QUALSTAR®

XLS

ENTERPRISE LIBRARY SYSTEM

SIMPLY RELIABLE ENTERPRISE DATA STORAGE

FEATURING

COMPASS ARCHITECTURE

- *Scales easily from 4 to 128 drives*

- *Readily grows from 350 to over 9,600 tapes*

- *Uses industry-leading LTO tape technology*

- *Very high density - up to 169 TB per square foot*

- *Up to eight independent host connections*

- *Advanced single-view, browser-based interface provides uniform local and worldwide management*

- *Highly efficient power design: low power consumption, reduced cooling requirements*

XLS is Qualstar's highly modular enterprise library design delivering new levels of intelligence, density, flexibility, scalability, and ease of use coupled with our proven record of reliability and value.

XLS features Compass Architecture™ an advanced robotics design that yields superior reliability and density; X-Link™ a single-view worldwide management interface, and N+1 power management, redundant cooling, and hot-swap components for high reliability.

XLS ADVANCED MODULAR DESIGN

Start with 350 tapes and grow in easy increments to over 9,600 tapes as your storage requirements grow. Cartridge slots and tape drives are readily added to maintain data access and control cost.

XLS combines two distinct modules to deliver high-density, cost-effective and flexible library systems. The Library Resource Module, LRM, is a complete, self-contained library and forms the base unit for larger systems. The Memory Expansion Modules, MEMs, contain 535 or 1,075 tape storage slots in economical and very compact footprints.

Three LRM models house up to 32 drives and 1,066 slots. Each LRM is highly scalable, making it easy to vary drive and slot ratios to optimize resources. Support for up to eight logical library partitions is built into each XLS, giving administrators the flexibility needed to economically

handle multiple applications in a single *Simply Reliable* library.

LRM 832700   **MEM1**

When additional storage is required, one or two MEMs can be easily added to each LRM. Two MEM models contain either 535 or 1,075 tape slots. Qualstar's trademark rotary carousel design yields very high storage density,

In just 21" of horizontal travel the XLS robot can access over 3,200 tapes.

over 125 tapes per square foot in an MEM1. If more data transfer capability is required, adding LRMs expands the number of tape drives up to 128. Or, two MEMs can be added to one LRM to deliver a configuration that packs over 4.8 petabytes (native) in just 28 square feet of valuable IT floor space. Capacity expansion is both quick and cost effective.

◄ ADD MEM   START WITH LRM   ADD MEM ►

XLS HIGHLIGHTS

COMPONENT	LRM 820500
Drive Bays - Standard	1 with 4 drive slots
Drive Bays - Optional	Up to 4 additional bays with 4 drive slots in each
Cartridge Slots - Standard	355*
Cartridge Slots - Optional	Add 110
I/O Slots - Standard	10
I/O Slots - Optional	Add 10 or 30 (maximum 40)
Equipment Bay Options	6U or 8U
Supported Tape Drives	LTO 4 and LTO 5
Library Interfaces	FC or SCSI, added in increments of 2 (maximum 8)

* Each additional drive bay subtracts 30 tape slots

POWERFUL COMPASS ARCHITECTURE

Qualstar's patented Compass Architecture delivers a library system where one highly reliable robot travels an average of just 21 inches horizontally to access over 3,200 tapes. Robotics located in each LRM simply reach into adjacent MEMs to access

cartridges located there. The robotics always remain within the LRM cabinet, eliminating the power consumption, reliability problems and delays that can occur with robots that must traverse long distances between cabinets at high speed to access distant cartridges.

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SIMPLY RELIABLE ENTERPRISE DATA STORAGE

FEATURES

- *N+1 hot swappable power system*
- *Up to 40 I/O slots per LRM*
- *Single-view, local and remote management*
- *Automatic fault notification*
- *Independent control interfaces for up to 8 partitions*
- *15" color touch screen for local control*
- *LED indicators provide real-time visual status check*

DATA-GUARD™ UPS INVENTORY SENTRY™

XLS delivers built-in power failure protection for the library robotics, independent of any external power protection hardware. If input power to the library fails, the Data-Guard UPS maintains system power long enough to protect any media in transition from harm. It also carries out an orderly shutdown of the library controllers to allow problem-free restarts when power returns. UPS protection is restored within 10 minutes of restart as normal operation recharges the onboard battery.

