



**XLS-810160/  
810240  
Tape Library**  
Product Specification

501800 Rev. F

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For additional information, contact Qualstar at:

**QUALSTAR CORPORATION**

3990-B Heritage Oak Court  
Simi Valley CA 93063

Fax: (805) 583-7749  
Phone: (805) 583-7744

Email: [sales@qualstar.com](mailto:sales@qualstar.com)  
[www.qualstar.com](http://www.qualstar.com)

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# 1

# Introduction

## 1.1 Scope

This product specification describes the Qualstar model XLS-810160/810240 intelligent tape libraries. It provides detailed specifications, configuration options, and installation requirements. This document is intended for use by individuals evaluating, purchasing, or integrating the XLS-810160/810240 tape libraries.

## 1.2 Related Documentation

For additional information about the XLS, refer to the documents listed in Table 1-1.

Subject	Document	Qualstar Document
Installation	XLS Installation Manual	<a href="#">501801</a>
Operation and Administration	XLS User Guide	<a href="#">501803</a>
Service	XLS Technical Service Manual	<a href="#">501810</a>
Medium Changer Interface	XLS Interface Manual	<a href="#">501611</a>
Approved Data Cartridges	Approved Data Cartridges	<a href="#">PIN-038</a>
Barcode Label Specification	Barcode Label Information and Specifications	<a href="#">PIN-040</a>
SCSI-3 Primary Command Set	ANSI INCITS 301:1997, SCSI-3 Primary Commands (SPC)	
SCSI-3 Medium Changer Command Set	NCITS 314:1998, SCSI-3 Medium Changer Commands (SMC)	
Parallel SCSI Standard	ANSI X3.302-1998 SCSI Parallel Interface-2 (SPI-2)	
Fibre Channel Standard	ANSI X3.269:1996 Fibre Channel Protocol (FCP)	
TapeAlert	T10/143r0, TapeAlert Specification v 3, Hewlett-Packard Company.	

**Table 1-1 Related Documents**

This chapter provides an introduction to the Qualstar XLS-810160/810240 tape libraries and describes the major features and components.

## 2.1 General Description

The Qualstar XLS is a mid-range tape library combining an efficient design with an intelligent system architecture. The XLS library is designed to accommodate a wide range of storage needs.

The XLS 810240 accommodates up to 10 tape drives, up to 762 cartridges, and up to two 10-slot I/O ports. The XLS 810160 can accommodate up to 10 tape drives, up to 682 cartridges, and up to two 10-slot I/O ports. The XLS-810160/810240 is shown in Figure 2-1. An optional expansion pod consisting of 116 tape slots may be installed on the left side of the unit. Alternatively, both models can also host one XLS-85000 Media Expansion Module (MEM2). The MEM2 houses 517 tape slots.

A system controller within the library oversees the operation of the robotics, tape drives, and power supplies. It also hosts the X-Link™ library management interface, which can be accessed locally using the touch screen or remotely across a LAN or the Internet. Remote monitoring is also supported over Ethernet using SNMP.

Resources in the XLS can be subdivided into as many as eight independent logical library partitions, with each partition controlled across its own host connection. Interface offerings include parallel SCSI and Fibre Channel.

Access to the control functions of the XLS is protected by user names and passwords.

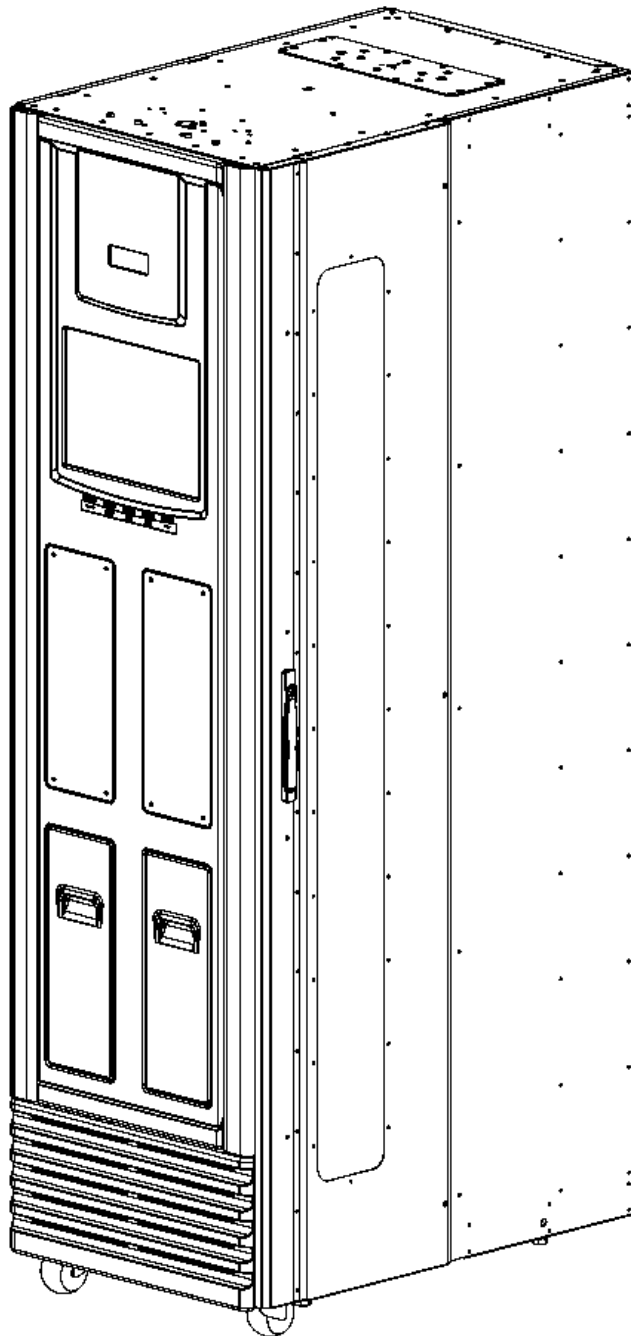


Figure 2-1 XLS-810160/810240



## 2.2 XLS Standard Features

The following features are standard:

