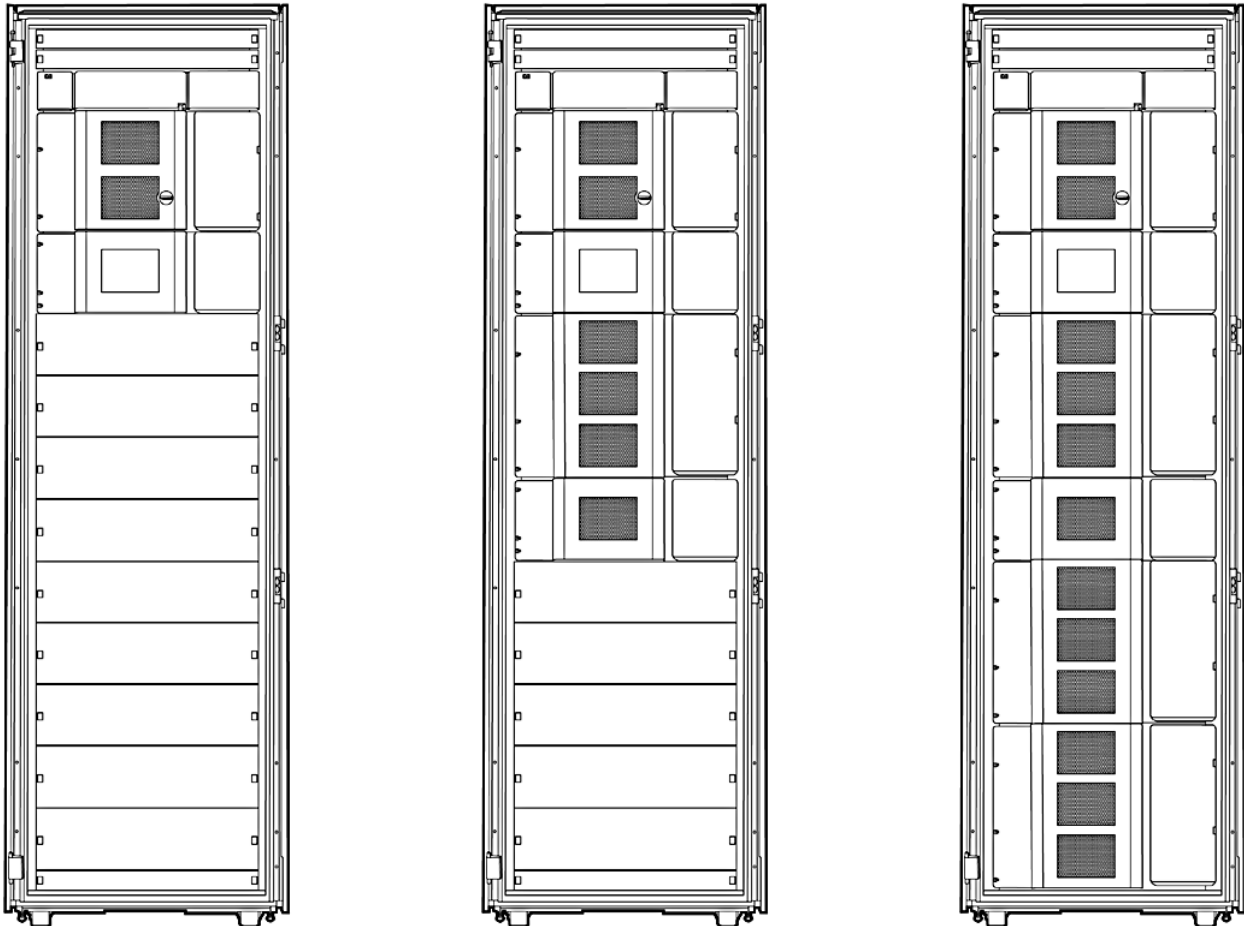


Overview

The HP StorageWorks Enterprise Modular Library (EML) E-Series Tape Libraries provide reliability, scalability and manageability with robust data protection and investment protection in heterogeneous Storage Area Network (SAN) environments. The EML delivers superior data availability with protection against SAN event disruptions using the built in HP StorageWorks Extended Tape Library Architecture (ETLA). ETLA intercepts rogue I/O requests from applications or new servers and prevents those requests from interrupting backup or recovery processes. You can also flexibly scale to 808 TB compressed (2:1) storage capacity or 13.8 TB/hr compressed (2:1) throughput performance from rack-ready or factory racked configurations. Easily manage the EML remotely while simplifying complex environments with logical library partitioning. The EML is ideally suited for medium to large data centers and as a companion for the HP StorageWorks Enterprise Virtual Array (EVA) family.

The EML Tape Libraries are fully integrated into the HP StorageWorks portfolio through interoperability and compatible capacity points. The EML tape library is extensively tested in the HP StorageWorks Enterprise Backup Solutions (EBS) to ensure that it works in the most rigorous environment. Documentation is provided to enable you to configure, design and implement the best data protection solution for your environment. Entry configurations start at 71 slots. Maximize capacity with 505 slots or maximize performance with 16 LTO-4 Ultrium 1840 or LTO-3 Ultrium 960 FC tape drives and 442 slots. The LTO-4 Ultrium 1840 tape drive provides encryption support. The EML delivers value through high reliability data protection, agility through modular scalability and simplicity through ease of management.

HP StorageWorks EML E-Series Tape Libraries



Overview

103e Configuration
or rack-ready EML71e

245e Configuration

505e Configuration

What's New

New EML E-Series Enhancements:

- Centralized encryption key management solution through Secure Key Manager (SKM)
- Integration of the HP StorageWorks LTO-4 Ultrium 1840 Tape Drive
- LTO-4 Ultrium 1840 tape drive hardware encryption for secure, high-performance backups
- HP StorageWorks EML 71e LTO-4 Ultrium 1840 Tape Library

Key Features

- Scalable capacity from 71 slots to over 500 slots
- Scalable performance up to 16 Ultrium tape drives with 442 slots
- ETLA protects tape drives from SAN events
- Easy-to-enable AES 256-bit embedded hardware encryption with compression
- Remote Management via Command View for Tape Libraries software or the command line interface
- Easy-to-use Touch-screen Graphical User Interface
- User configurable load ports with removable magazines
- Certified under the HP StorageWorks Enterprise Backup Solutions (EBS)
- LTO-4 Ultrium 1840 or LTO-3 Ultrium 960-FC Tape drives
- Factory rack and rack-ready configurations
- 2,000,000 Mean Swaps Between failure

Customer Benefits

- **Scalable Investment Protection:** The EML tape library expands in capacity and performance as customer needs change. Through the addition of expansion modules, the EML library scales within the rack footprint to 16 drives and 442 slots for maximum performance or 8 drives and 505 slots for maximum capacity. For field upgrades, follow the rules in the "Configuration Information" section of this document. Libraries with an "A" suffix part number (for example AG104A) can be upgraded with parts with a "B" suffix, but not vice-versa.
- **Improves reliability of backup and recovery processes:** Utilizing device-level access control, part of the Extended Tape Library Architecture, the EML tape library minimizes the effect of rogue programs on backup and recovery processes.
- **Manageable:** The EML library has been designed to ease the management burdens of data protection in your SAN. Utilizing HP StorageWorks Command View for Tape Libraries Software, management, diagnostic, and configuration features can be accessed from anywhere. Additionally, Command View EVA and Command View for Tape Libraries Software may co-exist on the same general purpose server.
- **Compatible:** Certified through the HP StorageWorks Enterprise Backup Solutions (EBS), the EML tape library is compatible with leading backup software packages, operating systems, servers, and disk arrays.
- **Performance:** Performance to meet critical backup windows is achieved through use of state-of-the-art HP Ultrium tape drives.
- **Compact:** Using a standard rack footprint, the EML library integrates easily into the rack-grid of your data center.
- **Resiliency and Reliability:** Highly reliable robotics and tape drives coupled with optional redundant power supplies and redundant cooling provide resiliency should a component fail.
- **Provides a high level of encryption security, with compression, for strong backup data privacy to secure confidential information and address compliance quickly.** Encryption key management support via HP Data Protector Software and other ISV backup applications. The EML tape libraries can be factory integrated for rapid deployment or mounted at the customer site with rack-ready configurations.

Overview

Family Configuration Comparisons (Examples)

Configuration	EML 71e Rack-ready Configuration	EML 103e Base Configuration	EML 245e	EML 442e Maximum Performance Configuration	EML 505e Maximum Capacity Configuration
# of drives possible	2-4	1-4	1-8	1-16	1-8
# of slots	71 5 in configurable load port	103 5 in configurable load port	245 15 in configurable load port	442 35 in configurable load port	505 35 in configurable load port
Product height within rack	12U + 1U (LTO-4)* 12U (LTO-3)	12U + 1U (LTO-4)* 12U (LTO-3)	24U + 1U (LTO-4)* 24U (LTO-3)	40U + 1U (LTO-4)* 40U (LTO-3)	40U + 1U (LTO-4)* 40U (LTO-3)
Maximum Capacity (2:1 compression)	113.6 TB (LTO-4)	164.8 TB (LTO-4)	392 TB (LTO-4)	707.2 TB (LTO-4)	808 TB (LTO-4)
Maximum throughput (2:1 compression)	3.4 TB/hr (LTO-4)	3.4 TB/hr (LTO-4)	6.9 TB/hr (LTO-4)	13.8 TB/hr (LTO-4)	6.9 TB/hr (LTO-4)

* For all EML library configurations with LTO-4 Ultrium 1840 drive(s), an additional 1U height is required for the EML Internal Network Kit.

