

# Automated Cartridge System Library Software

**Product Information**

**Version 7.1**

**CRC Update**

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We welcome your feedback. Please contact the Global Learning Solutions Feedback System at:

GLSFS@stortek.com

or

Global Learning Solutions  
Storage Technology Corporation  
One StorageTek Drive  
Louisville, CO 80028-3256  
USA

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### **CRC Update - November 2005**

See [“Summary of Changes” on page iii](#) for the revision history and summary of changes made to this publication.

# Summary of Changes

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EC released document table

<b>EC</b>	<b>Date</b>	<b>Edition</b>	<b>Revision</b>	<b>Description</b>
128921	May 2004	First	A	Initial release.
132082	October 2004	Second	B	See this edition for details.
132225	February 2005	Third	C	See this edition for details.

CRC Updates

<b>Date</b>	<b>Revision</b>	<b>Description</b>
November 2005	A	Listed additional media and drive support.

## Summary of Changes

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# Preface

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## ■ About this Book

ACSL S Product Information provides information about ACSLS 7.1.

## Audience

This information is provided for system programmers, system administrators, and operators who need general requirements, enhancements for ACSLS 7.1, and other information.

We'd like to know what you think about this book. If you'd like, you can e-mail your comments to Global Learning Solutions directly. Our Internet address is:

`glsfs@stortek.com`

## About the Software

This book supports ACSLS 7.1.

## What's New in This Guide

This guide contains the following new information for ACSLS 7.1:

- Description of ACSLS 7.1 features and enhancements in the “Features and Enhancements” section.

## Conventions for Reader Usability

Conventions are used to shorten and clarify explanations and examples within this book.

The following typographical conventions are used in this book:

- **Bold** is used to introduce new or unfamiliar terminology, or it's used in steps to indicate either an action or a decision the user has to make.
- Letter Gothic is used to indicate filenames, command names, and literal output by the computer.
- Letter Gothic Bold is used to indicate literal input to the computer by you.

- *Letter Gothic Italic* is used to indicate that you must substitute the actual value for a command parameter. In the following example, you would substitute your name for the “username” parameter.

Logon *username*

- A bar ( | ) is used to separate alternative parameter values. In the example shown below either username or systemname must be entered.

Logon *username|systemname*

- Brackets [ ] are used to indicate that a command parameter is optional.

## Related Documentation

### ACSL S 7.1 Documentation

The following publications provide more information about ACSLS 7.1. They are provided in PDF format on a documentation CD-ROM, and also appear on the StorageTek Customer Resource Center (CRC). A Read Me First document is shipped with the product CD.

The *ACSL S Documentation* CD-ROM, is automatically shipped with the program package and provides in PDF format, all the ACSLS documents. These documents are:

- *ACSL S Product Information*
- *ACSL S Installation, Configuration, and Administration Guide*
- *ACSL S Quick Reference*
- *ACSL S Messages*

Depending on the release, there may be additional documents provided, such as SNMP.

### ACSL S Information on the StorageTek CRC

In addition to the PDF collection on the *ACSL S Information CD-ROM*, the StorageTek CRC provides a PDF collection for ACSLS. Use the following procedure to access this collection on the StorageTek CRC.

To access ACSLS PDF collections on the StorageTek CRC:

1. **Using an Internet browser such as Netscape or Internet Explorer, go to the StorageTek CRC. The URL is:**

<http://www.support.storagetek.com/>

2. **Click the login link.**

If this is the first time you have used the CRC, click [Request a CRC Password](#) and fill in the requested information. You should receive your account information within two business days.

3. **From the upper left bar, click [Product Information](#) and [Current Products](#) from the dropdown links.**
4. **Select [Software](#) from the Product Family dropdown menu and click [Next](#).**
5. **Click the [ACSLs](#) link from the Product Categories and navigate to the documents you want to view.**

**Note:** The Customer Resource Center also lets you download ACSLS PTFs and software support for product enhancements such as new drive or library types.

## Technical Support

Refer to the *Requesting Help from Software Support* guide (included in hard copy only with the ACSLS program package) for information about contacting StorageTek for technical support.

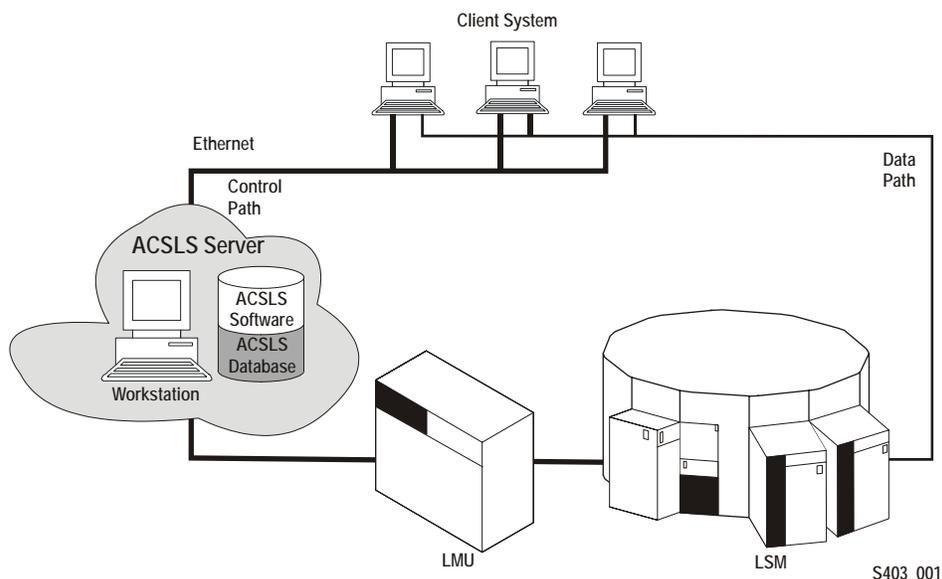


# ACSL S 7.1 Features and Enhancements

1

Automated Cartridge System Library Software (ACSL S) is StorageTek's server software that controls a StorageTek Automated Cartridge System (ACS). ACSLS accesses and manages information stored in an ACS through command processing across a network. The software includes a system administration component and interfaces to client system applications, and library management facilities.