- Ability to attach one expansion pod or MEM2 for additional capacity. The expansion pod can store up to 116 cartridges and the MEM2 can store 517 cartridges.
- Linux-based system controller to oversee the operation of the robotics, sensors, and power supplies and to provide the library's management and control interfaces.
- Internal CAN protocol for highly reliable inter-processor communications.
- Integrated support for Fibre Channel and SCSI Library Interface Adapters (LIAs). Up to four dual-ported LIAs enable host software to control the library's medium-changer interface using the standard SCSI-3 command set.
- Support for up to eight independent, user-configurable library partitions. Each partition (referred to as a *logical library*) is a subset of the available tape drives, cartridge slots, and I/O ports.
- Supports Fibre Channel and SCSI LTO tape drives.
- Robotic handler with integrated barcode reader to provide automated inventory tracking and optical calibration of storage and tape drive positions.
- Up to two I/O ports to facilitate the import and export of cartridges. Each I/O port includes a removable 10-cartridge magazine.
- Fifteen-inch color touch screen for local configuration, monitoring, and control using X-Link.
- Highly visible colored LEDs to provide instantaneous status of the library, power supplies, and tape drives from a distance.
- Comprehensive security system to protect the library from unauthorized access. Key locks and electronic locks secure the doors. The Inventory Sentry monitors intrusions into the storage areas and minimizes off-line time.
- Encryption Key Management enables use of the powerful data encryption capability built into every LTO tape drive. Simple, easy-to-use, library-based key management allows Administrators to assign a separate key to each partition. The data on all tapes within a partition are encrypted and decrypted with a single key.

---

## 2.3 X-Link Features

With a web-based design that supports standard Internet browsers, the X-Link library management interface can be accessed locally using the color touch screen or remotely over a LAN or the Internet. The local and remote functions are identical, and multiple simultaneous connections are supported.

Features of X-Link include the following:

- Menu-based organization that includes customizable content, intuitive controls, and comprehensive, context-sensitive help.
- Installation and configuration wizards to streamline the installation process.
- Configurable access to various library functions. Using the familiar user group paradigm, a library administrator can control what tasks each user can perform. All X-Link users must have valid user IDs and passwords.
- A View Hardware capability that allows library operators to obtain status information about the tape drives and other hardware components.
- Comprehensive event manager to track and log recent library events. The library can be configured to send email and pager alerts to specified users when an event occurs.
- Support for the SNIA Storage Media Library (SML) SNMP MIB, using messages. The MIB can be downloaded at [www.qualstar.com/snua-mib](http://www.qualstar.com/snua-mib)
- Exportable reports and tables. Inventory reports, event logs, and other tables can be exported to Microsoft Excel, XML, or comma-separated value (CSV) files.
- “Never lost” manuals. The XLS ships with paper manuals, but electronic versions are always available in Adobe Acrobat PDF format from X-Link or from Qualstar’s web site.

## 2.4 XLS High Availability Features

The XLS is designed for 24/7/365 operation and includes the following features for high availability and “online” serviceability:

- N+1 redundant power system option.
- Dual AC input power option.
- System health monitor and restart manager.
- Automated event reporting via email and pager alerts.
- Remote configuration and management.
- Journaling file system on the system controller for faster recovery from power losses and system resets.

- Hot-swappable tape drives, power supplies, and controller fans. These components can be replaced while the library and all other tape drives remain up and running. For safety reasons, the robot will not move while a drive slot is unoccupied. Safety covers must be inserted in place of unused tape drives.
- Ability to send email and pager alerts to designated users when a failure occurs.
- Dual mirrored controller disks option

## 2.5 Features

Table 2-1 lists the options available for the XLS model:

Feature	XLS-810160		XLS-810240		Notes
	Standard	Optional	Standard	Optional	
Fibre Channel or parallel SCSI LIAs		1 to 4 <sup>®</sup>		1 to 4 <sup>®</sup>	Each LIA includes two ports, providing up to 8 independent connections.
I/O ports	1	1 more	1	1 more	Each port holds 10 cartridges.
Drive bays	1	4 more	1	4 more	Each drive bay holds 2 tape drives.
XLS-85000 Media Expansion Module (MEM2)		1 <sup>①</sup>		1 <sup>①</sup>	The module houses 517 tapes.
Expansion Pod		1 <sup>①</sup>		1 <sup>①</sup>	The pod holds 116 tapes.
N+1 Redundant AC/DC Power Supplies		Optional		Optional	User may add optional power supplies
Dual AC Power Input		Optional		Optional	Automatic failover if primary AC power source is lost.
Power Monitoring Input Module <sup>®</sup>		Optional		Optional	
Drive bay security panel		Optional		Optional	
Mirrored Disk Drive		1		1	Automatic back up of system configuration.
Electronic door lock	Standard		Standard		Allow entry to the library to be controlled from X-Link.

<sup>①</sup> An Expansion Pod or a MEM2 may be added, but not both.

<sup>®</sup> Automatically included if Dual AC Power Input is selected.

<sup>®</sup> 1-3 with mirrored disk option

**Table 2-1 Options for the XLS-810160 and XLS-810240**

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## 2.6 XLS Library

The XLS, shown in Figures 2-2, contains the following components:

- 682 Cartridge Slots for a XLS-810160 with the optional MEM2 unit
- 762 Cartridge Slots for a XLS-810240 with the optional MEM2 unit
- Dual-port Fibre Channel or SCSI LIAs
- X-Link interface with touch screen
- Robotic handler and barcode reader
- Up to 10 tape drives
- One I/O port standard (second is optional)
- Right side door with window and security features
- Left side window