Configuration/slots	Tape Drives	I/F Controller Cards	Redundant Power Supply
103e/103	1-4	1 (LTO-4) 1 (LTO-3)	0-1
245e/245	1-8	1 (LTO-4) 1-2 (LTO-3)	0-2
348e/348	1-12	1 (LTO-4) 1-3 (LTO-3)	0-3
375e/375	1-8	1 (LTO-4) 1-2 (LTO-3)	0-2
442e/442	1-16	1 (LTO-4) 1-4 (LTO-3)	0-4
469e/469	1-12	1 (LTO-4) 1-3 (LTO-3)	0-3
505e/505	1-8	1 (LTO-4) 1-2 (LTO-3)	0-2

NOTE: To order an EML library factory integrated (CTO) library, begin by selecting the EML 103e Base Library sku (AG104B). Next add the following #0D1 options for integration into the EML 103e Base Library. Select the number of required slots, the number of tape drives, I/F controller card or cards (1 card for LTO-4 and 1 card for every four LTO-3 tape drives) and the number of redundant power supplies.

NOTE: The EML71e Configuration is not CTO. It is a rack-ready, field rack-mount configuration that can be upgraded to any EML configuration.

Overview

Rack-ready Configuration (EML 71e)

Logic	Options	Component	Quantity	Comments
71e LTO-4 Tape Library -71 Slots -Bundle includes drives, internal network kit, interface controller and basic management software	AH876A	HP StorageWorks EML 71e LTO-4 Ultrium 1840 Tape Library	1	Required; Bundles two HP EML LTO-4 Ultrium 1840 FC drives, HP EML e2400-FC 2Gb Controller, HP EML LTO-4 Ultrium 1840 Internal Network Kit and full functionality special edition HP Command View Tape Library Software for EML71e only. Permanent license included with capacity upgrade
71e LTO-3 Tape Library -71 Slots -Bundle includes drives, interface controller and basic management software	AH062A	HP StorageWorks EML 71e Library (LTO-3 Ultrium 960)	1	Required; Bundles two HP EML LTO-3 Ultrium 960 FC Drives, HP EML e2400-FC 4Gb Controller and full functionality special edition HP Command View Tape Library Software for EML71e only. Permanent license included with capacity upgrade
Additional Options				
Choose incremental drives	AH682A or AD568B	HP EML LTO4 Ultrium 1840 FC Drive or HP EML LTO-3 Ultrium 960 FC Drive	0-2	Optional Field installed
EML Secure Manager	T3664A	Secure Manager Tape Library Software for EML	0-1	Optional
Licensed Capacity Upgrade	AH063A	HP EML 71e Licensed Capacity Upgrade	0-1	Optional upgrade of EML 71e to EML103e capacity and configuration; includes permanent license for HP Command View Tape Library Software

CTO Configurations (EML 103e, 245e, 348e, 375e, 442e, 469e and 505e)

Logic	Options	Component	Quantity	Comments
103 Slots	AG104B	HP StorageWorks EML 103e Base Library	1	Required
	252663-B24 #0D1	PDU, 16A High Voltage Modular -WW	1 or 2	1 Required Second Optional

Overview

	T3663A	EML Command View License	1	Required
Library Configure				
Choose drives	AH682A #0D1 or AD568B #0D1	HP EML LTO-4 Ultrium 1840 FC Drive or HP EML LTO-3 Ultrium 960 FC Drive	1-4	Must be same drive type throughout for CTO
Choose Controller Card Quantity	AD567B #0D1 or AD569B #0D1	HP EML e2400-FC 2Gb Controller or HP EML e2400-FC 4Gb Controller	1	For EML libraries with LTO-4 Ultrium 1840 drive(s): 1 HP EML e2400-FC 2Gb Controller For EML libraries with LTO-3 Ultrium 960 drive(s): 1 card (2Gb or 4Gb) for every 4 drives - must be same card type throughout for CTO
Choose Internal Network Kit	AJ001A #0D1	HP EML LTO-4 Ultrium 1840 Internal Network Kit	0 or 1	1 kit for each EML Library with LTO-4 Ultrium 1840 drive(s) (Not used with LTO-3 drives)
Choose Redundant Power Supply	AD563B #0D1	HP EML Redundant Power Supply	0 or 1	Optional
Additional Options				
EML Secure Manager	T3664A	Secure Manager Tape Library Software for EML	0-1	Optional
245 Slots	AG104B	HP StorageWorks EML 103e Base Library	1	Required
	AG112B #0D1	HP EML 245e Expansion Module	1	Required, contains qty 1 AD565B and qty 1 AD566B
	252663-B24 #0D1	PDU, 16A High Voltage Modular -WW	1 or 2	1 Required Second Optional
	T3663A	EML Command View License	1	Required
Library Configure				
Choose drives	AH682A #0D1 or AD568B #0D1	HP EML LTO-4 Ultrium 1840 FC Drive or HP EML LTO-3 Ultrium 960 FC Drive	1-8	Must be same drive type throughout for CTO
Choose Controller Card Quantity	AD567B #0D1 or AD569B #0D1	HP EML e2400-FC 2Gb Controller or HP EML e2400-FC 4Gb Controller	1	For EML libraries with LTO-4 Ultrium 1840 drive(s): 1 HP EML e2400-FC 2Gb Controller

Overview

				For EML libraries with LTO-3 Ultrium 960 drive(s): 1 card (2Gb or 4Gb) for every 4 drives - must be same card type throughout for CTO
Choose Internal Network Kit	AJ001A #0D1	HP EML LTO-4 Ultrium 1840 Internal Network Kit	0 or 1	1 kit for each EML Library with LTO-4 Ultrium 1840 drive(s) (Not used with LTO-3 drives)
Choose Redundant Power Supply	AD563B #0D1	HP EML Redundant Power Supply	0 or 2	Optional
Additional Options				
EML Secure Manager	T3664A	Secure Manager Tape Library Software for EML	0-1	Optional
348 Slots	AG104B	HP StorageWorks EML 103e Base Library	1	Required
	AG112B #0D1	HP EML 245e Expansion Module	1	Required, contains qty 1 AD565B and qty 1 AD566B
	AD565B #0D1	HP EML 4-Drive Expansion Module	1	Required
	252663-B24 #0D1	PDU, 16A High Voltage Modular -WW	2	Required
	T3663A	EML Command View License	1	Required
Library Configure				
Choose drives	AH682A #0D1 or AD568B #0D1	HP EML LTO-4 Ultrium 1840 FC Drive or HP EML LTO-3 Ultrium 960 FC Drive	1-12	Must be same drive type throughout for CTO
Choose Controller Card Quantity	AD567B #0D1 or AD569B #0D1	HP EML e2400-FC 2Gb Controller or HP EML e2400-FC 4Gb Controller	1	For EML libraries with LTO-4 Ultrium 1840 drive(s): 1 HP EML e2400-FC 2Gb Controller For EML libraries with LTO-3 Ultrium 960 drive(s): 1 card (2Gb or 4Gb) for every 4 drives - must be same card type throughout for CTO

Overview

Choose Internal Network Kit	AJ001A #0D1	HP EML LTO-4 Ultrium 1840 Internal Network Kit	0 or 1	1 kit for each EML Library with LTO-4 Ultrium 1840 drive(s) (Not used with LTO-3 drives)
Choose Redundant Power Supply	AD563A #0D1	HP EML Redundant Power Supply	0 or 3	Optional
Additional Options				
EML Secure Manager	T3664A	Secure Manager Tape Library Software for EML	0-1	Optional
375 Slots	AG104B	HP StorageWorks EML 103e Base Library	1	Required
	AG112B #0D1	HP EML 245e Expansion Module	1	Required, contains qty 1 AD565B and qty 1 AD566B
	AD564B #0D1	HP EML Capacity Expansion Module	1	Required
	252663-B24 #0D1	PDU, 16A High Voltage Modular -WW	1 or 2	1 Required Second Optional
	T3663A	EML Command View License	1	Required
Library Configure				
Choose drives	AH682A #0D1 or AD568B #0D1	HP EML LTO-4 Ultrium 1840 FC Drive or HP EML LTO-3 Ultrium 960 FC Drive	1-8	Must be same drive type throughout for CTO
Choose Controller Card Quantity	AD567B #0D1 or AD569B #0D1	HP EML e2400-FC 2Gb Controller or HP EML e2400-FC 4Gb Controller	1	For EML libraries with LTO-4 Ultrium 1840 drive(s): 1 HP EML e2400-FC 2Gb Controller For EML libraries with LTO-3 Ultrium 960 drive(s): 1 card (2Gb or 4Gb) for every 4 drives - must be same card type throughout for CTO
Choose Internal Network Kit	AJ001A #0D1	HP EML LTO-4 Ultrium 1840 Internal Network Kit	0 or 1	1 kit for each EML Library with LTO-4 Ultrium 1840 drive(s) (Not used with LTO-3 drives)
Choose Redundant Power Supply	AD563B #0D1	HP EML Redundant Power Supply	0 or 2	Optional
Additional Options				