Inventory Sentry senses whether tapes have actually been moved when a door is opened. If they haven't, operation is resumed without causing a time consuming reinventory.

EASE OF SERVICE

XLS uses a modern design incorporating easily exchanged modules. The power supplies, cooling fans, and tape drives are all designed for easy replacement. MTTR for any service operation is less than 30 minutes. Remote access by Qualstar Technical Support will speed monitoring and diagnosis to eliminate service interruptions.

LRM 832700	LRM 8161100	MEM1	MEM2
2 with 8 drive slots	1 with 4 drive slots		
Up to 6 additional bays with 4 drive slots in each	Up to 3 additional bays with 4 drive slots in each		
435*	846*	1,075	535
Add 110 or 220	Add 110 or 220		
20	10		
Add 20 (maximum 40)	Add 10 or 30 (maximum 40)		
6U or 8U	N/A		
LTO 4 and LTO 5	LTO 4 and LTO 5		
FC or SCSI, added in increments of 2 (maximum 8)	FC or SCSI, added in increments of 2 (maximum 8)		

Robotics never leave the LRM to access cartridges in the MEM, insuring fast access times and high reliability.

FLEXIBILITY

LRM models hold any mix of up to 32 LTO tape drives. Bays holding up to 4 tape drives or 30 cartridge slots can be mixed and matched to meet changing requirements. Up to 40 I/O slots are supported in each LRM. The XLS accommodates up to four dual-channel LIAs yielding up to eight independent library control channels. User configured parameters can be backed up remotely so that the user configuration can be uploaded and the library brought back online immediately. Some models also offer optional 6U or 8U EIA rack modules to accommodate equipment such as switches, storage controllers or other gear.

LOGICAL LIBRARY PARTITIONS

Up to eight logical library partitions can be established. Each partition contains tape drives, cartridge slots, and a dedicated library control interface. X-Link provides complete information about and control of the storage elements assigned to each partition, making setup, administration and re-configuration easy.

HIGH AVAILABILITY

N+1 power is standard on the XLS 832700 and XLS 8161100 and optional on the XLS 820500. The system controller uses a journaling file system for faster recovery from power loss/system resets. XLS uses a distributed control intelligence connected by a high reliability CAN bus. Advanced diagnostics and error recovery procedures are incorporated in the XLS firmware design.

XLS CONFIGURATION EXAMPLES

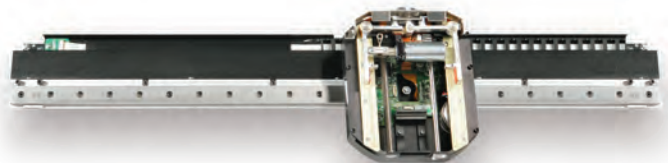| Configuration	Tape Drive Slots	Cartridge Slots†	Native Capacity with LTO 5	Native Data Rate with LTO 5	Terabytes per Square Foot	Cartridges per Square Foot
XLS 820500	4	465	697 TB	2.0 TB/hr	82	55
XLS 820500 + 1 MEM2	6	970	1.5 PB	3.0 TB/hr	105	70
XLS 820500 + 1 MEM1	8	1,510	2.3 PB	4.0 TB/hr	133	89
XLS 820500 + 2 MEM1	8	2,585	3.9 PB	4.0 TB/hr	152	101
XLS 832700	8	655	982 TB	4.0 TB/hr	92	61
XLS 832700 + 1 MEM1	12	1,700	2.6 PB	6.0 TB/hr	133	89
XLS 832700 + 2 MEM1	12	2,775	4.2 PB	6.6 TB/hr	150	100
3 XLS 832700 + 4 MEM1	36	6,175	9.3 PB	18.1 TB/hr	140	93
XLS 8161100	4	1,066	1.6 PB	2.0 TB/hr	149	99
XLS 8161100 + 1 MEM1	4	2,141	3.2 PB	2.0 TB/hr	167	111
2 XLS 8161100 + 2 MEM1	8	4,282	6.4 PB	4.0 TB/hr	167	111
4 XLS 8161100 + 5 MEM1	16	9,639	14.5 PB	8.1 TB/hr	169	113

