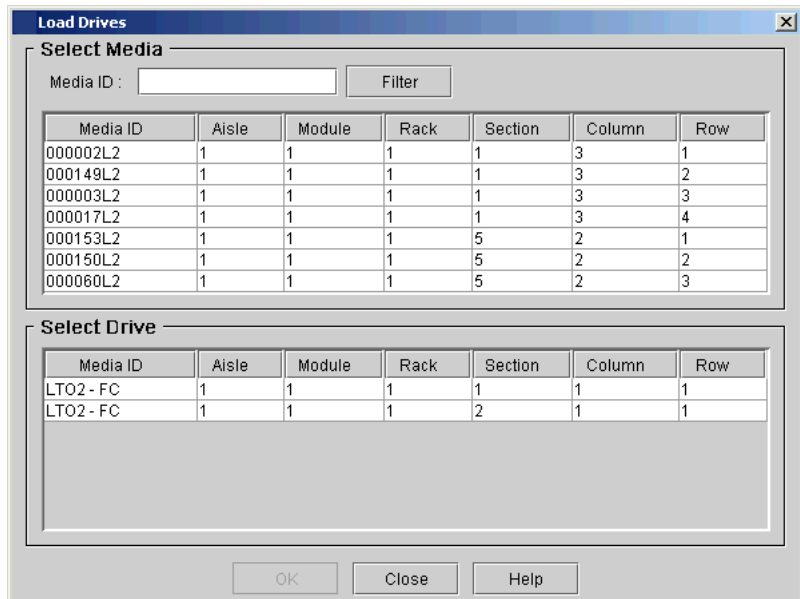
[Figure 41](#) on page 372 shows examples of location coordinates. These examples assume that the linear storage is located in aisle 1, module 1, and rack 1. That is why the first three numbers in the comma separated list are 1,1,1. The last three numbers represent the address on the linear storage assembly.

Figure 41 Example Location Coordinates



The LMC uses dialog boxes, like the one shown in [figure 42](#), that enable you to specify cartridge locations. These coordinates are reported in parenthetical format with each element separated by commas. In parenthetical format, the location of cartridge 000002L2, shown in the **Load Drives** dialog box below, is (1,1,1,1,3,1).

Figure 42 Coordinates in Load Drives Dialog



Tape Drive Locations

The location coordinates of a drive is based on the position of the drive in the module and section.

- Tape drives are always in rack 1, column 1, of a particular module.
- Columns are read from left to right as you face the rack.
- Because all drives in the library are full-height drives, each drive is in row 1 of the designated section.
- The library can accommodate two drive clusters per rack with each drive cluster containing up to six drives.

- Drive number 1 is in the lowest section of the lower drive cluster. Drives are numbered from bottom to top. [Figure 44](#) on page 375 shows the physical location of drive 9, which is the last drive listed in the **Move Media** dialog box shown in [figure 43](#). Compare with [table 31](#).

Figure 43 Location Coordinates for Drives

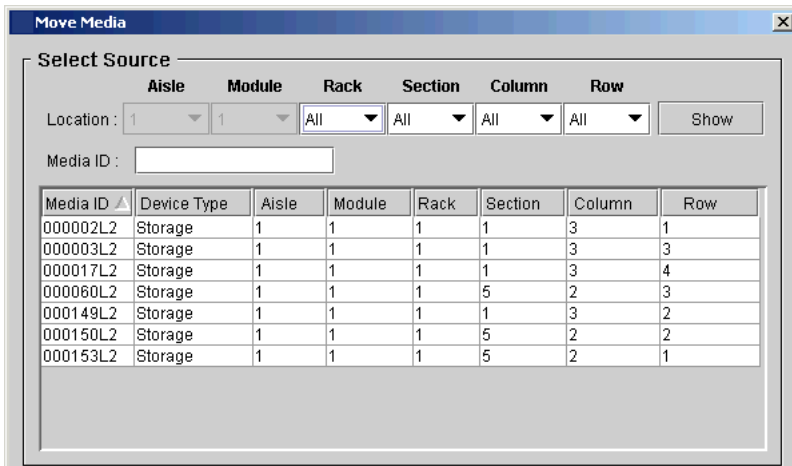
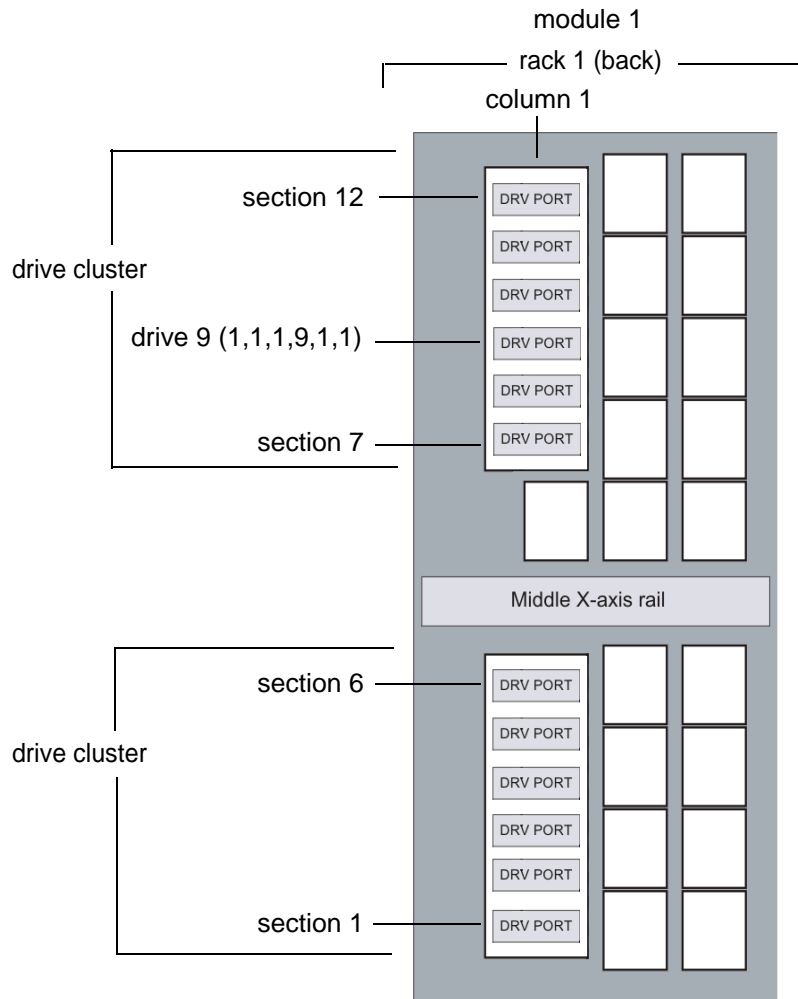


Table 31 Drive Location Coordinates

1	1-8	1	1-12	1	1
Aisle	Module	Rack	Section	Column	Row

Figure 44 Drive-side Location Coordinates



I/O Blade Locations

The LMC displays I/O blade locations in parenthetical format. For example, see the **Connectivity** dialog box in [figure 45](#). The location for the first I/O blade listed in the **Connectivity** dialog box is reported as (1,1,1,1,3). The location coordinates see aisle, module, rack, cluster, and bay. By reading the numbers backwards, you can determine that the location of the I/O blade is in bay 3 of the control module's I/O management unit. In [figure 46](#) on page 377, its bay (1,1,1,1,3) is shaded gray.

Figure 45 I/O Blade Location Coordinates

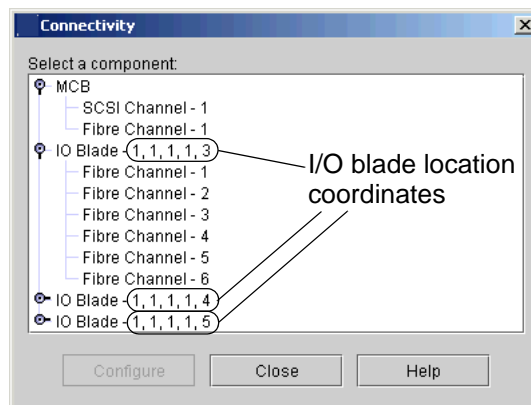


Figure 46 I/O Management
Unit Blade Numbering

fan	
bay 2 (CMB) (1,1,1,1,2)	
bay 4 (second FC I/O blade) (1,1,1,1,4)	
bay 6 (not used) (1,1,1,1,6)	
bay 8 (not used) (1,1,1,1,8)	
bay 1 (not used)	
bay 3 (first FC I/O blade) (1,1,1,1,3)	
bay 5 (third FC I/O blade) (1,1,1,1,5)	
bay 7 (not used) (1,1,1,1,7)	

The definitions for aisle, module, and rack are the same for I/O blades as they are for other library components. For more information, see [Cartridge Locations](#) on page 366.

The key to interpreting the last two blade location coordinates follows:

- **Cluster** – the cluster designation for the I/O management unit is always 1.
- **Bay** – there are eight bays in the I/O management unit. If you look at the I/O management unit from the back of a library module, bay 1 is the bay on the lower left. Bay 1 is not populated. Bay 2 always contains a management control blade (MCB). No I/O blades can be installed in bays 1 or 2. Bays 3 through 5 can contain I/O blades.

Table 32 Blade Location
Coordinates

1	1-8	1	1	3-8
Aisle	Module	Rack	Cluster	Bay

Viewing the Library (Physical or Partition)

The **View** menu enables you to view details about the physical library or a specific partition in the library information panel area of the main LMC display. It also provides access to the **Manage Views** dialog box from which you can quickly select between library views (physical or individual partitions) and take the physical library or a partition online or offline.