Overview

EML Secure Manager	T3664A	Secure Manager Tape Library Software for EML	0-1	Optional
442 Slots	AG104B	HP StorageWorks EML 103e Base Library	1	Required
	AG112B #0D1	HP EML 245e Expansion Module	1	Required, contains qty 1 AD565B and qty 1 AD566B
	AD565B #0D1	HP EML 4-Drive Expansion Module	2	Required
	252663-B24 #0D1	PDU, 16A High Voltage Modular -WW	2	Required
	T3663A	EML Command View License	1	Required
Library Configure				
Choose drives	AH682A #0D1 or AD568B #0D1	HP EML LTO-4 Ultrium 1840 FC Drive or HP EML LTO-3 Ultrium 960 FC Drive	1-16	Must be same drive type throughout for CTO
Choose Controller Card Quantity	AD567B #0D1 or AD569B #0D1	HP EML e2400-FC 2Gb Controller or HP EML e2400-FC 4Gb Controller	1	For EML libraries with LTO-4 Ultrium 1840 drive(s): 1 HP EML e2400-FC 2Gb Controller For EML libraries with LTO-3 Ultrium 960 drive(s): 1 card (2Gb or 4Gb) for every 4 drives - must be same card type throughout for CTO
Choose Internal Network Kit	AJ001A #0D1	HP EML LTO-4 Ultrium 1840 Internal Network Kit	0 or 1	1 kit for each EML Library with LTO-4 Ultrium 1840 drive(s) (Not used with LTO-3 drives)
Choose Redundant Power Supply	AD563B #0D1		0 or 4	Optional
Additional Options				
EML Secure Manager	T3664A	Secure Manager Tape Library Software for EML	0-1	Optional
469 Slots	AG104B	HP StorageWorks EML 103e Base Library	1	Required
	AG112B #0D1	HP EML 245e Expansion Module	1	Required, contains qty 1 AD565B and qty 1 AD566B
	AD565B #0D1	HP EML 4-Drive Expansion Module	1	Required

Overview

	AD564B #0D1	HP EML Capacity Expansion Module	1	Required
	252663-B24 #0D1	PDU, 16A High Voltage Modular -WW	2	Required
	T3663A	EML Command View License	1	Required
Library Configure				
Choose drives	AH682A #0D1 AD568B #0D1	HP EML e2400-FC 2Gb Controller or HP EML e2400-FC 4Gb Controller	1-12	Must be same drive type throughout for CTO
Choose Controller Card Quantity	AD567B #0D1 or AD569B #0D1	HP EML e2400-FC 2Gb Controller or HP EML e2400-FC 4Gb Controller	1	For EML libraries with LTO-4 Ultrium 1840 drive(s): 1 HP EML e2400-FC 2Gb Controller For EML libraries with LTO-3 Ultrium 960 drive(s): 1 card (2Gb or 4Gb) for every 4 drives - must be same card type throughout for CTO
Choose Internal Network Kit	AJ001A #0D1	HP EML LTO-4 Ultrium 1840 Internal Network Kit	0 or 1	1 kit for each EML Library with LTO-4 Ultrium 1840 drive(s) (Not used with LTO-3 drives)
Choose Redundant Power Supply	AD563B #0D1	HP EML Redundant Power Supply	0 or 3	Optional
Additional Options				
EML Secure Manager	T3664A	Secure Manager Tape Library Software for EML	0-1	Optional
505 Slots	AG104B	HP StorageWorks EML 103e Base Library	1	Required
	AG112B #0D1	HP EML 245e Expansion Module	1	Required, contains qty 1 AD565B and qty 1 AD566B
	AD564B #0D1	HP EML Capacity Expansion Module	2	Required
	252663-B24 #0D1	PDU, 16A High Voltage Modular -WW	1 or 2	1 Required Second Optional
	T3663A	EML Command View License	1	Required
Library Configure				

QuickSpecs

Overview

Choose drives	AH682A #0D1 AD568B #0D1	HP EML LTO-4 Ultrium 1840 FC Drive or HP EML LTO-3 Ultrium 960 FC Drive	1-8	Must be same drive type throughout for CTO
Choose Controller Card Quantity	AD567B #0D1 or AD569B #0D1	HP EML e2400-FC 2Gb Controller or HP EML e2400-FC 4Gb Controller	1	For EML libraries with LTO-4 Ultrium 1840 drives: 1 HP EML e2400-FC 2Gb Controller For LTO-3 Ultrium 960 libraries: 1 card (2Gb or 4Gb) for every 4 drives - must be same card type throughout for CTO
Choose Internal Network Kit	AJ001A #0D1	HP EML LTO-4 Ultrium 1840 Internal Network Kit	0 or 1	1 kit for each EML Library with LTO-4 Ultrium 1840 drive(s) (Not used with LTO-3 drives)
Choose Redundant Power Supply	AD563B #0D1	HP EML Redundant Power Supply	0 or 2	Optional
Additional Options				
EML Secure Manager	T3664A	Secure Manager Tape Library Software for EML	0-1	Optional

Product Highlights

Scalability (Investment Protection)

The HP StorageWorks Enterprise Modular Library provides investment protection as your environment grows and changes. With superb scalability, the EML can flexibly scale to 808 TB compressed (2:1) storage capacity or 13.8 TB/hr compressed (2:1) throughput performance from rack-ready or factory racked configurations. Additionally, certification under the Enterprise Backup Solutions (EBS) is a continuing process. As servers and HBAs continue to change, backup software packages evolve and improve, the EML E-Series tape library will expand its compatibility.

Manageability

HP StorageWorks Extended Tape Library Architecture will save library and SAN administrators time and money by simplifying library setup, configuration, and troubleshooting, increasing reliability and robustness of libraries in the SAN, integrating with leading enterprise management applications, and offering advanced features -- such as Access Control (EML Secure Manager) -- that further increases backup performance and reliability. HP offers a balanced solution - neither piece-meal nor monolithic - that includes a generous initial feature set and allows users to buy only the advanced options they need.

Reliability

As data becomes more and more mission critical, and downtime becomes more costly to the enterprise, customers are requiring high availability consolidated storage solutions which offer hot-plug components and redundancies of key operating subsystems (cooling fans and power supplies). With optional redundant power distribution and power supplies the HP StorageWorks EML Tape Libraries offer the best in high availability for continuous operation. The EML provides superior data availability with protection against SAN event disruptions (HP StorageWorks Extended Tape Library Architecture). Also, this library ensures heterogeneous SAN interoperability and solution support (Certified as an HP Enterprise Backup Solutions (EBS) and uses highly dependable HP Ultrium LTO tape drives designed for 24x7 operations.

Data Privacy

To greatly enhance data privacy, HP StorageWorks EML Tape Libraries are now available with LTO-4 Ultrium 1840 hardware encrypting tape drives for secure high performance backups meeting consortium specifications for LTO-4. HP Data Protector Software can enable the drive encryption and provide basic key management capabilities. Additional information regarding ISV's supporting hardware encryption is available on the HP StorageWorks Enterprise Backup Solutions (EBS) website at www.hp.com/go/ebs. The encryption on LTO-4 media occurs with or without compression, and without speed or capacity penalties. You can read LTO-2 and LTO-3 tapes, and write LTO-3 tapes, but hardware encryption is not supported in these formats.

LTO-4 uses the Advanced Encryption Standard (AES) with the longest and most secure keys -- 256 bits. AES-256 is implemented within Galois Counter Mode (GCM). This is a method of increasing AES security by efficiently adding Message Authentication Codes to ensure the integrity of the backup data stored on tape. The HP LTO-4 Ultrium 1840 Tape Drive is designed to be compliant with the emerging standard for tape drive security (IEEE 1619.1).

SKM: The HP StorageWorks Secure Key Manager reduces your risk of a costly data breach and reputation damage while improving regulatory compliance with a secure centralized encryption key management solution for HP LTO-4 enterprise tape libraries (EML & ESL). In addition, the SKM provides strong auditable security and reliable lifetime key archival. The SKM and LTO-4 drive encryption in the EML library provides a complete and secure privacy solution to protect customers' confidential data.

For further information on the SKM please visit:

http://h18006.www1.hp.com/products/storageworks/secure_key/index.html
<http://www.hp.com/go/dataencryption>

Product Highlights

Density HP StorageWorks EML E-Series Libraries exceptional density and integrate seamlessly into rack-grid data centers.

HP LTO Ultrium Technology HP StorageWorks LTO (Linear Tape Open) Ultrium Tape Drives use best of breed technology. By taking the best features from other tape technologies and combining them into a single new technology, Ultrium tape drives are in a league of their own. Inclusion of innovative features such as Adaptive Tape Speed (ATS) ensure that Ultrium drives can meet the performance and reliability demands of a library environment. LTO technology is an open industry standard format; thus data written on HP StorageWorks Ultrium Tape Drives can be interchanged directly with Ultrium Tape Drives from other vendors.