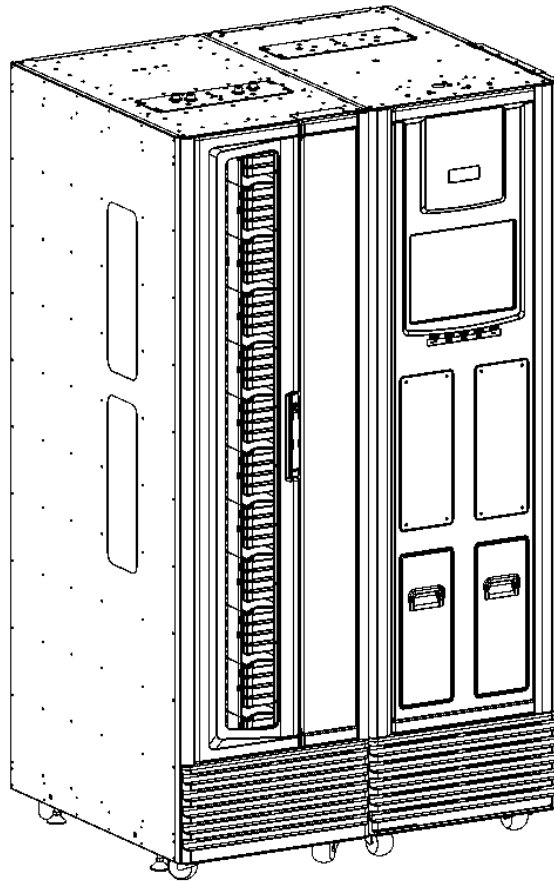


Figure 2-2 XLS-810160 or XLS-810240 Library with the XLS-85000 MEM2

## 2.6.1 System Controller

The system controller is a Linux-based computer. The system controller:

- Controls the operation of the robotics, sensors and power supplies
- Communicates with each tape drive to monitor tape drive status, receive tape drive alerts, and so on.
- Manages all communications between the medium changer and the host applications
- Maintains an up-to-date cartridge inventory
- Hosts X-Link

### 2.6.1.1 Ethernet Connectors

The system controller includes a single Ethernet connector. The connector allows the library to be connected to a network for remote X-Link management or directly to a laptop or other standalone computer to facilitate service operations.

### 2.6.1.2 Library Interface Adapter Cards

The system controller includes expansion slots for up to four Library Interface Adapter s (LIAs). Each LIA has two ports, allowing the medium changer interface in the XLS to be concurrently connected to up to eight independent computers. The XLS supports SCSI and Fibre Channel LIAs. The SCSI LIAs use VHDCI connectors.

### 2.6.1.3 Cooling Fans and Air Filter

Two cooling fans in the system controller draw air in through the grille and air filter on the front of the library and exhaust it out through the back. (Individual fans are also included in each tape drive assembly and power supply module.) Sensors can detect a failed fan, causing email or pager alerts to be issued to specified users. A calendar-based reminder can be emailed to designed maintenance personnel when air filter replacement is due.

Both the system controller fans and the air filters may be changed without interrupting XLS operations.

## 2.6.2 Power Supplies

The XLS-810160/810240 uses distributed power regulation where all operational voltages are developed locally from a common 24-volt DC power bus. This includes everything in the library. Active over-current protection on all 24-volt feeder busses protects the system from high-current faults. The power bay includes slots for up to three 24-volt DC power supplies including one required for support of N+1 power.

The number of power supplies required varies with the number of installed tape drives (see Section 4.1 for details). Multiple power supplies share the total load equally, thus reducing the stress on each power supply and greatly extending their service life. Each supply has two cooling fans.

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The power bay at the rear of the library houses the following components:

- **Main power disconnect switch.** The single disconnect switch for the library is a 20-amp circuit breaker. When this switch is shut off, all XLS functions are immediately powered down. Two circuit breakers are included when the optional dual AC power input module is purchased.
- **AC power connector.** The power connector is a single-phase, 100 to 240 volt service connection. A single North American or international power cord is provided to power the library unless the optional dual AC power input module is purchased. Refer to Section 4.1.3 for more information.
- **Power supplies.** One to three removable power supply modules provide power to all components within the library and expansion modules including the tape drives. N+1 power redundancy is optional. Power module status is monitored by X-Link and alerts are issued if necessary.

A redundant power supply is optional on the XLS-810160/810240, and it provides true N+1 redundancy and enables hot-swapping. The individual power supplies slide in and out of the back of the library and are secured with captive screws.

An optional dual AC power input module allows the XLS library to be powered by two independent power sources, providing a redundant power source in the event one of the power sources should fail. The module switches to the second power input if the first has failed. The module will switch back to the first input when it has functioned properly for a period of time.

Features of the redundant power input module include the following:

- An input voltage range of 100-264 VAC with 15 amps maximum current.
- A transfer time between 4-13 milliseconds providing for uninterruptible service.
- Over current protection provided by 20 amp circuit breakers on both sides of each line.
- No requirement for line frequencies or line voltages to match.
- No requirement for power sources to be in-phase.
- Soft startup (starts up at zero crossings).
- Voltage and Power reporting over CAN interface.
- LED status indicators.
- Redundant internal cooling fans with faults monitored by the library.

A rechargeable battery is integrated into the XLS. If primary power fails, this module provides sufficient 24-volt DC bus power to properly terminate all control processes before shutting down the XLS. Tape drives are powered down immediately upon a primary power failure unless an external UPS is provided.

The battery is user replaceable with an expected operational life of approximately five years. Protection is typically restored in approximately 10 minutes following the

restoration of power. Status LEDs on the module include Primary Power, Charging, Discharging and Fault. The internal battery module may be changed without interrupting the library operations.

## 2.6.3 Touch Screen and X-Link Interface

Each library includes a 15-inch, color touch screen. The X-Link interface can be accessed locally from the touch screen or remotely by using one of the Ethernet connectors to attach the XLS to a LAN or the Internet. The interface and available functions are the same regardless of how they are accessed.

Permission to access X-Link is maintained and configured by an administrator. Access is password protected.

### 2.6.3.1 Configuration Wizards

X-Link includes a installation and configuration wizard:

- The Create Logical Library wizard assists while creating one or more logical libraries (partitions of the XLS physical system), providing a convenient way for installers to specify and assign information about LIA connections, tape drives, cartridge slots, and I/O ports.