Note

Before you can begin many of the library operations that this guide describes, you must first set the library view to either the physical library or a partition.

Displaying the Physical Library or a Partition

From the **View** menu, click the name of the physical library or a partition. The physical library is listed at the top of the **View** menu. Individual partitions, if they exist, are listed below the physical library.

After you select a library view, the library information panel area of the main LMC display shows status information and statistical details about the physical library or partition.

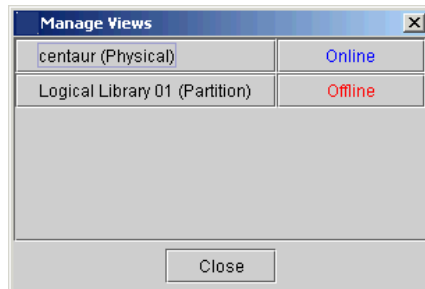
Managing Library Views

The **Manage Views** dialog box enables you to quickly select between library views (physical or individual partitions) and take the physical library or a partition online or offline. If you are using the LMC from a

remote client, you can keep this dialog box in view while you use the LMC to perform other library operations.

1 Click View→ Views.

The **Manage Views** dialog box appears with the physical library and any existing partitions listed. It also shows the current online or offline mode of each.



It is recommended that you keep this dialog box displayed to quickly manage library views and change online/offline modes as required by many library operations.

2 To change the library view, click the button with the name of the physical library or partition you want to view.

After you select a library view, the library information panel area of the main LMC display shows status information and statistical details about the physical library or partition.

3 To take the physical library or a partition online or offline, click the button in the right column that corresponds with the physical library or partition.



Note

You do not need to change the current library view to change the online or offline state of the physical library or a partition.

The **Change Library Mode** dialog box appears. For more information about using this dialog box to change online or offline mode, see [Changing the Library's State](#) on page 380.

Changing the Library's State

You can take the physical library or any of its partitions online or offline. Some library functions require that the physical library or partitions be in an online or offline state. You also can shut down the physical library from the library's touch screen.



Note

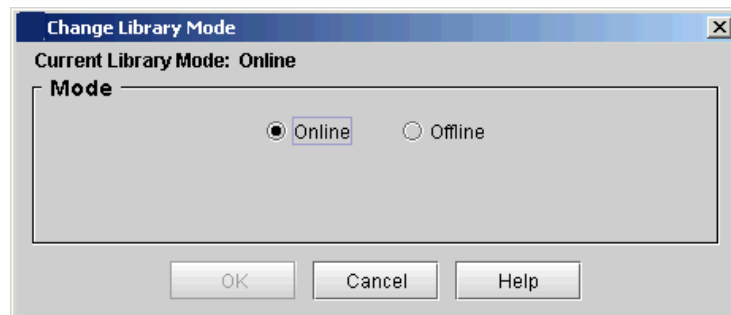
Shutting down the library only prepares it to be powered off. You will use the shutdown procedure in some circumstances to prepare the library for remove and replace procedures. For more information about shutting down the library, see [Shutting Down/Rebooting the Library](#) on page 393.

Taking the Physical Library or a Partition Online or Offline

To take the physical library online or offline, change its mode.

- 1 Make sure that you are viewing the physical library or the partition that you want to take online or offline. From the **View** menu, click the name of the physical library or the appropriate partition.
- 2 Click **Operations**→ **Change Mode**.

The **Change Library Mode** dialog box appears with the current state of the physical library or partition shown.



You can select the **Online** button to take either the physical library or a partition, depending on the current view, to an online state, which is the normal operating condition. In this mode, the robotics are enabled and all host commands are processed.

You can select the **Offline** button to take either the physical library or a partition, depending on the current view, to an offline state. If only the physical library is taken offline, the library's partitions will not process robotics commands, even though they are online. If only a partition is taken offline, neither the physical library nor the other partitions are affected.

- 3** Select either **Online** or **Offline**, and then click **OK**.
- 4** If you selected **Offline**, a message appears that asks you whether you want to continue. If you are sure that all backup applications are not using the library, click **Yes**.

Online and Offline Functionality

Some library functions require the physical library or partitions to be in a particular state (either online or offline) before they can be performed. If you choose a function that requires the library or partition state to be changed from its current state, you are prompted to do so.

[Table 33](#) on page 382 summarizes the library functions that require the physical library or partitions to be either online or offline.

Table 33 Library Functions
Requiring Online or Offline
State

Function	Physical Library	Partition
Operations→ Import Operations→ Export Operations→ Drives→ Load Operations→ Drives→ Unload Operations→ Move Media Operations→ Inventory (partition view) Setup→ Partitions (create, modify, or delete)	Online	Offline
Setup→ Device→ IDs Tools→ Partitions Defragmentation	–	Offline
Operations→ Inventory (physical library view) Tools→ Teach Tools→ Save/Restore (restore, revert, or rescue) Tools→ Verification Tests (start test) Tools→ Update Software (update or reinstall library software) Service→ Manual Diagnostics	Offline	–
Tools→ Update Software (set up autoleveling or update drive firmware) Tools→ Update Drive Firmware	(Offline) Current view (library or partition) must be offline	

Working With Local User Accounts

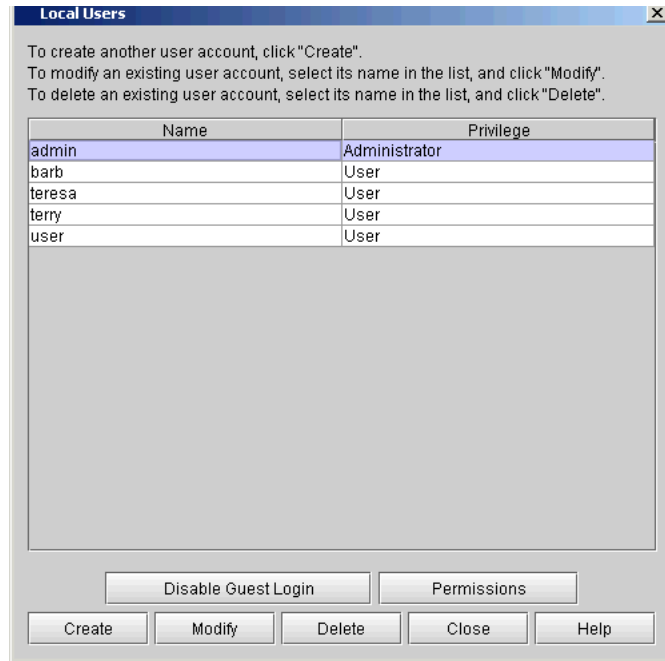
You can set up three levels of user accounts: guest, user, and administrator. Guests see only the main LMC display. Local Users can operate a partition, but cannot run diagnostic tools, which require access to the physical library. Administrators can access the entire physical library and all of its partitions. For a summary of user privileges defined by physical library, partition, and command menu, see [table 28](#) on page 354.

For information on user accounts that reside on a Lightweight Directory Access Protocol (LDAP) server, see [Using LDAP](#) on page 192.

Creating Local User Accounts

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup** → **Local Users**.

The **Local Users** dialog box appears.



- 4 To prevent guest login privileges on the library, you must click **Disable Guest Login**. You can toggle between **Disable Guest Login** and **Enable Guest Login**.



Note For a list of commands that are available to users logging on to the library as a guest, see [table 28](#) on page 354.

- 5 To create a user account, click **Create**.

The **Local Users - User Account Type** dialog box appears.

Local Users - User Account Type

Create User Account

Enter a name for the user account. Enter a password and confirm the password. To create a "User" account, select "User" and click "Next". To create a "Administrator" account, select "Administrator" and click "Finish".

Enter User Name:

Enter Password:

Confirm Password:

Select Privilege: Administrator
 User

< Back Next > Finish Cancel Help

6 In the **Enter User Name** text box, type a user name.



Note

User accounts with the names "guest", "admin", and "service" are reserved. You cannot use these names for user accounts.

7 In the **Enter Password** text box, type a password.




Note

Passwords that are most secure include a combination of letters, numbers, and non-alphanumeric characters. Passwords must be eight or more characters in length. The word "password" is not available for use.

8 In the **Confirm Password** text box, type the password again.

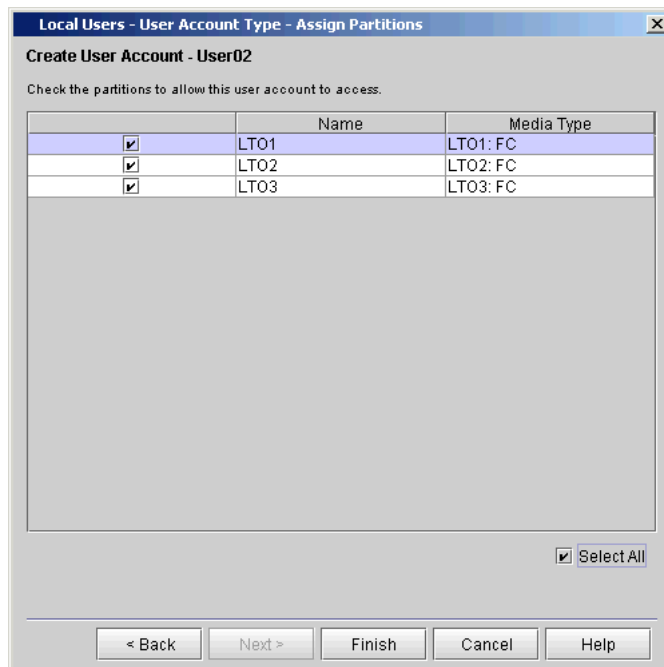
9 For **Select Privilege**, select a privilege level (**Administrator** or **User**).