Data Rate Matching Data Rate Matching combines sophisticated buffer management with HP's exclusive Infinitely Variable Adaptive Tape Speed technology, to allow the tape drive to match its transfer rate to the host speed dynamically and continuously across the whole range of transfer rates. This feature ensures that the tape drive continues to stream data regardless of the environment, and brings two big advantages:

- It optimizes backup performance, regardless of the speed of the host or the network.
- It minimizes rewinding and repositioning of the tape, reducing wear and increasing reliability.

Mixed Media Extending the E-Series flexibility and investment protection, the HP StorageWorks EML E-Series tape libraries support mixing drive technology. Technologies included are LTO-4 Ultrium 1840 FC, LTO-3 Ultrium 960 FC, and LTO-2 Ultrium 460. One drive type can be specified for CTO and the other drive types must be field installed.

HP Ultrium Storage Media HP recommends that you use HP-branded cartridges in the HP EML E-Series Tape Libraries to assure the highest level of protection for your valuable data. The test program for HP media is the most thorough and comprehensive in the industry.

All HP cartridges must satisfy an exhaustive battery of additional tests that relate directly to real life situations, where real data and real businesses are at stake. The benefit of the HP brand specification for media is consistent quality. Through the testing of thousands of HP drives and HP cartridges, the ideal formulation for backup performance is defined and then continuously monitored. This hugely resource-intensive process is unique to HP and affords deep insight into the HP+HP backup solution for a wide range of environments and duty cycles. Your best choice for ease of support and maximum dependability is to use HP-branded Ultrium cartridges at all times.

HP strongly encourages the use of bar code labels on tapes to track media and ensure optimum library performance and usability. Correctly labeling your media will allow the library to quickly determine media and drive compatibility.

Product Highlights

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- Removable Magazines** The EML tape library comes standard with removable magazines in every load port. The magazines allow easy loading and unloading of media and are ideal for storage. Additional magazines are available for purchase (AD579A - 2 5-slot magazines)
-
- LTO-4 Ultrium 1840 FC Interface Controller** With LTO-4 Ultrium 1840 drives, HP delivers dual-port, native fibre SAN connectivity, while HP's Extended Tape Library Architecture (ETLA) continues to provide Secure Manager and partitioning features. One e2400-FC 2Gb interface controller is still needed and recommended for the robot. A e2400-FC 4Gb Interface Controller can be requested but is not needed for performance.
-
- LTO-3 Ultrium 960 FC Interface Controllers** As a key component of the Extended Tape Library Architecture, the Interface Controllers are integrated into the entire tape library solution. Similar to disk array controllers, the Interface Controllers provide the highest level of security, reliability, and broad interoperability for tape drives being connected into a storage area network. The EML tape libraries utilize the e2400-FC 2Gb and e2400-FC 4Gb Interface Controllers with Ultrium fibre channel tape drives. Each controller manages up to four tape drives and provides 2Gbit and 4Gbit FC connections to the SAN. (In effect, two drives per switch port) While you can mix controller types in the same library, only one controller type (e2400-FC 4Gb or e2400-FC 2Gb) may be ordered with factory integration. The other controller type must be field-installed.
-
- HP EML LTO-4 Ultrium 1840 Internal Network Kit** The purpose of the EML Internal Network Kit is to provide a private management network inside the library to connect the Interface Manager (IM) to the LTO-4 drives.

Software Components

Extended Tape Library Architecture (ETLA)

The HP StorageWorks Extended Tape Library Architecture (ETLA) will save library and SAN administrators time and money by simplifying library setup, configuration, and troubleshooting. HP's architecture increases reliability and robustness of libraries in the SAN, and integrates with leading enterprise management applications. Advanced features such as Access Control (HP StorageWorks Secure Manager) further increase backup performance and reliability. HP offers a balanced solution - neither piece-meal nor monolithic - that includes a generous initial feature set and allows users to buy only the advanced options they need.

The HP StorageWorks Interface Manager and Command View for Tape Libraries software are the next step in HP's Extended Tape Library Architecture, itself a key component of the HP Adaptive Infrastructure strategy. This architecture delivers tape libraries that are self-aware - self-managed, automatically maintained, continuously available - and network-aware - resilient, secure, and adaptable. HP's high-end tape libraries provide the reliability, interoperability, and advanced functionality required for your enterprise SAN environment.

NOTE: For more information please visit: <http://www.hp.com/go/ETLA>

Intelligent SAN-Aware Functionality

- Caching and intelligent network behavior to control SAN traffic
- Robust and automated configuration and verification of Interface Controller settings
- SAN-aware event tracking and detection of conflicts
- Persistent history and intelligent analysis of events and logs
- Persistent drive numbering and mapping across component swaps and reboot

Command View TL Web Interface Features

- Select from a list of multiple supported libraries to manage
- View asset information for the library system
- View health summaries for all components of the library system: drives, robotics, Interface Controllers, and Interface Manager
- View library inventory: slots, media, and drives
- Search for media by barcode label
- View details on drives, robotics, Interface Controllers, and Interface Manager, including WWNs, speeds, and connection types
- Configure hosts/HBA-to-drive mapping and masking settings with Secure Manager EML
- Automatically discover hosts and HBAs on the SAN or add your own for access control and security purposes
- Upgrade firmware on all library components
- Configure IP network parameters for the management station and Interface Manager cards in each library
- Configure SNMP trap/event destinations to receive alerts asynchronously
- View persistent event logs for the library system

Secure Manager EML

- Easily configure device-level security settings
- Allow only authorized servers to access tape drives and critical data
- Manage access control from a single pane of glass, through the library itself
- Library partitioning - Up to six "virtual" partitions available
- Paths to robotics can be separated between multiple independent SANs for isolation purposes

Software Components

HP Data Protector Software

HP Data Protector Software automates high performance backup and recovery, from disk or tape, over unlimited distances, to enable 24x7 business continuity and improve IT resource utilization. Data Protector Software responds to the pressure for lower IT costs and greater operational efficiency by offering acquisition and deployment costs which are 30 - 70 % less than competition. The license model is very simple and easy to understand, helping to reduce complexity. Extensive scalability and features for continuous backup and recovery operations enable growth with a single product. A superb solution, no other software can integrate better with the HP market-leading line of StorageWorks disk and tape family of products, as well as with other heterogeneous storage infrastructures. As an integral component of the fast-growing HP StorageWorks software portfolio, which includes storage resource management, archiving, replication, and device management software, Data Protector Software also fully integrates with the HP OpenView management solutions, allowing managing data protection as an essential element of an overall IT service. This solution offers the unique advantage of being able to source hardware, software, and award winning service offerings from a single, trusted source. Data Protector Software simplifies the use of complex backup and recovery procedures with the fastest installation, automated routine tasks, and easy-to-use features. The centralized multi-site management easily allows implementing multi-site changes, adapting in real time to changing business requirements. Appropriate for medium and large companies in any industry, Data Protector Software is the ideal solution to reduce IT costs and complexity while remaining reliable and scalable to grow from single server environments to the largest distributed enterprise infrastructures.

If you are using HP Data Protector Software with your EML tape library, a FREE 61-250 slot License-to-Use entitlement certificate is included in the box.

For further information, please visit our web page at <http://www.hp.com/go/dataprotector>

HP StorageWorks Library and Tape Tools (L&TT)

The EML Tape Library configurations are supported on HP's industry-leading diagnostic tool - HP StorageWorks Library and Tape Tools (L&TT). L&TT is a single, convenient program that's a snap to install and simple to operate. L&TT's intuitive user interface eliminates the need for training and deploys in less than five minutes. This robust diagnostic tool is designed for both the experienced professional and the untrained administrator. It ensures product integrity through self-diagnostics and fast resolution to device concerns. Additional information on L&TT plus download information can be found at: <http://www.hp.com/support/tapetools>.

Compatibility

HP's Enterprise Backup Solutions (EBS) assures that your HP StorageWorks Enterprise Modular Library (EML) E-Series works with leading servers, operating systems, and backup applications - and not just those sold by HP. Based on a foundation of extensive interoperability testing, EBS 1-2-3 provides a step-by-step methodology for designing, configuring, and implementing your SAN ensuring HP EML tape libraries work seamlessly in many environments. HP EML libraries are especially suitable if you have a mixed system environment. For the latest list of servers, workstations, operating systems, and backup software that support HP EML, check the tape backup compatibility pages on our web site at: <http://www.hp.com/go/ebs>.

HP Server Compatibility The HP StorageWorks EML Tape Libraries are supported on the following classes of HP systems:

- HP ProLiant servers
- HP-UX Servers
- HP AlphaServers

NOTE: For details of which models work with which systems, including third-party systems, visit <http://www.hp.com/go/ebs> for the latest hardware compatibility information.

OS Support The HP StorageWorks EML E-Series Tape Libraries are supported on many popular operating systems. For the most up-to-date information, please visit the Enterprise Backup Solutions (EBS) compatibility matrix at <http://www.hp.com/go/ebs>.