### 2.6.3.2 X-Link Home Page

The X-Link home page provides information about status, events, contacts, and a configuration summary. In addition, the home page provides an access point to the following library management tasks:

- **Logical library tasks**, including modifying the resources assigned to each logical library partition, editing administrator information, monitoring events, and opening the I/O ports.
- **Event tasks**, including viewing, sorting, and exporting the library's event log.
- **User and user group tasks**, including adding and modifying information about library users and setting up permissions for different user groups.
- **Physical library tasks**, including viewing hardware status, moving cartridges, locking and unlocking doors, managing tape drives, and shutting down the library.
- **Settings and policies tasks**, including managing e-mail, SNMP, and event log settings.
- **Configuration tasks**, including managing administrator and network connection information.
- **Service tasks**, including running diagnostic routines.

A context-sensitive, searchable help system is available from every screen and provides detailed information about each option.

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### 2.6.3.3 LEDs

Located directly below the touch screen, the five status LEDs indicate the library's operational status at a glance, as shown in Table 2-2.

LED	State	Indicates
Attention	Flashing yellow - slow	Operator intervention is required; for example, a door is unlocked or opened.
Attention	Flashing yellow - fast	Operator intervention is required; for example, a light curtain is blocked.
Attention	Solid yellow	An I/O port is open.
Robot Activity	Flashing green	The handler or the carousel is moving.
Fault	Flashing red	The XLS has experienced an unrecoverable error or it has been shut down from the X-Link interface.

**Table 2-2 LED states**

In addition to the front panel LEDs, status LEDs are included on the back of each tape drive assembly and each power supply as well as the redundant power input module.

## 2.6.4 Robotic Handler and Barcode Reader

A robotic tape handler within the library moves on four axes to access cartridges anywhere in the library.

The servos are self-calibrating and require no adjustments. All servos are closed loop and digitally controlled with optical position sensors to ensure fast, smooth, trouble-free cartridge handling.

The barcode reader scans barcode labels on all cartridges to establish and maintain an up-to-date cartridge inventory. The system controller stores the cartridge inventory in a database and makes it available to the host applications.

### 2.6.4.1 Barcode Labels

Barcode labels must conform to the *ANSI/AIM BCI-1995, Uniform Symbol Specification (USS-39)*.

Pre-printed barcode labels, which are both human- and machine-readable, are available from multiple sources.

## 2.6.5 Tape Drives

The XLS-810160/810240 can accommodate up to ten tape drives, which are installed in one to five drive bays (2 drives per bay). The tape drive data paths are independent of the medium changer interface.



### 2.6.5.1 Tape Drive Assemblies

An XLS tape drive assembly consists of a tape drive enclosed in a drive carrier. The drive carrier provides regulated and switched power to the tape drive and a cooling fan. SCSI tape drive assemblies include dual SCSI HD68 connectors and a single status LED, while Fibre Channel tape drive assemblies include a duplex LC multi-mode Fibre Channel receptacle and three LEDs.

Two captive screws secure each tape drive assembly in position. Tape drive models and interface types may be mixed within a drive bay. For safety reasons, any unused slots must be filled with a blank drive filler assembly. (The handler is prevented from moving if any of the tape drive slots are unoccupied and a drive filler assembly is not installed.)

The XLS communicates with each tape drive using a serial connection within the drive carrier. The serial connection allows the library to monitor tape drive status, set target IDs, receive tape drive alerts, and so on.

Depending on the capabilities of the application software being used, the Fibre Channel tape drive assemblies can be hot swapped. That is, you can remove and replace tape drive assemblies without powering down the library. The library automatically detects the presence of a new tape drive.

### 2.6.6 I/O Port

The I/O port on the front of the library allow cartridges to be imported or exported without opening the doors or interrupting XLS operations. The I/O port holds 10 cartridges in a removable magazine. The XLS includes one I/O port and a second one is available as an option.

Access to the I/O port is controlled by the application software and X-Link. The I/O port uses a removable magazine suitable for long-term storage. A removable dust cover is provided with each I/O port magazine.

### 2.6.7 Cartridge Slots

The XLS-810240 includes storage slots for 245 cartridges while the XLS-810160 includes slots for 165 cartridges when the optional second I/O port is not selected. Adding the I/O port option subtracts 10 storage slots.

### 2.6.8 Doors, Windows, Locks, and Security Features

#### 2.6.8.1 Doors and Windows

The XLS-810160/810240 has a single door with a window for viewing robot operations on the right hand side of the unit. A minimum clearance of 14 inches is required on the right side to access the interior. Additional windows are located on the front and left hand side of the unit.

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### 2.6.8.2 Door Locks

The door includes a key lock and an electronic lock. A user name and password are required to unlock the electronic lock. Pending operations are completed and the handler is parked in a safe location before the door is electronically unlocked. All robotic motion immediately stops when the door is opened.

### 2.6.8.3 Inventory Sentry

The Inventory Sentry consists of a highly sensitive “light curtain,” which allows the XLS to precisely monitor all areas within the library cabinet, as follows:

- When the door is closed, the Inventory Sentry can detect if a cartridge is protruding out of a slot. If this is the case, the XLS prevents the handler from moving to avoid damage.
- When the door is open, the Inventory Sentry can detect when someone reaches into the cabinet, possibly to add or remove a cartridge. If the light curtain is violated, the XLS reestablishes its cartridge inventory as soon as the door is closed. To speed the time it takes to become ready, the XLS audits only the potentially affected areas of the cabinet.

### 2.6.8.4 Door-Opened Sensors

The door includes a door-opened sensor to protect the integrity of the cartridge inventory. The sensor detects if the door was opened while the library power is off, thus reducing the time required to recover from a power-off event.

When the power is reapplied, the XLS checks the state of the door-opened sensor and performs one of the following actions:

- If the sensor indicates that the door was opened while the power was off, the XLS audits all cartridge locations before becoming ready.
- If the sensor indicates that the door was not opened while the power was off, the XLS bypasses the inventory audit, thus minimizing the time to become ready.

The sensor will be functional for power outages lasting up to 24 hours.

### 2.6.8.5 Security Cover

As an option, a tape drive bay locking security cover installed on the rear prevents the removal of drives.

## 2.6.9 Expansion Pod

The optional expansion pod shown in Figure 2-3 provides for a 116 tape capacity expansion. The pod may be installed in the field by qualified personnel and is powered by the library.