 **Note** For a list of commands that are available to administrators and users, see [table 28](#) on page 354.

10 Perform one of the following tasks:

- If you selected **Administrator**, the **Finish** button becomes available. To register your user account selections, click **Finish**, and then skip the remaining information in this procedure.
- If you selected **User**, click **Next**.

The **Local Users - User Account Type - Assign Partitions** dialog box appears.



11 On the **Local Users - User Account Type - Assign Partitions** dialog box, select the check boxes to the left of the libraries to which you want the user to have access, or select the **Select All** check box to give the user access to all listed libraries.

12 To register your user account selections, click **Finish**.



Note The **Back** button enables you to go back to a previous dialog box and make changes to your selections.

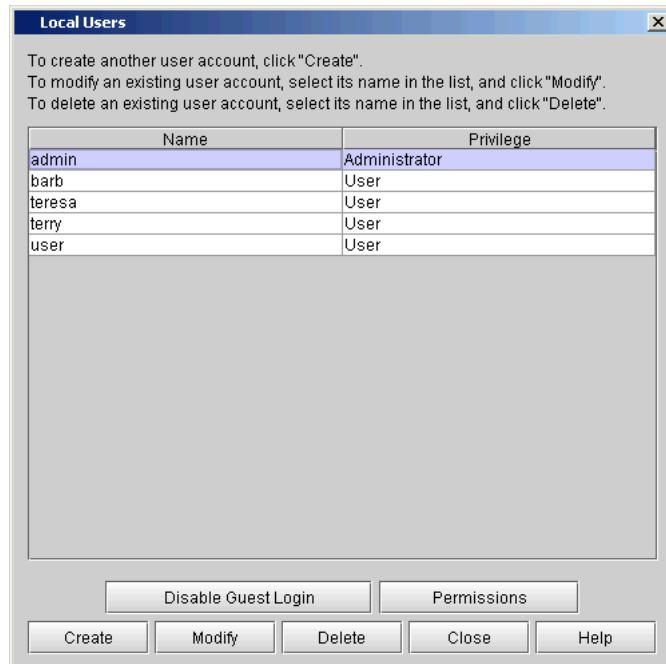
13 Modifying Local User Accounts

14 Log on as an administrator.

15 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.

16 Click **Setup**→ **Local Users**.

The **Local Users** dialog box appears.





Note

If you want to modify guest privileges, you can toggle between **Enable Guest Login** and **Disable Guest Login**. For a list of commands that are available to users logging on to the library as a guest, see [table 28](#) on page 354.

- 17 Click the name of the account that you want to modify to highlight it, and then click **Modify**.

The following dialog box appears.

Local Users

Modify User Account - user

Change the password or the privilege for this user account.

Enter Password: [*****]

Confirm Password: [*****]

Select Privilege: Administrator
 User

< Back Next > Finish Cancel Help

- 18 If you want to change the user account password, type a new password in both the **Enter Password** and **Confirm Password** text boxes. Otherwise, proceed to the next step.



Note

Passwords that are most secure include a combination of letters, numbers, and non-alphanumeric characters. Passwords must be eight or more characters in length. The word “password” is not available for use.

It is recommended that you change all account passwords periodically.

- 19** If you want to change the privilege level of this user account, select the appropriate privilege level (**Administrator** or **User**). Otherwise, proceed to the next step.

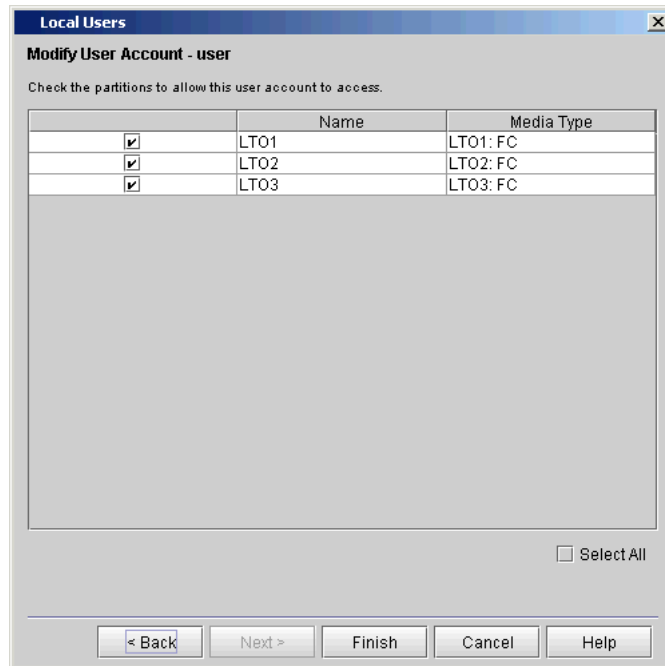


Note

For a list of commands that are available to administrators and users, see [table 28](#) on page 354.

- 20** Perform one of the following tasks:
 - If **Select Privilege** is set to **Administrator**, the **Finish** button is available. To register your user account changes, click **Finish**, and then skip the remaining information in this procedure.
 - If **Select Privilege** is set to **User**, click **Next**.

The following dialog box appears.



- 21 On this dialog box, select the check boxes to the left of the libraries to which you want the user to have access, or select the **Select All** check box to give the user access to all listed libraries.
- 22 To register your user account selections, click **Finish**.



Note

The **Back** button enables you to go back to a previous dialog box and make changes to your selections.

Deleting Local User Accounts

- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→**Local Users**.

The **Local Users** dialog box appears.

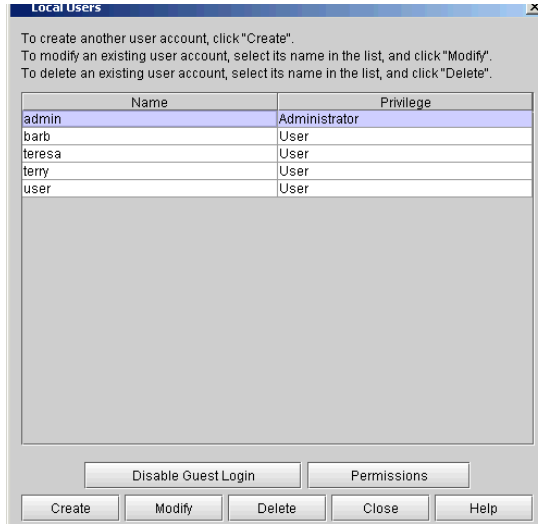
- 4 Click the name of the account that you want to delete to highlight it.
- 5 Click **Delete**.
- 6 A message appears that asks you whether you are sure that you want to delete the account. Click **Yes**.

The library deletes the user account.

Viewing Local User Account Permissions

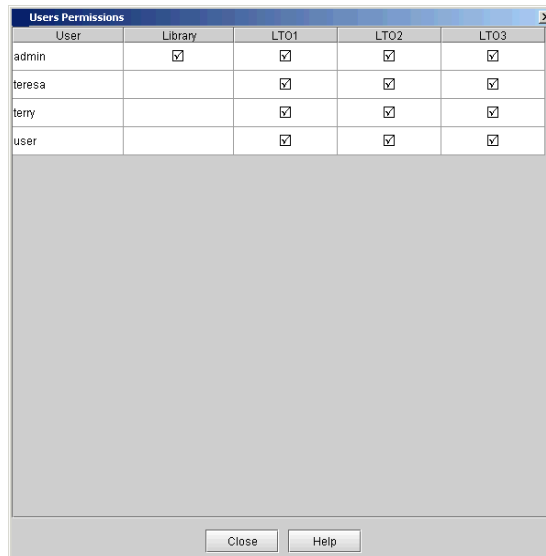
- 1 Log on as an administrator.
- 2 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 3 Click **Setup**→**Local Users**.

The **Local Users** dialog box appears.



To view the permissions for all users, click **Permissions**.

The **Users Permissions** dialog box displays.



4 Click **Close** to return to the **Local Users** dialog box.

Shutting Down/Rebooting the Library

Always perform the shutdown process before you remove power from the library. **Shutdown** prepares the library's operation system and firmware for when you physically turn off power to the library. Shutdown makes sure that the library finishes all active commands received from the host and prevents the processing of any new commands. It also shuts down all partitions.

Reboot shuts down and restarts the library's operating system and firmware. When performing a reboot, the library finishes all active commands received from the host application and does not process any new commands. The library shuts down all partitions and restarts them during the reboot. In addition, if automatic inventory is enabled, the library performs an inventory of cartridges, tape drives, and slots during a reboot. For more information on automatic inventory, see [Setting Up Policies for the Physical Library](#) on page 136.

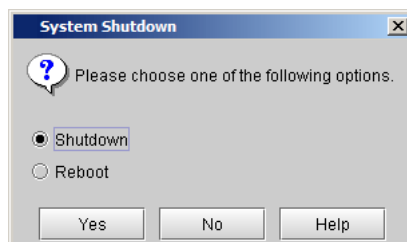


CAUTION

Before shutting down or rebooting the library, make certain there is no I/O activity on any of the partitions.

- 1 Make sure that you are viewing the physical library. From the **View** menu, select the name of the physical library.
- 2 Select **Operations**→**System Shutdown**.

The **System Shutdown** dialog box appears with Shutdown selected as the default.



- 3 Select **Shutdown** to do a complete shutdown and power off of the library, or select **Reboot** to do a reset of the library without powering off.
- 4 A message appears that asks you whether you want to continue. If you are sure that all I/O operations are finished, click **OK**.



Note

To recover from library shutdown, you must cycle power on the library (power it off and then power it on). See [Powering Off the Library](#) and [Powering On the Library](#) on page 395.

When the shutdown process completes, the LMC display turns dark. The library is now ready to be powered off.