Software Support The HP StorageWorks EML E-Series Tape Libraries are supported on leading backup applications. For the most up-to-date information, please visit the Enterprise Backup Solutions (EBS) compatibility matrix at <http://www.hp.com/go/ebs>.

Service and Support, HP Care Pack, and Warranty Information

Warranty and Services Included with the Product EML Hardware: The warranty for this product consists of 1-year onsite, next business day.
NOTE: The HP EML Enterprise Tape Library warranty includes support for Customer Self Repair (CSR). The tape library cartridges, terminators, external cables, drives, magazines, controller board and power supplies are mandatory customer self repair parts. This means both the removal and replacement of the above parts are designed for easy replacement; the on-site warranty does not extend to these parts. However, customers may request HP Services to replace these replaceable units (RUs) for an additional charge. Also, customers who purchase an HP Support Agreement have the option to perform CSR or receive onsite support.

EML Software: HP provides 1-year, 9x5 phone support. HP also warrants that the Software media will be free of physical defects for a period of ninety (90) days from delivery.

For business-critical requirements, the level of support may be increased through a full range of upgrade products. You can learn more about HP's Global Limited Warranty and Technical Support by visiting: <http://h18006.www1.hp.com/products/storageworks/warranty.html>

Deployment and Per Event Service Descriptions HP Installation & Startup for HP StorageWorks Enterprise Modular Libraries

- Provides for the implementation of HP StorageWorks EML products in SAN environments (ESL/MSL service also available), including the installation of a Fibre Channel Interface Controller(s) and tape drive(s).
- Minimizes implementation-related disruptions to your environment and helps ensure increased system reliability and more effective data management

Due to the complexities involved with the initial installation of an enterprise Library into a SAN environment, Hewlett Packard highly recommends that a Hardware Implementation Service (HA114A1) is purchased. This service covers pre-installation preparation activities, installation and configuration of the library, drive(s), and interface controllers, Command View for EML license installation (if applicable), Secure Manager Software for EML license installation (if applicable), configuration of hosts (up to 5, additional handled via HA124A1 5B2 per additional 10) and switches, verification testing and customer orientation.

For more information please visit: http://www.hp.com/hps/storage/ns_info.html#related

Service and Support, HP Care Pack, and Warranty Information

Recommended Services

In order to maximize ROI and product uptime, and minimize the cost of ownership, Hewlett Packard recommends:

3 years 24 x 7 Hardware Support

- Guards against downtime, which reduces productivity and profitability
- Eases budget planning with fixed-cost support that includes parts and labor
- Direct access to proven technical and problem-solving expertise

3 years 24 x 7 Software Support

- Improve the productivity of system managers and operators
- Improve system performance and reduce downtime due to software defects
- Expedite problem resolution through expert-level technical resources
- Enjoy consistent service coverage across geographically dispersed sites
- Update HP and selected third-party software at a predictable cost
- Take advantage of subscription savings on software updates
- Keep your license compliancy up-to-date

HP Care Pack Information HP Care Pack Services offer upgraded service levels to extend and expand your standard product warranty with easy to buy, easy to use support packages that help you make the most of your hardware and software investments. They let you choose the support levels that meet your business requirements, from basic to mission-critical. They help you contain total cost of ownership.

HP Care Pack warranty extensions can be purchased along with HP products to cost-effectively upgrade or extend your warranty. For many products, post-warranty HP Care Pack Services are available when your original warranty has expired.

Why purchase an HP Care Pack service?

Your standard warranty protects against product defects. HP Care Pack Services help you guard against unplanned downtime, which can reduce your productivity and profitability. These convenient service packages:

- Protect your investment in HP products
- Provide consistent, predictable levels of support across your entire department or business
- Ease budget planning with fixed-cost support that includes parts and labor
- Give you direct access to proven technical and problem-solving expertise
- Offer a choice of response-time and repair-time commitments
- Deliver prompt, measurable results
- Are available whenever and wherever you do business

HP Care Pack availability may vary by country and product.

Supporting your Adaptive Enterprise journey

HP Services helps you make the Adaptive Enterprise real for your organization. The breadth, depth, and quality of HP hardware and software support services can help you **improve the performance** of your IT support processes and resolve the complex software and hardware problems that tax user productivity. HP Care Pack services help you **increase IT environment stability**, efficiency, and agility from the desktop to the data center, and improve the productivity of your employees.

Service and Support, HP Care Pack, and Warranty Information

Available HP Care Pack Services

Extend your product warranty with a wide choice of cost-saving support packages.

HP Care Pack Services are sold by HP and HP authorized enterprise and commercial resellers. Services for customers purchasing via direct and enterprise resellers are quoted using HP order configuration tools. Additional information about HP Care Pack Service features and benefits is available at <http://www.hp.com/hps/carepack/services/>.

Key for HP Care Pack Service availability in the table below:

E = Service available for customers purchasing direct and via enterprise resellers

C = Service available for customers purchasing via commercial resellers

N/A = Service not applicable

	HP Care Pack Services Deployment and Per Event Services	Service Available
HP Installation		E/C
HP Installation & Startup*		E/C
HP Implementation		N/A

* HP Installation is required and HP Installation & Startup is highly recommended for EML tape libraries.

	HP Care Pack Services Availability Services			
	1 yr	3 yr	4 yr	5 yr
HP Next Day Hardware Support	E/C	E/C	E/C	E/C
HP 4 Hr, 9x5 HW Support	N/A	N/A	N/A	N/A
HP 4 Hr, 13x5 Hardware Support	E/C	E/C	E/C	E/C
HP 4 Hr, 24x7 Hardware Support	E/C	E/C	E/C	E/C
HP 6 HR Call-to-Repair HW Support	E/C	E/C	E/C	E/C
HP Software Support	E/C	E/C	E/C	E/C
HP Software Support 24x7	E/C	E/C	E/C	E/C
HP Support Plus	E/C	E/C	E/C	E/C
HP Support Plus 24	E/C	E/C	E/C	E/C
HP Proactive Essentials 9x5, 10 SW Incidents	N/A	N/A	N/A	N/A
HP Proactive Essentials 9x5, 25 SW Incidents	N/A	N/A	N/A	N/A
HP Proactive Essentials 9x5 Unlimited	N/A	N/A	N/A	N/A
HP Proactive Essentials 24x7, 25 SW Incidents	N/A	N/A	N/A	N/A
HP Proactive Essentials 24x7, 50 SW Incidents	N/A	N/A	N/A	N/A
HP Proactive Essentials 24x7 Unlimited	N/A	N/A	N/A	N/A
HP Proactive 24 Service*	E/C	E/C	E/C	E/C
HP Critical Service*	E/C	E/C	E/C	E/C

* Both Proactive 24 & Critical Service only relate to 'reactive elements', work is ongoing to offer the 'proactive elements' in the near future (SW is supported separately per package).

Service and Support, HP Care Pack, and Warranty Information

Installation Services

Care Pack	Description	band
For the EML 71e configuration		
HA113A1	Tape Installation HW Installation Only	5KJ
HA114A1*	Tape Library Installation And Start Up	5KJ
For the EML 103e and 245e configurations		
HA113A1	Tape Installation HW Installation Only	5KF
HA114A1*	Tape Library Installation And Start Up	5KF
Additional EML 103e and 245e configurations**		
HA124A1	Each additional library on the same site	5B1
For add-on Tape Drive Installation		
HA113A1***	Subsequent Add-on Tape Drive Installation	5DU
For add-on Interface Controller Installation		
HA113A1	Subsequent Interface Controller Installation	5DP
For Command View for Tape Library and Secure Manager Installation		
HA113A1	Command View or Secure Manager Installation Into SAN	5J5
<p>* Installation and Start up (HA114A1) includes the installation of all subcomponents. i.e. If HA114A1 is ordered for the library no HA113A1 are needed for any component purchased at the same time as the library. The Installation and Start Up Service HA114A1 is highly recommended for the EML tape libraries but only Installation is required.</p> <p>** If the additional library is to be configured at a different site the customer must purchase an additional HA114A1.</p> <p>*** For add-on tape drive installation, HA113A1 5DU, the Internal Network Kit (AJ001A) is included in the installation of LTO-4 drives.</p>		

Support Services

Libraries

Care Pack	Description	EML 103e Configuration band	EML 245e Configuration band	EML 71e Configuration band
HA101A3	HW, "3-year", "next-day", "13x5", "on-site"	8XE	8XF	LTO-3 80P LTO-4 80Y
HA103A3	HW, "3-year", "4-hour", "13x5", "on-site"	8XE	8XF	LTO-3 80P LTO-4 80Y
HA104A3	HW, "3-year", "4-hour", "24x7", "on-site"	8XE	8XF	LTO-3 80P LTO-4 80Y
HA105A3	HW, "3-year", "6hr CTR", "24x7", "on-site"	8XE	8XF	LTO-3 80P LTO-4 80Y
HA106A3	SW, "3-year", "Phone-in", "9x5"	8XL	8XL	LTO-3 80P LTO-4 80Y
HA107A3	SW, "3-year", "Phone-in", "24x7"	8XL	8XL	LTO-3 80P LTO-4 80Y
HA109A3	HW Only, Support Plus, "3-year", "13x5"	8XE	8XF	LTO-3 80P LTO-4 80Y
HA110A3	HW Only Support Plus 24, "3-year", "24x7"	8XE	8XF	LTO-3 80P LTO-4 80Y