**Figure 2-3 XLS-810240 Library with Expansion Pod**

### **2.6.10 XLS-85000 Memory Expansion Module**

The XLS-85000 MEM2 can be attached to the XLS as shown in Figure 2-2. The MEM2 houses 517 tape slots in a compact rotary carousel unit that increases the total capacity of the XLS-810240 to 762 slots and the XLS-810160 to 682 slots. The MEM2 can be installed in the field by qualified personnel.

# 3

# Physical Specifications

## 3.1 Dimensions

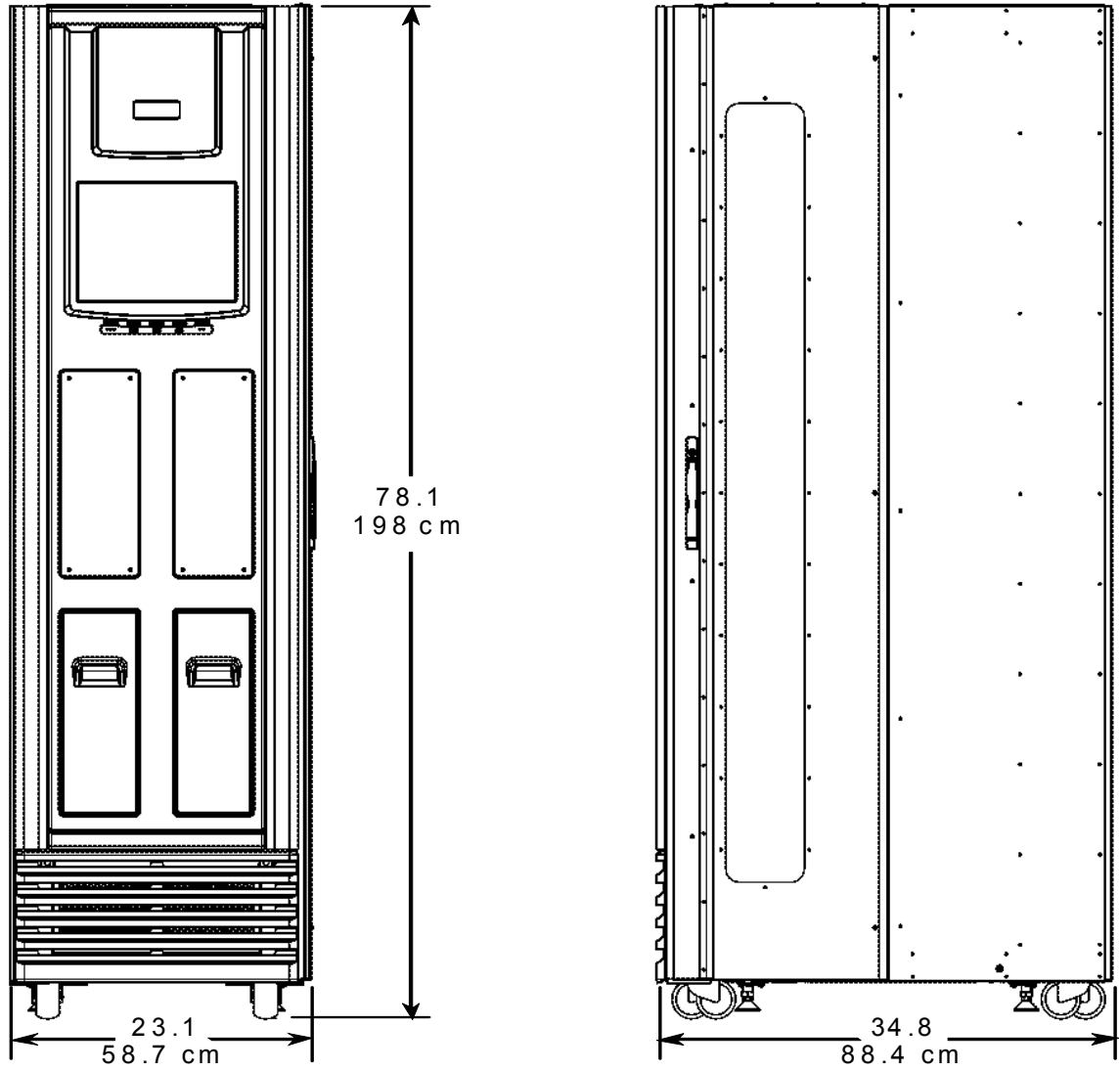


Figure 3-1 810160/810240 library external dimensions

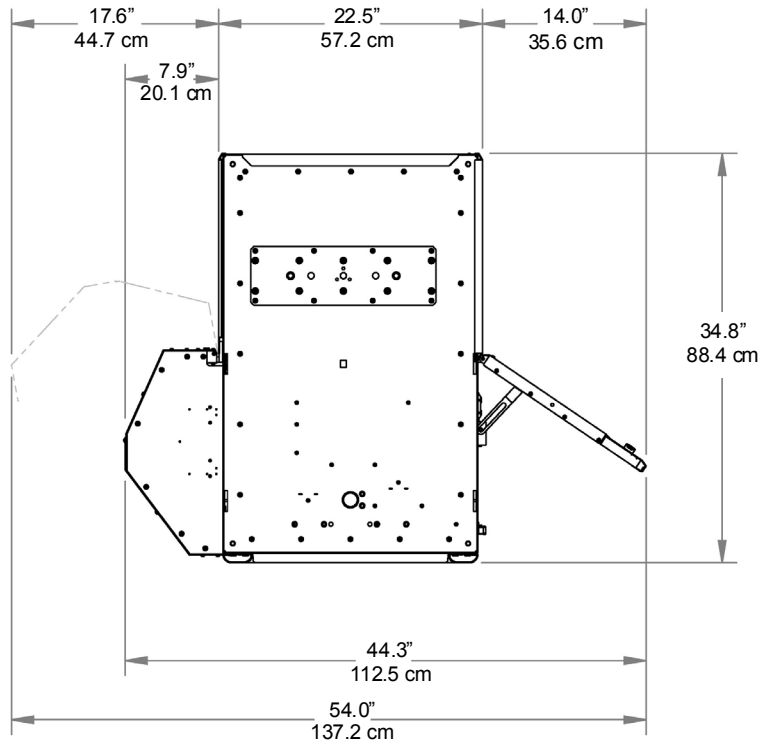


Figure 3-2 810160/810240 library plan view showing service access requirements

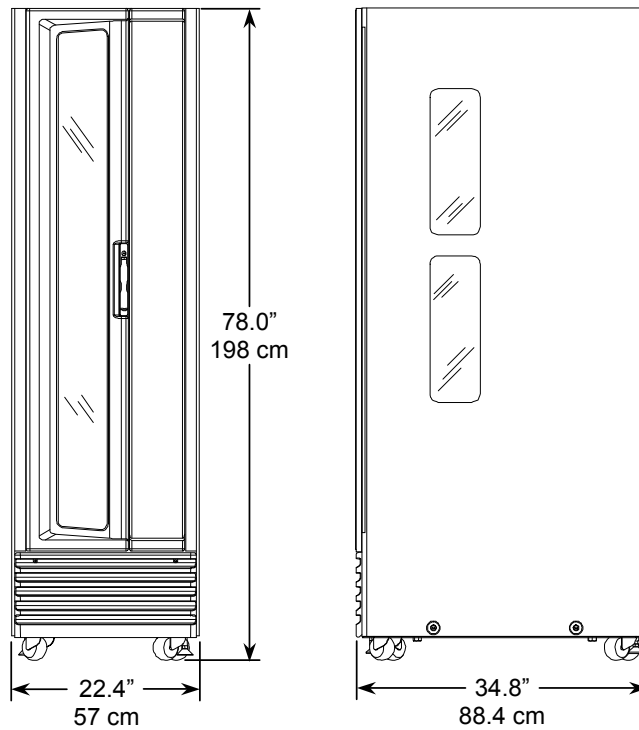


Figure 3-3 XLS-85000 MEM2 external dimensions

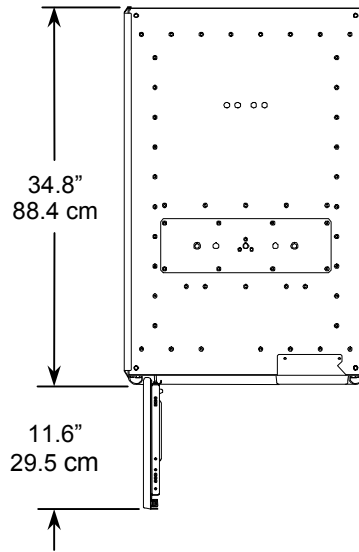


Figure 3-4 XLS-85000 MEM2 plan view with door opened

### 3.2 Weights

Unit	Tape Drives Installed	Cartridge Slots Filled	Net Weight Empty (lbs / kg)	Net Weight Loaded (lbs / kg)	Floor Loading (lbs/ft <sup>2</sup> / kg/m <sup>2</sup> )
810160	10	165	500 / 227	715 / 324	76 / 34
810160 with Expansion Pod	10	281	535 / 243	799 / 362	58 / 26
810160 with MEM2	10	682	920 / 417	1402 / 636	84 / 38
810240	10	245	550 / 249	821 / 372	87 / 39
810240 with Expansion Pod	10	361	585 / 265	905 / 411	66 / 30
810240 with MEM2	10	762	970 / 440	1508 / 684	91 / 42

Table 3-1 XLS Weights and Floor Loading

### 3.3 Exterior Color

The exterior color of the library is textured black.

### 3.4 Logo

A blue and brushed metal Qualstar logo is standard on the library.

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### 3.5 Physical Installation

The library is attached to and shipped on a pallet. Removing the equipment from the pallet entails removing the protective cardboard exterior restraint screws, attaching the supplied ramps to the edge of the pallet, and rolling the equipment off the pallet.

The library is fitted with casters and when installed, the cabinet must be leveled with the height-adjustable feet.