.Powering Off the Library



CAUTION

Always perform the shutdown procedure before powering off the library. Shutdown prepares the library's operation system and firmware for when you physically turn off power to the library. If you do not perform library shutdown before you power off the library, loss of data could occur. See [Shutting Down/Rebooting the Library](#) on page 393.

- 1 After starting the shutdown process, wait for the LMC display to turn dark.
- 2 To turn off power to the library, press the **Power** button on the indicator panel.
- 3 On the power distribution unit(s), set the circuit breaker switch to the down (O) position.

Powering On the Library

- 1 Make sure that you wait 15 seconds after powering off the library before you power it on.



CAUTION

Waiting 15 seconds is important because the power supply discharges for 10 seconds after you power off the library. If you attempt to power on the library too soon, the power supply will fault.

- 2 On the power distribution unit(s), set the circuit breaker switch to the up (I) position.
- 3 To turn on power to the library, press the **Power** button on the indicator panel.

The library begins to boot up. Within five minutes, the LMC display appears on the library's touch screen. A library with only a few drives usually will be fully powered on and ready for use within 10 minutes. However, if a library is large with a high number of drives, it can take more than an hour for the library to fully power on, complete its discovery process, and become ready for use. During the power-on process, the **Robotics Enabled** indicator flashes. When the library is fully up and ready to receive commands, the **Robotics Enabled** indicator turns solid green.

Locking/Unlocking the I/E Station

The Scalar i2000 I/E stations have multiple open and close sensors. When you are finished accessing the I/E station, make sure the station door is fully closed.

There are two reasons the I/E station door locks:

- The library imports or exports a cartridge from the I/E station door. While the library is attempting to import or export a tape from a given I/E station slot, only the associated I/E station door is locked in the closed position. All other I/E station doors remain accessible.

On a get command from an I/E station slot, the associated I/E station door remains locked until the media has been successfully moved to its destination. This allows the media to be returned to the I/E station slot in the event of a put error.

- A user has requested that the I/E station door be locked.
- The application software has locked the I/E station as part of the normal tape movement process.

Administrative users can lock or unlock the I/E station doors using an option from the **Tools** menu.

- 1 Make sure that you are viewing the physical library. From the **View** menu, click the name of the physical library.
- 2 Click **Tools**→ **I/E Station**.
The **I/E Stations** dialog box appears.



- 3 To change the state of the I/E station doors, do one of the following:
 - To lock an I/E station door, in the appropriate Action column, click **Lock**.
 - To unlock an I/E station door, in the appropriate Action column, click **Unlock**.
- 4 To return to the main console, click **Close**.

When Robotics Are Not Ready

When the library robotics are not yet ready to accept commands, aspects of the LMC are still available while other aspects are not. This situation can occur during startup, reboot, or while the library is running. During run time, for example, the robotics will become unavailable if someone opens and closes an access door without then pressing the **Robotics Enabled** button.

Whenever robotics become disabled, a message appears in the **Activity** area on the main LMC display that states, “Warning: The Robotics are not Enabled.” Users can log on locally or remotely while the robotics are disabled.

[Figure 34](#) lists the menu commands that are available when the robotics become disabled either before system discovery can occur or after system discovery has occurred. As the table shows, significantly fewer menu commands are available when the library is started up or rebooted and the robotics become disabled before system discovery occurs.



Note

Menu commands not listed in the table are not available at all when the robotics become disabled, regardless of when the robotics become disabled. Unavailable menu commands are grayed out on the LMC.

Table 34 Menu Commands
When Robotics Are Disabled

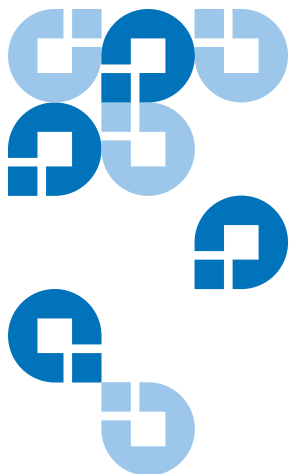
Available Menu Commands When Robotics Become Disabled	After Discovery	Before Discovery
Operations→ Change Mode (for shutdown only)	X	X
Operations→ Log Off	X	X
Monitor→ Drives	X	
Monitor→ Connectivity→ IO Blade	X	

Table 34 Menu Commands
When Robotics Are Disabled

Available Menu Commands When Robotics Become Disabled	After Discovery	Before Discovery
Monitor→Connectivity→SCSI Channel	X	
Monitor→Connectivity→Fibre Channel	X	
Monitor→IE Station	X	
Monitor→Slot	X	
Monitor→Media	X	
Monitor→Sensor	X	
Monitor→Users	X	
Setup→Setup Wizard	X	
Setup→Partitions	X	
Setup→Device→IDs	X	
Setup→Device→Access→Channel Zoning	X	
Setup→Device→Access→SCSI Host	X	
Setup→Device→Access→FC Host	X	
Setup→Connectivity→Port Configuration	X	
Setup→Connectivity→Datapath Conditioning	X	
Setup→Connectivity→FC Host Port Failover	X	
Setup→Network Configuration (from library's touch screen only)	X	X
Setup→Physical Library	X	
Setup→Users	X	
Setup→Notification	X	
Setup→Date and Time	X	
Setup→Licenses	X	

Table 34 Menu Commands
When Robotics Are Disabled

Available Menu Commands When Robotics Become Disabled	After Discovery	Before Discovery
Setup→ Email Configuration	X	X
Setup→ Trap Registration	X	
Setup→ Security	X	X
Tools→ Tickets	X	X
Tools→ Drives	X	
Tools→ Connectivity	X	
Tools→ Capture Snapshot	X	
Tools→ Save/Restore	X	
Tools→ Verification Tests	X	X
Tools→ Command History Log	X	X
View→ [physical library name] (Physical)	X	X
View→ [partition name] (Partition)	X	
View→ Views	X	X
Help→ Index	X	X
Help→ About	X	X



Working With Cartridges and Barcodes

The Library Management Console (LMC) simplifies cartridge loading and unloading, importing and exporting, and moving and inventory operations. The maximum library configuration can accommodate from 102 to 3,492 LTO cartridges or from 100 to 2,915 DLT cartridges for the following drive types:

- SCSI or Fibre LTO-1
- SCSI or Fibre LTO-2
- Fibre LTO-3
- Fibre LTO-4
- SCSI SDLT-320
- Fibre SDLT-600
- Fibre DLT-S4



CAUTION

Although the physical library can contain more than one media domain or drive domain, you cannot have a mix of domain types within a partition (for example, LTO and DLT). A single partition can have a mixture of drive types and interface types within the same domain (for example LTO-1 and LTO-2 with SCSI or Fibre Channel interfaces).

Every partition in the library must contain at least one cleaning cartridge.

This chapter consists of the following sections:

- [Handling Cartridges Properly](#) on page 401
- [Write-Protecting Cartridges](#) on page 402
- [Barcode Requirements](#) on page 403
- [Installing Barcode Labels](#) on page 405
- [Using Cleaning Cartridges](#) on page 406
- [Managing Media](#) on page 407

Handling Cartridges Properly

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

- Select a visible location to post procedures that describe proper media handling.
- Ensure that anyone who handles cartridges has been properly trained in all procedures.
- Do not drop or strike cartridges. Excessive shock could damage the internal contents of cartridges or the casings themselves, rendering the cartridges unusable.
- Do not expose cartridges to direct sunlight or sources of heat, including portable heaters and heating ducts.
- Do not stack cartridges more than five high.
- The operating temperature range for LTO cartridges is 10° to 35°C. The storage temperature range is 16° to 32°C in a dust-free environment with a relative humidity range between 20% and 80% (non-condensing).
- If cartridges have been exposed to temperatures outside the ranges specified above, stabilize the cartridges at room temperature for the same amount of time they were exposed to extreme temperatures or 24 hours, whichever is less.

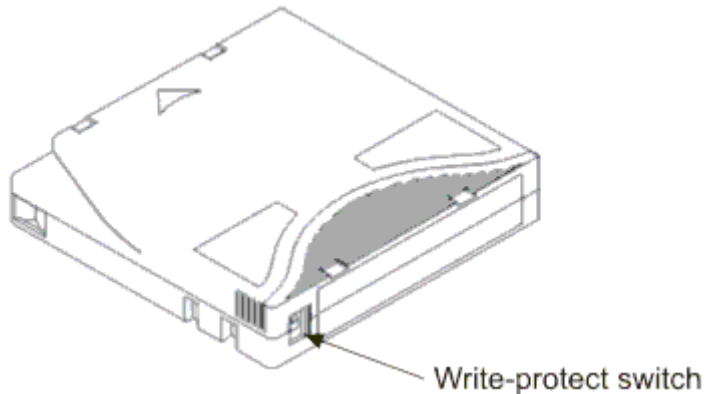
- Do not place cartridges near sources of electromagnetic energy or strong magnetic fields, such as computer monitors, electric motors, speakers, or x-ray equipment. Exposure to electromagnetic energy or magnetic fields can destroy data and the embedded servo code written on the media by the cartridge manufacturer, rendering the cartridges unusable.
- Place identification labels only in the designated slots on the cartridges.
- If you ship cartridges, ship them in their original packaging or something stronger.
- Do not insert damaged cartridges into drives.
- Do not touch the tape or tape leader.
- Do not degauss cartridges that you intend to reuse.

Write-Protecting Cartridges

All cartridges, whether LTO or DLT, have a write-protect (write-inhibit) switch to prevent accidental erasure or overwriting of data. Before loading a cartridge into the library, make sure that the write-protect switch is positioned correctly (either on or off).