Service and Support, HP Care Pack, and Warranty Information

HA111A3	HW Only, Proactive 24, "3-year", "24x7"****	8XE	8XF	LTO-3 80P LTO-4 80Y
HA112A3	HW Only, Critical Service, "3-year", "24x7"****	8XE	8XF	LTO-3 80P LTO-4 80Y

Accessories and Components

Care Pack	Description	Drive band (AD568B or AH682A)	Interface Controller band (AD567B) or (AD569B)	Capacity Or Drive Expansion (AD564B or AD565B) band	Card Cage band (AD566B)	245e Expansion module band (AG112B)
HA101A3	HW, "3-year", "next-day", "13x5", "on-site"	LTO-3 LTO-4 80W	8SV	8XH	8SU	80G
HA103A3	HW, "3-year", "4-hour", "13x5", "on-site"	LTO-3 8G5 LTO-4 80W	8SV	8XH	8SU	80G
HA104A3	HW, "3-year", "4-hour", "24x7", "on-site"	LTO-3 8G5 LTO-4 80W	8SV	8XH	8SU	80G
HA105A3	HW, "3-year", "6hr CTR", "24x7", "on-site"	LTO-3 8G5 LTO-4 80W	8SV	8XH	8SU	80G
HA106A3	SW, "3-year", "Phone-in", "9x5"***	LTO-3 8G5 LTO-4 80W	NA	NA	NA	NA
HA107A3	SW, "3-year", "Phone-in", "24x7"***	NA	NA	NA	NA	NA
HA109A3	HW Only, Support Plus, "3-year", "13x5"***	LTO-3 8G5 LTO-4 80W	8SV	8XH	8SU	80G
HA110A3	HW Only Support Plus 24, "3-year", "24x7"***	LTO-3 8G5 LTO-4 80W	8SV	8XH	8SU	80G
HA111A3	HW Only, Proactive 24, "3-year", "24x7"****	LTO-3 8G5 LTO-4 80W	8SV	8XH	8SU	80G

Service and Support, HP Care Pack, and Warranty Information

HA112A3	HW Only, Critical Service, "3-year", "24x7"****	LTO-3 8G5 LTO-4 80W	8SV	8XH	8SU	80G
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NOTES:

* 6hr CTR 'standalone' service is not offered in Latin or North America.

** Software supported under this service is Command View for Tape Libraries Software or EML Secure Manager (SW support for each package purchased separately).

*** Support Plus covers 4hr H/W response (SW is supported separately per package).

**** Both Proactive 24 & Critical Service only relate to 'reactive elements', work is ongoing to offer the 'proactive elements' in the near future (SW is supported separately per package).

NOTE: HP Care Pack information quoted above relates to 3 year offerings only, 1yr, 4yr and 5yr packs are available for each offering (replace A3 with A1, A4, A5 respectively).

Due to the scalability of the product, service offerings match that of the purchase motion, i.e. support for the robotics, drives, interface controllers, drive expansions, card cage and software is purchased separately.

To find HP Care Pack Services available via HP authorized commercial resellers, visit http://h30125.www3.hp.com/csn/salesmktg/elfpack/elf_nonlkup_ctrylang.asp?code=ELNL

Services Example

Hardware/Software purchased: EML 245e configuration, 8 LTO-3 drives, 2 Interface Controllers, Command View for tape libraries software License and Secure Manager TL License

Desire HP installation and Start Up and 3yr 24x7 uplift

Services needed CTO Library:

HA114A1 5KF (Installation and Startup for Tape Library and all subcomponents)

HA104A3 8XE (EML 103e Base Library AG104B uplift)

HA104A3 80G (245e Expansion Module AG112B uplift)

8 x HA104A3 8G5 (LTO-3 drive uplifts)

2 x HA104A3 8SV (Interface Controller uplifts)

2 x HA107A3 8XL (Command View TL & Secure Manager uplifts)

Service and Support, HP Care Pack, and Warranty Information

eSupport

HP eSupport is a portfolio of technology-based services that assist you with managing your business environment - from the desktop to the data center.

Support Portal

The HP support portal provides one-stop access to the information, tools and services you need to manage the daily operations of your IT environment.

Features include:

- Access to self-solve tools (including search technical knowledge base)
- Efficient logging and tracking of support cases
- Collaboration with other business and IT professionals
- Download of patches and drivers
- Access to diagnostic tools
- Proactive notification of relevant information

Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit <http://www.hp.com/support>

HP Education Services

For more information about HP Education Services for Storage and SAN, visit <http://education.hp.com/curr-storsan.htm>

Additional Services Information

For more information about Deployment, Per Event, Consulting and Education services for HP Storage, visit: <http://www.hp.com/hps/storage/>

For more information about HP Care Pack Services for Storage, visit: http://www.hp.com/hps/carepack/storage/cp_networked.html

For more information about HP Storage Software, services and updates, visit: <http://h18006.www1.hp.com/storage/software.html>

If you have specific questions, contact your local HP representative. Contact information for a representative in your area can be found at "Contact HP" <http://www.hp.com>

Configuration Information

Step 1 "Product" Rack-ready Configuration (not shipped in a rack)

NOTE: The HP EML71e Tape Library comes standard as a rack-ready unit and includes a rack-mount hardware specifically designed for field installation in HP 10000 G1 or G2 series racks. It does NOT ship with a rack.

Model Name	Model Description:	
HP StorageWorks EML 71e LTO-4 Ultrium 1840 Tape Library	Two drive, 71 slot Ultrium cartridge tape library <ul style="list-style-type: none">• Supports up to 4 Fibre Channel Ultrium tape drives• 2 PCI card slots available• 5-slot load port with removable magazine	AH876A

What's included in the box:

- EML 71e Library, 8U and 4U height modules including rack-mount hardware
- Two LTO-4 Ultrium 1840 tape drives
- HP EML LTO-4 Ultrium 1840 Internal Network Kit, 1U height module includes rack-mount hardware
- e2400-FC 2Gb interface controller
- Includes full functionality special edition HP Command View Tape Library Software for EML71e only.
- Sample media labels (Ultrium 4, Ultrium 4 WORM, Ultrium 3, Ultrium 3 WORM)
- Installation poster
- Documentation CD including User Guide and parts replacement information
- Safety Guide
- Warranty booklet
- Two drive, 71 slot Ultrium cartridge tape library
- Supports up to 4 Fibre Channel Ultrium tape drives
- 2 PCI card slots available
- 5-slot load port with removable magazine

NOTE: The EML 71e LTO-4 Ultrium 1840 Tape Library (AH876A) height is 12U. An additional 1U height is required for the EML Internal Network Kit.

NOTE: This is not a Configure-to-Order (CTO) library. It does not ship with a rack. Configure in an HP 10000 G1 or HP 10000 G2 series rack. Can be field upgraded to other EML configurations, therefore assure the destination rack accounts for the maximum intended scaling.

HP StorageWorks EML 71e Library (LTO-3 Ultrium 960)	Two drive, 71 slot Ultrium cartridge tape library <ul style="list-style-type: none">• Supports up to 4 Fibre Channel Ultrium tape drives• 2 PCI card slots available• 5-slot load port with removable magazine	AH062A
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What's included in the box:

- EML 71e Library, 8U and 4U height modules including rack-mount hardware
- Two Ultrium 960 LTO3 tape drives
- e2400FC 4Gb interface controller
- Includes full functionality special edition HP Command View Tape Library Software for EML71e only.
- Sample media labels (Ultrium 4, Ultrium 4 WORM, Ultrium 3, Ultrium 3

Configuration Information

- WORM)
- Installation poster
- Documentation CD including User Guide and parts replacement information
- Safety Guide
- Warranty booklet

NOTE: The EML 71e LTO-4 Ultrium 1840 Tape Library (AH876A) height is 12U. An additional 1U height is required for the EML Internal Network Kit.

NOTE: This is not a Configure-to-Order (CTO) library. It does not ship with a rack. Configure in an HP 10000 G1 or HP 10000 G2 series rack. Can be field upgraded to other EML configurations, therefore assure the destination rack accounts for the maximum intended scaling.

Step 2 - Additional Options

Select each option with quantities specified.

Model Name	Model Description with Parts Shipped:	Quantity	Part Number
Secure Manager Tape Library Software for EML	Enables partitioning and access control of tape drives	1 per library	T3664A
HP EML 71e Licensed Capacity Upgrade	License to electronically expand EML71e capacity from 71 slots to 103 slots. Also includes permanent license for Command View for Tape Libraries Software	1 per library	AH063A

NOTE: If an EML71e is scaled/upgraded larger than the 12U 103-slot configuration then rack side panels and doors are required for regulatory compliance.