† May include optional cartridge slots

Configurations containing up to 4 LRMs and 5 MEMs store over 9,600 tapes.

XLS SPECIFICATIONS

Specification	LRM	MEM1	MEM2
Dimensions 820500 (w, d, h)	35 x 35 x 78 in 88 x 88 x 198 cm	35 x 35 x 78 in 88 x 88 x 198 cm	22 x 35 x 78 in 56 x 88 x 198 cm
Dimensions 832700 (w, d, h)	45 x 35 x 78 in 113 x 88 x 198 cm		
Dimensions 8161100 (w, d, h)	45 x 36 x 78 in 113 x 91 x 198 cm		
Weight 820500	1,202 lbs / 545 kg		
Weight 832700	1,527 lbs / 693 kg		
Weight 8161100 (all fully populated)	1,777 lbs / 806 kg	1,057 lbs / 479 kg	687 lbs / 312 kg
Power Requirements	100 – 240 VAC • 48 – 62 Hz		
Power Consumption	See XLS Product Specification		
Reliability	> 2,000,000 MEBF		
MTTR	< 30 minutes		

XLS Performance

• Load a drive or slot within an LRM: 11 seconds average

• Load a drive or slot to / from an MEM: 13 seconds average

Qualstar's trademark robotic mechanisms provide precise positioning and flawless media handling for years of Simply Reliable operation.

Learn more at www.Qualstar.com / XLS

XLS

ENTERPRISE LIBRARY SYSTEM

X-LINK™

SINGLE-VIEW, WORLDWIDE MANAGEMENT INTERFACE FOR XLS LIBRARIES

X-Link, the Qualstar XLS Management Interface provides intelligent, powerful tools and comprehensive information to monitor and manage enterprise library operations around the clock and across the globe. Incorporated into every XLS, X-Link combines an easy to use graphical interface with sophisticated library control and management tools.

FLEXIBLE, WORLDWIDE ACCESS

X-Link is accessed locally using the 15-inch, color touch screen or the Ethernet port built into the XLS, or remotely via a local area network or the Internet. Each connection mode provides the same security features, and multiple simultaneous connections are supported.

Remote access requires nothing more than a standard browser. Authorized users can log in remotely to check the status of the library; review detailed event logs; upgrade library firmware; import, export and move cartridges; clean tape drives; change SCSI IDs and even run diagnostic routines if required. Access through a VPN or firewall ensures complete system security.

LOGICAL LIBRARY MANAGEMENT

X-Link can group tape drives, cartridge slots and I/O ports into up to eight logical libraries. Partitioning the physical components into logical libraries allows several software applications to share XLS resources. An application controls each partition over a dedicated command and control port. Events are reported by X-Link for each logical library, and each

partition can be individually taken offline for administration actions or maintenance.

SIMPLE INSTALLATION AND SETUP

X-Link includes two installation wizards, which assist with configuring the physical library and creating logical library partitions. The X-Link Homepage provides a high-level summary of library status and streamlined access to library settings and policies, to operations of the physical library, the logical library partitions, the user groups and the event log. **1**

Portlet technology allows each user to tailor the interface by displaying, hiding or rearranging X-Link functional areas. A virtual keyboard and options for larger controls and text enhance the usability of the front panel touch screen.

COMPREHENSIVE HELP AND DOCUMENTATION

The X-Link Help System provides intelligent, detailed, context-sensitive explanations and step-by-step instructions. X-Link users can also download XLS manuals to any connected computer.