Table 3-1 above shows the floor loading presented by the XLS. The installation space requirements for an XLS system are modest. Table 3-2 lists the floor space needed for the library cabinet with and without the expansion pods attached. The addition of 24 inches (0.6 meters) of aisle space on all sides is recommended. The XLS door requires only 12 inches (0.3 meters) of aisle space.

<b>XLS-810160 or XLS-810240</b>		
<b>Unit</b>	<b>Sq. Feet</b>	<b>Sq. Meters</b>
810160/810240	6.17	0.57
810160/810240 with Expansion Pod	13.70	1.27
810160/810240 with MEM2	16.64	1.55

**Table 3-2 Recommended floor space for the XLS-810160/810240**

A single 100-240 volt, single-phase, 50/60-Hertz power source is required for the XLS. An Uninterruptible Power Source (UPS) is always recommended for the XLS and the equipment connected to it. See Table 4-2 for UPS requirements. A second AC power input source is supported via the optional dual AC power input module.

# 4

# Power Requirements

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## 4.1 AC Power Requirements and Consumption

The XLS operates from the single-phase alternating current power sources (mains) shown in Table 4-1.

<b>Rated Line Voltage</b>	<b>Maximum Operating Line Voltage</b>	<b>Minimum Operating Line Voltage</b>	<b>Line Frequency Range</b>
115–240 VAC	260 VAC	105 VAC	48–62 Hz

**Table 4-1 XLS mains requirements**

Other than selecting the appropriate AC power cord(s) for connection to the mains, the XLS requires no changes to operate from any input voltage within the rated line voltage. Power is connected to LRM cabinets only. MEM cabinets get their power from an adjacent LRM.

Power consumption varies with the number of tape drives installed; the number of tape drives operating simultaneously, and the occurrence of robotic motion. The XLS is equipped with one or more Power Factor Corrected (PFC) power supplies. Table 4-2 lists power requirements for a few typical system configurations. From this information, the actual power needs of any system configuration can be determined. Use the peak watts data to calculate the power system requirements and use the average BTUs/Hr to size the cooling system requirements.