- For LTO cartridges, slide the red or orange write-protect switch to the right so that the padlock shows in the closed position. The switch is located on the left side of the cartridge front. See [figure 47](#) on page 403 for the location of the switch on an LTO cartridge.
- For DLT cartridges, slide the write-protect switch to the left so that the switch window shows orange. The switch is located on the left side of the cartridge front.

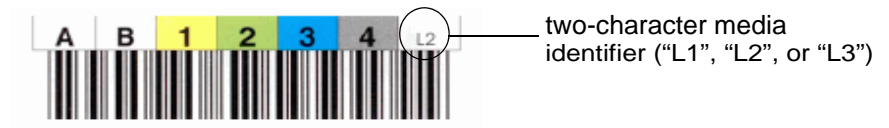
Figure 47 Write-protect Switch
on an LTO-1 Cartridge



Barcode Requirements

Cartridges must have an external barcode label that is machine-readable to identify the volume serial number. A barcode must use only uppercase letters A to Z and/or numeric values 0 to 9. The library supports Code 39 (3 of 9) type barcode labels.

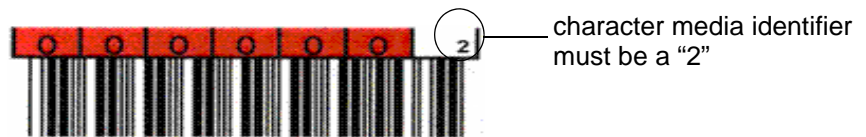
For LTO media barcodes, the library dynamically supports 1 to 14 characters for volume serial number plus a two-character media type identifier. The image below is an example of a supported LTO barcode label.



For SDLT I media barcodes, the library dynamically supports 1 to 14 characters for volume serial number plus a one-character media type identifier. The image below is an example of a supported SDLT I barcode label.



For SDLT II media barcodes, the library dynamically supports 1 to 14 characters for volume serial number plus a one-character media type identifier. The image below is an example of a supported SDLT II barcode label.



For DLT-S4 media barcodes, the library dynamically supports 1 to 14 characters for volume serial number plus a one-character or two-character media type identifier. The media identifier can be either "4" or "S4".

Quantum-supplied barcode labels will provide the best results. Barcode labels from other sources can be used, but they must meet the following requirements:

- ANSI MH10.8M-1983 Standard
- Number of digits: 6+1 (DLT) or 6+2 (LTO)
- Background reflection: greater than 25 percent
- Print contrast: greater than 75 percent
- Ratio: greater than 2.2
- Module: 250 mm
- Print tolerance: ± 57 mm

Additional Requirements:

- Height of the visible portion of the barcode: 10 mm \pm 2 mm

- Length of the rest zones: 5.25 mm ± 0.25 mm
- No black marks should be present in the intermediate spaces or rest zones
- No white areas should be present on the bars

Installing Barcode Labels

Each cartridge in the library must have an external label that is operator and machine readable to identify the barcode number. Most manufacturers offer cartridges with the labels already applied or with the labels included that you can attach.



Note

Duplicate barcodes are not supported even if you have mixed media or multiple partitions in the library. If the library detects cartridges in vertically adjacent storage slots with identical barcode labels, the library creates a ticket to notify you of the problem. If the library has non-adjacent cartridges with identical barcode labels, the library does not notify you of the problem. Areas in the LMC where media IDs are listed will show information for the first cartridge, but the cartridge with the duplicate barcode label will not be listed.

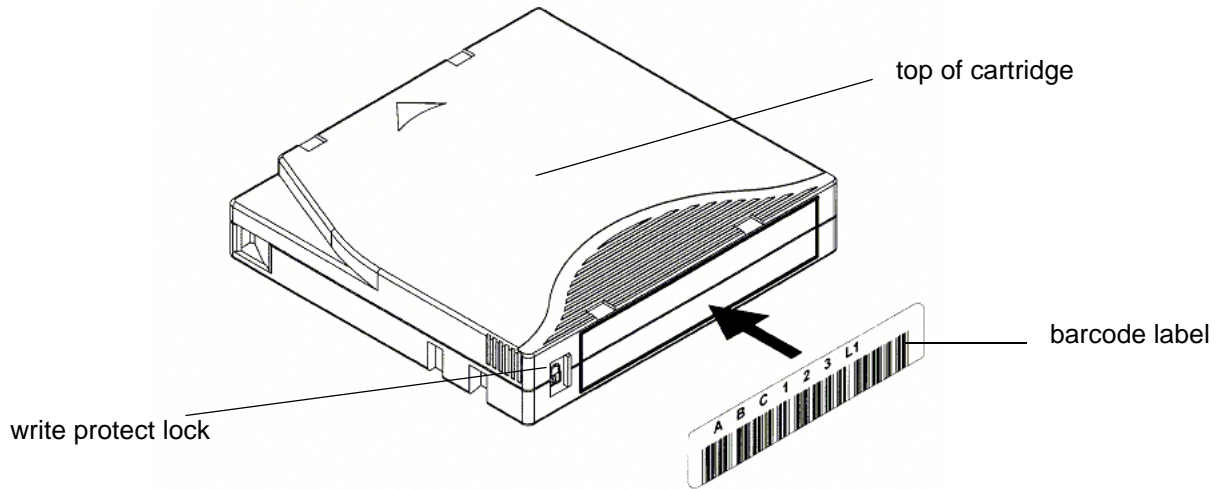
All barcode labels are applied to the front of a cartridge. Peel off the label and place it on the cartridge. Verify that label is oriented so that the numbers appear above the barcode. [Figure 48](#) on page 406 shows an example of a barcode label being applied to an LTO cartridge.



CAUTION

Do not place a barcode label on top of a cartridge. Doing so can cause inventory operations to fail.

Figure 48 Applying Barcode Labels to Cartridges



Using Cleaning Cartridges

Most tape drives require occasional cleaning. A cleaning cartridge cleans accumulated debris from the tape drive and the read/write head.



CAUTION

You must use a separate cleaning cartridge for each partition in the library.

Backup applications or archive software applications use different techniques to automate the process of cleaning drives. These tools specify cleaning cycles based on cycle counts of the drive, drive requests, or regularly scheduled intervals.

The cleaning process itself requires certain considerations:

- Cleaning tapes must be labeled with a barcode. In some cases, specific labels have been established as industry standard. For instance, the prefix “CLN” might be used to identify a cleaning tape. The library does not require a specific content to the label and accepts conventional tape labels.
- Insert a cleaning tape just as you do any other data tape. For example, the most common method is by means of the I/E station using host application control.
- Cleaning tapes often have limited lives that can last only as long as 20 cycles. The controlling host application manages the number of uses of a cleaning tape. Errors can occur if a tape is inserted into a drive when the tape has already been used the maximum number of times.
- Export a cleaning tape just as you would export any other data tape.
- The concepts of physical and partitions must be considered when setting up cleaning procedures and methods. In general, cleaning cartridges must be treated in the same manner as data cartridges. Any physical cartridge (cleaning or data) can exist in only one partition. There can be no sharing of cleaning cartridges between partitions.

Managing Media

The LMC provides you with commands for:

- Importing and exporting cartridges
- Moving media from one storage location to another
- Loading and unloading drives
- Taking inventory

The following sections provide step-by-step instructions for performing these tasks.



Note

Unless the situation requires it, use the host application to move, load, unload, import, or export cartridges instead of doing so through the LMC. Using the host to move media makes sure that the host's view of the library remains in sync with the library's actual configuration.

Importing Cartridges Into Partitions

When you first start using your library, open the door and manually insert, directly into storage slots, as many cartridges as you plan to use. The cartridges will not go back all the way if they are inserted incorrectly.

After your library begins operation, use the **Import Media** dialog box to add cartridges without interrupting library operations. Place cartridges in the I/E station. The scanner automatically reads the barcodes on new cartridges.

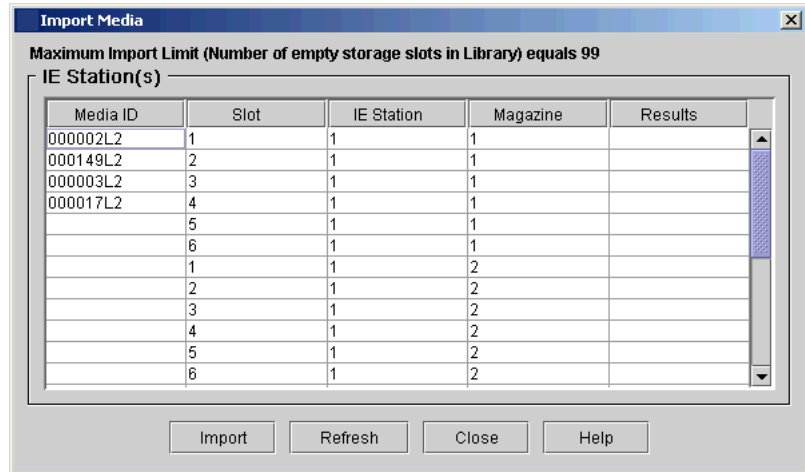
- 1 Make sure that you are viewing the partition into which you want to import a data cartridge. From the **View** menu, click the name of the appropriate partition.
- 2 Insert a data cartridge into an appropriate I/E station. You can insert multiple cartridges up to the maximum number of slots in your I/E station.

To see which I/E stations are associated with a particular partition, click **Monitor**→**IE Station**.

- 3 Click **Operations**→**Import** or click the **Import** toolbar button.

If the partition is not offline, you receive a message that asks you whether you want to take it offline. Click **Yes**.

The **Import Media** dialog box appears with a list of cartridges in the I/E station displayed.



The following table describes the elements on the **Import Media** dialog box.