The following figure shows how ACSLS connects the client system with the library. The client system consists of a Client System Component (CSC), an interface between client applications and ACSLS that is written using the CSC developer's toolkit. Independent software vendors commonly write CSCs for their applications.



## ■ ACSLS Features and Enhancements

### ACSL S 7.1

ACSL S 7.1 supports the following features and enhancements:

- Support for the SL8500 Library and its Pass-Three-Port (PTP)
- Support for Solaris 10 and AIX 5.3
- Support for the StorageTek ACSLS CIM Provider

The ACSLS ACSLS CIM Provider is an optional ACSLS feature that can be installed with ACSLS on Solaris platforms only. The ACSLS CIM Provider cannot be installed on AIX because WBEM Solutions Server product does not support AIX at this time. The ACSLS CIM Provider allows customers to monitor ACSLS-controlled tape libraries using a SNIA Storage Management Interface.

Currently, Storage Area Network (SAN) management mostly relies on proprietary interfaces and applications. This results in complex SAN management, and limits the ability to provide higher value added management features. Most of the storage vendors joined under the Storage Networking Industry Association (SNIA) to provide a way to manage SAN's. For this a Storage Management Initiative (SMI) was created. SMI relies on: 1) the Common Interface Model (CIM) which defines the classes of objects that are manipulated in computer systems in general, and 2) the Web Based Enterprise Management (WBEM) which defines the protocol to use for Client Applications and Device Providers (i.e. agents). CIM and WBEM were initiated by the Distributed Management Task Force (DMTF).

The SMI Specification (SMI-S) has been released and has been submitted to the ISO for standardization.

The StorageTek ACSLS CIM Provider is an implementation of the SMI-S for ACSLS. It supplies an SMI-S management compatible interface to ACSLS. When this provider is installed, client applications can access to ACSLS monitoring and status information using the CIM and WBEM. ACSLS events are wrapped in CIM events (i.e. CIM indications). The StorageTek ACSLS CIM Provider is an optional component of ACSLS and is installed on the ACSLS server.

For more information refer to the *StorageTek ACSLS CIM Provider User's Guide*.

- Support for dynamic configuration

The dynamic configuration (`config`) utility allows you to implement configuration changes to ACSLS libraries (and components) while ACSLS remains online and running. These configuration changes are recorded in the `acsss_config.log` file.

The following new dynamic configuration utilities are supported: `config acs`; `config lsm`; and `config ports`. The `config drives` utility was already supported.

The `config` utility provides the following benefits:

- ACSLS can continue running, allowing you to perform mount requests to unaffected library components.
- Allows you to reconfigure specified library components while all other configuration information remains unchanged. For example, when specifying:
  - An ACS, the configurations of other ACSs are not affected.
  - An LSM, the configurations of other LSMs are not affected.
  - A drive, the drives on a panel, mounts and dismounts to all existing drives are not affected.
- Support for the SL8500 library
- SL8500 Multiple Robot Enter/Eject Support

Eject and enter operations (including enter in both manual and automatic CAP modes) has been enhanced so that the multiple robots in the SL8500 are used more fully and efficiently to populate the SL8500 or to extract cartridges from it during those operations.

- A firewall-secure option

This optional feature allows ACSLS to be used behind a firewall, while client software makes requests across that firewall. It provides the following benefits:

- Restricts incoming connections for ACSLS communications to a single TCP port for all registered program numbers. There are two registered program numbers for the ACSLS CSI, both of which will be serviced by one single port.
- Allows you to specify the identity of that port, and configure your firewall in a corresponding fashion.
- Turns off ACSLS communications to UDP ports.
- Disables any communication by the ACSLS server to the client-side portmapper(s) (UDP/TCP port 111). The portmapper must still remain

running on client platforms to preserve compatibility with client side code. However, it will not be used for network communications initiated by the server, and therefore the clients' firewall(s) can be configured to disallow access to it.

- Unrestricted outgoing connections (from the ACSLS server side to client) with respect to the server-side ports used to preserve current performance. This follows widely accepted practices by the security community.
- Support for new tape drives and media include:
  - SDLT-600  

All the StorageTek libraries that support SDLT 600 drives will be able to use SDLT 600 drives and media with this enhancement. The media compatible for SDLT 600 include SDLT and SDLT-2.
  - T9840C
  - LTO Generation 2
  - LTO Generation 3
- Event Notification enhancements for CIM Provider  

The event notification enhancements include Event Notification at Shutdown and Mount/Dismount notification.
- Automatic driver installation for LSI SCSI Host Adapter, JNI Fibre Host Adapter  

When you run `$ACS_HOME/install/install_scsi_sol.sh` the routine probes the system for the existence of new hardware: either a JNI card or an LSILogic card. If either of these HBA cards is present on the system, but the corresponding driver is not in place, this routine asks you for permission to locate the appropriate driver package and install it.
- Improved error reporting in the event of a host name change

## ■ Determining Disk Size Requirements

Where ACSLS is intended to control library environments with fewer than 20,000 volumes, the ACSLS platform requires no more than 8GB of disk space. In larger library environments, the ACSLS platform should be configured with disk capacity of 27GB or larger.

## ■ LSMs Supported

- 4410 LSMs
- 9310 LSMs
- 9360 LSMs
- 9740 SCSI-Attached LSMs
- 9740 HLI-Attached LSMs
- 9710 LSMs
- 9714 LSMs
- 9730 LSMs
- 9738 LSMs
- L20, L40, L80 LSMs
- L180 LSMs
- L700 LSMs
- L700e PTP
- SL500 LSMs
- L5500 LSMs
- SL8500 LSMs

## ■ Tape Drives Supported

The following table is used to translate drive types between applications. The Drive Type Name represents the drive type in `cmd_proc` and event log messages. The ACSAPI Drive Type Number is used in ACSLS software operations and ACS\_API client communications.