In Table 4-2, the maximum power figures indicate the power consumed when the robotics are accelerating and all of the tape drives are writing. The maximum power levels are not expected to last for more than two seconds at a time.

The input power to the library is nearly constant over changes in incoming line voltage. Low line voltages proportionally increase the incoming AC current and may cause the library or external circuit breaker to trip prematurely.



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### 4.1.1 Power Source Disturbances

The XLS includes a small 24VDC UPS module with battery backup to allow the library to shut down properly in case of power source disturbances. If the primary power drops below 90 VAC for more than 20 milliseconds, the XLS commences the following routine:

1. Immediately powers down the tape drives
2. If a cartridge is already in the handler, it is returned to its last origin or held in a safe manner
3. The robotic handler is parked at the bottom of its travel
4. All XLS system files are closed and all control processes are shut down
5. The system controller is shut down

### 4.1.2 Power Entry

Power is normally connected to the LRM cabinet through a 20-amp, 3-pin connector. An internal AC line filter reduces EMI conducted emissions and protects the XLS from noise on the power lines. A built-in 20-amp switch/circuit breaker disconnects the power source from the XLS and is manually resettable. If the optional dual AC power input module is installed power can be connected from two independent power sources through two 20-amp, 3-pin connectors allowing for automatic failover if the primary source is lost.

Some examples of power consumption requirements are listed in Table 4-2. Tape drive power includes a SCSI terminator for each drive.

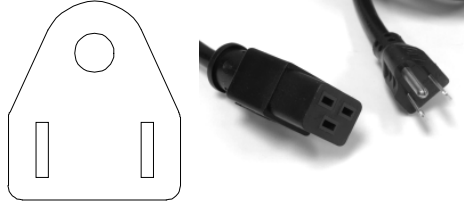
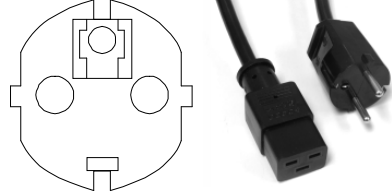
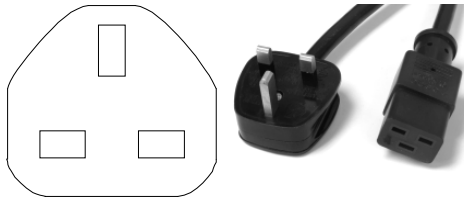
Peak Watts in Table 4-2 assumes that all modules within the XLS are drawing maximum current. This state is virtually impossible to actually achieve. For example, if all drives were reading or writing data, the robot will not be in motion since no tapes are waiting to be moved.

System Configuration	Consumption	
	Peak Watts	Average BTUs/hr
1 LRM, 4 tape drives	475	1,100
1 LRM, 4 tape drives, 1 MEM	713	1,350

Table 4-2 Approximate XLS power consumption examples

### 4.1.3 Power Cords

Table 4-3 lists the standard detachable six-foot (or two-meter) power cords that are available.

Country	Volts/Amps	Qualstar Part Number	Power Cord Styles
North America	105-125V 15A	664-0107-6	
Continental Europe	230-240V 16A	664-0200-9	
United Kingdom	200-240V 13A	664-0201-7	

**Table 4-3 Available standard XLS power cords**

XLS models equipped with the optional dual AC power input module come supplied with two power cords. The cords are three-conductor 14 AWG SJT PVC-jacketed cords terminated with an IEC 60320 C-19 type connector at the XLS end. See Table 4-3.

# 5

# Performance Specifications

## 5.1 Data Cartridge Handling Times

Table 5-1 lists the average time required for the XLS to pick a cartridge from a storage slot and place it in a tape drive and to pick a cartridge from a tape drive and return it to a storage slot. In the table:

- The **Average Times** assume random locations for the tape drives and storage slots.
- The **Worse Case Times** are for moves from a tape drive at bottom left corner of the unit to the storage slot at the top right corner of the carousel.

Condition	Average Time	Worst Case Time
Load drive from slot in library	11 seconds	17 seconds
Unload drive and return to slot in library	10 seconds	16 seconds
Load drive from slot in MEM	13 seconds	21 seconds
Unload drive and return to slot in MEM	12 seconds	20 seconds

Table 5-1 Cartridge handling times

## 5.2 Scan All Barcodes

Table 5-2 lists the typical times required to scan data cartridges in the XLS-810240. The table assumes all cartridges use barcode labels and that no retries are needed.

To Scan	Typical Time
245 cartridges in a library	170 seconds
517 cartridges in an XLS-85000 MEM	300 seconds
116 cartridges in an expansion pod	50 seconds

Table 5-2 Barcode and inventory scanning times

# 6

# Environmental Specifications

## 6.1 Temperature, Humidity, and Altitude

Parameter	Operating	Non-Operating <sup>1</sup>
Ambient temperature	+5°C to +32°C (+41°F to +90°F)	-20°C to +60°C (-4°F to +140°F)
Temperature gradient (maximum)	1°C/minute, 10°C/hour (2°F/minute, 18°F/hour)	1°C/minute, 20°C/hour (2°F/minute, +36°F/hour)
Relative humidity (non-condensing)	20% to 80%	10% to 90%
Wet bulb temperature	26°C (79°F) maximum	29°C (84°F) maximum
Altitude	-1,000 to +8,000 feet -304.8 to +2,438 meters	-1,000 to +40,000 feet -304.8 to +12,192 meters

<sup>1</sup> Includes tape drives.

**Table 6-1 Environmental specifications**

### NOTE

*Rapid changes in temperature that produce condensation must never be allowed since the condensed liquid may contaminate bearing lubricants and possibly shorten the expected Mean Time Between Failures.*

## 6.2 Acoustical Noise

Overall noise level at one meter from the front of the XLS shall not exceed:

- With 10 tape drives operating and N+1 power supplies: ≤ 70 dBA
- As above plus robotic handler operating: ≤ 75 dBA

## 7.1 Mean Exchanges Between Failures

The Mean Exchanges Between Failures (MEBF) rating exceeds 2,000,000 exchange cycles. The MEBF rating excludes tape drives, which are rated separately by their manufacturers. An exchange cycle consists of the following actions:

1. Pick a data cartridge from a storage location.
2. Place the cartridge into a tape drive.
3. Remove a cartridge from a tape drive.
4. Return the cartridge to the same storage location.