Element	Description
Media ID	The volume serial number of the cartridge.
Slot	The number of the slot in the I/E station magazine. To understand the location designation, see Understanding Location Coordinates on page 366.
IE Station	The number of the module. To understand the location designation, see Understanding Location Coordinates on page 366.
Magazine	The number of the magazine (section) where the slot is located, numbered from the top down. To understand the location designation, see Understanding Location Coordinates on page 366.
Results	“Imported” or “Failed”.

4 Click a cartridge to highlight it, and then click **Import**.

The picker automatically moves the cartridge from the I/E station to the first available empty slot in that partition. You cannot manually specify the slot.

Exporting Cartridges From Partitions

When partitions are created, specific I/E station slots are associated with that partition. When you export cartridges in a library with partitions, cartridges are exported to the partition's I/E station slots. You can only export cartridges if I/E station slots for that partition are empty.

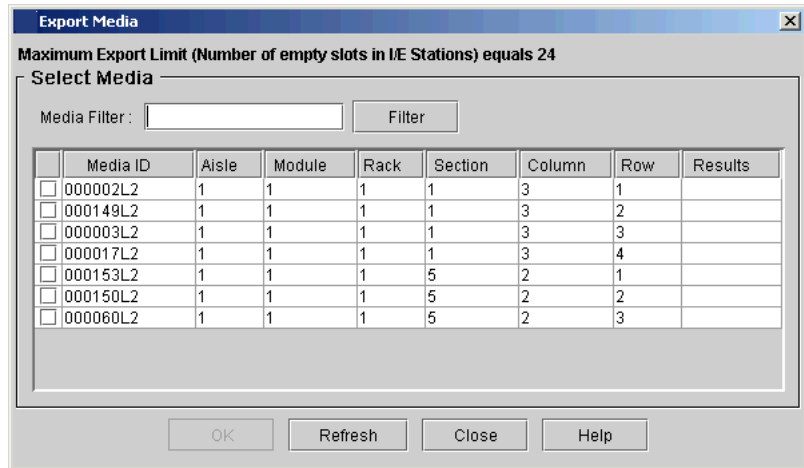
- 1 Make sure that you are viewing the partition from which you want to export a data cartridge. From the **View** menu, click the name of the appropriate partition.
- 2 Click **Operations**→ **Export** or click the **Export** toolbar button.



Note The physical library must be online.

If the partition is not offline, you receive a message that asks you whether you want to take it offline. Click **Yes**.

The **Export Media** dialog box appears with a list of cartridges in the partition displayed.



- 3 If you want to display one or more media IDs that match a particular pattern, type a media filter in the **Media Filter** text box, and then click **Filter**.

Filter performs a search for media IDs that match a particular pattern. In the example, the media filter has been set to capture media IDs beginning with the string "J00".

- 4 Select the corresponding check box in the leftmost column for each cartridge that you want to export.

The maximum number of slots that are available in the I/E station partition appears at the top of the table.

- 5 Click **OK**.

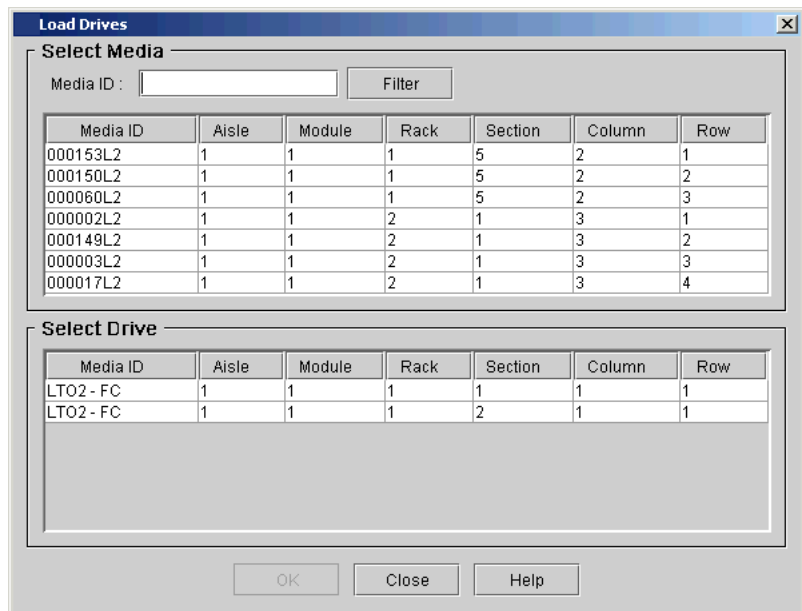
All designated cartridges are exported to the I/E station slots that are associated with the partition. After the operation completes, the library automatically refreshes information in the table.

Loading Drives

The **Load Drives** dialog box enables you to load drives with cartridges from the current partition.

- 1 Make sure that you are viewing the partition from which you want to load drives. From the **View** menu, click the name of the appropriate partition.
- 2 Click **Operations**→**Drives**→**Load**.

The **Load Drives** dialog box appears.



- 3 If you want to display one or more media IDs that match a particular pattern, type a media filter in the **Media ID** text box, and then click **Filter**.

Filter performs a search for media IDs that match a particular pattern. In the example, the media filter has been set to capture media IDs beginning with the string "J00".

- 4 Click the data cartridge to load into the drive to highlight it.



Note

You can load only one cartridge at a time.

The parameters used to define a cartridge are media ID (barcode) and location. Location is defined as a series of coordinates representing the aisle, module, rack, section, column, and row where a cartridge is located. See [Understanding Location Coordinates](#) on page 366.

The **Select Media** area shows the full slots.

- 5 Click the destination drive to receive the media to highlight it. The **Select Drive** area is populated with empty drives.

You can select only one drive at a time.

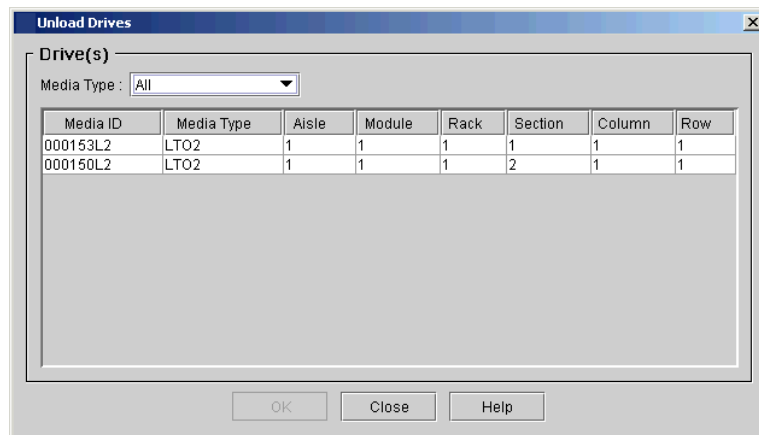
- 6 To load the data cartridge into the selected drive, click **OK**.

Unloading Drives

The **Unload Drives** dialog box enables you to rewind the cartridge in the drive, eject it, and return it to storage.

- 1 Make sure that you are viewing the partition from which you want to unload drives. From the **View** menu, click the name of the appropriate partition.
- 2 Click **Operations**→**Drives**→**Unload**.

The **Unload Drives** dialog box appears.



- 3 If you want to display media IDs by media type, click the appropriate media type from the **Media Type** drop-down list.
- 4 Click the drive you want to unload to highlight it. You can only unload one drive at a time.

The parameters used to define a cartridge are media ID (volume serial number) and location. Location is defined as a series of coordinates representing the aisle, module, rack, section, column, and row where a cartridge is located. See [Understanding Location Coordinates](#) on page 366.

5 Click OK.

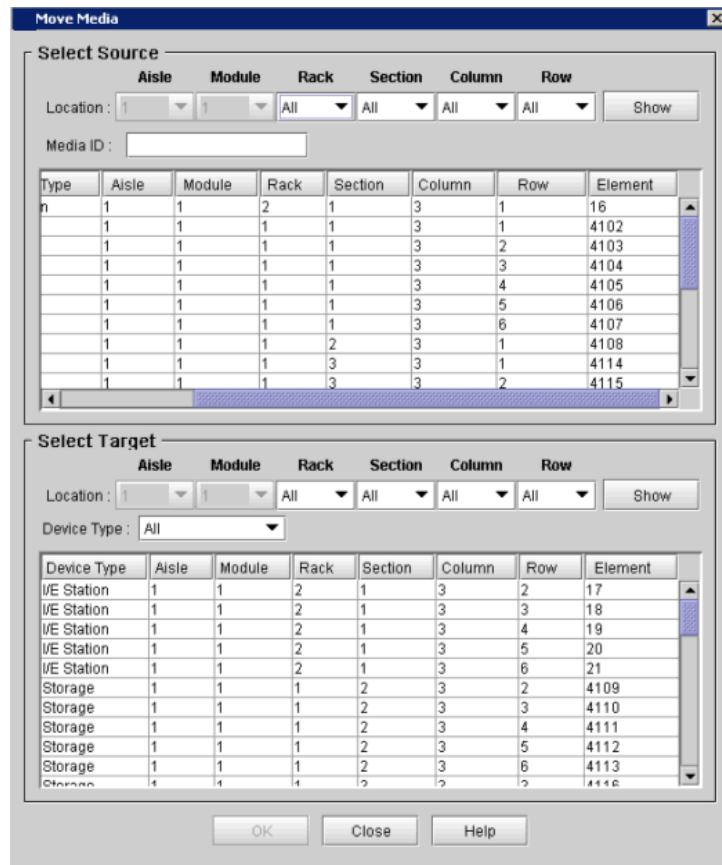
The library rewinds the data cartridge, unloads it from the drive, and returns it to storage.

Moving Media

The **Move Media** dialog box enables you to move media from one location to another within a partition.