**Table 1. Tape Drives**

Drive Type Name	Tape Drive Description	ACSAPI Drive Type Number
4480	StorageTek 18-track	0
4490	StorageTek Silverton 36-track	1
9490	StorageTek TimberLine 36-track high performance	2

**Table 1. Tape Drives**

<b>Drive Type Name</b>	<b>Tape Drive Description</b>	<b>ACSAPI Drive Type Number</b>
SD3	StorageTek Redwood Helical	3
4890	StorageTek Twin Peaks 36-track	4
DLT2000	Quantum DLT2000	5
DLT2000XT	Quantum DLT2000XT	6
DLT4000	Quantum DLT4000	7
DLT7000	Quantum DLT7000	8
9840	StorageTek T9840A	9
9491	StorageTek TimberLine EE 36-track	10
DLT8000	Quantum DLT8000	11
9840-3590	T9840A with IBM 3590 emulation	12
T9940A	T9940A with SCSI/Fibre or 3490E emulation	13
9940--3590	T9940A with 3590 emulation	14
SDLT	Super DLT 220	15
T9840B	High Performance 9840 with SCSI/Fibre or 3490E emulation	16
T9840B35	T9840B with 3590 emulation	17
HP-LTO	HP LTO Generation 1	18
IBM-LTO	IBM LTO Generation 1	19
CER-LTO	Certance LTO Generation 1	20
T9940B	T9940B with SCSI/Fibre or 3490E emulation	21
T9940B35	T9940B with 3590 emulation	22
VIRT-DRV	(reserved for) VSM virtual drive	23
SDLT-320	Super DLT 320	24
T9840C	T9840C with Fibre or 3490E emulation	25
T9840C35	T9840C with 3590 emulation	26
HP-LTO-2	HP LTO Generation 2	27
IBM-LTO-2	IBM LTO Generation 2	28
CER-LTO-2	Certance LTO Generation 2	29

**Table 1. Tape Drives**

Drive Type Name	Tape Drive Description	ACSAPI Drive Type Number
SDLT-600	Super DLT 600	30
reserved		31
reserved		32
HP-LTO-3	HP LTO Generation 3	33
IBM-LTO-3	IBM LTO Generation 3	34

## ■ Tape Media Supported

The following table lists the compatible tape media supported for each transport type.

**Note:**

- \* Legacy StorageTek media do not have a media domain on the label. They are reported as media domain 0 (zero).
- \*\* 3480 cartridges do not have a media type label. They are reported as media type1.
- \*\*\* DLT cartridges do not have a media domain on the label. They are reported as media domain 1.
- \*\*\*\* When a media type is reported as cleaning cartridge “maybe”, both data or cleaning cartridges can have this media type.

**Table 2. Tape Media**

Media Type Name	Media Description	Media Domain (on label)	Media Type (on label)	Cleaning Cartridge ****	ACSAPI Media Type Number
3480	3480 18 or 6-track	0*	1**	maybe	0
3490E	3490E 36-track	0*	E	no	1
DD3A	StorageTek Redwood (Helical) 10GB	0*	A	no	2
DD3B	StorageTek Redwood (Helical) 25GB	0*	B	no	3
DD3C	StorageTek Redwood (Helical) 40GB	0*	C	no	4

Media Type Name	Media Description	Media Domain (on label)	Media Type (on label)	Cleaning Cartridge ****	ACSAPI Media Type Number
DD3D	StorageTek Redwood Cleaning Cartridge	0*	D	yes	5
DLTIII	Quantum DLT III - 10GB	1***	C	maybe	6
DLTIV	Quantum DLT IV - 20GB or 35GB	1***	D	no	7
DLTIIIXT	Quantum DLT IIIxt - 15GB	1***	E	no	8
STK1R	T9840A, 9840B, 9840C data cartridge	0*	R	no	9
STK1U	T9840A, 9840B, 9840C cleaning cartridge	0*	U	yes	10
EECART	9490EE 36-track	0*	Z	no	11
Reserved	n/a	n/a	n/a	n/a	12
STK2P	9940 data cartridge	0*	P	no	13
STK2W	9940 cleaning cartridge	0*	W	yes	14
Reserved	n/a	n/a	n/a	n/a	15
LTO-100G	LTO Generation 1 data cartridge	L	1	no	16
LTO-50GB	LTO Generation 1 data cartridge	L	A	no	17
LTO-35GB	LTO Generation 1 data cartridge	L	B	no	18
LTO-10GB	LTO Generation 1 data cartridge	L	C	no	19
LTO-CLN2	IBM cleaning cartridge	C	2	yes	20
LTO-CLN3	Certance cleaning cartridge	C	3	yes	21
LTO-CLN1	HP cleaning cartridge	C	1	yes	22
SDLT	Super DLT	1	S	maybe	23
VIRTUAL	(reserved for) VSM virtual media	0*	v	no	24
LTO-CLNU	LTO universal cleaning cartridge	C	U	yes	25
LTO-200G	LTO Generation 2 data cartridge	L	2	no	26
SDLT-2	Super DLT Generation 2 data cartridge	1	2	no	27

Media Type Name	Media Description	Media Domain (on label)	Media Type (on label)	Cleaning Cartridge ****	ACSAPI Media Type Number
reserved					28
reserved					29
reserved					30
LTO-400G	LTO Generation 3 data cartridge	L	3	no	31

## ■ Transport and Media Compatibility Supported

The following table lists the compatible media for each transport type. Use these values as input to the `media media_type` and `drive drive_type` parameters on ACSLS commands.