In the 42U HP 10K G2 rack:
Front door: supplied with rack, AF009A
Rear Door: supplied with rack
Side panel kit: AF054A

In the 42U HP 10K G1 rack:
Front Door: supplied with rack
Rear Door: supplied with rack
Side panel Kit: 246099-B21

NOTE: End of configuration steps for rack-ready EML71e

Configuration Information

Step 1 - "Product" - Base Configuration (CTO Factory racking)

Select one:

Model Name:	Model Description:	AG104B
HP EML 103e Base Tape Library	Zero drive, 103 slot Ultrium cartridge tape library <ul style="list-style-type: none"> ● Supports up to 4 Fibre Channel Ultrium tape drives ● 2 PCI card slots available ● 5-slot load port with removable magazine 	

What's included in the box:

- EML 103e Base Library integrated in 42U rack with side and filler panels
- Sample media labels (Ultrium 4, Ultrium 4 WORM, Ultrium 3, Ultrium 3 WORM)
- Installation poster
- Documentation CD including User Guide and parts replacement information
- Safety Guide
- Warranty booklet

NOTE: All EML Configure-to-Order (CTO) libraries are built on this base including the 103e, 245e, 348e, 375e, 442e, 469e, and 505e configurations.

Step 2 - Required Options

Select each required option with quantities specified.

Model Name	Model Description with Parts Shipped:	Quantity	Part Number
HP EML 245e Expansion Module	Contents: <ul style="list-style-type: none"> ● Allows for the expansion from 103 to 245 slots and up to eight tape drives ● Only to be used with CTO library orders ● For field upgrades instead order 1 AD565B and 1 AD566B. <p>NOTE: #0D1 will appear after this part number on your sales order when factory integration is indicated.</p>		AG112B
Power Distribution Unit	16A Power Distribution Unit with two extension bars <p>NOTE: Country specific power cord required</p> <p>NOTE: The 103, 245, 375 and 505 slot tape libraries require 1 total per unit (second optional). The 348, 442 and 469 slot tape libraries require 2 total per unit because they contain an extra 4-Drive Expansion Module.</p> <p>NOTE: #0D1 will appear after this part number on your sales order when factory integration is indicated.</p>	1-2 per library	252663-B24
EML E-Series LTO-4 Ultrium 1840 FC Drive Kit	Contents: <ul style="list-style-type: none"> ● HP LTO-4 Ultrium 1840 Fibre Channel tape drive integrated in EML canister ● Installation poster 	1 to 16 drives	AH682A

Configuration Information

EML E-Series LTO-3 Ultrium 960 FC Drive Upgrade Kit	<p>NOTE: #0D1 will appear after this part number on your sales order when factory integration is indicated.</p> <p>Contents:</p> <ul style="list-style-type: none"> ● HP LTO-3 Ultrium 960 Fibre Channel tape drive integrated in EML canister ● 2m Fibre Channel Cable ● Installation poster 	1 to 16 drives	AD568B
e2400-FC 2Gb for EML	<p>NOTE: #0D1 will appear after this part number on your sales order when factory integration is indicated.</p> <p>Contents:</p> <ul style="list-style-type: none"> ● e2400-FC 2Gb interface controller ● Installation poster <p>NOTE: #0D1 will appear after this part number on your sales order when factory integration is indicated.</p>	<p>For EML libraries with LTO-4 Ultrium 1840 drive(s): 1 HP EML e2400-FC 2Gb Controller</p>	AD567B
e2400-FC 4Gb for EML	<p>Contents:</p> <ul style="list-style-type: none"> ● e2400-FC 4Gb interface controller ● Installation poster <p>NOTE: #0D1 will appear after this part number on your sales order when factory integration is indicated.</p> <p>NOTE: When connecting e2400-FC 4G interface controllers to the SAN disable auto speed negotiation of the fibre channel switch ports connected to the controller. The switch ports should be fixed at 1Gb/s, 2Gb/s or 4Gb/s as described in the switch documentation</p>	<p>For EML libraries with LTO-3 Ultrium 960 drive(s): 1 card for every 4 drives</p>	AD569B
HP EML LTO-4 Ultrium 1840 Internal Network Kit	<p>Content:</p> <ul style="list-style-type: none"> ● Internal LAN Switch ● Cable ● Installation poster 	1 kit for each EML Library with LTO-4 Ultrium 1840 drive(s)	AJ001A
Command View for Tape Libraries Software	<p>Contents:</p> <ul style="list-style-type: none"> ● License to use Command View for EML 	1 per library	T3663A

Configuration Information

Step 3 - Additional Options

Select each option with quantities specified.

Model Name	Model Description with Parts Shipped:	Quantity	Part Number
HP EML 4-Drive Expansion Module	Adds 4 drive bays. See capacity matrix below for capacity in various configurations HP installation included via MCC Code NOTE: #OD1 will appear after this part number on your sales order when factory integration is indicated.	Up to 3	AD565B
HP EML Capacity Expansion Module	See capacity matrix below for capacity in various configurations HP installation included via MCC Code NOTE: #OD1 will appear after this part number on your sales order when factory integration is indicated.	Up to 2	AD564B
EML Card Cage Module	NOTE: only use the card cage module when expanding to more than 4 drives. NOTE: card cage module includes redundant power supply capability HP installation included via MCC Code	1	AD566B
Redundant Power Supply for EML	NOTE: EML Card Cage module includes redundant power supplies - no additional power supply is required for that module. NOTE: #OD1 will appear after this part number on your sales order when factory integration is indicated.	1 per module	AD563B
Additional Power Distribution Unit	16A Power Distribution Unit with two extension bars NOTE: Country specific power cord required NOTE: This optional redundant Power Distribution Unit for 103, 245, 375 and 505 slot libraries is not factory integrated (not CTO).	1 per library	252663-B24
Spare Magazines for EML	Contains: <ul style="list-style-type: none">• 2 5-slot magazines		AD579A
Secure Manager Tape Library Software for EML	Enables partitioning and access control of tape drives	1 per library	T3664A

Capacity Matrix (CTO)

NOTE: EML 71e is not a CTO configuration but can be upgraded at the customer site

Configuration Information

Configuration/Slots	Modules required using EML 103e Base Tape Library	Product height within rack	# drives possible
103e/103 Base	<ul style="list-style-type: none"> HP StorageWorks EML 103e Base Tape Library (AG104B) 	12U + 1U (LTO-4)* 12U (LTO-3)	1-4
245e/245	<ul style="list-style-type: none"> HP StorageWorks EML 103e Base Tape Library (AG104B) HP EML 245e Expansion Module (AG112B #0D1) for factory install HP EML 4-Drive Expansion Module (AD565B) and EML Card Cage Module (AD566B) for field install 	24U + 1U (LTO-4)* 24U (LTO-3)	1-8
348e/348	<ul style="list-style-type: none"> HP StorageWorks EML 103e Base Tape Library (AG104B) HP EML 245e Expansion Module (AG112B #0D1) HP EML 4-Drive Expansion Module (AD565B #0D1) [Qty1] 	32U + 1U (LTO-4)* 32U (LTO-3)	1-12
375e/375	<ul style="list-style-type: none"> HP StorageWorks EML 103e Base Tape Library (AG104B) HP EML 245e Expansion Module (AG112B #0D1) HP EML Capacity Expansion Module(AD564B #0D1) [Qty1] 	32U + 1U (LTO-4)* 32U (LTO-3)	1-8
442e/442 Maximum Performance	<ul style="list-style-type: none"> HP StorageWorks EML 103e Base Tape Library (AG104B) HP EML 245e Expansion Module (AG112B #0D1) HP EML 4-Drive Expansion Module(AD565B #0D1) [Qty2] 	40U + 1U (LTO-4)* 40U (LTO-3)	1-16
469e/469	<ul style="list-style-type: none"> HP StorageWorks EML 103e Base Tape Library (AG104B) HP EML 245e Expansion Module (AG112B #0D1) HP EML 4-Drive Expansion Module(AD565B #0D1) [Qty1] HP EML Capacity Expansion Module(AD564B #0D1) [Qty1] 	40U + 1U (LTO-4)* 40U (LTO-3)	1-12
505e/505 Maximum Capacity	<ul style="list-style-type: none"> HP StorageWorks EML 103e Base Tape Library (AG104B) HP EML 245e Expansion Module (AG112B #0D1) HP EML Capacity Expansion Module(AD564B #0D1) [Qty2] 	40U + 1U (LTO-4)* 40U (LTO-3)	1-8

* For all EML library configurations with LTO-4 Ultrium 1840 drive(s), an additional 1U height is required for the EML Internal Network Kit.