- 1 Make sure that you are viewing the partition within which you want to move media. From the **View** menu, click the name of the appropriate partition.
- 2 Click **Operations**→ **Move Media**.

The **Move Media** dialog box appears.



The table in the **Select Source** area lists slot locations with cartridges, and the table in the **Select Target** area lists slot locations without cartridges.

You can limit the cartridges that are listed in the **Select Source** table in the following ways:

- To list cartridges by location, click the arrows next to the location coordinate boxes at the top of the **Select Source** area, click the appropriate numbers or **All**, and then click **Show**. For information about location coordinates, see [Understanding Location Coordinates](#) on page 366.
- To list a particular cartridge by media ID, type the volume serial number of the cartridge in the **Media ID** text box, and then click **Show**. You also can type a partial volume serial number, such as "K00", to list all cartridges within the specified location coordinates that have a volume serial number containing the specified string of characters.

You also can limit the slot locations that are listed in the **Select Target** table by device type. From the **Device Type** drop-down list, click **I/E Station**, **Storage**, or **Drive**.

- 3 In the **Select Source** table, click the media ID for the cartridge that you want to move to highlight it. If necessary, you can use the scroll bar to display additional media IDs for cartridges that are in drives or I/E stations.
- 4 In the **Select Target** table, click the destination for the cartridge that you want to move to highlight it. If necessary, you can use the scroll bar to display additional slot locations.
- 5 Click **OK**.



Note

Only one cartridge can be moved at a time.

Inventory

The **Inventory** command causes the library to scan all storage locations, drives, and I/E stations. The library automatically performs an inventory when doors are closed or the library's configuration information is changed in any way. You can configure inventories to automatically occur whenever the power is cycled, or you can perform an inventory whenever you want by clicking **Operations**→**Inventory**. To enable automatic inventories, see [Setting Up Policies for the Physical Library](#) on page 136.

- 1 Log on as an administrator.

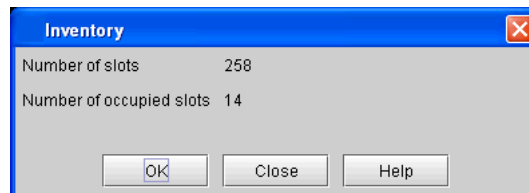
- 2 You can perform this procedure while either viewing the physical library or a partition. From the **View** menu, click the name of the physical library or the appropriate partition.
- 3 Click **Operations**→**Inventory**.



Note

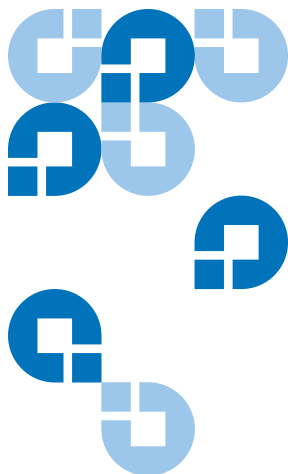
- If you want to perform an inventory of the physical library, and it is not offline, you receive a message that asks you whether you want to take it offline. Click **Yes**.
- If you want to perform an inventory of a partition, and if the physical library is offline, you receive a message asks you whether you want to take the physical library online. Click **Yes**. Also, if the partition is online, you receive a message that asks you whether you want to take it offline. Click **Yes**.

The **Inventory** dialog box appears.



This dialog box shows the total number of slots and the number of occupied slots in the physical library or the partition, depending on the view you chose.

- 4 To perform an inventory, click **OK**.
- 5 The inventory process take a few minutes to complete. When the “Inventory completed successfully” message appears, click **OK**.



Frequently Asked Questions

This appendix answers some questions that are most often asked about the library.

Where do I find installation instructions? The library requires that a trained Quantum Support Engineer perform the installation.

Where are error messages described? When the library detects issues, it sends you e-mail notifications and creates tickets that provide you with detailed information about the issues and corrective actions you can perform. A ticket can direct you to obtain further help from technical support. For more information about troubleshooting, see [Troubleshooting Your Library](#) on page 6.

How do I clean a drive? Use your backup software to clean the drives. For detailed instructions, see [Using Cleaning Cartridges](#) on page 406.

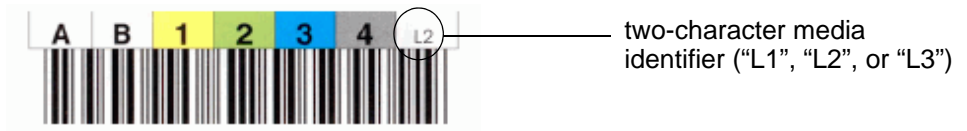
How do I know when the drives need cleaning? The host application informs you when drives need to be cleaned. See [Using Cleaning Cartridges](#) on page 406.

What is a partition? A partition is an abstraction of a single underlying physical library that presents the appearance of multiple, separate libraries for purposes of file management, access by multiple users, or dedication to one or more host applications. It is a collection of real physical elements, combined to create a grouping that is different from the physical library, and is often dedicated to a single host application. For example, you can choose to run one software application in one partition, and a different software application in a second partition. For a

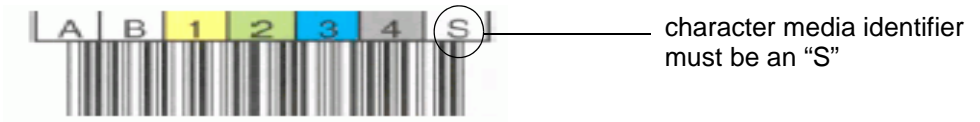
more information, see [Working With Partitions](#) on page 106. To learn how to create a partition, see [Creating Partitions](#) on page 111.

Where can I find the library's serial number? The serial number appears in the **ID** column for the first line of output on the **System Status** dialog box (**Monitor**→**System**). Use the serial number when contacting technical support for assistance.

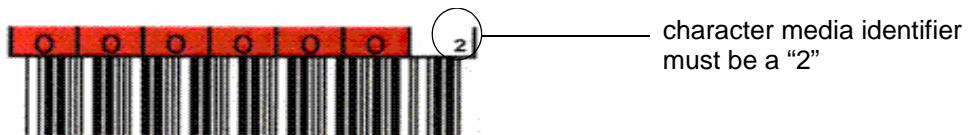
How many characters can be in the barcodes? For LTO media barcodes, the library dynamically supports 1 to 14 characters for volume serial number plus a two-character media type identifier. The image below is an example of a supported LTO barcode label.



For SDLT I media barcodes, the library dynamically supports 1 to 14 characters for volume serial number plus a one-character media type identifier. The image below is an example of a supported SDLT I barcode label.



For SDLT II media barcodes, the library dynamically supports 1 to 14 characters for volume serial number plus a one-character media type identifier. The image below is an example of a supported SDLT II barcode label.



For DLT-S4 media barcodes, the library dynamically supports 1 to 14 characters for volume serial number plus a one-character or two-character media type identifier. The media identifier can be either “4” or “S4”.

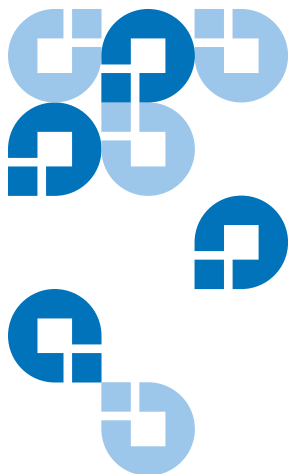
What barcode formats are supported? Cartridges must have an external barcode label that is machine-readable to identify the volume serial number. A barcode must use only uppercase letters A to Z and/or numeric values 0 to 9. The library currently supports Code 39 (3 of 9) type barcode labels.

What do I do if I lose my password? Contact technical support and they will tell you how to reset the password. See [Getting More Information or Help](#) on page 5.

What do I do if I lose power during a backup? If your library contains a redundant power supply, it is unlikely that power will ever be completely unavailable to the library.

The library should recover even if power goes out completely during a backup. If power remains off, press the **Power** button and leave it in the off position until you can obtain a reliable power source. When the power to the library is turned back on, the library will recover. You must re-run the backup using your application software.

If the library does not automatically come back up after a power outage, cycle library power. Cycling library power involves shutting down the library, powering it off, and then powering it on. For more information, see [Shutting Down/Rebooting the Library](#) on page 393, [Powering Off the Library](#) on page 394, and [Powering On the Library](#) on page 395. The blue LED on the power supply will be on and not blinking.



Appendix C Glossary

This glossary consists of terms unique to the library along with some storage industry terminology.

Access door

Refers to the doors on either the control module or expansion module from which you can access the magazines and accessor assembly.

ADIC Management Console (AMC)

The AMC server is used to manage the storage area network (SAN) and the library. AMC version 4.0 is the first version of the software to provide access to two clients, the AMC client (which manages the SAN) and the LMC client (which manages the library).

Capacity on demand (COD)

An Quantum library feature that enables users to have a large physical library, but users pay only for what capacity they are currently using. License upgrades enable more capacity to be added without a system interruption.

Control management blade (CMB)

A version of the MCB that has no I/O ports for Ethernet, SCSI, serial, or Fibre Channel. It is the controller board for the I/O management unit in expansion modules.

Control module

The first component of the library. It consists of an library management module, cartridges, drives, power, and an I/E station.

Data path

One of the many possible paths that data can move over in the storage area network environment, potentially involving many components or connections between initiators and targets that have been set since the initial configuration occurred.

Drive pooling

Drives to be held in a pool (or pools) of drives. You can specify policy settings for the drive pools to configure how each pool will react to a drive failure and load balancing.

Drive sled position

A slot where a Fibre Channel or SCSI drives reside in the control module or expansion module in one of the two drive clusters. There are six drive sled positions in each of the two drive clusters.