**Table 3. Transport and Media Compatibility**

Transport Type ( <i>drive_type</i> )	Compatible Media ( <i>media_type</i> )	
	Data Cartridge	Cleaning Cartridge
4480	3480,	3480
4490	3480, 3490E	3480
4890	3480, 3490E	3480
9490	3480, 3490E	3480
9490EE	3480 (read only), 3490E, EECART	3480
SD3	DD3A, DD3B, DD3C	DD3D
9840	STK1R	STK1U
T9840B	STK1R	STK1U
T9840C	STK1R	STK1U
T9940A	STK2P	STK2W
T9940B	STK2P	STK2W
DLT2000	DLTIII	DLTIII
DLT2000XT	DLTIII, DLTIIIXT	DLTIII
DLT4000	DLTIII, DLTIIIXT, DLTIV	DLTIII
DLT7000	DLTIII, DLTIIIXT, DLTIV	DLTIII
DLT8000	DLTIII, DLTIIIXT, DLTIV	DLTIII
SDLT	SDLT, DLTIV	SDLT
SDLT-320	SDLT, DLTIV	SDLT
SDLT-600	SDLT, SDLT-2	SDLT

**Table 3. Transport and Media Compatibility**

Transport Type ( <i>drive_type</i> )	Compatible Media ( <i>media_type</i> )	
	Data Cartridge	Cleaning Cartridge
HP-LTO	LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN1, LTO-CLNU
IBM-LTO	LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN2, LTO-CLNU
CER-LTO	LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN3, LTO-CLNU
HP-LTO-2	LTO-200G, LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN1, LTO-CLNU
IBM-LTO-2	LTO-200G, LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN2, LTO-CLNU
CER-LTO-2	LTO-200G, LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN3, LTO-CLNU
HP-LTO-3	LTO-400G, LTO-200G, LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN1, LTO-CLNU
IBM-LTO-3	LTO-400G, LTO-200G, LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN2, LTO-CLNU

**Note:** For information about transport media, go to:  
[http://www.storagetek.com/products/tape\\_storage.html](http://www.storagetek.com/products/tape_storage.html)

## ■ Co-hosting on the ACSLS Server

We do not test, certify, or support co-hosting of other applications on ACSLS servers.

This applies to this release and prior releases.

## ■ Solaris Requirements

The following table describes the hardware and software requirements for the Solaris platform.

**Table 4. Solaris Requirements**

Requirement	Description
Operating system	Solaris 8, Solaris 9, and Solaris 10.
Memory requirements	256 MB minimum, 512 MB minimum with the ACSLS CIM Provider feature installed.
ACSAPI Clients must support ACSAPI packet version 3 or higher	<p>ACSLs supports these ACSAPI packet versions:</p> <ul style="list-style-type: none"> <li>• Packet version 3 (minimum)</li> <li>• Packet version 4 (recommended)</li> </ul> <p>The CSC Developer's Toolkit is used to create ACSAPI clients.</p> <p><b>Note:</b> The CSC Developer's Toolkit and ACSLS have supported packet version 3 since 1993.</p> <p>Support for versions 1 and 2 ended May 1, 2002.</p>
Disk requirements	<p>4 GB minimum</p> <p>9 GB minimum with the ACSLS CIM Provider feature installed.</p> <p>20 GB for Solaris 10.</p> <p>You should reserve 2 GB for the ACSLS application.</p>
Disk partitions	<p>/export/home - 1 GB</p> <p>/export/backup - 1 GB or more</p>
Swap space	500 MB
Library connectivity to the STK 44SB-150	Standard RS-423/RS-232 straight-through cable.
For serial host_LMUs	See tables 5-8 in this document.

**Table 4. Solaris Requirements**

Requirement	Description
Library connectivity to the STK 44SB-150 For TCP/IP Lams	IEEE 802.3 Ethernet 10base-T with a RJ45 jack.
Library connectivity to the STK 44SB-150 For SCSI LSMs	Requires a SCSI host adapter card or fibre card.  See tables 9-12 in this document.

## ■ AIX Requirements

The following table describes the hardware and software requirements for the Solaris platform.

**Table 5. AIX Requirements**

Requirement	Description
Operating system	AIX 5.1, AIX 5.2, and AIX 5.3.
Memory requirements	256 MB minimum,
ACSAPI Clients must support ACSAPI packet version 3 or higher	<p>ACSL 7.1 supports these ACSAPI packet versions:</p> <ul style="list-style-type: none"> <li>• Packet version 3 (minimum)</li> <li>• Packet version 4 (recommended)</li> </ul> <p>The CSC Developer's Toolkit is used to create ACSAPI clients.</p> <p><b>Note:</b> The CSC Developer's Toolkit and ACSL 7.1 have supported packet version 3 since 1993.</p> <p>Support for versions 1 and 2 ended May 1, 2002.</p>
Disk requirements	<p>4 GB minimum</p> <p>You should reserve 2 GB for the ACSL 7.1 application.</p>
Disk partitions	<p>/export/home - 1 GB</p> <p>/export/backup - 1 GB or more</p>
Swap space	500 MB

**Table 5. AIX Requirements**

Requirement	Description
Library connectivity to the STK 44SB-150 For serial host_LMUs	Standard RS-423/RS-232 straight-through cable. See tables 5-8 in this document.
Library connectivity to the STK 44SB-150 For TCP/IP Lams	IEEE 802.3 Ethernet 10base-T with a RJ45 jack.
Library connectivity to the STK 44SB-150 For SCSI LSMs	Requires a SCSI host adapter card See tables 9-12 in this document.

## ■ Microcode Requirements

For current microcode levels, your StorageTek field representative should access the following microcode download web sites:

- For Host/LMU Interface (serial or TCP/IP connections) libraries:

<http://svs.storitek.com> (Click Tech Assist)

- For SCSI libraries:

<http://mpss.storitek.com>

## ■ Upgrading to ACSLS 7.1

You can upgrade directly to ACSLS 7.1 from ACSLS 7.0.0, 6.1.1, 6.1.0, 6.0.1, 6.0, 5.4, and 5.3.2. See the *ACSLs Installation, Configuration, and Administration Guide* for upgrade installation procedures.