Qualstar Corporation does not warrant either the MEBF or the failure rate 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.

## 8.1 EEC Directive Compliance (European Economic Community)

The XLS meets or exceeds the requirements of the CE Mark as set forth by:

- Electromagnetic Compatibility Directive 89/336/EEC
- Low Voltage Directive 73/23/EEC
- European Directive on Waste Electrical and Electronic Equipment (WEEE)

### 8.1.1 Reduction of Hazardous Substances (RoHS)

Qualstar is committed to the implementation of RoHS (Restriction of the use of certain hazardous substances in electrical and electronic equipment) in accordance with the European Directive. The compliance date is July 1, 2006, at which time Qualstar will certify that its tape library products are compliant with the RoHS standard.

Qualstar tape libraries are classified as “Information Technology Storage Array Systems” for which the RoHS Directive provides an exemption for lead solder until the year 2010. Until Qualstar replaces lead-based solder with lead-free solder, affected subassemblies must be disposed of appropriately.

### 8.1.2 XLS Construction Materials

The XLS unit is of riveted construction made from steel that has been pre-plated with zinc for corrosion protection. The G90 steel material meets U.S. ASTM Specification A653.

Exterior side covers are made from 5052-H32 aluminum alloy that has been powder coated in a black textured finish. The aluminum alloy meets U.S. Federal Specification QQ-A-250/8.

Five different types of plastic materials are used within the library as follows:

- The decorative front face coverings are made from vacuum-formed ABS material attached to a steel sub-structure. The ABS material is listed in the current UL Recognized Component Directory and is fire rated UL94V-2 minimum. Exterior surfaces are coated with a textured enamel finish.
- Windows on access doors and side covers are made from clear Polycarbonate. The material is listed in the current UL Recognized Component Directory and is fire rated UL94V-2 minimum.
- Tape and I/O Port magazines are molded from polycarbonate that is filled with 20% glass fiber and 15% Teflon (PTFE) fluoropolymer resin to minimize mechanical wear on the tape cartridges. The polycarbonate material is listed in

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the current UL Recognized Component Directory and is fire rated UL94V-2 minimum.

- Air filters are fabricated from 25 PPI (pours per inch) Quadrafoam. Quadrafoam is an open cell polyurethane foam coated for flame retardancy and fungus resistance. The filter material is listed in the current UL Recognized Component Directory and is fire rated UL94HF-1 minimum.
- E-Chain Cable Carriers are used to protect flex-print cables from damage during robotic motion. The links are molded from Igumid NB polymer, a proprietary compound developed by Igus Incorporated. The material is non-burning and has a UL rating of 94V2 minimum.

Internal wiring is accomplished with UL Style 1429 and UL Style 1430 Hook-Up wire. The insulation on Styles 1429 and 1430 is irradiated PVC for high reliability and high abrasion resistance. This wire meets the requirements of MIL-W-16878, Type B and MIL-W-16878, Type C and is an Underwriters Laboratories Inc. recognized component. UL Style 1429 has a nominal insulation thickness of .010 inches (0,25 mm). UL Style 1430 has a nominal insulation thickness of .016 inches (0,41 mm).

## 8.2 Emissions/Immunity Standards Compliance

The XLS meets or exceeds the standards set forth by:

- FCC Rules, Part 15, Subpart B, Class A Computing Devices
- CISPR 22 (1993)
- CE per EN55022 (1998) Class A and EN55024 (1998) including:  
EN61000-3-2, -3-3, -4-2, -4-3, -4-4, -4-5, -4-6, -4-8 and -4-11

## 8.3 Safety Standards Compliance

The XLS meets or exceeds the standards set forth by:

- ANSI/UL60950 Third Edition – Certified by ITS – usETL
- CAN/CSA-C22.2 No. 60950-00 Third Edition – Certified by ITS – cETL
- CE per EN 60950 – ITS CB Certificate & Report US/995/ITS

## 9.1 Mean Time To Repair

The Mean Time To Repair (MTTR) shall not exceed 30 minutes. The MTTR is the average time for an adequately trained and equipped technician to diagnose and correct a malfunction while following the service procedures in the *XLS Technical Service Manual*. Servicing will be limited to replacing field replaceable units (FRUs). Repair time does not include system retest, calibration, or inventory times.

## 9.2 Preventive Maintenance

The only preventive maintenance required by the XLS consists of periodically cleaning the library and replacing the air filters, which are located on the front of the library. The XLS keeps track of its power-on hours and periodically issues replacement orders. The replacement interval can be changed to match the local environmental conditions. Air filters can be changed without interrupting library operation.

### 9.2.1 Controller Battery Replacement

The NICAD battery pack used in the controller has a five year operating life. The module must be replaced at five-year intervals to maintain power interruption protection. The module may be replaced by the user without interrupting XLS operation.

### 9.2.2 CMOS Battery Replacement

The CMOS battery used on the system controller's mother board should be replaced at three-year intervals to maintain service interruption protection. The battery may be replaced by the user without interrupting XLS operation.

### 9.2.3 Maintaining Controller UPS Protection

Storing the XLS without power for 30 days will cause the battery in the 24-volt DC UPS to discharge to the point where power interruption protection may be lost. The UPS function will be re-established approximately 10 minutes after normal power is restored.

## 9.3 Tape Drive Cleaning

During normal library operations, tape drive cleaning is managed by the host software applications using cleaning cartridges installed in each logical library partition. In addition to these cleaning cartridges, each library includes four reserved cleaning cartridge slots for maintenance and service operations performed using X-Link. These cartridges can be used, for example, if a software application does not



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perform automated cleaning. The cartridges in the reserved slots are not accessible to the software applications.

## 9.4 Adjustments

The XLS does not require electrical or mechanical adjustments after any field replaceable unit (FRU) or tape drive is replaced. All adjustments, alignments and calibrations are performed automatically.