Expansion module

The library can have up to seven expansion modules. The optional hardware is available only in the control module and upgraded expansion modules. Storage-only expansion modules are available.

Host Registration Service (HRS)

Presents host information that the AMC server uses to manage host access and data retrieval. This information includes host name, host type, host connection, and the online or offline status.

I/E station

A door on the access door of the control module (or expansion modules) that contains magazines into which cartridges can be imported into or exported out of the library.

I/O management unit

A management and connectivity interface for the library. The control module and any expansion module can have I/O management units installed. The I/O management unit consists of at least one CMB and from one to six FC I/O blades.

Latchhook

The latches used to lock the printed circuit blades into place when they are inserted into the I/O management unit or library management module (LMM).

Library Management Console (LMC)

The management software client for the library. You can use the LMC either locally from the touch screen operator panel on the control module or remotely through a client instance of the AMC software on any computer attached to the network.

Library management module (LMM)

The connectivity interface for the three blades that provide intelligence and connectivity to the library through the control module. The management control blade (MCB), robotics control unit (RCU), and library motor drive (LMD) blades are installed in the LMM.

Linear Tape-Open (LTO)

A media technology that is open format. LTO comes in two formats, Accelis and Ultrium. Accelis is the fast access implementation, while Ultrium is the high capacity implementation.

Management control blade (MCB)

The library controller board, which resides in the LMM. The MCB has I/O ports for Fibre Channel, Ethernet, serial, and SCSI.

Partition

A partition is a logical portion of the physical library that is viewed by the host as if it is a complete library. Partitions present the appearance of multiple, separate libraries for purposes of file management, access by multiple users, or dedication to one or more host applications.

Picker

The robotic hand portion of the accessor assembly that handles cartridges.

Service door

The door on either the control module or expansion module that provides access to the I/O management unit, LMM, power supplies, drive sleds and other components.

Storage area network (SAN)

A SAN is a dedicated, high-performance network whose primary purpose is the transfer of data along FC or high-speed Ethernet connections between servers, interconnect devices, and storage peripherals.

Universal drive sled (UDS)

A sheet metal case that houses LTO or SCSI drives in the drive clusters.

WORM

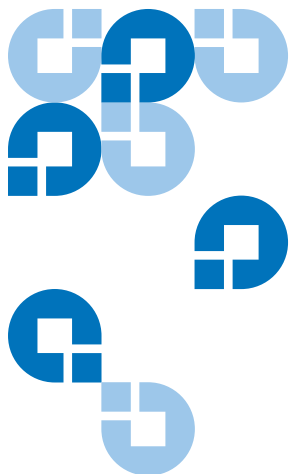
The Scalar i2000 library supports write once, read many technology in LTO-3 and LTO-4 tape drives. WORM allows non-erasable data to be written once and provides extra data security by prohibiting accidental data erasure.

X-axis

The horizontal position of the accessor assembly.

Y-axis

The vertical position of the accessor assembly.



Setting Up Your Library for Remote Access

The Library Management Console (LMC) that is available from the library's touch screen is also available as a remote client application. For more information about the LMC and its features, see [Library Management Console \(LMC\)](#) on page 349. For more information concerning using the Java applet (web browser), see [Logging On From the LMC Applet \(Web Browser\)](#) on page 340. Before you can manage the library remotely, you must install the LMC client application.



Note

You also can manage the library as part of a storage area network (SAN) by pointing the remote client to an external ADIC Management Console (AMC) server, separate from the LMC server on the library. Pointing the client to the external AMC server provides access to the AMC SAN client. This client shows the SAN and detected devices, including the Scalar i2000 library. Through the SAN client, you also can access the LMC. For more information about installing the AMC server and using the SAN client software, see the *ADIC Management Console User's Guide*.

Installing a Remote Client

Before installation, make sure that the system on which you are installing the remote client meets the following installation requirements.

Microsoft® Windows®	AIX®	HP-UX™	Solaris™	Linux
<ul style="list-style-type: none"> • Microsoft Windows 2000 with Service Pack 4 or later, Microsoft Windows 2003, Microsoft Windows XP with Service Pack 2 or later • 96 MB system memory • 40 MB free disk space 	<ul style="list-style-type: none"> • AIX 5.3 • 128 MB system memory • 60 MB free disk space on destination partition 	<ul style="list-style-type: none"> • HP-UX 11.i or later • 80 MB system memory • 80 MB free disk space on destination partition 	<ul style="list-style-type: none"> • Solaris 9. • 80 MB system memory • 60 MB free disk space in the destination partition • Common Desktop Environment (CDE) 	<ul style="list-style-type: none"> • ES 3.0 or AS 2.1 • 80 MB system memory • 60 MB free disk space

Installing the Client on a Windows System

The Windows client can run with Windows 2000, Windows 2003, or Windows XP.

- 1 Download the AMC application installer from:
<http://www.quantum.com/support>

Make sure to download the version of the client software that is compatible with:

- The library software version currently installed in the library.
- The hardware platform and operating system version of the host computer.

See <http://www.quantum.com/support> for information about hardware and software compatibility.

- 2 Unzip the downloaded file to extract the installer.
- 3 Double-click the installer to start the installation program.
- 4 The InstallAnywhere wizard starts and guides you through the installation.
- 5 When you are prompted to choose an installation set, select **Client Only**.
- 6 Complete the InstallAnywhere wizard and click **Done**.

To launch the AMC client, on the Windows **Start** menu, click **All Programs**→ **ADIC Management Console**→ **Client**.

Installing the Client on a UNIX System

The UNIX clients can run with Solaris, Linux, HP-UX, or AIX.

- 1 Download the AMC application installer from:
<http://www.quantum.com/support>

Make sure to download the version of the client software that is compatible with:

- The library software version currently installed in the library.
- The hardware platform and operating system version of the host computer.

See <http://www.quantum.com/support> for information about hardware and software compatibility.

- 2 Unzip the downloaded file to extract the folder containing the installer image file.
- 3 Open the unzipped folder and copy the image file inside to a temporary folder on the host.

**CAUTION**

To complete the installation, verify that you have about 80 MB in the temporary directory (`/tmp`). On Solaris systems, if the `/tmp` directory is not large enough for `InstallAnywhere` to operate, the installation fails, even if the temporary directory is resized later.

Set the `IATEMPDIR` environment variable to have the name of a directory that is large enough. Then `InstallAnywhere` will use that directory instead of `/tmp`.

To set the variable for Bourne shell (`sh`), `ksh`, `bash` and `zsh`:

```
$IATEMPDIR=/your/free/space/
directory
$ export IATEMPDIR -
```

To set the variable for C shell (`csh`) and `tcsh`:

```
$ setenv IATEMPDIR /your/free/
space/directory
```

4 From the temporary folder, type: `chmod 777 <filename>`

For example:

```
chmod 777 MC400SOL.bin
```

5 If the temporary folder is NOT in the user's path, type: `[space] ./ <filename>`

For example:

```
./MC400SOL.bin
```

This launches the installation from the current directory.

If the temporary folder is in the user's path, type: `<filename>` (including extension)

For example:

```
MC400SOL.bin
```

This starts the `InstallAnywhere` program, which prompts you throughout the installation.

- 6 When you are prompted to choose an installation set, select **Client Only**.
- 7 The name of the executable program will be **Client**.

Launching the Remote Client

To manage your library remotely, point your client to the IP address of the library. Only one administration user should be logged on and performing system configuration at any one time.

Use one of the following procedures to start the client, depending on the operating system your client is running.




Note

- Only one client session should be running on a single host at any one time.
- Only one client session should be run against a single system at any one time.

Launching a Windows Client

On Windows, clicking **Start**→ **ADIC Management Console**→ **Client** runs a different client, either the LMC or the AMC SAN Manager, depending on the path you take to the AMC server. There are two ways to get to the LMC for a particular library:

- Launch the remote client from a remote computer and enter the IP address of the library. The LMC for that library opens on the computer.
 - With an external AMC server running, launch the remote client on a remote computer. Enter the IP address of the external AMC server. The AMC SAN manager application opens on the computer. Once configured, the external AMC server detects all libraries. Select the library from the SAN Manager, and then right-click to open the LMC for that library.
- 1 If you accepted the defaults during the installation, click the **ADIC Management Console** program group on the **Start** menu to see the **Client** icon. If you installed a program group other than the default, go there instead.
 - 2 Click **Client** to launch the program.

 **Note** The program takes about one minute to start.

- 3 Type the IP address of the library, and then click **OK**.
- 4 When prompted, enter your user name and password to log on to the client.


Launching a UNIX Client

- 1 To start the HP_UX, AIX, Solaris, or Linux client, start a terminal window and type:

Client

and then press **ENTER**. The uppercase “C” is mandatory.

- 2 Enter your user name and password to log on to the client.

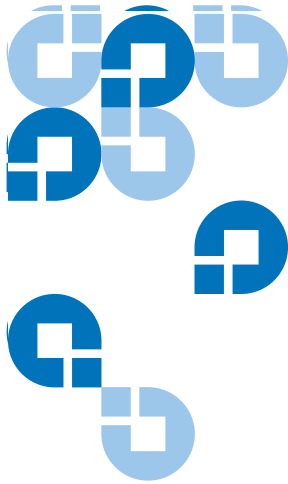
 **Note** If when running the remote client on a Linux host, if you see the “Failed to connect to server” message, edit the **/etc/hosts** file on the host computer to remove the host name from line 127.0.0.1.

For example, if the host name is `hostname` and the original line is:

```
127.0.0.1 hostname localhost.localdomain localhost
```

then change to:

```
127.0.0.1 localhost.localdomain localhost
```



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