# Library Interface and Cable Specifications for the 44SB-150

2

The STK 44SB-150 is the 'turnkey platform' for ACSLS. It is the platform that is sold and serviced by STK for the convenience of library and ACSLS customers who prefer to have the vendor assume responsibility for the entire solution. This 44SB-150 platform is a Sun SunBlade-150 with options that support library connection via TCP/IP, RS-232 Serial, SCSI LVD and HVD, and Fibre Channel. The 44SB-150 standard configuration is structured as follows:

## ■ SunBlade 150 workstation: A41-UPA19C-256M-DL

- 64bit 550MHz UltraSPARC Ili CPU
- 512 KB Level-2 cache
- 256 MB SDRAM Memory, expandable to 2GB
- two internal 80GB, 7200 RPM, EIDE disk drives
- PGX64 PCI 24 bit Color Graphics Frame Buffer
- 16X Internal ATAPI DVD drive
- 3.5-inch 1.44MB Floppy drive
- three available PCI expansion slots
- x311L North America/Asia standard power cord
- Solaris 9.0 DVD media
- USB universal/European Unix keyboard
- USB mouse

## ■ Configurable Options

**Table 6. Configuration Options**

2012	PCI Dual Differential (HVD) Ultra-3 SCSI Host Bus Adapter (X6541A)
SLVD	PCI single channel Differential (LVD) Ultra-3 SCSI HBA (SLI-20320).
SER2	PCI Eight-port RS-232 Serial Adapter (X2156A).

**Table 6. Configuration Options**

DDS3	12GB Helical Scan SCSI Tape Drive (SG-XTAP4MM-011A)  Includes dual channel PCI Single Ended SCSI Host Adapter (X6540A) and 2-meter VHDCI/VHDCI cable.
256M	256MB Memory Expansion (1x256MB SDRAM Memory Module) (X6180A)
CMON	17-inch VGA Color CRT Monitor (X7147A)
LCDM	19-inch Flat Panel LCD Monitor 500:1 contrast ratio (X7144A)

For compatible fibre-channel library connectivity to the 44SB-150, STK offers two separate model numbers:

- **HBAJ-001**: Single port 1GB-2GB fibre-channel HBA (JNI FCX-6562-N)
- **HBAJ-002**: Dual port 1GB-2GB fibre-channel HBA (JNI FCX2-6562-N)

## ■ 44SB-150 COMPATIBLE CABLES

The 44SB-150 supports library connection via TCP/IP, RS-232 Serial, LVD or HVD SCSI, and fibre channel.

### TCP/IP

No specific StorageTek cables are released for the TCP/IP connection. Use a UTP-5 data grade cable for 10BASE-T or 100BASE-T signals. Cable length should not exceed 100 meters. The SunBlade-150 provides a standard RJ45 Cat5 UTP ethernet connection.

### RS423 / RS232 Serial

The STK LMU serial interface complies with signal characteristics of the EIA RS-423 standard. The SunBlade-150 serial port complies with the RS-232 standard. The two standards are mutually compatible but RS-423 qualifies cable lengths of up to 260 feet while RS-232 specifies limits of only 50 feet. Can the 50-foot cable limit be exceeded? The answer is a qualified yes. However, when running cables in excess of 50 feet, it is important to be conscious of noise sources. Data cables should not run parallel to nearby AC power cables or in proximity to large power transformers. To protect against

lightening interference or strong radio signals, longer cables should be run in a well-grounded metal conduit or under a raised metal floor.

A single male 9-pin RS-232 port is provided on the SunBlade-150 requiring a female 9-pin cable connector. The 4430/9315/9330/L5500 LMU is a female 25-pin RS-423 connection. For proper connection between these subsystems, the following interconnecting cables are available from StorageTek.

**Table 7. 4430/9315/9330/L5500 LMU cable connections**

Part Number	Description
3106577-01	20-ft DB-9(f) DB-25(m) RS-232/RS-423
3106577-02	50-ft DB-9(f) DB-25(m) RS-232/RS-423
3106577-03	100-ft DB-9(f) DB-25(m) RS-432
3106577-04	200-ft DB-9(f) DB-25(m) RS-432

In cases requiring multiple port connections to a single library or multiple library connections, a serial-port expansion unit will be required with the SunBlade-150. For the 44SB-150, specify feature code SER2. The external connector box provides eight female DB-25 RS-232 connectors. The following interconnecting cables are compatible between the SER2 feature and the 4430/9330/9315/L5500 LMU:

**Table 8. Multiple or single library cable connectors**

Part Number	Description
4108192-05	50-ft DB-25(m) DB-25(m) RS-232/RS-423
4108192-10	100-ft DB-25(m) DB-25(m) RS-423
4108192-20	200-ft DB-25(m) DB-25(m) RS-423

The STK 9740 serial-attached library utilizes the identical DB-9 male connector that is used on the 44SB-150. The following cables are available for interconnection between the 44SB-150 and the 9740 library equipped with a PRI card.

**Table 9. STK 9740 serial-attached library cable connectors**

Part Number	Description
3106578-01	20-ft DB-9(f) DB-9(f) RS-232/ RS-423
3106578-02	50-ft DB-9(f) DB-9(f) RS-232/ RS-423
3106578-03	100-ft DB-9(f) DB-9(f) RS-232/ RS-423
3106578-04	200-ft DB-9(f) DB-9(f) RS-232/ RS-423

The following interconnecting cables are compatible between the SER2 feature and the 9740 library equipped with the PRI serial interface card:

**Table 10. SER2 feature and 9740 library cable connectors**

Part Number	Description
3106577-01	20-ft DB-9(f) DB-25(m) RS-232/ RS-423
3106577-02	50-ft DB-9(f) DB-25(m) RS-232/ RS-423
3106577-03	100-ft DB-9(f) DB-25(m) RS-432
3106577-04	200-ft DB-9(f) DB-25(m) RS-432

## SCSI

StorageTek libraries that support the SCSI interface include the 9710, 9714, 9730, 9740, L700, L700e, L20, L40, L80, L180, and SL500. SCSI cable lengths are more critical than serial and it is wise not to extend the limit if possible.