EVENT MONITORING AND NOTIFICATION

If a hardware sensor is triggered, X-Link collects the relevant information and automatically sends a detailed e-mail to designated administrators and service personnel. Because XLS diagnostic routines can be run remotely via X-Link, problem resolution can begin immediately, saving both time and money.

HARDWARE MONITORING

Selecting View Hardware allows users to drill down a hierarchical

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X-LINK LOCAL AND REMOTE MONITORING IS THE FASTEST WAY TO SOLVE PROBLEMS

2:10 PM
A sensor in the XLS is triggered, indicating that a hardware error has occurred. X-Link automatically sends an e-mail to the designated administrator(s), containing detailed information about the event.

2:14 PM
After reviewing the e-mail, the administrator contacts Qualstar Technical Support.
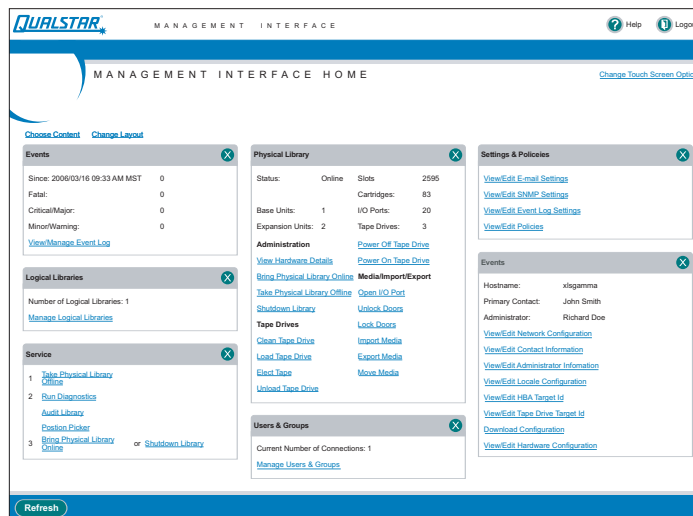
2:18 PM
Using a secure connection through the customer's network, Tech Support logs into X-Link, runs a diagnostic procedure and determines that a component needs to be replaced.

2:25 PM
On-site service is dispatched, with the correct replacement part in hand.

1 The XLS Homepage provides quick access to all library functions.

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X-LINK™

tree to obtain summary and status information for major library components, cartridges and tape drives. **2**

RELIABLE OPERATION

X-Link includes an automatic restart manager to recover from an unexpected power failure. Firmware updates can also be installed remotely.

CUSTOMIZABLE SECURITY

X-Link provides a fast way for administrators to set up system access. The administrator merely identifies authorized users,

gives each a unique ID and password, and assigns them to one or more user groups. Depending on their user group, users can "monitor" or "monitor and configure" the entire physical library or an individual logical library partition.

Default user groups – Super User, Physical Library Administrator, Logical Library Administrator, Library Operator and Logical Library User – can be used as is or modified. Or, administrators can create completely new groups as required. **3**

VIEW/EDIT USER GROUP

3 User groups let the X-Link administrator control exactly which tasks each user can perform.

2 To view the status of the cartridge slots, simply select a storage area from the View Hardware panel.

X-LINK SPECIFICATIONS

Ethernet Connection (for remote access)	10/100 Base-T network with CAT5e or better, straight-through Ethernet cable
Web Browser Compatibility	Microsoft Internet Explorer 6 (and higher) Netscape 7.2 (and higher) Mozilla 1.7.12 (and higher) Firefox 1.5 (and higher)
Browser Requirements	Java Script and cookies must be enabled
E-mail Requirements (for alerts)	SMTP server and Name server

Qualstar Corporation does not warrant the MEBF to be representative of any particular unit installed for customer use. Failure rates are derived from a large database of test samples. The individual failure rate will vary from unit to unit.

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Qualstar products are covered by one or more of the following patents: 6,271,982, 6,560,061 and 7,181,313. Other patents pending.

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QUALSTAR® *Simply Reliable*