Related Options

Media	HP LTO4 Ultrium 1.6TB RW Data Cartridge (1 pack)	C7974A	
	HP LTO4 Ultrium 1.6TB WORM Data Cartridge (1 pack)	C7974W	
	HP Ultrium 800GB RW Data Cartridge (1 pack)	C7973A	
	HP Ultrium 800GB WORM Data Cartridge (1 pack)	C7973W	
	HP Ultrium 400GB data cartridge (1 pack)	C7972A	
	HP Ultrium Universal Cleaning Cartridge (1 pack)	C7978A	
	HP LTO4 Ultrium RW Bar Code Labels (100 pack)	Q2009A	
	HP LTO4 Ultrium WORM Bar Code Labels (100 pack)	Q2010A	
	HP Ultrium 3 RW Bar Code Labels (100 pack)	Q2007A	
	HP Ultrium 3 WORM Bar Code Labels (100 pack)	Q2008A	
	HP Ultrium 2 Bar Code Labels (100 pack)	Q2002A	
	Non-Custom Labeled Data Cartridges		
	NOTE: Non-Custom labels will come pre-labeled with a pre-determined number sequence.		
	HP LTO4 Ultrium 1.6TB RW Non-Custom Labeled Data Cartridge (20 pack)	C7974AN	
HP Ultrium 800GB RW Non-Custom Labeled Data Cartridge (20 pack)	C7973AN		
HP Ultrium 400GB Non-Custom Labeled Data Cartridge (20 pack)	C7972AN		
HP Ultrium 200GB Non-Custom Labeled Data Cartridge (20 pack)	C7971AN		
Custom labeled Data Cartridges			
NOTE: Custom labeled products allow customers to customize a specific sequence printed on each label.			
HP LTO4 Ultrium 1.6TB RW Custom Labeled Data Cartridge (20 pack)	C7974AL		
HP LTO4 Ultrium 1.6TB WORM Custom Labeled Data Cartridge (20 pack)	C7974WL		
HP Ultrium 800GB RW Custom Labeled Data Cartridge (20 pack)	C7973AL		
HP Ultrium 800GB WORM Custom Labeled Data Cartridge (20 pack)	C7973WL		
HP Ultrium 400GB Custom Labeled Data Cartridge (20 pack)	C7972AL		
HP Ultrium 200GB Custom Labeled Data Cartridge (20 pack)	C7971AL		
Media Kits			
HP Ultrium 200 GB Storage Media Kit	C8013A		
HP Ultrium 400 GB Storage Media Kit	C8014A		
NOTE: Kit includes 20 data cartridges, one cleaning cartridge, 20 colored labels, a protective carrying case that can be used to securely store or transport data cartridges, one copy of "The Essentials of Successful Tape Backup," and one copy of HP StorageWorks Data Protector Express Evaluation Software (60 day free trial).			

HP StorageWorks Command View for Tape Libraries Software	Permanent License (per library) for Command View EML	T3663A
	NOTE: Please reference the Extended Tape Library Architecture QuickSpecs for more information at http://www.hp.com/go/etla	
NOTE: Only the EML71e is bundled with full use special edition HP Command View Tape Library Software. A permanent license is granted upon capacity upgrade purchase.		

Related Options

HP StorageWorks Secure Manager Tape Library Software for EML Permanent (per library) License for Secure Manager EML T3664A
NOTE: Please reference the Secure Manager QuickSpecs for more information at <http://www.hp.com/go/etla>

Host Bus Adapters and Controllers for ProLiant Servers **NOTE:** For a complete list of supported HBA's, please visit: <http://www.hp.com/go/ebs>.

Host Bus Adapters and Controllers for Alpha Servers **NOTE:** For a complete list of supported HBA's, please visit: <http://www.hp.com/go/ebs>.

Fibre Channel Cables **NOTE:** Additional Fibre Channel Cables are needed. Order Two cables per Interface Controller, and Two cables per LTO-4 tape drive, selecting cable length and converter type to match the appropriate environment.

2m SW LC/SC FC Cable Kit	221691-B21
5m SW LC/SC FC Cable Kit	221691-B22
15m SW LC/SC FC Cable Kit	221691-B23
2m SW LC/LC FC Cable Kit	221692-B21
5m SW LC/LC FC Cable Kit	221692-B22
15m SW LC/LC FC Cable Kit	221692-B23

Power Cord **NOTE:** THIS PRODUCT CAN ONLY BE USED WITH AN HP APPROVED POWER CORD FOR THE CUSTOMER'S SPECIFIC GEOGRAPHIC REGION.

WARNING: Use of a non-HP approved power cord may result in (1) use of a power cord that does not meet individual country specific safety requirements; (2) a power cord with insufficient conductor ampacity that could result in overheating with potential personal injury and/or property damage; and/or (3) an unapproved power cord could fracture resulting in the internal contacts being exposed which potentially could subject the user to a shock hazard. Use ONLY an HP approved power cord for your particular country. HP disclaims all liability in the event a non-HP approved power cord is used.

HP Power Cord, North America and Japan, NEMA L6-20P Plug	340653-001
HP Power Cord, Universal PDU, C20 Plug	E7804A
HP Power Cord, Custom Applications, No Plug	E7806A
NOTE: This power cord should only be installed by a qualified electrician	
HP Power Cord, Europe, IEC309 Plug	AF581A
HP Power Cord, Europe, CEE 7/7 Plug	AF576A
HP Power Cord, China, GB16C Plug	AF584A
HP Power Cord, Israel, C-19 straight 2.5 meter length Plug	AF583A
HP Power Cord, Brazil, AR20S Plug	AF586A

Technical Specifications

Dimensions	Form Factor	Free standing			
		NOTE: EML71e is shipped as a rack-ready/rack-mount, all other configurations are shipped integrated into a Free standing rack			
	Configuration	EML 71e	EML 103e	EML 442e	EML 505e
	Physical (HxWxD)	20.8 x 19 x 32.8 in (52.8 x 48.3 x 83.3 cm)	89.96 x 24 x 39.691 in (199.9 x 60.96 x 100.82 cm)	89.96 x 24 x 39.691 in (199.9 x 60.96 x 100.82 cm)	89.96 x 24 x 39.691 in (199.9 x 60.96 x 100.82 cm)
	Shipping (HxWxD)	59.5 x 24.5 x 36.5 (151.1 x 62.2 x 92.7 cm)	95.47 x 32 x 48 in (242.49 x 81.28 x 121.92 cm)	95.47 x 32 x 48 in (242.49 x 81.28 x 121.92 cm)	95.47 x 32 x 48 in (242.49 x 81.28 x 121.92 cm)
Weight	Out of box (16 drives)	144 lbs (65.5 kg)	433 lbs (196.4 kg)	729 lb (330.7 kg)	644 lbs (292.1 kg)
	Shipping (16 drives)	225 lbs (102.1 kg)	606 lbs (274.5 kg)	902 lb (409.1 kg)	817 lbs (370.2 kg)
Control Panel	Touch Screen GUI				
Host Interface	Fibre Channel, 4Gb/2Gb/1Gb Multi-mode optical, LC connector				
Management Interface	10/100 Ethernet				
Drive Performance		LTO-4 Ultrium 1840 FC	LTO-3 Ultrium 960 FC		
	Native Capacity	800 GB	400 GB		
	Native Transfer Rates	120 MB/s	80 MB/s		
Storage Capacity	Configuration	EML 71e	EML 442e	EML 505e	
	Number of Slots	71	442	505	
	Number of drive bays	4	16	8	
	Native Capacity	56.8 TB (LTO4)	353.6 TB (LTO4)	404 TB (LTO4)	
		28.4 TB (LTO3)	176.8 TB (LTO3)	202 TB (LTO3)	
	Compressed Capacity	113.6 TB (LTO4)	707.2 TB (LTO4)	808 TB (LTO4)	
56.8 TB (LTO3)		353.6 TB (LTO3)	404 TB (LTO3)		
Loadport		5 configurable slots: 1 5-slot magazine	35 configurable slots: 7 5-slot magazines	35 configurable slots: 7 5-slot magazines	
Initialization (cartridge inventory) time	A 24U configuration will take less than 18 minutes with bar code labels required, less than 30 minutes with no bar code labels required.				
Cartridge Swap Time	The average exchange time will be less than 36 seconds The worst case exchange time (without errors) will be less than 45 seconds				
Input Requirements	200-240VAC				
Drives Supported	HP LTO-4 Ultrium 1840 Fibre Channel Tape Drives HP LTO-3 Ultrium 960 Fibre Channel Tape Drives				
Maximum Number of Drives	16 Ultrium Tape Drives				
Reliability (Library Only)	2 million MSBF				
Acoustic Noise	Sound power	7.6 Bels			
	Bystander sound pressure	64 dba			

Technical Specifications

Worldwide Product Safety & EMC Approvals	Safety	IEC 60950
	EMC	CISPR 22/class A , CISPR 24
	Country Regulatory Compliance	For country specific compliance contact your local sales representative
Regulatory Model Number	LVLDC-0401	
Temperature Range	Operating	10°C to 35°C
	Transportation	-40°C to 60°C
Relative Humidity (non-condensing)	20% to 80 %	
Voltage Requirement	200 - 240 Volts AC 50 - 60 Hz	
Current Rating (4-drive)	4 Amps	
Typical power (4-drive)	250 Watts	
12u base module	100w	340 Btu/hr
4u card cage module	70w	240 Btu/hr
8u drive module	35w	120 Btu/hr
LTO-4 Ultrium 1840 tape drive	20w	70 Btu/hr
LTO-3 Ultrium 960 tape drive	20w	70 Btu/hr
Ultrium 1840/960 reading and writing add	15w	60 Btu/hr
Redundant Power Supply	30w	100 Btu/hr
Altitude	10,000 ft. (3000 m)	

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For tape drives and media, 1 GB = 1 billion bytes. Actual formatted capacity is less.