## High Voltage Differential (HVD) SCSI

A high-voltage differential SCSI bus allows cable lengths up to 25 meters (approximately 80 feet). This includes cabling inside each library that may be daisy-chained on a single SCSI bus. The following libraries support a differential connection: 9710, 9714, 9730, 9740, L20, L40, L80, L180, L700, and L700e. The SCSI connector on these libraries is a 68-pin female micro-D (MD) connector. For differential SCSI capabilities on the 44SB-150 platform, you must specify the 2012 feature. The SCSI connectors on this dual-channel HBA are female 68-pin very high density cable interconnect (VHDCI)

connectors. The following HVD SCSI cables are available for interconnection between the 2012 and any of the above-mentioned libraries:

**Table 11. HVD SCSI cable connectors**

Part Number	Description
10083594	3 m (10 ft) 68 MD to 68 VHDCI
10083595	6 m (20 ft) 68 MD to 68 VHDCI
10083596	12 m (40 ft) 68 MD to 68 VHDCI
10083597	15 m (49 ft) 68 MD to 68 VHDCI
10083598	18 m (59 ft) 68 MD to 68 VHDCI

## Low Voltage Differential (LVD) SCSI

The L700, L700e, L20, L40, L80, and L180 libraries support both HVD and LVD SCSI. The SL500 library only supports LVD SCSI and fibre channel. The SCSI connector on these libraries is a 68-pin female micro-D (MD) connector. A low-voltage differential SCSI bus allows cable lengths up to 12 meters. For the 44SB-150 to be LVD SCSI compatible, you must specify the SLVD feature. The SCSI connector on this single-channel HBA is a female 68-pin very high density cable interconnect (VHDCI) connector. The following LVD SCSI cables are available for interconnection between the SLVD feature and any of the above-mentioned libraries:

**Table 12. LVD SCSI cable connections**

Part Number	Description
10083682	3 m (10 ft) 68 MD to 68 VHDCI
10083683	5m (18 ft) 68 MD to 68 VHDCI
10083684	10 m (40 ft) 68 MD to 68 VHDCI

## Fibre Channel

The L700, L700e, L20, L40, L80, L180, and SL500 libraries support fibre channel control-path access. To provide fibre-channel communication capabilities with the 44SB-150, it is necessary to configure the 44SB-150 with model number HBAJ-001 or HBAJ-002. The logic associated with these HBAs can negotiate both transfer rates: 1Gb and 2Gb. The two HBAs are equipped with an LC connector. The library may be configured with either the 1Gb MPU card with an SC connector, or the 2Gb MPU2 card with an LC connector.

The following cables apply for connection between HBAJ-001 or HBAJ-002 on the 44SB-150 and a library equipped with an MPU card:

**Table 13. Fibre Channel cable connections**

<b>Part Number</b>	<b>Description</b>
10800234	10m Plenum Rated LC to SC
10800235	50m Plenum Rated LC to SC
10800236	100m Plenum Rated LC to SC

The following cables apply for connection between HBAJ-001 or HBAJ-002 on the 44SB-150 and a library equipped with a MPU2 card:

**Table 14. Connecting Between HBAJ-001 or HBAJ-0002 on the 44SB-150 and a Library Equipped with a MPU2 card**

<b>Part Number</b>	<b>Description</b>
10800224	10m Plenum Rated LC to LC
10800225	50m Plenum Rated LC to LC
10800226	100m Plenum Rated LC to LC

# Glossary

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## A

**absent cartridge** -A volume that is in the database, but that couldn't be found when all recorded locations for the volume were catalogued. If a nonzero retention period is set, the volume status is changed to STATUS\_VOLUME\_ABSENT.

**ACS** -See Automated Cartridge System.

**ACSEL** -See ACS Event Logger.

**ACS Event Logger (ACSEL)** -The software component that receives messages from other ACSLS components and writes them to an Event Log.

**ACS ID** -A unique identifier for an ACS.

**ACSLH** -See ACS Library Handler.

**ACS library** -A library is composed of one or more ACSs, attached tape drives, and cartridges residing in the ACSs.

**ACS Library Handler (ACSLH)** The part of the ACSLM that communicates directly with the LMU.

**ACSLM** -See ACS Library Manager.

**ACS Library Manager (ACSLM)** -The software component that validates and routes library requests and responses.

**ACSLS** -See ACS Library Software.

**ACSLS database** -ACSLS database containing information about the location and status of the tape cartridges. The information includes cell location, scratch status, etc.)

**ACSLS platform** -The server hardware and software that provide the proper environment for ACSLS.

**ACS Library Software (ACSLS)** - Manages ACS library contents and controls ACS library hardware to mount and dismount cartridges on ACS cartridge drives.

**ACSLS database** -A database used by ACSLS to track the library configuration and the locations and IDs of all tape cartridges in the library.

**ACSSA** See ACS System Administrator.

**ACS System Administrator (ACSSA)** The interface between the Command Processor and the rest of the system.

**ADI** Application Data Interchange.

**audit** A physical inventory of the contents of all or part of a library.

**Automated Cartridge System (ACS)** The library subsystem consisting of a single or dual LMU, and 1 to 24 LSMs connected to that LMU.

**automated library** See library.

## B

**beginning of tape (BOT)** The location on a tape where written data begins.

**BOT** See Beginning of Tape.

**CAP** See Cartridge Access Port.

## C

**CAP ID** A unique identifier for the location of a CAP. A CAP ID consists of the ACS ID, the LSM number, and the CAP number.

**cartridge** A plastic housing containing a length of data recording tape. The tape is threaded automatically when loaded in a transport. A plastic leader block is attached to the tape for automatic threading. The spine of the cartridge can contain an OCR/Bar Code label listing the volume ID.

**Cartridge Access Port (CAP)** A bidirectional port built into the door panel of an LSM, which provides for the manual entry or automatic ejection of tape cartridges.

**cartridge drive (CD)** A device containing two or four cartridge transports and their associated power and pneumatic supplies.

**cartridge tape I/O driver** Operating system software which issues commands (e.g., read, write, and rewind) to cartridge subsystems.

**cartridge transport** An electromechanical device that moves tape from a cartridge over a head that writes and reads data from the tape. A transport is distinct from the power and pneumatic sources that supply the electricity and air it needs to function. See cartridge drive.

**CCI** See client computing system.

**CD** See cartridge drive.

**cell** A receptacle in the LSM in which a cartridge is stored.

**channel** A device that connects the host and main storage with the input and output control units.

**client applications** Software applications that manage tape cartridge contents. They access tape cartridges by interacting with

ACSLs. Any number of client applications can be resident on a client system.

**client computing system** A computer and an executable image of the operating system.

**client software** This software manages tape cartridge contents, generates requests for cartridges, and transfers data to and from cartridges. The client software is not part of ACSLS.

**Client System Component** Software which provides an interface between the client computing system's operating system and ACSLS.

**Client System Interface (CSI)** The software component that translates and routes messages between the ACS Library Manager and the Client System Component.

**command access control** Limits access to commands.

**command area** The bottom area of the cmd\_proc interface where you enter requests and receive responses.

**command processor (cmd\_proc)** The screen interface of the ACSSA. cmd\_proc lets you enter the commands described in Chapter 7.

**control path adapter** A hardware device which converts a Client Computing System's control protocol to the control protocol of the StorageTek Library Control System.

**control unit (CU)** A microprocessor-based unit logically situated between a channel and up to sixteen cartridge transports. The CU translates channel commands into transport commands and sends transport status to the channel.

**CSE** Customer Services Engineer.

**CSC** Client System Component.

**CSI** See Client System Interface.

**CSI variables** Used to define various options to fine-tune communications between a CSC and the CSI. You change these variables in the acsss\_config program.

**CU** See control unit.

**cycle error messages** Messages that indicate a library or ACSLS failure.

## D

**database** A collection of interrelated data records. See also ACSLS Database.

**data path** The network path that allows client applications read/write access to tape cartridges.

**data path adapter** A hardware device which translates a Client Computing System's data protocol to the data protocol of the StorageTek Control Unit.

**display area** The top area of the cmd\_proc interface that collects messages regarding the status of the library.

## E

**ejected cartridge** A volume that has been ejected from the library. If a nonzero retention period is set, the volume status is changed to STATUS\_VOLUME\_EJECTED.

**end of tape (EOT)** The location on a tape where written data ends.

**EOT** See end of tape.

**EPO** Emergency Power Off.

**EPROM** See erasable programmable read only memory.

**erasable programmable read-only memory (EPROM)** A special memory chip that can be erased and reprogrammed.

**Event Log** A file, maintained by the ACSEL, that contains messages describing library and ACSLS events.

**Event Logger** See ACS Event Logger.

**external label identifiers** A six-character alphanumeric label on the outside edge of a cartridge used to identify a physical tape volume. It may consist of uppercase letters A through Z, numerals 0 through 9, \$, #, and blanks.

## F

**full installation** A complete software installation required for new customer sites or for existing sites where a new library has been installed.

## H

**HLI** Host/LMU Interface. One way that the StreamLine Library Manager communicates with a library.

**HLI-attached** Libraries that are connected to the StreamLine Library Manager through the HLI. These libraries can be connected through a serial interface (serial-attached) or through a TCP/IP interface (TCP/IP-attached).

**home location** The cell associated with a given cartridge.

**HVD** High voltage differential. A SCSI physical-layer communication standard.

## I

**ID** Identifier or identification.

**Informix** The relational database used by ACSLS 6.1.

**Informix Storage Manager (ISM)** The Informix database manager, which manages

database backups and offloaded transaction logs.

**Initial Program Load (IPL)** A process that activates a machine reset, initiates wake up diagnostics (from EPROMs) and loads functional code.

**inline diagnostics** Routines that test components of a subsystem while operating on a time-sharing basis with the functional microcode in the subsystem component.

**in-transit cartridges** Cartridges between their source and destination locations. Cartridges are considered in-transit if they are in pass-thru ports, robot hands, or playground.

**I/O** Input/Output.

**IPC** Interprocess Communication.

**IPL** See Initial Program Load.

**ISM** See Informix Storage Manager.

## J

**journal** A sequential log of changes made to the database since the last checkpoint.

## L

**LAD** Lock Access Door.

**LAN** See local area network.

**large CAP (LCAP)** A 40-cartridge CAP with the storage cells arranged in four removable magazines of ten cells each. The magazines appear as a single column of 40 cells to the host software.

**LC** Fibre connector type with 1.25mm ceramic ferrule.

**LCAP** See large CAP.

**LCU** See Library Control Unit.

**LED** See Light Emitting Diode.

**library** A library is composed of one or more ACSs, attached tape drives, volumes in the ACSs, and the ACSLS software that controls and manages the ACSs.

**library configuration options** Allows the customer to specify the number of ACSs in the library and the connections between each ACS and the server system.

**library control component** Software which controls the mounting and dismounting of cartridges in the ACS.

**library control processor** Properly configured computer hardware that, with the addition of appropriate software, supports the operation of the Library Control Software.

**library control system** The library control platform loaded with library control software (ACSLs).

**library control software** The software components of ACSLS including the library control component, the Client System Interface and Library Utilities.

**Library Control Unit** The portion of the LSM that controls the picking, mounting, dismounting, and replacing of tape cartridges.

**library drive** A cartridge transport attached to an LSM that is connected to, and controlled by, a client system. Library drives interact with the LCU during automated tape cartridge mount and dismount operations. Library drives interact with a client application during tape data transfer operations. Library drives are individually addressable by the ACSLS and are individually accessible by client applications. See Cartridge Transport.

**library errors** Errors that occur because the library is offline, has suffered hardware failure, is unavailable, etc.

**Library Management Unit (LMU)** The portion of an ACS that manages LSM's, allocates their resources, and communicates with ACSLS.

**Library Storage Module (LSM)** An ACS structure that provides the storage area for cartridges, cartridge drives, CAPs, and the robot necessary for moving them.

**light emitting diode (LED)** A light emitting device that uses little energy and is used mainly to indicate on/off conditions.

**LMU** See Library Management Unit.

**local area network (LAN)** A computer network in which any component in the network can access any other component. This is the type of interface between an LMU and attached LSM's.

**LSM** See Library Storage Module.

**LSM ID** A unique identifier for an LSM. The LSM ID consists of the ACS ID and the LSM number.

**LTO** Linear Tape Open Ultrium.

**LVD** Low voltage differential. A SCSI physical-layer communication standard.

## M

**MD** A micro-D connector specification. There are two rows of 34-pins inside a D-shaped connector collar.

**missing cartridge** A volume that is in the database, but couldn't be found. If a recorded possible location for the volume could not be examined due to an offline LSM or a drive not communicating, the volume is marked MISSING instead of ABSENT. The

volume status is changed to STATUS\_VOLUME\_MISSING.

## N

**network adapter** Equipment that provides an electrical and logical interface between a network and specific attached equipment.

**Network Interface (NI)** An interface between the server system and the client systems that maintains network connections and controls the exchange of messages. The NI is resident on the server system and each client system.

**NI** See Network Interface.

## O

**OCR** Optical character recognition.

**ONC** Open network computing.

**Open Systems Interconnection (OSI)** A software architecture model of the International Organization for Standardization. The OSI model provides standards for the interconnection of data processing systems.

**OSI** See Open Systems Interconnection.

**OSLAN** Open Systems Local Area Network.

## P

**Pass-Thru Port (PTP)** Mechanism that allows a cartridge to be passed from one LSM to another in a multiple LSM ACS.

**PCAP** See priority CAP.

**playground** A reserved area of special cells (within an LSM) used for storing diagnostic cartridges and cartridges found in-transit upon power-on and before initialization of the LSM is completed.

**policy** The policy files are located in \$ACS\_HOME/data/external. These miscellaneous files define your policies for ACSLS. They specify Access Control settings, scratch preferences, Extended Store LSMs, custom volrpt settings, volume attributes (for watch\_vols utility), etc.

**pool** A collection of tape cartridges having one or more similar features or attributes, such as a pool of scratch tapes.

**POST** Power-on self-test.

**priority CAP (PCAP)** A single-cartridge CAP used for priority entry and ejection of cartridges.

**processing errors** Errors that result from processing or network communication failures.

**PROM** Programmable read-only memory.

**PTP** See Pass-Thru Port.

## R

**RDBMS** Relational database management system.

**redo log files** Backup files used to restore the ACSLS database.

**relational database** A database that is organized and accessed according to relationships between the data items; relationships are represented by tables.

**ROM** Read-only memory.

**RPC** Remote Procedure Call.

## S

**SC** Fibre connector type with 2.5mm ceramic ferrule.

**SCAP** See standard CAP.

**scratch** An attribute of a tape cartridge, indicating that it is blank or contains no useful data.

**SCSI** Small computer serial interface.

**second disk journaling** Allows for the database's journal records to be written to a second disk device, instead of writing records to the primary disk. This improves the chances of recovery from a disk failure.

**Serial-attached** See HLI-attached.

**server system** The part of the library that is the residence for ACSLS, now referred to as the Library Control System. The Library Control System acts as an interface between a library and client systems.

**server system user** A person who invokes ACSLS commands, utilities, or procedures on the server system. Server system users are generally site and maintenance personnel (for example, library operators, tape librarians, system administrators, CSEs, and systems personnel).

**servo** A system that uses feedback to control a process.

**silo** A commonly used term for an LSM. See Library Storage Module.

**SIMM** Single inline memory module.

**SQL** See structured query language.

**SRN** See service request number.

**SSI** See Storage Server Interface.

**SSR** Software Support Representative.

**Standard CAP (SCAP)** A 21-cartridge CAP with the storage cells arranged in three rows of seven fixed cells.

**Storage Server Interface (SSI)** A software component, resident on a client system, that translates and routes messages between client applications and the CSI.

**structured query language (SQL)**- A language used to define, access, and update data in a database.

**system resource variable** Used to control the amount of system resources used by ACSLS.

**system unit** The Library Control Platform.

## T

**tape library management system (TLMS)**  
A type of client application.

**TCP** Transmission Control Protocol.

**TLMS** See tape library management system.

**TOD** Time of day.

## U

**UDP** User Datagram Protocol.

**UNIX** An operating system originally developed by Bell Laboratories (now UNIX Systems Laboratories, Inc.) and used by a variety of computer systems.

**unsolicited messages** Messages that indicate an error or notify you when a particular routine action can be taken.

**UOC** Usable on codes.

**upgrade installation** Performed when installing a new version of ACSLS at an existing customer site.

**user-selectable features and options variables** Used to define various user-selectable features and options.

## V

**validation errors** Errors that result from format and syntax validation performed by cmd\_proc.

**venter** Virtual enter. Entering an unlabeled cartridge with a virtual label.

**VHDCI** Very high density cable interconnect. This is a SCSI-III connector specification.

**virtual label** A logical volume ID (volser) that can be assigned to a cartridge when its physical label is missing or unreadable.

**volser** Volume Serial Number.

**volume** A tape cartridge.

**volume access control** Limits access to volumes, usually by the client.

**volume identifier** -A six-character string that uniquely identifies a tape cartridge to the database.

**volume serial number (volser)** A synonym for external label identifier.

## W

**WORM** Write-Once Read-Many. Any type of storage medium to which data can be written to only a single time, but can be read from any number of times.

**WTM** write tape mark.

## X

**XDR** External data representation.

**XML** Extensible Markup Language. A universal format for structured documents and/or data on the Web.





